



Conditional Letter of Map Revision and Letter of Map Revision

Las Vegas Wash - Sloan Channel to Bonanza Road and Flamingo Wash - Below I-515

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 21 SOUTH, RANGE 61 EAST AND TOWNSHIP 21 SOUTH, RANGE 62 EAST.

Prepared for



CH2MHILL®
Stanley Consultants INC.



August 2013

Conditional Letter of Map Revision *and* Letter of Map Revision

Las Vegas Wash - Sloan Channel to Bonanza Road and Flamingo Wash - Below I-515



VEG080613204111LAS

Prepared for



Prepared by

CH2MHILL
Stanley Consultants INC.

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Introduction

The purpose of this request for a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) is to analyze and address needed revisions to the current flood zones within the Las Vegas Watershed and Flamingo Wash Watershed in Clark County, Nevada and the City of Las Vegas, Nevada (Clark County). This CLOMR is provided to address the proposed modification of the existing Zone AE and Zone A flood zones along the Las Vegas Wash, between Bonanza Road and the confluence of the Las Vegas Wash and the Sloan Channel, as well as the Zone A flood zone along the Flamingo Wash, between the confluence with the Las Vegas Wash and Nellis Boulevard. The LOMR is provided to address the proposed modification of the existing Zone A flood zone along the Flamingo Wash, between Nellis Boulevard and US-95/I-515. This analysis provides documentation to demonstrate that the proposed and existing channel improvements will contain the 100-year flood event and the post-improvement condition will no longer warrant a portion of the flood zone delineations shown on the existing FIRM Panels dated November 16, 2011. Refer to Figure 1 in Appendix B for an overall view of the Project Area and where it is in relation to the Las Vegas Valley.

The project facilities would be located in the Las Vegas Wash drainage, from Bonanza Road, continuing to the south to the existing concrete-lined confluence with the Sloan Channel, approximately 1,100 feet east of Sloan Lane. Proposed project facilities are also located in the Flamingo Wash drainage, immediately downstream of Nellis Boulevard and continuing to the confluence with the Las Vegas Wash. Improvements that have recently been constructed, as part of the Las Vegas Valley Master Plan, in the Flamingo Wash drainage from US-95/I-515 to Nellis Boulevard are included as a LOMR request with the CLOMR to update the flood zone along the upstream reach of the Flamingo Wash.

The upstream portion of the Las Vegas Wash project, between Bonanza Road and Nellis Boulevard, consists of an existing partially improved channel section within an approximately 150-foot wide right-of-way that includes some sections of riprap or concrete slope lining and articulated concrete block on the channel invert. There is an existing 66-inch sanitary sewer facility along the west side of the channel that will be protected in place with the channel improvements. The four existing bridges along this upper reach, Bonanza Road, Stewart Avenue, Charleston Boulevard, and Nellis Boulevard have dissimilar conveyance capacities. The project improvements begin just downstream of Bonanza Road, with a transition from the existing partially improved wash section to a 80-foot wide rectangular reinforced concrete flood channel. The wall heights of the channel will vary to provide for hydraulic capacity, freeboard, and a bench for the existing and future trail facilities and maintenance access. A concrete confluence structure will be constructed just downstream of the existing Cedar Avenue trapezoidal concrete channel. The channel width increases to 90 feet at this location. The Stewart Avenue Bridge will be protected in place, with the channel lining constructed below the structure. The 90-foot wide rectangular channel continues downstream to a transition just north of Charleston Boulevard. The capacity of the Charleston Boulevard Bridge will be increased by lowering the existing invert of the wash, approximately five feet, and transitioning to 100-foot wide rectangular reinforced concrete flood channel. These improvements will protect the existing 51-inch sanitary sewer that is attached to the underside of the bridge structure and eliminate overtopping of the bridge, which currently happens during storm events. The 100-foot wide concrete channel continues downstream to Nellis Boulevard with a transition to an 85-foot wide rectangular reinforced concrete flood channel. Between Charleston Boulevard and Nellis Boulevard, flow will be collected from two tributary facilities, an existing reinforced concrete box at Colorado Avenue, and the existing trapezoidal concrete channel along Nellis Boulevard. The Nellis Boulevard Bridge will also be protected in place with the channel lining

underneath the bridge structure, approximately eight feet lower than the invert of the existing wash. The 85-foot wide concrete channel continues downstream to the Desert Rose Golf Course.

The middle portion of the project consists of improvements on the Las Vegas Wash and the Flamingo Wash, between Nellis Boulevard and just west of Sloan Lane. This section of the project is located within the existing Desert Rose Golf Course. Due to the significant increase in right-of-way, approximately 450-foot to 575-foot wide, a grass-lined channel section with varying cross-section will accommodate the flood events and the golf course layout. The existing flood conveyance capacity of the golf course section is undersized and does not convey the entire 100-year storm event flow within the public right-of-way. In order to increase the conveyance capacity, the golf course will be regraded and reconfigured by dropping the invert of the channel, between three to ten feet lower than the existing wash invert, and increasing the cross slopes to keep flow toward the center of the right-of-way. The capacity of the channel at the Sahara Avenue Bridge will be increased by removing the existing bridge and constructing a new, larger bridge, 230-feet long, with an invert nine feet lower than existing bridge invert. Three existing golf cart bridges will either be relocated or replaced to entirely span the 100-year storm event flood channel, and provide over two feet of freeboard. An existing 8-foot wide concrete low-flow channel conveys the nuisance flow in the Las Vegas Wash; this system will be replaced with a 20-foot wide reinforced concrete low-flow channel through the golf course. The nuisance flow on the Flamingo Wash will also be conveyed in a reinforced concrete low-flow channel through the golf course. The existing storm drain pipe that conveys the Flamingo Wash nuisance flow through the golf course will be removed to allow for the wider channel section. The Flamingo Wash invert will also be lowered between two to ten feet to add conveyance capacity. The typical channel section for the Las Vegas and Flamingo Washes through the golf course is a 50-foot bottom width trapezoidal grass-lined channel with maximum side slopes of 3:1 to 4:1 (horizontal:vertical).

The downstream portion of the project, between the confluence of the Las Vegas Wash and the Flamingo Wash and the existing concrete lined Sloan Channel confluence, consists of a partially improved channel section within an approximately 300-foot right-of-way that includes reinforced concrete slope lining on the north bank of the channel and areas of riprap and crushed concrete rubble protection on the channel invert and south bank. This portion of the wash will be improved and widened with a 120-foot bottom width trapezoidal reinforced concrete channel with 2:1 SS from the Flamingo Wash confluence to the existing trapezoidal concrete channel at the Sloan Channel confluence.

The project's intent is to improve four miles of existing flood control facilities through an urban corridor within existing public right-of-way to convey the 100-year storm event flows as presented in the 2011 Flood Insurance Study, which was based on the 2008 Flood Hazard Mapping Restudy and increase flood protection to the surrounding private and commercial developments. The proposed improvements will also prevent erosion and scour to the channel and banks, as well as protect the bridge structures at Stewart Avenue, Charleston Boulevard, and Nellis Boulevard, the Cedar Avenue pedestrian bridge, the proposed Charleston pedestrian bridge, the Nellis Boulevard pedestrian bridge, and the proposed cart path bridges in the golf course.

Hydrology

2.1 Las Vegas Wash

The hydrologic analysis approved in the 2011 Flood Insurance Study update, Table 3, and the 2008 Flood Hazard Mapping Restudy – Summary of Existing Flows for Las Vegas Wash was used for the hydraulic analysis performed for this CLOMR request. The 2008 Restudy is the basis for the 11/16/2011 Flood Insurance Study update. An excerpt from the 2008 Flood Hazard Mapping Restudy, including a complete summary table of flowrates throughout the Las Vegas Wash reach has been included in Appendix E. The applicable flowrates used for this CLOMR analysis are shown in Table 2.1.1 below, flowrates from the FIS are also identified.

TABLE 2.1.1
FEMA 100-YEAR FLOOD FLOWRATE SUMMARY FOR THE LAS VEGAS WASH

Concentration Point*	Location	Area (sq. mi.)	FEMA Hydrologic Model Name	100-Year Peak Discharge
10	Bonanza Road	65.7	MPU1	11,948
11	Cedar Avenue Channel	67.5	MPU1	12,706
12	Stewart Avenue	68.0	MPU1	12,754**
13	Charleston Boulevard	73.0	MPU1	13,326
14	Nellis Boulevard	74.3	MPU1	13,515**
15	Christy Lane	76.9	MPU1	13,861
16	Sahara Avenue	77.3	MPU1	13,861
17	Flamingo Wash	124.4	MPU6	18,601
18	Sloan Lane	125.4	MPU1	18,672**
19	Vegas Valley Drive	126.3	MPU1	18,718

^a Refer to Figure FS-4 from the Flood Hazard Mapping Restudy located in Appendix E.

** Flow listed in Table 3 of the 2011 Flood Insurance Study.

2.2 Flamingo Wash

The hydrologic analysis approved in the 1997 Flood Insurance Study Restudy for the Flamingo Wash is the regulatory discharge and was used for the hydraulic analysis performed for this CLOMR request. An excerpt from the Flood Insurance Study Restudy, including a complete summary table of flowrates throughout the Flamingo Wash reach has been included in Appendix E. The applicable flowrates used for this CLOMR analysis are shown in Table 2.2.1 below.

TABLE 2.2.1
FEMA 100-YEAR FLOOD FLOWRATE SUMMARY FOR THE FLAMINGO WASH

Concentration Point	Location	Area (sq. mi.)	FEMA Hydrologic Model Name	100-Year Peak Discharge
F22	Boulder Highway	55.59	Central	6,300
F23	Nellis Blvd./Las Vegas Wash	57.51	Central	6,400

Hydraulics

3.1 Las Vegas Wash

Hydraulic modeling of the Las Vegas Wash was performed using the U.S. Army Corp of Engineers' River Analysis System (HEC-RAS), Version 4.1.0 and conforms to the local standards as specified in the CCRFCD Hydrologic Criteria and Drainage Design Manual. The following is a summary of the models included with this request.

3.1.1 Pre-Project Conditions

The project area along the Las Vegas Wash was previously analyzed as part of the Floodplain Hazard Mapping Restudy in 2008. This mapping utilized HEC-RAS, Version 3.1.3. The effective model from the 2008 Restudy was truncated for this analysis to eliminate the portions of the analysis significantly outside the vicinity of the project improvements. As discussed above, the flows used for modeling the existing channel were taken from the Summary of Existing Flows for Las Vegas Wash – Flood Hazard Mapping Restudy. Cross sections are generally spaced at 200 foot increments and are based on the mapping provided for the 2008 Restudy. The cross section locations were moved to the project coordinates and analyzed in HEC-RAS, Version 4.1.0. The Pre-Project Conditions HEC-RAS model, *LVWashEX.prj*, is included in Appendix C. Figure 5.1 shows the limits of the Pre-Project 100-year special flood hazard area, Zone AE and Zone A. The breakout flows from the Las Vegas Wash identified in the 2008 Restudy were not analyzed with this project and were accepted as shown.

3.1.2 Post-Project Conditions

The proposed channel facilities along the Las Vegas Wash include a reinforced concrete channel and grass-lined channel that will convey the 100-year flood flows from Bonanza Road to the existing reinforced concrete lining at the Sloan Channel. The stream centerline was adjusted from the Pre-Project conditions to follow the centerline of the proposed improvements. Cross sections were added at grade breaks and geometric changes in the reinforced concrete channel. Additional cross sections were also added in the Desert Rose Golf Course to more accurately model the varying channel sections within the grass-lined channel. Flow conditions at the upstream and downstream cross sections are consistent between the Pre- and Post-Conditions analysis. The Post-Project Conditions HEC-RAS analysis, *LVWashPost.prj*, showing that the improvements will collect and convey the entire 100-year flood flow, is included in Appendix C. With the flows contained in the Las Vegas Wash, the breakout flows along this reach are entirely eliminated.

3.2 Flamingo Wash

Hydraulic modeling of the Flamingo Wash was also performed using HEC-RAS, Version 4.1.0 and conforms to the local standards as specified in the CCRFCD Hydrologic Criteria and Drainage Design Manual. The following is a summary of the models included with this request.

3.2.1 Corrected Effective Model

The Corrected Effective model for this study is compiled with reference to the approved Request for Letter of Map Revision Flamingo Wash Channel Improvements Phase III, Boulder Highway to I 515, prepared by PBS&J, Case No. 07-09-1642P, effective November 20, 2007 and the Request for Letter of Map Revision Flamingo Wash Mojave Road to Boulder Highway, prepared by The Louis Berger Group, Inc., Case No. 04-09-0166P, effective March 12, 2004. As part of the LOMR by The Louis Berger Group, the elevations for the HEC-2 FIS model were adjusted by a factor of 2.26 feet from the National Geodetic Vertical Datum of 1929 (NGVD29) to the North American Vertical

Datum of 1988 (NAVD88). The Louis Berger Group truncated the converted 1997 FIS model to eliminate irrelevant sections from their project vicinity and converted the truncated cross sections from HEC-2 to HEC-RAS. The Louis Berger Group then modified the sections to include the improvements from Mojave Road to Boulder Highway. PBS&J updated the sections with the channel modifications from Boulder Highway to I-515.

For this study the downstream cross sections were converted from HEC-2 to HEC-RAS and added to the model to reproduce the 1997 FIS conditions at the NAVD88 datum, with channel improvements in place from I-515 to the downstream section near the confluence of the Flamingo Wash with the Las Vegas Wash in the Desert Rose Golf Course. The referenced HEC-2 model and HEC-RAS models are provided on the Data CD in Appendix F. The Corrected Effective HEC-RAS model, *FlamWashEX.prj* is included in Appendix D.

3.2.2 Pre-Project Conditions

Clark County Public Works (CCPW) completed a Capital Improvement Project in 2006 for the Flamingo Wash Channel at Nellis Boulevard, designed by G.C. Wallace, Inc. that modified the transitions into and out of the bridge and lowered the invert through the existing Nellis Bridge Structure. The As-Built Drawings for the project have been included in Appendix E. In August 2012, CCPW completed the improvements for the Flamingo Wash – Nellis Blvd to I-515, designed by VTN. The project included flood control improvements from the downstream end of the Flamingo Wash Channel Improvements Phase III, Boulder Highway to I 515, through the existing Lamb Boulevard Bridge, and continued to the existing Nellis Boulevard Bridge. VTN used the Water Surface Profile Gradient (WSPGW) program to model the existing and proposed channel improvements from Nellis Boulevard to Mojave Road. The WSPGW model and the record drawings for the project have been included in Appendix E. The Pre-Project Conditions model includes the channel improvements as discussed, upstream of Nellis Boulevard and the Bridge at Nellis Boulevard, referencing the geometrics from the WSPG model and the record drawings by VTN.

The Pre-Project Conditions HEC-RAS model, *FlamWashPre.prj*, is included in Appendix D. Figure 5.2 shows the limits of the Pre-Project 100-year special flood hazard area, Zone A confined to the concrete channel upstream of Nellis Boulevard.

3.2.3 Post-Project Conditions

Additional sections for the proposed project improvements in the Desert Rose Golf Course, based on proposed detailed topography, were added to the pre-project conditions model. The proposed improvements will decrease the water surface through the golf course to a level below the adjacent properties. The channel will also meet local drainage requirements established by CCRFCD, including velocity and freeboard, while still providing a corridor to facilitate golf adjacent to the channel and into the channel when not flooding.

The upstream limit of the Post-Project Conditions model was adjusted upstream a sufficient distance to tie into the Pre-Project flood zone limits. Figure 6.2 is a work map for the Flamingo Wash showing the locations of the Post-Project Conditions cross-sections, and the upstream and downstream limits of the study. Flow conditions at the upstream cross sections are consistent between the Pre- and Post-Conditions analysis. The downstream flow conditions vary greatly because of the amount of excavation occurring at the Las Vegas Wash confluence. The water surface is below the Pre-Conditions analysis and the velocity has been lowered to meet criteria. The Post-Project Conditions HEC-RAS analysis, *FlamWashPost.prj*, showing that the improvements will collect and convey the entire 100-year flood flow, is included in Appendix D.

Results

4.1 Las Vegas Wash

The Post-Project conditions model for this study was modeled in HEC-RAS using the mixed flow option to accommodate the supercritical flow on the concrete channel and the subcritical flow through the grass-lined channel portions. The Post-Project Conditions analysis shows that the proposed channel improvements will collect the 100-year flood flow south of Bonanza Road and convey the flow south in a rectangular concrete channel. Flow is added to the Las Vegas Wash from Cedar Avenue Channel, Stewart Avenue, Colorado Storm Drain, and Nellis Wyoming Channel facility. The invert of the channel improvements has been lowered under the existing Charleston Boulevard Bridge to protect the existing 51-inch sanitary sewer suspended underneath the bridge and to maintain a supercritical flow regime. A hydraulic jump occurs downstream of the Charleston Boulevard Bridge, within the rectangular reinforced concrete channel as the slope decreases to 0.15%. The subcritical flow continues to the grass-lined trapezoidal channel section through the Desert Rose Golf Course. At the confluence of the Las Vegas Wash with the Flamingo Wash, the existing driving range has been lowered to provide a smoother combination of flows at the confluence of the two washes. Just downstream of the confluence, the grass-lined channel transitions to a trapezoidal reinforced concrete channel. At this location, within the concrete channel, the flow transitions back to supercritical flow. Downstream of the project improvements in the existing reinforced concrete trapezoidal channel, a hydraulic jump occurs as a result of the geometric constriction at the Vegas Valley Bridge, at the same location and fashion as in the Pre-Project conditions. The proposed upstream improvements increase the incoming velocity and energy and decrease the subcritical water surface by 0.5 feet upstream of the bridge but tie-in downstream of the bridge within 0.2 feet.

A comparison of the Pre-Project Conditions HEC-RAS analysis and the Post-Project Conditions HEC-RAS analysis reveals that the water surface elevations have decreased throughout the improved reach. The revised inundation limits will be within the public right-of-way with additional freeboard. The 2008 Restudy analyzed the breakout flow from the Las Vegas Wash and established Zone A in the surrounding areas. The breakout flows north of Charleston and along the Desert Rose Golf Course have been eliminated and the areas of Zone A have been removed. The comparison table has been included in Appendix C with the Post-Project Conditions HEC-RAS output. Figure 6.1 is a work map for the Las Vegas Wash showing the locations of the model cross-sections, the revised Zone AE and Zone A boundaries, and the upstream and downstream limits of the study.

4.2 Flamingo Wash

The Pre-Project conditions model illustrates that for the purposes of the LOMR request the entire 100-year flood flow is contained within the existing concrete-lined flood control structure. The Post-Project conditions model for this study was modeled in HEC-RAS using a mixed flow option to accommodate the supercritical flow on the concrete channel and the subcritical flow through the grass-lined channel portions. The results of the Post-Project Conditions show that supercritical flow is maintained throughout the upstream concrete channel improvements until a hydraulic jump occurs within the proposed concrete stilling basin downstream of Nellis Boulevard. The subcritical flow continues within the grass-lined trapezoidal channel section through the Desert Rose Golf Course to the downstream limit of the model, just upstream of the confluence with the Las Vegas Wash. Figure 6.2 is a work map for the Flamingo Wash showing the locations of the model cross-sections, the revised Zone A boundaries, and the upstream and downstream limits of the study.

Conclusion

The data and calculations provided in the CLOMR and LOMR request show that the 100-year flood flows will be contained in the proposed channel improvements for the Las Vegas Wash and the Flamingo Wash. The existing FEMA FIRM Panels 2187, 2190, and 2195 dated November 16, 2011, should be revised. The Las Vegas Wash from Bonanza Road to Nellis Boulevard and the Flamingo Wash from I-515 to Nellis Boulevard should reflect the conveyance of the 1% annual chance flood discharge within the concrete-lined flood control facility. The Las Vegas Wash and Flamingo Wash below Nellis Boulevard should be revised to reflect the limits of flooding as shown on the Annotated FEMA Flood Zone Map, Figure 4. Figures 5.1 and 5.2 are the Pre-Project Condition Work Maps for Las Vegas Wash and Flamingo Wash, respectively. Figures 6.1 and 6.2 are the Post-Project Condition Work Maps for Las Vegas Wash and Flamingo Wash, respectively. Because the Flamingo Wash between I-515 and Nellis Boulevard has already been completed it is requested to grant a LOMR to change the Zone A in the region to show that the 100-year flow is contained within the channel. The models have been extended upstream and downstream to tie into the existing FEMA limits within 0.5 feet. All of the figures have been included in Appendix B and electronic files are included on the Data CD in Appendix F.

References

1. Clark County Regional Flood Control District, *Hydrologic Criteria and Drainage Design Manual*, August 1999.
2. U.S. Army Corps of Engineers' River Analysis System (HEC-RAS), V 4.1.0, Hydrologic Engineering Center, January 2010.
3. Clark County Regional Flood Control District , *2008 Las Vegas Valley Flood Control Master Plan Update*, September 2008, by PBS&J.
4. Las Vegas Wash Flood Hazard Mapping Restudy Technical Support Data Notebook. November 2008, Submitted by G.C. Wallace, Inc.
5. Request for Letter of Map Revision Flamingo Wash Mojave Road to Boulder Highway. October 15, 2003, Submitted by Louis Berger Group, Inc.
6. Request for Conditional Letter of Map Revision Flamingo Wash Channel Improvements Phase III Boulder Highway to I 515. September 2004, Submitted by PBS&J.
7. Draft Flood Insurance Study Restudy. October 1997, Submitted by G.C. Wallace, Inc.
8. Flamingo Wash FIS Restudy Additional Information. March 1998, Submitted by G.C. Wallace, Inc.



U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301	City of Katy	TX	48473C	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
320003	CLARK COUNTY (*SEE ATTACHED)	NV	32003C	*	11/16/11
325276	LAS VEGAS, CITY OF (*SEE ATTACHED)	NV	32003C	*	11/16/11

2. a. Flooding Source: Las Vegas Wash

b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Las Vegas Wash - Sloan Channel to Bonanza and Flamingo Wash - Below I 515

4. FEMA zone designations affected: A and AE (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data ☒ Regulatory Floodway Revision ☐ Base Map Changes
☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☒ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$5300

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/fm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Michael Warnick, PE

Company: CH2M HILL

Mailing Address:
2485 Village View Drive, Suite 350
Henderson, NV 89074

Daytime Telephone No.: 702-953-1204

Fax No.: 702-369-1107

E-Mail Address: Michael.Warnick@ch2m.com

Signature of Requester (required):

Date:

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Mona Stammetti, PE / Project Manager

Community Name: CLARK COUNTY

Mailing Address:
500 South Grand Central Parkway
Las Vegas, NV 89155

Daytime Telephone No.: 702-455-6077

Fax No.: 702-455-6113

E-Mail Address: monas@ClarkCountyNV.gov

Community Official's Signature (required):

Date:

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Michael Warnick, PE

License No.: 20023

Expiration Date: 06/30/14

Company Name: CH2M HILL

Telephone No.: 702-953-1204

Fax No.: 702-369-1107

Signature:

Date:

E-Mail Address: Michael.Warnick@ch2m.com

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☒ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes Fee amount: \$5300

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/fm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

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Name: Michael Warnick, PE

Company: CH2M HILL

Mailing Address:
2485 Village View Drive, Suite 350
Henderson, NV 89074

Daytime Telephone No.: 702-953-1204

Fax No.: 702-369-1107

E-Mail Address: Michael.Warnick@ch2m.com

Signature of Requester (required):

Date:

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Randy Fultz, PE, CFM / Assistant City Engineer

Community Name: LAS VEGAS, CITY OF

Mailing Address:
333 N. Rancho Dr., 7th Floor
Las Vegas, NV 89106

Daytime Telephone No.: 702-229-2176

Fax No.: 702-382-8551

E-Mail Address: rfultz@lasvegasnevada.gov

Community Official's Signature (required):

Date:

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Signature:

Date:

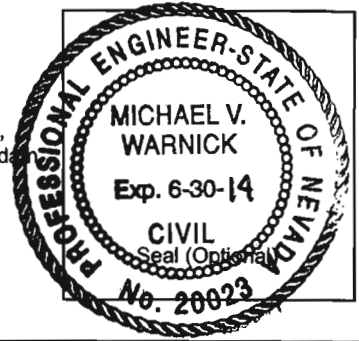
E-Mail Address: Michael.Warnick@ch2m.com

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|---|---|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of d |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



ATTACHMENT

FEMA Form MT-2 Form 1 (cont.)

B. OVERVIEW					
1. The NFIP map panels affected for all impacted communities are:					
Community No.	Community Name	State	Map No.	Panel No.	Effective Date
320003	CLARK COUNTY	NV	32003C	2187F	11/16/11
			32003C	2190F	11/16/11
			32003C	2195F	11/16/11
325276	LAS VEGAS, CITY OF	NV	32003C	2187F	11/16/11
			32003C	2190F	11/16/11



U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ **CLOMR:** A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ **LOMR:** A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
320003	CLARK COUNTY (*SEE ATTACHED)	NV	32003C	*	11/16/11

2. a. Flooding Source: Flamingo Wash

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Las Vegas Wash - Sloan Channel to Bonanza and Flamingo Wash - Below I 515

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

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C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$5300

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/fm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Michael Warnick, PE

Company: CH2M HILL

Mailing Address:
2485 Village View Drive, Suite 350
Henderson, NV 89074

Daytime Telephone No.: 702-953-1204

Fax No.: 702-369-1107

E-Mail Address: Michael.Warnick@ch2m.com

Signature of Requester (required):



Date:

8/6/2013

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Mona Stammetti, PE / Project Manager

Community Name: CLARK COUNTY

Mailing Address:
500 South Grand Central Parkway
Las Vegas, NV 89155

Daytime Telephone No.: 702-455-6077

Fax No.: 702-455-6113

E-Mail Address: monas@ClarkCountyNV.gov

Community Official's Signature (required):



Date:

8.8.13

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License No.: 20023

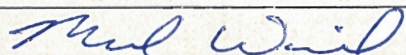
Expiration Date: 06/30/14

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Telephone No.: 702-953-1204

Fax No.: 702-369-1107

Signature:



Date: 8/6/2013

E-Mail Address: Michael.Warnick@ch2m.com

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|---|--|
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FEDERAL EMERGENCY MANAGEMENT AGENCY
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*O.M.B No. 1660-0016
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Form Name and (Number)

Required If ...

- | | |
|---|---|
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FEMA Form MT-2 Form 1 (cont.)

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U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Not revised (skip to section B) | <input type="checkbox"/> No existing analysis | <input type="checkbox"/> Improved data |
| <input type="checkbox"/> Alternative methodology | <input type="checkbox"/> Proposed Conditions (CLOMR) | <input type="checkbox"/> Changed physical condition of watershed |

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Statistical Analysis of Gage Records | <input type="checkbox"/> Precipitation/Runoff Model → Specify Model: _____ |
| <input type="checkbox"/> Regional Regression Equations | <input type="checkbox"/> Other (please attach description) |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	<u>Vegas Valley Drive</u>	<u>1074</u>	<u>1691.2</u>	<u>1691.2</u>
Upstream Limit*	<u>Bonanza Road</u>	<u>1172</u>	<u>1764.1</u>	<u>1764.2</u>

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

<u>Models Submitted</u>	<u>Natural Run</u>		<u>Floodway Run</u>		<u>Datum</u>
Duplicate Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
Corrected Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
Existing or Pre-Project Conditions Model	File Name: <u>LVWashEX.prj</u>	Plan Name: <u>Existing</u>	File Name: _____	Plan Name: _____	NAVD88
Revised or Post-Project Conditions Model	File Name: <u>LVWashPost.prj</u>	Plan Name: <u>Proposed</u>	File Name: _____	Plan Name: _____	NAVD88
Other - (attach description)	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: _____

Source: _____ Date: _____

Accuracy: _____

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No
- If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.



U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Flamingo Wash

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Not revised (skip to section B) | <input type="checkbox"/> No existing analysis | <input type="checkbox"/> Improved data |
| <input type="checkbox"/> Alternative methodology | <input type="checkbox"/> Proposed Conditions (CLOMR) | <input type="checkbox"/> Changed physical condition of watershed |

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Statistical Analysis of Gage Records | <input type="checkbox"/> Precipitation/Runoff Model → Specify Model: _____ |
| <input type="checkbox"/> Regional Regression Equations | <input type="checkbox"/> Other (please attach description) |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	<u>Downstream of Nellis Blvd</u>	<u>90</u>	<u>1727.03</u>	<u>1727.03</u>
Upstream Limit*	<u>US 95 / I 515</u>	<u>380</u>	<u>1790.68</u>	<u>1790.68</u>

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

<u>Models Submitted</u>	<u>Natural Run</u>		<u>Floodway Run</u>		<u>Datum</u>
Duplicate Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
Corrected Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
Existing or Pre-Project Conditions Model	File Name: <u>FlamWashEX.prj</u>	Plan Name: <u>EX</u>	File Name: _____	Plan Name: _____	<u>NAVD88</u>
Revised or Post-Project Conditions Model	File Name: <u>FlamWashPre.prj</u>	Plan Name: <u>Existing</u>	File Name: _____	Plan Name: _____	<u>NAVD88</u>
Other - (attach description)	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: _____

Source: _____ Date: _____

Accuracy: _____

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No
- If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

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FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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Flooding Source: Flamingo Wash

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> Not revised (skip to section B) | <input type="checkbox"/> No existing analysis | <input type="checkbox"/> Improved data |
| <input type="checkbox"/> Alternative methodology | <input type="checkbox"/> Proposed Conditions (CLOMR) | <input type="checkbox"/> Changed physical condition of watershed |

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

3. Methodology for New Hydrologic Analysis (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Statistical Analysis of Gage Records | <input type="checkbox"/> Precipitation/Runoff Model → Specify Model: _____ |
| <input type="checkbox"/> Regional Regression Equations | <input type="checkbox"/> Other (please attach description) |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	<u>Las Vegas Wash Confluence</u>	<u>11</u>	<u>1710.97</u>	<u>1709.63</u>
Upstream Limit*	<u>Nellis Boulevard</u>	<u>131</u>	<u>1726.40</u>	<u>1726.40</u>

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

<u>Models Submitted</u>	<u>Natural Run</u>		<u>Floodway Run</u>		<u>Datum</u>
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
	_____	_____	_____	_____	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
	_____	_____	_____	_____	
Existing or Pre-Project Conditions Model	File Name: <u>FlamWashPre.prj</u>	Plan Name: <u>Existing</u>	File Name:	Plan Name:	<u>NAVD88</u>
Revised or Post-Project Conditions Model	File Name: <u>FlamWashPost.prj</u>	Plan Name: <u>Proposed</u>	File Name:	Plan Name:	<u>NAVD88</u>
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	
	_____	_____	_____	_____	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

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Topographic Information: _____

Source: _____ Date: _____

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D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
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- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
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3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☐ No
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DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash Existing Trap Channel

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Bonanza Road

Downstream Limit/Cross Section: HEC-RAS Section 1168; "LV" 7+00

Upstream Limit/Cross Section: HEC-RAS Section 1172

2. Name of Structure: Bonanza Road Bridge

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Bonanza Road

Downstream Limit/Cross Section: HEC-RAS Section 1167.05; "LV" 8+75

Upstream Limit/Cross Section: HEC-RAS Section 1168; "LV" 7+00

3. Name of Structure: Las Vegas Wash Trapezoidal Channel Transition

Type (check one) ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: South of Bonanza Road

Downstream Limit/Cross Section: HEC-RAS Section 1166.5; "LV" 12+00

Upstream Limit/Cross Section: HEC-RAS Section 1167.05; "LV" 9+47

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

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Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash 80-ft Concrete Channel

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Bonanza Road to Cedar Avenue Channel

Downstream Limit/Cross Section: HEC-RAS Section 1159.71; "LV" 25+51

Upstream Limit/Cross Section: HEC-RAS Section 1166.5; "LV" 12+00

2. Name of Structure: Las Vegas Wash 90-ft Concrete Channel-Upstream of Stewart Avenue

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Cedar Avenue Channel to Stewart Avenue

Downstream Limit/Cross Section: HEC-RAS Section 1152.9; "LV" 38+00

Upstream Limit/Cross Section: HEC-RAS Section 1159.71; "LV" 25+51

3. Name of Structure: Stewart Avenue Bridge

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Stewart Avenue

Downstream Limit/Cross Section: HEC-RAS Section 1152.1; "LV" 39+50

Upstream Limit/Cross Section: HEC-RAS Section 1152.9; "LV" 38+00

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

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Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash 90-ft Concrete Channel-Downstream of Stewart Avenue

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Stewart Avenue to Upstream of Charleston Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1140.4; "LV" 63+66

Upstream Limit/Cross Section: HEC-RAS Section 1152.1; "LV" 39+50

2. Name of Structure: Las Vegas Wash 100-ft Concrete Channel-Upstream of Charleston Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Upstream of Charleston Boulevard to Charleston Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1139.9; "LV" 65+40

Upstream Limit/Cross Section: HEC-RAS Section 1140.4; "LV" 63+66

3. Name of Structure: Charleston Boulevard Bridge

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Charleston Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1139.1; "LV" 66+75

Upstream Limit/Cross Section: HEC-RAS Section 1139.9; "LV" 65+40

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash 100-ft Concrete Channel-Downstream of Charleston Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Charleston Boulevard to Upstream of Nellis Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1134; "LV" 76+61

Upstream Limit/Cross Section: HEC-RAS Section 1139.1; "LV" 66+75

2. Name of Structure: Las Vegas Wash 85-ft Concrete Channel-Upstream of Nellis Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Upstream of Nellis Boulevard to Nellis Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1132.9; "LV" 78+50

Upstream Limit/Cross Section: HEC-RAS Section 1134; "LV" 76+61

3. Name of Structure: Nellis Boulevard Bridge

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Nellis Boulevard

Downstream Limit/Cross Section: HEC-RAS Section 1132.1; "LV" 80+00

Upstream Limit/Cross Section: HEC-RAS Section 1132.9; "LV" 78+50

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash 85-ft Concrete Channel-Downstream of Nellis Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Nellis Boulevard to Desert Rose Golf Course

Downstream Limit/Cross Section: HEC-RAS Section 1127.7; "DR" 19+35

Upstream Limit/Cross Section: HEC-RAS Section 1132.1; "LV" 80+00

2. Name of Structure: Las Vegas Wash Grass-Lined Trapezoidal Channel-Upstream of Sahara Avenue

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Desert Rose Golf Course to Sahara Avenue

Downstream Limit/Cross Section: HEC-RAS Section 1107.95; "DR" 60+46

Upstream Limit/Cross Section: HEC-RAS Section 1127.7; "DR" 19+35

3. Name of Structure: Sahara Avenue Bridge

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Sahara Avenue

Downstream Limit/Cross Section: HEC-RAS Section 1107.15; "DR" 61+70

Upstream Limit/Cross Section: HEC-RAS Section 1107.95; "DR" 60+46

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Las Vegas Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Las Vegas Wash Grass-Lined Trapezoidal Channel-Downstream of Sahara Avenue
Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: Sahara Avenue to Desert Rose Golf Course 800 feet west of Sloan Lane
Downstream Limit/Cross Section: HEC-RAS Section 1094.6; "DR" 87+50
Upstream Limit/Cross Section: HEC-RAS Section 1107.15; "DR" 61+70
2. Name of Structure: Las Vegas Wash 120-ft Concrete Trapezoidal Channel
Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: 800 feet west of Sloan Lane to Existing Concrete Lining at Sloan Channel
Downstream Limit/Cross Section: HEC-RAS Section 1085.4; "DR" 105+15
Upstream Limit/Cross Section: HEC-RAS Section 1094.6; "DR" 87+50
3. Name of Structure: Las Vegas Wash Existing Concrete Trapezoidal Channel
Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: Sloan Channel to Vegas Valley Drive
Downstream Limit/Cross Section: HEC-RAS Section 1077
Upstream Limit/Cross Section: HEC-RAS Section 1085.4; "DR" 105+15

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash Existing Trap Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Las Vegas Wash

Name of Structure: Bonanza Road Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☒ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length)	<input checked="" type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input checked="" type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash Trapezoidal Channel Transistion

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 80-ft Concrete Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 90-ft Concrete Channel-Upstream of Stewart Avenue

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☒ Other locations (specify): Junction with Cedar Ave Channel

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Las Vegas Wash

Name of Structure: Stewart Avenue Bridge

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
☒ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Distances Between Cross Sections |
| <input type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Material | <input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input checked="" type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 90-ft Concrete Channel-Downstream of Stewart Avenue

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☒ Other locations (specify): Junction at Stewart Avenue

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|---|--|
| <input type="checkbox"/> Dimensions (height, width, span, radius, length) | <input type="checkbox"/> Distances Between Cross Sections |
| <input type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Wing Wall Angle | <input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 100-ft Concrete Channel-Upstream of Charleston Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Las Vegas Wash

Name of Structure: Charleston Boulevard Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☒ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length)	<input checked="" type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input checked="" type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 100-ft Concrete Channel-Downstream of Charleston Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

- ☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- ☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☒ Other locations (specify): At "LV" 69+50 because of flat slope and narrower channel

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|---|--|
| <input type="checkbox"/> Dimensions (height, width, span, radius, length) | <input type="checkbox"/> Distances Between Cross Sections |
| <input type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Wing Wall Angle | <input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 85-ft Concrete Channel-Upstream of Nellis Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Las Vegas Wash

Name of Structure: Nellis Boulevard Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☒ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)

☒ Distances Between Cross Sections

☐ Shape (culverts only)

☐ Erosion Protection

☐ Material

☒ Low Chord Elevations – Upstream and Downstream

☐ Beveling or Rounding

☒ Top of Road Elevations – Upstream and Downstream

☐ Wing Wall Angle

☒ Structure Invert Elevations – Upstream and Downstream

☐ Skew Angle

☒ Stream Invert Elevations – Upstream and Downstream

☒ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 85-ft Concrete Channel-Downstream of Nellis Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash Grass-Lined Trapezoidal Channel-Upstream of Sahara Avenue

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☒ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Las Vegas Wash

Name of Structure: Sahara Avenue Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☒ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)

☒ Distances Between Cross Sections

☐ Shape (culverts only)

☐ Erosion Protection

☐ Material

☒ Low Chord Elevations – Upstream and Downstream

☐ Beveling or Rounding

☒ Top of Road Elevations – Upstream and Downstream

☐ Wing Wall Angle

☒ Structure Invert Elevations – Upstream and Downstream

☐ Skew Angle

☒ Stream Invert Elevations – Upstream and Downstream

☒ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash Grass-Lined Trapezoidal Channel-Downstream of Sahara Avenue

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☒ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|---|--|
| <input type="checkbox"/> Dimensions (height, width, span, radius, length) | <input type="checkbox"/> Distances Between Cross Sections |
| <input type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Wing Wall Angle | <input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash 120-ft Concrete Trapezoidal Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Las Vegas Wash

Name of Structure: Las Vegas Wash Existing Concrete Trapezoidal Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☒ At Transitions

☒ Other locations (specify): Junction with Sloan Channel

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____

Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin
2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number _____ Permitting Agency or Organization _____

- a. ☐ Local Government Dam ☐ Private Dam

Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

- ☐ Yes, provide supporting documentation with your completed Form 2.
- ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

FREQUENCY (% annual chance)	Stillwater Elevation Behind the Dam/Basin	
	FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of
an existing
levee/floodwall
system
- ☐ a newly
constructed
levee/floodwall
system
- ☐ reanalysis of
an existing
levee/floodwall
system

b. Levee elements and locations are (check one):

- ☐ earthen embankment, dike, berm, etc. Station _____ to _____
- ☐ structural floodwall Station _____ to _____
- ☐ Other (describe): Station _____ to _____

c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling
☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- | | |
|---|----------------------|
| 1. Plan of the levee embankment and floodwall structures. | Sheet Numbers: _____ |
| 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE),
levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: _____ |
| 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size
of opening, and kind of closure. | Sheet Numbers: _____ |
| 4. A layout detail for the embankment protection measures. | Sheet Numbers: _____ |
| 5. Location, layout, and size and shape of the levee embankment features, foundation treatment,
Floodwall structure, closure structures, and pump stations. | Sheet Numbers: _____ |

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- | | | |
|--|------------------------------|-----------------------------|
| 3.0 feet or more at the downstream end and throughout | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3.5 feet or more at the upstream end | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4.0 feet within 100 feet upstream of all structures and/or constrictions | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Coastal

- | | | |
|--|------------------------------|-----------------------------|
| 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance
stillwater surge elevation or maximum wave runup (whichever is greater). | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.0 feet above the 1%-annual-chance stillwater surge elevation | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope land side is: _____
- b. The maximum levee slope flood side is: _____
- c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)
- d. Embankment material is protected by (describe what kind): _____
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

- ☐ Overall height: Sta.: _____, height _____ ft.
- ☐ Limiting foundation soil strength:
- Strength ϕ = _____ degrees, c = _____ psf
- Slope: SS = _____ (h) to _____ (v)
- (Repeat as needed on an added sheet for additional locations)
- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ $P_A =$ _____ psf; $P_p =$ _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ $P_w =$ _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ $P_{eq} =$ _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

- f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is _____ ft. to _____ ft.
- c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression
☐ Other (Describe): _____
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:

Draining to pressure conduit: _____ acres

Draining to ponding area: _____ acres

- b. Relationships Established

Ponding elevation vs. storage

☐ Yes ☐ No

Ponding elevation vs. gravity flow

☐ Yes ☐ No

Differential head vs. gravity flow

☐ Yes ☐ No

- c. The river flow duration curve is enclosed: ☐ Yes ☐ No

- d. Specify the discharge capacity of the head pressure conduit: _____ cfs

- e. Which flooding conditions were analyzed?

- Gravity flow (Interior Watershed) ☐ Yes ☐ No
- Common storm (River Watershed) ☐ Yes ☐ No
- Historical ponding probability ☐ Yes ☐ No
- Coastal wave overtopping ☐ Yes ☐ No

If No for any of the above, attach explanation.

- e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is _____ cfs
- h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

- i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the formal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTATION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____

Company Name: _____ Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acre-feet

Debris load associated with the base flood discharge: Volume _____ acre-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

ATTACHMENT

FEMA Form MT-2 Form 3 (cont.)

B. Channelization

1. Hydraulic Considerations: Locations that have the potential for a hydraulic jump are located in the concrete channel lining. The hard lining will protect the channel from the instabilities caused by a hydraulic jump. Wall heights have been checked to verify that design heights provide adequate freeboard in subcritical flows and meet Clark County Regional Flood Control District's design guidelines.

4. Sediment Transport Considerations: Sediment transport was not considered for any of the bridge structures because the Las Vegas Wash is a stable, regularly maintained Regional Flood Control Facility. The Clark County Regional Flood Control District's Operation and Maintenance Manual was updated in 2010. A copy of the revised manual is included electronically on the Data CD in Appendix F.

C. Bridge/Culvert

4. Sediment Transport Considerations: Sediment transport was not considered for any of the bridge structures because the Las Vegas Wash is a stable, regularly maintained Regional Flood Control Facility. The Clark County Regional Flood Control District's Operation and Maintenance Manual was updated in 2010. A copy of the revised manual is included electronically on the Data CD in Appendix F.



DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Flamingo Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Flamingo Wash Concrete Channel-Upstream of Lamb Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Upstream of Lamb Boulevard

Downstream Limit/Cross Section: 305

Upstream Limit/Cross Section: 341

2. Name of Structure: Flamingo Wash Lamb Boulevard Bridge

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Lamb Boulevard

Downstream Limit/Cross Section: 295

Upstream Limit/Cross Section: 305

3. Name of Structure: Flamingo Wash Concrete Channel-Between Lamb Boulevard and Nellis Boulevard

Type (check one) ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Between Lamb Boulevard and Nellis Boulevard

Downstream Limit/Cross Section: 131

Upstream Limit/Cross Section: 295

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Flamingo Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Flamingo Wash Nellis Boulevard Bridge

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Nellis Boulevard

Downstream Limit/Cross Section: 120

Upstream Limit/Cross Section: 130

2. Name of Structure: Flamingo Wash Nellis Outlet Structure

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Downstream of Nellis Boulevard

Downstream Limit/Cross Section: 100

Upstream Limit/Cross Section: 120

3. Name of Structure: Flamingo Wash Grass Lined Trapezoidal Channel

Type (check one) ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Between Nellis Boulevard and Las Vegas Wash Confluence

Downstream Limit/Cross Section: 10

Upstream Limit/Cross Section: 100

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Concrete Channel-Upstream of Lamb Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Lamb Boulevard Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☒ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length)	<input checked="" type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input checked="" type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Concrete Channel-Between Lamb Boulevard and Nellis Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Nellis Boulevard Bridge

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☒ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length)	<input checked="" type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input checked="" type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Nellis Outlet Structure

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☒ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☒ Energy dissipator

☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☐ Dimensions (height, width, span, radius, length)

☐ Distances Between Cross Sections

☐ Shape (culverts only)

☐ Erosion Protection

☐ Material

☐ Low Chord Elevations – Upstream and Downstream

☐ Beveling or Rounding

☐ Top of Road Elevations – Upstream and Downstream

☐ Wing Wall Angle

☐ Structure Invert Elevations – Upstream and Downstream

☐ Skew Angle

☐ Stream Invert Elevations – Upstream and Downstream

☐ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Grass Lined Trapezoidal Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☒ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____

Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin
2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number _____ Permitting Agency or Organization _____

- a. ☐ Local Government Dam ☐ Private Dam

Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

- ☐ Yes, provide supporting documentation with your completed Form 2.
- ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

FREQUENCY (% annual chance)	Stillwater Elevation Behind the Dam/Basin	
	FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of
an existing
levee/floodwall
system
- ☐ a newly
constructed
levee/floodwall
system
- ☐ reanalysis of
an existing
levee/floodwall
system

b. Levee elements and locations are (check one):

- ☐ earthen embankment, dike, berm, etc. Station _____ to _____
- ☐ structural floodwall Station _____ to _____
- ☐ Other (describe): Station _____ to _____

c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling
☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- | | |
|---|----------------------|
| 1. Plan of the levee embankment and floodwall structures. | Sheet Numbers: _____ |
| 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE),
levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: _____ |
| 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size
of opening, and kind of closure. | Sheet Numbers: _____ |
| 4. A layout detail for the embankment protection measures. | Sheet Numbers: _____ |
| 5. Location, layout, and size and shape of the levee embankment features, foundation treatment,
Floodwall structure, closure structures, and pump stations. | Sheet Numbers: _____ |

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- | | | |
|--|------------------------------|-----------------------------|
| 3.0 feet or more at the downstream end and throughout | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3.5 feet or more at the upstream end | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4.0 feet within 100 feet upstream of all structures and/or constrictions | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Coastal

- | | | |
|--|------------------------------|-----------------------------|
| 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance
stillwater surge elevation or maximum wave runup (whichever is greater). | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.0 feet above the 1%-annual-chance stillwater surge elevation | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope land side is: _____
- b. The maximum levee slope flood side is: _____
- c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)
- d. Embankment material is protected by (describe what kind): _____
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

- ☐ Overall height: Sta.: _____, height _____ ft.
- ☐ Limiting foundation soil strength:
- Strength ϕ = _____ degrees, c = _____ psf
- Slope: SS = _____ (h) to _____ (v)
- (Repeat as needed on an added sheet for additional locations)
- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ $P_A =$ _____ psf; $P_p =$ _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ $P_w =$ _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ $P_{eq} =$ _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

- f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is _____ ft. to _____ ft.
- c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression
☐ Other (Describe): _____
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:

Draining to pressure conduit: _____ acres

Draining to ponding area: _____ acres

- b. Relationships Established

Ponding elevation vs. storage

☐ Yes ☐ No

Ponding elevation vs. gravity flow

☐ Yes ☐ No

Differential head vs. gravity flow

☐ Yes ☐ No

- c. The river flow duration curve is enclosed: ☐ Yes ☐ No

- d. Specify the discharge capacity of the head pressure conduit: _____ cfs

- e. Which flooding conditions were analyzed?

- Gravity flow (Interior Watershed) ☐ Yes ☐ No
- Common storm (River Watershed) ☐ Yes ☐ No
- Historical ponding probability ☐ Yes ☐ No
- Coastal wave overtopping ☐ Yes ☐ No

If No for any of the above, attach explanation.

- e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is _____ cfs
- h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

- i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the formal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTATION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____
Company Name: _____ Telephone No.: _____ Fax No.: _____
Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acre-feet

Debris load associated with the base flood discharge: Volume _____ acre-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

ATTACHMENT

FEMA Form MT-2 Form 3 (cont.)

B. Channelization

1. Hydraulic Considerations: Locations that have the potential for a hydraulic jump are located in the concrete channel lining. The hard lining will protect the channel from the instabilities caused by a hydraulic jump. Wall heights have been checked to verify that design heights provide adequate freeboard in subcritical flows and meet Clark County Regional Flood Control District's design guidelines.

4. Sediment Transport Considerations: Sediment transport was not considered for any of the bridge structures because the Las Vegas Wash is a stable, regularly maintained Regional Flood Control Facility. The Clark County Regional Flood Control District's Operation and Maintenance Manual was updated in 2010. A copy of the revised manual is included electronically on the Data CD in Appendix F.

C. Bridge/Culvert

4. Sediment Transport Considerations: Sediment transport was not considered for any of the bridge structures because the Las Vegas Wash is a stable, regularly maintained Regional Flood Control Facility. The Clark County Regional Flood Control District's Operation and Maintenance Manual was updated in 2010. A copy of the revised manual is included electronically on the Data CD in Appendix F.



DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Flamingo Wash

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Flamingo Wash Nellis Drop Structure

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Downstream of Nellis Boulevard

Downstream Limit/Cross Section: 94

Upstream Limit/Cross Section: 116

2. Name of Structure: Flamingo Wash Grass-Lined Trapezoidal Channel-Downstream of Nellis Boulevard

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Between Nellis Boulevard and Las Vegas Wash Confluence

Downstream Limit/Cross Section: 1

Upstream Limit/Cross Section: 94

3. Name of Structure: _____

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Nellis Drop Structure

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☒ At Drop Structures ☒ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☒ Drop structures ☐ Superelevated sections
☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☒ Energy dissipator
☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

B. CHANNELIZATION

Flooding Source: Flamingo Wash

Name of Structure: Flamingo Wash Grass-Lined Trapezoidal Channel-Downstream of Nellis Boulevard

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☒ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☐ Dimensions (height, width, span, radius, length)

☐ Distances Between Cross Sections

☐ Shape (culverts only)

☐ Erosion Protection

☐ Material

☐ Low Chord Elevations – Upstream and Downstream

☐ Beveling or Rounding

☐ Top of Road Elevations – Upstream and Downstream

☐ Wing Wall Angle

☐ Structure Invert Elevations – Upstream and Downstream

☐ Skew Angle

☐ Stream Invert Elevations – Upstream and Downstream

☐ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____

Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin
2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

Permit or ID number _____ Permitting Agency or Organization _____

- a. ☐ Local Government Dam ☐ Private Dam

Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

- ☐ Yes, provide supporting documentation with your completed Form 2.
- ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

FREQUENCY (% annual chance)	Stillwater Elevation Behind the Dam/Basin	
	FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of
an existing
levee/floodwall
system
- ☐ a newly
constructed
levee/floodwall
system
- ☐ reanalysis of
an existing
levee/floodwall
system

b. Levee elements and locations are (check one):

- ☐ earthen embankment, dike, berm, etc. Station _____ to _____
- ☐ structural floodwall Station _____ to _____
- ☐ Other (describe): Station _____ to _____

c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling
☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

- | | |
|---|----------------------|
| 1. Plan of the levee embankment and floodwall structures. | Sheet Numbers: _____ |
| 2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE),
levee and/or wall crest and foundation, and closure locations for the total levee system. | Sheet Numbers: _____ |
| 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size
of opening, and kind of closure. | Sheet Numbers: _____ |
| 4. A layout detail for the embankment protection measures. | Sheet Numbers: _____ |
| 5. Location, layout, and size and shape of the levee embankment features, foundation treatment,
Floodwall structure, closure structures, and pump stations. | Sheet Numbers: _____ |

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- | | | |
|--|------------------------------|-----------------------------|
| 3.0 feet or more at the downstream end and throughout | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3.5 feet or more at the upstream end | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4.0 feet within 100 feet upstream of all structures and/or constrictions | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Coastal

- | | | |
|--|------------------------------|-----------------------------|
| 1.0 foot above the height of the one percent wave associated with the 1%-annual-chance
stillwater surge elevation or maximum wave runup (whichever is greater). | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.0 feet above the 1%-annual-chance stillwater surge elevation | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope land side is: _____
- b. The maximum levee slope flood side is: _____
- c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)
- d. Embankment material is protected by (describe what kind): _____
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:

- ☐ Overall height: Sta.: _____, height _____ ft.
- ☐ Limiting foundation soil strength:
- Strength ϕ = _____ degrees, c = _____ psf
- Slope: SS = _____ (h) to _____ (v)
- (Repeat as needed on an added sheet for additional locations)
- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

- c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ $P_A =$ _____ psf; $P_p =$ _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ $P_w =$ _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ $P_{eq} =$ _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

- f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is _____ ft. to _____ ft.
- c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression
☐ Other (Describe): _____
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:

Draining to pressure conduit: _____ acres

Draining to ponding area: _____ acres

- b. Relationships Established

Ponding elevation vs. storage

☐ Yes ☐ No

Ponding elevation vs. gravity flow

☐ Yes ☐ No

Differential head vs. gravity flow

☐ Yes ☐ No

- c. The river flow duration curve is enclosed: ☐ Yes ☐ No

- d. Specify the discharge capacity of the head pressure conduit: _____ cfs

- e. Which flooding conditions were analyzed?

- Gravity flow (Interior Watershed) ☐ Yes ☐ No
- Common storm (River Watershed) ☐ Yes ☐ No
- Historical ponding probability ☐ Yes ☐ No
- Coastal wave overtopping ☐ Yes ☐ No

If No for any of the above, attach explanation.

- e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.
- g. The rate of seepage through the levee system for the base flood is _____ cfs
- h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

- i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the formal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTATION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____
Company Name: _____ Telephone No.: _____ Fax No.: _____
Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acre-feet

Debris load associated with the base flood discharge: Volume _____ acre-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

ATTACHMENT

FEMA Form MT-2 Form 3 (cont.)

B. Channelization

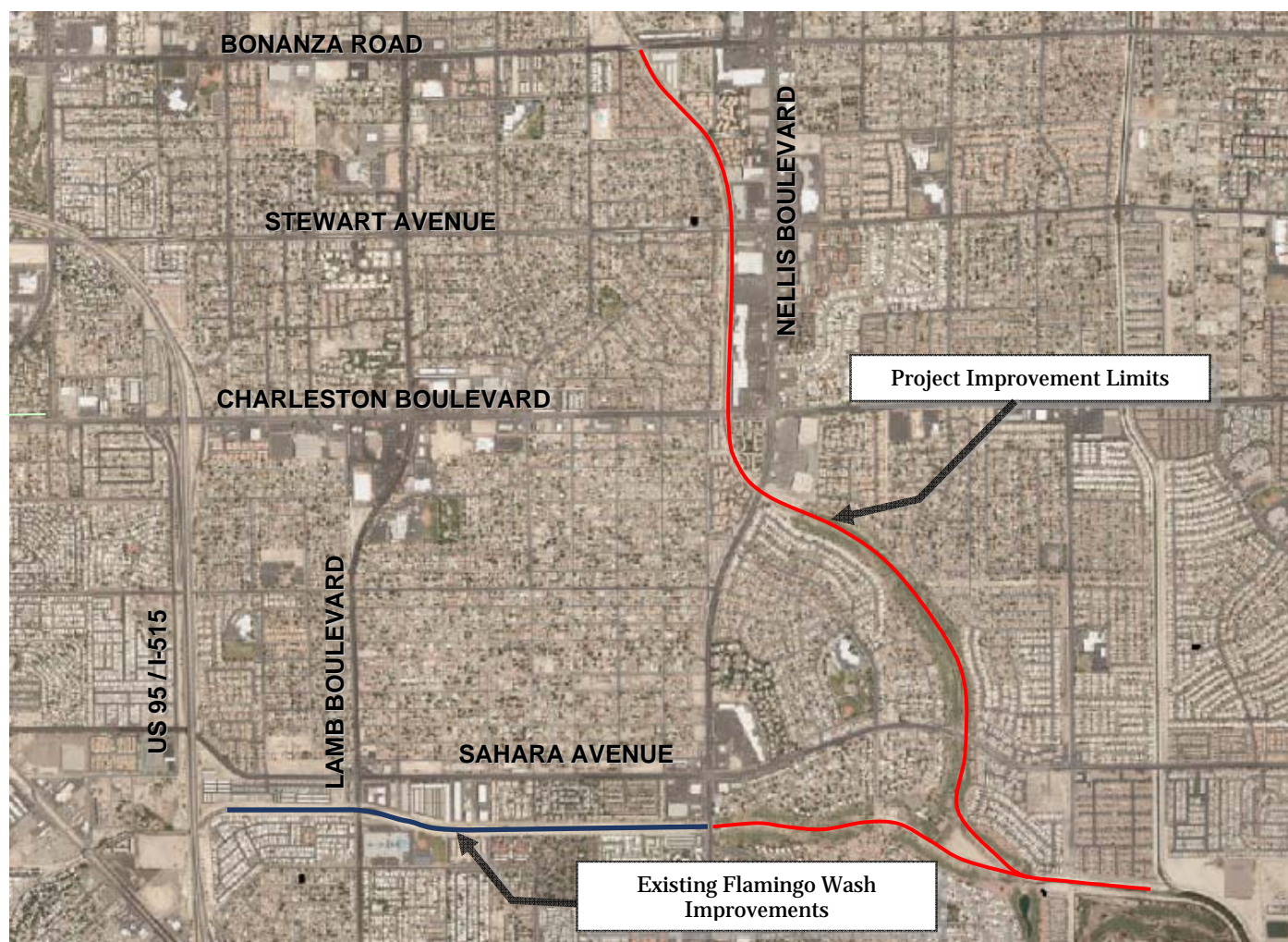
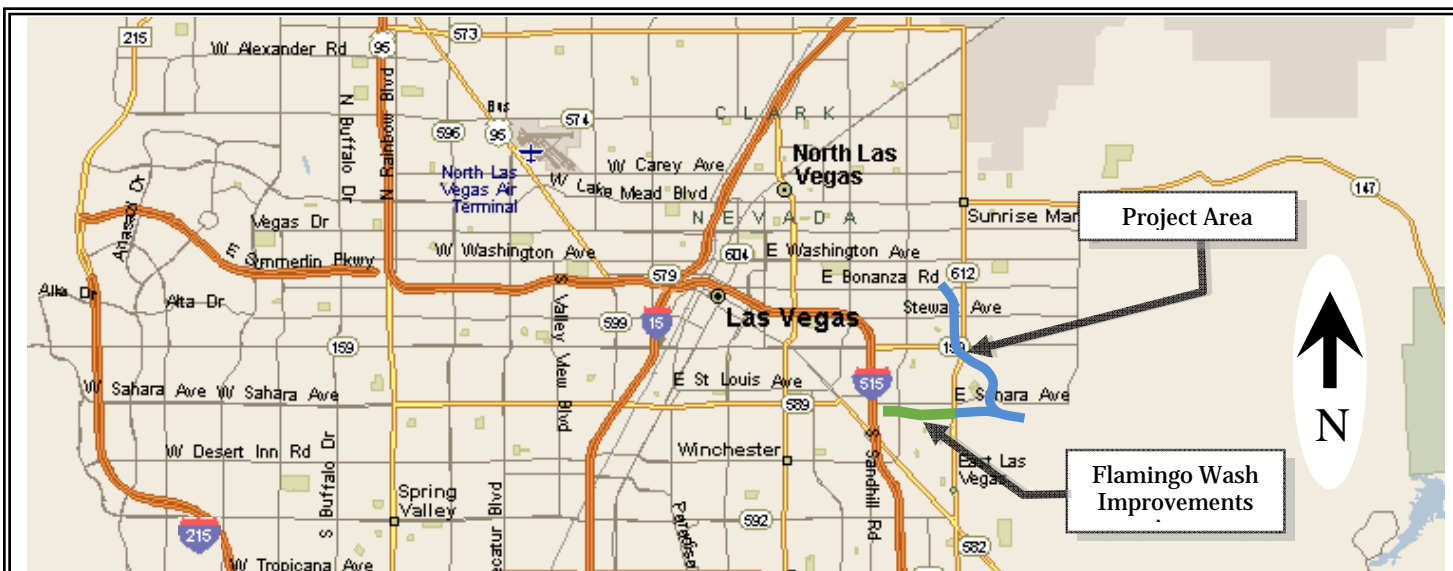
1. Hydraulic Considerations: Locations that have the potential for a hydraulic jump are located in the concrete channel lining. The hard lining will protect the channel from the instabilities caused by a hydraulic jump. Wall heights have been checked to verify that design heights provide adequate freeboard in subcritical flows and meet Clark County Regional Flood Control District's design guidelines.

4. Sediment Transport Considerations: Sediment transport was not considered for any of the bridge structures because the Las Vegas Wash is a stable, regularly maintained Regional Flood Control Facility. The Clark County Regional Flood Control District's Operation and Maintenance Manual was updated in 2010. A copy of the revised manual is included electronically on the Data CD in Appendix F.





Appendix B.1
Figure 1 – Vicinity Map



Vicinity Map
 Las Vegas Wash - Sloan Channel to Bonanza Road and
 Flamingo Wash below I-515

Figure 1

08/2013



NOTES TO USERS

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSM-C-3, 49202
1315 East-West Highway
Silver Spring, MD 20910-3282

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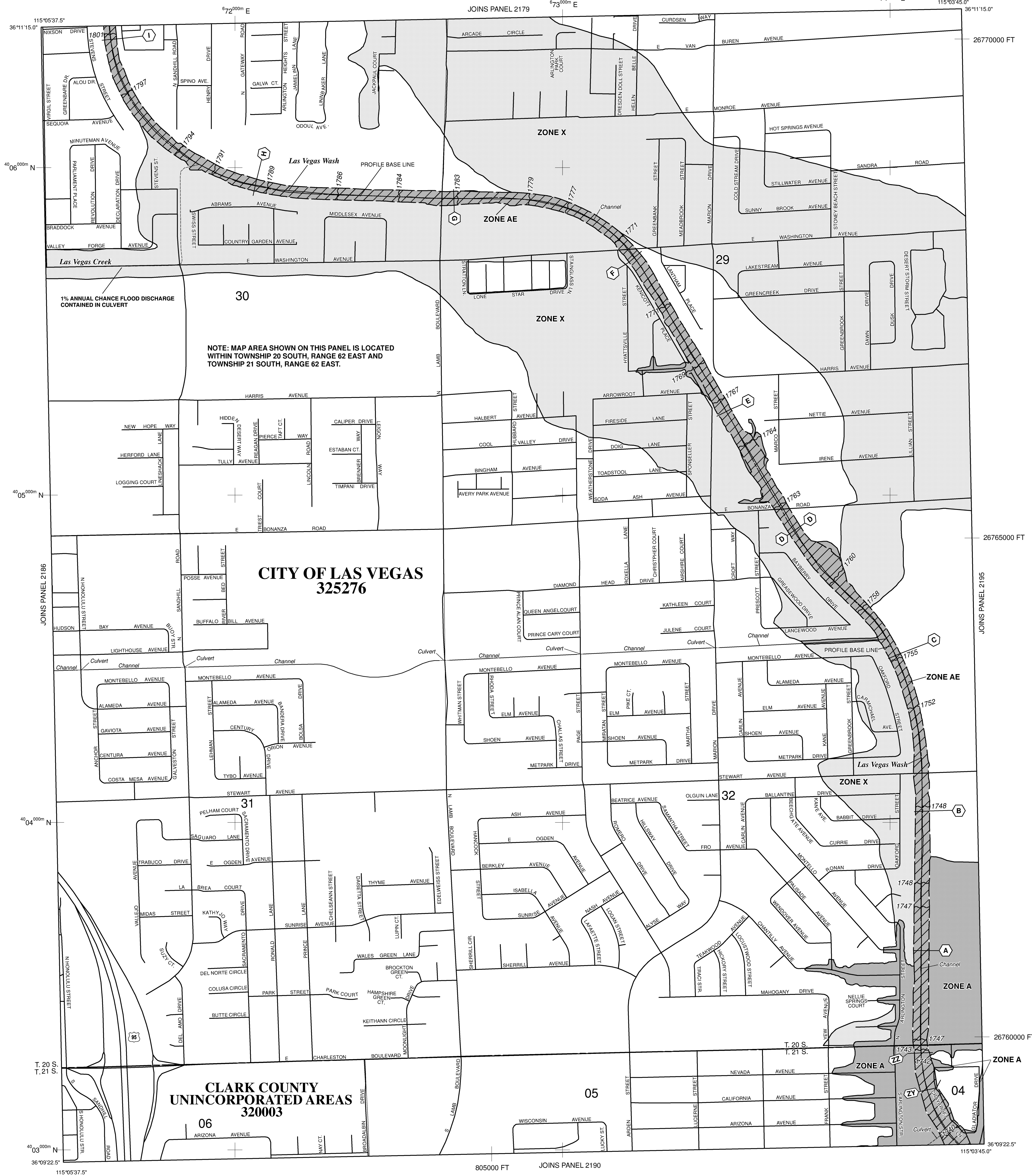
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DIGITAL DATA AVAILABILITY: <http://www.co.clark.nv.us/ceit/gismo/gismo.htm>



REGIONAL FLOOD
CONTROL DISTRICT



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- Cross section line
- Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks, zone 11

5000-foot grid ticks: Nevada State Plane coordinate system, east zone (FIPSZONE 2701), Transverse Mercator

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

August 16, 1995

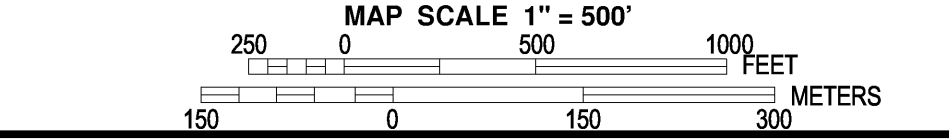
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

September 27, 2002

November 16, 2011 - to reflect updated topographic information, to change floodway, to add Base Flood Elevations, to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



PANEL 2187F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,

NEVADA

AND INCORPORATED AREAS

PANEL 2187 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY **NUMBER** **PANEL** **SUFFIX**

CLARK COUNTY 320003 2187 F

LAS VEGAS, CITY OF 325276 2187 F

Figure 2.1

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER

32003C2187F

MAP REVISED

NOVEMBER 16, 2011

Federal Emergency Management Agency

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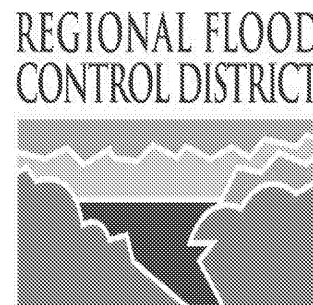
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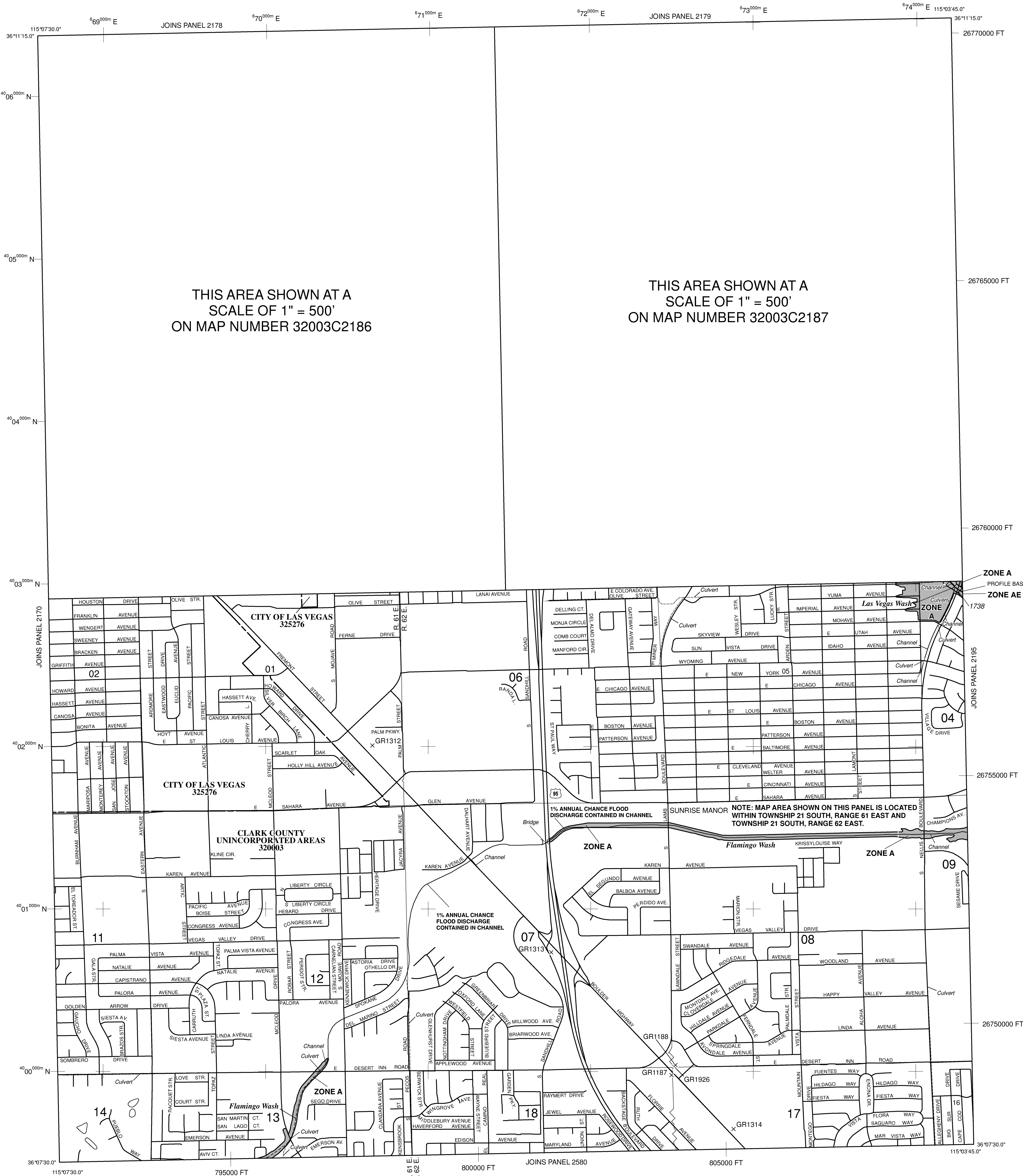
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DIGITAL DATA AVAILABILITY: <http://www.co.clark.nv.us/ceit/gismo/gismo.htm>



THIS AREA SHOWN AT A
SCALE OF 1" = 500'
ON MAP NUMBER 32003C2186

THIS AREA SHOWN AT A
SCALE OF 1" = 500'
ON MAP NUMBER 32003C2187



LEGEND

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OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
 Floodway boundary
 Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*
 Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks, zone 11

5000-foot grid ticks: Nevada State Plane coordinate system, east zone (FIPSZONE 2701), Transverse Mercator

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

August 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

September 27, 2002

November 16, 2011 - to reflect updated topographic information, to change floodway, to add Base Flood Elevations, to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2190F

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS

PANEL 2190 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2190	F
LAS VEGAS, CITY OF	325276	2190	F

Figure 2.2

Notes to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER

32003C2190F

MAP REVISED

NOVEMBER 16, 2011

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD83. GPS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was provided in digital format by the Clark County GIS Management Office (GISMO).

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study report* (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The Digital Flood Insurance Rate Map (DFIRM) was produced through a unique partnership between Clark County and the Federal Emergency Management Agency (FEMA). Clark County has developed a long-term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the Clark County commitment to share and maintain floodplain layers within their Geographic Information System Management Office (GISMO).

This DFIRM reflects several innovative features. These include:

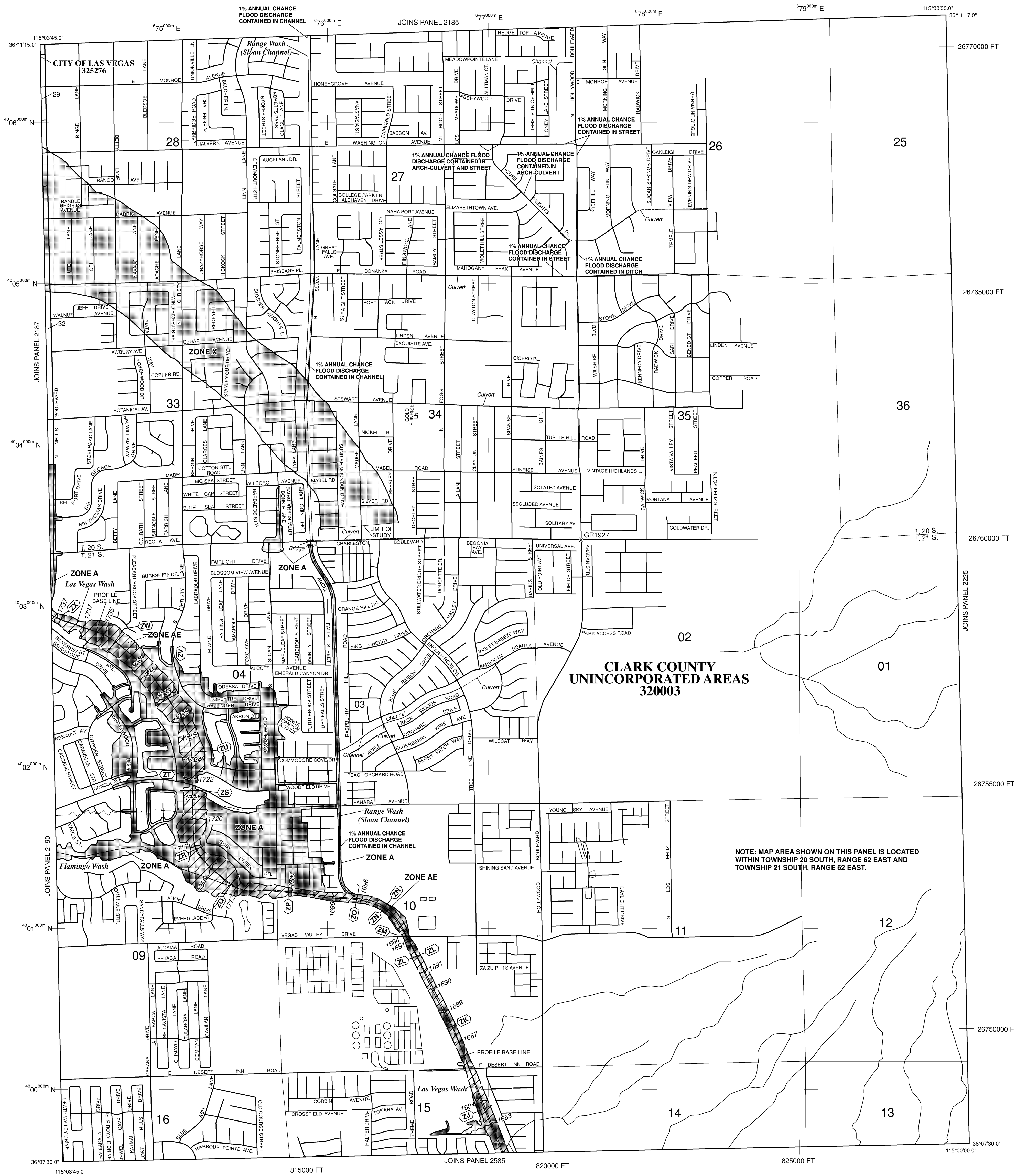
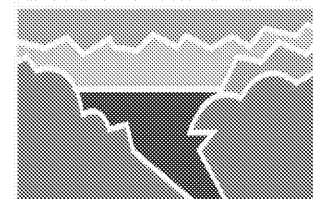
+ Southern Nevada GIS - Cooperation among local government agencies throughout Clark County. The foundation of cooperation is the GIS Interlocal Agreements formed between fourteen regional participants. In part, the agreements specify that the Clark County GIS Management Office (GISMO) will be responsible for maintaining a GIS data warehouse and associated Southern Nevada GIS metadata.

+ The GISMO's responsibilities go beyond maintaining the GIS data warehouse. GISMO also maintains the Street Centerline Database used by 911 dispatch services. This centerline database serves as the base map for this DFIRM.

DIGITAL DATA AVAILABILITY: <http://www.co.clark.nv.us/ceit/gismo/gismo.htm>



REGIONAL FLOOD
CONTROL DISTRICT



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 11
- 5000-foot grid ticks: Nevada State Plane coordinate system, east zone (FIPSZONE 2701), Transverse Mercator
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile
- MAP REPOSITORIES
- Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP August 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL September 27, 2002

November 16, 2011 - to reflect updated topographic information, to change floodway, to add Base Flood Elevations, to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2195F

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS

PANEL 2195 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2195	F
LAS VEGAS, CITY OF	325276	2195	F

Figure 2.3

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER

32003C2195F

MAP REVISED

NOVEMBER 16, 2011

Federal Emergency Management Agency



Appendix B.3
**Figure 3 – FEMA Annotated Flood Zone Map
Flamingo Wash LOMR**

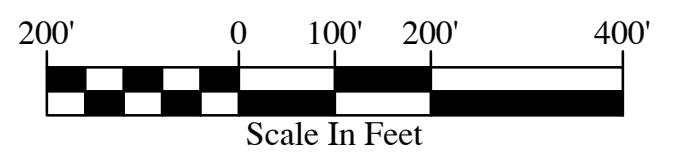
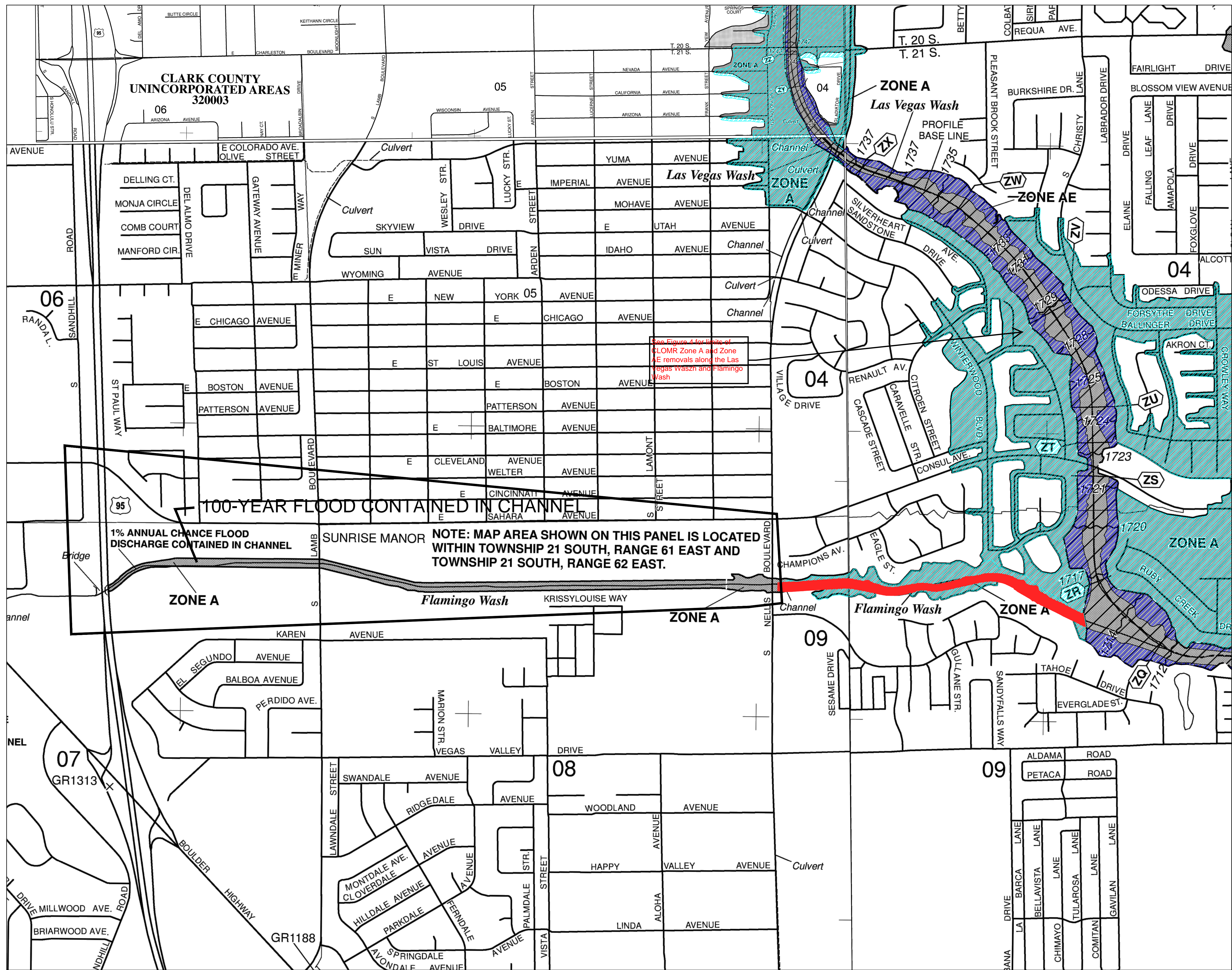


FIGURE 3 -
FEMA ANNOTATED FLOOD ZONE MAP
FLAMINGO WASH LOMR



CH2MHILL.





Appendix B.4
**Figure 4 – FEMA Annotated Flood Zone Map
Las Vegas Wash & Flamingo Wash CLOMR**

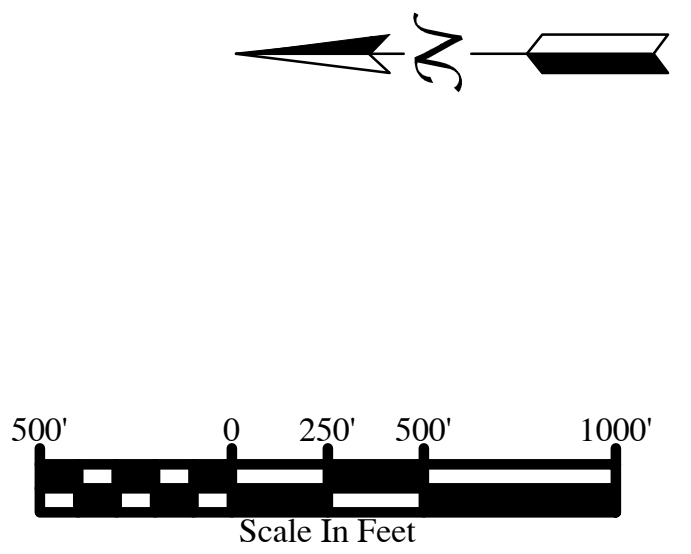
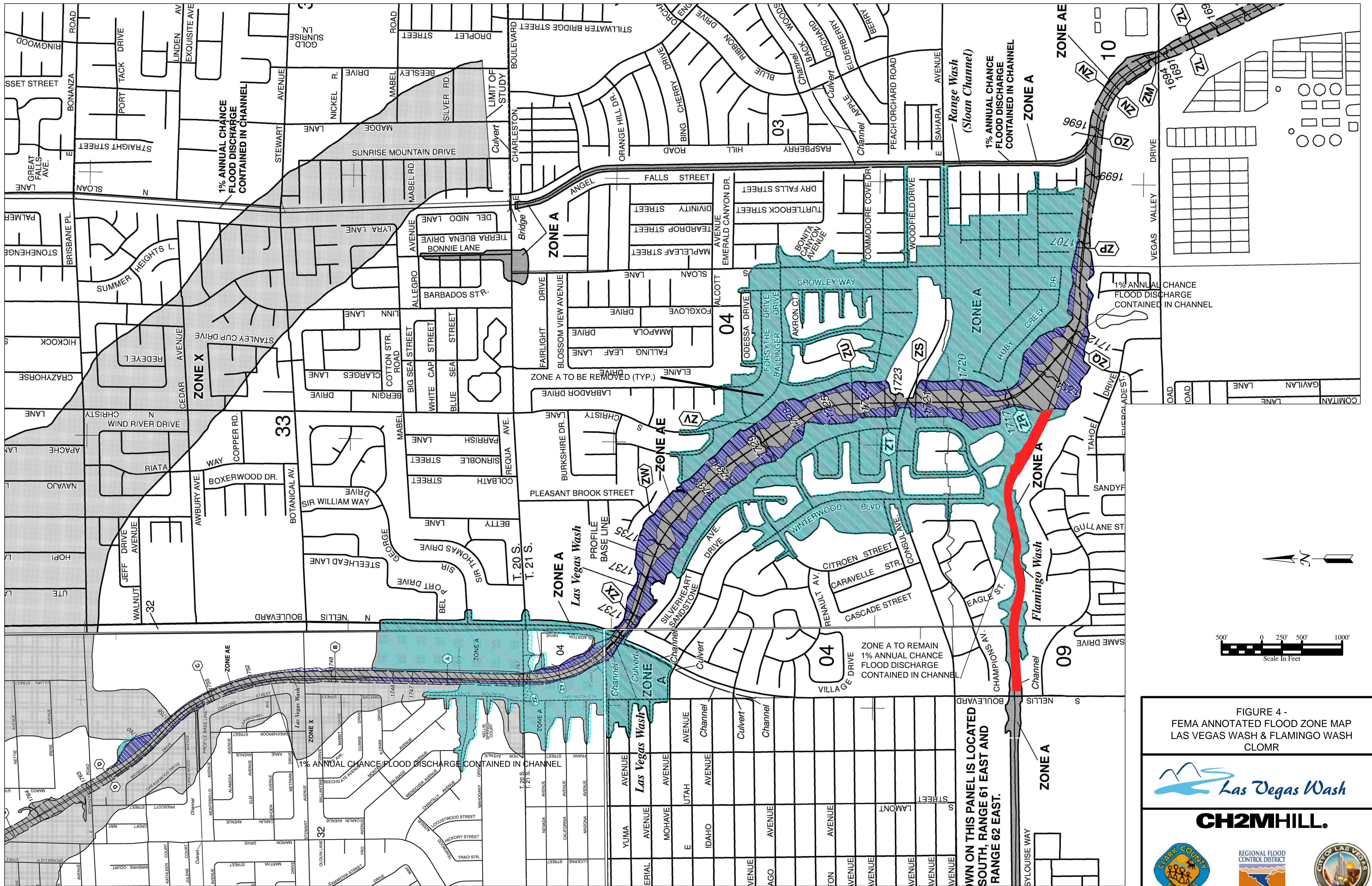


FIGURE 4 -
FEMA ANNOTATED FLOOD ZONE MAP
LAS VEGAS WASH & FLAMINGO WASH
CLOMR

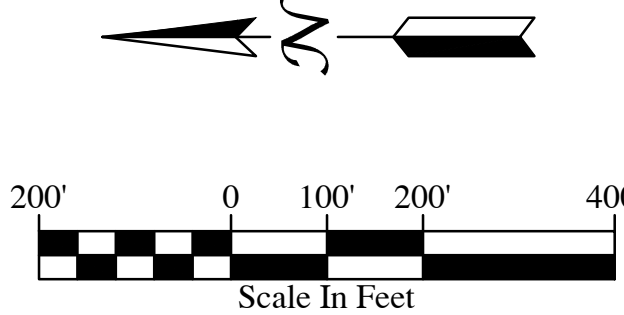
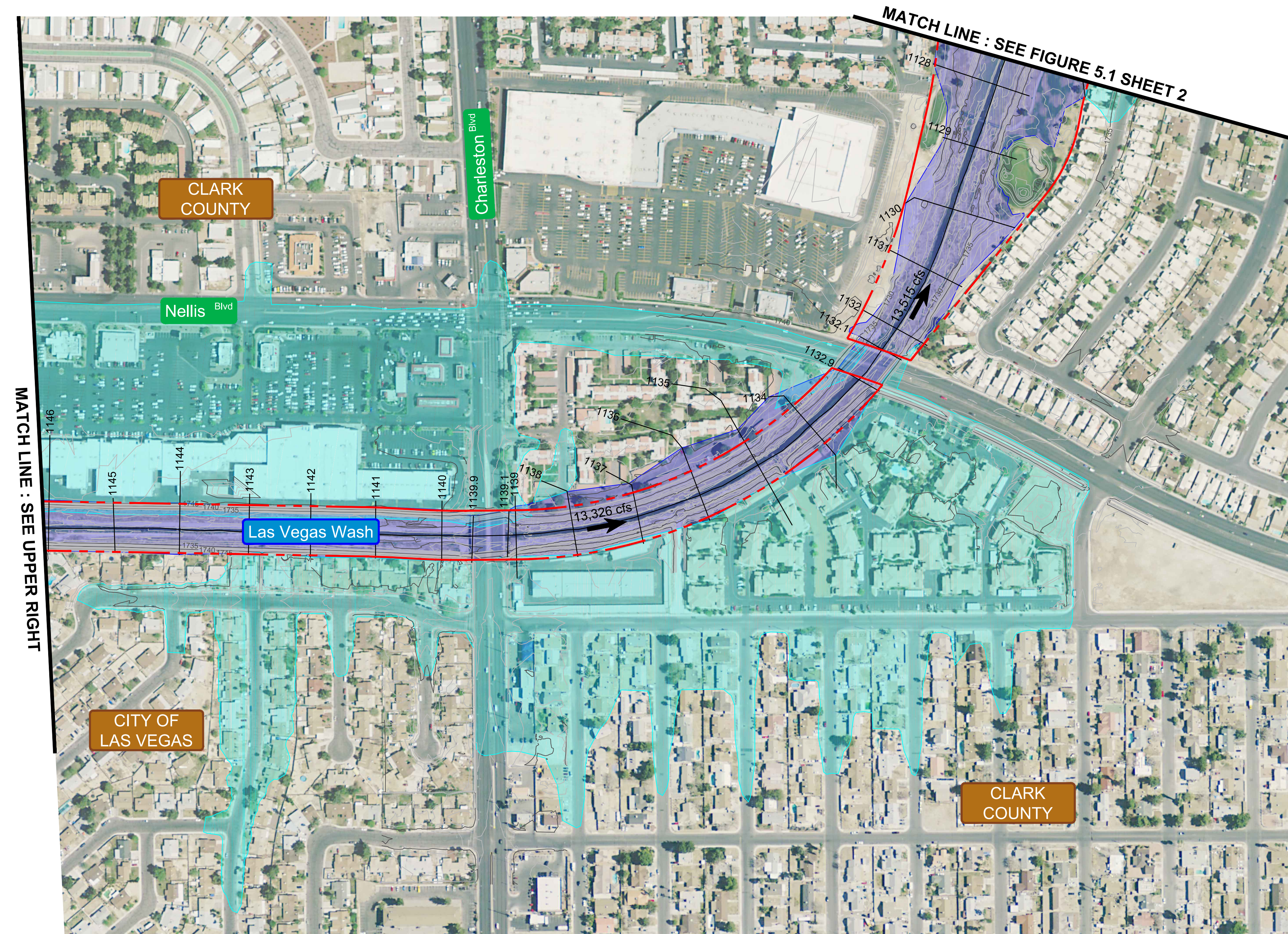
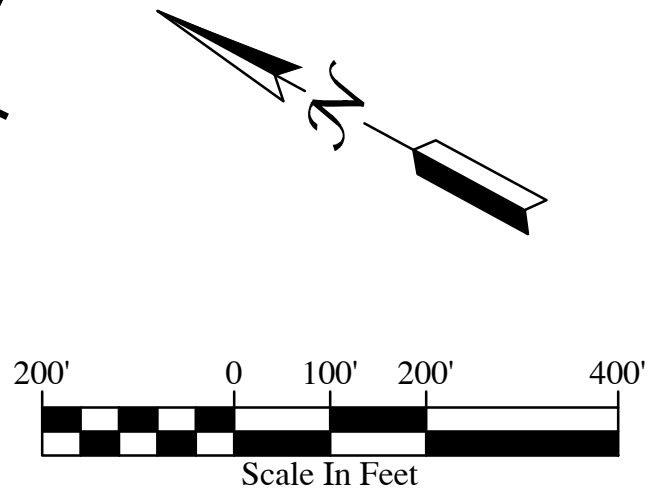
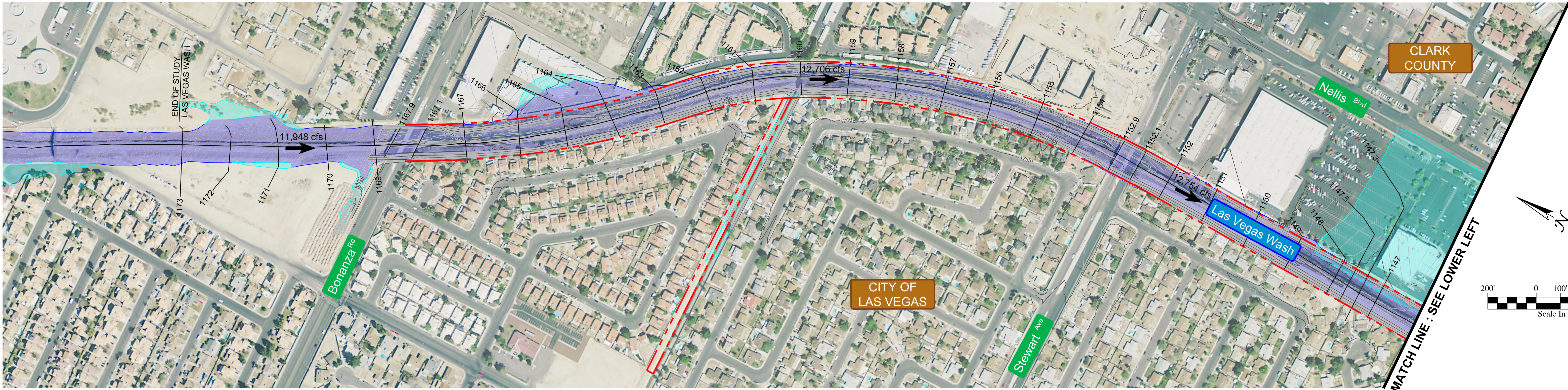


CH2MHILL.





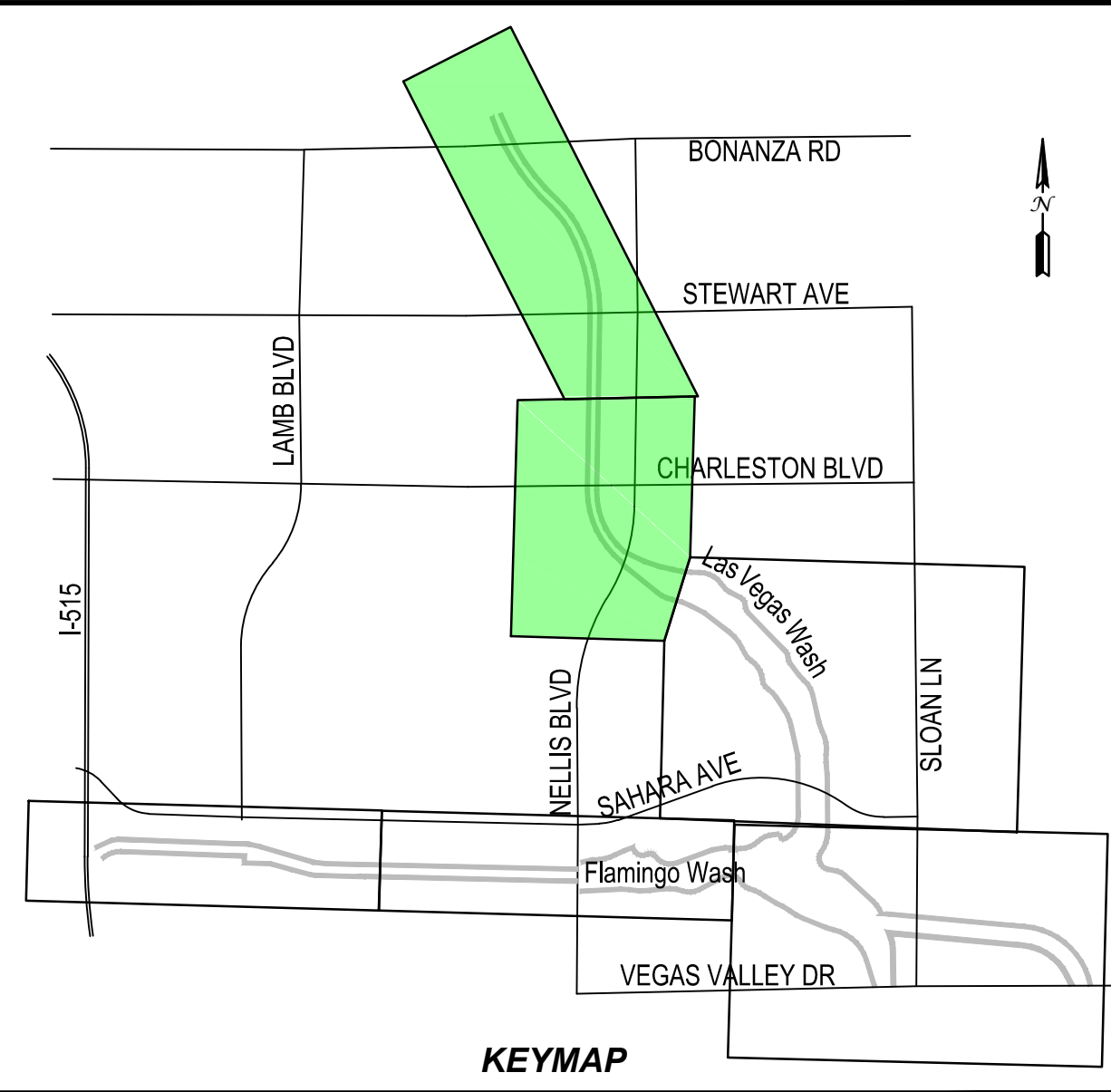
Appendix B.5
Figure 5.1 – Pre-Project Conditions Work Map
Las Vegas Wash



NOTES:

FLOODING SOURCE:
LAS VEGAS WASH

FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F



BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

NOTES:

1. STATE PLANE NAD 83 POSITIONS CAN BE DERIVED AS FOLLOWS BASE ON EPOCH 2002 POSITIONS. LVVWD CORS STATIONS NVCA, NVTP, AND NVBM WERE ALL UTILIZED FOR THIS SURVEY.
2. FOR NAD 83 STATE PLANE COORDINATE VALUES (EPOCH 2002.0):
SUBTRACT 760021.661 FROM THE NORTHING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 26760021.661
SUBTRACT 810017.508 FROM THE EASTING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 810017.508

BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)

LEGEND

- 100 YEAR PRE-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR PRE-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY

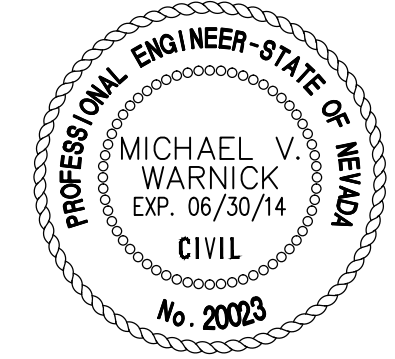
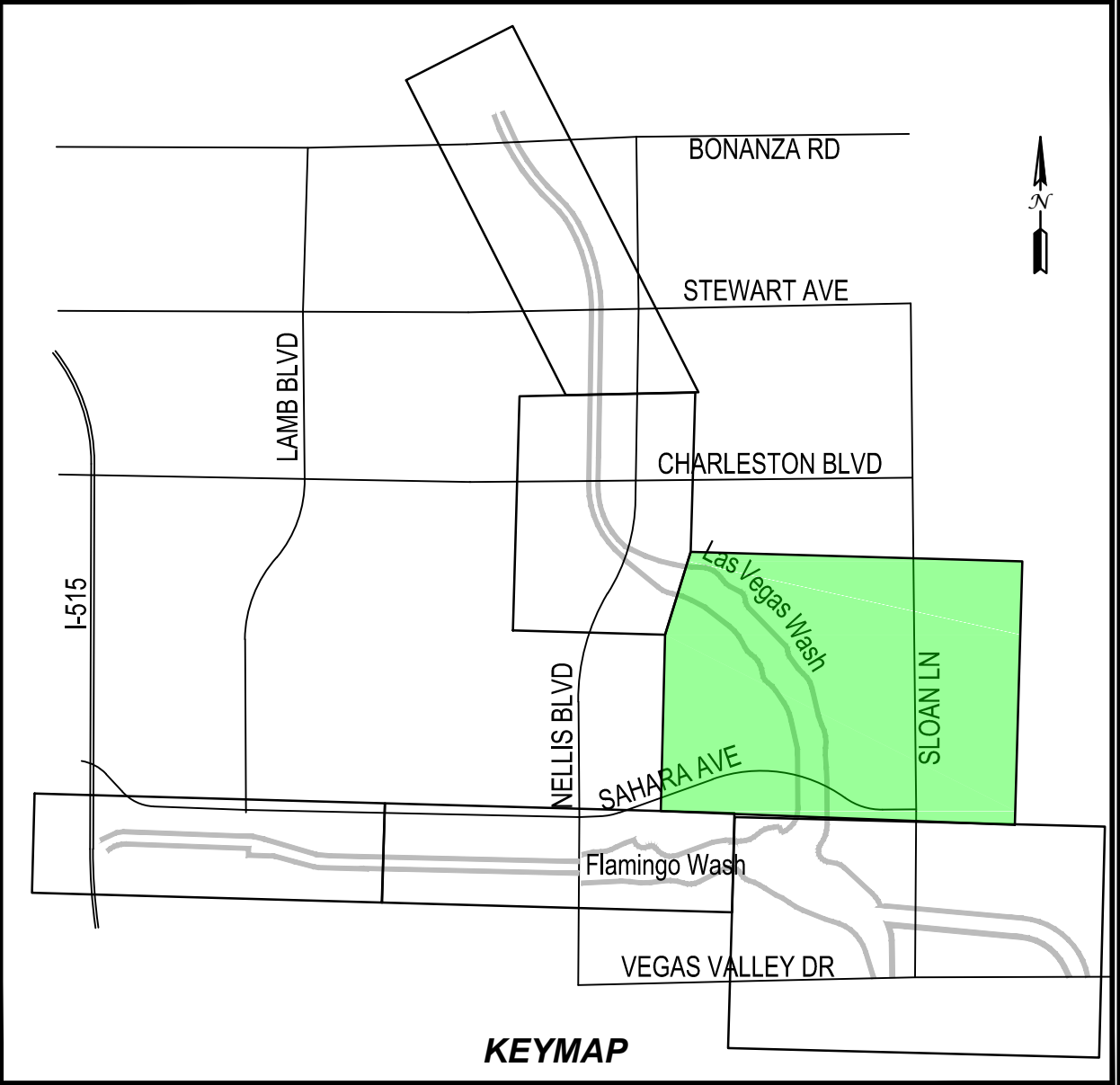
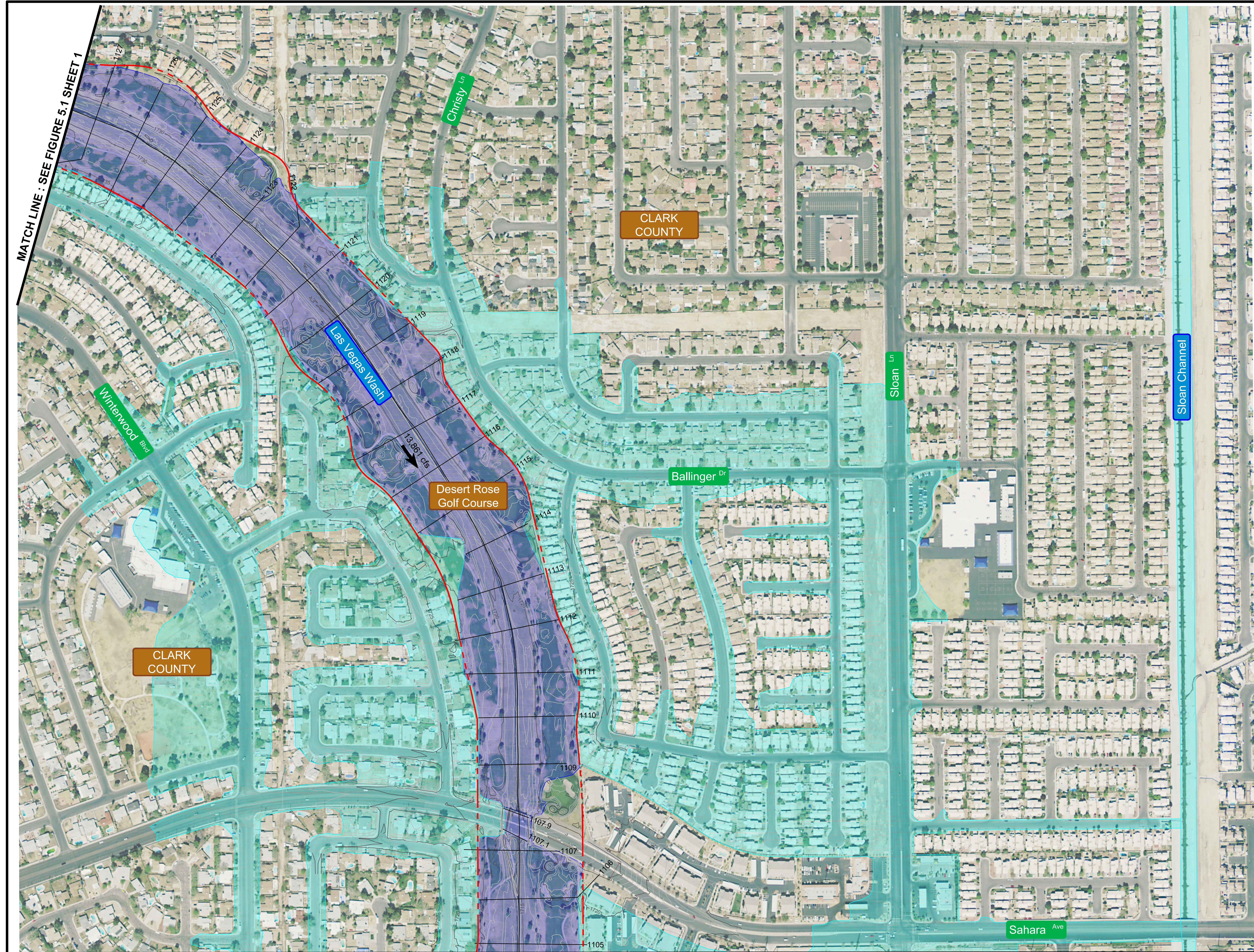


FIGURE 5.1 - PRE-PROJECT CONDITIONS WORK MAP LAS VEGAS WASH SHEET 1 OF 3



CH2MHILL.





LEGEND

- 100 YEAR PRE-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR PRE-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY

NOTES:

- FLOODING SOURCE:
LAS VEGAS WASH
- FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

NOTES:

- STATE PLANE NAD 83 POSITIONS CAN BE DERIVED AS FOLLOWS BASE ON EPOCH 2002 POSITIONS. LVWVD CORS STATIONS NVCA, NVTP, AND NVBM WERE ALL UTILIZED FOR THIS SURVEY.
- FOR NAD 83 STATE PLANE COORDINATE VALUES (EPOCH 2002.0):
SUBTRACT 760021.661 FROM THE NORTHING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 26760021.661
SUBTRACT 810017.508 FROM THE EASTING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 810017.508

BENCHMARK:

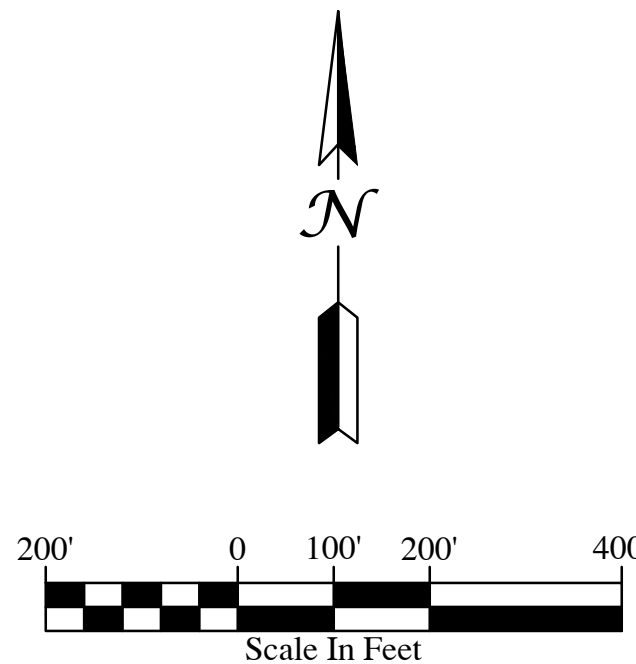
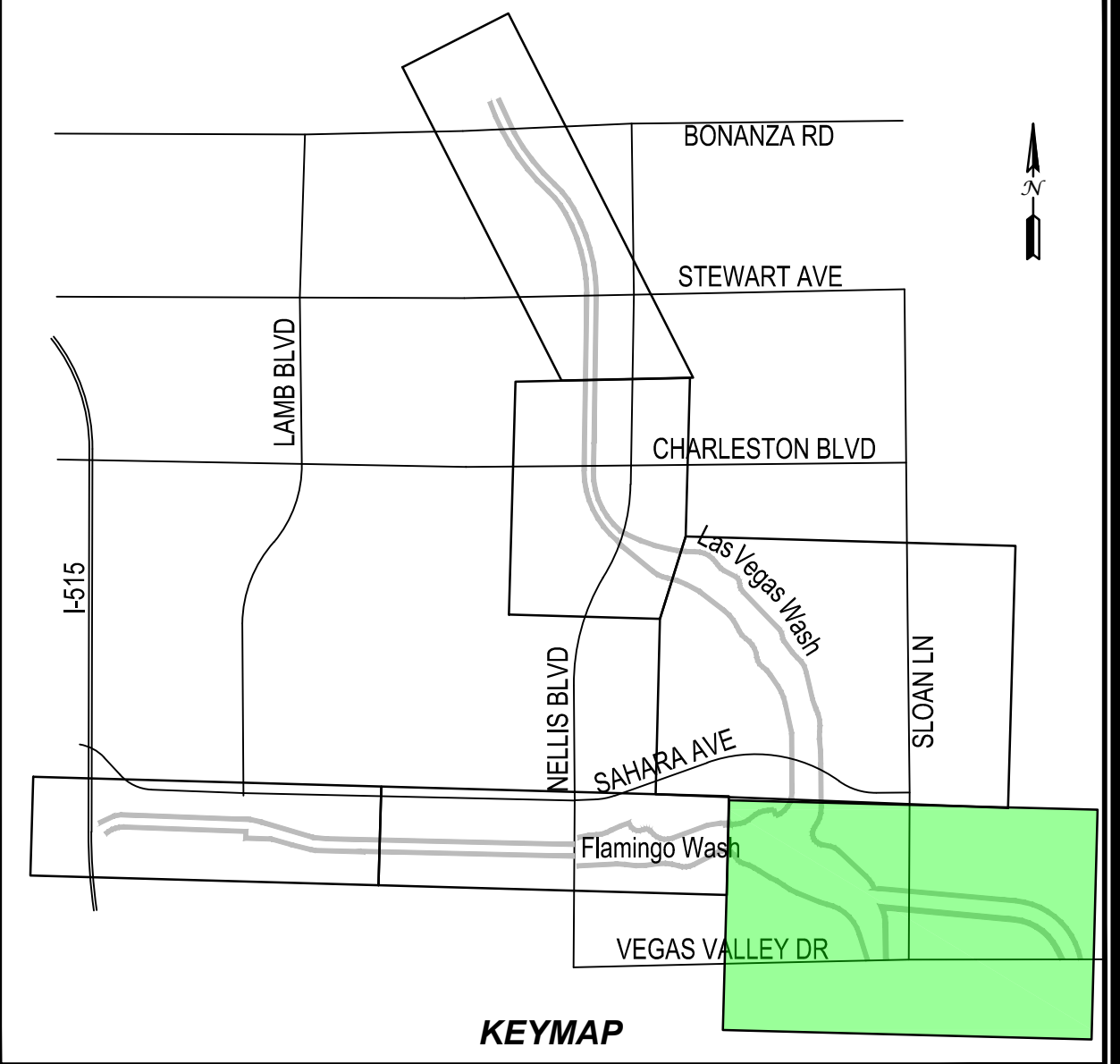
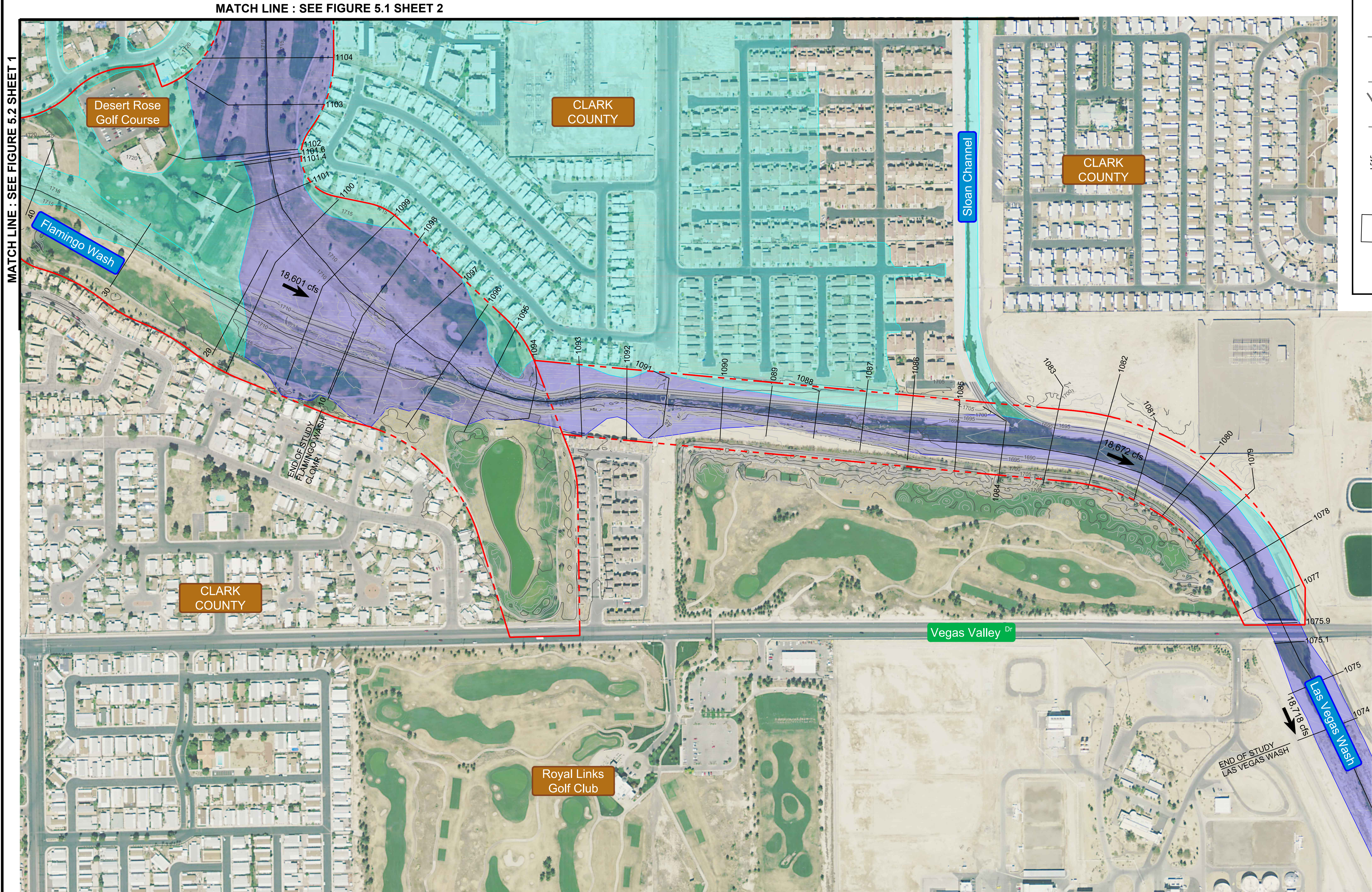
CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)



FIGURE 5.1 - PRE-PROJECT CONDITIONS WORK MAP LAS VEGAS WASH SHEET 2 OF 3





NOTES:

FLOODING SOURCE:
LAS VEGAS WASH

FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F

LEGEND

- 100 YEAR PRE-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR PRE-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY



FIGURE 5.1 - PRE-PROJECT
CONDITIONS WORK MAP LAS VEGAS WASH
SHEET 3 OF 3

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

NOTES:

- STATE PLANE NAD 83 POSITIONS CAN BE DERIVED AS FOLLOWS BASE ON EPOCH 2002 POSITIONS. LVVWD CORS STATIONS NVCA, NVTP, AND NVBM WERE ALL UTILIZED FOR THIS SURVEY.
- FOR NAD 83 STATE PLANE COORDINATE VALUES (EPOCH 2002.0):
SUBTRACT 760021.661 FROM THE NORTHING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 26760021.661
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BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)



CH2MHILL.

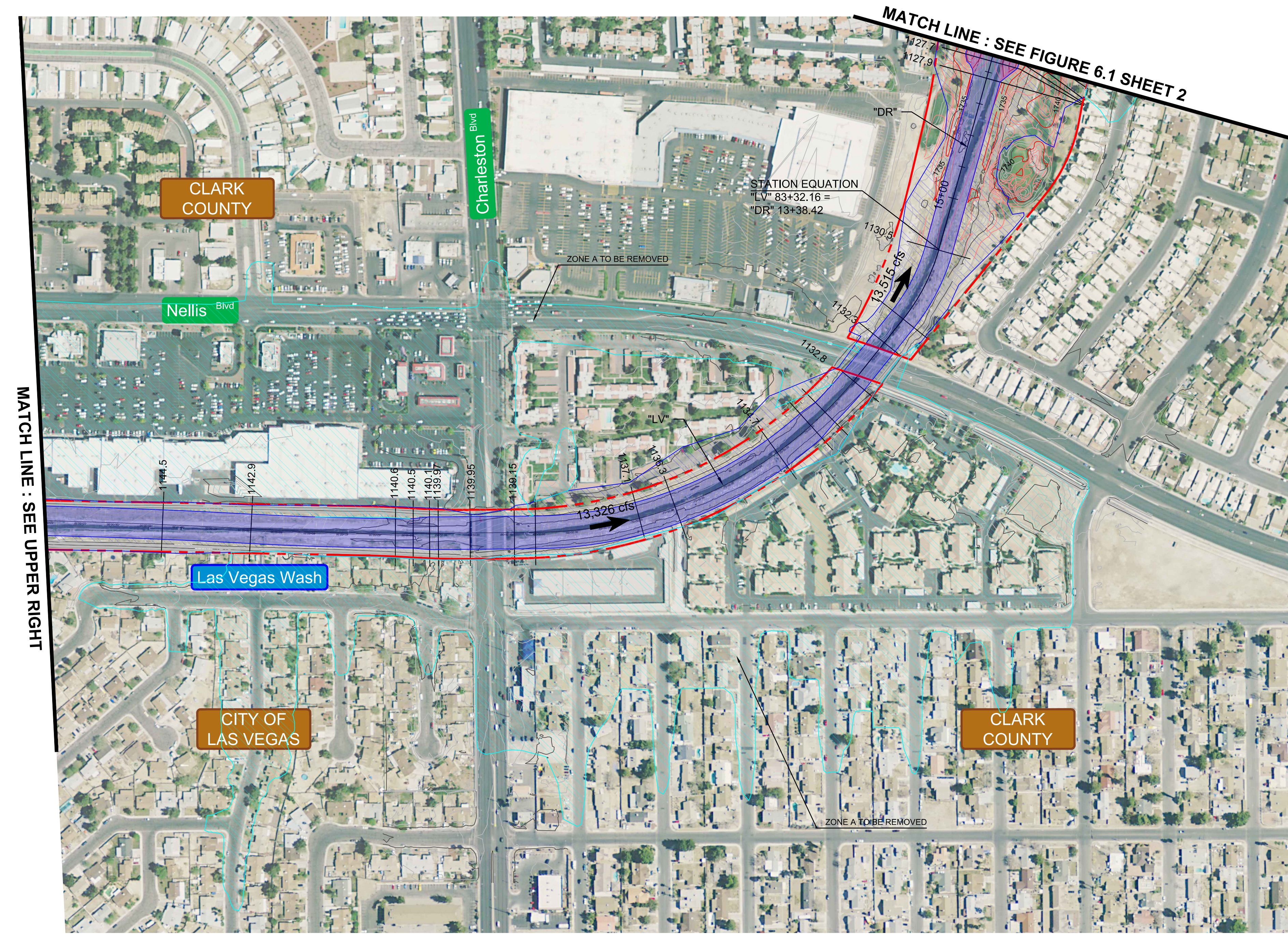
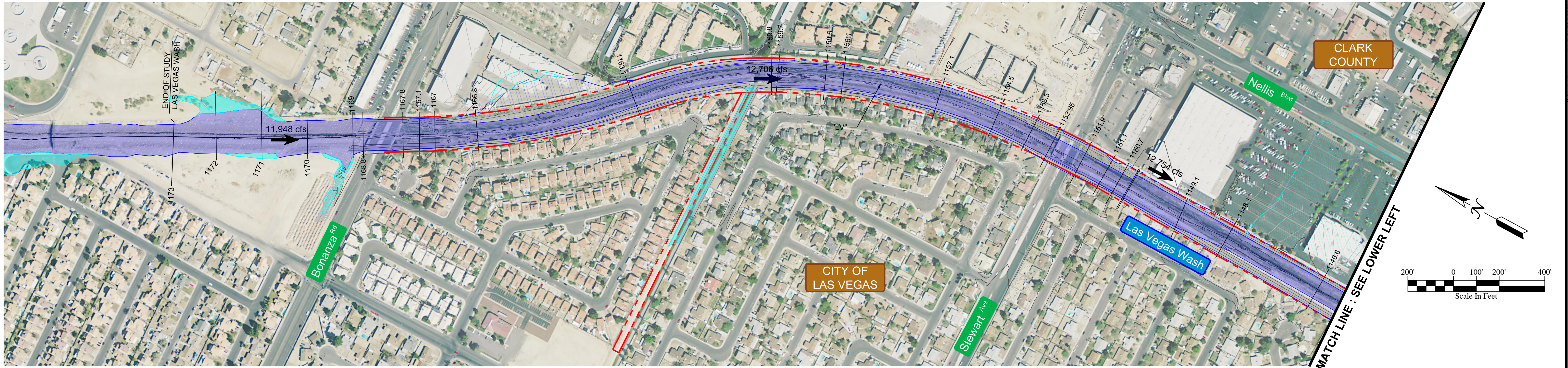




Appendix B.6
Figure 5.2 – Pre-Project Conditions Work Map
Flamingo Wash



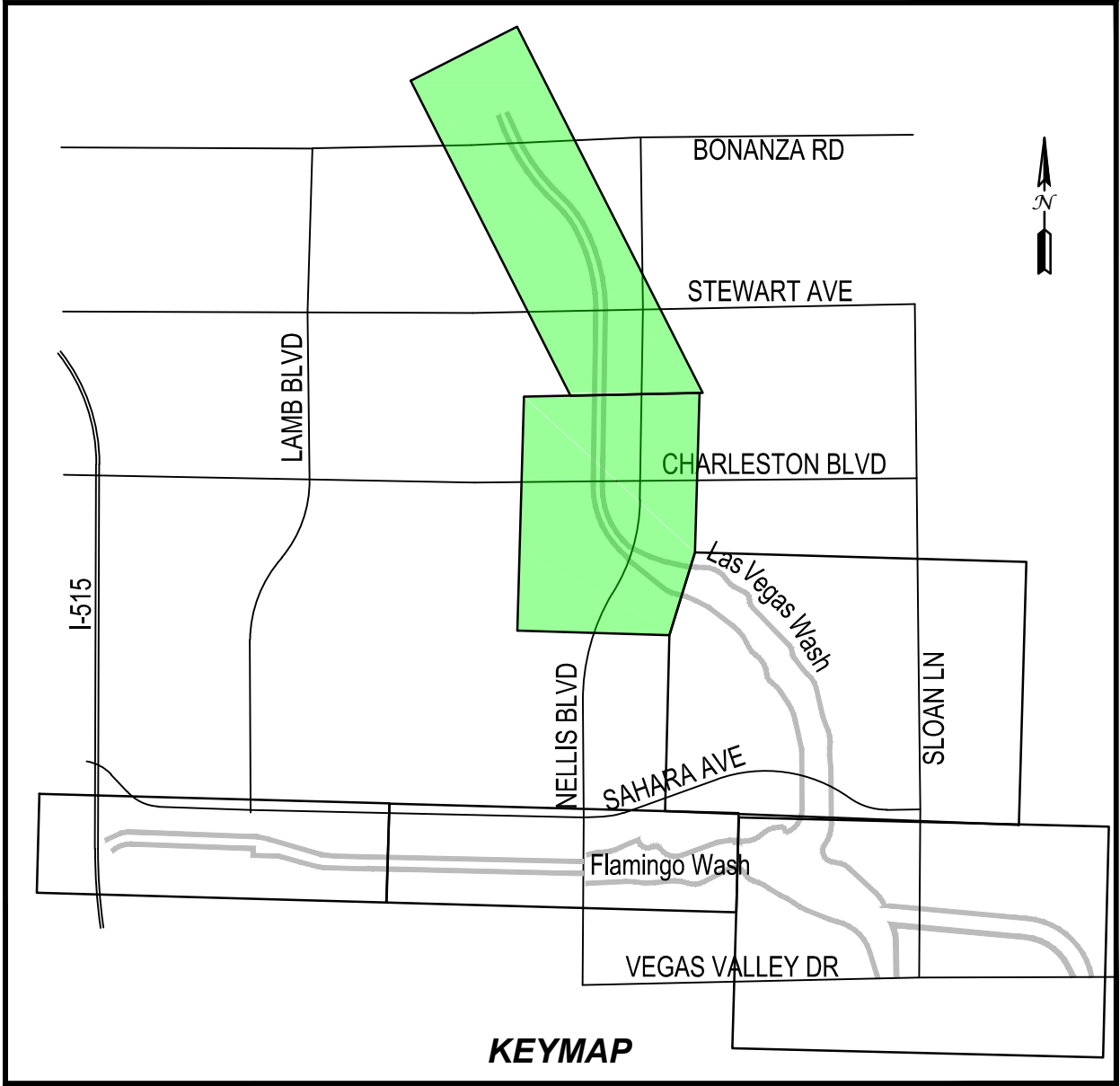
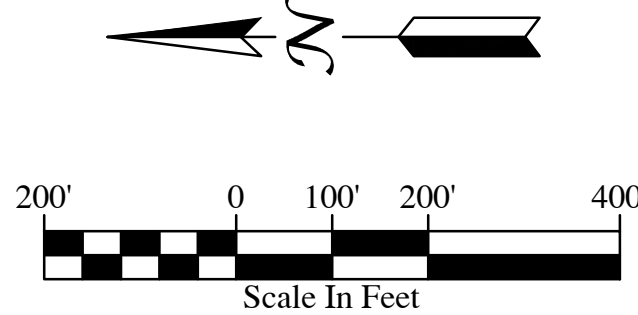
Appendix B.7
Figure 6.1 – Post Project Conditions Work Map
Las Vegas Wash



NOTES:

FLOODING SOURCE:
LAS VEGAS WASH

FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F



LEGEND

- 100 YEAR POST-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR POST-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY



BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

NOTES:

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- FOR NAD 83 STATE PLANE COORDINATE VALUES (EPOCH 2002.0):
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SUBTRACT 810017.508 FROM THE EASTING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 810017.508

BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

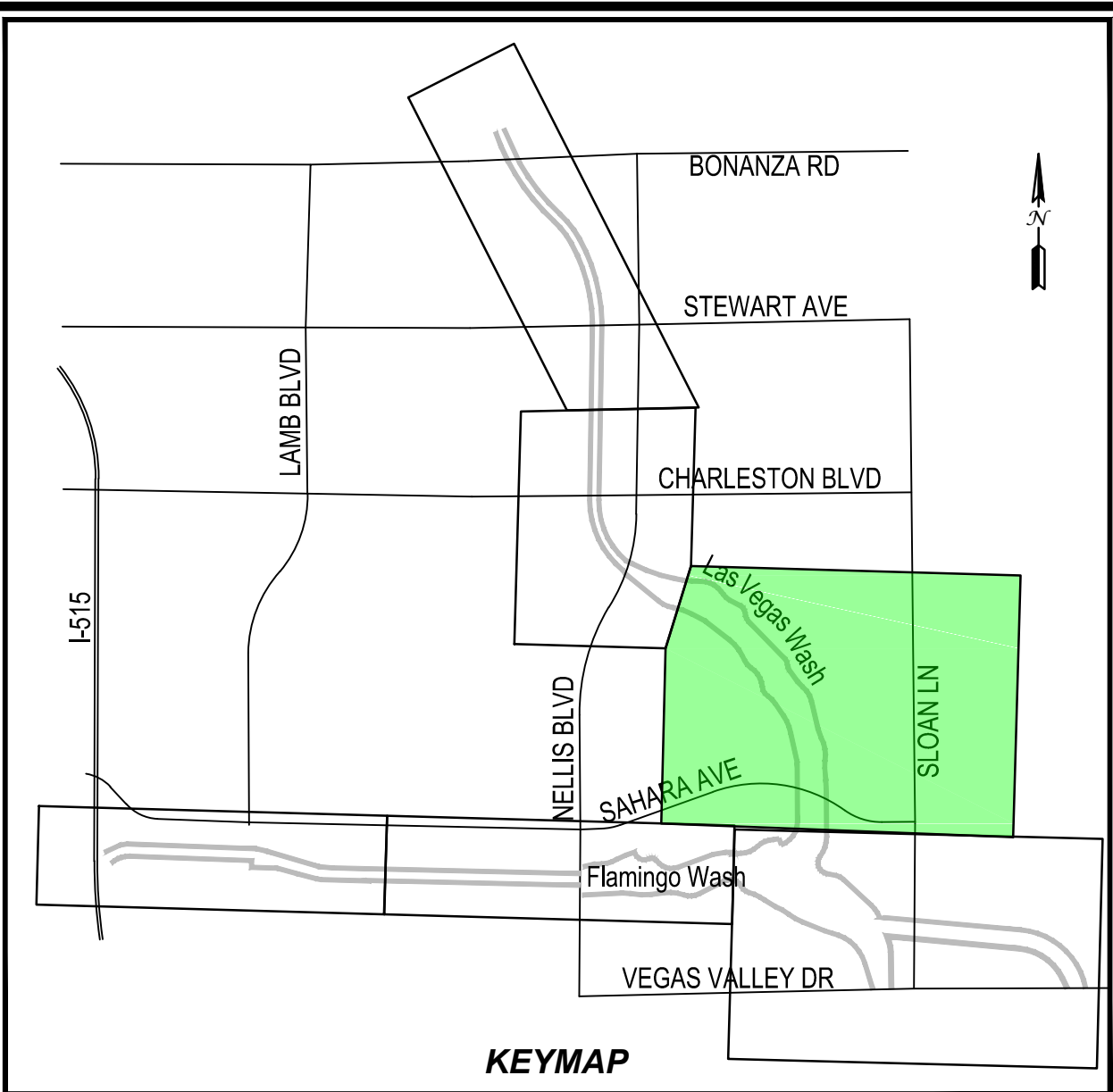
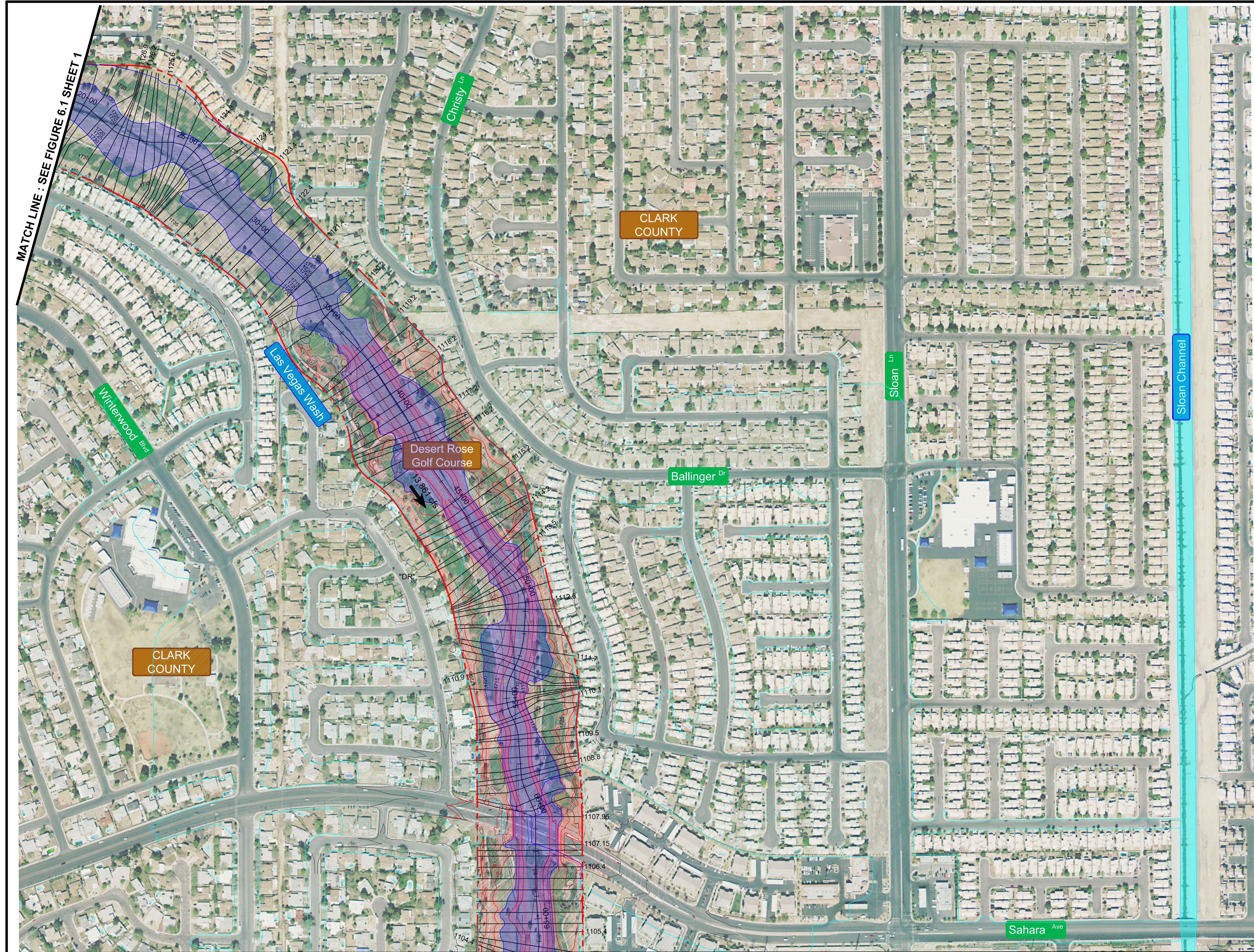
ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)

FIGURE 6.1 - POST-PROJECT
CONDITIONS WORK MAP LAS VEGAS WASH
SHEET 1 OF 3



CH2MHILL.





LEGEND

- 100 YEAR POST-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR POST-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY

NOTES:

FLOODING SOURCE:
LAS VEGAS WASH

FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

NOTES:

- STATE PLANE NAD 83 POSITIONS CAN BE DERIVED AS FOLLOWS BASE ON EPOCH 2002 POSITIONS. LVVWD CORS STATIONS NVCA, NVTP, AND NVBM WERE ALL UTILIZED FOR THIS SURVEY.
- FOR NAD 83 STATE PLANE COORDINATE VALUES (EPOCH 2002.0):
SUBTRACT 760021.661 FROM THE NORTHING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 26760021.661
SUBTRACT 810017.508 FROM THE EASTING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 810017.508

BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.



ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)

FIGURE 6.1 - POST-PROJECT
CONDITIONS WORK MAP LAS VEGAS WASH
SHEET 2 OF 3

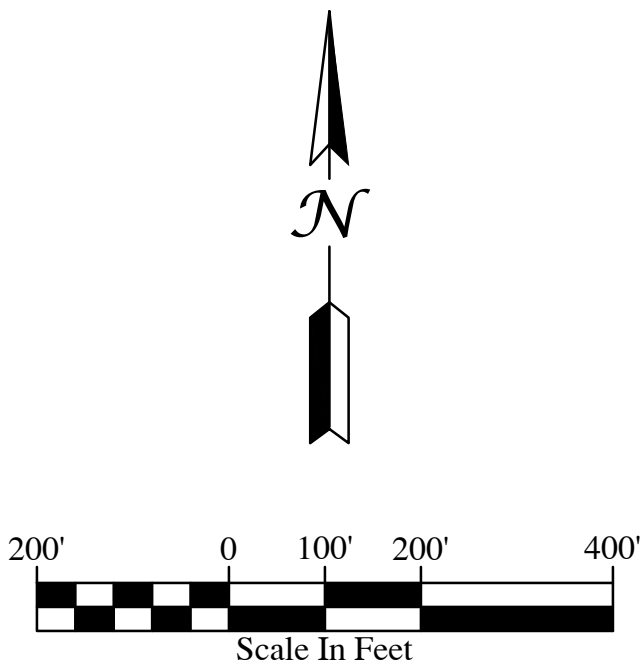
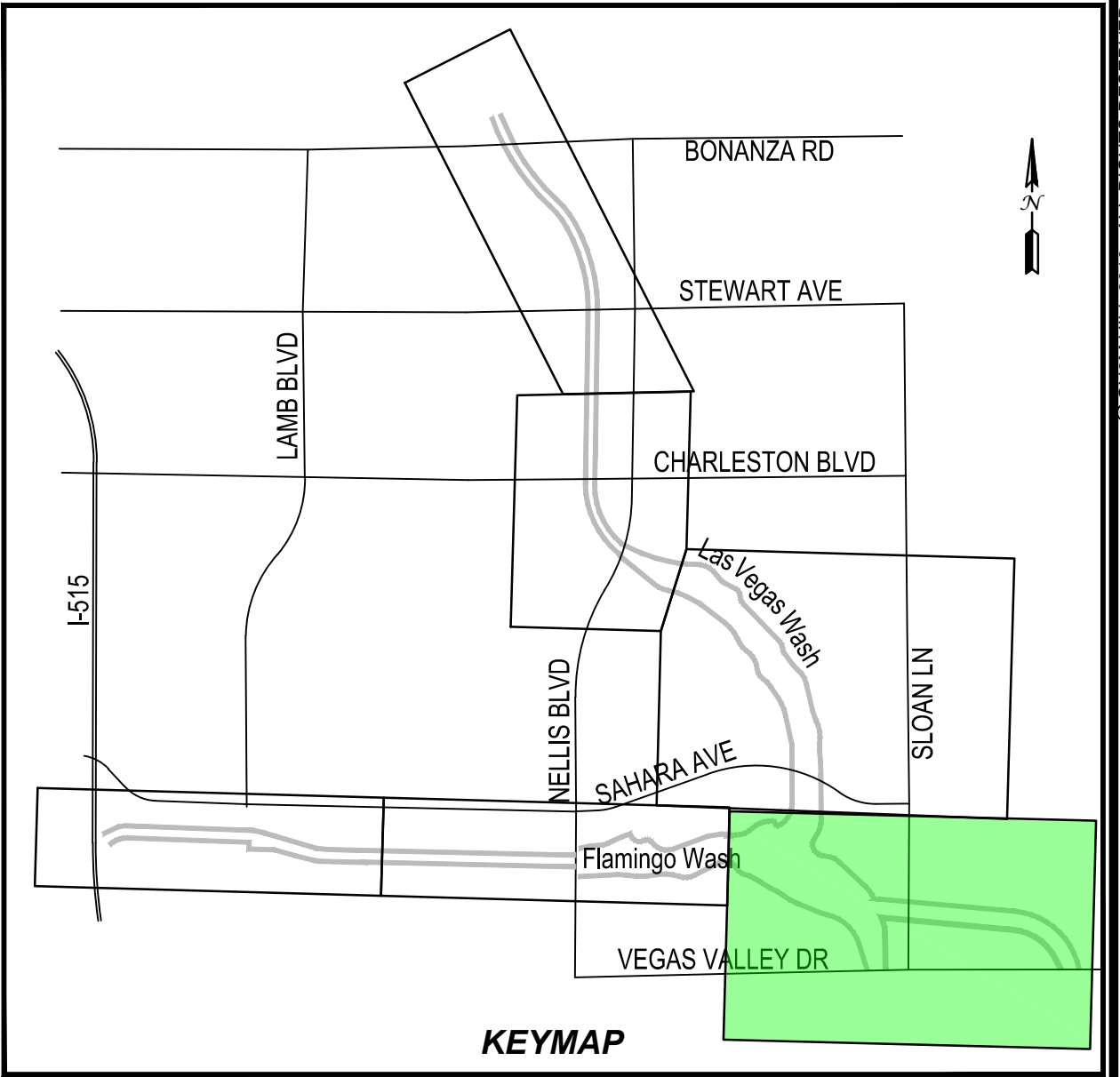
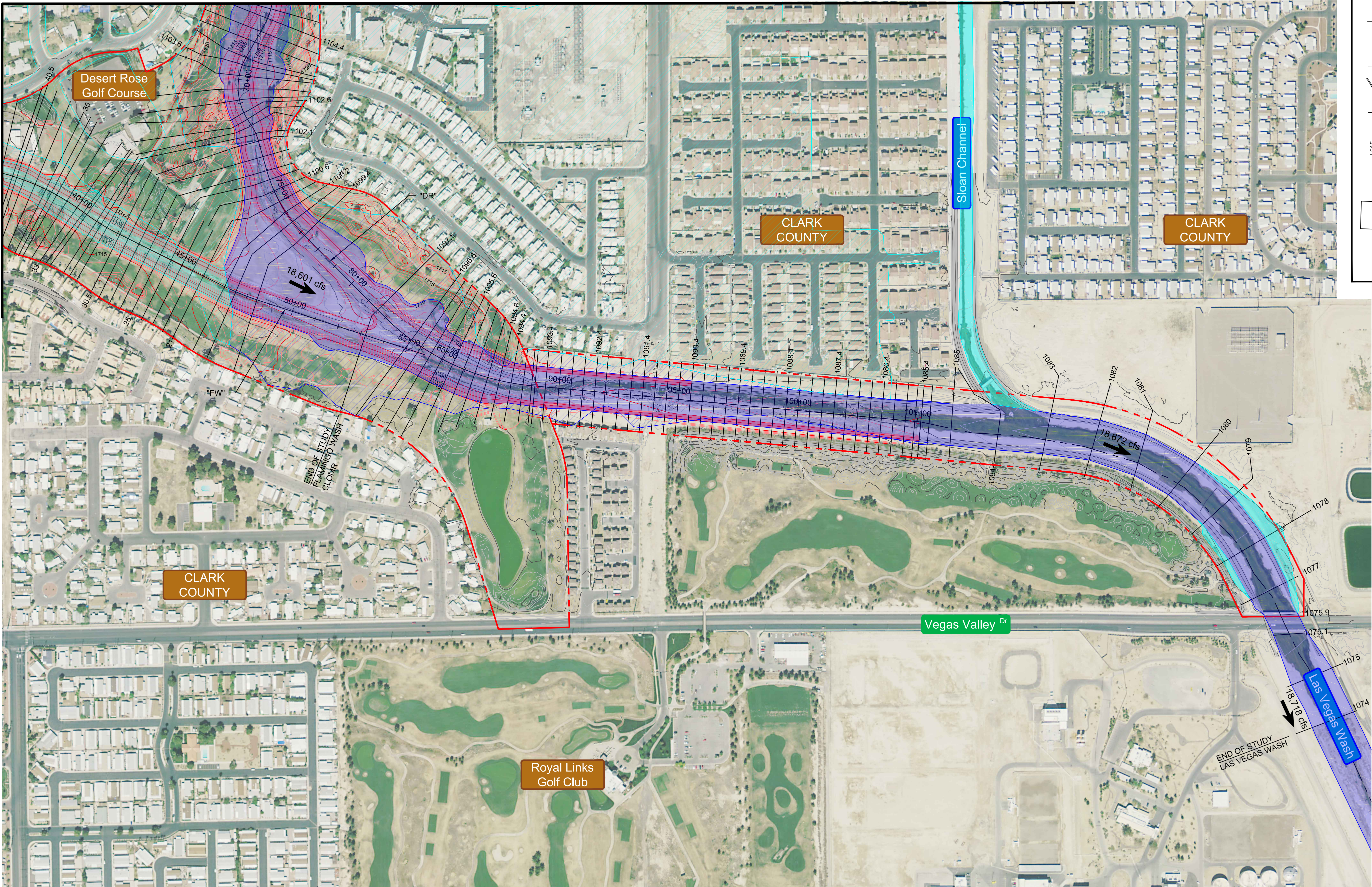


CH2MHILL.



MATCH LINE : SEE FIGURE 6.1 SHEET 2

MATCH LINE : SEE FIGURE 6.2 SHEET 1



NOTES:

FLOODING SOURCE:
LAS VEGAS WASH

FIRM PANEL(S) AFFECTED:
32003C2187F
32003C2190F
32003C2195F

LEGEND

- 100 YEAR POST-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR POST-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY



FIGURE 6.1 - POST-PROJECT CONDITIONS WORK MAP LAS VEGAS WASH SHEET 3 OF 3

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83) EAST ZONE 2701.

THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

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SUBTRACT 810017.508 FROM THE EASTING THEN MULTIPLY BY .999842655 (PROJECT COMBINED FACTOR) AND ADD 810017.508

BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)



CH2MHILL.



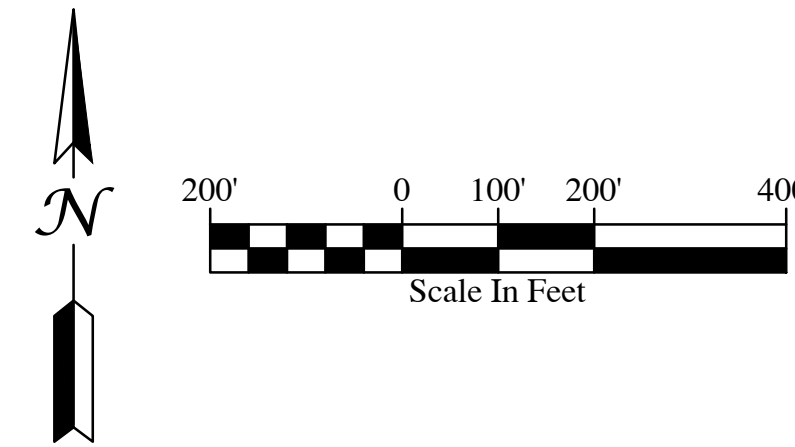
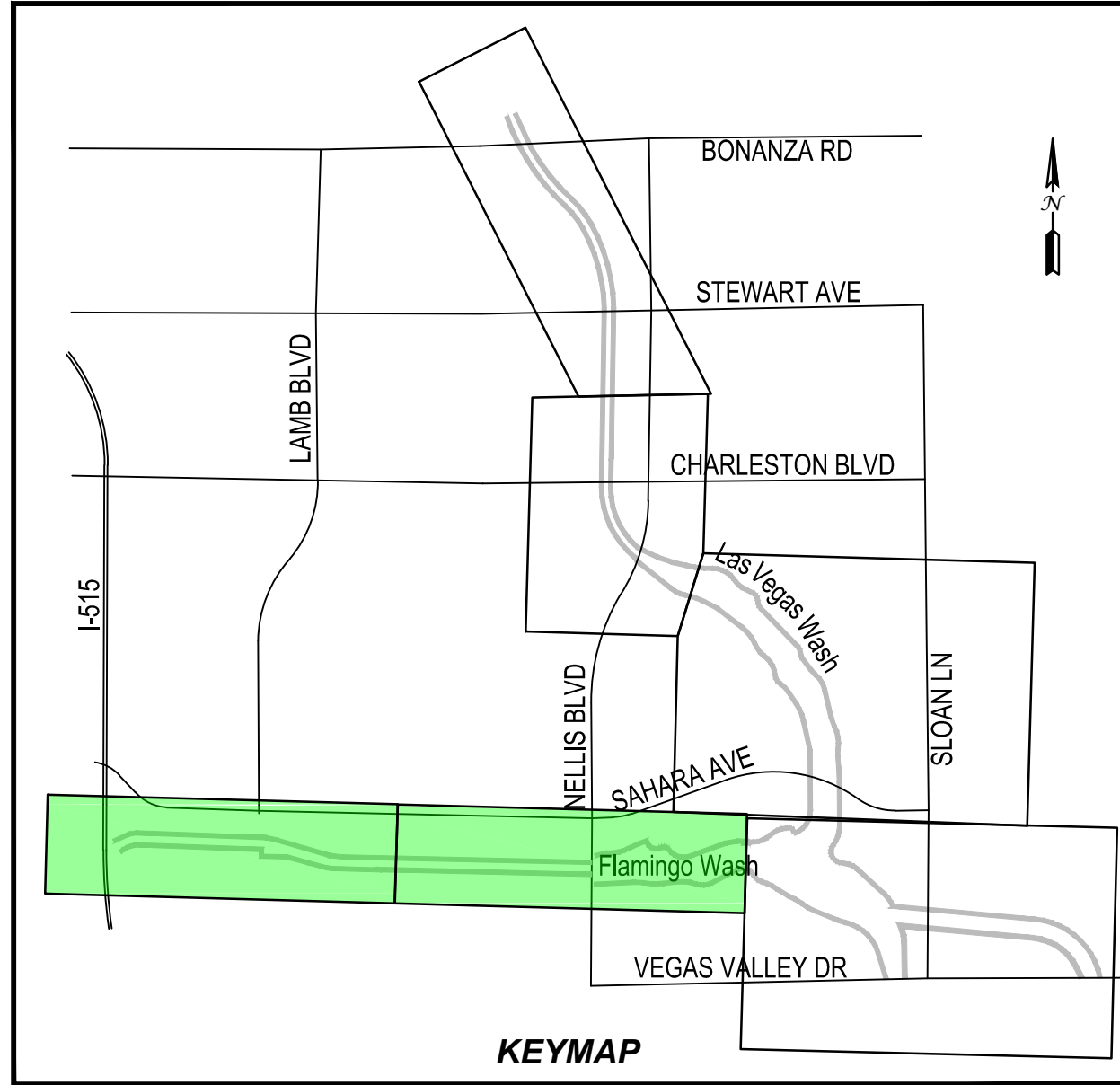


Appendix B.8

Figure 6.2 – Post Project Conditions Work Map
Flamingo Wash



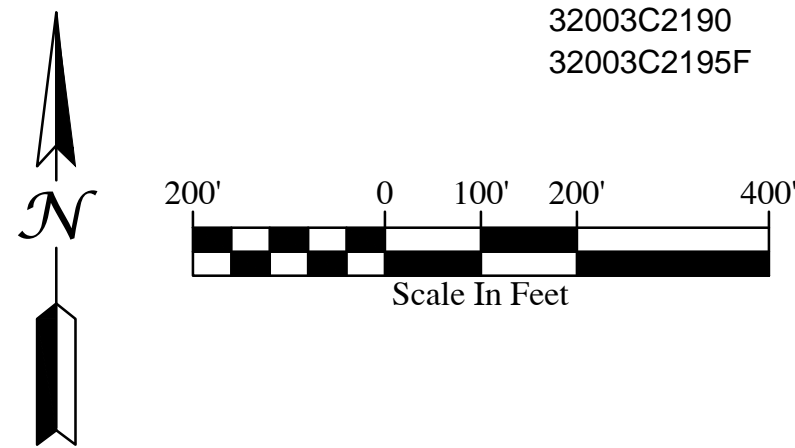
MATCH LINE : SEE LOWER LEFT



NOTES:

FLOODING SOURCE:
FLAMINGO WASH

FIRM PANEL(S) AFFECTED:
32003C2190
32003C2195F



LEGEND

- 100 YEAR POST-PROJECT FLOODPLAIN BOUNDARY, ZONE A
- 100 YEAR POST-PROJECT FLOODWAY BOUNDARY, ZONE AE
- PUBLIC RIGHT-OF-WAY



MATCH LINE : SEE FIGURE 6.1 SHEET 3

NOTES:

- STATE PLANE NAD 83 POSITIONS CAN BE DERIVED AS FOLLOWS BASE ON EPOCH 2002 POSITIONS. LVVWD CORS STATIONS NVCA, NVTP, AND NVBM WERE ALL UTILIZED FOR THIS SURVEY.
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BENCHMARK:

CLARK COUNTY BENCHMARK # 6C0232SSE6, BEING A RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB, NORTHEAST CORNER OF CHARLESTON BOULEVARD, AND YEW AVENUE, NEAR THE PC OF CHARLESTON BOULEVARD.

ELEVATION = 531.416 METER = 1743.487 FEET (NAVD88)

BASIS OF BEARINGS:

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THE MEASURED BEARING BETWEEN POINT NUMBERS 1 AND 2, BEING THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 21 SOUTH, RANGE 62 EAST, AS SHOWN ON RECORD OF SURVEY FILE 180, PAGE 51, CLARK COUNTY RECORDS, CLARK COUNTY, NEVADA IS NORTH 00°37'59" WEST.

FIGURE 6.2 - POST-PROJECT
CONDITIONS WORK MAP FLAMINGO WASH
SHEET 1 OF 1



CH2MHILL.





APPENDIX C HYDRAULICS – LAS VEGAS WASH



Las Vegas Wash HEC-RAS Output
Standard Table 1
Pre-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach #1	1173	PF 1	11948	1754.00	1764.77	1763.70	1767.35	0.004806	12.90	931.26	133.19	0.81
Reach #1	1172	PF 1	11948	1753.00	1764.07	1763.20	1766.39	0.004081	12.43	1030.75	204.68	0.76
Reach #1	1171	PF 1	11948	1753.00	1763.61	1761.70	1765.55	0.003247	11.28	1124.93	239.22	0.68
Reach #1	1170	PF 1	11948	1752.00	1762.95		1764.88	0.003436	11.16	1074.37	142.05	0.69
Reach #1	1169	PF 1	11948	1752.00	1762.81		1764.15	0.002264	9.28	1287.45	152.71	0.56
Reach #1	1167.9	PF 1	11948	1747.00	1763.02	1757.03	1763.90	0.001026	7.52	1589.70	136.54	0.39
Reach #1	1167.5		Bonanza Bridge									
Reach #1	1167.1	PF 1	11948	1747.00	1761.23		1763.04	0.003294	10.80	1106.45	135.84	0.67
Reach #1	1167	PF 1	11948	1747.00	1760.90		1762.34	0.002147	9.62	1241.99	133.43	0.56
Reach #1	1166	PF 1	11948	1747.00	1760.35		1761.83	0.002436	9.76	1244.84	179.72	0.58
Reach #1	1165	PF 1	11948	1747.00	1760.40		1761.32	0.001307	7.91	1794.17	327.86	0.44
Reach #1	1164	PF 1	11948	1747.00	1760.13		1761.06	0.001371	8.02	1776.87	400.27	0.45
Reach #1	1163	PF 1	11948	1746.00	1758.75		1760.58	0.002897	10.87	1108.93	152.62	0.64
Reach #1	1162	PF 1	11948	1746.00	1758.08		1759.96	0.003283	11.01	1085.55	132.90	0.68
Reach #1	1161	PF 1	11948	1746.00	1756.86		1759.19	0.004038	12.25	975.59	116.38	0.75
Reach #1	1160	PF 1	11948	1745.00	1756.59		1758.37	0.002682	10.71	1115.64	119.37	0.62
Reach #1	1159	PF 1	12706	1742.00	1755.13		1757.63	0.004203	12.70	1000.49	117.09	0.76
Reach #1	1158	PF 1	12706	1742.00	1753.81		1756.67	0.005140	13.57	936.38	115.48	0.84
Reach #1	1157	PF 1	12706	1740.00	1753.35		1755.62	0.003752	12.09	1051.17	121.20	0.72
Reach #1	1156	PF 1	12706	1739.00	1751.55	1750.76	1754.63	0.005706	14.07	903.23	112.97	0.88
Reach #1	1155	PF 1	12706	1738.00	1750.44	1749.70	1753.47	0.005694	13.96	909.88	115.46	0.88
Reach #1	1154	PF 1	12706	1737.00	1750.10		1752.31	0.003794	11.94	1064.46	126.37	0.72
Reach #1	1152.9	PF 1	12706	1733.46	1750.43	1746.01	1751.60	0.001624	8.70	1460.75	140.00	0.47
Reach #1	1152.5		Stewart Avenue Bridge									
Reach #1	1152.1	PF 1	12706	1733.46	1748.67		1750.69	0.003774	11.40	1114.82	139.08	0.71
Reach #1	1152	PF 1	12754	1733.25	1748.20		1750.21	0.003319	11.36	1122.46	126.23	0.67
Reach #1	1151	PF 1	12754	1733.00	1747.96		1749.60	0.001934	10.26	1242.85	136.30	0.60
Reach #1	1150	PF 1	12754	1733.00	1747.69		1749.20	0.001678	9.84	1295.81	135.66	0.56
Reach #1	1149	PF 1	12754	1733.00	1747.61		1748.82	0.001258	8.85	1440.42	144.13	0.49
Reach #1	1148	PF 1	12754	1733.00	1747.65		1748.53	0.000798	7.67	1783.40	297.33	0.40
Reach #1	1147.5	PF 1	12754	1733.00	1747.86		1748.38	0.000496	5.83	2300.69	468.92	0.39
Reach #1	1147.3	PF 1	12754	1733.00	1747.98		1748.29	0.000295	4.50	2990.91	684.80	0.32
Reach #1	1147	PF 1	12364	1733.00	1747.49		1748.22	0.000625	6.97	1833.83	202.29	0.36
Reach #1	1146	PF 1	12364	1733.00	1747.26		1748.07	0.000720	7.24	1730.83	213.82	0.38
Reach #1	1145	PF 1	12364	1733.00	1747.12		1747.93	0.000699	7.24	1719.73	161.90	0.38
Reach #1	1144.5		Lat Struct									
Reach #1	1144	PF 1	12362	1732.00	1747.17		1747.75	0.000489	6.24	2074.92	253.74	0.32
Reach #1	1143	PF 1	12324.79	1731.00	1747.08		1747.65	0.000425	6.14	2046.35	185.27	0.30
Reach #1	1142	PF 1	11901.55	1731.00	1747.05		1747.55	0.000363	5.69	2135.54	194.57	0.27
Reach #1	1141	PF 1	11719.72	1730.00	1747.02		1747.47	0.000312	5.39	2194.77	173.72	0.26
Reach #1	1140	PF 1	11467.08	1729.00	1747.00		1747.40	0.000260	5.05	2303.53	182.60	0.24
Reach #1	1139.9	PF 1	11304.35	1726.44	1747.06	1734.03	1747.35	0.000153	4.27	2646.33	141.50	0.17
Reach #1	1139.5		Charleston Boulevard Bridge									
Reach #1	1139.1	PF 1	11304.35	1726.25	1742.89		1743.33	0.000297	5.32	2123.08	141.50	0.24
Reach #1	1139	PF 1	11876.35	1726.00	1742.50		1743.24	0.000644	6.87	1772.66	222.46	0.36
Reach #1	1138	PF 1	12936	1726.00	1741.29		1742.96	0.001876	10.45	1343.41	263.22	0.60
Reach #1	1137	PF 1	12936	1726.00	1740.89		1742.55	0.002177	10.42	1318.50	244.19	0.59
Reach #1	1136	PF 1	12936	1726.00	1740.70		1742.03	0.002077	9.36	1478.53	271.83	0.56
Reach #1	1135	PF 1	12936	1726.00	1740.43		1741.60	0.001760	8.99	1672.20	441.97	0.52
Reach #1	1134	PF 1	12936	1726.00	1740.25		1741.24	0.001325	8.40	1883.87	379.14	0.46
Reach #1	1132.9	PF 1	12936	1724.48	1740.24	1733.34	1740.97	0.000708	6.84	1891.32	143.00	0.33
Reach #1	1132.5		Nellis Boulevard Bridge									
Reach #1	1132.1	PF 1	12936	1724.00	1738.06		1739.39	0.001852	9.26	1396.66	143.00	0.52
Reach #1	1132	PF 1	13515	1724.00	1737.64		1739.16	0.002574	9.88	1367.88	172.56	0.62
Reach #1	1131	PF 1	13515	1724.00	1737.14		1738.65	0.002496	9.88	1367.37	195.97	0.66
Reach #1	1130	PF 1	13515	1724.00	1737.30		1738.03	0.001547	6.83	1978.19	350.65	0.51
Reach #1	1129	PF 1	13515	1724.00	1735.96		1737.57	0.002307	10.16	1330.55	173.37	0.65

Las Vegas Wash HEC-RAS Output
Standard Table 1
Pre-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach #1	1128	PF 1	13515	1724.00	1735.83		1736.96	0.002347	8.51	1588.59	276.99	0.63
Reach #1	1127.5		Lat Struct									
Reach #1	1127	PF 1	13440.42	1724.00	1735.87		1736.37	0.001698	5.66	2374.88	600.37	0.50
Reach #1	1126	PF 1	13372.8	1724.00	1735.47		1736.02	0.001766	5.93	2254.19	546.91	0.51
Reach #1	1125	PF 1	13222.81	1724.00	1734.83		1735.57	0.002659	6.88	1921.50	506.60	0.62
Reach #1	1124.5		Lat Struct									
Reach #1	1124	PF 1	13074.79	1724.00	1734.42		1735.07	0.002089	6.47	2021.53	487.40	0.56
Reach #1	1123	PF 1	12808.24	1723.00	1733.74		1734.63	0.002124	7.58	1688.86	324.70	0.59
Reach #1	1122	PF 1	12754.82	1722.00	1733.22		1734.07	0.003592	7.42	1718.02	506.92	0.71
Reach #1	1121	PF 1	12510.4	1722.00	1732.84		1733.49	0.001970	6.46	1937.29	447.83	0.55
Reach #1	1120	PF 1	11555.53	1722.00	1731.10	1730.56	1732.72	0.007375	10.22	1131.21	353.51	1.01
Reach #1	1119	PF 1	10925.12	1722.00	1730.73		1731.48	0.003448	6.98	1566.23	490.63	0.69
Reach #1	1118	PF 1	10186.1	1722.00	1729.82	1729.41	1730.67	0.004818	7.37	1381.98	512.18	0.79
Reach #1	1117	PF 1	10127.71	1722.00	1728.72		1729.64	0.005412	7.71	1313.87	498.05	0.84
Reach #1	1116.5		Lat Struct									
Reach #1	1116.4		Lat Struct									
Reach #1	1116	PF 1	9756.4	1721.00	1728.47		1728.92	0.001763	5.41	1803.02	498.92	0.50
Reach #1	1115	PF 1	9212.09	1721.00	1728.16		1728.56	0.001718	5.12	1799.70	532.77	0.49
Reach #1	1114	PF 1	8907.23	1721.00	1726.08	1726.08	1727.81	0.007251	10.57	842.42	247.16	1.01
Reach #1	1113	PF 1	8874.03	1719.00	1725.10		1726.04	0.004958	7.78	1141.31	402.60	0.81
Reach #1	1112	PF 1	8873.91	1718.00	1724.52		1725.18	0.003094	6.50	1366.21	441.64	0.65
Reach #1	1111	PF 1	8856.65	1717.00	1724.00		1724.57	0.002739	6.02	1470.01	484.51	0.61
Reach #1	1110	PF 1	8691.68	1716.00	1723.76		1724.15	0.001311	5.03	1728.99	428.52	0.44
Reach #1	1109	PF 1	8217.15	1716.00	1723.58		1723.88	0.001088	4.40	1867.23	491.15	0.40
Reach #1	1107.9	PF 1	7973.39	1713.61	1722.09	1720.36	1723.56	0.000805	9.71	820.86	118.64	0.65
Reach #1	1107.5		Sahara Avenue Bridge									
Reach #1	1107.1	PF 1	7973.39	1713.19	1721.65		1723.13	0.000823	9.79	814.69	118.64	0.66
Reach #1	1107	PF 1	7973.39	1713.00	1722.05		1722.52	0.001864	5.49	1453.66	412.91	0.52
Reach #1	1106	PF 1	11220.64	1713.00	1720.39	1720.39	1721.78	0.007046	9.44	1189.06	430.06	1.00
Reach #1	1105.5		Lat Struct									
Reach #1	1105	PF 1	10707.31	1713.00	1720.08		1720.72	0.002238	6.46	1658.72	447.20	0.59
Reach #1	1104	PF 1	10297.21	1713.00	1719.76		1720.26	0.001980	5.67	1817.24	544.22	0.55
Reach #1	1103	PF 1	9627.67	1713.00	1719.55		1719.88	0.001344	4.67	2060.83	615.61	0.45
Reach #1	1102	PF 1	9109.22	1712.00	1718.89		1719.51	0.002297	6.33	1439.16	406.28	0.59
Reach #1	1101.6	PF 1	9109.22	1712.00	1718.08	1717.01	1719.38	0.002976	9.15	995.60	196.00	0.72
Reach #1	1101.5		Golf Course Bridge									
Reach #1	1101.4	PF 1	9109.22	1712.00	1717.07	1717.01	1719.09	0.005995	11.40	799.08	192.11	0.99
Reach #1	1101.3		Lat Struct									
Reach #1	1101	PF 1	9109.05	1711.00	1716.13	1716.13	1718.01	0.006389	10.98	829.26	221.92	1.00
Reach #1	1100	PF 1	13849.05	1707.00	1714.75		1715.57	0.003324	7.26	1906.98	581.09	0.71
Reach #1	1099	PF 1	13849.05	1707.00	1714.22		1714.81	0.003131	6.13	2254.04	843.99	0.66
Reach #1	1098	PF 1	13845.96	1706.00	1713.71		1714.32	0.001958	6.10	2212.19	566.32	0.55
Reach #1	1097	PF 1	13771.77	1704.00	1713.27		1713.94	0.002757	5.69	2142.99	698.44	0.62
Reach #1	1096	PF 1	13645.7	1699.00	1712.70		1713.54	0.001242	7.35	1857.27	263.08	0.49
Reach #1	1095	PF 1	13616.28	1698.00	1711.88		1713.15	0.002604	9.06	1502.71	270.02	0.68
Reach #1	1094	PF 1	13442.78	1697.00	1711.01		1712.50	0.003897	9.80	1371.21	294.76	0.80
Reach #1	1093	PF 1	13083.42	1696.00	1710.98	1706.73	1712.03	0.000906	8.83	1811.61	297.39	0.45
Reach #1	1092	PF 1	12869.24	1696.00	1707.45	1707.45	1711.39	0.004777	15.95	815.59	129.84	0.96
Reach #1	1091	PF 1	12940.24	1694.00	1708.03	1705.60	1709.67	0.001872	10.48	1452.18	357.23	0.62
Reach #1	1090	PF 1	12940.24	1692.00	1707.68		1709.18	0.001967	10.01	1380.48	208.21	0.51
Reach #1	1089	PF 1	18672	1691.00	1704.47	1703.56	1708.25	0.006096	15.59	1201.49	139.75	0.88
Reach #1	1088	PF 1	18672	1691.00	1702.63	1702.46	1706.84	0.007680	16.45	1135.15	129.35	0.98
Reach #1	1087	PF 1	18672	1691.00	1701.17	1701.17	1705.22	0.008156	16.15	1156.04	142.72	1.00
Reach #1	1086	PF 1	18672	1690.00	1699.65	1699.65	1703.50	0.008326	15.75	1185.31	154.97	1.00
Reach #1	1085	PF 1	18672	1690.00	1698.46	1698.46	1702.03	0.001739	15.16	1231.94	172.90	1.00
Reach #1	1084	PF 1	18672	1689.00	1697.79	1697.15	1700.37	0.001371	12.88	1449.53	218.39	0.88
Reach #1	1083	PF 1	18672	1688.00	1696.39	1696.39	1699.96	0.001739	15.15	1232.34	172.96	1.00

Las Vegas Wash HEC-RAS Output
Standard Table 1
Pre-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach #1	1082	PF 1	18672	1687.00	1695.63	1695.61	1699.21	0.001722	15.18	1229.77	170.89	1.00
Reach #1	1081	PF 1	18672	1687.00	1695.34	1695.34	1698.84	0.001749	15.01	1243.78	177.98	1.00
Reach #1	1080	PF 1	18672	1686.00	1694.95	1694.39	1697.99	0.001403	14.00	1333.83	179.43	0.90
Reach #1	1079	PF 1	18672	1685.00	1695.32		1697.53	0.000812	11.93	1595.28	229.74	0.71
Reach #1	1078	PF 1	18672	1684.00	1695.56		1697.24	0.000542	10.46	1901.79	330.72	0.59
Reach #1	1077	PF 1	18672	1683.00	1695.48		1697.12	0.000489	10.32	1860.53	225.56	0.56
Reach #1	1075.9	PF 1	18672	1682.27	1694.66	1691.23	1696.99	0.000687	12.27	1522.22	123.61	0.62
Reach #1	1075.5		Vegas Valley Bridge									
Reach #1	1075.1	PF 1	18672	1681.88	1690.84	1690.84	1695.29	0.001894	16.94	1102.00	123.61	1.00
Reach #1	1075	PF 1	18718	1681.00	1691.45		1693.97	0.001033	12.73	1470.05	181.13	0.79
Reach #1	1074	PF 1	18718	1681.00	1691.20	1689.57	1693.56	0.004020	12.32	1518.85	183.18	0.75

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1173	PF 1	1767.35	1764.77	2.58	0.88	0.08	5.00	11935.50	7.50	133.19
Reach #1	1172	PF 1	1766.39	1764.07	2.33	0.72	0.12	386.56	11527.77	33.67	204.68
Reach #1	1171	PF 1	1765.55	1763.61	1.94	0.67	0.00	233.84	11699.53	14.63	239.22
Reach #1	1170	PF 1	1764.88	1762.95	1.93	0.55	0.18	9.89	11938.11		142.05
Reach #1	1169	PF 1	1764.15	1762.81	1.34	0.12	0.14		11948.00		152.71
Reach #1	1167.9	PF 1	1763.90	1763.02	0.88	0.00	0.03		11948.00		136.54
Reach #1	1167.5		Bonanza Bridge								
Reach #1	1167.1	PF 1	1763.04	1761.23	1.81	0.51	0.19		11948.00		135.84
Reach #1	1167	PF 1	1762.34	1760.90	1.44	0.51	0.00		11948.00		133.43
Reach #1	1166	PF 1	1761.83	1760.35	1.47	0.34	0.17	67.54	11876.87	3.59	179.72
Reach #1	1165	PF 1	1761.32	1760.40	0.92	0.26	0.00	703.32	11189.83	54.85	327.86
Reach #1	1164	PF 1	1761.06	1760.13	0.92	0.39	0.09	950.18	10973.48	24.34	400.27
Reach #1	1163	PF 1	1760.58	1758.75	1.83	0.62	0.01	17.44	11929.89	0.67	152.62
Reach #1	1162	PF 1	1759.96	1758.08	1.88	0.73	0.04	0.02	11947.98	0.00	132.90
Reach #1	1161	PF 1	1759.19	1756.86	2.33	0.65	0.16		11948.00		116.38
Reach #1	1160	PF 1	1758.37	1756.59	1.78	0.67	0.07		11948.00		119.37
Reach #1	1159	PF 1	1757.63	1755.13	2.50	0.93	0.04	0.03	12705.96		117.09
Reach #1	1158	PF 1	1756.67	1753.81	2.86	0.87	0.18		12706.00		115.48
Reach #1	1157	PF 1	1755.62	1753.35	2.27	0.92	0.08		12706.00		121.20
Reach #1	1156	PF 1	1754.63	1751.55	3.07	1.14	0.01		12706.00		112.97
Reach #1	1155	PF 1	1753.47	1750.44	3.03	0.92	0.24		12706.00		115.46
Reach #1	1154	PF 1	1752.31	1750.10	2.21	0.39	0.31		12706.00		126.37
Reach #1	1152.9	PF 1	1751.60	1750.43	1.17	0.00	0.04		12706.00		140.00
Reach #1	1152.5		Stewart Avenue Bridge								
Reach #1	1152.1	PF 1	1750.69	1748.67	2.02	0.47	0.01		12706.00		139.08
Reach #1	1152	PF 1	1750.21	1748.20	2.00	0.50	0.11		12754.00		126.23
Reach #1	1151	PF 1	1749.60	1747.96	1.64	0.36	0.04		12754.00		136.30
Reach #1	1150	PF 1	1749.20	1747.69	1.50	0.29	0.09		12754.00		135.66
Reach #1	1149	PF 1	1748.82	1747.61	1.22	0.20	0.10		12754.00		144.13
Reach #1	1148	PF 1	1748.53	1747.65	0.88	0.04	0.11	583.63	12158.62	11.75	297.33
Reach #1	1147.5	PF 1	1748.38	1747.86	0.51	0.02	0.06	387.41	12342.34	24.26	468.92
Reach #1	1147.3	PF 1	1748.29	1747.98	0.31	0.03	0.04	317.74	12397.56	38.70	684.80
Reach #1	1147	PF 1	1748.22	1747.49	0.73	0.13	0.01	755.08	11587.57	21.36	202.29
Reach #1	1146	PF 1	1748.07	1747.26	0.81	0.14	0.00	40.44	12321.60	1.96	213.82
Reach #1	1145	PF 1	1747.93	1747.12	0.81	0.12	0.07	75.28	12288.72		161.90
Reach #1	1144.5		Lat Struct								
Reach #1	1144	PF 1	1747.75	1747.17	0.58	0.09	0.00	634.60	11727.39	0.00	253.74
Reach #1	1143	PF 1	1747.65	1747.08	0.58	0.08	0.02	234.29	12090.50		185.27
Reach #1	1142	PF 1	1747.55	1747.05	0.50	0.07	0.01	156.44	11745.11		194.57
Reach #1	1141	PF 1	1747.47	1747.02	0.45	0.06	0.02	122.48	11597.24		173.72
Reach #1	1140	PF 1	1747.40	1747.00	0.39	0.02	0.03	171.44	11295.63		182.60
Reach #1	1139.9	PF 1	1747.35	1747.06	0.28				11304.35		141.50
Reach #1	1139.5		Charleston Boulevard Bridge								
Reach #1	1139.1	PF 1	1743.33	1742.89	0.44	0.01	0.09		11304.35		141.50
Reach #1	1139	PF 1	1743.24	1742.50	0.73	0.18	0.09	15.55	11845.50	15.29	222.46
Reach #1	1138	PF 1	1742.96	1741.29	1.67	0.40	0.00	191.96	12739.15	4.89	263.22
Reach #1	1137	PF 1	1742.55	1740.89	1.66	0.42	0.10	202.29	12718.09	15.61	244.19
Reach #1	1136	PF 1	1742.03	1740.70	1.33	0.38	0.05	353.59	12582.41		271.83
Reach #1	1135	PF 1	1741.60	1740.43	1.17	0.30	0.05	297.45	11989.63	648.92	441.97

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

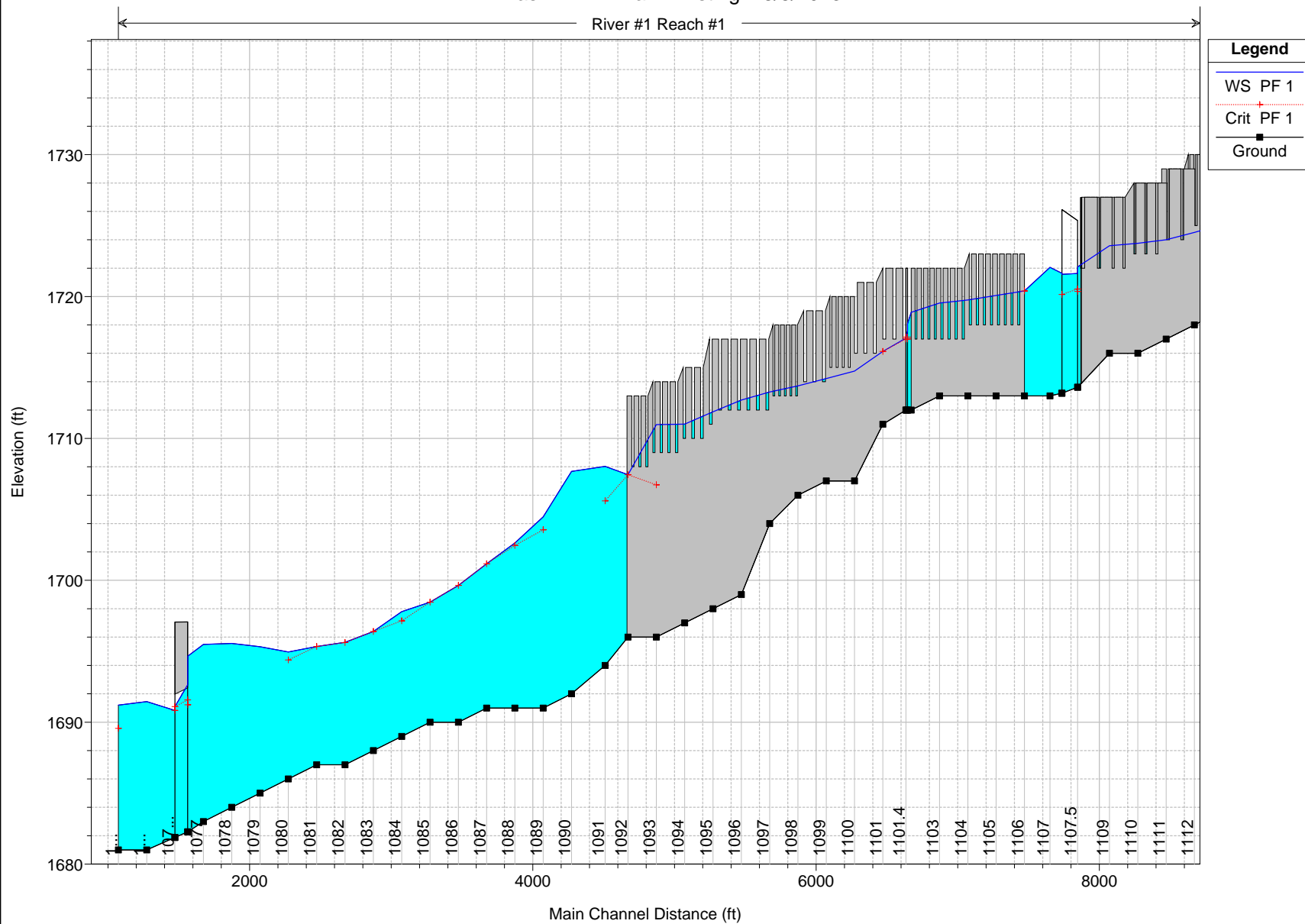
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1134	PF 1	1741.24	1740.25	0.99	0.20	0.08	604.02	11564.33	767.65	379.14
Reach #1	1132.9	PF 1	1740.97	1740.24	0.73				12936.00		143.00
Reach #1	1132.5		Nellis Boulevard Bridge								
Reach #1	1132.1	PF 1	1739.39	1738.06	1.33	0.17	0.06		12936.00		143.00
Reach #1	1132	PF 1	1739.16	1737.64	1.52	0.51	0.00		13515.00		172.56
Reach #1	1131	PF 1	1738.65	1737.14	1.52	0.39	0.24		13515.00		195.97
Reach #1	1130	PF 1	1738.03	1737.30	0.72	0.37	0.09		13515.00		350.65
Reach #1	1129	PF 1	1737.57	1735.96	1.60	0.47	0.14		13515.00		173.37
Reach #1	1128	PF 1	1736.96	1735.83	1.12	0.40	0.19		13515.00		276.99
Reach #1	1127.5		Lat Struct								
Reach #1	1127	PF 1	1736.37	1735.87	0.50	0.35	0.00		13440.42		600.37
Reach #1	1126	PF 1	1736.02	1735.47	0.55	0.43	0.02		13372.80		546.91
Reach #1	1125	PF 1	1735.57	1734.83	0.74	0.47	0.03		13222.81		506.60
Reach #1	1124.5		Lat Struct								
Reach #1	1124	PF 1	1735.07	1734.42	0.65	0.42	0.02		13074.79		487.40
Reach #1	1123	PF 1	1734.63	1733.74	0.89	0.54	0.01		12808.24		324.70
Reach #1	1122	PF 1	1734.07	1733.22	0.86	0.52	0.06		12754.82		506.92
Reach #1	1121	PF 1	1733.49	1732.84	0.65	0.67	0.10		12510.40		447.83
Reach #1	1120	PF 1	1732.72	1731.10	1.62	0.98	0.26		11555.53		353.51
Reach #1	1119	PF 1	1731.48	1730.73	0.76	0.80	0.01		10925.12		490.63
Reach #1	1118	PF 1	1730.67	1729.82	0.84	1.02	0.01		10186.10		512.18
Reach #1	1117	PF 1	1729.64	1728.72	0.92	0.57	0.14		10127.71		498.05
Reach #1	1116.5		Lat Struct								
Reach #1	1116.4		Lat Struct								
Reach #1	1116	PF 1	1728.92	1728.47	0.45	0.35	0.01		9756.40		498.92
Reach #1	1115	PF 1	1728.56	1728.16	0.41	0.61	0.13		9212.09		532.77
Reach #1	1114	PF 1	1727.81	1726.08	1.74	1.19	0.24		8907.23		247.16
Reach #1	1113	PF 1	1726.04	1725.10	0.94	0.77	0.09	0.01	8874.02		402.60
Reach #1	1112	PF 1	1725.18	1724.52	0.66	0.58	0.03		8873.91		441.64
Reach #1	1111	PF 1	1724.57	1724.00	0.56	0.37	0.05		8856.65		484.51
Reach #1	1110	PF 1	1724.15	1723.76	0.39	0.24	0.03		8691.68		428.52
Reach #1	1109	PF 1	1723.88	1723.58	0.30	0.21	0.12		8217.15		491.15
Reach #1	1107.9	PF 1	1723.56	1722.09	1.47	0.00	0.11		7973.39		118.64
Reach #1	1107.5		Sahara Avenue Bridge								
Reach #1	1107.1	PF 1	1723.13	1721.65	1.49	0.10	0.51		7973.39		118.64
Reach #1	1107	PF 1	1722.52	1722.05	0.47	0.65	0.09		7973.39		412.91
Reach #1	1106	PF 1	1721.78	1720.39	1.38	0.74	0.22		11220.64		430.06
Reach #1	1105.5		Lat Struct								
Reach #1	1105	PF 1	1720.72	1720.08	0.65	0.42	0.04		10707.31		447.20
Reach #1	1104	PF 1	1720.26	1719.76	0.50	0.33	0.05		10297.21		544.22
Reach #1	1103	PF 1	1719.88	1719.55	0.34	0.34	0.03		9627.67		615.61
Reach #1	1102	PF 1	1719.51	1718.89	0.62	0.07	0.07		9109.22		406.28
Reach #1	1101.6	PF 1	1719.38	1718.08	1.30				9109.22		196.00
Reach #1	1101.5		Golf Course Bridge								
Reach #1	1101.4	PF 1	1719.09	1717.07	2.02	1.01	0.07		9109.22		192.11
Reach #1	1101.3		Lat Struct								
Reach #1	1101	PF 1	1718.01	1716.13	1.87	0.84	0.32		9109.05		221.92
Reach #1	1100	PF 1	1715.57	1714.75	0.82	0.69	0.07		13849.05		581.09
Reach #1	1099	PF 1	1714.81	1714.22	0.59	0.49	0.00		5732.39	8116.67	843.99

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1098	PF 1	1714.32	1713.71	0.61	0.37	0.01		4710.35	9135.61	566.32
Reach #1	1097	PF 1	1713.94	1713.27	0.66	0.38	0.02		5655.10	8116.67	698.44
Reach #1	1096	PF 1	1713.54	1712.70	0.84	0.35	0.04		13645.70		263.08
Reach #1	1095	PF 1	1713.15	1711.88	1.27	0.63	0.02		13616.28		270.02
Reach #1	1094	PF 1	1712.50	1711.01	1.49	0.34	0.13		13442.78		294.76
Reach #1	1093	PF 1	1712.03	1710.98	1.05	0.35	0.29	854.01	11054.52	1174.90	297.39
Reach #1	1092	PF 1	1711.39	1707.45	3.94	0.46	0.69		12853.03	16.21	129.84
Reach #1	1091	PF 1	1709.67	1708.03	1.64	0.45	0.04	502.71	12409.14	28.38	357.23
Reach #1	1090	PF 1	1709.18	1707.68	1.50	0.71	0.23	481.14	12425.22	33.87	208.21
Reach #1	1089	PF 1	1708.25	1704.47	3.77	1.36	0.04	6.20	18665.06	0.74	139.75
Reach #1	1088	PF 1	1706.84	1702.63	4.20	1.57	0.05		18672.00		129.35
Reach #1	1087	PF 1	1705.22	1701.17	4.05	1.65	0.06		18672.00		142.72
Reach #1	1086	PF 1	1703.50	1699.65	3.85	0.66	0.09		18672.00		154.97
Reach #1	1085	PF 1	1702.03	1698.46	3.57	0.31	0.30		18672.00		172.90
Reach #1	1084	PF 1	1700.37	1697.79	2.58	0.31	0.10		18672.00		218.39
Reach #1	1083	PF 1	1699.96	1696.39	3.56	0.35	0.00		18672.00		172.96
Reach #1	1082	PF 1	1699.21	1695.63	3.58	0.35	0.02		18672.00		170.89
Reach #1	1081	PF 1	1698.84	1695.34	3.50	0.31	0.14		18672.00		177.98
Reach #1	1080	PF 1	1697.99	1694.95	3.04	0.21	0.25		18672.00		179.43
Reach #1	1079	PF 1	1697.53	1695.32	2.21	0.13	0.16	38.90	18628.20	4.90	229.74
Reach #1	1078	PF 1	1697.24	1695.56	1.68	0.10	0.01	140.63	18501.80	29.57	330.72
Reach #1	1077	PF 1	1697.12	1695.48	1.64	0.06	0.07	90.64	18579.95	1.40	225.56
Reach #1	1075.9	PF 1	1696.99	1694.66	2.34	0.00	0.46		18672.00		123.61
Reach #1	1075.5		Vegas Valley Bridge								
Reach #1	1075.1	PF 1	1695.29	1690.84	4.46	0.27	0.97		18672.00		123.61
Reach #1	1075	PF 1	1693.97	1691.45	2.52	0.36	0.05		18718.00		181.13
Reach #1	1074	PF 1	1693.56	1691.20	2.36				18718.00		183.18

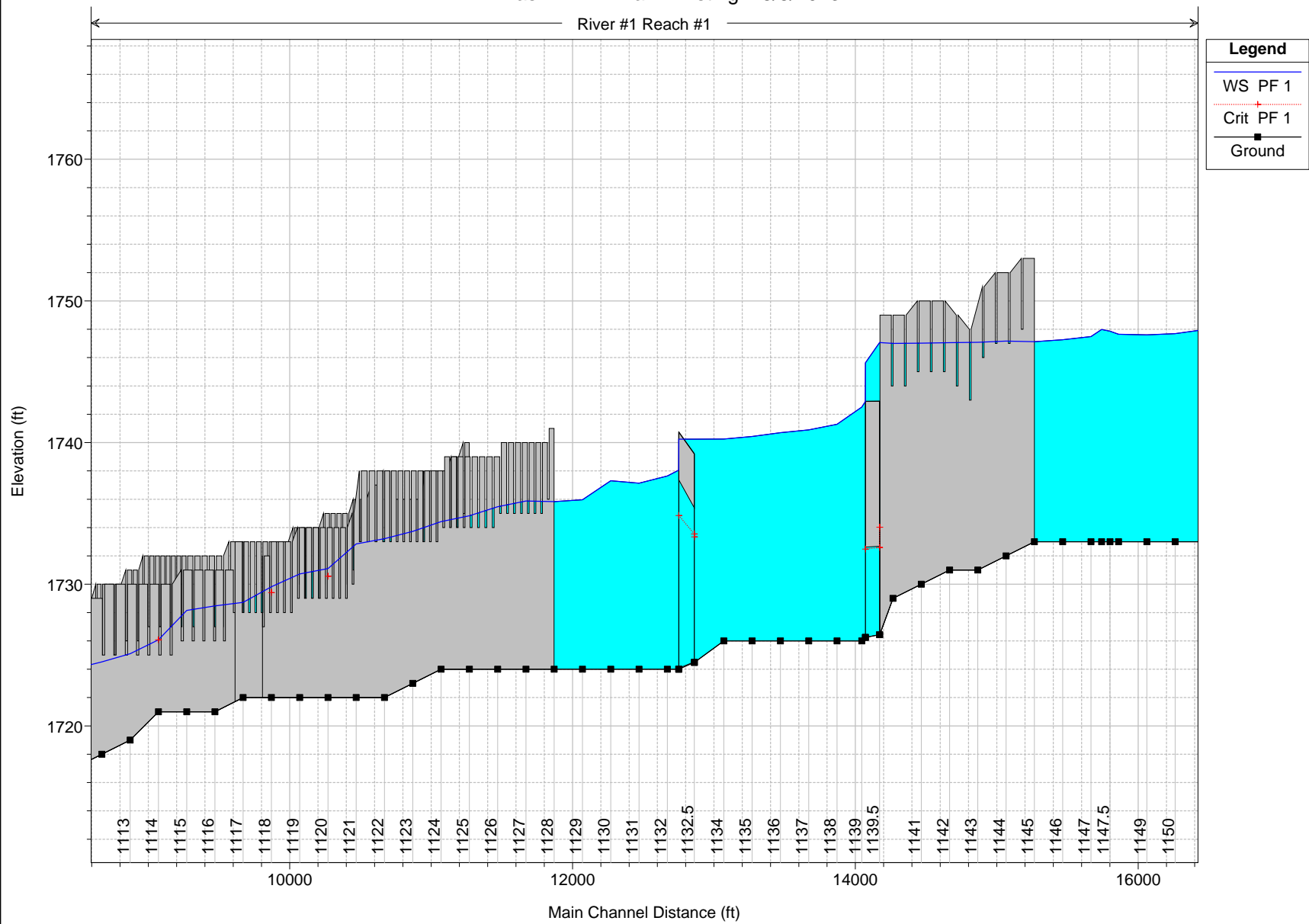
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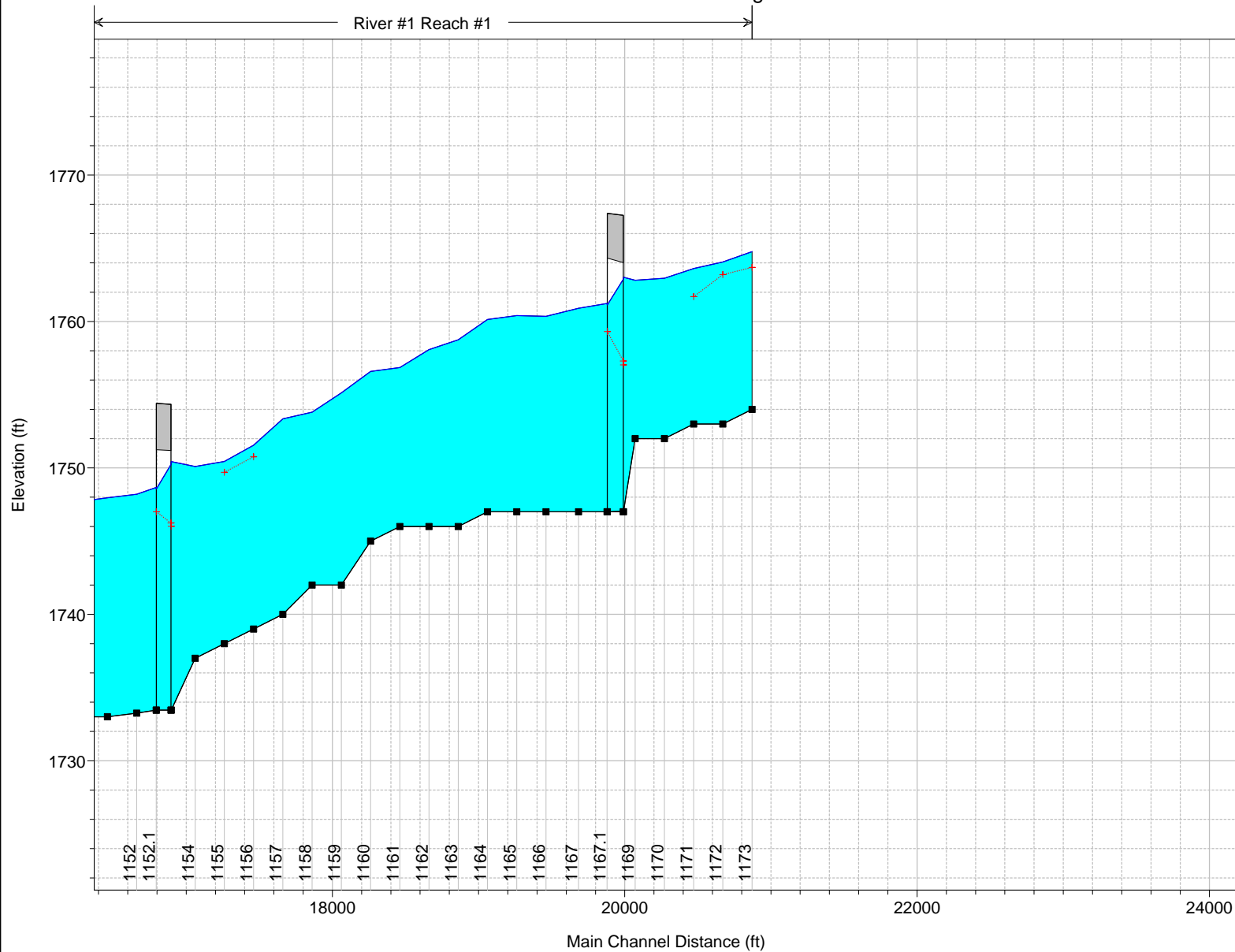
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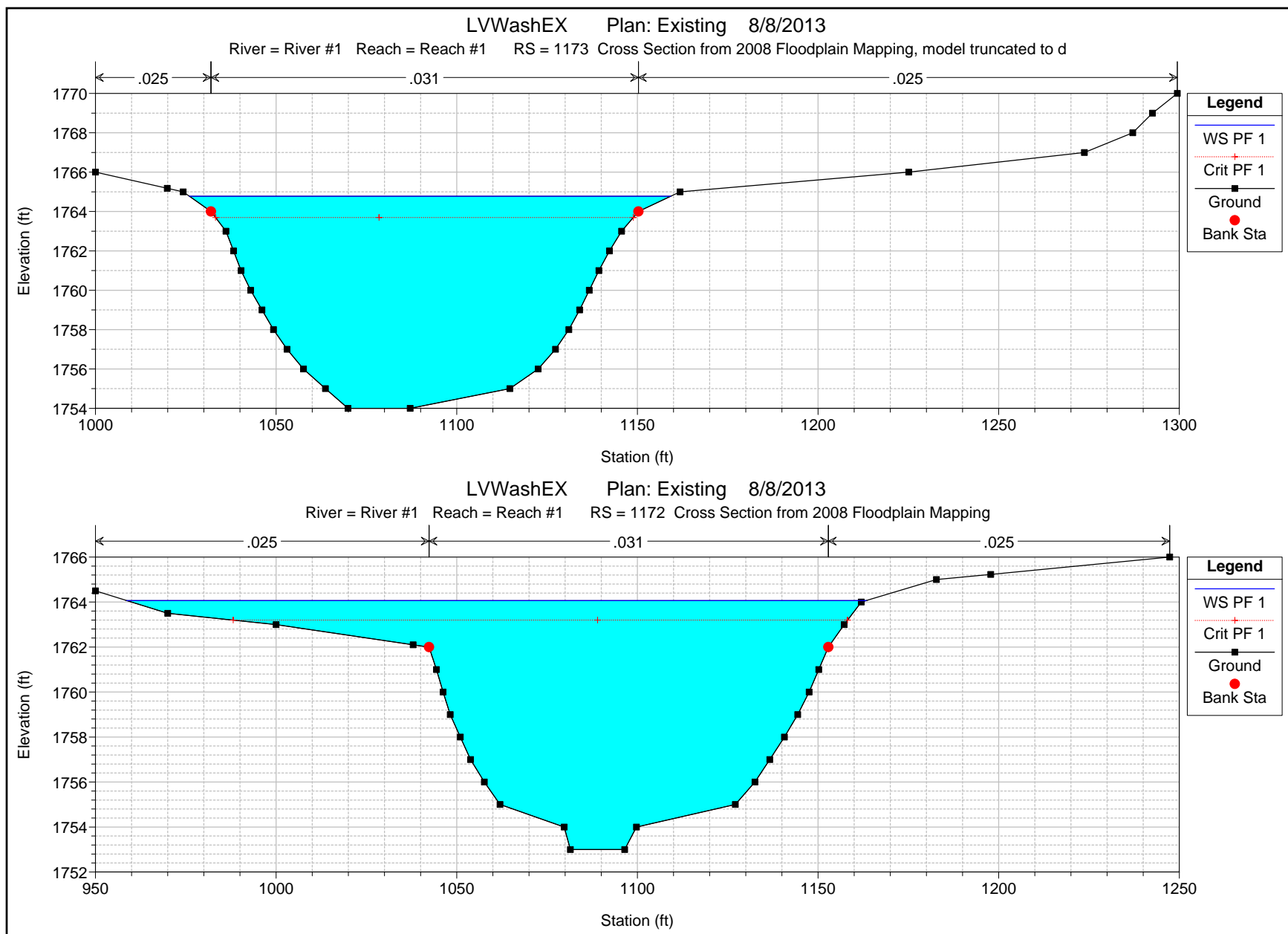


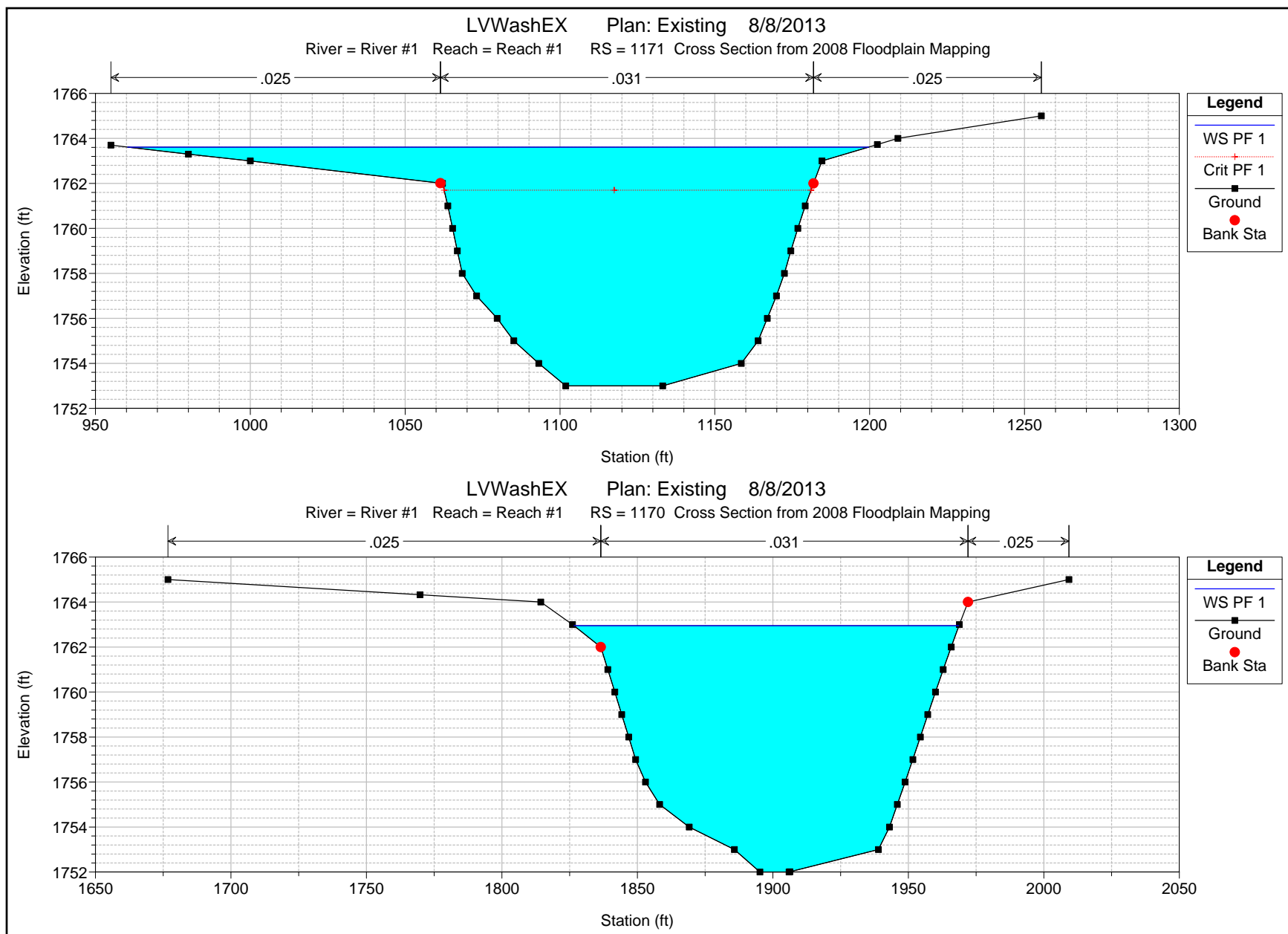
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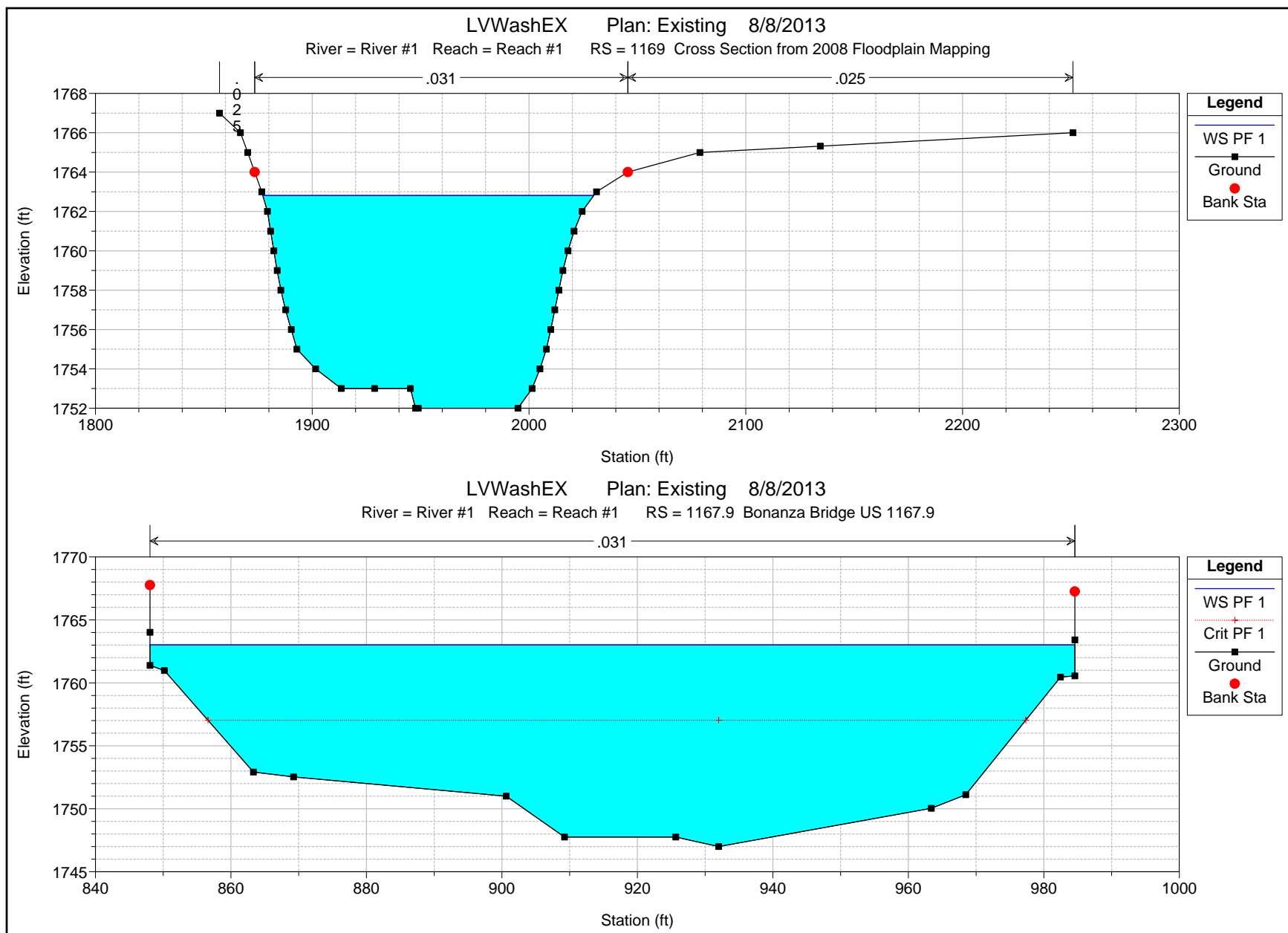
River #1 Reach #1



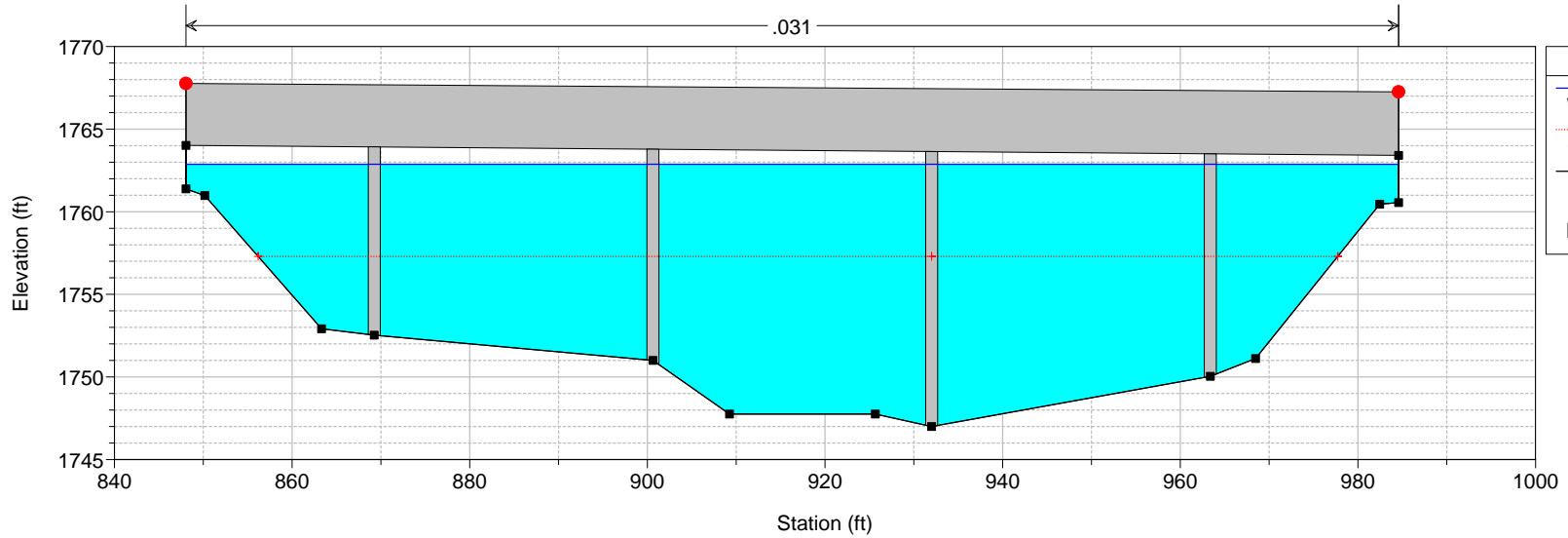




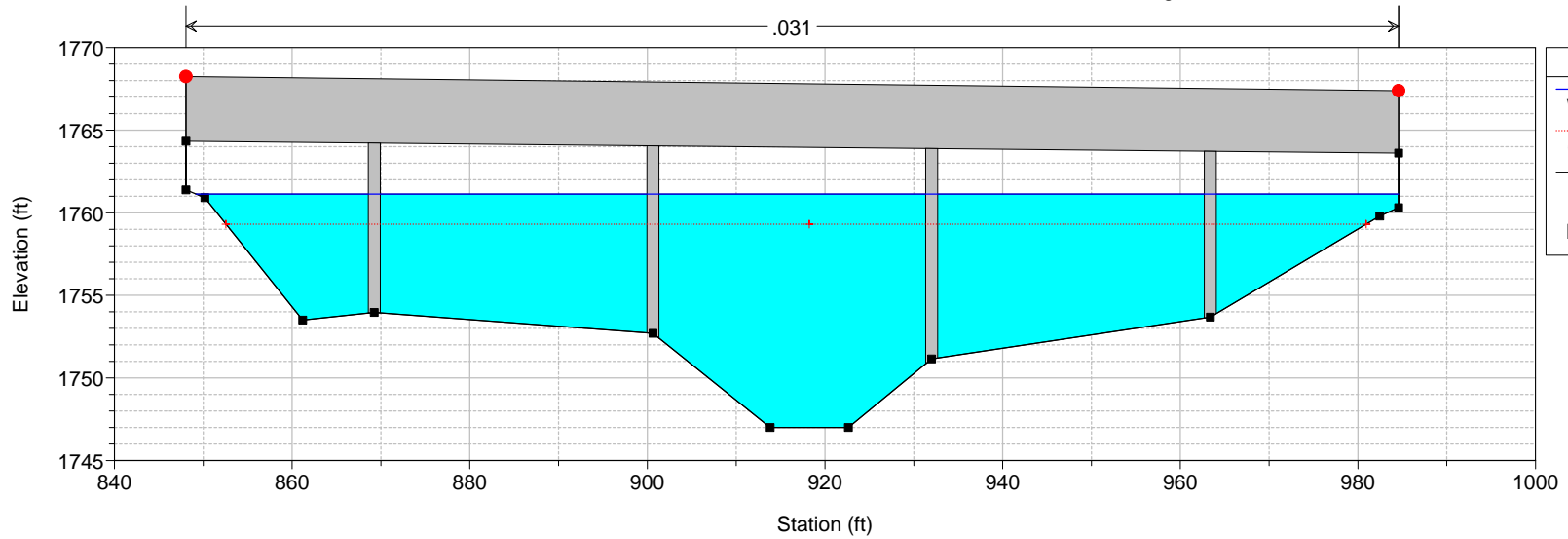




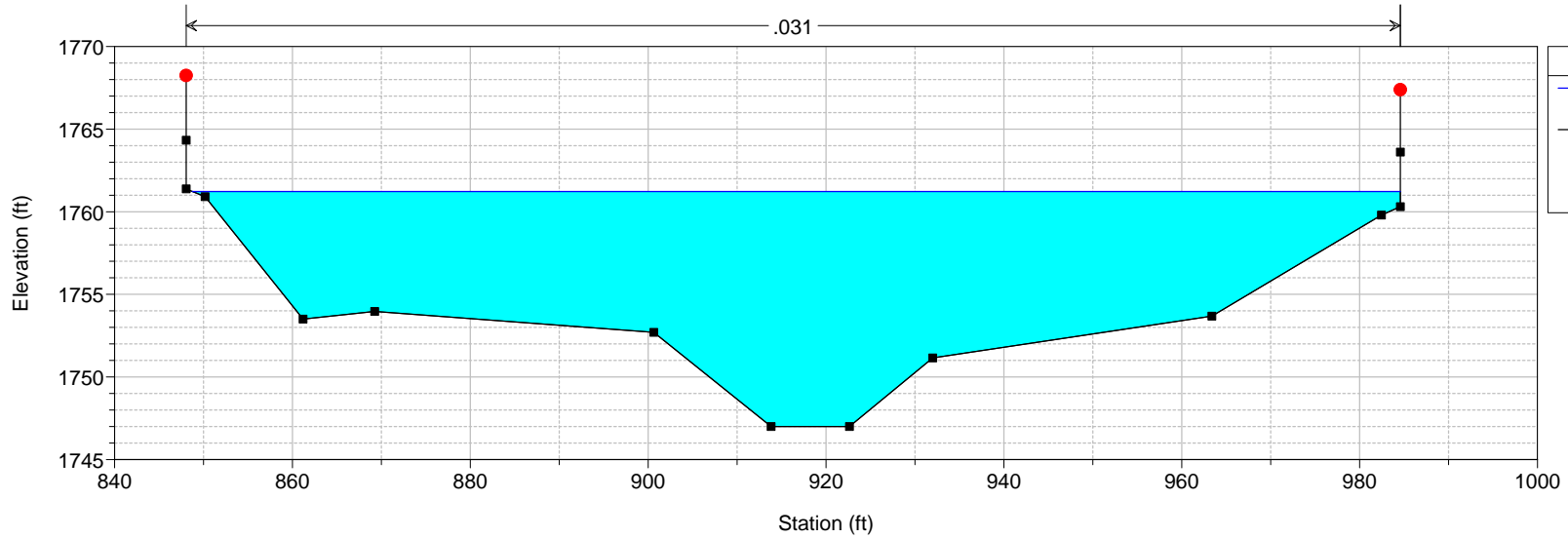
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.5 BR Bonanza Bridge



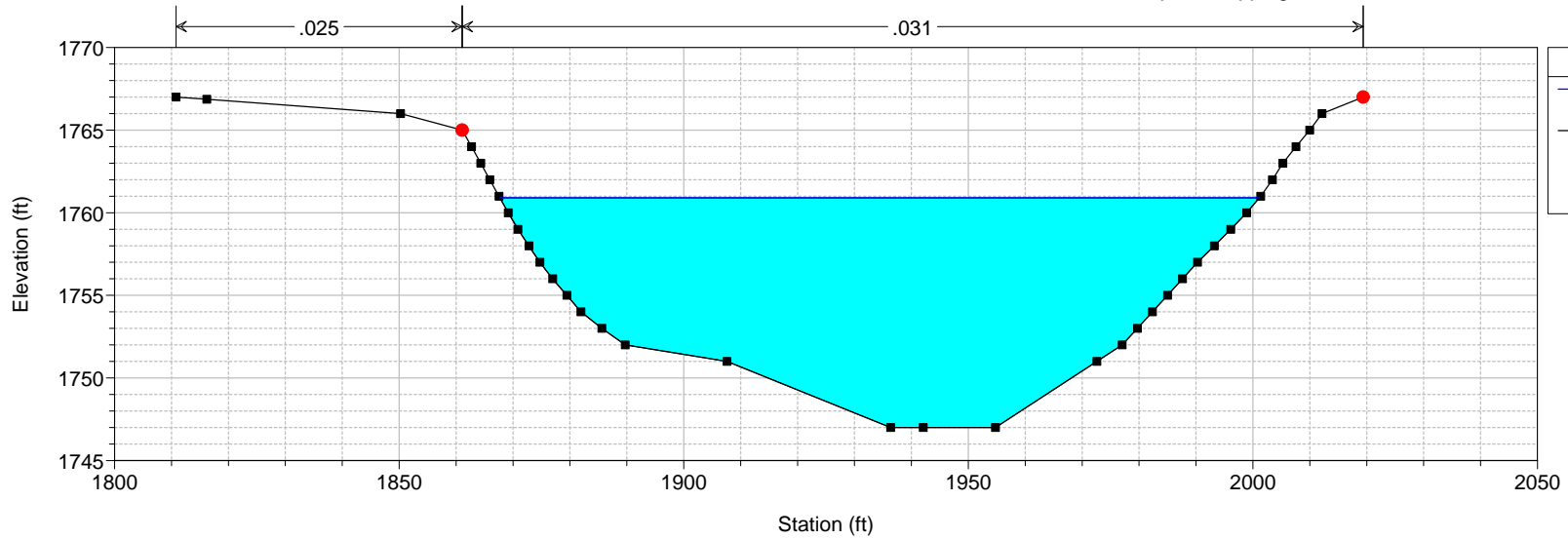
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.5 BR Bonanza Bridge

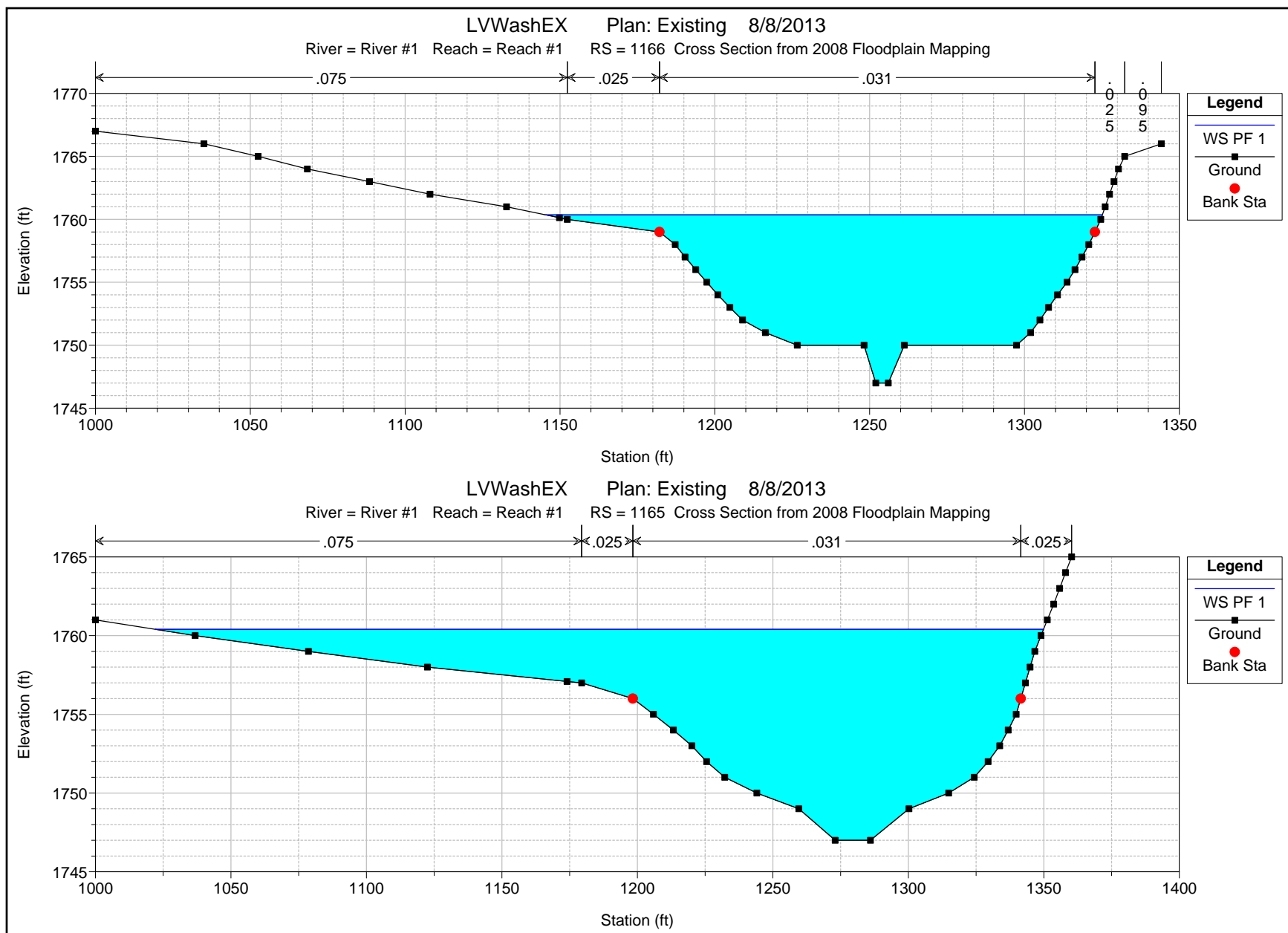


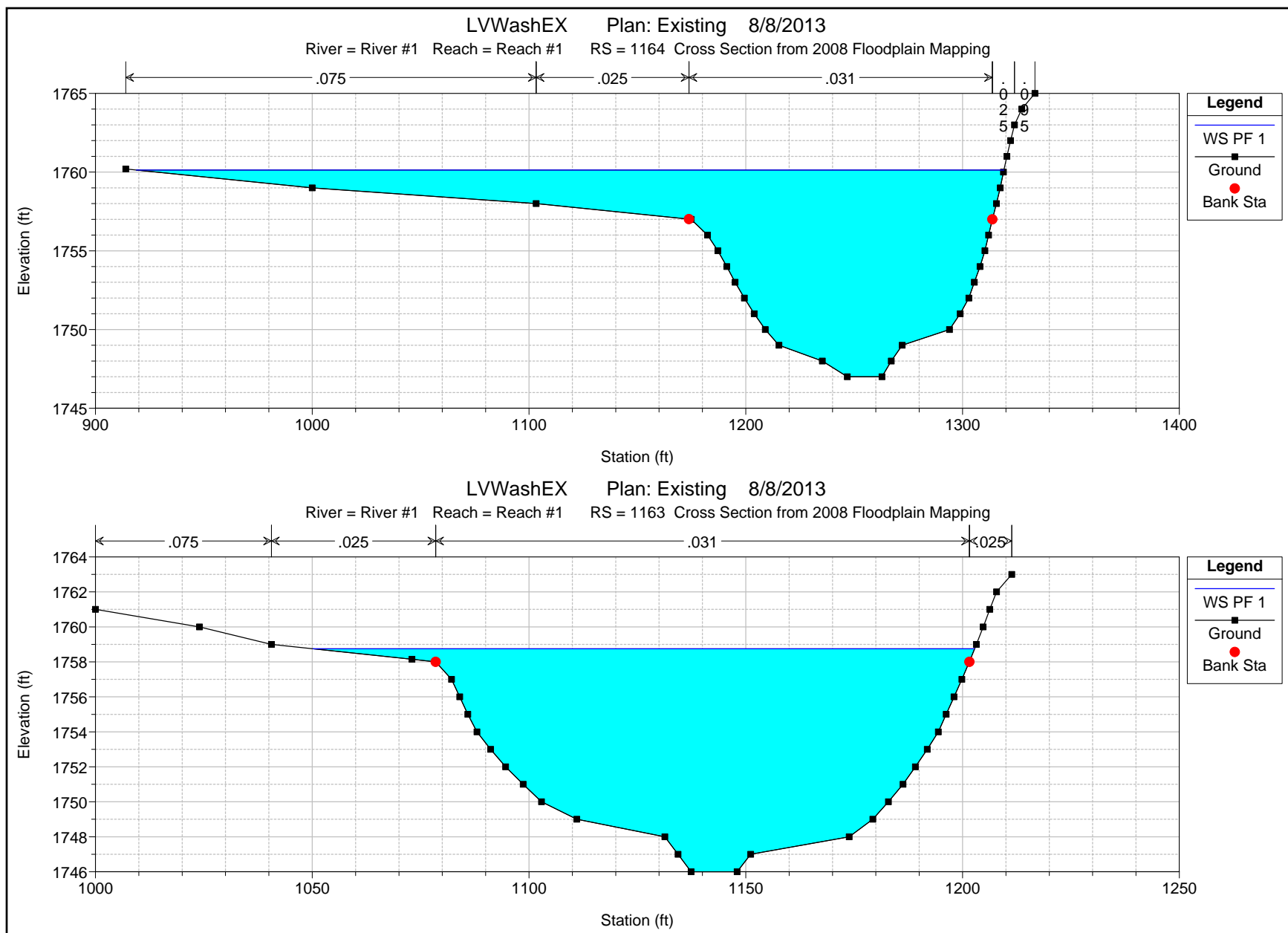
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.1 Bonanza Bridge DS 1167.1

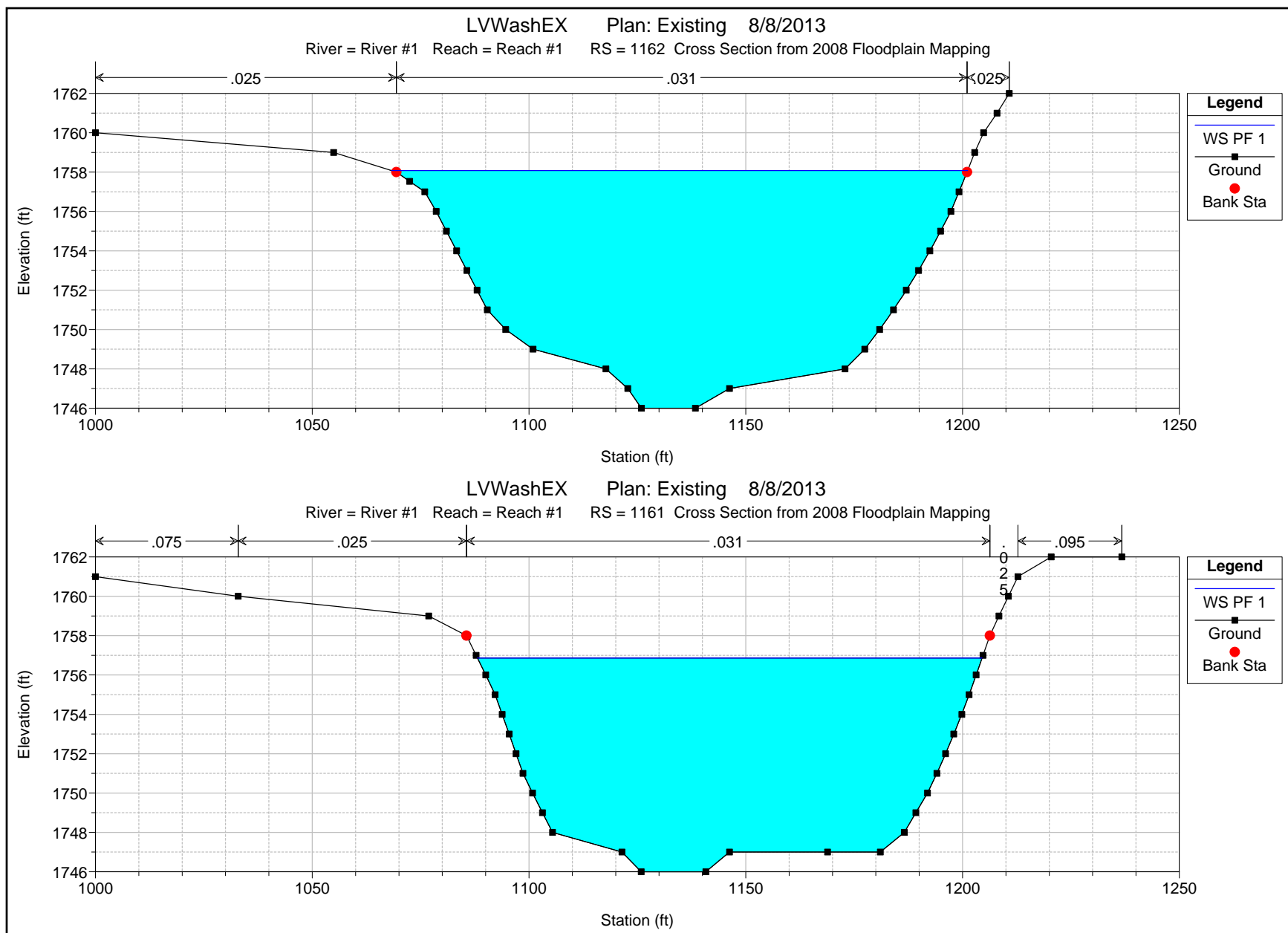


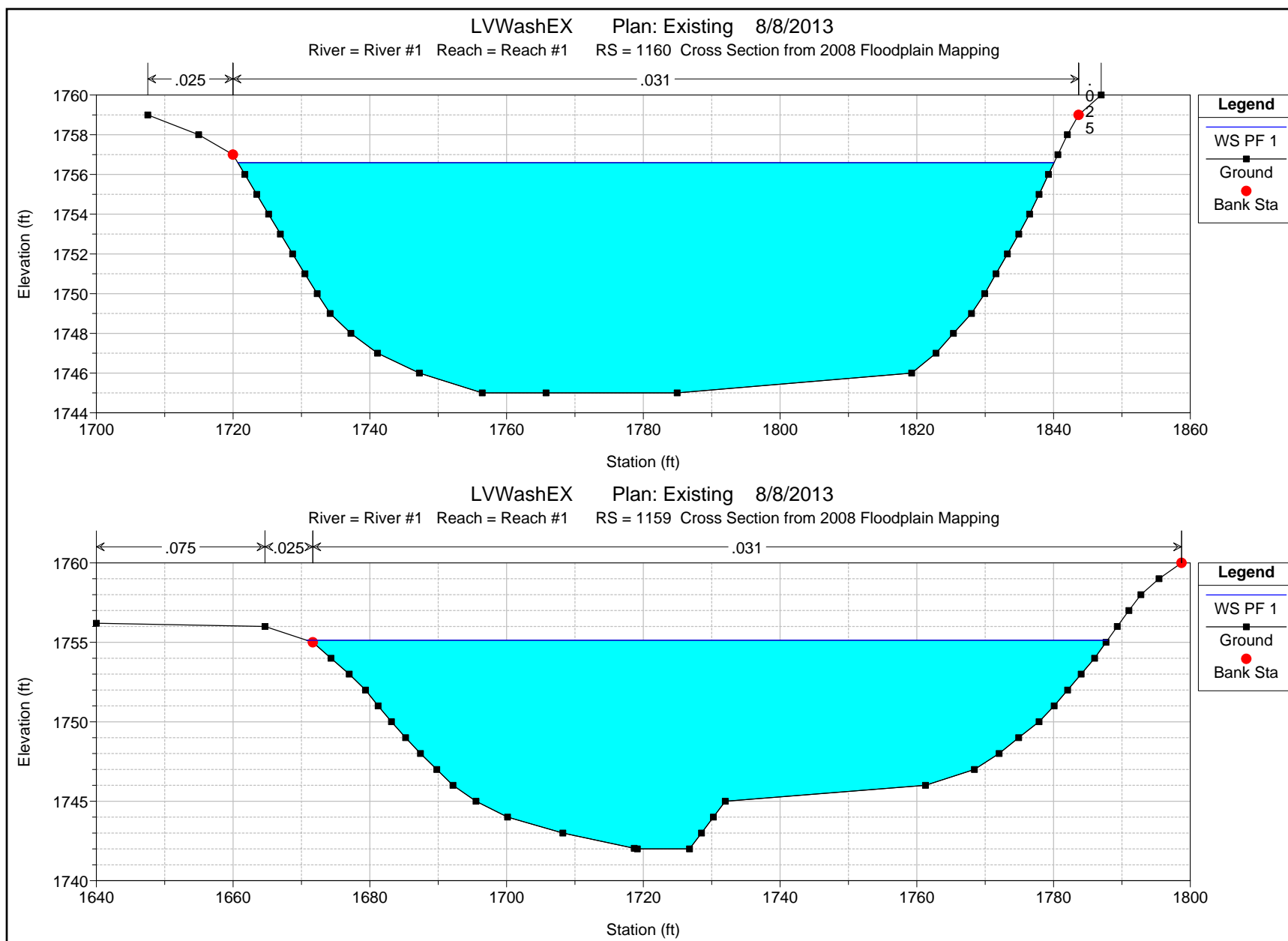
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167 Cross Section from 2008 Floodplain Mapping

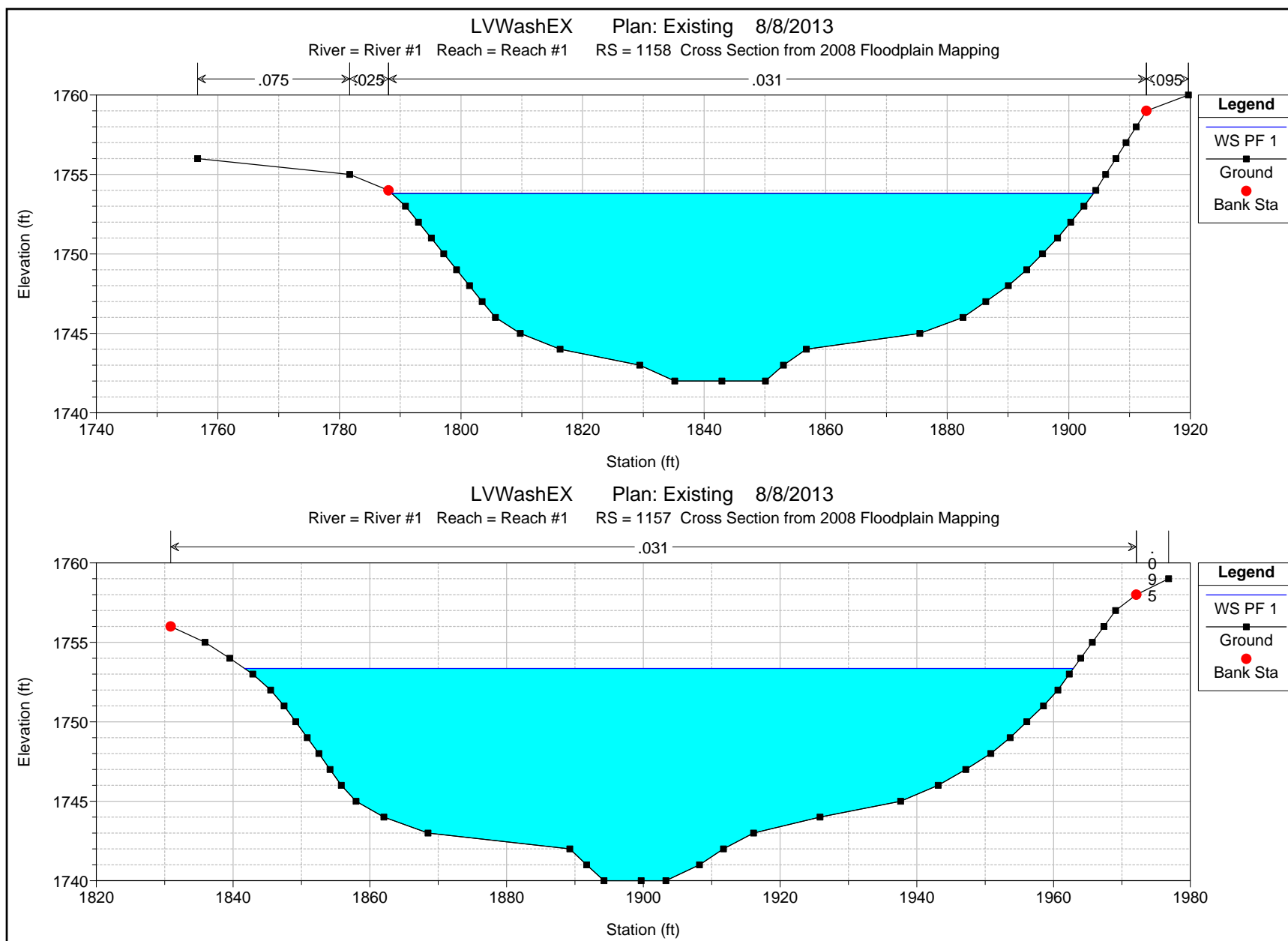


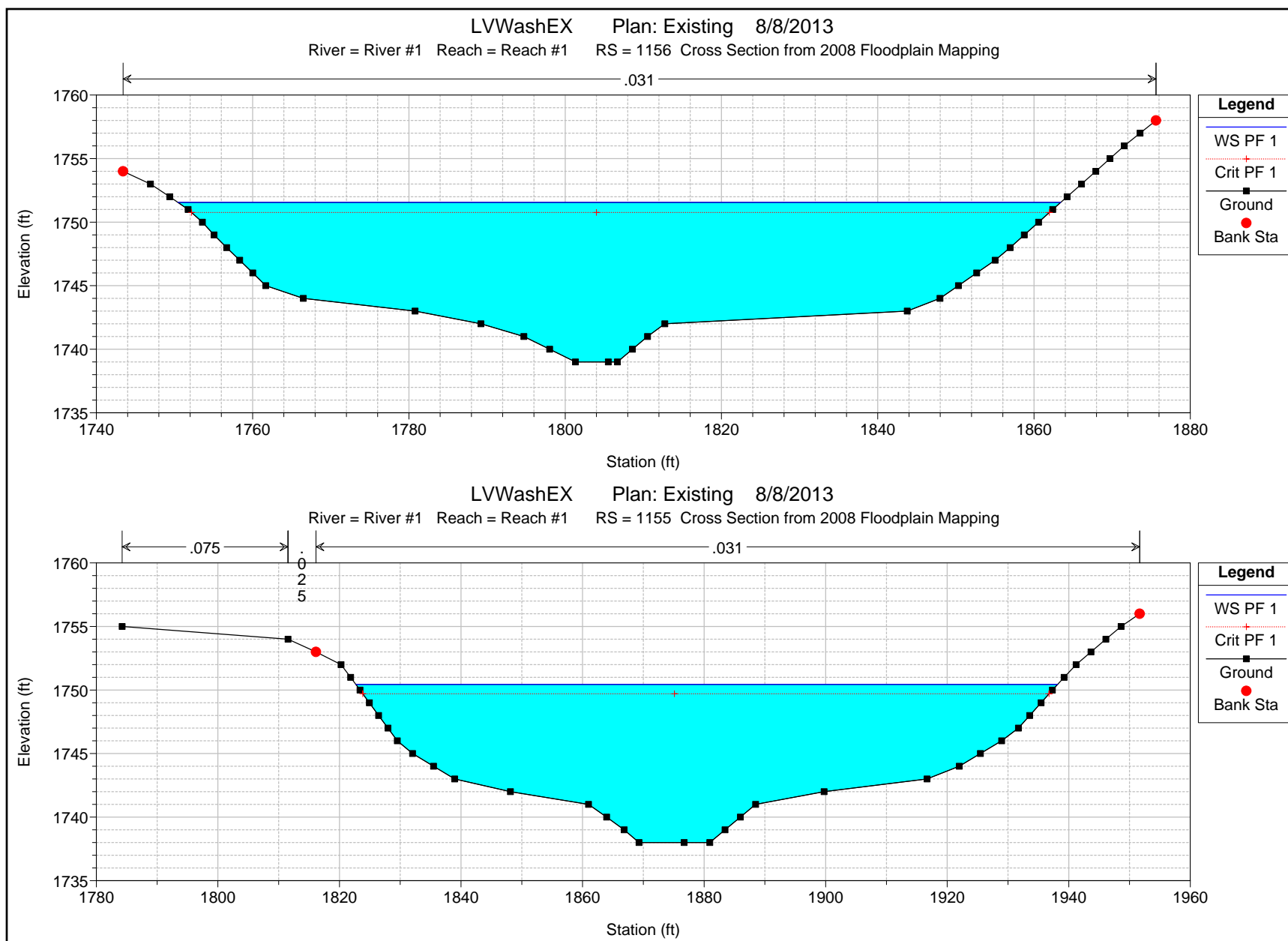


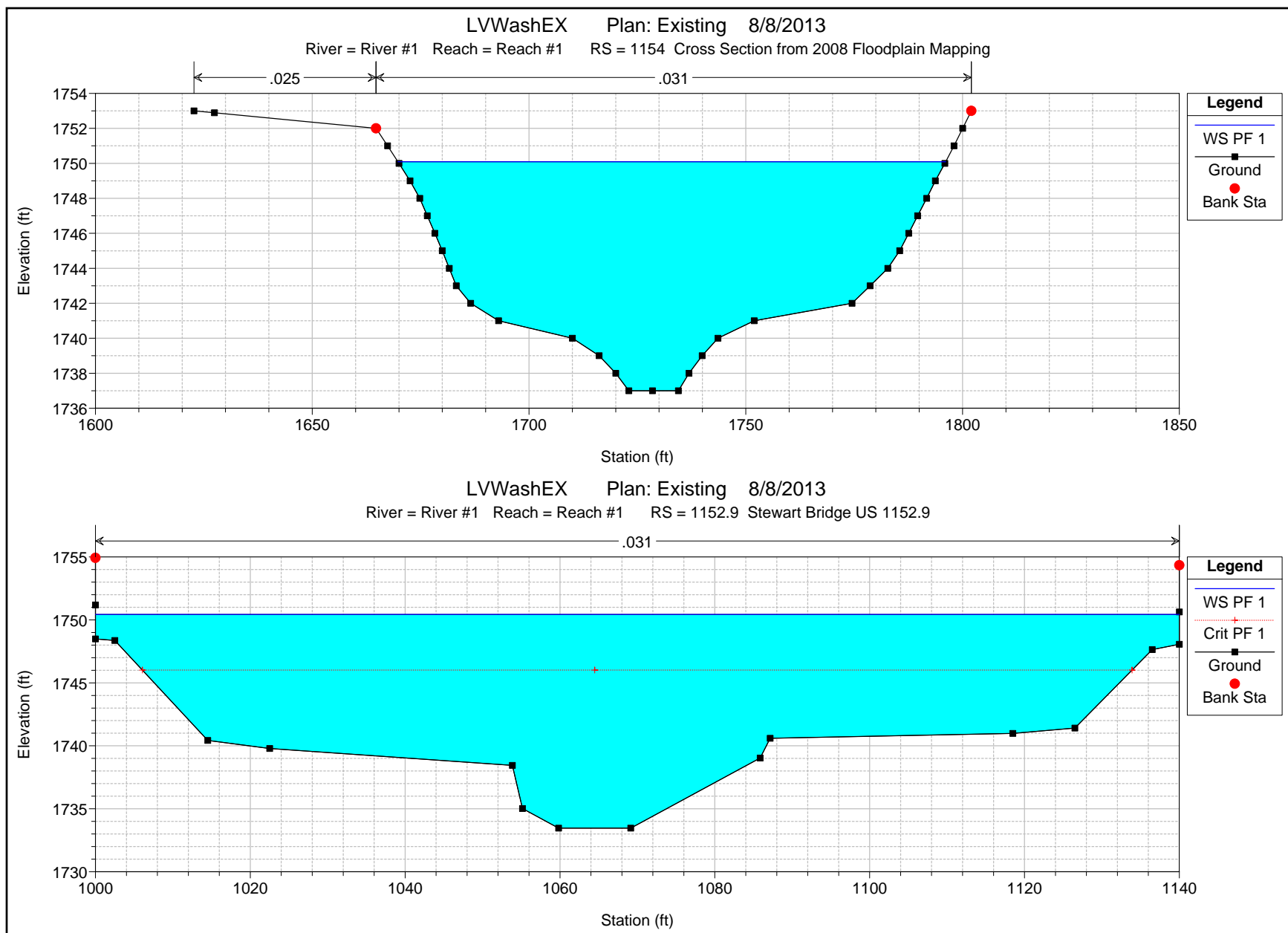




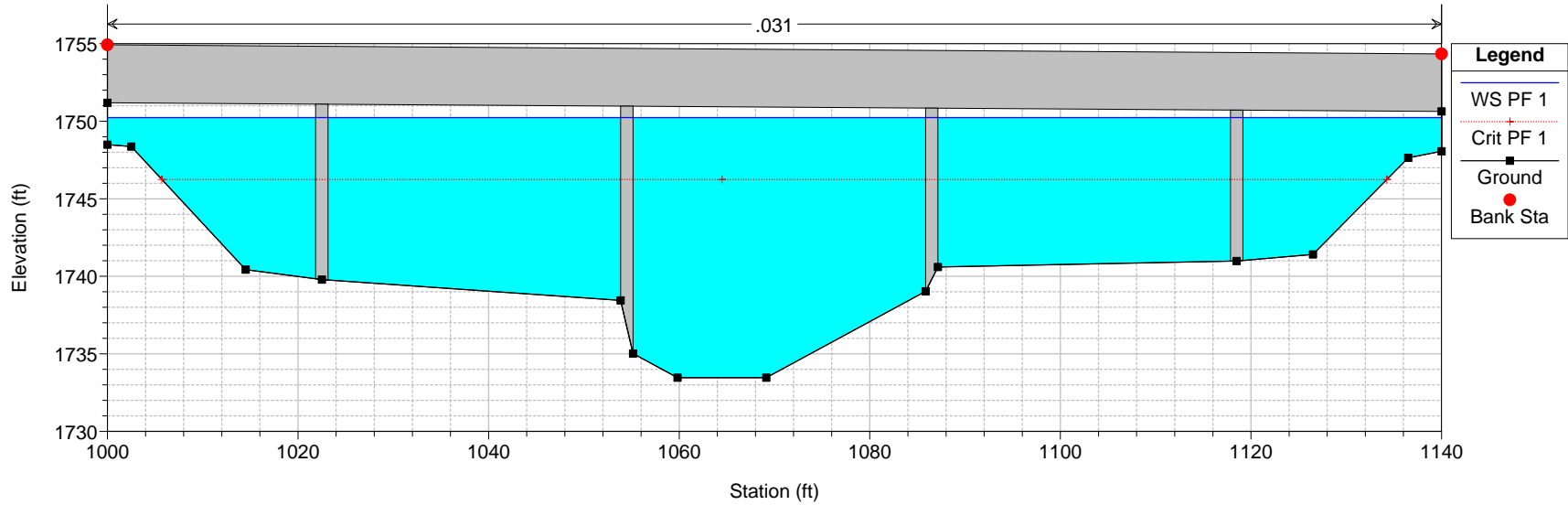




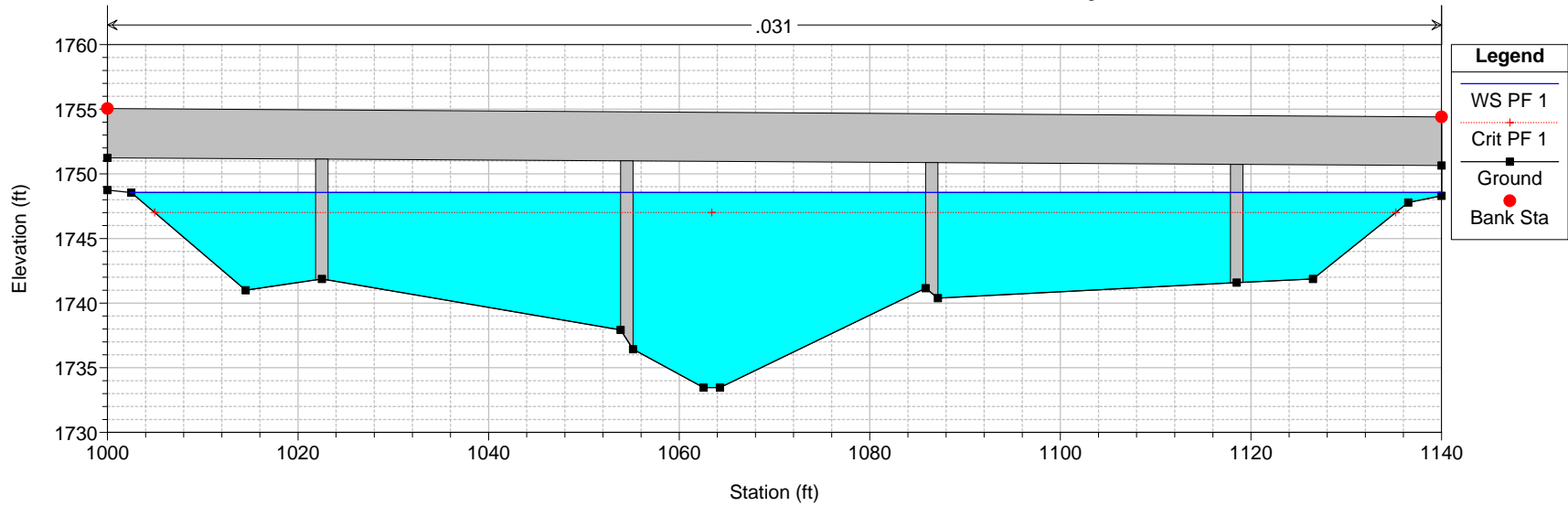




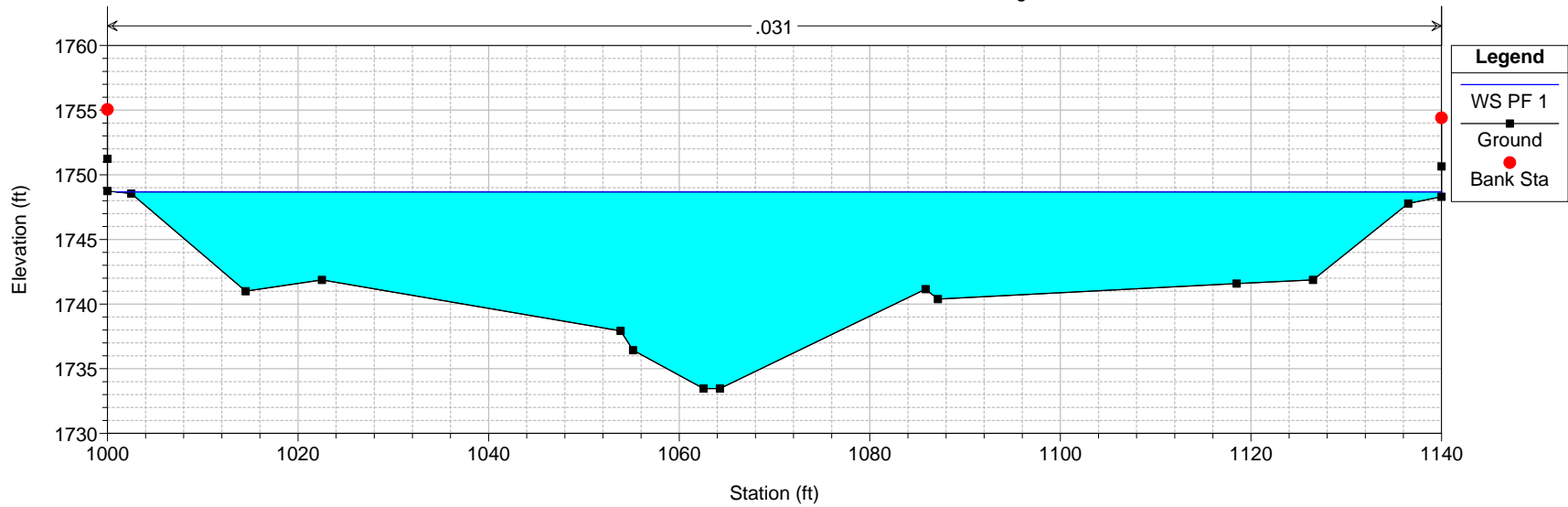
LVWashEX Plan: Existing 8/8/2013
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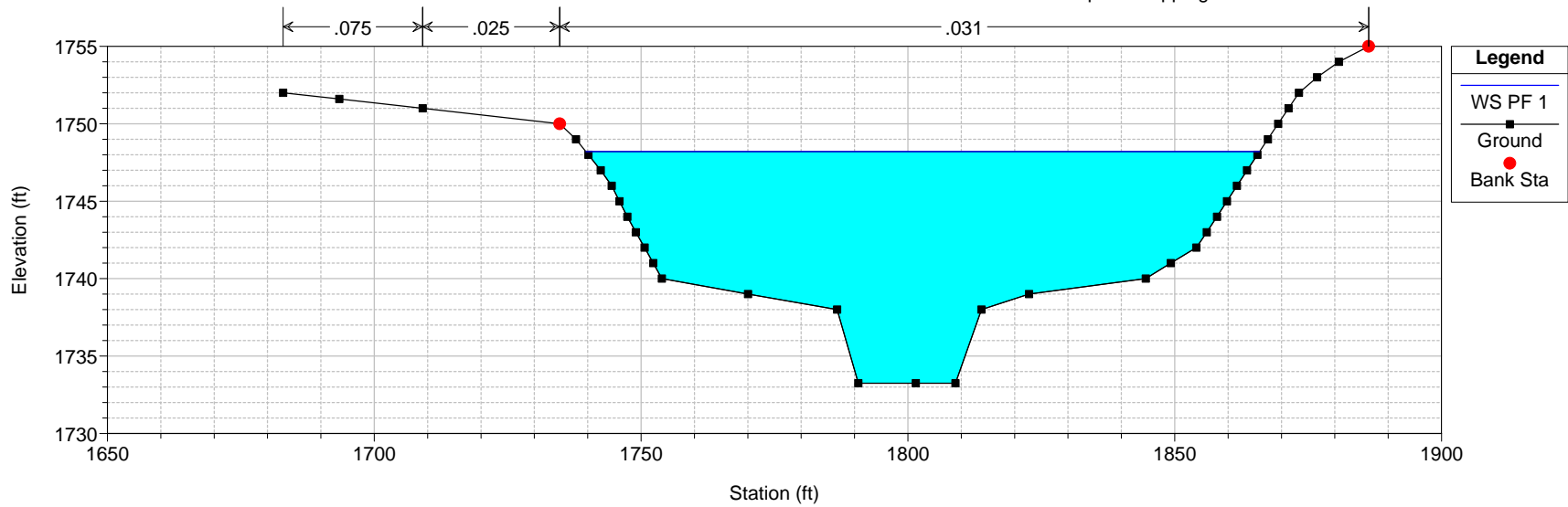
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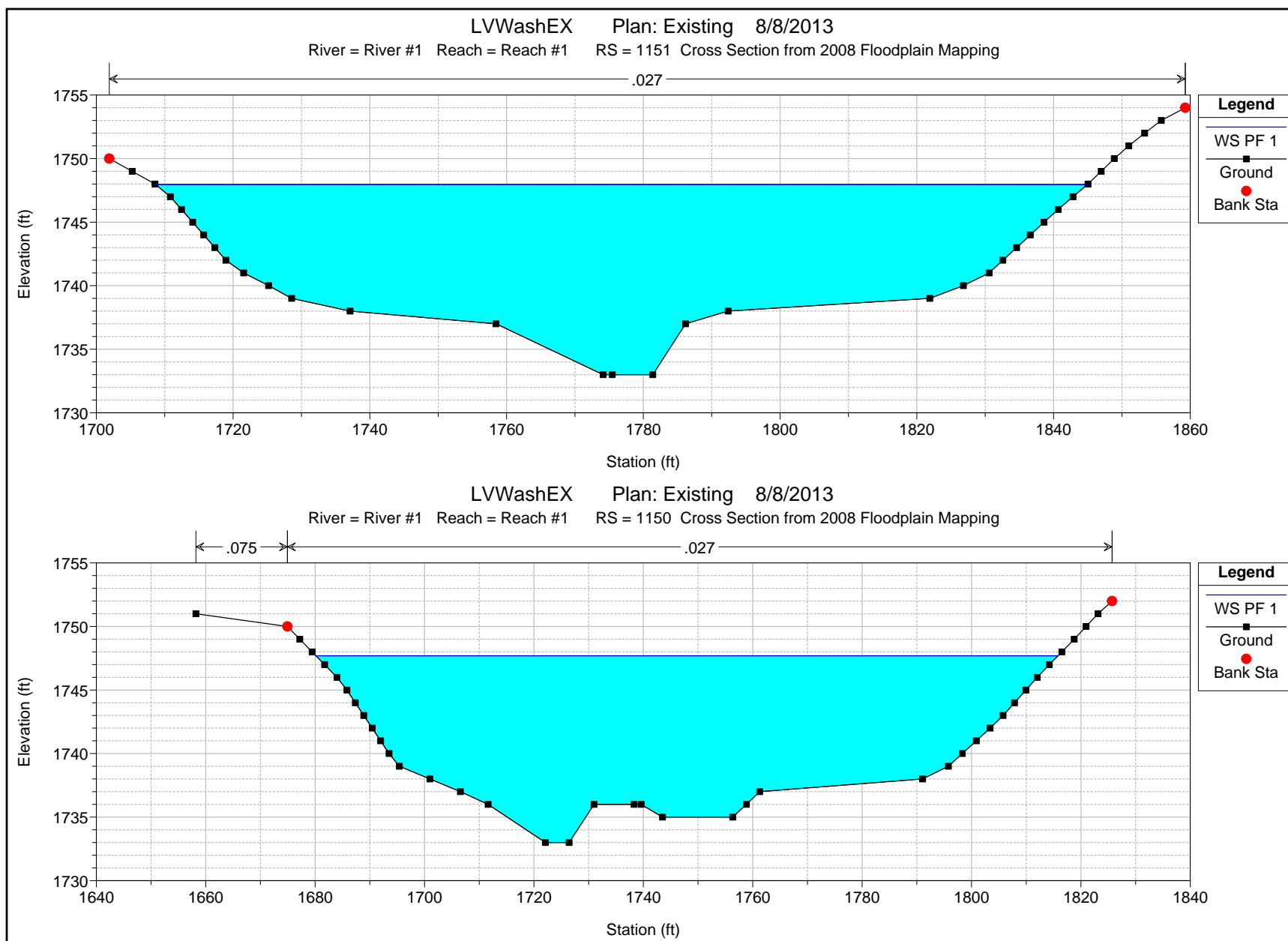


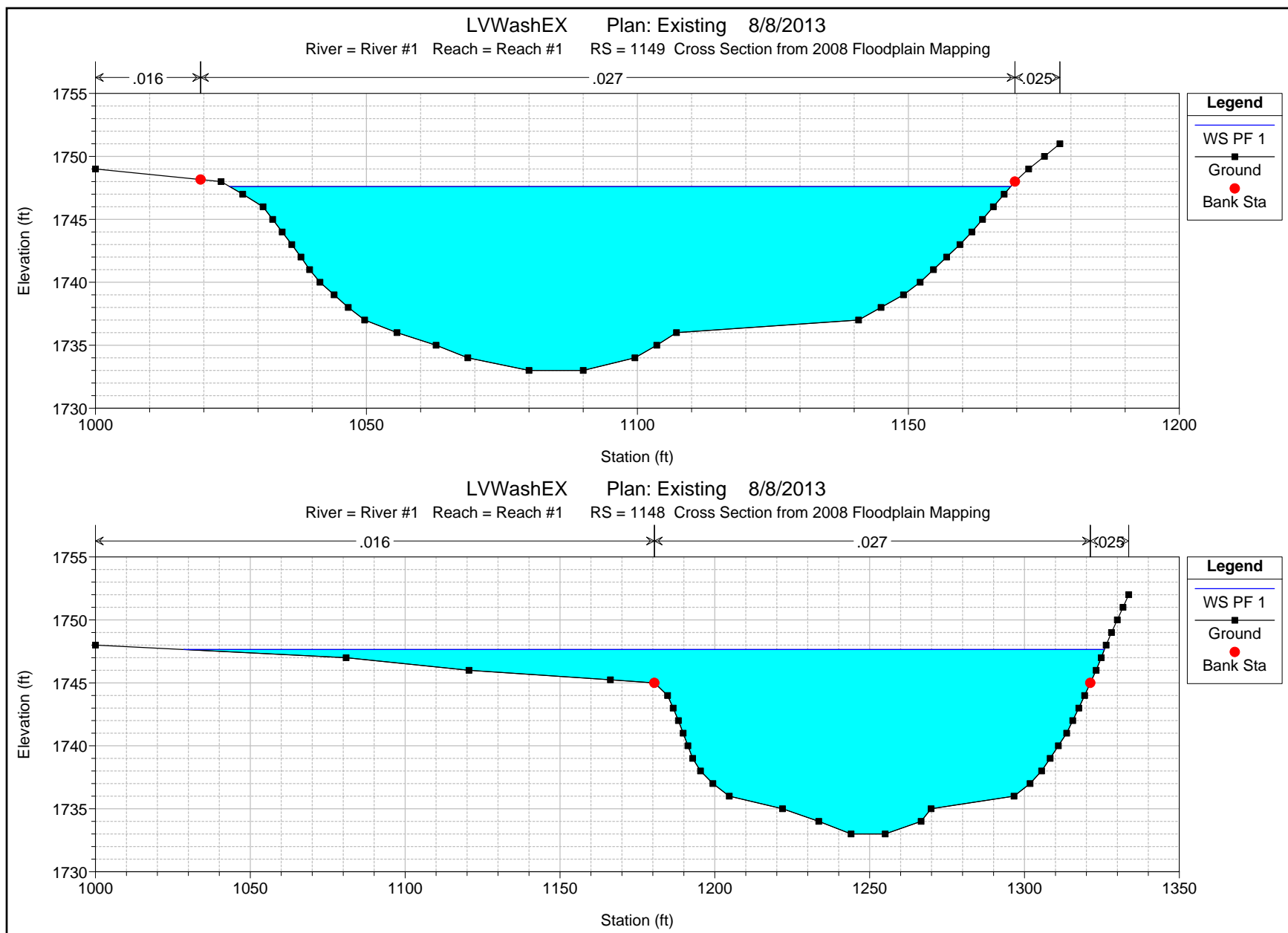
LVWashEX Plan: Existing 8/8/2013
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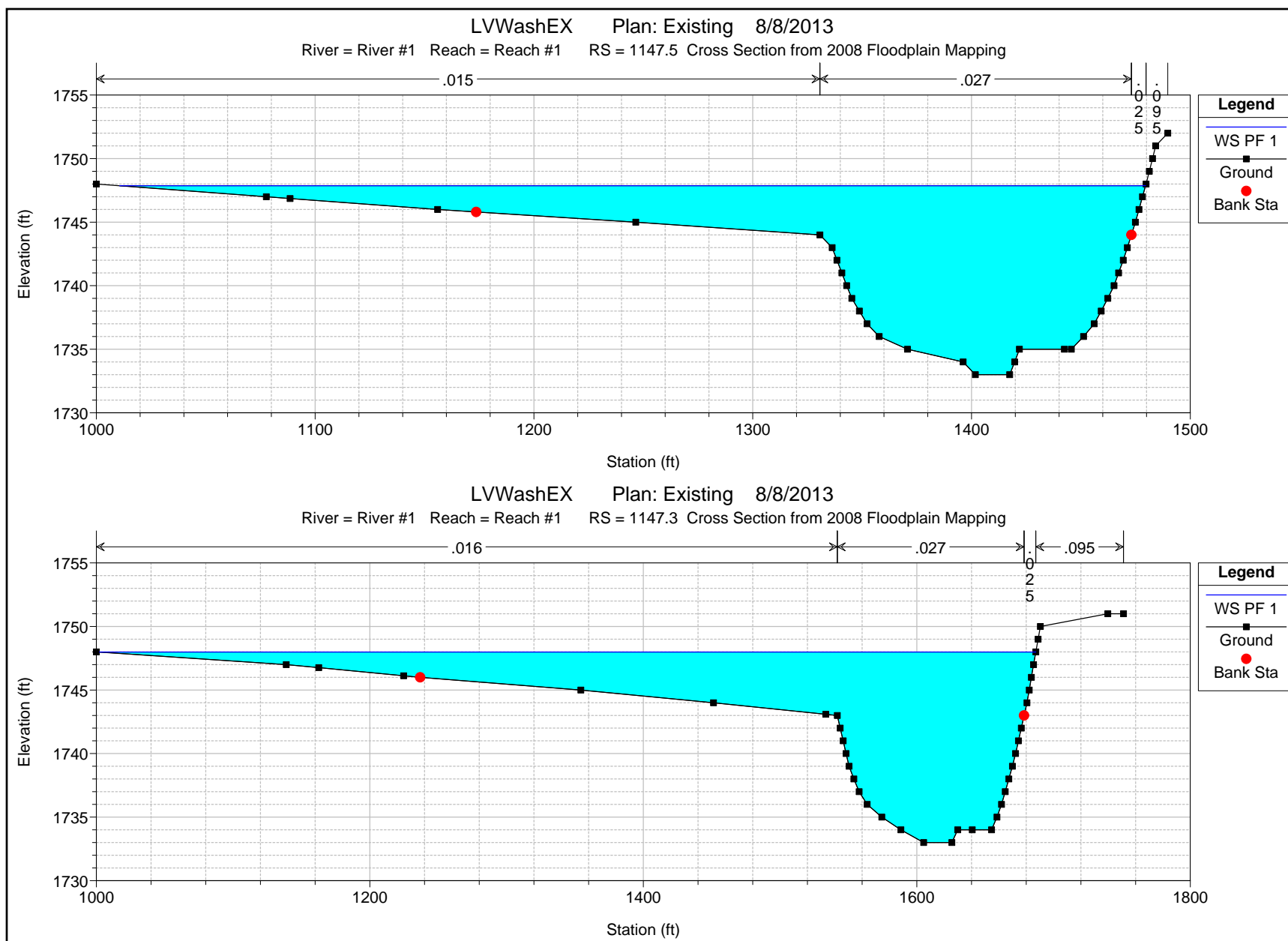


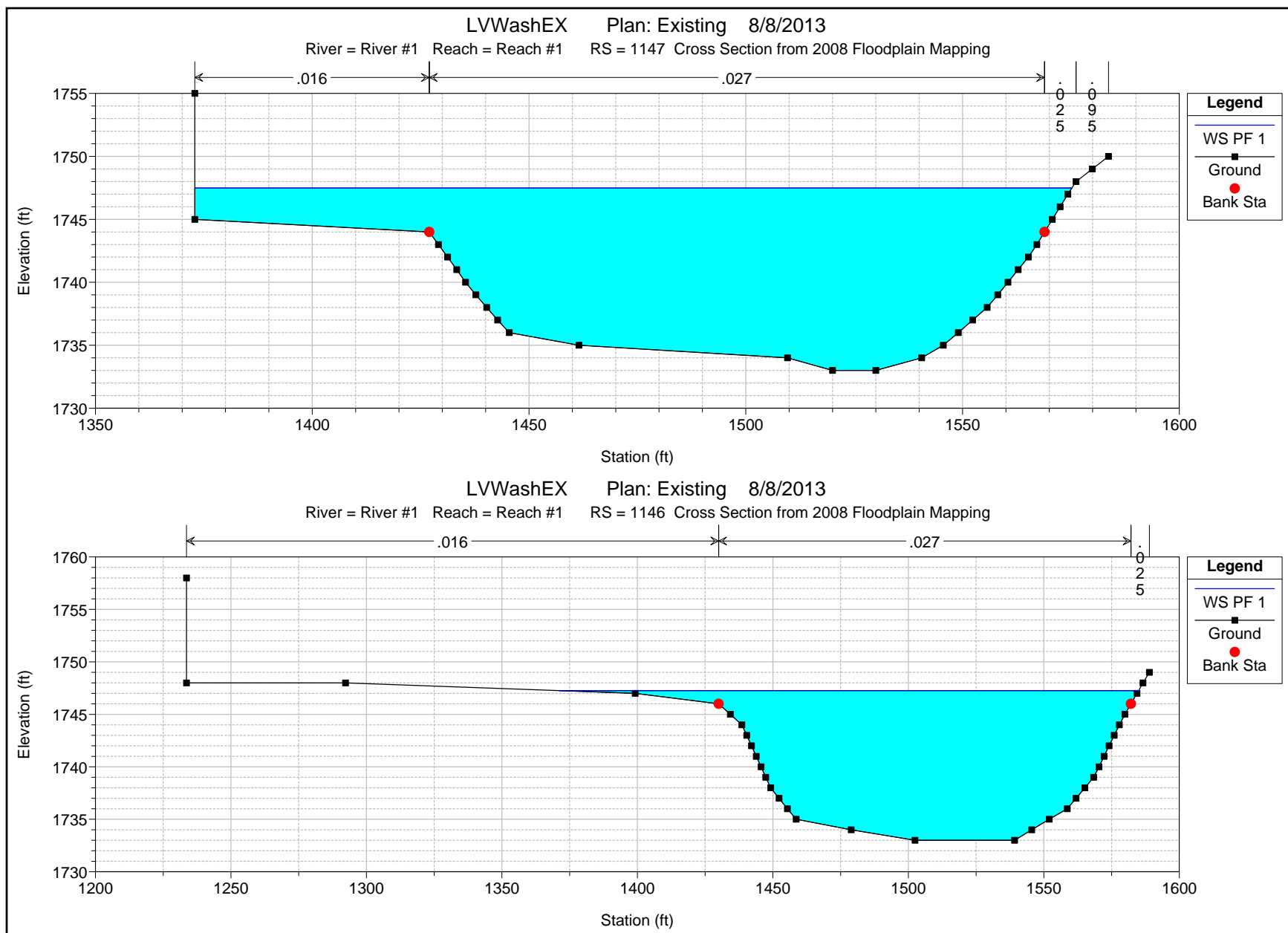
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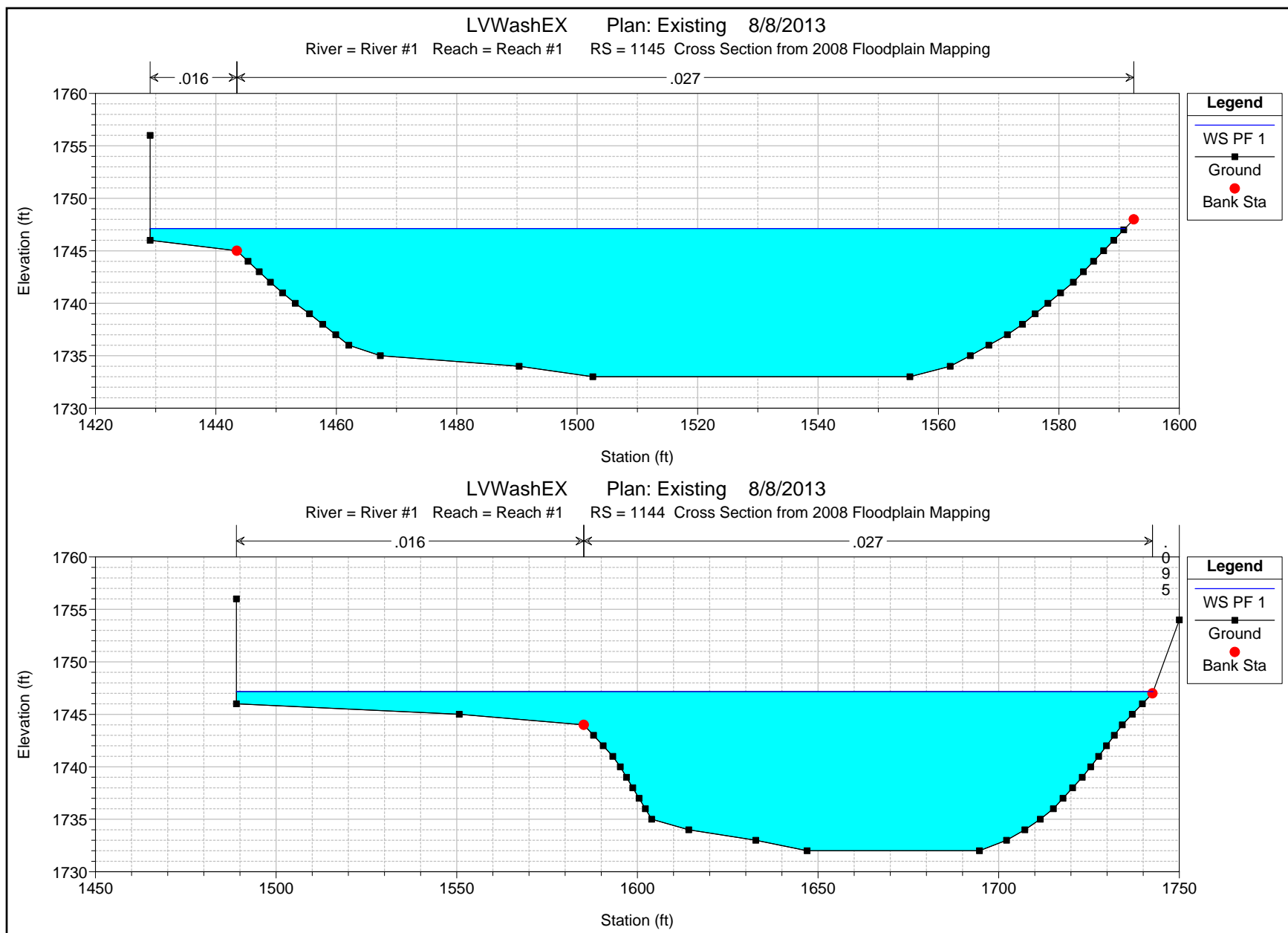


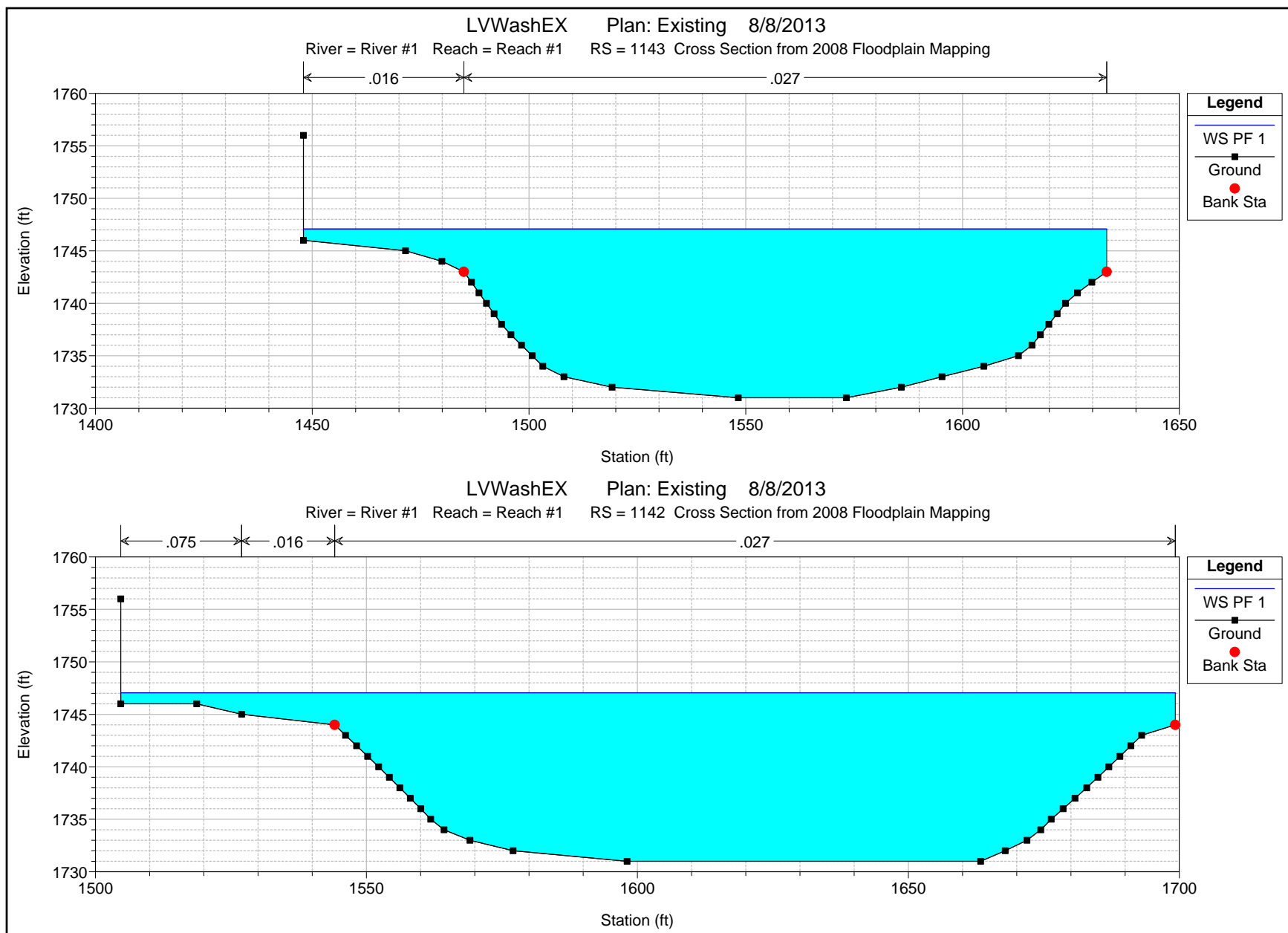


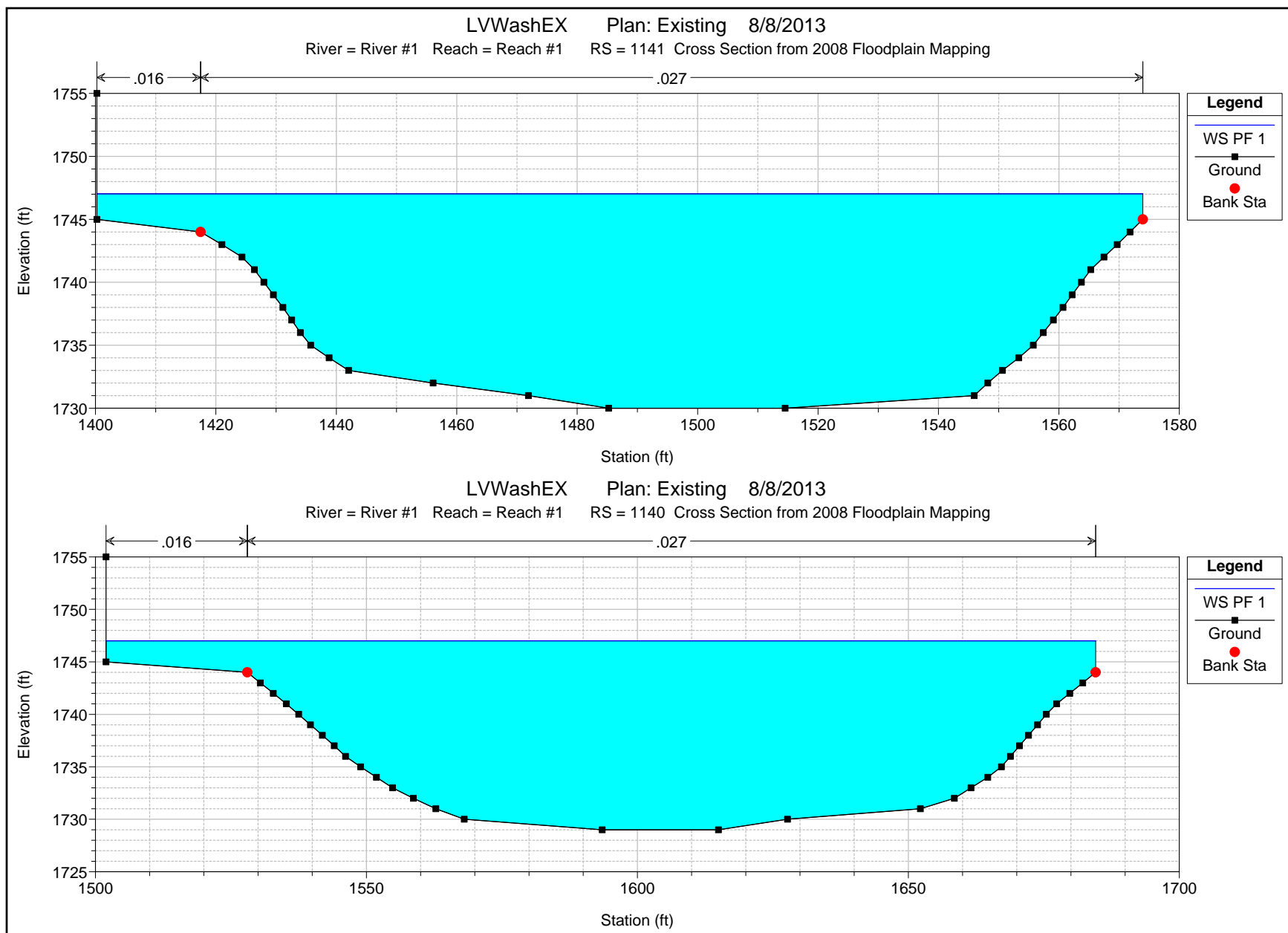




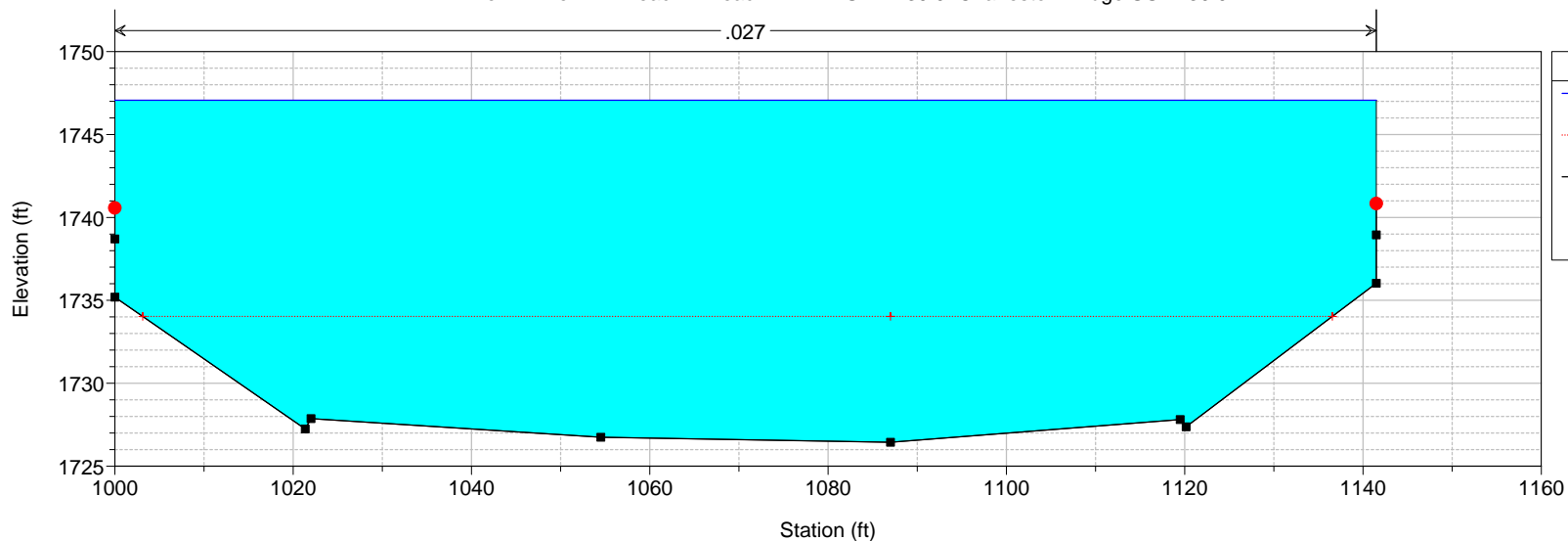








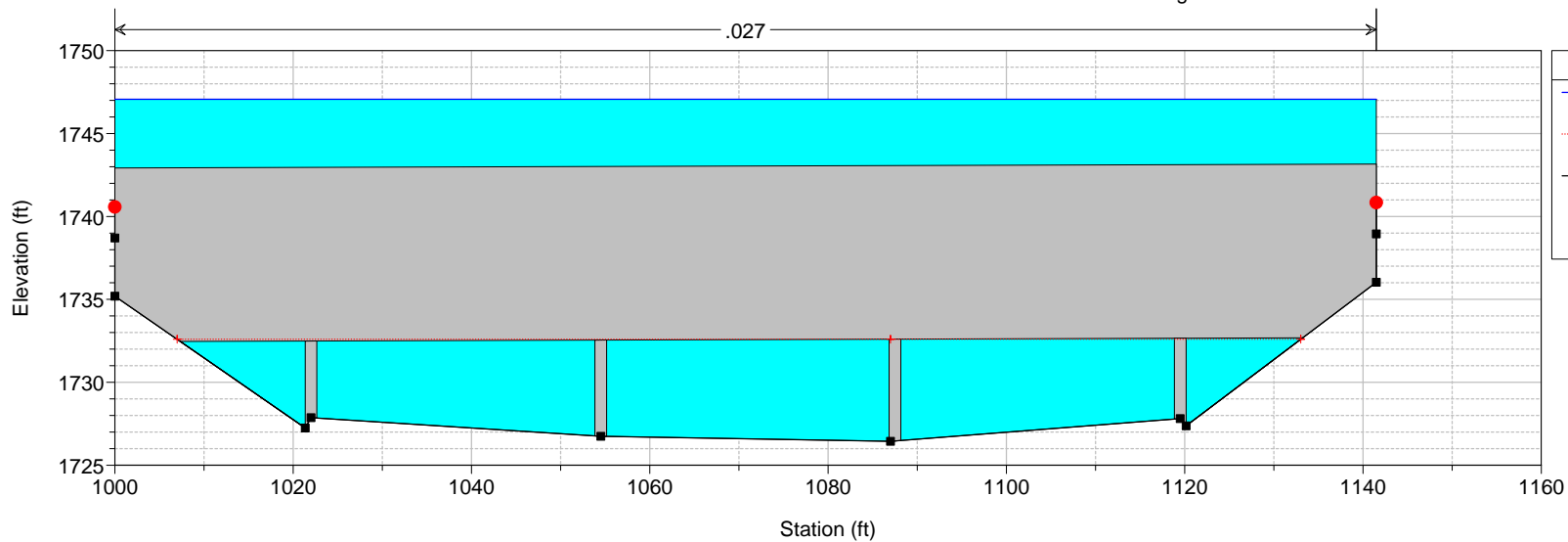
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.9 Charleston Bridge US 1139.9



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

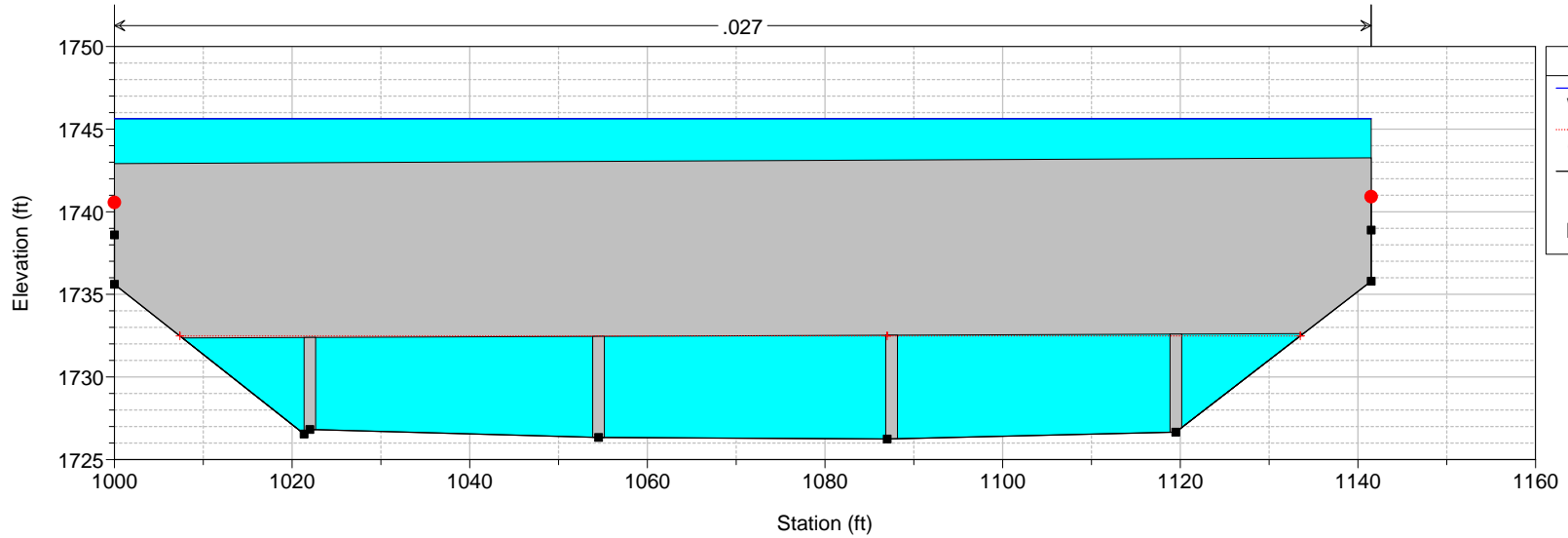
LVWashEX Plan: Existing 8/8/2013
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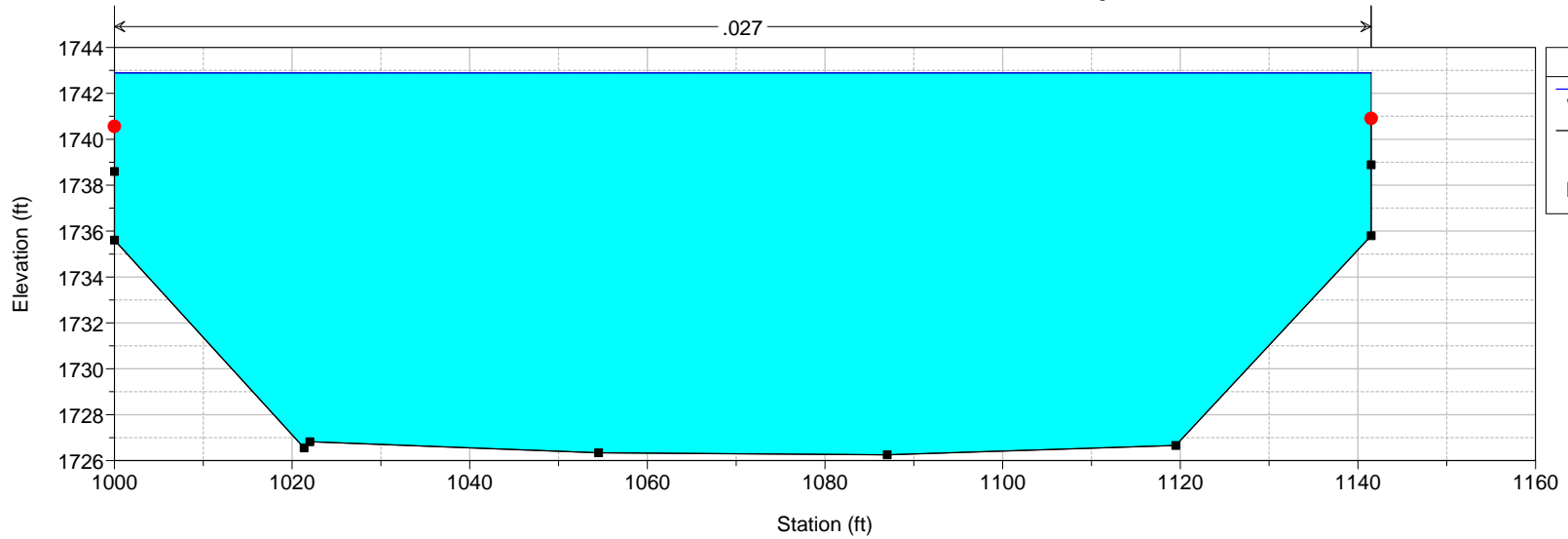
Legend

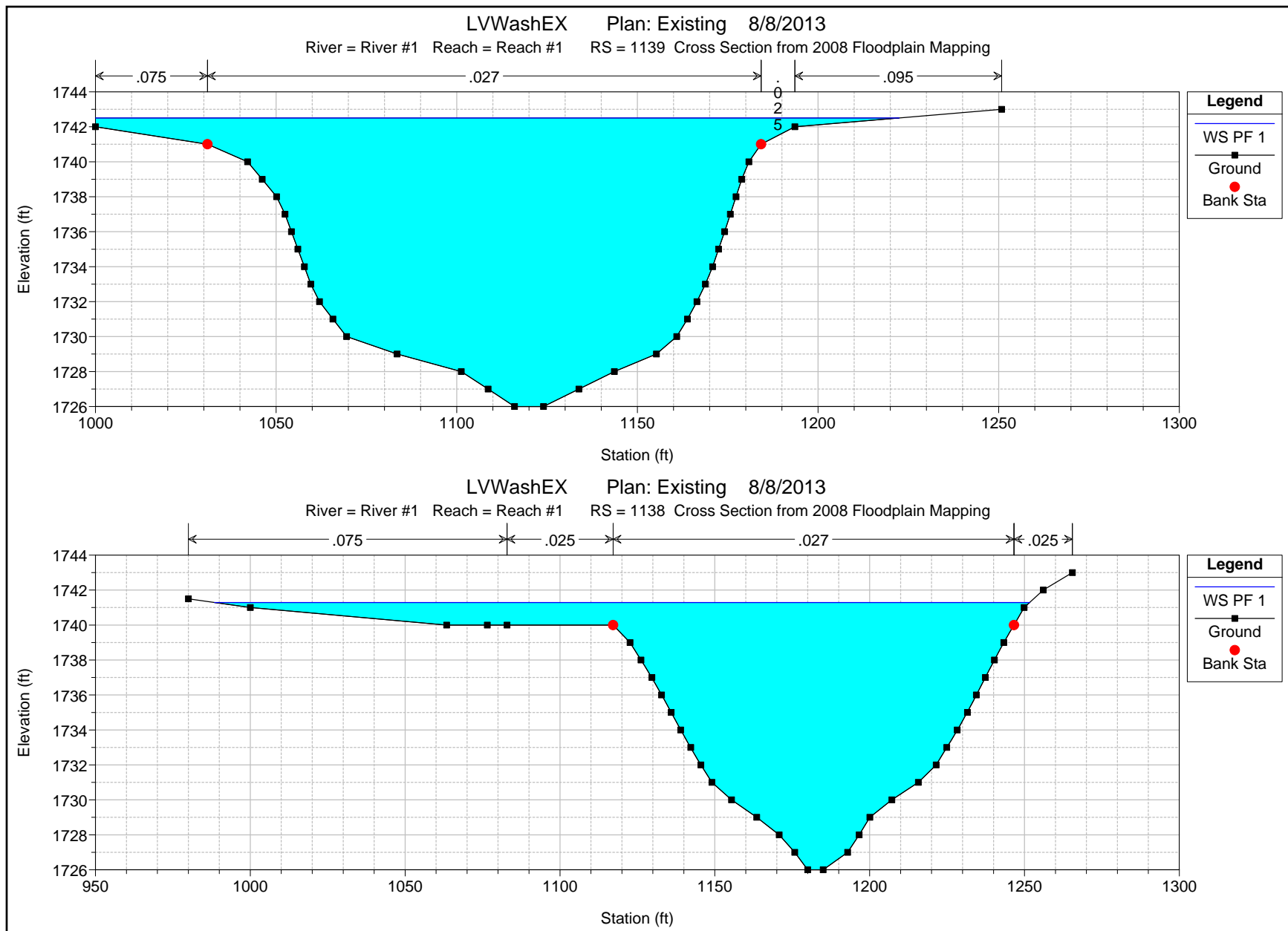
- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

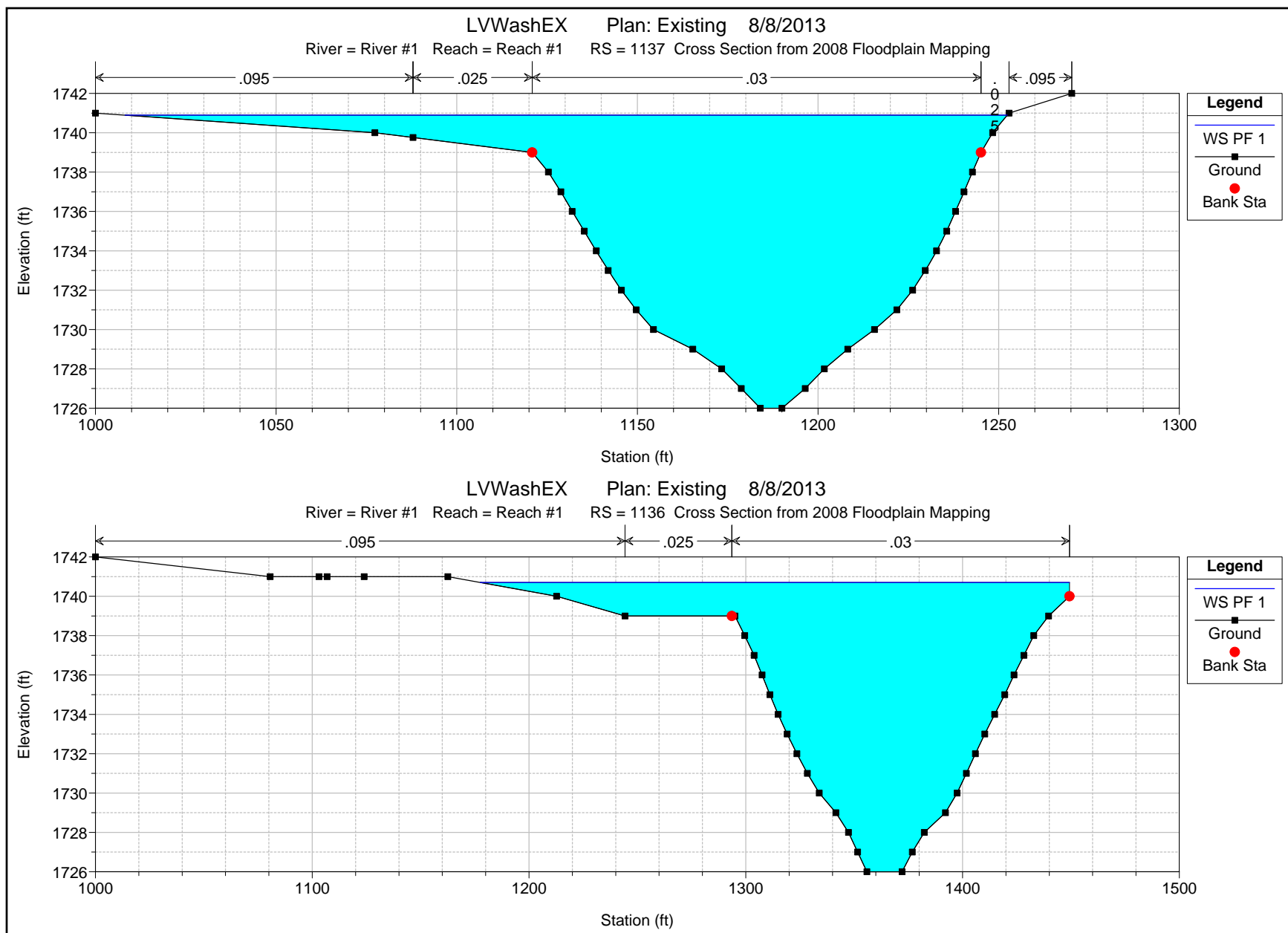
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.5 BR Charleston Bridge

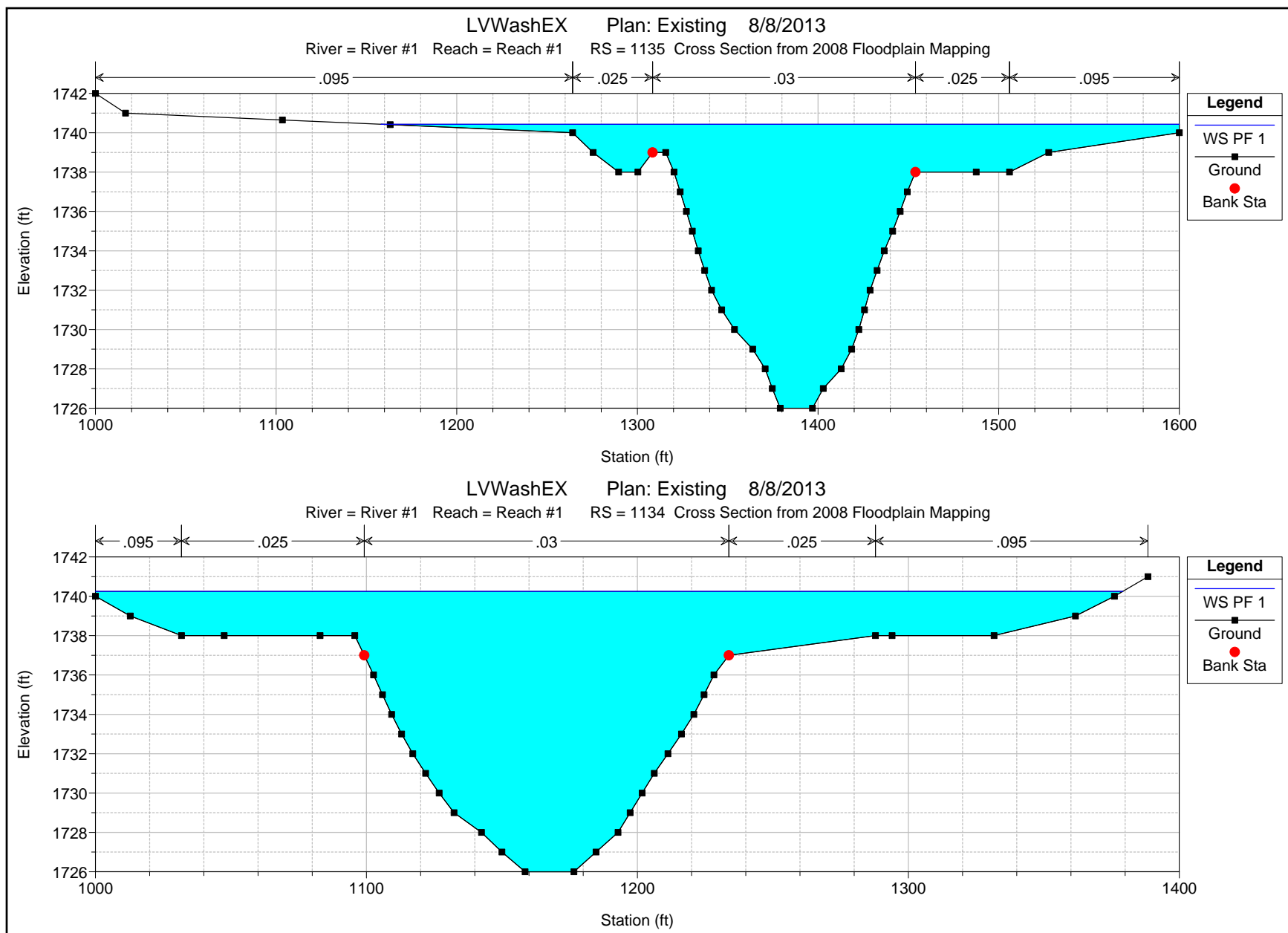


LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.1 Charleston Bridge DS 1139.1

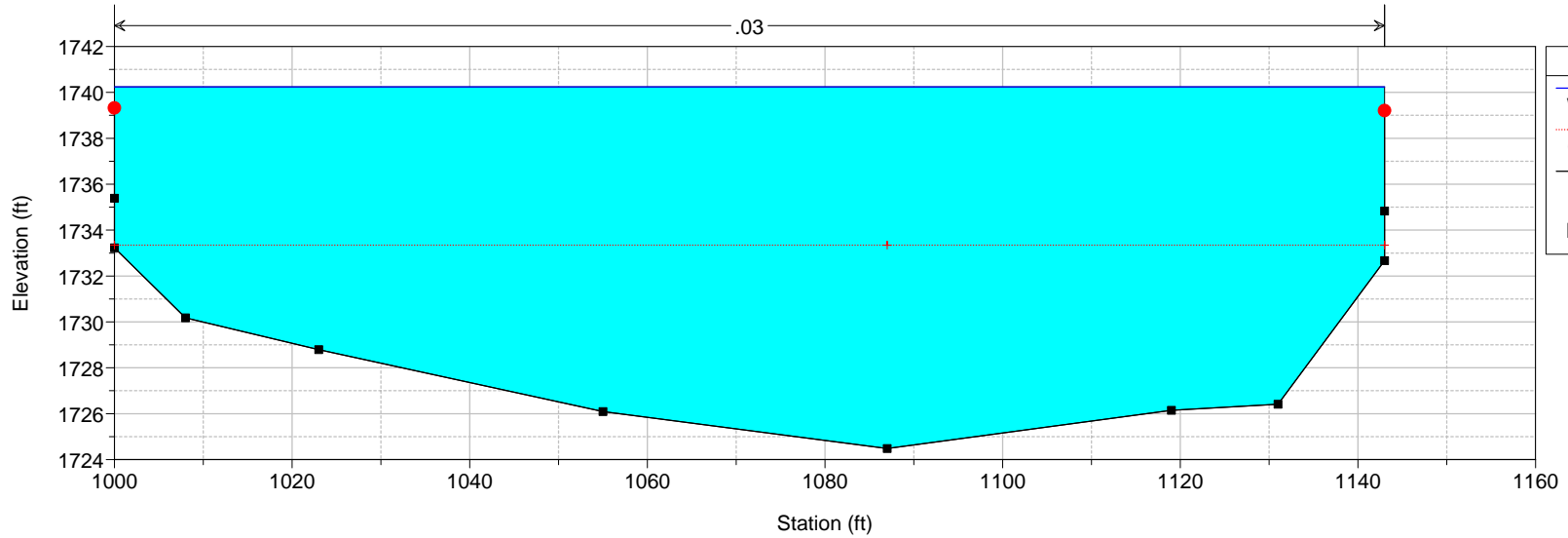




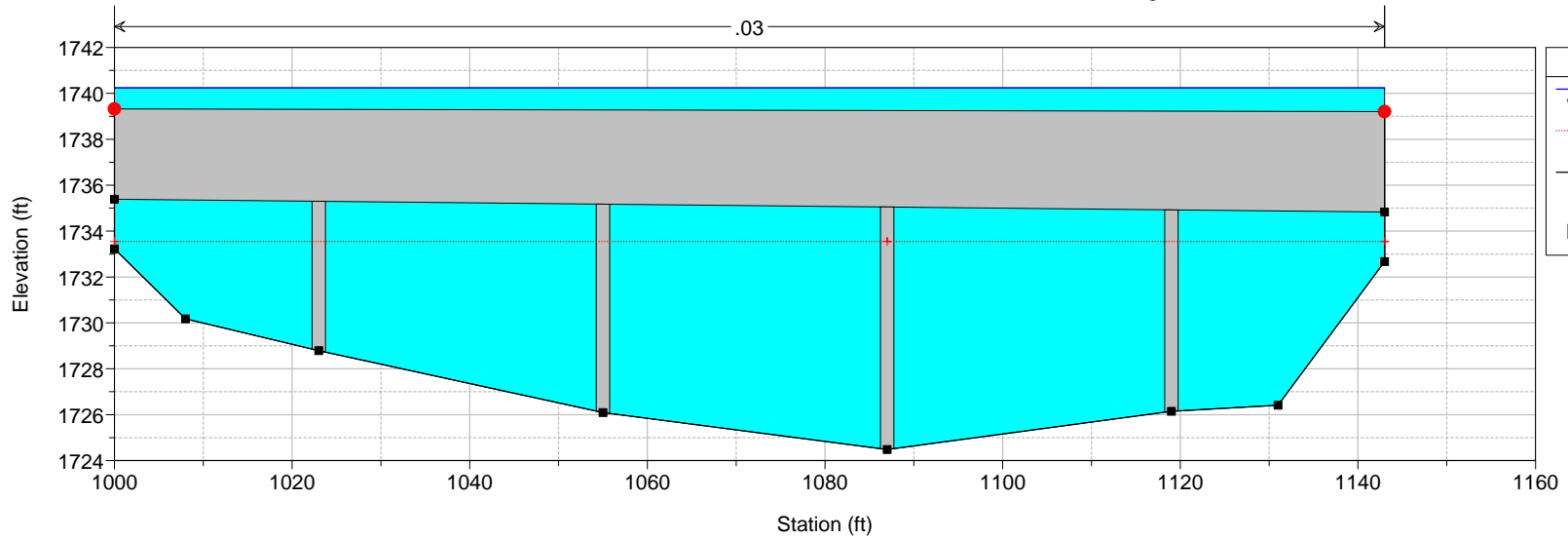




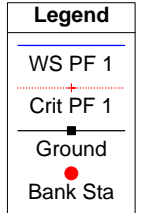
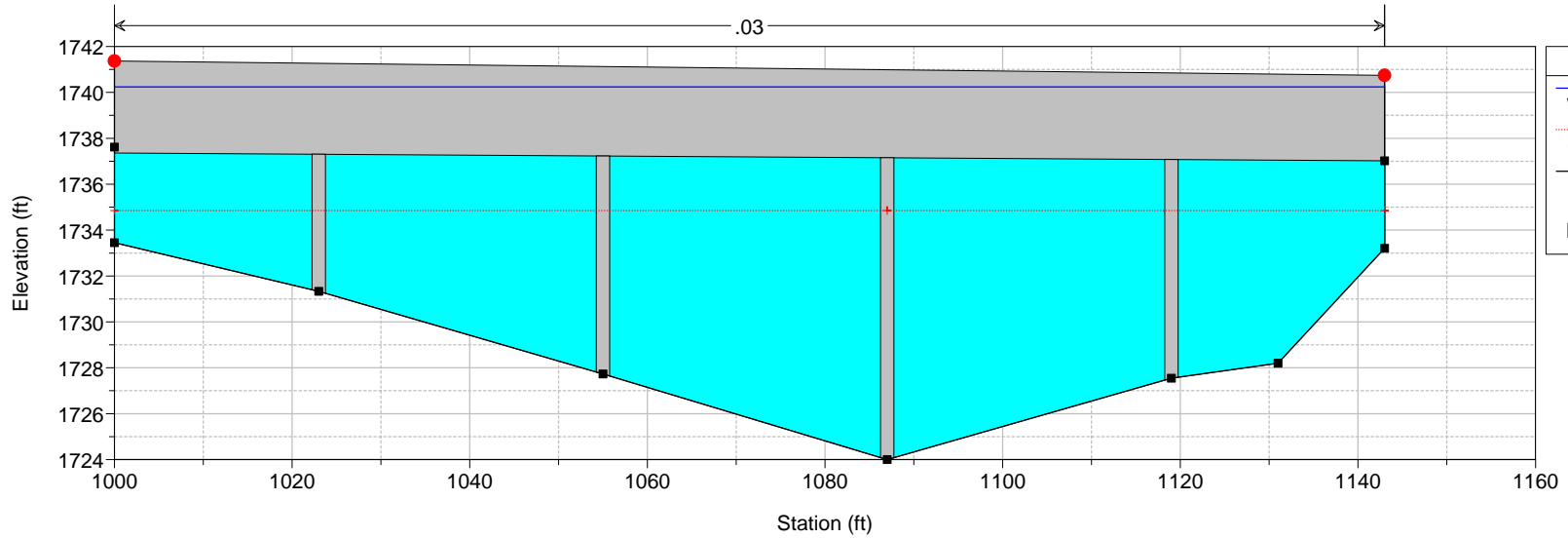
LVWashEX Plan: Existing 8/8/2013
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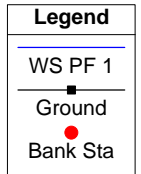
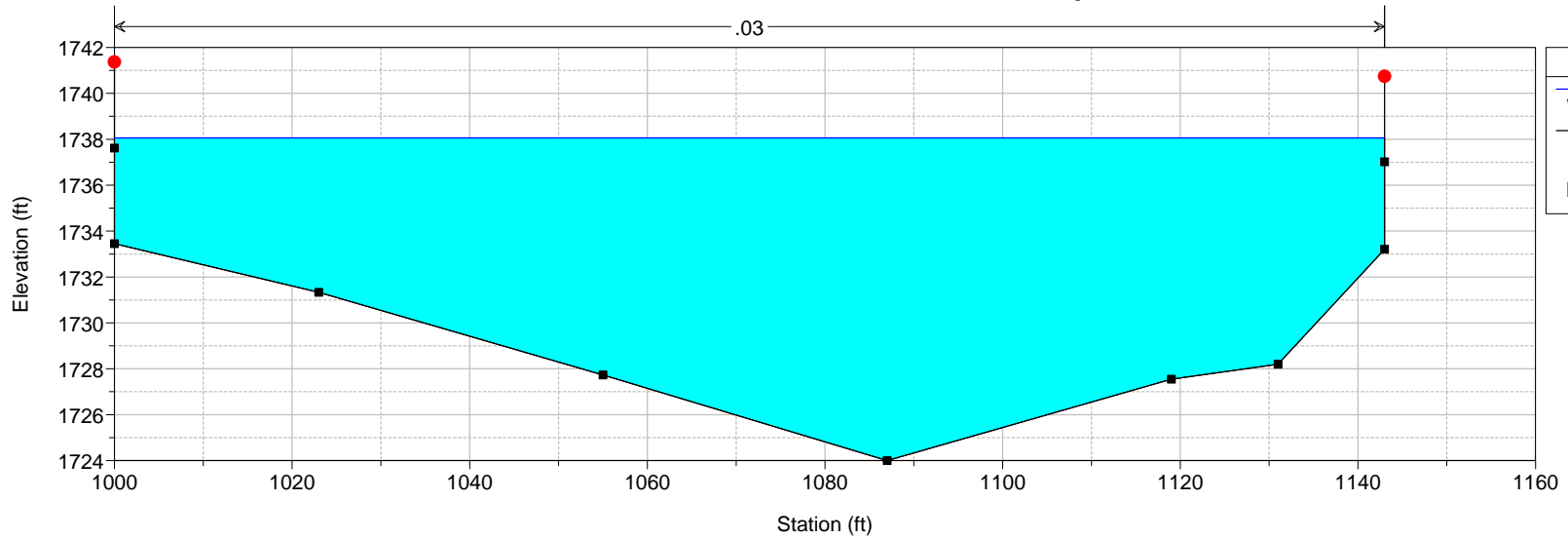
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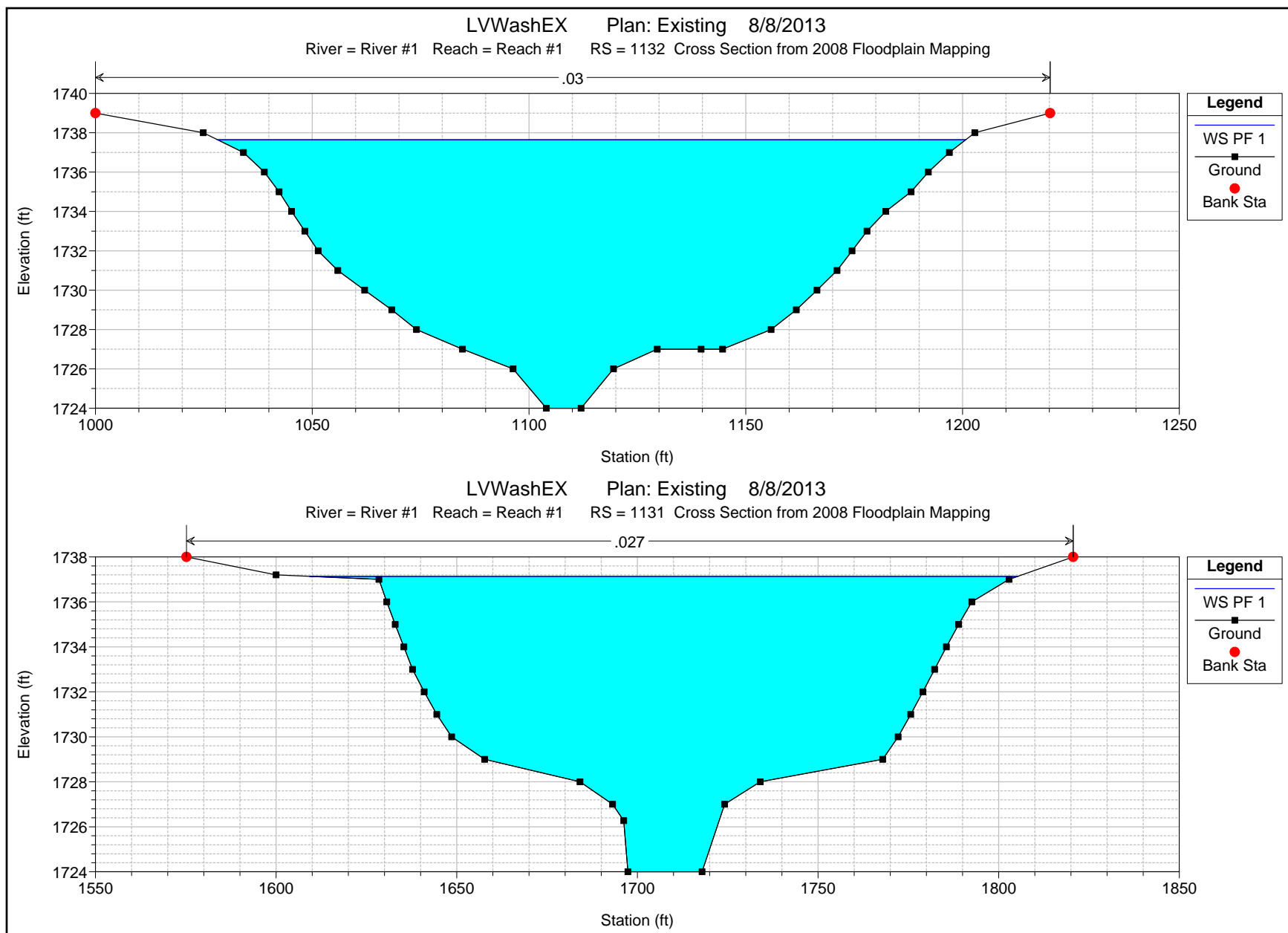


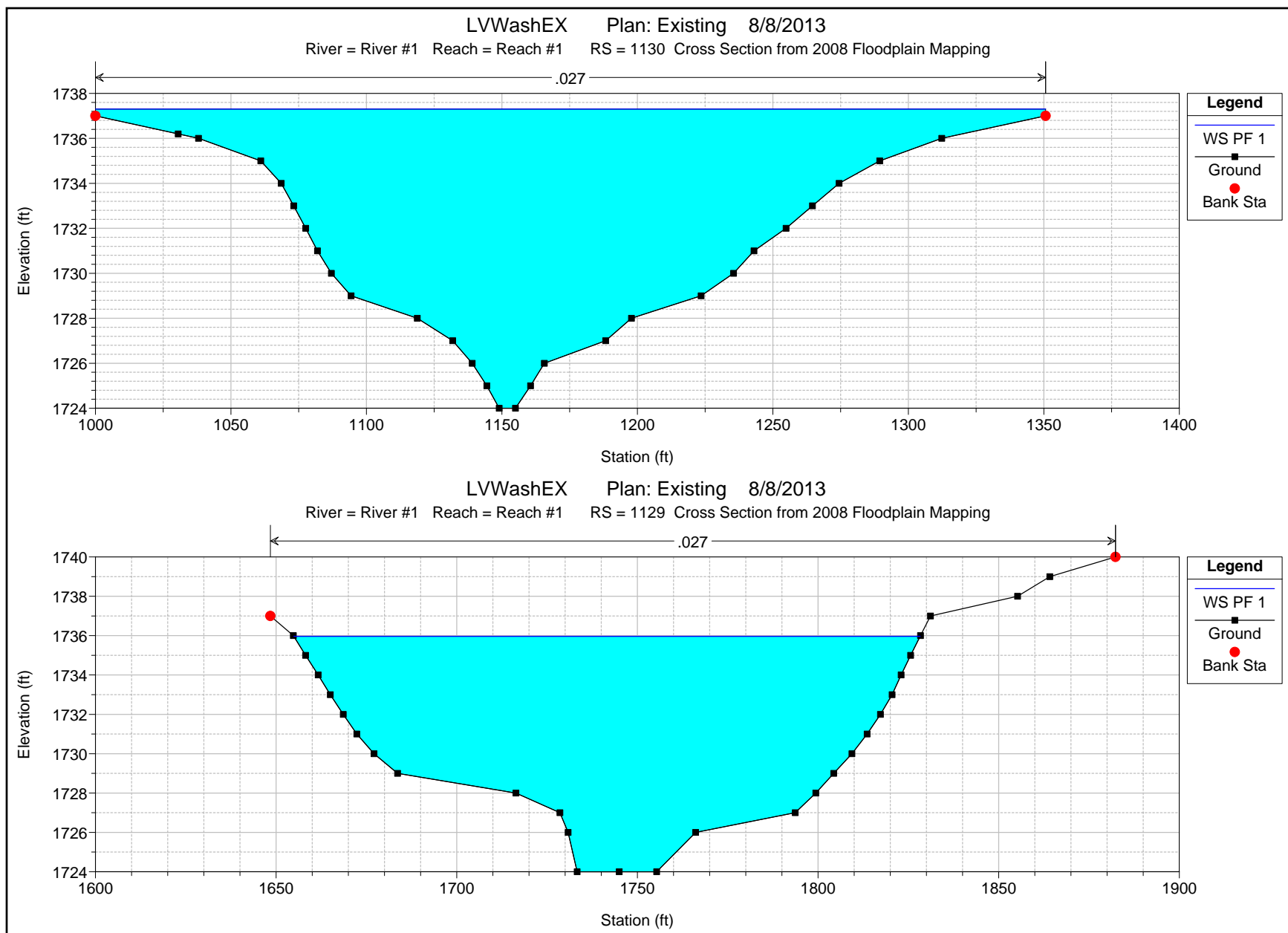
LVWashEX Plan: Existing 8/8/2013
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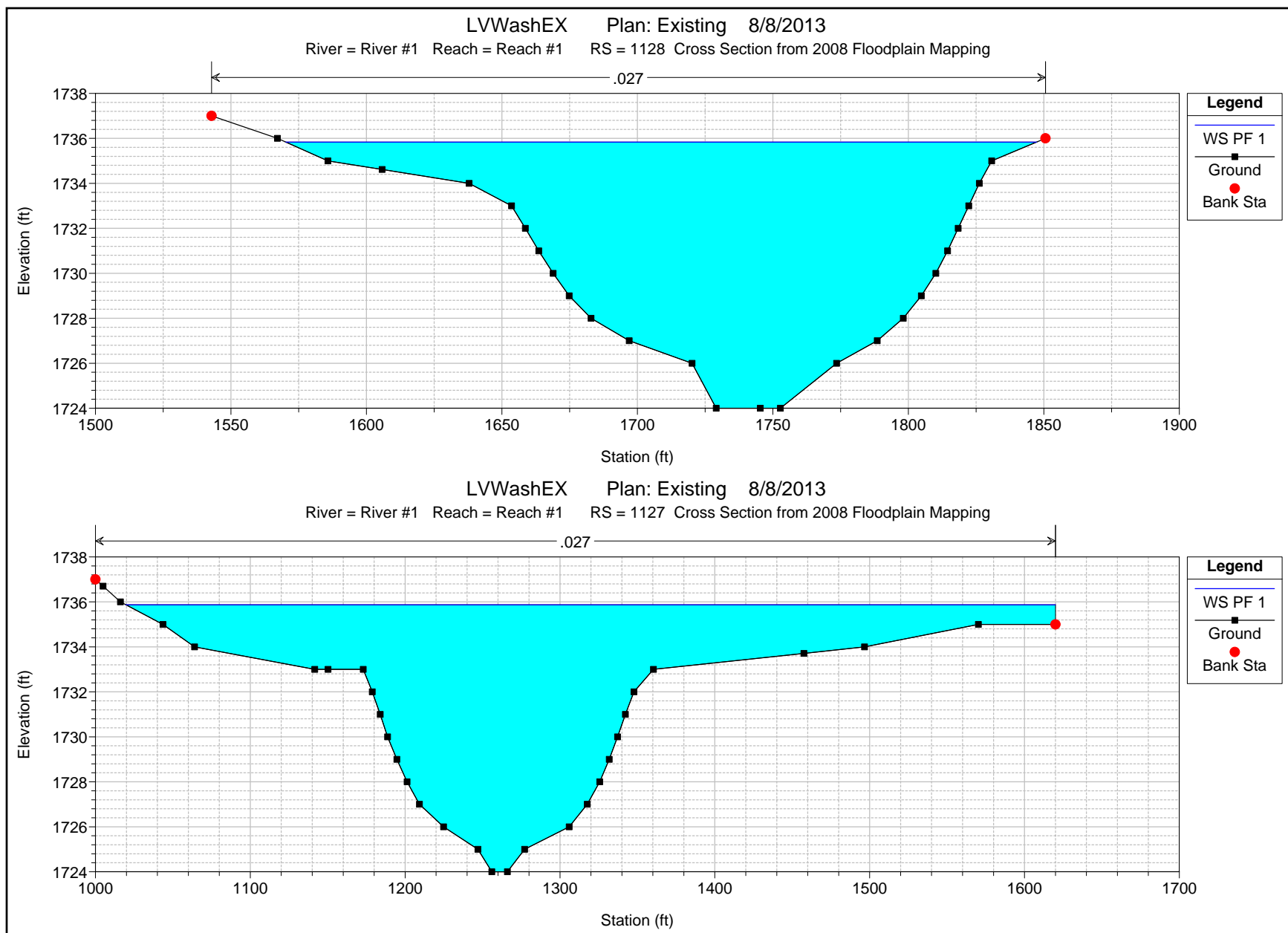


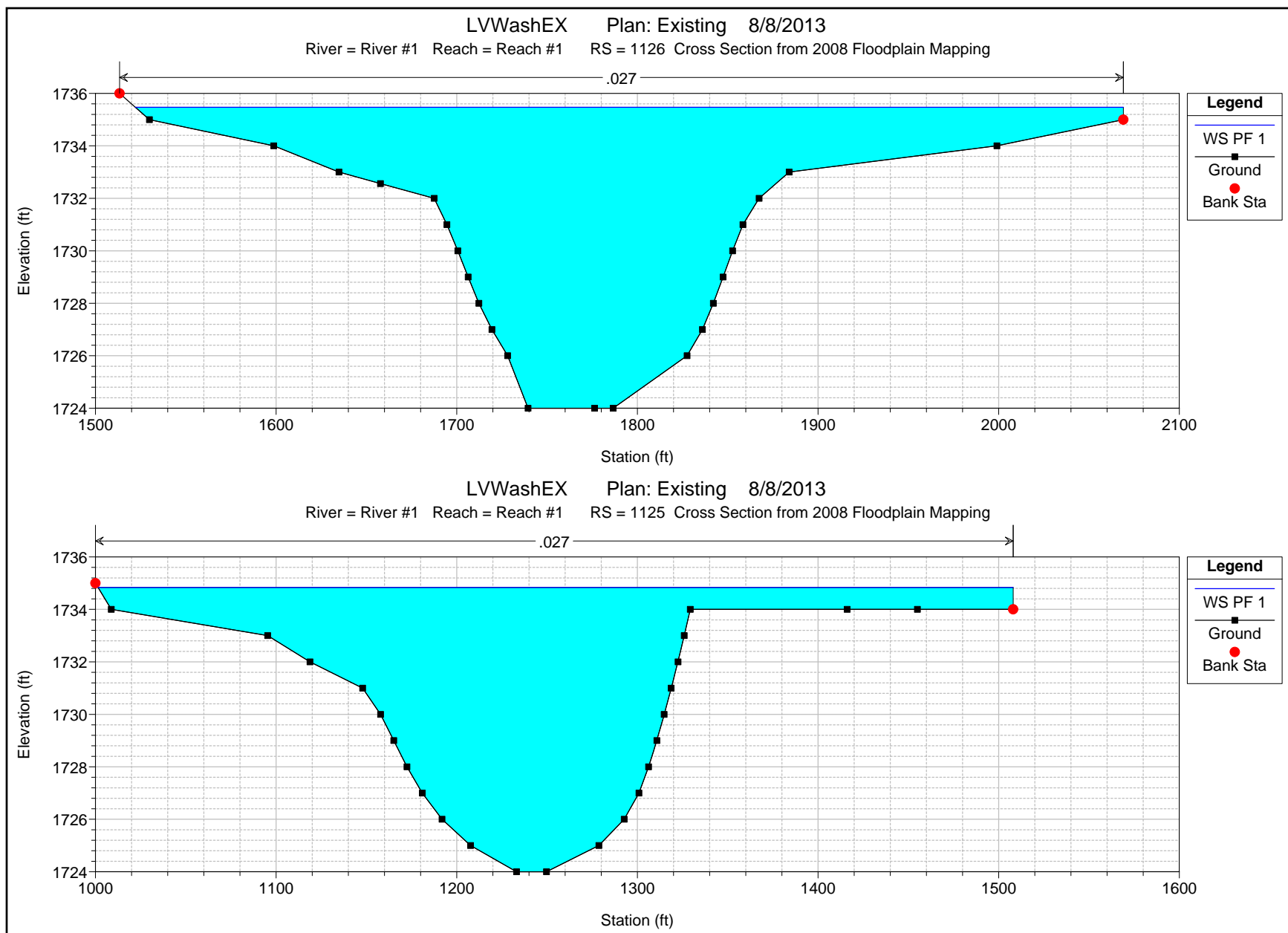
LVWashEX Plan: Existing 8/8/2013
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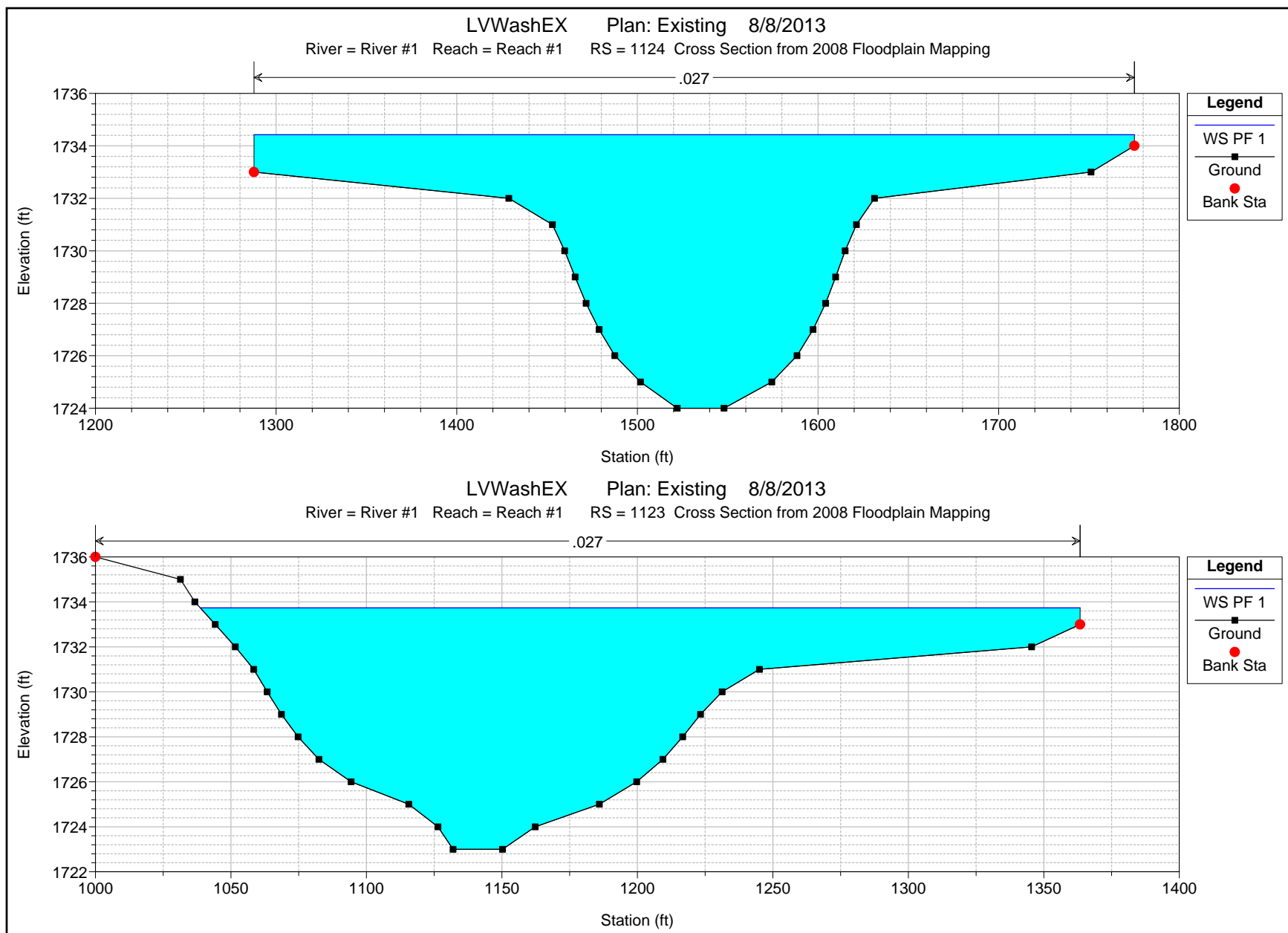


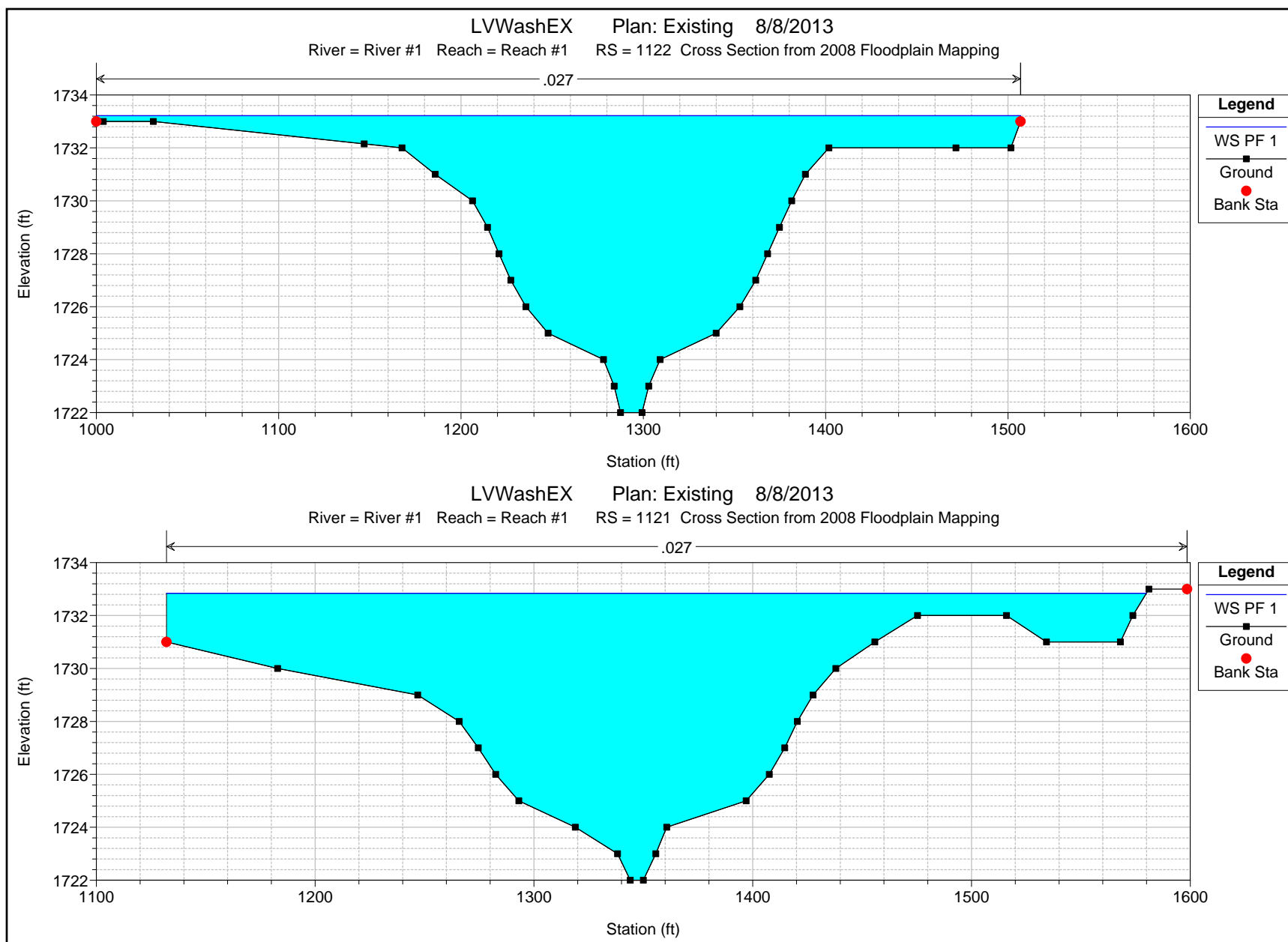


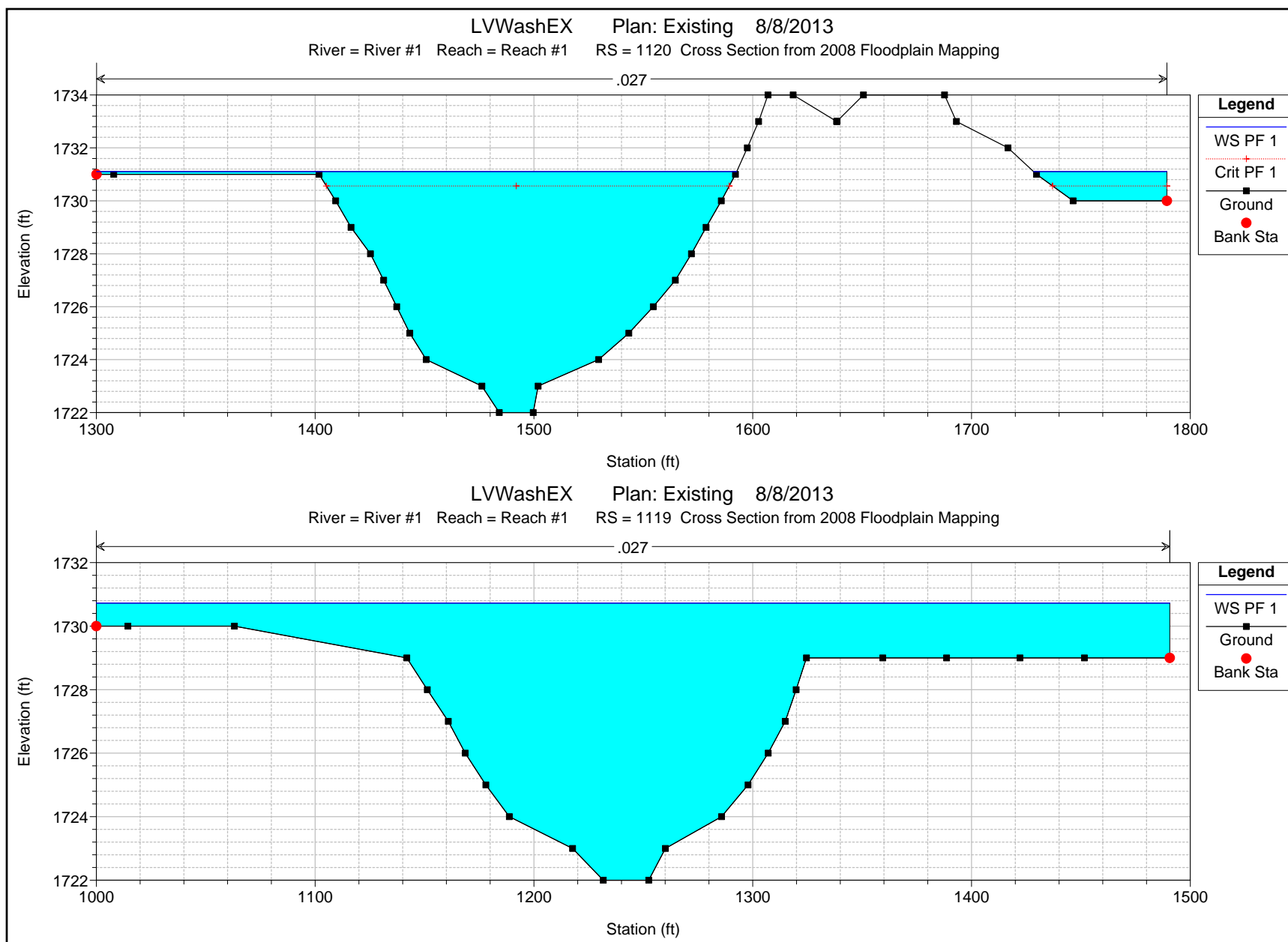


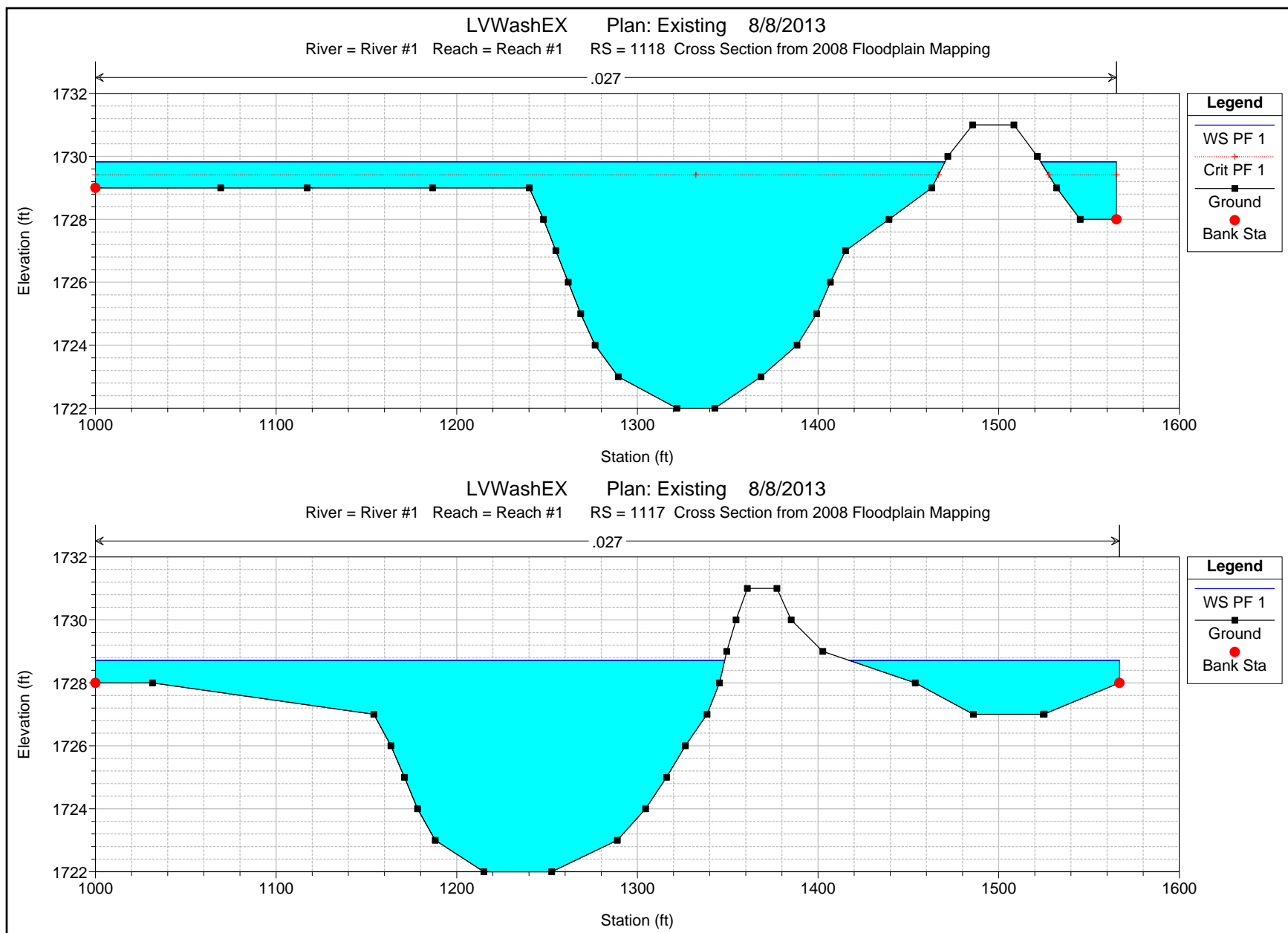


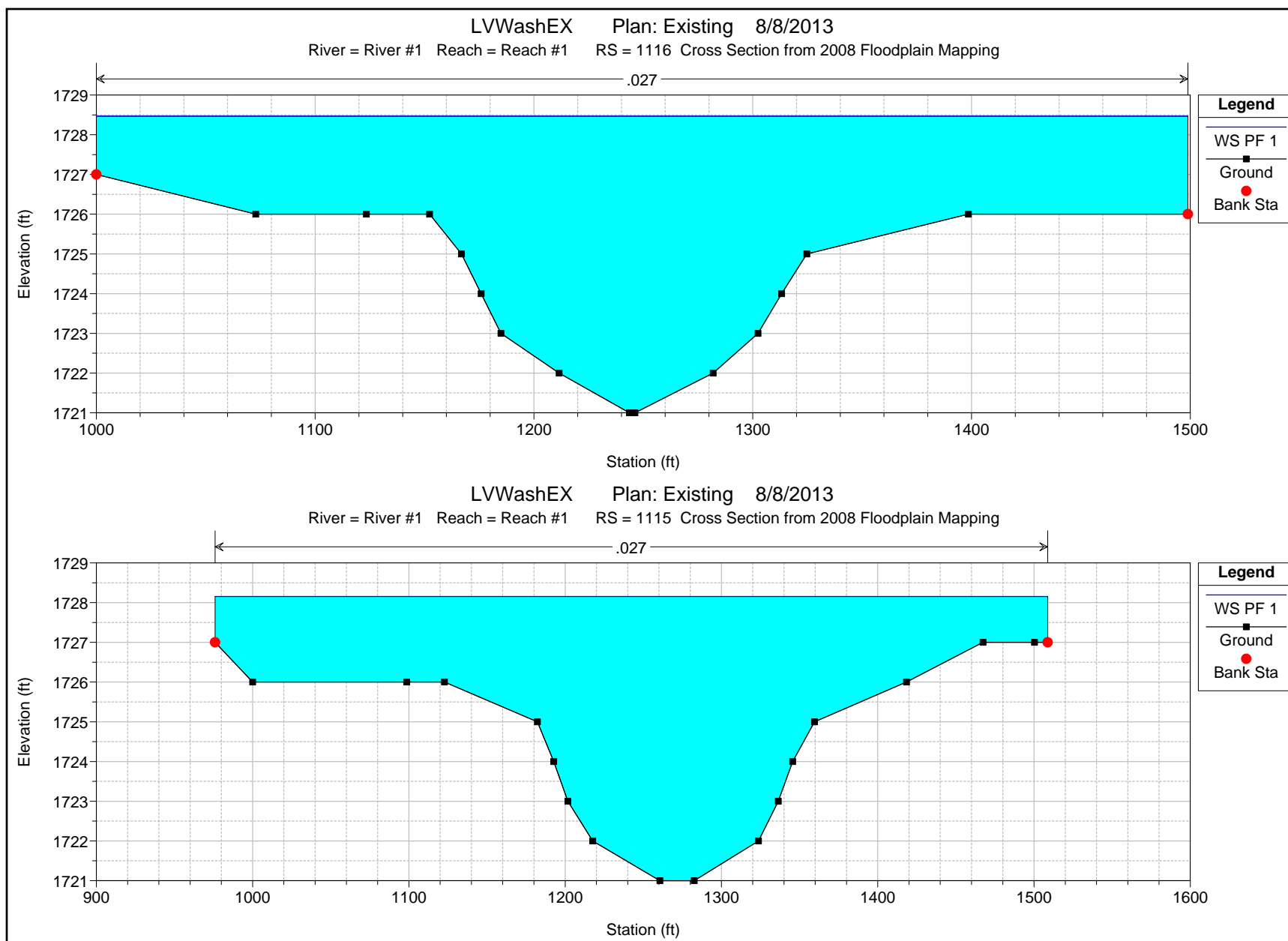


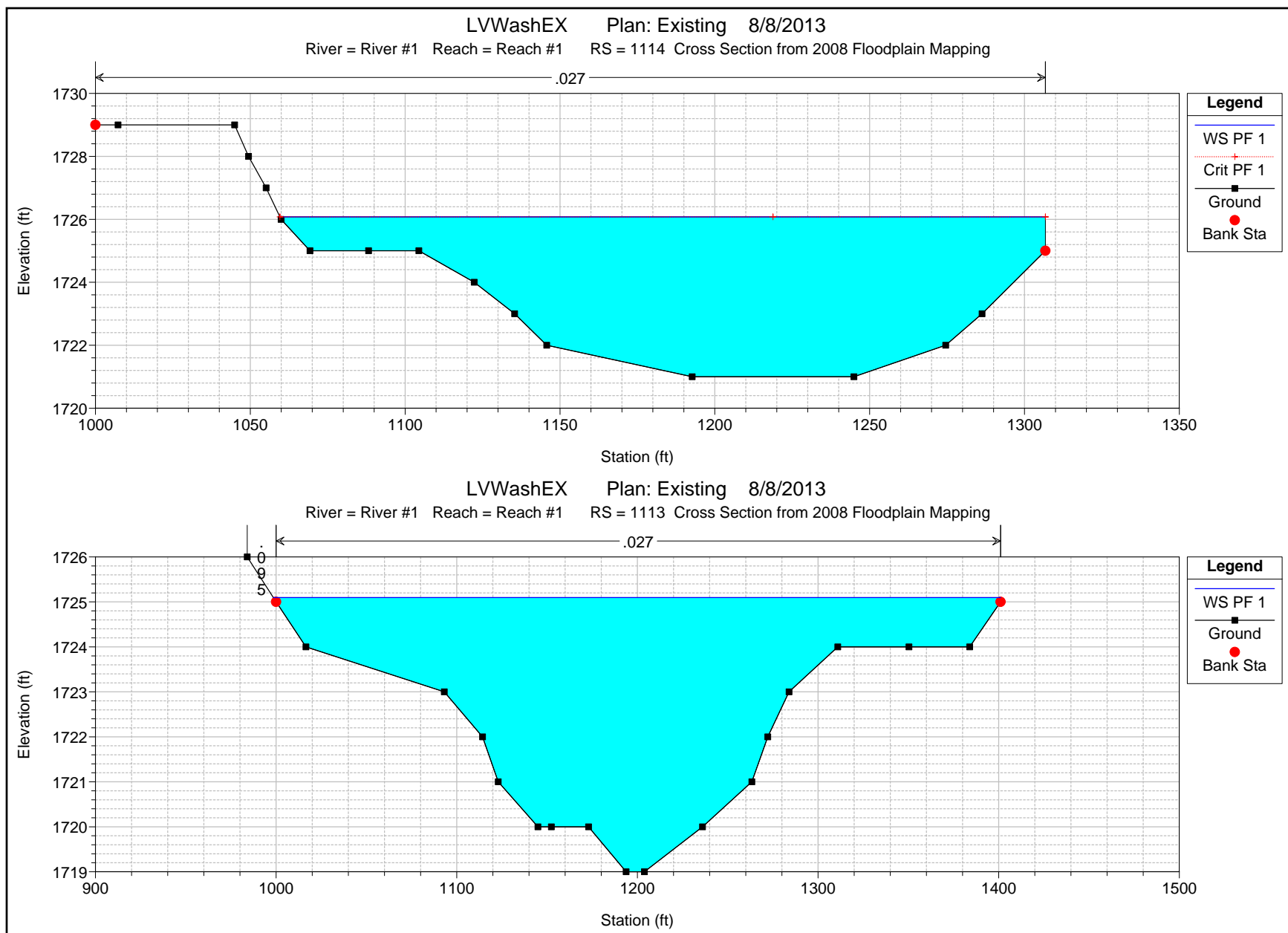


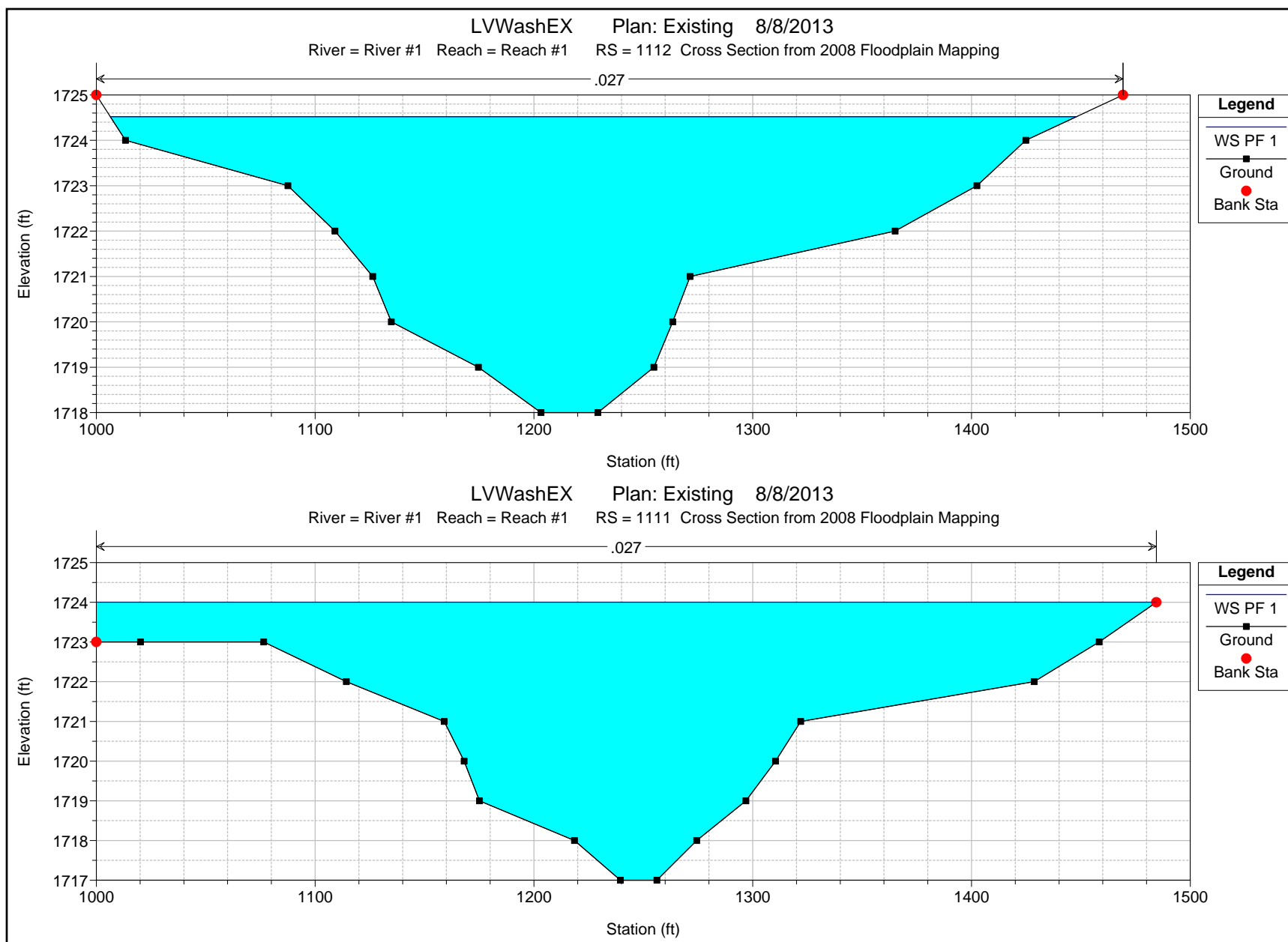


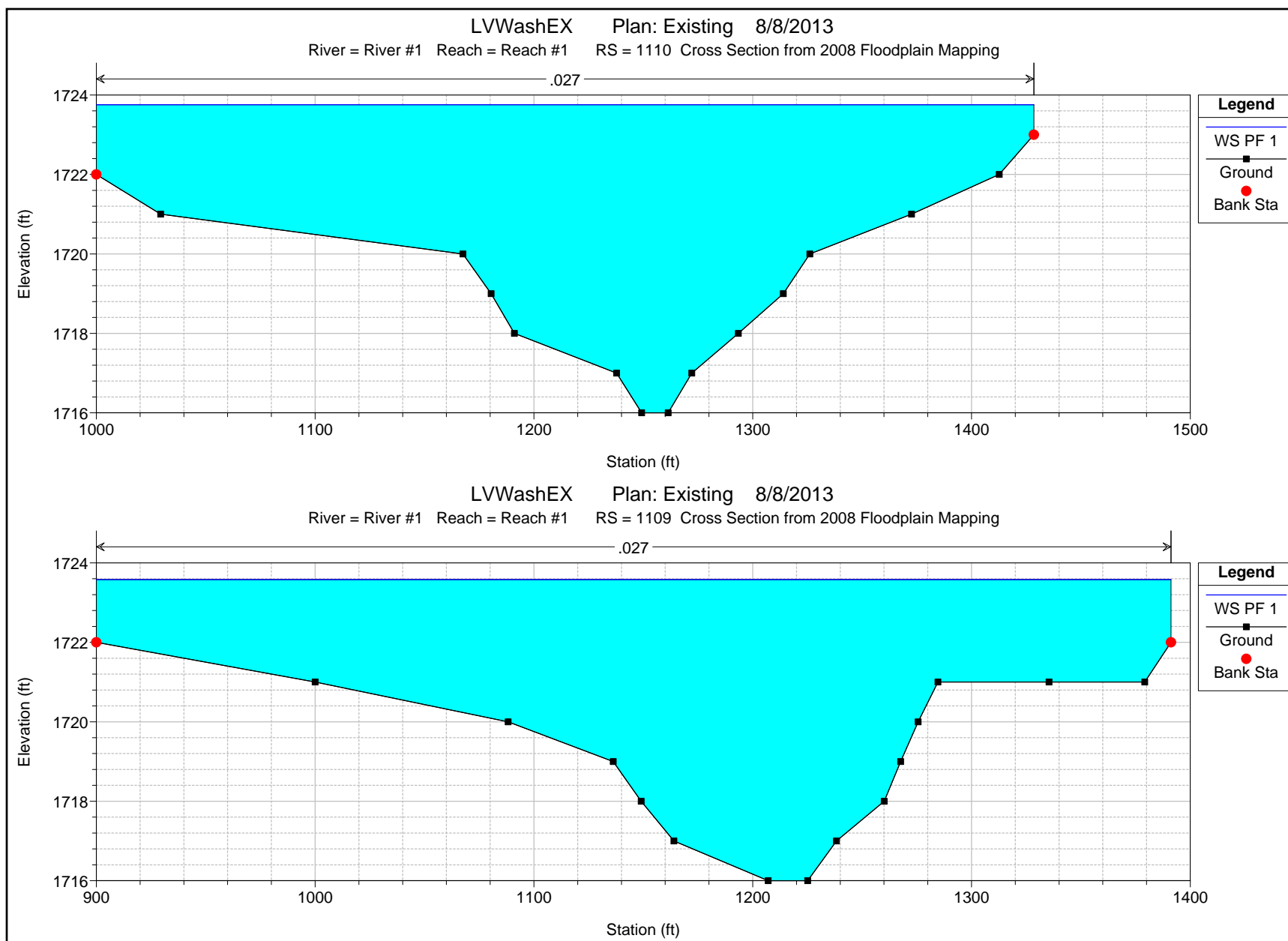




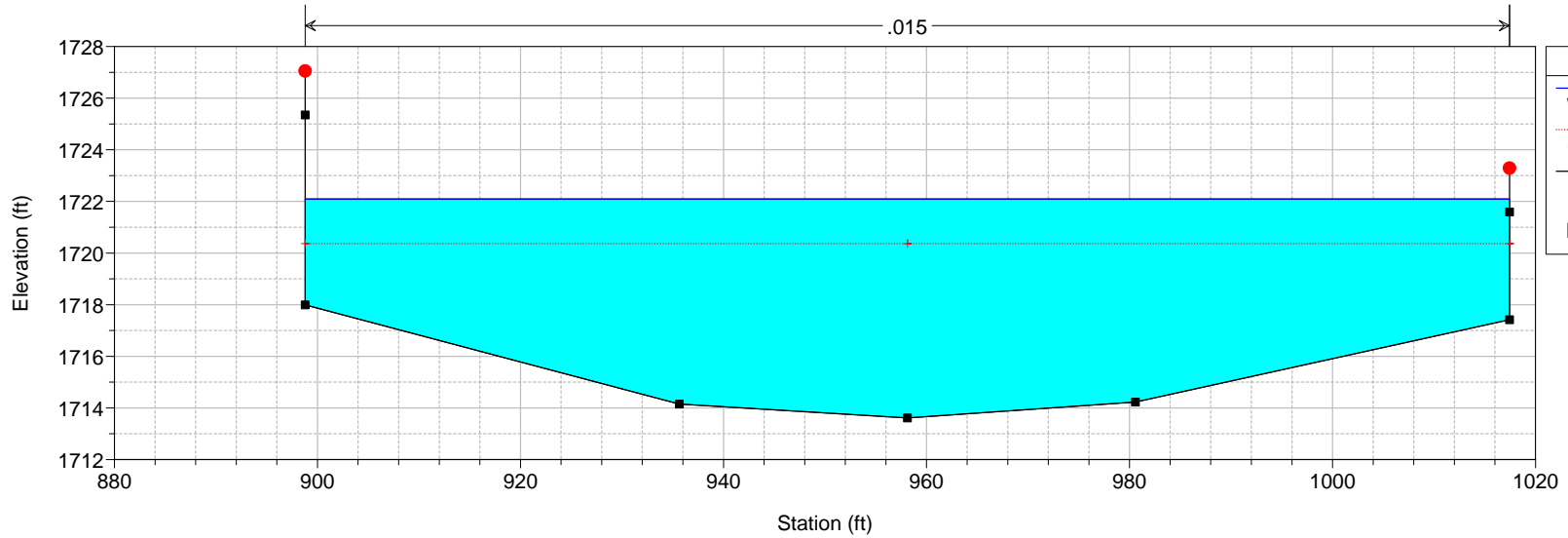




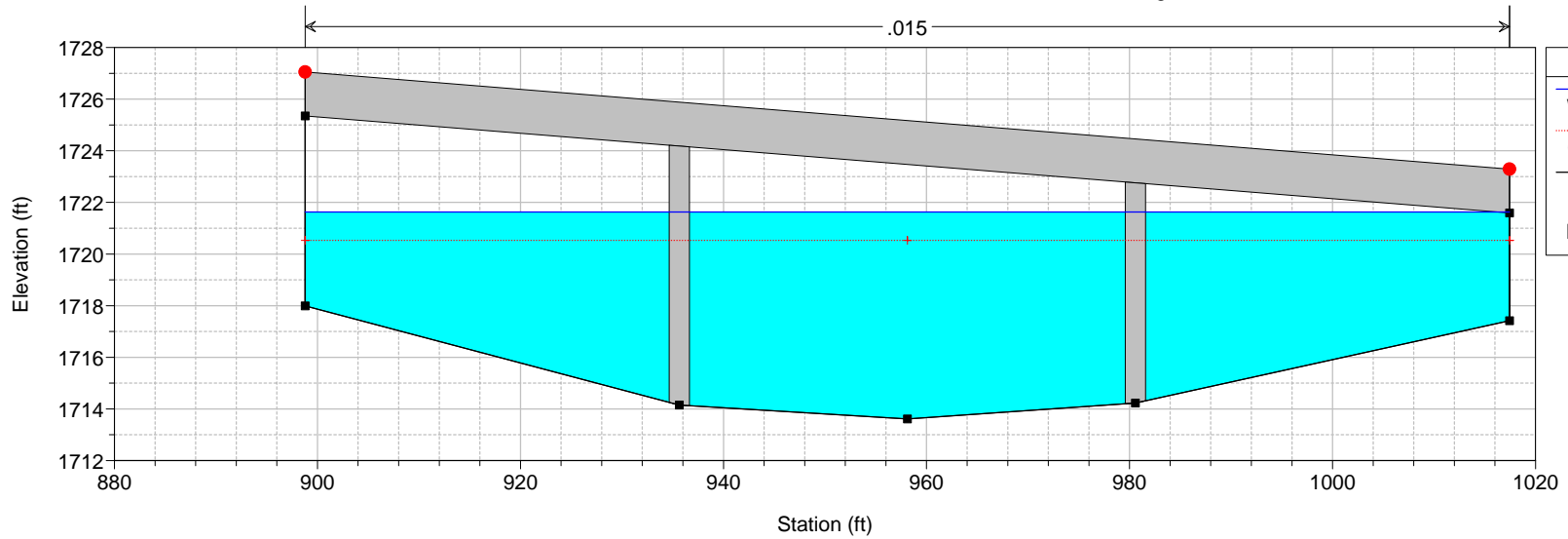




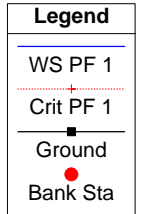
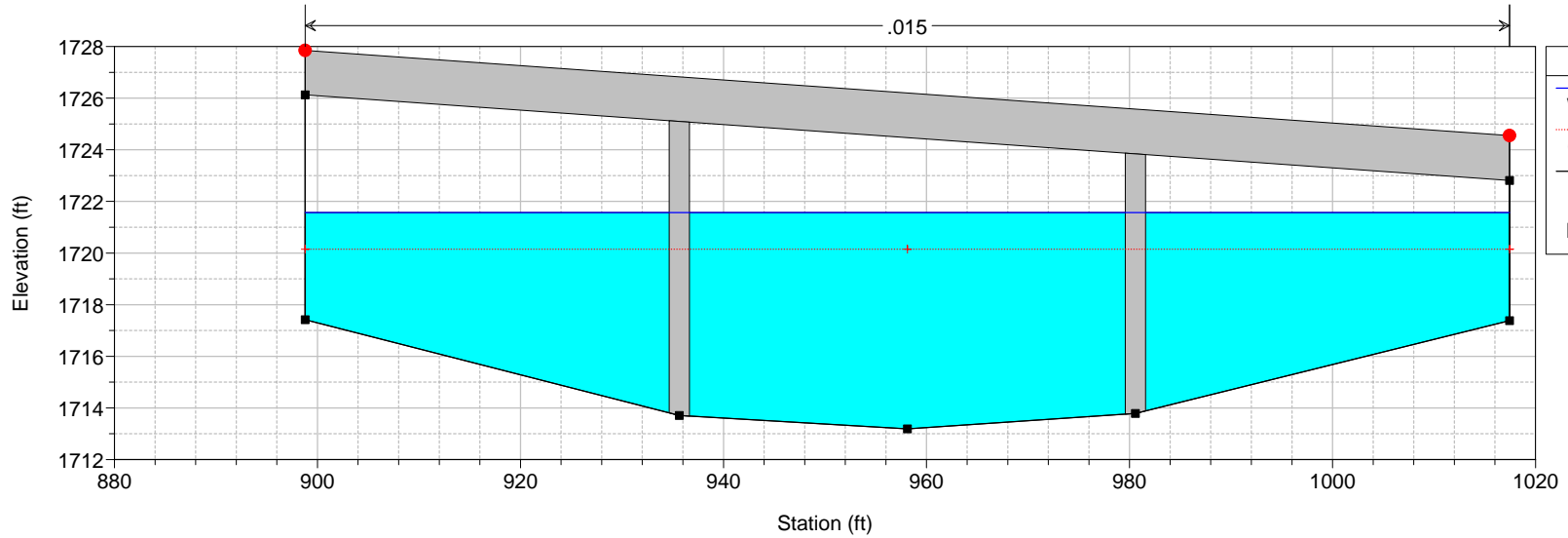
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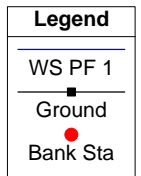
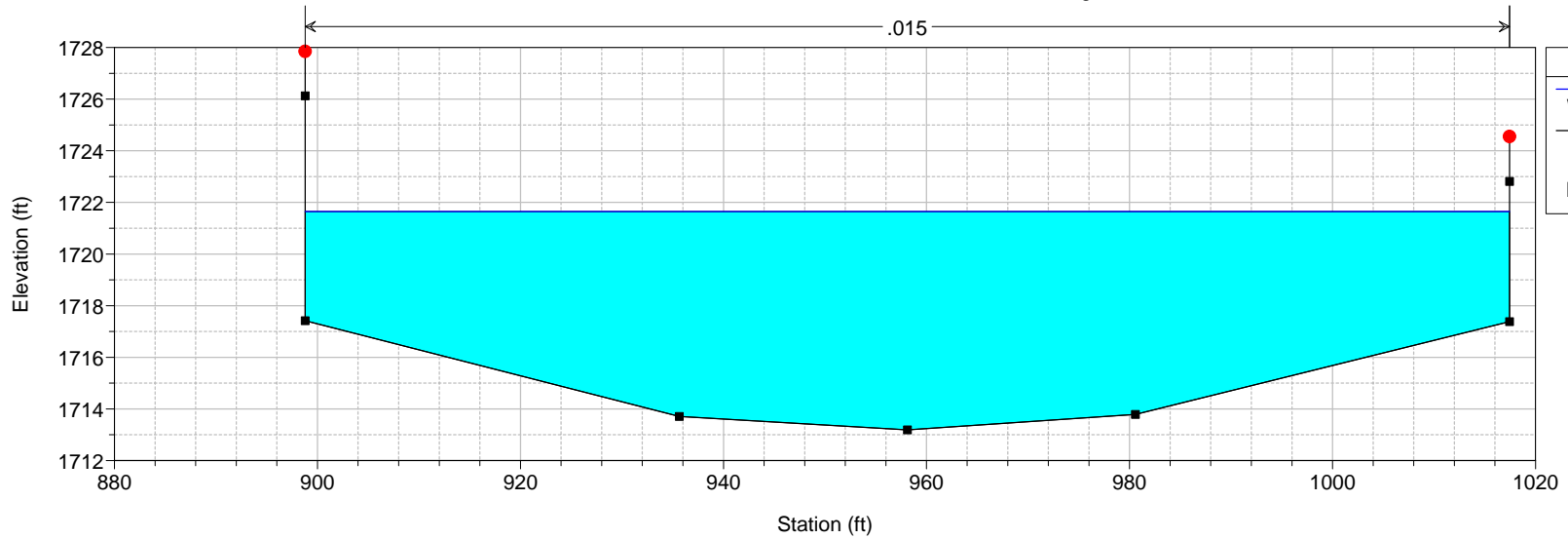
LVWashEX Plan: Existing 8/8/2013
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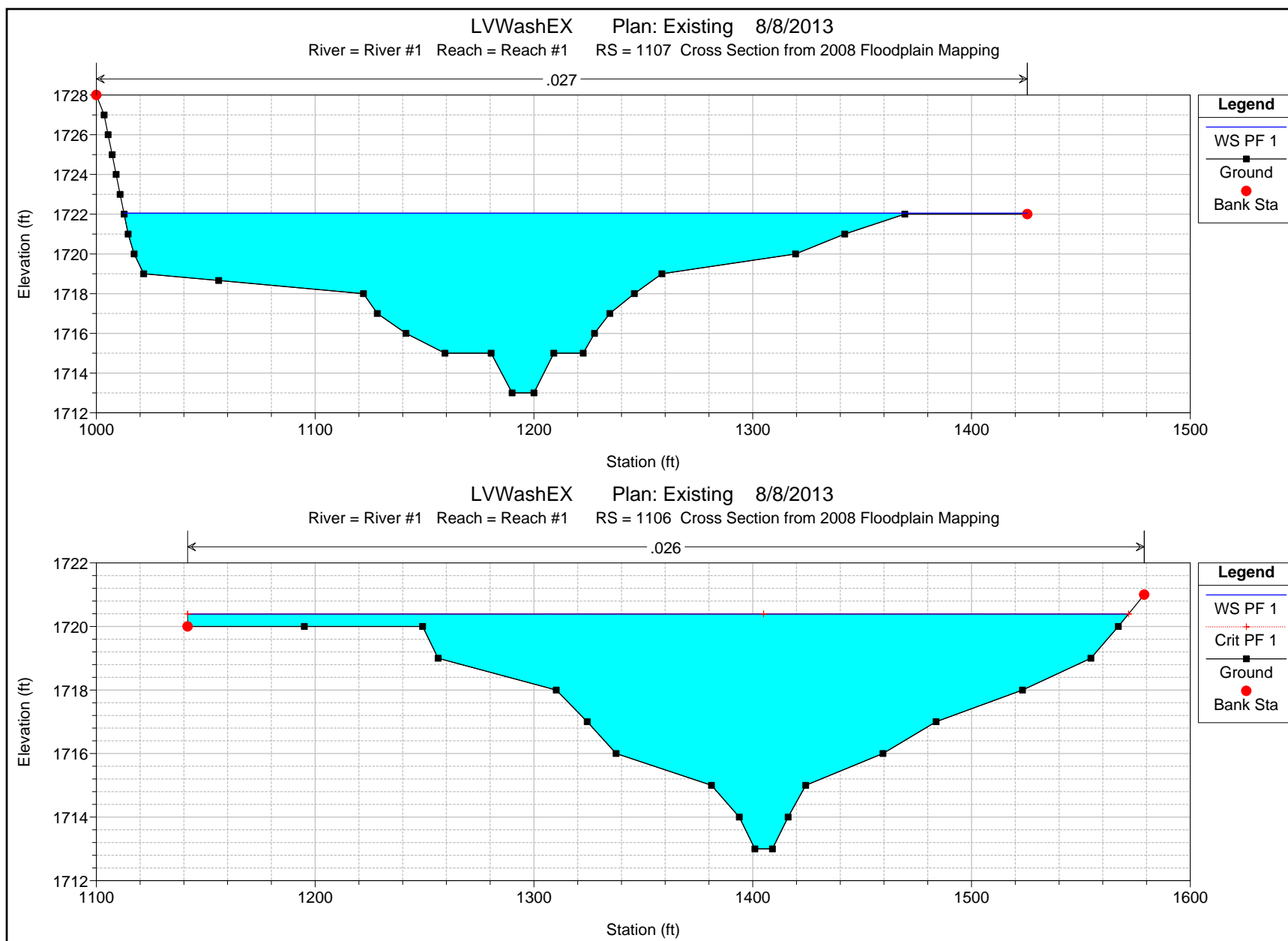


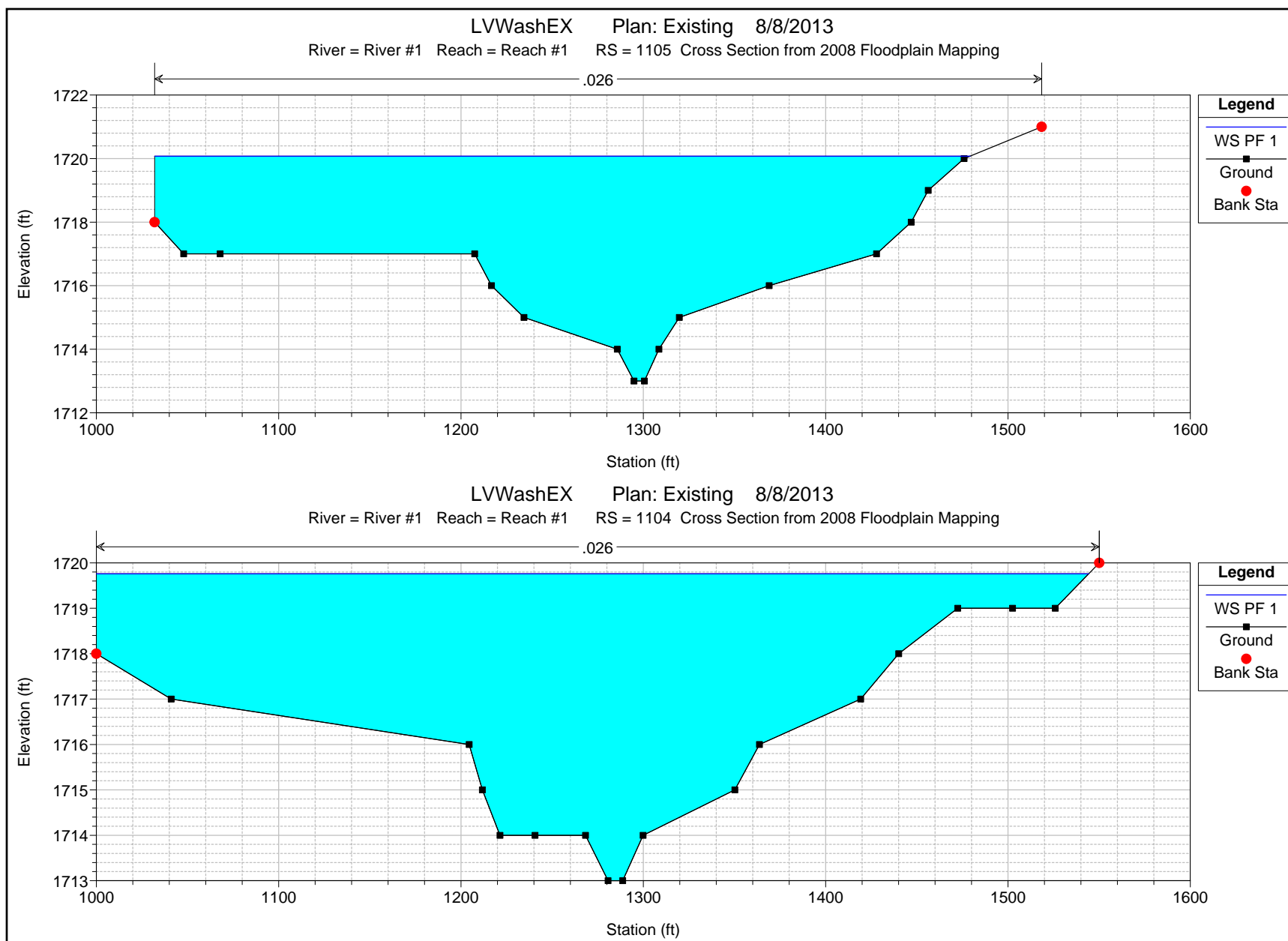
LVWashEX Plan: Existing 8/8/2013
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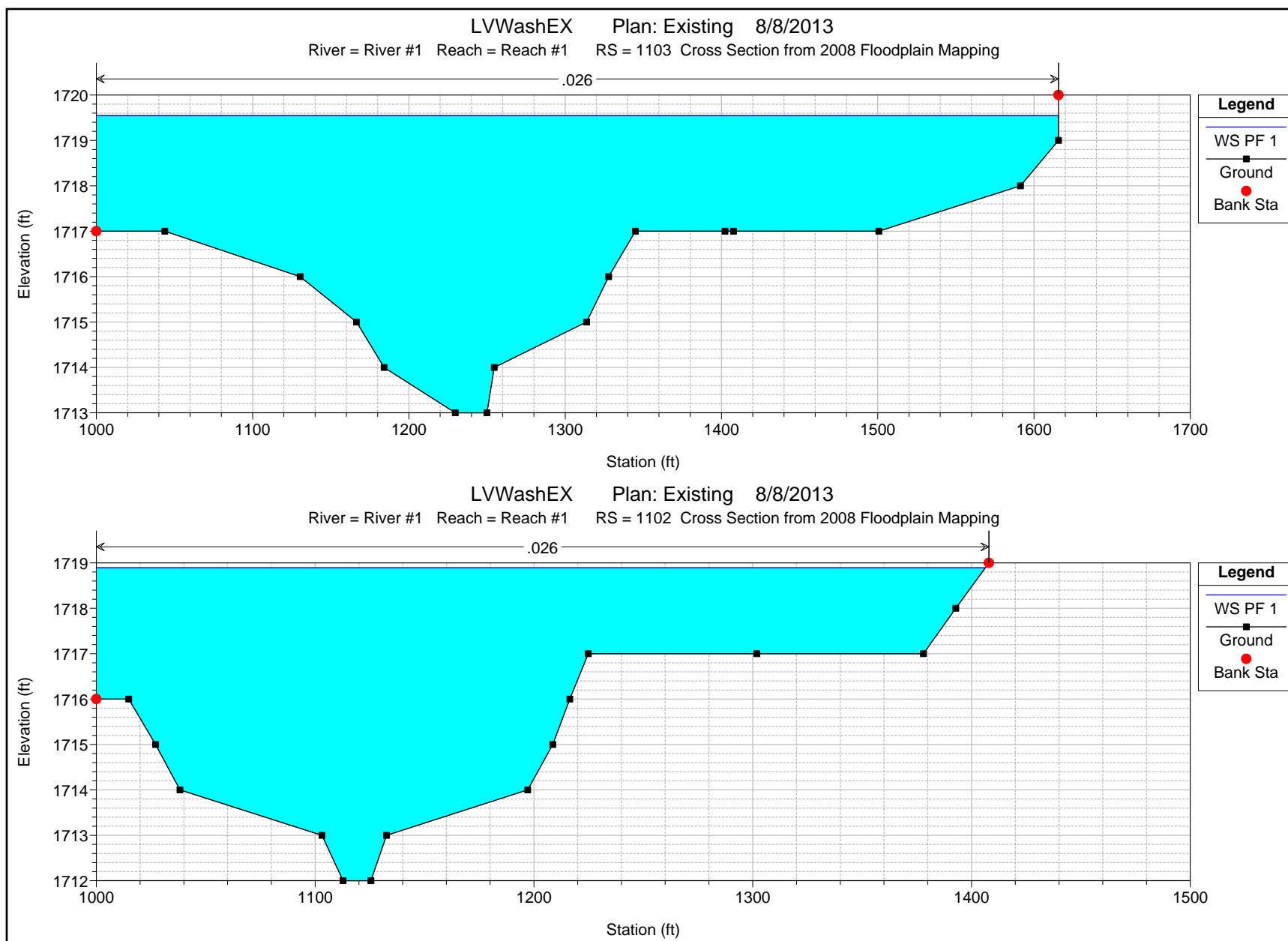


LVWashEX Plan: Existing 8/8/2013
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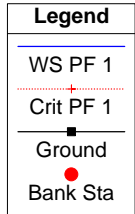
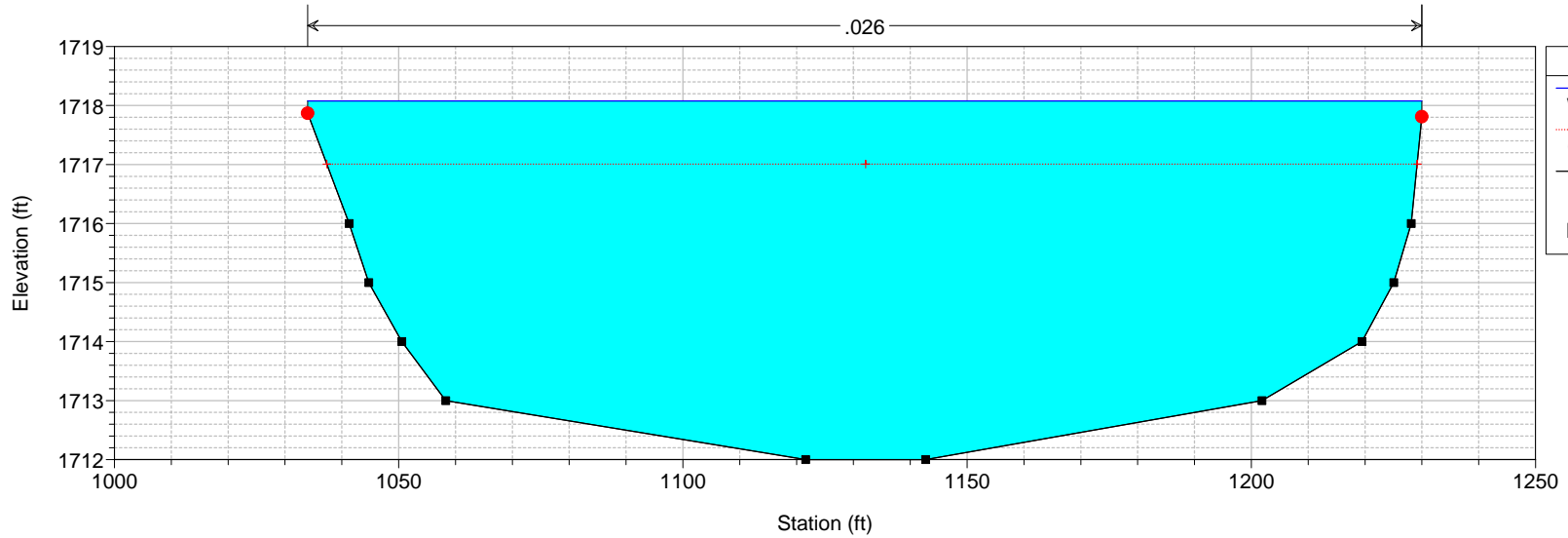




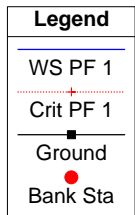
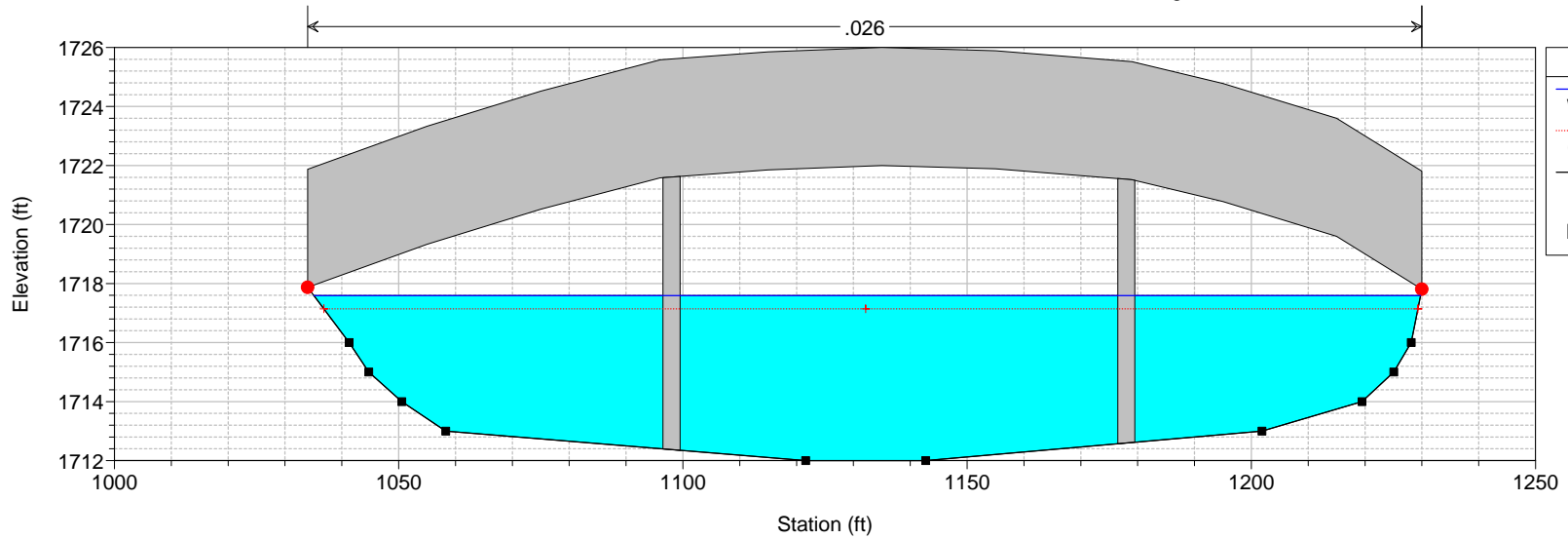




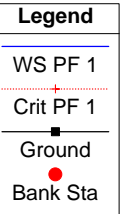
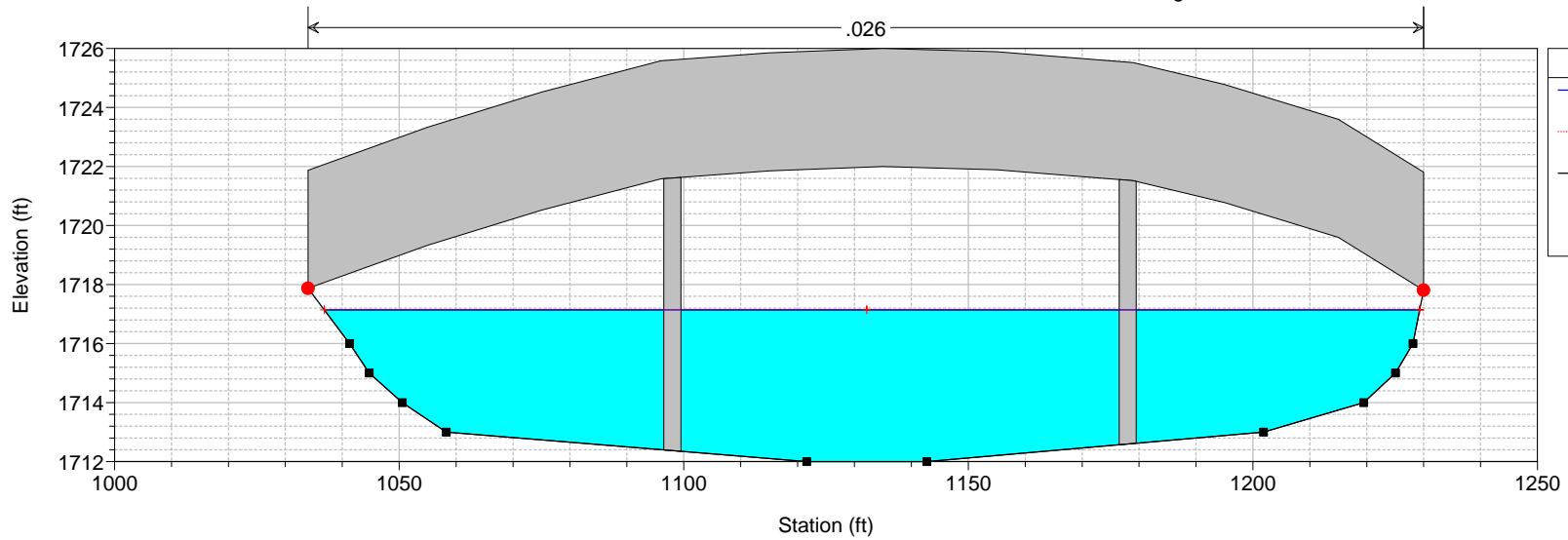
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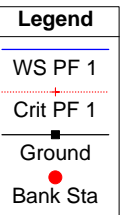
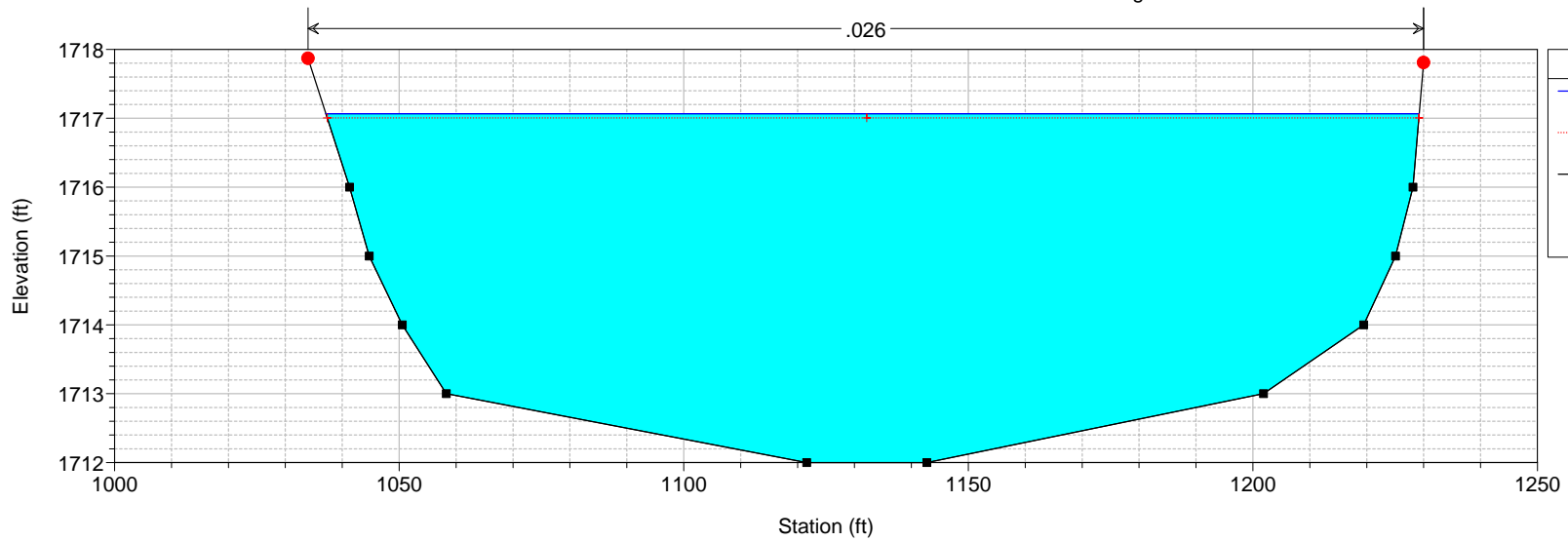
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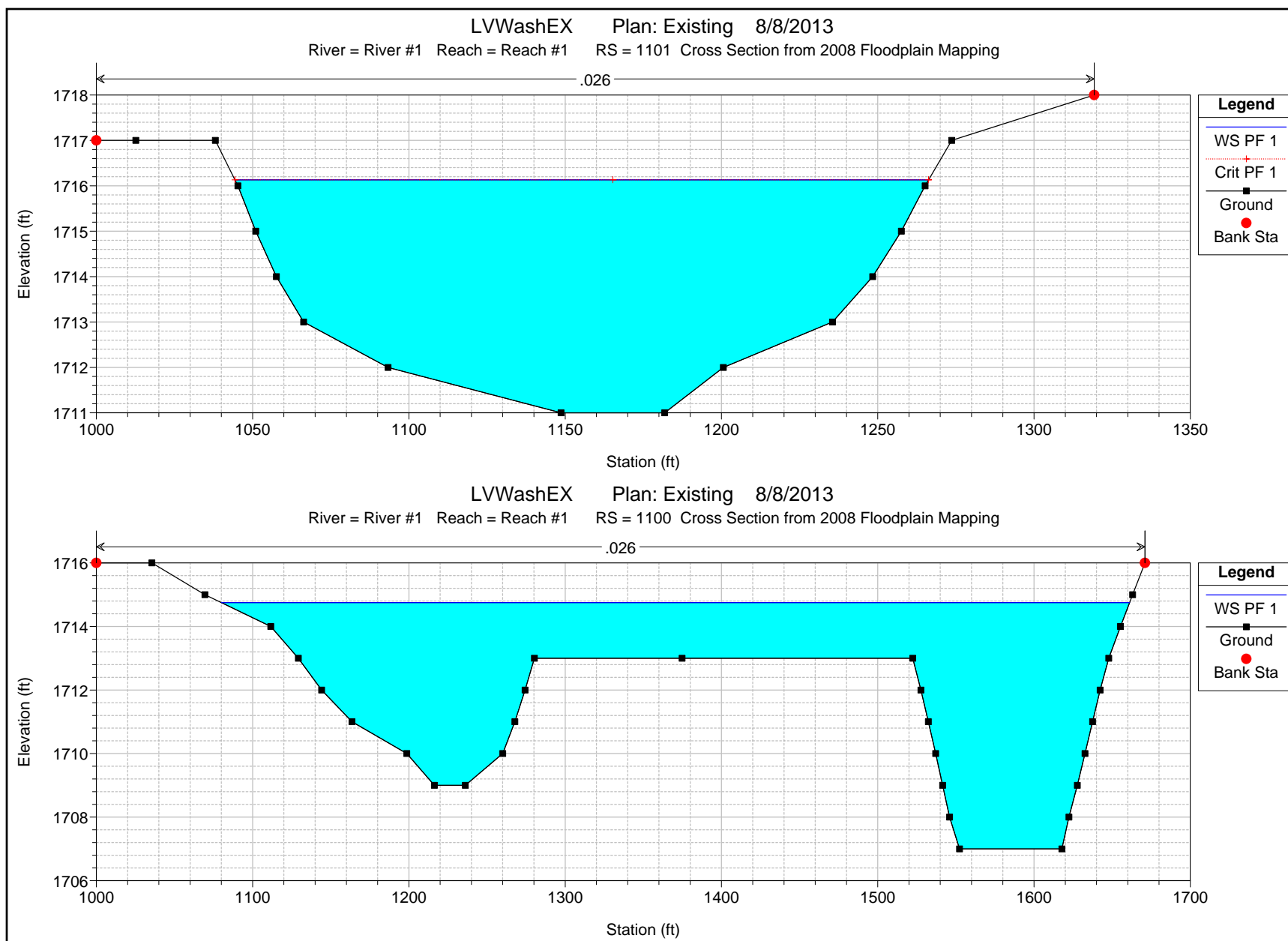


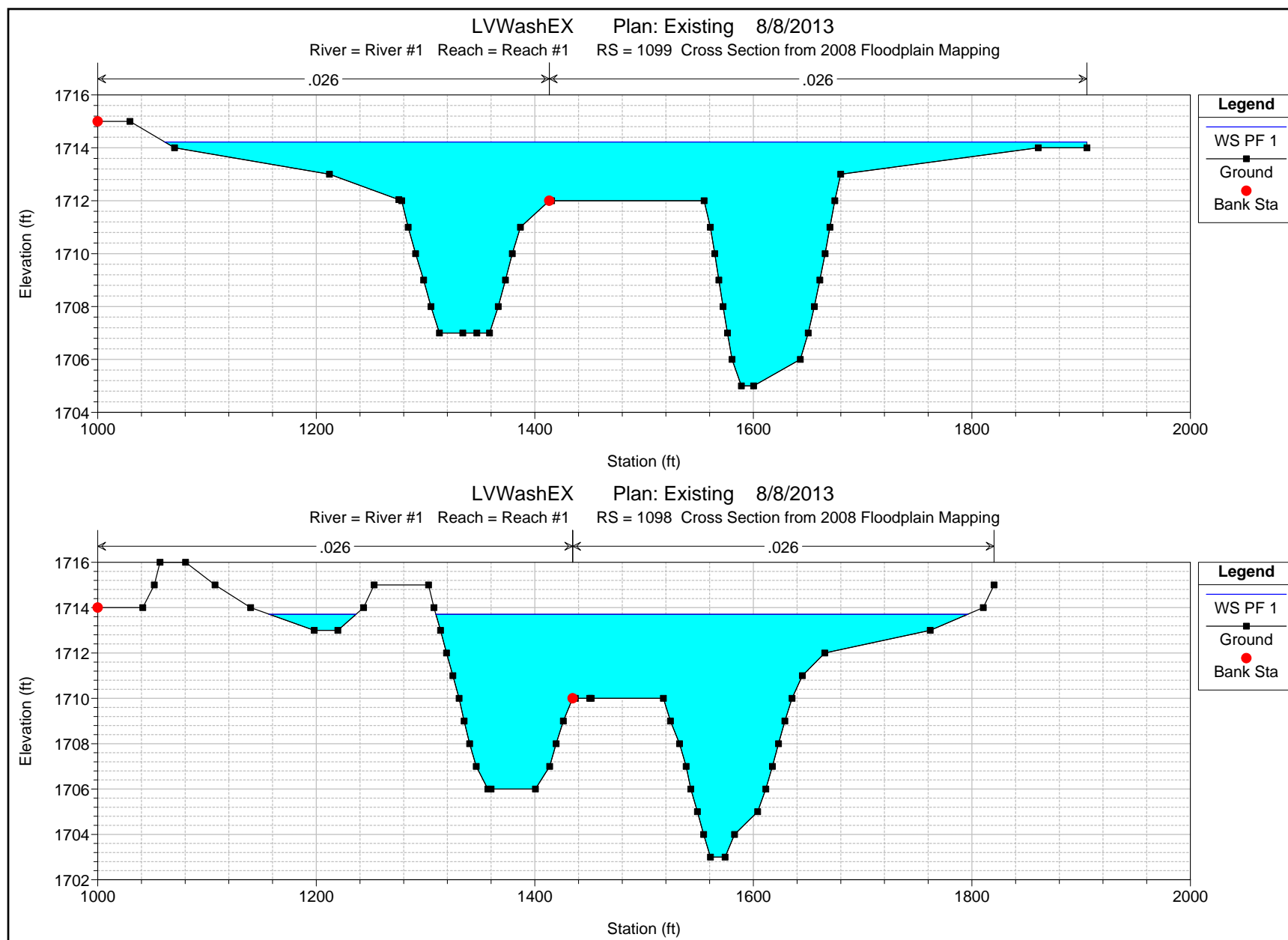
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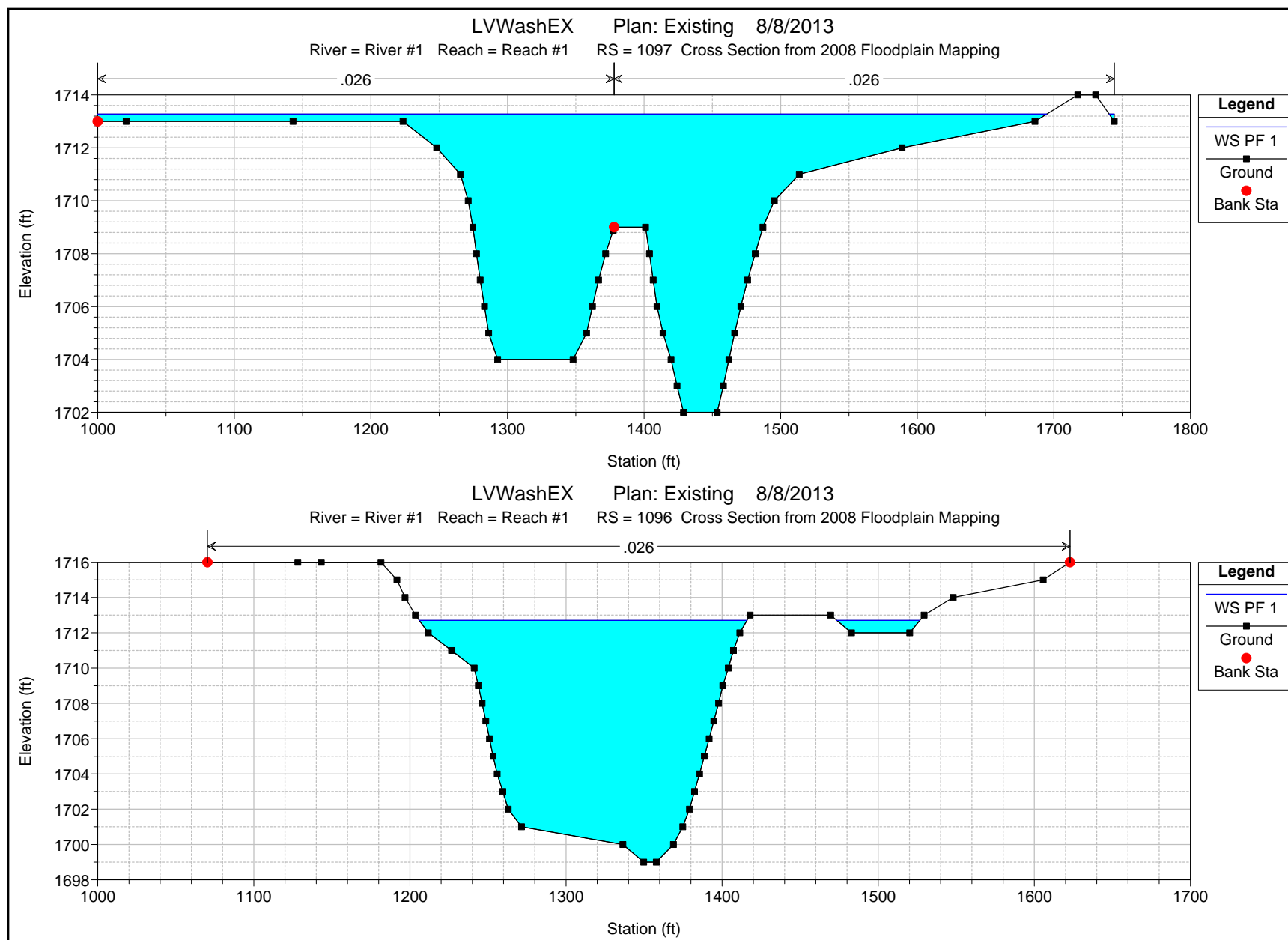


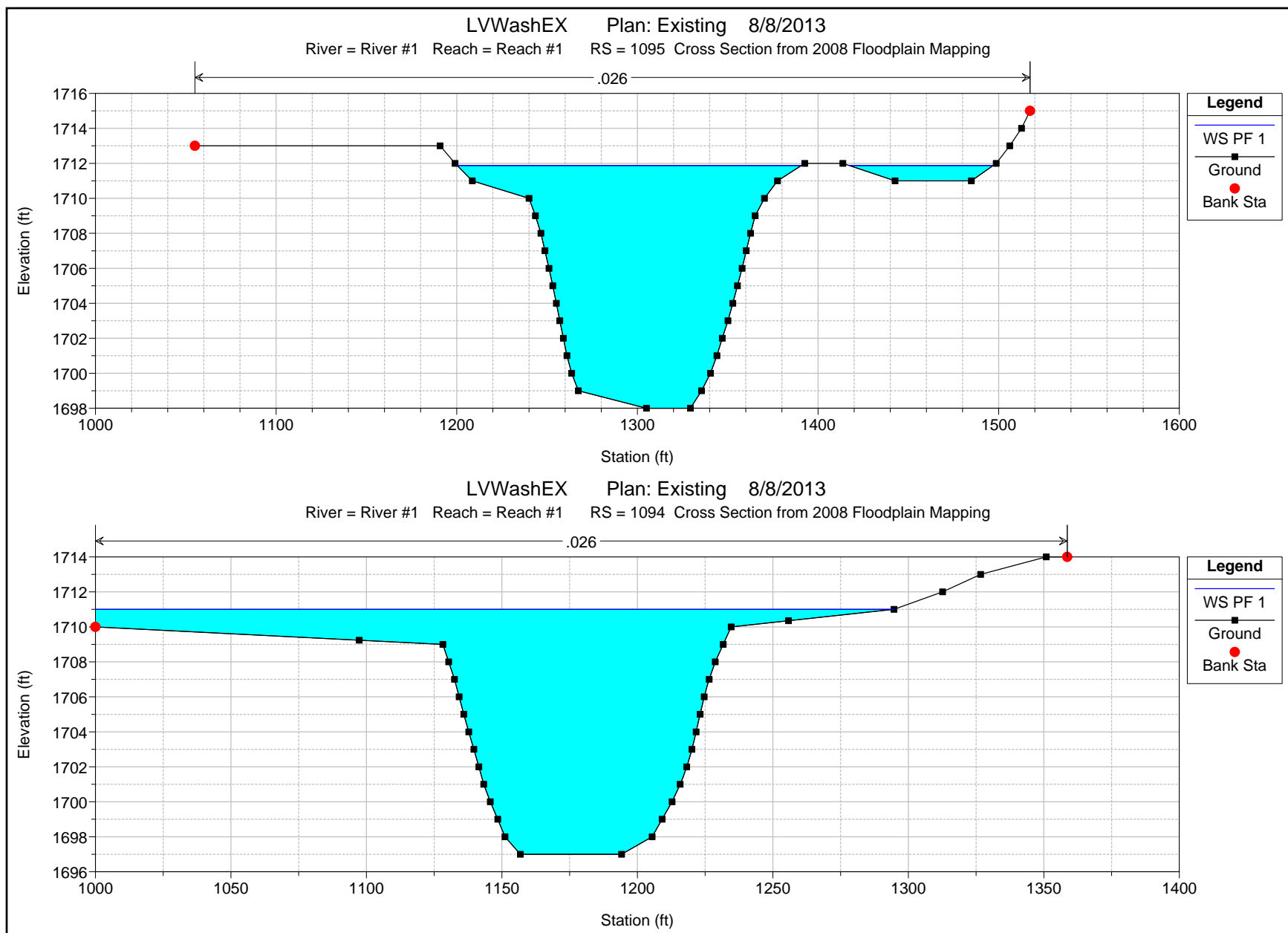
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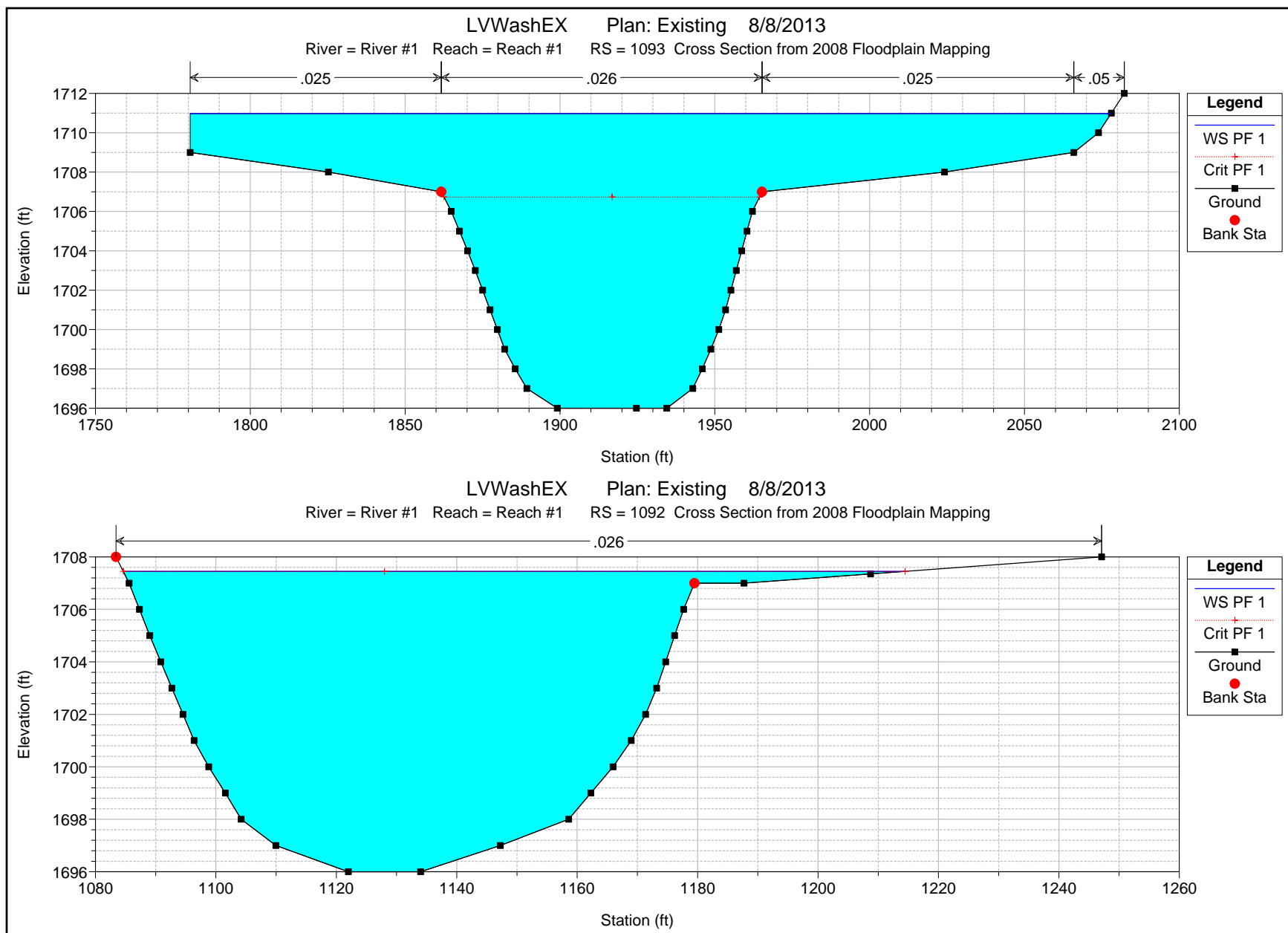


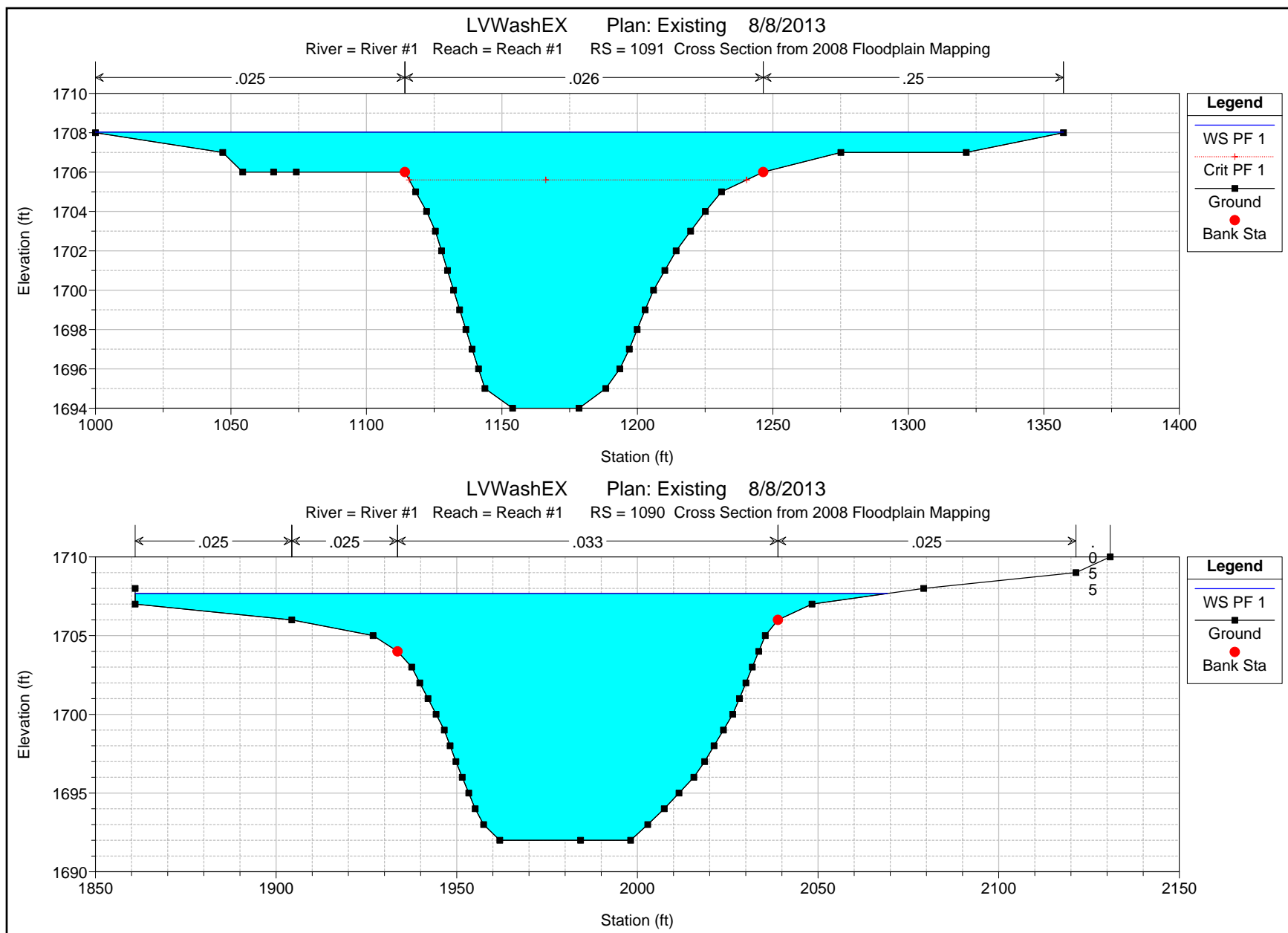


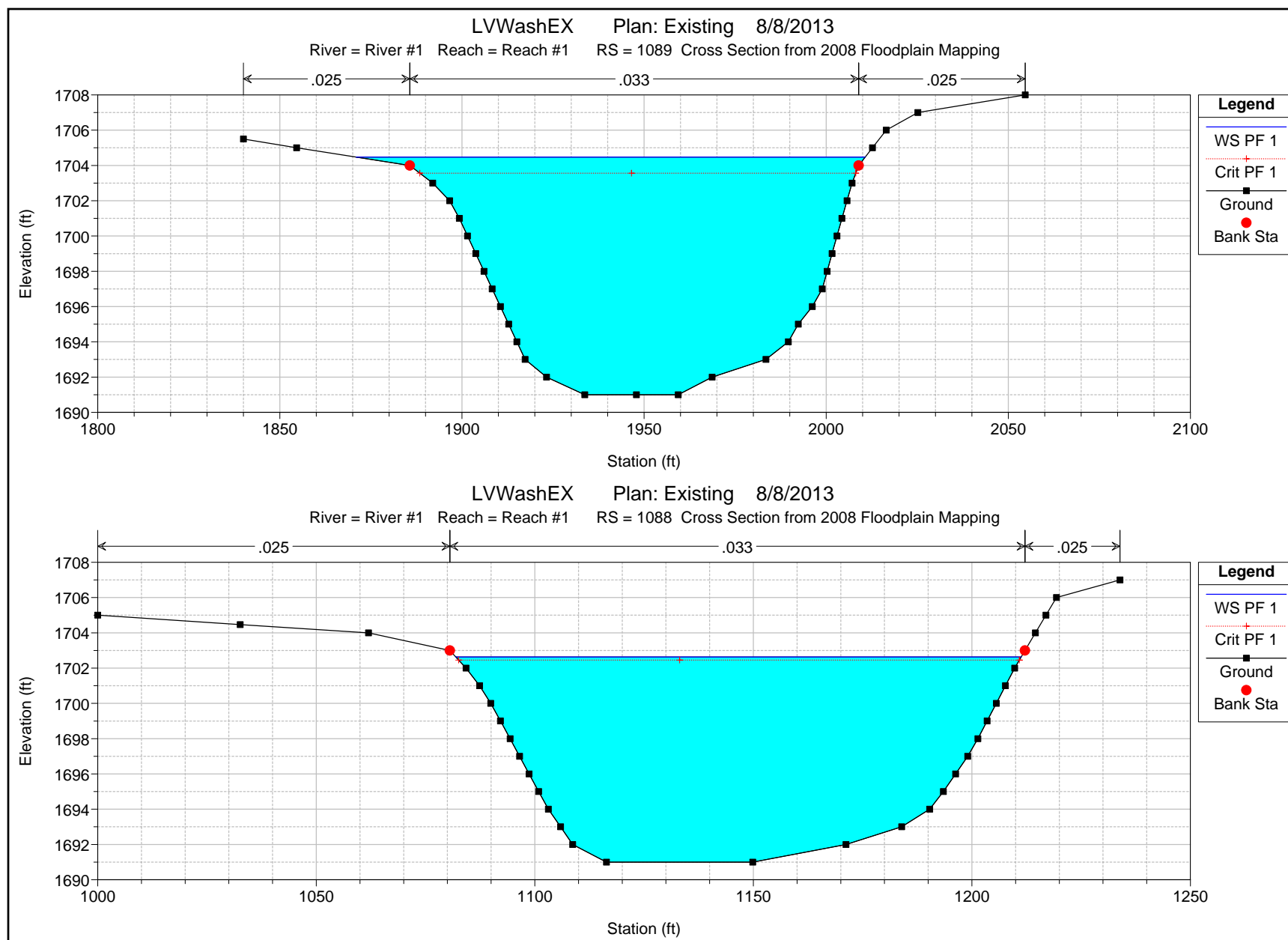


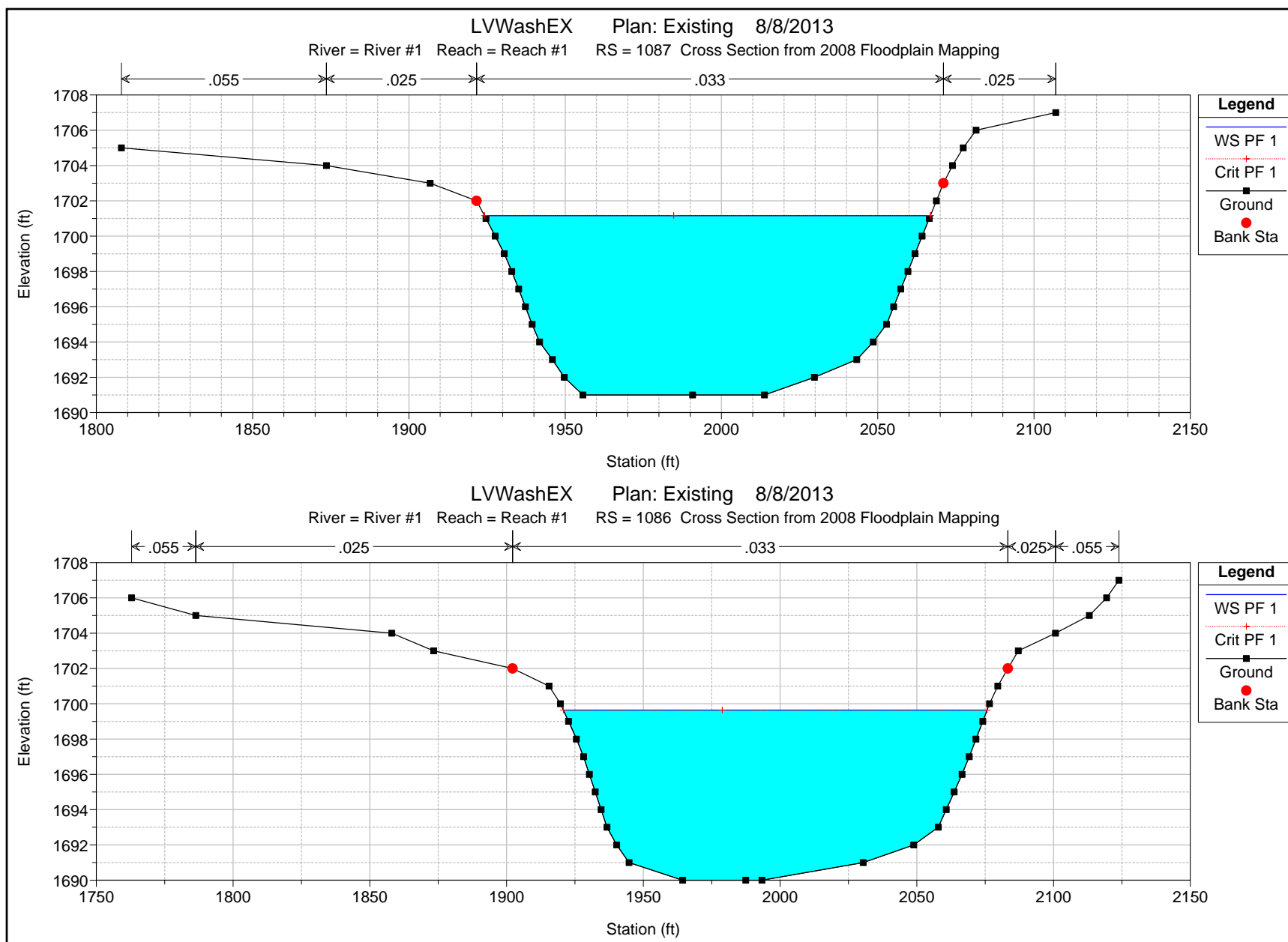






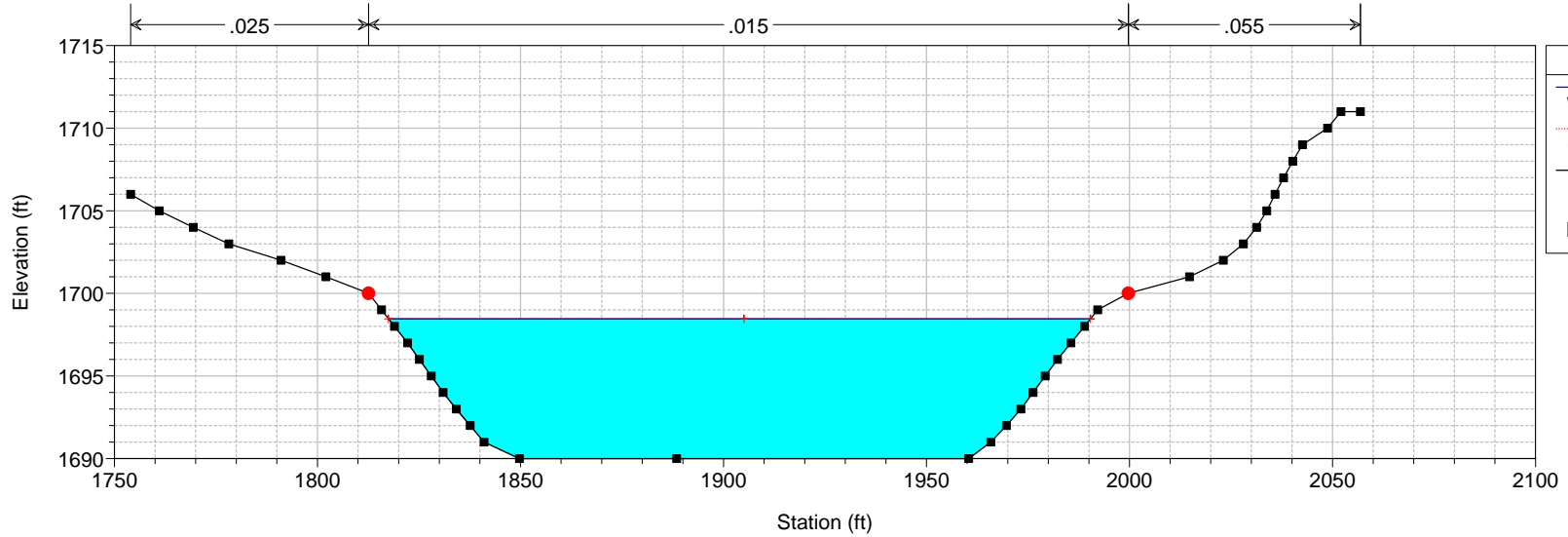






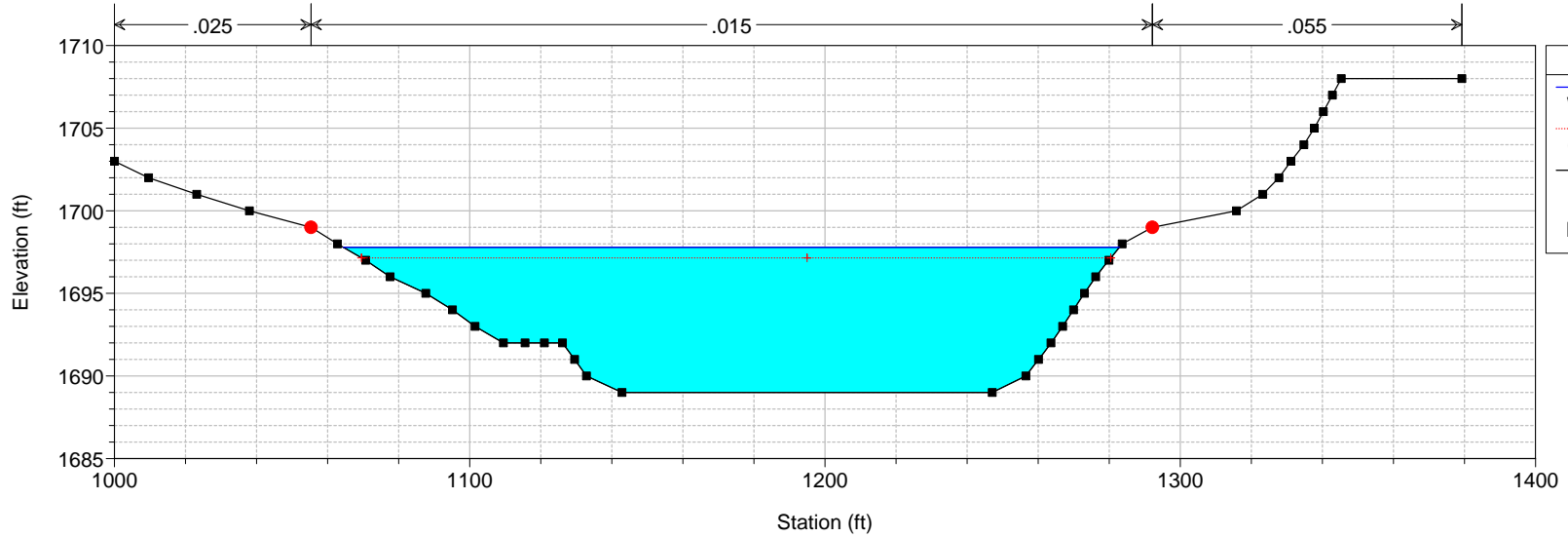
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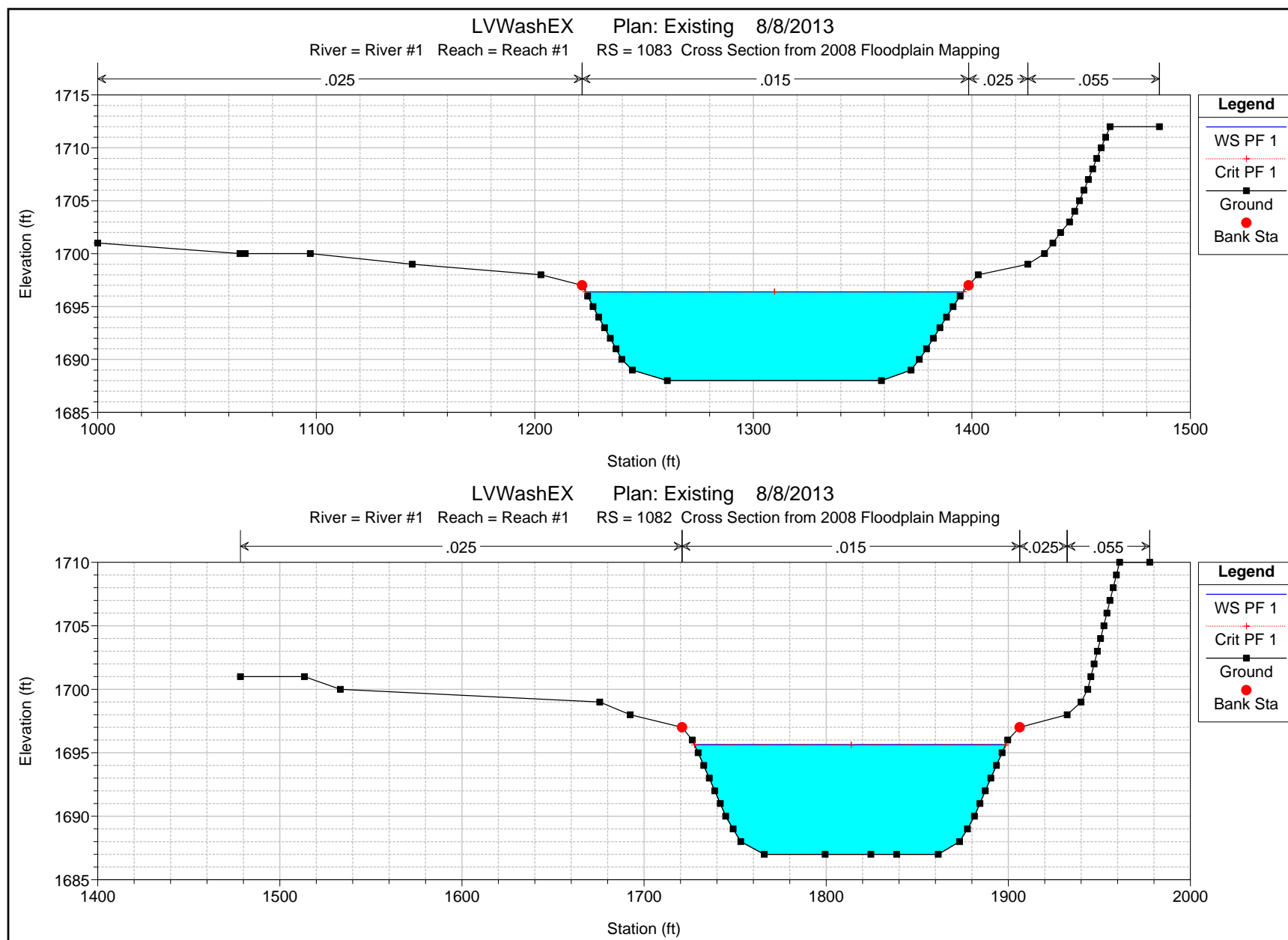
River = River #1 Reach = Reach #1 RS = 1085 Cross Section from 2008 Floodplain Mapping

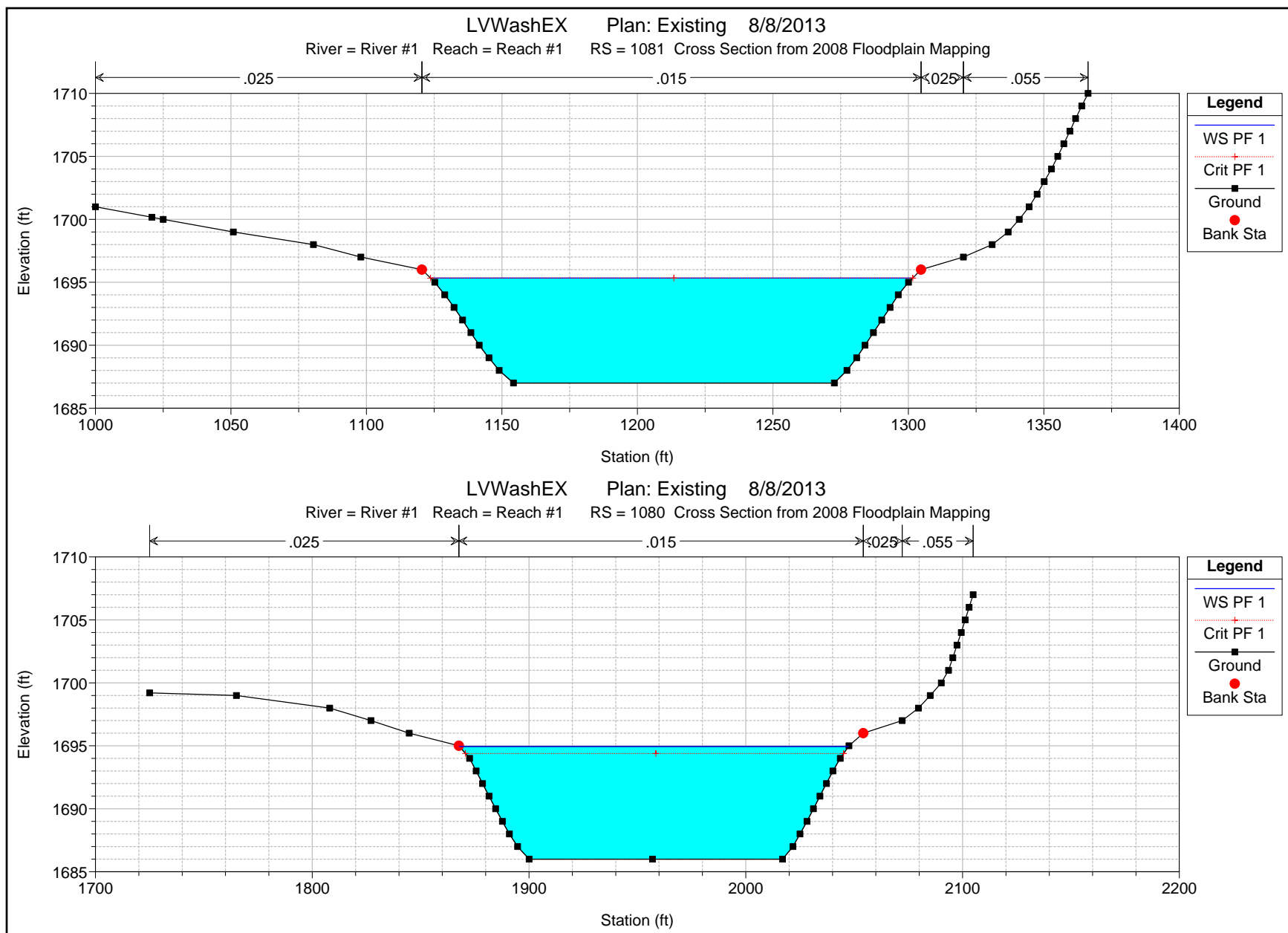


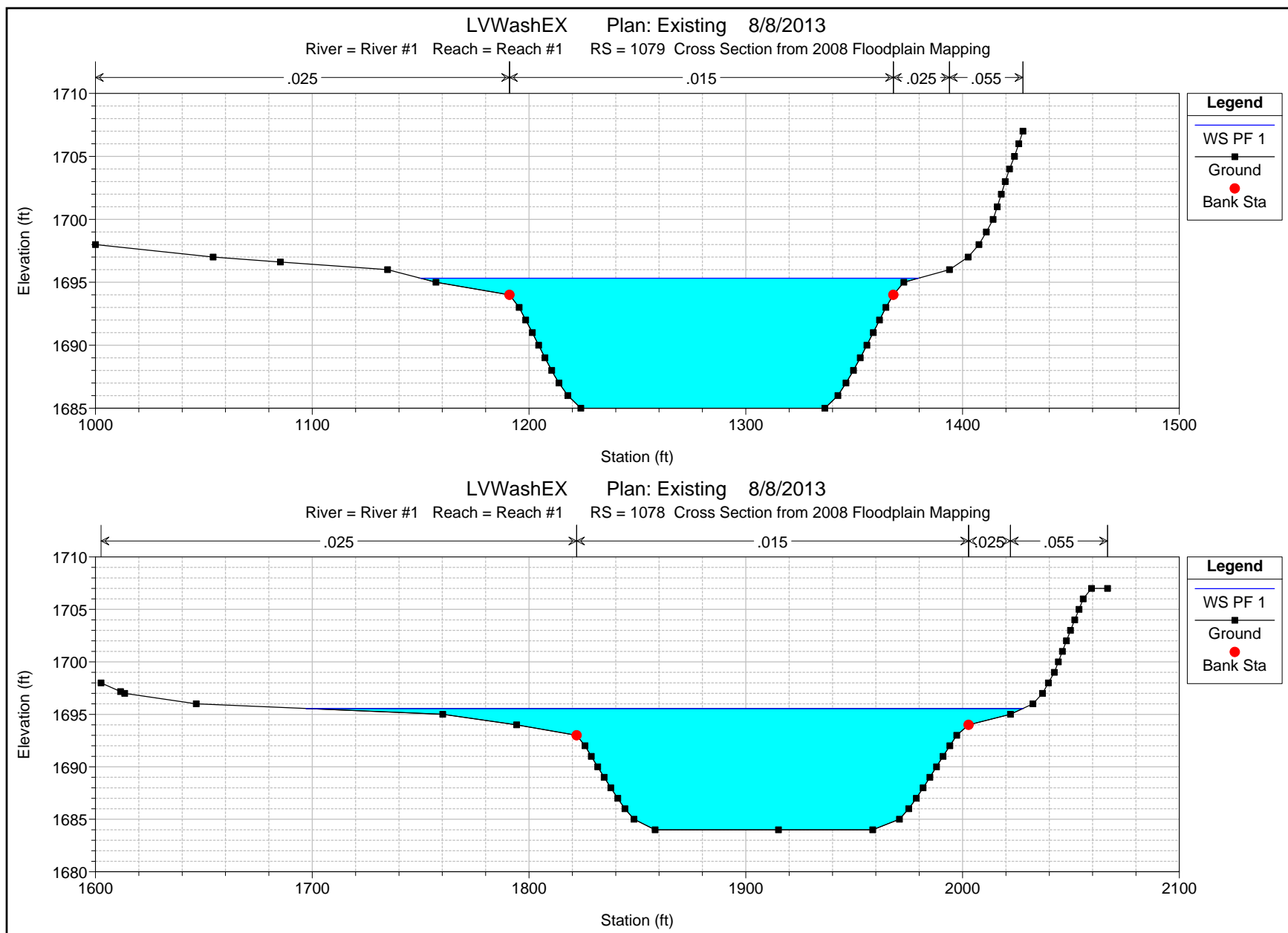
LVWashEX Plan: Existing 8/8/2013

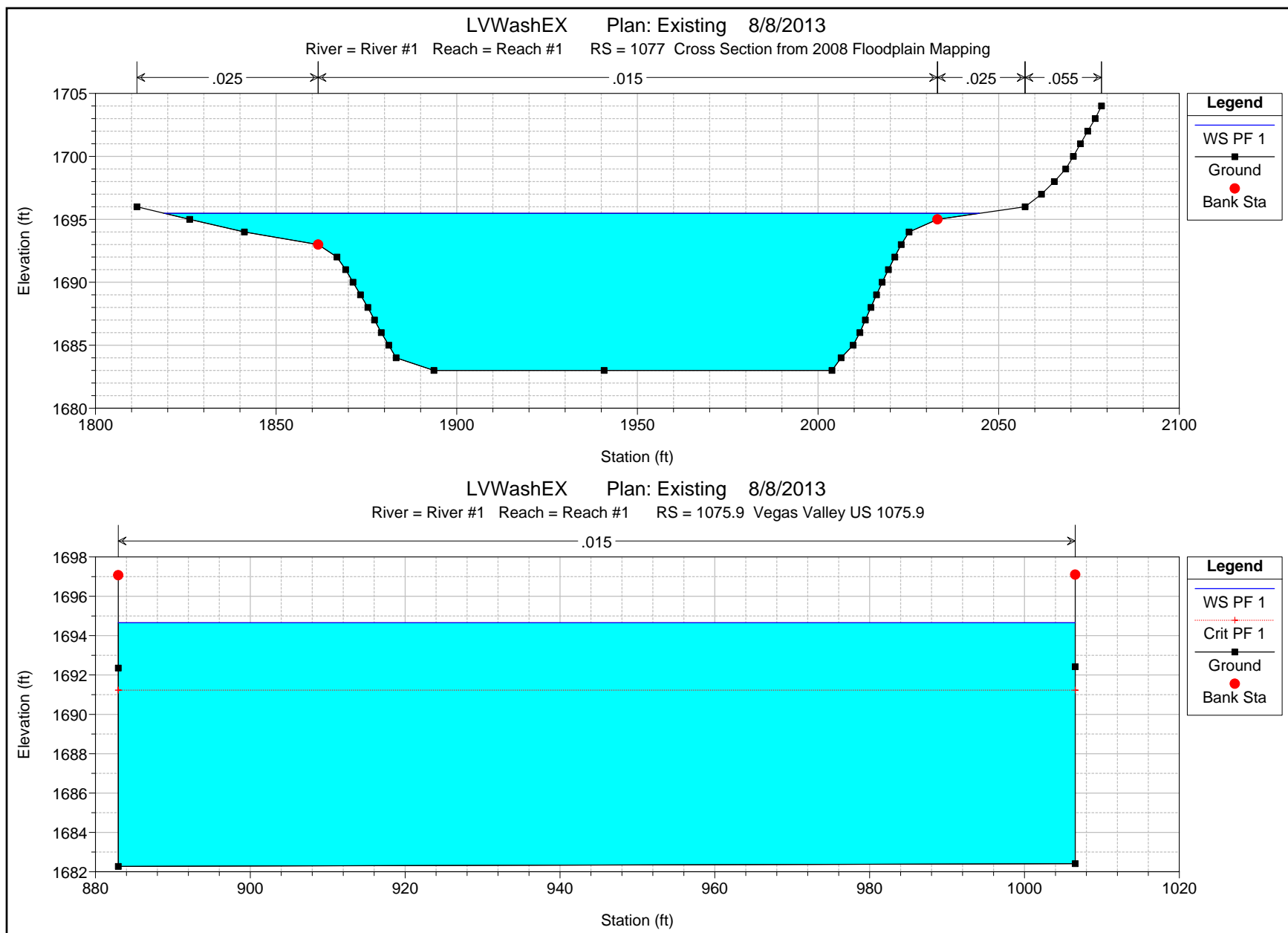
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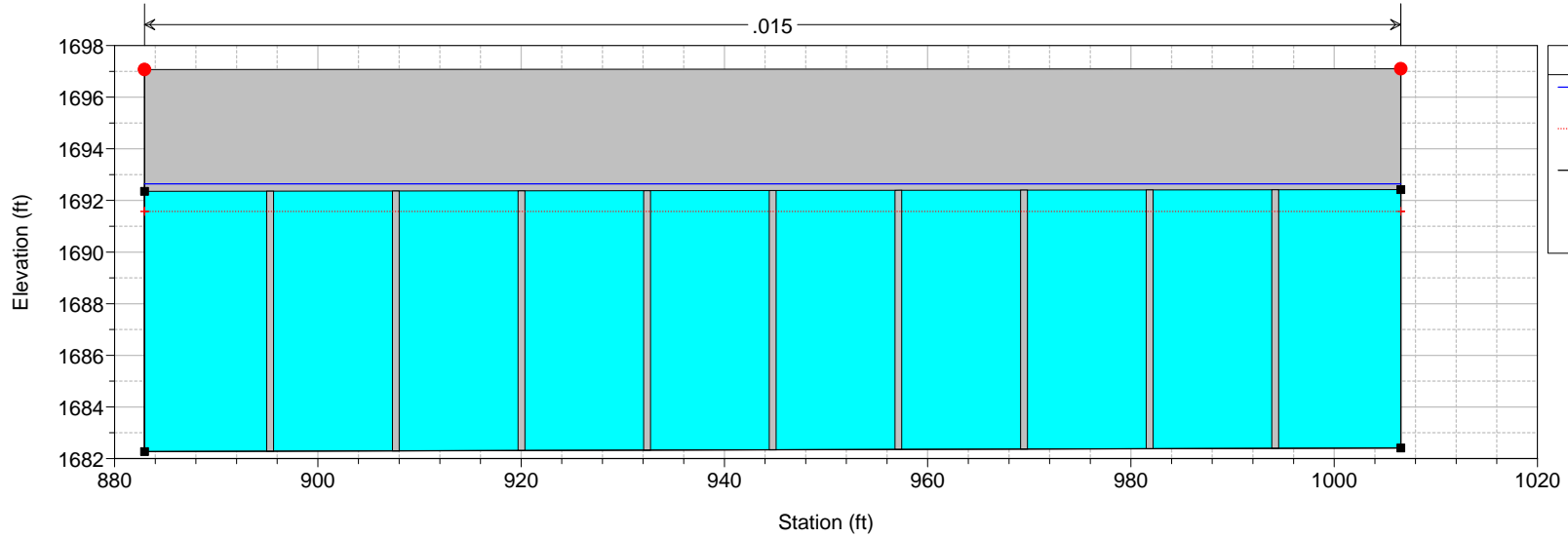




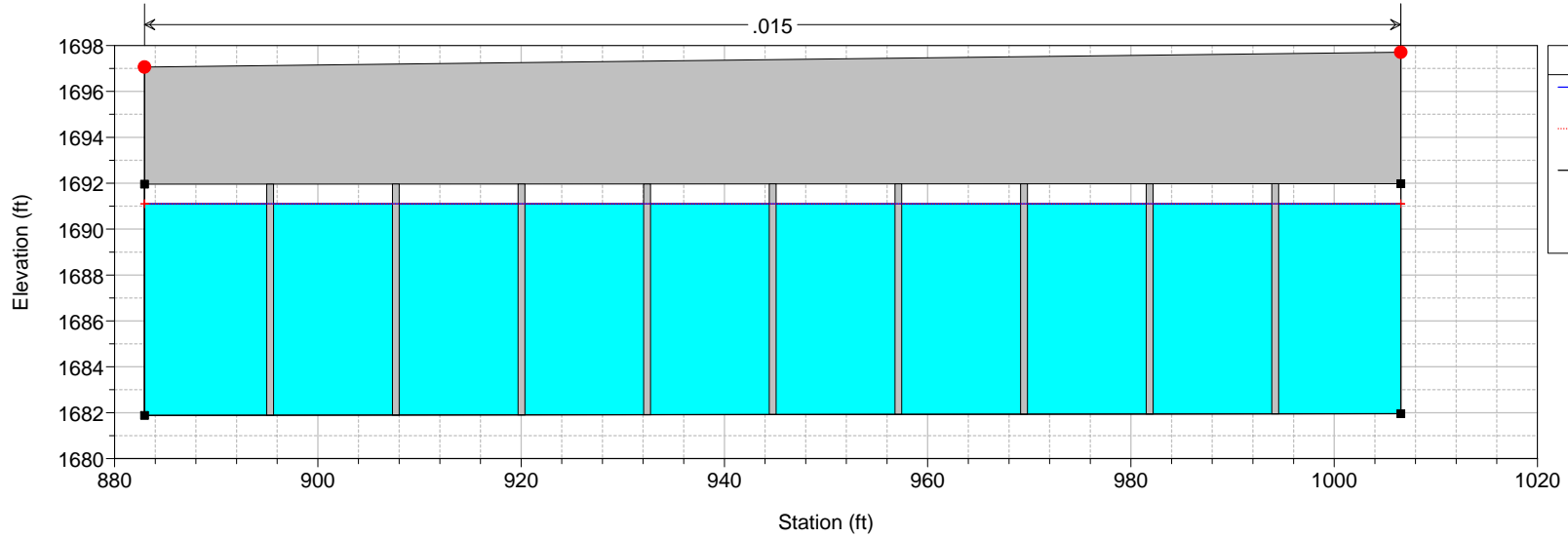




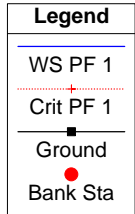
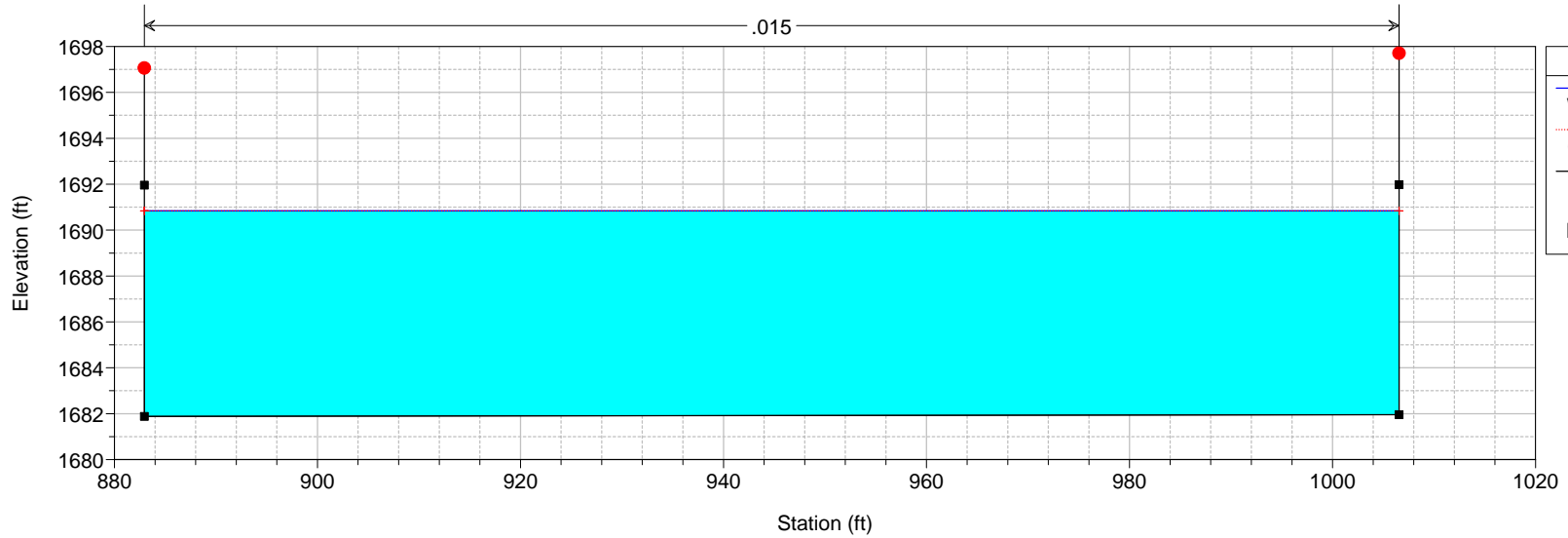
LVWashEX Plan: Existing 8/8/2013
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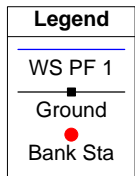
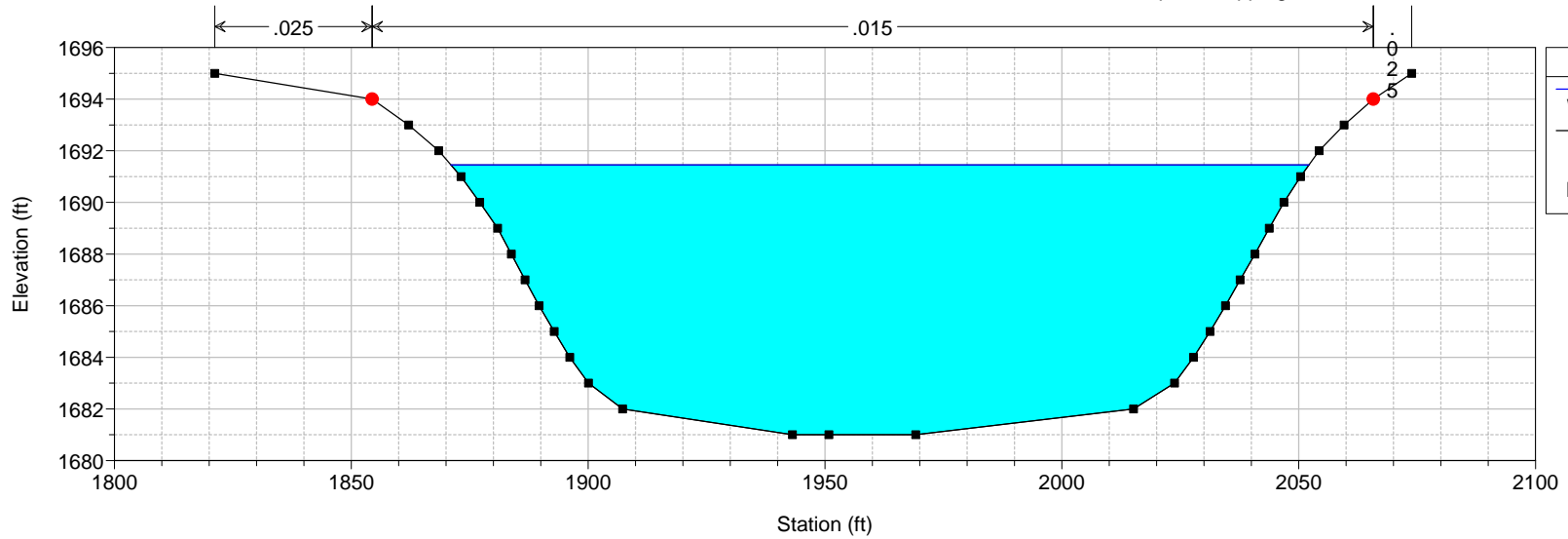
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075.5 BR Vegas Valley Bridge



LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075.1 Vegas Valley DS 1075.1

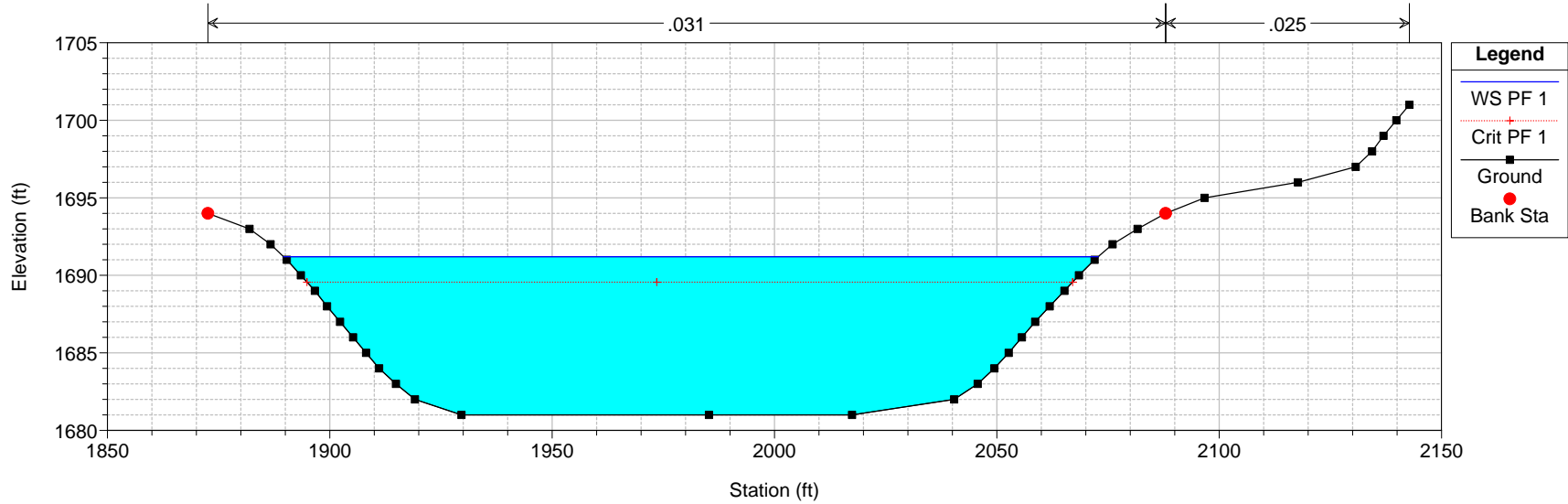


LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075 Cross Section from 2008 Floodplain Mapping



LVWashEX Plan: Existing 8/8/2013

River = River #1 Reach = Reach #1 RS = 1074 Cross Section from 2008 Floodplain Mapping, model truncated to d



HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X      X      X      X  X      X  X      X
X      X  X      X      X      X  X      X  X      X
XXXXXXXX XXXX      X      XXX XXXX      XXXXXX      XXXX
X      X  X      X      X      X  X      X  X      X
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```

PROJECT DATA

Project Title: LVWashEX
Project File : LVWashEX.prj
Run Date and Time: 8/8/2013 10:45:55 PM

Project in English units

Project Description:

Pre-Project Conditions Model truncated from 2008 Floodplain Hazard Mapping
Restudy by G.C. Wallace, initial conditions were set at the Water Surface
Elevations from the 2008 Restudy

PLAN DATA

Plan Title: Existing

Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.p01

Geometry Title: LVWashEX

Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.g01

Flow Title : LVWashEX

Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.f01

Plan Summary Information:

Number of:	Cross Sections =	111	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	7	Lateral Structures =	7

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: LVWashEX

Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.f01

Flow Data (cfs)

River	Reach	RS	PF 1
River #1	Reach #1	1173	11948
River #1	Reach #1	1169	11948

River #1	Reach #1	1159	12706
River #1	Reach #1	1152	12754
River #1	Reach #1	1147	12364
River #1	Reach #1	1139	12936
River #1	Reach #1	1132	13515
River #1	Reach #1	1117	13861
River #1	Reach #1	1107	13861
River #1	Reach #1	1100	18601
River #1	Reach #1	1091	18672
River #1	Reach #1	1075	18718

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	PF 1	Known WS = 1764.8	Known WS = 1691.2

GEOMETRY DATA

Geometry Title: LVWashEX

Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.g01

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1173

INPUT

Description: Cross Section from 2008 Floodplain Mapping, model truncated to determine effective water surface tie in locations within project vicinity

Station	Elevation	Data	num=	31
Sta	Elev	Sta	Elev	Sta
1000	1766	1019.88	1765.18	1024.26
1038.21	1762	1040.3	1761	1042.97
1053.01	1757	1057.56	1756	1063.66
1114.69	1755	1122.53	1756	1127.34
1136.68	1760	1139.34	1761	1142.26
1161.81	1765	1225.09	1766	1273.71
1299.45	1770			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.025	1031.96	.031
		1150.3	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1031.96	1150.3		190	200	150	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1767.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.58	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1764.77	Reach Len. (ft)	190.00	200.00	150.00
Crit W.S. (ft)	1763.70	Flow Area (sq ft)	2.30	925.52	3.44
E.G. Slope (ft/ft)	0.004806	Area (sq ft)	2.30	925.52	3.44
Q Total (cfs)	11948.00	Flow (cfs)	5.00	11935.50	7.50
Top Width (ft)	133.19	Top Width (ft)	5.95	118.34	8.90
Vel Total (ft/s)	12.83	Avg. Vel. (ft/s)	2.17	12.90	2.18
Max Chl Dpth (ft)	10.77	Hydr. Depth (ft)	0.39	7.82	0.39
Conv. Total (cfs)	172340.0	Conv. (cfs)	72.1	172159.7	108.2
Length Wtd. (ft)	199.75	Wetted Per. (ft)	6.00	121.06	8.93
Min Ch El (ft)	1754.00	Shear (lb/sq ft)	0.12	2.29	0.12
Alpha	1.01	Stream Power (lb/ft s)	1299.45	0.00	0.00
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	13.92	639.68	23.00
C & E Loss (ft)	0.08	Cum SA (acres)	10.56	109.52	8.79

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1172

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data				num=	29
Sta	Elev	Sta	Elev	Sta	Elev
950	1764.5	970	1763.5	1000	1763
1044.38	1761	1046.22	1760	1048.19	1759
1057.63	1756	1061.98	1755	1079.73	1754
1099.75	1754	1127.1	1755	1132.52	1756
1144.36	1759	1147.52	1760	1150.19	1761
1161.96	1764	1182.75	1765	1197.78	1765.23
				1247.33	1766

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
950	.025	1042.34	.031	1152.87	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1042.34	1152.87		180	200	190	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1766.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1764.07	Reach Len. (ft)	180.00	200.00	190.00
Crit W.S. (ft)	1763.20	Flow Area (sq ft)	94.14	927.05	9.56
E.G. Slope (ft/ft)	0.004081	Area (sq ft)	94.14	927.05	9.56
Q Total (cfs)	11948.00	Flow (cfs)	386.56	11527.77	33.67
Top Width (ft)	204.68	Top Width (ft)	83.68	110.53	10.48
Vel Total (ft/s)	11.59	Avg. Vel. (ft/s)	4.11	12.43	3.52
Max Chl Dpth (ft)	11.07	Hydr. Depth (ft)	1.13	8.39	0.91
Conv. Total (cfs)	187021.9	Conv. (cfs)	6050.8	180444.0	527.0
Length Wtd. (ft)	199.46	Wetted Per. (ft)	83.71	113.29	10.70
Min Ch El (ft)	1753.00	Shear (lb/sq ft)	0.29	2.09	0.23
Alpha	1.11	Stream Power (lb/ft s)	1247.33	0.00	0.00
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	13.71	635.43	22.97
C & E Loss (ft)	0.12	Cum SA (acres)	10.37	108.99	8.76

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1171

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data				num=	28
Sta	Elev	Sta	Elev	Sta	Elev
955	1763.7	980	1763.3	1000	1763
1063.77	1761	1065.32	1760	1066.87	1759
1079.73	1756	1085.1	1755	1093.14	1754
1158.53	1754	1163.99	1755	1166.96	1756
1174.54	1759	1176.82	1760	1179.17	1761
1202.48	1763.73	1209.14	1764	1255.44	1765

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
955	.025	1061.4	.031	1181.89	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1061.4	1181.89		220	200	201	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1765.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.94	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1763.61	Reach Len. (ft)	220.00	200.00	201.00
Crit W.S. (ft)	1761.70	Flow Area (sq ft)	80.39	1036.91	7.63
E.G. Slope (ft/ft)	0.003247	Area (sq ft)	80.39	1036.91	7.63
Q Total (cfs)	11948.00	Flow (cfs)	233.84	11699.53	14.63
Top Width (ft)	239.22	Top Width (ft)	100.99	120.49	17.74
Vel Total (ft/s)	10.62	Avg. Vel. (ft/s)	2.91	11.28	1.92
Max Chl Dpth (ft)	10.61	Hydr. Depth (ft)	0.80	8.61	0.43
Conv. Total (cfs)	209689.7	Conv. (cfs)	4103.9	205329.0	256.8
Length Wtd. (ft)	200.20	Wetted Per. (ft)	101.00	123.49	17.93
Min Ch El (ft)	1753.00	Shear (lb/sq ft)	0.16	1.70	0.09
Alpha	1.11	Stream Power (lb/ft s)	1255.44	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	13.35	630.92	22.94
C & E Loss (ft)	0.00	Cum SA (acres)	9.99	108.46	8.70

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1170

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30		
Sta	Elev	Sta	Elev	Sta	Elev
1676.74	1765	1769.78	1764.32	1814.35	1764
1839.07	1761	1841.68	1760	1844.22	1759
1852.99	1756	1858.2	1755	1869.14	1754
1905.96	1752	1906.26	1752.01	1938.96	1753
1948.79	1756	1951.66	1757	1954.42	1758
1962.86	1761	1965.84	1762	1968.81	1763

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1676.74	.025	1836.47	.031	1972.02	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1836.47	1972.02		212	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.93	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1762.95	Reach Len. (ft)	212.00	200.00	197.00
Crit W.S. (ft)		Flow Area (sq ft)	4.68	1069.69	
E.G. Slope (ft/ft)	0.003436	Area (sq ft)	4.68	1069.69	
Q Total (cfs)	11948.00	Flow (cfs)	9.89	11938.11	
Top Width (ft)	142.05	Top Width (ft)	9.87	132.19	
Vel Total (ft/s)	11.12	Avg. Vel. (ft/s)	2.11	11.16	
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)	0.47	8.09	
Conv. Total (cfs)	203818.0	Conv. (cfs)	168.7	203649.3	
Length Wtd. (ft)	200.01	Wetted Per. (ft)	9.91	135.14	
Min Ch El (ft)	1752.00	Shear (lb/sq ft)	0.10	1.70	
Alpha	1.01	Stream Power (lb/ft s)	2009.24	0.00	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	13.14	626.09	22.92
C & E Loss (ft)	0.18	Cum SA (acres)	9.71	107.88	8.65

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1169

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 35		
Sta	Elev	Sta	Elev	Sta	Elev
1857.21	1767	1866.89	1766	1870.21	1765
1879.32	1762	1880.81	1761	1882.31	1760
1887.8	1757	1890.34	1756	1892.93	1755
1928.81	1753	1945.3	1753	1947.64	1752
2001.42	1753	2005.05	1754	2008.02	1755
2013.76	1758	2015.65	1759	2018	1760
2031.12	1763	2045.61	1764	2078.86	1765

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1857.21	.025	1873.46	.031	2045.61	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1873.46	2045.61		110	80		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.031	
W.S. Elev (ft)	1762.81	Reach Len. (ft)	110.00	80.00	40.00
Crit W.S. (ft)		Flow Area (sq ft)		1287.45	
E.G. Slope (ft/ft)	0.002264	Area (sq ft)		1287.45	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	152.71	Top Width (ft)		152.71	
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)		9.28	
Max Chl Dpth (ft)	10.81	Hydr. Depth (ft)		8.43	
Conv. Total (cfs)	251098.8	Conv. (cfs)		251098.8	
Length Wtd. (ft)	80.00	Wetted Per. (ft)		156.86	

Min Ch El (ft)	1752.00	Shear (lb/sq ft)	1.16
Alpha	1.00	Stream Power (lb/ft s)	2250.92
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	13.13
C & E Loss (ft)	0.14	Cum SA (acres)	9.68
			107.23
			8.65

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1167.9

INPUT

Description: Bonanza Bridge US 1167.9

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
848.048	1767.76	848.048	1764.02	848.048
869.249	1752.53	900.627	1751	909.243
963.383	1750.04	968.471	1751.12	982.464
984.584	1767.25			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
848.048	.095	848.048	.031
		984.584	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	848.048	984.584		112	112	.3	.5

Skew Angle = 32

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.031	
W.S. Elev (ft)	1763.02	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1757.03	Flow Area (sq ft)		1589.70	
E.G. Slope (ft/ft)	0.001026	Area (sq ft)		1589.70	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	136.54	Top Width (ft)		136.54	
Vel Total (ft/s)	7.52	Avg. Vel. (ft/s)		7.52	
Max Chl Dpth (ft)	16.02	Hydr. Depth (ft)		11.64	
Conv. Total (cfs)	373088.6	Conv. (cfs)		373088.6	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		146.73	
Min Ch El (ft)	1747.00	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	984.58	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	13.13	618.03	22.92
C & E Loss (ft)	0.03	Cum SA (acres)	9.68	106.96	8.65

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1167.5

INPUT

Description: Bonanza Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 110

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew = 32

Upstream Deck/Roadway Coordinates

num=	2
Sta Hi Cord	Lo Cord
848.048	1767.76
1764.02	984.584
1767.25	1763.41

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
848.048	1767.76	848.048	1764.02	848.048
869.249	1752.53	900.627	1751	909.243
963.383	1750.04	968.471	1751.12	982.464
984.584	1767.25			

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
848.048 .095 848.048 .031 984.584 .095

Bank Sta: Left Right Coeff Contr. Expan.
848.048 984.584 .3 .5
Skew Angle = 32

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
848.048 1768.24 1764.33 984.584 1767.39 1763.61

Downstream Bridge Cross Section Data
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
848.048 1768.24 848.048 1764.33 848.048 1761.38 850.168 1760.91 861.193 1753.5
869.249 1753.97 900.627 1752.7 913.823 1747 922.634 1747 932.005 1751.15
963.383 1753.68 982.464 1759.8 984.584 1760.31 984.584 1763.61 984.584 1767.39

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
848.048 .095 848.048 .031 984.584 .095

Bank Sta: Left Right Coeff Contr. Expan.
848.048 984.584 .3 .5
Skew Angle = 32

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data
Pier Station Upstream= 869.249 Downstream= 869.249
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 900.627 Downstream= 900.627
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 932.005 Downstream= 932.005
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 963.383 Downstream= 963.383
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1763.90	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1763.02	E.G. Elev (ft)	1763.86	1763.15
Q Total (cfs)	11948.00	W.S. Elev (ft)	1762.88	1761.13
Q Bridge (cfs)	11948.00	Crit W.S. (ft)	1757.30	1759.31
Q Weir (cfs)		Max Chl Dpth (ft)	15.81	14.13
Weir Sta Lft (ft)		Vel Total (ft/s)	7.95	11.40
Weir Sta Rgt (ft)		Flow Area (sq ft)	1502.02	1048.37
Weir Submerg		Froude # Chl	0.41	0.71
Weir Max Depth (ft)		Specif Force (cu ft)	12487.56	9163.31
Min El Weir Flow (ft)	1767.40	Hydr Depth (ft)	11.45	8.06
Min El Prs (ft)	1764.02	W.P. Total (ft)	242.86	202.59
Delta EG (ft)	0.86	Conv. Total (cfs)	242581.3	150342.6
Delta WS (ft)	1.79	Top Width (ft)	131.14	130.00
BR Open Area (sq ft)	1420.93	Frctn Loss (ft)	0.41	0.00
BR Open Vel (ft/s)	11.40	C & E Loss (ft)	0.31	0.10
Coef of Q		Shear Total (lb/sq ft)	0.94	2.04
Br Sel Method	Energy only	Power Total (lb/ft s)	848.05	848.05

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy.
The

program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the

program will default to an energy based solution.

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy.

This is not physically possible, the momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1167.1

INPUT

Description: Bonanza Bridge DS 1167.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
848.048	1768.24	848.048	1764.33	848.048	1761.38	850.168	1760.91	861.193	1753.5
869.249	1753.97	900.627	1752.7	913.823	1747	922.634	1747	932.005	1751.15
963.383	1753.68	982.464	1759.8	984.584	1760.31	984.584	1763.61	984.584	1767.39

Sta	n Val	Sta	n Val	Sta	n Val
848.048	.095	848.048	.031	984.584	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	848.048	984.584		150	195	230	.3
Skew Angle =	32						.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.031	
W.S. Elev (ft)	1761.23	Reach Len. (ft)	150.00	195.00	230.00
Crit W.S. (ft)		Flow Area (sq ft)		1106.45	
E.G. Slope (ft/ft)	0.003294	Area (sq ft)		1106.45	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	135.84	Top Width (ft)		135.84	
Vel Total (ft/s)	10.80	Avg. Vel. (ft/s)		10.80	
Max Chl Dpth (ft)	14.23	Hydr. Depth (ft)		8.15	
Conv. Total (cfs)	208183.3	Conv. (cfs)		208183.3	
Length Wtd. (ft)	195.00	Wetted Per. (ft)		142.27	

Min Ch El (ft)	1747.00	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)	984.58	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	13.13	614.75	22.92
C & E Loss (ft)	0.19	Cum SA (acres)	9.68	106.62	8.65

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1167

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		38	
Sta	Elev	Sta	Elev	Sta	Elev
1810.81	1767	1816.21	1766.863	1850.26	1766
1864.33	1763	1865.94	1762	1867.54	1761
1872.8	1758	1874.73	1757	1876.97	1756
1885.61	1753	1889.71	1752	1907.59	1751
1954.78	1747	1972.58	1751	1977.04	1752
1985	1755	1987.63	1756	1990.27	1757
1998.91	1760	2001.38	1761	2003.43	1762
2009.97	1765	2012.14	1766	2019.37	1767

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1810.81	.025	1861.07	.031	2019.37	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1861.07	2019.37		160	223	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1762.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.031	
W.S. Elev (ft)	1760.90	Reach Len. (ft)	160.00	223.00	189.36
Crit W.S. (ft)		Flow Area (sq ft)		1241.99	
E.G. Slope (ft/ft)	0.002147	Area (sq ft)		1241.99	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	133.43	Top Width (ft)		133.43	
Vel Total (ft/s)	9.62	Avg. Vel. (ft/s)		9.62	
Max Chl Dpth (ft)	13.90	Hydr. Depth (ft)		9.31	
Conv. Total (cfs)	257884.4	Conv. (cfs)		257884.4	
Length Wtd. (ft)	222.82	Wetted Per. (ft)		137.76	
Min Ch El (ft)	1747.00	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)	2019.37	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	13.13	609.50	22.92
C & E Loss (ft)	0.00	Cum SA (acres)	9.68	106.02	8.65

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1166

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		40	
Sta	Elev	Sta	Elev	Sta	Elev
1000	1767	1035.04	1766	1052.54	1765
1108.04	1762	1132.74	1761	1149.82	1760
1187.2	1758	1190.4	1757	1193.84	1756
1204.84	1753	1208.96	1752	1216.35	1751
1252	1747	1256	1747	1261.19	1750
1305	1752	1307.8	1753	1310.66	1754
1318.55	1757	1320.75	1758	1322.77	1759
1327.48	1762	1328.91	1763	1330.34	1764

Manning's n Values		num=		5	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1152.37	.025	1182.14	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1182.14	1322.77		90	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.47	Wt. n-Val.	0.025	0.031	0.025

W.S. Elev (ft)	1760.35	Reach Len. (ft)	90.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	26.67	1216.49	1.69
E.G. Slope (ft/ft)	0.002436	Area (sq ft)	26.67	1216.49	1.69
Q Total (cfs)	11948.00	Flow (cfs)	67.54	11876.87	3.59
Top Width (ft)	179.72	Top Width (ft)	36.72	140.63	2.37
Vel Total (ft/s)	9.60	Avg. Vel. (ft/s)	2.53	9.76	2.13
Max Chl Dpth (ft)	13.35	Hydr. Depth (ft)	0.73	8.65	0.71
Conv. Total (cfs)	242056.4	Conv. (cfs)	1368.3	240615.4	72.6
Length Wtd. (ft)	196.46	Wetted Per. (ft)	36.75	145.12	2.73
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.11	1.28	0.09
Alpha	1.03	Stream Power (lb/ft s)	1344.19	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	13.08	603.20	22.92
C & E Loss (ft)	0.17	Cum SA (acres)	9.61	105.32	8.65

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1165

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 33								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
1000	1761	1036.82	1760	1078.61	1759	1122.5	1758	1174.05	1757.09	
1179.42	1757	1198.32	1756	1205.9	1755	1213.27	1754	1220.08	1753	
1225.52	1752	1232.22	1751	1244.1	1750	1259.54	1749	1273	1747	
1286	1747	1300.22	1749	1314.89	1750	1324.3	1751	1329.45	1752	
1333.74	1753	1336.85	1754	1339.8	1755	1341.51	1756	1343.22	1757	
1344.93	1758	1346.66	1759	1348.95	1760	1351.29	1761	1353.63	1762	
1355.82	1763	1357.98	1764	1360.25	1765					

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val		
1000	.075	1179.42	.025	1198.32	.031	1341.51	.025		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1198.32	1341.51		102	200	212		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.047	0.031	0.025
W.S. Elev (ft)	1760.40	Reach Len. (ft)	102.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	363.16	1413.84	17.18
E.G. Slope (ft/ft)	0.001307	Area (sq ft)	363.16	1413.84	17.18
Q Total (cfs)	11948.00	Flow (cfs)	703.32	11189.83	54.85
Top Width (ft)	327.86	Top Width (ft)	176.29	143.19	8.38
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)	1.94	7.91	3.19
Max Chl Dpth (ft)	13.40	Hydr. Depth (ft)	2.06	9.87	2.05
Conv. Total (cfs)	330544.8	Conv. (cfs)	19457.5	309569.9	1517.4
Length Wtd. (ft)	193.26	Wetted Per. (ft)	176.36	144.81	9.48
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.17	0.80	0.15
Alpha	1.33	Stream Power (lb/ft s)	1360.25	0.00	0.00
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	12.68	597.17	22.87
C & E Loss (ft)	0.00	Cum SA (acres)	9.39	104.67	8.62

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1164

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 34							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
914	1760.2	1000	1759	1103.31	1758	1173.79	1757.01	1174.76	1757
1182.32	1756	1187.14	1755	1191.23	1754	1195.09	1753	1199.36	1752
1203.87	1751	1209	1750	1215.31	1749	1235.3	1748	1246.8	1747
1262.85	1747	1267.13	1748	1272.17	1749	1293.99	1750	1298.93	1751
1302.91	1752	1305.45	1753	1308.05	1754	1310.3	1755	1312.01	1756
1313.74	1757	1315.63	1758	1317.36	1759	1318.88	1760	1320.44	1761
1322.15	1762	1323.97	1763	1327.3	1764	1333.4	1765		

Manning's n Values	num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
914	.075	1103.31	.025	1173.79	.031	1313.74	.025	1323.97	.095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1173.79 1313.74 215 200 190 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.034	0.031	0.025
W.S. Elev (ft)	1760.13	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	399.85	1368.25	8.78
E.G. Slope (ft/ft)	0.001371	Area (sq ft)	399.85	1368.25	8.78
Q Total (cfs)	11948.00	Flow (cfs)	950.18	10973.48	24.34
Top Width (ft)	400.27	Top Width (ft)	254.97	139.95	5.35
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	2.38	8.02	2.77
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)	1.57	9.78	1.64
Conv. Total (cfs)	322706.8	Conv. (cfs)	25663.7	296385.7	657.4
Length Wtd. (ft)	200.60	Wetted Per. (ft)	254.99	142.42	6.20
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.13	0.82	0.12
Alpha	1.32	Stream Power (lb/ft s)	1333.40	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	11.78	590.78	22.81
C & E Loss (ft)	0.09	Cum SA (acres)	8.89	104.02	8.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1163

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1761	1023.99	1760	1040.59	1759	1072.99	1758.15	1078.49	1758
1082.12	1757	1084.01	1756	1085.89	1755	1088	1754	1091.14	1753
1094.6	1752	1098.65	1751	1102.87	1750	1111.01	1749	1131.34	1748
1134.37	1747	1137.4	1746	1147.99	1746	1151.13	1747	1173.84	1748
1179.31	1749	1182.89	1750	1186.26	1751	1189.12	1752	1191.86	1753
1194.42	1754	1196.23	1755	1198.03	1756	1199.83	1757	1201.58	1758
1203.18	1759	1204.73	1760	1206.29	1761	1207.85	1762	1211.35	1763

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1040.59	.025	1078.49	.031	1201.58	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1078.49 1201.58 155 200 212 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.83	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1758.75	Reach Len. (ft)	155.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	10.54	1097.94	0.45
E.G. Slope (ft/ft)	0.002897	Area (sq ft)	10.54	1097.94	0.45
Q Total (cfs)	11948.00	Flow (cfs)	17.44	11929.89	0.67
Top Width (ft)	152.62	Top Width (ft)	28.33	123.09	1.20
Vel Total (ft/s)	10.77	Avg. Vel. (ft/s)	1.65	10.87	1.49
Max Chl Dpth (ft)	12.75	Hydr. Depth (ft)	0.37	8.92	0.37
Conv. Total (cfs)	221997.9	Conv. (cfs)	324.1	221661.4	12.4
Length Wtd. (ft)	199.97	Wetted Per. (ft)	28.34	127.02	1.41
Min Ch El (ft)	1746.00	Shear (lb/sq ft)	0.07	1.56	0.06
Alpha	1.02	Stream Power (lb/ft s)	1211.35	0.00	0.00
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	10.77	585.12	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.19	103.41	8.58

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1162

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		33					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1760	1054.93	1759	1069.4	1758	1072.46	1757.53	1075.96	1757
1078.59	1756	1080.96	1755	1083.3	1754	1085.66	1753	1088.02	1752
1090.38	1751	1094.64	1750	1100.92	1749	1117.73	1748	1122.79	1747
1125.94	1746	1138.39	1746	1146.24	1747	1172.9	1748	1177.44	1749
1180.86	1750	1184.07	1751	1187.01	1752	1189.87	1753	1192.45	1754
1194.92	1755	1197.3	1756	1199.17	1757	1201.05	1758	1202.79	1759
1204.84	1760	1207.96	1761	1210.76	1762				

Manning's n Values

num=		3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1069.4	.031	1201.05	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1069.4	1201.05		230	200	180	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1759.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1758.08	Reach Len. (ft)	230.00	200.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)	0.04	1085.50	0.01
E.G. Slope (ft/ft)	0.003283	Area (sq ft)	0.04	1085.50	0.01
Q Total (cfs)	11948.00	Flow (cfs)	0.02	11947.98	0.00
Top Width (ft)	132.90	Top Width (ft)	1.12	131.65	0.13
Vel Total (ft/s)	11.01	Avg. Vel. (ft/s)	0.39	11.01	0.35
Max Chl Dpth (ft)	12.08	Hydr. Depth (ft)	0.04	8.25	0.04
Conv. Total (cfs)	208513.0	Conv. (cfs)	0.3	208512.7	0.0
Length Wtd. (ft)	200.00	Wetted Per. (ft)	1.12	135.31	0.15
Min Ch El (ft)	1746.00	Shear (lb/sq ft)	0.01	1.64	0.01
Alpha	1.00	Stream Power (lb/ft s)	1210.76	0.00	0.00
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	10.75	580.10	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.14	102.83	8.57

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1161

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		37					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1761	1032.93	1760	1076.86	1759	1085.58	1758	1085.71	1757.94
1087.8	1757	1090.01	1756	1092.18	1755	1093.81	1754	1095.41	1753
1097.01	1752	1098.61	1751	1100.81	1750	1103.09	1749	1105.43	1748
1121.44	1747	1125.89	1746	1140.79	1746	1146.25	1747	1168.85	1747
1181.03	1747	1186.56	1748	1189.23	1749	1191.91	1750	1194.07	1751
1196.08	1752	1197.98	1753	1199.83	1754	1201.51	1755	1203.13	1756
1204.72	1757	1206.31	1758	1208.39	1759	1210.58	1760	1212.78	1761
1220.46	1762	1236.74	1762						

Manning's n Values

num=		5			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1032.93	.025	1085.58	.031
				1206.31	.025
				1212.78	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1085.58	1206.31		245	200	192	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1759.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.		0.031	
W.S. Elev (ft)	1756.86	Reach Len. (ft)	245.00	200.00	192.00
Crit W.S. (ft)		Flow Area (sq ft)		975.59	
E.G. Slope (ft/ft)	0.004038	Area (sq ft)		975.59	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	116.38	Top Width (ft)		116.38	
Vel Total (ft/s)	12.25	Avg. Vel. (ft/s)		12.25	
Max Chl Dpth (ft)	10.86	Hydr. Depth (ft)		8.38	
Conv. Total (cfs)	188019.0	Conv. (cfs)		188019.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		121.01	
Min Ch El (ft)	1746.00	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)	1236.74	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	10.75	575.37	22.79
C & E Loss (ft)	0.16	Cum SA (acres)	8.14	102.26	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1160

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num=		32			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1707.52	1759	1714.96	1758	1719.99	1757	1721.72	1756	1723.45	1755
1725.19	1754	1726.92	1753	1728.71	1752	1730.5	1751	1732.29	1750
1734.19	1749	1737.22	1748	1741.12	1747	1747.24	1746	1756.44	1745
1765.77	1745	1784.95	1745	1819.24	1746	1822.81	1747	1825.35	1748
1828	1749	1829.93	1750	1831.58	1751	1833.25	1752	1834.92	1753
1836.49	1754	1837.87	1755	1839.25	1756	1840.63	1757	1842.02	1758
1843.66	1759	1846.97	1760						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1707.52	.025	1719.99	.031	1843.66	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1719.99	1843.66		205	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1758.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.		0.031	
W.S. Elev (ft)	1756.59	Reach Len. (ft)	205.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1115.64	
E.G. Slope (ft/ft)	0.002682	Area (sq ft)		1115.64	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	119.37	Top Width (ft)		119.37	
Vel Total (ft/s)	10.71	Avg. Vel. (ft/s)		10.71	
Max Chl Dpth (ft)	11.59	Hydr. Depth (ft)		9.35	
Conv. Total (cfs)	230692.0	Conv. (cfs)		230692.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		124.51	
Min Ch El (ft)	1745.00	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	1846.97	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	10.75	570.57	22.79
C & E Loss (ft)	0.07	Cum SA (acres)	8.14	101.72	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1159

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num=		36			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1640	1756.2	1664.66	1756	1671.67	1755	1674.32	1754	1676.98	1753
1679.36	1752	1681.21	1751	1683.16	1750	1685.22	1749	1687.41	1748
1689.79	1747	1692.16	1746	1695.52	1745	1700.14	1744	1708.22	1743
1718.67	1742.04	1719.12	1742	1726.76	1742	1728.5	1743	1730.24	1744
1731.98	1745	1761.26	1746	1768.42	1747	1772.04	1748	1774.9	1749
1777.87	1750	1780.08	1751	1782.06	1752	1784.04	1753	1786	1754
1787.66	1755	1789.31	1756	1791.01	1757	1792.78	1758	1795.42	1759
1798.72	1760								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1640	.075	1664.66	.025	1671.67	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1671.67	1798.72		206.54	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1757.63	Element	Left OB	Channel	Right OB
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Vel Head (ft)	2.50	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1755.13	Reach Len. (ft)	206.54	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	0.06	1000.43	
E.G. Slope (ft/ft)	0.004203	Area (sq ft)	0.06	1000.43	
Q Total (cfs)	12706.00	Flow (cfs)	0.03	12705.96	
Top Width (ft)	117.09	Top Width (ft)	0.89	116.20	
Vel Total (ft/s)	12.70	Avg. Vel. (ft/s)	0.61	12.70	
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)	0.06	8.61	
Conv. Total (cfs)	195997.0	Conv. (cfs)	0.5	195996.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	0.90	121.07	
Min Ch El (ft)	1742.00	Shear (lb/sq ft)	0.02	2.17	
Alpha	1.00	Stream Power (lb/ft s)	1798.72	0.00	0.00
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	10.75	565.71	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13	101.18	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1158

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 35		
Sta	Elev	Sta	Elev	Sta	Elev
1756.65	1756	1781.68	1755	1788.07	1754
1795.12	1751	1797.15	1750	1799.26	1749
1805.67	1746	1809.75	1745	1816.31	1744
1842.92	1742	1850.1	1742	1853.06	1743
1882.59	1746	1886.35	1747	1890.06	1748
1898.16	1751	1900.33	1752	1902.5	1753
1907.76	1756	1909.43	1757	1911.1	1758
					1759
					1760

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1756.65	.075	1781.68	.025	1788.07	.031
					1912.77
					.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1788.07	1912.77		212	200	185	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1756.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.86	Wt. n-Val.		0.031	
W.S. Elev (ft)	1753.81	Reach Len. (ft)	212.00	200.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)		936.38	
E.G. Slope (ft/ft)	0.005140	Area (sq ft)		936.38	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	115.48	Top Width (ft)		115.48	
Vel Total (ft/s)	13.57	Avg. Vel. (ft/s)		13.57	
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)		8.11	
Conv. Total (cfs)	177224.6	Conv. (cfs)		177224.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		119.34	
Min Ch El (ft)	1742.00	Shear (lb/sq ft)		2.52	
Alpha	1.00	Stream Power (lb/ft s)	1919.69	0.00	0.00
Frctn Loss (ft)	0.87	Cum Volume (acre-ft)	10.75	561.27	22.79
C & E Loss (ft)	0.18	Cum SA (acres)	8.13	100.65	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1157

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
1830.87	1756	1835.9	1755	1839.51	1754
1847.46	1751	1849.15	1750	1850.85	1749
1855.82	1746	1857.98	1745	1862.06	1744
1891.71	1741	1894.24	1740	1899.68	1740
1911.72	1742	1916.13	1743	1925.85	1744
					1937.64
					1745
					1845.5
					1752
					1747
					1742
					1741
					1746

1947.15	1747	1950.82	1748	1953.65	1749	1956.09	1750	1958.53	1751
1960.64	1752	1962.3	1753	1963.96	1754	1965.66	1755	1967.36	1756
1969.07	1757	1972.1	1758	1976.83	1759				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1830.87	.075	1830.87	.031	1972.1	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1830.87	1972.1		202.058	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1755.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.27	Wt. n-Val.		0.031	
W.S. Elev (ft)	1753.35	Reach Len. (ft)	202.06	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1051.17	
E.G. Slope (ft/ft)	0.003752	Area (sq ft)		1051.17	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	121.20	Top Width (ft)		121.20	
Vel Total (ft/s)	12.09	Avg. Vel. (ft/s)		12.09	
Max Chl Dpth (ft)	13.35	Hydr. Depth (ft)		8.67	
Conv. Total (cfs)	207430.0	Conv. (cfs)		207430.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		125.84	
Min Ch El (ft)	1740.00	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)	1976.83	0.00	0.00
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	10.75	556.71	22.79
C & E Loss (ft)	0.08	Cum SA (acres)	8.13	100.10	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1156

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	37
Sta	Elev	Sta	Elev	Sta
1743.43	1754	1746.93	1753	1749.39
1755.06	1749	1756.67	1748	1758.34
1766.48	1744	1780.79	1743	1789.22
1801.31	1739	1805.51	1739	1806.68
1812.75	1742	1843.77	1743	1847.97
1855.02	1747	1856.95	1748	1858.76
1864.23	1752	1866.07	1753	1867.9
1873.57	1757	1875.61	1758	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1743.43	.075	1743.43	.031	1875.61	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1743.43	1875.61		215	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1754.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.07	Wt. n-Val.		0.031	
W.S. Elev (ft)	1751.55	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)	1750.76	Flow Area (sq ft)		903.23	
E.G. Slope (ft/ft)	0.005706	Area (sq ft)		903.23	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	112.97	Top Width (ft)		112.97	
Vel Total (ft/s)	14.07	Avg. Vel. (ft/s)		14.07	
Max Chl Dpth (ft)	12.55	Hydr. Depth (ft)		8.00	
Conv. Total (cfs)	168203.9	Conv. (cfs)		168203.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		117.95	
Min Ch El (ft)	1739.00	Shear (lb/sq ft)		2.73	
Alpha	1.00	Stream Power (lb/ft s)	1875.61	0.00	0.00
Frctn Loss (ft)	1.14	Cum Volume (acre-ft)	10.75	552.22	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.13	99.57	8.57

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1155

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
1784.24	1755	1811.54	1754	1816.14	1753
1823.39	1750	1824.92	1749	1826.45	1748
1832.02	1745	1835.49	1744	1838.96	1743
1863.97	1740	1866.84	1739	1869.29	1738
1883.45	1739	1885.96	1740	1888.47	1741
1921.98	1744	1925.47	1745	1928.96	1746
1935.45	1749	1937.31	1750	1939.23	1751
1946.11	1754	1948.61	1755	1951.68	1756

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1784.24	.075	1811.54	.025	1816.14	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1816.14	1951.68		212	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1753.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.03	Wt. n-Val.		0.031	
W.S. Elev (ft)	1750.44	Reach Len. (ft)	212.00	200.00	195.00
Crit W.S. (ft)	1749.70	Flow Area (sq ft)		909.88	
E.G. Slope (ft/ft)	0.005694	Area (sq ft)		909.88	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	115.46	Top Width (ft)		115.46	
Vel Total (ft/s)	13.96	Avg. Vel. (ft/s)		13.96	
Max Chl Dpth (ft)	12.44	Hydr. Depth (ft)		7.88	
Conv. Total (cfs)	168387.5	Conv. (cfs)		168387.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		119.94	
Min Ch El (ft)	1738.00	Shear (lb/sq ft)		2.70	
Alpha	1.00	Stream Power (lb/ft s)	1951.68	0.00	0.00
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	10.75	548.06	22.79
C & E Loss (ft)	0.24	Cum SA (acres)	8.13	99.04	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1154

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 36		
Sta	Elev	Sta	Elev	Sta	Elev
1622.72	1753	1627.45	1752.89	1664.72	1752
1672.55	1749	1674.8	1748	1676.54	1747
1681.6	1744	1683.22	1743	1686.55	1742
1716.17	1739	1720	1738	1723.02	1737
1736.91	1738	1739.94	1739	1743.59	1740
1778.66	1743	1782.75	1744	1785.51	1745
1791.71	1748	1793.71	1749	1795.92	1750
1802.03	1753				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1622.72	.025	1664.72	.031	1802.03	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1664.72	1802.03		150	164	164	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1752.31	Element	Left OB	Channel	Right OB
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Vel Head (ft)	2.21	Wt. n-Val.	0.031		
W.S. Elev (ft)	1750.10	Reach Len. (ft)	150.00	164.00	164.00
Crit W.S. (ft)		Flow Area (sq ft)		1064.46	
E.G. Slope (ft/ft)	0.003794	Area (sq ft)		1064.46	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	126.37	Top Width (ft)		126.37	
Vel Total (ft/s)	11.94	Avg. Vel. (ft/s)		11.94	
Max Chl Dpth (ft)	13.09	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	206291.3	Conv. (cfs)		206291.3	
Length Wtd. (ft)	164.00	Wetted Per. (ft)		130.93	
Min Ch El (ft)	1737.00	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)	1802.03	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	10.75	543.52	22.79
C & E Loss (ft)	0.31	Cum SA (acres)	8.13	98.49	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1152.9

INPUT

Description: Stewart Bridge US 1152.9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1754.92	1000	1751.19	1000	1748.49	1002.5	1748.37	1014.5	1740.43
1022.5	1739.79	1053.85	1738.45	1055.15	1735.02	1059.83	1733.46	1069.14	1733.46
1085.85	1739.03	1087.15	1740.6	1118.5	1740.99	1126.5	1741.41	1136.5	1747.64
1140	1748.06	1140	1750.63	1140	1754.34				

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1140		102	102	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1751.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.031	
W.S. Elev (ft)	1750.43	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1746.01	Flow Area (sq ft)		1460.75	
E.G. Slope (ft/ft)	0.001624	Area (sq ft)		1460.75	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	140.00	Top Width (ft)		140.00	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)		8.70	
Max Chl Dpth (ft)	16.97	Hydr. Depth (ft)		10.43	
Conv. Total (cfs)	315334.2	Conv. (cfs)		315334.2	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		152.84	
Min Ch El (ft)	1733.46	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)	1140.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	10.75	538.77	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13	97.98	8.57

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1152.5

INPUT

Description: Stewart Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2		
Sta Hi	Cord Lo Cord	Sta Hi	Cord Lo Cord

1000 1754.92 1751.19 1140 1754.34 1750.63

Upstream Bridge Cross Section Data

Station Elevation Data				num=	18		
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1754.92	1000	1751.19	1000	1748.49	1002.5	1748.37
1022.5	1739.79	1053.85	1738.45	1055.15	1735.02	1059.83	1733.46
1085.85	1739.03	1087.15	1740.6	1118.5	1740.99	1126.5	1741.41
1140	1748.06	1140	1750.63	1140	1754.34		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1140		.3	.5

Downstream Deck/Roadway Coordinates

num=	2								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1000	1755.05	1751.24	1140	1754.41	1750.64				

Downstream Bridge Cross Section Data

Station Elevation Data				num=	18		
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1755.05	1000	1751.24	1000	1748.74	1002.5	1748.55
1022.5	1741.87	1053.85	1737.93	1055.15	1736.43	1062.56	1733.46
1085.85	1741.15	1087.15	1740.39	1118.5	1741.59	1126.5	1741.87
1140	1748.3	1140	1750.64	1140	1754.41		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1140		.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station	Upstream=	1022.5	Downstream=	1022.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1054.5	Downstream=	1054.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1086.5	Downstream=	1086.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1118.5	Downstream=	1118.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	

1.3 1730 1.3 1760

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1751.60	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1750.43	E.G. Elev (ft)	1751.56	1750.81
Q Total (cfs)	12706.00	W.S. Elev (ft)	1750.24	1748.56
Q Bridge (cfs)	12706.00	Crit W.S. (ft)	1746.24	1747.01
Q Weir (cfs)		Max Chl Dpth (ft)	16.78	15.10
Weir Sta Lft (ft)		Vel Total (ft/s)	9.23	12.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	1376.88	1057.13
Weir Submerg		Froude # Chl	0.51	0.75
Weir Max Depth (ft)		Specif Force (cu ft)	11582.75	9674.06
Min El Weir Flow (ft)	1754.42	Hydr Depth (ft)	10.21	7.98
Min El Prs (ft)	1751.19	W.P. Total (ft)	231.31	204.60
Delta EG (ft)	0.92	Conv. Total (cfs)	216769.9	151443.5
Delta WS (ft)	1.76	Top Width (ft)	134.80	132.46
BR Open Area (sq ft)	1377.49	Frctn Loss (ft)	0.48	0.01
BR Open Vel (ft/s)	12.02	C & E Loss (ft)	0.28	0.11
Coef of Q		Shear Total (lb/sq ft)	1.28	2.27
Br Sel Method	Energy only	Power Total (lb/ft s)	1000.00	1000.00

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy.
The

program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the

program will default to an energy based solution.

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy.

This is not physically possible, the momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1152.1

INPUT

Description: Stewart Bridge DS 1152.1

Station	Elevation	Data	num=	18					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1755.05	1000	1751.24	1000	1748.74	1002.5	1748.55	1014.5	1741
1022.5	1741.87	1053.85	1737.93	1055.15	1736.43	1062.56	1733.46	1064.28	1733.46
1085.85	1741.15	1087.15	1740.39	1118.5	1741.59	1126.5	1741.87	1136.5	1747.78
1140	1748.3	1140	1750.64	1140	1754.41				

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1000	1140		134	134	134		.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1750.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.031	

W.S. Elev (ft)	1748.67	Reach Len. (ft)	134.00	134.00	134.00
Crit W.S. (ft)		Flow Area (sq ft)		1114.82	
E.G. Slope (ft/ft)	0.003774	Area (sq ft)		1114.82	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	139.08	Top Width (ft)		139.08	
Vel Total (ft/s)	11.40	Avg. Vel. (ft/s)		11.40	
Max Chl Dpth (ft)	15.21	Hydr. Depth (ft)		8.02	
Conv. Total (cfs)	206828.0	Conv. (cfs)		206828.0	
Length Wtd. (ft)	134.00	Wetted Per. (ft)		146.40	
Min Ch El (ft)	1733.46	Shear (lb/sq ft)		1.79	
Alpha	1.00	Stream Power (lb/ft s)	1140.00	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	10.75	535.92	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.13	97.67	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1152

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
1682.91	1752	1693.46	1751.6	1709.06	1751	1734.76	1750	1737.81	1749	
1740.12	1748	1742.43	1747	1744.49	1746	1745.95	1745	1747.41	1744	
1749.02	1743	1750.65	1742	1752.27	1741	1753.89	1740	1770.05	1739	
1786.72	1738	1790.72	1733.25	1801.49	1733.25	1808.9	1733.25	1813.78	1738	
1822.71	1739	1844.57	1740	1849.26	1741	1854.06	1742	1855.99	1743	
1857.91	1744	1859.79	1745	1861.66	1746	1863.54	1747	1865.48	1748	
1867.45	1749	1869.38	1750	1871.32	1751	1873.26	1752	1876.66	1753	
1880.75	1754	1886.36	1755							

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1682.91	.075	1709.06	.025	1734.76	.031	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1734.76	1886.36		190	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1750.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.031	
W.S. Elev (ft)	1748.20	Reach Len. (ft)	190.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1122.46	
E.G. Slope (ft/ft)	0.003319	Area (sq ft)		1122.46	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	126.23	Top Width (ft)		126.23	
Vel Total (ft/s)	11.36	Avg. Vel. (ft/s)		11.36	
Max Chl Dpth (ft)	14.95	Hydr. Depth (ft)		8.89	
Conv. Total (cfs)	221387.4	Conv. (cfs)		221387.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		134.48	
Min Ch El (ft)	1733.25	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)	1886.36	0.00	0.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	10.75	532.48	22.79
C & E Loss (ft)	0.11	Cum SA (acres)	8.13	97.26	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1151

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	35						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1701.89	1750	1705.24	1749	1708.58	1748	1710.83	1747	1712.45	1746
1714.08	1745	1715.7	1744	1717.33	1743	1718.95	1742	1721.55	1741
1725.2	1740	1728.57	1739	1737.1	1738	1758.46	1737	1774.13	1733
1775.45	1733	1781.39	1733	1786.17	1737	1792.4	1738	1821.89	1739
1826.81	1740	1830.58	1741	1832.58	1742	1834.59	1743	1836.59	1744
1838.59	1745	1840.67	1746	1842.85	1747	1845.04	1748	1846.96	1749
1848.88	1750	1851	1751	1853.32	1752	1855.75	1753	1859.26	1754

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1701.89	.075	1701.89	.027	1859.26	.095	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1701.89	1859.26		193	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1749.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.96	Reach Len. (ft)	193.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1242.85	
E.G. Slope (ft/ft)	0.001934	Area (sq ft)		1242.85	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	136.30	Top Width (ft)		136.30	
Vel Total (ft/s)	10.26	Avg. Vel. (ft/s)		10.26	
Max Chl Dpth (ft)	14.96	Hydr. Depth (ft)		9.12	
Conv. Total (cfs)	290021.6	Conv. (cfs)		290021.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		142.35	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	1859.26	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	10.75	527.05	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13	96.66	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1150

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	40
Sta	Elev	Sta	Elev	Sta
1658.21	1751	1674.94	1750	1677.19
1684	1746	1685.81	1745	1687.35
1691.97	1741	1693.51	1740	1695.4
1711.63	1736	1722.1	1733	1726.43
1739.61	1736	1743.5	1735	1756.33
1791.06	1738	1795.76	1739	1798.32
1805.77	1743	1807.85	1744	1809.93
1816.52	1748	1818.78	1749	1820.95

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1658.21	.075	1674.94	.027
		1825.71	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1674.94	1825.71		180	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1749.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.69	Reach Len. (ft)	180.00	200.00	198.00
Crit W.S. (ft)		Flow Area (sq ft)		1295.81	
E.G. Slope (ft/ft)	0.001678	Area (sq ft)		1295.81	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	135.66	Top Width (ft)		135.66	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	14.69	Hydr. Depth (ft)		9.55	
Conv. Total (cfs)	311340.3	Conv. (cfs)		311340.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		142.05	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	1825.71	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	10.75	521.22	22.79
C & E Loss (ft)	0.09	Cum SA (acres)	8.13	96.04	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1149

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	37
Sta	Elev	Sta	Elev	Sta
1000	1749	1019.41	1748.16	1023.18
1032.69	1745	1034.45	1744	1036.22
1041.42	1740	1044.03	1739	1046.64

1062.85	1735	1068.71	1734	1080	1733	1090	1733	1099.53	1734
1103.57	1735	1107.21	1736	1140.82	1737	1144.96	1738	1149.1	1739
1152.17	1740	1154.62	1741	1157.07	1742	1159.52	1743	1161.7	1744
1163.68	1745	1165.68	1746	1167.68	1747	1169.68	1748	1172.2	1749
1175.1	1750	1177.96	1751						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1019.41	.027	1169.68	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1019.41	1169.68		115	200	199.956	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.61	Reach Len. (ft)	115.00	200.00	199.96
Crit W.S. (ft)		Flow Area (sq ft)		1440.42	
E.G. Slope (ft/ft)	0.001258	Area (sq ft)		1440.42	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	144.13	Top Width (ft)		144.13	
Vel Total (ft/s)	8.85	Avg. Vel. (ft/s)		8.85	
Max Chl Dpth (ft)	14.61	Hydr. Depth (ft)		9.99	
Conv. Total (cfs)	359530.5	Conv. (cfs)		359530.5	
Length Wtd. (ft)	198.06	Wetted Per. (ft)		149.13	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1177.96	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	10.75	514.94	22.79
C & E Loss (ft)	0.10	Cum SA (acres)	8.13	95.39	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1148

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation Data	num=	37						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1080.94	1747	1120.61	1746	1166.28	1745.24	1180.47	1745
1184.75	1744	1186.55	1743	1188.25	1742	1189.79	1741	1191.32	1740
1192.86	1739	1195.37	1738	1199.37	1737	1204.66	1736	1221.84	1735
1233.56	1734	1244	1733	1255	1733	1266.59	1734	1269.83	1735
1296.62	1736	1301.8	1737	1305.51	1738	1308.27	1739	1310.93	1740
1313.6	1741	1315.59	1742	1317.52	1743	1319.4	1744	1321.27	1745
1323.14	1746	1324.79	1747	1326.35	1748	1328.1	1749	1329.95	1750
1331.8	1751	1333.64	1752						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1180.47	.027	1321.27	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1180.47	1321.27		150	60	60	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.65	Reach Len. (ft)	150.00	60.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	191.06	1586.11	6.24
E.G. Slope (ft/ft)	0.000798	Area (sq ft)	191.06	1586.11	6.24
Q Total (cfs)	12754.00	Flow (cfs)	583.63	12158.62	11.75
Top Width (ft)	297.33	Top Width (ft)	151.99	140.80	4.53
Vel Total (ft/s)	7.15	Avg. Vel. (ft/s)	3.05	7.67	1.88
Max Chl Dpth (ft)	14.65	Hydr. Depth (ft)	1.26	11.26	1.38
Conv. Total (cfs)	451562.6	Conv. (cfs)	20663.7	430482.9	416.0
Length Wtd. (ft)	63.43	Wetted Per. (ft)	152.02	144.82	5.25
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.06	0.55	0.06
Alpha	1.10	Stream Power (lb/ft s)	1333.64	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	10.50	507.99	22.77
C & E Loss (ft)	0.11	Cum SA (acres)	7.93	94.74	8.56

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1147.5

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 40		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1077.71	1747	1088.53	1746.86
1246.56	1745	1330.69	1744	1336.28	1743
1342.94	1740	1345.3	1739	1348.72	1738
1370.73	1735	1396.15	1734	1401.73	1733
1421.86	1735	1442.41	1735	1445.61	1735
1459.27	1738	1462.26	1739	1465.11	1740
1471.21	1743	1473.06	1744	1474.9	1745
1479.77	1748	1481.27	1749	1482.72	1750

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1330.69	.027	1473.06	.025
				1479.77	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1173.65	1473.06		180	60	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.015	0.025	0.025
W.S. Elev (ft)	1747.86	Reach Len. (ft)	180.00	60.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	170.42	2117.42	12.85
E.G. Slope (ft/ft)	0.000496	Area (sq ft)	170.42	2117.42	12.85
Q Total (cfs)	12754.00	Flow (cfs)	387.41	12342.34	24.26
Top Width (ft)	468.92	Top Width (ft)	163.03	299.41	6.49
Vel Total (ft/s)	5.54	Avg. Vel. (ft/s)	2.27	5.83	1.89
Max Chl Dpth (ft)	14.86	Hydr. Depth (ft)	1.05	7.07	1.98
Conv. Total (cfs)	572410.3	Conv. (cfs)	17387.1	553934.5	1088.8
Length Wtd. (ft)	63.32	Wetted Per. (ft)	163.04	302.94	7.55
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.03	0.22	0.05
Alpha	1.08	Stream Power (lb/ft s)	1489.69	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	9.88	505.44	22.76
C & E Loss (ft)	0.06	Cum SA (acres)	7.39	94.44	8.56

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1147.3

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 41		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1138.82	1747	1162.62	1746.76
1354.33	1745	1451.32	1744	1533.44	1743.09
1546.12	1741	1548.26	1740	1550.4	1739
1563.71	1736	1574.36	1735	1588.3	1734
1629.87	1734	1640.56	1734	1654.69	1734
1664.68	1737	1667.3	1738	1669.91	1739
1676.39	1742	1678.46	1743	1680.53	1744
1685.36	1747	1687.03	1748	1688.69	1749
1751.16	1751			1690.36	1750

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1541.84	.027	1678.46	.025
				1687.03	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1236.85	1678.46		120	75	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.016	0.024	0.025
W.S. Elev (ft)	1747.98	Reach Len. (ft)	120.00	75.00	70.00
Crit W.S. (ft)		Flow Area (sq ft)	212.71	2756.04	22.16
E.G. Slope (ft/ft)	0.000295	Area (sq ft)	212.71	2756.04	22.16
Q Total (cfs)	12754.00	Flow (cfs)	317.74	12397.56	38.70
Top Width (ft)	684.80	Top Width (ft)	234.65	441.61	8.54
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.49	4.50	1.75
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	0.91	6.24	2.59
Conv. Total (cfs)	742695.3	Conv. (cfs)	18502.7	721939.0	2253.6
Length Wtd. (ft)	76.91	Wetted Per. (ft)	234.66	444.80	9.90

Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.02	0.11	0.04
Alpha	1.09	Stream Power (lb/ft s)	1751.16	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	9.08	502.08	22.74
C & E Loss (ft)	0.04	Cum SA (acres)	6.57	93.93	8.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1147

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1372.93	1755	1372.93	1745	1427.01	1744	1429.12	1743	1431.23	1742
1433.34	1741	1435.37	1740	1437.74	1739	1440.24	1738	1442.75	1737
1445.45	1736	1461.5	1735	1509.61	1734	1520	1733	1530	1733
1540.56	1734	1545.55	1735	1549	1736	1552.34	1737	1555.68	1738
1558.11	1739	1560.47	1740	1562.82	1741	1565.18	1742	1567.13	1743
1568.92	1744	1570.71	1745	1572.5	1746	1574.29	1747	1576.19	1748
1579.93	1749	1583.67	1750						

Manning's n Values			num=	4			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1372.93	.016	1427.01	.027	1568.92	.025	1576.19	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1427.01	1568.92		220	200	198.468	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.49	Reach Len. (ft)	220.00	200.00	198.47
Crit W.S. (ft)		Flow Area (sq ft)	161.57	1661.36	10.90
E.G. Slope (ft/ft)	0.000625	Area (sq ft)	161.57	1661.36	10.90
Q Total (cfs)	12364.00	Flow (cfs)	755.08	11587.57	21.36
Top Width (ft)	202.29	Top Width (ft)	54.08	141.91	6.30
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)	4.67	6.97	1.96
Max Chl Dpth (ft)	14.49	Hydr. Depth (ft)	2.99	11.71	1.73
Conv. Total (cfs)	494540.5	Conv. (cfs)	30202.0	463484.4	854.2
Length Wtd. (ft)	200.64	Wetted Per. (ft)	56.58	145.56	7.20
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.11	0.45	0.06
Alpha	1.03	Stream Power (lb/ft s)	1583.67	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	8.57	498.28	22.71
C & E Loss (ft)	0.01	Cum SA (acres)	6.17	93.42	8.53

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1146

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1233.6	1758	1233.6	1748	1292.28	1748	1399.17	1747	1429.98	1746
1434.28	1745	1438.56	1744	1440.36	1743	1442.12	1742	1443.88	1741
1445.65	1740	1447.36	1739	1449.19	1738	1452.27	1737	1455.36	1736
1458.58	1735	1478.9	1734	1502.47	1733	1539.21	1733	1545.51	1734
1551.98	1735	1558.63	1736	1561.87	1737	1565.11	1738	1568.36	1739
1570.35	1740	1572.22	1741	1574.1	1742	1575.97	1743	1577.85	1744
1579.92	1745	1582.14	1746	1584.37	1747	1586.59	1748	1588.96	1749

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
1233.6	.016	1429.98	.027	1582.14	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1429.98	1582.14		200	200	202	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.26	Reach Len. (ft)	200.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	27.17	1701.89	1.78
E.G. Slope (ft/ft)	0.000720	Area (sq ft)	27.17	1701.89	1.78
Q Total (cfs)	12364.00	Flow (cfs)	40.44	12321.60	1.96
Top Width (ft)	213.82	Top Width (ft)	58.85	152.16	2.81
Vel Total (ft/s)	7.14	Avg. Vel. (ft/s)	1.49	7.24	1.10
Max Chl Dpth (ft)	14.26	Hydr. Depth (ft)	0.46	11.18	0.63
Conv. Total (cfs)	460640.8	Conv. (cfs)	1506.5	459061.2	73.1
Length Wtd. (ft)	200.00	Wetted Per. (ft)	58.87	156.84	3.08
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.02	0.49	0.03
Alpha	1.02	Stream Power (lb/ft s)	1588.96	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	8.09	490.56	22.68
C & E Loss (ft)	0.00	Cum SA (acres)	5.88	92.75	8.51

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1145

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1429.07	1756	1429.07	1746	1443.49	1745	1445.35	1744	1447.2	1743
1449.06	1742	1451.07	1741	1453.18	1740	1455.54	1739	1457.73	1738
1459.91	1737	1462.08	1736	1467.3	1735	1490.37	1734	1502.59	1733
1555.26	1733	1561.94	1734	1565.29	1735	1568.37	1736	1571.45	1737
1573.95	1738	1576.06	1739	1578.17	1740	1580.28	1741	1582.39	1742
1584.08	1743	1585.75	1744	1587.43	1745	1589.1	1746	1590.77	1747
1592.44	1748								

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
1429.07	.016	1443.49	.027	1592.44	.095

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
1443.49	1592.44	215	200	195	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.12	Reach Len. (ft)	215.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)	23.38	1696.35	
E.G. Slope (ft/ft)	0.000699	Area (sq ft)	23.38	1696.35	
Q Total (cfs)	12364.00	Flow (cfs)	75.28	12288.72	
Top Width (ft)	161.90	Top Width (ft)	14.42	147.48	
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)	3.22	7.24	
Max Chl Dpth (ft)	14.12	Hydr. Depth (ft)	1.62	11.50	
Conv. Total (cfs)	467529.4	Conv. (cfs)	2846.5	464683.0	
Length Wtd. (ft)	200.43	Wetted Per. (ft)	15.58	152.76	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.07	0.48	
Alpha	1.01	Stream Power (lb/ft s)	1592.44	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	7.98	482.76	22.68
C & E Loss (ft)	0.07	Cum SA (acres)	5.72	92.06	8.51

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1144.5

INPUT

Description:

Lateral structure position = Next ot right bank station

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1753	80	1753	80	1748	92	1748	92	1753
172	1752	172	1747	184	1747	184	1752	264	1752
264	1747	276	1747	276	1752	356	1751	356	1746
368	1746	368	1751	448	1748	448	1743	460	1743
460	1748	540	1749	540	1744	552	1744	552	1749

632	1750	632	1745	644	1745	644	1750	724	1750
724	1745	736	1745	736	1750	816	1750	816	1745
828	1745	828	1750	908	1749	908	1744	920	1744
920	1749	1000	1749	1000	1744	1012	1744	1012	1749
1092	1749	1092	1744						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1747.93	Weir Sta US (ft)	172.00
W.S. US. (ft)	1747.12	Weir Sta DS (ft)	1012.00
E.G. DS (ft)	1747.35	Min El Weir Flow (ft)	1743.00
W.S. DS (ft)	1747.06	Wr Top Wdth (ft)	120.00
Q US (cfs)	12364.00	Weir Max Depth (ft)	4.07
Q Leaving Total (cfs)	1059.65	Weir Avg Depth (ft)	2.06
Q DS (cfs)	11304.35	Weir Flow Area (sq ft)	247.63
Perc Q Leaving	8.57	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	1059.65	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1144

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	33						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1489	1756	1489	1746	1550.69	1745	1585.18	1744	1587.85	1743
1590.52	1742	1593.19	1741	1595.25	1740	1596.99	1739	1598.73	1738
1600.47	1737	1602.2	1736	1603.94	1735	1614.21	1734	1632.77	1733
1646.99	1732	1694.67	1732	1702.16	1733	1707.23	1734	1711.52	1735
1715.13	1736	1717.8	1737	1720.46	1738	1723.13	1739	1725.47	1740
1727.66	1741	1729.84	1742	1732.02	1743	1734.21	1744	1736.99	1745
1739.78	1746	1742.56	1747	1750	1754				

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
1489	.016	1585.18	.027	1742.56	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1585.18	1742.56		220	200	212	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.016	0.027	0.095
W.S. Elev (ft)	1747.17	Reach Len. (ft)	220.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	194.65	1880.26	0.01
E.G. Slope (ft/ft)	0.000489	Area (sq ft)	194.65	1880.26	0.01
Q Total (cfs)	12362.00	Flow (cfs)	634.60	11727.39	0.00
Top Width (ft)	253.74	Top Width (ft)	96.18	157.38	0.18
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)	3.26	6.24	0.05
Max Chl Dpth (ft)	15.17	Hydr. Depth (ft)	2.02	11.95	0.08
Conv. Total (cfs)	558801.4	Conv. (cfs)	28686.1	530115.3	0.0
Length Wtd. (ft)	200.70	Wetted Per. (ft)	97.37	162.16	0.24
Min Ch El (ft)	1732.00	Shear (lb/sq ft)	0.06	0.35	0.00
Alpha	1.06	Stream Power (lb/ft s)	1750.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	7.44	474.55	22.68
C & E Loss (ft)	0.00	Cum SA (acres)	5.44	91.36	8.51

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1143

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1447.98	1756	1447.98	1746	1471.52	1745	1479.91	1744	1484.98	1743		
1486.72	1742	1488.46	1741	1490.2	1740	1491.94	1739	1493.68	1738		
1495.83	1737	1498.28	1736	1500.73	1735	1503.18	1734	1508.07	1733		
1519.16	1732	1548.27	1731	1573.18	1731	1585.89	1732	1595.26	1733		
1604.91	1734	1612.89	1735	1616.02	1736	1617.96	1737	1619.89	1738		
1621.83	1739	1623.73	1740	1626.51	1741	1629.83	1742	1633.25	1743		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1447.98	.016	1484.98	.027	1633.25	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1484.98	1633.25		190	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.08	Reach Len. (ft)	190.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	76.86	1969.49	
E.G. Slope (ft/ft)	0.000425	Area (sq ft)	76.86	1969.49	
Q Total (cfs)	12324.79	Flow (cfs)	234.29	12090.50	
Top Width (ft)	185.27	Top Width (ft)	37.00	148.27	
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)	3.05	6.14	
Max Chl Dpth (ft)	16.08	Hydr. Depth (ft)	2.08	13.28	
Conv. Total (cfs)	597894.9	Conv. (cfs)	11365.9	586529.1	
Length Wtd. (ft)	199.84	Wetted Per. (ft)	38.25	156.46	
Min Ch El (ft)	1731.00	Shear (lb/sq ft)	0.05	0.33	
Alpha	1.02	Stream Power (lb/ft s)	1633.25	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	6.75	465.71	22.68
C & E Loss (ft)	0.02	Cum SA (acres)	5.11	90.66	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1142

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 32								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1504.68	1756	1504.68	1746	1518.68	1746	1526.97	1745	1544.14	1744		
1546.15	1743	1548.18	1742	1550.21	1741	1552.25	1740	1554.23	1739		
1556.16	1738	1558.1	1737	1560.03	1736	1561.86	1735	1564.32	1734		
1569.1	1733	1577.06	1732	1598.1	1731	1663.34	1731	1667.87	1732		
1671.88	1733	1674.43	1734	1676.37	1735	1678.56	1736	1680.74	1737		
1682.92	1738	1684.97	1739	1687	1740	1689.03	1741	1691.05	1742		
1693.05	1743	1699.25	1744								

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1504.68	.075	1526.97	.016	1544.14	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1544.14	1699.25		196	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.020	0.027	
W.S. Elev (ft)	1747.05	Reach Len. (ft)	196.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	71.48	2064.06	
E.G. Slope (ft/ft)	0.000363	Area (sq ft)	71.48	2064.06	
Q Total (cfs)	11901.55	Flow (cfs)	156.44	11745.11	
Top Width (ft)	194.57	Top Width (ft)	39.46	155.11	
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)	2.19	5.69	
Max Chl Dpth (ft)	16.05	Hydr. Depth (ft)	1.81	13.31	
Conv. Total (cfs)	624658.3	Conv. (cfs)	8210.9	616447.4	
Length Wtd. (ft)	199.95	Wetted Per. (ft)	40.60	163.27	
Min Ch El (ft)	1731.00	Shear (lb/sq ft)	0.04	0.29	
Alpha	1.03	Stream Power (lb/ft s)	1699.25	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	6.43	456.45	22.68
C & E Loss (ft)	0.01	Cum SA (acres)	4.94	89.96	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1141

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 33		
Sta	Elev	Sta	Elev	Sta	Elev
1400.23	1755	1400.23	1745	1417.47	1744
1426.39	1741	1427.97	1740	1429.55	1739
1434.02	1736	1435.74	1735	1438.81	1734
1471.9	1731	1485.23	1730	1514.53	1730
1550.61	1733	1553.34	1734	1555.74	1735
1560.67	1738	1562.2	1739	1563.74	1740
1569.67	1743	1571.81	1744	1573.95	1745

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1400.23	.016	1417.47	.027	1573.95	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1417.47	1573.95		195	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.02	Reach Len. (ft)	195.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	43.46	2151.30	
E.G. Slope (ft/ft)	0.000312	Area (sq ft)	43.46	2151.30	
Q Total (cfs)	11719.72	Flow (cfs)	122.48	11597.24	
Top Width (ft)	173.72	Top Width (ft)	17.24	156.48	
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	2.82	5.39	
Max Chl Dpth (ft)	17.02	Hydr. Depth (ft)	2.52	13.75	
Conv. Total (cfs)	663841.3	Conv. (cfs)	6937.5	656903.8	
Length Wtd. (ft)	199.94	Wetted Per. (ft)	19.29	164.61	
Min Ch El (ft)	1730.00	Shear (lb/sq ft)	0.04	0.25	
Alpha	1.01	Stream Power (lb/ft s)	1573.95	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	6.17	446.77	22.68
C & E Loss (ft)	0.02	Cum SA (acres)	4.81	89.25	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1140

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 34		
Sta	Elev	Sta	Elev	Sta	Elev
1501.96	1755	1501.96	1745	1528.03	1744
1535.21	1741	1537.5	1740	1539.68	1739
1546.13	1736	1548.92	1735	1551.85	1734
1562.81	1731	1568.05	1730	1593.51	1729
1652.22	1731	1658.48	1732	1661.55	1733
1668.83	1736	1670.5	1737	1672.17	1738
1677.37	1741	1679.77	1742	1682.17	1743

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1501.96	.016	1528.03	.027	1684.56	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1528.03	1684.56		114	94	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.00	Reach Len. (ft)	114.00	94.00	87.00
Crit W.S. (ft)		Flow Area (sq ft)	65.28	2238.26	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)	65.28	2238.26	
Q Total (cfs)	11467.08	Flow (cfs)	171.44	11295.63	

Top Width (ft)	182.60	Top Width (ft)	26.07	156.53
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	2.63	5.05
Max Chl Dpth (ft)	18.00	Hydr. Depth (ft)	2.50	14.30
Conv. Total (cfs)	711339.6	Conv. (cfs)	10635.1	700704.4
Length Wtd. (ft)	94.15	Wetted Per. (ft)	28.09	164.98
Min Ch El (ft)	1729.00	Shear (lb/sq ft)	0.04	0.22
Alpha	1.02	Stream Power (lb/ft s)	1684.56	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	5.93	436.70
C & E Loss (ft)	0.03	Cum SA (acres)	4.72	88.53
				22.68
				8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1139.9

INPUT

Description: Charleston Bridge US 1139.9

Station	Elevation	Data	num=	12	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.57	1000	1738.7	1000	1735.19	1021.35	1727.25	1022	1727.87			
1054.5	1726.75	1087	1726.44	1119.5	1727.81	1120.15	1727.38	1141.5	1736.03			
1141.5	1738.95	1141.5	1740.84									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
1000	1141.5	102	102	102			.3	.5	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.06	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1734.03	Flow Area (sq ft)		2646.33	
E.G. Slope (ft/ft)	0.000153	Area (sq ft)		2646.33	
Q Total (cfs)	11304.35	Flow (cfs)		11304.35	
Top Width (ft)	141.50	Top Width (ft)		141.50	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)		4.27	
Max Chl Dpth (ft)	20.62	Hydr. Depth (ft)		18.70	
Conv. Total (cfs)	915368.6	Conv. (cfs)		915368.6	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		167.94	
Min Ch El (ft)	1726.44	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)	1141.50	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	5.84	431.43	22.68
C & E Loss (ft)		Cum SA (acres)	4.68	88.21	8.50

BRIDGE

RIVER: River #1
 REACH: Reach #1 RS: 1139.5

INPUT

Description: Charleston Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1000	1742.92	1732.45	1141.5	1743.16	1732.7						

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	12	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.57	1000	1738.7	1000	1735.19	1021.35	1727.25	1022	1727.87			
1054.5	1726.75	1087	1726.44	1119.5	1727.81	1120.15	1727.38	1141.5	1736.03			
1141.5	1738.95	1141.5	1740.84									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.

1000 1141.5 .3 .5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1742.91 1732.35 1141.5 1743.26 1732.64

Downstream Bridge Cross Section Data

Station Elevation Data num= 11
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
1000 1740.56 1000 1738.6 1000 1735.61 1021.35 1726.55 1022 1726.82
1054.5 1726.34 1087 1726.25 1119.5 1726.66 1141.5 1735.8 1141.5 1738.89
1141.5 1740.91

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
1000 .075 1000 .027 1141.5 .095

Bank Sta: Left Right Coeff Contr. Expan.

1000 1141.5 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station Upstream= 1022 Downstream= 1022

Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1054.5 Downstream= 1054.5

Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1087.5 Downstream= 1087.5

Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1119.5 Downstream= 1119.5

Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Number of Bridge Coefficient Sets = 2

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1747.35	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1747.06	E.G. Elev (ft)	1747.34	1746.92
Q Total (cfs)	11304.35	W.S. Elev (ft)	1747.06	1745.63
Q Bridge (cfs)	8023.26	Crit W.S. (ft)	1732.59	1732.48
Q Weir (cfs)	3281.09	Max Chl Dpth (ft)	20.62	19.38
Weir Sta Lft (ft)	1000.00	Vel Total (ft/s)	0.00	0.00
Weir Sta Rgt (ft)	1141.50	Flow Area (sq ft)		
Weir Submerg	0.00	Froude # Chl	0.38	0.45
Weir Max Depth (ft)	4.42	Specif Force (cu ft)	14722.99	14749.75
Min El Weir Flow (ft)	1742.93	Hydr Depth (ft)		
Min El Prs (ft)	1732.69	W.P. Total (ft)	436.88	438.76
Delta EG (ft)	4.01	Conv. Total (cfs)		
Delta WS (ft)	4.17	Top Width (ft)	141.50	141.50
BR Open Area (sq ft)	592.18	Frctn Loss (ft)		
BR Open Vel (ft/s)	13.55	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1139.1

INPUT

Description: Charleston Bridge DS 1139.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.56	1000	1738.6	1000	1735.61	1021.35	1726.55	1022	1726.82
1054.5	1726.34	1087	1726.25	1119.5	1726.66	1141.5	1735.8	1141.5	1738.89
1141.5	1740.91								

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1141.5		19	25	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1743.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1742.89	Reach Len. (ft)	19.00	25.00	28.00
Crit W.S. (ft)		Flow Area (sq ft)		2123.08	
E.G. Slope (ft/ft)	0.000297	Area (sq ft)		2123.08	
Q Total (cfs)	11304.35	Flow (cfs)		11304.35	

Top Width (ft)	141.50	Top Width (ft)	141.50
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	5.32
Max Chl Dpth (ft)	16.64	Hydr. Depth (ft)	15.00
Conv. Total (cfs)	655971.2	Conv. (cfs)	655971.2
Length Wtd. (ft)	25.00	Wetted Per. (ft)	159.60
Min Ch El (ft)	1726.25	Shear (lb/sq ft)	0.25
Alpha	1.00	Stream Power (lb/ft s)	1141.50 0.00 0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	5.84 428.86 22.68
C & E Loss (ft)	0.09	Cum SA (acres)	4.68 87.88 8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1139

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 35		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1742	1031.03	1741	1042.1	1740 1046.14
1052.46	1737	1054.24	1736	1056.03	1735 1057.82
1062.02	1732	1065.71	1731	1069.51	1730 1083.5
1108.7	1727	1116	1726	1124	1726 1133.83
1155.25	1729	1160.88	1730	1163.86	1731 1166.48
1170.82	1734	1172.48	1735	1174.13	1736 1175.74
1178.87	1739	1180.87	1740	1184.24	1741 1193.58
					1742 1250.83 1743

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1031.03	.027	1184.24	.025 1193.58
					.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1031.03	1184.24		132	175	185	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1743.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.075	0.027	0.030
W.S. Elev (ft)	1742.50	Reach Len. (ft)	132.00	175.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)	31.17	1724.83	16.66
E.G. Slope (ft/ft)	0.000644	Area (sq ft)	31.17	1724.83	16.66
Q Total (cfs)	11876.35	Flow (cfs)	15.55	11845.50	15.29
Top Width (ft)	222.46	Top Width (ft)	31.03	153.21	38.22
Vel Total (ft/s)	6.70	Avg. Vel. (ft/s)	0.50	6.87	0.92
Max Chl Dpth (ft)	16.50	Hydr. Depth (ft)	1.00	11.26	0.44
Conv. Total (cfs)	467877.4	Conv. (cfs)	612.5	466662.4	602.6
Length Wtd. (ft)	174.65	Wetted Per. (ft)	31.55	158.24	38.27
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.04	0.44	0.02
Alpha	1.05	Stream Power (lb/ft s)	1250.83	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	5.83	427.75	22.67
C & E Loss (ft)	0.09	Cum SA (acres)	4.67	87.79	8.49

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1138

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
980	1741.5	1000	1741	1063.4	1740 1076.53
1117.16	1740	1122.62	1739	1126.16	1738 1129.69
1135.88	1735	1138.98	1734	1142.23	1733 1145.51
1155.4	1730	1163.52	1729	1170.78	1728 1175.83
					1727 1180 1726

1185	1726	1192.9	1727	1196.6	1728	1200.06	1729	1207.15	1730
1215.71	1731	1221.47	1732	1224.88	1733	1228.29	1734	1231.58	1735
1234.44	1736	1237.37	1737	1240.3	1738	1243.31	1739	1246.6	1740
1249.89	1741	1256.07	1742	1265.45	1743				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980	.075	1082.9	.025	1117.16	.027	1246.6	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1117.16	1246.6		150	200	202	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.67	Wt. n-Val.	0.040	0.027	0.025
W.S. Elev (ft)	1741.29	Reach Len. (ft)	150.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	120.93	1219.62	2.85
E.G. Slope (ft/ft)	0.001876	Area (sq ft)	120.93	1219.62	2.85
Q Total (cfs)	12936.00	Flow (cfs)	191.96	12739.15	4.89
Top Width (ft)	263.22	Top Width (ft)	128.70	129.44	5.07
Vel Total (ft/s)	9.63	Avg. Vel. (ft/s)	1.59	10.45	1.71
Max Chl Dpth (ft)	15.29	Hydr. Depth (ft)	0.94	9.42	0.56
Conv. Total (cfs)	298692.4	Conv. (cfs)	4432.3	294147.2	112.9
Length Wtd. (ft)	199.24	Wetted Per. (ft)	128.71	132.94	5.25
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.11	1.07	0.06
Alpha	1.16	Stream Power (lb/ft s)	1265.45	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	5.60	421.84	22.63
C & E Loss (ft)	0.00	Cum SA (acres)	4.43	87.22	8.40

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1137

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1741	1077.33	1740	1087.89	1739.76	1120.88	1739	1125.37	1738
1128.81	1737	1131.95	1736	1135.28	1735	1138.63	1734	1141.92	1733
1145.57	1732	1149.67	1731	1154.45	1730	1165.34	1729	1173.32	1728
1178.75	1727	1184	1726	1190	1726	1196.45	1727	1201.73	1728
1208.22	1729	1215.64	1730	1221.82	1731	1226.2	1732	1229.66	1733
1232.78	1734	1235.61	1735	1238.05	1736	1240.41	1737	1242.74	1738
1245.09	1739	1248.33	1740	1252.86	1741	1270.22	1742		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1087.89	.025	1120.88	.03	1245.09	.025	1252.86	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1120.88	1245.09		185	200	210	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.	0.032	0.030	0.025
W.S. Elev (ft)	1740.89	Reach Len. (ft)	185.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	91.56	1220.61	6.33
E.G. Slope (ft/ft)	0.002177	Area (sq ft)	91.56	1220.61	6.33
Q Total (cfs)	12936.00	Flow (cfs)	202.29	12718.09	15.61
Top Width (ft)	244.19	Top Width (ft)	112.69	124.21	7.29
Vel Total (ft/s)	9.81	Avg. Vel. (ft/s)	2.21	10.42	2.47
Max Chl Dpth (ft)	14.89	Hydr. Depth (ft)	0.81	9.83	0.87
Conv. Total (cfs)	277255.4	Conv. (cfs)	4335.7	272585.0	334.6
Length Wtd. (ft)	199.68	Wetted Per. (ft)	112.70	127.50	7.54
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.11	1.30	0.11
Alpha	1.11	Stream Power (lb/ft s)	1270.22	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	5.24	416.24	22.61
C & E Loss (ft)	0.10	Cum SA (acres)	4.02	86.64	8.37

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1136

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1742	1080.59	1741	1103.15	1741	1106.83
1162.57	1741	1212.71	1740	1244.32	1739	1293.58
1299.49	1738	1303.82	1737	1307.5	1736	1311.14
1319.07	1733	1323.56	1732	1328.41	1731	1333.89
1347.36	1728	1351.6	1727	1355.85	1726	1372.12
1382.35	1728	1392.13	1729	1397.48	1730	1401.73
1410.24	1733	1414.78	1734	1419.46	1735	1423.75
1432.86	1738	1439.67	1739	1449.33	1740	

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1244.32	.025	1293.58	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1293.58	1449.33		160	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.031	0.030	
W.S. Elev (ft)	1740.70	Reach Len. (ft)	160.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	134.22	1344.30	
E.G. Slope (ft/ft)	0.002077	Area (sq ft)	134.22	1344.30	
Q Total (cfs)	12936.00	Flow (cfs)	353.59	12582.41	
Top Width (ft)	271.83	Top Width (ft)	116.08	155.75	
Vel Total (ft/s)	8.75	Avg. Vel. (ft/s)	2.63	9.36	
Max Chl Dpth (ft)	14.70	Hydr. Depth (ft)	1.16	8.63	
Conv. Total (cfs)	283821.1	Conv. (cfs)	7757.9	276063.2	
Length Wtd. (ft)	199.24	Wetted Per. (ft)	116.10	159.24	
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.15	1.09	
Alpha	1.12	Stream Power (lb/ft s)	1449.33	0.00	0.00
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	4.76	410.35	22.59
C & E Loss (ft)	0.05	Cum SA (acres)	3.53	86.00	8.35

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1135

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 40			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1742	1016.66	1741	1103.49	1740.65	1163.13
1275.46	1739	1289.63	1738	1300.25	1738	1308.42
1320.27	1738	1323.69	1737	1327.1	1736	1330.38
1337.22	1733	1341.08	1732	1346.63	1731	1353.73
1370.71	1728	1374.69	1727	1379.09	1726	1396.93
1412.81	1728	1418.65	1729	1422.56	1730	1425.7
1432.68	1733	1436.65	1734	1441.33	1735	1445.44
1453.98	1738	1487.57	1738	1506.01	1739	1527.67

Manning's n Values			num= 5		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1264.15	.025	1308.42	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1308.42	1453.98		155	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1741.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.026	0.030	0.034
W.S. Elev (ft)	1740.43	Reach Len. (ft)	155.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	102.30	1334.32	235.58
E.G. Slope (ft/ft)	0.001760	Area (sq ft)	102.30	1334.32	235.58
Q Total (cfs)	12936.00	Flow (cfs)	297.45	11989.63	648.92
Top Width (ft)	441.97	Top Width (ft)	150.39	145.56	146.02
Vel Total (ft/s)	7.74	Avg. Vel. (ft/s)	2.91	8.99	2.75
Max Chl Dpth (ft)	14.43	Hydr. Depth (ft)	0.68	9.17	1.61
Conv. Total (cfs)	308327.9	Conv. (cfs)	7089.6	285771.2	15467.0
Length Wtd. (ft)	198.98	Wetted Per. (ft)	150.53	148.40	146.48
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.07	0.99	0.18

Alpha	1.26	Stream Power (lb/ft s)	1600.00	0.00	0.00
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	4.32	404.20	22.03
C & E Loss (ft)	0.05	Cum SA (acres)	3.04	85.31	8.00

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1134

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	36
Sta	Elev	Sta	Elev	Sta
1000	1740	1012.86	1739	1031.77
1095.68	1738	1099.23	1737	1102.63
1112.99	1733	1117.1	1732	1121.83
1142.46	1728	1150.02	1727	1158.57
1192.85	1728	1197.34	1729	1201.77
1216.28	1733	1220.85	1734	1224.59
1287.87	1738	1293.97	1738	1331.61
1388.41	1741		1738	1361.68

Manning's n	Values	num=	5
Sta	n Val	Sta	n Val
1000	.095	1031.77	.025
		1099.23	.03
		1233.77	.025
		1287.87	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1099.23	1233.77		180	208	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1741.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.	0.028	0.030	0.037
W.S. Elev (ft)	1740.25	Reach Len. (ft)	180.00	208.00	265.00
Crit W.S. (ft)		Flow Area (sq ft)	196.39	1376.37	311.11
E.G. Slope (ft/ft)	0.001325	Area (sq ft)	196.39	1376.37	311.11
Q Total (cfs)	12936.00	Flow (cfs)	604.02	11564.33	767.65
Top Width (ft)	379.14	Top Width (ft)	99.23	134.54	145.37
Vel Total (ft/s)	6.87	Avg. Vel. (ft/s)	3.08	8.40	2.47
Max Chl Dpth (ft)	14.25	Hydr. Depth (ft)	1.98	10.23	2.14
Conv. Total (cfs)	355378.9	Conv. (cfs)	16593.8	317696.3	21088.9
Length Wtd. (ft)	209.04	Wetted Per. (ft)	99.68	136.81	145.45
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.16	0.83	0.18
Alpha	1.36	Stream Power (lb/ft s)	1388.41	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.79	397.98	20.71
C & E Loss (ft)	0.08	Cum SA (acres)	2.60	84.66	7.30

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132.9

INPUT

Description: Nellis Bridge US 1132.9

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1000	1739.32	1000	1735.39	1000
1055	1726.09	1087	1724.48	1119
1143	1734.83	1143	1739.21	1131

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.03
		1143	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1143		112	112	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1740.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.		0.030	
W.S. Elev (ft)	1740.24	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1733.34	Flow Area (sq ft)		1891.32	

E.G. Slope (ft/ft)	0.000708	Area (sq ft)	1891.32		
Q Total (cfs)	12936.00	Flow (cfs)	12936.00		
Top Width (ft)	143.00	Top Width (ft)	143.00		
Vel Total (ft/s)	6.84	Avg. Vel. (ft/s)	6.84		
Max Chl Dpth (ft)	15.76	Hydr. Depth (ft)	13.23		
Conv. Total (cfs)	486228.5	Conv. (cfs)	486228.5		
Length Wtd. (ft)	1.00	Wetted Per. (ft)	159.94		
Min Ch El (ft)	1724.48	Shear (lb/sq ft)	0.52		
Alpha	1.00	Stream Power (lb/ft s)	1143.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	3.39	390.18	19.76
C & E Loss (ft)		Cum SA (acres)	2.39	84.00	6.86

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1132.5

INPUT

Description: Nellis Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 110
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1739.32 1735.39 1143 1739.21 1734.83

Upstream Bridge Cross Section Data

Station Elevation Data		num=	12				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1739.32	1000	1735.39	1000	1733.23	1008	1730.18
1055	1726.09	1087	1724.48	1119	1726.15	1131	1726.41
1143	1734.83	1143	1739.21			1143	1732.67

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1143	.095		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1143		.3	.5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1741.37 1737.362 1143 1740.74 1737.02

Downstream Bridge Cross Section Data

Station Elevation Data		num=	11				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1741.37	1000	1737.62	1000	1733.45	1023	1731.33
1087	1724	1119	1727.55	1131	1728.2	1143	1733.21
1143	1740.74					1143	1737.02

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1143	.095		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1143		.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station	Upstream=	1023	Downstream=	1023
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1720	1.5	1745	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1720	1.5	1745	

Pier Data
Pier Station Upstream= 1055 Downstream= 1055
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Pier Data
Pier Station Upstream= 1087 Downstream= 1087
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Pier Data
Pier Station Upstream= 1119 Downstream= 1119
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1740.97	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1740.24	E.G. Elev (ft)	1740.97	1740.97
Q Total (cfs)	12936.00	W.S. Elev (ft)	1740.24	1740.24
Q Bridge (cfs)	12106.24	Crit W.S. (ft)	1733.55	1734.86
Q Weir (cfs)	829.76	Max Chl Dpth (ft)	15.72	16.16
Weir Sta Lft (ft)	1000.00	Vel Total (ft/s)	0.00	0.00
Weir Sta Rgt (ft)	1143.00	Flow Area (sq ft)		
Weir Submerg	0.00	Froude # Chl	0.46	0.47
Weir Max Depth (ft)	1.76	Specif Force (cu ft)	14675.49	13873.23
Min El Weir Flow (ft)	1740.75	Hydr Depth (ft)		
Min El Prs (ft)	1735.39	W.P. Total (ft)	493.46	359.63
Delta EG (ft)	1.58	Conv. Total (cfs)		
Delta WS (ft)	2.18	Top Width (ft)	143.00	
BR Open Area (sq ft)	1105.32	Frctn Loss (ft)		
BR Open Vel (ft/s)	10.95	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from

the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132.1

INPUT

Description: Nellis Bridge DS 1132.1

Station Elevation Data		num= 11		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1741.37	1000	1737.62	1000	1733.45	1023	1731.33	1055	1727.73
1087	1724	1119	1727.55	1131	1728.2	1143	1733.21	1143	1737.02
1143	1740.74								

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1143	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1143		80	80	90	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

						Left OB		Channel		Right OB	
E.G. Elev (ft)	1739.39	Element									
Vel Head (ft)	1.33	Wt. n-Val.									
W.S. Elev (ft)	1738.06	Reach Len. (ft)		80.00		80.00				90.00	
Crit W.S. (ft)		Flow Area (sq ft)							1396.66		
E.G. Slope (ft/ft)	0.001852	Area (sq ft)							1396.66		
Q Total (cfs)	12936.00	Flow (cfs)							12936.00		
Top Width (ft)	143.00	Top Width (ft)							143.00		
Vel Total (ft/s)	9.26	Avg. Vel. (ft/s)							9.26		
Max Chl Dpth (ft)	14.06	Hydr. Depth (ft)							9.77		
Conv. Total (cfs)	300604.7	Conv. (cfs)							300604.7		
Length Wtd. (ft)	80.00	Wetted Per. (ft)							154.19		
Min Ch El (ft)	1724.00	Shear (lb/sq ft)							1.05		
Alpha	1.00	Stream Power (lb/ft s)		1143.00					0.00		0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)				3.39			387.00		19.76
C & E Loss (ft)	0.06	Cum SA (acres)				2.39			83.82		6.86

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 32		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1739	1024.85	1738	1034.12	1737	1038.95	1736	1042.34	1735		
1045.22	1734	1048.29	1733	1051.37	1732	1055.89	1731	1062.08	1730		
1068.34	1729	1074.03	1728	1084.64	1727	1096.34	1726	1104	1724		
1112	1724	1119.5	1726	1129.59	1727	1139.7	1727	1144.65	1727		
1155.85	1728	1161.66	1729	1166.41	1730	1171.05	1731	1174.5	1732		
1177.97	1733	1182.3	1734	1188.14	1735	1192.1	1736	1196.95	1737		
1202.82	1738	1220.2	1739								

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1220.2	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1220.2		195	200	212	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

						Left OB		Channel		Right OB	
E.G. Elev (ft)	1739.16	Element									
Vel Head (ft)	1.52	Wt. n-Val.									
W.S. Elev (ft)	1737.64	Reach Len. (ft)		195.00		200.00				212.00	
Crit W.S. (ft)		Flow Area (sq ft)							1367.88		
E.G. Slope (ft/ft)	0.002574	Area (sq ft)							1367.88		
Q Total (cfs)	13515.00	Flow (cfs)							13515.00		
Top Width (ft)	172.56	Top Width (ft)							172.56		

Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)	9.88		
Max Chl Dpth (ft)	13.64	Hydr. Depth (ft)	7.93		
Conv. Total (cfs)	266396.0	Conv. (cfs)	266396.0		
Length Wtd. (ft)	200.00	Wetted Per. (ft)	175.45		
Min Ch El (ft)	1724.00	Shear (lb/sq ft)	1.25		
Alpha	1.00	Stream Power (lb/ft s)	1220.20	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	3.39	384.46	19.76
C & E Loss (ft)	0.00	Cum SA (acres)	2.39	83.53	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1131

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 28						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1575.21	1738	1600	1737.2	1628.45	1737	1630.61	1736	1632.96	1735
1635.36	1734	1637.75	1733	1640.98	1732	1644.47	1731	1648.57	1730
1657.72	1729	1684.1	1728	1693.13	1727	1696.22	1726.27	1697.36	1724
1717.89	1724	1724.15	1727	1734.01	1728	1767.88	1729	1772.17	1730
1775.66	1731	1779.01	1732	1782.27	1733	1785.51	1734	1788.93	1735
1792.56	1736	1802.87	1737	1820.64	1738				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1575.21	.095	1575.21	.027	1820.64	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1575.21	1820.64		170	200	235	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1738.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.027	
W.S. Elev (ft)	1737.14	Reach Len. (ft)	170.00	200.00	235.00
Crit W.S. (ft)		Flow Area (sq ft)		1367.37	
E.G. Slope (ft/ft)	0.002496	Area (sq ft)		1367.37	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	195.97	Top Width (ft)		195.97	
Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)		9.88	
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)		6.98	
Conv. Total (cfs)	270532.1	Conv. (cfs)		270532.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		200.60	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	1820.64	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	3.39	378.18	19.76
C & E Loss (ft)	0.24	Cum SA (acres)	2.39	82.68	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1130

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 29						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1737	1030.52	1736.2	1038.04	1736	1060.99	1735	1068.55	1734
1073.14	1733	1077.59	1732	1081.91	1731	1087.05	1730	1094.34	1729
1118.79	1728	1131.84	1727	1139.02	1726	1144.43	1725	1149	1724
1155	1724	1160.56	1725	1165.65	1726	1188.27	1727	1197.82	1728
1223.49	1729	1235.48	1730	1243.04	1731	1254.86	1732	1264.62	1733
1274.45	1734	1289.43	1735	1312.33	1736	1350.65	1737		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1350.65	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1350.65		200	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1738.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1737.30	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1978.19	
E.G. Slope (ft/ft)	0.001547	Area (sq ft)		1978.19	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	350.65	Top Width (ft)		350.65	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	13.30	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	343618.4	Conv. (cfs)		343618.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		352.78	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1350.65	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	370.50	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.39	81.43	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1129

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30		
Sta	Elev	Sta	Elev	Sta	Elev
1648.42	1737	1654.77	1736	1658.17	1735
1668.57	1732	1672.34	1731	1677.11	1730
1728.55	1727	1730.83	1726	1733.33	1724
1766.11	1726	1793.68	1727	1799.36	1728
1813.58	1731	1817.28	1732	1820.5	1733
1828.37	1736	1831.13	1737	1855.22	1738

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1648.42	.095	1648.42	.027	1882.32	.095

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1648.42	1882.32		195	200	190		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1737.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.96	Reach Len. (ft)	195.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1330.55	
E.G. Slope (ft/ft)	0.002307	Area (sq ft)		1330.55	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	173.37	Top Width (ft)		173.37	
Vel Total (ft/s)	10.16	Avg. Vel. (ft/s)		10.16	
Max Chl Dpth (ft)	11.96	Hydr. Depth (ft)		7.67	
Conv. Total (cfs)	281371.6	Conv. (cfs)		281371.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		176.65	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	1882.32	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	3.39	362.91	19.76
C & E Loss (ft)	0.14	Cum SA (acres)	2.39	80.22	6.86

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1128

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 27		
Sta	Elev	Sta	Elev	Sta	Elev
1542.83	1737	1567.15	1736	1585.77	1735
1653.56	1733	1658.65	1732	1663.58	1731
1682.91	1728	1696.98	1727	1720.19	1726
1752.76	1724	1773.53	1726	1788.52	1727
1810.11	1730	1814.47	1731	1818.36	1732
1830.76	1735	1850.62	1736		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
1542.83 .095 1542.83 .027 1850.62 .095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1542.83 1850.62 210 200 200 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.83	Reach Len. (ft)	210.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1588.59	
E.G. Slope (ft/ft)	0.002347	Area (sq ft)		1588.59	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	276.99	Top Width (ft)		276.99	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	11.83	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	278945.0	Conv. (cfs)		278945.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		278.74	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	1850.62	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	3.39	356.21	19.76
C & E Loss (ft)	0.19	Cum SA (acres)	2.39	79.19	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1
REACH: Reach #1 RS: 1127.5

INPUT

Description: XS 1127 Right Overbank Breakout
Lateral structure position = Right overbank
Distance from Upstream XS =
Deck/Roadway Width = 10
Weir Coefficient = 2.6
Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 169

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1741	35	1741	35	1736	47	1736	47	1740
82	1740	82	1735	94	1735	94	1740	129	1740
129	1735	141	1735	141	1740	176	1740	176	1735
188	1735	188	1740	223	1740	223	1735	235	1735
235	1740	270	1740	270	1735	282	1735	282	1740
317	1740	317	1735	329	1735	329	1740	364	1740
364	1735	376	1735	376	1739	411	1739	411	1734
423	1734	423	1739	458	1739	458	1734	470	1734
470	1739	505	1739	505	1734	517	1734	517	1739
552	1739	552	1734	564	1734	564	1739	599	1739
599	1734	611	1734	611	1739	646	1739	646	1734
658	1734	658	1739	693	1739	693	1734	705	1734
705	1739	740	1739	740	1734	752	1734	752	1738
787	1738	787	1733	799	1733	799	1738	834	1738
834	1733	846	1733	846	1738	881	1738	881	1733
893	1733	893	1738	928	1738	928	1733	940	1733
940	1738	975	1738	975	1733	987	1733	987	1738
1022	1738	1022	1733	1034	1733	1034	1738	1069	1738
1069	1733	1081	1733	1081	1738	1116	1738	1116	1733
1128	1733	1128	1738	1163	1738	1163	1733	1175	1733
1175	1738	1210	1738	1210	1733	1222	1733	1222	1738
1257	1738	1257	1733	1269	1733	1269	1738	1304	1738
1304	1733	1316	1733	1316	1738	1351	1735	1351	1730
1363	1730	1363	1735	1398	1734	1398	1729	1410	1729
1410	1734	1445	1734	1445	1729	1457	1729	1457	1734
1492	1734	1492	1729	1504	1729	1504	1734	1539	1734
1539	1729	1551	1729	1551	1734	1586	1734	1586	1729
1598	1729	1598	1734	1633	1734	1633	1729	1645	1729
1645	1734	1680	1734	1680	1729	1692	1729	1692	1734
1727	1734	1727	1729	1739	1729	1739	1734	1774	1733
1774	1728	1786	1728	1786	1733	1821	1733	1821	1728
1833	1728	1833	1733	1868	1733	1868	1728	1880	1728
1880	1733	1915	1733	1915	1728	1927	1728	1927	1732
1962	1732	1962	1727	1974	1727	1974	1732		

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1736.95	Weir Sta US (ft)	82.00
W.S. US. (ft)	1735.83	Weir Sta DS (ft)	1974.00
E.G. DS (ft)	1730.35	Min El Weir Flow (ft)	1727.00
W.S. DS (ft)	1729.48	Wr Top Wdth (ft)	468.00
Q US (cfs)	13515.00	Weir Max Depth (ft)	3.29
Q Leaving Total (cfs)	2046.31	Weir Avg Depth (ft)	1.29
Q DS (cfs)	10127.71	Weir Flow Area (sq ft)	605.14
Perc Q Leaving	15.15	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	2046.31	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1127

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1737	1004.91	1736.7	1016.12	1736	1043.62	1735	1063.98	1734
1141.6	1733	1150.24	1733	1172.94	1733	1178.73	1732	1183.87	1731
1188.63	1730	1194.63	1729	1201.27	1728	1209.2	1727	1224.82	1726
1246.99	1725	1256	1724	1266	1724	1277.18	1725	1305.91	1726
1317.62	1727	1325.67	1728	1331.79	1729	1337.21	1730	1342.27	1731
1347.76	1732	1360.4	1733	1457.54	1733.71	1496.66	1734	1570.17	1735
1620	1735								

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1620	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1620		240	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.87	Reach Len. (ft)	240.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		2374.88	
E.G. Slope (ft/ft)	0.001698	Area (sq ft)		2374.88	
Q Total (cfs)	13440.42	Flow (cfs)		13440.42	
Top Width (ft)	600.37	Top Width (ft)		600.37	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	
Max Chl Dpth (ft)	11.87	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	326138.7	Conv. (cfs)		326138.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		602.48	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)	1620.00	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	347.11	19.76
C & E Loss (ft)	0.00	Cum SA (acres)	2.39	77.17	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1126

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	25					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1513.37	1736	1529.85	1735	1598.68	1734	1634.82	1733	1657.78	1732.56
1687.51	1732	1694.52	1731	1700.62	1730	1706.3	1729	1712.26	1728
1719.46	1727	1728.13	1726	1739.49	1724	1776.29	1724	1786.58	1724

1827.48	1726	1835.99	1727	1842.02	1728	1847.46	1729	1852.72	1730
1858.42	1731	1867.35	1732	1883.99	1733	1999	1734	2069	1735

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1513.37	.095	1513.37	.027	2069	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1513.37	2069		260	200	180	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.47	Reach Len. (ft)	260.00	200.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		2254.19	
E.G. Slope (ft/ft)	0.001766	Area (sq ft)		2254.19	
Q Total (cfs)	13372.80	Flow (cfs)		13372.80	
Top Width (ft)	546.91	Top Width (ft)		546.91	
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)		5.93	
Max Chl Dpth (ft)	11.47	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	318253.6	Conv. (cfs)		318253.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		548.61	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)	2069.00	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	3.39	336.48	19.76
C & E Loss (ft)	0.02	Cum SA (acres)	2.39	74.54	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1125

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	26
Sta	Elev	Sta	Elev	Sta
1000	1735	1008.75	1734	1095.34
1157.85	1730	1165.12	1729	1172.44
1207.66	1725	1233.1	1724	1249.67
1300.87	1727	1306.19	1728	1310.79
1322.47	1732	1325.89	1733	1329.28
1508.05	1734		1734	1416.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1508.05	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1508.05		220	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1734.83	Reach Len. (ft)	220.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1921.50	
E.G. Slope (ft/ft)	0.002659	Area (sq ft)		1921.50	
Q Total (cfs)	13222.81	Flow (cfs)		13222.81	
Top Width (ft)	506.60	Top Width (ft)		506.60	
Vel Total (ft/s)	6.88	Avg. Vel. (ft/s)		6.88	
Max Chl Dpth (ft)	10.83	Hydr. Depth (ft)		3.79	
Conv. Total (cfs)	256431.2	Conv. (cfs)		256431.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		508.85	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)	1508.05	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	3.39	326.90	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.39	72.12	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1124.5

INPUT

Description:
Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates		num =		133					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1740	35	1740	35	1735	47	1735	47	1740
82	1739	82	1734	94	1734	94	1739	129	1739
129	1734	141	1734	141	1739	176	1738	176	1733
188	1733	188	1738	223	1738	223	1733	235	1733
235	1738	270	1738	270	1733	282	1733	282	1738
317	1738	317	1733	329	1733	329	1738	341	1736
533	1736	552	1738	552	1733	564	1733	564	1738
599	1738	599	1733	611	1733	611	1738	646	1737
646	1732	658	1732	658	1737	693	1737	693	1732
705	1732	705	1737	740	1736	740	1731	752	1731
752	1736	787	1736	787	1731	799	1731	799	1736
834	1736	834	1731	846	1731	846	1736	881	1735
881	1730	893	1730	893	1735	928	1735	928	1730
940	1730	940	1735	975	1735	975	1730	987	1730
987	1735	1022	1735	1022	1730	1034	1730	1034	1735
1069	1735	1069	1730	1081	1730	1081	1735	1116	1734
1116	1729	1128	1729	1128	1734	1163	1734	1163	1729
1175	1729	1175	1734	1210	1734	1210	1729	1222	1729
1222	1734	1257	1734	1257	1730	1269	1730	1269	1734
1304	1734	1304	1729	1316	1729	1316	1734	1351	1733
1351	1728	1363	1728	1363	1733	1398	1733	1398	1728
1410	1728	1410	1733	1445	1733	1445	1728	1457	1728
1457	1733	1492	1733	1492	1728	1504	1728	1504	1733
1539	1733	1539	1728	1551	1728	1551	1733	1586	1733
1586	1728	1598	1728	1598	1733	1633	1733	1633	1728
1645	1728	1645	1733	1680	1733	1680	1728	1692	1728
1692	1733	1727	1733	1739	1733				

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1735.57	Weir Sta US (ft)	82.00
W.S. US. (ft)	1734.83	Weir Sta DS (ft)	1692.00
E.G. DS (ft)	1729.43	Min El Weir Flow (ft)	1728.00
W.S. DS (ft)	1728.65	Wr Top Wdth (ft)	372.00
Q US (cfs)	13222.81	Weir Max Depth (ft)	2.38
Q Leaving Total (cfs)	1696.41	Weir Avg Depth (ft)	1.40
Q DS (cfs)	9756.40	Weir Flow Area (sq ft)	518.99
Perc Q Leaving	12.82	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	1696.41	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1124

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		21					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1287.75	1733	1428.82	1732	1452.97	1731	1459.76	1730	1465.55	1729
1471.61	1728	1478.81	1727	1487.53	1726	1501.71	1725	1522.04	1724
1547.99	1724	1574.42	1725	1588.37	1726	1597.24	1727	1604.22	1728
1609.73	1729	1614.97	1730	1621.24	1731	1631.22	1732	1751.14	1733
1775.15	1734								

Manning's n Values

num=		3			
Sta	n Val	Sta	n Val	Sta	n Val
1287.75	.095	1287.75	.027	1775.15	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1287.75	1775.15		180	200 200.421	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.027	
W.S. Elev (ft)	1734.42	Reach Len. (ft)	180.00	200.00	200.42
Crit W.S. (ft)		Flow Area (sq ft)		2021.53	
E.G. Slope (ft/ft)	0.002089	Area (sq ft)		2021.53	
Q Total (cfs)	13074.79	Flow (cfs)		13074.79	
Top Width (ft)	487.40	Top Width (ft)		487.40	
Vel Total (ft/s)	6.47	Avg. Vel. (ft/s)		6.47	
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)		4.15	
Conv. Total (cfs)	286090.0	Conv. (cfs)		286090.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		490.22	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1775.15	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	3.39	317.84	19.76
C & E Loss (ft)	0.02	Cum SA (acres)	2.39	69.84	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1

RS: 1123

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num=	25
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1736 1031.36 1735 1036.67 1734 1044.22 1733 1051.62 1732		
1058.44 1731 1063.36 1730 1068.65 1729 1074.76 1728 1082.46 1727		
1094.34 1726 1115.61 1725 1126.42 1724 1131.96 1723 1150.24 1723		
1162.29 1724 1185.97 1725 1199.74 1726 1209.43 1727 1216.72 1728		
1223.28 1729 1231.29 1730 1245.05 1731 1345.5 1732 1363.37 1733		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .095 1000 .027 1363.37 .095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1363.37		202	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.		0.027	
W.S. Elev (ft)	1733.74	Reach Len. (ft)	202.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1688.86	
E.G. Slope (ft/ft)	0.002124	Area (sq ft)		1688.86	
Q Total (cfs)	12808.24	Flow (cfs)		12808.24	
Top Width (ft)	324.70	Top Width (ft)		324.70	
Vel Total (ft/s)	7.58	Avg. Vel. (ft/s)		7.58	
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)		5.20	
Conv. Total (cfs)	277940.8	Conv. (cfs)		277940.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		326.59	
Min Ch El (ft)	1723.00	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	1363.37	0.00	0.00
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	3.39	309.33	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	67.98	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1

RS: 1122

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num=	29
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1733 1003.81 1733 1031.26 1733 1146.88 1732.15 1167.6 1732		
1185.86 1731 1206.3 1730 1214.51 1729 1220.87 1728 1227.29 1727		
1235.57 1726 1247.76 1725 1278.14 1724 1284.01 1723 1287.5 1722		

1299.27	1722	1302.97	1723	1309.2	1724	1339.95	1725	1352.93	1726
1361.62	1727	1368.16	1728	1374.7	1729	1381.4	1730	1388.9	1731
1401.75	1732	1471.42	1732	1501.6	1732	1506.92	1733		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1506.92	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1506.92		220	200	170	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1733.22	Reach Len. (ft)	220.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)		1718.02	
E.G. Slope (ft/ft)	0.003592	Area (sq ft)		1718.02	
Q Total (cfs)	12754.82	Flow (cfs)		12754.82	
Top Width (ft)	506.92	Top Width (ft)		506.92	
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)		7.42	
Max Chl Dpth (ft)	11.22	Hydr. Depth (ft)		3.39	
Conv. Total (cfs)	212827.0	Conv. (cfs)		212827.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		508.72	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1506.92	0.00	0.00
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	3.39	301.50	19.76
C & E Loss (ft)	0.06	Cum SA (acres)	2.39	66.07	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1121

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	27
Sta	Elev	Sta	Elev	Sta
1132.09	1731	1182.84	1730	1246.86
1282.51	1726	1293.08	1725	1318.92
1350	1722	1355.69	1723	1360.71
1414.66	1727	1420.42	1728	1427.55
1475.35	1732	1515.94	1732	1534.26
1581.08	1733	1598.51	1733	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1132.09	.095	1132.09	.027	1598.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1132.09	1598.51		225	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.027	
W.S. Elev (ft)	1732.84	Reach Len. (ft)	225.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1937.29	
E.G. Slope (ft/ft)	0.001970	Area (sq ft)		1937.29	
Q Total (cfs)	12510.40	Flow (cfs)		12510.40	
Top Width (ft)	447.83	Top Width (ft)		447.83	
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46	
Max Chl Dpth (ft)	10.84	Hydr. Depth (ft)		4.33	
Conv. Total (cfs)	281833.3	Conv. (cfs)		281833.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		450.76	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)	1598.51	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	3.39	293.11	19.76
C & E Loss (ft)	0.10	Cum SA (acres)	2.39	63.87	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1120

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 36		
Sta	Elev	Sta	Elev	Sta	Elev
1300.11	1731	1307.97	1731	1401.81	1731
1425.25	1728	1431.32	1727	1437.3	1726
1476.18	1723	1484.14	1722	1499.66	1722
1543.39	1725	1554.56	1726	1564.64	1727
1585.66	1730	1592.1	1731	1597.52	1732
1618.5	1734	1638.39	1733	1638.43	1733
1687.69	1734	1693.07	1733	1716.67	1732
1789.33	1730				1731

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1300.11	.095	1300.11	.027	1789.33	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1300.11	1789.33		220	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.10	Reach Len. (ft)	220.00	200.00	190.00
Crit W.S. (ft)	1730.56	Flow Area (sq ft)		1131.21	
E.G. Slope (ft/ft)	0.007375	Area (sq ft)		1131.21	
Q Total (cfs)	11555.53	Flow (cfs)		11555.53	
Top Width (ft)	353.51	Top Width (ft)		353.51	
Vel Total (ft/s)	10.22	Avg. Vel. (ft/s)		10.22	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		3.20	
Conv. Total (cfs)	134555.6	Conv. (cfs)		134555.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		356.00	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	1789.33	0.00	0.00
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)		3.39	286.07
C & E Loss (ft)	0.26	Cum SA (acres)		2.39	62.04

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1119

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 24		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1730	1014.4	1730	1063.09	1730
1160.87	1727	1168.58	1726	1178	1725
1231.68	1722	1252.45	1722	1260.08	1723
1307.05	1726	1314.88	1727	1319.83	1724
1388.61	1729	1422.14	1729	1451.6	1729

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1490.63	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1490.63		210	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.027	

W.S. Elev (ft)	1730.73	Reach Len. (ft)	210.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1566.23	
E.G. Slope (ft/ft)	0.003448	Area (sq ft)		1566.23	
Q Total (cfs)	10925.12	Flow (cfs)		10925.12	
Top Width (ft)	490.63	Top Width (ft)		490.63	
Vel Total (ft/s)	6.98	Avg. Vel. (ft/s)		6.98	
Max Chl Dpth (ft)	8.73	Hydr. Depth (ft)		3.19	
Conv. Total (cfs)	186062.2	Conv. (cfs)		186062.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		493.86	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	1490.63	0.00	0.00
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	3.39	279.88	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	60.10	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1118

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	27						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1729	1069.32	1729	1117.15	1729	1186.63	1729	1240.15	1729
1248.02	1728	1254.85	1727	1261.74	1726	1268.62	1725	1276.56	1724
1289.38	1723	1321.86	1722	1342.9	1722	1368.4	1723	1388.37	1724
1399.29	1725	1406.83	1726	1415.18	1727	1439.28	1728	1462.98	1729
1471.82	1730	1485.58	1731	1508.45	1731	1521.35	1730	1532.13	1729
1545.1	1728	1565.17	1728						

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1000	.095	1000	.027	1565.17	.095	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1565.17		210	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.82	Reach Len. (ft)	210.00	200.00	190.00
Crit W.S. (ft)	1729.41	Flow Area (sq ft)		1381.98	
E.G. Slope (ft/ft)	0.004818	Area (sq ft)		1381.98	
Q Total (cfs)	10186.10	Flow (cfs)		10186.10	
Top Width (ft)	512.18	Top Width (ft)		512.18	
Vel Total (ft/s)	7.37	Avg. Vel. (ft/s)		7.37	
Max Chl Dpth (ft)	7.82	Hydr. Depth (ft)		2.70	
Conv. Total (cfs)	146752.1	Conv. (cfs)		146752.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		515.61	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)	1565.17	0.00	0.00
Frctn Loss (ft)	1.02	Cum Volume (acre-ft)	3.39	273.11	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	57.80	6.86

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1117

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	26						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728	1031.6	1728	1154.08	1727	1163.55	1726	1171.05	1725
1178.29	1724	1188.12	1723	1215.02	1722	1252.54	1722	1288.85	1723
1304.51	1724	1316.12	1725	1326.55	1726	1338.53	1727	1345.47	1728
1349.48	1729	1354.6	1730	1360.85	1731	1377.25	1731	1385.12	1730
1402.61	1729	1453.82	1728	1486	1727	1524.75	1727	1525.2	1727.01

1566.82 1728

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
1000 .095 1000 .027 1566.82 .095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1000 1566.82 185 199 215 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.72	Reach Len. (ft)	185.00	199.00	215.00
Crit W.S. (ft)		Flow Area (sq ft)		1313.87	
E.G. Slope (ft/ft)	0.005412	Area (sq ft)		1313.87	
Q Total (cfs)	10127.71	Flow (cfs)		10127.71	
Top Width (ft)	498.05	Top Width (ft)		498.05	
Vel Total (ft/s)	7.71	Avg. Vel. (ft/s)		7.71	
Max Chl Dpth (ft)	6.72	Hydr. Depth (ft)		2.64	
Conv. Total (cfs)	137669.2	Conv. (cfs)		137669.2	
Length Wtd. (ft)	199.00	Wetted Per. (ft)		500.12	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	1566.82	0.00	0.00
Frothn Loss (ft)	0.57	Cum Volume (acre-ft)	3.39	266.92	19.76
C & E Loss (ft)	0.14	Cum SA (acres)	2.39	55.48	6.86

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1

REACH: Reach #1 RS: 1116.5

INPUT

Description:

Lateral structure position = Right overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733	60	1733	60	1728	75	1728	75	1731
135	1731	135	1726	150	1726	150	1731	210	1731
210	1726	225	1726	225	1731	285	1731	285	1726
300	1726	300	1731	360	1731	360	1726	375	1726
375	1731	435	1731	435	1726	450	1726	450	1731
510	1730	510	1725	525	1725	525	1730	585	1730
585	1725	600	1725	600	1730	660	1730	660	1725
675	1725	675	1730	735	1730	735	1725	750	1725
750	1730	810	1730	810	1725	825	1725	825	1730
885	1730	885	1725	900	1725	900	1730	960	1730
960	1725	975	1725	975	1729	1035	1729	1035	1724
1050	1724	1050	1729	1110	1729	1110	1724	1125	1724
1125	1728	1185	1728	1185	1723	1200	1723	1200	1728
1260	1728	1260	1723	1275	1723	1275	1728	1335	1728
1335	1723	1350	1723	1350	1728	1410	1727	1410	1722
1425	1722	1425	1727	1485	1727	1485	1722	1500	1722
1500	1727	1560	1727	1560	1722	1575	1722	1575	1727
1635	1727	1635	1722	1650	1722	1650	1727		

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1729.64	Weir Sta US (ft)	60.00
W.S. US. (ft)	1728.72	Weir Sta DS (ft)	1650.00
E.G. DS (ft)	1723.60	Min El Weir Flow (ft)	1722.00
W.S. DS (ft)	1722.27	Wr Top Wdth (ft)	298.94
Q US (cfs)	10127.71	Weir Max Depth (ft)	2.56
Q Leaving Total (cfs)	1203.07	Weir Avg Depth (ft)	1.20
Q DS (cfs)	7973.39	Weir Flow Area (sq ft)	358.83
Perc Q Leaving	11.85	Weir Coef (ft ^{1/2})	2.600

Q Weir (cfs)	1203.07	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1116.4

INPUT

Description:
 Lateral structure position = Left overbank
 Distance from Upstream XS =
 Deck/Roadway Width = 10
 Weir Coefficient = 2.6
 Weir Flow Reference = Water Surface

Weir Embankment Coordinates		num = 173									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733	35	1733	35	1728	47	1728	47	1733		
82	1733	82	1728	94	1728	94	1733	129	1732		
129	1727	141	1727	141	1732	176	1732	176	1727		
188	1727	188	1732	223	1732	223	1727	235	1727		
235	1732	270	1732	270	1727	282	1727	282	1732		
317	1732	317	1727	329	1727	329	1732	364	1732		
364	1727	376	1727	376	1732	411	1732	411	1727		
423	1727	423	1732	458	1732	458	1727	470	1727		
470	1732	505	1732	505	1727	517	1727	517	1732		
552	1732	552	1727	564	1727	564	1732	599	1732		
599	1727	611	1727	611	1732	646	1732	646	1727		
658	1727	658	1732	693	1732	693	1727	705	1727		
705	1732	740	1732	740	1727	752	1727	752	1732		
787	1731	787	1726	799	1726	799	1731	834	1731		
834	1726	846	1726	846	1731	881	1731	881	1726		
893	1726	893	1731	928	1730	928	1725	940	1725		
940	1730	975	1730	975	1725	987	1725	987	1730		
1022	1730	1022	1725	1034	1725	1034	1730	1069	1730		
1069	1725	1081	1725	1081	1730	1116	1730	1116	1725		
1128	1725	1128	1730	1163	1729	1163	1724	1175	1724		
1175	1729	1210	1729	1210	1724	1222	1724	1222	1729		
1257	1729	1257	1724	1269	1724	1269	1729	1304	1729		
1304	1724	1316	1724	1316	1729	1351	1729	1351	1723		
1363	1723	1363	1728	1398	1728	1398	1723	1410	1723		
1410	1728	1445	1728	1445	1723	1457	1723	1457	1728		
1492	1728	1492	1723	1504	1723	1504	1728	1539	1728		
1539	1722	1551	1722	1551	1727	1586	1727	1586	1722		
1598	1722	1598	1727	1633	1727	1633	1722	1645	1722		
1645	1727	1680	1727	1680	1722	1692	1722	1692	1727		
1727	1727	1727	1722	1739	1722	1739	1727	1774	1727		
1774	1722	1786	1722	1786	1727	1821	1727	1821	1722		
1833	1722	1833	1727	1868	1727	1868	1722	1880	1722		
1880	1727	1915	1727	1915	1722	1927	1722	1927	1727		
1962	1727	1962	1722	1974	1722	1974	1727	2009	1727		
2009	1722	2021	1722	2021	1727						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1729.64	Weir Sta US (ft)	35.00
W.S. US. (ft)	1728.72	Weir Sta DS (ft)	2021.00
E.G. DS (ft)	1723.59	Min El Weir Flow (ft)	1722.00
W.S. DS (ft)	1722.23	Wr Top Wdth (ft)	348.00
Q US (cfs)	10127.71	Weir Max Depth (ft)	1.74
Q Leaving Total (cfs)	942.54	Weir Avg Depth (ft)	0.96
Q DS (cfs)	7973.39	Weir Flow Area (sq ft)	332.79
Perc Q Leaving	9.33	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	942.54	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	

Breach Flow Area (sq ft)

Gate Weir Coef

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1116

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	16					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1727	1072.87	1726	1123.42	1726	1152.3	1726	1166.87	1725
1175.87	1724	1184.94	1723	1211.52	1722	1243.63	1721	1246.18	1721
1281.93	1722	1302.43	1723	1313.23	1724	1324.71	1725	1398.55	1726
1498.92	1726								

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1498.92	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	1000	1498.92		185	200	198	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.47	Reach Len. (ft)	185.00	200.00	198.00
Crit W.S. (ft)		Flow Area (sq ft)		1803.02	
E.G. Slope (ft/ft)	0.001763	Area (sq ft)		1803.02	
Q Total (cfs)	9756.40	Flow (cfs)		9756.40	
Top Width (ft)	498.92	Top Width (ft)		498.92	
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)		5.41	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)		3.61	
Conv. Total (cfs)	232353.7	Conv. (cfs)		232353.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		503.18	
Min Ch El (ft)	1721.00	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)	1498.92	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	259.80	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	53.20	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1115

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	18					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
976	1727	1000	1726	1098.55	1726	1122.73	1726	1182.24	1725
1192.64	1724	1201.74	1723	1217.61	1722	1260.6	1721	1282.53	1721
1323.69	1722	1336.35	1723	1345.58	1724	1359.53	1725	1418.37	1726
1467.4	1727	1500.28	1727	1508.77	1727				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
976	.095	976	.027	1508.77	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	976	1508.77		250	200	190	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.16	Reach Len. (ft)	250.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1799.70	
E.G. Slope (ft/ft)	0.001718	Area (sq ft)		1799.70	
Q Total (cfs)	9212.09	Flow (cfs)		9212.09	
Top Width (ft)	532.77	Top Width (ft)		532.77	
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)		3.38	
Conv. Total (cfs)	222247.1	Conv. (cfs)		222247.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		535.41	

Min Ch El (ft)	1721.00	Shear (lb/sq ft)	0.36
Alpha	1.00	Stream Power (lb/ft s)	1508.77
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.13	Cum SA (acres)	2.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1114

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	17
Sta	Elev	Sta	Elev	Sta
1000	1729	1007.29	1729	1044.94
1059.95	1726	1069.28	1725	1088.21
1135.34	1723	1145.72	1722	1192.68
1286.31	1723	1306.74	1725	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.027
		1306.74	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1306.74		240	200	190	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.08	Reach Len. (ft)	240.00	200.00	190.00
Crit W.S. (ft)	1726.08	Flow Area (sq ft)		842.42	
E.G. Slope (ft/ft)	0.007251	Area (sq ft)		842.42	
Q Total (cfs)	8907.23	Flow (cfs)		8907.23	
Top Width (ft)	247.16	Top Width (ft)		247.16	
Vel Total (ft/s)	10.57	Avg. Vel. (ft/s)		10.57	
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)		3.41	
Conv. Total (cfs)	104600.7	Conv. (cfs)		104600.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		248.58	
Min Ch El (ft)	1721.00	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)	1306.74	0.00	0.00
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	3.39	245.46	19.76
C & E Loss (ft)	0.24	Cum SA (acres)	2.39	49.04	6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
 Warning: The cross-section end points had to be extended vertically for the computed water surface.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1113

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	19
Sta	Elev	Sta	Elev	Sta
984	1726	1000	1725	1016.51
1122.98	1721	1144.93	1720	1152.35
			1720	1172.99
			1720	1193.78
				1719

1203.91	1719	1236.06	1720	1263.34	1721	1272.16	1722	1283.95	1723
1310.94	1724	1350.34	1724	1383.92	1724	1401.06	1725		

Manning's n Values num= 3

Sta	n Val	Sta	n Val
984	.095	1000	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1401.06		215	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.94	Wt. n-Val.	0.095	0.027	
W.S. Elev (ft)	1725.10	Reach Len. (ft)	215.00	200.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)	0.07	1141.24	
E.G. Slope (ft/ft)	0.004958	Area (sq ft)	0.07	1141.24	
Q Total (cfs)	8874.03	Flow (cfs)	0.01	8874.02	
Top Width (ft)	402.60	Top Width (ft)	1.54	401.06	
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	0.15	7.78	
Max Chl Dpth (ft)	6.10	Hydr. Depth (ft)	0.05	2.85	
Conv. Total (cfs)	126027.9	Conv. (cfs)	0.2	126027.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	1.54	401.50	
Min Ch El (ft)	1719.00	Shear (lb/sq ft)	0.01	0.88	
Alpha	1.00	Stream Power (lb/ft s)	1401.06	0.00	0.00
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	3.39	240.91	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.39	47.55	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1112

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
1000	1725	1013.34	1724	1087.53
1134.84	1720	1174.61	1719	1203.21
1263.45	1720	1271.38	1721	1365.1
1469.27	1725		1722	1402.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val
1000	.095	1000	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1469.27		245	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.027	
W.S. Elev (ft)	1724.52	Reach Len. (ft)	245.00	200.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1366.21	
E.G. Slope (ft/ft)	0.003094	Area (sq ft)		1366.21	
Q Total (cfs)	8873.91	Flow (cfs)		8873.91	
Top Width (ft)	441.64	Top Width (ft)		441.64	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	6.52	Hydr. Depth (ft)		3.09	
Conv. Total (cfs)	159545.5	Conv. (cfs)		159545.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		441.99	
Min Ch El (ft)	1718.00	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1469.27	0.00	0.00
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	3.39	235.15	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	45.62	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1111

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	17
---------	-----------	------	------	----

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1723	1020.19	1723	1076.48	1723	1114.23	1722	1158.97	1721
1168.08	1720	1175.12	1719	1218.53	1718	1239.55	1717	1256.22	1717
1274.39	1718	1296.9	1719	1310.4	1720	1321.94	1721	1428.63	1722
1458.32	1723	1484.51	1724						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1484.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1484.51		195	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.		0.027	
W.S. Elev (ft)	1724.00	Reach Len. (ft)	195.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1470.01	
E.G. Slope (ft/ft)	0.002739	Area (sq ft)		1470.01	
Q Total (cfs)	8856.65	Flow (cfs)		8856.65	
Top Width (ft)	484.51	Top Width (ft)		484.51	
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)		6.02	
Max Chl Dpth (ft)	7.00	Hydr. Depth (ft)		3.03	
Conv. Total (cfs)	169232.3	Conv. (cfs)		169232.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		485.87	
Min Ch El (ft)	1717.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	1484.51	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	228.64	19.76
C & E Loss (ft)	0.05	Cum SA (acres)	2.38	43.49	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1110

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num=	15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1722 1029.41 1721 1167.55 1720 1180.42 1719 1191.08 1718		
1237.79 1717 1249.21 1716 1261.33 1716 1272.15 1717 1293.4 1718		
1314 1719 1326.1 1720 1372.59 1721 1412.67 1722 1428.52 1723		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1428.52	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1428.52		215	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.76	Reach Len. (ft)	215.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1728.99	
E.G. Slope (ft/ft)	0.001311	Area (sq ft)		1728.99	
Q Total (cfs)	8691.68	Flow (cfs)		8691.68	
Top Width (ft)	428.52	Top Width (ft)		428.52	
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		5.03	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)		4.03	
Conv. Total (cfs)	240090.5	Conv. (cfs)		240090.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		431.38	
Min Ch El (ft)	1716.00	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	1428.52	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.39	221.30	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	41.39	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1109

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 16	
Sta	Elev	Sta	Elev
900	1722	1000	1721
1163.98	1717	1207.07	1716
1267.58	1719	1275.6	1720
1391.15	1722		

Manning's n Values

num= 3	
Sta	n Val
900	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
900	1391.15		320	224	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

	1723.88	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1723.88	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.58	Reach Len. (ft)	320.00	224.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1867.23	
E.G. Slope (ft/ft)	0.001088	Area (sq ft)		1867.23	
Q Total (cfs)	8217.15	Flow (cfs)		8217.15	
Top Width (ft)	491.15	Top Width (ft)		491.15	
Vel Total (ft/s)	4.40	Avg. Vel. (ft/s)		4.40	
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)		3.80	
Conv. Total (cfs)	249113.6	Conv. (cfs)		249113.6	
Length Wtd. (ft)	224.00	Wetted Per. (ft)		494.70	
Min Ch El (ft)	1716.00	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)	1391.15	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	3.39	213.04	19.76
C & E Loss (ft)	0.12	Cum SA (acres)	2.38	39.28	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1107.9

INPUT

Description: Sahara Bridge US 1107.9

Station Elevation Data		num= 9	
Sta	Elev	Sta	Elev
898.794	1727.05	898.794	1725.35
980.584	1714.23	1017.435	1717.42
		1017.435	1721.59
		1017.435	1723.29

Manning's n Values

num= 3	
Sta	n Val
898.794	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
898.794	1017.435		112	112	112	.3	.5

Skew Angle = 26

CROSS SECTION OUTPUT Profile #PF 1

	1723.56	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1723.56	Element			
Vel Head (ft)	1.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1722.09	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1720.36	Flow Area (sq ft)		820.86	
E.G. Slope (ft/ft)	0.000805	Area (sq ft)		820.86	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	118.64	Top Width (ft)		118.64	
Vel Total (ft/s)	9.71	Avg. Vel. (ft/s)		9.71	
Max Chl Dpth (ft)	8.48	Hydr. Depth (ft)		6.92	
Conv. Total (cfs)	281025.7	Conv. (cfs)		281025.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		127.77	
Min Ch El (ft)	1713.61	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)	1017.44	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	3.39	206.13	19.76
C & E Loss (ft)	0.11	Cum SA (acres)	2.38	37.72	6.86

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1107.5

INPUT

Description: Sahara Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 110
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew = 26
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
898.794 1727.05 1725.35 1017.435 1723.29 1721.59

Upstream Bridge Cross Section Data

Station Elevation Data num= 9
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
898.794 1727.05 898.794 1725.35 898.794 1717.99 935.645 1714.15 958.114 1713.61
980.584 1714.23 1017.435 1717.42 1017.435 1721.59 1017.435 1723.29

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
898.794 .095 898.794 .015 1017.435 .095

Bank Sta: Left Right Coeff Contr. Expan.
898.794 1017.435 .3 .5
Skew Angle = 26

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
898.794 1727.85 1726.13 1017.435 1724.55 1722.81

Downstream Bridge Cross Section Data

Station Elevation Data num= 9
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
898.794 1727.85 898.794 1726.13 898.794 1717.42 935.645 1713.71 958.114 1713.19
980.584 1713.79 1017.435 1717.38 1017.435 1722.81 1017.435 1724.55

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
898.794 .095 898.794 .015 1017.435 .095

Bank Sta: Left Right Coeff Contr. Expan.
898.794 1017.435 .3 .5
Skew Angle = 26

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station Upstream= 935.645 Downstream= 935.645
Upstream num= 2
Width Elev Width Elev
2 1710 2 1730
Downstream num= 2
Width Elev Width Elev
2 1710 2 1730

Pier Data

Pier Station Upstream= 980.584 Downstream= 980.584
Upstream num= 2
Width Elev Width Elev
2 1710 2 1730
Downstream num= 2
Width Elev Width Elev
2 1710 2 1730

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy

Momentum Cd = 1.2
 Yarnell KVal = .9
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method
 Energy Only

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1723.56	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1722.09	E.G. Elev (ft)	1723.45	1723.21
Q Total (cfs)	7973.39	W.S. Elev (ft)	1721.63	1721.57
Q Bridge (cfs)	7973.39	Crit W.S. (ft)	1720.53	1720.15
Q Weir (cfs)		Max Chl Dpth (ft)	8.02	8.38
Weir Sta Lft (ft)		Vel Total (ft/s)	10.83	10.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	736.46	774.15
Weir Submerg		Froude # Chl	0.67	0.70
Weir Max Depth (ft)		Specif Force (cu ft)	5142.65	5265.50
Min El Weir Flow (ft)	1724.56	Hydr Depth (ft)	6.50	6.75
Min El Prs (ft)	1725.35	W.P. Total (ft)	153.67	154.45
Delta EG (ft)	0.42	Conv. Total (cfs)	207372.9	224605.0
Delta WS (ft)	0.45	Top Width (ft)	113.38	114.64
BR Open Area (sq ft)	947.43	Frctn Loss (ft)	0.15	0.00
BR Open Vel (ft/s)	10.83	C & E Loss (ft)	0.09	0.08
Coef of Q		Shear Total (lb/sq ft)	0.44	0.39
Br Sel Method	Energy only	Power Total (lb/ft s)	898.79	898.79

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow.
 The momentum answer has been disregarded.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1107.1

INPUT

Description: Sahara Bridge DS 1107.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
898.794	1727.85	898.794	1726.13	898.794	1717.42	935.645	1713.71
980.584	1713.79	1017.435	1717.38	1017.435	1722.81	1017.435	1724.55

Sta	n Val	Sta	n Val	Sta	n Val
898.794	.095	898.794	.015	1017.435	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	898.794	1017.435		64	84	64	.3
Skew Angle =	26						

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.		0.015	
W.S. Elev (ft)	1721.65	Reach Len. (ft)	64.00	84.00	64.00
Crit W.S. (ft)		Flow Area (sq ft)		814.69	
E.G. Slope (ft/ft)	0.000823	Area (sq ft)		814.69	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	118.64	Top Width (ft)		118.64	
Vel Total (ft/s)	9.79	Avg. Vel. (ft/s)		9.79	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		6.87	
Conv. Total (cfs)	277891.7	Conv. (cfs)		277891.7	
Length Wtd. (ft)	84.00	Wetted Per. (ft)		127.50	
Min Ch El (ft)	1713.19	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	1017.44	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	3.39	204.19	19.76
C & E Loss (ft)	0.51	Cum SA (acres)	2.38	37.42	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1107

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 28						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728	1003.56	1727	1005.39	1726	1007.22	1725	1009.05	1724
1010.88	1723	1012.7	1722	1014.53	1721	1017.26	1720	1021.63	1719
1055.9	1718.66	1122.1	1718	1128.38	1717	1141.48	1716	1159.3	1715
1180.44	1715	1190	1713	1200	1713	1209.12	1715	1222.51	1715
1227.66	1716	1234.69	1717	1245.9	1718	1258.48	1719	1319.56	1720
1342.03	1721	1369.53	1722	1425.51	1722				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1425.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1425.51		200	180	200.57	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.027	
W.S. Elev (ft)	1722.05	Reach Len. (ft)	200.00	180.00	200.57
Crit W.S. (ft)		Flow Area (sq ft)		1453.66	
E.G. Slope (ft/ft)	0.001864	Area (sq ft)		1453.66	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	412.91	Top Width (ft)		412.91	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		3.52	
Conv. Total (cfs)	184696.8	Conv. (cfs)		184696.8	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		414.39	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)	1425.51	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	3.39	202.00	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.38	36.91	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1106

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 19						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1141.71	1720	1195.06	1720	1249.14	1720	1256.2	1719	1310.22	1718
1324.32	1717	1337.53	1716	1381.12	1715	1393.86	1714	1401	1713
1409	1713	1416.17	1714	1424.25	1715	1459.54	1716	1483.82	1717
1523.32	1718	1554.55	1719	1567.13	1720	1578.97	1721		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1141.71	.055	1141.71	.026	1578.97	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1141.71	1578.97		210	200	192	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.		0.026	
W.S. Elev (ft)	1720.39	Reach Len. (ft)	210.00	200.00	192.00
Crit W.S. (ft)	1720.39	Flow Area (sq ft)		1189.06	
E.G. Slope (ft/ft)	0.007046	Area (sq ft)		1189.06	
Q Total (cfs)	11220.64	Flow (cfs)		11220.64	

Top Width (ft)	430.06	Top Width (ft)	430.06
Vel Total (ft/s)	9.44	Avg. Vel. (ft/s)	9.44
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)	2.76
Conv. Total (cfs)	133676.8	Conv. (cfs)	133676.8
Length Wtd. (ft)	200.00	Wetted Per. (ft)	430.98
Min Ch El (ft)	1713.00	Shear (lb/sq ft)	1.21
Alpha	1.00	Stream Power (lb/ft s)	1578.97
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.22	Cum SA (acres)	2.38
			35.17
			6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

LATERAL STRUCTURE

RIVER: River #1

REACH: Reach #1 RS: 1105.5

INPUT

Description:

Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates				num =	67				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723	35	1723	35	1718	50	1718	50	1723
85	1723	85	1718	100	1718	100	1723	135	1723
135	1718	150	1718	150	1723	185	1723	185	1718
200	1718	200	1723	235	1723	235	1718	250	1718
250	1723	285	1723	285	1718	300	1718	300	1723
335	1723	335	1718	350	1718	350	1723	385	1723
385	1718	400	1718	400	1723	435	1722	435	1717
450	1717	450	1722	485	1722	485	1717	500	1717
500	1722	535	1722	535	1717	550	1717	550	1722
585	1722	585	1717	600	1717	600	1722	635	1722
635	1717	650	1717	650	1722	685	1722	685	1717
700	1717	700	1722	735	1722	735	1717	750	1717
750	1722	785	1722	785	1717	800	1717	800	1722
830	1722	830	1716						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1721.78	Weir Sta US (ft)	35.00
W.S. US. (ft)	1720.39	Weir Sta DS (ft)	800.00
E.G. DS (ft)	1719.51	Min El Weir Flow (ft)	1716.00
W.S. DS (ft)	1718.89	Wr Top Wdth (ft)	240.00
Q US (cfs)	11220.64	Weir Max Depth (ft)	2.73
Q Leaving Total (cfs)	2115.32	Weir Avg Depth (ft)	2.25
Q DS (cfs)	9109.22	Weir Flow Area (sq ft)	539.45
Perc Q Leaving	18.82	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	2115.32	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1105

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 17		
Sta	Elev	Sta	Elev	Sta	Elev
1031.99	1718	1047.9	1717	1067.9	1717
1234.51	1715	1285.73	1714	1294.88	1713
1319.73	1715	1369.03	1716	1427.92	1717
1475.93	1720	1518.48	1721		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1031.99	.055	1031.99	.026	1518.48	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1031.99	1518.48		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.026	
W.S. Elev (ft)	1720.08	Reach Len. (ft)	200.00	200.00	205.00
Crit W.S. (ft)		Flow Area (sq ft)		1658.72	
E.G. Slope (ft/ft)	0.002238	Area (sq ft)		1658.72	
Q Total (cfs)	10707.31	Flow (cfs)		10707.31	
Top Width (ft)	447.20	Top Width (ft)		447.20	
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46	
Max Chl Dpth (ft)	7.08	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	226310.8	Conv. (cfs)		226310.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		449.68	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	1518.48	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	3.39	190.00	19.76
C & E Loss (ft)	0.04	Cum SA (acres)	2.38	33.15	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1104

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 18		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1718	1041.06	1717	1204.48	1716
1240.62	1714	1268.29	1714	1280.65	1713
1350.23	1715	1363.67	1716	1419.2	1717
1502.48	1719	1525.9	1719	1550.04	1720

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1550.04	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1550.04		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.026	
W.S. Elev (ft)	1719.76	Reach Len. (ft)	200.00	200.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)		1817.24	
E.G. Slope (ft/ft)	0.001980	Area (sq ft)		1817.24	
Q Total (cfs)	10297.21	Flow (cfs)		10297.21	
Top Width (ft)	544.22	Top Width (ft)		544.22	
Vel Total (ft/s)	5.67	Avg. Vel. (ft/s)		5.67	
Max Chl Dpth (ft)	6.76	Hydr. Depth (ft)		3.34	
Conv. Total (cfs)	231428.0	Conv. (cfs)		231428.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		546.31	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)	1550.04	0.00	0.00

Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	3.39	182.02	19.76
C & E Loss (ft)	0.05	Cum SA (acres)	2.38	30.88	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1103

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 17									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1717	1043.79	1717	1130.4	1716	1166.5	1715	1184.17	1714		
1229.63	1713	1249.92	1713	1254.56	1714	1313.66	1715	1327.82	1716		
1344.95	1717	1402.28	1717	1407.72	1717	1500.7	1717	1591.29	1718		
1615.61	1719	1615.61	1720								

Manning's n Values		num= 3					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1615.61	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1615.61		220	200	279.323	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.026	
W.S. Elev (ft)	1719.55	Reach Len. (ft)	220.00	200.00	279.32
Crit W.S. (ft)		Flow Area (sq ft)		2060.83	
E.G. Slope (ft/ft)	0.001344	Area (sq ft)		2060.83	
Q Total (cfs)	9627.67	Flow (cfs)		9627.67	
Top Width (ft)	615.61	Top Width (ft)		615.61	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)		3.35	
Conv. Total (cfs)	262610.9	Conv. (cfs)		262610.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		618.97	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)	1615.61	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	3.39	173.12	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	28.22	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1102

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 16									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1716	1014.79	1716	1027.11	1715	1038.23	1714	1103.1	1713		
1112.79	1712	1125.52	1712	1132.61	1713	1197.17	1714	1208.6	1715		
1216.38	1716	1224.81	1717	1301.89	1717	1378.02	1717	1392.82	1718		
1407.93	1719										

Manning's n Values		num= 3					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1407.93	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1407.93		20	26	31	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.026	
W.S. Elev (ft)	1718.89	Reach Len. (ft)	20.00	26.00	31.00
Crit W.S. (ft)		Flow Area (sq ft)		1439.16	
E.G. Slope (ft/ft)	0.002297	Area (sq ft)		1439.16	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	406.28	Top Width (ft)		406.28	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33	

Max Chl Dpth (ft)	6.89	Hydr. Depth (ft)	3.54
Conv. Total (cfs)	190083.5	Conv. (cfs)	190083.5
Length Wtd. (ft)	26.00	Wetted Per. (ft)	409.63
Min Ch El (ft)	1712.00	Shear (lb/sq ft)	0.50
Alpha	1.00	Stream Power (lb/ft s)	1407.93
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.07	Cum SA (acres)	2.38
			25.87
			6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1101.6

INPUT

Description: Pedestrian Bridge US

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1034	1717.87	1041.28	1716	1044.75
1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86
1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1034	1230		11.2	11.2	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.		0.026	
W.S. Elev (ft)	1718.08	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1717.01	Flow Area (sq ft)		995.60	
E.G. Slope (ft/ft)	0.002976	Area (sq ft)		995.60	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	196.00	Top Width (ft)		196.00	
Vel Total (ft/s)	9.15	Avg. Vel. (ft/s)		9.15	
Max Chl Dpth (ft)	6.08	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	166986.3	Conv. (cfs)		166986.3	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		198.03	
Min Ch El (ft)	1712.00	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	1230.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	3.39	164.36	19.76
C & E Loss (ft)		Cum SA (acres)	2.38	25.69	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1101.5

INPUT

Description: Pedestrian Bridge

Distance from Upstream XS = .1
Deck/Roadway Width = 11
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	13
Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord
1028 1721.38 1716	1034 1721.87 1717.87
1075 1724.52 1720.52	1096 1725.58 1721.58
1135 1726 1722	1155 1725.89 1721.89
1195 1724.78 1720.78	1215 1723.6 1719.6
1246 1721.27 1717	1230 1721.81 1717.81

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1034	1717.87	1041.28	1716	1044.75
1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86
1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81	

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1034	1230		.3	.5

Downstream Deck/Roadway Coordinates

num= 13								
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1028	1721.38	1716	1034	1721.87	1717.87	1055	1723.33	1719.33
1075	1724.52	1720.52	1096	1725.58	1721.58	1115	1725.85	1721.85
1135	1726	1722	1155	1725.89	1721.89	1179	1725.52	1721.52
1195	1724.78	1720.78	1215	1723.6	1719.6	1230	1721.81	1717.81
1246	1721.27	1717						

Downstream Bridge Cross Section Data

Station Elevation Data		num= 12							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1034	1717.87	1041.28	1716	1044.75	1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86	1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1034	1230		.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station	Upstream=	1098	Downstream=	1098
Upstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	

Pier Data

Pier Station	Upstream=	1178	Downstream=	1178
Upstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1719.38	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1718.08	E.G. Elev (ft)	1719.29	1719.23
Q Total (cfs)	9109.22	W.S. Elev (ft)	1717.59	1717.14
Q Bridge (cfs)	9109.22	Crit W.S. (ft)	1717.14	1717.14

Q Weir (cfs)		Max Chl Dpth (ft)	5.59	5.14
Weir Sta Lft (ft)		Vel Total (ft/s)	10.48	11.60
Weir Sta Rgt (ft)		Flow Area (sq ft)	869.29	785.24
Weir Submerg		Froude # Chl	0.86	1.00
Weir Max Depth (ft)		Specif Force (cu ft)	5092.48	5039.13
Min El Weir Flow (ft)	1721.82	Hydr Depth (ft)	4.61	4.21
Min El Prs (ft)	1722.00	W.P. Total (ft)	210.52	206.28
Delta EG (ft)	0.29	Conv. Total (cfs)	127869.4	109407.1
Delta WS (ft)	1.01	Top Width (ft)	188.68	186.47
BR Open Area (sq ft)	1462.61	Frctn Loss (ft)		
BR Open Vel (ft/s)	11.60	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.31	1.65
Br Sel Method	Momentum	Power Total (lb/ft s)	1034.00	1034.00

Warning: The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be
run as a mixed flow problem.

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program
defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1101.4

INPUT

Description: Pedestrian Bridge DS

Station Elevation Data		num= 12	
Sta	Elev	Sta	Elev
1034	1717.87	1041.28	1716
1121.59	1712	1142.72	1712
1228.13	1716	1230	1717.81

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1034	.055	1034	.026
		1230	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1034	1230		115	163	190	
						.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.026	
W.S. Elev (ft)	1717.07	Reach Len. (ft)	115.00	163.00	190.00
Crit W.S. (ft)	1717.01	Flow Area (sq ft)		799.08	
E.G. Slope (ft/ft)	0.005995	Area (sq ft)		799.08	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	192.11	Top Width (ft)		192.11	
Vel Total (ft/s)	11.40	Avg. Vel. (ft/s)		11.40	
Max Chl Dpth (ft)	5.07	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	117647.2	Conv. (cfs)		117647.2	
Length Wtd. (ft)	163.00	Wetted Per. (ft)		193.26	
Min Ch El (ft)	1712.00	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)	1230.00	0.00	0.00
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)	3.39	164.15	19.76
C & E Loss (ft)	0.07	Cum SA (acres)	2.38	25.64	6.86

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1
REACH: Reach #1 RS: 1101.3

INPUT

Description:

Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722	0	1717	15	1717	15	1722	50	1722
50	1717	65	1717	65	1722	100	1722	100	1717
115	1717	115	1722	150	1721	150	1716	165	1716
165	1721	200	1721	200	1716	215	1716	215	1721
250	1721	250	1716	265	1716	265	1720	300	1720
300	1715	315	1715	315	1720	350	1720	350	1715
365	1715	365	1720	400	1720	400	1715	415	1715
415	1720	450	1720	450	1715	465	1715	465	1720
500	1719	500	1714	515	1714	515	1719	550	1719
550	1714	565	1714	565	1719	600	1719	600	1714
615	1714	615	1719	650	1718	650	1713	665	1713
665	1718	700	1718	700	1713	715	1713	715	1718
750	1718	750	1713	765	1713	765	1718	800	1718
800	1713	815	1713	815	1718	850	1718	850	1713
865	1713	865	1718	900	1717	900	1712	915	1712
915	1717	950	1717	950	1712	965	1712	965	1717
1000	1717	1000	1712	1015	1712	1015	1717	1050	1717
1050	1712	1065	1712	1065	1717	1100	1717	1100	1712
1115	1712	1115	1717	1150	1717	1150	1712	1165	1712
1165	1717	1200	1717	1200	1711	1215	1711	1215	1717
1250	1715	1250	1710	1265	1710	1265	1715	1300	1715
1300	1710	1315	1710	1315	1715	1350	1715	1350	1710
1365	1710	1365	1715	1400	1714	1400	1709	1415	1709
1415	1714	1450	1714	1450	1709	1465	1709	1465	1714
1500	1714	1500	1709	1515	1709	1515	1714	1550	1714
1550	1709	1565	1709	1565	1714	1600	1713	1600	1708
1615	1708	1615	1713	1650	1713	1650	1708	1665	1708
1665	1713	1700	1713	1700	1708	1715	1708	1715	1713
1750	1713	1750	1708						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1719.09	Weir Sta US (ft)	0.00
W.S. US. (ft)	1717.07	Weir Sta DS (ft)	1715.00
E.G. DS (ft)	1711.31	Min El Weir Flow (ft)	1708.00
W.S. DS (ft)	1707.47	Wr Top Wdth (ft)	358.38
Q US (cfs)	9109.22	Weir Max Depth (ft)	2.00
Q Leaving Total (cfs)	968.76	Weir Avg Depth (ft)	0.92
Q DS (cfs)	12940.24	Weir Flow Area (sq ft)	329.74
Perc Q Leaving	10.76	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	968.76	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1101

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation Data	num=	17						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1717	1012.63	1717	1038.06	1717	1045.27	1716	1050.99	1715
1057.59	1714	1066.33	1713	1093.35	1712	1148.69	1711	1181.83	1711
1200.61	1712	1235.52	1713	1248.39	1714	1257.54	1715	1265.13	1716
1273.66	1717	1319.25	1718						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1319.25	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1000 1319.25 150 200 320 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.		0.026	
W.S. Elev (ft)	1716.13	Reach Len. (ft)	150.00	200.00	320.00
Crit W.S. (ft)	1716.13	Flow Area (sq ft)		829.26	
E.G. Slope (ft/ft)	0.006389	Area (sq ft)		829.26	
Q Total (cfs)	9109.05	Flow (cfs)		9109.05	
Top Width (ft)	221.92	Top Width (ft)		221.92	
Vel Total (ft/s)	10.98	Avg. Vel. (ft/s)		10.98	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		3.74	
Conv. Total (cfs)	113963.9	Conv. (cfs)		113963.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		222.39	
Min Ch El (ft)	1711.00	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	1319.25	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	3.39	161.10	19.76
C & E Loss (ft)	0.32	Cum SA (acres)	2.38	24.87	6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1100

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	32
Sta	Elev	Sta	Elev	Sta
1000	1716	1035.5	1716	1069.48
1144.15	1712	1163.56	1711	1198.64
1260.07	1710	1267.77	1711	1274.32
1522.37	1713	1527.61	1712	1532.39
1545.95	1708	1552.33	1707	1617.79
1632.59	1710	1637.48	1711	1642.29
1663.1	1715	1670.96	1716	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.055	1000	.026
		1670.96	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1670.96		230	199	250	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.		0.026	
W.S. Elev (ft)	1714.75	Reach Len. (ft)	230.00	199.00	250.00
Crit W.S. (ft)		Flow Area (sq ft)		1906.98	
E.G. Slope (ft/ft)	0.003324	Area (sq ft)		1906.98	
Q Total (cfs)	13849.05	Flow (cfs)		13849.05	
Top Width (ft)	581.09	Top Width (ft)		581.09	
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)		7.26	
Max Chl Dpth (ft)	7.75	Hydr. Depth (ft)		3.28	
Conv. Total (cfs)	240212.1	Conv. (cfs)		240212.1	
Length Wtd. (ft)	213.95	Wetted Per. (ft)		582.78	
Min Ch El (ft)	1707.00	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	1670.96	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	3.39	154.82	19.76
C & E Loss (ft)	0.07	Cum SA (acres)	2.38	23.02	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1099

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 39		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1715	1029.51	1715	1070.3	1714 1212.04
1278.21	1712	1284.13	1711	1290.87	1710 1298.26
1312.73	1707	1334.12	1707	1346.97	1707 1358.52
1373.11	1709	1379.4	1710	1386.79	1711 1413.28
1554.93	1712	1560.61	1711	1564.66	1710 1568.46
1576.28	1707	1580.45	1706	1589.05	1705 1600.17
1650.27	1707	1655.84	1708	1660.89	1709 1665.67
1674.54	1712	1679.91	1713	1860.72	1714 1905.24

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1413.28	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1413.28		150	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1714.22	Reach Len. (ft)	150.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		935.53	1318.50
E.G. Slope (ft/ft)	0.003131	Area (sq ft)		935.53	1318.50
Q Total (cfs)	13849.05	Flow (cfs)		5732.39	8116.67
Top Width (ft)	843.99	Top Width (ft)		352.03	491.96
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)		6.13	6.16
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)		2.66	2.68
Conv. Total (cfs)	247510.9	Conv. (cfs)		102449.5	145061.4
Length Wtd. (ft)	200.00	Wetted Per. (ft)		352.71	493.64
Min Ch El (ft)	1707.00	Shear (lb/sq ft)		0.52	0.52
Alpha	1.00	Stream Power (lb/ft s)	1905.24	0.00	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	3.39	148.33	15.98
C & E Loss (ft)	0.00	Cum SA (acres)	2.38	20.89	5.45

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1098

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 51		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1714	1041.28	1714	1051.72	1715 1057.01
1107.33	1715	1139.9	1714	1198.16	1713 1219.76
1252.96	1715	1302.73	1715	1307.67	1714 1313.68
1324.99	1711	1330.65	1710	1335.26	1709 1340.32
1357	1706	1360.02	1706	1400.58	1706 1413.59
1426.05	1709	1434.67	1710	1437.07	1710 1450.22
1517.7	1710	1524.11	1709	1532.41	1708 1538.45
1548.74	1705	1554.51	1704	1560.76	1703 1574.07
1603.97	1705	1611.38	1706	1617.45	1707 1622.98
1635.45	1710	1644.87	1711	1665.34	1712 1761.89
1820.25	1715				1713 1810.41

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1434.67	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1434.67		250	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.026	0.026

W.S. Elev (ft)	1713.71	Reach Len. (ft)	250.00	200.00	140.00
Crit W.S. (ft)		Flow Area (sq ft)		771.61	1440.58
E.G. Slope (ft/ft)	0.001958	Area (sq ft)		771.61	1440.58
Q Total (cfs)	13845.96	Flow (cfs)		4710.35	9135.61
Top Width (ft)	566.32	Top Width (ft)		204.76	361.55
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)		6.10	6.34
Max Chl Dpth (ft)	10.71	Hydr. Depth (ft)		3.77	3.98
Conv. Total (cfs)	312944.2	Conv. (cfs)		106462.6	206481.6
Length Wtd. (ft)	162.52	Wetted Per. (ft)		205.70	362.71
Min Ch El (ft)	1706.00	Shear (lb/sq ft)		0.46	0.49
Alpha	1.00	Stream Power (lb/ft s)	1820.25	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	144.41	9.64
C & E Loss (ft)	0.01	Cum SA (acres)	2.38	19.61	3.49

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1097

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	43						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1713	1020.78	1713	1142.96	1713	1223.52	1713	1248.16	1712
1265.49	1711	1271.2	1710	1274.62	1709	1277.32	1708	1280	1707
1283.18	1706	1286.27	1705	1292.79	1704	1347.96	1704	1357.93	1705
1362.18	1706	1366.64	1707	1371.8	1708	1377.33	1708.88	1378.11	1709
1401.03	1709	1403.94	1708	1406.71	1707	1409.5	1706	1413.85	1705
1419.74	1704	1424.09	1703	1428.89	1702	1453.48	1702	1458.04	1703
1462.12	1704	1466.32	1705	1470.92	1706	1475.75	1707	1481.41	1708
1487	1709	1495.37	1710	1513.59	1711	1588.83	1712	1686.1	1713
1717.56	1714	1730.61	1714	1744.24	1713				

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1000	.055	1000	.026	1378.11	.026	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1378.11		150	200	240	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1713.27	Reach Len. (ft)	150.00	200.00	240.00
Crit W.S. (ft)		Flow Area (sq ft)		993.10	1149.89
E.G. Slope (ft/ft)	0.002757	Area (sq ft)		993.10	1149.89
Q Total (cfs)	13771.77	Flow (cfs)		5655.10	8116.67
Top Width (ft)	698.44	Top Width (ft)		378.11	320.33
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)		5.69	7.06
Max Chl Dpth (ft)	11.27	Hydr. Depth (ft)		2.63	3.59
Conv. Total (cfs)	262306.6	Conv. (cfs)		107711.0	154595.6
Length Wtd. (ft)	211.84	Wetted Per. (ft)		379.86	322.38
Min Ch El (ft)	1704.00	Shear (lb/sq ft)		0.45	0.61
Alpha	1.03	Stream Power (lb/ft s)	1744.24	0.00	0.00
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	3.39	140.35	5.48
C & E Loss (ft)	0.02	Cum SA (acres)	2.38	18.28	2.39

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1096

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	43						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070.33	1716	1128.17	1716	1143.24	1716	1181.45	1716	1191.69	1715
1196.9	1714	1203.52	1713	1211.79	1712	1226.65	1711	1241.15	1710

1243.82	1709	1246.22	1708	1248.63	1707	1250.97	1706	1253.31	1705
1255.89	1704	1259.48	1703	1262.99	1702	1271.47	1701	1336.43	1700
1349.78	1699	1357.84	1699	1368.81	1700	1374.77	1701	1379.06	1702
1382.31	1703	1385.57	1704	1388.6	1705	1391.65	1706	1394.69	1707
1397.74	1708	1400.41	1709	1403.93	1710	1407.25	1711	1411.36	1712
1417.82	1713	1469.5	1713	1482.85	1712	1520.15	1712	1529.36	1713
1548.05	1714	1605.64	1715	1622.86	1716				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070.33	.055	1070.33	.026	1622.86	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1070.33	1622.86		150	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.026	
W.S. Elev (ft)	1712.70	Reach Len. (ft)	150.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1857.27	
E.G. Slope (ft/ft)	0.001242	Area (sq ft)		1857.27	
Q Total (cfs)	13645.70	Flow (cfs)		13645.70	
Top Width (ft)	263.08	Top Width (ft)		263.08	
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)		7.35	
Max Chl Dpth (ft)	13.70	Hydr. Depth (ft)		7.06	
Conv. Total (cfs)	387140.2	Conv. (cfs)		387140.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		266.63	
Min Ch El (ft)	1699.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1622.86	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	133.81	2.31
C & E Loss (ft)	0.04	Cum SA (acres)	2.38	16.80	1.51

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1095

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 39	
Sta	Elev	Sta	Elev
1055.07	1713	1190.77	1713
1243.57	1709	1246.58	1708
1255.11	1704	1257.05	1703
1267.28	1699	1304.99	1698
1343.99	1701	1347	1702
1357.98	1706	1360.29	1707
1377.58	1711	1392.65	1712
1498.6	1712	1506.1	1713

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055.07	.055	1055.07	.026	1517.34	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1055.07	1517.34		160	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.026	
W.S. Elev (ft)	1711.88	Reach Len. (ft)	160.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)		1502.71	
E.G. Slope (ft/ft)	0.002604	Area (sq ft)		1502.71	
Q Total (cfs)	13616.28	Flow (cfs)		13616.28	
Top Width (ft)	270.02	Top Width (ft)		270.02	
Vel Total (ft/s)	9.06	Avg. Vel. (ft/s)		9.06	
Max Chl Dpth (ft)	13.87	Hydr. Depth (ft)		5.57	
Conv. Total (cfs)	266848.1	Conv. (cfs)		266848.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		274.36	
Min Ch El (ft)	1698.00	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	1517.34	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	3.39	126.10	2.31

C & E Loss (ft)	0.02	Cum SA (acres)	2.38	15.58	1.51
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Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1094

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num= 35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1710	1097.32	1709.24	1128.18	1709	1130.35	1708	1132.51	1707
1134.22	1706	1135.94	1705	1137.78	1704	1139.63	1703	1141.47	1702
1143.31	1701	1145.7	1700	1148.46	1699	1151.12	1698	1156.81	1697
1194.15	1697	1205.44	1698	1209.12	1699	1212.79	1700	1215.81	1701
1218.2	1702	1220.15	1703	1221.65	1704	1223.15	1705	1224.65	1706
1226.5	1707	1228.71	1708	1231.66	1709	1234.6	1710	1255.75	1710.35
1294.68	1711	1312.61	1712	1326.68	1713	1350.86	1714	1358.62	1714

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1358.62	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1358.62		185	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.		0.026	
W.S. Elev (ft)	1711.01	Reach Len. (ft)	185.00	200.00	240.00
Crit W.S. (ft)		Flow Area (sq ft)		1371.21	
E.G. Slope (ft/ft)	0.003897	Area (sq ft)		1371.21	
Q Total (cfs)	13442.78	Flow (cfs)		13442.78	
Top Width (ft)	294.76	Top Width (ft)		294.76	
Vel Total (ft/s)	9.80	Avg. Vel. (ft/s)		9.80	
Max Chl Dpth (ft)	14.00	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	215334.0	Conv. (cfs)		215334.0	
Length Wtd. (ft)	201.29	Wetted Per. (ft)		301.04	
Min Ch El (ft)	1697.00	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	1358.62	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	3.39	119.50	2.31
C & E Loss (ft)	0.13	Cum SA (acres)	2.38	14.28	1.51

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1093

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num= 32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1780.57	1709	1825.21	1708	1861.67	1707	1864.89	1706	1867.54	1705
1870.17	1704	1872.66	1703	1875.04	1702	1877.42	1701	1879.8	1700
1882.14	1699	1885.55	1698	1889.3	1697	1899.13	1696	1924.7	1696
1934.49	1696	1942.88	1697	1945.95	1698	1948.7	1699	1951.29	1700
1953.48	1701	1955.21	1702	1956.94	1703	1958.67	1704	1960.4	1705
1962.13	1706	1965.27	1707	2024.18	1708	2065.91	1709	2073.89	1710
2078.06	1711	2082.22	1712						

Manning's n Values		num= 4			
Sta	n Val	Sta	n Val	Sta	n Val
1780.57	.025	1861.67	.026	1965.27	.025
				2065.91	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1861.67	1965.27		202	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.	0.025	0.026	0.025
W.S. Elev (ft)	1710.98	Reach Len. (ft)	202.00	200.00	190.00
Crit W.S. (ft)	1706.73	Flow Area (sq ft)	237.25	1252.52	321.84
E.G. Slope (ft/ft)	0.000906	Area (sq ft)	237.25	1252.52	321.84
Q Total (cfs)	13083.42	Flow (cfs)	854.01	11054.52	1174.90
Top Width (ft)	297.39	Top Width (ft)	81.10	103.60	112.69
Vel Total (ft/s)	7.22	Avg. Vel. (ft/s)	3.60	8.83	3.65
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	2.93	12.09	2.86
Conv. Total (cfs)	434766.0	Conv. (cfs)	28378.9	367345.0	39042.1
Length Wtd. (ft)	199.61	Wetted Per. (ft)	83.10	107.74	112.89
Min Ch El (ft)	1696.00	Shear (lb/sq ft)	0.16	0.66	0.16
Alpha	1.30	Stream Power (lb/ft s)	2082.22	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2.88	113.48	1.43
C & E Loss (ft)	0.29	Cum SA (acres)	2.21	13.37	1.20

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1092

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 28									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1083.42	1708	1085.58	1707	1087.3	1706	1089.02	1705	1090.86	1704		
1092.7	1703	1094.54	1702	1096.38	1701	1098.81	1700	1101.58	1699		
1104.2	1698	1109.97	1697	1122	1696	1134	1696	1147.24	1697		
1158.59	1698	1162.27	1699	1165.95	1700	1168.98	1701	1171.37	1702		
1173.19	1703	1174.69	1704	1176.18	1705	1177.68	1706	1179.48	1707		
1187.7	1707	1208.72	1707.35	1247.1	1708						

Manning's n Values		num= 2	
Sta	n Val	Sta	n Val
1083.42	.026	1247.1	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1083.42	1179.48		175	162	125	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.94	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1707.45	Reach Len. (ft)	175.00	162.00	125.00
Crit W.S. (ft)	1707.45	Flow Area (sq ft)		805.92	9.67
E.G. Slope (ft/ft)	0.004777	Area (sq ft)		805.92	9.67
Q Total (cfs)	12869.24	Flow (cfs)		12853.03	16.21
Top Width (ft)	129.84	Top Width (ft)		94.87	34.97
Vel Total (ft/s)	15.78	Avg. Vel. (ft/s)		15.95	1.68
Max Chl Dpth (ft)	11.45	Hydr. Depth (ft)		8.50	0.28
Conv. Total (cfs)	186197.2	Conv. (cfs)		185962.6	234.6
Length Wtd. (ft)	162.19	Wetted Per. (ft)		99.34	34.97
Min Ch El (ft)	1696.00	Shear (lb/sq ft)		2.42	0.08
Alpha	1.02	Stream Power (lb/ft s)	1247.10	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	2.33	108.75	0.70
C & E Loss (ft)	0.69	Cum SA (acres)	2.02	12.91	0.88

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1091

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 34			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1708	1046.98	1707	1054.34	1706	1065.73
1114.2	1706	1118.16	1705	1122.2	1704	1125.45
1129.93	1701	1132.16	1700	1134.39	1699	1136.7
1141.35	1696	1143.72	1695	1153.93	1694	1178.46
1193.53	1696	1197	1697	1199.93	1698	1202.85
1210.12	1701	1214.32	1702	1219.65	1703	1225.09
1246.43	1706	1275.1	1707	1321.35	1707	1357.23

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1114.2	.026	1246.43	.25

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1114.2	1246.43		230	237	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.025	0.026	0.250
W.S. Elev (ft)	1708.03	Reach Len. (ft)	230.00	237.00	250.00
Crit W.S. (ft)	1705.60	Flow Area (sq ft)	157.72	1183.90	110.56
E.G. Slope (ft/ft)	0.001872	Area (sq ft)	157.72	1183.90	110.56
Q Total (cfs)	12940.24	Flow (cfs)	502.71	12409.14	28.38
Top Width (ft)	357.23	Top Width (ft)	114.20	132.23	110.80
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)	3.19	10.48	0.26
Max Chl Dpth (ft)	14.03	Hydr. Depth (ft)	1.38	8.95	1.00
Conv. Total (cfs)	299070.1	Conv. (cfs)	11618.6	286795.6	656.0
Length Wtd. (ft)	236.77	Wetted Per. (ft)	114.31	135.66	110.86
Min Ch El (ft)	1694.00	Shear (lb/sq ft)	0.16	1.02	0.12
Alpha	1.33	Stream Power (lb/ft s)	1357.23	0.00	0.00
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2.02	105.05	0.53
C & E Loss (ft)	0.04	Cum SA (acres)	1.79	12.49	0.67

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1090

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 37			
Sta	Elev	Sta	Elev	Sta	Elev	
1861	1708	1861	1707	1904.35	1706	1926.83
1937.52	1703	1939.77	1702	1942.03	1701	1944.29
1948.16	1698	1949.78	1697	1951.52	1696	1953.31
1957.43	1693	1961.9	1692	1984.29	1692	1998.11
2007.42	1694	2011.52	1695	2015.63	1696	2018.61
2023.81	1699	2026.39	1700	2028.25	1701	2030.03
2033.6	1704	2035.38	1705	2038.9	1706	2048.32
2121.39	1709	2130.85	1710			

Manning's n Values			num= 5		
Sta	n Val	Sta	n Val	Sta	n Val
1861	.025	1904.35	.025	1933.63	.033
				2038.9	.025
				2121.39	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1933.63	2038.9		205	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.	0.025	0.033	0.025
W.S. Elev (ft)	1707.68	Reach Len. (ft)	205.00	200.00	193.00

Crit W.S. (ft)		Flow Area (sq ft)	121.45	1240.90	18.13
E.G. Slope (ft/ft)	0.001967	Area (sq ft)	121.45	1240.90	18.13
Q Total (cfs)	12940.24	Flow (cfs)	481.14	12425.22	33.87
Top Width (ft)	208.21	Top Width (ft)	72.63	105.27	30.31
Vel Total (ft/s)	9.37	Avg. Vel. (ft/s)	3.96	10.01	1.87
Max Chl Dpth (ft)	15.68	Hydr. Depth (ft)	1.67	11.79	0.60
Conv. Total (cfs)	291769.7	Conv. (cfs)	10848.6	280157.4	763.7
Length Wtd. (ft)	200.07	Wetted Per. (ft)	73.41	110.53	30.37
Min Ch El (ft)	1692.00	Shear (lb/sq ft)	0.20	1.38	0.07
Alpha	1.10	Stream Power (lb/ft s)	2130.85	0.00	0.00
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	1.28	98.45	0.16
C & E Loss (ft)	0.23	Cum SA (acres)	1.30	11.85	0.26

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1089

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	35
Sta	Elev	Sta	Elev	Sta
1840	1705.5	1854.61	1705	1885.68
1899.26	1701	1901.52	1700	1903.78
1910.56	1696	1912.82	1695	1915.08
1933.71	1691	1947.88	1691	1959.38
1989.61	1694	1992.34	1695	1996.19
2001.62	1699	2002.97	1700	2004.32
2008.92	1704	2012.69	1705	2016.47

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1840	.025	1885.68	.033
		2008.92	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1885.68	2008.92		200	200	200.118	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.77	Wt. n-Val.	0.025	0.033	0.025
W.S. Elev (ft)	1704.47	Reach Len. (ft)	200.00	200.00	200.12
Crit W.S. (ft)	1703.56	Flow Area (sq ft)	3.49	1197.58	0.42
E.G. Slope (ft/ft)	0.006096	Area (sq ft)	3.49	1197.58	0.42
Q Total (cfs)	18672.00	Flow (cfs)	6.20	18665.06	0.74
Top Width (ft)	139.75	Top Width (ft)	14.73	123.24	1.79
Vel Total (ft/s)	15.54	Avg. Vel. (ft/s)	1.78	15.59	1.74
Max Chl Dpth (ft)	13.47	Hydr. Depth (ft)	0.24	9.72	0.24
Conv. Total (cfs)	239144.3	Conv. (cfs)	79.4	239055.4	9.4
Length Wtd. (ft)	200.00	Wetted Per. (ft)	14.73	128.30	1.85
Min Ch El (ft)	1691.00	Shear (lb/sq ft)	0.09	3.55	0.09
Alpha	1.01	Stream Power (lb/ft s)	2054.64	0.00	0.00
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)	0.99	92.86	0.12
C & E Loss (ft)	0.04	Cum SA (acres)	1.10	11.32	0.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1088

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	33
Sta	Elev	Sta	Elev	Sta
1000	1705	1032.58	1704.47	1061.94
1087.35	1701	1089.92	1700	1092.13
1098.68	1696	1100.88	1695	1103.11
1116.39	1691	1149.87	1691	1171.2
1193.48	1695	1196.27	1696	1199.05
1205.58	1700	1207.68	1701	1209.78

1216.95 1705 1219.35 1706 1233.87 1707

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1080.56	.033	1212.13	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1080.56	1212.13	199	199	204.09	.1	.3
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CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.20	Wt. n-Val.		0.033	
W.S. Elev (ft)	1702.63	Reach Len. (ft)	199.00	199.00	204.09
Crit W.S. (ft)	1702.46	Flow Area (sq ft)		1135.15	
E.G. Slope (ft/ft)	0.007680	Area (sq ft)		1135.15	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	129.35	Top Width (ft)		129.35	
Vel Total (ft/s)	16.45	Avg. Vel. (ft/s)		16.45	
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)		8.78	
Conv. Total (cfs)	213067.8	Conv. (cfs)		213067.8	
Length Wtd. (ft)	199.00	Wetted Per. (ft)		133.38	
Min Ch El (ft)	1691.00	Shear (lb/sq ft)		4.08	
Alpha	1.00	Stream Power (lb/ft s)	1233.87	0.00	0.00
Frctn Loss (ft)	1.57	Cum Volume (acre-ft)	0.98	87.50	0.12
C & E Loss (ft)	0.05	Cum SA (acres)	1.06	10.74	0.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1087

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1808.01	1705	1873.6	1704	1906.82	1703	1921.64	1702	1924.64	1701
1927.61	1700	1930.53	1699	1932.91	1698	1935.13	1697	1937.27	1696
1939.41	1695	1941.82	1694	1945.9	1693	1949.7	1692	1955.64	1691
1990.79	1691	2013.76	1691	2029.74	1692	2043.26	1693	2048.55	1694
2052.82	1695	2055.09	1696	2057.37	1697	2059.65	1698	2061.93	1699
2064.2	1700	2066.48	1701	2068.76	1702	2071.03	1703	2073.89	1704
2077.34	1705	2081.44	1706	2106.96	1707				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val
1808.01	.055	1873.6	.025	1921.64	.033
				2071.03	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1921.64	2071.03	197	200	205	.1	.3
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CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.05	Wt. n-Val.		0.033	
W.S. Elev (ft)	1701.17	Reach Len. (ft)	197.00	200.00	205.00
Crit W.S. (ft)	1701.17	Flow Area (sq ft)		1156.04	
E.G. Slope (ft/ft)	0.008156	Area (sq ft)		1156.04	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	142.72	Top Width (ft)		142.72	
Vel Total (ft/s)	16.15	Avg. Vel. (ft/s)		16.15	
Max Chl Dpth (ft)	10.17	Hydr. Depth (ft)		8.10	
Conv. Total (cfs)	206749.8	Conv. (cfs)		206749.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		146.04	
Min Ch El (ft)	1691.00	Shear (lb/sq ft)		4.03	
Alpha	1.00	Stream Power (lb/ft s)	2106.96	0.00	0.00
Frctn Loss (ft)	1.65	Cum Volume (acre-ft)	0.98	82.27	0.12
C & E Loss (ft)	0.06	Cum SA (acres)	1.06	10.12	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1086

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 36	
Sta	Elev	Sta	Elev
1762.91	1706	1786.36	1705
1915.52	1701	1919.7	1700
1930.28	1696	1932.42	1695
1944.76	1691	1964.37	1690
2048.87	1692	2057.83	1693
2069.17	1697	2071.64	1698
2083.29	1702	2087.09	1703
2123.89	1707		

Manning's n Values		num= 5	
Sta	n Val	Sta	n Val
1762.91	.055	1786.36	.025
		1902.19	.033
		2083.29	.025
		2100.71	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1902.19	2083.29		197	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.85	Wt. n-Val.		0.033	
W.S. Elev (ft)	1699.65	Reach Len. (ft)	197.00	200.00	202.00
Crit W.S. (ft)	1699.65	Flow Area (sq ft)		1185.31	
E.G. Slope (ft/ft)	0.008326	Area (sq ft)		1185.31	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	154.97	Top Width (ft)		154.97	
Vel Total (ft/s)	15.75	Avg. Vel. (ft/s)		15.75	
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)		7.65	
Conv. Total (cfs)	204631.7	Conv. (cfs)		204631.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		157.89	
Min Ch El (ft)	1690.00	Shear (lb/sq ft)		3.90	
Alpha	1.00	Stream Power (lb/ft s)	2123.89	0.00	0.00
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	0.98	76.89	0.12
C & E Loss (ft)	0.09	Cum SA (acres)	1.06	9.44	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1085

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 41	
Sta	Elev	Sta	Elev
1754.01	1706	1761.05	1705
1802.07	1701	1812.58	1700
1825.11	1696	1828.02	1695
1841.02	1691	1849.74	1690

1699.69	1692	1973.25	1693	1976.24	1694	1979.23	1695	1982.24	1696
1985.55	1697	1988.88	1698	1992.15	1699	1999.73	1700	2014.77	1701
2023.1	1702	2028.06	1703	2031.32	1704	2033.79	1705	2035.83	1706
2037.93	1707	2040.22	1708	2042.57	1709	2048.75	1710	2052.08	1711
2056.87	1711								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1754.01	.025	1812.58	.015	1999.73	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1812.58	1999.73		150	200	193	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1702.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.46	Reach Len. (ft)	150.00	200.00	193.00
Crit W.S. (ft)	1698.46	Flow Area (sq ft)		1231.94	
E.G. Slope (ft/ft)	0.001739	Area (sq ft)		1231.94	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	172.90	Top Width (ft)		172.90	
Vel Total (ft/s)	15.16	Avg. Vel. (ft/s)		15.16	
Max Chl Dpth (ft)	8.46	Hydr. Depth (ft)		7.13	
Conv. Total (cfs)	447713.4	Conv. (cfs)		447713.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		175.32	
Min Ch El (ft)	1690.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	2056.87	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98	71.34	0.12
C & E Loss (ft)	0.30	Cum SA (acres)	1.06	8.68	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1084

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	39
Sta	Elev	Sta	Elev	Sta
1000	1703	1009.6	1702	1023.14
1062.76	1698	1070.69	1697	1077.6
1101.47	1693	1109.46	1692	1115.59
1129.51	1691	1132.85	1690	1142.86
1260.1	1691	1263.6	1692	1266.9
1276.19	1696	1279.91	1697	1283.62
1323.22	1701	1327.76	1702	1331.12
1340.27	1706	1342.8	1707	1345.32

Sta	Elev	Sta	Elev	Sta	Elev
1701	1037.98	1700	1055.35	1699	
1696	1087.61	1695	1095.15	1694	
1692	1121	1692	1126.08	1692	
1689	1247.05	1689	1256.54	1690	
1693	1269.96	1694	1273.02	1695	
1698	1292.15	1699	1315.8	1700	
1703	1334.8	1704	1337.74	1705	
1708	1379.26	1708			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1055.35	.015	1292.15	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1055.35	1292.15		215	200	193	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1700.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.79	Reach Len. (ft)	215.00	200.00	193.00
Crit W.S. (ft)	1697.15	Flow Area (sq ft)		1449.53	
E.G. Slope (ft/ft)	0.001371	Area (sq ft)		1449.53	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	218.39	Top Width (ft)		218.39	

Vel Total (ft/s)	12.88	Avg. Vel. (ft/s)	12.88
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)	6.64
Conv. Total (cfs)	504206.8	Conv. (cfs)	504206.8
Length Wtd. (ft)	200.00	Wetted Per. (ft)	220.30
Min Ch El (ft)	1689.00	Shear (lb/sq ft)	0.56
Alpha	1.00	Stream Power (lb/ft s)	1379.26
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98
C & E Loss (ft)	0.10	Cum SA (acres)	1.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1083

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 43	
Sta	Elev	Sta	Elev
1000	1701	1065.05	1700
1143.9	1699	1202.78	1698
1229.24	1694	1231.89	1693
1244.62	1689	1260.66	1688
1379.21	1691	1382.36	1692
1394.63	1696	1398.52	1697
1437.08	1701	1440.58	1702
1451.26	1706	1453.31	1707
1461.18	1711	1463.2	1712

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
1000	.025	1221.67	.015
		1398.52	.025
		1425.61	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1221.67	1398.52		217	200	190	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1699.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	1696.39	Reach Len. (ft)	217.00	200.00	190.00
Crit W.S. (ft)	1696.39	Flow Area (sq ft)		1232.34	
E.G. Slope (ft/ft)	0.001739	Area (sq ft)		1232.34	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	172.96	Top Width (ft)		172.96	
Vel Total (ft/s)	15.15	Avg. Vel. (ft/s)		15.15	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		7.12	
Conv. Total (cfs)	447750.8	Conv. (cfs)		447750.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		175.44	
Min Ch El (ft)	1688.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1485.82	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.98	59.03	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.06	6.89	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1082

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 44	
Sta	Elev	Sta	Elev
1478.378	1701	1513.48	1701
1720.86	1697	1726.48	1696
1738.81	1692	1741.81	1691

1765.96	1687	1799.4	1687	1824.53	1687	1838.68	1687	1861.52	1687
1873.2	1688	1877.59	1689	1881.35	1690	1884.39	1691	1887.39	1692
1890.39	1693	1893.48	1694	1896.57	1695	1899.7	1696	1906.28	1697
1932.28	1698	1939.94	1699	1943.59	1700	1945.35	1701	1947.11	1702
1948.9	1703	1950.69	1704	1952.49	1705	1954.16	1706	1955.81	1707
1957.59	1708	1959.36	1709	1961.14	1710	1977.65	1710		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1478.378	.025	1720.86	.015	1906.28	.025	1932.28	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1720.86	1906.28		200	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1699.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1695.63	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	1695.61	Flow Area (sq ft)		1229.77	
E.G. Slope (ft/ft)	0.001722	Area (sq ft)		1229.77	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	170.89	Top Width (ft)		170.89	
Vel Total (ft/s)	15.18	Avg. Vel. (ft/s)		15.18	
Max Chl Dpth (ft)	8.63	Hydr. Depth (ft)		7.20	
Conv. Total (cfs)	449939.8	Conv. (cfs)		449939.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		173.25	
Min Ch El (ft)	1687.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1977.65	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.98	53.38	0.12
C & E Loss (ft)	0.02	Cum SA (acres)	1.06	6.10	0.19

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1081

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	40
Sta	Elev	Sta	Elev	Sta
1000	1701	1020.82	1700.17	1024.99
1097.94	1697	1120.48	1696	1125.23
1135.48	1692	1138.56	1691	1141.64
1154.26	1687	1272.68	1687	1277.31
1287.12	1691	1290.18	1692	1293.23
1304.69	1696	1320.29	1697	1330.91
1344.58	1701	1347.49	1702	1350.14
1357.38	1706	1359.61	1707	1361.69

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1120.48	.015	1304.69	.025	1320.29	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1120.48	1304.69		265	200	160	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1698.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1695.34	Reach Len. (ft)	265.00	200.00	160.00
Crit W.S. (ft)	1695.34	Flow Area (sq ft)		1243.78	
E.G. Slope (ft/ft)	0.001749	Area (sq ft)		1243.78	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	177.98	Top Width (ft)		177.98	
Vel Total (ft/s)	15.01	Avg. Vel. (ft/s)		15.01	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	446451.3	Conv. (cfs)		446451.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		180.33	
Min Ch El (ft)	1687.00	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)	1366.32	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98	47.70	0.12
C & E Loss (ft)	0.14	Cum SA (acres)	1.06	5.30	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1080

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	
1725	1699.2	1765.04	1699	1808.05	1698	1827.1
1867.67	1695	1872.61	1694	1875.6	1693	1878.59
1884.58	1690	1887.7	1689	1890.93	1688	1894.72
1956.96	1686	2016.95	1686	2021.77	1687	2025
2031.22	1690	2034.21	1691	2037.2	1692	2040.2
2047.58	1695	2054.24	1696	2072.15	1697	2079.65
2090.17	1700	2093.55	1701	2095.5	1702	2097.45
2101.21	1705	2103.04	1706	2104.86	1707	

Manning's n Values			num= 4			
Sta	n Val	Sta	n Val	Sta	n Val	
1725	.025	1867.67	.015	2054.24	.025	2072.15
						.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1867.67	2054.24		221	200	185	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.04	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.95	Reach Len. (ft)	221.00	200.00	185.00
Crit W.S. (ft)	1694.39	Flow Area (sq ft)		1333.83	
E.G. Slope (ft/ft)	0.001403	Area (sq ft)		1333.83	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	179.43	Top Width (ft)		179.43	
Vel Total (ft/s)	14.00	Avg. Vel. (ft/s)		14.00	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		7.43	
Conv. Total (cfs)	498486.0	Conv. (cfs)		498486.0	
Length Wtd. (ft)	200.02	Wetted Per. (ft)		182.02	
Min Ch El (ft)	1686.00	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)	2104.86	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.98	41.78	0.12
C & E Loss (ft)	0.25	Cum SA (acres)	1.06	4.48	0.19

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1079

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1698	1054.26	1697	1085.3	1696.61	
1191.03	1694	1195.44	1693	1198.48	1692	1201.51
1207.37	1689	1210.49	1688	1213.82	1687	1217.95
1336.46	1685	1342.51	1686	1346.19	1687	1349.65
1355.86	1690	1358.83	1691	1361.7	1692	1364.63
1372.93	1695	1393.98	1696	1402.58	1697	1407.56
1414.09	1700	1415.99	1701	1417.89	1702	1419.69
1423.98	1705	1425.91	1706	1427.85	1707	

Manning's n Values			num= 4			
Sta	n Val	Sta	n Val	Sta	n Val	
1000	.025	1191.03	.015	1368.08	.025	1393.98
						.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1191.03	1368.08		250	200	170	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.21	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.32	Reach Len. (ft)	250.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)	28.99	1561.23	5.06
E.G. Slope (ft/ft)	0.000812	Area (sq ft)	28.99	1561.23	5.06
Q Total (cfs)	18672.00	Flow (cfs)	38.90	18628.20	4.90
Top Width (ft)	229.74	Top Width (ft)	41.10	177.05	11.60
Vel Total (ft/s)	11.70	Avg. Vel. (ft/s)	1.34	11.93	0.97
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)	0.71	8.82	0.44
Conv. Total (cfs)	655305.3	Conv. (cfs)	1365.1	653768.3	171.9
Length Wtd. (ft)	200.21	Wetted Per. (ft)	41.12	179.63	11.70
Min Ch El (ft)	1685.00	Shear (lb/sq ft)	0.04	0.44	0.02
Alpha	1.04	Stream Power (lb/ft s)	1427.85	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.90	35.14	0.11
C & E Loss (ft)	0.16	Cum SA (acres)	0.96	3.66	0.16

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1078

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 42							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1602.58	1698	1611.57	1697	1613.47	1697	1646.48	1696	1760.21	1695
1794.28	1694	1821.97	1693	1825.83	1692	1828.74	1691	1831.67	1690
1834.67	1689	1837.7	1688	1840.97	1687	1844.27	1686	1848.39	1685
1858.16	1684	1915.06	1684	1958.58	1684	1970.9	1685	1975.19	1686
1978.66	1687	1981.81	1688	1984.93	1689	1987.97	1690	1991.02	1691
1994.16	1692	1997.31	1693	2002.8	1694	2022.08	1695	2032.44	1696
2036.91	1697	2039.61	1698	2042.32	1699	2044.21	1700	2046.06	1701
2047.93	1702	2049.8	1703	2051.76	1704	2053.71	1705	2055.67	1706
2059.51	1707	2066.88	1707						

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1602.58	.025	1821.97	.015	2002.8	.025	2022.08	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1821.97	2002.8		215	200	190	
							.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.56	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	110.34	1769.52	21.93
E.G. Slope (ft/ft)	0.000542	Area (sq ft)	110.34	1769.52	21.93
Q Total (cfs)	18672.00	Flow (cfs)	140.63	18501.80	29.57
Top Width (ft)	330.72	Top Width (ft)	124.86	180.83	25.03
Vel Total (ft/s)	9.82	Avg. Vel. (ft/s)	1.27	10.46	1.35
Max Chl Dpth (ft)	11.55	Hydr. Depth (ft)	0.88	9.79	0.88
Conv. Total (cfs)	801723.1	Conv. (cfs)	6038.2	794415.2	1269.7
Length Wtd. (ft)	200.08	Wetted Per. (ft)	124.89	183.41	25.08
Min Ch El (ft)	1684.00	Shear (lb/sq ft)	0.03	0.33	0.03
Alpha	1.12	Stream Power (lb/ft s)	2066.88	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.50	27.49	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.48	2.84	0.09

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1077

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1811.48	1696	1826.09	1695	1841.21	1694	1861.63	1693	1866.83	1692
1869.23	1691	1871.29	1690	1873.36	1689	1875.4	1688	1877.24	1687
1879.12	1686	1881.17	1685	1883.22	1684	1893.7	1683	1940.8	1683
2003.84	1683	2006.37	1684	2009.69	1685	2011.57	1686	2013.08	1687

2014.63	1688	2016.18	1689	2017.73	1690	2019.48	1691	2021.24	1692
2023.01	1693	2025.21	1694	2033.06	1695	2057.29	1696	2061.84	1697
2065.38	1698	2068.56	1699	2070.66	1700	2072.63	1701	2074.65	1702
2076.7	1703	2078.46	1704						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1811.48	.025	1861.63	.015	2033.06	.025	2057.29	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1861.63	2033.06		140	110		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.48	Reach Len. (ft)	140.00	110.00	80.00
Crit W.S. (ft)		Flow Area (sq ft)	56.87	1800.89	2.77
E.G. Slope (ft/ft)	0.000489	Area (sq ft)	56.87	1800.89	2.77
Q Total (cfs)	18672.00	Flow (cfs)	90.64	18579.95	1.40
Top Width (ft)	225.56	Top Width (ft)	42.53	171.43	11.59
Vel Total (ft/s)	10.04	Avg. Vel. (ft/s)	1.59	10.32	0.51
Max Chl Dpth (ft)	12.48	Hydr. Depth (ft)	1.34	10.51	0.24
Conv. Total (cfs)	844115.9	Conv. (cfs)	4097.7	839954.6	63.5
Length Wtd. (ft)	110.07	Wetted Per. (ft)	42.60	176.27	11.60
Min Ch El (ft)	1683.00	Shear (lb/sq ft)	0.04	0.31	0.01
Alpha	1.05	Stream Power (lb/ft s)	2078.46	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.09	19.29	0.00
C & E Loss (ft)	0.07	Cum SA (acres)	0.07	2.03	0.01

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1075.9

INPUT

Description: Vegas Valley US 1075.9

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.07	882.948	1692.35	882.948	1682.27	1006.56	1682.41	1006.56	1692.42
1006.56	1697.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	882.948	1006.56		92	92		.3	.5

Skew Angle = 28

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1696.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.66	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1691.23	Flow Area (sq ft)		1522.22	
E.G. Slope (ft/ft)	0.000687	Area (sq ft)		1522.22	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	12.27	Avg. Vel. (ft/s)		12.27	
Max Chl Dpth (ft)	12.38	Hydr. Depth (ft)		12.31	
Conv. Total (cfs)	712395.7	Conv. (cfs)		712395.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		148.24	
Min Ch El (ft)	1682.27	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		15.10	
C & E Loss (ft)	0.46	Cum SA (acres)		1.65	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1075.5

INPUT

Description: Vegas Valley Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 90

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew = 28

Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
882.948	1697.07	1692.35	1006.56	1697.1	1692.42				

Upstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.07	882.948	1692.35	882.948	1682.27	1006.56	1682.41	1006.56	1692.42
1006.56	1697.1								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta: Left Right Coeff Contr. Expan.

882.948	1006.56	.3	.5
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Skew Angle = 28

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
882.948	1697.06	1691.96	1006.56	1697.71	1691.98				

Downstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.06	882.948	1691.96	882.948	1681.88	1006.56	1681.96	1006.56	1691.98
1006.56	1697.71								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta: Left Right Coeff Contr. Expan.

882.948	1006.56	.3	.5
---------	---------	----	----

Skew Angle = 28

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Piers = 9

Pier Data

Pier Station Upstream= 895.309 Downstream= 895.309

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Downstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data

Pier Station Upstream= 907.67 Downstream= 907.67

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Downstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data

Pier Station Upstream= 920.031 Downstream= 920.031

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

.67	1680	.67	1700
Downstream	num=	2	
Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data
Pier Station Upstream= 932.393 Downstream= 932.393
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 944.754 Downstream= 944.754
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 957.115 Downstream= 957.115
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 969.476 Downstream= 969.476
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 981.838 Downstream= 981.838
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 994.199 Downstream= 994.199
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 2
Yarnell KVal = 1.25
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1696.99	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1694.66	E.G. Elev (ft)	1696.53	1695.75

Q Total (cfs)	18672.00	W.S. Elev (ft)	1692.65	1691.10
Q Bridge (cfs)	18672.00	Crit W.S. (ft)	1691.57	1691.10
Q Weir (cfs)		Max Chl Dpth (ft)	10.37	9.22
Weir Sta Lft (ft)		Vel Total (ft/s)	15.81	17.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	1181.09	1079.53
Weir Submerg		Froude # Chl	0.86	1.01
Weir Max Depth (ft)		Specif Force (cu ft)	15406.27	14985.43
Min El Weir Flow (ft)	1697.08	Hydr Depth (ft)		9.18
Min El Prs (ft)	1692.42	W.P. Total (ft)	436.06	301.20
Delta EG (ft)	1.70	Conv. Total (cfs)	227340.4	250449.7
Delta WS (ft)	3.82	Top Width (ft)		117.58
BR Open Area (sq ft)	1181.09	Frctn Loss (ft)	0.55	0.00
BR Open Vel (ft/s)	17.30	C & E Loss (ft)	0.23	0.09
Coef of Q		Shear Total (lb/sq ft)	1.14	1.24
Br Sel Method	Energy only	Power Total (lb/ft s)	882.95	882.95

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1075.1

INPUT

Description: Vegas Valley DS 1075.1

Station		Elevation		Data		num=		6	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.06	882.948	1691.96	882.948	1681.88	1006.56	1681.96	1006.56	1691.98
1006.56	1697.71								

Manning's n		Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff Contr.	Expan.
	882.948	1006.56		180	198	220	.3	.5
Skew Angle =	28							

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1695.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1690.84	Reach Len. (ft)	180.00	198.00	220.00
Crit W.S. (ft)	1690.84	Flow Area (sq ft)		1102.00	
E.G. Slope (ft/ft)	0.001894	Area (sq ft)		1102.00	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	16.94	Avg. Vel. (ft/s)		16.94	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		8.91	
Conv. Total (cfs)	429028.9	Conv. (cfs)		429028.9	
Length Wtd. (ft)	198.00	Wetted Per. (ft)		141.44	
Min Ch El (ft)	1681.88	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		12.71	
C & E Loss (ft)	0.97	Cum SA (acres)		1.53	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1075

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		31	
Sta	Elev	Sta	Elev	Sta	Elev
1821.2	1695	1854.41	1694	1862.1	1693
1877.11	1690	1880.88	1689	1883.78	1688
1892.83	1685	1896.12	1684	1900.06	1683
1950.82	1681	1969.14	1681	2015.14	1682
2031.27	1685	2034.53	1686	2037.64	1687
2046.88	1690	2050.38	1691	2054.3	1692
2073.84	1695			2059.57	1693

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1821.2	.025	1854.41	.015	2065.77	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1854.41	2065.77		201	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1693.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1691.45	Reach Len. (ft)	201.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1470.05	
E.G. Slope (ft/ft)	0.001033	Area (sq ft)		1470.05	
Q Total (cfs)	18718.00	Flow (cfs)		18718.00	
Top Width (ft)	181.13	Top Width (ft)		181.13	
Vel Total (ft/s)	12.73	Avg. Vel. (ft/s)		12.73	
Max Chl Dpth (ft)	10.45	Hydr. Depth (ft)		8.12	
Conv. Total (cfs)	582501.8	Conv. (cfs)		582501.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		183.76	
Min Ch El (ft)	1681.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	2073.84	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		6.86	
C & E Loss (ft)	0.05	Cum SA (acres)		0.84	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1074

INPUT

Description: Cross Section from 2008 Floodplain Mapping, model truncated to determine effective water surface tie in locations within project vicinity

Station Elevation Data		num=		36	
Sta	Elev	Sta	Elev	Sta	Elev
1872.61	1694	1881.94	1693	1886.68	1692
1896.65	1689	1899.39	1688	1902.31	1687
1911.09	1684	1914.87	1683	1919.14	1682
2017.45	1681	2040.41	1682	2045.68	1683
2055.63	1686	2058.61	1687	2061.89	1688
2071.98	1691	2076.03	1692	2081.64	1693
2117.7	1696	2130.69	1697	2134.37	1698
2142.75	1701			2136.95	1699

Manning's n Values		num=		3	
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Sta	n Val	Sta	n Val	Sta	n Val
1872.61	.025	1872.61	.031	2087.97	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1872.61	2087.97		191	200	205	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1693.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.36	Wt. n-Val.		0.031	
W.S. Elev (ft)	1691.20	Reach Len. (ft)			
Crit W.S. (ft)	1689.57	Flow Area (sq ft)		1518.85	
E.G. Slope (ft/ft)	0.004020	Area (sq ft)		1518.85	
Q Total (cfs)	18718.00	Flow (cfs)		18718.00	
Top Width (ft)	183.18	Top Width (ft)		183.18	
Vel Total (ft/s)	12.32	Avg. Vel. (ft/s)		12.32	
Max Chl Dpth (ft)	10.20	Hydr. Depth (ft)		8.29	
Conv. Total (cfs)	295235.6	Conv. (cfs)		295235.6	
Length Wtd. (ft)		Wetted Per. (ft)		185.99	
Min Ch El (ft)	1681.00	Shear (lb/sq ft)		2.05	
Alpha	1.00	Stream Power (lb/ft s)	2142.75	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3	n4	n5
Reach #1	1173	.025	.031	.025		
Reach #1	1172	.025	.031	.025		
Reach #1	1171	.025	.031	.025		
Reach #1	1170	.025	.031	.025		
Reach #1	1169	.025	.031	.025		
Reach #1	1167.9	.095	.031	.095		
Reach #1	1167.5	Bridge				
Reach #1	1167.1	.095	.031	.095		
Reach #1	1167	.025	.031	.025		
Reach #1	1166	.075	.025	.031	.025	.095
Reach #1	1165	.075	.025	.031	.025	
Reach #1	1164	.075	.025	.031	.025	.095
Reach #1	1163	.075	.025	.031	.025	
Reach #1	1162	.025	.031	.025		
Reach #1	1161	.075	.025	.031	.025	.095
Reach #1	1160	.025	.031	.025		
Reach #1	1159	.075	.025	.031		
Reach #1	1158	.075	.025	.031	.095	
Reach #1	1157	.075	.031	.095		
Reach #1	1156	.075	.031	.095		
Reach #1	1155	.075	.025	.031		
Reach #1	1154	.025	.031	.025		
Reach #1	1152.9	.075	.031	.095		
Reach #1	1152.5	Bridge				
Reach #1	1152.1	.075	.031	.095		
Reach #1	1152	.075	.025	.031		
Reach #1	1151	.075	.027	.095		
Reach #1	1150	.075	.027	.095		
Reach #1	1149	.016	.027	.025		
Reach #1	1148	.016	.027	.025		
Reach #1	1147.5	.015	.027	.025	.095	
Reach #1	1147.3	.016	.027	.025	.095	
Reach #1	1147	.016	.027	.025	.095	
Reach #1	1146	.016	.027	.025		
Reach #1	1145	.016	.027	.095		
Reach #1	1144.5	Lat Struct				
Reach #1	1144	.016	.027	.095		
Reach #1	1143	.016	.027	.095		
Reach #1	1142	.075	.016	.027		
Reach #1	1141	.016	.027	.095		
Reach #1	1140	.016	.027	.095		
Reach #1	1139.9	.075	.027	.095		
Reach #1	1139.5	Bridge				
Reach #1	1139.1	.075	.027	.095		
Reach #1	1139	.075	.027	.025	.095	
Reach #1	1138	.075	.025	.027	.025	
Reach #1	1137	.095	.025	.03	.025	.095
Reach #1	1136	.095	.025	.03		

Reach #1	1135	.095	.025	.03	.025	.095
Reach #1	1134	.095	.025	.03	.025	.095
Reach #1	1132.9	.095	.03	.095		
Reach #1	1132.5	Bridge				
Reach #1	1132.1	.095	.03	.095		
Reach #1	1132	.095	.03	.095		
Reach #1	1131	.095	.027	.095		
Reach #1	1130	.095	.027	.095		
Reach #1	1129	.095	.027	.095		
Reach #1	1128	.095	.027	.095		
Reach #1	1127.5	Lat Struct				
Reach #1	1127	.095	.027	.095		
Reach #1	1126	.095	.027	.095		
Reach #1	1125	.095	.027	.095		
Reach #1	1124.5	Lat Struct				
Reach #1	1124	.095	.027	.095		
Reach #1	1123	.095	.027	.095		
Reach #1	1122	.095	.027	.095		
Reach #1	1121	.095	.027	.095		
Reach #1	1120	.095	.027	.095		
Reach #1	1119	.095	.027	.095		
Reach #1	1118	.095	.027	.095		
Reach #1	1117	.095	.027	.095		
Reach #1	1116.5	Lat Struct				
Reach #1	1116.4	Lat Struct				
Reach #1	1116	.095	.027	.095		
Reach #1	1115	.095	.027	.095		
Reach #1	1114	.095	.027	.095		
Reach #1	1113	.095	.027	.095		
Reach #1	1112	.095	.027	.095		
Reach #1	1111	.095	.027	.095		
Reach #1	1110	.095	.027	.095		
Reach #1	1109	.095	.027	.095		
Reach #1	1107.9	.095	.015	.095		
Reach #1	1107.5	Bridge				
Reach #1	1107.1	.095	.015	.095		
Reach #1	1107	.095	.027	.095		
Reach #1	1106	.055	.026	.05		
Reach #1	1105.5	Lat Struct				
Reach #1	1105	.055	.026	.05		
Reach #1	1104	.055	.026	.05		
Reach #1	1103	.055	.026	.05		
Reach #1	1102	.055	.026	.05		
Reach #1	1101.6	.055	.026	.05		
Reach #1	1101.5	Bridge				
Reach #1	1101.4	.055	.026	.05		
Reach #1	1101.3	Lat Struct				
Reach #1	1101	.055	.026	.05		
Reach #1	1100	.055	.026	.026		
Reach #1	1099	.055	.026	.026		
Reach #1	1098	.055	.026	.026		
Reach #1	1097	.055	.026	.026		
Reach #1	1096	.055	.026	.05		
Reach #1	1095	.055	.026	.05		
Reach #1	1094	.055	.026	.05		
Reach #1	1093	.025	.026	.025	.05	
Reach #1	1092	.026	.05			
Reach #1	1091	.025	.026	.25		
Reach #1	1090	.025	.025	.033	.025	.055
Reach #1	1089	.025	.033	.025		
Reach #1	1088	.025	.033	.025		
Reach #1	1087	.055	.025	.033	.025	
Reach #1	1086	.055	.025	.033	.025	.055
Reach #1	1085	.025	.015	.055		
Reach #1	1084	.025	.015	.055		
Reach #1	1083	.025	.015	.025	.055	
Reach #1	1082	.025	.015	.025	.055	
Reach #1	1081	.025	.015	.025	.055	
Reach #1	1080	.025	.015	.025	.055	
Reach #1	1079	.025	.015	.025	.055	
Reach #1	1078	.025	.015	.025	.055	
Reach #1	1077	.025	.015	.025	.055	
Reach #1	1075.9	.055	.015	.055		
Reach #1	1075.5	Bridge				
Reach #1	1075.1	.055	.015	.055		
Reach #1	1075	.025	.015	.025		
Reach #1	1074	.025	.031	.025		

SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1173	190	200	150
Reach #1	1172	180	200	190
Reach #1	1171	220	200	201
Reach #1	1170	212	200	197
Reach #1	1169	110	80	40
Reach #1	1167.9	112	112	112
Reach #1	1167.5	Bridge		
Reach #1	1167.1	150	195	230
Reach #1	1167	160	223	189.36
Reach #1	1166	90	200	202
Reach #1	1165	102	200	212
Reach #1	1164	215	200	190
Reach #1	1163	155	200	212
Reach #1	1162	230	200	180
Reach #1	1161	245	200	192
Reach #1	1160	205	200	190
Reach #1	1159	206.54	200	200
Reach #1	1158	212	200	185
Reach #1	1157	202.058	200	200
Reach #1	1156	215	200	190
Reach #1	1155	212	200	195
Reach #1	1154	150	164	164
Reach #1	1152.9	102	102	102
Reach #1	1152.5	Bridge		
Reach #1	1152.1	134	134	134
Reach #1	1152	190	200	200
Reach #1	1151	193	200	200
Reach #1	1150	180	200	198
Reach #1	1149	115	200	199.956
Reach #1	1148	150	60	60
Reach #1	1147.5	180	60	60
Reach #1	1147.3	120	75	70
Reach #1	1147	220	200	198.468
Reach #1	1146	200	200	202
Reach #1	1145	215	200	195
Reach #1	1144.5	Lat Struct		
Reach #1	1144	220	200	212
Reach #1	1143	190	200	190
Reach #1	1142	196	200	200
Reach #1	1141	195	200	202
Reach #1	1140	114	94	87
Reach #1	1139.9	102	102	102
Reach #1	1139.5	Bridge		
Reach #1	1139.1	19	25	28
Reach #1	1139	132	175	185
Reach #1	1138	150	200	202
Reach #1	1137	185	200	210
Reach #1	1136	160	200	210
Reach #1	1135	155	200	210
Reach #1	1134	180	208	265
Reach #1	1132.9	112	112	112
Reach #1	1132.5	Bridge		
Reach #1	1132.1	80	80	90
Reach #1	1132	195	200	212
Reach #1	1131	170	200	235
Reach #1	1130	200	200	200
Reach #1	1129	195	200	190
Reach #1	1128	210	200	200
Reach #1	1127.5	Lat Struct		
Reach #1	1127	240	200	190
Reach #1	1126	260	200	180
Reach #1	1125	220	200	195
Reach #1	1124.5	Lat Struct		
Reach #1	1124	180	200	200.421
Reach #1	1123	202	200	200
Reach #1	1122	220	200	170
Reach #1	1121	225	200	200
Reach #1	1120	220	200	190
Reach #1	1119	210	200	190
Reach #1	1118	210	200	190
Reach #1	1117	185	199	215
Reach #1	1116.5	Lat Struct		
Reach #1	1116.4	Lat Struct		
Reach #1	1116	185	200	198
Reach #1	1115	250	200	190

Reach #1	1114	240	200	190
Reach #1	1113	215	200	185
Reach #1	1112	245	200	150
Reach #1	1111	195	200	195
Reach #1	1110	215	200	195
Reach #1	1109	320	224	150
Reach #1	1107.9	112	112	112
Reach #1	1107.5	Bridge		
Reach #1	1107.1	64	84	64
Reach #1	1107	200	180	200.57
Reach #1	1106	210	200	192
Reach #1	1105.5	Lat Struct		
Reach #1	1105	200	200	205
Reach #1	1104	200	200	120
Reach #1	1103	220	200	279.323
Reach #1	1102	20	26	31
Reach #1	1101.6	11.2	11.2	11.2
Reach #1	1101.5	Bridge		
Reach #1	1101.4	115	163	190
Reach #1	1101.3	Lat Struct		
Reach #1	1101	150	200	320
Reach #1	1100	230	199	250
Reach #1	1099	150	200	200
Reach #1	1098	250	200	140
Reach #1	1097	150	200	240
Reach #1	1096	150	200	200
Reach #1	1095	160	200	170
Reach #1	1094	185	200	240
Reach #1	1093	202	200	190
Reach #1	1092	175	162	125
Reach #1	1091	230	237	250
Reach #1	1090	205	200	193
Reach #1	1089	200	200	200.118
Reach #1	1088	199	199	204.09
Reach #1	1087	197	200	205
Reach #1	1086	197	200	202
Reach #1	1085	150	200	193
Reach #1	1084	215	200	193
Reach #1	1083	217	200	190
Reach #1	1082	200	200	200
Reach #1	1081	265	200	160
Reach #1	1080	221	200	185
Reach #1	1079	250	200	170
Reach #1	1078	215	200	190
Reach #1	1077	140	110	80
Reach #1	1075.9	92	92	92
Reach #1	1075.5	Bridge		
Reach #1	1075.1	180	198	220
Reach #1	1075	201	200	200
Reach #1	1074	191	200	205

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

Reach	River Sta.	Contr.	Expan.
Reach #1	1173	.1	.3
Reach #1	1172	.1	.3
Reach #1	1171	.1	.3
Reach #1	1170	.1	.3
Reach #1	1169	.1	.3
Reach #1	1167.9	.3	.5
Reach #1	1167.5	Bridge	
Reach #1	1167.1	.3	.5
Reach #1	1167	.1	.3
Reach #1	1166	.1	.3
Reach #1	1165	.1	.3
Reach #1	1164	.1	.3
Reach #1	1163	.1	.3
Reach #1	1162	.1	.3
Reach #1	1161	.1	.3
Reach #1	1160	.1	.3
Reach #1	1159	.1	.3
Reach #1	1158	.1	.3
Reach #1	1157	.1	.3
Reach #1	1156	.1	.3
Reach #1	1155	.1	.3

Reach #1	1154	.1	.3
Reach #1	1152.9	.3	.5
Reach #1	1152.5	Bridge	
Reach #1	1152.1	.3	.5
Reach #1	1152	.1	.3
Reach #1	1151	.1	.3
Reach #1	1150	.1	.3
Reach #1	1149	.1	.3
Reach #1	1148	.1	.3
Reach #1	1147.5	.1	.3
Reach #1	1147.3	.1	.3
Reach #1	1147	.1	.3
Reach #1	1146	.1	.3
Reach #1	1145	.1	.3
Reach #1	1144.5	Lat Struct	
Reach #1	1144	.1	.3
Reach #1	1143	.1	.3
Reach #1	1142	.1	.3
Reach #1	1141	.1	.3
Reach #1	1140	.1	.3
Reach #1	1139.9	.3	.5
Reach #1	1139.5	Bridge	
Reach #1	1139.1	.3	.5
Reach #1	1139	.1	.3
Reach #1	1138	.1	.3
Reach #1	1137	.1	.3
Reach #1	1136	.1	.3
Reach #1	1135	.1	.3
Reach #1	1134	.1	.3
Reach #1	1132.9	.3	.5
Reach #1	1132.5	Bridge	
Reach #1	1132.1	.3	.5
Reach #1	1132	.1	.3
Reach #1	1131	.1	.3
Reach #1	1130	.1	.3
Reach #1	1129	.1	.3
Reach #1	1128	.1	.3
Reach #1	1127.5	Lat Struct	
Reach #1	1127	.1	.3
Reach #1	1126	.1	.3
Reach #1	1125	.1	.3
Reach #1	1124.5	Lat Struct	
Reach #1	1124	.1	.3
Reach #1	1123	.1	.3
Reach #1	1122	.1	.3
Reach #1	1121	.1	.3
Reach #1	1120	.1	.3
Reach #1	1119	.1	.3
Reach #1	1118	.1	.3
Reach #1	1117	.1	.3
Reach #1	1116.5	Lat Struct	
Reach #1	1116.4	Lat Struct	
Reach #1	1116	.1	.3
Reach #1	1115	.1	.3
Reach #1	1114	.1	.3
Reach #1	1113	.1	.3
Reach #1	1112	.1	.3
Reach #1	1111	.1	.3
Reach #1	1110	.1	.3
Reach #1	1109	.1	.3
Reach #1	1107.9	.3	.5
Reach #1	1107.5	Bridge	
Reach #1	1107.1	.3	.5
Reach #1	1107	.1	.3
Reach #1	1106	.1	.3
Reach #1	1105.5	Lat Struct	
Reach #1	1105	.1	.3
Reach #1	1104	.1	.3
Reach #1	1103	.1	.3
Reach #1	1102	.1	.3
Reach #1	1101.6	.3	.5
Reach #1	1101.5	Bridge	
Reach #1	1101.4	.3	.5
Reach #1	1101.3	Lat Struct	
Reach #1	1101	.1	.3
Reach #1	1100	.1	.3
Reach #1	1099	.1	.3
Reach #1	1098	.1	.3
Reach #1	1097	.1	.3
Reach #1	1096	.1	.3
Reach #1	1095	.1	.3

Reach #1	1094	.1	.3
Reach #1	1093	.1	.3
Reach #1	1092	.1	.3
Reach #1	1091	.1	.3
Reach #1	1090	.1	.3
Reach #1	1089	.1	.3
Reach #1	1088	.1	.3
Reach #1	1087	.1	.3
Reach #1	1086	.1	.3
Reach #1	1085	.1	.3
Reach #1	1084	.1	.3
Reach #1	1083	.1	.3
Reach #1	1082	.1	.3
Reach #1	1081	.1	.3
Reach #1	1080	.1	.3
Reach #1	1079	.1	.3
Reach #1	1078	.1	.3
Reach #1	1077	.1	.3
Reach #1	1075.9	.3	.5
Reach #1	1075.5	Bridge	
Reach #1	1075.1	.3	.5
Reach #1	1075	.1	.3
Reach #1	1074	.1	.3

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1173	PF 1	1767.35	1764.77	2.58	0.88	0.08	5.00	11935.50	7.50	133.19
Reach #1	1172	PF 1	1766.39	1764.07	2.33	0.72	0.12	386.56	11527.77	33.67	204.68
Reach #1	1171	PF 1	1765.55	1763.61	1.94	0.67	0.00	233.84	11699.53	14.63	239.22
Reach #1	1170	PF 1	1764.88	1762.95	1.93	0.55	0.18	9.89	11938.11		142.05
Reach #1	1169	PF 1	1764.15	1762.81	1.34	0.12	0.14		11948.00		152.71
Reach #1	1167.9	PF 1	1763.90	1763.02	0.88	0.00	0.03		11948.00		136.54
Reach #1	1167.5		Bonanza Bridge								
Reach #1	1167.1	PF 1	1763.04	1761.23	1.81	0.51	0.19		11948.00		135.84
Reach #1	1167	PF 1	1762.34	1760.90	1.44	0.51	0.00		11948.00		133.43
Reach #1	1166	PF 1	1761.83	1760.35	1.47	0.34	0.17	67.54	11876.87	3.59	179.72
Reach #1	1165	PF 1	1761.32	1760.40	0.92	0.26	0.00	703.32	11189.83	54.85	327.86
Reach #1	1164	PF 1	1761.06	1760.13	0.92	0.39	0.09	950.18	10973.48	24.34	400.27
Reach #1	1163	PF 1	1760.58	1758.75	1.83	0.62	0.01	17.44	11929.89	0.67	152.62
Reach #1	1162	PF 1	1759.96	1758.08	1.88	0.73	0.04	0.02	11947.98	0.00	132.90
Reach #1	1161	PF 1	1759.19	1756.86	2.33	0.65	0.16		11948.00		116.38
Reach #1	1160	PF 1	1758.37	1756.59	1.78	0.67	0.07		11948.00		119.37
Reach #1	1159	PF 1	1757.63	1755.13	2.50	0.93	0.04	0.03	12705.96		117.09
Reach #1	1158	PF 1	1756.67	1753.81	2.86	0.87	0.18		12706.00		115.48
Reach #1	1157	PF 1	1755.62	1753.35	2.27	0.92	0.08		12706.00		121.20
Reach #1	1156	PF 1	1754.63	1751.55	3.07	1.14	0.01		12706.00		112.97
Reach #1	1155	PF 1	1753.47	1750.44	3.03	0.92	0.24		12706.00		115.46
Reach #1	1154	PF 1	1752.31	1750.10	2.21	0.39	0.31		12706.00		126.37
Reach #1	1152.9	PF 1	1751.60	1750.43	1.17	0.00	0.04		12706.00		140.00
Reach #1	1152.5		Stewart Avenue Bridge								
Reach #1	1152.1	PF 1	1750.69	1748.67	2.02	0.47	0.01		12706.00		139.08
Reach #1	1152	PF 1	1750.21	1748.20	2.00	0.50	0.11		12754.00		126.23
Reach #1	1151	PF 1	1749.60	1747.96	1.64	0.36	0.04		12754.00		136.30
Reach #1	1150	PF 1	1749.20	1747.69	1.50	0.29	0.09		12754.00		135.66
Reach #1	1149	PF 1	1748.82	1747.61	1.22	0.20	0.10		12754.00		144.13
Reach #1	1148	PF 1	1748.53	1747.65	0.88	0.04	0.11	583.63	12158.62	11.75	297.33
Reach #1	1147.5	PF 1	1748.38	1747.86	0.51	0.02	0.06	387.41	12342.34	24.26	468.92
Reach #1	1147.3	PF 1	1748.29	1747.98	0.31	0.03	0.04	317.74	12397.56	38.70	684.80
Reach #1	1147	PF 1	1748.22	1747.49	0.73	0.13	0.01	755.08	11587.57	21.36	202.29
Reach #1	1146	PF 1	1748.07	1747.26	0.81	0.14	0.00	40.44	12321.60	1.96	213.82
Reach #1	1145	PF 1	1747.93	1747.12	0.81	0.12	0.07	75.28	12288.72		161.90
Reach #1	1144.5		Lat Struct								
Reach #1	1144	PF 1	1747.75	1747.17	0.58	0.09	0.00	634.60	11727.39	0.00	253.74
Reach #1	1143	PF 1	1747.65	1747.08	0.58	0.08	0.02	234.29	12090.50		185.27
Reach #1	1142	PF 1	1747.55	1747.05	0.50	0.07	0.01	156.44	11745.11		194.57
Reach #1	1141	PF 1	1747.47	1747.02	0.45	0.06	0.02	122.48	11597.24		173.72
Reach #1	1140	PF 1	1747.40	1747.00	0.39	0.02	0.03	171.44	11295.63		182.60
Reach #1	1139.9	PF 1	1747.35	1747.06	0.28				11304.35		141.50
Reach #1	1139.5		Charleston Boulevard Bridge								
Reach #1	1139.1	PF 1	1743.33	1742.89	0.44	0.01	0.09		11304.35		141.50
Reach #1	1139	PF 1	1743.24	1742.50	0.73	0.18	0.09	15.55	11845.50	15.29	222.46
Reach #1	1138	PF 1	1742.96	1741.29	1.67	0.40	0.00	191.96	12739.15	4.89	263.22
Reach #1	1137	PF 1	1742.55	1740.89	1.66	0.42	0.10	202.29	12718.09	15.61	244.19
Reach #1	1136	PF 1	1742.03	1740.70	1.33	0.38	0.05	353.59	12582.41		271.83
Reach #1	1135	PF 1	1741.60	1740.43	1.17	0.30	0.05	297.45	11989.63	648.92	441.97

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

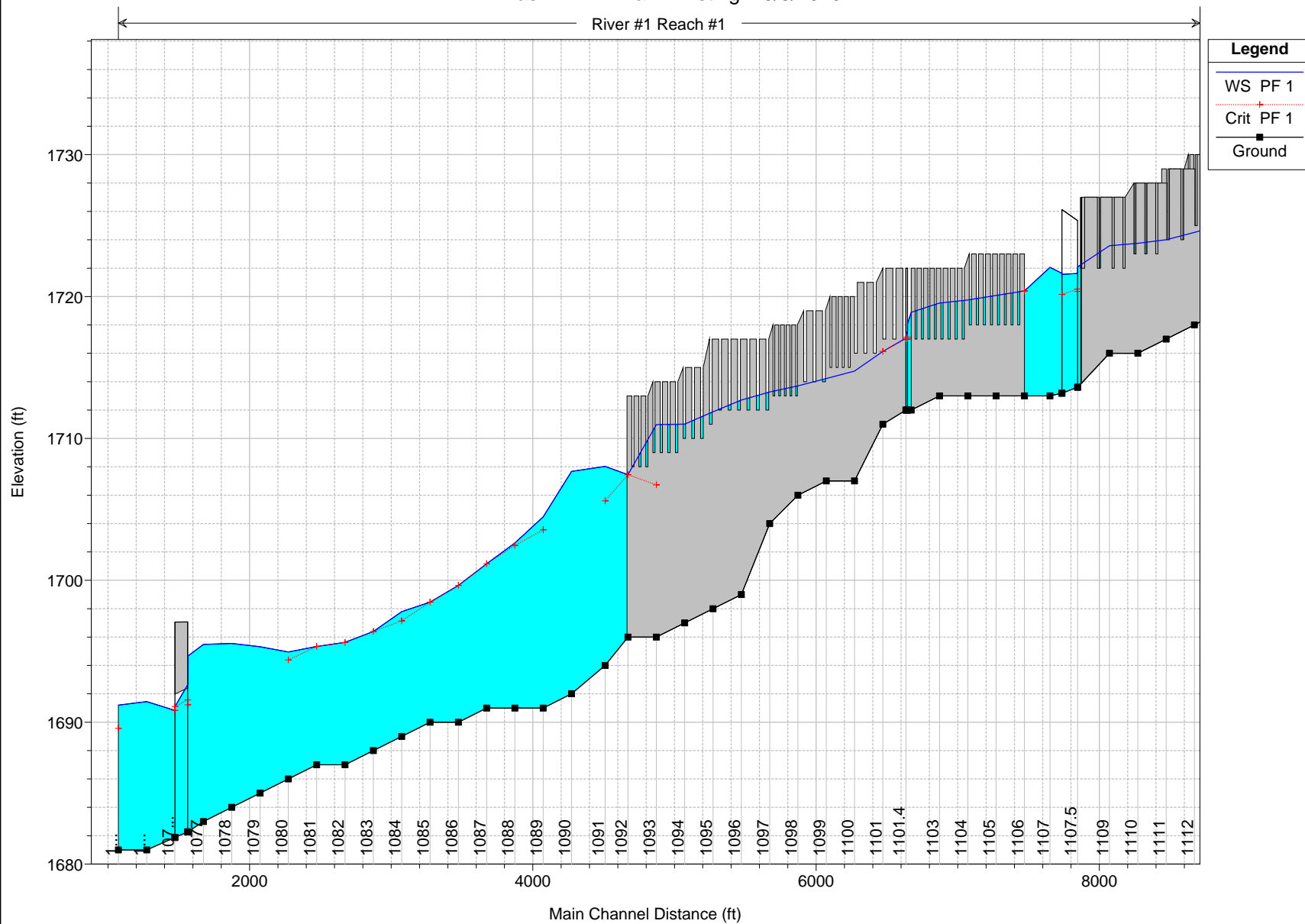
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1134	PF 1	1741.24	1740.25	0.99	0.20	0.08	604.02	11564.33	767.65	379.14
Reach #1	1132.9	PF 1	1740.97	1740.24	0.73				12936.00		143.00
Reach #1	1132.5		Nellis Boulevard Bridge								
Reach #1	1132.1	PF 1	1739.39	1738.06	1.33	0.17	0.06		12936.00		143.00
Reach #1	1132	PF 1	1739.16	1737.64	1.52	0.51	0.00		13515.00		172.56
Reach #1	1131	PF 1	1738.65	1737.14	1.52	0.39	0.24		13515.00		195.97
Reach #1	1130	PF 1	1738.03	1737.30	0.72	0.37	0.09		13515.00		350.65
Reach #1	1129	PF 1	1737.57	1735.96	1.60	0.47	0.14		13515.00		173.37
Reach #1	1128	PF 1	1736.96	1735.83	1.12	0.40	0.19		13515.00		276.99
Reach #1	1127.5		Lat Struct								
Reach #1	1127	PF 1	1736.37	1735.87	0.50	0.35	0.00		13440.42		600.37
Reach #1	1126	PF 1	1736.02	1735.47	0.55	0.43	0.02		13372.80		546.91
Reach #1	1125	PF 1	1735.57	1734.83	0.74	0.47	0.03		13222.81		506.60
Reach #1	1124.5		Lat Struct								
Reach #1	1124	PF 1	1735.07	1734.42	0.65	0.42	0.02		13074.79		487.40
Reach #1	1123	PF 1	1734.63	1733.74	0.89	0.54	0.01		12808.24		324.70
Reach #1	1122	PF 1	1734.07	1733.22	0.86	0.52	0.06		12754.82		506.92
Reach #1	1121	PF 1	1733.49	1732.84	0.65	0.67	0.10		12510.40		447.83
Reach #1	1120	PF 1	1732.72	1731.10	1.62	0.98	0.26		11555.53		353.51
Reach #1	1119	PF 1	1731.48	1730.73	0.76	0.80	0.01		10925.12		490.63
Reach #1	1118	PF 1	1730.67	1729.82	0.84	1.02	0.01		10186.10		512.18
Reach #1	1117	PF 1	1729.64	1728.72	0.92	0.57	0.14		10127.71		498.05
Reach #1	1116.5		Lat Struct								
Reach #1	1116.4		Lat Struct								
Reach #1	1116	PF 1	1728.92	1728.47	0.45	0.35	0.01		9756.40		498.92
Reach #1	1115	PF 1	1728.56	1728.16	0.41	0.61	0.13		9212.09		532.77
Reach #1	1114	PF 1	1727.81	1726.08	1.74	1.19	0.24		8907.23		247.16
Reach #1	1113	PF 1	1726.04	1725.10	0.94	0.77	0.09	0.01	8874.02		402.60
Reach #1	1112	PF 1	1725.18	1724.52	0.66	0.58	0.03		8873.91		441.64
Reach #1	1111	PF 1	1724.57	1724.00	0.56	0.37	0.05		8856.65		484.51
Reach #1	1110	PF 1	1724.15	1723.76	0.39	0.24	0.03		8691.68		428.52
Reach #1	1109	PF 1	1723.88	1723.58	0.30	0.21	0.12		8217.15		491.15
Reach #1	1107.9	PF 1	1723.56	1722.09	1.47	0.00	0.11		7973.39		118.64
Reach #1	1107.5		Sahara Avenue Bridge								
Reach #1	1107.1	PF 1	1723.13	1721.65	1.49	0.10	0.51		7973.39		118.64
Reach #1	1107	PF 1	1722.52	1722.05	0.47	0.65	0.09		7973.39		412.91
Reach #1	1106	PF 1	1721.78	1720.39	1.38	0.74	0.22		11220.64		430.06
Reach #1	1105.5		Lat Struct								
Reach #1	1105	PF 1	1720.72	1720.08	0.65	0.42	0.04		10707.31		447.20
Reach #1	1104	PF 1	1720.26	1719.76	0.50	0.33	0.05		10297.21		544.22
Reach #1	1103	PF 1	1719.88	1719.55	0.34	0.34	0.03		9627.67		615.61
Reach #1	1102	PF 1	1719.51	1718.89	0.62	0.07	0.07		9109.22		406.28
Reach #1	1101.6	PF 1	1719.38	1718.08	1.30				9109.22		196.00
Reach #1	1101.5		Golf Course Bridge								
Reach #1	1101.4	PF 1	1719.09	1717.07	2.02	1.01	0.07		9109.22		192.11
Reach #1	1101.3		Lat Struct								
Reach #1	1101	PF 1	1718.01	1716.13	1.87	0.84	0.32		9109.05		221.92
Reach #1	1100	PF 1	1715.57	1714.75	0.82	0.69	0.07		13849.05		581.09
Reach #1	1099	PF 1	1714.81	1714.22	0.59	0.49	0.00		5732.39	8116.67	843.99

Las Vegas Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach #1	1098	PF 1	1714.32	1713.71	0.61	0.37	0.01		4710.35	9135.61	566.32
Reach #1	1097	PF 1	1713.94	1713.27	0.66	0.38	0.02		5655.10	8116.67	698.44
Reach #1	1096	PF 1	1713.54	1712.70	0.84	0.35	0.04		13645.70		263.08
Reach #1	1095	PF 1	1713.15	1711.88	1.27	0.63	0.02		13616.28		270.02
Reach #1	1094	PF 1	1712.50	1711.01	1.49	0.34	0.13		13442.78		294.76
Reach #1	1093	PF 1	1712.03	1710.98	1.05	0.35	0.29	854.01	11054.52	1174.90	297.39
Reach #1	1092	PF 1	1711.39	1707.45	3.94	0.46	0.69		12853.03	16.21	129.84
Reach #1	1091	PF 1	1709.67	1708.03	1.64	0.45	0.04	502.71	12409.14	28.38	357.23
Reach #1	1090	PF 1	1709.18	1707.68	1.50	0.71	0.23	481.14	12425.22	33.87	208.21
Reach #1	1089	PF 1	1708.25	1704.47	3.77	1.36	0.04	6.20	18665.06	0.74	139.75
Reach #1	1088	PF 1	1706.84	1702.63	4.20	1.57	0.05		18672.00		129.35
Reach #1	1087	PF 1	1705.22	1701.17	4.05	1.65	0.06		18672.00		142.72
Reach #1	1086	PF 1	1703.50	1699.65	3.85	0.66	0.09		18672.00		154.97
Reach #1	1085	PF 1	1702.03	1698.46	3.57	0.31	0.30		18672.00		172.90
Reach #1	1084	PF 1	1700.37	1697.79	2.58	0.31	0.10		18672.00		218.39
Reach #1	1083	PF 1	1699.96	1696.39	3.56	0.35	0.00		18672.00		172.96
Reach #1	1082	PF 1	1699.21	1695.63	3.58	0.35	0.02		18672.00		170.89
Reach #1	1081	PF 1	1698.84	1695.34	3.50	0.31	0.14		18672.00		177.98
Reach #1	1080	PF 1	1697.99	1694.95	3.04	0.21	0.25		18672.00		179.43
Reach #1	1079	PF 1	1697.53	1695.32	2.21	0.13	0.16	38.90	18628.20	4.90	229.74
Reach #1	1078	PF 1	1697.24	1695.56	1.68	0.10	0.01	140.63	18501.80	29.57	330.72
Reach #1	1077	PF 1	1697.12	1695.48	1.64	0.06	0.07	90.64	18579.95	1.40	225.56
Reach #1	1075.9	PF 1	1696.99	1694.66	2.34	0.00	0.46		18672.00		123.61
Reach #1	1075.5		Vegas Valley Bridge								
Reach #1	1075.1	PF 1	1695.29	1690.84	4.46	0.27	0.97		18672.00		123.61
Reach #1	1075	PF 1	1693.97	1691.45	2.52	0.36	0.05		18718.00		181.13
Reach #1	1074	PF 1	1693.56	1691.20	2.36				18718.00		183.18

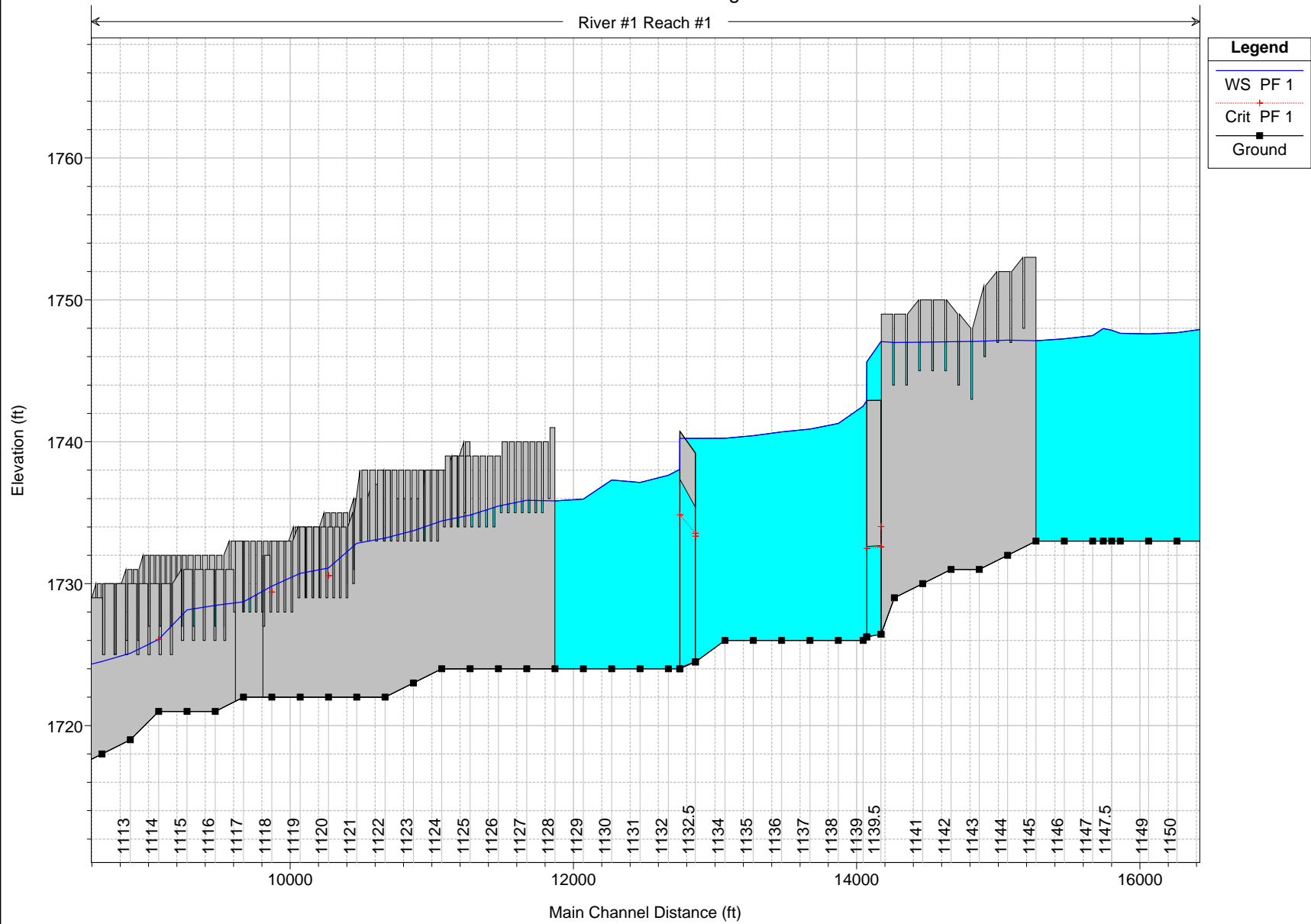
LVWashEX Plan: Existing 8/8/2013

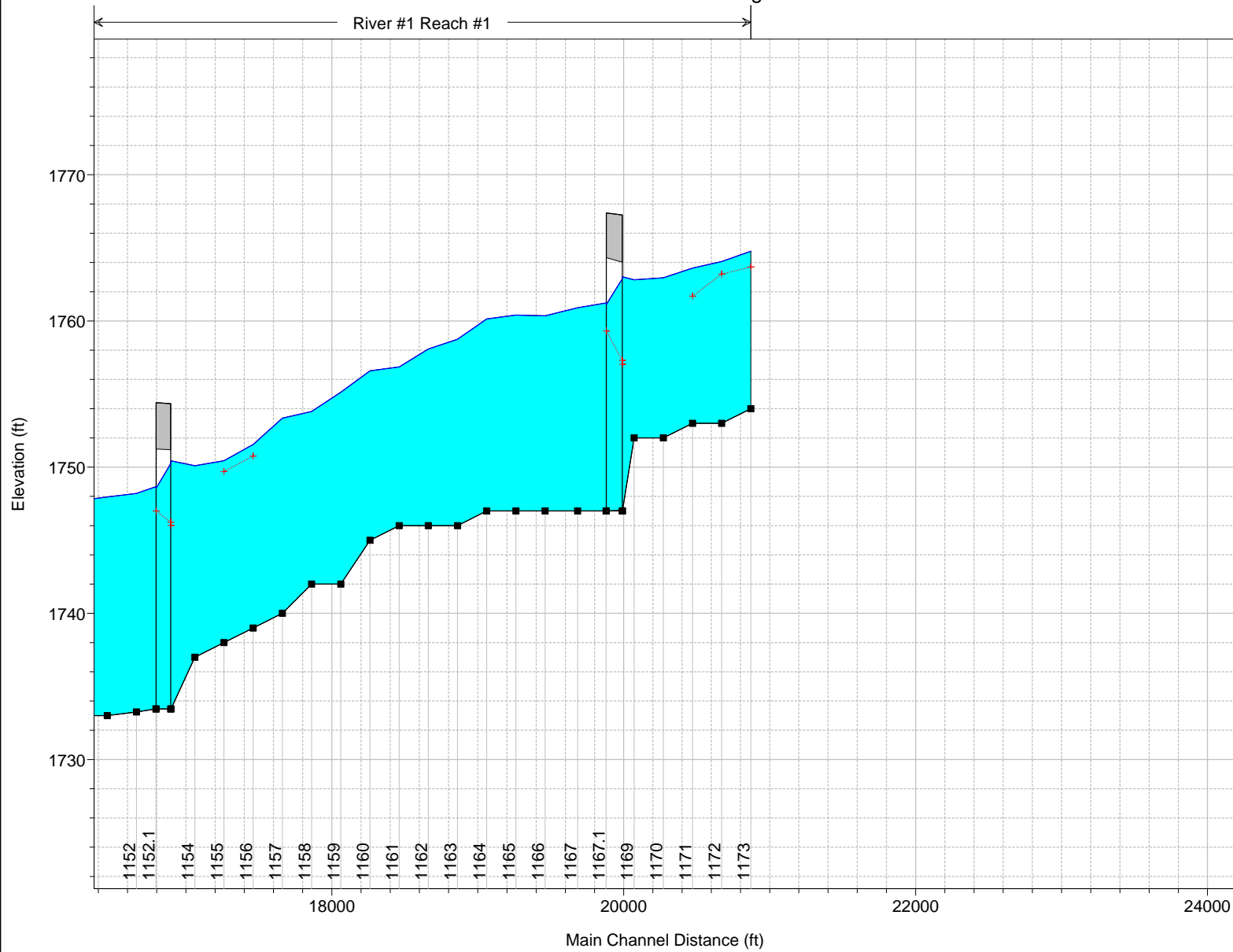
River #1 Reach #1



LVWashEX Plan: Existing 8/8/2013

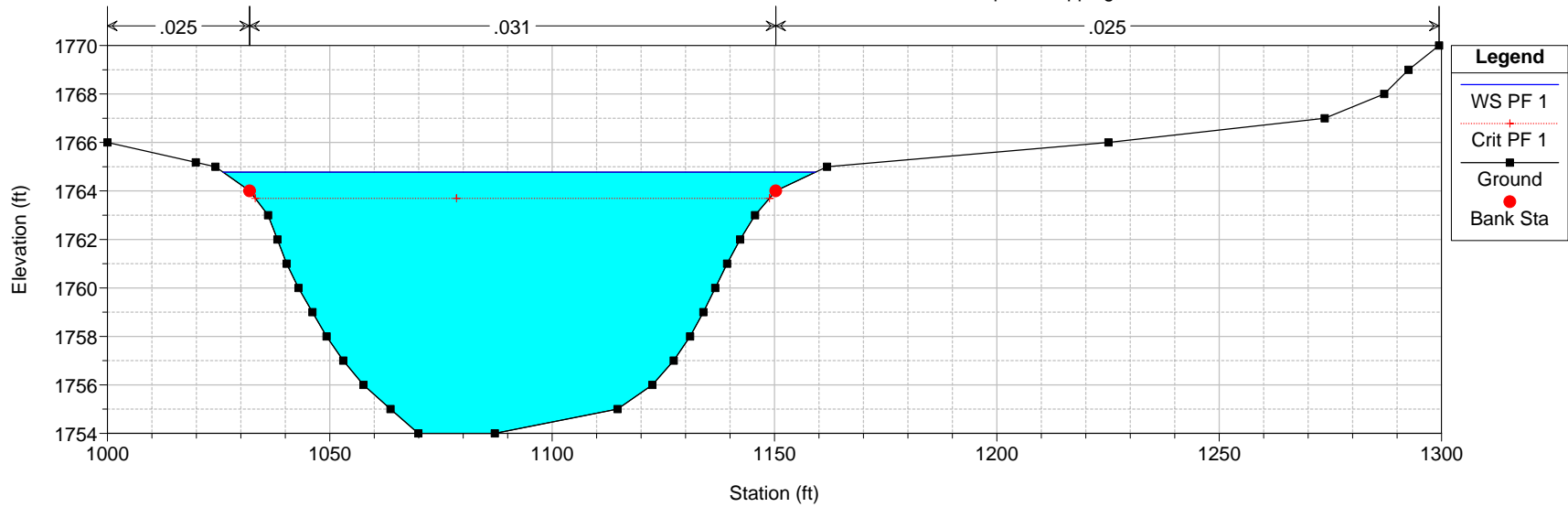
River #1 Reach #1





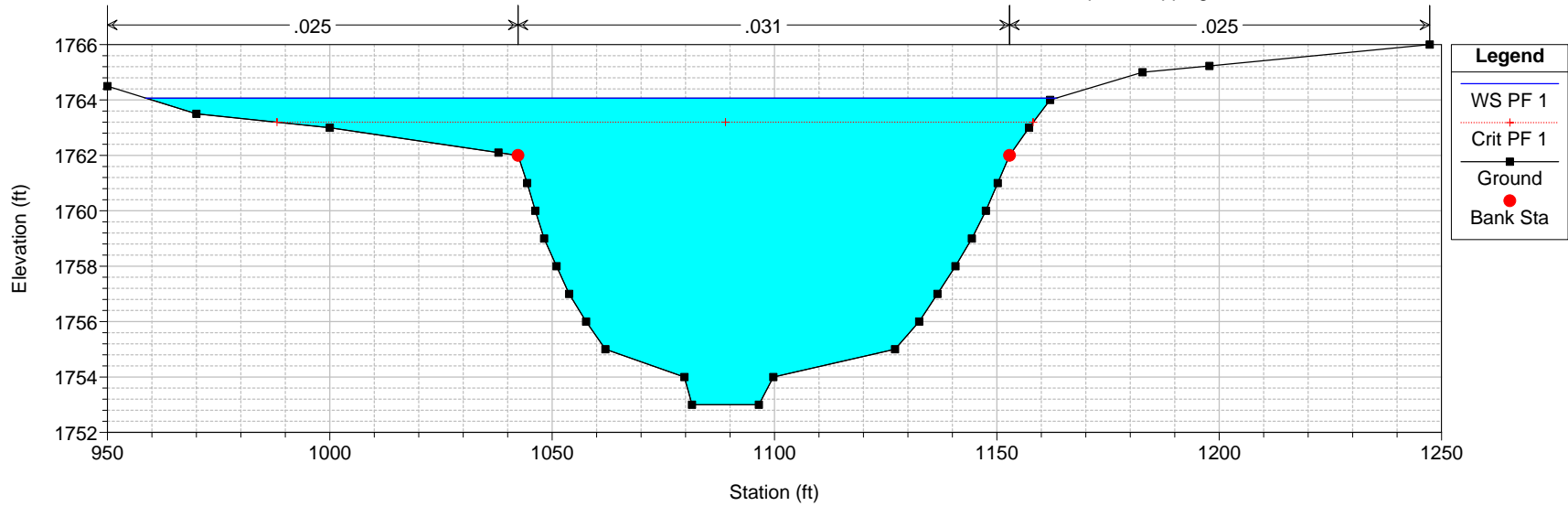
LVWashEX Plan: Existing 8/8/2013

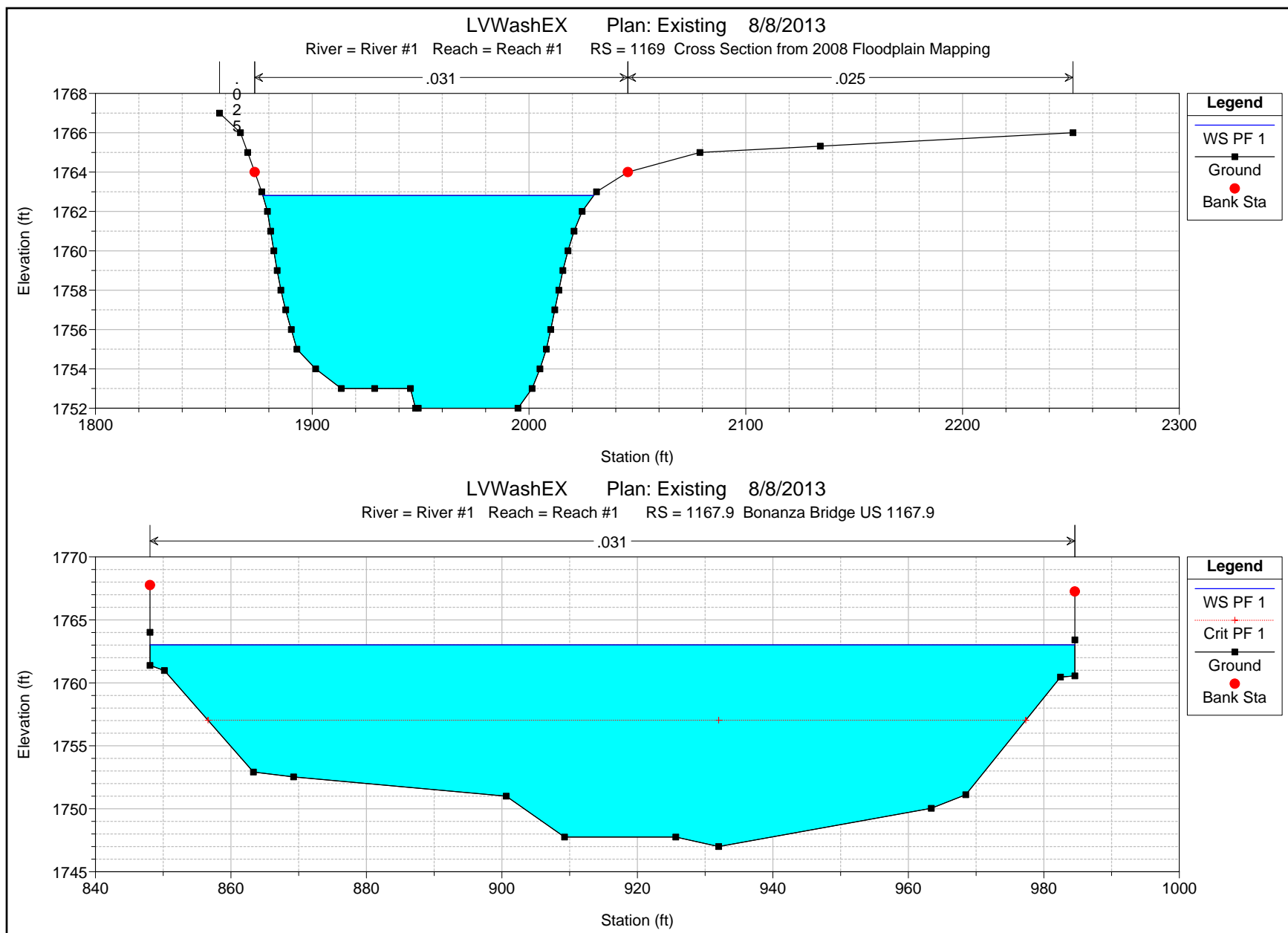
River = River #1 Reach = Reach #1 RS = 1173 Cross Section from 2008 Floodplain Mapping, model truncated to d



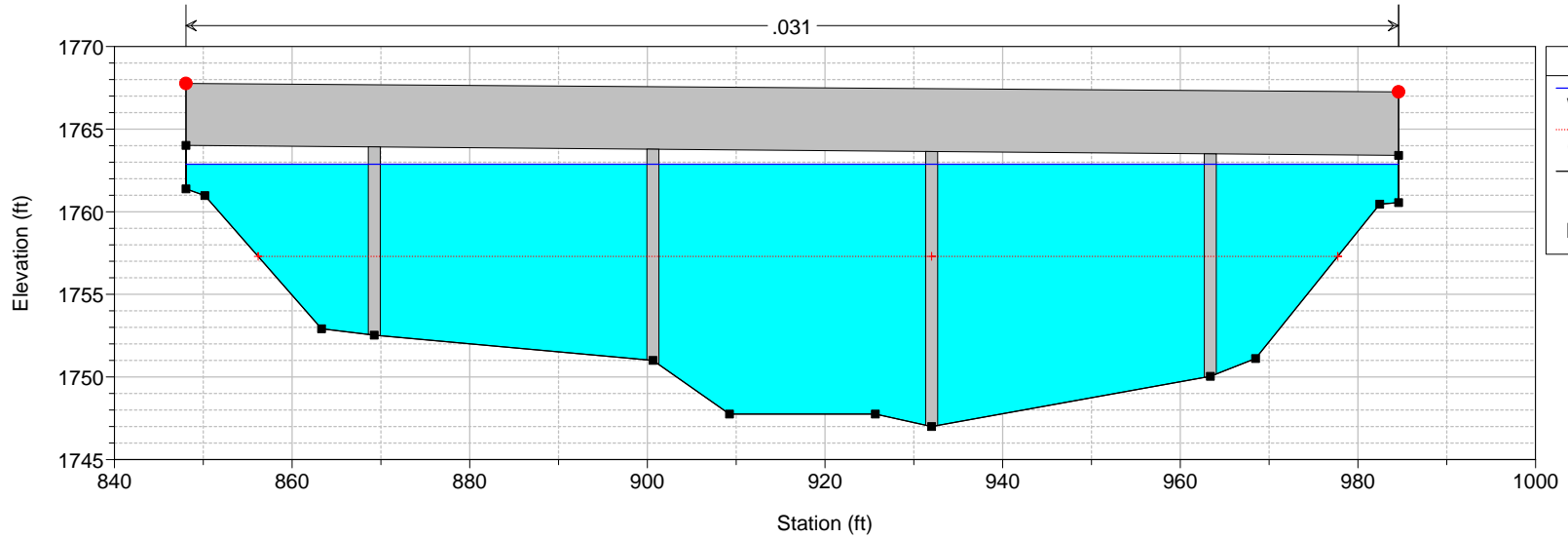
LVWashEX Plan: Existing 8/8/2013

River = River #1 Reach = Reach #1 RS = 1172 Cross Section from 2008 Floodplain Mapping

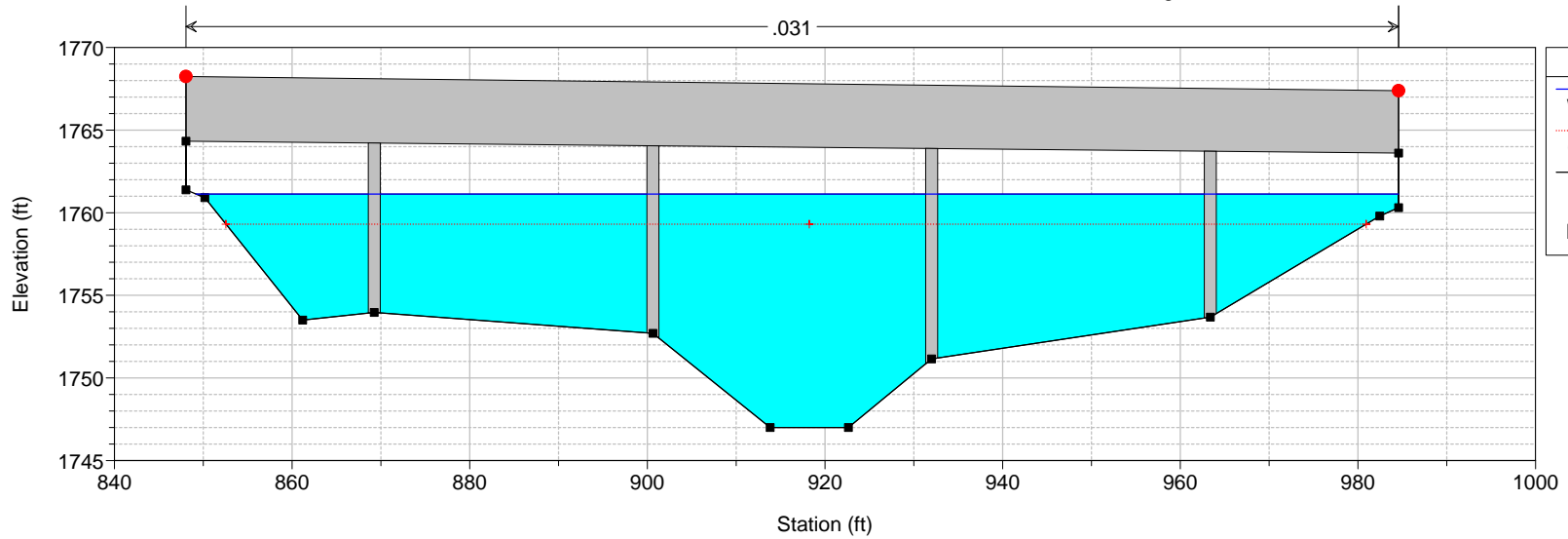




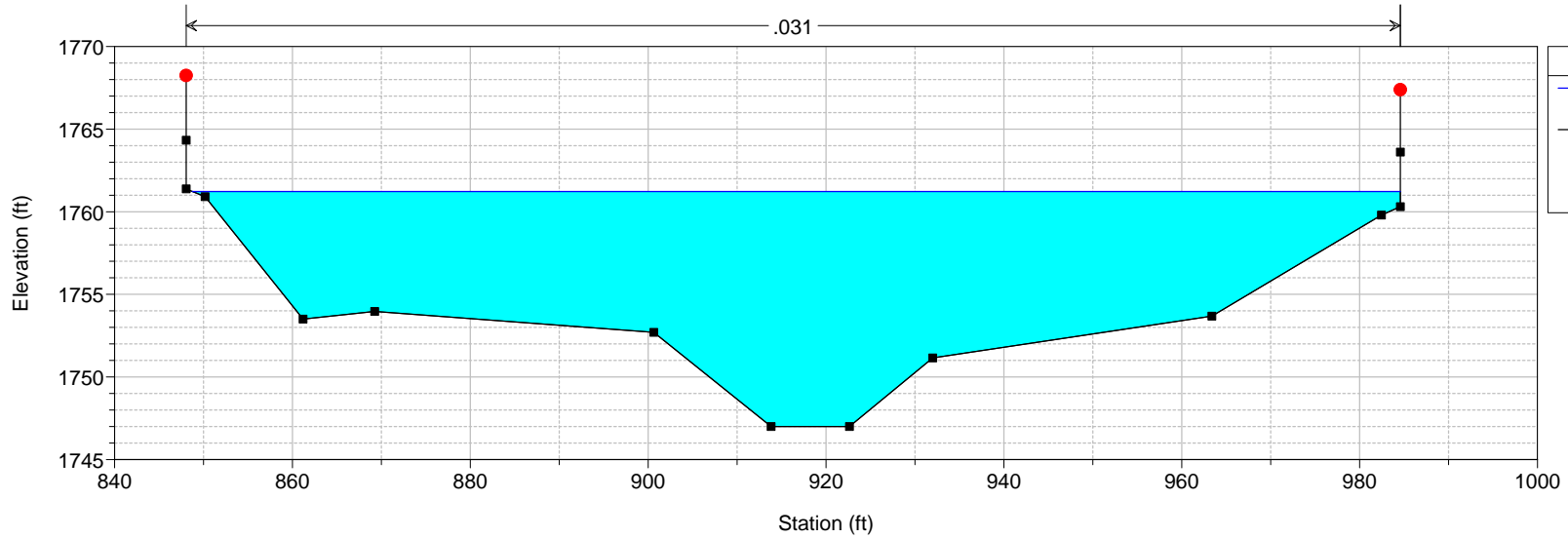
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.5 BR Bonanza Bridge



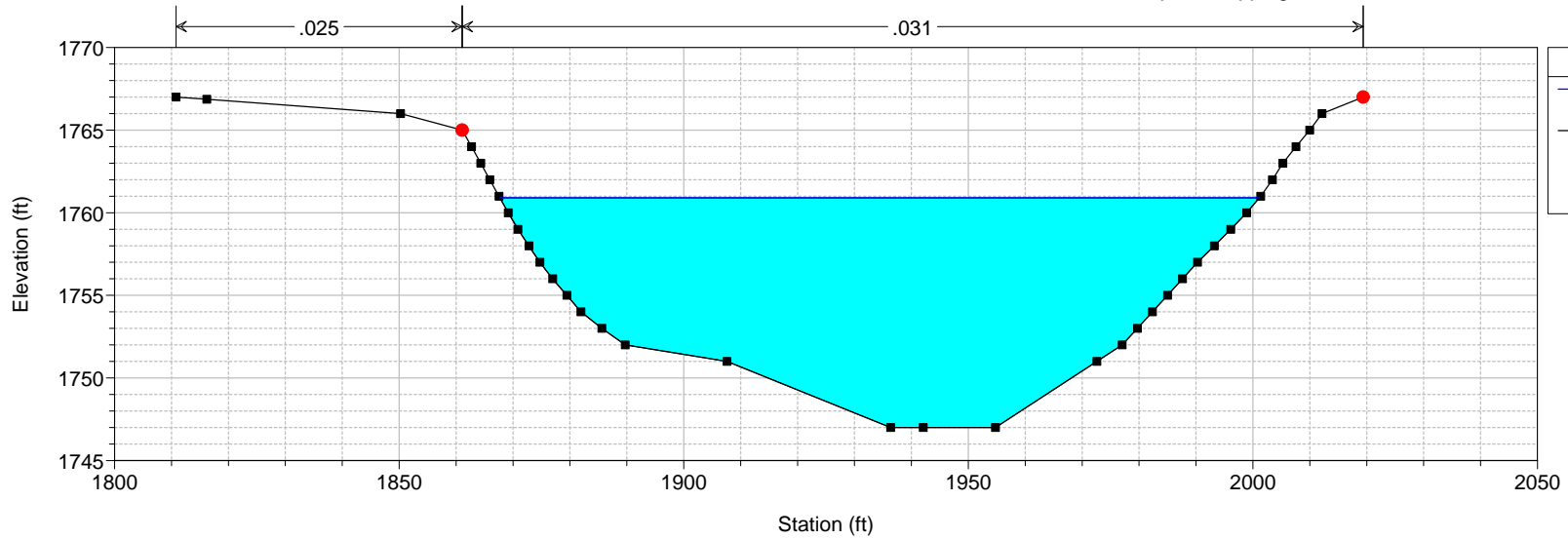
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.5 BR Bonanza Bridge

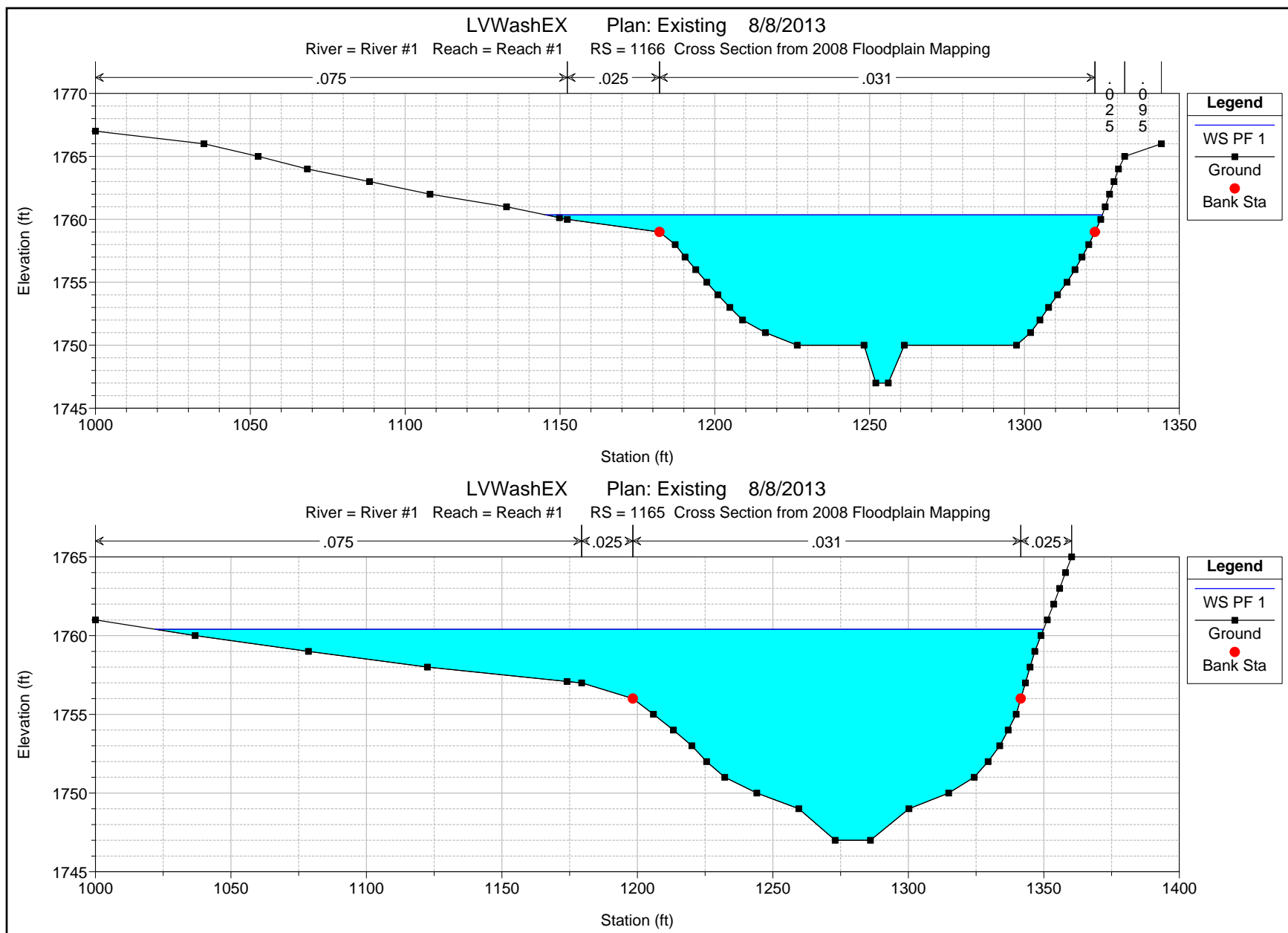


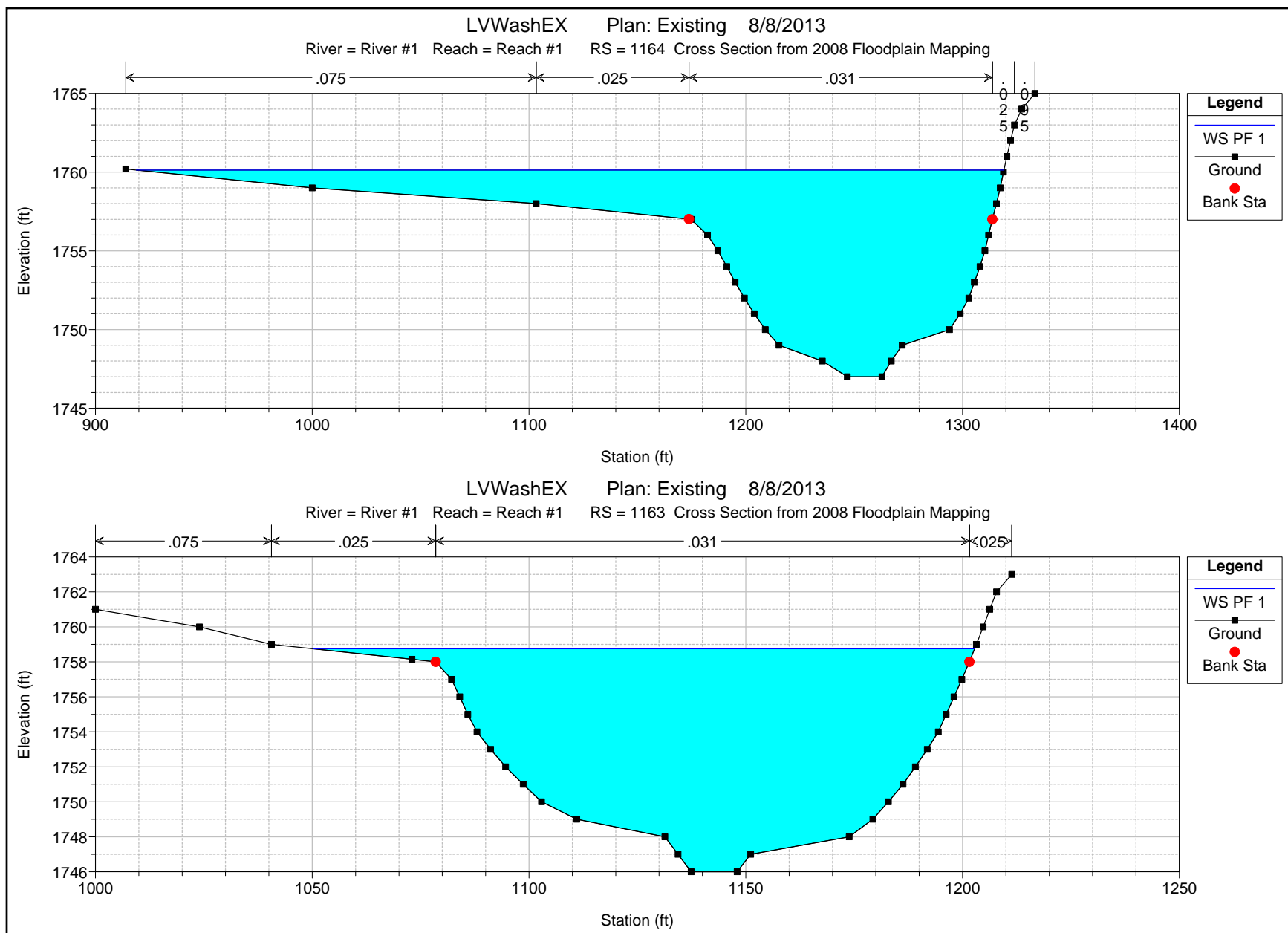
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1167.1 Bonanza Bridge DS 1167.1

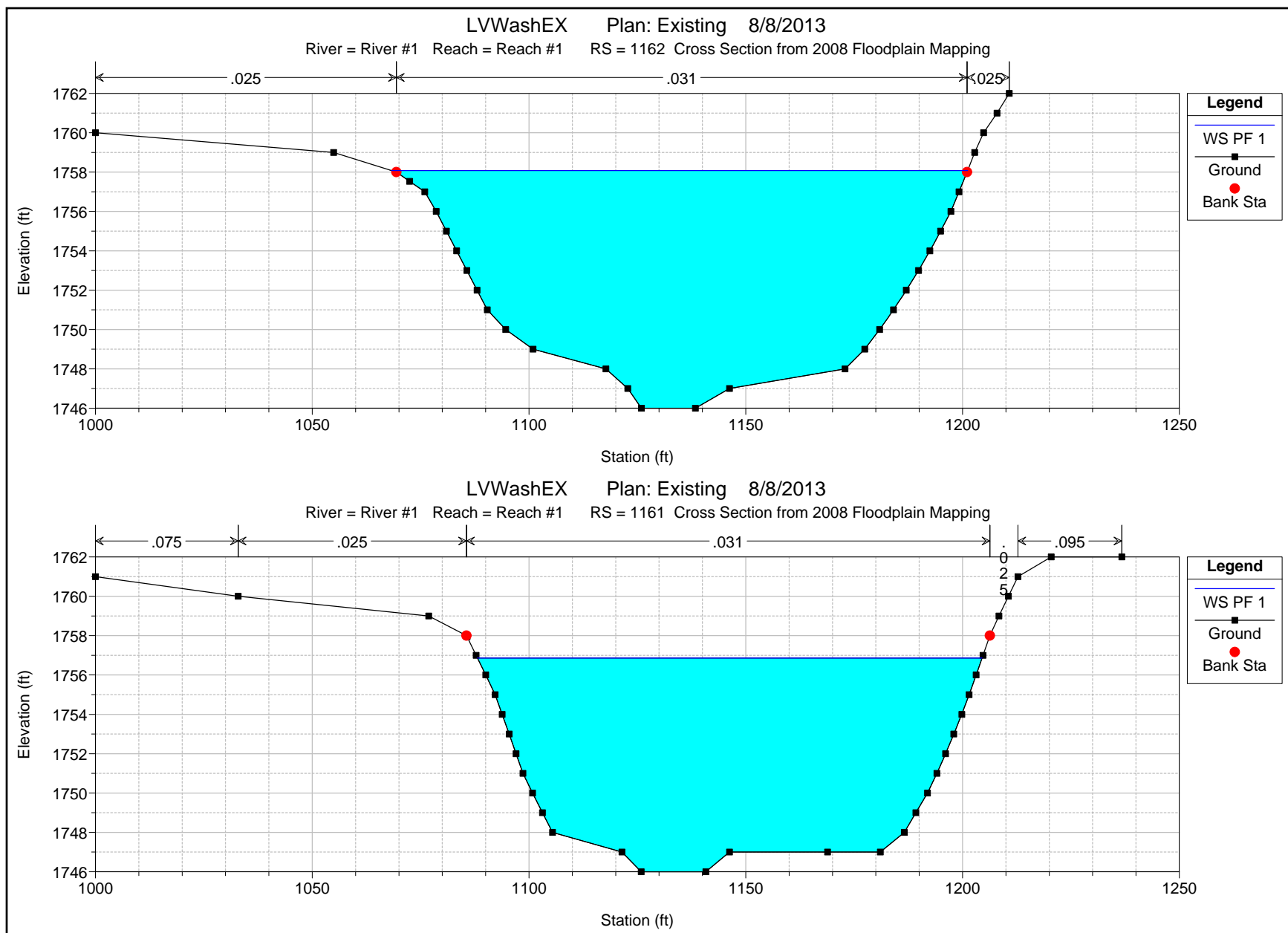


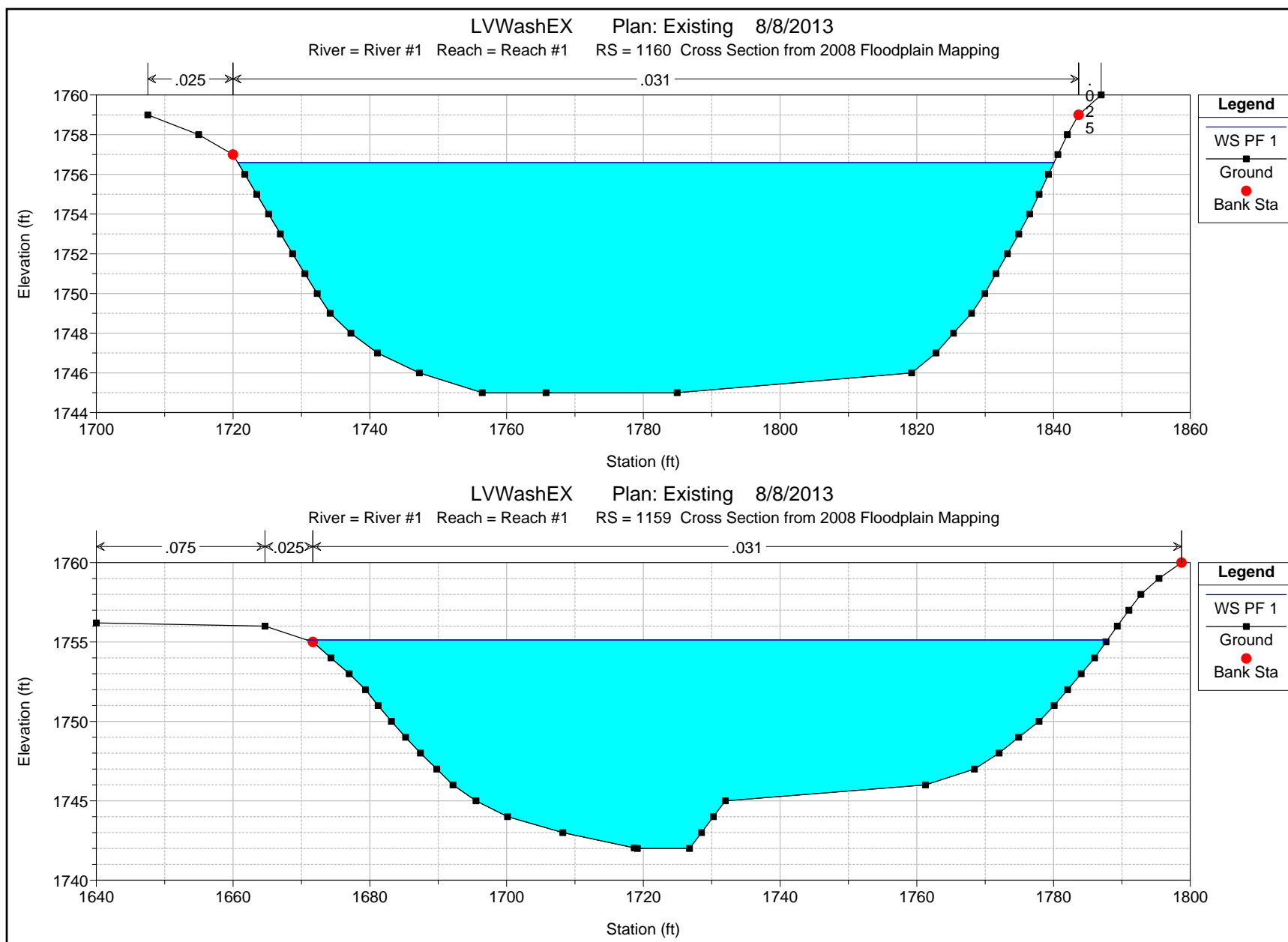
LVWashEX Plan: Existing 8/8/2013
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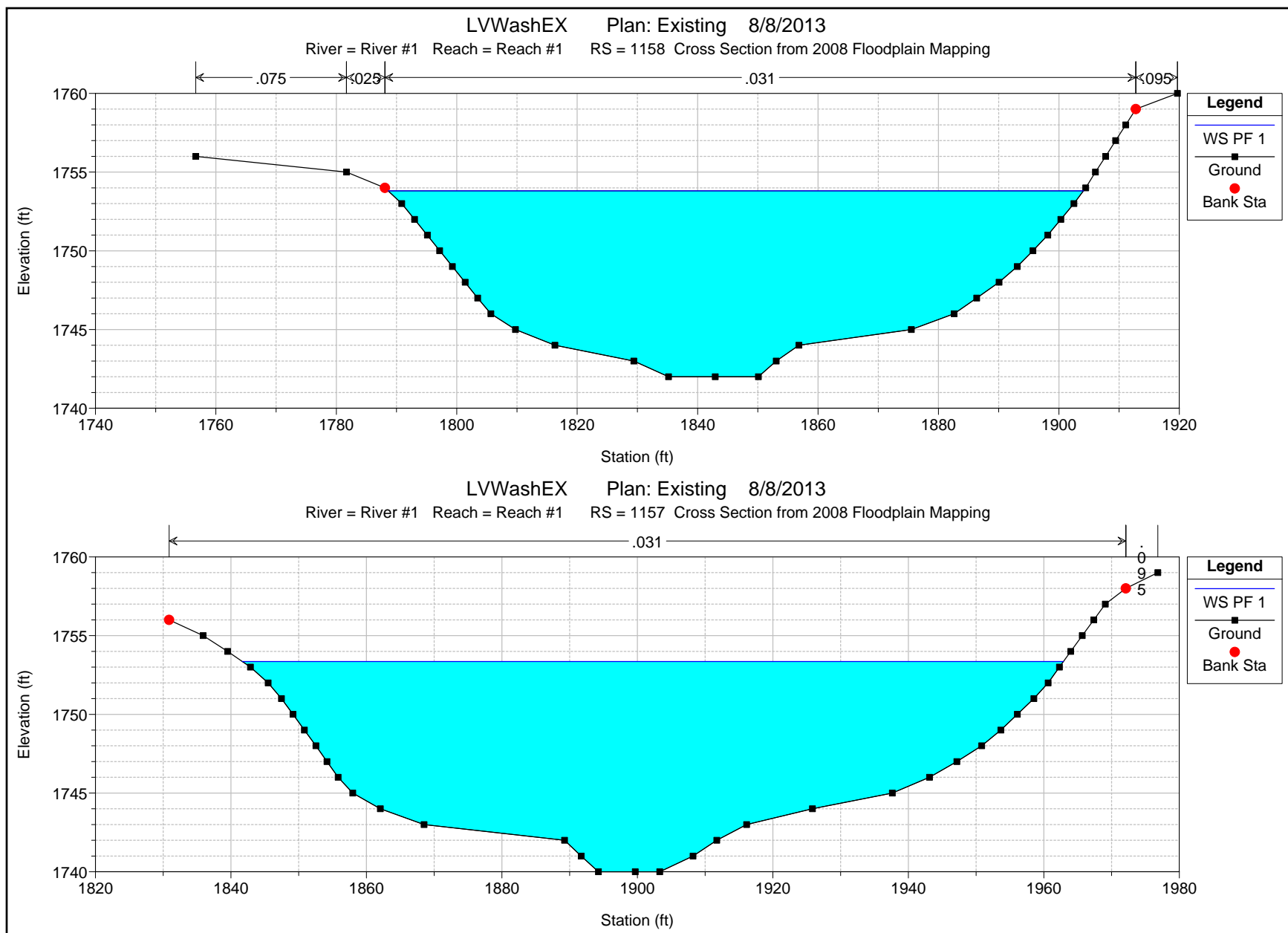


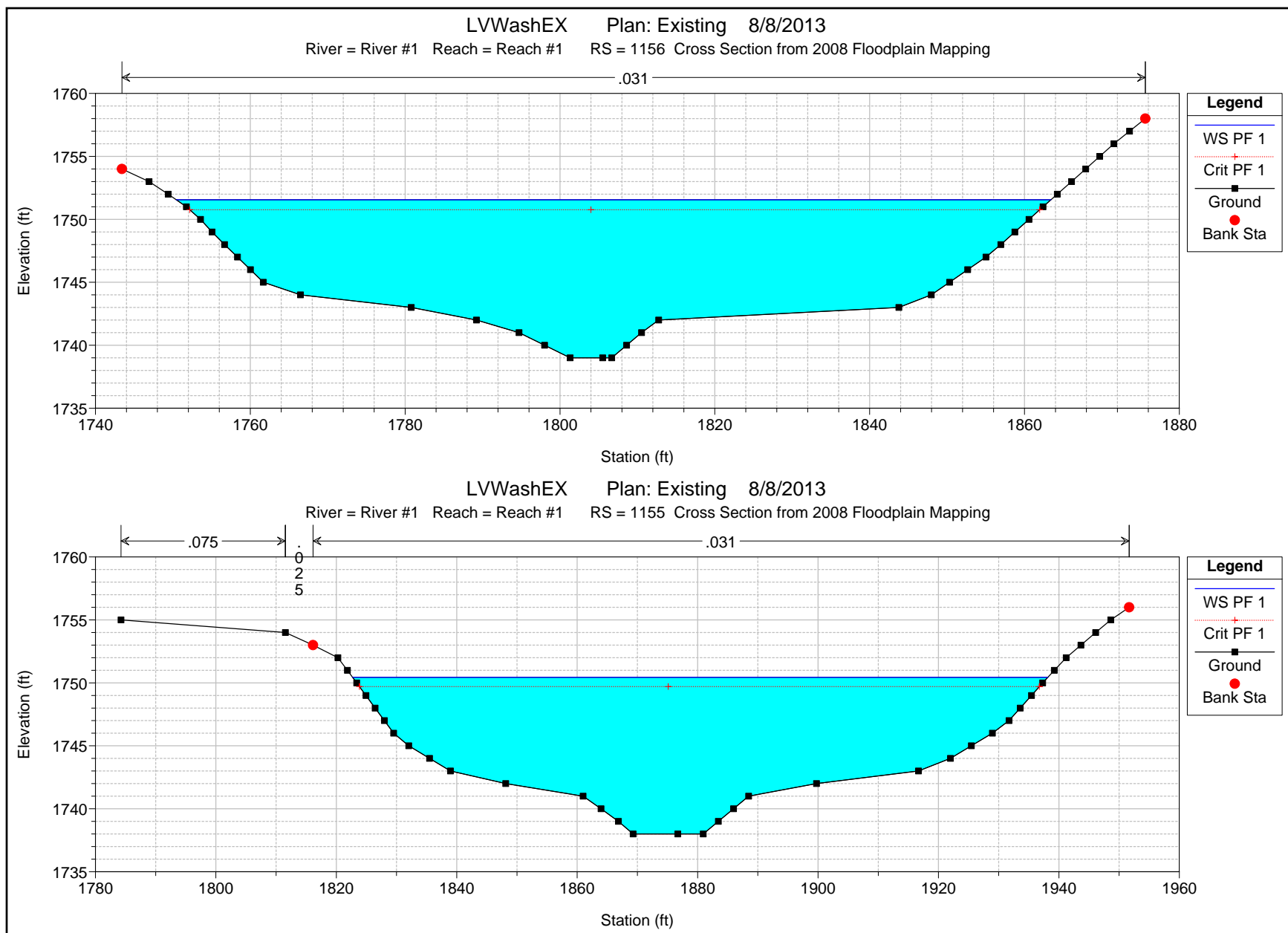


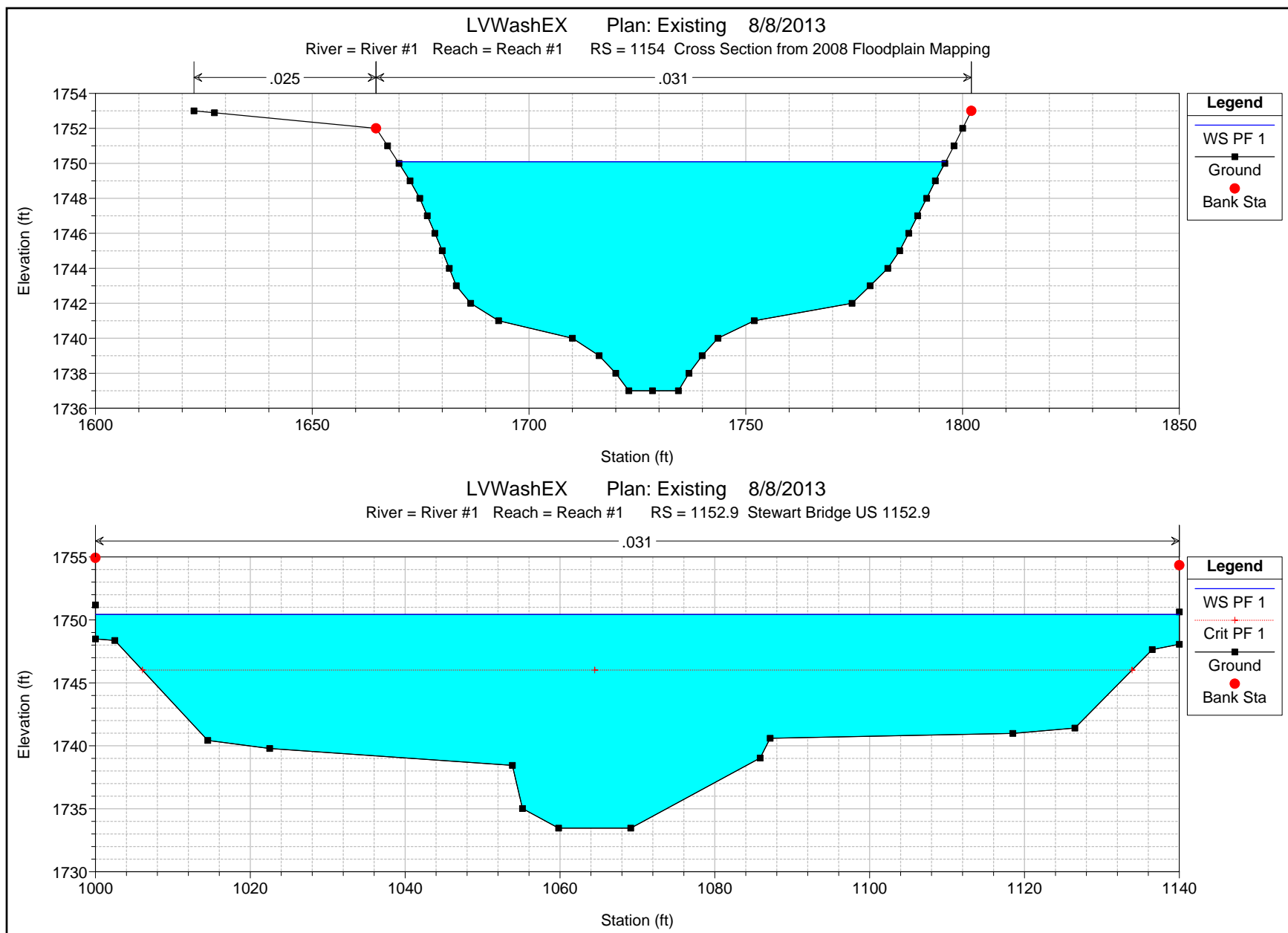




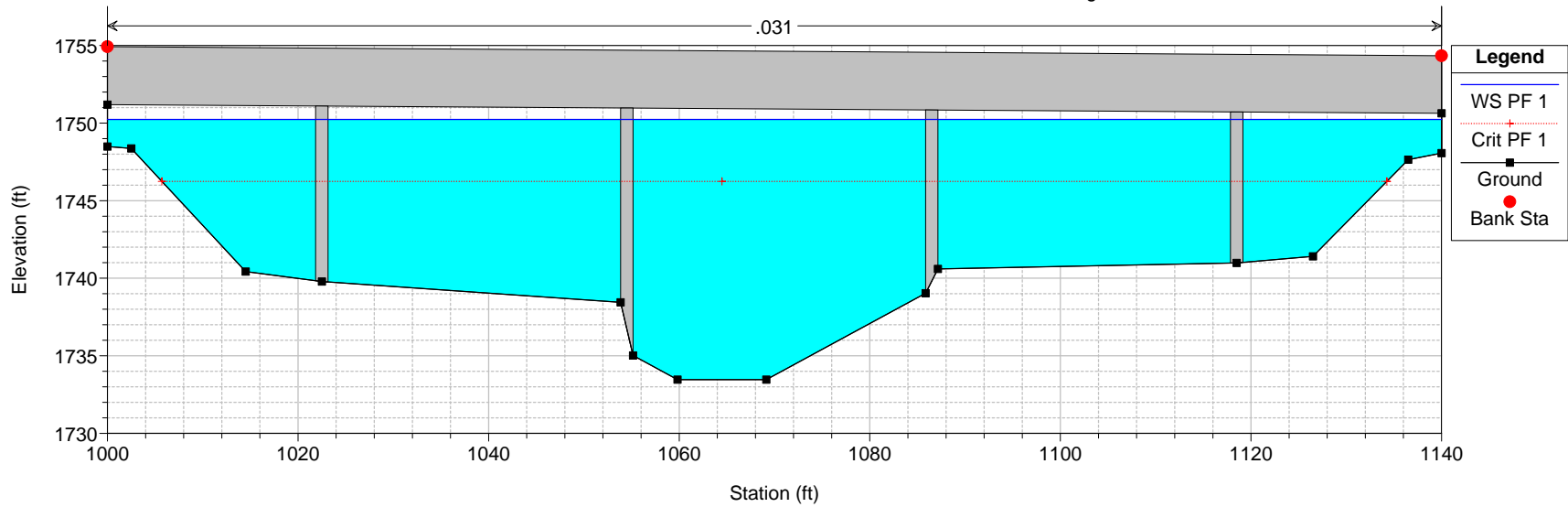




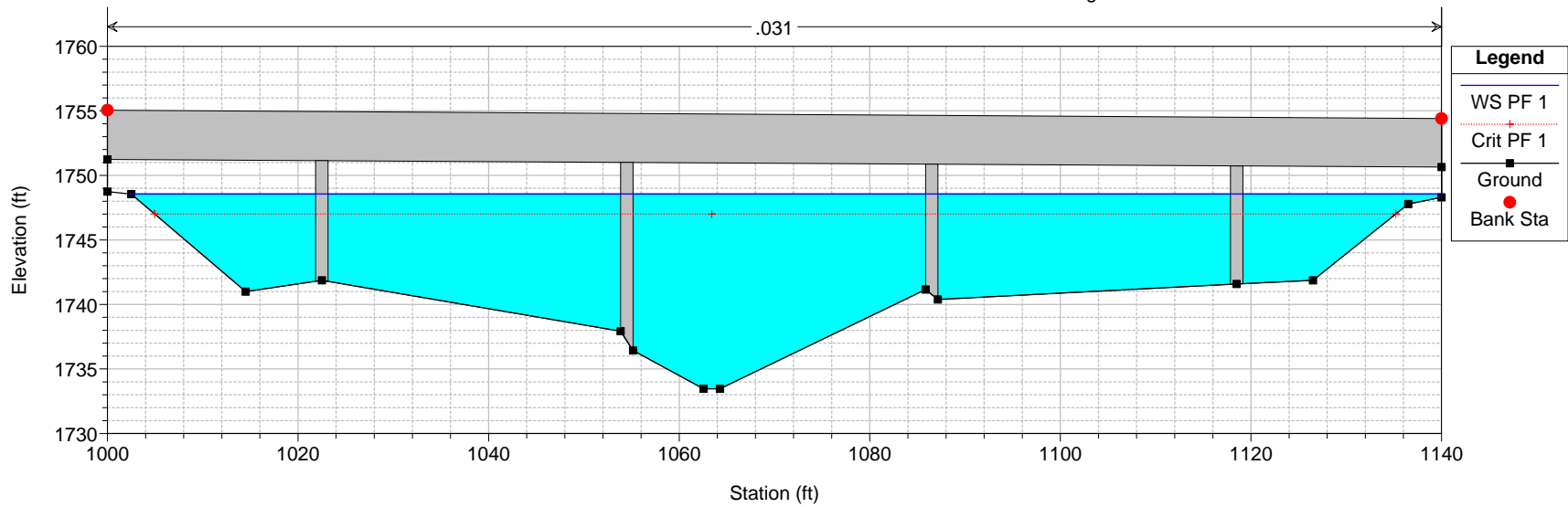




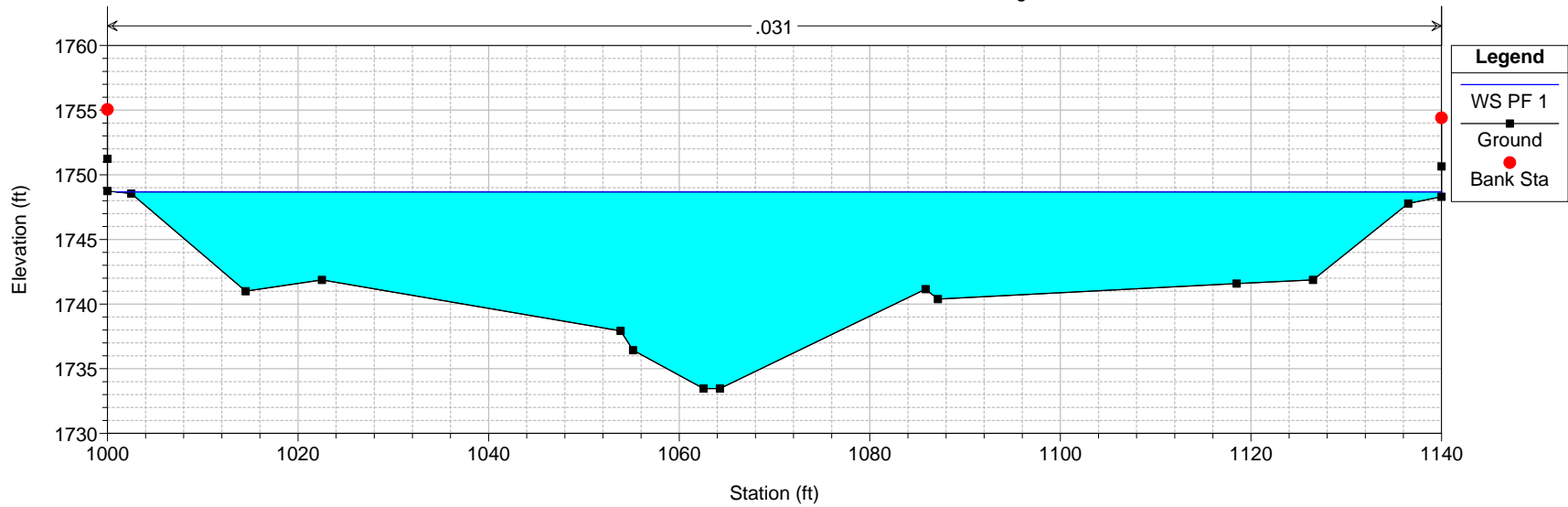
LVWashEX Plan: Existing 8/8/2013
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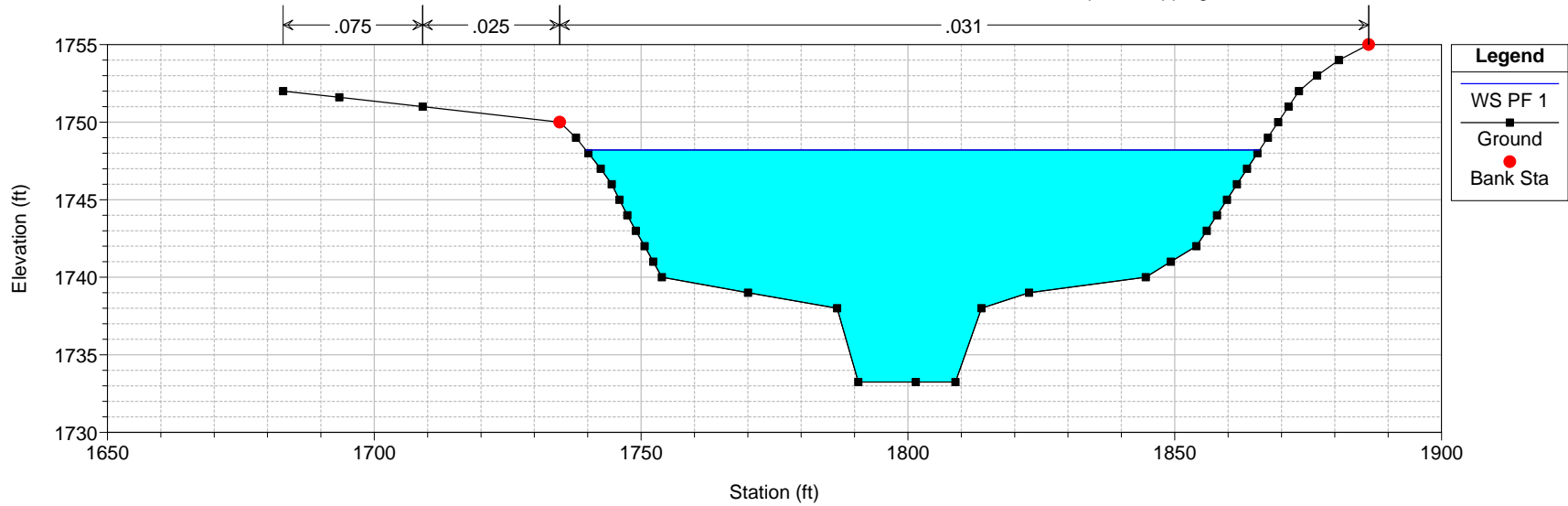
LVWashEX Plan: Existing 8/8/2013
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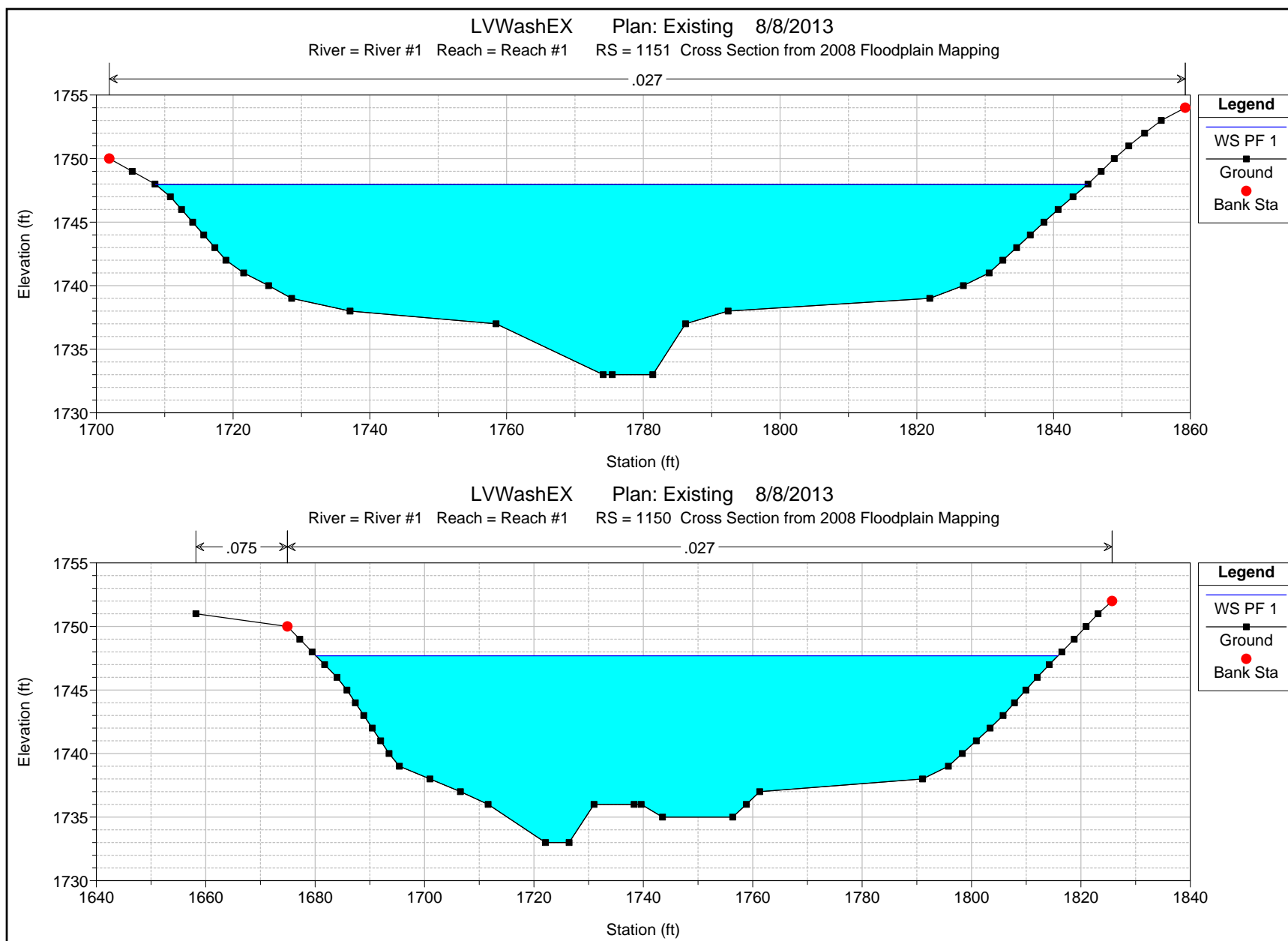


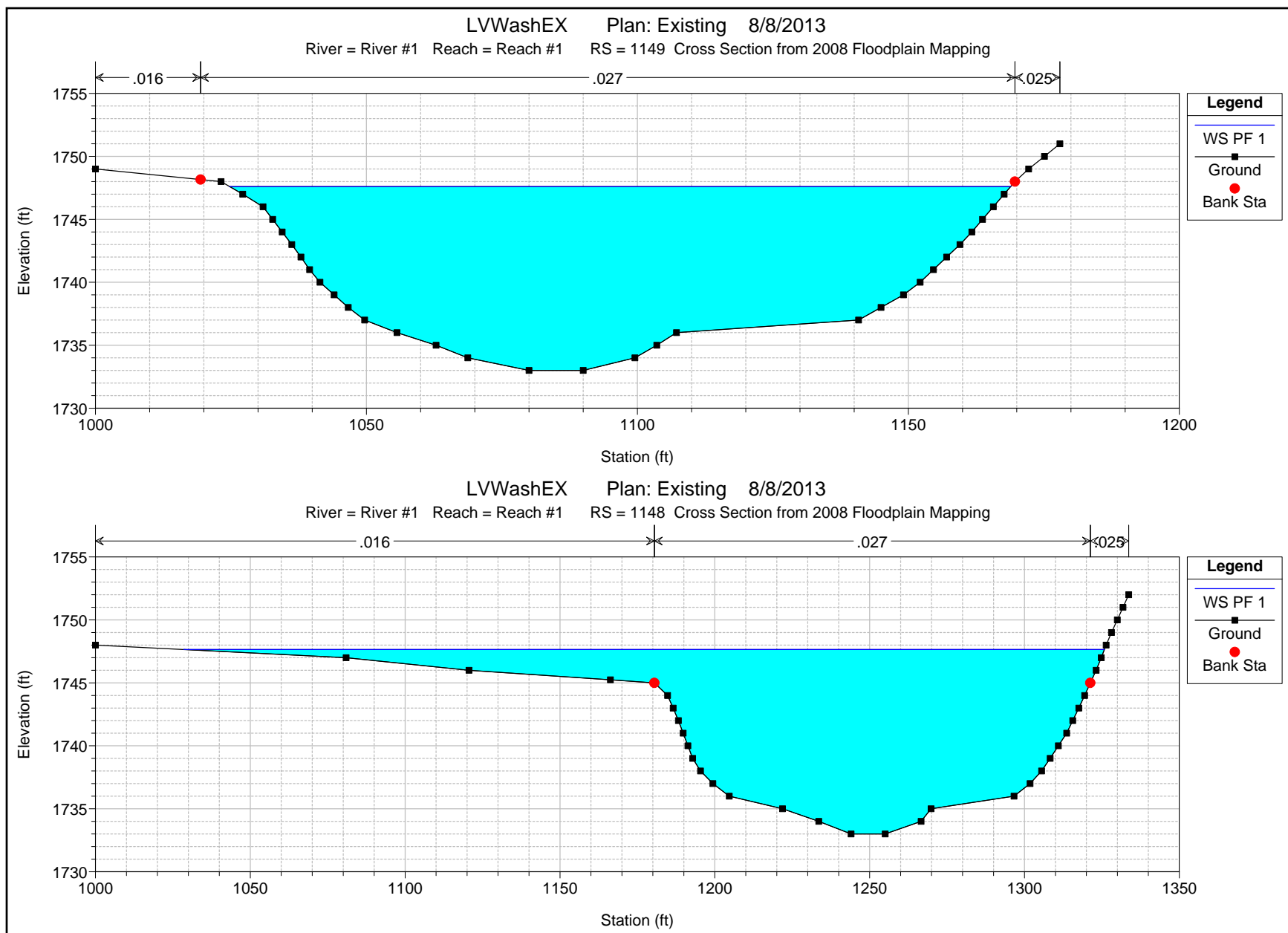
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1152.1 Stewart Bridge DS 1152.1

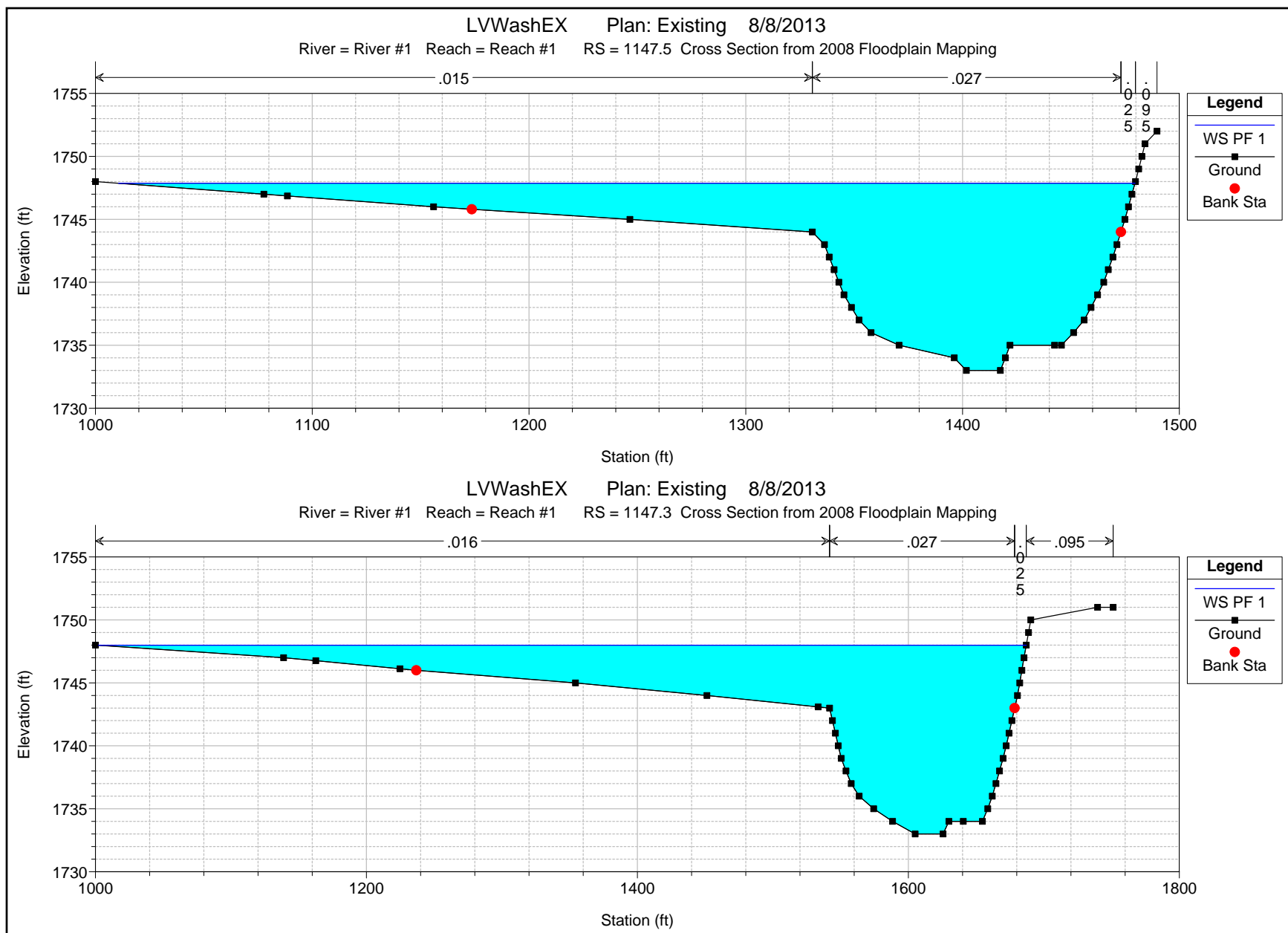


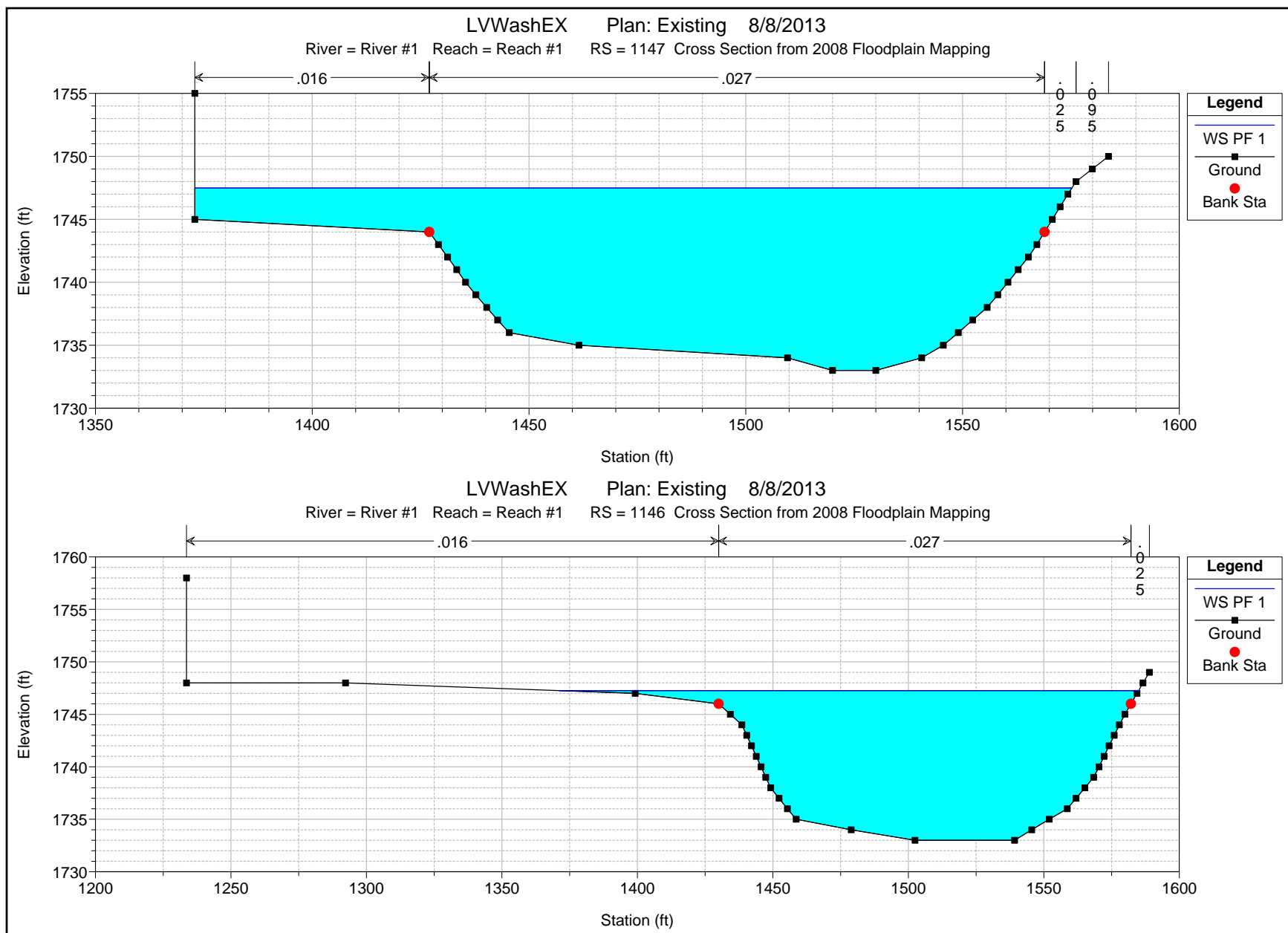
LVWashEX Plan: Existing 8/8/2013
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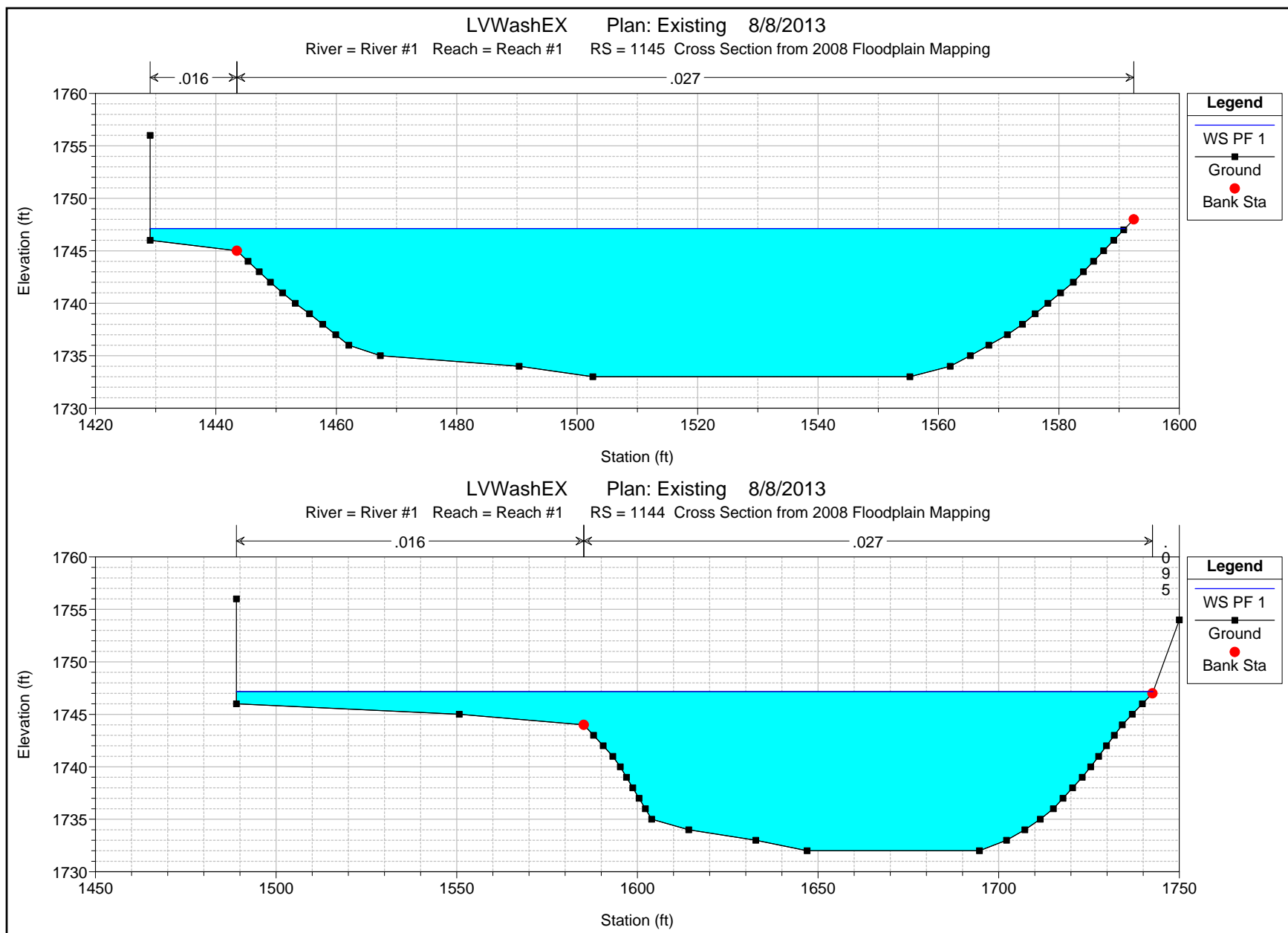


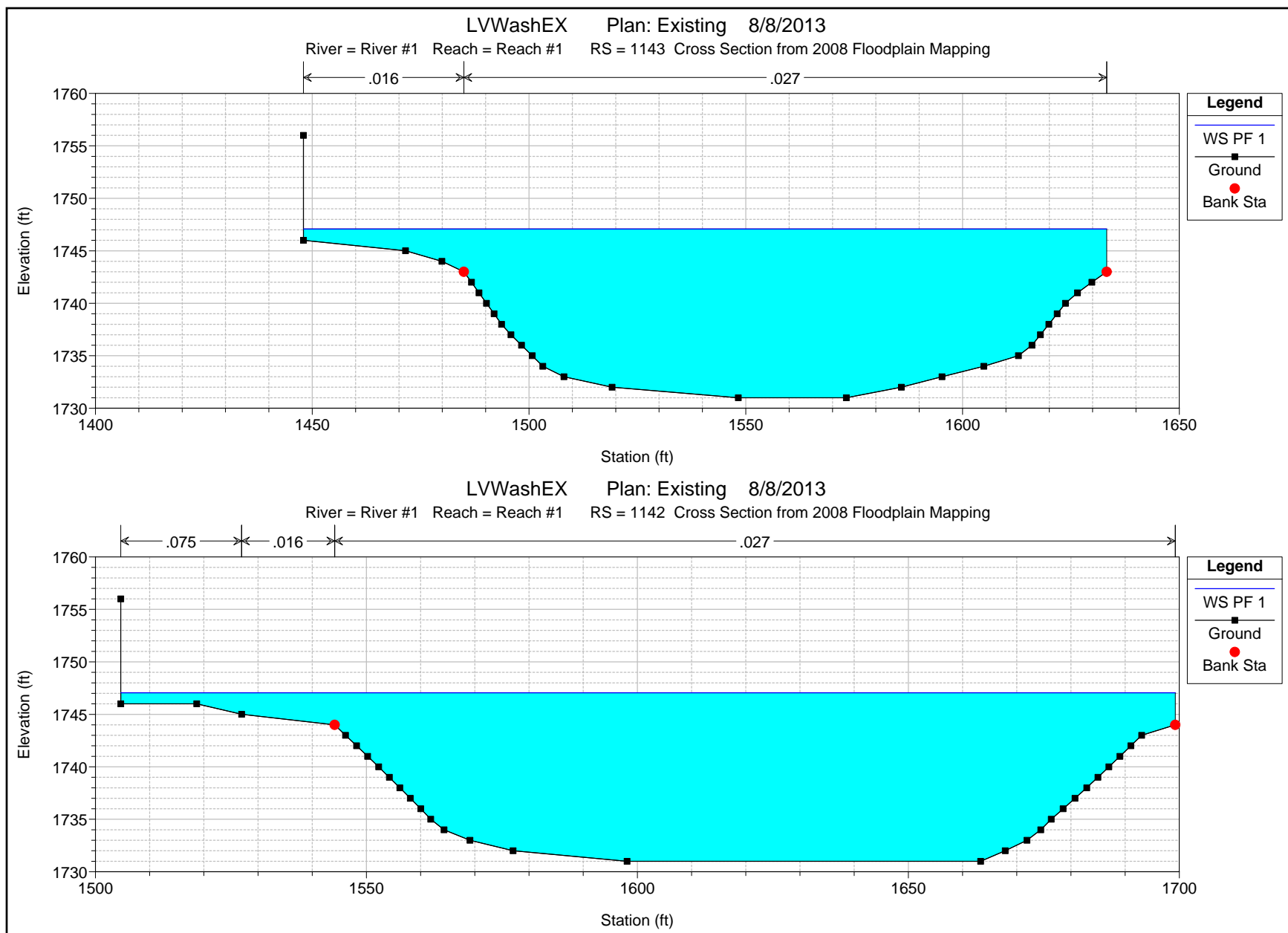


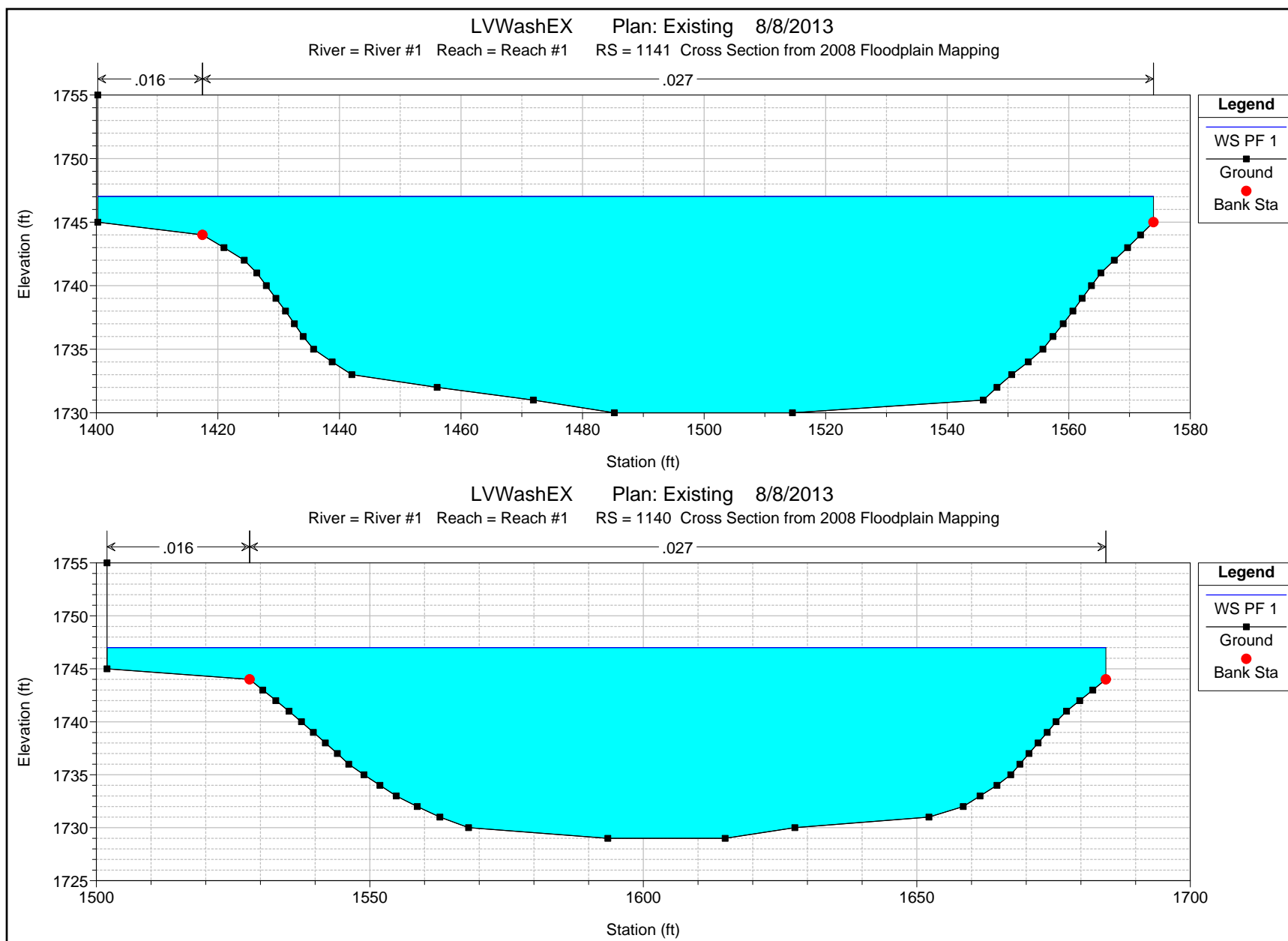




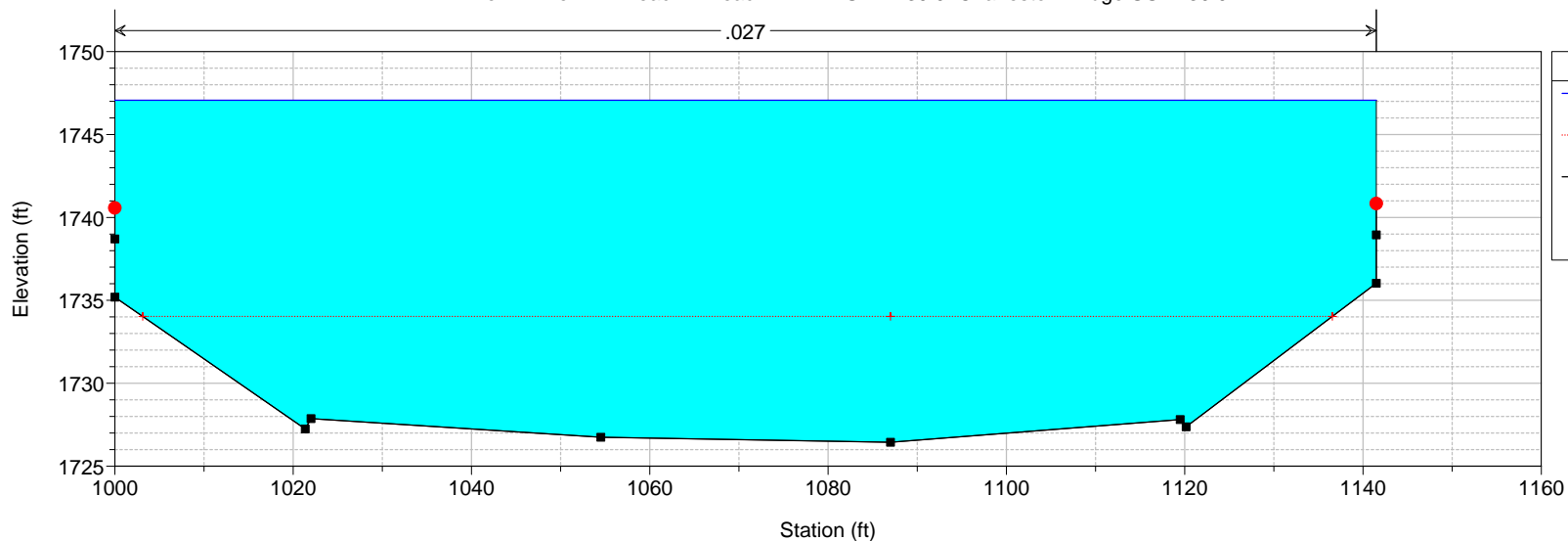








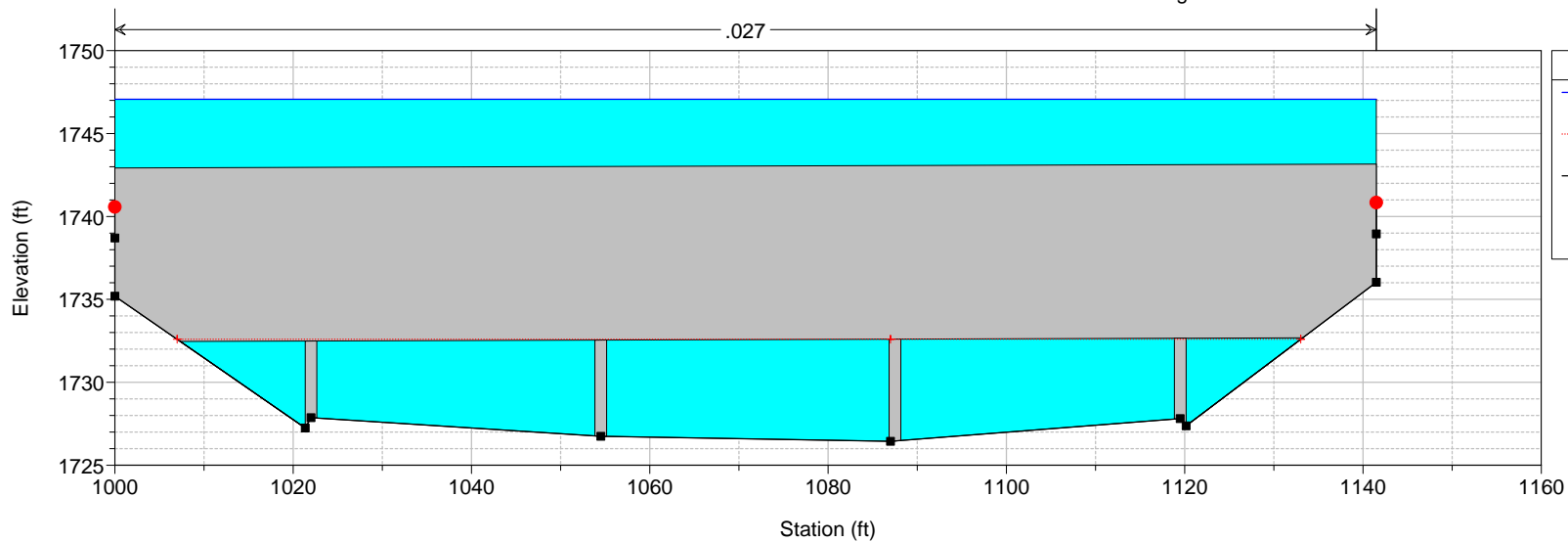
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.9 Charleston Bridge US 1139.9



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

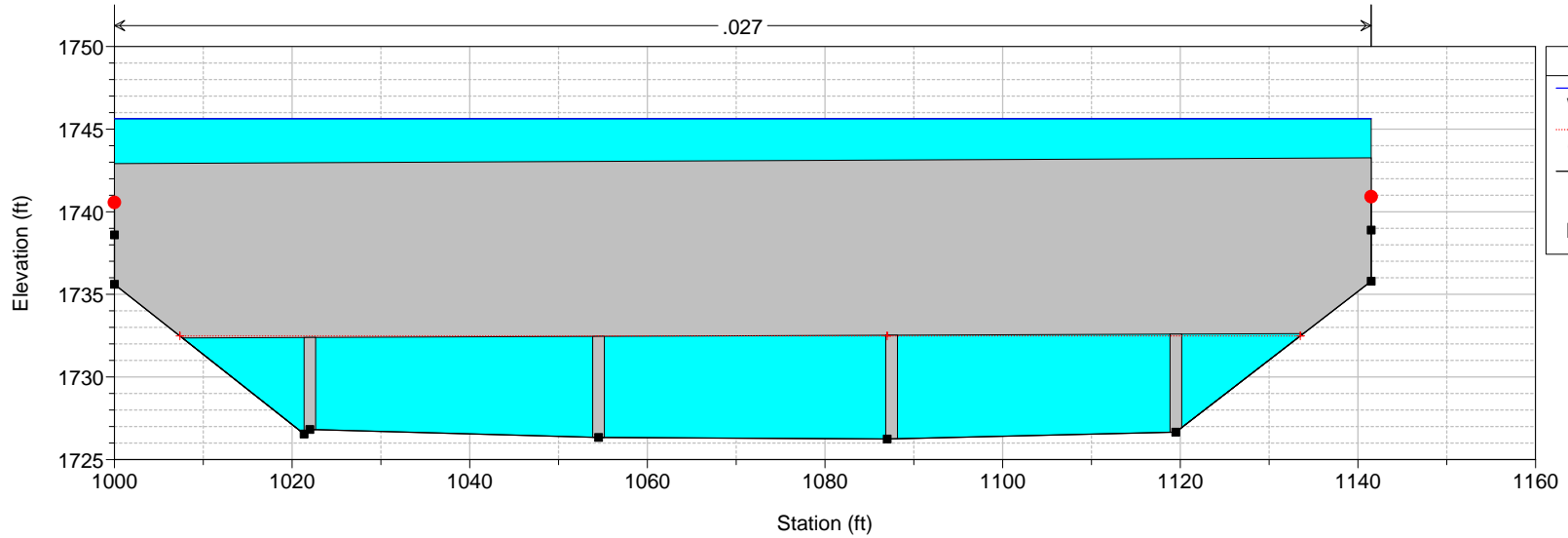
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.5 BR Charleston Bridge



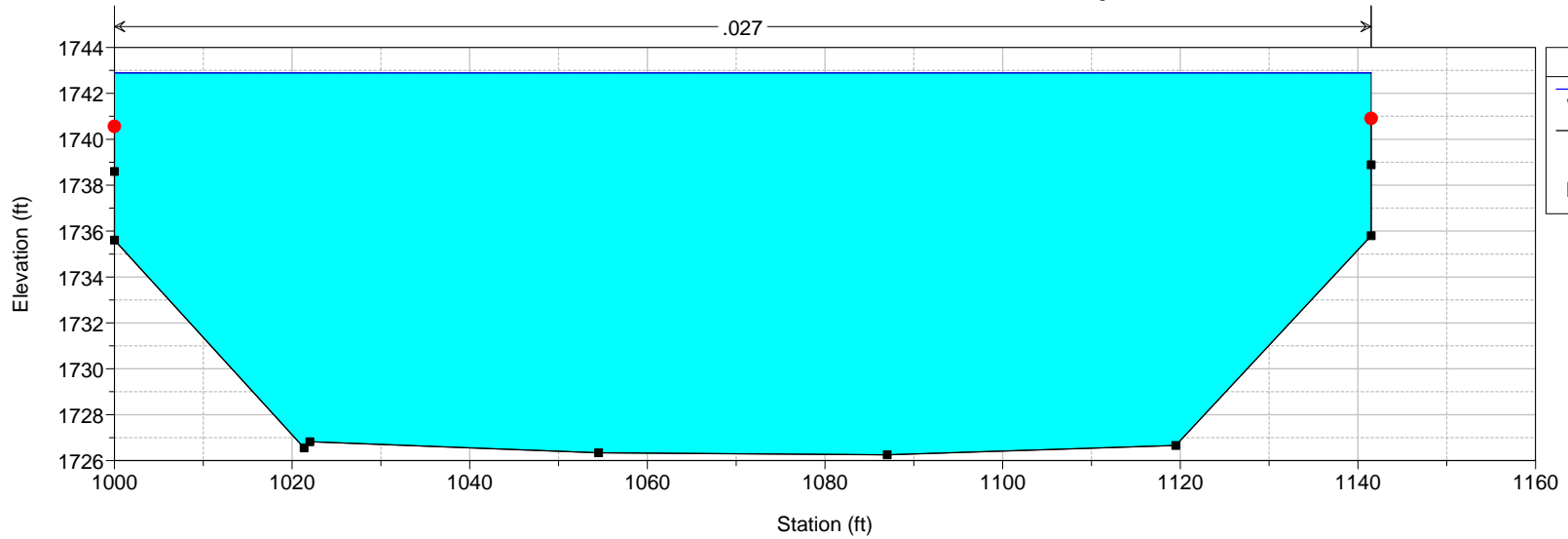
Legend

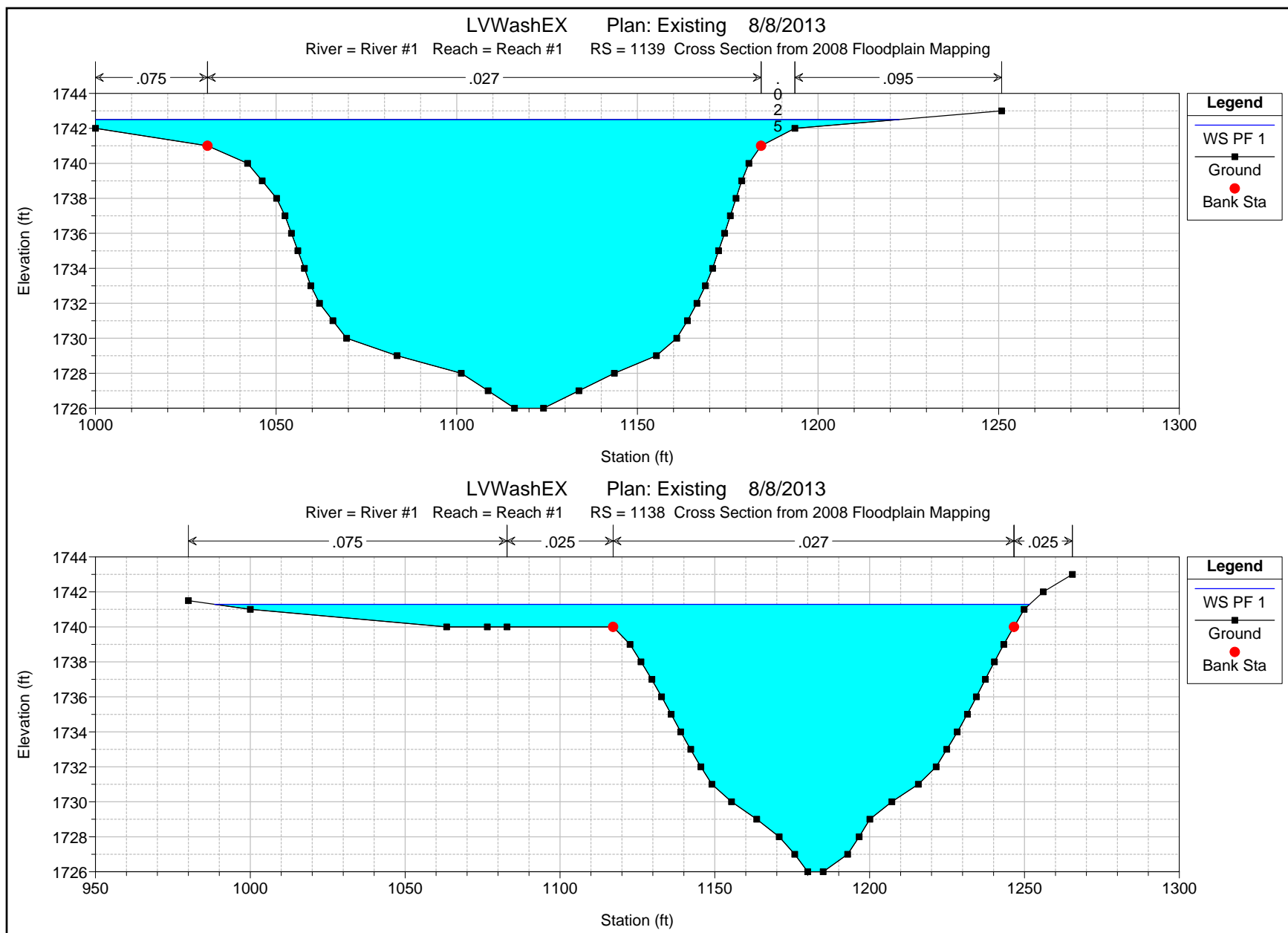
- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

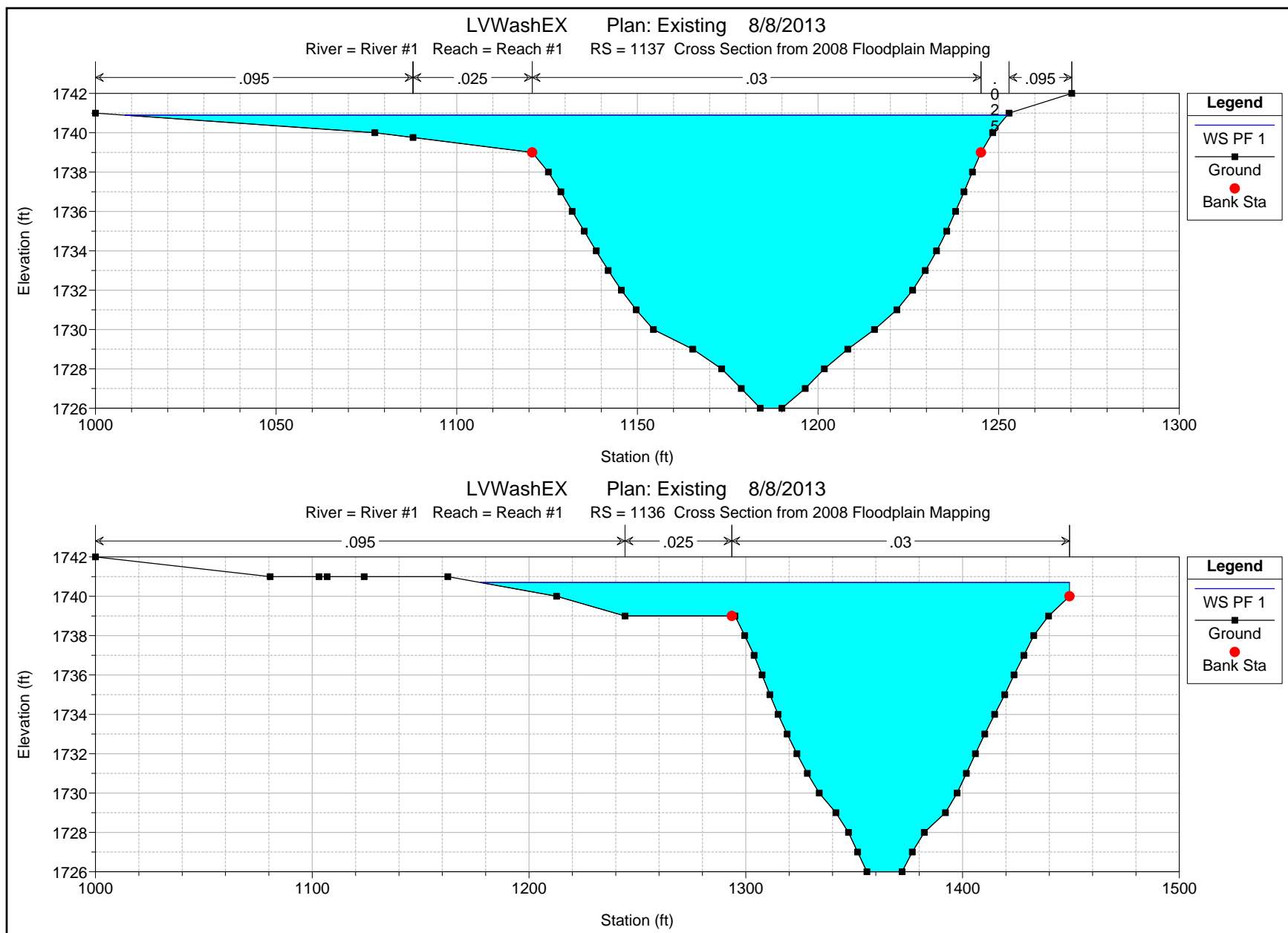
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1139.5 BR Charleston Bridge

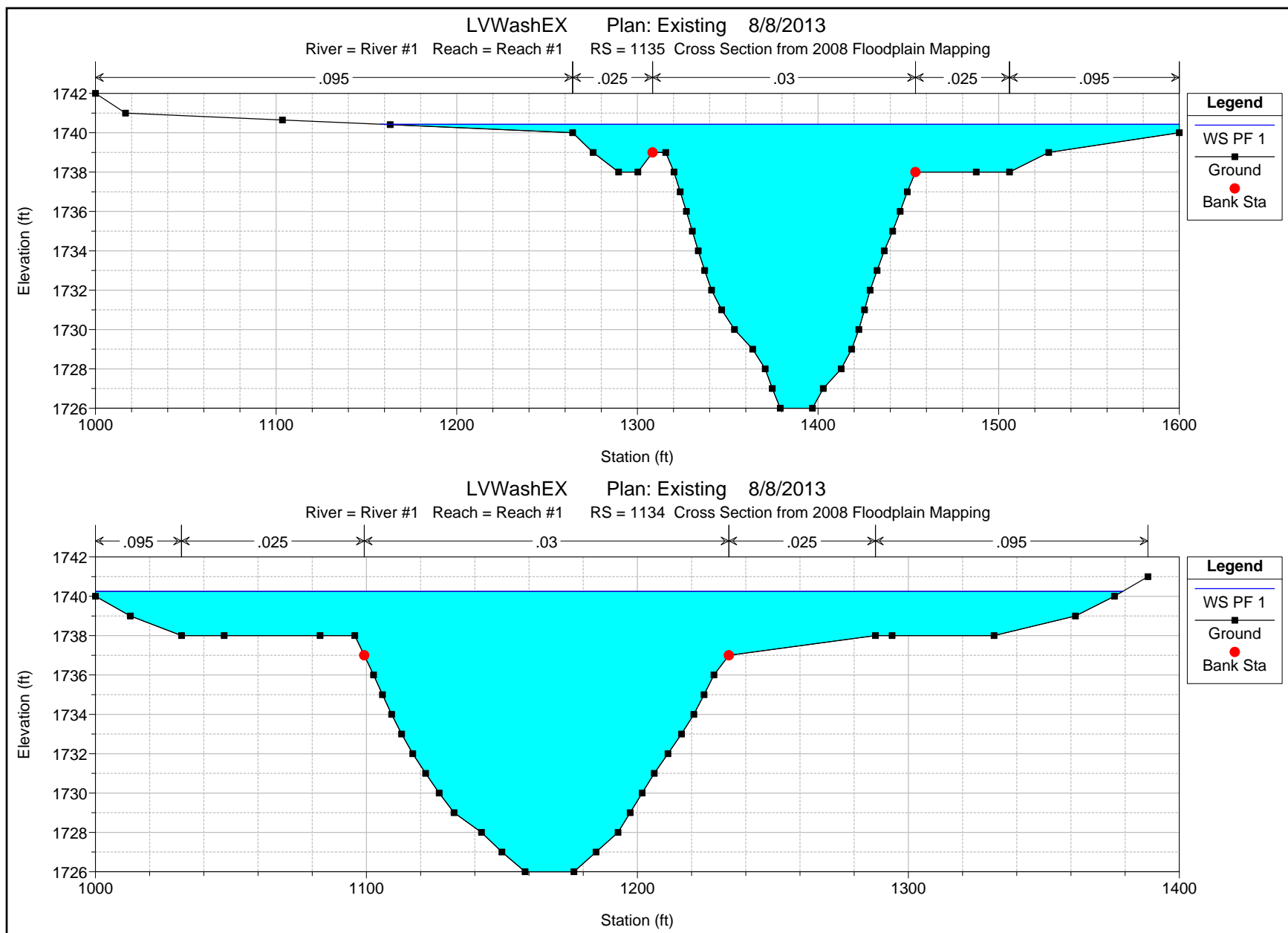


LVWashEX Plan: Existing 8/8/2013
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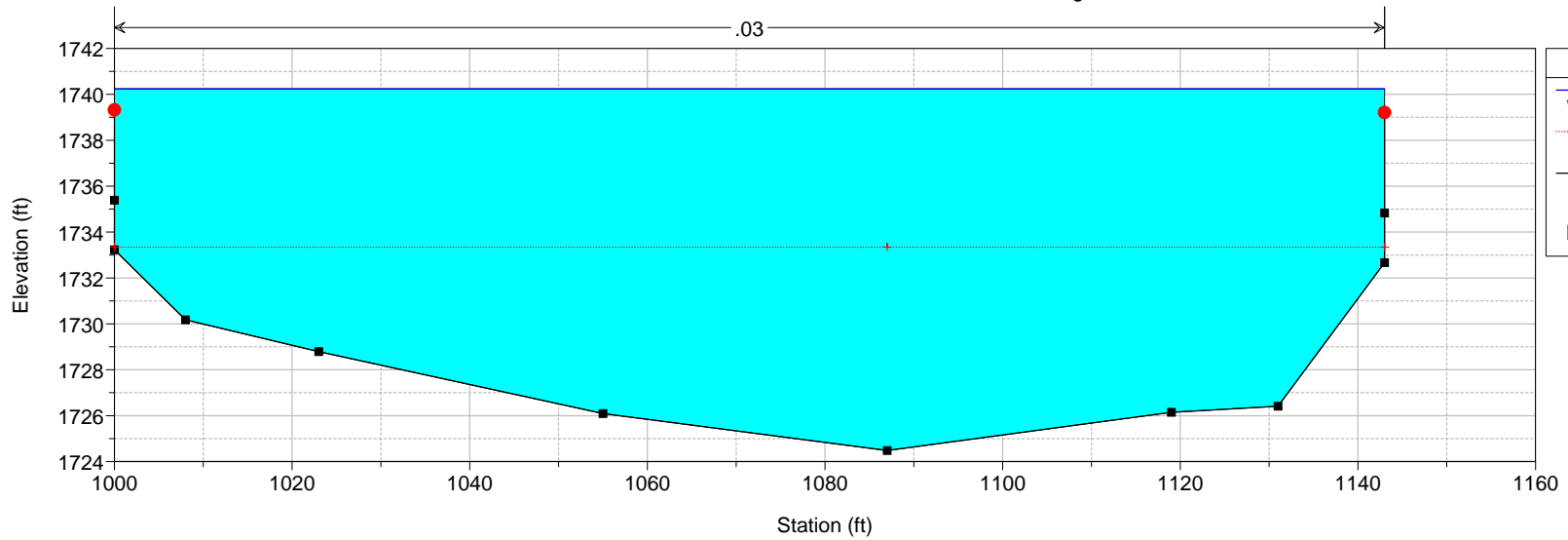




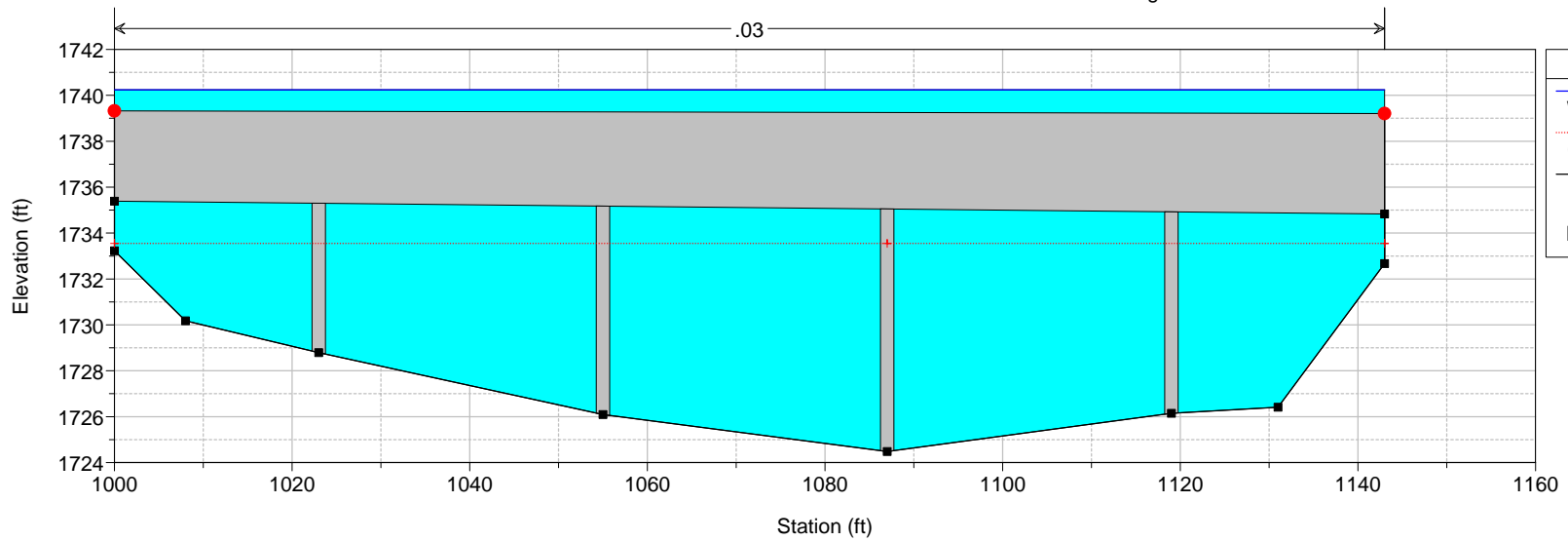




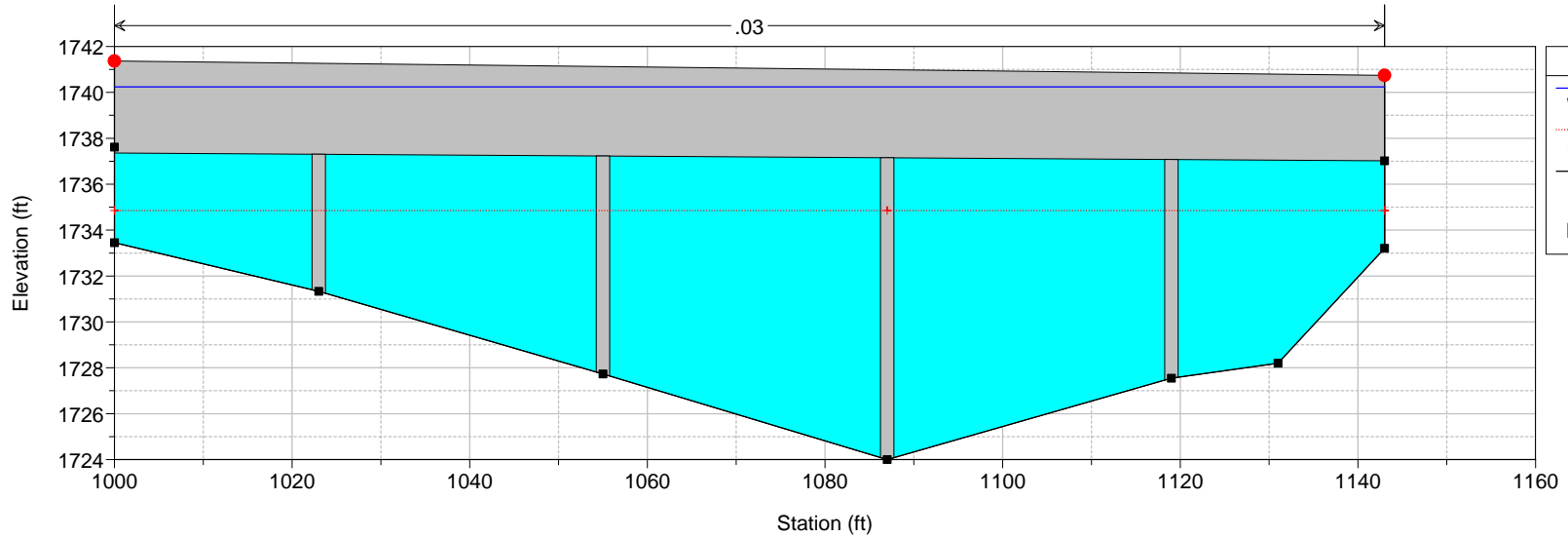
LVWashEX Plan: Existing 8/8/2013
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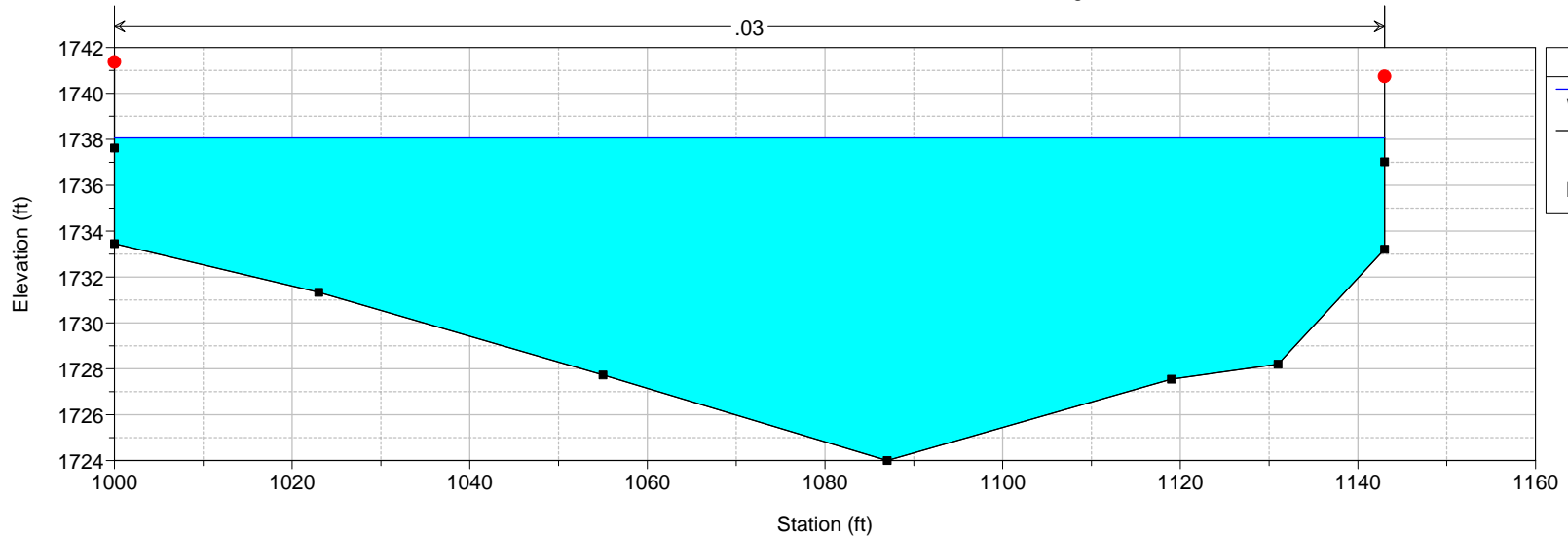
LVWashEX Plan: Existing 8/8/2013
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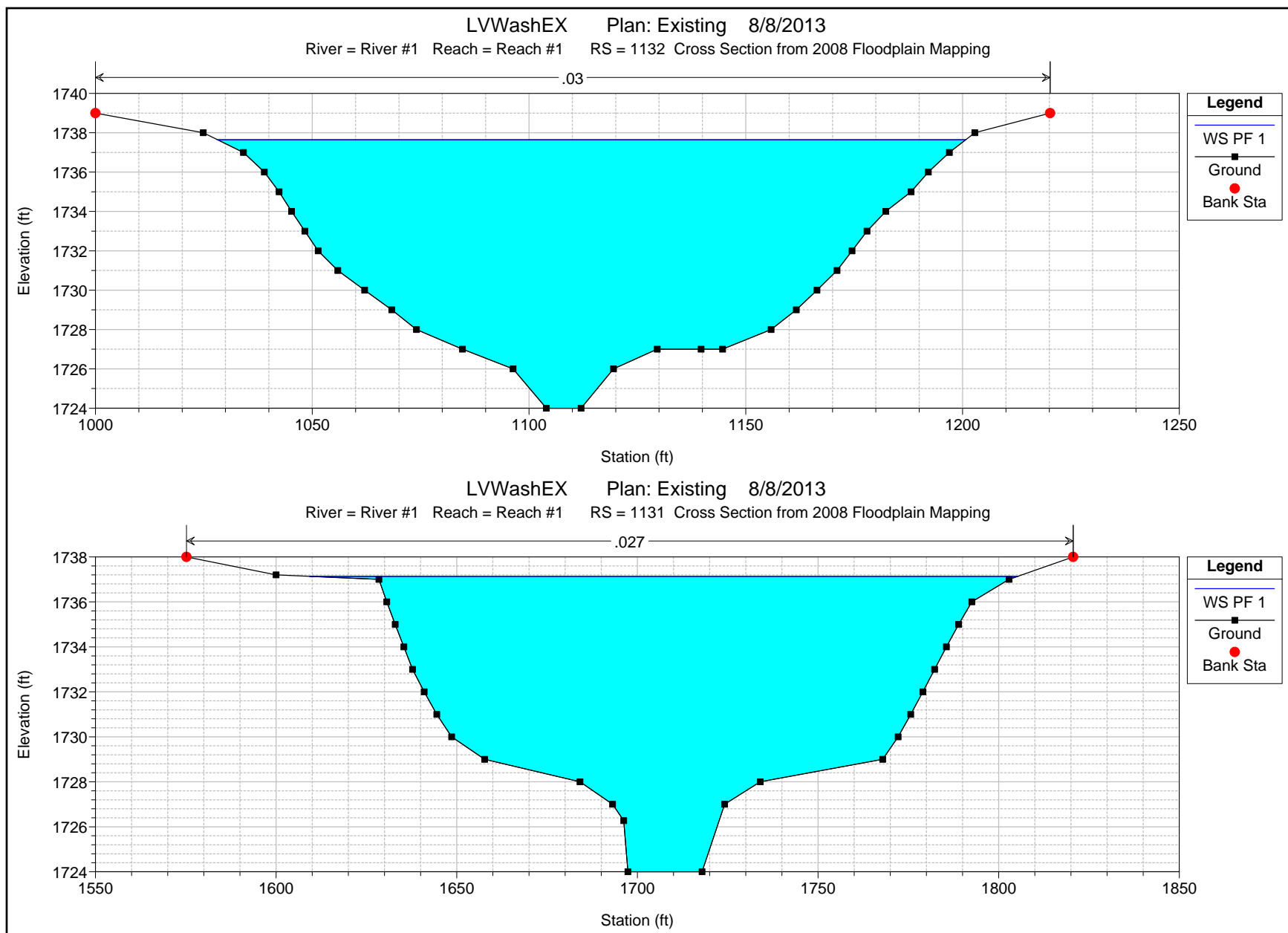


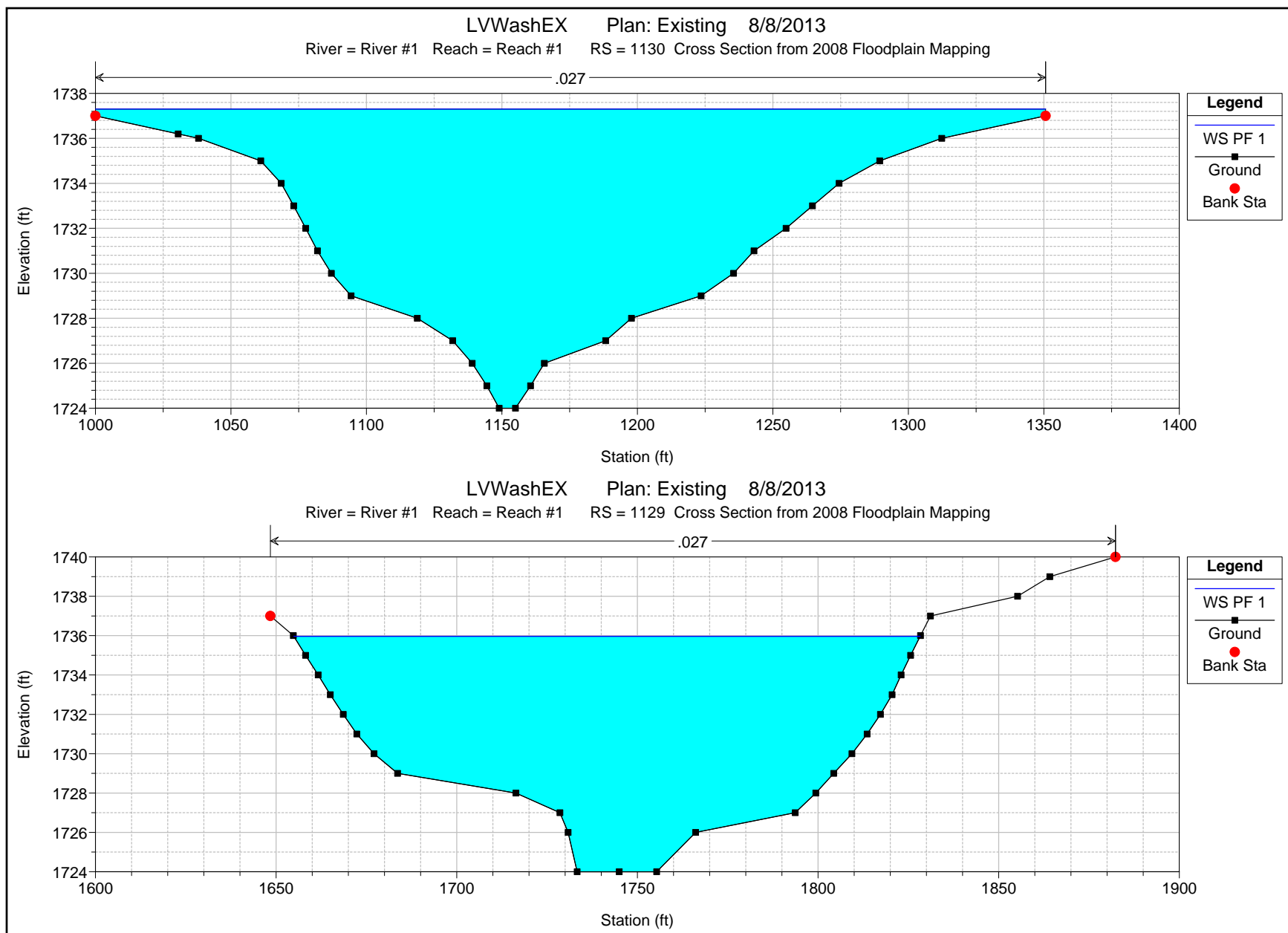
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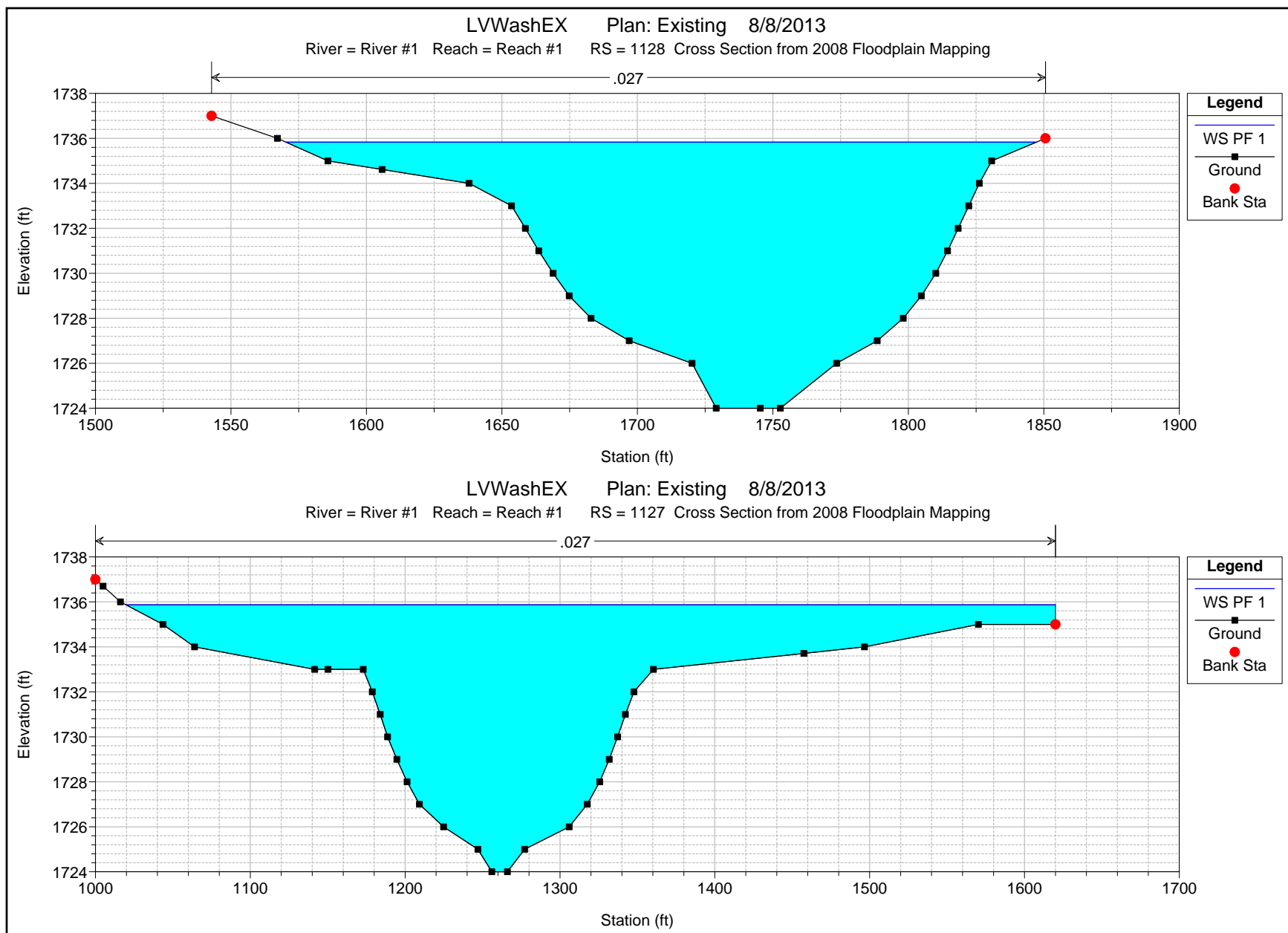


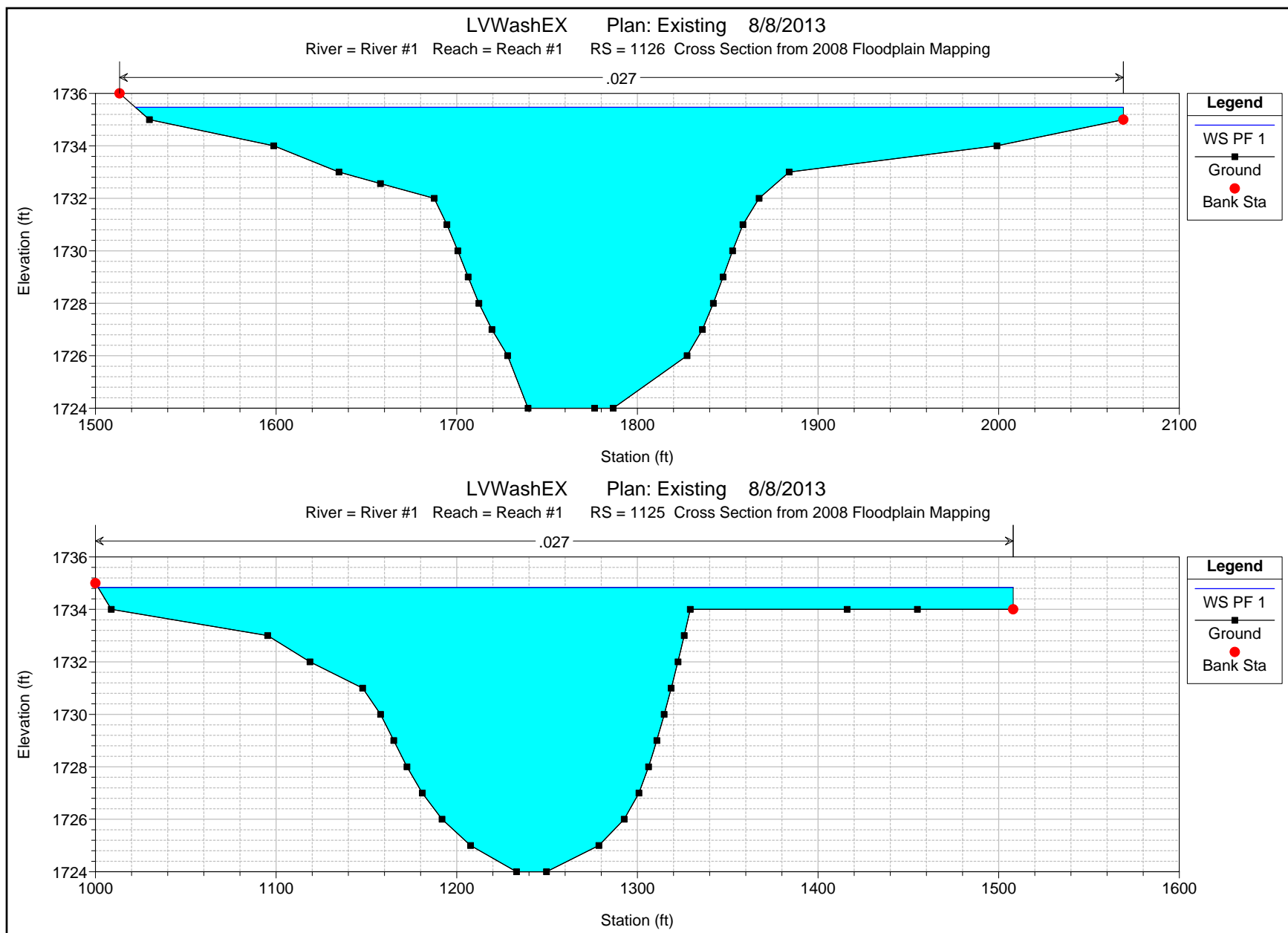
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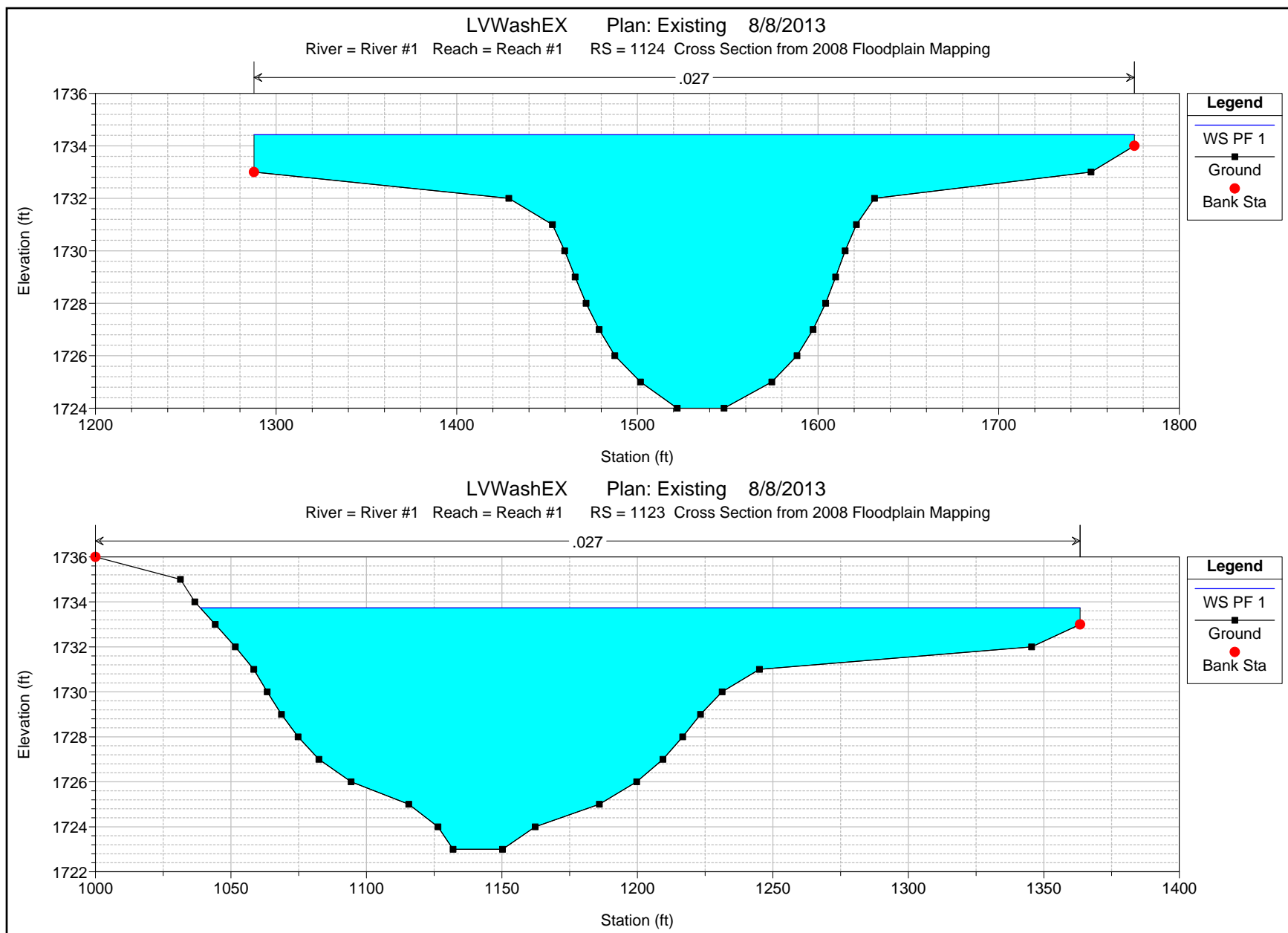


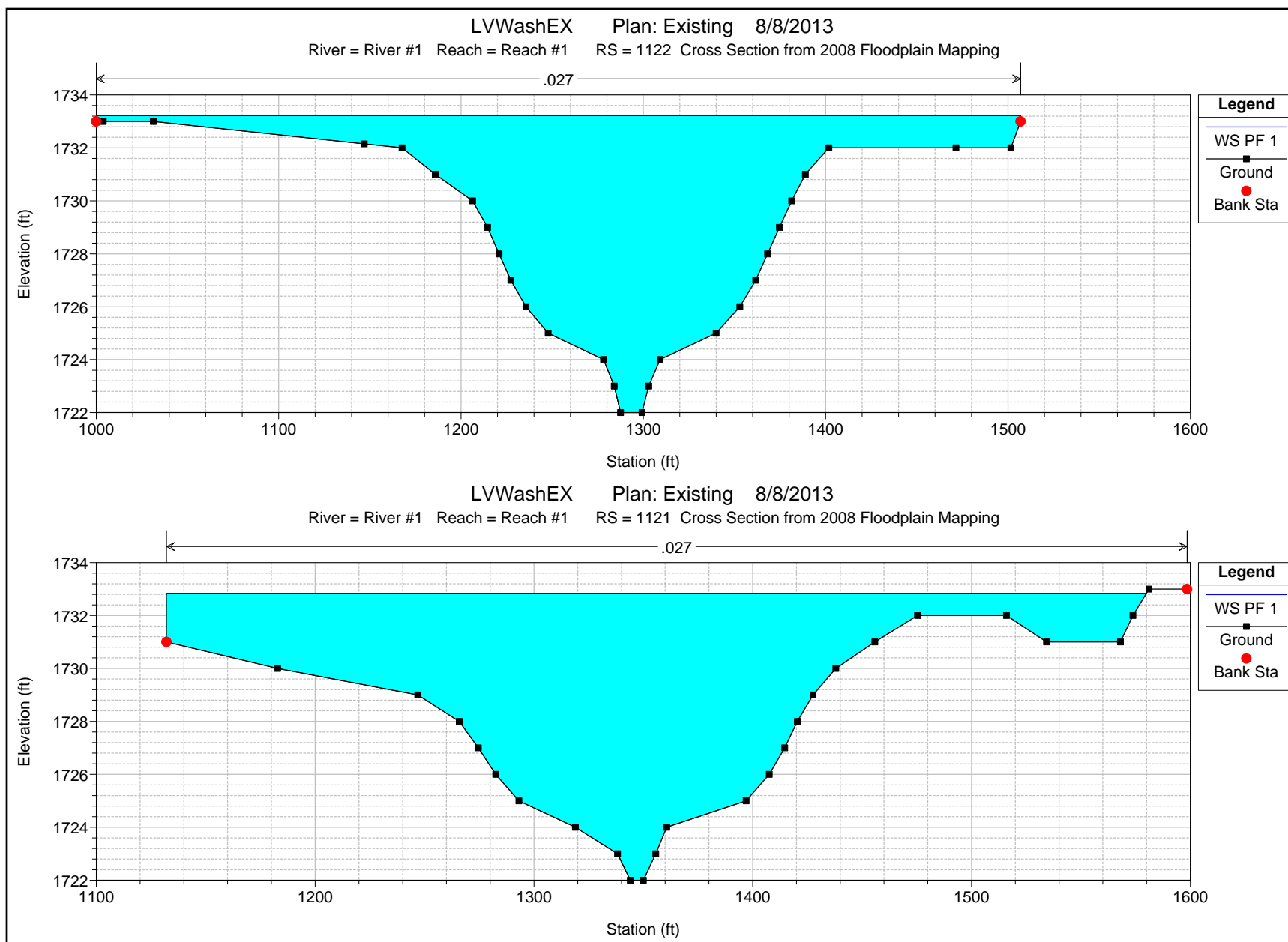


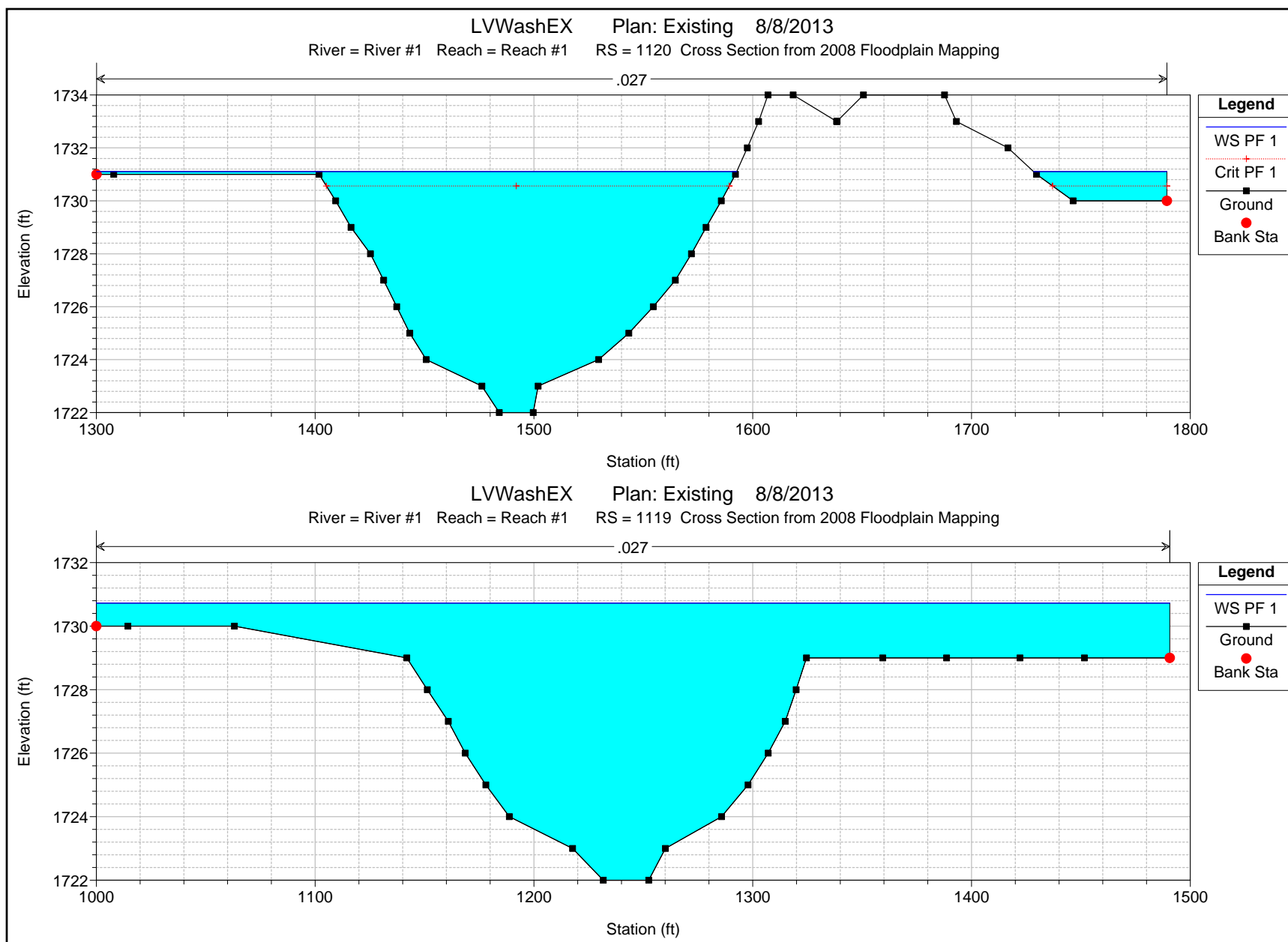


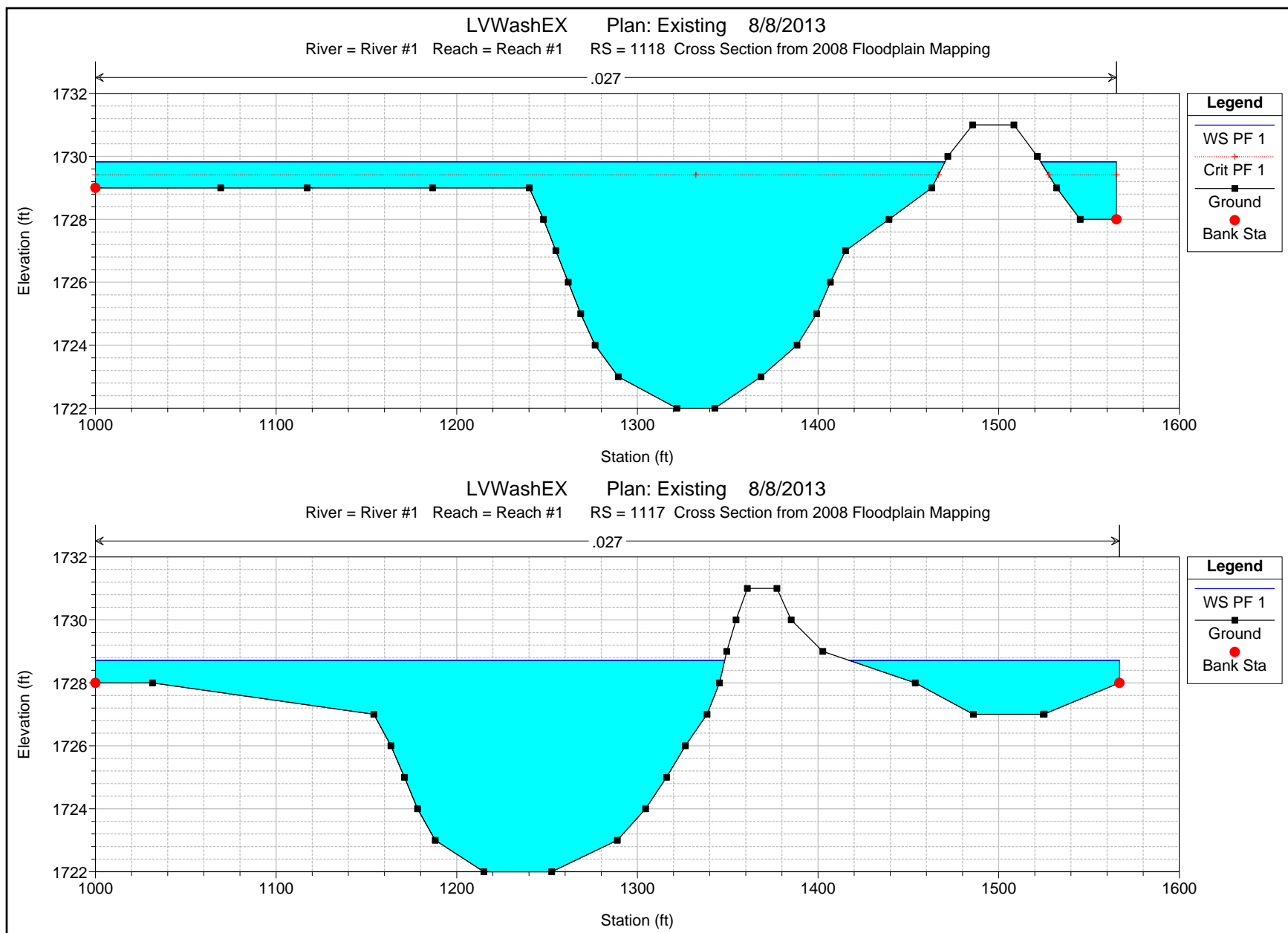


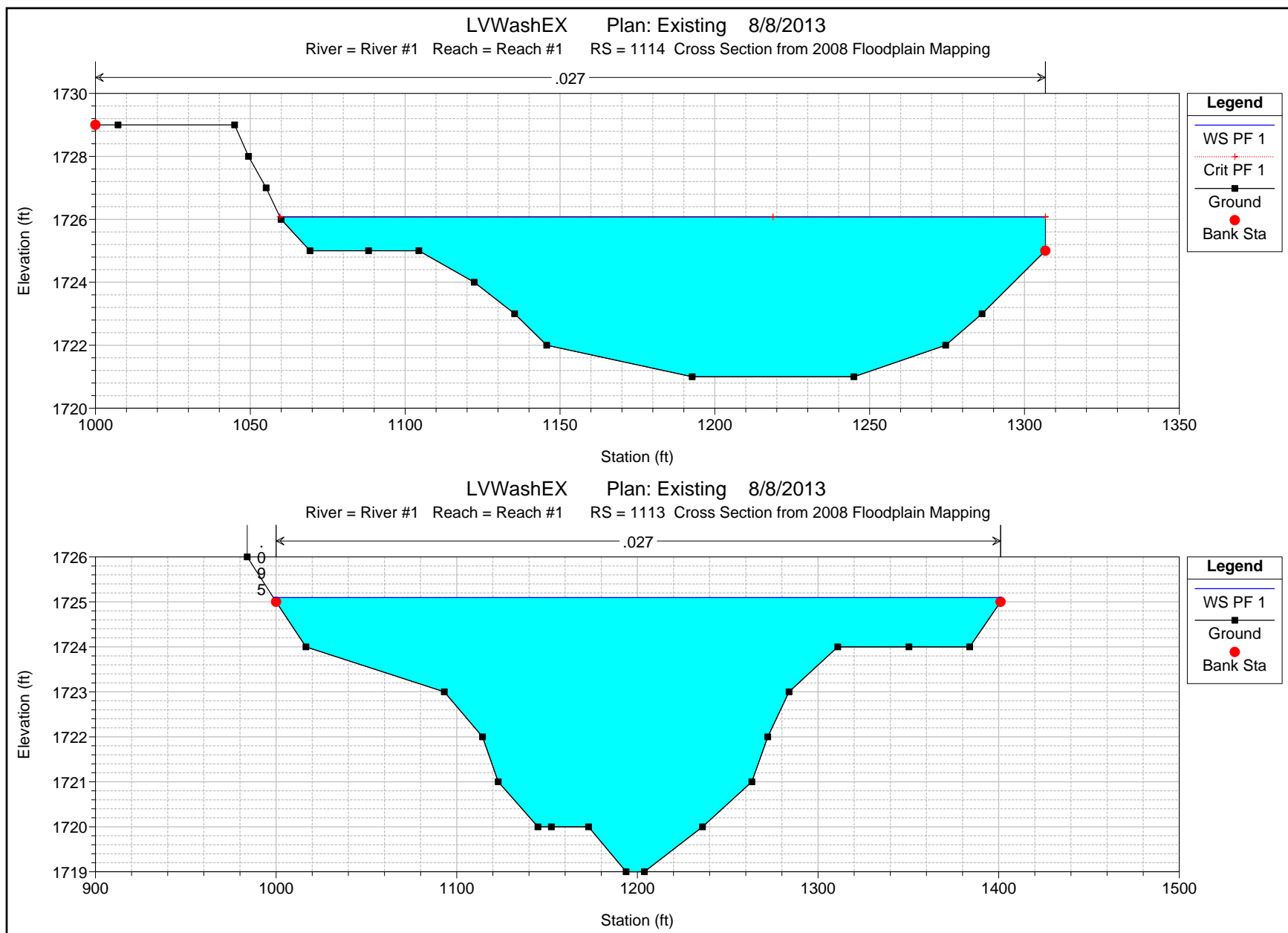


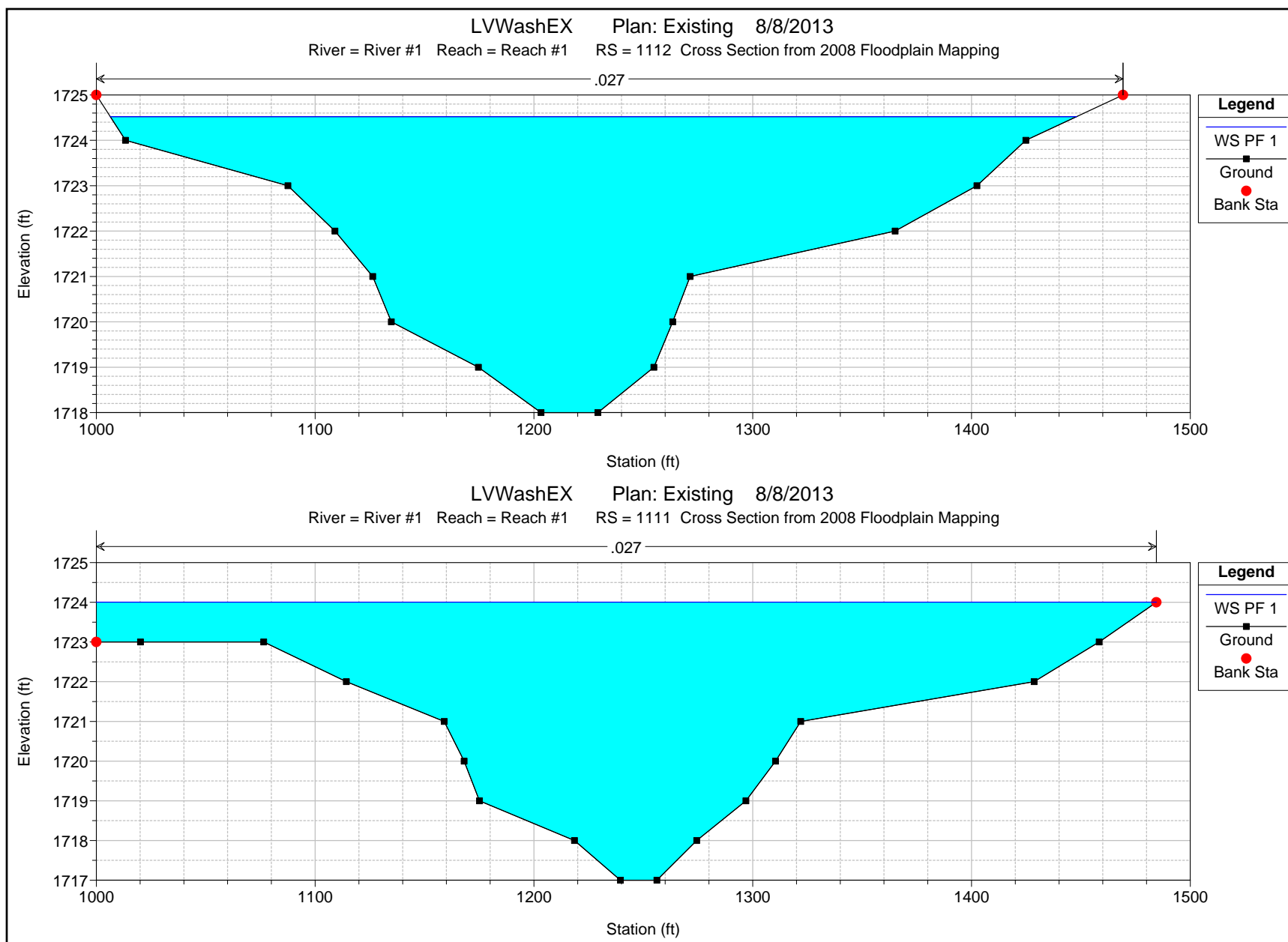


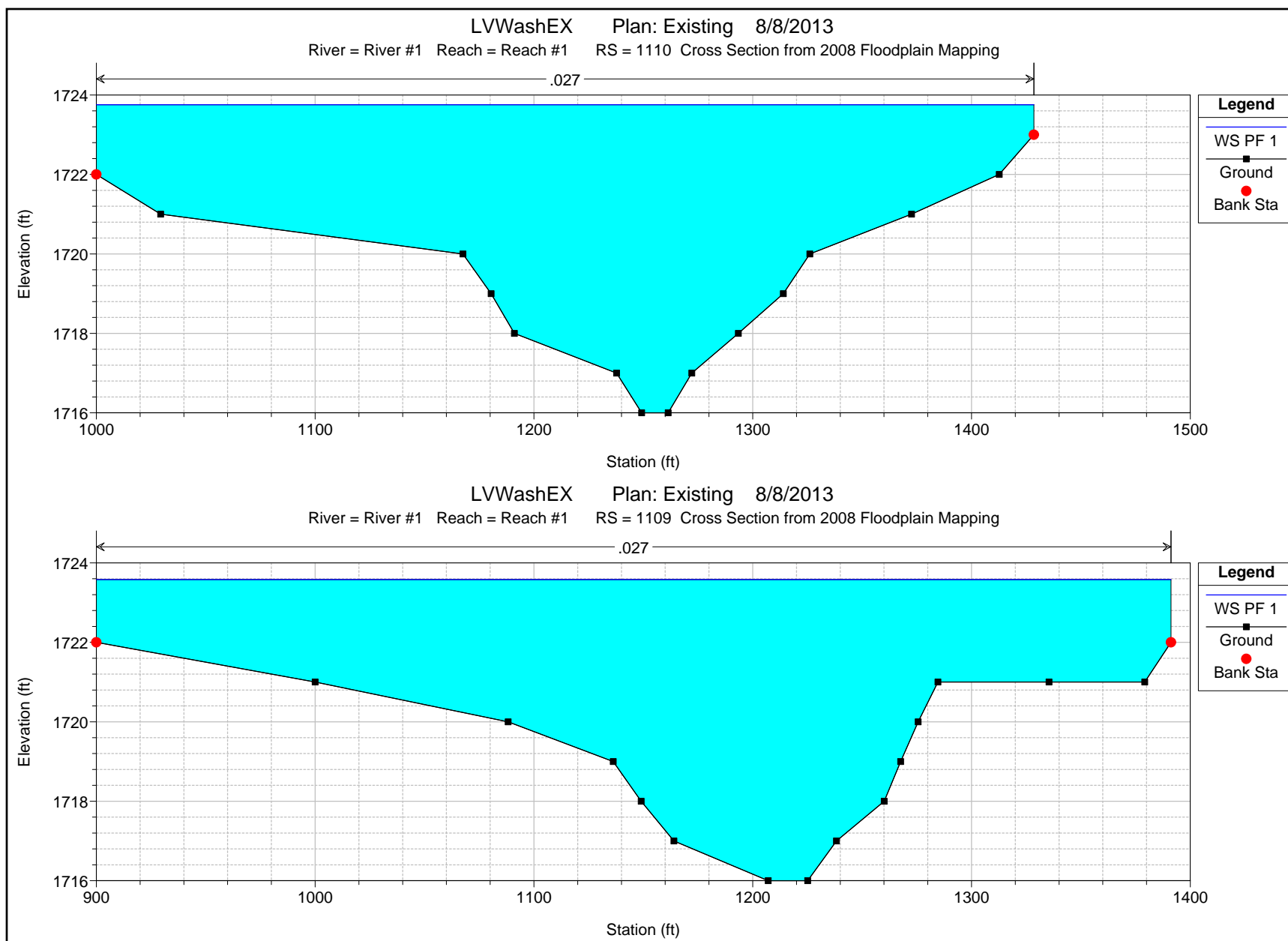




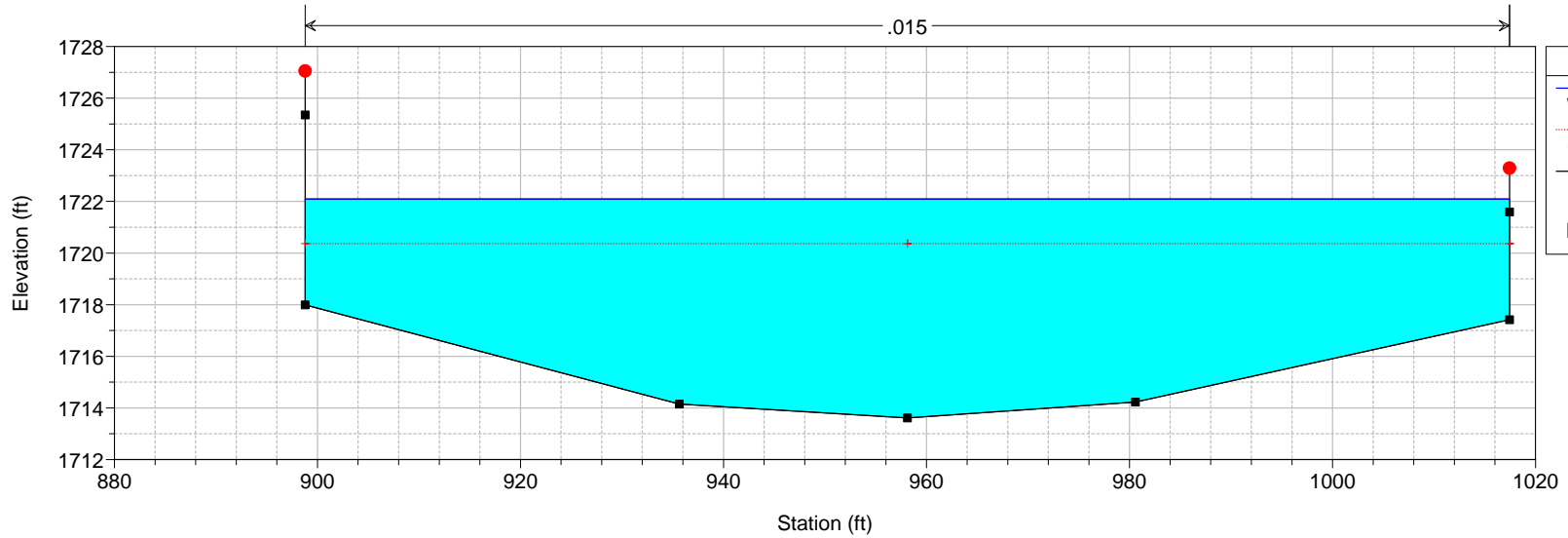




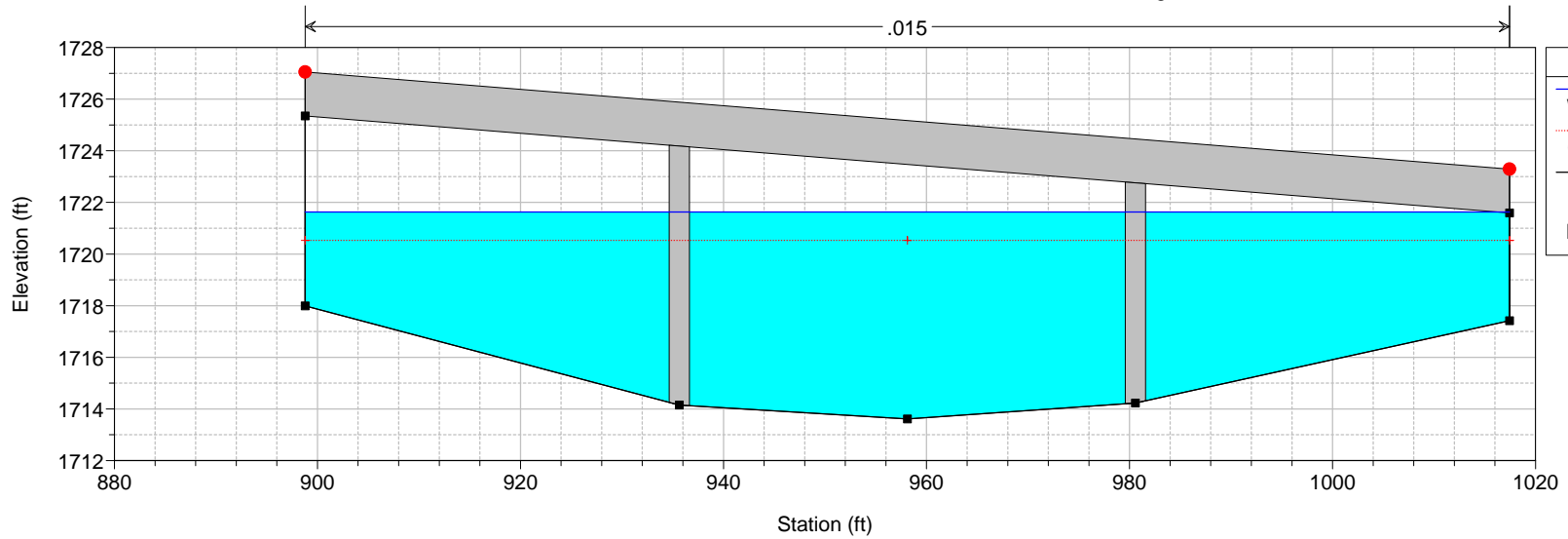




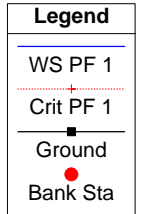
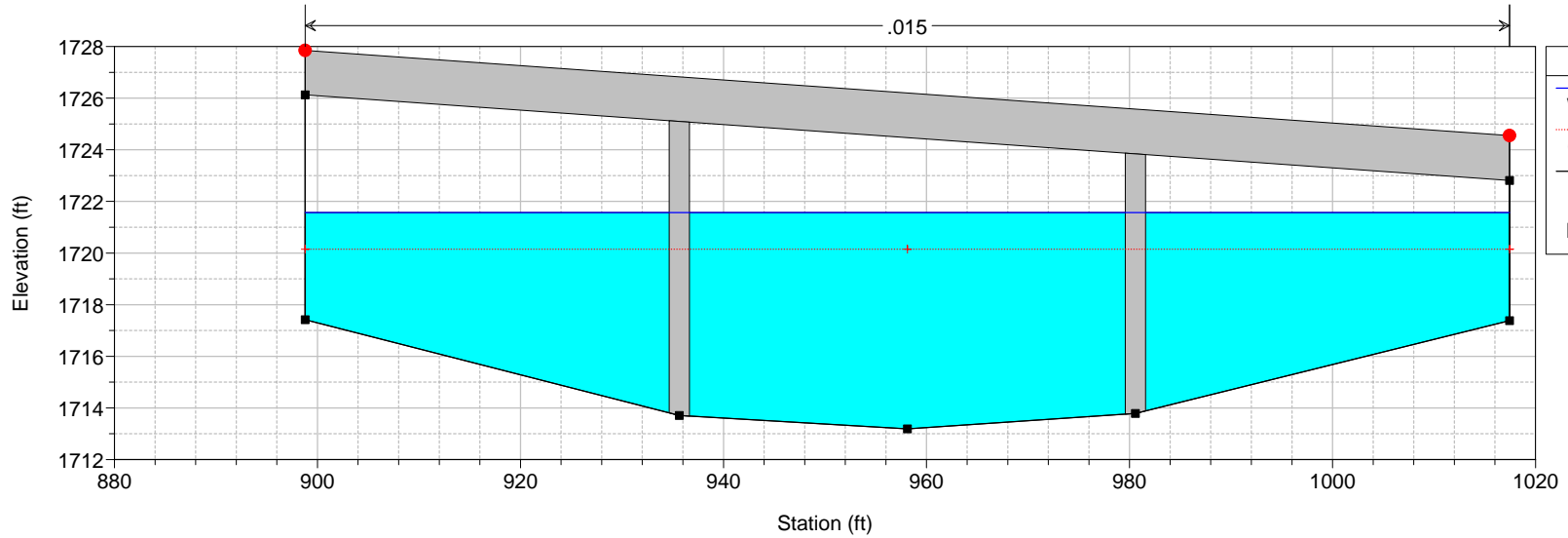
LVWashEX Plan: Existing 8/8/2013
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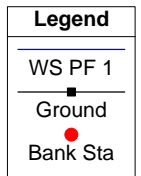
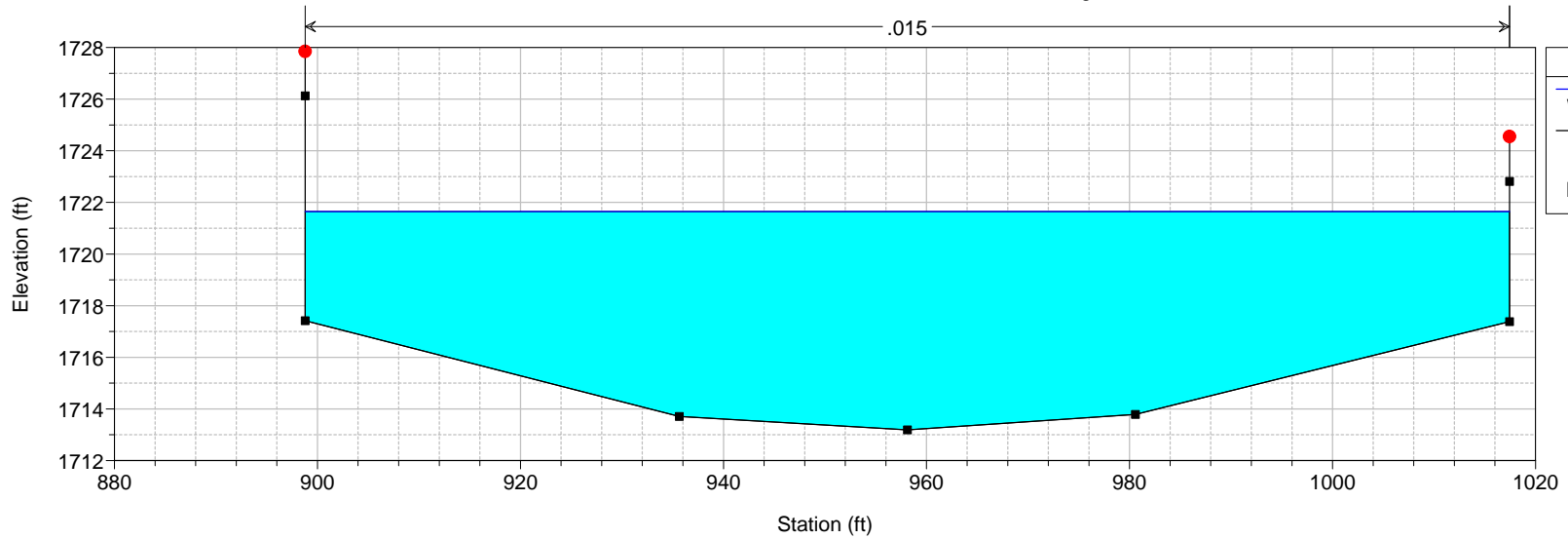
LVWashEX Plan: Existing 8/8/2013
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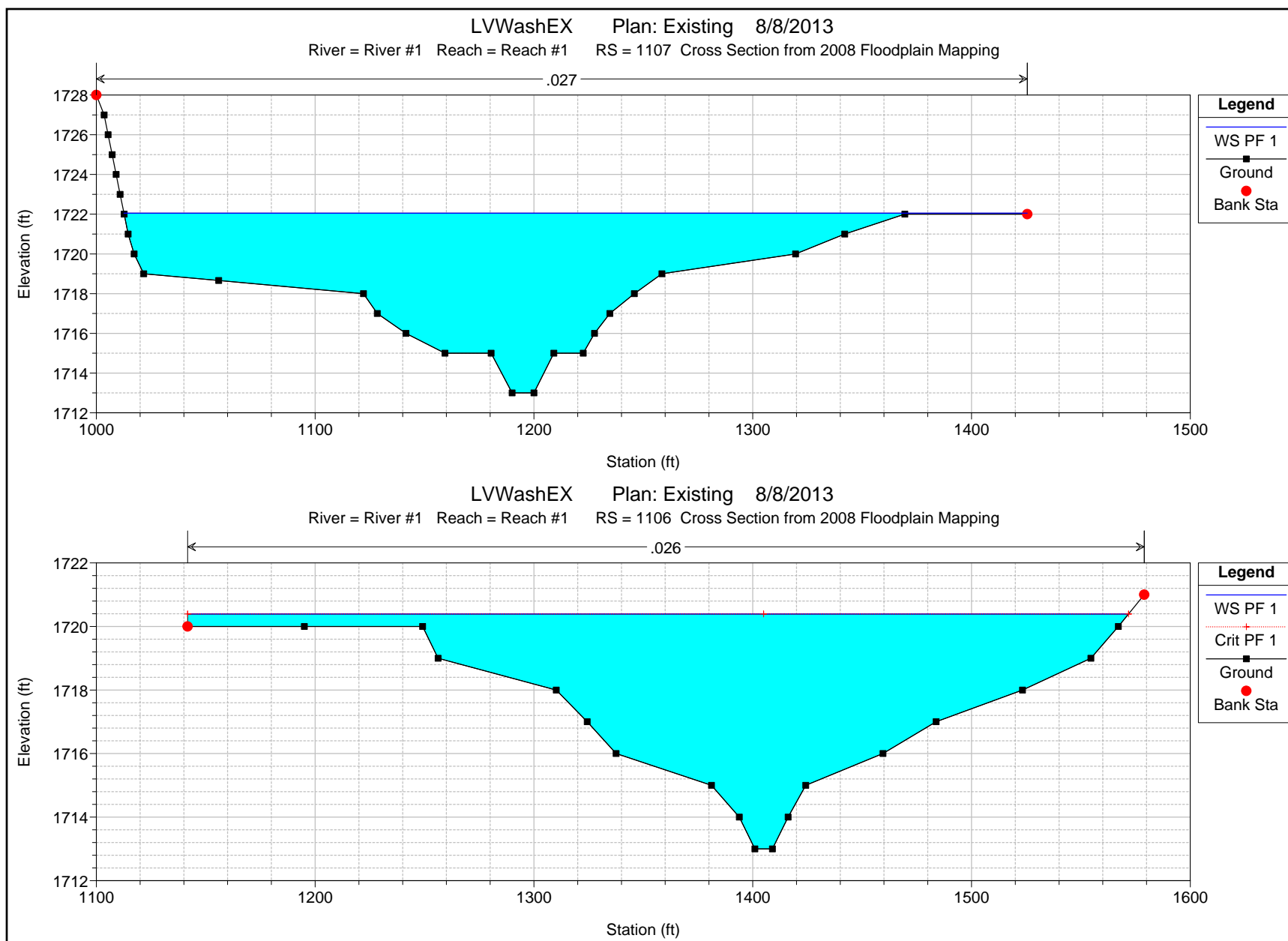


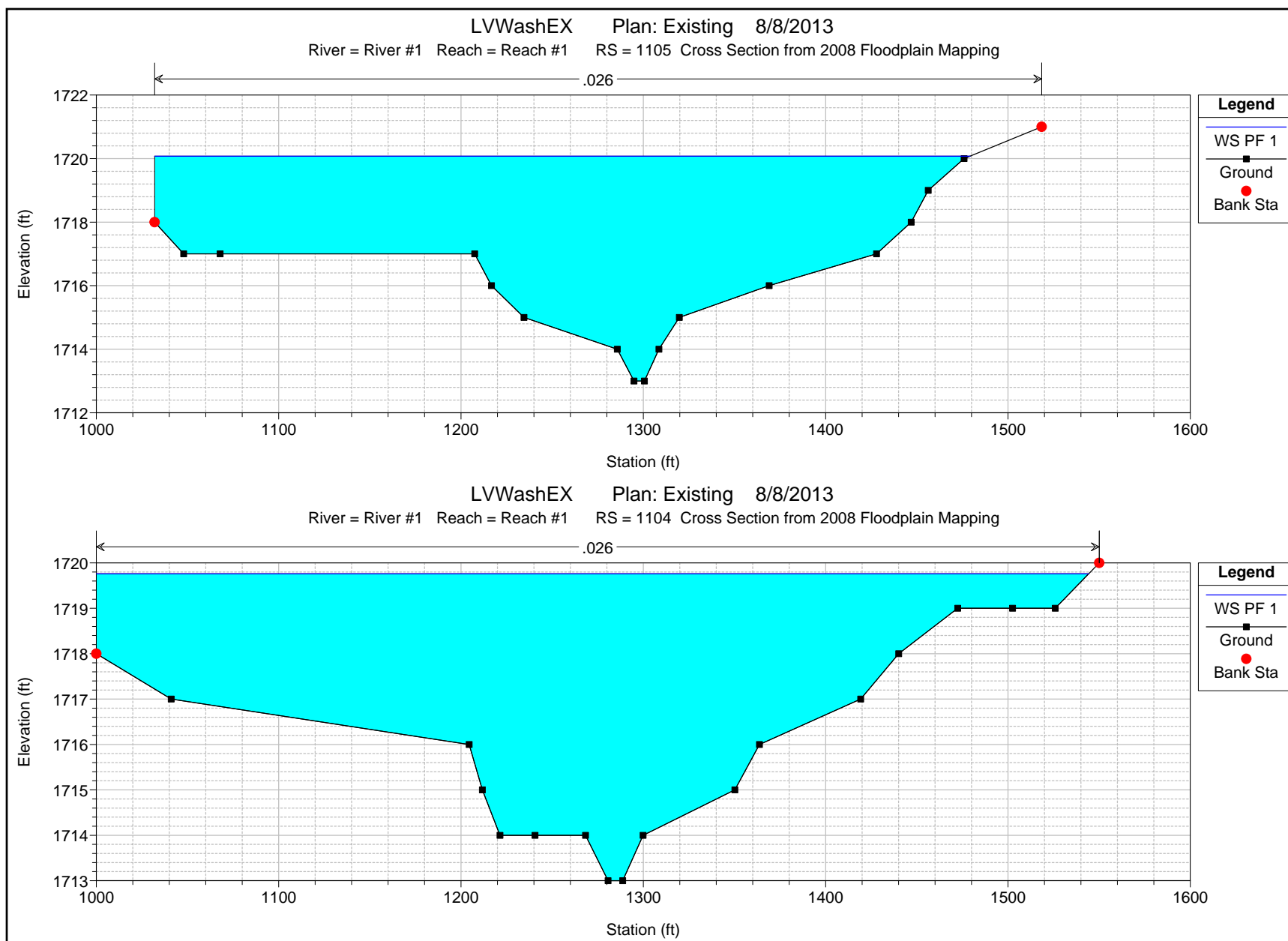
LVWashEX Plan: Existing 8/8/2013
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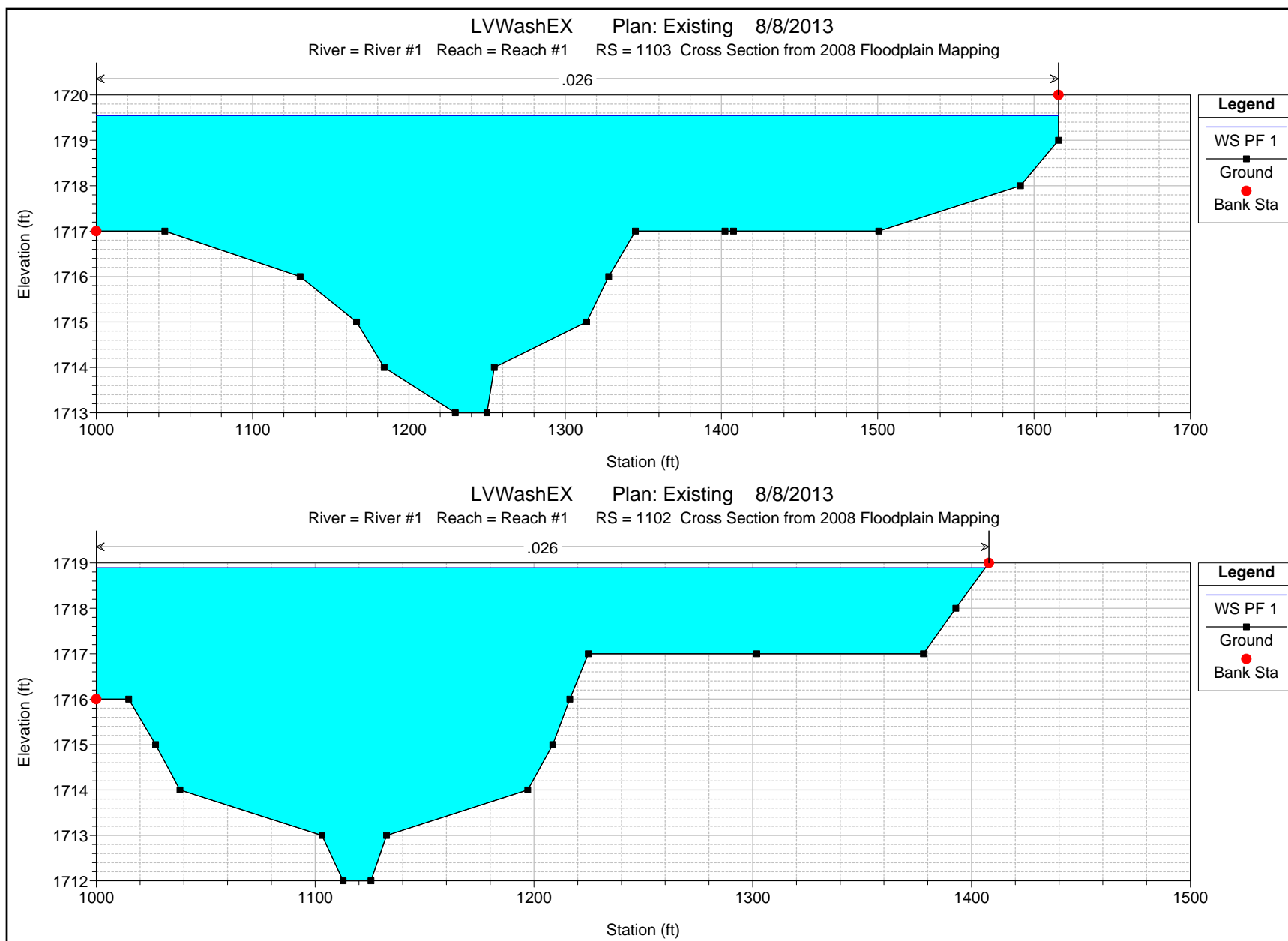


LVWashEX Plan: Existing 8/8/2013
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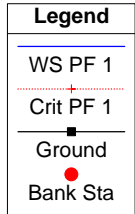
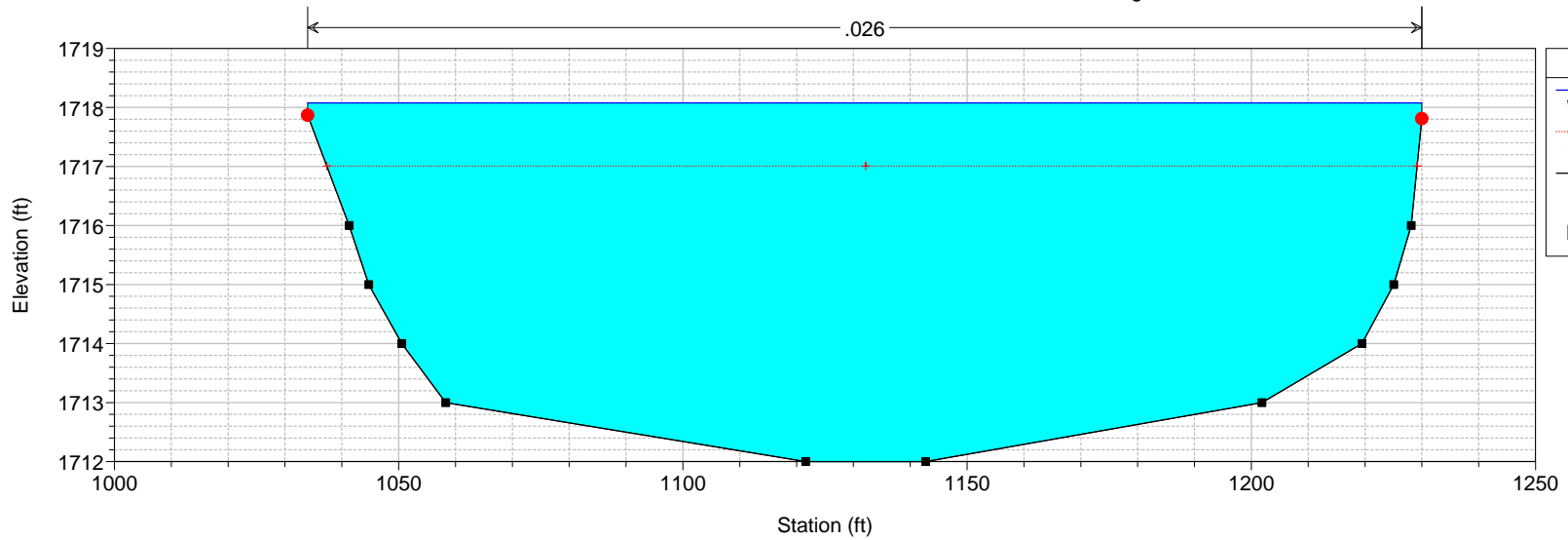




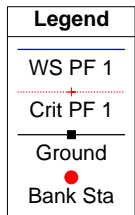
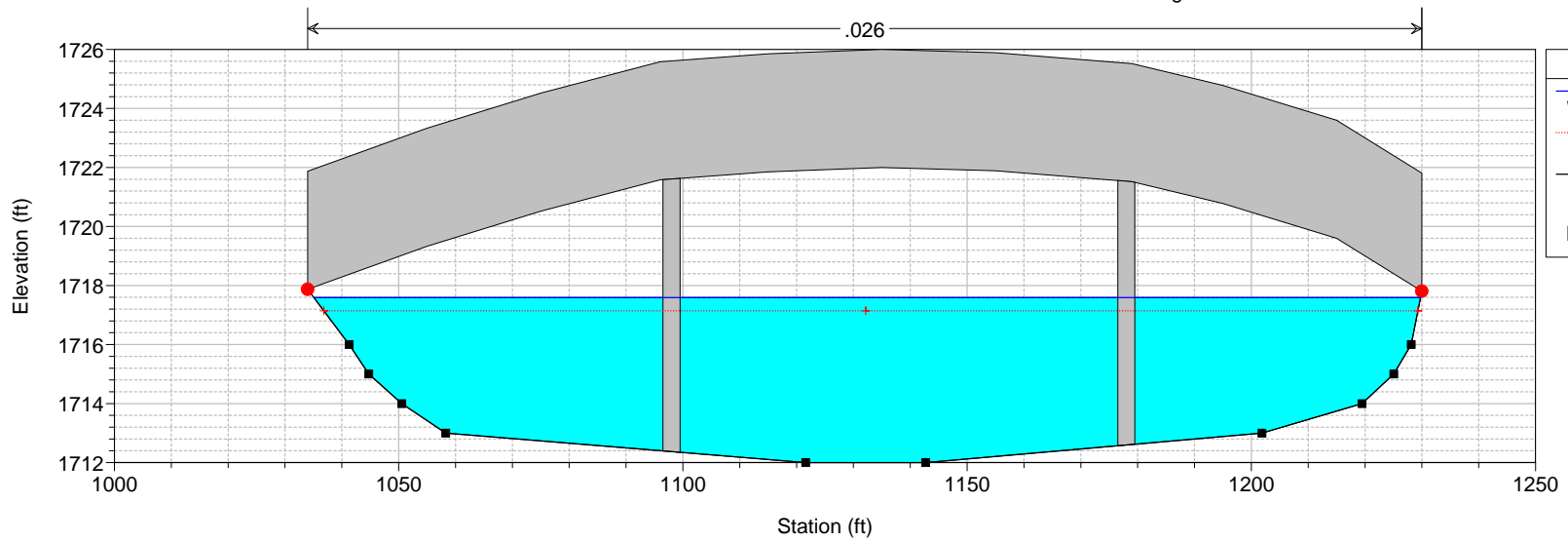




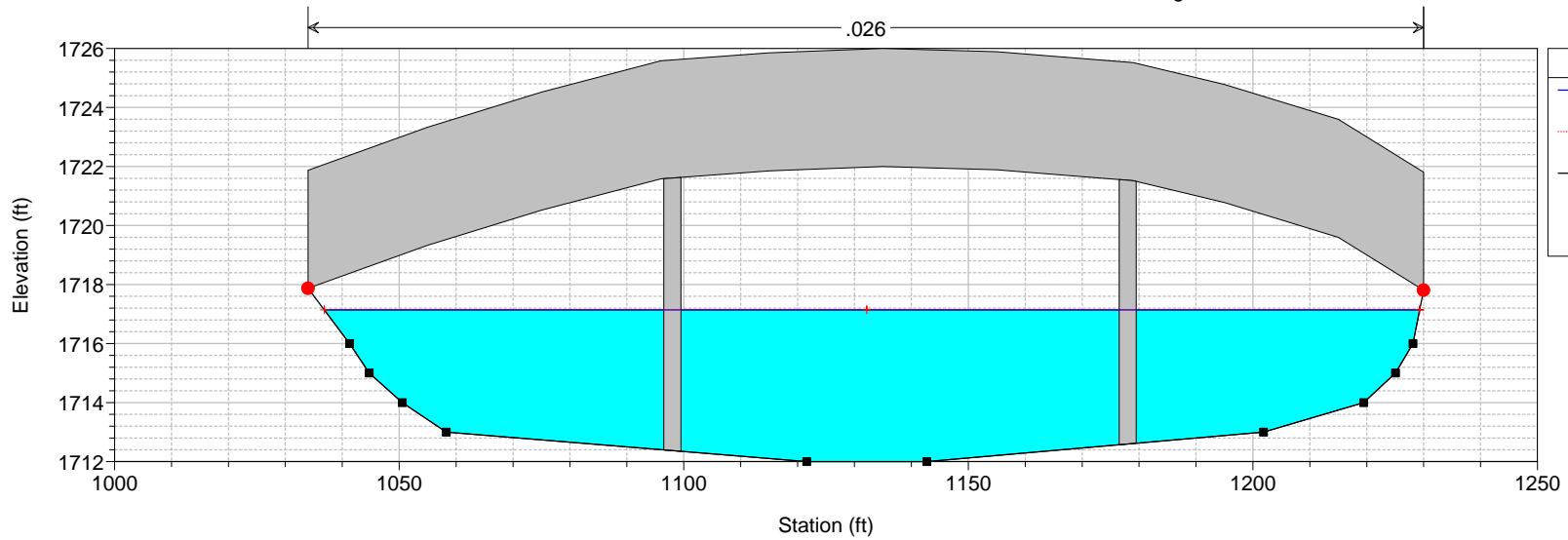
LVWashEX Plan: Existing 8/8/2013
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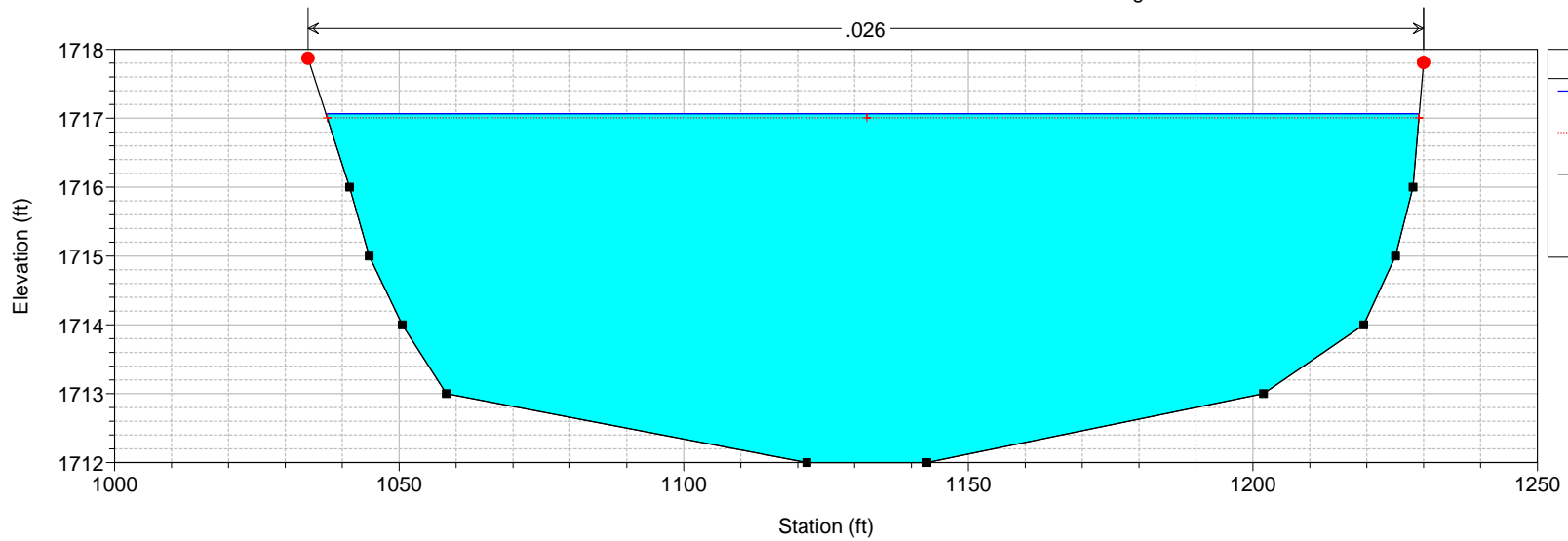
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1101.5 BR Pedestrian Bridge

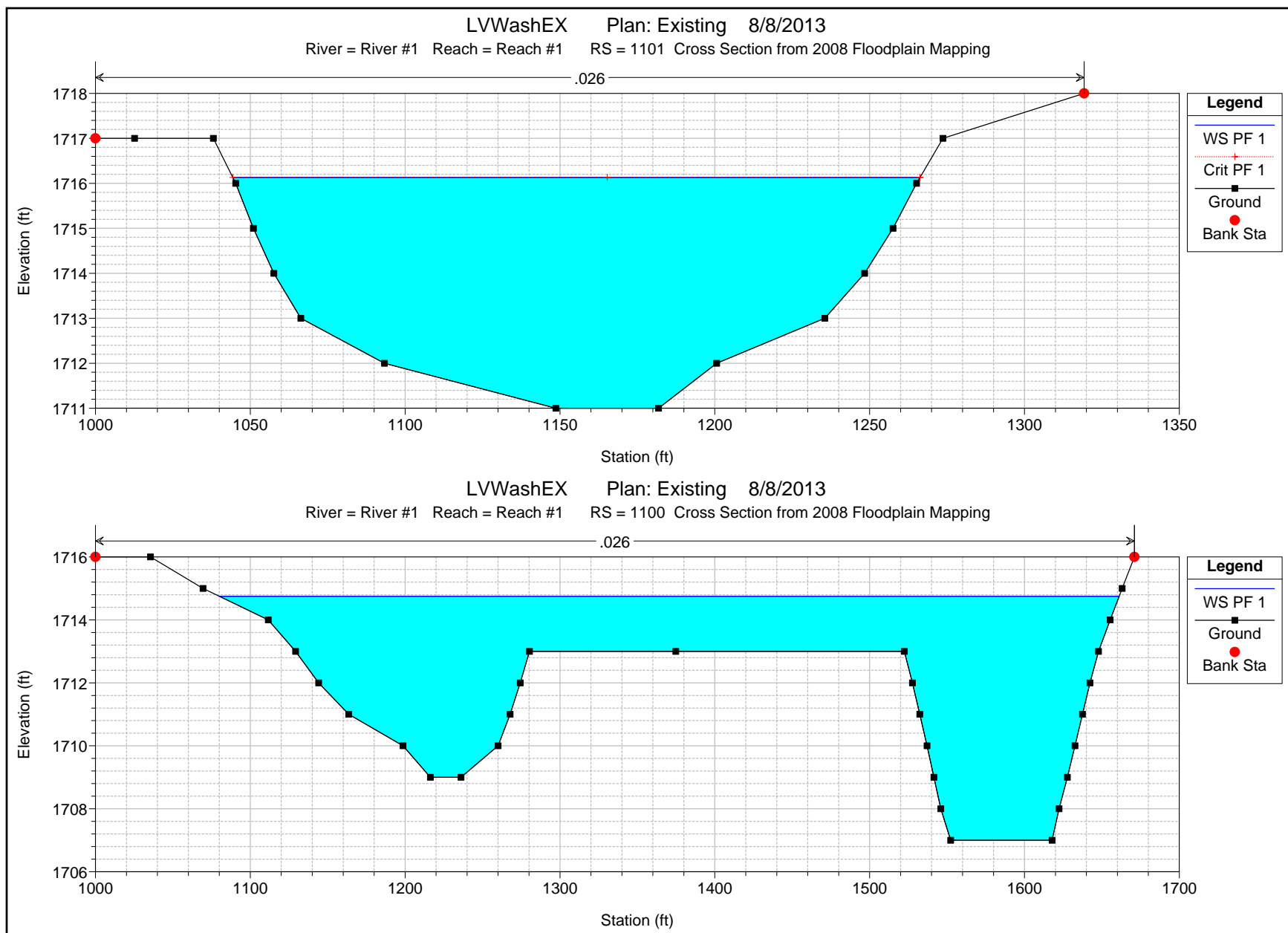


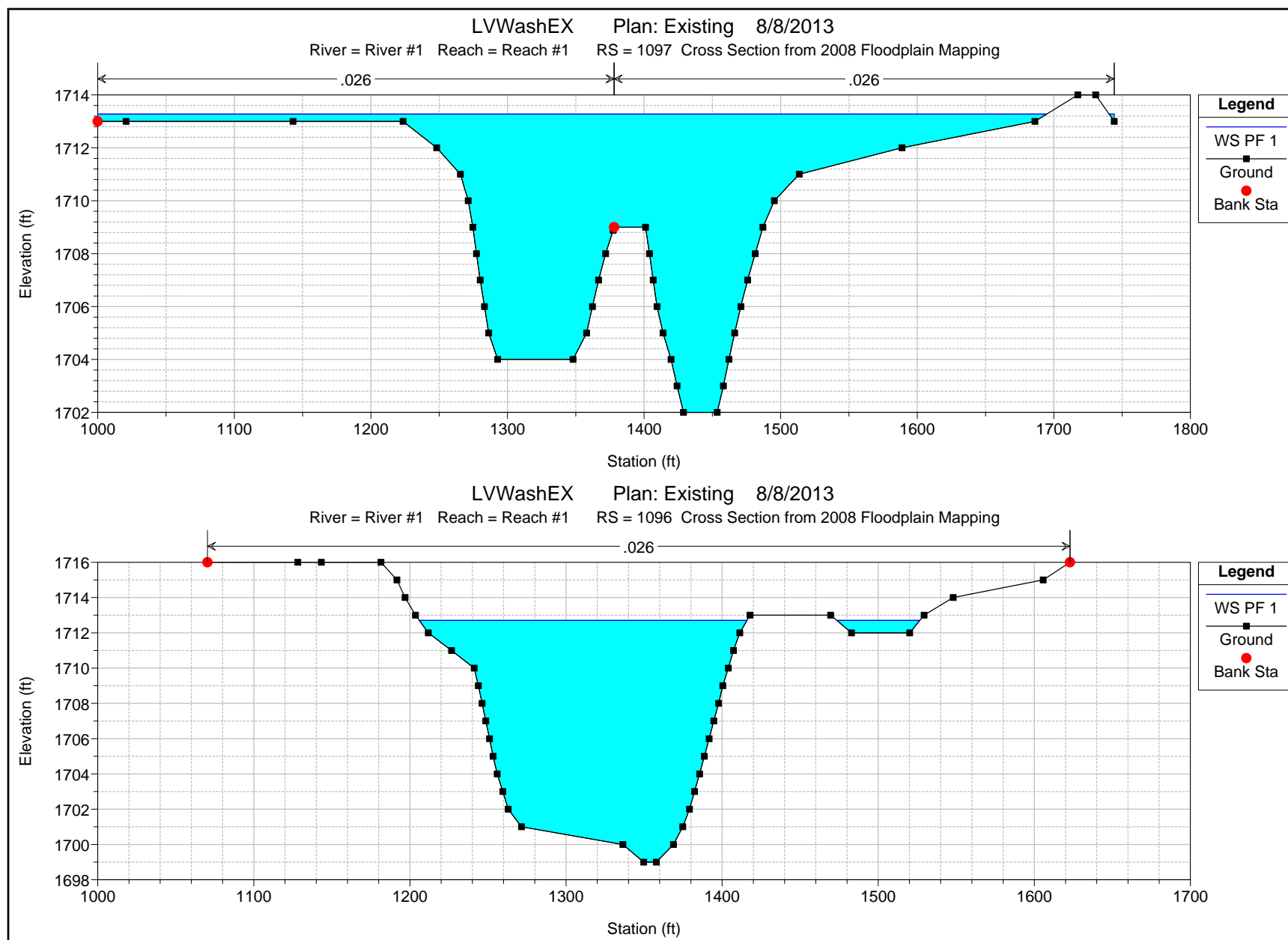
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1101.5 BR Pedestrian Bridge

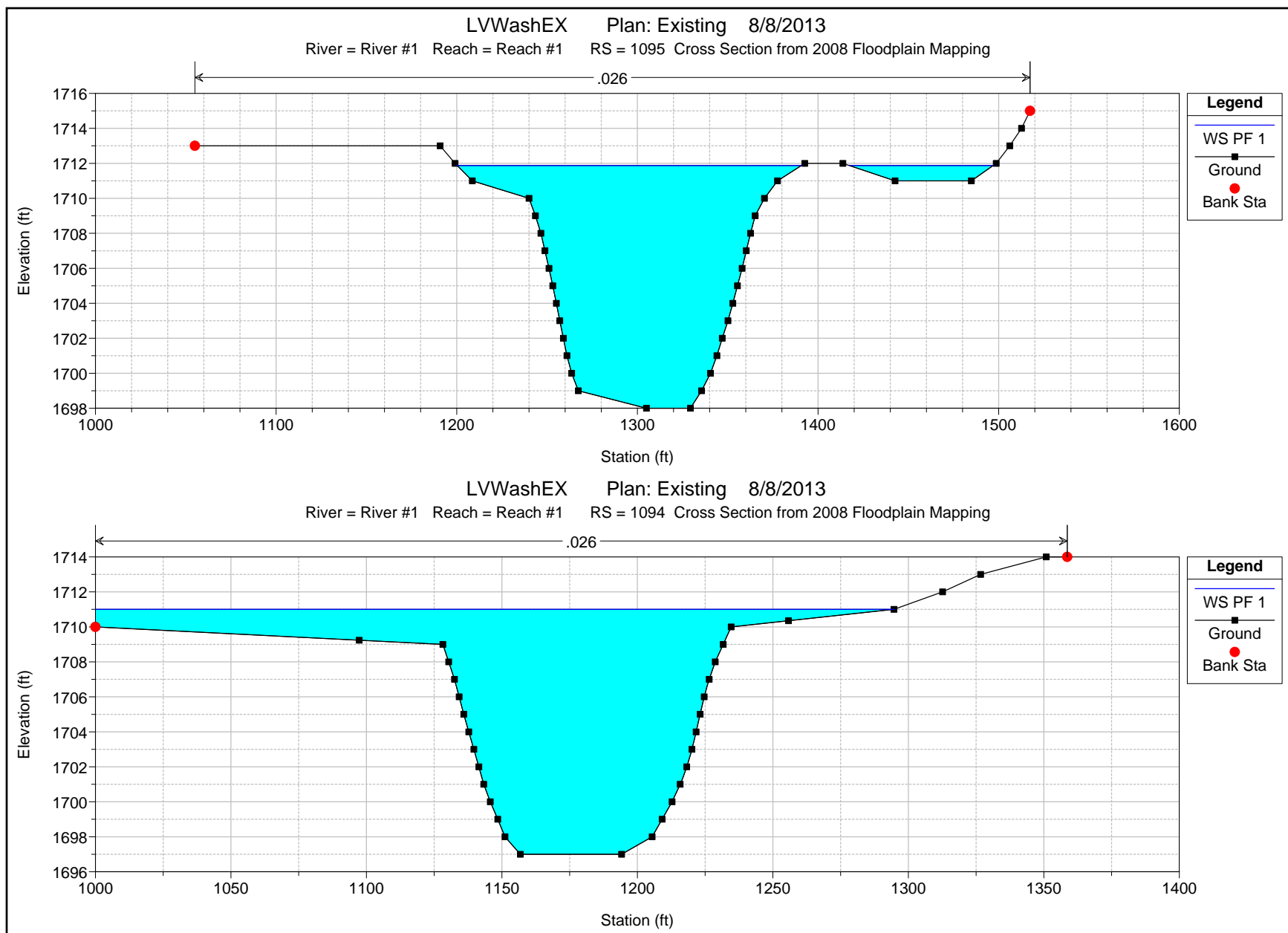


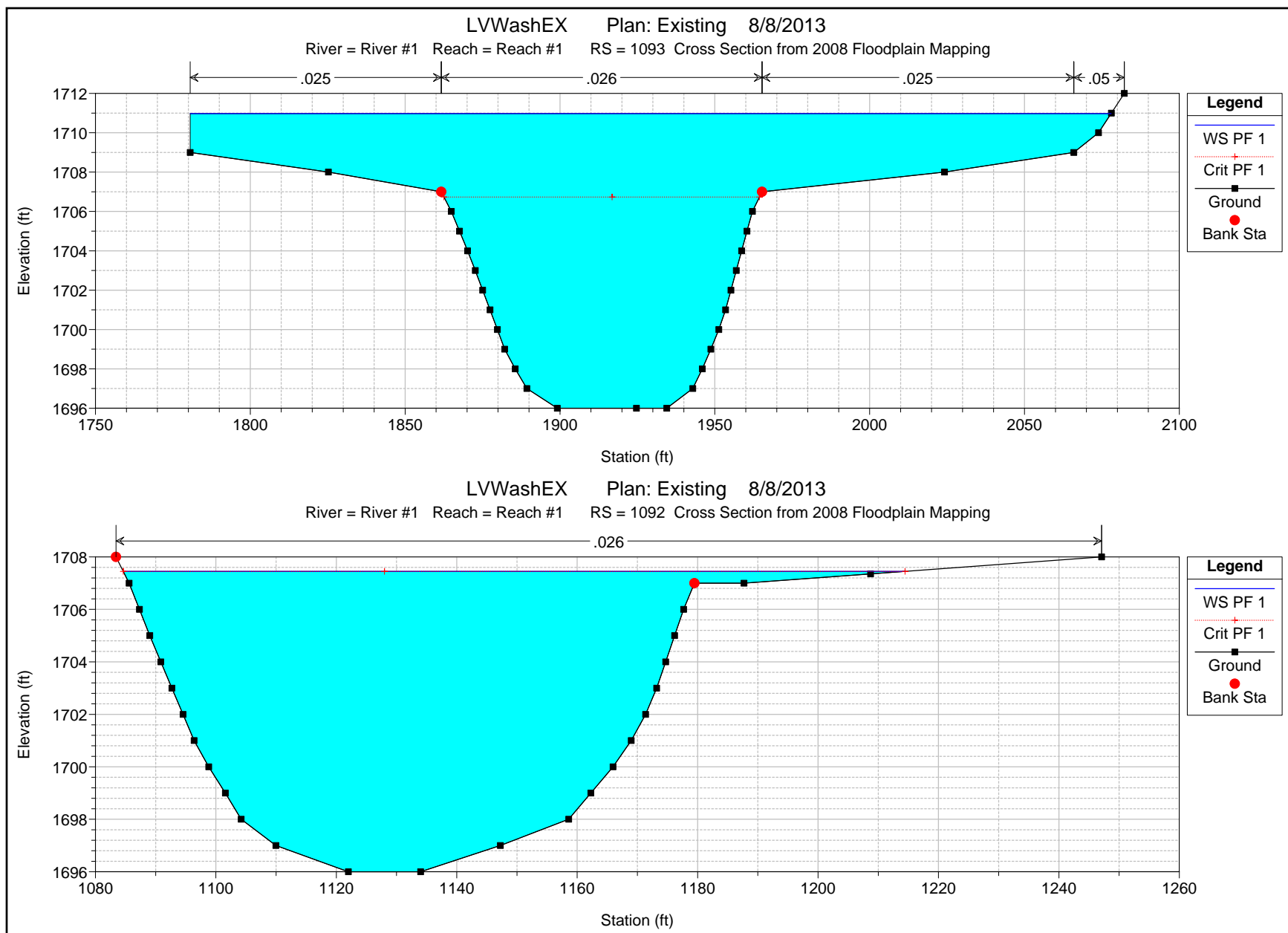
LVWashEX Plan: Existing 8/8/2013
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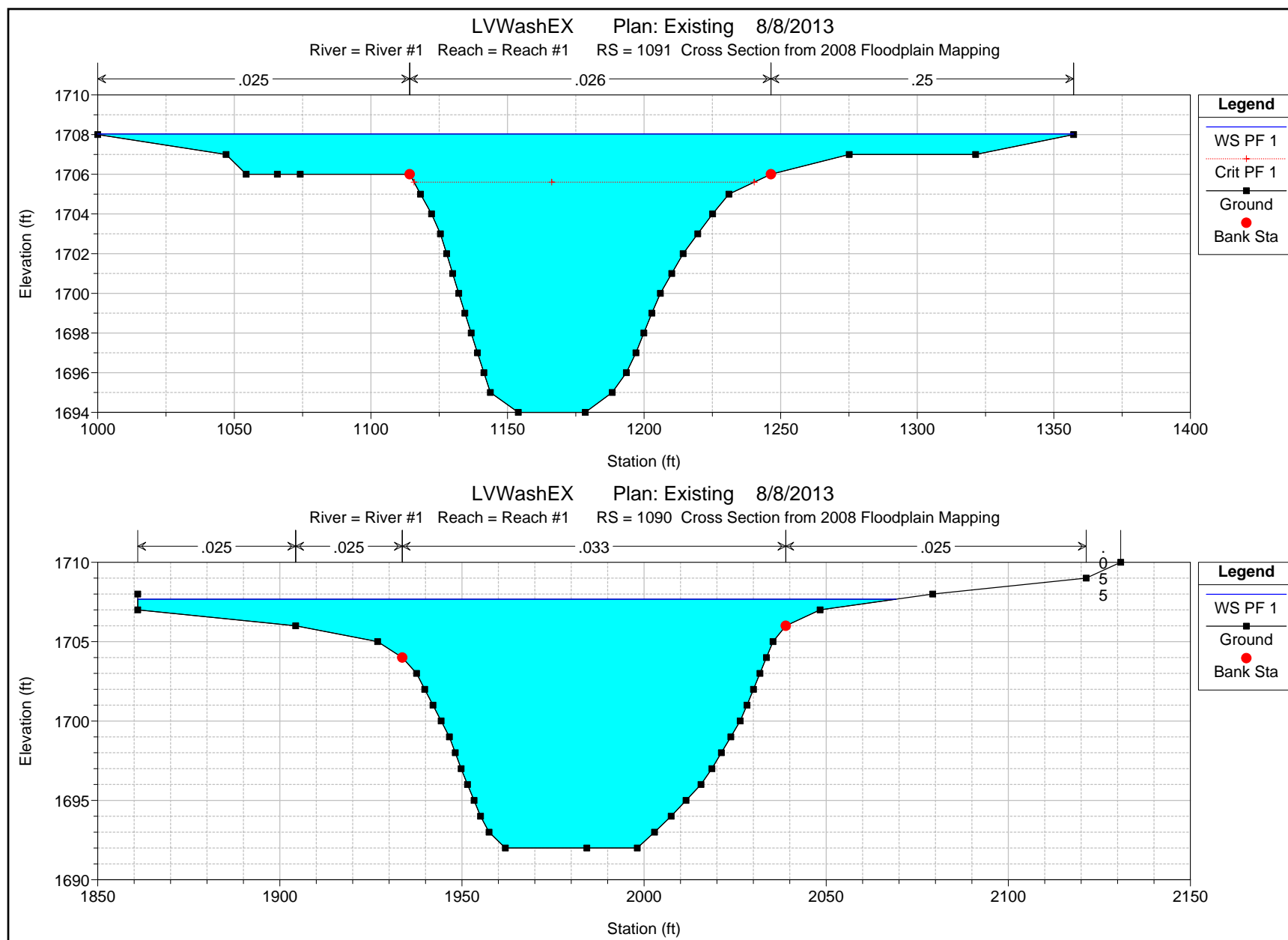


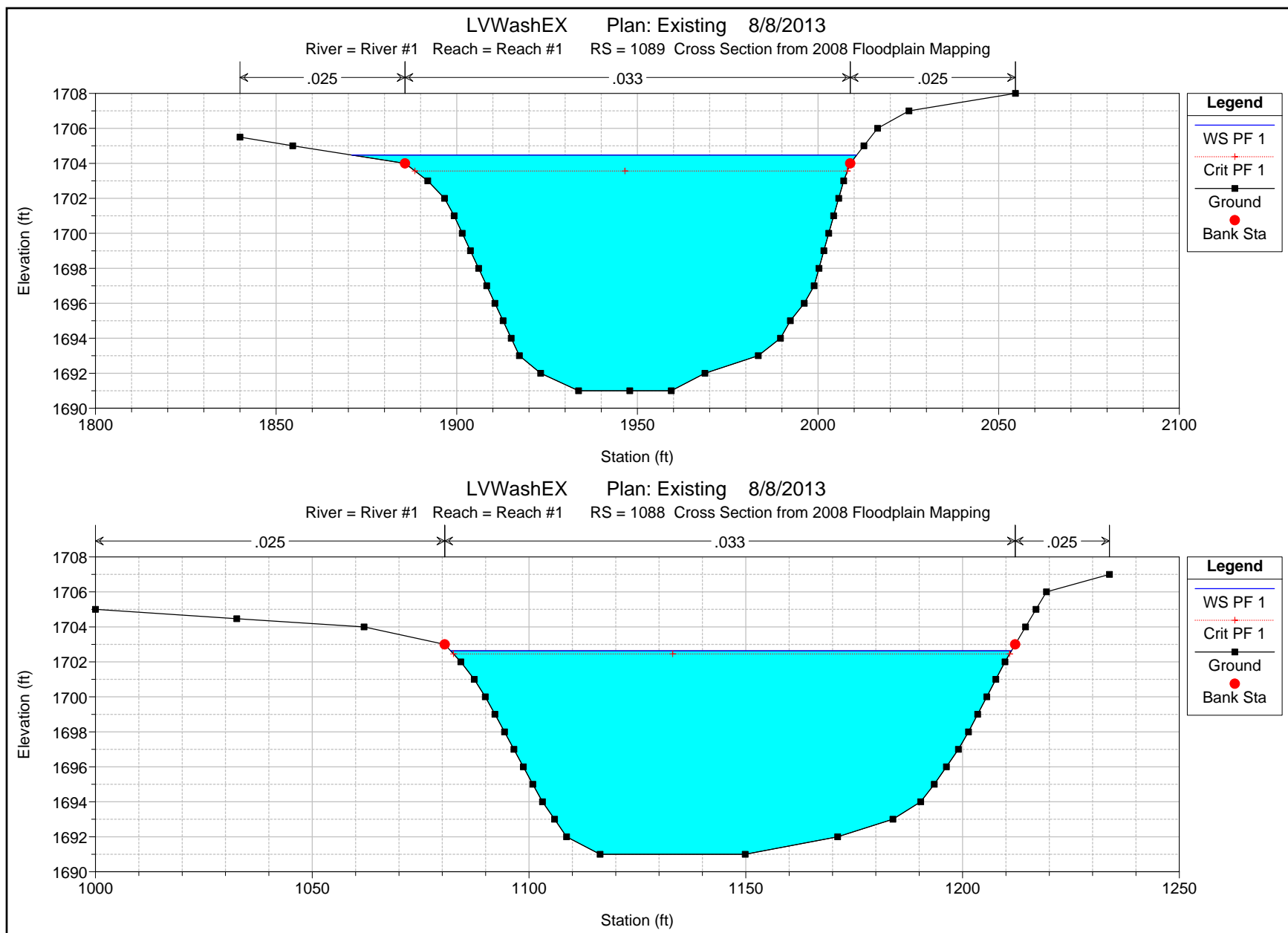






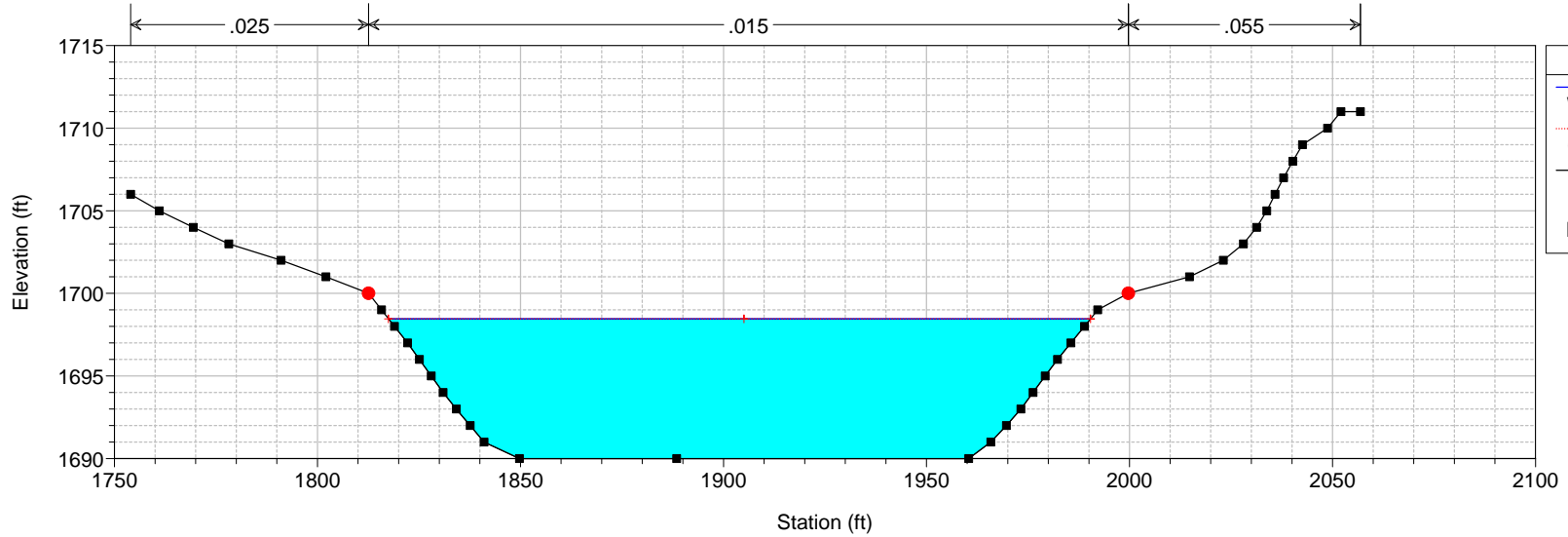






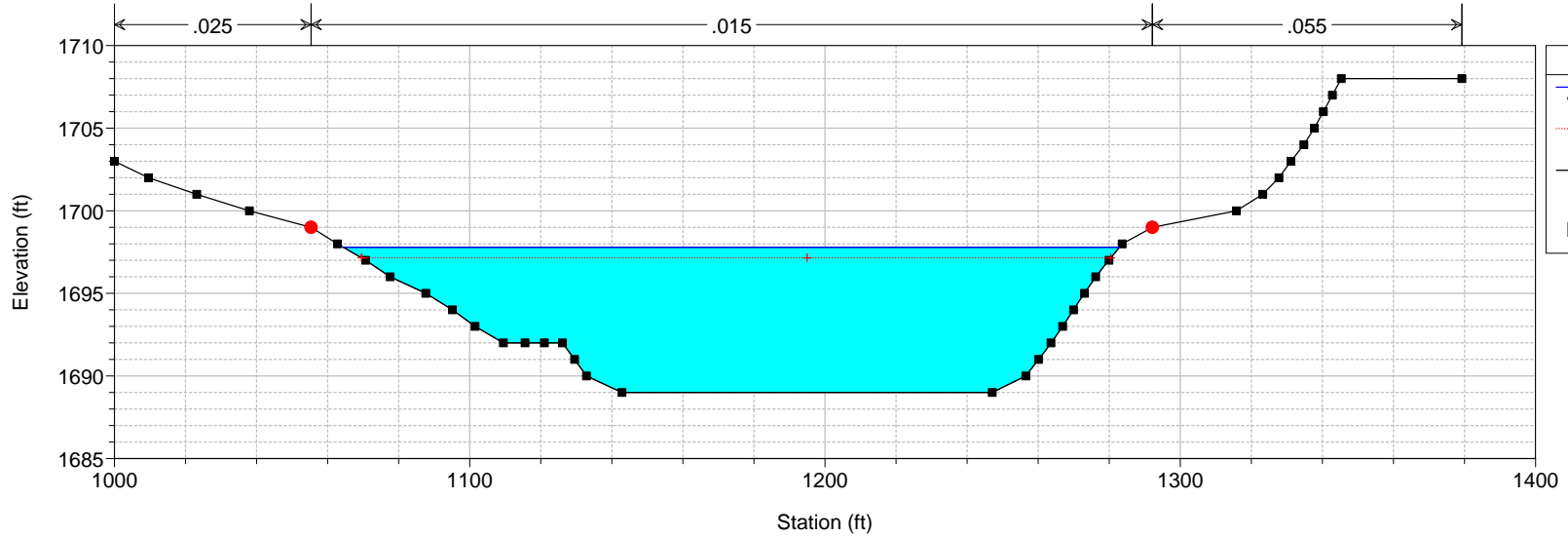
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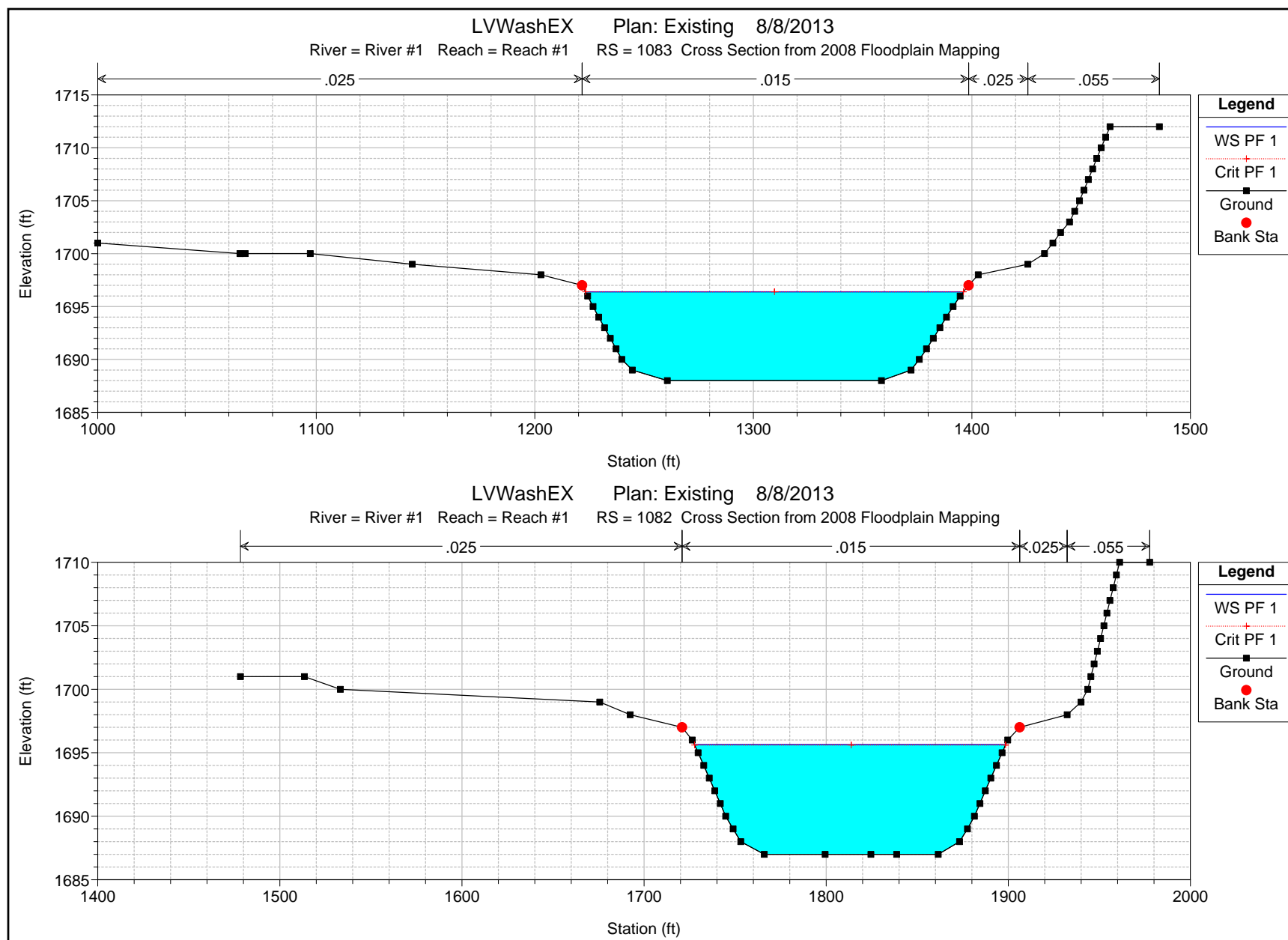
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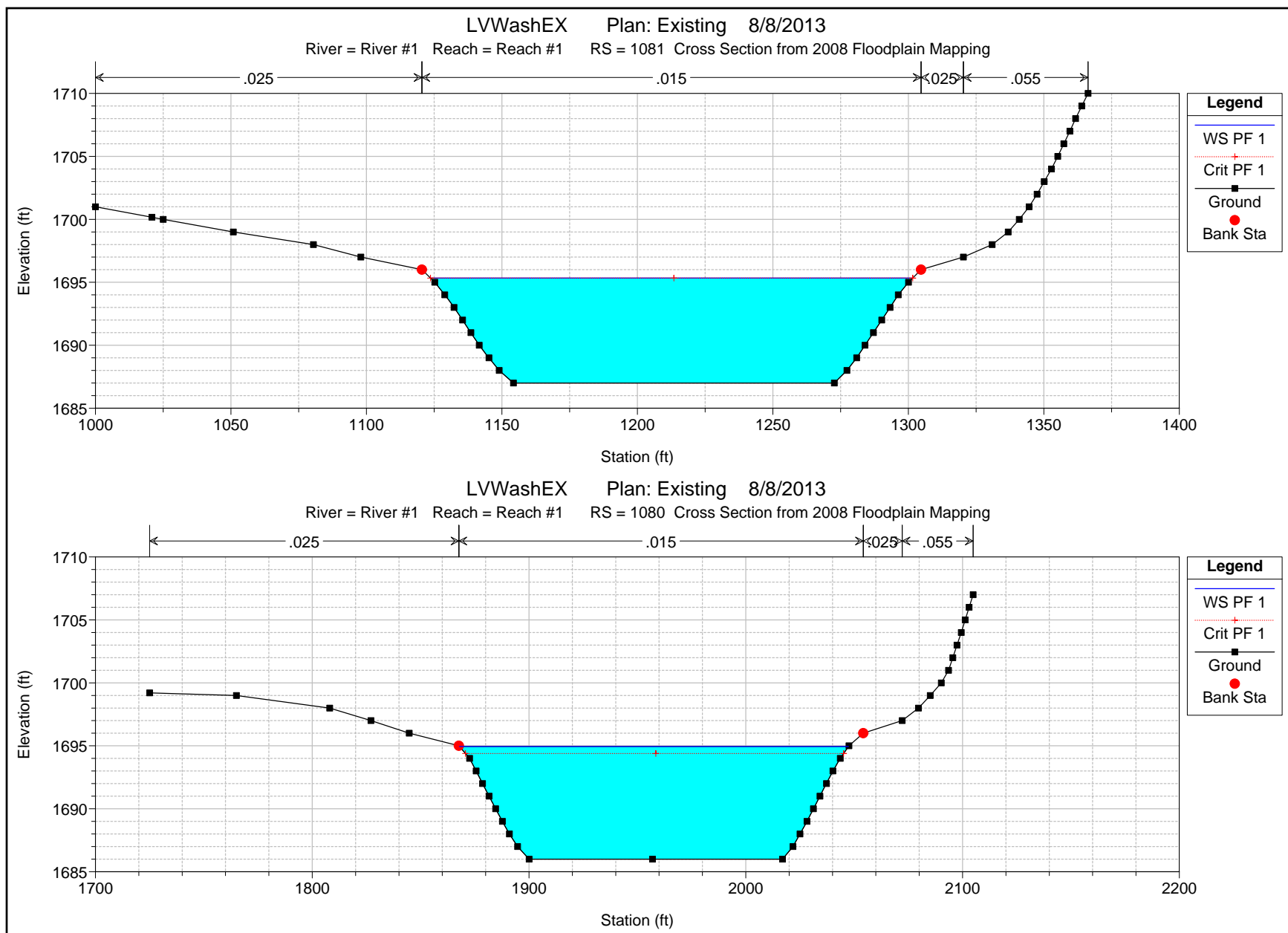


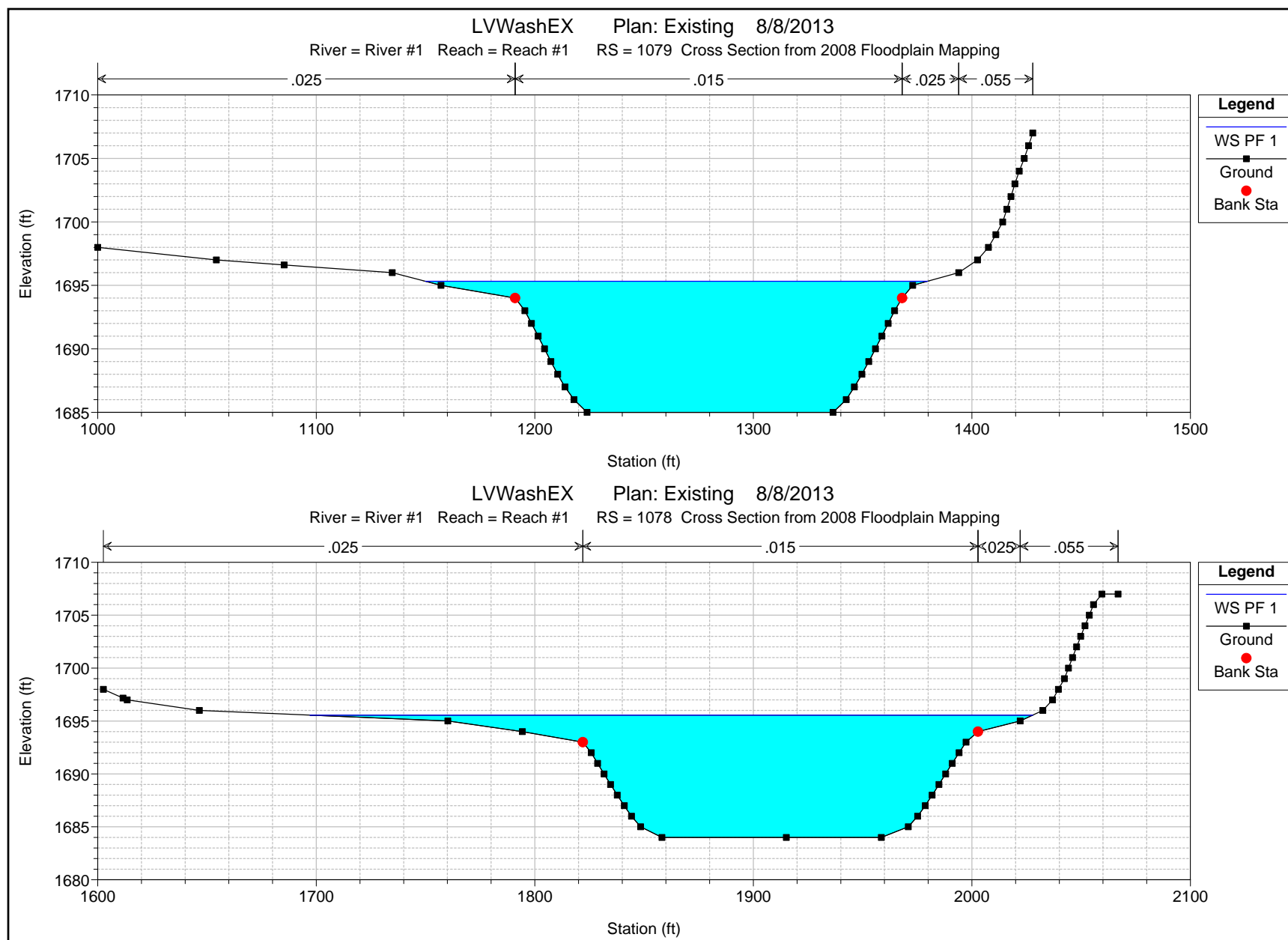
LVWashEX Plan: Existing 8/8/2013

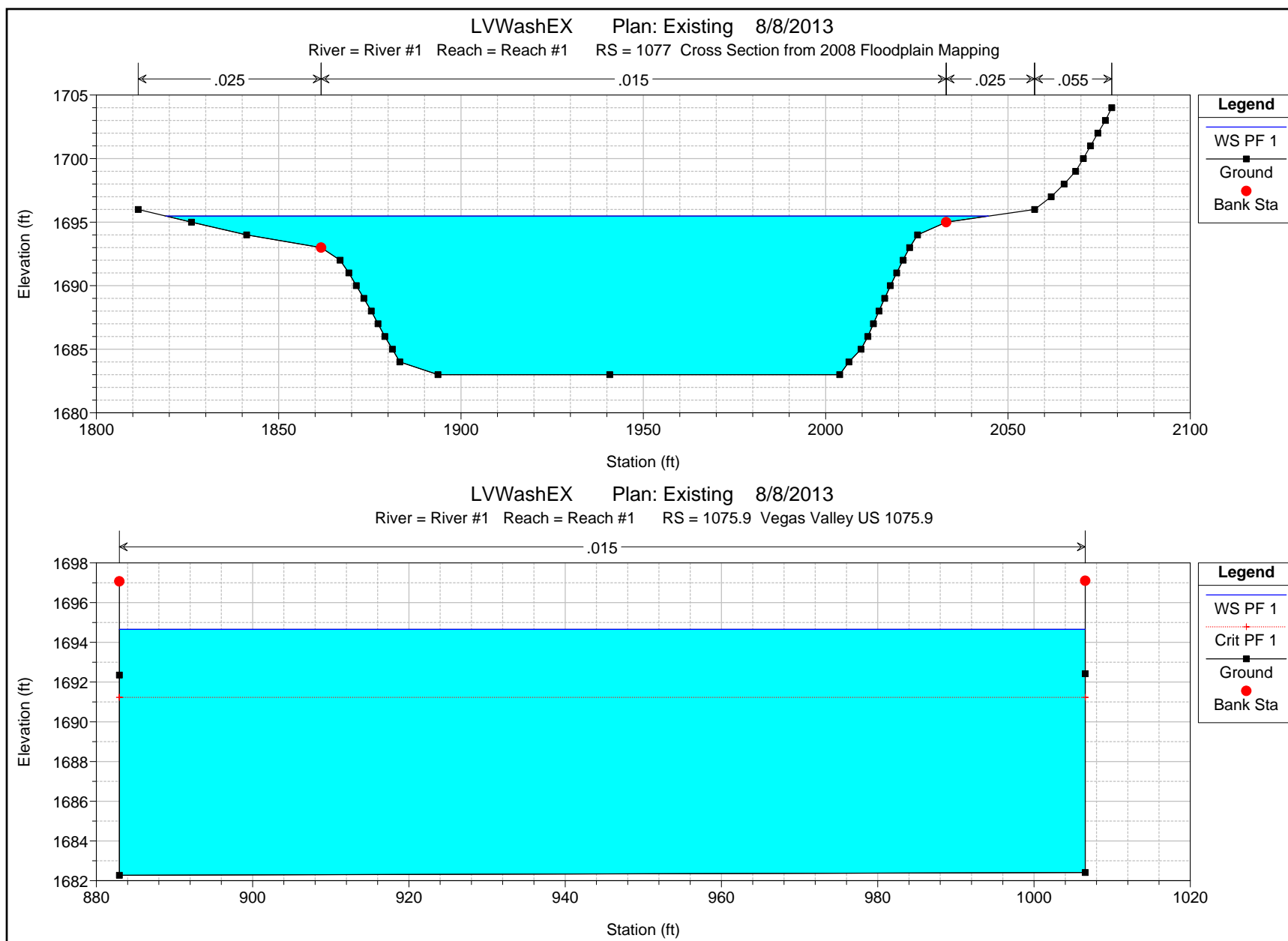
River = River #1 Reach = Reach #1 RS = 1084 Cross Section from 2008 Floodplain Mapping



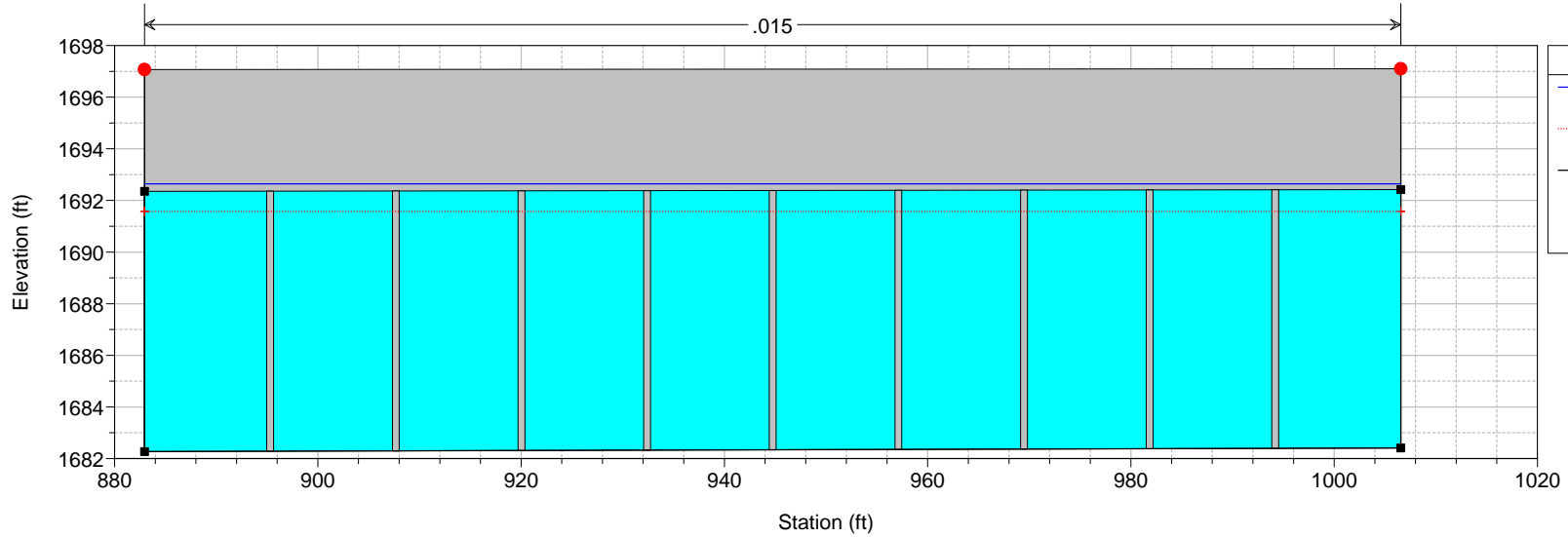




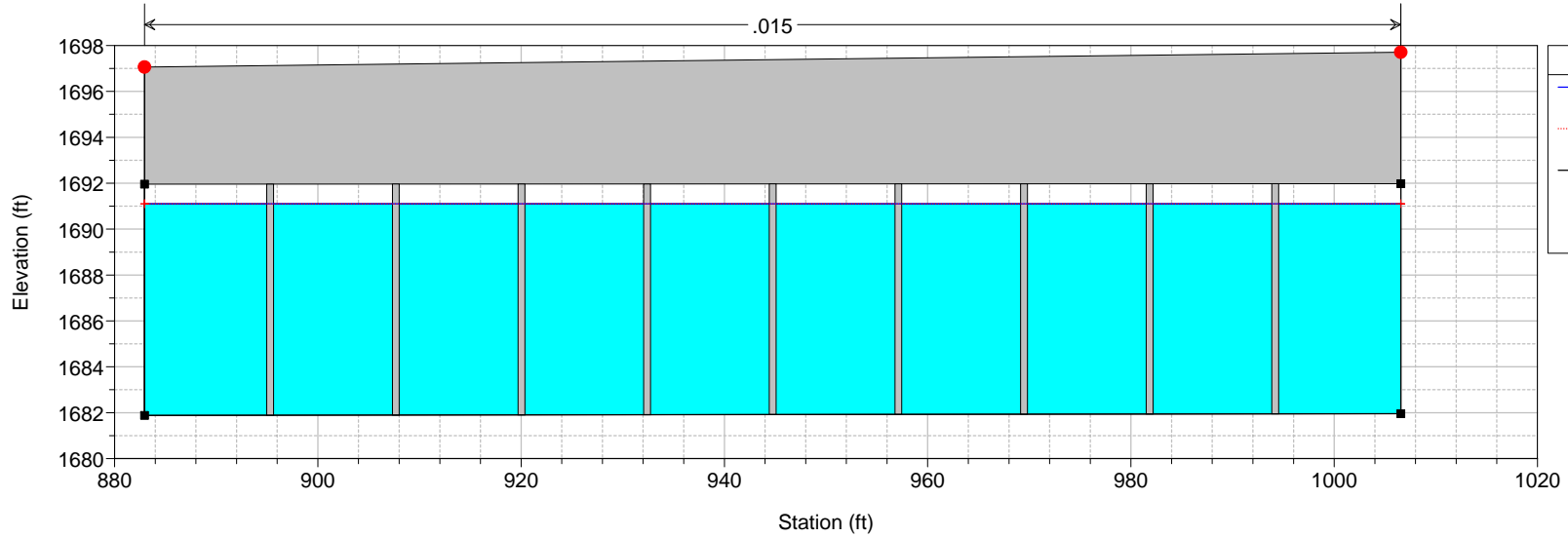




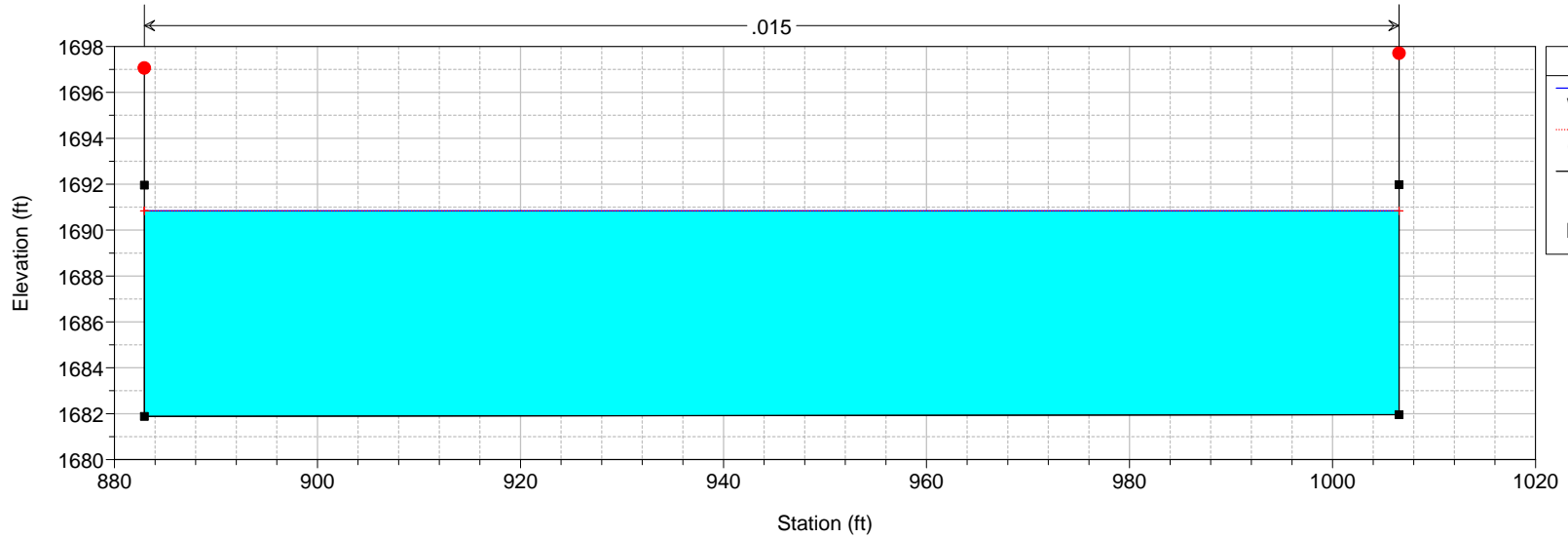
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075.5 BR Vegas Valley Bridge



LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075.5 BR Vegas Valley Bridge

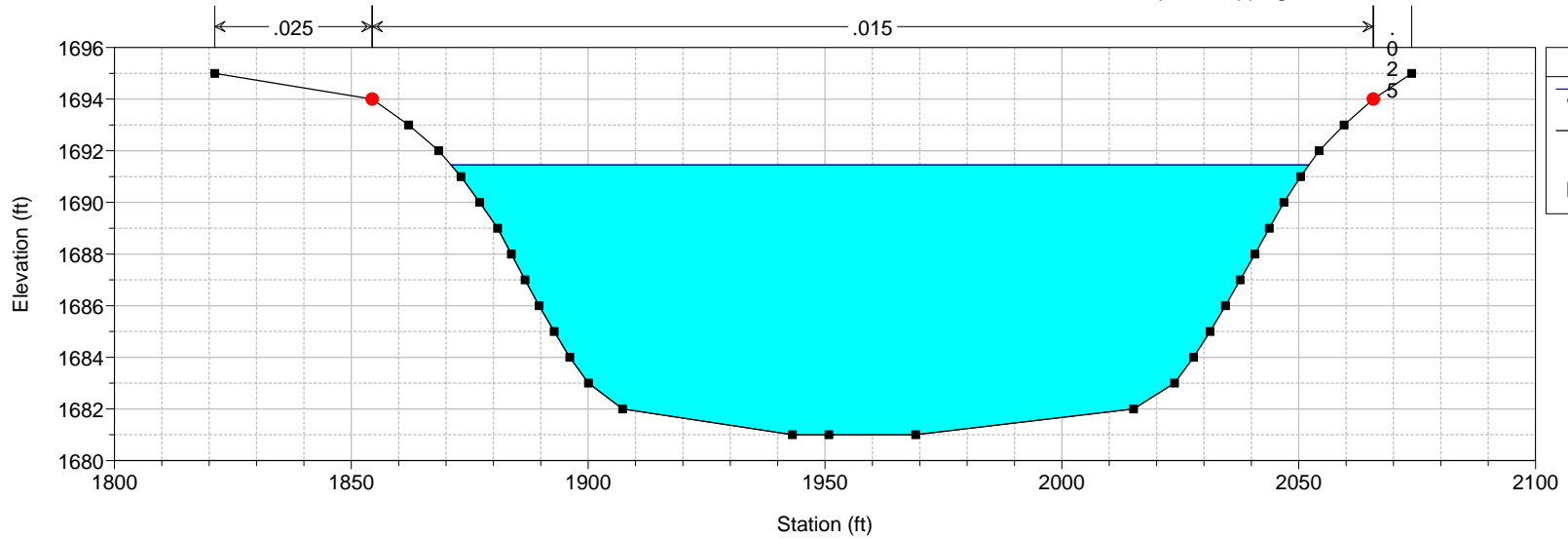


LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075.1 Vegas Valley DS 1075.1



Legend	
WS PF 1	+
Crit PF 1	+
Ground	■
Bank Sta	●

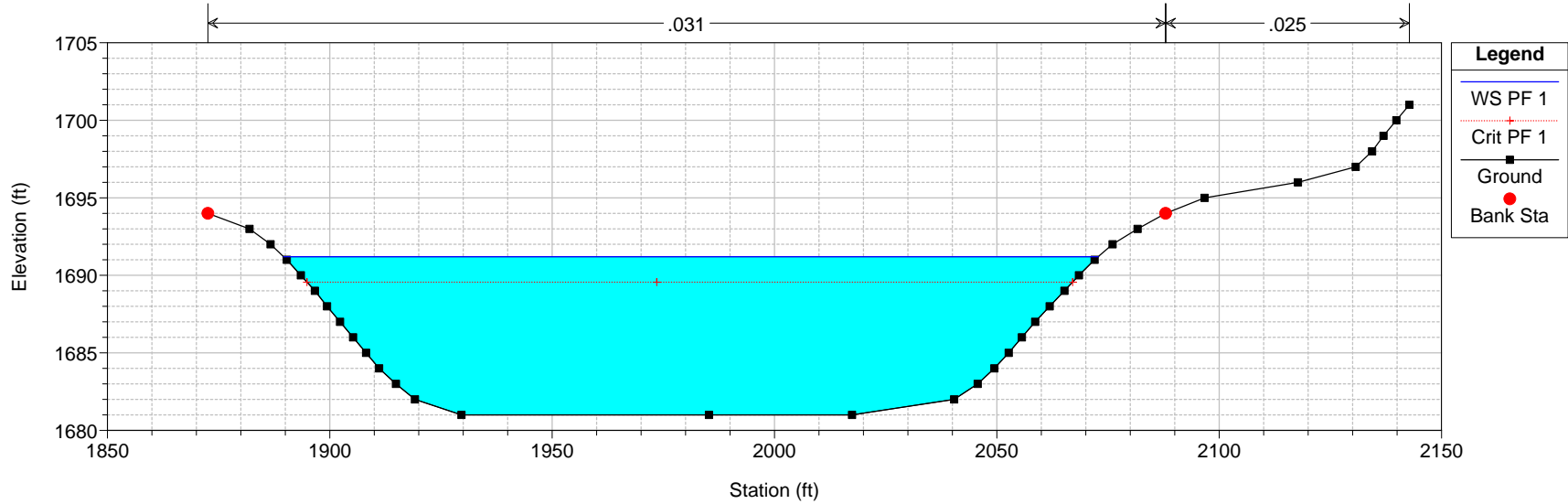
LVWashEX Plan: Existing 8/8/2013
 River = River #1 Reach = Reach #1 RS = 1075 Cross Section from 2008 Floodplain Mapping



Legend	
WS PF 1	+
Ground	■
Bank Sta	●

LVWashEX Plan: Existing 8/8/2013

River = River #1 Reach = Reach #1 RS = 1074 Cross Section from 2008 Floodplain Mapping, model truncated to d



HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X      X  XXXXXX      XXXX      XXXX      XX      XXXX
X      X  X          X      X      X  X      X  X      X
X      X  X          X      X      X  X      X  X      X
XXXXXXXX XXXX      X      XXX XXXX      XXXXXX      XXXX
X      X  X          X      X      X  X      X  X      X
X      X  X          X      X      X  X      X  X      X
X      X  XXXXXX      XXXX      X      X      X  X      XXXXX

```

PROJECT DATA

Project Title: LVWashEX
Project File : LVWashEX.prj
Run Date and Time: 8/8/2013 10:45:55 PM

Project in English units

Project Description:

Pre-Project Conditions Model truncated from 2008 Floodplain Hazard Mapping
Restudy by G.C. Wallace, initial conditions were set at the Water Surface
Elevations from the 2008 Restudy

PLAN DATA

Plan Title: Existing

Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.p01

Geometry Title: LVWashEX

Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.g01

Flow Title : LVWashEX

Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.f01

Plan Summary Information:

Number of:	Cross Sections =	111	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	7	Lateral Structures =	7

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3
Flow tolerance factor =	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: LVWashEX

Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.f01

Flow Data (cfs)

River	Reach	RS	PF 1
River #1	Reach #1	1173	11948
River #1	Reach #1	1169	11948

River #1	Reach #1	1159	12706
River #1	Reach #1	1152	12754
River #1	Reach #1	1147	12364
River #1	Reach #1	1139	12936
River #1	Reach #1	1132	13515
River #1	Reach #1	1117	13861
River #1	Reach #1	1107	13861
River #1	Reach #1	1100	18601
River #1	Reach #1	1091	18672
River #1	Reach #1	1075	18718

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	PF 1	Known WS = 1764.8	Known WS = 1691.2

GEOMETRY DATA

Geometry Title: LVWashEX

Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Pre-Project Condition\LVWashEX.g01

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1173

INPUT

Description: Cross Section from 2008 Floodplain Mapping, model truncated to determine effective water surface tie in locations within project vicinity

Station	Elevation	Data	num=	31
Sta	Elev	Sta	Elev	Sta
1000	1766	1019.88	1765.18	1024.26
1038.21	1762	1040.3	1761	1042.97
1053.01	1757	1057.56	1756	1063.66
1114.69	1755	1122.53	1756	1127.34
1136.68	1760	1139.34	1761	1142.26
1161.81	1765	1225.09	1766	1273.71
1299.45	1770			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.025	1031.96	.031
		1150.3	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1031.96	1150.3		190	200	150	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1767.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.58	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1764.77	Reach Len. (ft)	190.00	200.00	150.00
Crit W.S. (ft)	1763.70	Flow Area (sq ft)	2.30	925.52	3.44
E.G. Slope (ft/ft)	0.004806	Area (sq ft)	2.30	925.52	3.44
Q Total (cfs)	11948.00	Flow (cfs)	5.00	11935.50	7.50
Top Width (ft)	133.19	Top Width (ft)	5.95	118.34	8.90
Vel Total (ft/s)	12.83	Avg. Vel. (ft/s)	2.17	12.90	2.18
Max Chl Dpth (ft)	10.77	Hydr. Depth (ft)	0.39	7.82	0.39
Conv. Total (cfs)	172340.0	Conv. (cfs)	72.1	172159.7	108.2
Length Wtd. (ft)	199.75	Wetted Per. (ft)	6.00	121.06	8.93
Min Ch El (ft)	1754.00	Shear (lb/sq ft)	0.12	2.29	0.12
Alpha	1.01	Stream Power (lb/ft s)	1299.45	0.00	0.00
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	13.92	639.68	23.00
C & E Loss (ft)	0.08	Cum SA (acres)	10.56	109.52	8.79

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1172

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data				num=	29
Sta	Elev	Sta	Elev	Sta	Elev
950	1764.5	970	1763.5	1000	1763
1044.38	1761	1046.22	1760	1048.19	1759
1057.63	1756	1061.98	1755	1079.73	1754
1099.75	1754	1127.1	1755	1132.52	1756
1144.36	1759	1147.52	1760	1150.19	1761
1161.96	1764	1182.75	1765	1197.78	1765.23
				1247.33	1766

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
950	.025	1042.34	.031	1152.87	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1042.34	1152.87		180	200	190	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1766.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1764.07	Reach Len. (ft)	180.00	200.00	190.00
Crit W.S. (ft)	1763.20	Flow Area (sq ft)	94.14	927.05	9.56
E.G. Slope (ft/ft)	0.004081	Area (sq ft)	94.14	927.05	9.56
Q Total (cfs)	11948.00	Flow (cfs)	386.56	11527.77	33.67
Top Width (ft)	204.68	Top Width (ft)	83.68	110.53	10.48
Vel Total (ft/s)	11.59	Avg. Vel. (ft/s)	4.11	12.43	3.52
Max Chl Dpth (ft)	11.07	Hydr. Depth (ft)	1.13	8.39	0.91
Conv. Total (cfs)	187021.9	Conv. (cfs)	6050.8	180444.0	527.0
Length Wtd. (ft)	199.46	Wetted Per. (ft)	83.71	113.29	10.70
Min Ch El (ft)	1753.00	Shear (lb/sq ft)	0.29	2.09	0.23
Alpha	1.11	Stream Power (lb/ft s)	1247.33	0.00	0.00
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	13.71	635.43	22.97
C & E Loss (ft)	0.12	Cum SA (acres)	10.37	108.99	8.76

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1171

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data				num=	28
Sta	Elev	Sta	Elev	Sta	Elev
955	1763.7	980	1763.3	1000	1763
1063.77	1761	1065.32	1760	1066.87	1759
1079.73	1756	1085.1	1755	1093.14	1754
1158.53	1754	1163.99	1755	1166.96	1756
1174.54	1759	1176.82	1760	1179.17	1761
1202.48	1763.73	1209.14	1764	1255.44	1765

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
955	.025	1061.4	.031	1181.89	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1061.4	1181.89		220	200	201	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1765.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.94	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1763.61	Reach Len. (ft)	220.00	200.00	201.00
Crit W.S. (ft)	1761.70	Flow Area (sq ft)	80.39	1036.91	7.63
E.G. Slope (ft/ft)	0.003247	Area (sq ft)	80.39	1036.91	7.63
Q Total (cfs)	11948.00	Flow (cfs)	233.84	11699.53	14.63
Top Width (ft)	239.22	Top Width (ft)	100.99	120.49	17.74
Vel Total (ft/s)	10.62	Avg. Vel. (ft/s)	2.91	11.28	1.92
Max Chl Dpth (ft)	10.61	Hydr. Depth (ft)	0.80	8.61	0.43
Conv. Total (cfs)	209689.7	Conv. (cfs)	4103.9	205329.0	256.8
Length Wtd. (ft)	200.20	Wetted Per. (ft)	101.00	123.49	17.93
Min Ch El (ft)	1753.00	Shear (lb/sq ft)	0.16	1.70	0.09
Alpha	1.11	Stream Power (lb/ft s)	1255.44	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	13.35	630.92	22.94
C & E Loss (ft)	0.00	Cum SA (acres)	9.99	108.46	8.70

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1170

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30		
Sta	Elev	Sta	Elev	Sta	Elev
1676.74	1765	1769.78	1764.32	1814.35	1764
1839.07	1761	1841.68	1760	1844.22	1759
1852.99	1756	1858.2	1755	1869.14	1754
1905.96	1752	1906.26	1752.01	1938.96	1753
1948.79	1756	1951.66	1757	1954.42	1758
1962.86	1761	1965.84	1762	1968.81	1763

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1676.74	.025	1836.47	.031	1972.02	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1836.47	1972.02		212	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.93	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1762.95	Reach Len. (ft)	212.00	200.00	197.00
Crit W.S. (ft)		Flow Area (sq ft)	4.68	1069.69	
E.G. Slope (ft/ft)	0.003436	Area (sq ft)	4.68	1069.69	
Q Total (cfs)	11948.00	Flow (cfs)	9.89	11938.11	
Top Width (ft)	142.05	Top Width (ft)	9.87	132.19	
Vel Total (ft/s)	11.12	Avg. Vel. (ft/s)	2.11	11.16	
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)	0.47	8.09	
Conv. Total (cfs)	203818.0	Conv. (cfs)	168.7	203649.3	
Length Wtd. (ft)	200.01	Wetted Per. (ft)	9.91	135.14	
Min Ch El (ft)	1752.00	Shear (lb/sq ft)	0.10	1.70	
Alpha	1.01	Stream Power (lb/ft s)	2009.24	0.00	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	13.14	626.09	22.92
C & E Loss (ft)	0.18	Cum SA (acres)	9.71	107.88	8.65

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1169

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 35		
Sta	Elev	Sta	Elev	Sta	Elev
1857.21	1767	1866.89	1766	1870.21	1765
1879.32	1762	1880.81	1761	1882.31	1760
1887.8	1757	1890.34	1756	1892.93	1755
1928.81	1753	1945.3	1753	1947.64	1752
2001.42	1753	2005.05	1754	2008.02	1755
2013.76	1758	2015.65	1759	2018	1760
2031.12	1763	2045.61	1764	2078.86	1765

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1857.21	.025	1873.46	.031	2045.61	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1873.46	2045.61		110	80		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.031	
W.S. Elev (ft)	1762.81	Reach Len. (ft)	110.00	80.00	40.00
Crit W.S. (ft)		Flow Area (sq ft)		1287.45	
E.G. Slope (ft/ft)	0.002264	Area (sq ft)		1287.45	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	152.71	Top Width (ft)		152.71	
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)		9.28	
Max Chl Dpth (ft)	10.81	Hydr. Depth (ft)		8.43	
Conv. Total (cfs)	251098.8	Conv. (cfs)		251098.8	
Length Wtd. (ft)	80.00	Wetted Per. (ft)		156.86	

Min Ch El (ft)	1752.00	Shear (lb/sq ft)	1.16
Alpha	1.00	Stream Power (lb/ft s)	2250.92
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	13.13
C & E Loss (ft)	0.14	Cum SA (acres)	9.68
			107.23
			8.65

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1167.9

INPUT

Description: Bonanza Bridge US 1167.9

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
848.048	1767.76	848.048	1764.02	848.048
869.249	1752.53	900.627	1751	909.243
963.383	1750.04	968.471	1751.12	982.464
984.584	1767.25			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
848.048	.095	848.048	.031
		984.584	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	848.048	984.584		112	112	.3	.5

Skew Angle = 32

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.031	
W.S. Elev (ft)	1763.02	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1757.03	Flow Area (sq ft)		1589.70	
E.G. Slope (ft/ft)	0.001026	Area (sq ft)		1589.70	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	136.54	Top Width (ft)		136.54	
Vel Total (ft/s)	7.52	Avg. Vel. (ft/s)		7.52	
Max Chl Dpth (ft)	16.02	Hydr. Depth (ft)		11.64	
Conv. Total (cfs)	373088.6	Conv. (cfs)		373088.6	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		146.73	
Min Ch El (ft)	1747.00	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	984.58	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	13.13	618.03	22.92
C & E Loss (ft)	0.03	Cum SA (acres)	9.68	106.96	8.65

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1167.5

INPUT

Description: Bonanza Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 110

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew = 32

Upstream Deck/Roadway Coordinates

num=	2
Sta Hi Cord	Lo Cord
848.048	1767.76
1764.02	984.584
1767.25	1763.41

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
848.048	1767.76	848.048	1764.02	848.048
869.249	1752.53	900.627	1751	909.243
963.383	1750.04	968.471	1751.12	982.464
984.584	1767.25			

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
848.048 .095 848.048 .031 984.584 .095

Bank Sta: Left Right Coeff Contr. Expan.
848.048 984.584 .3 .5
Skew Angle = 32

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
848.048 1768.24 1764.33 984.584 1767.39 1763.61

Downstream Bridge Cross Section Data
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
848.048 1768.24 848.048 1764.33 848.048 1761.38 850.168 1760.91 861.193 1753.5
869.249 1753.97 900.627 1752.7 913.823 1747 922.634 1747 932.005 1751.15
963.383 1753.68 982.464 1759.8 984.584 1760.31 984.584 1763.61 984.584 1767.39

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
848.048 .095 848.048 .031 984.584 .095

Bank Sta: Left Right Coeff Contr. Expan.
848.048 984.584 .3 .5
Skew Angle = 32

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data
Pier Station Upstream= 869.249 Downstream= 869.249
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 900.627 Downstream= 900.627
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 932.005 Downstream= 932.005
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Pier Data
Pier Station Upstream= 963.383 Downstream= 963.383
Upstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770
Downstream num= 2
Width Elev Width Elev
1.35 1745 1.35 1770

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 1.2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1763.90	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1763.02	E.G. Elev (ft)	1763.86	1763.15
Q Total (cfs)	11948.00	W.S. Elev (ft)	1762.88	1761.13
Q Bridge (cfs)	11948.00	Crit W.S. (ft)	1757.30	1759.31
Q Weir (cfs)		Max Chl Dpth (ft)	15.81	14.13
Weir Sta Lft (ft)		Vel Total (ft/s)	7.95	11.40
Weir Sta Rgt (ft)		Flow Area (sq ft)	1502.02	1048.37
Weir Submerg		Froude # Chl	0.41	0.71
Weir Max Depth (ft)		Specif Force (cu ft)	12487.56	9163.31
Min El Weir Flow (ft)	1767.40	Hydr Depth (ft)	11.45	8.06
Min El Prs (ft)	1764.02	W.P. Total (ft)	242.86	202.59
Delta EG (ft)	0.86	Conv. Total (cfs)	242581.3	150342.6
Delta WS (ft)	1.79	Top Width (ft)	131.14	130.00
BR Open Area (sq ft)	1420.93	Frctn Loss (ft)	0.41	0.00
BR Open Vel (ft/s)	11.40	C & E Loss (ft)	0.31	0.10
Coef of Q		Shear Total (lb/sq ft)	0.94	2.04
Br Sel Method	Energy only	Power Total (lb/ft s)	848.05	848.05

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy.
The

program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the

program will default to an energy based solution.

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy.

This is not physically possible, the momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1167.1

INPUT

Description: Bonanza Bridge DS 1167.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
848.048	1768.24	848.048	1764.33	848.048	1761.38	850.168	1760.91	861.193	1753.5
869.249	1753.97	900.627	1752.7	913.823	1747	922.634	1747	932.005	1751.15
963.383	1753.68	982.464	1759.8	984.584	1760.31	984.584	1763.61	984.584	1767.39

Sta	n Val	Sta	n Val	Sta	n Val
848.048	.095	848.048	.031	984.584	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	848.048	984.584		150	195	230	.3
Skew Angle =	32						.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.031	
W.S. Elev (ft)	1761.23	Reach Len. (ft)	150.00	195.00	230.00
Crit W.S. (ft)		Flow Area (sq ft)		1106.45	
E.G. Slope (ft/ft)	0.003294	Area (sq ft)		1106.45	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	135.84	Top Width (ft)		135.84	
Vel Total (ft/s)	10.80	Avg. Vel. (ft/s)		10.80	
Max Chl Dpth (ft)	14.23	Hydr. Depth (ft)		8.15	
Conv. Total (cfs)	208183.3	Conv. (cfs)		208183.3	
Length Wtd. (ft)	195.00	Wetted Per. (ft)		142.27	

Min Ch El (ft)	1747.00	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)	984.58	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	13.13	614.75	22.92
C & E Loss (ft)	0.19	Cum SA (acres)	9.68	106.62	8.65

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1167

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		38	
Sta	Elev	Sta	Elev	Sta	Elev
1810.81	1767	1816.21	1766.863	1850.26	1766
1864.33	1763	1865.94	1762	1867.54	1761
1872.8	1758	1874.73	1757	1876.97	1756
1885.61	1753	1889.71	1752	1907.59	1751
1954.78	1747	1972.58	1751	1977.04	1752
1985	1755	1987.63	1756	1990.27	1757
1998.91	1760	2001.38	1761	2003.43	1762
2009.97	1765	2012.14	1766	2019.37	1767

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1810.81	.025	1861.07	.031	2019.37	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1861.07	2019.37		160	223	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1762.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.031	
W.S. Elev (ft)	1760.90	Reach Len. (ft)	160.00	223.00	189.36
Crit W.S. (ft)		Flow Area (sq ft)		1241.99	
E.G. Slope (ft/ft)	0.002147	Area (sq ft)		1241.99	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	133.43	Top Width (ft)		133.43	
Vel Total (ft/s)	9.62	Avg. Vel. (ft/s)		9.62	
Max Chl Dpth (ft)	13.90	Hydr. Depth (ft)		9.31	
Conv. Total (cfs)	257884.4	Conv. (cfs)		257884.4	
Length Wtd. (ft)	222.82	Wetted Per. (ft)		137.76	
Min Ch El (ft)	1747.00	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)	2019.37	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	13.13	609.50	22.92
C & E Loss (ft)	0.00	Cum SA (acres)	9.68	106.02	8.65

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1166

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		40	
Sta	Elev	Sta	Elev	Sta	Elev
1000	1767	1035.04	1766	1052.54	1765
1108.04	1762	1132.74	1761	1149.82	1760
1187.2	1758	1190.4	1757	1193.84	1756
1204.84	1753	1208.96	1752	1216.35	1751
1252	1747	1256	1747	1261.19	1750
1305	1752	1307.8	1753	1310.66	1754
1318.55	1757	1320.75	1758	1322.77	1759
1327.48	1762	1328.91	1763	1330.34	1764

Manning's n Values		num=		5	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1152.37	.025	1182.14	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1182.14	1322.77		90	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.47	Wt. n-Val.	0.025	0.031	0.025

W.S. Elev (ft)	1760.35	Reach Len. (ft)	90.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	26.67	1216.49	1.69
E.G. Slope (ft/ft)	0.002436	Area (sq ft)	26.67	1216.49	1.69
Q Total (cfs)	11948.00	Flow (cfs)	67.54	11876.87	3.59
Top Width (ft)	179.72	Top Width (ft)	36.72	140.63	2.37
Vel Total (ft/s)	9.60	Avg. Vel. (ft/s)	2.53	9.76	2.13
Max Chl Dpth (ft)	13.35	Hydr. Depth (ft)	0.73	8.65	0.71
Conv. Total (cfs)	242056.4	Conv. (cfs)	1368.3	240615.4	72.6
Length Wtd. (ft)	196.46	Wetted Per. (ft)	36.75	145.12	2.73
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.11	1.28	0.09
Alpha	1.03	Stream Power (lb/ft s)	1344.19	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	13.08	603.20	22.92
C & E Loss (ft)	0.17	Cum SA (acres)	9.61	105.32	8.65

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1165

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 33								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
1000	1761	1036.82	1760	1078.61	1759	1122.5	1758	1174.05	1757.09	
1179.42	1757	1198.32	1756	1205.9	1755	1213.27	1754	1220.08	1753	
1225.52	1752	1232.22	1751	1244.1	1750	1259.54	1749	1273	1747	
1286	1747	1300.22	1749	1314.89	1750	1324.3	1751	1329.45	1752	
1333.74	1753	1336.85	1754	1339.8	1755	1341.51	1756	1343.22	1757	
1344.93	1758	1346.66	1759	1348.95	1760	1351.29	1761	1353.63	1762	
1355.82	1763	1357.98	1764	1360.25	1765					

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1179.42	.025	1198.32	.031	1341.51	.025		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1198.32	1341.51		102	200	212		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.047	0.031	0.025
W.S. Elev (ft)	1760.40	Reach Len. (ft)	102.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	363.16	1413.84	17.18
E.G. Slope (ft/ft)	0.001307	Area (sq ft)	363.16	1413.84	17.18
Q Total (cfs)	11948.00	Flow (cfs)	703.32	11189.83	54.85
Top Width (ft)	327.86	Top Width (ft)	176.29	143.19	8.38
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)	1.94	7.91	3.19
Max Chl Dpth (ft)	13.40	Hydr. Depth (ft)	2.06	9.87	2.05
Conv. Total (cfs)	330544.8	Conv. (cfs)	19457.5	309569.9	1517.4
Length Wtd. (ft)	193.26	Wetted Per. (ft)	176.36	144.81	9.48
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.17	0.80	0.15
Alpha	1.33	Stream Power (lb/ft s)	1360.25	0.00	0.00
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	12.68	597.17	22.87
C & E Loss (ft)	0.00	Cum SA (acres)	9.39	104.67	8.62

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1164

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 34							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
914	1760.2	1000	1759	1103.31	1758	1173.79	1757.01	1174.76	1757
1182.32	1756	1187.14	1755	1191.23	1754	1195.09	1753	1199.36	1752
1203.87	1751	1209	1750	1215.31	1749	1235.3	1748	1246.8	1747
1262.85	1747	1267.13	1748	1272.17	1749	1293.99	1750	1298.93	1751
1302.91	1752	1305.45	1753	1308.05	1754	1310.3	1755	1312.01	1756
1313.74	1757	1315.63	1758	1317.36	1759	1318.88	1760	1320.44	1761
1322.15	1762	1323.97	1763	1327.3	1764	1333.4	1765		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
914	.075	1103.31	.025	1173.79	.031	1313.74	.025	1323.97	.095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1173.79 1313.74 215 200 190 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.034	0.031	0.025
W.S. Elev (ft)	1760.13	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	399.85	1368.25	8.78
E.G. Slope (ft/ft)	0.001371	Area (sq ft)	399.85	1368.25	8.78
Q Total (cfs)	11948.00	Flow (cfs)	950.18	10973.48	24.34
Top Width (ft)	400.27	Top Width (ft)	254.97	139.95	5.35
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	2.38	8.02	2.77
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)	1.57	9.78	1.64
Conv. Total (cfs)	322706.8	Conv. (cfs)	25663.7	296385.7	657.4
Length Wtd. (ft)	200.60	Wetted Per. (ft)	254.99	142.42	6.20
Min Ch El (ft)	1747.00	Shear (lb/sq ft)	0.13	0.82	0.12
Alpha	1.32	Stream Power (lb/ft s)	1333.40	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	11.78	590.78	22.81
C & E Loss (ft)	0.09	Cum SA (acres)	8.89	104.02	8.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1163

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1761	1023.99	1760	1040.59	1759	1072.99	1758.15	1078.49	1758
1082.12	1757	1084.01	1756	1085.89	1755	1088	1754	1091.14	1753
1094.6	1752	1098.65	1751	1102.87	1750	1111.01	1749	1131.34	1748
1134.37	1747	1137.4	1746	1147.99	1746	1151.13	1747	1173.84	1748
1179.31	1749	1182.89	1750	1186.26	1751	1189.12	1752	1191.86	1753
1194.42	1754	1196.23	1755	1198.03	1756	1199.83	1757	1201.58	1758
1203.18	1759	1204.73	1760	1206.29	1761	1207.85	1762	1211.35	1763

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1040.59	.025	1078.49	.031	1201.58	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1078.49 1201.58 155 200 212 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.83	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1758.75	Reach Len. (ft)	155.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	10.54	1097.94	0.45
E.G. Slope (ft/ft)	0.002897	Area (sq ft)	10.54	1097.94	0.45
Q Total (cfs)	11948.00	Flow (cfs)	17.44	11929.89	0.67
Top Width (ft)	152.62	Top Width (ft)	28.33	123.09	1.20
Vel Total (ft/s)	10.77	Avg. Vel. (ft/s)	1.65	10.87	1.49
Max Chl Dpth (ft)	12.75	Hydr. Depth (ft)	0.37	8.92	0.37
Conv. Total (cfs)	221997.9	Conv. (cfs)	324.1	221661.4	12.4
Length Wtd. (ft)	199.97	Wetted Per. (ft)	28.34	127.02	1.41
Min Ch El (ft)	1746.00	Shear (lb/sq ft)	0.07	1.56	0.06
Alpha	1.02	Stream Power (lb/ft s)	1211.35	0.00	0.00
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	10.77	585.12	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.19	103.41	8.58

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1162

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 33								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1760	1054.93	1759	1069.4	1758	1072.46	1757.53	1075.96	1757		
1078.59	1756	1080.96	1755	1083.3	1754	1085.66	1753	1088.02	1752		
1090.38	1751	1094.64	1750	1100.92	1749	1117.73	1748	1122.79	1747		
1125.94	1746	1138.39	1746	1146.24	1747	1172.9	1748	1177.44	1749		
1180.86	1750	1184.07	1751	1187.01	1752	1189.87	1753	1192.45	1754		
1194.92	1755	1197.3	1756	1199.17	1757	1201.05	1758	1202.79	1759		
1204.84	1760	1207.96	1761	1210.76	1762						

Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1069.4	.031	1201.05	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1069.4	1201.05		230	200	180	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1759.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1758.08	Reach Len. (ft)	230.00	200.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)	0.04	1085.50	0.01
E.G. Slope (ft/ft)	0.003283	Area (sq ft)	0.04	1085.50	0.01
Q Total (cfs)	11948.00	Flow (cfs)	0.02	11947.98	0.00
Top Width (ft)	132.90	Top Width (ft)	1.12	131.65	0.13
Vel Total (ft/s)	11.01	Avg. Vel. (ft/s)	0.39	11.01	0.35
Max Chl Dpth (ft)	12.08	Hydr. Depth (ft)	0.04	8.25	0.04
Conv. Total (cfs)	208513.0	Conv. (cfs)	0.3	208512.7	0.0
Length Wtd. (ft)	200.00	Wetted Per. (ft)	1.12	135.31	0.15
Min Ch El (ft)	1746.00	Shear (lb/sq ft)	0.01	1.64	0.01
Alpha	1.00	Stream Power (lb/ft s)	1210.76	0.00	0.00
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	10.75	580.10	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.14	102.83	8.57

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1161

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 37								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1761	1032.93	1760	1076.86	1759	1085.58	1758	1085.71	1757.94		
1087.8	1757	1090.01	1756	1092.18	1755	1093.81	1754	1095.41	1753		
1097.01	1752	1098.61	1751	1100.81	1750	1103.09	1749	1105.43	1748		
1121.44	1747	1125.89	1746	1140.79	1746	1146.25	1747	1168.85	1747		
1181.03	1747	1186.56	1748	1189.23	1749	1191.91	1750	1194.07	1751		
1196.08	1752	1197.98	1753	1199.83	1754	1201.51	1755	1203.13	1756		
1204.72	1757	1206.31	1758	1208.39	1759	1210.58	1760	1212.78	1761		
1220.46	1762	1236.74	1762								

Manning's n Values

Sta		n Val		Sta		n Val		Sta		n Val	
1000	.075	1032.93	.025	1085.58	.031	1206.31	.025	1212.78	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1085.58	1206.31		245	200	192	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1759.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.		0.031	
W.S. Elev (ft)	1756.86	Reach Len. (ft)	245.00	200.00	192.00
Crit W.S. (ft)		Flow Area (sq ft)		975.59	
E.G. Slope (ft/ft)	0.004038	Area (sq ft)		975.59	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	116.38	Top Width (ft)		116.38	
Vel Total (ft/s)	12.25	Avg. Vel. (ft/s)		12.25	
Max Chl Dpth (ft)	10.86	Hydr. Depth (ft)		8.38	
Conv. Total (cfs)	188019.0	Conv. (cfs)		188019.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		121.01	
Min Ch El (ft)	1746.00	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)	1236.74	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	10.75	575.37	22.79
C & E Loss (ft)	0.16	Cum SA (acres)	8.14	102.26	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1160

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 32		
Sta	Elev	Sta	Elev	Sta	Elev
1707.52	1759	1714.96	1758	1719.99	1757
1725.19	1754	1726.92	1753	1728.71	1752
1734.19	1749	1737.22	1748	1741.12	1747
1765.77	1745	1784.95	1745	1819.24	1746
1828	1749	1829.93	1750	1831.58	1751
1836.49	1754	1837.87	1755	1839.25	1756
1843.66	1759	1846.97	1760	1840.63	1757

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1707.52	.025	1719.99	.031	1843.66	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1719.99	1843.66		205	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1758.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.		0.031	
W.S. Elev (ft)	1756.59	Reach Len. (ft)	205.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1115.64	
E.G. Slope (ft/ft)	0.002682	Area (sq ft)		1115.64	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	119.37	Top Width (ft)		119.37	
Vel Total (ft/s)	10.71	Avg. Vel. (ft/s)		10.71	
Max Chl Dpth (ft)	11.59	Hydr. Depth (ft)		9.35	
Conv. Total (cfs)	230692.0	Conv. (cfs)		230692.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		124.51	
Min Ch El (ft)	1745.00	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	1846.97	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	10.75	570.57	22.79
C & E Loss (ft)	0.07	Cum SA (acres)	8.14	101.72	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1159

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 36		
Sta	Elev	Sta	Elev	Sta	Elev
1640	1756.2	1664.66	1756	1671.67	1755
1679.36	1752	1681.21	1751	1683.16	1750
1689.79	1747	1692.16	1746	1695.52	1745
1718.67	1742	1719.12	1742	1726.76	1742
1731.98	1745	1761.26	1746	1768.42	1747
1777.87	1750	1780.08	1751	1782.06	1752
1787.66	1755	1789.31	1756	1791.01	1757
1798.72	1760			1792.78	1758

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1640	.075	1664.66	.025	1671.67	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1671.67	1798.72		206.54	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1757.63	Element	Left OB	Channel	Right OB
----------------	---------	---------	---------	---------	----------

Vel Head (ft)	2.50	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1755.13	Reach Len. (ft)	206.54	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	0.06	1000.43	
E.G. Slope (ft/ft)	0.004203	Area (sq ft)	0.06	1000.43	
Q Total (cfs)	12706.00	Flow (cfs)	0.03	12705.96	
Top Width (ft)	117.09	Top Width (ft)	0.89	116.20	
Vel Total (ft/s)	12.70	Avg. Vel. (ft/s)	0.61	12.70	
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)	0.06	8.61	
Conv. Total (cfs)	195997.0	Conv. (cfs)	0.5	195996.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	0.90	121.07	
Min Ch El (ft)	1742.00	Shear (lb/sq ft)	0.02	2.17	
Alpha	1.00	Stream Power (lb/ft s)	1798.72	0.00	0.00
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	10.75	565.71	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13	101.18	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1158

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 35		
Sta	Elev	Sta	Elev	Sta	Elev
1756.65	1756	1781.68	1755	1788.07	1754
1795.12	1751	1797.15	1750	1799.26	1749
1805.67	1746	1809.75	1745	1816.31	1744
1842.92	1742	1850.1	1742	1853.06	1743
1882.59	1746	1886.35	1747	1890.06	1748
1898.16	1751	1900.33	1752	1902.5	1753
1907.76	1756	1909.43	1757	1911.1	1758

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1756.65	.075	1781.68	.025	1788.07	.031
				1912.77	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1788.07	1912.77		212	200	185	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1756.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.86	Wt. n-Val.		0.031	
W.S. Elev (ft)	1753.81	Reach Len. (ft)	212.00	200.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)		936.38	
E.G. Slope (ft/ft)	0.005140	Area (sq ft)		936.38	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	115.48	Top Width (ft)		115.48	
Vel Total (ft/s)	13.57	Avg. Vel. (ft/s)		13.57	
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)		8.11	
Conv. Total (cfs)	177224.6	Conv. (cfs)		177224.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		119.34	
Min Ch El (ft)	1742.00	Shear (lb/sq ft)		2.52	
Alpha	1.00	Stream Power (lb/ft s)	1919.69	0.00	0.00
Frctn Loss (ft)	0.87	Cum Volume (acre-ft)	10.75	561.27	22.79
C & E Loss (ft)	0.18	Cum SA (acres)	8.13	100.65	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1157

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
1830.87	1756	1835.9	1755	1839.51	1754
1847.46	1751	1849.15	1750	1850.85	1749
1855.82	1746	1857.98	1745	1862.06	1744
1891.71	1741	1894.24	1740	1899.68	1740
1911.72	1742	1916.13	1743	1925.85	1744

1947.15	1747	1950.82	1748	1953.65	1749	1956.09	1750	1958.53	1751
1960.64	1752	1962.3	1753	1963.96	1754	1965.66	1755	1967.36	1756
1969.07	1757	1972.1	1758	1976.83	1759				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1830.87	.075	1830.87	.031	1972.1	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1830.87	1972.1		202.058	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1755.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.27	Wt. n-Val.		0.031	
W.S. Elev (ft)	1753.35	Reach Len. (ft)	202.06	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1051.17	
E.G. Slope (ft/ft)	0.003752	Area (sq ft)		1051.17	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	121.20	Top Width (ft)		121.20	
Vel Total (ft/s)	12.09	Avg. Vel. (ft/s)		12.09	
Max Chl Dpth (ft)	13.35	Hydr. Depth (ft)		8.67	
Conv. Total (cfs)	207430.0	Conv. (cfs)		207430.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		125.84	
Min Ch El (ft)	1740.00	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)	1976.83	0.00	0.00
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	10.75	556.71	22.79
C & E Loss (ft)	0.08	Cum SA (acres)	8.13	100.10	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1156

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	37
Sta	Elev	Sta	Elev	Sta
1743.43	1754	1746.93	1753	1749.39
1755.06	1749	1756.67	1748	1758.34
1766.48	1744	1780.79	1743	1789.22
1801.31	1739	1805.51	1739	1806.68
1812.75	1742	1843.77	1743	1847.97
1855.02	1747	1856.95	1748	1858.76
1864.23	1752	1866.07	1753	1867.9
1873.57	1757	1875.61	1758	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1743.43	.075	1743.43	.031	1875.61	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1743.43	1875.61		215	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1754.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.07	Wt. n-Val.		0.031	
W.S. Elev (ft)	1751.55	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)	1750.76	Flow Area (sq ft)		903.23	
E.G. Slope (ft/ft)	0.005706	Area (sq ft)		903.23	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	112.97	Top Width (ft)		112.97	
Vel Total (ft/s)	14.07	Avg. Vel. (ft/s)		14.07	
Max Chl Dpth (ft)	12.55	Hydr. Depth (ft)		8.00	
Conv. Total (cfs)	168203.9	Conv. (cfs)		168203.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		117.95	
Min Ch El (ft)	1739.00	Shear (lb/sq ft)		2.73	
Alpha	1.00	Stream Power (lb/ft s)	1875.61	0.00	0.00
Frctn Loss (ft)	1.14	Cum Volume (acre-ft)	10.75	552.22	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.13	99.57	8.57

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1155

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
1784.24	1755	1811.54	1754	1816.14	1753
1823.39	1750	1824.92	1749	1826.45	1748
1832.02	1745	1835.49	1744	1838.96	1743
1863.97	1740	1866.84	1739	1869.29	1738
1883.45	1739	1885.96	1740	1888.47	1741
1921.98	1744	1925.47	1745	1928.96	1746
1935.45	1749	1937.31	1750	1939.23	1751
1946.11	1754	1948.61	1755	1951.68	1756

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1784.24	.075	1811.54	.025	1816.14	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1816.14	1951.68		212	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1753.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.03	Wt. n-Val.		0.031	
W.S. Elev (ft)	1750.44	Reach Len. (ft)	212.00	200.00	195.00
Crit W.S. (ft)	1749.70	Flow Area (sq ft)		909.88	
E.G. Slope (ft/ft)	0.005694	Area (sq ft)		909.88	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	115.46	Top Width (ft)		115.46	
Vel Total (ft/s)	13.96	Avg. Vel. (ft/s)		13.96	
Max Chl Dpth (ft)	12.44	Hydr. Depth (ft)		7.88	
Conv. Total (cfs)	168387.5	Conv. (cfs)		168387.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		119.94	
Min Ch El (ft)	1738.00	Shear (lb/sq ft)		2.70	
Alpha	1.00	Stream Power (lb/ft s)	1951.68	0.00	0.00
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	10.75	548.06	22.79
C & E Loss (ft)	0.24	Cum SA (acres)	8.13	99.04	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1154

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 36		
Sta	Elev	Sta	Elev	Sta	Elev
1622.72	1753	1627.45	1752.89	1664.72	1752
1672.55	1749	1674.8	1748	1676.54	1747
1681.6	1744	1683.22	1743	1686.55	1742
1716.17	1739	1720	1738	1723.02	1737
1736.91	1738	1739.94	1739	1743.59	1740
1778.66	1743	1782.75	1744	1785.51	1745
1791.71	1748	1793.71	1749	1795.92	1750
1802.03	1753				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1622.72	.025	1664.72	.031	1802.03	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1664.72	1802.03		150	164	164	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1752.31	Element	Left OB	Channel	Right OB
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Vel Head (ft)	2.21	Wt. n-Val.		0.031	
W.S. Elev (ft)	1750.10	Reach Len. (ft)	150.00	164.00	164.00
Crit W.S. (ft)		Flow Area (sq ft)		1064.46	
E.G. Slope (ft/ft)	0.003794	Area (sq ft)		1064.46	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	126.37	Top Width (ft)		126.37	
Vel Total (ft/s)	11.94	Avg. Vel. (ft/s)		11.94	
Max Chl Dpth (ft)	13.09	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	206291.3	Conv. (cfs)		206291.3	
Length Wtd. (ft)	164.00	Wetted Per. (ft)		130.93	
Min Ch El (ft)	1737.00	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)	1802.03	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	10.75	543.52	22.79
C & E Loss (ft)	0.31	Cum SA (acres)	8.13	98.49	8.57

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1152.9

INPUT

Description: Stewart Bridge US 1152.9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1754.92	1000	1751.19	1000	1748.49	1002.5	1748.37	1014.5	1740.43
1022.5	1739.79	1053.85	1738.45	1055.15	1735.02	1059.83	1733.46	1069.14	1733.46
1085.85	1739.03	1087.15	1740.6	1118.5	1740.99	1126.5	1741.41	1136.5	1747.64
1140	1748.06	1140	1750.63	1140	1754.34				

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1140		102	102	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1751.60	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.			0.031	
W.S. Elev (ft)	1750.43	Reach Len. (ft)		1.00	1.00	1.00
Crit W.S. (ft)	1746.01	Flow Area (sq ft)			1460.75	
E.G. Slope (ft/ft)	0.001624	Area (sq ft)			1460.75	
Q Total (cfs)	12706.00	Flow (cfs)			12706.00	
Top Width (ft)	140.00	Top Width (ft)			140.00	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)			8.70	
Max Chl Dpth (ft)	16.97	Hydr. Depth (ft)			10.43	
Conv. Total (cfs)	315334.2	Conv. (cfs)			315334.2	
Length Wtd. (ft)	1.00	Wetted Per. (ft)			152.84	
Min Ch El (ft)	1733.46	Shear (lb/sq ft)			0.97	
Alpha	1.00	Stream Power (lb/ft s)	1140.00		0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	10.75		538.77	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13		97.98	8.57

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1152.5

INPUT

Description: Stewart Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2		
Sta Hi	Cord Lo Cord	Sta Hi	Cord Lo Cord

1000 1754.92 1751.19 1140 1754.34 1750.63

Upstream Bridge Cross Section Data

Station Elevation Data				num=	18		
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1754.92	1000	1751.19	1000	1748.49	1002.5	1748.37
1022.5	1739.79	1053.85	1738.45	1055.15	1735.02	1059.83	1733.46
1085.85	1739.03	1087.15	1740.6	1118.5	1740.99	1126.5	1741.41
1140	1748.06	1140	1750.63	1140	1754.34		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1140		.3	.5

Downstream Deck/Roadway Coordinates

num=	2								
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1000	1755.05	1751.24	1140	1754.41	1750.64				

Downstream Bridge Cross Section Data

Station Elevation Data				num=	18		
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1755.05	1000	1751.24	1000	1748.74	1002.5	1748.55
1022.5	1741.87	1053.85	1737.93	1055.15	1736.43	1062.56	1733.46
1085.85	1741.15	1087.15	1740.39	1118.5	1741.59	1126.5	1741.87
1140	1748.3	1140	1750.64	1140	1754.41		

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1000	1140		.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station	Upstream=	1022.5	Downstream=	1022.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1054.5	Downstream=	1054.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1086.5	Downstream=	1086.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	

Pier Data

Pier Station	Upstream=	1118.5	Downstream=	1118.5
Upstream	num=	2		
Width	Elev	Width	Elev	
1.3	1730	1.3	1760	
Downstream	num=	2		
Width	Elev	Width	Elev	

1.3 1730 1.3 1760

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1751.60	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1750.43	E.G. Elev (ft)	1751.56	1750.81
Q Total (cfs)	12706.00	W.S. Elev (ft)	1750.24	1748.56
Q Bridge (cfs)	12706.00	Crit W.S. (ft)	1746.24	1747.01
Q Weir (cfs)		Max Chl Dpth (ft)	16.78	15.10
Weir Sta Lft (ft)		Vel Total (ft/s)	9.23	12.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	1376.88	1057.13
Weir Submerg		Froude # Chl	0.51	0.75
Weir Max Depth (ft)		Specif Force (cu ft)	11582.75	9674.06
Min El Weir Flow (ft)	1754.42	Hydr Depth (ft)	10.21	7.98
Min El Prs (ft)	1751.19	W.P. Total (ft)	231.31	204.60
Delta EG (ft)	0.92	Conv. Total (cfs)	216769.9	151443.5
Delta WS (ft)	1.76	Top Width (ft)	134.80	132.46
BR Open Area (sq ft)	1377.49	Frctn Loss (ft)	0.48	0.01
BR Open Vel (ft/s)	12.02	C & E Loss (ft)	0.28	0.11
Coef of Q		Shear Total (lb/sq ft)	1.28	2.27
Br Sel Method	Energy only	Power Total (lb/ft s)	1000.00	1000.00

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy.
The

program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the

program will default to an energy based solution.

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy.

This is not physically possible, the momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1152.1

INPUT

Description: Stewart Bridge DS 1152.1

Station	Elevation	Data	num=	18					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1755.05	1000	1751.24	1000	1748.74	1002.5	1748.55	1014.5	1741
1022.5	1741.87	1053.85	1737.93	1055.15	1736.43	1062.56	1733.46	1064.28	1733.46
1085.85	1741.15	1087.15	1740.39	1118.5	1741.59	1126.5	1741.87	1136.5	1747.78
1140	1748.3	1140	1750.64	1140	1754.41				

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.031	1140	.095

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1000	1140		134	134	134		.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1750.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.031	

W.S. Elev (ft)	1748.67	Reach Len. (ft)	134.00	134.00	134.00
Crit W.S. (ft)		Flow Area (sq ft)		1114.82	
E.G. Slope (ft/ft)	0.003774	Area (sq ft)		1114.82	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	139.08	Top Width (ft)		139.08	
Vel Total (ft/s)	11.40	Avg. Vel. (ft/s)		11.40	
Max Chl Dpth (ft)	15.21	Hydr. Depth (ft)		8.02	
Conv. Total (cfs)	206828.0	Conv. (cfs)		206828.0	
Length Wtd. (ft)	134.00	Wetted Per. (ft)		146.40	
Min Ch El (ft)	1733.46	Shear (lb/sq ft)		1.79	
Alpha	1.00	Stream Power (lb/ft s)	1140.00	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	10.75	535.92	22.79
C & E Loss (ft)	0.01	Cum SA (acres)	8.13	97.67	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1152

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
1682.91	1752	1693.46	1751.6	1709.06	1751	1734.76	1750	1737.81	1749	
1740.12	1748	1742.43	1747	1744.49	1746	1745.95	1745	1747.41	1744	
1749.02	1743	1750.65	1742	1752.27	1741	1753.89	1740	1770.05	1739	
1786.72	1738	1790.72	1733.25	1801.49	1733.25	1808.9	1733.25	1813.78	1738	
1822.71	1739	1844.57	1740	1849.26	1741	1854.06	1742	1855.99	1743	
1857.91	1744	1859.79	1745	1861.66	1746	1863.54	1747	1865.48	1748	
1867.45	1749	1869.38	1750	1871.32	1751	1873.26	1752	1876.66	1753	
1880.75	1754	1886.36	1755							

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1682.91	.075	1709.06	.025	1734.76	.031	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1734.76	1886.36		190	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1750.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.031	
W.S. Elev (ft)	1748.20	Reach Len. (ft)	190.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1122.46	
E.G. Slope (ft/ft)	0.003319	Area (sq ft)		1122.46	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	126.23	Top Width (ft)		126.23	
Vel Total (ft/s)	11.36	Avg. Vel. (ft/s)		11.36	
Max Chl Dpth (ft)	14.95	Hydr. Depth (ft)		8.89	
Conv. Total (cfs)	221387.4	Conv. (cfs)		221387.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		134.48	
Min Ch El (ft)	1733.25	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)	1886.36	0.00	0.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	10.75	532.48	22.79
C & E Loss (ft)	0.11	Cum SA (acres)	8.13	97.26	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1151

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	35						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1701.89	1750	1705.24	1749	1708.58	1748	1710.83	1747	1712.45	1746
1714.08	1745	1715.7	1744	1717.33	1743	1718.95	1742	1721.55	1741
1725.2	1740	1728.57	1739	1737.1	1738	1758.46	1737	1774.13	1733
1775.45	1733	1781.39	1733	1786.17	1737	1792.4	1738	1821.89	1739
1826.81	1740	1830.58	1741	1832.58	1742	1834.59	1743	1836.59	1744
1838.59	1745	1840.67	1746	1842.85	1747	1845.04	1748	1846.96	1749
1848.88	1750	1851	1751	1853.32	1752	1855.75	1753	1859.26	1754

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1701.89	.075	1701.89	.027	1859.26	.095	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1701.89	1859.26		193	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1749.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.96	Reach Len. (ft)	193.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1242.85	
E.G. Slope (ft/ft)	0.001934	Area (sq ft)		1242.85	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	136.30	Top Width (ft)		136.30	
Vel Total (ft/s)	10.26	Avg. Vel. (ft/s)		10.26	
Max Chl Dpth (ft)	14.96	Hydr. Depth (ft)		9.12	
Conv. Total (cfs)	290021.6	Conv. (cfs)		290021.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		142.35	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	1859.26	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	10.75	527.05	22.79
C & E Loss (ft)	0.04	Cum SA (acres)	8.13	96.66	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1150

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	40
Sta	Elev	Sta	Elev	Sta
1658.21	1751	1674.94	1750	1677.19
1684	1746	1685.81	1745	1687.35
1691.97	1741	1693.51	1740	1695.4
1711.63	1736	1722.1	1733	1726.43
1739.61	1736	1743.5	1735	1756.33
1791.06	1738	1795.76	1739	1798.32
1805.77	1743	1807.85	1744	1809.93
1816.52	1748	1818.78	1749	1820.95

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1658.21	.075	1674.94	.027
		1825.71	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1674.94	1825.71		180	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1749.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.69	Reach Len. (ft)	180.00	200.00	198.00
Crit W.S. (ft)		Flow Area (sq ft)		1295.81	
E.G. Slope (ft/ft)	0.001678	Area (sq ft)		1295.81	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	135.66	Top Width (ft)		135.66	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	14.69	Hydr. Depth (ft)		9.55	
Conv. Total (cfs)	311340.3	Conv. (cfs)		311340.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		142.05	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	1825.71	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	10.75	521.22	22.79
C & E Loss (ft)	0.09	Cum SA (acres)	8.13	96.04	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1149

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	37
Sta	Elev	Sta	Elev	Sta
1000	1749	1019.41	1748.16	1023.18
1032.69	1745	1034.45	1744	1036.22
1041.42	1740	1044.03	1739	1046.64

1062.85	1735	1068.71	1734	1080	1733	1090	1733	1099.53	1734
1103.57	1735	1107.21	1736	1140.82	1737	1144.96	1738	1149.1	1739
1152.17	1740	1154.62	1741	1157.07	1742	1159.52	1743	1161.7	1744
1163.68	1745	1165.68	1746	1167.68	1747	1169.68	1748	1172.2	1749
1175.1	1750	1177.96	1751						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1019.41	.027	1169.68	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1019.41	1169.68		115	200	199.956	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.61	Reach Len. (ft)	115.00	200.00	199.96
Crit W.S. (ft)		Flow Area (sq ft)		1440.42	
E.G. Slope (ft/ft)	0.001258	Area (sq ft)		1440.42	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	144.13	Top Width (ft)		144.13	
Vel Total (ft/s)	8.85	Avg. Vel. (ft/s)		8.85	
Max Chl Dpth (ft)	14.61	Hydr. Depth (ft)		9.99	
Conv. Total (cfs)	359530.5	Conv. (cfs)		359530.5	
Length Wtd. (ft)	198.06	Wetted Per. (ft)		149.13	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1177.96	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	10.75	514.94	22.79
C & E Loss (ft)	0.10	Cum SA (acres)	8.13	95.39	8.57

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1148

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation Data	num=	37						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1080.94	1747	1120.61	1746	1166.28	1745.24	1180.47	1745
1184.75	1744	1186.55	1743	1188.25	1742	1189.79	1741	1191.32	1740
1192.86	1739	1195.37	1738	1199.37	1737	1204.66	1736	1221.84	1735
1233.56	1734	1244	1733	1255	1733	1266.59	1734	1269.83	1735
1296.62	1736	1301.8	1737	1305.51	1738	1308.27	1739	1310.93	1740
1313.6	1741	1315.59	1742	1317.52	1743	1319.4	1744	1321.27	1745
1323.14	1746	1324.79	1747	1326.35	1748	1328.1	1749	1329.95	1750
1331.8	1751	1333.64	1752						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1180.47	.027	1321.27	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1180.47	1321.27		150	60	60	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.65	Reach Len. (ft)	150.00	60.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	191.06	1586.11	6.24
E.G. Slope (ft/ft)	0.000798	Area (sq ft)	191.06	1586.11	6.24
Q Total (cfs)	12754.00	Flow (cfs)	583.63	12158.62	11.75
Top Width (ft)	297.33	Top Width (ft)	151.99	140.80	4.53
Vel Total (ft/s)	7.15	Avg. Vel. (ft/s)	3.05	7.67	1.88
Max Chl Dpth (ft)	14.65	Hydr. Depth (ft)	1.26	11.26	1.38
Conv. Total (cfs)	451562.6	Conv. (cfs)	20663.7	430482.9	416.0
Length Wtd. (ft)	63.43	Wetted Per. (ft)	152.02	144.82	5.25
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.06	0.55	0.06
Alpha	1.10	Stream Power (lb/ft s)	1333.64	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	10.50	507.99	22.77
C & E Loss (ft)	0.11	Cum SA (acres)	7.93	94.74	8.56

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1147.5

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 40		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1077.71	1747	1088.53	1746.86
1246.56	1745	1330.69	1744	1336.28	1743
1342.94	1740	1345.3	1739	1348.72	1738
1370.73	1735	1396.15	1734	1401.73	1733
1421.86	1735	1442.41	1735	1445.61	1735
1459.27	1738	1462.26	1739	1465.11	1740
1471.21	1743	1473.06	1744	1474.9	1745
1479.77	1748	1481.27	1749	1482.72	1750

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1330.69	.027	1473.06	.025
				1479.77	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1173.65	1473.06		180	60	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.015	0.025	0.025
W.S. Elev (ft)	1747.86	Reach Len. (ft)	180.00	60.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	170.42	2117.42	12.85
E.G. Slope (ft/ft)	0.000496	Area (sq ft)	170.42	2117.42	12.85
Q Total (cfs)	12754.00	Flow (cfs)	387.41	12342.34	24.26
Top Width (ft)	468.92	Top Width (ft)	163.03	299.41	6.49
Vel Total (ft/s)	5.54	Avg. Vel. (ft/s)	2.27	5.83	1.89
Max Chl Dpth (ft)	14.86	Hydr. Depth (ft)	1.05	7.07	1.98
Conv. Total (cfs)	572410.3	Conv. (cfs)	17387.1	553934.5	1088.8
Length Wtd. (ft)	63.32	Wetted Per. (ft)	163.04	302.94	7.55
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.03	0.22	0.05
Alpha	1.08	Stream Power (lb/ft s)	1489.69	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	9.88	505.44	22.76
C & E Loss (ft)	0.06	Cum SA (acres)	7.39	94.44	8.56

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1147.3

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 41		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1748	1138.82	1747	1162.62	1746.76
1354.33	1745	1451.32	1744	1533.44	1743.09
1546.12	1741	1548.26	1740	1550.4	1739
1563.71	1736	1574.36	1735	1588.3	1734
1629.87	1734	1640.56	1734	1654.69	1734
1664.68	1737	1667.3	1738	1669.91	1739
1676.39	1742	1678.46	1743	1680.53	1744
1685.36	1747	1687.03	1748	1688.69	1749
1751.16	1751			1690.36	1750

Manning's n Values			num= 4		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.016	1541.84	.027	1678.46	.025
				1687.03	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1236.85	1678.46		120	75	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.016	0.024	0.025
W.S. Elev (ft)	1747.98	Reach Len. (ft)	120.00	75.00	70.00
Crit W.S. (ft)		Flow Area (sq ft)	212.71	2756.04	22.16
E.G. Slope (ft/ft)	0.000295	Area (sq ft)	212.71	2756.04	22.16
Q Total (cfs)	12754.00	Flow (cfs)	317.74	12397.56	38.70
Top Width (ft)	684.80	Top Width (ft)	234.65	441.61	8.54
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.49	4.50	1.75
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	0.91	6.24	2.59
Conv. Total (cfs)	742695.3	Conv. (cfs)	18502.7	721939.0	2253.6
Length Wtd. (ft)	76.91	Wetted Per. (ft)	234.66	444.80	9.90

Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.02	0.11	0.04
Alpha	1.09	Stream Power (lb/ft s)	1751.16	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	9.08	502.08	22.74
C & E Loss (ft)	0.04	Cum SA (acres)	6.57	93.93	8.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1147

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	32					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1372.93	1755	1372.93	1745	1427.01	1744	1429.12	1743	1431.23	1742
1433.34	1741	1435.37	1740	1437.74	1739	1440.24	1738	1442.75	1737
1445.45	1736	1461.5	1735	1509.61	1734	1520	1733	1530	1733
1540.56	1734	1545.55	1735	1549	1736	1552.34	1737	1555.68	1738
1558.11	1739	1560.47	1740	1562.82	1741	1565.18	1742	1567.13	1743
1568.92	1744	1570.71	1745	1572.5	1746	1574.29	1747	1576.19	1748
1579.93	1749	1583.67	1750						

Manning's n Values			num=	4			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1372.93	.016	1427.01	.027	1568.92	.025	1576.19	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1427.01	1568.92		220	200	198.468	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.49	Reach Len. (ft)	220.00	200.00	198.47
Crit W.S. (ft)		Flow Area (sq ft)	161.57	1661.36	10.90
E.G. Slope (ft/ft)	0.000625	Area (sq ft)	161.57	1661.36	10.90
Q Total (cfs)	12364.00	Flow (cfs)	755.08	11587.57	21.36
Top Width (ft)	202.29	Top Width (ft)	54.08	141.91	6.30
Vel Total (ft/s)	6.74	Avg. Vel. (ft/s)	4.67	6.97	1.96
Max Chl Dpth (ft)	14.49	Hydr. Depth (ft)	2.99	11.71	1.73
Conv. Total (cfs)	494540.5	Conv. (cfs)	30202.0	463484.4	854.2
Length Wtd. (ft)	200.64	Wetted Per. (ft)	56.58	145.56	7.20
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.11	0.45	0.06
Alpha	1.03	Stream Power (lb/ft s)	1583.67	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	8.57	498.28	22.71
C & E Loss (ft)	0.01	Cum SA (acres)	6.17	93.42	8.53

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1146

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	35					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1233.6	1758	1233.6	1748	1292.28	1748	1399.17	1747	1429.98	1746
1434.28	1745	1438.56	1744	1440.36	1743	1442.12	1742	1443.88	1741
1445.65	1740	1447.36	1739	1449.19	1738	1452.27	1737	1455.36	1736
1458.58	1735	1478.9	1734	1502.47	1733	1539.21	1733	1545.51	1734
1551.98	1735	1558.63	1736	1561.87	1737	1565.11	1738	1568.36	1739
1570.35	1740	1572.22	1741	1574.1	1742	1575.97	1743	1577.85	1744
1579.92	1745	1582.14	1746	1584.37	1747	1586.59	1748	1588.96	1749

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
1233.6	.016	1429.98	.027	1582.14	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1429.98	1582.14		200	200	202	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.016	0.027	0.025
W.S. Elev (ft)	1747.26	Reach Len. (ft)	200.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	27.17	1701.89	1.78
E.G. Slope (ft/ft)	0.000720	Area (sq ft)	27.17	1701.89	1.78
Q Total (cfs)	12364.00	Flow (cfs)	40.44	12321.60	1.96
Top Width (ft)	213.82	Top Width (ft)	58.85	152.16	2.81
Vel Total (ft/s)	7.14	Avg. Vel. (ft/s)	1.49	7.24	1.10
Max Chl Dpth (ft)	14.26	Hydr. Depth (ft)	0.46	11.18	0.63
Conv. Total (cfs)	460640.8	Conv. (cfs)	1506.5	459061.2	73.1
Length Wtd. (ft)	200.00	Wetted Per. (ft)	58.87	156.84	3.08
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.02	0.49	0.03
Alpha	1.02	Stream Power (lb/ft s)	1588.96	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	8.09	490.56	22.68
C & E Loss (ft)	0.00	Cum SA (acres)	5.88	92.75	8.51

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1145

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1429.07	1756	1429.07	1746	1443.49	1745	1445.35	1744	1447.2	1743
1449.06	1742	1451.07	1741	1453.18	1740	1455.54	1739	1457.73	1738
1459.91	1737	1462.08	1736	1467.3	1735	1490.37	1734	1502.59	1733
1555.26	1733	1561.94	1734	1565.29	1735	1568.37	1736	1571.45	1737
1573.95	1738	1576.06	1739	1578.17	1740	1580.28	1741	1582.39	1742
1584.08	1743	1585.75	1744	1587.43	1745	1589.1	1746	1590.77	1747
1592.44	1748								

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
1429.07	.016	1443.49	.027	1592.44	.095

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
1443.49	1592.44	215	200	195	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.12	Reach Len. (ft)	215.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)	23.38	1696.35	
E.G. Slope (ft/ft)	0.000699	Area (sq ft)	23.38	1696.35	
Q Total (cfs)	12364.00	Flow (cfs)	75.28	12288.72	
Top Width (ft)	161.90	Top Width (ft)	14.42	147.48	
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)	3.22	7.24	
Max Chl Dpth (ft)	14.12	Hydr. Depth (ft)	1.62	11.50	
Conv. Total (cfs)	467529.4	Conv. (cfs)	2846.5	464683.0	
Length Wtd. (ft)	200.43	Wetted Per. (ft)	15.58	152.76	
Min Ch El (ft)	1733.00	Shear (lb/sq ft)	0.07	0.48	
Alpha	1.01	Stream Power (lb/ft s)	1592.44	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	7.98	482.76	22.68
C & E Loss (ft)	0.07	Cum SA (acres)	5.72	92.06	8.51

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1144.5

INPUT

Description:

Lateral structure position = Next ot right bank station

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1753	80	1753	80	1748	92	1748	92	1753
172	1752	172	1747	184	1747	184	1752	264	1752
264	1747	276	1747	276	1752	356	1751	356	1746
368	1746	368	1751	448	1748	448	1743	460	1743
460	1748	540	1749	540	1744	552	1744	552	1749

632	1750	632	1745	644	1745	644	1750	724	1750
724	1745	736	1745	736	1750	816	1750	816	1745
828	1745	828	1750	908	1749	908	1744	920	1744
920	1749	1000	1749	1000	1744	1012	1744	1012	1749
1092	1749	1092	1744						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1747.93	Weir Sta US (ft)	172.00
W.S. US. (ft)	1747.12	Weir Sta DS (ft)	1012.00
E.G. DS (ft)	1747.35	Min El Weir Flow (ft)	1743.00
W.S. DS (ft)	1747.06	Wr Top Wdth (ft)	120.00
Q US (cfs)	12364.00	Weir Max Depth (ft)	4.07
Q Leaving Total (cfs)	1059.65	Weir Avg Depth (ft)	2.06
Q DS (cfs)	11304.35	Weir Flow Area (sq ft)	247.63
Perc Q Leaving	8.57	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	1059.65	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1144

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	33						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1489	1756	1489	1746	1550.69	1745	1585.18	1744	1587.85	1743
1590.52	1742	1593.19	1741	1595.25	1740	1596.99	1739	1598.73	1738
1600.47	1737	1602.2	1736	1603.94	1735	1614.21	1734	1632.77	1733
1646.99	1732	1694.67	1732	1702.16	1733	1707.23	1734	1711.52	1735
1715.13	1736	1717.8	1737	1720.46	1738	1723.13	1739	1725.47	1740
1727.66	1741	1729.84	1742	1732.02	1743	1734.21	1744	1736.99	1745
1739.78	1746	1742.56	1747	1750	1754				

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
1489	.016	1585.18	.027	1742.56	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1585.18	1742.56		220	200	212	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.016	0.027	0.095
W.S. Elev (ft)	1747.17	Reach Len. (ft)	220.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)	194.65	1880.26	0.01
E.G. Slope (ft/ft)	0.000489	Area (sq ft)	194.65	1880.26	0.01
Q Total (cfs)	12362.00	Flow (cfs)	634.60	11727.39	0.00
Top Width (ft)	253.74	Top Width (ft)	96.18	157.38	0.18
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)	3.26	6.24	0.05
Max Chl Dpth (ft)	15.17	Hydr. Depth (ft)	2.02	11.95	0.08
Conv. Total (cfs)	558801.4	Conv. (cfs)	28686.1	530115.3	0.0
Length Wtd. (ft)	200.70	Wetted Per. (ft)	97.37	162.16	0.24
Min Ch El (ft)	1732.00	Shear (lb/sq ft)	0.06	0.35	0.00
Alpha	1.06	Stream Power (lb/ft s)	1750.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	7.44	474.55	22.68
C & E Loss (ft)	0.00	Cum SA (acres)	5.44	91.36	8.51

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1143

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1447.98	1756	1447.98	1746	1471.52	1745	1479.91	1744	1484.98	1743		
1486.72	1742	1488.46	1741	1490.2	1740	1491.94	1739	1493.68	1738		
1495.83	1737	1498.28	1736	1500.73	1735	1503.18	1734	1508.07	1733		
1519.16	1732	1548.27	1731	1573.18	1731	1585.89	1732	1595.26	1733		
1604.91	1734	1612.89	1735	1616.02	1736	1617.96	1737	1619.89	1738		
1621.83	1739	1623.73	1740	1626.51	1741	1629.83	1742	1633.25	1743		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1447.98	.016	1484.98	.027	1633.25	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1484.98	1633.25		190	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.08	Reach Len. (ft)	190.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	76.86	1969.49	
E.G. Slope (ft/ft)	0.000425	Area (sq ft)	76.86	1969.49	
Q Total (cfs)	12324.79	Flow (cfs)	234.29	12090.50	
Top Width (ft)	185.27	Top Width (ft)	37.00	148.27	
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)	3.05	6.14	
Max Chl Dpth (ft)	16.08	Hydr. Depth (ft)	2.08	13.28	
Conv. Total (cfs)	597894.9	Conv. (cfs)	11365.9	586529.1	
Length Wtd. (ft)	199.84	Wetted Per. (ft)	38.25	156.46	
Min Ch El (ft)	1731.00	Shear (lb/sq ft)	0.05	0.33	
Alpha	1.02	Stream Power (lb/ft s)	1633.25	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	6.75	465.71	22.68
C & E Loss (ft)	0.02	Cum SA (acres)	5.11	90.66	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1142

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 32								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1504.68	1756	1504.68	1746	1518.68	1746	1526.97	1745	1544.14	1744		
1546.15	1743	1548.18	1742	1550.21	1741	1552.25	1740	1554.23	1739		
1556.16	1738	1558.1	1737	1560.03	1736	1561.86	1735	1564.32	1734		
1569.1	1733	1577.06	1732	1598.1	1731	1663.34	1731	1667.87	1732		
1671.88	1733	1674.43	1734	1676.37	1735	1678.56	1736	1680.74	1737		
1682.92	1738	1684.97	1739	1687	1740	1689.03	1741	1691.05	1742		
1693.05	1743	1699.25	1744								

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1504.68	.075	1526.97	.016	1544.14	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1544.14	1699.25		196	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.020	0.027	
W.S. Elev (ft)	1747.05	Reach Len. (ft)	196.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	71.48	2064.06	
E.G. Slope (ft/ft)	0.000363	Area (sq ft)	71.48	2064.06	
Q Total (cfs)	11901.55	Flow (cfs)	156.44	11745.11	
Top Width (ft)	194.57	Top Width (ft)	39.46	155.11	
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)	2.19	5.69	
Max Chl Dpth (ft)	16.05	Hydr. Depth (ft)	1.81	13.31	
Conv. Total (cfs)	624658.3	Conv. (cfs)	8210.9	616447.4	
Length Wtd. (ft)	199.95	Wetted Per. (ft)	40.60	163.27	
Min Ch El (ft)	1731.00	Shear (lb/sq ft)	0.04	0.29	
Alpha	1.03	Stream Power (lb/ft s)	1699.25	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	6.43	456.45	22.68
C & E Loss (ft)	0.01	Cum SA (acres)	4.94	89.96	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1141

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 33		
Sta	Elev	Sta	Elev	Sta	Elev
1400.23	1755	1400.23	1745	1417.47	1744
1426.39	1741	1427.97	1740	1429.55	1739
1434.02	1736	1435.74	1735	1438.81	1734
1471.9	1731	1485.23	1730	1514.53	1730
1550.61	1733	1553.34	1734	1555.74	1735
1560.67	1738	1562.2	1739	1563.74	1740
1569.67	1743	1571.81	1744	1573.95	1745

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1400.23	.016	1417.47	.027	1573.95	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1417.47	1573.95		195	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.02	Reach Len. (ft)	195.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	43.46	2151.30	
E.G. Slope (ft/ft)	0.000312	Area (sq ft)	43.46	2151.30	
Q Total (cfs)	11719.72	Flow (cfs)	122.48	11597.24	
Top Width (ft)	173.72	Top Width (ft)	17.24	156.48	
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	2.82	5.39	
Max Chl Dpth (ft)	17.02	Hydr. Depth (ft)	2.52	13.75	
Conv. Total (cfs)	663841.3	Conv. (cfs)	6937.5	656903.8	
Length Wtd. (ft)	199.94	Wetted Per. (ft)	19.29	164.61	
Min Ch El (ft)	1730.00	Shear (lb/sq ft)	0.04	0.25	
Alpha	1.01	Stream Power (lb/ft s)	1573.95	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	6.17	446.77	22.68
C & E Loss (ft)	0.02	Cum SA (acres)	4.81	89.25	8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1140

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 34		
Sta	Elev	Sta	Elev	Sta	Elev
1501.96	1755	1501.96	1745	1528.03	1744
1535.21	1741	1537.5	1740	1539.68	1739
1546.13	1736	1548.92	1735	1551.85	1734
1562.81	1731	1568.05	1730	1593.51	1729
1652.22	1731	1658.48	1732	1661.55	1733
1668.83	1736	1670.5	1737	1672.17	1738
1677.37	1741	1679.77	1742	1682.17	1743

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1501.96	.016	1528.03	.027	1684.56	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1528.03	1684.56		114	94	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.016	0.027	
W.S. Elev (ft)	1747.00	Reach Len. (ft)	114.00	94.00	87.00
Crit W.S. (ft)		Flow Area (sq ft)	65.28	2238.26	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)	65.28	2238.26	
Q Total (cfs)	11467.08	Flow (cfs)	171.44	11295.63	

Top Width (ft)	182.60	Top Width (ft)	26.07	156.53
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	2.63	5.05
Max Chl Dpth (ft)	18.00	Hydr. Depth (ft)	2.50	14.30
Conv. Total (cfs)	711339.6	Conv. (cfs)	10635.1	700704.4
Length Wtd. (ft)	94.15	Wetted Per. (ft)	28.09	164.98
Min Ch El (ft)	1729.00	Shear (lb/sq ft)	0.04	0.22
Alpha	1.02	Stream Power (lb/ft s)	1684.56	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	5.93	436.70
C & E Loss (ft)	0.03	Cum SA (acres)	4.72	88.53
				22.68
				8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1139.9

INPUT

Description: Charleston Bridge US 1139.9

Station	Elevation	Data	num=	12	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.57	1000	1738.7	1000	1735.19	1021.35	1727.25	1022	1727.87			
1054.5	1726.75	1087	1726.44	1119.5	1727.81	1120.15	1727.38	1141.5	1736.03			
1141.5	1738.95	1141.5	1740.84									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
1000	1141.5	102	102	102			.3	.5	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.027	
W.S. Elev (ft)	1747.06	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1734.03	Flow Area (sq ft)		2646.33	
E.G. Slope (ft/ft)	0.000153	Area (sq ft)		2646.33	
Q Total (cfs)	11304.35	Flow (cfs)		11304.35	
Top Width (ft)	141.50	Top Width (ft)		141.50	
Vel Total (ft/s)	4.27	Avg. Vel. (ft/s)		4.27	
Max Chl Dpth (ft)	20.62	Hydr. Depth (ft)		18.70	
Conv. Total (cfs)	915368.6	Conv. (cfs)		915368.6	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		167.94	
Min Ch El (ft)	1726.44	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)	1141.50	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	5.84	431.43	22.68
C & E Loss (ft)		Cum SA (acres)	4.68	88.21	8.50

BRIDGE

RIVER: River #1
 REACH: Reach #1 RS: 1139.5

INPUT

Description: Charleston Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
1000	1742.92	1732.45	1141.5	1743.16	1732.7						

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	12	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.57	1000	1738.7	1000	1735.19	1021.35	1727.25	1022	1727.87			
1054.5	1726.75	1087	1726.44	1119.5	1727.81	1120.15	1727.38	1141.5	1736.03			
1141.5	1738.95	1141.5	1740.84									

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.

1000 1141.5 .3 .5

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1742.91 1732.35 1141.5 1743.26 1732.64

Downstream Bridge Cross Section Data

Station Elevation Data num= 11
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
1000 1740.56 1000 1738.6 1000 1735.61 1021.35 1726.55 1022 1726.82
1054.5 1726.34 1087 1726.25 1119.5 1726.66 1141.5 1735.8 1141.5 1738.89
1141.5 1740.91

Manning's n Values

num= 3
Sta n Val Sta n Val Sta n Val
1000 .075 1000 .027 1141.5 .095

Bank Sta: Left Right Coeff Contr. Expan.

1000 1141.5 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station Upstream= 1022 Downstream= 1022
Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745
Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1054.5 Downstream= 1054.5
Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745
Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1087.5 Downstream= 1087.5
Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745
Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Pier Data

Pier Station Upstream= 1119.5 Downstream= 1119.5
Upstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745
Downstream num= 2
Width Elev Width Elev
1.3 1725 1.3 1745

Number of Bridge Coefficient Sets = 2

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1747.35	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1747.06	E.G. Elev (ft)	1747.34	1746.92
Q Total (cfs)	11304.35	W.S. Elev (ft)	1747.06	1745.63
Q Bridge (cfs)	8023.26	Crit W.S. (ft)	1732.59	1732.48
Q Weir (cfs)	3281.09	Max Chl Dpth (ft)	20.62	19.38
Weir Sta Lft (ft)	1000.00	Vel Total (ft/s)	0.00	0.00
Weir Sta Rgt (ft)	1141.50	Flow Area (sq ft)		
Weir Submerg	0.00	Froude # Chl	0.38	0.45
Weir Max Depth (ft)	4.42	Specif Force (cu ft)	14722.99	14749.75
Min El Weir Flow (ft)	1742.93	Hydr Depth (ft)		
Min El Prs (ft)	1732.69	W.P. Total (ft)	436.88	438.76
Delta EG (ft)	4.01	Conv. Total (cfs)		
Delta WS (ft)	4.17	Top Width (ft)	141.50	141.50
BR Open Area (sq ft)	592.18	Frctn Loss (ft)		
BR Open Vel (ft/s)	13.55	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1139.1

INPUT

Description: Charleston Bridge DS 1139.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.56	1000	1738.6	1000	1735.61	1021.35	1726.55	1022	1726.82
1054.5	1726.34	1087	1726.25	1119.5	1726.66	1141.5	1735.8	1141.5	1738.89
1141.5	1740.91								

Sta	n Val	Sta	n Val	Sta	n Val
1000	.075	1000	.027	1141.5	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1141.5		19	25	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1743.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1742.89	Reach Len. (ft)	19.00	25.00	28.00
Crit W.S. (ft)		Flow Area (sq ft)		2123.08	
E.G. Slope (ft/ft)	0.000297	Area (sq ft)		2123.08	
Q Total (cfs)	11304.35	Flow (cfs)		11304.35	

Top Width (ft)	141.50	Top Width (ft)	141.50
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	5.32
Max Chl Dpth (ft)	16.64	Hydr. Depth (ft)	15.00
Conv. Total (cfs)	655971.2	Conv. (cfs)	655971.2
Length Wtd. (ft)	25.00	Wetted Per. (ft)	159.60
Min Ch El (ft)	1726.25	Shear (lb/sq ft)	0.25
Alpha	1.00	Stream Power (lb/ft s)	1141.50 0.00 0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	5.84 428.86 22.68
C & E Loss (ft)	0.09	Cum SA (acres)	4.68 87.88 8.50

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1139

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	35
Sta	Elev	Sta	Elev	Sta
1000	1742	1031.03	1741	1042.1
1052.46	1737	1054.24	1736	1056.03
1062.02	1732	1065.71	1731	1069.51
1108.7	1727	1116	1726	1124
1155.25	1729	1160.88	1730	1163.86
1170.82	1734	1172.48	1735	1174.13
1178.87	1739	1180.87	1740	1184.24

Manning's n Values			num=	4
Sta	n Val	Sta	n Val	Sta
1000	.075	1031.03	.027	1184.24
				1193.58

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1031.03	1184.24		132	175	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1743.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.075	0.027	0.030
W.S. Elev (ft)	1742.50	Reach Len. (ft)	132.00	175.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)	31.17	1724.83	16.66
E.G. Slope (ft/ft)	0.000644	Area (sq ft)	31.17	1724.83	16.66
Q Total (cfs)	11876.35	Flow (cfs)	15.55	11845.50	15.29
Top Width (ft)	222.46	Top Width (ft)	31.03	153.21	38.22
Vel Total (ft/s)	6.70	Avg. Vel. (ft/s)	0.50	6.87	0.92
Max Chl Dpth (ft)	16.50	Hydr. Depth (ft)	1.00	11.26	0.44
Conv. Total (cfs)	467877.4	Conv. (cfs)	612.5	466662.4	602.6
Length Wtd. (ft)	174.65	Wetted Per. (ft)	31.55	158.24	38.27
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.04	0.44	0.02
Alpha	1.05	Stream Power (lb/ft s)	1250.83	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	5.83	427.75	22.67
C & E Loss (ft)	0.09	Cum SA (acres)	4.67	87.79	8.49

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1138

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	38
Sta	Elev	Sta	Elev	Sta
980	1741.5	1000	1741	1063.4
1117.16	1740	1122.62	1739	1126.16
1135.88	1735	1138.98	1734	1142.23
1155.4	1730	1163.52	1729	1170.78

1185	1726	1192.9	1727	1196.6	1728	1200.06	1729	1207.15	1730
1215.71	1731	1221.47	1732	1224.88	1733	1228.29	1734	1231.58	1735
1234.44	1736	1237.37	1737	1240.3	1738	1243.31	1739	1246.6	1740
1249.89	1741	1256.07	1742	1265.45	1743				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980	.075	1082.9	.025	1117.16	.027	1246.6	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1117.16	1246.6		150	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.67	Wt. n-Val.	0.040	0.027	0.025
W.S. Elev (ft)	1741.29	Reach Len. (ft)	150.00	200.00	202.00
Crit W.S. (ft)		Flow Area (sq ft)	120.93	1219.62	2.85
E.G. Slope (ft/ft)	0.001876	Area (sq ft)	120.93	1219.62	2.85
Q Total (cfs)	12936.00	Flow (cfs)	191.96	12739.15	4.89
Top Width (ft)	263.22	Top Width (ft)	128.70	129.44	5.07
Vel Total (ft/s)	9.63	Avg. Vel. (ft/s)	1.59	10.45	1.71
Max Chl Dpth (ft)	15.29	Hydr. Depth (ft)	0.94	9.42	0.56
Conv. Total (cfs)	298692.4	Conv. (cfs)	4432.3	294147.2	112.9
Length Wtd. (ft)	199.24	Wetted Per. (ft)	128.71	132.94	5.25
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.11	1.07	0.06
Alpha	1.16	Stream Power (lb/ft s)	1265.45	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	5.60	421.84	22.63
C & E Loss (ft)	0.00	Cum SA (acres)	4.43	87.22	8.40

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1137

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1741	1077.33	1740	1087.89	1739.76	1120.88	1739	1125.37	1738
1128.81	1737	1131.95	1736	1135.28	1735	1138.63	1734	1141.92	1733
1145.57	1732	1149.67	1731	1154.45	1730	1165.34	1729	1173.32	1728
1178.75	1727	1184	1726	1190	1726	1196.45	1727	1201.73	1728
1208.22	1729	1215.64	1730	1221.82	1731	1226.2	1732	1229.66	1733
1232.78	1734	1235.61	1735	1238.05	1736	1240.41	1737	1242.74	1738
1245.09	1739	1248.33	1740	1252.86	1741	1270.22	1742		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1087.89	.025	1120.88	.03	1245.09	.025	1252.86	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1120.88	1245.09		185	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.	0.032	0.030	0.025
W.S. Elev (ft)	1740.89	Reach Len. (ft)	185.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	91.56	1220.61	6.33
E.G. Slope (ft/ft)	0.002177	Area (sq ft)	91.56	1220.61	6.33
Q Total (cfs)	12936.00	Flow (cfs)	202.29	12718.09	15.61
Top Width (ft)	244.19	Top Width (ft)	112.69	124.21	7.29
Vel Total (ft/s)	9.81	Avg. Vel. (ft/s)	2.21	10.42	2.47
Max Chl Dpth (ft)	14.89	Hydr. Depth (ft)	0.81	9.83	0.87
Conv. Total (cfs)	277255.4	Conv. (cfs)	4335.7	272585.0	334.6
Length Wtd. (ft)	199.68	Wetted Per. (ft)	112.70	127.50	7.54
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.11	1.30	0.11
Alpha	1.11	Stream Power (lb/ft s)	1270.22	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	5.24	416.24	22.61
C & E Loss (ft)	0.10	Cum SA (acres)	4.02	86.64	8.37

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1136

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1742	1080.59	1741	1103.15	1741	1106.83
1162.57	1741	1212.71	1740	1244.32	1739	1293.58
1299.49	1738	1303.82	1737	1307.5	1736	1311.14
1319.07	1733	1323.56	1732	1328.41	1731	1333.89
1347.36	1728	1351.6	1727	1355.85	1726	1372.12
1382.35	1728	1392.13	1729	1397.48	1730	1401.73
1410.24	1733	1414.78	1734	1419.46	1735	1423.75
1432.86	1738	1439.67	1739	1449.33	1740	

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1244.32	.025	1293.58	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1293.58	1449.33		160	200	210	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.031	0.030	
W.S. Elev (ft)	1740.70	Reach Len. (ft)	160.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	134.22	1344.30	
E.G. Slope (ft/ft)	0.002077	Area (sq ft)	134.22	1344.30	
Q Total (cfs)	12936.00	Flow (cfs)	353.59	12582.41	
Top Width (ft)	271.83	Top Width (ft)	116.08	155.75	
Vel Total (ft/s)	8.75	Avg. Vel. (ft/s)	2.63	9.36	
Max Chl Dpth (ft)	14.70	Hydr. Depth (ft)	1.16	8.63	
Conv. Total (cfs)	283821.1	Conv. (cfs)	7757.9	276063.2	
Length Wtd. (ft)	199.24	Wetted Per. (ft)	116.10	159.24	
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.15	1.09	
Alpha	1.12	Stream Power (lb/ft s)	1449.33	0.00	0.00
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	4.76	410.35	22.59
C & E Loss (ft)	0.05	Cum SA (acres)	3.53	86.00	8.35

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1135

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 40			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1742	1016.66	1741	1103.49	1740.65	1163.13
1275.46	1739	1289.63	1738	1300.25	1738	1308.42
1320.27	1738	1323.69	1737	1327.1	1736	1330.38
1337.22	1733	1341.08	1732	1346.63	1731	1353.73
1370.71	1728	1374.69	1727	1379.09	1726	1396.93
1412.81	1728	1418.65	1729	1422.56	1730	1425.7
1432.68	1733	1436.65	1734	1441.33	1735	1445.44
1453.98	1738	1487.57	1738	1506.01	1739	1527.67

Manning's n Values			num= 5		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1264.15	.025	1308.42	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1308.42	1453.98		155	200	210	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1741.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.026	0.030	0.034
W.S. Elev (ft)	1740.43	Reach Len. (ft)	155.00	200.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)	102.30	1334.32	235.58
E.G. Slope (ft/ft)	0.001760	Area (sq ft)	102.30	1334.32	235.58
Q Total (cfs)	12936.00	Flow (cfs)	297.45	11989.63	648.92
Top Width (ft)	441.97	Top Width (ft)	150.39	145.56	146.02
Vel Total (ft/s)	7.74	Avg. Vel. (ft/s)	2.91	8.99	2.75
Max Chl Dpth (ft)	14.43	Hydr. Depth (ft)	0.68	9.17	1.61
Conv. Total (cfs)	308327.9	Conv. (cfs)	7089.6	285771.2	15467.0
Length Wtd. (ft)	198.98	Wetted Per. (ft)	150.53	148.40	146.48
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.07	0.99	0.18

Alpha	1.26	Stream Power (lb/ft s)	1600.00	0.00	0.00
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	4.32	404.20	22.03
C & E Loss (ft)	0.05	Cum SA (acres)	3.04	85.31	8.00

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1134

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	36
Sta	Elev	Sta	Elev	Sta
1000	1740	1012.86	1739	1031.77
1095.68	1738	1099.23	1737	1102.63
1112.99	1733	1117.1	1732	1121.83
1142.46	1728	1150.02	1727	1158.57
1192.85	1728	1197.34	1729	1201.77
1216.28	1733	1220.85	1734	1224.59
1287.87	1738	1293.97	1738	1331.61
1388.41	1741		1738	1361.68

Manning's n	Values	num=	5
Sta	n Val	Sta	n Val
1000	.095	1031.77	.025
		1099.23	.03
		1233.77	.025
		1287.87	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1099.23	1233.77		180	208		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1741.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.	0.028	0.030	0.037
W.S. Elev (ft)	1740.25	Reach Len. (ft)	180.00	208.00	265.00
Crit W.S. (ft)		Flow Area (sq ft)	196.39	1376.37	311.11
E.G. Slope (ft/ft)	0.001325	Area (sq ft)	196.39	1376.37	311.11
Q Total (cfs)	12936.00	Flow (cfs)	604.02	11564.33	767.65
Top Width (ft)	379.14	Top Width (ft)	99.23	134.54	145.37
Vel Total (ft/s)	6.87	Avg. Vel. (ft/s)	3.08	8.40	2.47
Max Chl Dpth (ft)	14.25	Hydr. Depth (ft)	1.98	10.23	2.14
Conv. Total (cfs)	355378.9	Conv. (cfs)	16593.8	317696.3	21088.9
Length Wtd. (ft)	209.04	Wetted Per. (ft)	99.68	136.81	145.45
Min Ch El (ft)	1726.00	Shear (lb/sq ft)	0.16	0.83	0.18
Alpha	1.36	Stream Power (lb/ft s)	1388.41	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.79	397.98	20.71
C & E Loss (ft)	0.08	Cum SA (acres)	2.60	84.66	7.30

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132.9

INPUT

Description: Nellis Bridge US 1132.9

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1000	1739.32	1000	1735.39	1000
1055	1726.09	1087	1724.48	1119
1143	1734.83	1143	1739.21	1131

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.03
		1143	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1143		112	112		.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1740.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.		0.030	
W.S. Elev (ft)	1740.24	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1733.34	Flow Area (sq ft)		1891.32	

E.G. Slope (ft/ft)	0.000708	Area (sq ft)		1891.32
Q Total (cfs)	12936.00	Flow (cfs)		12936.00
Top Width (ft)	143.00	Top Width (ft)		143.00
Vel Total (ft/s)	6.84	Avg. Vel. (ft/s)		6.84
Max Chl Dpth (ft)	15.76	Hydr. Depth (ft)		13.23
Conv. Total (cfs)	486228.5	Conv. (cfs)		486228.5
Length Wtd. (ft)	1.00	Wetted Per. (ft)		159.94
Min Ch El (ft)	1724.48	Shear (lb/sq ft)		0.52
Alpha	1.00	Stream Power (lb/ft s)	1143.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	3.39	390.18
C & E Loss (ft)		Cum SA (acres)	2.39	84.00
				6.86

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1132.5

INPUT

Description: Nellis Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 110
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1739.32 1735.39 1143 1739.21 1734.83

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	12				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
1000	1739.32	1000	1735.39	1000	1733.23	1008	1730.18	1023
1055	1726.09	1087	1724.48	1119	1726.15	1131	1726.41	1143
1143	1734.83	1143	1739.21					

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.03
		1143	.095

Bank	Sta: Left	Right	Coeff	Contr.	Expan.
	1000	1143	.3	.5	

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1741.37 1737.362 1143 1740.74 1737.02

Downstream Bridge Cross Section Data

Station	Elevation	Data	num=	11				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
1000	1741.37	1000	1737.62	1000	1733.45	1023	1731.33	1055
1087	1724	1119	1727.55	1131	1728.2	1143	1733.21	1143
1143	1740.74							

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.03
		1143	.095

Bank	Sta: Left	Right	Coeff	Contr.	Expan.
	1000	1143	.3	.5	

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station	Upstream=	1023	Downstream=	1023
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1720	1.5	1745	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1720	1.5	1745	

Pier Data
Pier Station Upstream= 1055 Downstream= 1055
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Pier Data
Pier Station Upstream= 1087 Downstream= 1087
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Pier Data
Pier Station Upstream= 1119 Downstream= 1119
Upstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745
Downstream num= 2
Width Elev Width Elev
1.5 1720 1.5 1745

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1740.97	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1740.24	E.G. Elev (ft)	1740.97	1740.97
Q Total (cfs)	12936.00	W.S. Elev (ft)	1740.24	1740.24
Q Bridge (cfs)	12106.24	Crit W.S. (ft)	1733.55	1734.86
Q Weir (cfs)	829.76	Max Chl Dpth (ft)	15.72	16.16
Weir Sta Lft (ft)	1000.00	Vel Total (ft/s)	0.00	0.00
Weir Sta Rgt (ft)	1143.00	Flow Area (sq ft)		
Weir Submerg	0.00	Froude # Chl	0.46	0.47
Weir Max Depth (ft)	1.76	Specif Force (cu ft)	14675.49	13873.23
Min El Weir Flow (ft)	1740.75	Hydr Depth (ft)		
Min El Prs (ft)	1735.39	W.P. Total (ft)	493.46	359.63
Delta EG (ft)	1.58	Conv. Total (cfs)		
Delta WS (ft)	2.18	Top Width (ft)	143.00	
BR Open Area (sq ft)	1105.32	Frctn Loss (ft)		
BR Open Vel (ft/s)	10.95	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from

the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132.1

INPUT

Description: Nellis Bridge DS 1132.1

Station Elevation Data		num=		11	
Sta	Elev	Sta	Elev	Sta	Elev
1000	1741.37	1000	1737.62	1000	1733.45
1087	1724	1119	1727.55	1131	1728.2
1143	1740.74			1143	1733.21
				1055	1727.73
				1143	1737.02

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1143	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1143		80	80	90	.3
							.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1739.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.		0.030	
W.S. Elev (ft)	1738.06	Reach Len. (ft)	80.00	80.00	90.00
Crit W.S. (ft)		Flow Area (sq ft)		1396.66	
E.G. Slope (ft/ft)	0.001852	Area (sq ft)		1396.66	
Q Total (cfs)	12936.00	Flow (cfs)		12936.00	
Top Width (ft)	143.00	Top Width (ft)		143.00	
Vel Total (ft/s)	9.26	Avg. Vel. (ft/s)		9.26	
Max Chl Dpth (ft)	14.06	Hydr. Depth (ft)		9.77	
Conv. Total (cfs)	300604.7	Conv. (cfs)		300604.7	
Length Wtd. (ft)	80.00	Wetted Per. (ft)		154.19	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	1143.00	0.00	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	3.39	387.00	19.76
C & E Loss (ft)	0.06	Cum SA (acres)	2.39	83.82	6.86

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1132

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		32	
Sta	Elev	Sta	Elev	Sta	Elev
1000	1739	1024.85	1738	1034.12	1737
1045.22	1734	1048.29	1733	1051.37	1732
1068.34	1729	1074.03	1728	1084.64	1727
1112	1724	1119.5	1726	1129.59	1727
1155.85	1728	1161.66	1729	1166.41	1730
1177.97	1733	1182.3	1734	1188.14	1735
1202.82	1738	1220.2	1739	1192.1	1736
					1196.95
					1737

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.03	1220.2	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1220.2		195	200	212	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1739.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	1737.64	Reach Len. (ft)	195.00	200.00	212.00
Crit W.S. (ft)		Flow Area (sq ft)		1367.88	
E.G. Slope (ft/ft)	0.002574	Area (sq ft)		1367.88	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	172.56	Top Width (ft)		172.56	

Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)	9.88		
Max Chl Dpth (ft)	13.64	Hydr. Depth (ft)	7.93		
Conv. Total (cfs)	266396.0	Conv. (cfs)	266396.0		
Length Wtd. (ft)	200.00	Wetted Per. (ft)	175.45		
Min Ch El (ft)	1724.00	Shear (lb/sq ft)	1.25		
Alpha	1.00	Stream Power (lb/ft s)	1220.20	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	3.39	384.46	19.76
C & E Loss (ft)	0.00	Cum SA (acres)	2.39	83.53	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1131

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 28						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1575.21	1738	1600	1737.2	1628.45	1737	1630.61	1736	1632.96	1735
1635.36	1734	1637.75	1733	1640.98	1732	1644.47	1731	1648.57	1730
1657.72	1729	1684.1	1728	1693.13	1727	1696.22	1726.27	1697.36	1724
1717.89	1724	1724.15	1727	1734.01	1728	1767.88	1729	1772.17	1730
1775.66	1731	1779.01	1732	1782.27	1733	1785.51	1734	1788.93	1735
1792.56	1736	1802.87	1737	1820.64	1738				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1575.21	.095	1575.21	.027	1820.64	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1575.21	1820.64		170	200	235	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1738.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.027	
W.S. Elev (ft)	1737.14	Reach Len. (ft)	170.00	200.00	235.00
Crit W.S. (ft)		Flow Area (sq ft)		1367.37	
E.G. Slope (ft/ft)	0.002496	Area (sq ft)		1367.37	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	195.97	Top Width (ft)		195.97	
Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)		9.88	
Max Chl Dpth (ft)	13.13	Hydr. Depth (ft)		6.98	
Conv. Total (cfs)	270532.1	Conv. (cfs)		270532.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		200.60	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	1820.64	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	3.39	378.18	19.76
C & E Loss (ft)	0.24	Cum SA (acres)	2.39	82.68	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1130

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 29						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1737	1030.52	1736.2	1038.04	1736	1060.99	1735	1068.55	1734
1073.14	1733	1077.59	1732	1081.91	1731	1087.05	1730	1094.34	1729
1118.79	1728	1131.84	1727	1139.02	1726	1144.43	1725	1149	1724
1155	1724	1160.56	1725	1165.65	1726	1188.27	1727	1197.82	1728
1223.49	1729	1235.48	1730	1243.04	1731	1254.86	1732	1264.62	1733
1274.45	1734	1289.43	1735	1312.33	1736	1350.65	1737		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1350.65	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1350.65		200	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1738.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1737.30	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1978.19	
E.G. Slope (ft/ft)	0.001547	Area (sq ft)		1978.19	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	350.65	Top Width (ft)		350.65	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	13.30	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	343618.4	Conv. (cfs)		343618.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		352.78	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1350.65	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	370.50	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.39	81.43	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1129

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 30		
Sta	Elev	Sta	Elev	Sta	Elev
1648.42	1737	1654.77	1736	1658.17	1735
1668.57	1732	1672.34	1731	1677.11	1730
1728.55	1727	1730.83	1726	1733.33	1724
1766.11	1726	1793.68	1727	1799.36	1728
1813.58	1731	1817.28	1732	1820.5	1733
1828.37	1736	1831.13	1737	1855.22	1738

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1648.42	.095	1648.42	.027	1882.32	.095

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1648.42	1882.32		195	200	190		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1737.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.96	Reach Len. (ft)	195.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1330.55	
E.G. Slope (ft/ft)	0.002307	Area (sq ft)		1330.55	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	173.37	Top Width (ft)		173.37	
Vel Total (ft/s)	10.16	Avg. Vel. (ft/s)		10.16	
Max Chl Dpth (ft)	11.96	Hydr. Depth (ft)		7.67	
Conv. Total (cfs)	281371.6	Conv. (cfs)		281371.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		176.65	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	1882.32	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	3.39	362.91	19.76
C & E Loss (ft)	0.14	Cum SA (acres)	2.39	80.22	6.86

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1128

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 27		
Sta	Elev	Sta	Elev	Sta	Elev
1542.83	1737	1567.15	1736	1585.77	1735
1653.56	1733	1658.65	1732	1663.58	1731
1682.91	1728	1696.98	1727	1720.19	1726
1752.76	1724	1773.53	1726	1788.52	1727
1810.11	1730	1814.47	1731	1818.36	1732
1830.76	1735	1850.62	1736		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
1542.83 .095 1542.83 .027 1850.62 .095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1542.83 1850.62 210 200 200 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.83	Reach Len. (ft)	210.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1588.59	
E.G. Slope (ft/ft)	0.002347	Area (sq ft)		1588.59	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	276.99	Top Width (ft)		276.99	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	11.83	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	278945.0	Conv. (cfs)		278945.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		278.74	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	1850.62	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	3.39	356.21	19.76
C & E Loss (ft)	0.19	Cum SA (acres)	2.39	79.19	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1
REACH: Reach #1 RS: 1127.5

INPUT

Description: XS 1127 Right Overbank Breakout
Lateral structure position = Right overbank
Distance from Upstream XS =
Deck/Roadway Width = 10
Weir Coefficient = 2.6
Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 169

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1741	35	1741	35	1736	47	1736	47	1740
82	1740	82	1735	94	1735	94	1740	129	1740
129	1735	141	1735	141	1740	176	1740	176	1735
188	1735	188	1740	223	1740	223	1735	235	1735
235	1740	270	1740	270	1735	282	1735	282	1740
317	1740	317	1735	329	1735	329	1740	364	1740
364	1735	376	1735	376	1739	411	1739	411	1734
423	1734	423	1739	458	1739	458	1734	470	1734
470	1739	505	1739	505	1734	517	1734	517	1739
552	1739	552	1734	564	1734	564	1739	599	1739
599	1734	611	1734	611	1739	646	1739	646	1734
658	1734	658	1739	693	1739	693	1734	705	1734
705	1739	740	1739	740	1734	752	1734	752	1738
787	1738	787	1733	799	1733	799	1738	834	1738
834	1733	846	1733	846	1738	881	1738	881	1733
893	1733	893	1738	928	1738	928	1733	940	1733
940	1738	975	1738	975	1733	987	1733	987	1738
1022	1738	1022	1733	1034	1733	1034	1738	1069	1738
1069	1733	1081	1733	1081	1738	1116	1738	1116	1733
1128	1733	1128	1738	1163	1738	1163	1733	1175	1733
1175	1738	1210	1738	1210	1733	1222	1733	1222	1738
1257	1738	1257	1733	1269	1733	1269	1738	1304	1738
1304	1733	1316	1733	1316	1738	1351	1735	1351	1730
1363	1730	1363	1735	1398	1734	1398	1729	1410	1729
1410	1734	1445	1734	1445	1729	1457	1729	1457	1734
1492	1734	1492	1729	1504	1729	1504	1734	1539	1734
1539	1729	1551	1729	1551	1734	1586	1734	1586	1729
1598	1729	1598	1734	1633	1734	1633	1729	1645	1729
1645	1734	1680	1734	1680	1729	1692	1729	1692	1734
1727	1734	1727	1729	1739	1729	1739	1734	1774	1733
1774	1728	1786	1728	1786	1733	1821	1733	1821	1728
1833	1728	1833	1733	1868	1733	1868	1728	1880	1728
1880	1733	1915	1733	1915	1728	1927	1728	1927	1732
1962	1732	1962	1727	1974	1727	1974	1732		

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1736.95	Weir Sta US (ft)	82.00
W.S. US. (ft)	1735.83	Weir Sta DS (ft)	1974.00
E.G. DS (ft)	1730.35	Min El Weir Flow (ft)	1727.00
W.S. DS (ft)	1729.48	Wr Top Wdth (ft)	468.00
Q US (cfs)	13515.00	Weir Max Depth (ft)	3.29
Q Leaving Total (cfs)	2046.31	Weir Avg Depth (ft)	1.29
Q DS (cfs)	10127.71	Weir Flow Area (sq ft)	605.14
Perc Q Leaving	15.15	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	2046.31	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1127

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1737	1004.91	1736.7	1016.12	1736	1043.62	1735	1063.98	1734
1141.6	1733	1150.24	1733	1172.94	1733	1178.73	1732	1183.87	1731
1188.63	1730	1194.63	1729	1201.27	1728	1209.2	1727	1224.82	1726
1246.99	1725	1256	1724	1266	1724	1277.18	1725	1305.91	1726
1317.62	1727	1325.67	1728	1331.79	1729	1337.21	1730	1342.27	1731
1347.76	1732	1360.4	1733	1457.54	1733.71	1496.66	1734	1570.17	1735
1620	1735								

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1620	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1620		240	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.87	Reach Len. (ft)	240.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		2374.88	
E.G. Slope (ft/ft)	0.001698	Area (sq ft)		2374.88	
Q Total (cfs)	13440.42	Flow (cfs)		13440.42	
Top Width (ft)	600.37	Top Width (ft)		600.37	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	
Max Chl Dpth (ft)	11.87	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	326138.7	Conv. (cfs)		326138.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		602.48	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)	1620.00	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	347.11	19.76
C & E Loss (ft)	0.00	Cum SA (acres)	2.39	77.17	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1126

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	25					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1513.37	1736	1529.85	1735	1598.68	1734	1634.82	1733	1657.78	1732.56
1687.51	1732	1694.52	1731	1700.62	1730	1706.3	1729	1712.26	1728
1719.46	1727	1728.13	1726	1739.49	1724	1776.29	1724	1786.58	1724

1827.48	1726	1835.99	1727	1842.02	1728	1847.46	1729	1852.72	1730
1858.42	1731	1867.35	1732	1883.99	1733	1999	1734	2069	1735

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1513.37	.095	1513.37	.027	2069	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1513.37	2069		260	200	180	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.		0.027	
W.S. Elev (ft)	1735.47	Reach Len. (ft)	260.00	200.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)		2254.19	
E.G. Slope (ft/ft)	0.001766	Area (sq ft)		2254.19	
Q Total (cfs)	13372.80	Flow (cfs)		13372.80	
Top Width (ft)	546.91	Top Width (ft)		546.91	
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)		5.93	
Max Chl Dpth (ft)	11.47	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	318253.6	Conv. (cfs)		318253.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		548.61	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)	2069.00	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	3.39	336.48	19.76
C & E Loss (ft)	0.02	Cum SA (acres)	2.39	74.54	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1125

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	26
Sta	Elev	Sta	Elev	Sta
1000	1735	1008.75	1734	1095.34
1157.85	1730	1165.12	1729	1172.44
1207.66	1725	1233.1	1724	1249.67
1300.87	1727	1306.19	1728	1310.79
1322.47	1732	1325.89	1733	1329.28
1508.05	1734		1734	1416.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1508.05	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1508.05		220	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1734.83	Reach Len. (ft)	220.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1921.50	
E.G. Slope (ft/ft)	0.002659	Area (sq ft)		1921.50	
Q Total (cfs)	13222.81	Flow (cfs)		13222.81	
Top Width (ft)	506.60	Top Width (ft)		506.60	
Vel Total (ft/s)	6.88	Avg. Vel. (ft/s)		6.88	
Max Chl Dpth (ft)	10.83	Hydr. Depth (ft)		3.79	
Conv. Total (cfs)	256431.2	Conv. (cfs)		256431.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		508.85	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)	1508.05	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	3.39	326.90	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.39	72.12	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1124.5

INPUT

Description:

Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates		num =		133					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1740	35	1740	35	1735	47	1735	47	1740
82	1739	82	1734	94	1734	94	1739	129	1739
129	1734	141	1734	141	1739	176	1738	176	1733
188	1733	188	1738	223	1738	223	1733	235	1733
235	1738	270	1738	270	1733	282	1733	282	1738
317	1738	317	1733	329	1733	329	1738	341	1736
533	1736	552	1738	552	1733	564	1733	564	1738
599	1738	599	1733	611	1733	611	1738	646	1737
646	1732	658	1732	658	1737	693	1737	693	1732
705	1732	705	1737	740	1736	740	1731	752	1731
752	1736	787	1736	787	1731	799	1731	799	1736
834	1736	834	1731	846	1731	846	1736	881	1735
881	1730	893	1730	893	1735	928	1735	928	1730
940	1730	940	1735	975	1735	975	1730	987	1730
987	1735	1022	1735	1022	1730	1034	1730	1034	1735
1069	1735	1069	1730	1081	1730	1081	1735	1116	1734
1116	1729	1128	1729	1128	1734	1163	1734	1163	1729
1175	1729	1175	1734	1210	1734	1210	1729	1222	1729
1222	1734	1257	1734	1257	1730	1269	1730	1269	1734
1304	1734	1304	1729	1316	1729	1316	1734	1351	1733
1351	1728	1363	1728	1363	1733	1398	1733	1398	1728
1410	1728	1410	1733	1445	1733	1445	1728	1457	1728
1457	1733	1492	1733	1492	1728	1504	1728	1504	1733
1539	1733	1539	1728	1551	1728	1551	1733	1586	1733
1586	1728	1598	1728	1598	1733	1633	1733	1633	1728
1645	1728	1645	1733	1680	1733	1680	1728	1692	1728
1692	1733	1727	1733	1739	1733				

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1735.57	Weir Sta US (ft)	82.00
W.S. US. (ft)	1734.83	Weir Sta DS (ft)	1692.00
E.G. DS (ft)	1729.43	Min El Weir Flow (ft)	1728.00
W.S. DS (ft)	1728.65	Wr Top Wdth (ft)	372.00
Q US (cfs)	13222.81	Weir Max Depth (ft)	2.38
Q Leaving Total (cfs)	1696.41	Weir Avg Depth (ft)	1.40
Q DS (cfs)	9756.40	Weir Flow Area (sq ft)	518.99
Perc Q Leaving	12.82	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	1696.41	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1124

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		21					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1287.75	1733	1428.82	1732	1452.97	1731	1459.76	1730	1465.55	1729
1471.61	1728	1478.81	1727	1487.53	1726	1501.71	1725	1522.04	1724
1547.99	1724	1574.42	1725	1588.37	1726	1597.24	1727	1604.22	1728
1609.73	1729	1614.97	1730	1621.24	1731	1631.22	1732	1751.14	1733
1775.15	1734								

Manning's n Values

Sta		num=		3			
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1287.75	.095	1287.75	.027	1775.15	.095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1287.75	1775.15		180	200 200.421	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.027	
W.S. Elev (ft)	1734.42	Reach Len. (ft)	180.00	200.00	200.42
Crit W.S. (ft)		Flow Area (sq ft)		2021.53	
E.G. Slope (ft/ft)	0.002089	Area (sq ft)		2021.53	
Q Total (cfs)	13074.79	Flow (cfs)		13074.79	
Top Width (ft)	487.40	Top Width (ft)		487.40	
Vel Total (ft/s)	6.47	Avg. Vel. (ft/s)		6.47	
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)		4.15	
Conv. Total (cfs)	286090.0	Conv. (cfs)		286090.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		490.22	
Min Ch El (ft)	1724.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1775.15	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	3.39	317.84	19.76
C & E Loss (ft)	0.02	Cum SA (acres)	2.39	69.84	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1123

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num=	25
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1736 1031.36 1735 1036.67 1734 1044.22 1733 1051.62 1732		
1058.44 1731 1063.36 1730 1068.65 1729 1074.76 1728 1082.46 1727		
1094.34 1726 1115.61 1725 1126.42 1724 1131.96 1723 1150.24 1723		
1162.29 1724 1185.97 1725 1199.74 1726 1209.43 1727 1216.72 1728		
1223.28 1729 1231.29 1730 1245.05 1731 1345.5 1732 1363.37 1733		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .095 1000 .027 1363.37 .095		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1363.37		202	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.		0.027	
W.S. Elev (ft)	1733.74	Reach Len. (ft)	202.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1688.86	
E.G. Slope (ft/ft)	0.002124	Area (sq ft)		1688.86	
Q Total (cfs)	12808.24	Flow (cfs)		12808.24	
Top Width (ft)	324.70	Top Width (ft)		324.70	
Vel Total (ft/s)	7.58	Avg. Vel. (ft/s)		7.58	
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)		5.20	
Conv. Total (cfs)	277940.8	Conv. (cfs)		277940.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		326.59	
Min Ch El (ft)	1723.00	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	1363.37	0.00	0.00
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	3.39	309.33	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	67.98	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1122

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num=	29
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1733 1003.81 1733 1031.26 1733 1146.88 1732.15 1167.6 1732		
1185.86 1731 1206.3 1730 1214.51 1729 1220.87 1728 1227.29 1727		
1235.57 1726 1247.76 1725 1278.14 1724 1284.01 1723 1287.5 1722		

1299.27	1722	1302.97	1723	1309.2	1724	1339.95	1725	1352.93	1726
1361.62	1727	1368.16	1728	1374.7	1729	1381.4	1730	1388.9	1731
1401.75	1732	1471.42	1732	1501.6	1732	1506.92	1733		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1506.92	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1506.92		220	200	170	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1733.22	Reach Len. (ft)	220.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)		1718.02	
E.G. Slope (ft/ft)	0.003592	Area (sq ft)		1718.02	
Q Total (cfs)	12754.82	Flow (cfs)		12754.82	
Top Width (ft)	506.92	Top Width (ft)		506.92	
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)		7.42	
Max Chl Dpth (ft)	11.22	Hydr. Depth (ft)		3.39	
Conv. Total (cfs)	212827.0	Conv. (cfs)		212827.0	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		508.72	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1506.92	0.00	0.00
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	3.39	301.50	19.76
C & E Loss (ft)	0.06	Cum SA (acres)	2.39	66.07	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1121

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	27
Sta	Elev	Sta	Elev	Sta
1132.09	1731	1182.84	1730	1246.86
1282.51	1726	1293.08	1725	1318.92
1350	1722	1355.69	1723	1360.71
1414.66	1727	1420.42	1728	1427.55
1475.35	1732	1515.94	1732	1534.26
1581.08	1733	1598.51	1733	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1132.09	.095	1132.09	.027	1598.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1132.09	1598.51		225	200	200	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.027	
W.S. Elev (ft)	1732.84	Reach Len. (ft)	225.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1937.29	
E.G. Slope (ft/ft)	0.001970	Area (sq ft)		1937.29	
Q Total (cfs)	12510.40	Flow (cfs)		12510.40	
Top Width (ft)	447.83	Top Width (ft)		447.83	
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46	
Max Chl Dpth (ft)	10.84	Hydr. Depth (ft)		4.33	
Conv. Total (cfs)	281833.3	Conv. (cfs)		281833.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		450.76	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)	1598.51	0.00	0.00
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	3.39	293.11	19.76
C & E Loss (ft)	0.10	Cum SA (acres)	2.39	63.87	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1120

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 36		
Sta	Elev	Sta	Elev	Sta	Elev
1300.11	1731	1307.97	1731	1401.81	1731
1425.25	1728	1431.32	1727	1437.3	1726
1476.18	1723	1484.14	1722	1499.66	1722
1543.39	1725	1554.56	1726	1564.64	1727
1585.66	1730	1592.1	1731	1597.52	1732
1618.5	1734	1638.39	1733	1638.43	1733
1687.69	1734	1693.07	1733	1716.67	1732
1789.33	1730				1731

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1300.11	.095	1300.11	.027	1789.33	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1300.11	1789.33		220	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.10	Reach Len. (ft)	220.00	200.00	190.00
Crit W.S. (ft)	1730.56	Flow Area (sq ft)		1131.21	
E.G. Slope (ft/ft)	0.007375	Area (sq ft)		1131.21	
Q Total (cfs)	11555.53	Flow (cfs)		11555.53	
Top Width (ft)	353.51	Top Width (ft)		353.51	
Vel Total (ft/s)	10.22	Avg. Vel. (ft/s)		10.22	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		3.20	
Conv. Total (cfs)	134555.6	Conv. (cfs)		134555.6	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		356.00	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	1789.33	0.00	0.00
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	3.39	286.07	19.76
C & E Loss (ft)	0.26	Cum SA (acres)	2.39	62.04	6.86

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1119

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 24		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1730	1014.4	1730	1063.09	1730
1160.87	1727	1168.58	1726	1178	1725
1231.68	1722	1252.45	1722	1260.08	1723
1307.05	1726	1314.88	1727	1319.83	1728
1388.61	1729	1422.14	1729	1451.6	1729

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1490.63	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1490.63		210	200	190	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.027	

W.S. Elev (ft)	1730.73	Reach Len. (ft)	210.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1566.23	
E.G. Slope (ft/ft)	0.003448	Area (sq ft)		1566.23	
Q Total (cfs)	10925.12	Flow (cfs)		10925.12	
Top Width (ft)	490.63	Top Width (ft)		490.63	
Vel Total (ft/s)	6.98	Avg. Vel. (ft/s)		6.98	
Max Chl Dpth (ft)	8.73	Hydr. Depth (ft)		3.19	
Conv. Total (cfs)	186062.2	Conv. (cfs)		186062.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		493.86	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	1490.63	0.00	0.00
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	3.39	279.88	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	60.10	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1118

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	27					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1729	1069.32	1729	1117.15	1729	1186.63	1729	1240.15	1729
1248.02	1728	1254.85	1727	1261.74	1726	1268.62	1725	1276.56	1724
1289.38	1723	1321.86	1722	1342.9	1722	1368.4	1723	1388.37	1724
1399.29	1725	1406.83	1726	1415.18	1727	1439.28	1728	1462.98	1729
1471.82	1730	1485.58	1731	1508.45	1731	1521.35	1730	1532.13	1729
1545.1	1728	1565.17	1728						

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1565.17	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1565.17		210	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.82	Reach Len. (ft)	210.00	200.00	190.00
Crit W.S. (ft)	1729.41	Flow Area (sq ft)		1381.98	
E.G. Slope (ft/ft)	0.004818	Area (sq ft)		1381.98	
Q Total (cfs)	10186.10	Flow (cfs)		10186.10	
Top Width (ft)	512.18	Top Width (ft)		512.18	
Vel Total (ft/s)	7.37	Avg. Vel. (ft/s)		7.37	
Max Chl Dpth (ft)	7.82	Hydr. Depth (ft)		2.70	
Conv. Total (cfs)	146752.1	Conv. (cfs)		146752.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		515.61	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)	1565.17	0.00	0.00
Frctn Loss (ft)	1.02	Cum Volume (acre-ft)	3.39	273.11	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	57.80	6.86

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1117

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	26					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728	1031.6	1728	1154.08	1727	1163.55	1726	1171.05	1725
1178.29	1724	1188.12	1723	1215.02	1722	1252.54	1722	1288.85	1723
1304.51	1724	1316.12	1725	1326.55	1726	1338.53	1727	1345.47	1728
1349.48	1729	1354.6	1730	1360.85	1731	1377.25	1731	1385.12	1730
1402.61	1729	1453.82	1728	1486	1727	1524.75	1727	1525.2	1727.01

1566.82 1728

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
1000 .095 1000 .027 1566.82 .095

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1000 1566.82 185 199 215 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.72	Reach Len. (ft)	185.00	199.00	215.00
Crit W.S. (ft)		Flow Area (sq ft)		1313.87	
E.G. Slope (ft/ft)	0.005412	Area (sq ft)		1313.87	
Q Total (cfs)	10127.71	Flow (cfs)		10127.71	
Top Width (ft)	498.05	Top Width (ft)		498.05	
Vel Total (ft/s)	7.71	Avg. Vel. (ft/s)		7.71	
Max Chl Dpth (ft)	6.72	Hydr. Depth (ft)		2.64	
Conv. Total (cfs)	137669.2	Conv. (cfs)		137669.2	
Length Wtd. (ft)	199.00	Wetted Per. (ft)		500.12	
Min Ch El (ft)	1722.00	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	1566.82	0.00	0.00
Frothn Loss (ft)	0.57	Cum Volume (acre-ft)	3.39	266.92	19.76
C & E Loss (ft)	0.14	Cum SA (acres)	2.39	55.48	6.86

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1

REACH: Reach #1 RS: 1116.5

INPUT

Description:

Lateral structure position = Right overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733	60	1733	60	1728	75	1728	75	1731
135	1731	135	1726	150	1726	150	1731	210	1731
210	1726	225	1726	225	1731	285	1731	285	1726
300	1726	300	1731	360	1731	360	1726	375	1726
375	1731	435	1731	435	1726	450	1726	450	1731
510	1730	510	1725	525	1725	525	1730	585	1730
585	1725	600	1725	600	1730	660	1730	660	1725
675	1725	675	1730	735	1730	735	1725	750	1725
750	1730	810	1730	810	1725	825	1725	825	1730
885	1730	885	1725	900	1725	900	1730	960	1730
960	1725	975	1725	975	1729	1035	1729	1035	1724
1050	1724	1050	1729	1110	1729	1110	1724	1125	1724
1125	1728	1185	1728	1185	1723	1200	1723	1200	1728
1260	1728	1260	1723	1275	1723	1275	1728	1335	1728
1335	1723	1350	1723	1350	1728	1410	1727	1410	1722
1425	1722	1425	1727	1485	1727	1485	1722	1500	1722
1500	1727	1560	1727	1560	1722	1575	1722	1575	1727
1635	1727	1635	1722	1650	1722	1650	1727		

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1729.64	Weir Sta US (ft)	60.00
W.S. US. (ft)	1728.72	Weir Sta DS (ft)	1650.00
E.G. DS (ft)	1723.60	Min El Weir Flow (ft)	1722.00
W.S. DS (ft)	1722.27	Wr Top Wdth (ft)	298.94
Q US (cfs)	10127.71	Weir Max Depth (ft)	2.56
Q Leaving Total (cfs)	1203.07	Weir Avg Depth (ft)	1.20
Q DS (cfs)	7973.39	Weir Flow Area (sq ft)	358.83
Perc Q Leaving	11.85	Weir Coef (ft ^{1/2})	2.600

Q Weir (cfs)	1203.07	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

LATERAL STRUCTURE

RIVER: River #1
 REACH: Reach #1 RS: 1116.4

INPUT

Description:
 Lateral structure position = Left overbank
 Distance from Upstream XS =
 Deck/Roadway Width = 10
 Weir Coefficient = 2.6
 Weir Flow Reference = Water Surface

Weir Embankment Coordinates		num = 173									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733	35	1733	35	1728	47	1728	47	1733		
82	1733	82	1728	94	1728	94	1733	129	1732		
129	1727	141	1727	141	1732	176	1732	176	1727		
188	1727	188	1732	223	1732	223	1727	235	1727		
235	1732	270	1732	270	1727	282	1727	282	1732		
317	1732	317	1727	329	1727	329	1732	364	1732		
364	1727	376	1727	376	1732	411	1732	411	1727		
423	1727	423	1732	458	1732	458	1727	470	1727		
470	1732	505	1732	505	1727	517	1727	517	1732		
552	1732	552	1727	564	1727	564	1732	599	1732		
599	1727	611	1727	611	1732	646	1732	646	1727		
658	1727	658	1732	693	1732	693	1727	705	1727		
705	1732	740	1732	740	1727	752	1727	752	1732		
787	1731	787	1726	799	1726	799	1731	834	1731		
834	1726	846	1726	846	1731	881	1731	881	1726		
893	1726	893	1731	928	1730	928	1725	940	1725		
940	1730	975	1730	975	1725	987	1725	987	1730		
1022	1730	1022	1725	1034	1725	1034	1730	1069	1730		
1069	1725	1081	1725	1081	1730	1116	1730	1116	1725		
1128	1725	1128	1730	1163	1729	1163	1724	1175	1724		
1175	1729	1210	1729	1210	1724	1222	1724	1222	1729		
1257	1729	1257	1724	1269	1724	1269	1729	1304	1729		
1304	1724	1316	1724	1316	1729	1351	1729	1351	1723		
1363	1723	1363	1728	1398	1728	1398	1723	1410	1723		
1410	1728	1445	1728	1445	1723	1457	1723	1457	1728		
1492	1728	1492	1723	1504	1723	1504	1728	1539	1728		
1539	1722	1551	1722	1551	1727	1586	1727	1586	1722		
1598	1722	1598	1727	1633	1727	1633	1722	1645	1722		
1645	1727	1680	1727	1680	1722	1692	1722	1692	1727		
1727	1727	1727	1722	1739	1722	1739	1727	1774	1727		
1774	1722	1786	1722	1786	1727	1821	1727	1821	1722		
1833	1722	1833	1727	1868	1727	1868	1722	1880	1722		
1880	1727	1915	1727	1915	1722	1927	1722	1927	1727		
1962	1727	1962	1722	1974	1722	1974	1727	2009	1727		
2009	1722	2021	1722	2021	1727						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1729.64	Weir Sta US (ft)	35.00
W.S. US. (ft)	1728.72	Weir Sta DS (ft)	2021.00
E.G. DS (ft)	1723.59	Min El Weir Flow (ft)	1722.00
W.S. DS (ft)	1722.23	Wr Top Wdth (ft)	348.00
Q US (cfs)	10127.71	Weir Max Depth (ft)	1.74
Q Leaving Total (cfs)	942.54	Weir Avg Depth (ft)	0.96
Q DS (cfs)	7973.39	Weir Flow Area (sq ft)	332.79
Perc Q Leaving	9.33	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	942.54	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	

Breach Flow Area (sq ft)

Gate Weir Coef

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1116

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	16					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1727	1072.87	1726	1123.42	1726	1152.3	1726	1166.87	1725
1175.87	1724	1184.94	1723	1211.52	1722	1243.63	1721	1246.18	1721
1281.93	1722	1302.43	1723	1313.23	1724	1324.71	1725	1398.55	1726
1498.92	1726								

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1498.92	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	1000	1498.92		185	200	198	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.47	Reach Len. (ft)	185.00	200.00	198.00
Crit W.S. (ft)		Flow Area (sq ft)		1803.02	
E.G. Slope (ft/ft)	0.001763	Area (sq ft)		1803.02	
Q Total (cfs)	9756.40	Flow (cfs)		9756.40	
Top Width (ft)	498.92	Top Width (ft)		498.92	
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)		5.41	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)		3.61	
Conv. Total (cfs)	232353.7	Conv. (cfs)		232353.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		503.18	
Min Ch El (ft)	1721.00	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)	1498.92	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	259.80	19.76
C & E Loss (ft)	0.01	Cum SA (acres)	2.39	53.20	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1115

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	18					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
976	1727	1000	1726	1098.55	1726	1122.73	1726	1182.24	1725
1192.64	1724	1201.74	1723	1217.61	1722	1260.6	1721	1282.53	1721
1323.69	1722	1336.35	1723	1345.58	1724	1359.53	1725	1418.37	1726
1467.4	1727	1500.28	1727	1508.77	1727				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
976	.095	976	.027	1508.77	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	976	1508.77		250	200	190	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.027	
W.S. Elev (ft)	1728.16	Reach Len. (ft)	250.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)		1799.70	
E.G. Slope (ft/ft)	0.001718	Area (sq ft)		1799.70	
Q Total (cfs)	9212.09	Flow (cfs)		9212.09	
Top Width (ft)	532.77	Top Width (ft)		532.77	
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)		3.38	
Conv. Total (cfs)	222247.1	Conv. (cfs)		222247.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		535.41	

Min Ch El (ft)	1721.00	Shear (lb/sq ft)	0.36
Alpha	1.00	Stream Power (lb/ft s)	1508.77
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.13	Cum SA (acres)	2.39

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1114

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	17
Sta	Elev	Sta	Elev
1000	1729	1007.29	1729
1059.95	1726	1069.28	1725
1135.34	1723	1145.72	1722
1286.31	1723	1306.74	1725

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
1000	.095	1000	.027
		1306.74	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1306.74		240	200	190	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.08	Reach Len. (ft)	240.00	200.00	190.00
Crit W.S. (ft)	1726.08	Flow Area (sq ft)		842.42	
E.G. Slope (ft/ft)	0.007251	Area (sq ft)		842.42	
Q Total (cfs)	8907.23	Flow (cfs)		8907.23	
Top Width (ft)	247.16	Top Width (ft)		247.16	
Vel Total (ft/s)	10.57	Avg. Vel. (ft/s)		10.57	
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)		3.41	
Conv. Total (cfs)	104600.7	Conv. (cfs)		104600.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		248.58	
Min Ch El (ft)	1721.00	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)	1306.74	0.00	0.00
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	3.39	245.46	19.76
C & E Loss (ft)	0.24	Cum SA (acres)	2.39	49.04	6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1113

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=	19
Sta	Elev	Sta	Elev
984	1726	1000	1725
1122.98	1721	1144.93	1720

1203.91	1719	1236.06	1720	1263.34	1721	1272.16	1722	1283.95	1723
1310.94	1724	1350.34	1724	1383.92	1724	1401.06	1725		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
984	.095	1000	.027	1401.06	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1401.06		215	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.94	Wt. n-Val.	0.095	0.027	
W.S. Elev (ft)	1725.10	Reach Len. (ft)	215.00	200.00	185.00
Crit W.S. (ft)		Flow Area (sq ft)	0.07	1141.24	
E.G. Slope (ft/ft)	0.004958	Area (sq ft)	0.07	1141.24	
Q Total (cfs)	8874.03	Flow (cfs)	0.01	8874.02	
Top Width (ft)	402.60	Top Width (ft)	1.54	401.06	
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	0.15	7.78	
Max Chl Dpth (ft)	6.10	Hydr. Depth (ft)	0.05	2.85	
Conv. Total (cfs)	126027.9	Conv. (cfs)	0.2	126027.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	1.54	401.50	
Min Ch El (ft)	1719.00	Shear (lb/sq ft)	0.01	0.88	
Alpha	1.00	Stream Power (lb/ft s)	1401.06	0.00	0.00
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	3.39	240.91	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.39	47.55	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1112

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	16
Sta	Elev	Sta	Elev	Sta
1000	1725	1013.34	1724	1087.53
1134.84	1720	1174.61	1719	1203.21
1263.45	1720	1271.38	1721	1365.1
1469.27	1725		1722	1402.49
			1723	1424.84
			1724	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1469.27	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1469.27		245	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.027	
W.S. Elev (ft)	1724.52	Reach Len. (ft)	245.00	200.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1366.21	
E.G. Slope (ft/ft)	0.003094	Area (sq ft)		1366.21	
Q Total (cfs)	8873.91	Flow (cfs)		8873.91	
Top Width (ft)	441.64	Top Width (ft)		441.64	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	6.52	Hydr. Depth (ft)		3.09	
Conv. Total (cfs)	159545.5	Conv. (cfs)		159545.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		441.99	
Min Ch El (ft)	1718.00	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1469.27	0.00	0.00
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	3.39	235.15	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	45.62	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1111

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	17
---------	-----------	------	------	----

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1723	1020.19	1723	1076.48	1723	1114.23	1722	1158.97	1721
1168.08	1720	1175.12	1719	1218.53	1718	1239.55	1717	1256.22	1717
1274.39	1718	1296.9	1719	1310.4	1720	1321.94	1721	1428.63	1722
1458.32	1723	1484.51	1724						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1484.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1484.51		195	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.		0.027	
W.S. Elev (ft)	1724.00	Reach Len. (ft)	195.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1470.01	
E.G. Slope (ft/ft)	0.002739	Area (sq ft)		1470.01	
Q Total (cfs)	8856.65	Flow (cfs)		8856.65	
Top Width (ft)	484.51	Top Width (ft)		484.51	
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)		6.02	
Max Chl Dpth (ft)	7.00	Hydr. Depth (ft)		3.03	
Conv. Total (cfs)	169232.3	Conv. (cfs)		169232.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		485.87	
Min Ch El (ft)	1717.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	1484.51	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	228.64	19.76
C & E Loss (ft)	0.05	Cum SA (acres)	2.38	43.49	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1110

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data	num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev	
1000 1722 1029.41 1721 1167.55 1720 1180.42 1719 1191.08 1718	
1237.79 1717 1249.21 1716 1261.33 1716 1272.15 1717 1293.4 1718	
1314 1719 1326.1 1720 1372.59 1721 1412.67 1722 1428.52 1723	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1428.52	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1428.52		215	200	195	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.76	Reach Len. (ft)	215.00	200.00	195.00
Crit W.S. (ft)		Flow Area (sq ft)		1728.99	
E.G. Slope (ft/ft)	0.001311	Area (sq ft)		1728.99	
Q Total (cfs)	8691.68	Flow (cfs)		8691.68	
Top Width (ft)	428.52	Top Width (ft)		428.52	
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		5.03	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)		4.03	
Conv. Total (cfs)	240090.5	Conv. (cfs)		240090.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		431.38	
Min Ch El (ft)	1716.00	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	1428.52	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	3.39	221.30	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	41.39	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1109

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 16	
Sta	Elev	Sta	Elev
900	1722	1000	1721
1163.98	1717	1207.07	1716
1267.58	1719	1275.6	1720
1391.15	1722		

Manning's n Values

num= 3	
Sta	n Val
900	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
900	1391.15		320	224	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

	1723.88	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1723.88	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.58	Reach Len. (ft)	320.00	224.00	150.00
Crit W.S. (ft)		Flow Area (sq ft)		1867.23	
E.G. Slope (ft/ft)	0.001088	Area (sq ft)		1867.23	
Q Total (cfs)	8217.15	Flow (cfs)		8217.15	
Top Width (ft)	491.15	Top Width (ft)		491.15	
Vel Total (ft/s)	4.40	Avg. Vel. (ft/s)		4.40	
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)		3.80	
Conv. Total (cfs)	249113.6	Conv. (cfs)		249113.6	
Length Wtd. (ft)	224.00	Wetted Per. (ft)		494.70	
Min Ch El (ft)	1716.00	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)	1391.15	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	3.39	213.04	19.76
C & E Loss (ft)	0.12	Cum SA (acres)	2.38	39.28	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1107.9

INPUT

Description: Sahara Bridge US 1107.9

Station Elevation Data		num= 9	
Sta	Elev	Sta	Elev
898.794	1727.05	898.794	1717.99
980.584	1714.23	1017.435	1721.59

Manning's n Values

num= 3	
Sta	n Val
898.794	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
898.794	1017.435		112	112	112	.3	.5

Skew Angle = 26

CROSS SECTION OUTPUT Profile #PF 1

	1723.56	Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1723.56	Element			
Vel Head (ft)	1.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1722.09	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1720.36	Flow Area (sq ft)		820.86	
E.G. Slope (ft/ft)	0.000805	Area (sq ft)		820.86	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	118.64	Top Width (ft)		118.64	
Vel Total (ft/s)	9.71	Avg. Vel. (ft/s)		9.71	
Max Chl Dpth (ft)	8.48	Hydr. Depth (ft)		6.92	
Conv. Total (cfs)	281025.7	Conv. (cfs)		281025.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		127.77	
Min Ch El (ft)	1713.61	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)	1017.44	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	3.39	206.13	19.76
C & E Loss (ft)	0.11	Cum SA (acres)	2.38	37.72	6.86

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1107.5

INPUT

Description: Sahara Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 110
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew = 26
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
898.794 1727.05 1725.35 1017.435 1723.29 1721.59

Upstream Bridge Cross Section Data

Station Elevation Data num= 9
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
898.794 1727.05 898.794 1725.35 898.794 1717.99 935.645 1714.15 958.114 1713.61
980.584 1714.23 1017.435 1717.42 1017.435 1721.59 1017.435 1723.29

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
898.794 .095 898.794 .015 1017.435 .095

Bank Sta: Left Right Coeff Contr. Expan.
898.794 1017.435 .3 .5
Skew Angle = 26

Downstream Deck/Roadway Coordinates

num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
898.794 1727.85 1726.13 1017.435 1724.55 1722.81

Downstream Bridge Cross Section Data

Station Elevation Data num= 9
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
898.794 1727.85 898.794 1726.13 898.794 1717.42 935.645 1713.71 958.114 1713.19
980.584 1713.79 1017.435 1717.38 1017.435 1722.81 1017.435 1724.55

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
898.794 .095 898.794 .015 1017.435 .095

Bank Sta: Left Right Coeff Contr. Expan.
898.794 1017.435 .3 .5
Skew Angle = 26

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station Upstream= 935.645 Downstream= 935.645
Upstream num= 2
Width Elev Width Elev
2 1710 2 1730
Downstream num= 2
Width Elev Width Elev
2 1710 2 1730

Pier Data

Pier Station Upstream= 980.584 Downstream= 980.584
Upstream num= 2
Width Elev Width Elev
2 1710 2 1730
Downstream num= 2
Width Elev Width Elev
2 1710 2 1730

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy

Momentum Cd = 1.2
 Yarnell KVal = .9
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method
 Energy Only

Additional Bridge Parameters
 Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1723.56	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1722.09	E.G. Elev (ft)	1723.45	1723.21
Q Total (cfs)	7973.39	W.S. Elev (ft)	1721.63	1721.57
Q Bridge (cfs)	7973.39	Crit W.S. (ft)	1720.53	1720.15
Q Weir (cfs)		Max Chl Dpth (ft)	8.02	8.38
Weir Sta Lft (ft)		Vel Total (ft/s)	10.83	10.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	736.46	774.15
Weir Submerg		Froude # Chl	0.67	0.70
Weir Max Depth (ft)		Specif Force (cu ft)	5142.65	5265.50
Min El Weir Flow (ft)	1724.56	Hydr Depth (ft)	6.50	6.75
Min El Prs (ft)	1725.35	W.P. Total (ft)	153.67	154.45
Delta EG (ft)	0.42	Conv. Total (cfs)	207372.9	224605.0
Delta WS (ft)	0.45	Top Width (ft)	113.38	114.64
BR Open Area (sq ft)	947.43	Frctn Loss (ft)	0.15	0.00
BR Open Vel (ft/s)	10.83	C & E Loss (ft)	0.09	0.08
Coef of Q		Shear Total (lb/sq ft)	0.44	0.39
Br Sel Method	Energy only	Power Total (lb/ft s)	898.79	898.79

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow.
 The momentum
 answer has been disregarded.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1107.1

INPUT

Description: Sahara Bridge DS 1107.1

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
898.794	1727.85	898.794	1726.13	898.794	1717.42	935.645	1713.71
980.584	1713.79	1017.435	1717.38	1017.435	1722.81	1017.435	1724.55

Sta	n Val	Sta	n Val	Sta	n Val
898.794	.095	898.794	.015	1017.435	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	898.794	1017.435		64	84	64	.3 .5

Skew Angle = 26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.		0.015	
W.S. Elev (ft)	1721.65	Reach Len. (ft)	64.00	84.00	64.00
Crit W.S. (ft)		Flow Area (sq ft)		814.69	
E.G. Slope (ft/ft)	0.000823	Area (sq ft)		814.69	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	118.64	Top Width (ft)		118.64	
Vel Total (ft/s)	9.79	Avg. Vel. (ft/s)		9.79	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		6.87	
Conv. Total (cfs)	277891.7	Conv. (cfs)		277891.7	
Length Wtd. (ft)	84.00	Wetted Per. (ft)		127.50	
Min Ch El (ft)	1713.19	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	1017.44	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	3.39	204.19	19.76
C & E Loss (ft)	0.51	Cum SA (acres)	2.38	37.42	6.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1107

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 28						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728	1003.56	1727	1005.39	1726	1007.22	1725	1009.05	1724
1010.88	1723	1012.7	1722	1014.53	1721	1017.26	1720	1021.63	1719
1055.9	1718.66	1122.1	1718	1128.38	1717	1141.48	1716	1159.3	1715
1180.44	1715	1190	1713	1200	1713	1209.12	1715	1222.51	1715
1227.66	1716	1234.69	1717	1245.9	1718	1258.48	1719	1319.56	1720
1342.03	1721	1369.53	1722	1425.51	1722				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.095	1000	.027	1425.51	.095

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1425.51		200	180	200.57	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.027	
W.S. Elev (ft)	1722.05	Reach Len. (ft)	200.00	180.00	200.57
Crit W.S. (ft)		Flow Area (sq ft)		1453.66	
E.G. Slope (ft/ft)	0.001864	Area (sq ft)		1453.66	
Q Total (cfs)	7973.39	Flow (cfs)		7973.39	
Top Width (ft)	412.91	Top Width (ft)		412.91	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	9.05	Hydr. Depth (ft)		3.52	
Conv. Total (cfs)	184696.8	Conv. (cfs)		184696.8	
Length Wtd. (ft)	180.00	Wetted Per. (ft)		414.39	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)	1425.51	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	3.39	202.00	19.76
C & E Loss (ft)	0.09	Cum SA (acres)	2.38	36.91	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1106

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 19						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1141.71	1720	1195.06	1720	1249.14	1720	1256.2	1719	1310.22	1718
1324.32	1717	1337.53	1716	1381.12	1715	1393.86	1714	1401	1713
1409	1713	1416.17	1714	1424.25	1715	1459.54	1716	1483.82	1717
1523.32	1718	1554.55	1719	1567.13	1720	1578.97	1721		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1141.71	.055	1141.71	.026	1578.97	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1141.71	1578.97		210	200	192	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.		0.026	
W.S. Elev (ft)	1720.39	Reach Len. (ft)	210.00	200.00	192.00
Crit W.S. (ft)	1720.39	Flow Area (sq ft)		1189.06	
E.G. Slope (ft/ft)	0.007046	Area (sq ft)		1189.06	
Q Total (cfs)	11220.64	Flow (cfs)		11220.64	

Top Width (ft)	430.06	Top Width (ft)	430.06
Vel Total (ft/s)	9.44	Avg. Vel. (ft/s)	9.44
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)	2.76
Conv. Total (cfs)	133676.8	Conv. (cfs)	133676.8
Length Wtd. (ft)	200.00	Wetted Per. (ft)	430.98
Min Ch El (ft)	1713.00	Shear (lb/sq ft)	1.21
Alpha	1.00	Stream Power (lb/ft s)	1578.97
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.22	Cum SA (acres)	2.38
			35.17
			6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

LATERAL STRUCTURE

RIVER: River #1

REACH: Reach #1 RS: 1105.5

INPUT

Description:

Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates				num =	67				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723	35	1723	35	1718	50	1718	50	1723
85	1723	85	1718	100	1718	100	1723	135	1723
135	1718	150	1718	150	1723	185	1723	185	1718
200	1718	200	1723	235	1723	235	1718	250	1718
250	1723	285	1723	285	1718	300	1718	300	1723
335	1723	335	1718	350	1718	350	1723	385	1723
385	1718	400	1718	400	1723	435	1722	435	1717
450	1717	450	1722	485	1722	485	1717	500	1717
500	1722	535	1722	535	1717	550	1717	550	1722
585	1722	585	1717	600	1717	600	1722	635	1722
635	1717	650	1717	650	1722	685	1722	685	1717
700	1717	700	1722	735	1722	735	1717	750	1717
750	1722	785	1722	785	1717	800	1717	800	1722
830	1722	830	1716						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1721.78	Weir Sta US (ft)	35.00
W.S. US. (ft)	1720.39	Weir Sta DS (ft)	800.00
E.G. DS (ft)	1719.51	Min El Weir Flow (ft)	1716.00
W.S. DS (ft)	1718.89	Wr Top Wdth (ft)	240.00
Q US (cfs)	11220.64	Weir Max Depth (ft)	2.73
Q Leaving Total (cfs)	2115.32	Weir Avg Depth (ft)	2.25
Q DS (cfs)	9109.22	Weir Flow Area (sq ft)	539.45
Perc Q Leaving	18.82	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	2115.32	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1105

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 17		
Sta	Elev	Sta	Elev	Sta	Elev
1031.99	1718	1047.9	1717	1067.9	1717
1234.51	1715	1285.73	1714	1294.88	1713
1319.73	1715	1369.03	1716	1427.92	1717
1475.93	1720	1518.48	1721		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1031.99	.055	1031.99	.026	1518.48	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1031.99	1518.48		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

	E.G. Elev (ft)	1720.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65		Wt. n-Val.		0.026	
W.S. Elev (ft)	1720.08		Reach Len. (ft)	200.00	200.00	205.00
Crit W.S. (ft)			Flow Area (sq ft)		1658.72	
E.G. Slope (ft/ft)	0.002238		Area (sq ft)		1658.72	
Q Total (cfs)	10707.31		Flow (cfs)		10707.31	
Top Width (ft)	447.20		Top Width (ft)		447.20	
Vel Total (ft/s)	6.46		Avg. Vel. (ft/s)		6.46	
Max Chl Dpth (ft)	7.08		Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	226310.8		Conv. (cfs)		226310.8	
Length Wtd. (ft)	200.00		Wetted Per. (ft)		449.68	
Min Ch El (ft)	1713.00		Shear (lb/sq ft)		0.52	
Alpha	1.00		Stream Power (lb/ft s)	1518.48	0.00	0.00
Frctn Loss (ft)	0.42		Cum Volume (acre-ft)	3.39	190.00	19.76
C & E Loss (ft)	0.04		Cum SA (acres)	2.38	33.15	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1104

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 18		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1718	1041.06	1717	1204.48	1716
1240.62	1714	1268.29	1714	1280.65	1713
1350.23	1715	1363.67	1716	1419.2	1717
1502.48	1719	1525.9	1719	1550.04	1720

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1550.04	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1550.04		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

	E.G. Elev (ft)	1720.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50		Wt. n-Val.		0.026	
W.S. Elev (ft)	1719.76		Reach Len. (ft)	200.00	200.00	120.00
Crit W.S. (ft)			Flow Area (sq ft)		1817.24	
E.G. Slope (ft/ft)	0.001980		Area (sq ft)		1817.24	
Q Total (cfs)	10297.21		Flow (cfs)		10297.21	
Top Width (ft)	544.22		Top Width (ft)		544.22	
Vel Total (ft/s)	5.67		Avg. Vel. (ft/s)		5.67	
Max Chl Dpth (ft)	6.76		Hydr. Depth (ft)		3.34	
Conv. Total (cfs)	231428.0		Conv. (cfs)		231428.0	
Length Wtd. (ft)	200.00		Wetted Per. (ft)		546.31	
Min Ch El (ft)	1713.00		Shear (lb/sq ft)		0.41	
Alpha	1.00		Stream Power (lb/ft s)	1550.04	0.00	0.00

Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	3.39	182.02	19.76
C & E Loss (ft)	0.05	Cum SA (acres)	2.38	30.88	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1103

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	17					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1717	1043.79	1717	1130.4	1716	1166.5	1715	1184.17	1714
1229.63	1713	1249.92	1713	1254.56	1714	1313.66	1715	1327.82	1716
1344.95	1717	1402.28	1717	1407.72	1717	1500.7	1717	1591.29	1718
1615.61	1719	1615.61	1720						

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1615.61	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1615.61		220	200	279.323	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.026	
W.S. Elev (ft)	1719.55	Reach Len. (ft)	220.00	200.00	279.32
Crit W.S. (ft)		Flow Area (sq ft)		2060.83	
E.G. Slope (ft/ft)	0.001344	Area (sq ft)		2060.83	
Q Total (cfs)	9627.67	Flow (cfs)		9627.67	
Top Width (ft)	615.61	Top Width (ft)		615.61	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)		3.35	
Conv. Total (cfs)	262610.9	Conv. (cfs)		262610.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		618.97	
Min Ch El (ft)	1713.00	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)	1615.61	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	3.39	173.12	19.76
C & E Loss (ft)	0.03	Cum SA (acres)	2.38	28.22	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1102

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num=	16					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1716	1014.79	1716	1027.11	1715	1038.23	1714	1103.1	1713
1112.79	1712	1125.52	1712	1132.61	1713	1197.17	1714	1208.6	1715
1216.38	1716	1224.81	1717	1301.89	1717	1378.02	1717	1392.82	1718
1407.93	1719								

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1407.93	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1407.93		20	26	31	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.026	
W.S. Elev (ft)	1718.89	Reach Len. (ft)	20.00	26.00	31.00
Crit W.S. (ft)		Flow Area (sq ft)		1439.16	
E.G. Slope (ft/ft)	0.002297	Area (sq ft)		1439.16	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	406.28	Top Width (ft)		406.28	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33	

Max Chl Dpth (ft)	6.89	Hydr. Depth (ft)	3.54
Conv. Total (cfs)	190083.5	Conv. (cfs)	190083.5
Length Wtd. (ft)	26.00	Wetted Per. (ft)	409.63
Min Ch El (ft)	1712.00	Shear (lb/sq ft)	0.50
Alpha	1.00	Stream Power (lb/ft s)	1407.93
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	3.39
C & E Loss (ft)	0.07	Cum SA (acres)	2.38
			25.87
			6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1101.6

INPUT

Description: Pedestrian Bridge US

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1034	1717.87	1041.28	1716	1044.75
1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86
1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1034	1230		11.2	11.2	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.		0.026	
W.S. Elev (ft)	1718.08	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1717.01	Flow Area (sq ft)		995.60	
E.G. Slope (ft/ft)	0.002976	Area (sq ft)		995.60	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	196.00	Top Width (ft)		196.00	
Vel Total (ft/s)	9.15	Avg. Vel. (ft/s)		9.15	
Max Chl Dpth (ft)	6.08	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	166986.3	Conv. (cfs)		166986.3	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		198.03	
Min Ch El (ft)	1712.00	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	1230.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	3.39	164.36	19.76
C & E Loss (ft)		Cum SA (acres)	2.38	25.69	6.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1101.5

INPUT

Description: Pedestrian Bridge

Distance from Upstream XS = .1
Deck/Roadway Width = 11
Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	13
Sta Hi Cord Lo Cord	Sta Hi Cord Lo Cord
1028 1721.38 1716	1034 1721.87 1717.87
1075 1724.52 1720.52	1096 1725.58 1721.58
1135 1726 1722	1155 1725.89 1721.89
1195 1724.78 1720.78	1215 1723.6 1719.6
1246 1721.27 1717	1230 1721.81 1717.81

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	12
Sta	Elev	Sta	Elev	Sta
1034	1717.87	1041.28	1716	1044.75
1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86
1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81	

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1034	1230		.3	.5

Downstream Deck/Roadway Coordinates

num= 13								
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1028	1721.38	1716	1034	1721.87	1717.87	1055	1723.33	1719.33
1075	1724.52	1720.52	1096	1725.58	1721.58	1115	1725.85	1721.85
1135	1726	1722	1155	1725.89	1721.89	1179	1725.52	1721.52
1195	1724.78	1720.78	1215	1723.6	1719.6	1230	1721.81	1717.81
1246	1721.27	1717						

Downstream Bridge Cross Section Data

Station Elevation Data		num= 12							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1034	1717.87	1041.28	1716	1044.75	1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86	1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
1034	.055	1034	.026
1230	.05		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1034	1230		.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station	Upstream=	1098	Downstream=	1098
Upstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	

Pier Data

Pier Station	Upstream=	1178	Downstream=	1178
Upstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	1710	3	1750	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1719.38	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1718.08	E.G. Elev (ft)	1719.29	1719.23
Q Total (cfs)	9109.22	W.S. Elev (ft)	1717.59	1717.14
Q Bridge (cfs)	9109.22	Crit W.S. (ft)	1717.14	1717.14

Q Weir (cfs)		Max Chl Dpth (ft)	5.59	5.14
Weir Sta Lft (ft)		Vel Total (ft/s)	10.48	11.60
Weir Sta Rgt (ft)		Flow Area (sq ft)	869.29	785.24
Weir Submerg		Froude # Chl	0.86	1.00
Weir Max Depth (ft)		Specif Force (cu ft)	5092.48	5039.13
Min El Weir Flow (ft)	1721.82	Hydr Depth (ft)	4.61	4.21
Min El Prs (ft)	1722.00	W.P. Total (ft)	210.52	206.28
Delta EG (ft)	0.29	Conv. Total (cfs)	127869.4	109407.1
Delta WS (ft)	1.01	Top Width (ft)	188.68	186.47
BR Open Area (sq ft)	1462.61	Frctn Loss (ft)		
BR Open Vel (ft/s)	11.60	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.31	1.65
Br Sel Method	Momentum	Power Total (lb/ft s)	1034.00	1034.00

Warning: The flow regime calculated by the momentum equation shows class B flow. For the best solution, this profile should be
run as a mixed flow problem.

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program
defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1101.4

INPUT

Description: Pedestrian Bridge DS

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1034	1717.87	1041.28	1716	1044.75	1715	1050.54	1714	1058.28	1713
1121.59	1712	1142.72	1712	1201.86	1713	1219.45	1714	1225.06	1715
1228.13	1716	1230	1717.81						

Sta	n Val	Sta	n Val	Sta	n Val
1034	.055	1034	.026	1230	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1034	1230		115	163	190	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.026	
W.S. Elev (ft)	1717.07	Reach Len. (ft)	115.00	163.00	190.00
Crit W.S. (ft)	1717.01	Flow Area (sq ft)		799.08	
E.G. Slope (ft/ft)	0.005995	Area (sq ft)		799.08	
Q Total (cfs)	9109.22	Flow (cfs)		9109.22	
Top Width (ft)	192.11	Top Width (ft)		192.11	
Vel Total (ft/s)	11.40	Avg. Vel. (ft/s)		11.40	
Max Chl Dpth (ft)	5.07	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	117647.2	Conv. (cfs)		117647.2	
Length Wtd. (ft)	163.00	Wetted Per. (ft)		193.26	
Min Ch El (ft)	1712.00	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)	1230.00	0.00	0.00
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)	3.39	164.15	19.76
C & E Loss (ft)	0.07	Cum SA (acres)	2.38	25.64	6.86

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

LATERAL STRUCTURE

RIVER: River #1
REACH: Reach #1 RS: 1101.3

INPUT

Description:

Lateral structure position = Left overbank

Distance from Upstream XS =

Deck/Roadway Width = 10

Weir Coefficient = 2.6

Weir Flow Reference = Water Surface

Weir Embankment Coordinates num = 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722	0	1717	15	1717	15	1722	50	1722
50	1717	65	1717	65	1722	100	1722	100	1717
115	1717	115	1722	150	1721	150	1716	165	1716
165	1721	200	1721	200	1716	215	1716	215	1721
250	1721	250	1716	265	1716	265	1720	300	1720
300	1715	315	1715	315	1720	350	1720	350	1715
365	1715	365	1720	400	1720	400	1715	415	1715
415	1720	450	1720	450	1715	465	1715	465	1720
500	1719	500	1714	515	1714	515	1719	550	1719
550	1714	565	1714	565	1719	600	1719	600	1714
615	1714	615	1719	650	1718	650	1713	665	1713
665	1718	700	1718	700	1713	715	1713	715	1718
750	1718	750	1713	765	1713	765	1718	800	1718
800	1713	815	1713	815	1718	850	1718	850	1713
865	1713	865	1718	900	1717	900	1712	915	1712
915	1717	950	1717	950	1712	965	1712	965	1717
1000	1717	1000	1712	1015	1712	1015	1717	1050	1717
1050	1712	1065	1712	1065	1717	1100	1717	1100	1712
1115	1712	1115	1717	1150	1717	1150	1712	1165	1712
1165	1717	1200	1717	1200	1711	1215	1711	1215	1717
1250	1715	1250	1710	1265	1710	1265	1715	1300	1715
1300	1710	1315	1710	1315	1715	1350	1715	1350	1710
1365	1710	1365	1715	1400	1714	1400	1709	1415	1709
1415	1714	1450	1714	1450	1709	1465	1709	1465	1714
1500	1714	1500	1709	1515	1709	1515	1714	1550	1714
1550	1709	1565	1709	1565	1714	1600	1713	1600	1708
1615	1708	1615	1713	1650	1713	1650	1708	1665	1708
1665	1713	1700	1713	1700	1708	1715	1708	1715	1713
1750	1713	1750	1708						

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	1719.09	Weir Sta US (ft)	0.00
W.S. US. (ft)	1717.07	Weir Sta DS (ft)	1715.00
E.G. DS (ft)	1711.31	Min El Weir Flow (ft)	1708.00
W.S. DS (ft)	1707.47	Wr Top Wdth (ft)	358.38
Q US (cfs)	9109.22	Weir Max Depth (ft)	2.00
Q Leaving Total (cfs)	968.76	Weir Avg Depth (ft)	0.92
Q DS (cfs)	12940.24	Weir Flow Area (sq ft)	329.74
Perc Q Leaving	10.76	Weir Coef (ft ^{1/2})	2.600
Q Weir (cfs)	968.76	Weir Submerg	0.00
Q Gates (cfs)		Q Gate Group (cfs)	
Q Culv (cfs)	0.00	Gate Open Ht (ft)	
Q Lat RC (cfs)		Gate #Open	
		Gate Area (sq ft)	
Q Breach (cfs)		Gate Submerg	
Breach Avg Velocity (ft/s)		Gate Invert (ft)	
Breach Flow Area (sq ft)		Gate Weir Coef	

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1101

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation Data	num=	17
Sta	Elev	Sta	Elev
1000	1717	1012.63	1717
1057.59	1714	1066.33	1713
1200.61	1712	1235.52	1713
1273.66	1717	1319.25	1718

Manning's n Values

Sta	n Val	Sta	n Val
1000	.055	1000	.026

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1000 1319.25 150 200 320 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.		0.026	
W.S. Elev (ft)	1716.13	Reach Len. (ft)	150.00	200.00	320.00
Crit W.S. (ft)	1716.13	Flow Area (sq ft)		829.26	
E.G. Slope (ft/ft)	0.006389	Area (sq ft)		829.26	
Q Total (cfs)	9109.05	Flow (cfs)		9109.05	
Top Width (ft)	221.92	Top Width (ft)		221.92	
Vel Total (ft/s)	10.98	Avg. Vel. (ft/s)		10.98	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		3.74	
Conv. Total (cfs)	113963.9	Conv. (cfs)		113963.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		222.39	
Min Ch El (ft)	1711.00	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	1319.25	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	3.39	161.10	19.76
C & E Loss (ft)	0.32	Cum SA (acres)	2.38	24.87	6.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1100

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	32
Sta	Elev	Sta	Elev	Sta
1000	1716	1035.5	1716	1069.48
1144.15	1712	1163.56	1711	1198.64
1260.07	1710	1267.77	1711	1274.32
1522.37	1713	1527.61	1712	1532.39
1545.95	1708	1552.33	1707	1617.79
1632.59	1710	1637.48	1711	1642.29
1663.1	1715	1670.96	1716	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.055	1000	.026
		1670.96	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1670.96		230	199	250	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.		0.026	
W.S. Elev (ft)	1714.75	Reach Len. (ft)	230.00	199.00	250.00
Crit W.S. (ft)		Flow Area (sq ft)		1906.98	
E.G. Slope (ft/ft)	0.003324	Area (sq ft)		1906.98	
Q Total (cfs)	13849.05	Flow (cfs)		13849.05	
Top Width (ft)	581.09	Top Width (ft)		581.09	
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)		7.26	
Max Chl Dpth (ft)	7.75	Hydr. Depth (ft)		3.28	
Conv. Total (cfs)	240212.1	Conv. (cfs)		240212.1	
Length Wtd. (ft)	213.95	Wetted Per. (ft)		582.78	
Min Ch El (ft)	1707.00	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	1670.96	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	3.39	154.82	19.76
C & E Loss (ft)	0.07	Cum SA (acres)	2.38	23.02	6.86

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1099

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 39		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1715	1029.51	1715	1070.3	1714 1212.04
1278.21	1712	1284.13	1711	1290.87	1710 1298.26
1312.73	1707	1334.12	1707	1346.97	1707 1358.52
1373.11	1709	1379.4	1710	1386.79	1711 1413.28
1554.93	1712	1560.61	1711	1564.66	1710 1568.46
1576.28	1707	1580.45	1706	1589.05	1705 1600.17
1650.27	1707	1655.84	1708	1660.89	1709 1665.67
1674.54	1712	1679.91	1713	1860.72	1714 1905.24

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1413.28	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1000	1413.28		150	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1714.22	Reach Len. (ft)	150.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		935.53	1318.50
E.G. Slope (ft/ft)	0.003131	Area (sq ft)		935.53	1318.50
Q Total (cfs)	13849.05	Flow (cfs)		5732.39	8116.67
Top Width (ft)	843.99	Top Width (ft)		352.03	491.96
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)		6.13	6.16
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)		2.66	2.68
Conv. Total (cfs)	247510.9	Conv. (cfs)		102449.5	145061.4
Length Wtd. (ft)	200.00	Wetted Per. (ft)		352.71	493.64
Min Ch El (ft)	1707.00	Shear (lb/sq ft)		0.52	0.52
Alpha	1.00	Stream Power (lb/ft s)	1905.24	0.00	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	3.39	148.33	15.98
C & E Loss (ft)	0.00	Cum SA (acres)	2.38	20.89	5.45

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1098

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 51		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1714	1041.28	1714	1051.72	1715 1057.01
1107.33	1715	1139.9	1714	1198.16	1713 1219.76
1252.96	1715	1302.73	1715	1307.67	1714 1313.68
1324.99	1711	1330.65	1710	1335.26	1709 1340.32
1357	1706	1360.02	1706	1400.58	1706 1413.59
1426.05	1709	1434.67	1710	1437.07	1710 1450.22
1517.7	1710	1524.11	1709	1532.41	1708 1538.45
1548.74	1705	1554.51	1704	1560.76	1703 1574.07
1603.97	1705	1611.38	1706	1617.45	1707 1622.98
1635.45	1710	1644.87	1711	1665.34	1712 1761.89
1820.25	1715				1713 1810.41

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1434.67	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1000	1434.67		250	200	140	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.026	0.026

W.S. Elev (ft)	1713.71	Reach Len. (ft)	250.00	200.00	140.00
Crit W.S. (ft)		Flow Area (sq ft)		771.61	1440.58
E.G. Slope (ft/ft)	0.001958	Area (sq ft)		771.61	1440.58
Q Total (cfs)	13845.96	Flow (cfs)		4710.35	9135.61
Top Width (ft)	566.32	Top Width (ft)		204.76	361.55
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)		6.10	6.34
Max Chl Dpth (ft)	10.71	Hydr. Depth (ft)		3.77	3.98
Conv. Total (cfs)	312944.2	Conv. (cfs)		106462.6	206481.6
Length Wtd. (ft)	162.52	Wetted Per. (ft)		205.70	362.71
Min Ch El (ft)	1706.00	Shear (lb/sq ft)		0.46	0.49
Alpha	1.00	Stream Power (lb/ft s)	1820.25	0.00	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.39	144.41	9.64
C & E Loss (ft)	0.01	Cum SA (acres)	2.38	19.61	3.49

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1097

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	43					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1713	1020.78	1713	1142.96	1713	1223.52	1713	1248.16	1712
1265.49	1711	1271.2	1710	1274.62	1709	1277.32	1708	1280	1707
1283.18	1706	1286.27	1705	1292.79	1704	1347.96	1704	1357.93	1705
1362.18	1706	1366.64	1707	1371.8	1708	1377.33	1708.88	1378.11	1709
1401.03	1709	1403.94	1708	1406.71	1707	1409.5	1706	1413.85	1705
1419.74	1704	1424.09	1703	1428.89	1702	1453.48	1702	1458.04	1703
1462.12	1704	1466.32	1705	1470.92	1706	1475.75	1707	1481.41	1708
1487	1709	1495.37	1710	1513.59	1711	1588.83	1712	1686.1	1713
1717.56	1714	1730.61	1714	1744.24	1713				

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1378.11	.026

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	1000	1378.11		150	200	240	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1713.27	Reach Len. (ft)	150.00	200.00	240.00
Crit W.S. (ft)		Flow Area (sq ft)		993.10	1149.89
E.G. Slope (ft/ft)	0.002757	Area (sq ft)		993.10	1149.89
Q Total (cfs)	13771.77	Flow (cfs)		5655.10	8116.67
Top Width (ft)	698.44	Top Width (ft)		378.11	320.33
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)		5.69	7.06
Max Chl Dpth (ft)	11.27	Hydr. Depth (ft)		2.63	3.59
Conv. Total (cfs)	262306.6	Conv. (cfs)		107711.0	154595.6
Length Wtd. (ft)	211.84	Wetted Per. (ft)		379.86	322.38
Min Ch El (ft)	1704.00	Shear (lb/sq ft)		0.45	0.61
Alpha	1.03	Stream Power (lb/ft s)	1744.24	0.00	0.00
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	3.39	140.35	5.48
C & E Loss (ft)	0.02	Cum SA (acres)	2.38	18.28	2.39

Warning: Divided flow computed for this cross-section.

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1096

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	43					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070.33	1716	1128.17	1716	1143.24	1716	1181.45	1716	1191.69	1715
1196.9	1714	1203.52	1713	1211.79	1712	1226.65	1711	1241.15	1710

1243.82	1709	1246.22	1708	1248.63	1707	1250.97	1706	1253.31	1705
1255.89	1704	1259.48	1703	1262.99	1702	1271.47	1701	1336.43	1700
1349.78	1699	1357.84	1699	1368.81	1700	1374.77	1701	1379.06	1702
1382.31	1703	1385.57	1704	1388.6	1705	1391.65	1706	1394.69	1707
1397.74	1708	1400.41	1709	1403.93	1710	1407.25	1711	1411.36	1712
1417.82	1713	1469.5	1713	1482.85	1712	1520.15	1712	1529.36	1713
1548.05	1714	1605.64	1715	1622.86	1716				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070.33	.055	1070.33	.026	1622.86	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1070.33	1622.86		150	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.026	
W.S. Elev (ft)	1712.70	Reach Len. (ft)	150.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1857.27	
E.G. Slope (ft/ft)	0.001242	Area (sq ft)		1857.27	
Q Total (cfs)	13645.70	Flow (cfs)		13645.70	
Top Width (ft)	263.08	Top Width (ft)		263.08	
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)		7.35	
Max Chl Dpth (ft)	13.70	Hydr. Depth (ft)		7.06	
Conv. Total (cfs)	387140.2	Conv. (cfs)		387140.2	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		266.63	
Min Ch El (ft)	1699.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1622.86	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.39	133.81	2.31
C & E Loss (ft)	0.04	Cum SA (acres)	2.38	16.80	1.51

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1095

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 39	
Sta	Elev	Sta	Elev
1055.07	1713	1190.77	1713
1243.57	1709	1246.58	1708
1255.11	1704	1257.05	1703
1267.28	1699	1304.99	1698
1343.99	1701	1347	1702
1357.98	1706	1360.29	1707
1377.58	1711	1392.65	1712
1498.6	1712	1506.1	1713

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055.07	.055	1055.07	.026	1517.34	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1055.07	1517.34		160	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.026	
W.S. Elev (ft)	1711.88	Reach Len. (ft)	160.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)		1502.71	
E.G. Slope (ft/ft)	0.002604	Area (sq ft)		1502.71	
Q Total (cfs)	13616.28	Flow (cfs)		13616.28	
Top Width (ft)	270.02	Top Width (ft)		270.02	
Vel Total (ft/s)	9.06	Avg. Vel. (ft/s)		9.06	
Max Chl Dpth (ft)	13.87	Hydr. Depth (ft)		5.57	
Conv. Total (cfs)	266848.1	Conv. (cfs)		266848.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		274.36	
Min Ch El (ft)	1698.00	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	1517.34	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	3.39	126.10	2.31

C & E Loss (ft)	0.02	Cum SA (acres)	2.38	15.58	1.51
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Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1094

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num=		35			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1710	1097.32	1709.24	1128.18	1709	1130.35	1708	1132.51	1707
1134.22	1706	1135.94	1705	1137.78	1704	1139.63	1703	1141.47	1702
1143.31	1701	1145.7	1700	1148.46	1699	1151.12	1698	1156.81	1697
1194.15	1697	1205.44	1698	1209.12	1699	1212.79	1700	1215.81	1701
1218.2	1702	1220.15	1703	1221.65	1704	1223.15	1705	1224.65	1706
1226.5	1707	1228.71	1708	1231.66	1709	1234.6	1710	1255.75	1710.35
1294.68	1711	1312.61	1712	1326.68	1713	1350.86	1714	1358.62	1714

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1000	.055	1000	.026	1358.62	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1358.62		185	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.		0.026	
W.S. Elev (ft)	1711.01	Reach Len. (ft)	185.00	200.00	240.00
Crit W.S. (ft)		Flow Area (sq ft)		1371.21	
E.G. Slope (ft/ft)	0.003897	Area (sq ft)		1371.21	
Q Total (cfs)	13442.78	Flow (cfs)		13442.78	
Top Width (ft)	294.76	Top Width (ft)		294.76	
Vel Total (ft/s)	9.80	Avg. Vel. (ft/s)		9.80	
Max Chl Dpth (ft)	14.00	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	215334.0	Conv. (cfs)		215334.0	
Length Wtd. (ft)	201.29	Wetted Per. (ft)		301.04	
Min Ch El (ft)	1697.00	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	1358.62	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	3.39	119.50	2.31
C & E Loss (ft)	0.13	Cum SA (acres)	2.38	14.28	1.51

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1093

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station		Elevation Data		num=		32			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1780.57	1709	1825.21	1708	1861.67	1707	1864.89	1706	1867.54	1705
1870.17	1704	1872.66	1703	1875.04	1702	1877.42	1701	1879.8	1700
1882.14	1699	1885.55	1698	1889.3	1697	1899.13	1696	1924.7	1696
1934.49	1696	1942.88	1697	1945.95	1698	1948.7	1699	1951.29	1700
1953.48	1701	1955.21	1702	1956.94	1703	1958.67	1704	1960.4	1705
1962.13	1706	1965.27	1707	2024.18	1708	2065.91	1709	2073.89	1710
2078.06	1711	2082.22	1712						

Manning's n Values		num=		4	
Sta	n Val	Sta	n Val	Sta	n Val
1780.57	.025	1861.67	.026	1965.27	.025
				2065.91	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1861.67	1965.27		202	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.	0.025	0.026	0.025
W.S. Elev (ft)	1710.98	Reach Len. (ft)	202.00	200.00	190.00
Crit W.S. (ft)	1706.73	Flow Area (sq ft)	237.25	1252.52	321.84
E.G. Slope (ft/ft)	0.000906	Area (sq ft)	237.25	1252.52	321.84
Q Total (cfs)	13083.42	Flow (cfs)	854.01	11054.52	1174.90
Top Width (ft)	297.39	Top Width (ft)	81.10	103.60	112.69
Vel Total (ft/s)	7.22	Avg. Vel. (ft/s)	3.60	8.83	3.65
Max Chl Dpth (ft)	14.98	Hydr. Depth (ft)	2.93	12.09	2.86
Conv. Total (cfs)	434766.0	Conv. (cfs)	28378.9	367345.0	39042.1
Length Wtd. (ft)	199.61	Wetted Per. (ft)	83.10	107.74	112.89
Min Ch El (ft)	1696.00	Shear (lb/sq ft)	0.16	0.66	0.16
Alpha	1.30	Stream Power (lb/ft s)	2082.22	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2.88	113.48	1.43
C & E Loss (ft)	0.29	Cum SA (acres)	2.21	13.37	1.20

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1092

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 28									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1083.42	1708	1085.58	1707	1087.3	1706	1089.02	1705	1090.86	1704		
1092.7	1703	1094.54	1702	1096.38	1701	1098.81	1700	1101.58	1699		
1104.2	1698	1109.97	1697	1122	1696	1134	1696	1147.24	1697		
1158.59	1698	1162.27	1699	1165.95	1700	1168.98	1701	1171.37	1702		
1173.19	1703	1174.69	1704	1176.18	1705	1177.68	1706	1179.48	1707		
1187.7	1707	1208.72	1707	1247.1	1708						

Manning's n Values		num= 2	
Sta	n Val	Sta	n Val
1083.42	.026	1247.1	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1083.42	1179.48		175	162	125	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.94	Wt. n-Val.		0.026	0.026
W.S. Elev (ft)	1707.45	Reach Len. (ft)	175.00	162.00	125.00
Crit W.S. (ft)	1707.45	Flow Area (sq ft)		805.92	9.67
E.G. Slope (ft/ft)	0.004777	Area (sq ft)		805.92	9.67
Q Total (cfs)	12869.24	Flow (cfs)		12853.03	16.21
Top Width (ft)	129.84	Top Width (ft)		94.87	34.97
Vel Total (ft/s)	15.78	Avg. Vel. (ft/s)		15.95	1.68
Max Chl Dpth (ft)	11.45	Hydr. Depth (ft)		8.50	0.28
Conv. Total (cfs)	186197.2	Conv. (cfs)		185962.6	234.6
Length Wtd. (ft)	162.19	Wetted Per. (ft)		99.34	34.97
Min Ch El (ft)	1696.00	Shear (lb/sq ft)		2.42	0.08
Alpha	1.02	Stream Power (lb/ft s)	1247.10	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	2.33	108.75	0.70
C & E Loss (ft)	0.69	Cum SA (acres)	2.02	12.91	0.88

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1091

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 34			
Sta	Elev	Sta	Elev	Sta	Elev	
1000	1708	1046.98	1707	1054.34	1706	1065.73
1114.2	1706	1118.16	1705	1122.2	1704	1125.45
1129.93	1701	1132.16	1700	1134.39	1699	1136.7
1141.35	1696	1143.72	1695	1153.93	1694	1178.46
1193.53	1696	1197	1697	1199.93	1698	1202.85
1210.12	1701	1214.32	1702	1219.65	1703	1225.09
1246.43	1706	1275.1	1707	1321.35	1707	1357.23

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1114.2	.026	1246.43	.25

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1114.2	1246.43		230	237	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.025	0.026	0.250
W.S. Elev (ft)	1708.03	Reach Len. (ft)	230.00	237.00	250.00
Crit W.S. (ft)	1705.60	Flow Area (sq ft)	157.72	1183.90	110.56
E.G. Slope (ft/ft)	0.001872	Area (sq ft)	157.72	1183.90	110.56
Q Total (cfs)	12940.24	Flow (cfs)	502.71	12409.14	28.38
Top Width (ft)	357.23	Top Width (ft)	114.20	132.23	110.80
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)	3.19	10.48	0.26
Max Chl Dpth (ft)	14.03	Hydr. Depth (ft)	1.38	8.95	1.00
Conv. Total (cfs)	299070.1	Conv. (cfs)	11618.6	286795.6	656.0
Length Wtd. (ft)	236.77	Wetted Per. (ft)	114.31	135.66	110.86
Min Ch El (ft)	1694.00	Shear (lb/sq ft)	0.16	1.02	0.12
Alpha	1.33	Stream Power (lb/ft s)	1357.23	0.00	0.00
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2.02	105.05	0.53
C & E Loss (ft)	0.04	Cum SA (acres)	1.79	12.49	0.67

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1090

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 37			
Sta	Elev	Sta	Elev	Sta	Elev	
1861	1708	1861	1707	1904.35	1706	1926.83
1937.52	1703	1939.77	1702	1942.03	1701	1944.29
1948.16	1698	1949.78	1697	1951.52	1696	1953.31
1957.43	1693	1961.9	1692	1984.29	1692	1998.11
2007.42	1694	2011.52	1695	2015.63	1696	2018.61
2023.81	1699	2026.39	1700	2028.25	1701	2030.03
2033.6	1704	2035.38	1705	2038.9	1706	2048.32
2121.39	1709	2130.85	1710			

Manning's n Values			num= 5		
Sta	n Val	Sta	n Val	Sta	n Val
1861	.025	1904.35	.025	1933.63	.033
				2038.9	.025
				2121.39	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1933.63	2038.9		205	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.	0.025	0.033	0.025
W.S. Elev (ft)	1707.68	Reach Len. (ft)	205.00	200.00	193.00

Crit W.S. (ft)		Flow Area (sq ft)	121.45	1240.90	18.13
E.G. Slope (ft/ft)	0.001967	Area (sq ft)	121.45	1240.90	18.13
Q Total (cfs)	12940.24	Flow (cfs)	481.14	12425.22	33.87
Top Width (ft)	208.21	Top Width (ft)	72.63	105.27	30.31
Vel Total (ft/s)	9.37	Avg. Vel. (ft/s)	3.96	10.01	1.87
Max Chl Dpth (ft)	15.68	Hydr. Depth (ft)	1.67	11.79	0.60
Conv. Total (cfs)	291769.7	Conv. (cfs)	10848.6	280157.4	763.7
Length Wtd. (ft)	200.07	Wetted Per. (ft)	73.41	110.53	30.37
Min Ch El (ft)	1692.00	Shear (lb/sq ft)	0.20	1.38	0.07
Alpha	1.10	Stream Power (lb/ft s)	2130.85	0.00	0.00
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	1.28	98.45	0.16
C & E Loss (ft)	0.23	Cum SA (acres)	1.30	11.85	0.26

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1089

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	35
Sta	Elev	Sta	Elev	Sta
1840	1705.5	1854.61	1705	1885.68
1899.26	1701	1901.52	1700	1903.78
1910.56	1696	1912.82	1695	1915.08
1933.71	1691	1947.88	1691	1959.38
1989.61	1694	1992.34	1695	1996.19
2001.62	1699	2002.97	1700	2004.32
2008.92	1704	2012.69	1705	2016.47

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1840	.025	1885.68	.033
		2008.92	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1885.68	2008.92		200	200	200.118	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.77	Wt. n-Val.	0.025	0.033	0.025
W.S. Elev (ft)	1704.47	Reach Len. (ft)	200.00	200.00	200.12
Crit W.S. (ft)	1703.56	Flow Area (sq ft)	3.49	1197.58	0.42
E.G. Slope (ft/ft)	0.006096	Area (sq ft)	3.49	1197.58	0.42
Q Total (cfs)	18672.00	Flow (cfs)	6.20	18665.06	0.74
Top Width (ft)	139.75	Top Width (ft)	14.73	123.24	1.79
Vel Total (ft/s)	15.54	Avg. Vel. (ft/s)	1.78	15.59	1.74
Max Chl Dpth (ft)	13.47	Hydr. Depth (ft)	0.24	9.72	0.24
Conv. Total (cfs)	239144.3	Conv. (cfs)	79.4	239055.4	9.4
Length Wtd. (ft)	200.00	Wetted Per. (ft)	14.73	128.30	1.85
Min Ch El (ft)	1691.00	Shear (lb/sq ft)	0.09	3.55	0.09
Alpha	1.01	Stream Power (lb/ft s)	2054.64	0.00	0.00
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)	0.99	92.86	0.12
C & E Loss (ft)	0.04	Cum SA (acres)	1.10	11.32	0.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1088

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	33
Sta	Elev	Sta	Elev	Sta
1000	1705	1032.58	1704.47	1061.94
1087.35	1701	1089.92	1700	1092.13
1098.68	1696	1100.88	1695	1103.11
1116.39	1691	1149.87	1691	1171.2
1193.48	1695	1196.27	1696	1199.05
1205.58	1700	1207.68	1701	1209.78

1216.95	1705	1219.35	1706	1233.87	1707
Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1080.56	.033	1212.13	.025
Bank Sta: Left		Right	Lengths: Left Channel		Right
1080.56		1212.13	199		199 204.09
			Coeff	Contr.	Expan.
				.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.20	Wt. n-Val.		0.033	
W.S. Elev (ft)	1702.63	Reach Len. (ft)	199.00	199.00	204.09
Crit W.S. (ft)	1702.46	Flow Area (sq ft)		1135.15	
E.G. Slope (ft/ft)	0.007680	Area (sq ft)		1135.15	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	129.35	Top Width (ft)		129.35	
Vel Total (ft/s)	16.45	Avg. Vel. (ft/s)		16.45	
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)		8.78	
Conv. Total (cfs)	213067.8	Conv. (cfs)		213067.8	
Length Wtd. (ft)	199.00	Wetted Per. (ft)		133.38	
Min Ch El (ft)	1691.00	Shear (lb/sq ft)		4.08	
Alpha	1.00	Stream Power (lb/ft s)	1233.87	0.00	0.00
Frctn Loss (ft)	1.57	Cum Volume (acre-ft)	0.98	87.50	0.12
C & E Loss (ft)	0.05	Cum SA (acres)	1.06	10.74	0.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1087

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 33	
Sta	Elev	Sta	Elev
1808.01	1705	1873.6	1704
1927.61	1700	1930.53	1699
1939.41	1695	1941.82	1694
1990.79	1691	2013.76	1691
2052.82	1695	2055.09	1696
2064.2	1700	2066.48	1701
2077.34	1705	2081.44	1706

Manning's n Values		num= 4	
Sta	n Val	Sta	n Val
1808.01	.055	1873.6	.025
		1921.64	.033
		2071.03	.025

Bank Sta: Left		Right	Lengths: Left Channel		Right
1921.64		2071.03	197		200 205
			Coeff	Contr.	Expan.
				.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.05	Wt. n-Val.		0.033	
W.S. Elev (ft)	1701.17	Reach Len. (ft)	197.00	200.00	205.00
Crit W.S. (ft)	1701.17	Flow Area (sq ft)		1156.04	
E.G. Slope (ft/ft)	0.008156	Area (sq ft)		1156.04	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	142.72	Top Width (ft)		142.72	
Vel Total (ft/s)	16.15	Avg. Vel. (ft/s)		16.15	
Max Chl Dpth (ft)	10.17	Hydr. Depth (ft)		8.10	
Conv. Total (cfs)	206749.8	Conv. (cfs)		206749.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		146.04	
Min Ch El (ft)	1691.00	Shear (lb/sq ft)		4.03	
Alpha	1.00	Stream Power (lb/ft s)	2106.96	0.00	0.00
Frctn Loss (ft)	1.65	Cum Volume (acre-ft)	0.98	82.27	0.12
C & E Loss (ft)	0.06	Cum SA (acres)	1.06	10.12	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program
defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1086

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 36	
Sta	Elev	Sta	Elev
1762.91	1706	1786.36	1705
1915.52	1701	1919.7	1700
1930.28	1696	1932.42	1695
1944.76	1691	1964.37	1690
2048.87	1692	2057.83	1693
2069.17	1697	2071.64	1698
2083.29	1702	2087.09	1703
2123.89	1707		

Manning's n Values		num= 5	
Sta	n Val	Sta	n Val
1762.91	.055	1786.36	.025
		1902.19	.033
		2083.29	.025
		2100.71	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1902.19	2083.29		197	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.85	Wt. n-Val.		0.033	
W.S. Elev (ft)	1699.65	Reach Len. (ft)	197.00	200.00	202.00
Crit W.S. (ft)	1699.65	Flow Area (sq ft)		1185.31	
E.G. Slope (ft/ft)	0.008326	Area (sq ft)		1185.31	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	154.97	Top Width (ft)		154.97	
Vel Total (ft/s)	15.75	Avg. Vel. (ft/s)		15.75	
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)		7.65	
Conv. Total (cfs)	204631.7	Conv. (cfs)		204631.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		157.89	
Min Ch El (ft)	1690.00	Shear (lb/sq ft)		3.90	
Alpha	1.00	Stream Power (lb/ft s)	2123.89	0.00	0.00
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	0.98	76.89	0.12
C & E Loss (ft)	0.09	Cum SA (acres)	1.06	9.44	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program
defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1085

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 41	
Sta	Elev	Sta	Elev
1754.01	1706	1761.05	1705
1802.07	1701	1812.58	1700
1825.11	1696	1828.02	1695
1841.02	1691	1849.74	1690

1699.69	1692	1973.25	1693	1976.24	1694	1979.23	1695	1982.24	1696
1985.55	1697	1988.88	1698	1992.15	1699	1999.73	1700	2014.77	1701
2023.1	1702	2028.06	1703	2031.32	1704	2033.79	1705	2035.83	1706
2037.93	1707	2040.22	1708	2042.57	1709	2048.75	1710	2052.08	1711
2056.87	1711								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1754.01	.025	1812.58	.015	1999.73	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1812.58	1999.73		150	200	193	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1702.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.46	Reach Len. (ft)	150.00	200.00	193.00
Crit W.S. (ft)	1698.46	Flow Area (sq ft)		1231.94	
E.G. Slope (ft/ft)	0.001739	Area (sq ft)		1231.94	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	172.90	Top Width (ft)		172.90	
Vel Total (ft/s)	15.16	Avg. Vel. (ft/s)		15.16	
Max Chl Dpth (ft)	8.46	Hydr. Depth (ft)		7.13	
Conv. Total (cfs)	447713.4	Conv. (cfs)		447713.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		175.32	
Min Ch El (ft)	1690.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	2056.87	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98	71.34	0.12
C & E Loss (ft)	0.30	Cum SA (acres)	1.06	8.68	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1084

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	39
Sta	Elev	Sta	Elev	Sta
1000	1703	1009.6	1702	1023.14
1062.76	1698	1070.69	1697	1077.6
1101.47	1693	1109.46	1692	1115.59
1129.51	1691	1132.85	1690	1142.86
1260.1	1691	1263.6	1692	1266.9
1276.19	1696	1279.91	1697	1283.62
1323.22	1701	1327.76	1702	1331.12
1340.27	1706	1342.8	1707	1345.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1055.35	.015	1292.15	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1055.35	1292.15		215	200	193	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1700.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.79	Reach Len. (ft)	215.00	200.00	193.00
Crit W.S. (ft)	1697.15	Flow Area (sq ft)		1449.53	
E.G. Slope (ft/ft)	0.001371	Area (sq ft)		1449.53	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	218.39	Top Width (ft)		218.39	

Vel Total (ft/s)	12.88	Avg. Vel. (ft/s)	12.88
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)	6.64
Conv. Total (cfs)	504206.8	Conv. (cfs)	504206.8
Length Wtd. (ft)	200.00	Wetted Per. (ft)	220.30
Min Ch El (ft)	1689.00	Shear (lb/sq ft)	0.56
Alpha	1.00	Stream Power (lb/ft s)	1379.26
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98
C & E Loss (ft)	0.10	Cum SA (acres)	1.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1083

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	43
Sta	Elev	Sta	Elev	Sta
1000	1701	1065.05	1700	1065.34
1143.9	1699	1202.78	1698	1221.67
1229.24	1694	1231.89	1693	1234.53
1244.62	1689	1260.66	1688	1358.6
1379.21	1691	1382.36	1692	1385.38
1394.63	1696	1398.52	1697	1402.89
1437.08	1701	1440.58	1702	1444.69
1451.26	1706	1453.31	1707	1455.28
1461.18	1711	1463.2	1712	1485.82

Manning's n	Values	num=	4
Sta	n Val	Sta	n Val
1000	.025	1221.67	.015
		1398.52	.025
		1425.61	.055

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	1221.67	1398.52	217	200	190	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1699.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	1696.39	Reach Len. (ft)	217.00	200.00	190.00
Crit W.S. (ft)	1696.39	Flow Area (sq ft)		1232.34	
E.G. Slope (ft/ft)	0.001739	Area (sq ft)		1232.34	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	172.96	Top Width (ft)		172.96	
Vel Total (ft/s)	15.15	Avg. Vel. (ft/s)		15.15	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		7.12	
Conv. Total (cfs)	447750.8	Conv. (cfs)		447750.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		175.44	
Min Ch El (ft)	1688.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1485.82	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.98	59.03	0.12
C & E Loss (ft)	0.00	Cum SA (acres)	1.06	6.89	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1082

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	44
Sta	Elev	Sta	Elev	Sta
1478.378	1701	1513.48	1701	1533.21
1720.86	1697	1726.48	1696	1729.68
1738.81	1692	1741.81	1691	1744.83
			1690	1748.87
			1689	1753.07
				1688

1765.96	1687	1799.4	1687	1824.53	1687	1838.68	1687	1861.52	1687
1873.2	1688	1877.59	1689	1881.35	1690	1884.39	1691	1887.39	1692
1890.39	1693	1893.48	1694	1896.57	1695	1899.7	1696	1906.28	1697
1932.28	1698	1939.94	1699	1943.59	1700	1945.35	1701	1947.11	1702
1948.9	1703	1950.69	1704	1952.49	1705	1954.16	1706	1955.81	1707
1957.59	1708	1959.36	1709	1961.14	1710	1977.65	1710		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1478.378	.025	1720.86	.015	1906.28	.025	1932.28	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1720.86	1906.28		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1699.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1695.63	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	1695.61	Flow Area (sq ft)		1229.77	
E.G. Slope (ft/ft)	0.001722	Area (sq ft)		1229.77	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	170.89	Top Width (ft)		170.89	
Vel Total (ft/s)	15.18	Avg. Vel. (ft/s)		15.18	
Max Chl Dpth (ft)	8.63	Hydr. Depth (ft)		7.20	
Conv. Total (cfs)	449939.8	Conv. (cfs)		449939.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		173.25	
Min Ch El (ft)	1687.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	1977.65	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.98	53.38	0.12
C & E Loss (ft)	0.02	Cum SA (acres)	1.06	6.10	0.19

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1081

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station	Elevation	Data	num=	40
Sta	Elev	Sta	Elev	Sta
1000	1701	1020.82	1700.17	1024.99
1097.94	1697	1120.48	1696	1125.23
1135.48	1692	1138.56	1691	1141.64
1154.26	1687	1272.68	1687	1277.31
1287.12	1691	1290.18	1692	1293.23
1304.69	1696	1320.29	1697	1330.91
1344.58	1701	1347.49	1702	1350.14
1357.38	1706	1359.61	1707	1361.69

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1120.48	.015	1304.69	.025	1320.29	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1120.48	1304.69		265	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1698.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1695.34	Reach Len. (ft)	265.00	200.00	160.00
Crit W.S. (ft)	1695.34	Flow Area (sq ft)		1243.78	
E.G. Slope (ft/ft)	0.001749	Area (sq ft)		1243.78	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	177.98	Top Width (ft)		177.98	
Vel Total (ft/s)	15.01	Avg. Vel. (ft/s)		15.01	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		6.99	
Conv. Total (cfs)	446451.3	Conv. (cfs)		446451.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		180.33	
Min Ch El (ft)	1687.00	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)	1366.32	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.98	47.70	0.12
C & E Loss (ft)	0.14	Cum SA (acres)	1.06	5.30	0.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1080

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38			
Sta	Elev	Sta	Elev	Sta	Elev	
1725	1699.2	1765.04	1699	1808.05	1698	1827.1
1867.67	1695	1872.61	1694	1875.6	1693	1878.59
1884.58	1690	1887.7	1689	1890.93	1688	1894.72
1956.96	1686	2016.95	1686	2021.77	1687	2025
2031.22	1690	2034.21	1691	2037.2	1692	2040.2
2047.58	1695	2054.24	1696	2072.15	1697	2079.65
2090.17	1700	2093.55	1701	2095.5	1702	2097.45
2101.21	1705	2103.04	1706	2104.86	1707	

Manning's n Values			num= 4			
Sta	n Val	Sta	n Val	Sta	n Val	
1725	.025	1867.67	.015	2054.24	.025	2072.15
						.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1867.67	2054.24		221	200	185	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.04	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.95	Reach Len. (ft)	221.00	200.00	185.00
Crit W.S. (ft)	1694.39	Flow Area (sq ft)		1333.83	
E.G. Slope (ft/ft)	0.001403	Area (sq ft)		1333.83	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	179.43	Top Width (ft)		179.43	
Vel Total (ft/s)	14.00	Avg. Vel. (ft/s)		14.00	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		7.43	
Conv. Total (cfs)	498486.0	Conv. (cfs)		498486.0	
Length Wtd. (ft)	200.02	Wetted Per. (ft)		182.02	
Min Ch El (ft)	1686.00	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)	2104.86	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.98	41.78	0.12
C & E Loss (ft)	0.25	Cum SA (acres)	1.06	4.48	0.19

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1079

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data			num= 38		
Sta	Elev	Sta	Elev	Sta	Elev
1000	1698	1054.26	1697	1085.3	1696.61
1191.03	1694	1195.44	1693	1198.48	1692
1207.37	1689	1210.49	1688	1213.82	1687
1336.46	1685	1342.51	1686	1346.19	1687
1355.86	1690	1358.83	1691	1361.7	1692
1372.93	1695	1393.98	1696	1402.58	1697
1414.09	1700	1415.99	1701	1417.89	1702
1423.98	1705	1425.91	1706	1427.85	1707

Manning's n Values			num= 4			
Sta	n Val	Sta	n Val	Sta	n Val	
1000	.025	1191.03	.015	1368.08	.025	1393.98
						.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1191.03	1368.08		250	200	170	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.21	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.32	Reach Len. (ft)	250.00	200.00	170.00
Crit W.S. (ft)		Flow Area (sq ft)	28.99	1561.23	5.06
E.G. Slope (ft/ft)	0.000812	Area (sq ft)	28.99	1561.23	5.06
Q Total (cfs)	18672.00	Flow (cfs)	38.90	18628.20	4.90
Top Width (ft)	229.74	Top Width (ft)	41.10	177.05	11.60
Vel Total (ft/s)	11.70	Avg. Vel. (ft/s)	1.34	11.93	0.97
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)	0.71	8.82	0.44
Conv. Total (cfs)	655305.3	Conv. (cfs)	1365.1	653768.3	171.9
Length Wtd. (ft)	200.21	Wetted Per. (ft)	41.12	179.63	11.70
Min Ch El (ft)	1685.00	Shear (lb/sq ft)	0.04	0.44	0.02
Alpha	1.04	Stream Power (lb/ft s)	1427.85	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.90	35.14	0.11
C & E Loss (ft)	0.16	Cum SA (acres)	0.96	3.66	0.16

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1078

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 42							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1602.58	1698	1611.57	1697	1613.47	1697	1646.48	1696	1760.21	1695
1794.28	1694	1821.97	1693	1825.83	1692	1828.74	1691	1831.67	1690
1834.67	1689	1837.7	1688	1840.97	1687	1844.27	1686	1848.39	1685
1858.16	1684	1915.06	1684	1958.58	1684	1970.9	1685	1975.19	1686
1978.66	1687	1981.81	1688	1984.93	1689	1987.97	1690	1991.02	1691
1994.16	1692	1997.31	1693	2002.8	1694	2022.08	1695	2032.44	1696
2036.91	1697	2039.61	1698	2042.32	1699	2044.21	1700	2046.06	1701
2047.93	1702	2049.8	1703	2051.76	1704	2053.71	1705	2055.67	1706
2059.51	1707	2066.88	1707						

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1602.58	.025	1821.97	.015	2002.8	.025	2022.08	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1821.97	2002.8		215	200	190	
							.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.56	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)		Flow Area (sq ft)	110.34	1769.52	21.93
E.G. Slope (ft/ft)	0.000542	Area (sq ft)	110.34	1769.52	21.93
Q Total (cfs)	18672.00	Flow (cfs)	140.63	18501.80	29.57
Top Width (ft)	330.72	Top Width (ft)	124.86	180.83	25.03
Vel Total (ft/s)	9.82	Avg. Vel. (ft/s)	1.27	10.46	1.35
Max Chl Dpth (ft)	11.55	Hydr. Depth (ft)	0.88	9.79	0.88
Conv. Total (cfs)	801723.1	Conv. (cfs)	6038.2	794415.2	1269.7
Length Wtd. (ft)	200.08	Wetted Per. (ft)	124.89	183.41	25.08
Min Ch El (ft)	1684.00	Shear (lb/sq ft)	0.03	0.33	0.03
Alpha	1.12	Stream Power (lb/ft s)	2066.88	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.50	27.49	0.06
C & E Loss (ft)	0.01	Cum SA (acres)	0.48	2.84	0.09

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1077

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num= 37							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1811.48	1696	1826.09	1695	1841.21	1694	1861.63	1693	1866.83	1692
1869.23	1691	1871.29	1690	1873.36	1689	1875.4	1688	1877.24	1687
1879.12	1686	1881.17	1685	1883.22	1684	1893.7	1683	1940.8	1683
2003.84	1683	2006.37	1684	2009.69	1685	2011.57	1686	2013.08	1687

2014.63	1688	2016.18	1689	2017.73	1690	2019.48	1691	2021.24	1692
2023.01	1693	2025.21	1694	2033.06	1695	2057.29	1696	2061.84	1697
2065.38	1698	2068.56	1699	2070.66	1700	2072.63	1701	2074.65	1702
2076.7	1703	2078.46	1704						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1811.48	.025	1861.63	.015	2033.06	.025	2057.29	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1861.63	2033.06		140	110	80	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1695.48	Reach Len. (ft)	140.00	110.00	80.00
Crit W.S. (ft)		Flow Area (sq ft)	56.87	1800.89	2.77
E.G. Slope (ft/ft)	0.000489	Area (sq ft)	56.87	1800.89	2.77
Q Total (cfs)	18672.00	Flow (cfs)	90.64	18579.95	1.40
Top Width (ft)	225.56	Top Width (ft)	42.53	171.43	11.59
Vel Total (ft/s)	10.04	Avg. Vel. (ft/s)	1.59	10.32	0.51
Max Chl Dpth (ft)	12.48	Hydr. Depth (ft)	1.34	10.51	0.24
Conv. Total (cfs)	844115.9	Conv. (cfs)	4097.7	839954.6	63.5
Length Wtd. (ft)	110.07	Wetted Per. (ft)	42.60	176.27	11.60
Min Ch El (ft)	1683.00	Shear (lb/sq ft)	0.04	0.31	0.01
Alpha	1.05	Stream Power (lb/ft s)	2078.46	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.09	19.29	0.00
C & E Loss (ft)	0.07	Cum SA (acres)	0.07	2.03	0.01

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
 REACH: Reach #1 RS: 1075.9

INPUT

Description: Vegas Valley US 1075.9

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.07	882.948	1692.35	882.948	1682.27	1006.56	1682.41	1006.56	1692.42
1006.56	1697.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	882.948	1006.56		92	92	92	.3 .5

Skew Angle = 28

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1696.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.66	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1691.23	Flow Area (sq ft)		1522.22	
E.G. Slope (ft/ft)	0.000687	Area (sq ft)		1522.22	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	12.27	Avg. Vel. (ft/s)		12.27	
Max Chl Dpth (ft)	12.38	Hydr. Depth (ft)		12.31	
Conv. Total (cfs)	712395.7	Conv. (cfs)		712395.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		148.24	
Min Ch El (ft)	1682.27	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		15.10	
C & E Loss (ft)	0.46	Cum SA (acres)		1.65	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

 This may indicate the need for additional cross sections.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1075.5

INPUT

Description: Vegas Valley Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 90

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew = 28

Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
882.948	1697.07	1692.35	1006.56	1697.1	1692.42				

Upstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.07	882.948	1692.35	882.948	1682.27	1006.56	1682.41	1006.56	1692.42
1006.56	1697.1								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta: Left Right Coeff Contr. Expan.

882.948	1006.56	.3	.5
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Skew Angle = 28

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
882.948	1697.06	1691.96	1006.56	1697.71	1691.98				

Downstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.06	882.948	1691.96	882.948	1681.88	1006.56	1681.96	1006.56	1691.98
1006.56	1697.71								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta: Left Right Coeff Contr. Expan.

882.948	1006.56	.3	.5
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Skew Angle = 28

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Piers = 9

Pier Data

Pier Station Upstream= 895.309 Downstream= 895.309

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Downstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data

Pier Station Upstream= 907.67 Downstream= 907.67

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Downstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data

Pier Station Upstream= 920.031 Downstream= 920.031

Upstream num= 2

Width	Elev	Width	Elev
.67	1680	.67	1700

.67	1680	.67	1700
Downstream	num=	2	
Width	Elev	Width	Elev
.67	1680	.67	1700

Pier Data
Pier Station Upstream= 932.393 Downstream= 932.393
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 944.754 Downstream= 944.754
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 957.115 Downstream= 957.115
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 969.476 Downstream= 969.476
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 981.838 Downstream= 981.838
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 994.199 Downstream= 994.199
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 2
Yarnell KVal = 1.25
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1696.99	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1694.66	E.G. Elev (ft)	1696.53	1695.75

Q Total (cfs)	18672.00	W.S. Elev (ft)	1692.65	1691.10
Q Bridge (cfs)	18672.00	Crit W.S. (ft)	1691.57	1691.10
Q Weir (cfs)		Max Chl Dpth (ft)	10.37	9.22
Weir Sta Lft (ft)		Vel Total (ft/s)	15.81	17.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	1181.09	1079.53
Weir Submerg		Froude # Chl	0.86	1.01
Weir Max Depth (ft)		Specif Force (cu ft)	15406.27	14985.43
Min El Weir Flow (ft)	1697.08	Hydr Depth (ft)		9.18
Min El Prs (ft)	1692.42	W.P. Total (ft)	436.06	301.20
Delta EG (ft)	1.70	Conv. Total (cfs)	227340.4	250449.7
Delta WS (ft)	3.82	Top Width (ft)		117.58
BR Open Area (sq ft)	1181.09	Frctn Loss (ft)	0.55	0.00
BR Open Vel (ft/s)	17.30	C & E Loss (ft)	0.23	0.09
Coef of Q		Shear Total (lb/sq ft)	1.14	1.24
Br Sel Method	Energy only	Power Total (lb/ft s)	882.95	882.95

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1075.1

INPUT

Description: Vegas Valley DS 1075.1

Station		Elevation Data		num=	6
Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.06	882.948	1691.96	882.948	1681.88
1006.56	1697.71			1006.56	1681.96
				1006.56	1691.98

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
882.948	.055	882.948	.015
		1006.56	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	882.948	1006.56		180	198	220	
Skew Angle =	28					.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1695.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1690.84	Reach Len. (ft)	180.00	198.00	220.00
Crit W.S. (ft)	1690.84	Flow Area (sq ft)		1102.00	
E.G. Slope (ft/ft)	0.001894	Area (sq ft)		1102.00	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	16.94	Avg. Vel. (ft/s)		16.94	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		8.91	
Conv. Total (cfs)	429028.9	Conv. (cfs)		429028.9	
Length Wtd. (ft)	198.00	Wetted Per. (ft)		141.44	
Min Ch El (ft)	1681.88	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)		12.71	
C & E Loss (ft)	0.97	Cum SA (acres)		1.53	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1075

INPUT

Description: Cross Section from 2008 Floodplain Mapping

Station Elevation Data		num=		31	
Sta	Elev	Sta	Elev	Sta	Elev
1821.2	1695	1854.41	1694	1862.1	1693
1877.11	1690	1880.88	1689	1883.78	1688
1892.83	1685	1896.12	1684	1900.06	1683
1950.82	1681	1969.14	1681	2015.14	1682
2031.27	1685	2034.53	1686	2037.64	1687
2046.88	1690	2050.38	1691	2054.3	1692
2073.84	1695			2059.57	1693

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
1821.2	.025	1854.41	.015	2065.77	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1854.41	2065.77		201	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1693.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1691.45	Reach Len. (ft)	201.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)		1470.05	
E.G. Slope (ft/ft)	0.001033	Area (sq ft)		1470.05	
Q Total (cfs)	18718.00	Flow (cfs)		18718.00	
Top Width (ft)	181.13	Top Width (ft)		181.13	
Vel Total (ft/s)	12.73	Avg. Vel. (ft/s)		12.73	
Max Chl Dpth (ft)	10.45	Hydr. Depth (ft)		8.12	
Conv. Total (cfs)	582501.8	Conv. (cfs)		582501.8	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		183.76	
Min Ch El (ft)	1681.00	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	2073.84	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		6.86	
C & E Loss (ft)	0.05	Cum SA (acres)		0.84	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 1074

INPUT

Description: Cross Section from 2008 Floodplain Mapping, model truncated to determine effective water surface tie in locations within project vicinity

Station Elevation Data		num=		36	
Sta	Elev	Sta	Elev	Sta	Elev
1872.61	1694	1881.94	1693	1886.68	1692
1896.65	1689	1899.39	1688	1902.31	1687
1911.09	1684	1914.87	1683	1919.14	1682
2017.45	1681	2040.41	1682	2045.68	1683
2055.63	1686	2058.61	1687	2061.89	1688
2071.98	1691	2076.03	1692	2081.64	1693
2117.7	1696	2130.69	1697	2134.37	1698
2142.75	1701			2136.95	1699

Manning's n Values		num=		3	
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Sta	n Val	Sta	n Val	Sta	n Val
1872.61	.025	1872.61	.031	2087.97	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1872.61	2087.97		191	200	205	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1693.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.36	Wt. n-Val.		0.031	
W.S. Elev (ft)	1691.20	Reach Len. (ft)			
Crit W.S. (ft)	1689.57	Flow Area (sq ft)		1518.85	
E.G. Slope (ft/ft)	0.004020	Area (sq ft)		1518.85	
Q Total (cfs)	18718.00	Flow (cfs)		18718.00	
Top Width (ft)	183.18	Top Width (ft)		183.18	
Vel Total (ft/s)	12.32	Avg. Vel. (ft/s)		12.32	
Max Chl Dpth (ft)	10.20	Hydr. Depth (ft)		8.29	
Conv. Total (cfs)	295235.6	Conv. (cfs)		295235.6	
Length Wtd. (ft)		Wetted Per. (ft)		185.99	
Min Ch El (ft)	1681.00	Shear (lb/sq ft)		2.05	
Alpha	1.00	Stream Power (lb/ft s)	2142.75	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3	n4	n5
Reach #1	1173	.025	.031	.025		
Reach #1	1172	.025	.031	.025		
Reach #1	1171	.025	.031	.025		
Reach #1	1170	.025	.031	.025		
Reach #1	1169	.025	.031	.025		
Reach #1	1167.9	.095	.031	.095		
Reach #1	1167.5	Bridge				
Reach #1	1167.1	.095	.031	.095		
Reach #1	1167	.025	.031	.025		
Reach #1	1166	.075	.025	.031	.025	.095
Reach #1	1165	.075	.025	.031	.025	
Reach #1	1164	.075	.025	.031	.025	.095
Reach #1	1163	.075	.025	.031	.025	
Reach #1	1162	.025	.031	.025		
Reach #1	1161	.075	.025	.031	.025	.095
Reach #1	1160	.025	.031	.025		
Reach #1	1159	.075	.025	.031		
Reach #1	1158	.075	.025	.031	.095	
Reach #1	1157	.075	.031	.095		
Reach #1	1156	.075	.031	.095		
Reach #1	1155	.075	.025	.031		
Reach #1	1154	.025	.031	.025		
Reach #1	1152.9	.075	.031	.095		
Reach #1	1152.5	Bridge				
Reach #1	1152.1	.075	.031	.095		
Reach #1	1152	.075	.025	.031		
Reach #1	1151	.075	.027	.095		
Reach #1	1150	.075	.027	.095		
Reach #1	1149	.016	.027	.025		
Reach #1	1148	.016	.027	.025		
Reach #1	1147.5	.015	.027	.025	.095	
Reach #1	1147.3	.016	.027	.025	.095	
Reach #1	1147	.016	.027	.025	.095	
Reach #1	1146	.016	.027	.025		
Reach #1	1145	.016	.027	.095		
Reach #1	1144.5	Lat Struct				
Reach #1	1144	.016	.027	.095		
Reach #1	1143	.016	.027	.095		
Reach #1	1142	.075	.016	.027		
Reach #1	1141	.016	.027	.095		
Reach #1	1140	.016	.027	.095		
Reach #1	1139.9	.075	.027	.095		
Reach #1	1139.5	Bridge				
Reach #1	1139.1	.075	.027	.095		
Reach #1	1139	.075	.027	.025	.095	
Reach #1	1138	.075	.025	.027	.025	
Reach #1	1137	.095	.025	.03	.025	.095
Reach #1	1136	.095	.025	.03		

Reach #1	1135	.095	.025	.03	.025	.095
Reach #1	1134	.095	.025	.03	.025	.095
Reach #1	1132.9	.095	.03	.095		
Reach #1	1132.5	Bridge				
Reach #1	1132.1	.095	.03	.095		
Reach #1	1132	.095	.03	.095		
Reach #1	1131	.095	.027	.095		
Reach #1	1130	.095	.027	.095		
Reach #1	1129	.095	.027	.095		
Reach #1	1128	.095	.027	.095		
Reach #1	1127.5	Lat Struct				
Reach #1	1127	.095	.027	.095		
Reach #1	1126	.095	.027	.095		
Reach #1	1125	.095	.027	.095		
Reach #1	1124.5	Lat Struct				
Reach #1	1124	.095	.027	.095		
Reach #1	1123	.095	.027	.095		
Reach #1	1122	.095	.027	.095		
Reach #1	1121	.095	.027	.095		
Reach #1	1120	.095	.027	.095		
Reach #1	1119	.095	.027	.095		
Reach #1	1118	.095	.027	.095		
Reach #1	1117	.095	.027	.095		
Reach #1	1116.5	Lat Struct				
Reach #1	1116.4	Lat Struct				
Reach #1	1116	.095	.027	.095		
Reach #1	1115	.095	.027	.095		
Reach #1	1114	.095	.027	.095		
Reach #1	1113	.095	.027	.095		
Reach #1	1112	.095	.027	.095		
Reach #1	1111	.095	.027	.095		
Reach #1	1110	.095	.027	.095		
Reach #1	1109	.095	.027	.095		
Reach #1	1107.9	.095	.015	.095		
Reach #1	1107.5	Bridge				
Reach #1	1107.1	.095	.015	.095		
Reach #1	1107	.095	.027	.095		
Reach #1	1106	.055	.026	.05		
Reach #1	1105.5	Lat Struct				
Reach #1	1105	.055	.026	.05		
Reach #1	1104	.055	.026	.05		
Reach #1	1103	.055	.026	.05		
Reach #1	1102	.055	.026	.05		
Reach #1	1101.6	.055	.026	.05		
Reach #1	1101.5	Bridge				
Reach #1	1101.4	.055	.026	.05		
Reach #1	1101.3	Lat Struct				
Reach #1	1101	.055	.026	.05		
Reach #1	1100	.055	.026	.026		
Reach #1	1099	.055	.026	.026		
Reach #1	1098	.055	.026	.026		
Reach #1	1097	.055	.026	.026		
Reach #1	1096	.055	.026	.05		
Reach #1	1095	.055	.026	.05		
Reach #1	1094	.055	.026	.05		
Reach #1	1093	.025	.026	.025	.05	
Reach #1	1092	.026	.05			
Reach #1	1091	.025	.026	.25		
Reach #1	1090	.025	.025	.033	.025	.055
Reach #1	1089	.025	.033	.025		
Reach #1	1088	.025	.033	.025		
Reach #1	1087	.055	.025	.033	.025	
Reach #1	1086	.055	.025	.033	.025	.055
Reach #1	1085	.025	.015	.055		
Reach #1	1084	.025	.015	.055		
Reach #1	1083	.025	.015	.025	.055	
Reach #1	1082	.025	.015	.025	.055	
Reach #1	1081	.025	.015	.025	.055	
Reach #1	1080	.025	.015	.025	.055	
Reach #1	1079	.025	.015	.025	.055	
Reach #1	1078	.025	.015	.025	.055	
Reach #1	1077	.025	.015	.025	.055	
Reach #1	1075.9	.055	.015	.055		
Reach #1	1075.5	Bridge				
Reach #1	1075.1	.055	.015	.055		
Reach #1	1075	.025	.015	.025		
Reach #1	1074	.025	.031	.025		

SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1173	190	200	150
Reach #1	1172	180	200	190
Reach #1	1171	220	200	201
Reach #1	1170	212	200	197
Reach #1	1169	110	80	40
Reach #1	1167.9	112	112	112
Reach #1	1167.5	Bridge		
Reach #1	1167.1	150	195	230
Reach #1	1167	160	223	189.36
Reach #1	1166	90	200	202
Reach #1	1165	102	200	212
Reach #1	1164	215	200	190
Reach #1	1163	155	200	212
Reach #1	1162	230	200	180
Reach #1	1161	245	200	192
Reach #1	1160	205	200	190
Reach #1	1159	206.54	200	200
Reach #1	1158	212	200	185
Reach #1	1157	202.058	200	200
Reach #1	1156	215	200	190
Reach #1	1155	212	200	195
Reach #1	1154	150	164	164
Reach #1	1152.9	102	102	102
Reach #1	1152.5	Bridge		
Reach #1	1152.1	134	134	134
Reach #1	1152	190	200	200
Reach #1	1151	193	200	200
Reach #1	1150	180	200	198
Reach #1	1149	115	200	199.956
Reach #1	1148	150	60	60
Reach #1	1147.5	180	60	60
Reach #1	1147.3	120	75	70
Reach #1	1147	220	200	198.468
Reach #1	1146	200	200	202
Reach #1	1145	215	200	195
Reach #1	1144.5	Lat Struct		
Reach #1	1144	220	200	212
Reach #1	1143	190	200	190
Reach #1	1142	196	200	200
Reach #1	1141	195	200	202
Reach #1	1140	114	94	87
Reach #1	1139.9	102	102	102
Reach #1	1139.5	Bridge		
Reach #1	1139.1	19	25	28
Reach #1	1139	132	175	185
Reach #1	1138	150	200	202
Reach #1	1137	185	200	210
Reach #1	1136	160	200	210
Reach #1	1135	155	200	210
Reach #1	1134	180	208	265
Reach #1	1132.9	112	112	112
Reach #1	1132.5	Bridge		
Reach #1	1132.1	80	80	90
Reach #1	1132	195	200	212
Reach #1	1131	170	200	235
Reach #1	1130	200	200	200
Reach #1	1129	195	200	190
Reach #1	1128	210	200	200
Reach #1	1127.5	Lat Struct		
Reach #1	1127	240	200	190
Reach #1	1126	260	200	180
Reach #1	1125	220	200	195
Reach #1	1124.5	Lat Struct		
Reach #1	1124	180	200	200.421
Reach #1	1123	202	200	200
Reach #1	1122	220	200	170
Reach #1	1121	225	200	200
Reach #1	1120	220	200	190
Reach #1	1119	210	200	190
Reach #1	1118	210	200	190
Reach #1	1117	185	199	215
Reach #1	1116.5	Lat Struct		
Reach #1	1116.4	Lat Struct		
Reach #1	1116	185	200	198
Reach #1	1115	250	200	190

Reach #1	1114	240	200	190
Reach #1	1113	215	200	185
Reach #1	1112	245	200	150
Reach #1	1111	195	200	195
Reach #1	1110	215	200	195
Reach #1	1109	320	224	150
Reach #1	1107.9	112	112	112
Reach #1	1107.5	Bridge		
Reach #1	1107.1	64	84	64
Reach #1	1107	200	180	200.57
Reach #1	1106	210	200	192
Reach #1	1105.5	Lat Struct		
Reach #1	1105	200	200	205
Reach #1	1104	200	200	120
Reach #1	1103	220	200	279.323
Reach #1	1102	20	26	31
Reach #1	1101.6	11.2	11.2	11.2
Reach #1	1101.5	Bridge		
Reach #1	1101.4	115	163	190
Reach #1	1101.3	Lat Struct		
Reach #1	1101	150	200	320
Reach #1	1100	230	199	250
Reach #1	1099	150	200	200
Reach #1	1098	250	200	140
Reach #1	1097	150	200	240
Reach #1	1096	150	200	200
Reach #1	1095	160	200	170
Reach #1	1094	185	200	240
Reach #1	1093	202	200	190
Reach #1	1092	175	162	125
Reach #1	1091	230	237	250
Reach #1	1090	205	200	193
Reach #1	1089	200	200	200.118
Reach #1	1088	199	199	204.09
Reach #1	1087	197	200	205
Reach #1	1086	197	200	202
Reach #1	1085	150	200	193
Reach #1	1084	215	200	193
Reach #1	1083	217	200	190
Reach #1	1082	200	200	200
Reach #1	1081	265	200	160
Reach #1	1080	221	200	185
Reach #1	1079	250	200	170
Reach #1	1078	215	200	190
Reach #1	1077	140	110	80
Reach #1	1075.9	92	92	92
Reach #1	1075.5	Bridge		
Reach #1	1075.1	180	198	220
Reach #1	1075	201	200	200
Reach #1	1074	191	200	205

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

Reach	River Sta.	Contr.	Expan.
Reach #1	1173	.1	.3
Reach #1	1172	.1	.3
Reach #1	1171	.1	.3
Reach #1	1170	.1	.3
Reach #1	1169	.1	.3
Reach #1	1167.9	.3	.5
Reach #1	1167.5	Bridge	
Reach #1	1167.1	.3	.5
Reach #1	1167	.1	.3
Reach #1	1166	.1	.3
Reach #1	1165	.1	.3
Reach #1	1164	.1	.3
Reach #1	1163	.1	.3
Reach #1	1162	.1	.3
Reach #1	1161	.1	.3
Reach #1	1160	.1	.3
Reach #1	1159	.1	.3
Reach #1	1158	.1	.3
Reach #1	1157	.1	.3
Reach #1	1156	.1	.3
Reach #1	1155	.1	.3

Reach #1	1154	.1	.3
Reach #1	1152.9	.3	.5
Reach #1	1152.5	Bridge	
Reach #1	1152.1	.3	.5
Reach #1	1152	.1	.3
Reach #1	1151	.1	.3
Reach #1	1150	.1	.3
Reach #1	1149	.1	.3
Reach #1	1148	.1	.3
Reach #1	1147.5	.1	.3
Reach #1	1147.3	.1	.3
Reach #1	1147	.1	.3
Reach #1	1146	.1	.3
Reach #1	1145	.1	.3
Reach #1	1144.5	Lat Struct	
Reach #1	1144	.1	.3
Reach #1	1143	.1	.3
Reach #1	1142	.1	.3
Reach #1	1141	.1	.3
Reach #1	1140	.1	.3
Reach #1	1139.9	.3	.5
Reach #1	1139.5	Bridge	
Reach #1	1139.1	.3	.5
Reach #1	1139	.1	.3
Reach #1	1138	.1	.3
Reach #1	1137	.1	.3
Reach #1	1136	.1	.3
Reach #1	1135	.1	.3
Reach #1	1134	.1	.3
Reach #1	1132.9	.3	.5
Reach #1	1132.5	Bridge	
Reach #1	1132.1	.3	.5
Reach #1	1132	.1	.3
Reach #1	1131	.1	.3
Reach #1	1130	.1	.3
Reach #1	1129	.1	.3
Reach #1	1128	.1	.3
Reach #1	1127.5	Lat Struct	
Reach #1	1127	.1	.3
Reach #1	1126	.1	.3
Reach #1	1125	.1	.3
Reach #1	1124.5	Lat Struct	
Reach #1	1124	.1	.3
Reach #1	1123	.1	.3
Reach #1	1122	.1	.3
Reach #1	1121	.1	.3
Reach #1	1120	.1	.3
Reach #1	1119	.1	.3
Reach #1	1118	.1	.3
Reach #1	1117	.1	.3
Reach #1	1116.5	Lat Struct	
Reach #1	1116.4	Lat Struct	
Reach #1	1116	.1	.3
Reach #1	1115	.1	.3
Reach #1	1114	.1	.3
Reach #1	1113	.1	.3
Reach #1	1112	.1	.3
Reach #1	1111	.1	.3
Reach #1	1110	.1	.3
Reach #1	1109	.1	.3
Reach #1	1107.9	.3	.5
Reach #1	1107.5	Bridge	
Reach #1	1107.1	.3	.5
Reach #1	1107	.1	.3
Reach #1	1106	.1	.3
Reach #1	1105.5	Lat Struct	
Reach #1	1105	.1	.3
Reach #1	1104	.1	.3
Reach #1	1103	.1	.3
Reach #1	1102	.1	.3
Reach #1	1101.6	.3	.5
Reach #1	1101.5	Bridge	
Reach #1	1101.4	.3	.5
Reach #1	1101.3	Lat Struct	
Reach #1	1101	.1	.3
Reach #1	1100	.1	.3
Reach #1	1099	.1	.3
Reach #1	1098	.1	.3
Reach #1	1097	.1	.3
Reach #1	1096	.1	.3
Reach #1	1095	.1	.3

Reach #1	1094	.1	.3
Reach #1	1093	.1	.3
Reach #1	1092	.1	.3
Reach #1	1091	.1	.3
Reach #1	1090	.1	.3
Reach #1	1089	.1	.3
Reach #1	1088	.1	.3
Reach #1	1087	.1	.3
Reach #1	1086	.1	.3
Reach #1	1085	.1	.3
Reach #1	1084	.1	.3
Reach #1	1083	.1	.3
Reach #1	1082	.1	.3
Reach #1	1081	.1	.3
Reach #1	1080	.1	.3
Reach #1	1079	.1	.3
Reach #1	1078	.1	.3
Reach #1	1077	.1	.3
Reach #1	1075.9	.3	.5
Reach #1	1075.5	Bridge	
Reach #1	1075.1	.3	.5
Reach #1	1075	.1	.3
Reach #1	1074	.1	.3



Group By Message ID

BR LF 01	<p>SECNO: 1167.5</p> <p>This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1763.89 is less than or equal to MinTopRd of 1767.39. 2. EGEL 3 of 1763.89 is less than MxLoCdU of 1764.02.</p>
BR LF 01	<p>SECNO: 1107.5</p> <p>This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1723.56 is less than or equal to MinTopRd of 1724.55. 2. EGEL 3 of 1723.56 is less than MxLoCdU of 1725.35.</p>
BR LF 01	<p>SECNO: 1101.5</p> <p>This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1719.38 is less than or equal to MinTopRd of 1721.87. 2. EGEL 3 of 1719.38 is less than MxLoCdU of 1722.</p>
BR PF 01	<p>SECNO: 1152.5</p> <p>This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1751.6 is less than or equal to MinTopRd of 1754.41 . 2. EGEL 3 of 1751.6 is greater than or equal to MxLoCdU of 1751.19 . 3. WSEL 2 of 1748.67 is less than MxLoCdD of 1751.24 .</p>
BR PF 01	<p>SECNO: 1075.5</p> <p>This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1696.99 is less than or equal to MinTopRd of 1697.07 . 2. EGEL 3 of 1696.99 is greater than or equal to MxLoCdU of 1692.42 . 3. WSEL 2 of 1690.83 is less than MxLoCdD of 1691.98 .</p>
BR PW 02	<p>SECNO: 1139.5</p> <p>This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is submerged pressure and weir flow because, 1. EGEL 3 of 1747.35 is greater than MinTopRd of 1742.92 . 2. EGEL 3 of 1747.35 is equal to or greater than MxLoCdU of 1732.662. 3. WSEL 2 of 1742.89 is equal to or greater than MxLoCdD of 1732.595 .</p>
BR PW 02	<p>SECNO: 1132.5</p> <p>This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is submerged pressure and weir flow because, 1. EGEL 3 of 1740.97 is greater than MinTopRd of 1740.74 . 2. EGEL 3 of 1740.97 is equal to or greater than MxLoCdU of 1735.39. 3. WSEL 2 of 1738.06 is equal to or greater than MxLoCdD of 1737.362 .</p>
BR PW 04	<p>SECNO: 1139.5</p> <p>This is a Bridge Section. High Flow Method is Energy Only. The selected profile is 1%-annual-chance. Type of flow is submerged pressure and weir flow. However, the EGEL difference between Sections 3 and 2 is more than 1.0 foot. Press/Weir should be selected as the High Flow Method.</p>
BR PW 06	<p>SECNO: 1132.5</p> <p>This is Bridge-UP. The selected profile is 1%-annual-chance. EGEL of 1740.97 at Section 3 is higher than the MinTopRd of 1740.74. However the WSEL of 1740.24 at BRU is less than MinTopRd. Please investigate the problem.</p>
MP SW 01DK	<p>The name of the stream is (River #1, Reach #1). The flow regime is subcritical or mixed flow. Starting water-surface elevations are computed from Known WSELs as the downstream boundary condition. Provide backup information on Known water-surface elevations or use same energy slope for all the profiles</p>

as the starting boundary condition and rerun the plan. (Known water surfaces were input from the 2008 Restudy model)

[MS MO 01B](#)

SECNO: 1139.5

This is (Bridge) section. However, multiple bridges or combination of culverts and bridges are modeled at this section. Multiple Opening Analysis must be selected from the Bridge Culvert Data window to analyze the structures properly. Multiple Openings Analysis is explained on page 5-1 of the Applications Guide (HEC, 2010).

[NT RC 01L](#)

SECNO: 1149

All of the left overbank Mannings "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1148

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1147.5

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1147.3

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1147

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1146

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1145

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the

procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1144.5

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1144

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1143

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1142

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1141

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 1140

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 05](#)

SECNO: 1173

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1172

NT RC 05	<p>SECNO: 1154</p> <p>The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.</p>
NT RC 05	<p>SECNO: 1149</p> <p>The left overbank n-value of 0.016 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.</p>
NT RC 05	<p>SECNO: 1148</p> <p>The left overbank n-value of 0.016 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.</p>
NT RC 05	<p>SECNO: 1146</p> <p>The left overbank n-value of 0.016 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.</p>
NT RC 05	<p>SECNO: 1138</p> <p>The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.</p>
NT TL 02	<p>SECNO: 1167.9</p> <p>Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).</p>
NT TL 02	<p>SECNO: 1167.1</p> <p>Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).</p>
NT TL 02	<p>SECNO: 1152.9</p> <p>Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).</p>
NT TL 02	<p>SECNO: 1152.1</p> <p>Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).</p>
NT TL 02	<p>SECNO: 1139.9</p>

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1139.1

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1132.9

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1132.1

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1107.9

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1107.1

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1101.6

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#)

SECNO: 1101.4

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[ST DT 01B](#)

SECNO: 1167.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 17.27. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1152.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 17.78. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1139.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 6.22. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1132.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 12.84. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1107.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 12.52. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1101.5

This is (Bridge-UP). 'Upstream Dist' of 0.1 in "Bridge Width Table" is less than the height of the bridge opening of 10. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#)

SECNO: 1075.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 10.15. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 02B](#)

SECNO: 1167.5

This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 17.27. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

[ST DT 02B](#)

SECNO: 1152.5

This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 17.78. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

[ST DT 02B](#)

SECNO: 1139.5

This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 6.22. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

ST DT 02B	<p>SECNO: 1132.5</p> <p>This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 12.84. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.</p>
ST DT 02B	<p>SECNO: 1107.5</p> <p>This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 12.52. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.</p>
ST DT 02B	<p>SECNO: 1101.5</p> <p>This is (Bridge-DN). 'Downstream Dist' of 0.1 in 'Bridge Width Table' is less than the height of the bridge opening of 10. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.</p>
ST DT 02B	<p>SECNO: 1075.5</p> <p>This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 10.15. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.</p>
ST DT 03	<p>SECNO: 1152.5</p> <p>This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 164 is longer than Section 2 channel distance of 134. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.</p>
ST DT 03	<p>SECNO: 1139.5</p> <p>This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 94 is longer than Section 2 channel distance of 25. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.</p>
ST DT 03	<p>SECNO: 1132.5</p> <p>This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 208 is longer than Section 2 channel distance of 80. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.</p>
ST DT 03	<p>SECNO: 1107.5</p> <p>This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 224 is longer than Section 2 channel distance of 84. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.</p>
ST IF 01S2L	<p>SECNO: 1167.5</p> <p>This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1761.23. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).</p>

[ST IF 01S2L](#) SECNO: 1152.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1748.67. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2L](#) SECNO: 1107.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1721.64. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2L](#) SECNO: 1101.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1717.07. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2L](#) SECNO: 1075.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1690.83. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1167.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1761.23. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1152.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1748.67. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1107.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1721.64. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1101.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1717.07. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1075.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1690.83. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1167.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1767.25. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1152.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1754.34. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1107.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1723.29. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1101.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1721.87. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1075.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1697.07. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1167.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1767.25. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1152.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1754.34. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1107.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1723.29. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1101.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1721.81. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1075.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1697.07. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2L](#) SECNO: 1139.5

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, left ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be less than the wsel2 of 1742.89 of the 1%-annual-chance profile. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2L](#) SECNO: 1132.5

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, left ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be less than the wsel2 of 1738.06 of the 1%-annual-chance profile. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2R](#) SECNO: 1139.5

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, right ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be less than the wsel2 of 1742.89 of the 1%-annual-chance profile. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2R](#) SECNO: 1132.5

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, right ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be less than the wsel2 of 1738.06 of the 1%-annual-chance profile. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3L](#) SECNO: 1139.5

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-UP). However, left ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1742.92. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3L](#) SECNO: 1132.5

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-UP). However, left ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to Imntprdu of 1739.21. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3R](#) SECNO: 1139.5

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, right ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1742.96. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3R](#) SECNO: 1132.5

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge). However, right ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1739.21. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[XS DC 03](#) SECNO: 1139.9

Discharge is different between the upstream side and downstream side of the structure for 1%-annual-chance flood. They should be the same.

[XS DC 03](#) SECNO: 1107.9

Discharge is different between the upstream side and downstream side of the structure for 1%-annual-chance flood. They should be the same.

[XS DT 01](#) SECNO: 1100

Both the right overbank distance of 250 and the left overbank distance of 230 are longer than the channel distance of 199 . Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences among the distances.

[XS DT 02L](#) SECNO: 1148

The Left overbank distance of 150 is greater than the channel distance of 60 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02L](#) SECNO: 1147.5

The Left overbank distance of 180 is greater than the channel distance of 60 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS EC 01BDL](#) SECNO: 1139.5

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1745.63 is higher than the starting combined GR and Road station elevation of 1735.61. The Left_Sta_Eff is equal to the starting GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC
01BDR](#)

SECNO: 1139.5

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1745.63 is higher than the ending combined GR and Road station elevation of 1735.8. The Right_Sta_Eff is equal to the ending GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUL](#) SECNO: 1139.5

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.06 is higher than the starting combined GR and Road station elevation of 1735.19. The Left_Sta_Eff is equal to the starting GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUL](#) SECNO: 1132.5

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1740.24 is higher than the starting combined GR and Road station elevation of 1733.23. The Left_Sta_Eff is equal to the starting GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC
01BUR](#)

SECNO: 1139.5

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747.06 is higher than the ending combined GR and Road station elevation of 1736.03. The Right_Sta_Eff is equal to the ending GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC
01BUR](#)

SECNO: 1132.5

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1740.24 is higher than the ending combined GR and Road station elevation of 1732.67. The Right_Sta_Eff is equal to the ending GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1147

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.49 is higher than the starting GR station elevation of 1745. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1145

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.12 is higher than the starting GR station elevation of 1746. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-

annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1144

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.17 is higher than the starting GR station elevation of 1746. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1143

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.08 is higher than the starting GR station elevation of 1746. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1142

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.05 is higher than the starting GR station elevation of 1746. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1141

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.02 is higher than the starting GR station elevation of 1745. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1140

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747 is higher than the starting GR station elevation of 1745. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1139.9

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1747.06 is higher than the starting GR station elevation of 1735.19. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1139.1

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1742.89 is higher than the starting GR station elevation of 1735.61. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to

block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1139

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1742.5 is higher than the starting GR station elevation of 1742. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1134

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1740.25 is higher than the starting GR station elevation of 1740. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1132.9

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1740.24 is higher than the starting GR station elevation of 1733.23. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1132.1

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1738.06 is higher than the starting GR station elevation of 1733.45. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1130

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1737.3 is higher than the starting GR station elevation of 1737. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1124

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1734.42 is higher than the starting GR station elevation of 1733. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1122

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1733.22 is higher than the starting GR station elevation of 1733. The Left_Sta_Eff is equal to the starting GR station. If there

is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1121

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1732.84 is higher than the starting GR station elevation of 1731. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1120

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1731.1 is higher than the starting GR station elevation of 1731. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1119

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1730.73 is higher than the starting GR station elevation of 1730. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1118

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1729.82 is higher than the starting GR station elevation of 1729. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1117

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1728.72 is higher than the starting GR station elevation of 1728. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1116

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1728.47 is higher than the starting GR station elevation of 1727. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1115

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1728.15 is higher than the starting GR station elevation of 1727. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1111

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1724 is higher than the starting GR station elevation of 1723. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1110

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1723.76 is higher than the starting GR station elevation of 1722. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1109

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1723.58 is higher than the starting GR station elevation of 1722. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1106

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1720.39 is higher than the starting GR station elevation of 1720. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1105

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1720.08 is higher than the starting GR station elevation of 1718. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#) SECNO: 1104

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1719.76 is higher than the starting GR station elevation of 1718. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1103

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1719.55 is higher than the starting GR station elevation of 1717. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1102

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1718.89 is higher than the starting GR station elevation of 1716. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1101.6

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1718.08 is higher than the starting GR station elevation of 1717.87. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1097

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1713.27 is higher than the starting GR station elevation of 1713. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1094

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1711 is higher than the starting GR station elevation of 1710. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1093

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1710.98 is higher than the starting GR station elevation of 1709. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1091

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1708.03 is higher than the starting GR station elevation of 1708. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 1090

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1707.68 is higher than the starting GR station elevation of 1707. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1143

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747.08 is higher than the ending GR station elevation of 1743. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1142

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747.05 is higher than the ending GR station elevation of 1744. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1141

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747.02 is higher than the ending GR station elevation of 1745. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1140

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747 is higher than the ending GR station elevation of 1744. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1139.9

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1747.06 is higher than the ending GR station elevation of 1736.03. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1139.1

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1742.89 is higher than the ending GR station elevation of 1735.8. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1136

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1740.7 is higher than the ending GR station elevation of 1740. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1135

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1740.43 is higher than the ending GR station elevation of 1740. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1132.9

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1740.24 is higher than the ending GR station elevation of 1732.67. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1132.1

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1738.06 is higher than the ending GR station elevation of 1733.21. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1130

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1737.3 is higher than the ending GR station elevation of 1737. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1127

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1735.87 is higher than the ending GR station elevation of 1735. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1126

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1735.47 is higher than the ending GR station elevation of 1735. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1125

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.83 is higher than the ending GR station elevation of 1734. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1124

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.42 is higher than the ending GR station elevation of 1734. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1123

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1733.73 is higher than the ending GR station elevation of 1733. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1122

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1733.22 is higher than the ending GR station elevation of 1733. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1120

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1731.1 is higher than the ending GR station elevation of 1730. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1119

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1730.73 is higher than the ending GR station elevation of 1729. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1118

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1729.82 is higher than the ending GR station elevation of 1728. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1117

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1728.72 is higher than the ending GR station elevation of 1728. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1116

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1728.47 is higher than the ending GR station elevation of 1726. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1115

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1728.15 is higher than the ending GR station elevation of 1727. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1114

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1726.08 is higher than the ending GR station elevation of 1725. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1113

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1725.1 is higher than the ending GR station elevation of 1725. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1110

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1723.76 is higher than the ending GR station elevation of 1723. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1109

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1723.58 is higher than the ending GR station elevation of 1722. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1107

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1722.05 is higher than the ending GR station elevation of 1722. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1103

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1719.55 is higher than the ending GR station elevation of 1719. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1101.6

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1718.08 is higher than the ending GR station elevation of 1717.81. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1099

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1714.22 is higher than the ending GR station elevation of 1714. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1097

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1713.27 is higher than the ending GR station elevation of 1713. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1091

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1708.03 is higher than the ending GR station elevation of 1708. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1075.9

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1694.65 is higher than the ending GR station elevation of 1682.41. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1075.1

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1690.83 is higher than the ending GR station elevation of 1681.96. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS SW 01DK](#)

SECNO: 1074

The name of the stream is River #1, Reach #1. The flow regime is subcritical or mixed flow. Starting WSEL is computed from Known WSEL as the downstream boundary for 1%-annual-chance flood. Provide backup information on Known WSEL or use energy slope as the downstream boundary.



Las Vegas Wash HEC-RAS Output
Standard Table 1
Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LV Wash	1173	PF 1	11948	1754.00	1764.42	1763.70	1767.26	0.005606	13.51	885.93	126.48	0.87
LV Wash	1172	PF 1	11948	1750.89	1764.46	1762.07	1766.11	0.002941	10.59	1255.70	280.70	0.63
LV Wash	1171	PF 1	11948	1750.66	1763.55		1765.46	0.003269	11.13	1096.70	167.80	0.67
LV Wash	1170	PF 1	11948	1750.75	1762.78		1764.77	0.003538	11.32	1056.13	132.34	0.69
LV Wash	1169	PF 1	11948	1749.77	1762.74		1764.03	0.002083	9.14	1307.89	145.27	0.54
LV Wash	1168.8	PF 1	11948	1748.87	1762.65	1759.27	1763.93	0.002151	9.10	1312.89	149.78	0.54
LV Wash	1168.5		Bonanza Bridge									
LV Wash	1167.8	PF 1	11948	1747.65	1759.46	1759.46	1762.72	0.008173	14.48	825.16	128.28	1.01
LV Wash	1167.1	PF 1	11948	1746.27	1752.42	1755.20	1761.58	0.007136	24.29	491.96	95.58	1.89
LV Wash	1167	PF 1	11948	1746.53	1758.51	1755.23	1760.17	0.000564	10.33	1157.14	118.98	0.58
LV Wash	1166.8	PF 1	11948	1746.33	1758.24		1760.11	0.000632	10.97	1089.47	109.48	0.61
LV Wash	1166.5	PF 1	11948	1745.78	1755.26	1755.26	1759.66	0.002013	16.84	709.52	81.37	1.00
LV Wash	1163.1	PF 1	11948	1743.67	1752.01	1753.11	1757.79	0.003085	19.29	619.26	80.00	1.22
LV Wash	1159.8	PF 1	11948	1741.81	1750.23	1751.25	1755.87	0.002966	19.05	627.13	80.01	1.20
LV Wash	1159.7	PF 1	12706	1741.74	1753.02	1750.04	1754.93	0.000685	11.10	1145.03	109.96	0.61
LV Wash	1158.6	PF 1	12706	1741.26	1752.99		1754.75	0.000599	10.65	1193.21	109.45	0.57
LV Wash	1158.1	PF 1	12706	1741.08	1750.18	1750.18	1754.43	0.002007	16.55	767.92	91.19	1.00
LV Wash	1157.1	PF 1	12706	1740.09	1749.19	1749.26	1753.55	0.002067	16.77	757.89	90.00	1.02
LV Wash	1154.5	PF 1	12706	1739.45	1748.35	1748.65	1752.95	0.002247	17.22	737.96	90.00	1.06
LV Wash	1153.5	PF 1	12706	1737.85	1745.15	1747.05	1752.21	0.004397	21.32	596.00	90.00	1.46
LV Wash	1152.95	PF 1	12706	1736.78	1743.72	1745.97	1751.61	0.005249	22.55	563.56	90.00	1.59
LV Wash	1152.5		Stewart Avenue Bridge									
LV Wash	1151.9	PF 1	12706	1735.27	1743.18	1744.44	1749.10	0.003335	19.53	650.66	90.00	1.28
LV Wash	1151.1	PF 1	12754	1734.12	1741.41	1743.31	1748.53	0.004441	21.42	595.53	90.00	1.47
LV Wash	1150.7	PF 1	12754	1733.42	1740.47	1742.61	1748.16	0.005014	22.25	573.13	90.00	1.55
LV Wash	1150.2	PF 1	12754	1733.28	1740.49	1742.47	1747.80	0.004634	21.71	587.58	90.00	1.50
LV Wash	1150.1	PF 1	12754	1733.27	1738.81	1741.39	1747.62	0.008146	23.82	535.51	115.50	1.95
LV Wash	1149.1	PF 1	12754	1732.57	1744.27	1740.69	1745.89	0.000552	10.22	1248.38	115.65	0.55
LV Wash	1148.1	PF 1	12754	1731.94	1741.14	1741.14	1745.41	0.001986	16.58	769.43	90.00	1.00
LV Wash	1146.6	PF 1	12754	1730.68	1739.18	1739.87	1744.28	0.002622	18.11	704.09	90.00	1.14
LV Wash	1144.5	PF 1	12754	1729.38	1737.79	1738.57	1743.00	0.002710	18.31	696.73	90.00	1.16
LV Wash	1142.9	PF 1	12754	1728.63	1737.03	1737.82	1742.26	0.002736	18.36	694.48	89.98	1.16
LV Wash	1140.6	PF 1	12754	1727.26	1735.44	1736.44	1740.97	0.002986	18.88	675.50	89.99	1.21
LV Wash	1140.5	PF 1	12754	1726.17	1733.44	1735.36	1740.62	0.004499	21.50	593.09	90.00	1.48
LV Wash	1140.1	PF 1	12754	1725.17	1731.23	1733.87	1740.16	0.007100	23.98	531.76	100.41	1.84
LV Wash	1139.97	PF 1	12754	1724.64	1730.60	1733.35	1739.92	0.007603	24.50	520.50	99.98	1.89
LV Wash	1139.95	PF 1	12754	1723.74	1729.64	1732.44	1739.15	0.007851	24.75	515.34	100.00	1.92
LV Wash	1139.5		Charleston Boulevard Bridge									
LV Wash	1139.15	PF 1	12754	1722.48	1728.50	1731.17	1737.58	0.007289	24.18	527.43	100.00	1.86
LV Wash	1138.5	PF 1	13326	1721.88	1728.21	1730.83	1737.07	0.006646	23.89	557.90	99.97	1.78
LV Wash	1137.1	PF 1	13326	1718.89	1732.88	1727.83	1734.45	0.000444	10.07	1323.83	100.00	0.49
LV Wash	1136.3	PF 1	13326	1718.70	1732.85		1734.39	0.000428	9.95	1339.79	99.99	0.48
LV Wash	1134.7	PF 1	13326	1718.12	1732.79		1734.21	0.000382	9.58	1390.97	99.98	0.45
LV Wash	1134.1	PF 1	13326	1717.91	1732.76		1734.15	0.000366	9.45	1410.23	99.97	0.44
LV Wash	1133.8	PF 1	13326	1717.81	1731.96		1734.05	0.000608	11.62	1147.30	84.97	0.56
LV Wash	1132.8	PF 1	13515	1717.60	1731.85	1727.45	1733.97	0.000611	11.68	1156.84	84.99	0.56
LV Wash	1132.5		Nellis Boulevard Bridge									
LV Wash	1132.3	PF 1	13515	1717.35	1731.57		1733.70	0.000614	11.71	1154.60	85.00	0.56
LV Wash	1131.8	PF 1	13515	1717.20	1731.54		1733.63	0.000598	11.60	1165.06	85.00	0.55
LV Wash	1130.5	PF 1	13515	1716.81	1731.47		1733.47	0.000559	11.34	1191.82	85.00	0.53
LV Wash	1127.9	PF 1	13515	1716.05	1731.35		1733.12	0.000470	10.69	1264.29	85.00	0.49
LV Wash	1127.7	PF 1	13515	1715.97	1731.77		1732.91	0.000389	8.56	1578.26	168.59	0.49
LV Wash	1127.6	PF 1	13515	1715.95	1731.76		1732.90	0.001254	8.55	1580.22	168.25	0.49
LV Wash	1127.4	PF 1	13515	1715.88	1731.96		1732.74	0.000835	7.10	1904.08	198.45	0.40
LV Wash	1127.2	PF 1	13515	1715.82	1731.88		1732.70	0.000868	7.28	1856.73	191.68	0.41
LV Wash	1126.9	PF 1	13515	1715.74	1731.87		1732.64	0.000817	7.07	1912.05	197.24	0.40
LV Wash	1126.7	PF 1	13515	1715.65	1731.44		1732.54	0.001257	8.41	1606.15	175.74	0.49

Las Vegas Wash HEC-RAS Output
Standard Table 1
Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LV Wash	1126.5	PF 1	13515	1715.57	1731.49		1732.46	0.001205	7.90	1711.23	200.05	0.48
LV Wash	1126.3	PF 1	13515	1715.50	1731.52		1732.40	0.001165	7.54	1791.78	219.23	0.46
LV Wash	1126.2	PF 1	13515	1715.44	1731.50		1732.37	0.001156	7.50	1802.76	221.28	0.46
LV Wash	1125.9	PF 1	13515	1715.33	1731.48		1732.30	0.001221	7.26	1860.87	250.08	0.47
LV Wash	1125.8	PF 1	13515	1715.24	1731.47		1732.25	0.001035	7.09	1906.60	234.47	0.44
LV Wash	1125.7	PF 1	13515	1715.16	1731.46		1732.21	0.000922	6.92	1953.40	228.16	0.42
LV Wash	1125.6	PF 1	13515	1715.07	1731.03		1732.13	0.001334	8.41	1606.16	183.62	0.50
LV Wash	1125.5	PF 1	13515	1715.01	1730.72		1732.07	0.001519	9.32	1450.58	156.07	0.54
LV Wash	1125.3	PF 1	13515	1714.95	1730.38		1732.00	0.001840	10.23	1321.12	142.00	0.59
LV Wash	1125.1	PF 1	13515	1714.83	1730.24		1731.91	0.001823	10.37	1302.66	135.76	0.59
LV Wash	1124.8	PF 1	13515	1714.70	1730.16		1731.81	0.001825	10.33	1308.73	137.52	0.59
LV Wash	1124.6	PF 1	13515	1714.58	1730.08		1731.72	0.001841	10.28	1315.25	140.26	0.59
LV Wash	1124.5	PF 1	13515	1714.52	1730.04		1731.67	0.001839	10.26	1317.12	140.67	0.59
LV Wash	1124.4	PF 1	13515	1714.45	1730.02		1731.60	0.001969	10.10	1338.66	154.81	0.61
LV Wash	1124.2	PF 1	13515	1714.33	1730.13		1731.41	0.002153	9.10	1485.80	216.85	0.61
LV Wash	1124.1	PF 1	13515	1714.28	1730.34		1731.26	0.001728	7.71	1752.79	279.27	0.54
LV Wash	1123.8	PF 1	13515	1714.18	1730.10		1731.18	0.001853	8.32	1624.54	242.96	0.57
LV Wash	1123.6	PF 1	13515	1714.08	1729.62		1731.06	0.002015	9.63	1403.93	178.55	0.61
LV Wash	1123.4	PF 1	13515	1713.96	1729.67		1730.92	0.001453	9.00	1502.42	165.45	0.53
LV Wash	1123.2	PF 1	13515	1713.84	1729.71		1730.81	0.001281	8.40	1607.98	178.98	0.49
LV Wash	1122.8	PF 1	13515	1713.71	1729.85		1730.67	0.000927	7.23	1868.12	204.81	0.42
LV Wash	1122.6	PF 1	13515	1713.59	1729.88		1730.59	0.000872	6.77	1994.88	231.10	0.41
LV Wash	1122.4	PF 1	13515	1713.48	1729.57		1730.53	0.001068	7.86	1718.46	184.47	0.45
LV Wash	1122.2	PF 1	13515	1713.34	1729.37		1730.45	0.001230	8.33	1622.58	177.47	0.49
LV Wash	1121.8	PF 1	13515	1713.22	1729.33		1730.38	0.001205	8.21	1645.40	181.02	0.48
LV Wash	1121.6	PF 1	13515	1713.09	1729.37		1730.28	0.000998	7.65	1766.36	187.88	0.44
LV Wash	1121.4	PF 1	13515	1712.97	1729.20		1730.22	0.001124	8.09	1670.85	178.43	0.47
LV Wash	1121.2	PF 1	13515	1712.82	1729.27		1730.10	0.000952	7.32	1845.77	202.71	0.43
LV Wash	1120.8	PF 1	13515	1712.69	1729.21		1730.05	0.001104	7.36	1835.53	223.84	0.45
LV Wash	1120.6	PF 1	13515	1712.56	1729.15		1729.98	0.001305	7.34	1840.78	255.82	0.48
LV Wash	1120.4	PF 1	13515	1712.43	1729.02		1729.92	0.001396	7.58	1783.07	248.09	0.50
LV Wash	1120.2	PF 1	13515	1712.36	1728.60	1723.66	1729.78	0.001298	8.71	1551.03	163.51	0.50
LV Wash	1120		Inline Weir - Low Flow Crossing									
LV Wash	1119.2	PF 1	13515	1711.81	1725.98		1727.68	0.002192	10.47	1291.43	154.39	0.64
LV Wash	1118.8	PF 1	13515	1711.69	1726.20		1727.28	0.001484	8.35	1618.88	204.51	0.52
LV Wash	1118.6	PF 1	13515	1711.57	1726.27		1727.16	0.001093	7.61	1776.48	205.08	0.46
LV Wash	1118.4	PF 1	13515	1711.49	1726.34		1727.08	0.000869	6.93	1950.65	218.15	0.41
LV Wash	1118.2	PF 1	13515	1711.36	1726.31		1727.03	0.000844	6.80	1987.17	223.71	0.40
LV Wash	1117.8	PF 1	13515	1711.24	1726.26		1726.99	0.000994	6.83	1979.77	251.01	0.43
LV Wash	1117.6	PF 1	13515	1711.12	1726.17		1726.93	0.001138	7.00	1931.26	261.25	0.45
LV Wash	1117.4	PF 1	13515	1711.01	1726.12		1726.87	0.001215	6.98	1935.77	276.21	0.46
LV Wash	1117.2	PF 1	13515	1710.87	1725.71		1726.76	0.002124	8.20	1647.65	280.52	0.60
LV Wash	1116.9	PF 1	13515	1710.74	1725.41		1726.63	0.002217	8.87	1523.76	237.66	0.62
LV Wash	1116.7	PF 1	13515	1710.68	1725.30		1726.57	0.002243	9.04	1494.68	228.30	0.62
LV Wash	1116.5	PF 1	13515	1710.61	1725.29		1726.49	0.001885	8.80	1536.37	214.31	0.58
LV Wash	1116.3	PF 1	13515	1710.52	1725.47		1726.33	0.001602	7.43	1818.76	290.56	0.52
LV Wash	1116.2	PF 1	13515	1710.43	1725.43	1720.60	1726.26	0.001591	7.30	1850.84	301.85	0.52
LV Wash	1116		Inline Weir - Low Flow Crossing									
LV Wash	1115.2	PF 1	13515	1709.86	1723.51		1725.98	0.003150	12.60	1072.34	125.94	0.76
LV Wash	1114.9	PF 1	13515	1709.74	1723.93		1725.35	0.001533	9.54	1416.00	147.73	0.54
LV Wash	1114.7	PF 1	13515	1709.65	1723.89		1725.29	0.001511	9.50	1422.27	147.76	0.54
LV Wash	1114.5	PF 1	13515	1709.56	1723.85		1725.23	0.001472	9.41	1436.63	148.59	0.53
LV Wash	1114.4	PF 1	13515	1709.51	1723.81		1725.19	0.001476	9.42	1434.55	148.33	0.53
LV Wash	1114.2	PF 1	13515	1709.38	1723.70		1725.11	0.001600	9.51	1421.87	154.97	0.55
LV Wash	1113.9	PF 1	13515	1709.19	1723.21		1724.93	0.002157	10.53	1283.77	150.38	0.63
LV Wash	1113.7	PF 1	13515	1709.14	1723.22		1724.86	0.002115	10.27	1315.77	157.83	0.63
LV Wash	1113.6	PF 1	13515	1709.01	1723.54		1724.58	0.001820	8.19	1649.42	250.01	0.56

Las Vegas Wash HEC-RAS Output
Standard Table 1
Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LV Wash	1113.5	PF 1	13515	1708.95	1723.34		1724.52	0.002046	8.70	1552.67	234.70	0.60
LV Wash	1113.3	PF 1	13515	1708.82	1722.78		1724.37	0.002282	10.11	1336.80	174.32	0.64
LV Wash	1113.1	PF 1	13515	1708.76	1722.18		1724.25	0.002999	11.54	1171.43	153.18	0.74
LV Wash	1112.8	PF 1	13515	1708.63	1721.85		1724.07	0.003173	11.96	1130.29	145.99	0.76
LV Wash	1112.6	PF 1	13515	1708.44	1721.88		1723.83	0.002682	11.22	1204.86	151.12	0.70
LV Wash	1112.4	PF 1	13515	1708.33	1721.59		1723.72	0.003284	11.72	1152.83	157.69	0.76
LV Wash	1112.2	PF 1	13515	1708.08	1721.74		1723.32	0.003245	10.06	1342.93	230.72	0.74
LV Wash	1111.9	PF 1	13515	1707.98	1721.70		1723.21	0.003360	9.86	1371.05	249.64	0.74
LV Wash	1111.7	PF 1	13515	1707.72	1721.55		1722.89	0.003734	9.28	1457.12	315.41	0.76
LV Wash	1111.5	PF 1	13515	1707.54	1721.43		1722.67	0.003749	8.95	1510.08	346.37	0.76
LV Wash	1111.3	PF 1	13515	1707.44	1721.31		1722.57	0.003253	9.01	1499.32	305.56	0.72
LV Wash	1111.1	PF 1	13515	1707.36	1721.31		1722.48	0.002697	8.70	1553.53	289.74	0.66
LV Wash	1110.9	PF 1	13515	1707.25	1721.25		1722.41	0.001749	8.63	1566.49	212.52	0.56
LV Wash	1110.7	PF 1	13515	1707.01	1720.91		1722.26	0.002015	9.33	1448.32	194.30	0.60
LV Wash	1110.5	PF 1	13515	1706.93	1720.55		1722.13	0.002198	10.08	1340.37	170.20	0.63
LV Wash	1110.3	PF 1	13515	1706.89	1720.47		1722.07	0.002201	10.14	1332.41	167.82	0.63
LV Wash	1110.1	PF 1	13515	1706.83	1720.21		1721.96	0.002344	10.63	1271.48	156.25	0.66
LV Wash	1109.9	PF 1	13861	1706.80	1719.99		1721.91	0.002395	11.12	1246.31	145.10	0.67
LV Wash	1109.8	PF 1	13861	1706.77	1719.92		1721.86	0.002460	11.20	1238.00	145.65	0.68
LV Wash	1109.6	PF 1	13861	1706.70	1719.84		1721.70	0.003102	10.92	1268.92	185.51	0.74
LV Wash	1109.5	PF 1	13861	1706.67	1719.83		1721.62	0.003170	10.73	1292.12	197.53	0.74
LV Wash	1109.3	PF 1	13861	1706.62	1719.86		1721.48	0.002555	10.22	1356.89	189.37	0.67
LV Wash	1109.1	PF 1	13861	1706.54	1719.92		1721.28	0.002334	9.34	1484.25	222.06	0.64
LV Wash	1108.9	PF 1	13861	1706.46	1719.86		1721.14	0.002281	9.08	1526.68	234.36	0.63
LV Wash	1108.8	PF 1	13861	1706.42	1719.71		1721.07	0.002534	9.34	1483.26	235.99	0.66
LV Wash	1108.7	PF 1	13861	1706.39	1719.56		1721.00	0.002772	9.63	1439.39	234.18	0.68
LV Wash	1108.5	PF 1	13861	1706.33	1719.28		1720.87	0.003130	10.14	1367.50	225.58	0.73
LV Wash	1108.3	PF 1	13861	1706.23	1719.19		1720.64	0.002853	9.66	1435.34	244.54	0.69
LV Wash	1108.2	PF 1	13861	1706.16	1719.18		1720.50	0.001707	9.25	1499.02	179.26	0.56
LV Wash	1107.95	PF 1	13861	1706.09	1719.33	1715.23	1720.26	0.001224	7.73	1792.25	219.11	0.48
LV Wash	1107.5		Proposed Sahara Avenue Bridge									
LV Wash	1107.15	PF 1	13861	1705.78	1719.04		1719.98	0.001191	7.76	1786.49	235.22	0.47
LV Wash	1107.1	PF 1	13861	1705.72	1718.90		1719.92	0.001207	8.12	1708.04	191.43	0.48
LV Wash	1106.8	PF 1	13861	1705.41	1718.83		1719.89	0.001227	8.23	1683.27	187.04	0.48
LV Wash	1106.6	PF 1	13861	1704.79	1718.00		1719.74	0.002484	10.57	1311.36	170.52	0.67
LV Wash	1106.4	PF 1	13861	1704.50	1717.46		1719.56	0.002840	11.64	1191.00	147.73	0.72
LV Wash	1106.2	PF 1	13861	1704.21	1717.45		1719.37	0.002517	11.12	1246.33	151.18	0.68
LV Wash	1105.8	PF 1	13861	1703.92	1717.60		1719.13	0.002571	9.92	1396.90	205.30	0.67
LV Wash	1105.6	PF 1	13861	1703.64	1717.94		1718.86	0.001364	7.69	1803.45	242.41	0.50
LV Wash	1105.4	PF 1	13861	1703.35	1717.73		1718.77	0.001562	8.20	1690.78	228.23	0.53
LV Wash	1105.2	PF 1	13861	1703.14	1717.50		1718.69	0.002206	8.74	1585.20	251.93	0.61
LV Wash	1104.8	PF 1	13861	1702.76	1717.10		1718.51	0.002793	9.52	1455.90	242.84	0.69
LV Wash	1104.6	PF 1	13861	1702.47	1716.94		1718.36	0.003015	9.55	1451.04	255.18	0.71
LV Wash	1104.4	PF 1	13861	1702.34	1716.78		1718.23	0.003225	9.64	1437.19	262.09	0.73
LV Wash	1104.2	PF 1	13861	1702.16	1716.51		1718.02	0.003261	9.86	1405.76	249.92	0.73
LV Wash	1104.1	PF 1	13861	1702.01	1716.12		1717.85	0.002738	10.54	1314.89	184.73	0.70
LV Wash	1103.8	PF 1	13861	1701.78	1716.39		1717.46	0.002415	8.33	1663.54	304.92	0.63
LV Wash	1103.6	PF 1	13861	1701.68	1716.14		1717.36	0.002672	8.89	1558.63	279.24	0.66
LV Wash	1103.4	PF 1	13861	1701.54	1715.81		1717.21	0.003023	9.49	1460.89	260.30	0.71
LV Wash	1103.2	PF 1	13861	1701.37	1715.47		1717.04	0.002636	10.06	1378.37	202.38	0.68
LV Wash	1102.8	PF 1	13861	1701.23	1715.32		1716.92	0.002571	10.15	1365.63	193.97	0.67
LV Wash	1102.6	PF 1	13861	1701.06	1715.05		1716.76	0.002634	10.50	1320.00	181.20	0.69
LV Wash	1102.4	PF 1	13861	1700.97	1714.82		1716.66	0.002655	10.90	1271.37	165.76	0.69
LV Wash	1102.2	PF 1	13861	1700.88	1714.98		1716.49	0.002020	9.86	1405.30	173.49	0.61
LV Wash	1102.1	PF 1	13861	1700.76	1714.53		1716.33	0.006105	10.77	1286.52	152.55	0.65
LV Wash	1101.8	PF 1	13861	1700.66	1713.53		1716.03	0.008564	12.68	1093.16	130.07	0.77
LV Wash	1101.3	PF 1	13861	1700.46	1712.44	1711.55	1715.34	0.010846	13.68	1013.39	128.81	0.86

Las Vegas Wash HEC-RAS Output
Standard Table 1
Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LV Wash	1101.2	PF 1	13861	1700.28	1711.95		1714.65	0.010046	13.19	1051.23	133.42	0.83
LV Wash	1100.8	PF 1	13861	1700.16	1712.20		1714.08	0.006800	10.99	1261.38	157.92	0.69
LV Wash	1100.6	PF 1	13861	1700.01	1712.40		1713.76	0.001912	9.35	1482.57	191.13	0.59
LV Wash	1100.4	PF 1	13861	1699.86	1712.56		1713.56	0.001535	8.02	1728.35	238.60	0.53
LV Wash	1100.2	PF 1	18601	1699.39	1712.77		1713.24	0.000901	5.49	3386.00	552.84	0.39
LV Wash	1099.8	PF 1	18601	1699.29	1712.69		1713.19	0.000946	5.65	3291.11	534.04	0.40
LV Wash	1099.4	PF 1	18601	1699.11	1712.58	1709.50	1713.11	0.000944	5.83	3192.62	494.08	0.40
LV Wash	1099.3		Inline Weir - Low Flow Crossing									
LV Wash	1097.5	PF 1	18601	1698.16	1711.19		1712.05	0.001554	7.43	2504.60	391.00	0.52
LV Wash	1096.6	PF 1	18601	1697.84	1710.74		1711.72	0.001542	7.92	2349.04	332.44	0.52
LV Wash	1096.4	PF 1	18601	1697.76	1710.43		1711.61	0.001800	8.75	2126.86	291.02	0.57
LV Wash	1096.2	PF 1	18601	1697.68	1710.08		1711.50	0.001781	9.56	1944.77	230.32	0.58
LV Wash	1095.8	PF 1	18601	1697.59	1709.98		1711.41	0.001728	9.61	1935.37	222.25	0.57
LV Wash	1095.6	PF 1	18601	1697.51	1709.56		1711.28	0.002198	10.53	1766.02	211.70	0.64
LV Wash	1095.4	PF 1	18601	1697.42	1709.47		1711.16	0.002163	10.44	1781.59	213.83	0.64
LV Wash	1095.2	PF 1	18601	1697.34	1709.37		1711.05	0.002147	10.40	1789.30	215.00	0.64
LV Wash	1094.8	PF 1	18601	1697.24	1709.23		1710.93	0.002176	10.47	1777.15	213.43	0.64
LV Wash	1094.6	PF 1	18601	1697.16	1707.19	1707.19	1710.66	0.001757	14.95	1244.49	180.20	1.00
LV Wash	1094.4	PF 1	18601	1697.07	1705.54	1706.39	1710.42	0.002446	17.72	1049.44	149.06	1.18
LV Wash	1094.2	PF 1	18601	1696.99	1705.42	1706.31	1710.35	0.002489	17.83	1043.47	148.90	1.19
LV Wash	1093.8	PF 1	18601	1696.93	1705.33	1706.25	1710.30	0.002522	17.90	1038.98	148.78	1.19
LV Wash	1093.6	PF 1	18601	1696.90	1705.30	1706.22	1710.27	0.002521	17.90	1039.12	148.78	1.19
LV Wash	1093.4	PF 1	18601	1696.83	1705.26	1706.15	1710.19	0.002489	17.83	1043.48	148.90	1.19
LV Wash	1093.2	PF 1	18601	1696.39	1704.40	1705.70	1709.97	0.003004	18.95	981.42	147.23	1.29
LV Wash	1092.8	PF 1	18601	1696.00	1703.76	1705.31	1709.77	0.003366	19.67	945.67	146.25	1.36
LV Wash	1092.6	PF 1	18601	1695.61	1703.18	1704.92	1709.56	0.003691	20.27	917.84	145.49	1.42
LV Wash	1092.4	PF 1	18601	1695.22	1702.64	1704.53	1709.34	0.003977	20.76	895.85	144.88	1.47
LV Wash	1092.2	PF 1	18601	1694.88	1702.19	1704.19	1709.13	0.004207	21.15	879.64	144.43	1.51
LV Wash	1091.8	PF 1	18601	1694.66	1701.99	1703.97	1708.89	0.004162	21.07	882.73	144.52	1.50
LV Wash	1091.6	PF 1	18601	1694.47	1701.82	1703.78	1708.67	0.004118	21.00	885.81	144.60	1.50
LV Wash	1091.4	PF 1	18601	1694.28	1701.64	1703.59	1708.47	0.004096	20.96	887.34	144.65	1.49
LV Wash	1091.2	PF 1	18672	1694.09	1701.54	1703.41	1708.22	0.003951	20.75	900.01	145.00	1.47
LV Wash	1090.8	PF 1	18672	1693.90	1701.35	1703.21	1708.03	0.003946	20.74	900.35	145.01	1.47
LV Wash	1090.6	PF 1	18672	1693.70	1701.15	1703.02	1707.83	0.003945	20.74	900.38	145.01	1.47
LV Wash	1090.4	PF 1	18672	1693.51	1700.86	1702.76	1707.62	0.004004	20.86	895.09	144.43	1.48
LV Wash	1090.2	PF 1	18672	1693.32	1700.68	1702.58	1707.42	0.004005	20.83	896.33	145.04	1.48
LV Wash	1089.8	PF 1	18672	1693.13	1700.57	1702.42	1707.19	0.003897	20.64	904.46	145.34	1.46
LV Wash	1089.6	PF 1	18672	1692.94	1700.38	1702.22	1707.00	0.003896	20.64	904.80	145.46	1.46
LV Wash	1089.4	PF 1	18672	1692.74	1700.20	1702.04	1706.80	0.003891	20.62	905.51	145.63	1.46
LV Wash	1089.2	PF 1	18672	1692.55	1700.02	1701.85	1706.61	0.003887	20.60	906.30	145.86	1.46
LV Wash	1088.8	PF 1	18672	1692.36	1699.81	1701.66	1706.41	0.003895	20.61	905.95	145.96	1.46
LV Wash	1088.6	PF 1	18672	1692.17	1699.60	1701.47	1706.21	0.003912	20.63	904.90	146.01	1.46
LV Wash	1088.4	PF 1	18672	1691.98	1699.34	1701.21	1706.01	0.003955	20.72	901.28	145.68	1.47
LV Wash	1088.2	PF 1	18672	1691.79	1699.10	1701.01	1705.80	0.003988	20.78	898.61	145.50	1.47
LV Wash	1087.8	PF 1	18672	1691.59	1698.92	1700.81	1705.61	0.003973	20.75	899.93	145.61	1.47
LV Wash	1087.6	PF 1	18672	1691.40	1698.76	1700.61	1705.40	0.003934	20.68	902.95	145.78	1.46
LV Wash	1087.4	PF 1	18672	1691.21	1698.65	1700.45	1705.18	0.003830	20.50	910.95	146.04	1.45
LV Wash	1087.2	PF 1	18672	1691.02	1698.45	1700.26	1704.98	0.003838	20.51	910.45	146.06	1.45
LV Wash	1086.8	PF 1	18672	1690.83	1698.13	1699.98	1704.76	0.003929	20.67	903.26	145.73	1.46
LV Wash	1086.6	PF 1	18672	1690.63	1697.93	1699.79	1704.57	0.003934	20.67	903.26	145.87	1.46
LV Wash	1086.4	PF 1	18672	1690.44	1697.79	1699.62	1704.36	0.003882	20.58	907.41	146.11	1.46
LV Wash	1086.2	PF 1	18672	1690.25	1697.54	1699.42	1704.16	0.003958	20.66	903.91	146.95	1.47
LV Wash	1085.8	PF 1	18672	1690.06	1697.24	1699.15	1703.95	0.004102	20.78	898.35	148.85	1.49
LV Wash	1085.6	PF 1	18672	1689.91	1697.03	1698.99	1703.78	0.004188	20.85	895.74	150.21	1.50
LV Wash	1085.4	PF 1	18672	1689.81	1696.88	1698.86	1703.67	0.004266	20.91	892.98	151.25	1.52
LV Wash	1085.2	PF 1	18672	1689.66	1696.21	1698.41	1703.46	0.004936	21.61	864.20	156.07	1.62
LV Wash	1085	PF 1	18672	1689.15	1695.81	1697.96	1702.99	0.004841	21.50	868.46	155.67	1.60

Las Vegas Wash HEC-RAS Output
Standard Table 1
Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
LV Wash	1084	PF 1	18672	1688.48	1694.76	1697.01	1701.94	0.005954	21.50	868.63	182.90	1.74
LV Wash	1083	PF 1	18672	1687.51	1694.44	1696.23	1700.69	0.004033	20.06	930.74	161.62	1.47
LV Wash	1082	PF 1	18672	1686.52	1693.72	1695.46	1699.88	0.003858	19.93	936.97	158.98	1.45
LV Wash	1081	PF 1	18672	1686.41	1694.42	1695.09	1698.74	0.002343	16.68	1119.67	170.52	1.15
LV Wash	1080	PF 1	18672	1685.42	1692.91	1694.16	1698.12	0.003045	18.32	1019.16	164.05	1.30
LV Wash	1079	PF 1	18672	1684.44	1691.72	1693.24	1697.42	0.003463	19.16	974.36	161.58	1.38
LV Wash	1078	PF 1	18672	1683.50	1694.72	1692.38	1696.71	0.000701	11.32	1692.12	247.11	0.66
LV Wash	1077	PF 1	18672	1682.50	1694.66		1696.55	0.000598	11.04	1715.47	199.15	0.61
LV Wash	1075.9	PF 1	18672	1682.27	1693.56	1691.23	1696.38	0.000918	13.46	1386.96	123.61	0.71
LV Wash	1075.5		Vegas Valley Bridge									
LV Wash	1075.1	PF 1	18672	1681.88	1689.90	1690.82	1695.47	0.002698	18.94	985.75	123.61	1.18
LV Wash	1075	PF 1	18718	1681.00	1688.23	1690.07	1694.58	0.004012	20.22	925.85	158.36	1.47
LV Wash	1074	PF 1	18718	1681.00	1691.15	1689.58	1693.54	0.004090	12.40	1509.72	182.80	0.76

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
LV Wash	1173	PF 1	1767.26	1764.42	2.83	0.79	0.36	1.09	11945.28	1.63	126.48
LV Wash	1172	PF 1	1766.11	1764.46	1.65	0.62	0.03	726.19	11221.81		280.70
LV Wash	1171	PF 1	1765.46	1763.55	1.91	0.68	0.01	82.20	11865.80		167.80
LV Wash	1170	PF 1	1764.77	1762.78	1.99	0.53	0.21	1.45	11946.55		132.34
LV Wash	1169	PF 1	1764.03	1762.74	1.30	0.09	0.00		11948.00		145.27
LV Wash	1168.8	PF 1	1763.93	1762.65	1.29	0.12	0.02		11948.00		149.78
LV Wash	1168.5		Bonanza Bridge								
LV Wash	1167.8	PF 1	1762.72	1759.46	3.26	0.10	0.44		11948.00		128.28
LV Wash	1167.1	PF 1	1761.58	1752.42	9.16	0.55	0.59		11948.00		95.58
LV Wash	1167	PF 1	1760.17	1758.51	1.66	0.04	0.02		11948.00		118.98
LV Wash	1166.8	PF 1	1760.11	1758.24	1.87	0.19	0.25		11948.00		109.48
LV Wash	1166.5	PF 1	1759.66	1755.26	4.40	1.43	0.00		11948.00		81.37
LV Wash	1163.1	PF 1	1757.79	1752.01	5.78	1.73	0.14		11948.00		80.00
LV Wash	1159.8	PF 1	1755.87	1750.23	5.64	1.87	0.04		11948.00		80.01
LV Wash	1159.7	PF 1	1754.93	1753.02	1.91	0.13	0.05		12706.00		109.96
LV Wash	1158.6	PF 1	1754.75	1752.99	1.76	0.08	0.25		12706.00		109.45
LV Wash	1158.1	PF 1	1754.43	1750.18	4.25	0.86	0.00		12706.00		91.19
LV Wash	1157.1	PF 1	1753.55	1749.19	4.36	0.87	0.01		12706.00		90.00
LV Wash	1154.5	PF 1	1752.95	1748.35	4.60	0.57	0.02		12706.00		90.00
LV Wash	1153.5	PF 1	1752.21	1745.15	7.06	0.50	0.25		12706.00		90.00
LV Wash	1152.95	PF 1	1751.61	1743.72	7.89	0.51	0.08		12706.00		90.00
LV Wash	1152.5		Stewart Avenue Bridge								
LV Wash	1151.9	PF 1	1749.10	1743.18	5.92				12706.00		90.00
LV Wash	1151.1	PF 1	1748.53	1741.41	7.12	0.44	0.12		12754.00		90.00
LV Wash	1150.7	PF 1	1748.16	1740.47	7.69	0.33	0.06		12754.00		90.00
LV Wash	1150.2	PF 1	1747.80	1740.49	7.32	0.24	0.11		12754.00		90.00
LV Wash	1150.1	PF 1	1747.62	1738.81	8.81	0.03	0.15		12754.00		115.50
LV Wash	1149.1	PF 1	1745.89	1744.27	1.62	0.21	0.26		12754.00		115.65
LV Wash	1148.1	PF 1	1745.41	1741.14	4.27	0.91	0.00		12754.00		90.00
LV Wash	1146.6	PF 1	1744.28	1739.18	5.10	1.04	0.08		12754.00		90.00
LV Wash	1144.5	PF 1	1743.00	1737.79	5.20	1.26	0.01		12754.00		90.00
LV Wash	1142.9	PF 1	1742.26	1737.03	5.24	0.74	0.00		12754.00		89.98
LV Wash	1140.6	PF 1	1740.97	1735.44	5.54	1.26	0.03		12754.00		89.99
LV Wash	1140.5	PF 1	1740.62	1733.44	7.18	0.20	0.16		12754.00		90.00
LV Wash	1140.1	PF 1	1740.16	1731.23	8.93	0.28	0.18		12754.00		100.41
LV Wash	1139.97	PF 1	1739.92	1730.60	9.32	0.20	0.04		12754.00		99.98
LV Wash	1139.95	PF 1	1739.15	1729.64	9.51	0.75	0.02		12754.00		100.00
LV Wash	1139.5		Charleston Boulevard Bridge								
LV Wash	1139.15	PF 1	1737.58	1728.50	9.08	0.19	0.01		12754.00		100.00
LV Wash	1138.5	PF 1	1737.07	1728.21	8.86	0.45	0.07		13326.00		99.97
LV Wash	1137.1	PF 1	1734.45	1732.88	1.57	0.05	0.01		13326.00		100.00
LV Wash	1136.3	PF 1	1734.39	1732.85	1.54	0.14	0.03		13326.00		99.99
LV Wash	1134.7	PF 1	1734.21	1732.79	1.43	0.05	0.01		13326.00		99.98
LV Wash	1134.1	PF 1	1734.15	1732.76	1.39	0.03	0.07		13326.00		99.97
LV Wash	1133.8	PF 1	1734.05	1731.96	2.09	0.08	0.00		13326.00		84.97
LV Wash	1132.8	PF 1	1733.97	1731.85	2.12	0.02	0.03		13515.00		84.99
LV Wash	1132.5		Nellis Boulevard Bridge								
LV Wash	1132.3	PF 1	1733.70	1731.57	2.13	0.06	0.01		13515.00		85.00
LV Wash	1131.8	PF 1	1733.63	1731.54	2.09	0.14	0.03		13515.00		85.00
LV Wash	1130.5	PF 1	1733.47	1731.47	2.00	0.28	0.07		13515.00		85.00

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1127.9	PF 1	1733.12	1731.35	1.77	0.02	0.19		13515.00		85.00
LV Wash	1127.7	PF 1	1732.91	1731.77	1.14	0.01	0.00		13515.00		168.59
LV Wash	1127.6	PF 1	1732.90	1731.76	1.14	0.05	0.11		13515.00		168.25
LV Wash	1127.4	PF 1	1732.74	1731.96	0.78	0.04	0.00		13515.00		198.45
LV Wash	1127.2	PF 1	1732.70	1731.88	0.82	0.05	0.01		13515.00		191.68
LV Wash	1126.9	PF 1	1732.64	1731.87	0.78	0.07	0.03		13515.00		197.24
LV Wash	1126.7	PF 1	1732.54	1731.44	1.10	0.04	0.04		13515.00		175.74
LV Wash	1126.5	PF 1	1732.46	1731.49	0.97	0.03	0.03		13515.00		200.05
LV Wash	1126.3	PF 1	1732.40	1731.52	0.88	0.03	0.00		13515.00		219.23
LV Wash	1126.2	PF 1	1732.37	1731.50	0.87	0.06	0.02		13515.00		221.28
LV Wash	1125.9	PF 1	1732.30	1731.48	0.82	0.04	0.01		13515.00		250.08
LV Wash	1125.8	PF 1	1732.25	1731.47	0.78	0.03	0.01		13515.00		234.47
LV Wash	1125.7	PF 1	1732.21	1731.46	0.74	0.04	0.04		13515.00		228.16
LV Wash	1125.6	PF 1	1732.13	1731.03	1.10	0.04	0.02		13515.00		183.62
LV Wash	1125.5	PF 1	1732.07	1730.72	1.35	0.04	0.03		13515.00		156.07
LV Wash	1125.3	PF 1	1732.00	1730.38	1.63	0.09	0.00		13515.00		142.00
LV Wash	1125.1	PF 1	1731.91	1730.24	1.67	0.09	0.00		13515.00		135.76
LV Wash	1124.8	PF 1	1731.81	1730.16	1.66	0.09	0.00		13515.00		137.52
LV Wash	1124.6	PF 1	1731.72	1730.08	1.64	0.04	0.00		13515.00		140.26
LV Wash	1124.5	PF 1	1731.67	1730.04	1.63	0.05	0.02		13515.00		140.67
LV Wash	1124.4	PF 1	1731.60	1730.02	1.58	0.10	0.09		13515.00		154.81
LV Wash	1124.2	PF 1	1731.41	1730.13	1.28	0.04	0.11		13515.00		216.85
LV Wash	1124.1	PF 1	1731.26	1730.34	0.92	0.07	0.02		13515.00		279.27
LV Wash	1123.8	PF 1	1731.18	1730.10	1.07	0.08	0.04		13515.00		242.96
LV Wash	1123.6	PF 1	1731.06	1729.62	1.44	0.08	0.05		13515.00		178.55
LV Wash	1123.4	PF 1	1730.92	1729.67	1.26	0.07	0.05		13515.00		165.45
LV Wash	1123.2	PF 1	1730.81	1729.71	1.10	0.05	0.09		13515.00		178.98
LV Wash	1122.8	PF 1	1730.67	1729.85	0.81	0.04	0.03		13515.00		204.81
LV Wash	1122.6	PF 1	1730.59	1729.88	0.71	0.04	0.02		13515.00		231.10
LV Wash	1122.4	PF 1	1730.53	1729.57	0.96	0.07	0.01		13515.00		184.47
LV Wash	1122.2	PF 1	1730.45	1729.37	1.08	0.06	0.01		13515.00		177.47
LV Wash	1121.8	PF 1	1730.38	1729.33	1.05	0.05	0.04		13515.00		181.02
LV Wash	1121.6	PF 1	1730.28	1729.37	0.91	0.05	0.01		13515.00		187.88
LV Wash	1121.4	PF 1	1730.22	1729.20	1.02	0.06	0.06		13515.00		178.43
LV Wash	1121.2	PF 1	1730.10	1729.27	0.83	0.05	0.00		13515.00		202.71
LV Wash	1120.8	PF 1	1730.05	1729.21	0.84	0.06	0.00		13515.00		223.84
LV Wash	1120.6	PF 1	1729.98	1729.15	0.84	0.06	0.01		13515.00		255.82
LV Wash	1120.4	PF 1	1729.92	1729.02	0.89	0.05	0.09		13515.00		248.09
LV Wash	1120.2	PF 1	1729.78	1728.60	1.18				13515.00		163.51
LV Wash	1120		Inline Weir - Low Flow Crossing								
LV Wash	1119.2	PF 1	1727.68	1725.98	1.70	0.09	0.31		13515.00		154.39
LV Wash	1118.8	PF 1	1727.28	1726.20	1.08	0.06	0.06		13515.00		204.51
LV Wash	1118.6	PF 1	1727.16	1726.27	0.90	0.03	0.05		13515.00		205.08
LV Wash	1118.4	PF 1	1727.08	1726.34	0.75	0.04	0.01		13515.00		218.15
LV Wash	1118.2	PF 1	1727.03	1726.31	0.72	0.05	0.00		13515.00		223.71
LV Wash	1117.8	PF 1	1726.99	1726.26	0.72	0.05	0.00		13515.00		251.01
LV Wash	1117.6	PF 1	1726.93	1726.17	0.76	0.05	0.00		13515.00		261.25
LV Wash	1117.4	PF 1	1726.87	1726.12	0.76	0.09	0.03		13515.00		276.21
LV Wash	1117.2	PF 1	1726.76	1725.71	1.04	0.11	0.02		13515.00		280.52
LV Wash	1116.9	PF 1	1726.63	1725.41	1.22	0.06	0.00		13515.00		237.66

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1116.7	PF 1	1726.57	1725.30	1.27	0.05	0.02		13515.00		228.30
LV Wash	1116.5	PF 1	1726.49	1725.29	1.20	0.06	0.10		13515.00		214.31
LV Wash	1116.3	PF 1	1726.33	1725.47	0.86	0.05	0.01		13515.00		290.56
LV Wash	1116.2	PF 1	1726.26	1725.43	0.83				13515.00		301.85
LV Wash	1116		Inline Weir - Low Flow Crossing								
LV Wash	1115.2	PF 1	1725.98	1723.51	2.47	0.11	0.53		13515.00		125.94
LV Wash	1114.9	PF 1	1725.35	1723.93	1.41	0.05	0.00		13515.00		147.73
LV Wash	1114.7	PF 1	1725.29	1723.89	1.40	0.05	0.01		13515.00		147.76
LV Wash	1114.5	PF 1	1725.23	1723.85	1.37	0.03	0.00		13515.00		148.59
LV Wash	1114.4	PF 1	1725.19	1723.81	1.38	0.08	0.00		13515.00		148.33
LV Wash	1114.2	PF 1	1725.11	1723.70	1.40	0.15	0.03		13515.00		154.97
LV Wash	1113.9	PF 1	1724.93	1723.21	1.72	0.04	0.02		13515.00		150.38
LV Wash	1113.7	PF 1	1724.86	1723.22	1.64	0.10	0.18		13515.00		157.83
LV Wash	1113.6	PF 1	1724.58	1723.54	1.04	0.05	0.01		13515.00		250.01
LV Wash	1113.5	PF 1	1724.52	1723.34	1.18	0.11	0.04		13515.00		234.70
LV Wash	1113.3	PF 1	1724.37	1722.78	1.59	0.07	0.05		13515.00		174.32
LV Wash	1113.1	PF 1	1724.25	1722.18	2.07	0.16	0.02		13515.00		153.18
LV Wash	1112.8	PF 1	1724.07	1721.85	2.22	0.16	0.08		13515.00		145.99
LV Wash	1112.6	PF 1	1723.83	1721.88	1.95	0.09	0.02		13515.00		151.12
LV Wash	1112.4	PF 1	1723.72	1721.59	2.13	0.24	0.17		13515.00		157.69
LV Wash	1112.2	PF 1	1723.32	1721.74	1.57	0.09	0.02		13515.00		230.72
LV Wash	1111.9	PF 1	1723.21	1721.70	1.51	0.27	0.05		13515.00		249.64
LV Wash	1111.7	PF 1	1722.89	1721.55	1.34	0.19	0.03		13515.00		315.41
LV Wash	1111.5	PF 1	1722.67	1721.43	1.24	0.10	0.00		13515.00		346.37
LV Wash	1111.3	PF 1	1722.57	1721.31	1.26	0.06	0.03		13515.00		305.56
LV Wash	1111.1	PF 1	1722.48	1721.31	1.18	0.07	0.01		13515.00		289.74
LV Wash	1110.9	PF 1	1722.41	1721.25	1.16	0.13	0.02		13515.00		212.52
LV Wash	1110.7	PF 1	1722.26	1720.91	1.35	0.11	0.02		13515.00		194.30
LV Wash	1110.5	PF 1	1722.13	1720.55	1.58	0.06	0.00		13515.00		170.20
LV Wash	1110.3	PF 1	1722.07	1720.47	1.60	0.09	0.02		13515.00		167.82
LV Wash	1110.1	PF 1	1721.96	1720.21	1.75	0.04	0.02		13515.00		156.25
LV Wash	1109.9	PF 1	1721.91	1719.99	1.92	0.05	0.00		13861.00		145.10
LV Wash	1109.8	PF 1	1721.86	1719.92	1.95	0.14	0.03		13861.00		145.65
LV Wash	1109.6	PF 1	1721.70	1719.84	1.85	0.06	0.02		13861.00		185.51
LV Wash	1109.5	PF 1	1721.62	1719.83	1.79	0.09	0.05		13861.00		197.53
LV Wash	1109.3	PF 1	1721.48	1719.86	1.62	0.12	0.08		13861.00		189.37
LV Wash	1109.1	PF 1	1721.28	1719.92	1.35	0.12	0.02		13861.00		222.06
LV Wash	1108.9	PF 1	1721.14	1719.86	1.28	0.07	0.01		13861.00		234.36
LV Wash	1108.8	PF 1	1721.07	1719.71	1.36	0.06	0.01		13861.00		235.99
LV Wash	1108.7	PF 1	1721.00	1719.56	1.44	0.11	0.02		13861.00		234.18
LV Wash	1108.5	PF 1	1720.87	1719.28	1.60	0.19	0.04		13861.00		225.58
LV Wash	1108.3	PF 1	1720.64	1719.19	1.45	0.10	0.04		13860.14	0.86	244.54
LV Wash	1108.2	PF 1	1720.50	1719.18	1.33	0.04	0.20		13861.00		179.26
LV Wash	1107.95	PF 1	1720.26	1719.33	0.93	0.03	0.03		13861.00		219.11
LV Wash	1107.5		Proposed Sahara Avenue Bridge								
LV Wash	1107.15	PF 1	1719.98	1719.04	0.93	0.03	0.03		13861.00		235.22
LV Wash	1107.1	PF 1	1719.92	1718.90	1.02	0.03	0.00		13861.00		191.43
LV Wash	1106.8	PF 1	1719.89	1718.83	1.05	0.08	0.07		13861.00		187.04
LV Wash	1106.6	PF 1	1719.74	1718.00	1.73	0.14	0.04		13861.00		170.52
LV Wash	1106.4	PF 1	1719.56	1717.46	2.10	0.13	0.05		13861.00		147.73

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1106.2	PF 1	1719.37	1717.45	1.92	0.13	0.12		13861.00		151.18
LV Wash	1105.8	PF 1	1719.13	1717.60	1.53	0.09	0.18		13861.00		205.30
LV Wash	1105.6	PF 1	1718.86	1717.94	0.92	0.07	0.01		13861.00		242.41
LV Wash	1105.4	PF 1	1718.77	1717.73	1.04	0.07	0.01		13861.00		228.23
LV Wash	1105.2	PF 1	1718.69	1717.50	1.19	0.16	0.02		13861.00		251.93
LV Wash	1104.8	PF 1	1718.51	1717.10	1.41	0.15	0.00		13861.00		242.84
LV Wash	1104.6	PF 1	1718.36	1716.94	1.42	0.13	0.00		13861.00		255.18
LV Wash	1104.4	PF 1	1718.23	1716.78	1.44	0.20	0.01		13861.00		262.09
LV Wash	1104.2	PF 1	1718.02	1716.51	1.51	0.15	0.02		13861.00		249.92
LV Wash	1104.1	PF 1	1717.85	1716.12	1.73	0.19	0.19		13861.00		184.73
LV Wash	1103.8	PF 1	1717.46	1716.39	1.08	0.09	0.02		13861.00		304.92
LV Wash	1103.6	PF 1	1717.36	1716.14	1.23	0.13	0.02		13861.00		279.24
LV Wash	1103.4	PF 1	1717.21	1715.81	1.40	0.16	0.02		13861.00		260.30
LV Wash	1103.2	PF 1	1717.04	1715.47	1.57	0.12	0.00		13861.00		202.38
LV Wash	1102.8	PF 1	1716.92	1715.32	1.60	0.15	0.01		13861.00		193.97
LV Wash	1102.6	PF 1	1716.76	1715.05	1.71	0.08	0.01		13861.00		181.20
LV Wash	1102.4	PF 1	1716.66	1714.82	1.85	0.07	0.10		13861.00		165.76
LV Wash	1102.2	PF 1	1716.49	1714.98	1.51	0.13	0.03		13861.00		173.49
LV Wash	1102.1	PF 1	1716.33	1714.53	1.80	0.24	0.07		13861.00		152.55
LV Wash	1101.8	PF 1	1716.03	1713.53	2.50	0.64	0.04		13861.00		130.07
LV Wash	1101.3	PF 1	1715.34	1712.44	2.91	0.63	0.06		13861.00		128.81
LV Wash	1101.2	PF 1	1714.65	1711.95	2.70	0.32	0.25		13861.00		133.42
LV Wash	1100.8	PF 1	1714.08	1712.20	1.88	0.16	0.16		13861.00		157.92
LV Wash	1100.6	PF 1	1713.76	1712.40	1.36	0.09	0.11		13861.00		191.13
LV Wash	1100.4	PF 1	1713.56	1712.56	1.00	0.06	0.27		13861.00		238.60
LV Wash	1100.2	PF 1	1713.24	1712.77	0.47	0.05	0.01		18601.00		552.84
LV Wash	1099.8	PF 1	1713.19	1712.69	0.50	0.07	0.01		18601.00		534.04
LV Wash	1099.4	PF 1	1713.11	1712.58	0.53				18601.00		494.08
LV Wash	1099.3		Inline Weir - Low Flow Crossing								
LV Wash	1097.5	PF 1	1712.05	1711.19	0.86	0.29	0.04		18601.00		391.00
LV Wash	1096.6	PF 1	1711.72	1710.74	0.97	0.08	0.02		18601.00		332.44
LV Wash	1096.4	PF 1	1711.61	1710.43	1.19	0.09	0.02		18601.00		291.02
LV Wash	1096.2	PF 1	1711.50	1710.08	1.42	0.09	0.00		18601.00		230.32
LV Wash	1095.8	PF 1	1711.41	1709.98	1.43	0.10	0.03		18601.00		222.25
LV Wash	1095.6	PF 1	1711.28	1709.56	1.72	0.11	0.01		18601.00		211.70
LV Wash	1095.4	PF 1	1711.16	1709.47	1.69	0.11	0.00		18601.00		213.83
LV Wash	1095.2	PF 1	1711.05	1709.37	1.68	0.12	0.00		18601.00		215.00
LV Wash	1094.8	PF 1	1710.93	1709.23	1.70	0.10	0.18		18601.00		213.43
LV Wash	1094.6	PF 1	1710.66	1707.19	3.47	0.09	0.04		18601.00		180.20
LV Wash	1094.4	PF 1	1710.42	1705.54	4.88	0.10	0.14		18601.00		149.06
LV Wash	1094.2	PF 1	1710.35	1705.42	4.93	0.10	0.30		18601.00		148.90
LV Wash	1093.8	PF 1	1710.30	1705.33	4.98	0.07	0.32		18601.00		148.78
LV Wash	1093.6	PF 1	1710.27	1705.30	4.98	0.03	0.00		18601.00		148.78
LV Wash	1093.4	PF 1	1710.19	1705.26	4.93	0.09	0.33		18601.00		148.90
LV Wash	1093.2	PF 1	1709.97	1704.40	5.58	0.15	0.06		18601.00		147.23
LV Wash	1092.8	PF 1	1709.77	1703.76	6.01	0.16	0.04		18601.00		146.25
LV Wash	1092.6	PF 1	1709.56	1703.18	6.38	0.18	0.04		18601.00		145.49
LV Wash	1092.4	PF 1	1709.34	1702.64	6.69	0.19	0.03		18601.00		144.88
LV Wash	1092.2	PF 1	1709.13	1702.19	6.94	0.18	0.02		18601.00		144.43
LV Wash	1091.8	PF 1	1708.89	1701.99	6.89	0.24	0.01		18601.00		144.52

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1091.6	PF 1	1708.67	1701.82	6.85	0.21	0.01		18601.00		144.60
LV Wash	1091.4	PF 1	1708.47	1701.64	6.82	0.21	0.01		18601.00		144.65
LV Wash	1091.2	PF 1	1708.22	1701.54	6.68	0.20	0.04		18672.00		145.00
LV Wash	1090.8	PF 1	1708.03	1701.35	6.68	0.20	0.00		18672.00		145.01
LV Wash	1090.6	PF 1	1707.83	1701.15	6.68	0.20	0.00		18672.00		145.01
LV Wash	1090.4	PF 1	1707.62	1700.86	6.76	0.20	0.01		18672.00		144.43
LV Wash	1090.2	PF 1	1707.42	1700.68	6.74	0.20	0.01		18672.00		145.04
LV Wash	1089.8	PF 1	1707.19	1700.57	6.62	0.20	0.04		18672.00		145.34
LV Wash	1089.6	PF 1	1707.00	1700.38	6.61	0.19	0.00		18672.00		145.46
LV Wash	1089.4	PF 1	1706.80	1700.20	6.60	0.19	0.00		18672.00		145.63
LV Wash	1089.2	PF 1	1706.61	1700.02	6.59	0.19	0.00		18672.00		145.86
LV Wash	1088.8	PF 1	1706.41	1699.81	6.60	0.19	0.00		18672.00		145.96
LV Wash	1088.6	PF 1	1706.21	1699.60	6.61	0.20	0.00		18672.00		146.01
LV Wash	1088.4	PF 1	1706.01	1699.34	6.66	0.20	0.01		18672.00		145.68
LV Wash	1088.2	PF 1	1705.80	1699.10	6.70	0.20	0.00		18672.00		145.50
LV Wash	1087.8	PF 1	1705.61	1698.92	6.68	0.20	0.01		18672.00		145.61
LV Wash	1087.6	PF 1	1705.40	1698.76	6.64	0.20	0.01		18672.00		145.78
LV Wash	1087.4	PF 1	1705.18	1698.65	6.52	0.19	0.03		18672.00		146.04
LV Wash	1087.2	PF 1	1704.98	1698.45	6.53	0.19	0.00		18672.00		146.06
LV Wash	1086.8	PF 1	1704.76	1698.13	6.64	0.19	0.01		18672.00		145.73
LV Wash	1086.6	PF 1	1704.57	1697.93	6.64	0.20	0.00		18672.00		145.87
LV Wash	1086.4	PF 1	1704.36	1697.79	6.57	0.20	0.02		18672.00		146.11
LV Wash	1086.2	PF 1	1704.16	1697.54	6.63	0.20	0.01		18672.00		146.95
LV Wash	1085.8	PF 1	1703.95	1697.24	6.71	0.20	0.01		18672.00		148.85
LV Wash	1085.6	PF 1	1703.78	1697.03	6.75	0.17	0.00		18672.00		150.21
LV Wash	1085.4	PF 1	1703.67	1696.88	6.79	0.11	0.00		18672.00		151.25
LV Wash	1085.2	PF 1	1703.46	1696.21	7.25	0.16	0.05		18672.00		156.07
LV Wash	1085	PF 1	1702.99	1695.81	7.18	0.46	0.02		18672.00		155.67
LV Wash	1084	PF 1	1701.94	1694.76	7.18	1.06	0.00		18672.00		182.90
LV Wash	1083	PF 1	1700.69	1694.44	6.25	0.97	0.28		18672.00		161.62
LV Wash	1082	PF 1	1699.88	1693.72	6.17	0.79	0.02		18672.00		158.98
LV Wash	1081	PF 1	1698.74	1694.42	4.32	0.59	0.55		18672.00		170.52
LV Wash	1080	PF 1	1698.12	1692.91	5.21	0.53	0.09		18672.00		164.05
LV Wash	1079	PF 1	1697.42	1691.72	5.70	0.65	0.05		18672.00		161.58
LV Wash	1078	PF 1	1696.71	1694.72	1.98	0.13	0.03	58.85	18609.13	4.03	247.11
LV Wash	1077	PF 1	1696.55	1694.66	1.89	0.08	0.09	36.16	18635.84		199.15
LV Wash	1075.9	PF 1	1696.38	1693.56	2.81				18672.00		123.61
LV Wash	1075.5		Vegas Valley Bridge								
LV Wash	1075.1	PF 1	1695.47	1689.90	5.57				18672.00		123.61
LV Wash	1075	PF 1	1694.58	1688.23	6.35	0.65	0.23		18718.00		158.36
LV Wash	1074	PF 1	1693.54	1691.15	2.39				18718.00		182.80

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
LV Wash	1173	PF 1	1767.26	1764.42	2.83	0.79	0.36	1.09	11945.28	1.63	126.48
LV Wash	1172	PF 1	1766.11	1764.46	1.65	0.62	0.03	726.19	11221.81		280.70
LV Wash	1171	PF 1	1765.46	1763.55	1.91	0.68	0.01	82.20	11865.80		167.80
LV Wash	1170	PF 1	1764.77	1762.78	1.99	0.53	0.21	1.45	11946.55		132.34
LV Wash	1169	PF 1	1764.03	1762.74	1.30	0.09	0.00		11948.00		145.27
LV Wash	1168.8	PF 1	1763.93	1762.65	1.29	0.12	0.02		11948.00		149.78
LV Wash	1168.5		Bonanza Bridge								
LV Wash	1167.8	PF 1	1762.72	1759.46	3.26	0.10	0.44		11948.00		128.28
LV Wash	1167.1	PF 1	1761.58	1752.42	9.16	0.55	0.59		11948.00		95.58
LV Wash	1167	PF 1	1760.17	1758.51	1.66	0.04	0.02		11948.00		118.98
LV Wash	1166.8	PF 1	1760.11	1758.24	1.87	0.19	0.25		11948.00		109.48
LV Wash	1166.5	PF 1	1759.66	1755.26	4.40	1.43	0.00		11948.00		81.37
LV Wash	1163.1	PF 1	1757.79	1752.01	5.78	1.73	0.14		11948.00		80.00
LV Wash	1159.8	PF 1	1755.87	1750.23	5.64	1.87	0.04		11948.00		80.01
LV Wash	1159.7	PF 1	1754.93	1753.02	1.91	0.13	0.05		12706.00		109.96
LV Wash	1158.6	PF 1	1754.75	1752.99	1.76	0.08	0.25		12706.00		109.45
LV Wash	1158.1	PF 1	1754.43	1750.18	4.25	0.86	0.00		12706.00		91.19
LV Wash	1157.1	PF 1	1753.55	1749.19	4.36	0.87	0.01		12706.00		90.00
LV Wash	1154.5	PF 1	1752.95	1748.35	4.60	0.57	0.02		12706.00		90.00
LV Wash	1153.5	PF 1	1752.21	1745.15	7.06	0.50	0.25		12706.00		90.00
LV Wash	1152.95	PF 1	1751.61	1743.72	7.89	0.51	0.08		12706.00		90.00
LV Wash	1152.5		Stewart Avenue Bridge								
LV Wash	1151.9	PF 1	1749.10	1743.18	5.92				12706.00		90.00
LV Wash	1151.1	PF 1	1748.53	1741.41	7.12	0.44	0.12		12754.00		90.00
LV Wash	1150.7	PF 1	1748.16	1740.47	7.69	0.33	0.06		12754.00		90.00
LV Wash	1150.2	PF 1	1747.80	1740.49	7.32	0.24	0.11		12754.00		90.00
LV Wash	1150.1	PF 1	1747.62	1738.81	8.81	0.03	0.15		12754.00		115.50
LV Wash	1149.1	PF 1	1745.89	1744.27	1.62	0.21	0.26		12754.00		115.65
LV Wash	1148.1	PF 1	1745.41	1741.14	4.27	0.91	0.00		12754.00		90.00
LV Wash	1146.6	PF 1	1744.28	1739.18	5.10	1.04	0.08		12754.00		90.00
LV Wash	1144.5	PF 1	1743.00	1737.79	5.20	1.26	0.01		12754.00		90.00
LV Wash	1142.9	PF 1	1742.26	1737.03	5.24	0.74	0.00		12754.00		89.98
LV Wash	1140.6	PF 1	1740.97	1735.44	5.54	1.26	0.03		12754.00		89.99
LV Wash	1140.5	PF 1	1740.62	1733.44	7.18	0.20	0.16		12754.00		90.00
LV Wash	1140.1	PF 1	1740.16	1731.23	8.93	0.28	0.18		12754.00		100.41
LV Wash	1139.97	PF 1	1739.92	1730.60	9.32	0.20	0.04		12754.00		99.98
LV Wash	1139.95	PF 1	1739.15	1729.64	9.51	0.75	0.02		12754.00		100.00
LV Wash	1139.5		Charleston Boulevard Bridge								
LV Wash	1139.15	PF 1	1737.58	1728.50	9.08	0.19	0.01		12754.00		100.00
LV Wash	1138.5	PF 1	1737.07	1728.21	8.86	0.45	0.07		13326.00		99.97
LV Wash	1137.1	PF 1	1734.45	1732.88	1.57	0.05	0.01		13326.00		100.00
LV Wash	1136.3	PF 1	1734.39	1732.85	1.54	0.14	0.03		13326.00		99.99
LV Wash	1134.7	PF 1	1734.21	1732.79	1.43	0.05	0.01		13326.00		99.98
LV Wash	1134.1	PF 1	1734.15	1732.76	1.39	0.03	0.07		13326.00		99.97
LV Wash	1133.8	PF 1	1734.05	1731.96	2.09	0.08	0.00		13326.00		84.97
LV Wash	1132.8	PF 1	1733.97	1731.85	2.12	0.02	0.03		13515.00		84.99
LV Wash	1132.5		Nellis Boulevard Bridge								
LV Wash	1132.3	PF 1	1733.70	1731.57	2.13	0.06	0.01		13515.00		85.00
LV Wash	1131.8	PF 1	1733.63	1731.54	2.09	0.14	0.03		13515.00		85.00
LV Wash	1130.5	PF 1	1733.47	1731.47	2.00	0.28	0.07		13515.00		85.00

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1127.9	PF 1	1733.12	1731.35	1.77	0.02	0.19		13515.00		85.00
LV Wash	1127.7	PF 1	1732.91	1731.77	1.14	0.01	0.00		13515.00		168.59
LV Wash	1127.6	PF 1	1732.90	1731.76	1.14	0.05	0.11		13515.00		168.25
LV Wash	1127.4	PF 1	1732.74	1731.96	0.78	0.04	0.00		13515.00		198.45
LV Wash	1127.2	PF 1	1732.70	1731.88	0.82	0.05	0.01		13515.00		191.68
LV Wash	1126.9	PF 1	1732.64	1731.87	0.78	0.07	0.03		13515.00		197.24
LV Wash	1126.7	PF 1	1732.54	1731.44	1.10	0.04	0.04		13515.00		175.74
LV Wash	1126.5	PF 1	1732.46	1731.49	0.97	0.03	0.03		13515.00		200.05
LV Wash	1126.3	PF 1	1732.40	1731.52	0.88	0.03	0.00		13515.00		219.23
LV Wash	1126.2	PF 1	1732.37	1731.50	0.87	0.06	0.02		13515.00		221.28
LV Wash	1125.9	PF 1	1732.30	1731.48	0.82	0.04	0.01		13515.00		250.08
LV Wash	1125.8	PF 1	1732.25	1731.47	0.78	0.03	0.01		13515.00		234.47
LV Wash	1125.7	PF 1	1732.21	1731.46	0.74	0.04	0.04		13515.00		228.16
LV Wash	1125.6	PF 1	1732.13	1731.03	1.10	0.04	0.02		13515.00		183.62
LV Wash	1125.5	PF 1	1732.07	1730.72	1.35	0.04	0.03		13515.00		156.07
LV Wash	1125.3	PF 1	1732.00	1730.38	1.63	0.09	0.00		13515.00		142.00
LV Wash	1125.1	PF 1	1731.91	1730.24	1.67	0.09	0.00		13515.00		135.76
LV Wash	1124.8	PF 1	1731.81	1730.16	1.66	0.09	0.00		13515.00		137.52
LV Wash	1124.6	PF 1	1731.72	1730.08	1.64	0.04	0.00		13515.00		140.26
LV Wash	1124.5	PF 1	1731.67	1730.04	1.63	0.05	0.02		13515.00		140.67
LV Wash	1124.4	PF 1	1731.60	1730.02	1.58	0.10	0.09		13515.00		154.81
LV Wash	1124.2	PF 1	1731.41	1730.13	1.28	0.04	0.11		13515.00		216.85
LV Wash	1124.1	PF 1	1731.26	1730.34	0.92	0.07	0.02		13515.00		279.27
LV Wash	1123.8	PF 1	1731.18	1730.10	1.07	0.08	0.04		13515.00		242.96
LV Wash	1123.6	PF 1	1731.06	1729.62	1.44	0.08	0.05		13515.00		178.55
LV Wash	1123.4	PF 1	1730.92	1729.67	1.26	0.07	0.05		13515.00		165.45
LV Wash	1123.2	PF 1	1730.81	1729.71	1.10	0.05	0.09		13515.00		178.98
LV Wash	1122.8	PF 1	1730.67	1729.85	0.81	0.04	0.03		13515.00		204.81
LV Wash	1122.6	PF 1	1730.59	1729.88	0.71	0.04	0.02		13515.00		231.10
LV Wash	1122.4	PF 1	1730.53	1729.57	0.96	0.07	0.01		13515.00		184.47
LV Wash	1122.2	PF 1	1730.45	1729.37	1.08	0.06	0.01		13515.00		177.47
LV Wash	1121.8	PF 1	1730.38	1729.33	1.05	0.05	0.04		13515.00		181.02
LV Wash	1121.6	PF 1	1730.28	1729.37	0.91	0.05	0.01		13515.00		187.88
LV Wash	1121.4	PF 1	1730.22	1729.20	1.02	0.06	0.06		13515.00		178.43
LV Wash	1121.2	PF 1	1730.10	1729.27	0.83	0.05	0.00		13515.00		202.71
LV Wash	1120.8	PF 1	1730.05	1729.21	0.84	0.06	0.00		13515.00		223.84
LV Wash	1120.6	PF 1	1729.98	1729.15	0.84	0.06	0.01		13515.00		255.82
LV Wash	1120.4	PF 1	1729.92	1729.02	0.89	0.05	0.09		13515.00		248.09
LV Wash	1120.2	PF 1	1729.78	1728.60	1.18				13515.00		163.51
LV Wash	1120		Inline Weir - Low Flow Crossing								
LV Wash	1119.2	PF 1	1727.68	1725.98	1.70	0.09	0.31		13515.00		154.39
LV Wash	1118.8	PF 1	1727.28	1726.20	1.08	0.06	0.06		13515.00		204.51
LV Wash	1118.6	PF 1	1727.16	1726.27	0.90	0.03	0.05		13515.00		205.08
LV Wash	1118.4	PF 1	1727.08	1726.34	0.75	0.04	0.01		13515.00		218.15
LV Wash	1118.2	PF 1	1727.03	1726.31	0.72	0.05	0.00		13515.00		223.71
LV Wash	1117.8	PF 1	1726.99	1726.26	0.72	0.05	0.00		13515.00		251.01
LV Wash	1117.6	PF 1	1726.93	1726.17	0.76	0.05	0.00		13515.00		261.25
LV Wash	1117.4	PF 1	1726.87	1726.12	0.76	0.09	0.03		13515.00		276.21
LV Wash	1117.2	PF 1	1726.76	1725.71	1.04	0.11	0.02		13515.00		280.52
LV Wash	1116.9	PF 1	1726.63	1725.41	1.22	0.06	0.00		13515.00		237.66

Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1116.7	PF 1	1726.57	1725.30	1.27	0.05	0.02		13515.00		228.30
LV Wash	1116.5	PF 1	1726.49	1725.29	1.20	0.06	0.10		13515.00		214.31
LV Wash	1116.3	PF 1	1726.33	1725.47	0.86	0.05	0.01		13515.00		290.56
LV Wash	1116.2	PF 1	1726.26	1725.43	0.83				13515.00		301.85
LV Wash	1116		Inline Weir - Low Flow Crossing								
LV Wash	1115.2	PF 1	1725.98	1723.51	2.47	0.11	0.53		13515.00		125.94
LV Wash	1114.9	PF 1	1725.35	1723.93	1.41	0.05	0.00		13515.00		147.73
LV Wash	1114.7	PF 1	1725.29	1723.89	1.40	0.05	0.01		13515.00		147.76
LV Wash	1114.5	PF 1	1725.23	1723.85	1.37	0.03	0.00		13515.00		148.59
LV Wash	1114.4	PF 1	1725.19	1723.81	1.38	0.08	0.00		13515.00		148.33
LV Wash	1114.2	PF 1	1725.11	1723.70	1.40	0.15	0.03		13515.00		154.97
LV Wash	1113.9	PF 1	1724.93	1723.21	1.72	0.04	0.02		13515.00		150.38
LV Wash	1113.7	PF 1	1724.86	1723.22	1.64	0.10	0.18		13515.00		157.83
LV Wash	1113.6	PF 1	1724.58	1723.54	1.04	0.05	0.01		13515.00		250.01
LV Wash	1113.5	PF 1	1724.52	1723.34	1.18	0.11	0.04		13515.00		234.70
LV Wash	1113.3	PF 1	1724.37	1722.78	1.59	0.07	0.05		13515.00		174.32
LV Wash	1113.1	PF 1	1724.25	1722.18	2.07	0.16	0.02		13515.00		153.18
LV Wash	1112.8	PF 1	1724.07	1721.85	2.22	0.16	0.08		13515.00		145.99
LV Wash	1112.6	PF 1	1723.83	1721.88	1.95	0.09	0.02		13515.00		151.12
LV Wash	1112.4	PF 1	1723.72	1721.59	2.13	0.24	0.17		13515.00		157.69
LV Wash	1112.2	PF 1	1723.32	1721.74	1.57	0.09	0.02		13515.00		230.72
LV Wash	1111.9	PF 1	1723.21	1721.70	1.51	0.27	0.05		13515.00		249.64
LV Wash	1111.7	PF 1	1722.89	1721.55	1.34	0.19	0.03		13515.00		315.41
LV Wash	1111.5	PF 1	1722.67	1721.43	1.24	0.10	0.00		13515.00		346.37
LV Wash	1111.3	PF 1	1722.57	1721.31	1.26	0.06	0.03		13515.00		305.56
LV Wash	1111.1	PF 1	1722.48	1721.31	1.18	0.07	0.01		13515.00		289.74
LV Wash	1110.9	PF 1	1722.41	1721.25	1.16	0.13	0.02		13515.00		212.52
LV Wash	1110.7	PF 1	1722.26	1720.91	1.35	0.11	0.02		13515.00		194.30
LV Wash	1110.5	PF 1	1722.13	1720.55	1.58	0.06	0.00		13515.00		170.20
LV Wash	1110.3	PF 1	1722.07	1720.47	1.60	0.09	0.02		13515.00		167.82
LV Wash	1110.1	PF 1	1721.96	1720.21	1.75	0.04	0.02		13515.00		156.25
LV Wash	1109.9	PF 1	1721.91	1719.99	1.92	0.05	0.00		13861.00		145.10
LV Wash	1109.8	PF 1	1721.86	1719.92	1.95	0.14	0.03		13861.00		145.65
LV Wash	1109.6	PF 1	1721.70	1719.84	1.85	0.06	0.02		13861.00		185.51
LV Wash	1109.5	PF 1	1721.62	1719.83	1.79	0.09	0.05		13861.00		197.53
LV Wash	1109.3	PF 1	1721.48	1719.86	1.62	0.12	0.08		13861.00		189.37
LV Wash	1109.1	PF 1	1721.28	1719.92	1.35	0.12	0.02		13861.00		222.06
LV Wash	1108.9	PF 1	1721.14	1719.86	1.28	0.07	0.01		13861.00		234.36
LV Wash	1108.8	PF 1	1721.07	1719.71	1.36	0.06	0.01		13861.00		235.99
LV Wash	1108.7	PF 1	1721.00	1719.56	1.44	0.11	0.02		13861.00		234.18
LV Wash	1108.5	PF 1	1720.87	1719.28	1.60	0.19	0.04		13861.00		225.58
LV Wash	1108.3	PF 1	1720.64	1719.19	1.45	0.10	0.04		13860.14	0.86	244.54
LV Wash	1108.2	PF 1	1720.50	1719.18	1.33	0.04	0.20		13861.00		179.26
LV Wash	1107.95	PF 1	1720.26	1719.33	0.93	0.03	0.03		13861.00		219.11
LV Wash	1107.5		Proposed Sahara Avenue Bridge								
LV Wash	1107.15	PF 1	1719.98	1719.04	0.93	0.03	0.03		13861.00		235.22
LV Wash	1107.1	PF 1	1719.92	1718.90	1.02	0.03	0.00		13861.00		191.43
LV Wash	1106.8	PF 1	1719.89	1718.83	1.05	0.08	0.07		13861.00		187.04
LV Wash	1106.6	PF 1	1719.74	1718.00	1.73	0.14	0.04		13861.00		170.52
LV Wash	1106.4	PF 1	1719.56	1717.46	2.10	0.13	0.05		13861.00		147.73

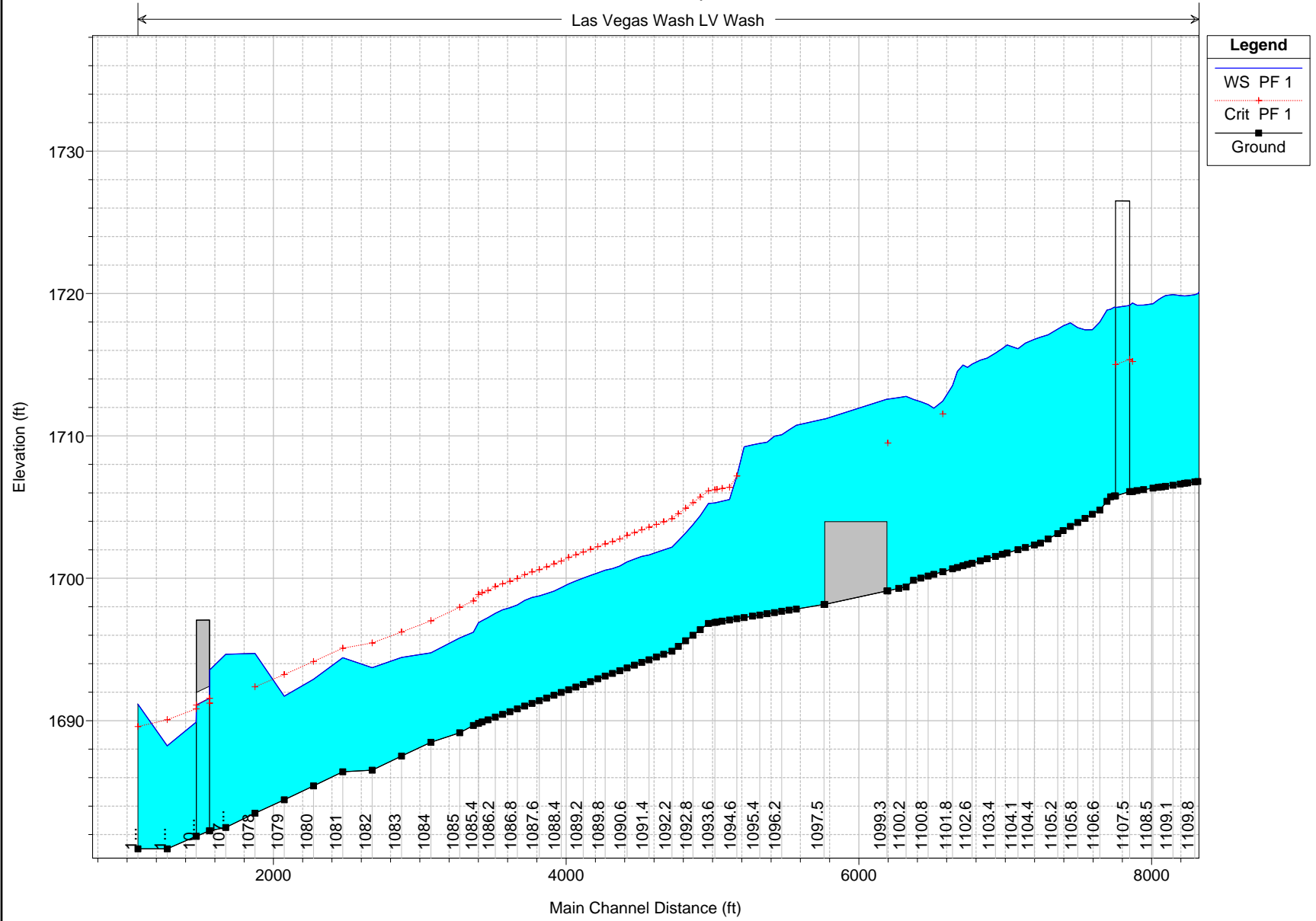
Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1106.2	PF 1	1719.37	1717.45	1.92	0.13	0.12		13861.00		151.18
LV Wash	1105.8	PF 1	1719.13	1717.60	1.53	0.09	0.18		13861.00		205.30
LV Wash	1105.6	PF 1	1718.86	1717.94	0.92	0.07	0.01		13861.00		242.41
LV Wash	1105.4	PF 1	1718.77	1717.73	1.04	0.07	0.01		13861.00		228.23
LV Wash	1105.2	PF 1	1718.69	1717.50	1.19	0.16	0.02		13861.00		251.93
LV Wash	1104.8	PF 1	1718.51	1717.10	1.41	0.15	0.00		13861.00		242.84
LV Wash	1104.6	PF 1	1718.36	1716.94	1.42	0.13	0.00		13861.00		255.18
LV Wash	1104.4	PF 1	1718.23	1716.78	1.44	0.20	0.01		13861.00		262.09
LV Wash	1104.2	PF 1	1718.02	1716.51	1.51	0.15	0.02		13861.00		249.92
LV Wash	1104.1	PF 1	1717.85	1716.12	1.73	0.19	0.19		13861.00		184.73
LV Wash	1103.8	PF 1	1717.46	1716.39	1.08	0.09	0.02		13861.00		304.92
LV Wash	1103.6	PF 1	1717.36	1716.14	1.23	0.13	0.02		13861.00		279.24
LV Wash	1103.4	PF 1	1717.21	1715.81	1.40	0.16	0.02		13861.00		260.30
LV Wash	1103.2	PF 1	1717.04	1715.47	1.57	0.12	0.00		13861.00		202.38
LV Wash	1102.8	PF 1	1716.92	1715.32	1.60	0.15	0.01		13861.00		193.97
LV Wash	1102.6	PF 1	1716.76	1715.05	1.71	0.08	0.01		13861.00		181.20
LV Wash	1102.4	PF 1	1716.66	1714.82	1.85	0.07	0.10		13861.00		165.76
LV Wash	1102.2	PF 1	1716.49	1714.98	1.51	0.13	0.03		13861.00		173.49
LV Wash	1102.1	PF 1	1716.33	1714.53	1.80	0.24	0.07		13861.00		152.55
LV Wash	1101.8	PF 1	1716.03	1713.53	2.50	0.64	0.04		13861.00		130.07
LV Wash	1101.3	PF 1	1715.34	1712.44	2.91	0.63	0.06		13861.00		128.81
LV Wash	1101.2	PF 1	1714.65	1711.95	2.70	0.32	0.25		13861.00		133.42
LV Wash	1100.8	PF 1	1714.08	1712.20	1.88	0.16	0.16		13861.00		157.92
LV Wash	1100.6	PF 1	1713.76	1712.40	1.36	0.09	0.11		13861.00		191.13
LV Wash	1100.4	PF 1	1713.56	1712.56	1.00	0.06	0.27		13861.00		238.60
LV Wash	1100.2	PF 1	1713.24	1712.77	0.47	0.05	0.01		18601.00		552.84
LV Wash	1099.8	PF 1	1713.19	1712.69	0.50	0.07	0.01		18601.00		534.04
LV Wash	1099.4	PF 1	1713.11	1712.58	0.53				18601.00		494.08
LV Wash	1099.3		Inline Weir - Low Flow Crossing								
LV Wash	1097.5	PF 1	1712.05	1711.19	0.86	0.29	0.04		18601.00		391.00
LV Wash	1096.6	PF 1	1711.72	1710.74	0.97	0.08	0.02		18601.00		332.44
LV Wash	1096.4	PF 1	1711.61	1710.43	1.19	0.09	0.02		18601.00		291.02
LV Wash	1096.2	PF 1	1711.50	1710.08	1.42	0.09	0.00		18601.00		230.32
LV Wash	1095.8	PF 1	1711.41	1709.98	1.43	0.10	0.03		18601.00		222.25
LV Wash	1095.6	PF 1	1711.28	1709.56	1.72	0.11	0.01		18601.00		211.70
LV Wash	1095.4	PF 1	1711.16	1709.47	1.69	0.11	0.00		18601.00		213.83
LV Wash	1095.2	PF 1	1711.05	1709.37	1.68	0.12	0.00		18601.00		215.00
LV Wash	1094.8	PF 1	1710.93	1709.23	1.70	0.10	0.18		18601.00		213.43
LV Wash	1094.6	PF 1	1710.66	1707.19	3.47	0.09	0.04		18601.00		180.20
LV Wash	1094.4	PF 1	1710.42	1705.54	4.88	0.10	0.14		18601.00		149.06
LV Wash	1094.2	PF 1	1710.35	1705.42	4.93	0.10	0.30		18601.00		148.90
LV Wash	1093.8	PF 1	1710.30	1705.33	4.98	0.07	0.32		18601.00		148.78
LV Wash	1093.6	PF 1	1710.27	1705.30	4.98	0.03	0.00		18601.00		148.78
LV Wash	1093.4	PF 1	1710.19	1705.26	4.93	0.09	0.33		18601.00		148.90
LV Wash	1093.2	PF 1	1709.97	1704.40	5.58	0.15	0.06		18601.00		147.23
LV Wash	1092.8	PF 1	1709.77	1703.76	6.01	0.16	0.04		18601.00		146.25
LV Wash	1092.6	PF 1	1709.56	1703.18	6.38	0.18	0.04		18601.00		145.49
LV Wash	1092.4	PF 1	1709.34	1702.64	6.69	0.19	0.03		18601.00		144.88
LV Wash	1092.2	PF 1	1709.13	1702.19	6.94	0.18	0.02		18601.00		144.43
LV Wash	1091.8	PF 1	1708.89	1701.99	6.89	0.24	0.01		18601.00		144.52

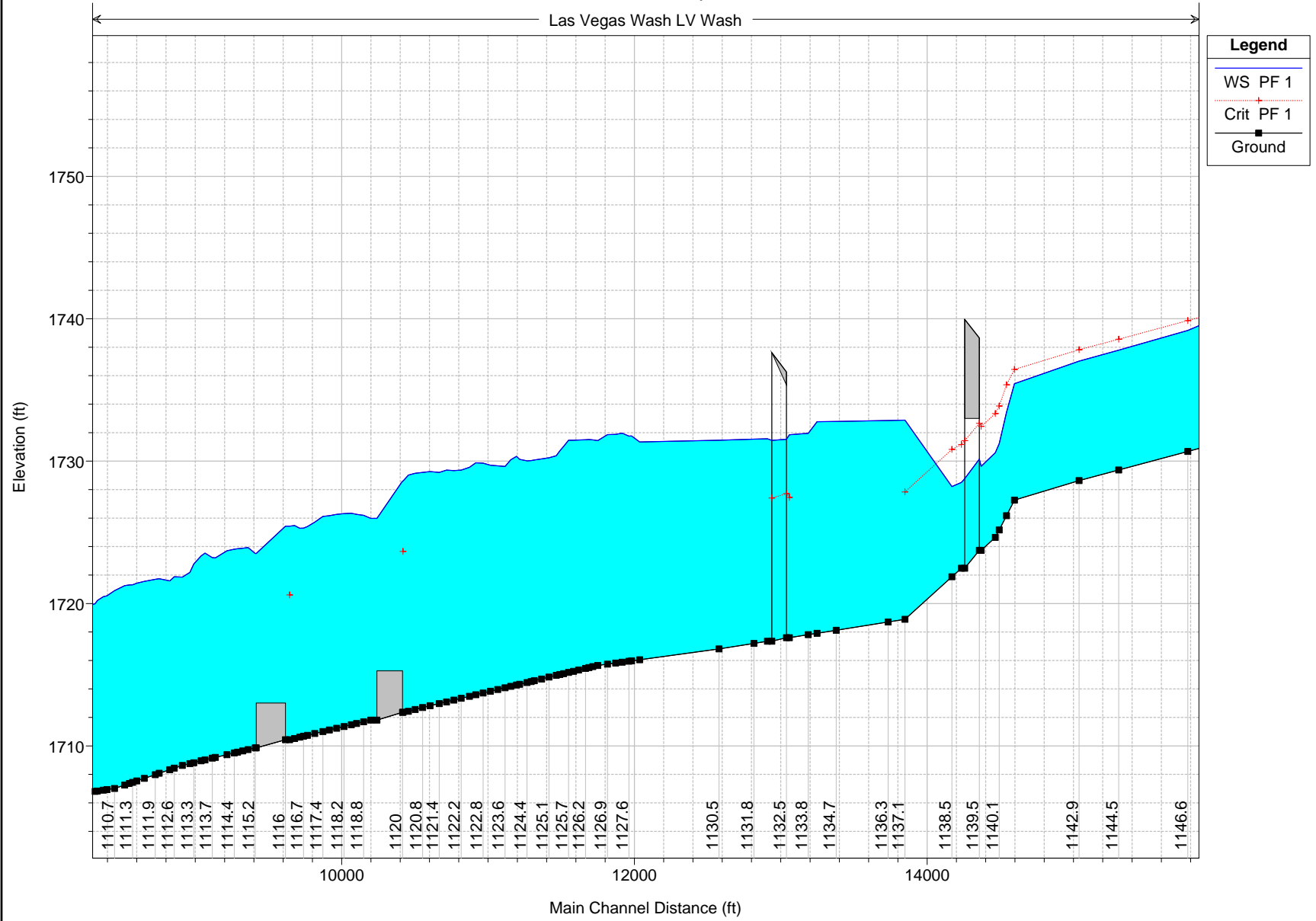
Las Vegas Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
LV Wash	1091.6	PF 1	1708.67	1701.82	6.85	0.21	0.01		18601.00		144.60
LV Wash	1091.4	PF 1	1708.47	1701.64	6.82	0.21	0.01		18601.00		144.65
LV Wash	1091.2	PF 1	1708.22	1701.54	6.68	0.20	0.04		18672.00		145.00
LV Wash	1090.8	PF 1	1708.03	1701.35	6.68	0.20	0.00		18672.00		145.01
LV Wash	1090.6	PF 1	1707.83	1701.15	6.68	0.20	0.00		18672.00		145.01
LV Wash	1090.4	PF 1	1707.62	1700.86	6.76	0.20	0.01		18672.00		144.43
LV Wash	1090.2	PF 1	1707.42	1700.68	6.74	0.20	0.01		18672.00		145.04
LV Wash	1089.8	PF 1	1707.19	1700.57	6.62	0.20	0.04		18672.00		145.34
LV Wash	1089.6	PF 1	1707.00	1700.38	6.61	0.19	0.00		18672.00		145.46
LV Wash	1089.4	PF 1	1706.80	1700.20	6.60	0.19	0.00		18672.00		145.63
LV Wash	1089.2	PF 1	1706.61	1700.02	6.59	0.19	0.00		18672.00		145.86
LV Wash	1088.8	PF 1	1706.41	1699.81	6.60	0.19	0.00		18672.00		145.96
LV Wash	1088.6	PF 1	1706.21	1699.60	6.61	0.20	0.00		18672.00		146.01
LV Wash	1088.4	PF 1	1706.01	1699.34	6.66	0.20	0.01		18672.00		145.68
LV Wash	1088.2	PF 1	1705.80	1699.10	6.70	0.20	0.00		18672.00		145.50
LV Wash	1087.8	PF 1	1705.61	1698.92	6.68	0.20	0.01		18672.00		145.61
LV Wash	1087.6	PF 1	1705.40	1698.76	6.64	0.20	0.01		18672.00		145.78
LV Wash	1087.4	PF 1	1705.18	1698.65	6.52	0.19	0.03		18672.00		146.04
LV Wash	1087.2	PF 1	1704.98	1698.45	6.53	0.19	0.00		18672.00		146.06
LV Wash	1086.8	PF 1	1704.76	1698.13	6.64	0.19	0.01		18672.00		145.73
LV Wash	1086.6	PF 1	1704.57	1697.93	6.64	0.20	0.00		18672.00		145.87
LV Wash	1086.4	PF 1	1704.36	1697.79	6.57	0.20	0.02		18672.00		146.11
LV Wash	1086.2	PF 1	1704.16	1697.54	6.63	0.20	0.01		18672.00		146.95
LV Wash	1085.8	PF 1	1703.95	1697.24	6.71	0.20	0.01		18672.00		148.85
LV Wash	1085.6	PF 1	1703.78	1697.03	6.75	0.17	0.00		18672.00		150.21
LV Wash	1085.4	PF 1	1703.67	1696.88	6.79	0.11	0.00		18672.00		151.25
LV Wash	1085.2	PF 1	1703.46	1696.21	7.25	0.16	0.05		18672.00		156.07
LV Wash	1085	PF 1	1702.99	1695.81	7.18	0.46	0.02		18672.00		155.67
LV Wash	1084	PF 1	1701.94	1694.76	7.18	1.06	0.00		18672.00		182.90
LV Wash	1083	PF 1	1700.69	1694.44	6.25	0.97	0.28		18672.00		161.62
LV Wash	1082	PF 1	1699.88	1693.72	6.17	0.79	0.02		18672.00		158.98
LV Wash	1081	PF 1	1698.74	1694.42	4.32	0.59	0.55		18672.00		170.52
LV Wash	1080	PF 1	1698.12	1692.91	5.21	0.53	0.09		18672.00		164.05
LV Wash	1079	PF 1	1697.42	1691.72	5.70	0.65	0.05		18672.00		161.58
LV Wash	1078	PF 1	1696.71	1694.72	1.98	0.13	0.03	58.85	18609.13	4.03	247.11
LV Wash	1077	PF 1	1696.55	1694.66	1.89	0.08	0.09	36.16	18635.84		199.15
LV Wash	1075.9	PF 1	1696.38	1693.56	2.81				18672.00		123.61
LV Wash	1075.5		Vegas Valley Bridge								
LV Wash	1075.1	PF 1	1695.47	1689.90	5.57				18672.00		123.61
LV Wash	1075	PF 1	1694.58	1688.23	6.35	0.65	0.23		18718.00		158.36
LV Wash	1074	PF 1	1693.54	1691.15	2.39				18718.00		182.80

LVWashPost Plan: Proposed 8/9/2013

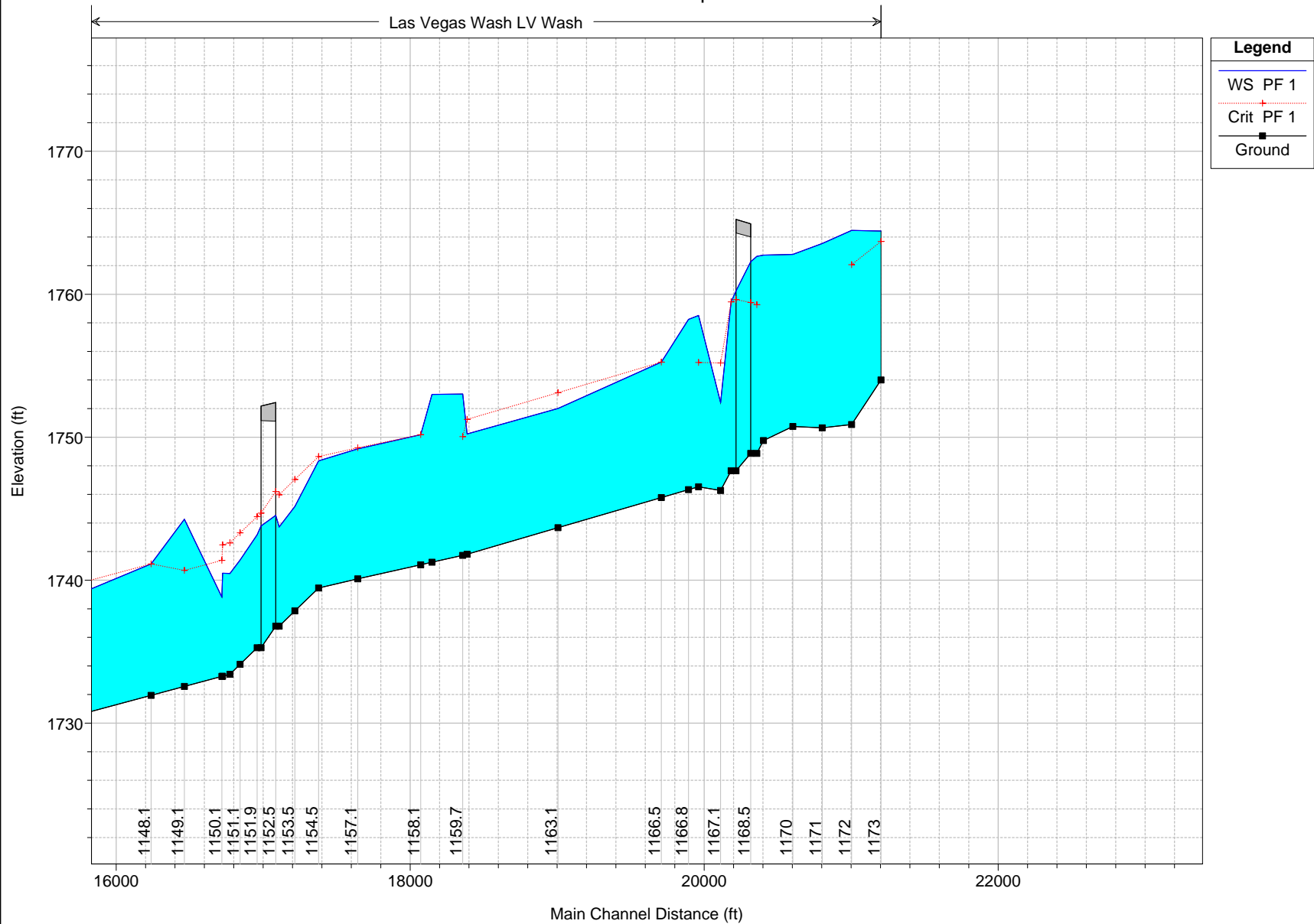


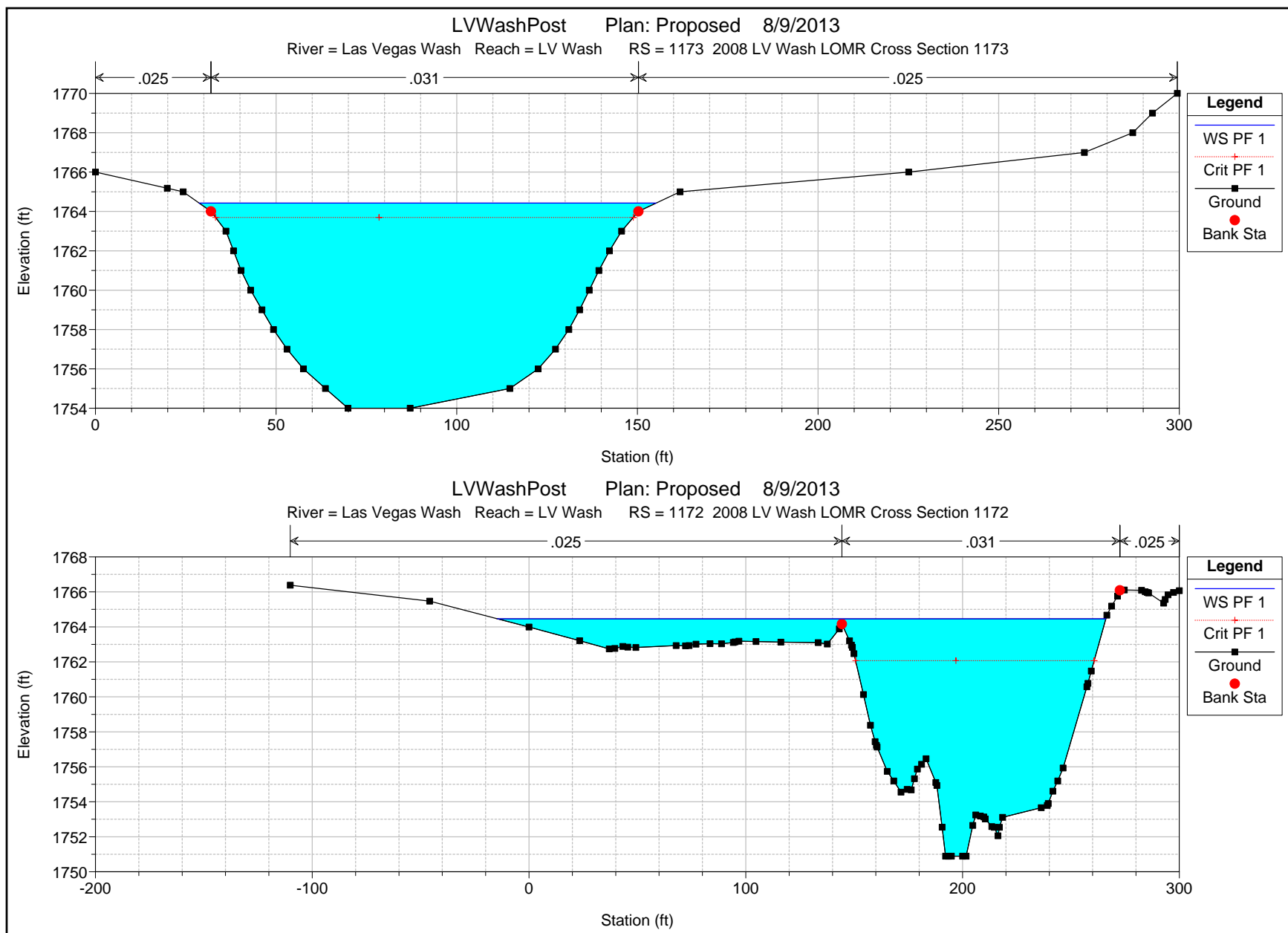
LVWashPost Plan: Proposed 8/9/2013

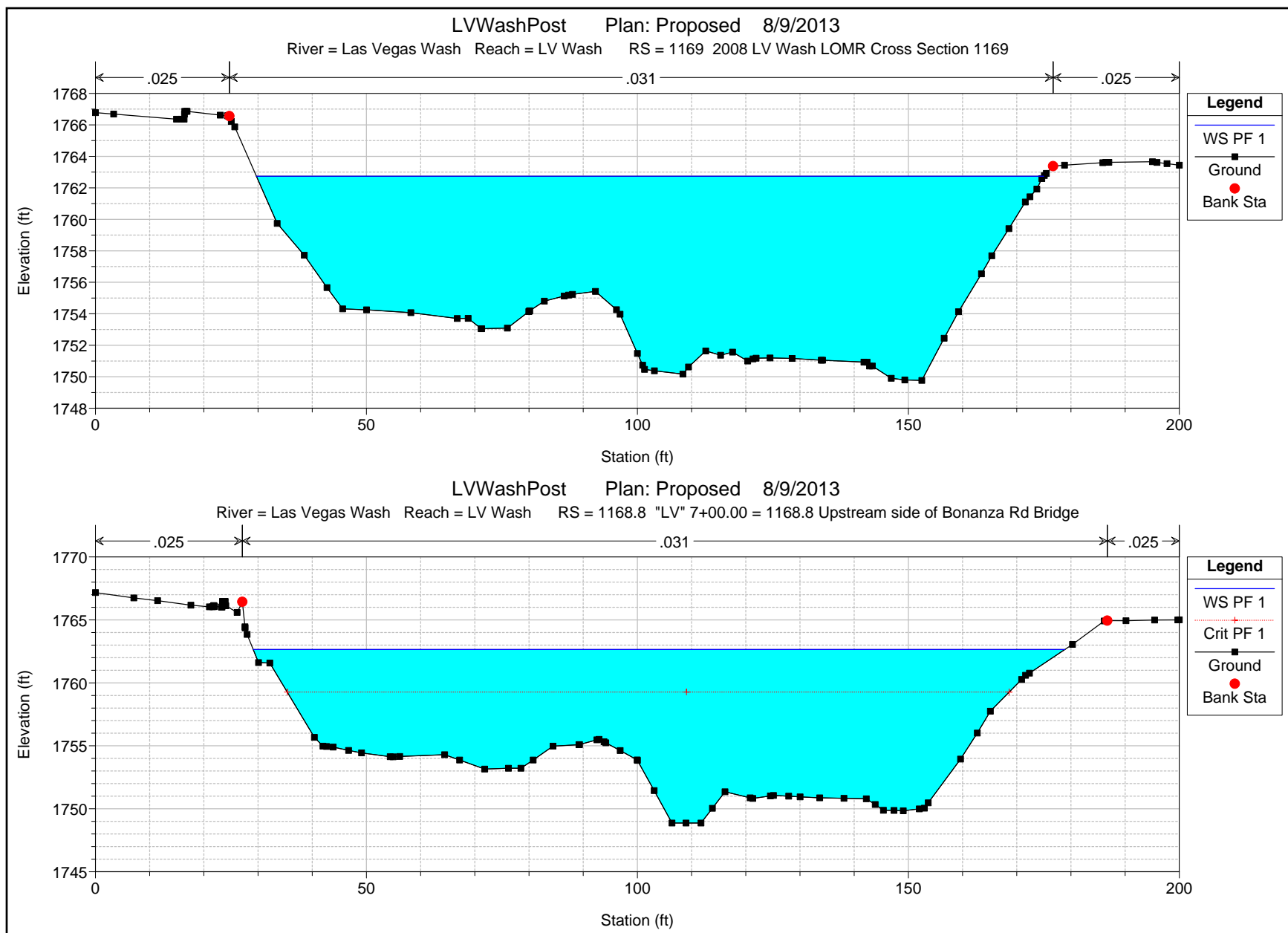


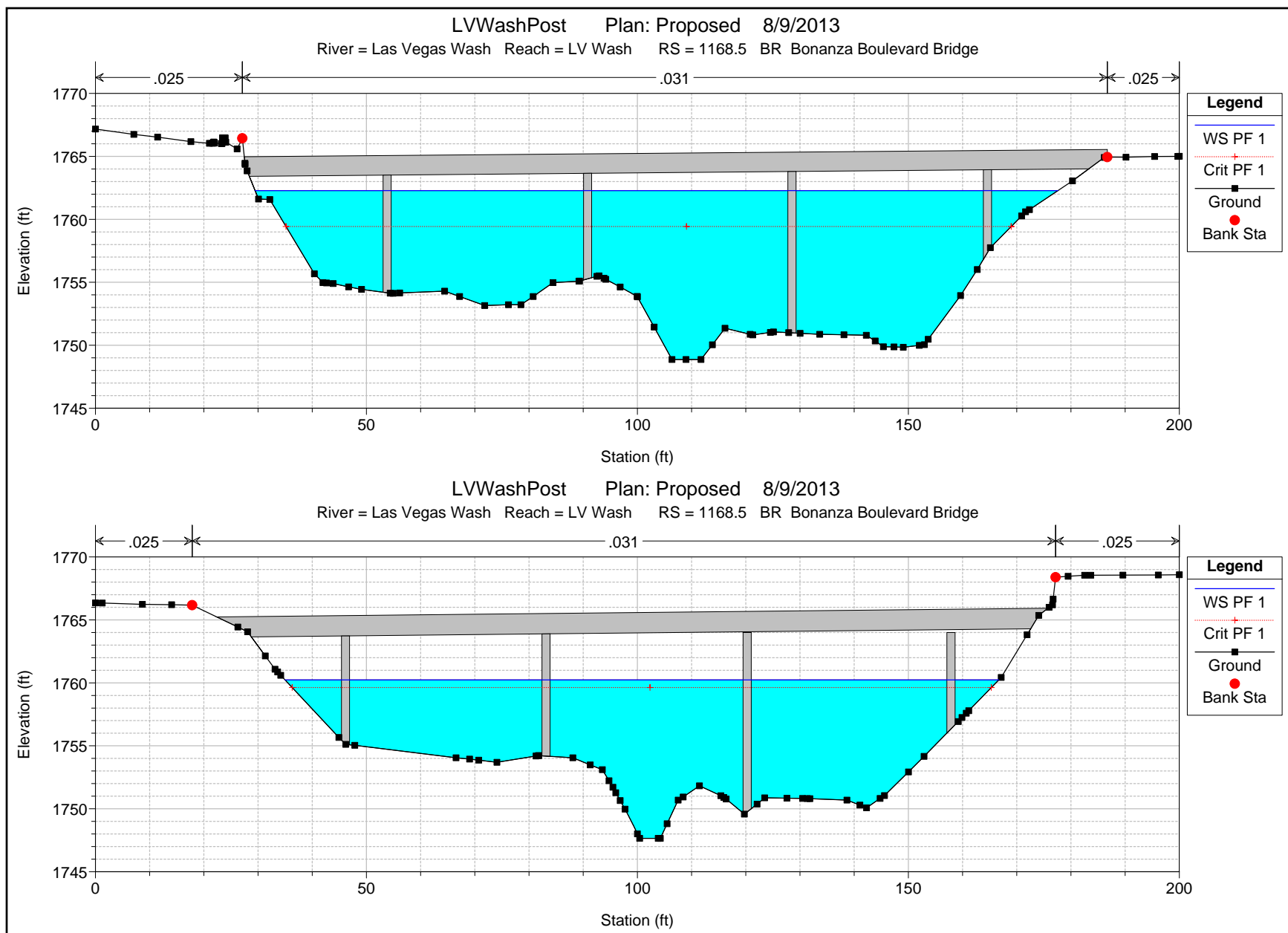
LVWashPost Plan: Proposed 8/9/2013

Las Vegas Wash LV Wash



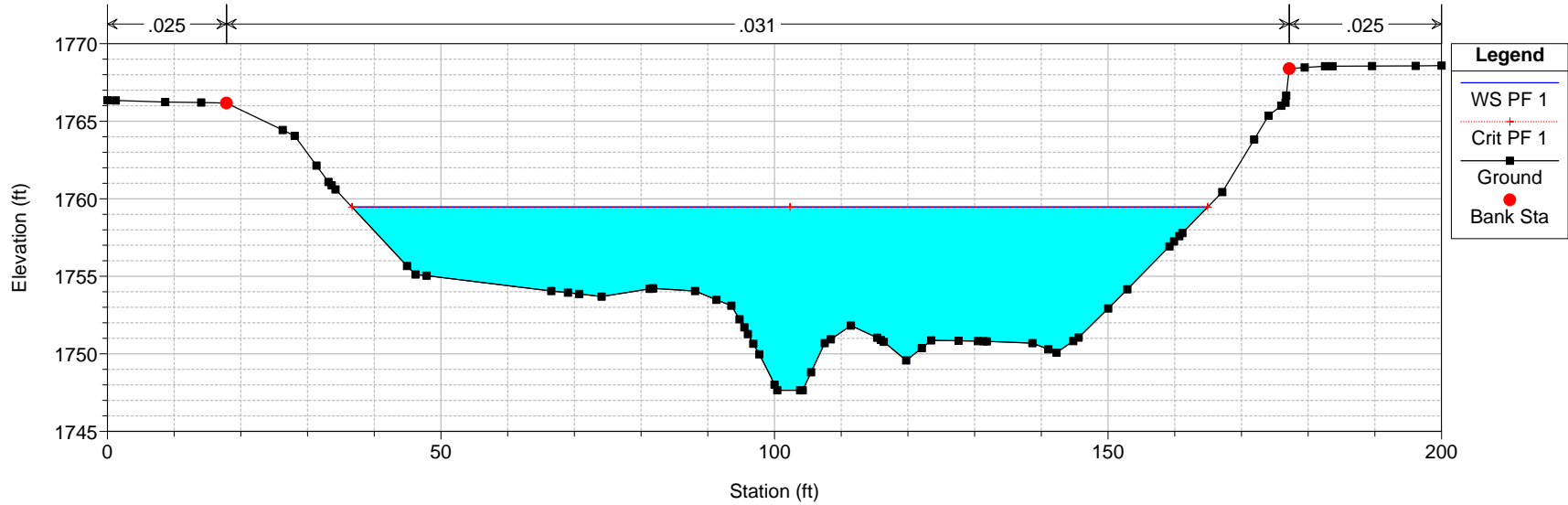






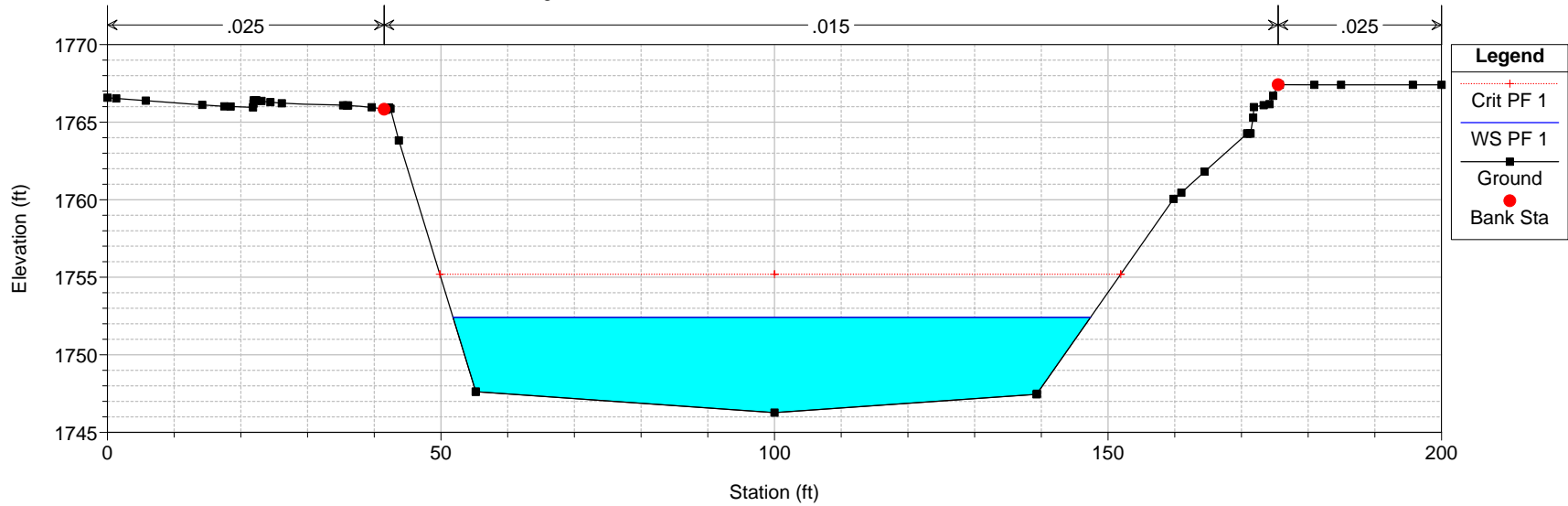
LVWashPost Plan: Proposed 8/9/2013

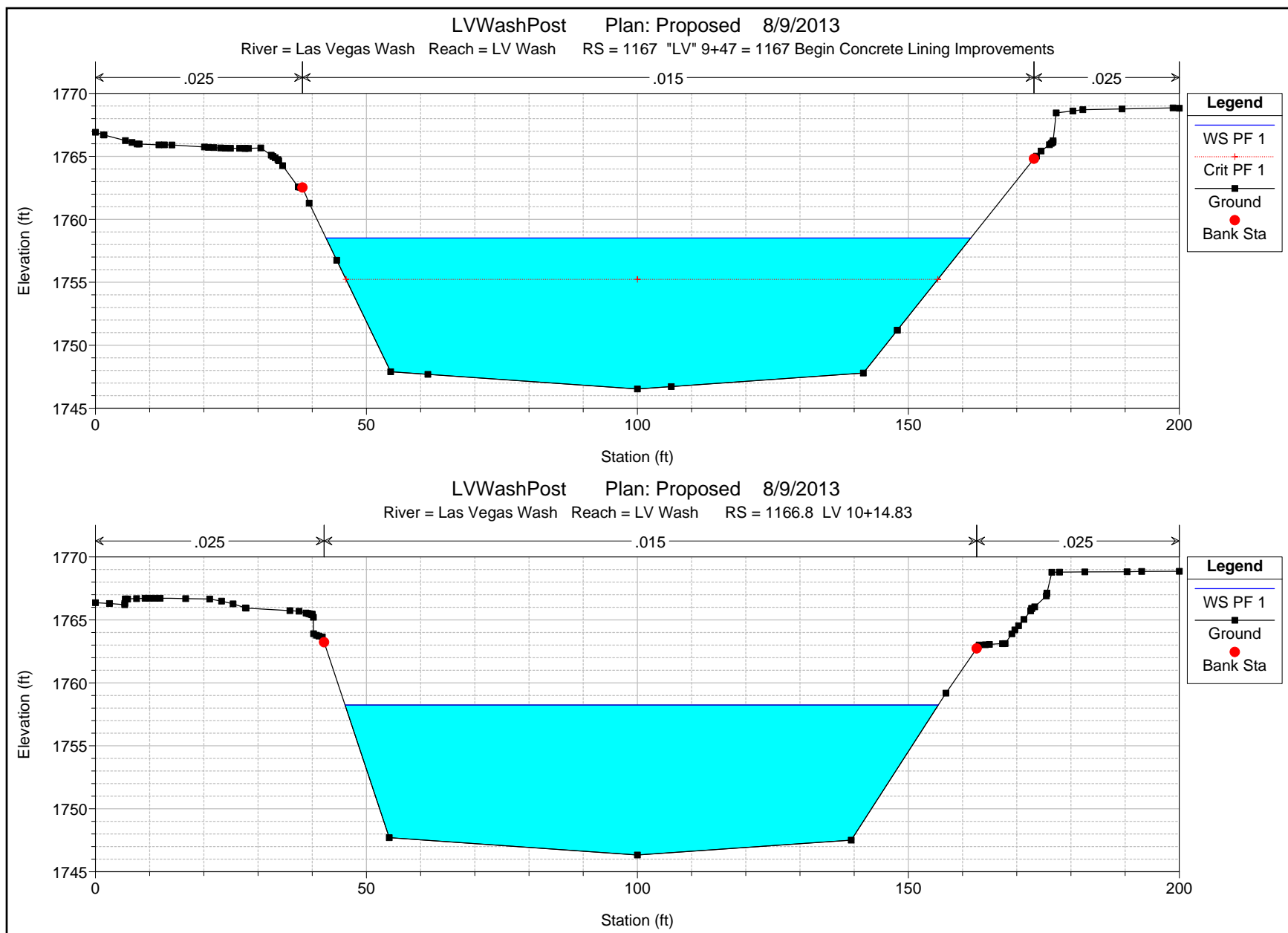
River = Las Vegas Wash Reach = LV Wash RS = 1167.8 "LV" 8+75.00 = 1167.8 Downstream Side of Bonanza Rd Bridge

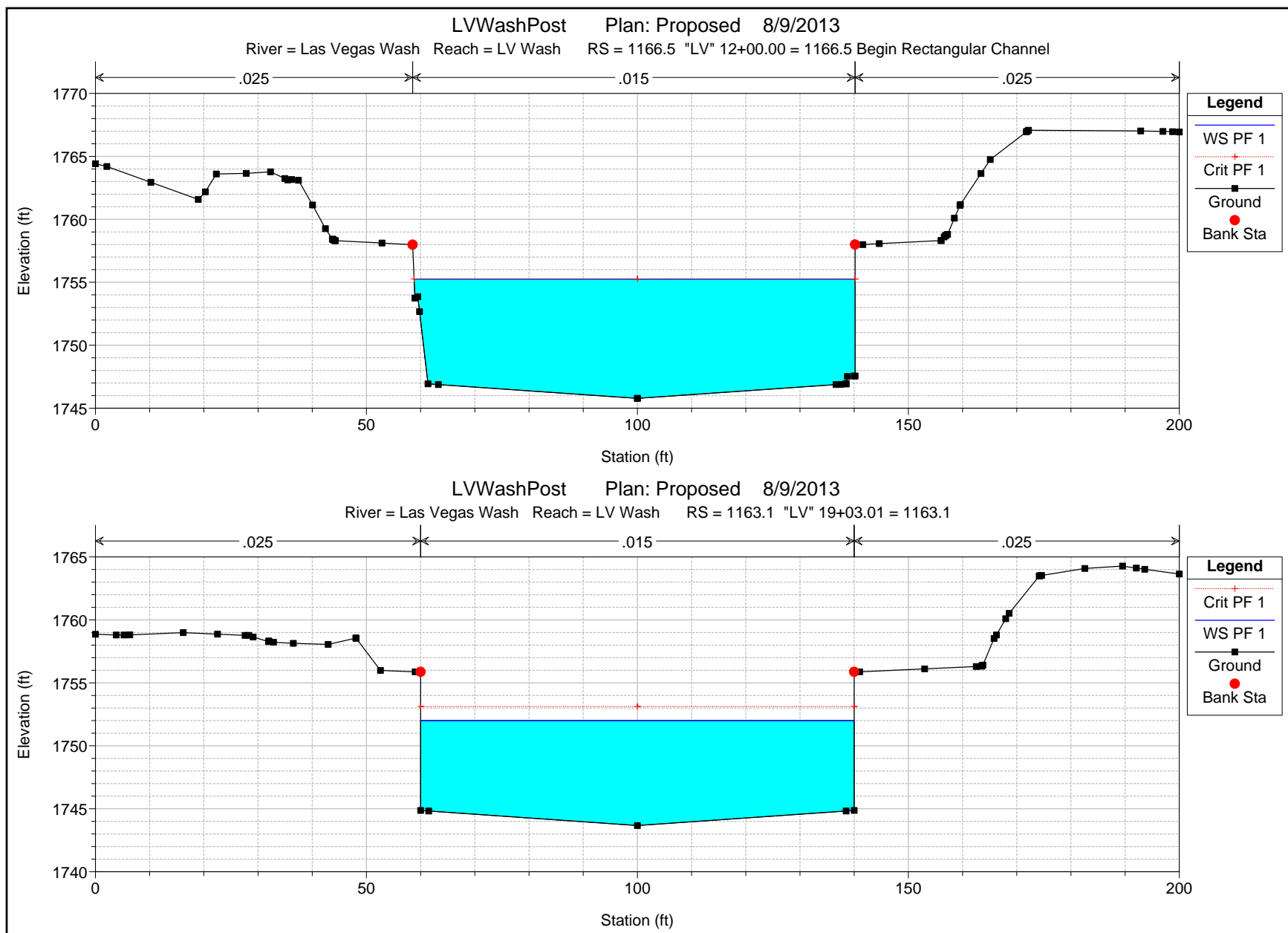


LVWashPost Plan: Proposed 8/9/2013

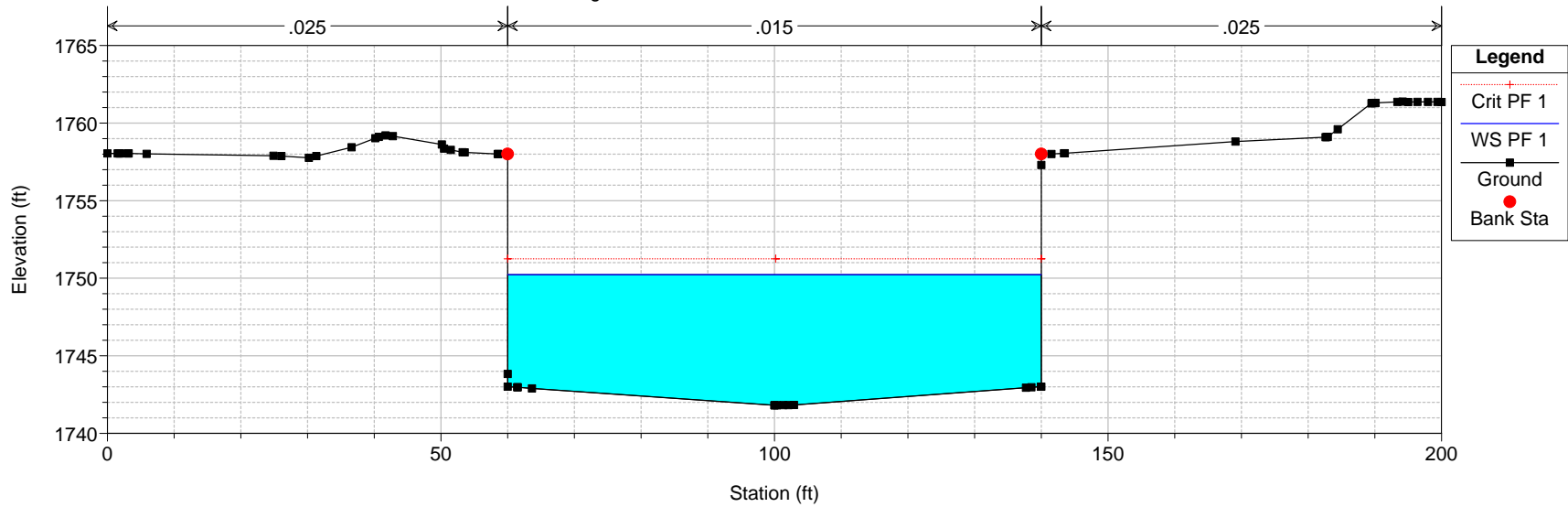
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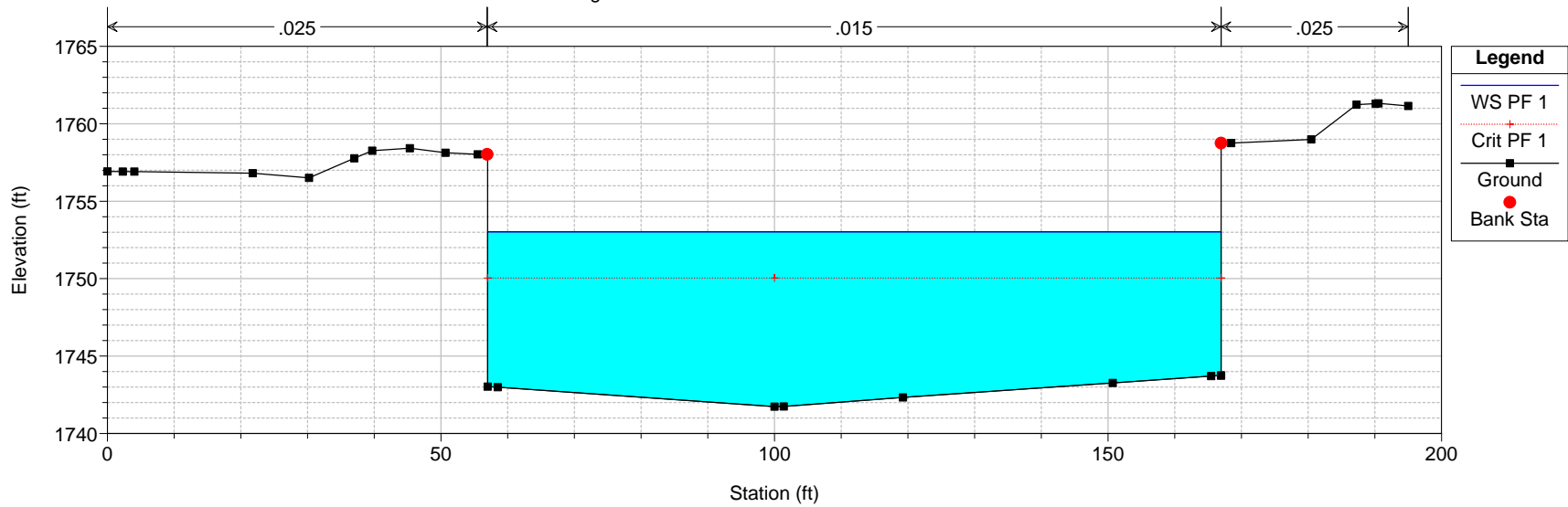




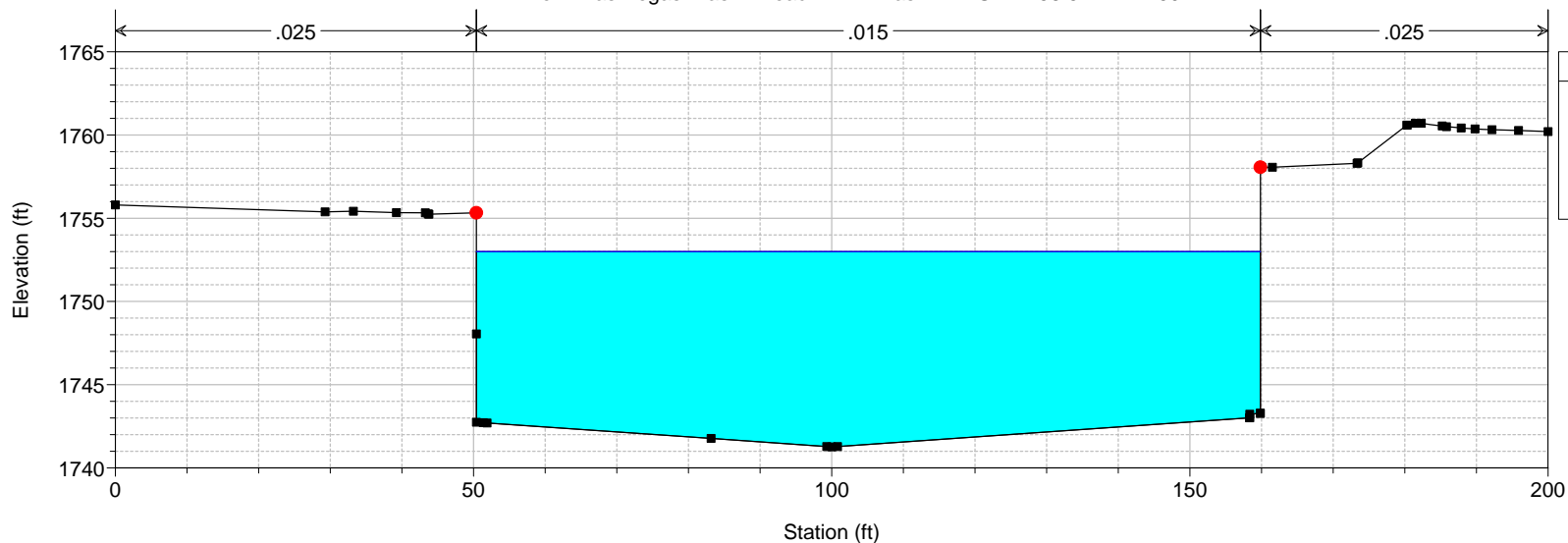
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1159.8 LV 25+21.35



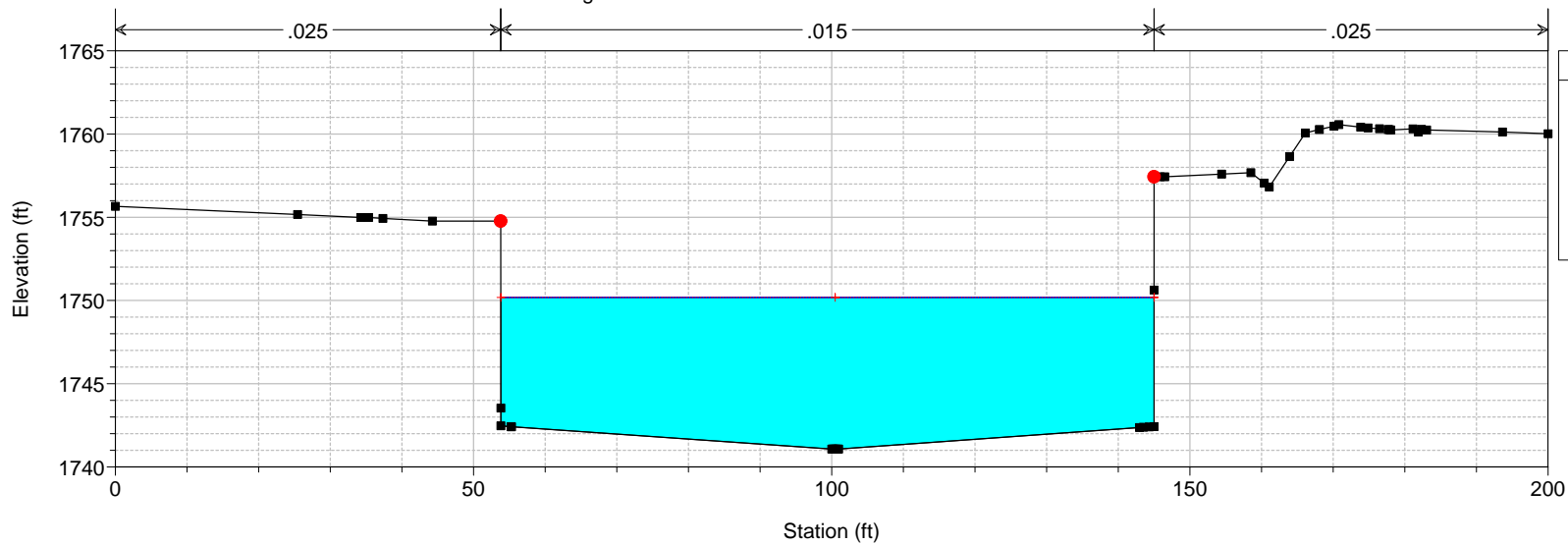
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1159.7 LV 25+51.16

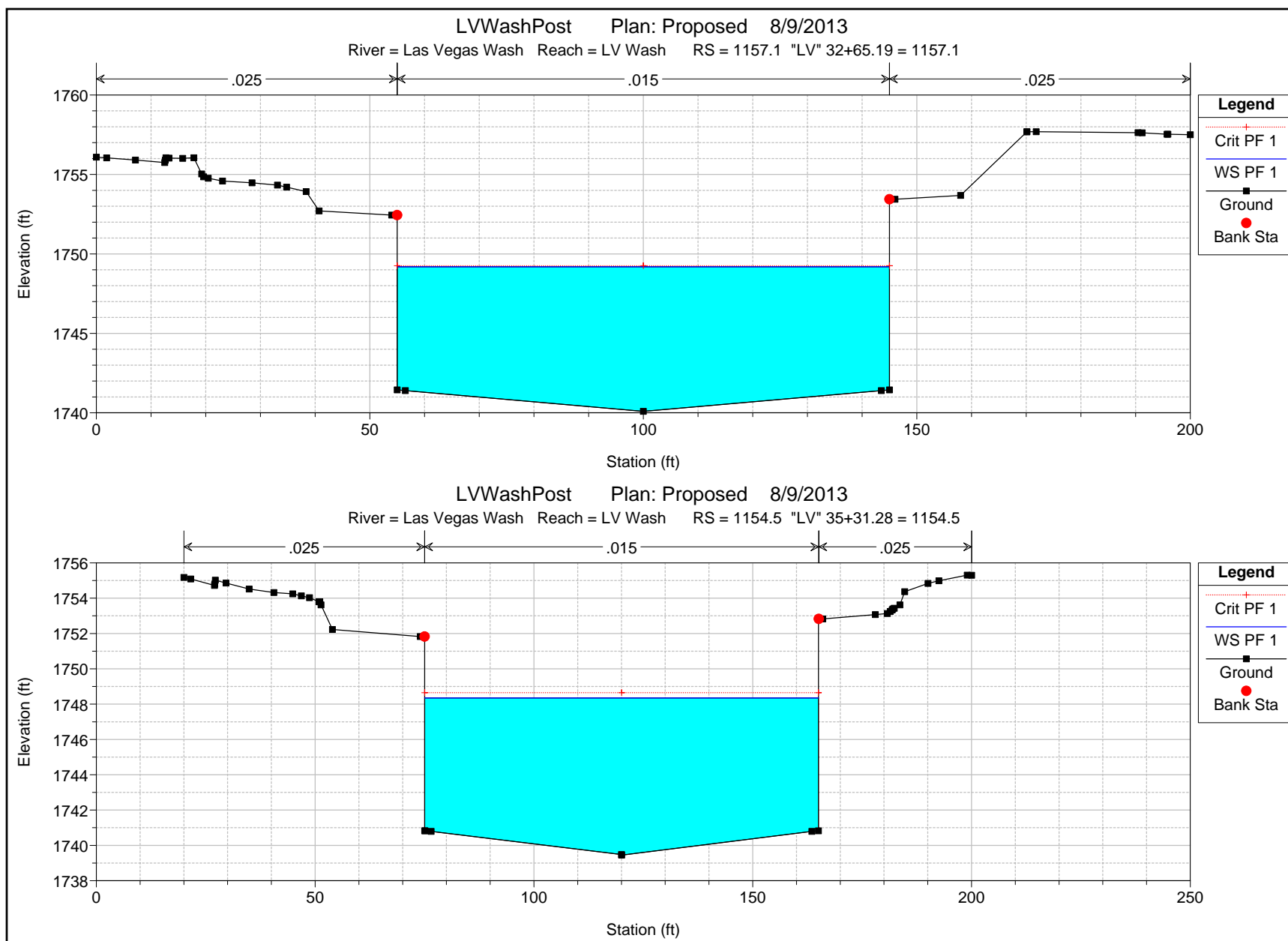


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1158.6 LV 27+60



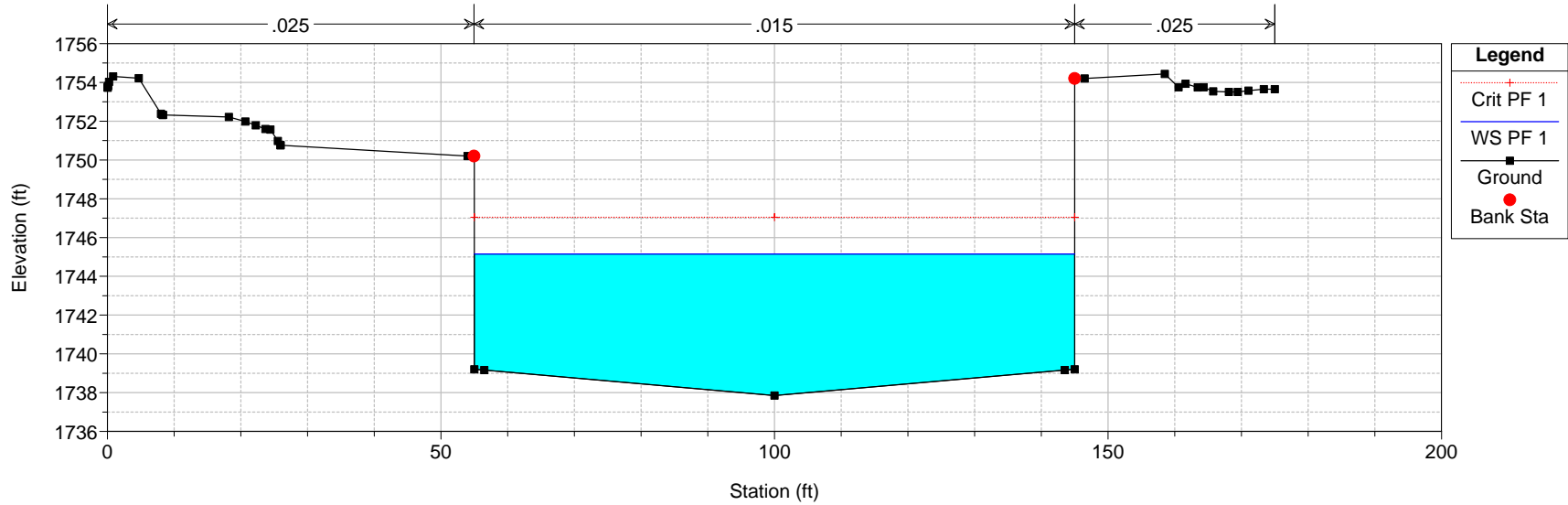
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1158.1 "LV" 28+36.90 = 1158.1





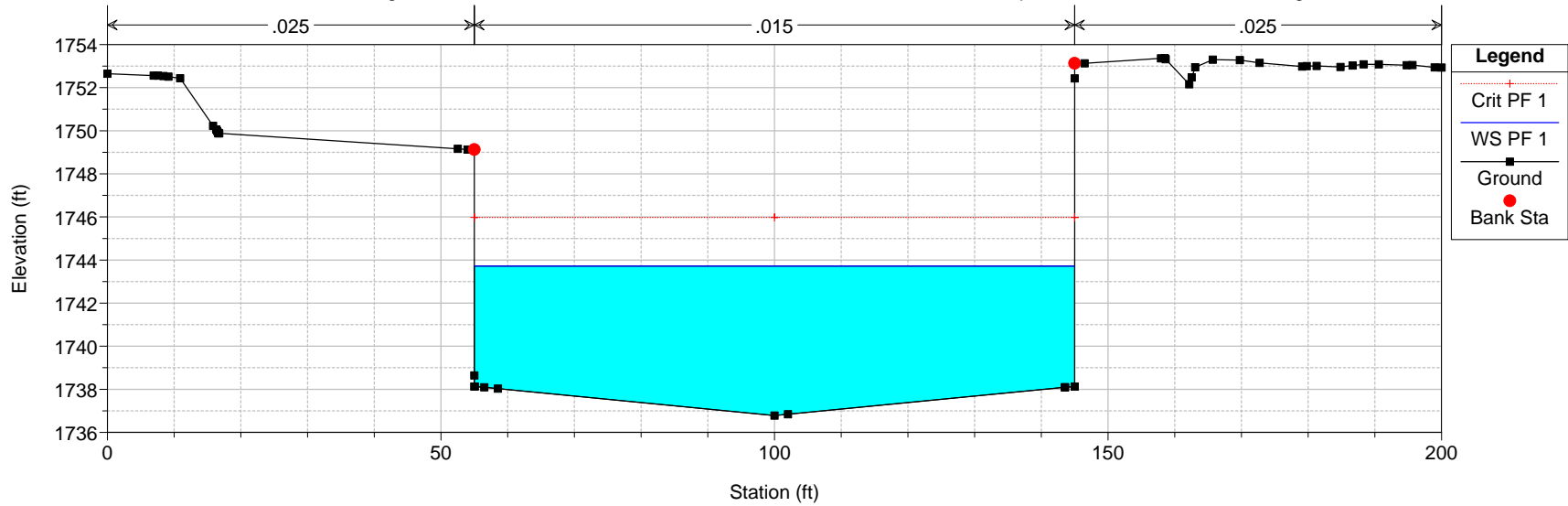
LVWashPost Plan: Proposed 8/9/2013

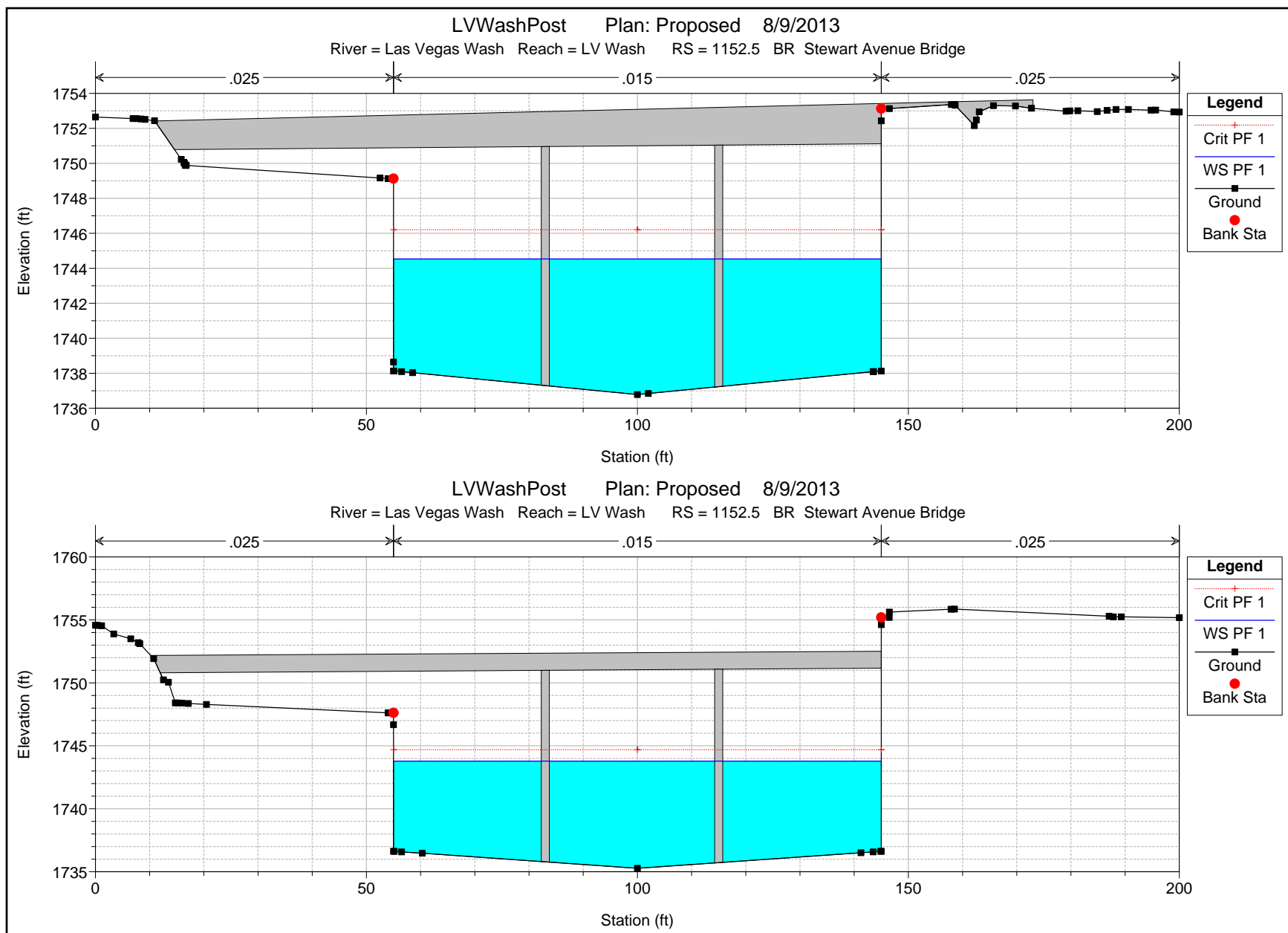
River = Las Vegas Wash Reach = LV Wash RS = 1153.5 LV 36+93.48

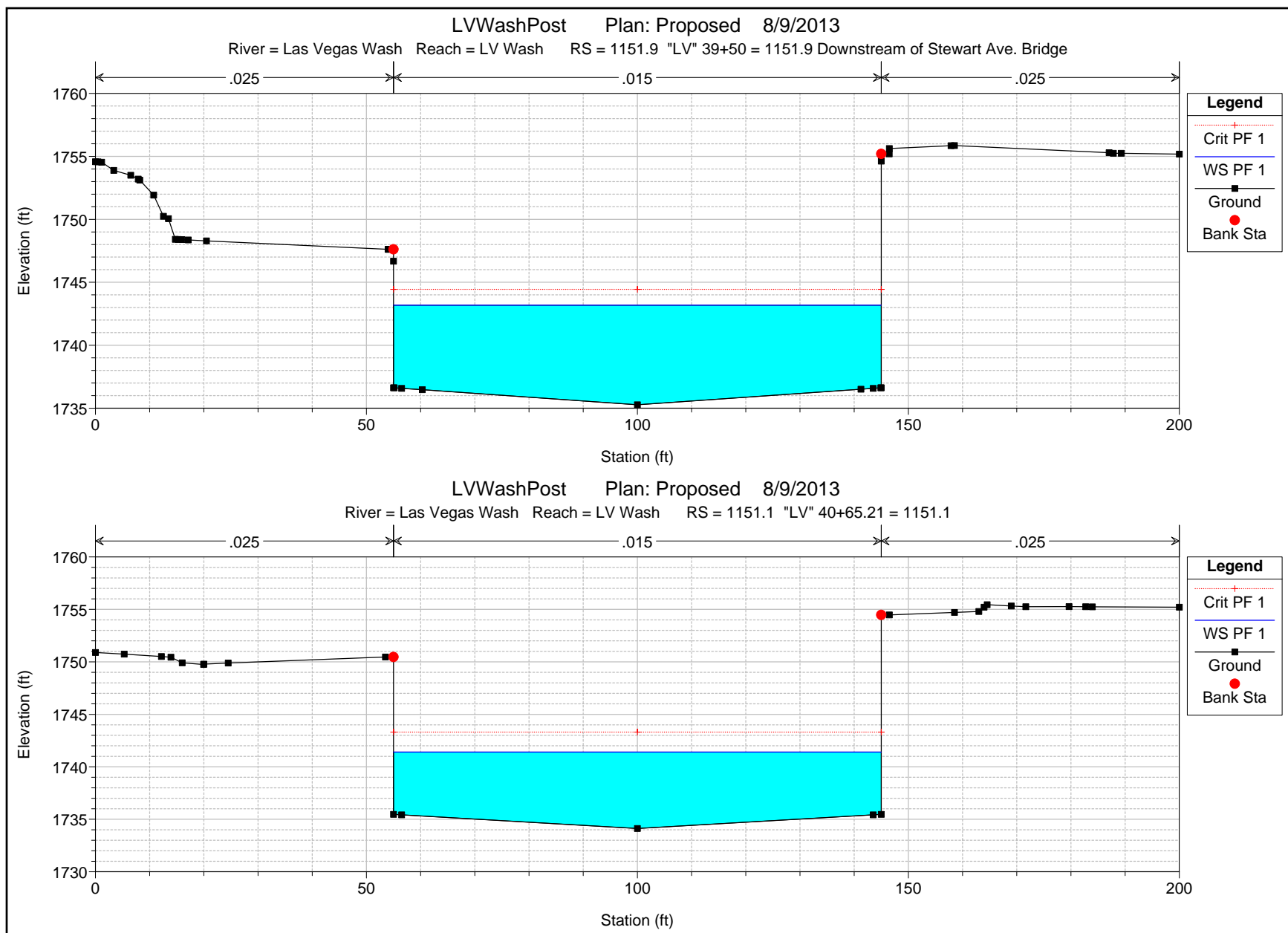


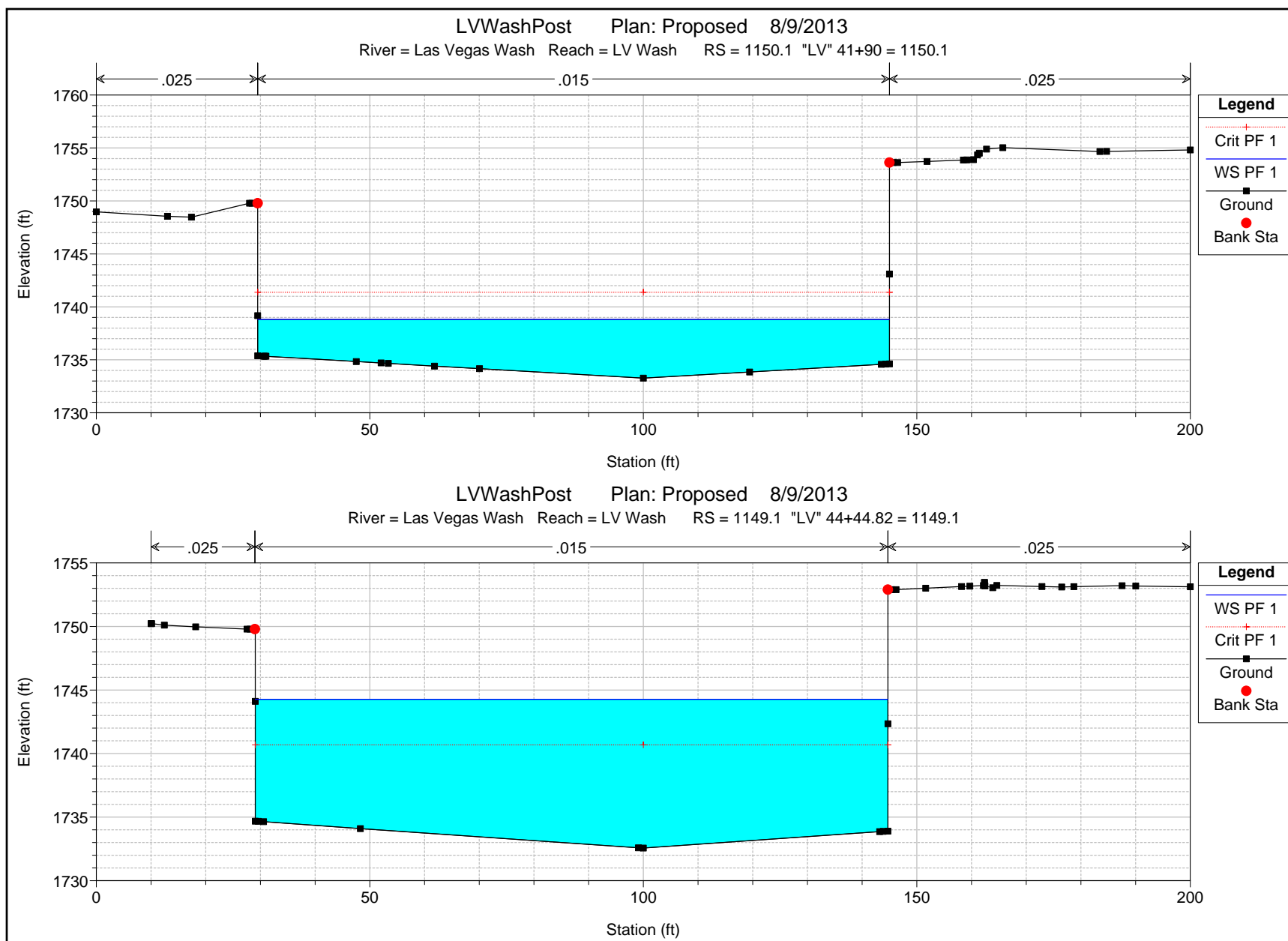
LVWashPost Plan: Proposed 8/9/2013

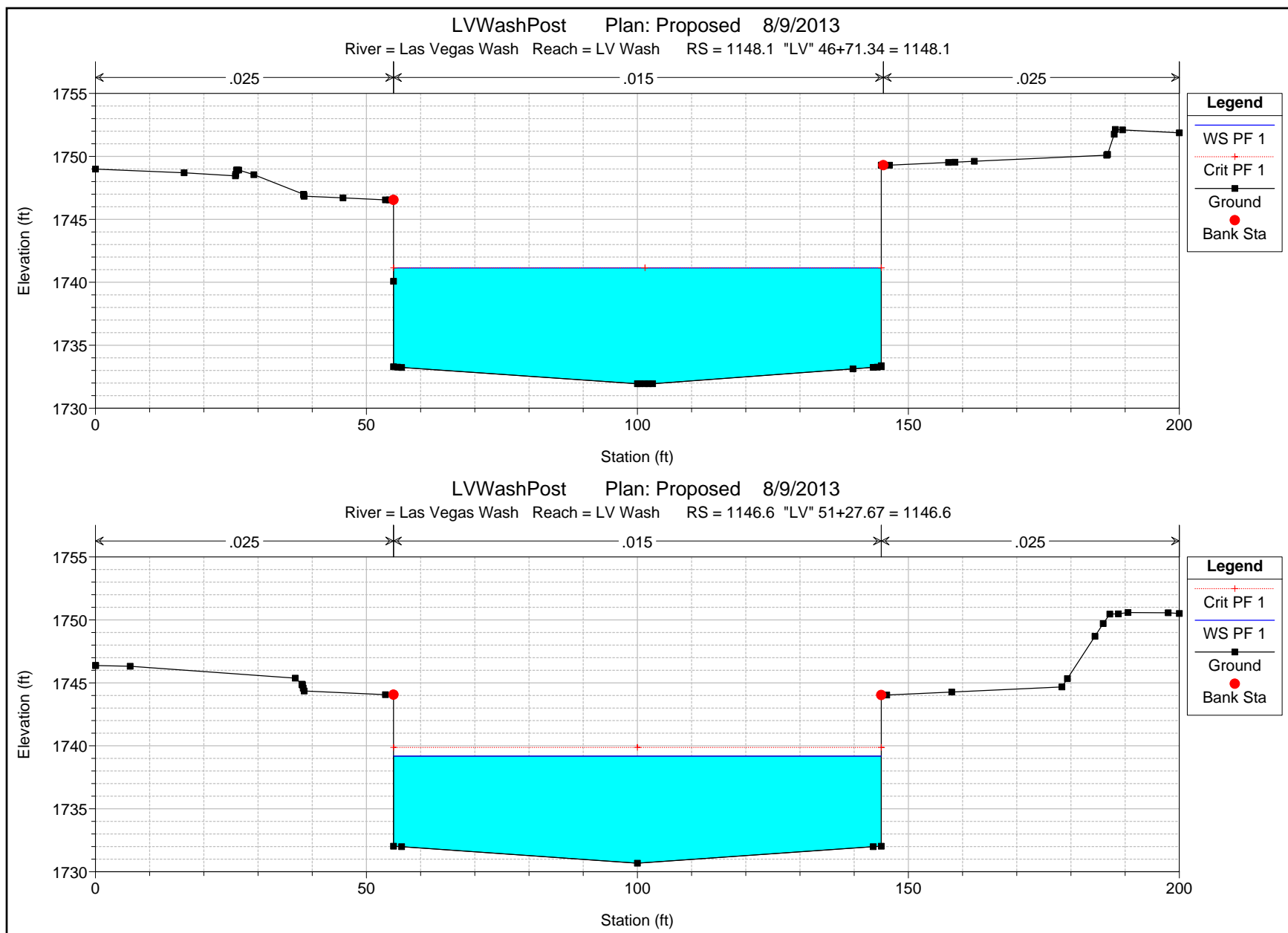
River = Las Vegas Wash Reach = LV Wash RS = 1152.95 "LV" 38+00 = 1152.95 Upstream of Stewart Avenue Bridge





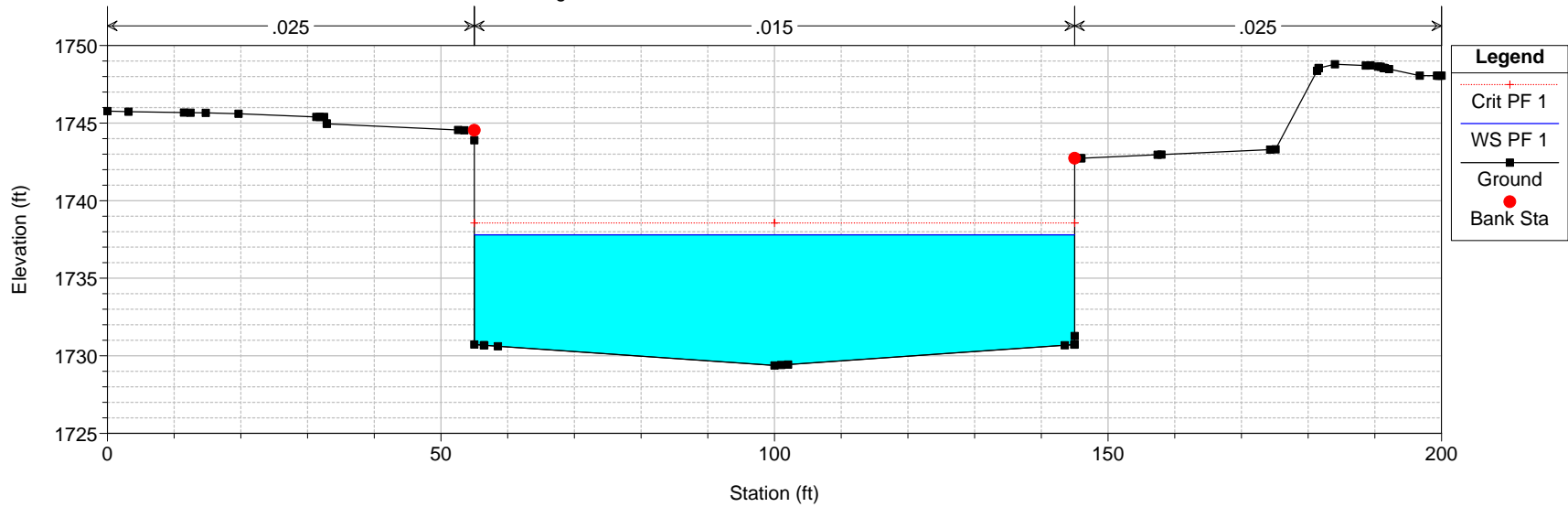






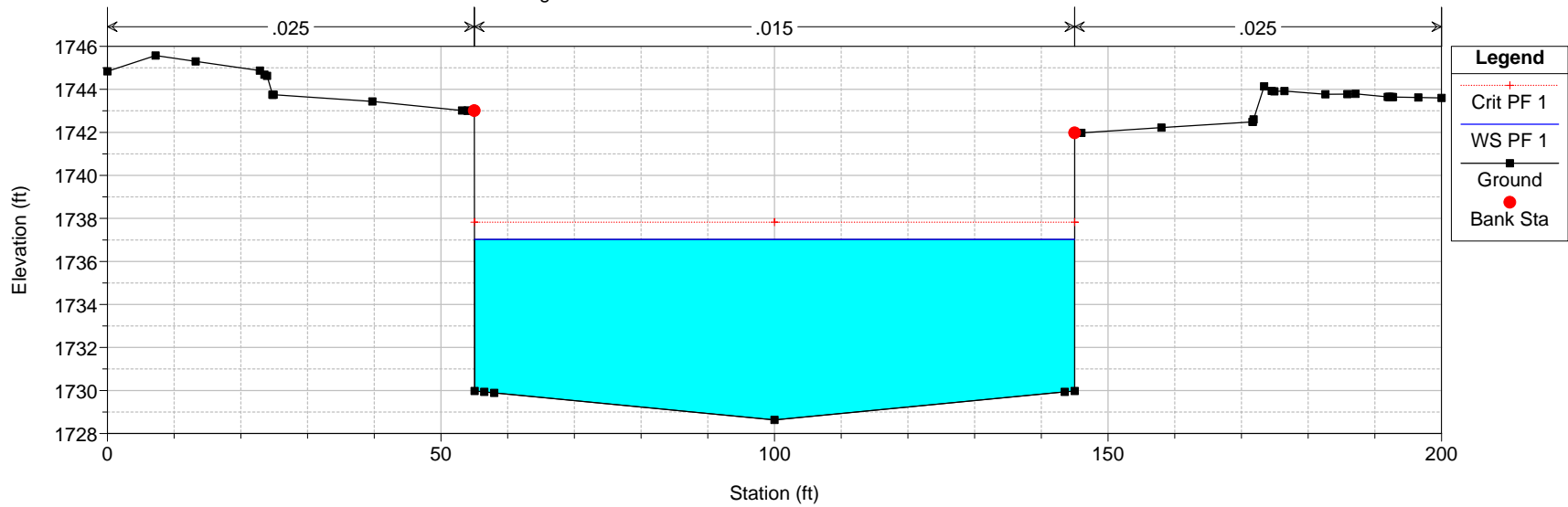
LVWashPost Plan: Proposed 8/9/2013

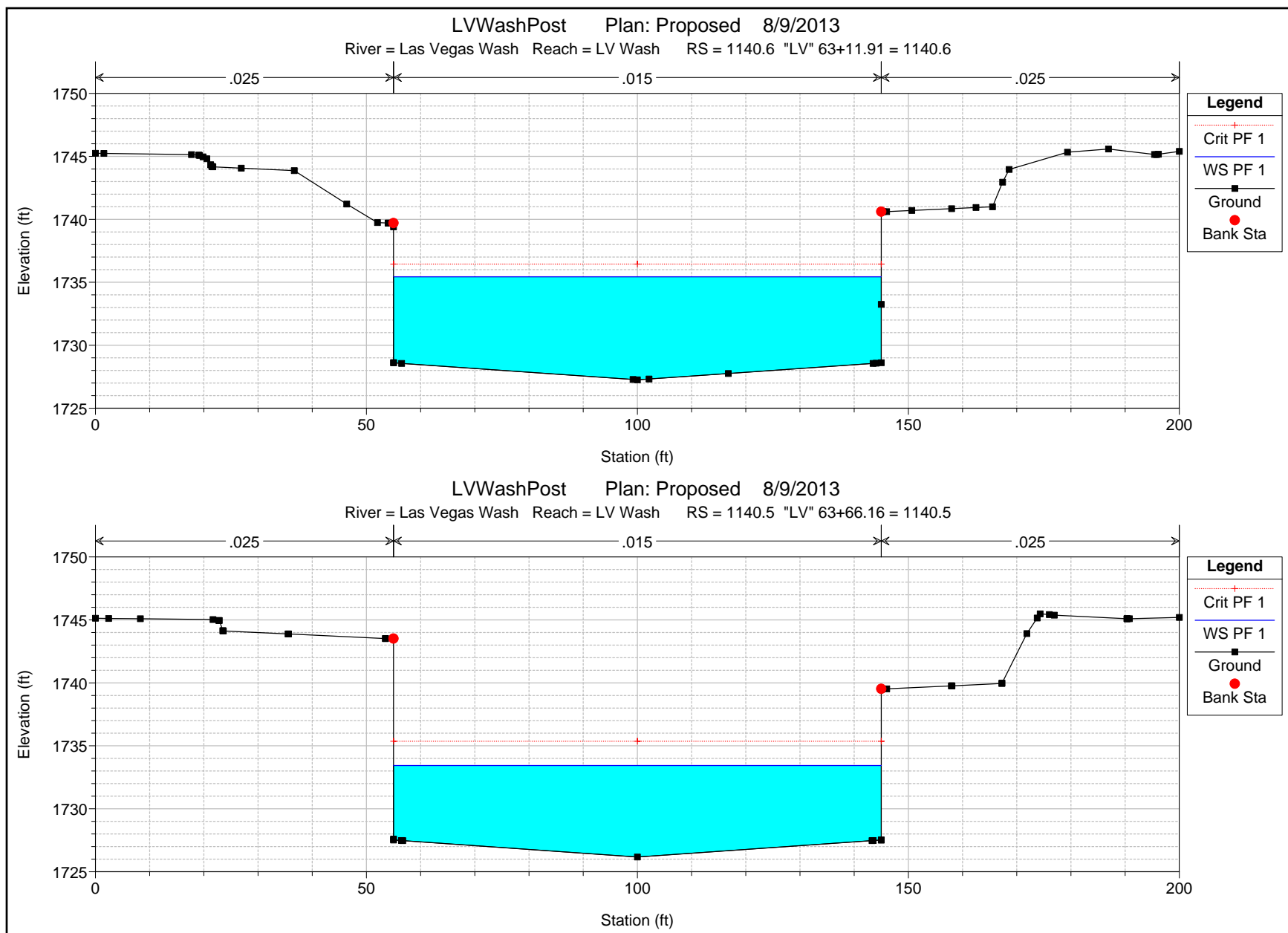
River = Las Vegas Wash Reach = LV Wash RS = 1144.5 "LV" 56+00 = 1144.5

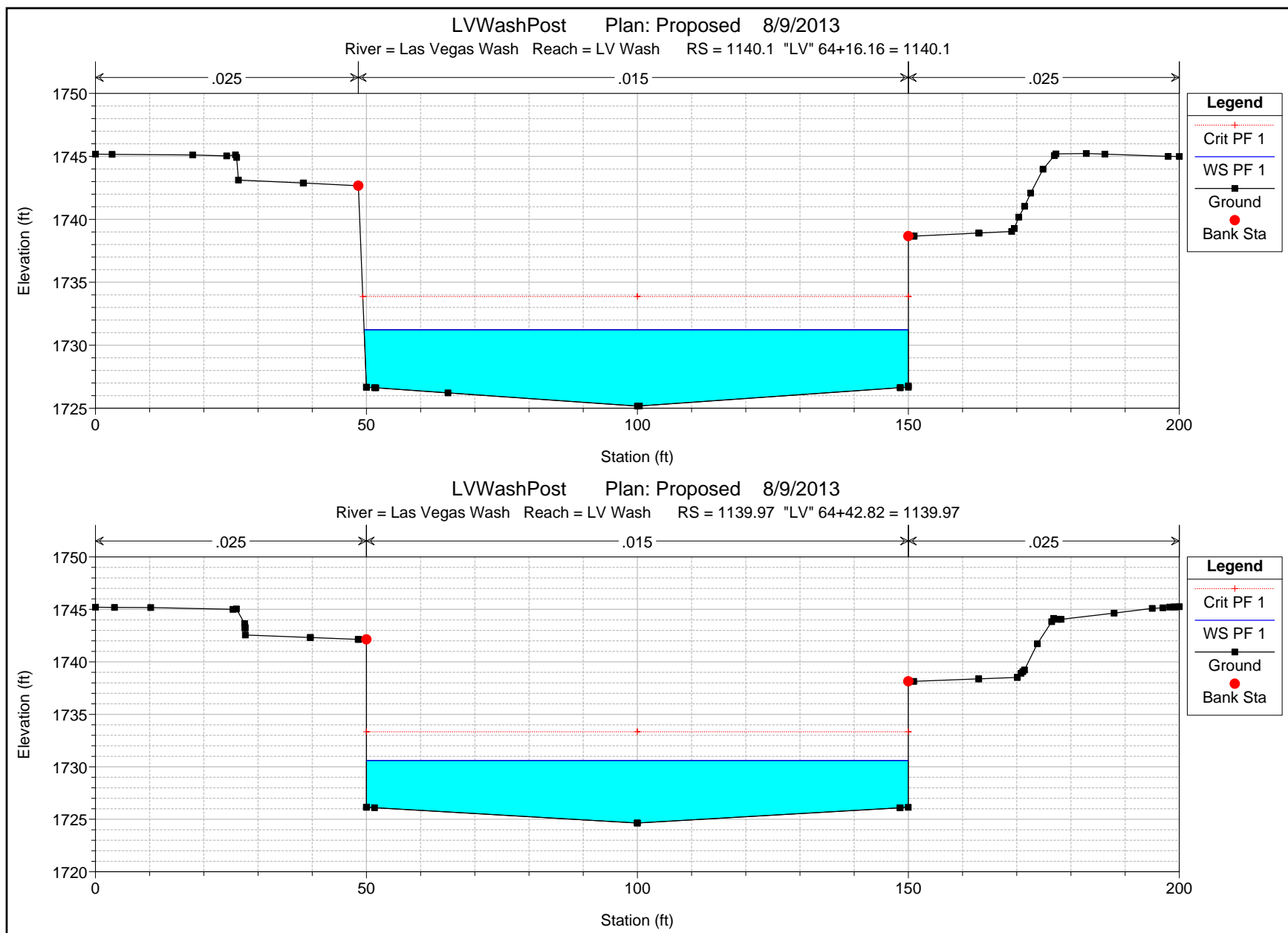


LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1142.9 "LV" 58+70.48 = 1142.9

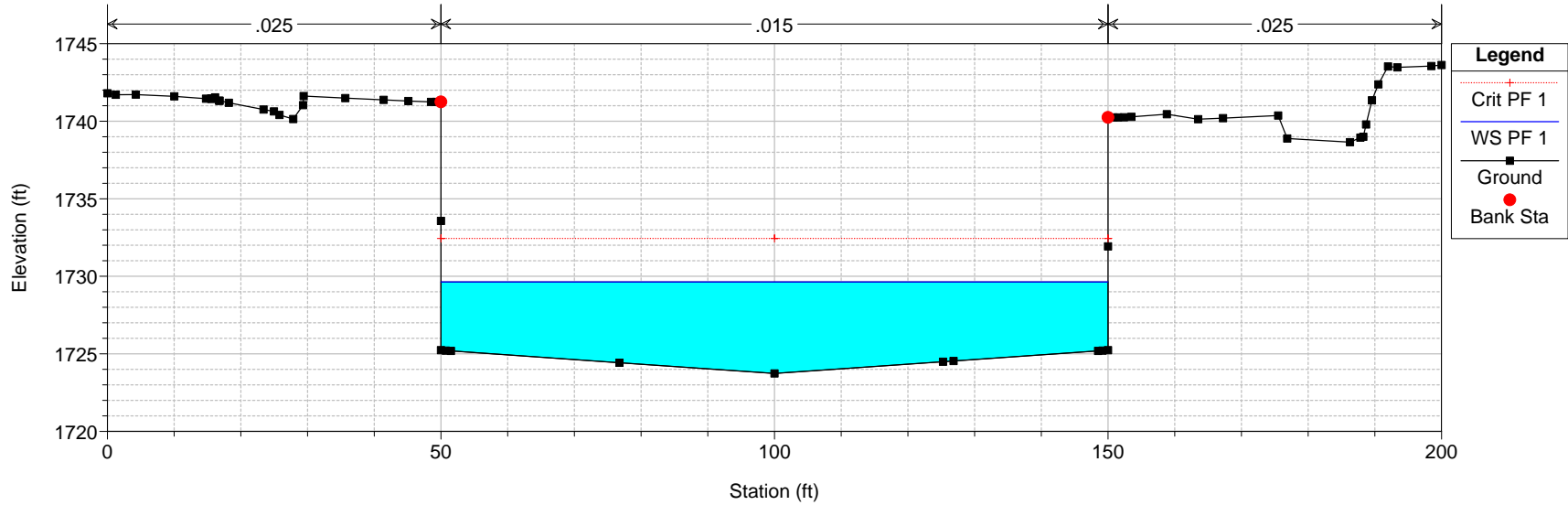






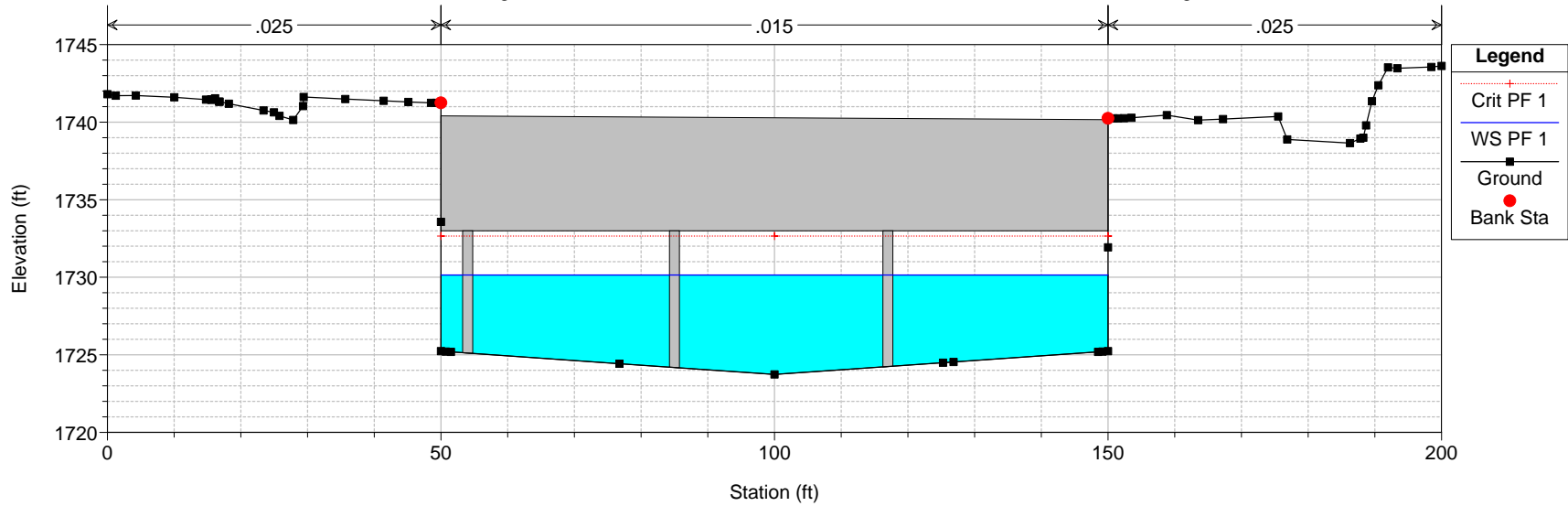
LVWashPost Plan: Proposed 8/9/2013

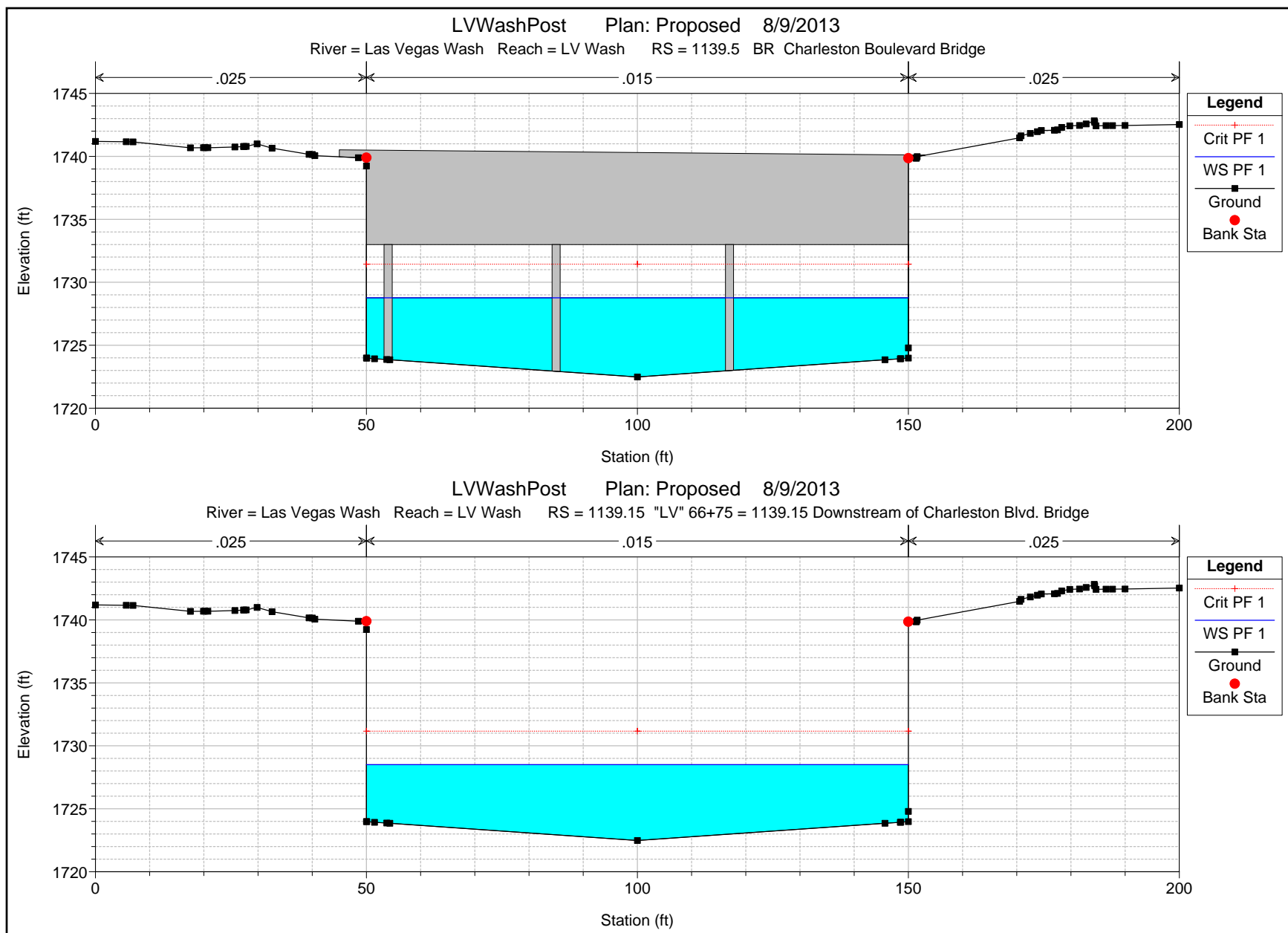
River = Las Vegas Wash Reach = LV Wash RS = 1139.95 "LV" 65+40 = 1139.95 Upstream of Charleston Blvd. bridge

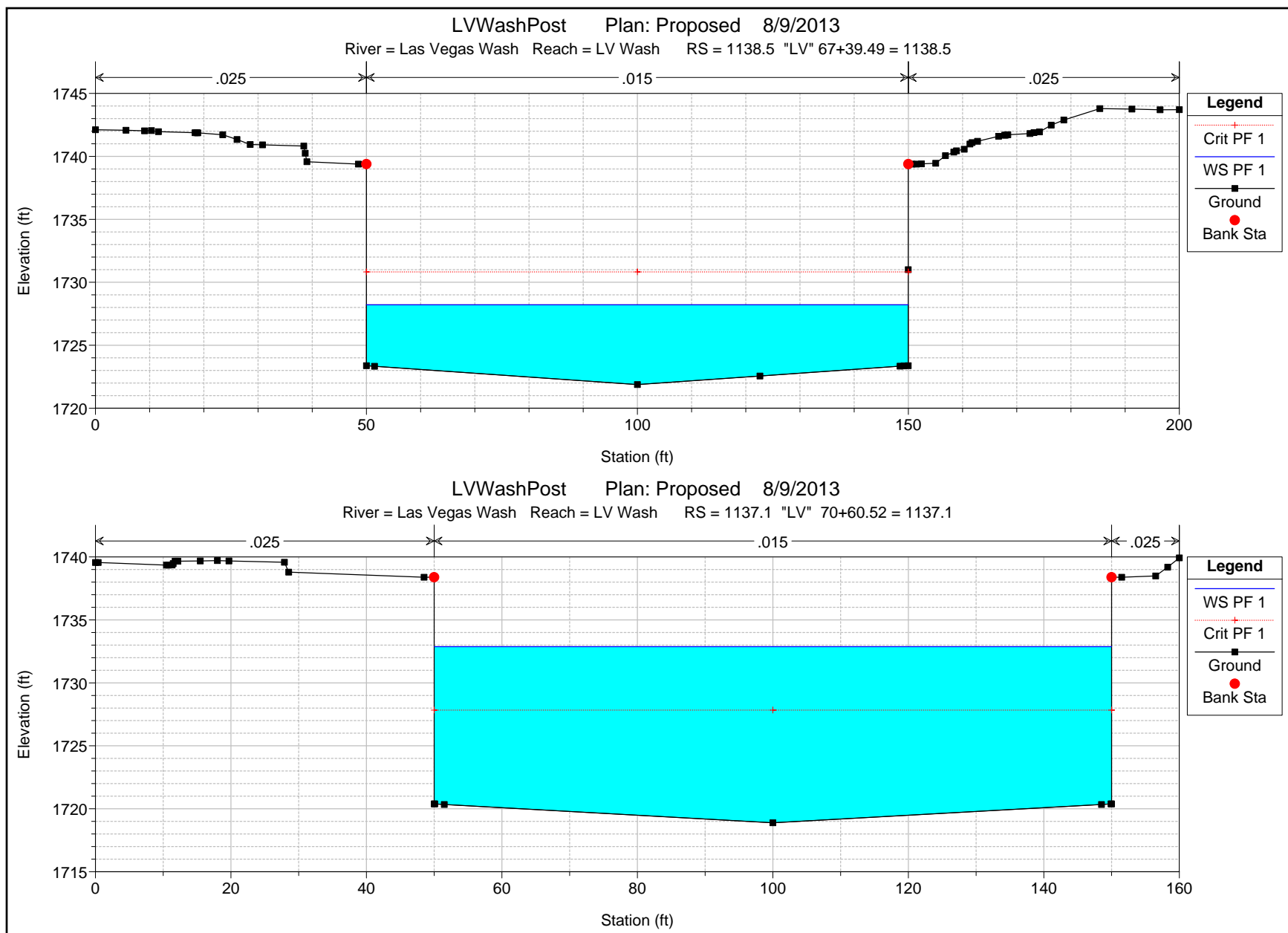


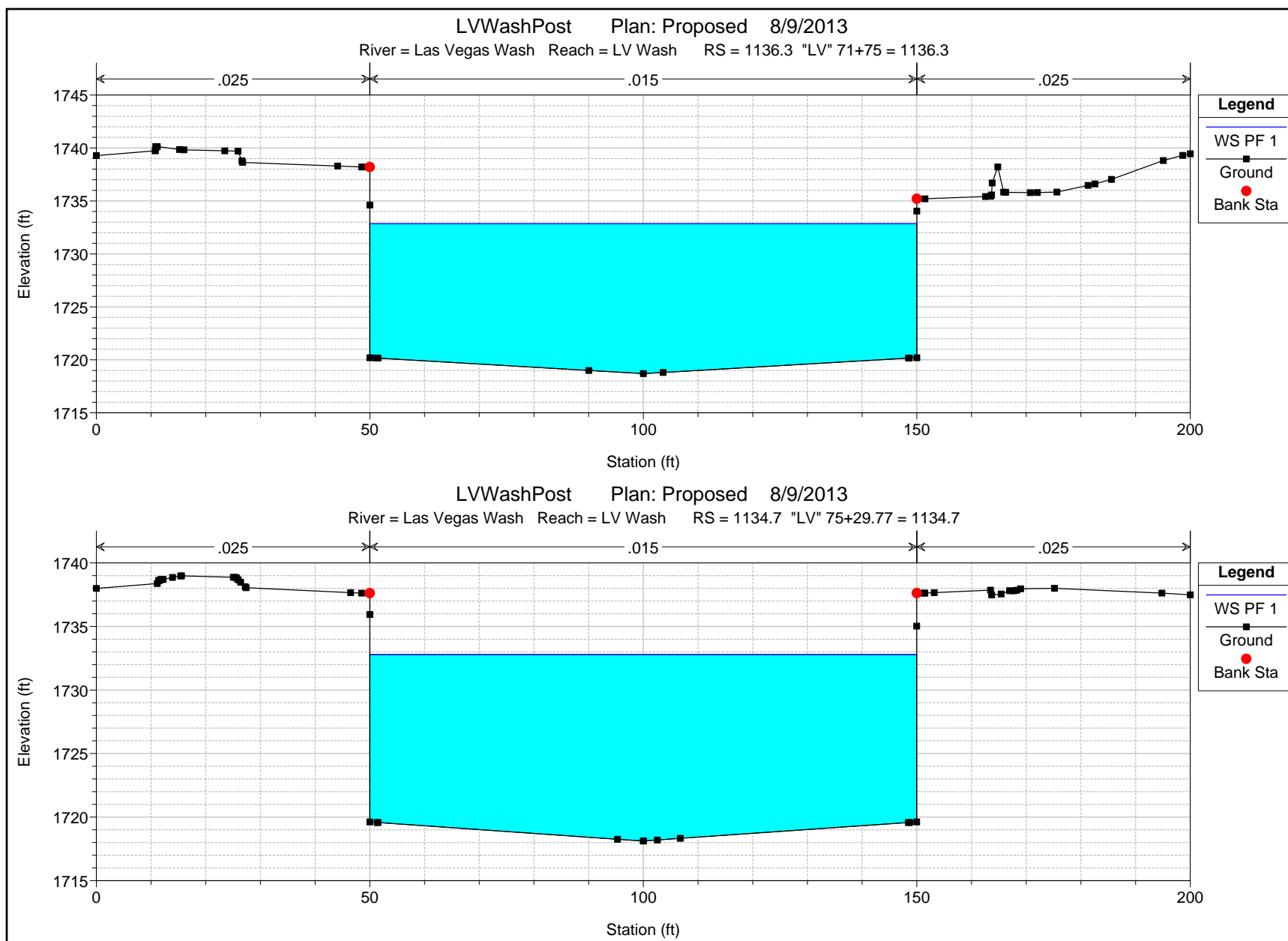
LVWashPost Plan: Proposed 8/9/2013

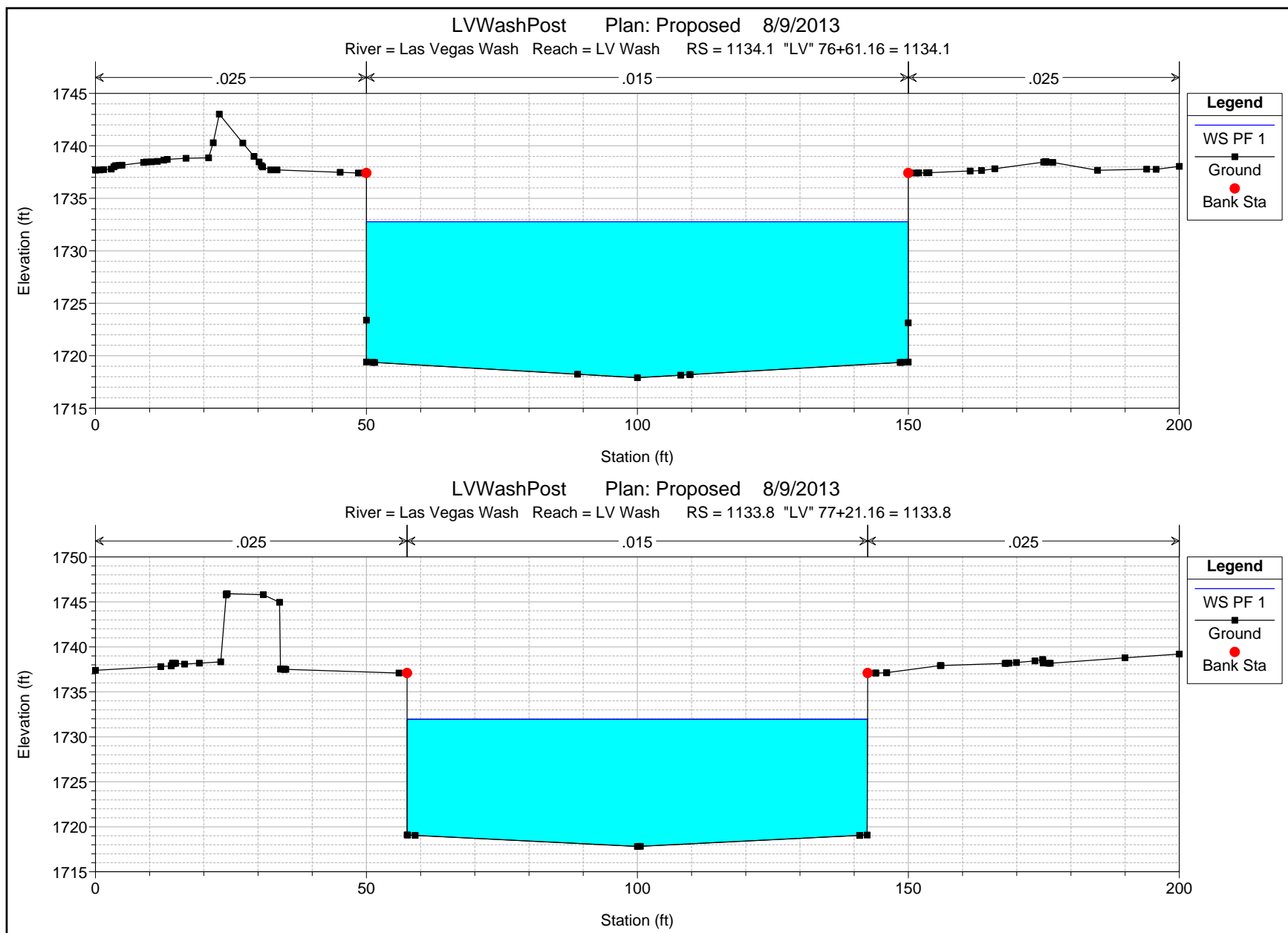
River = Las Vegas Wash Reach = LV Wash RS = 1139.5 BR Charleston Boulevard Bridge

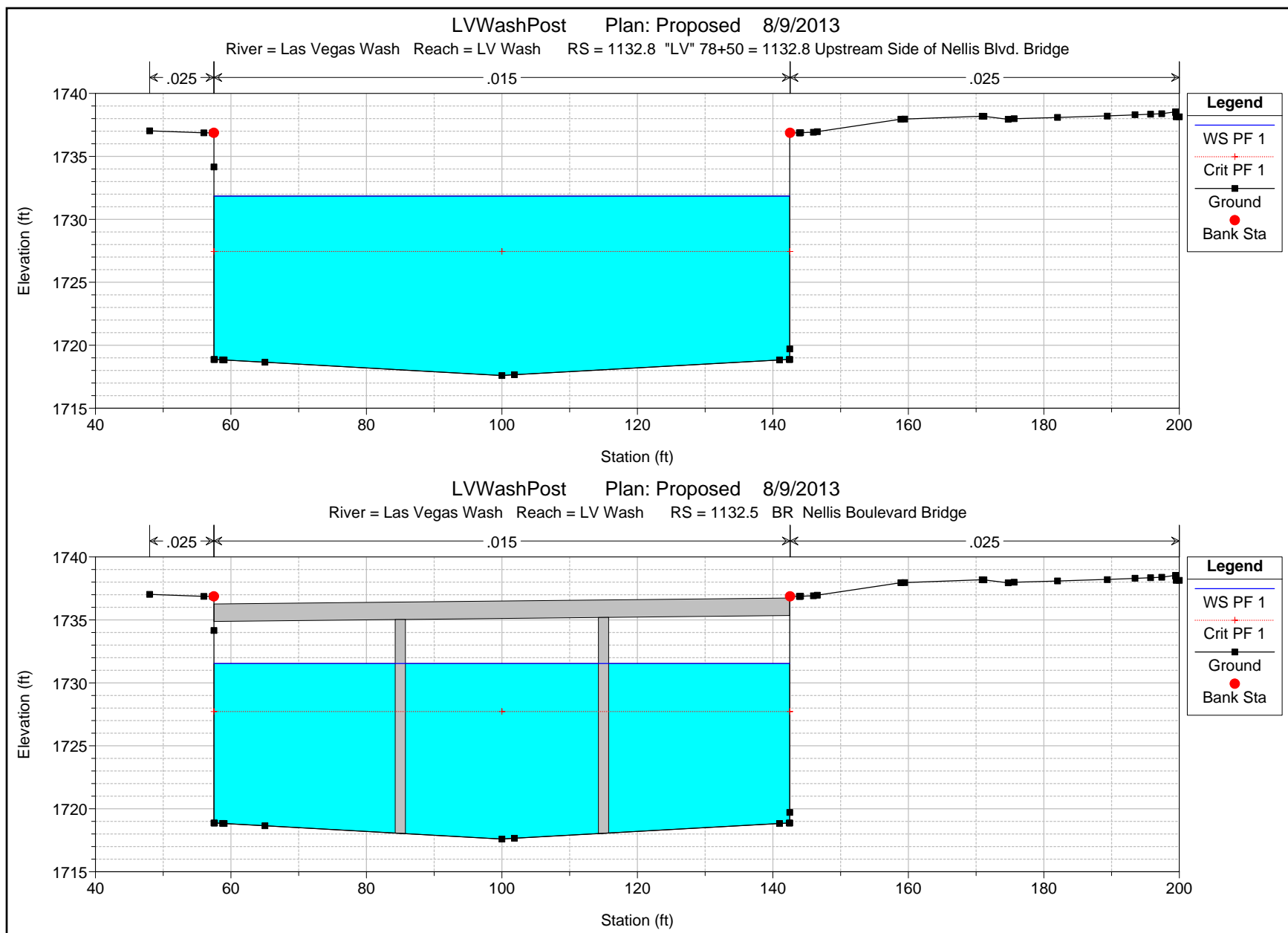


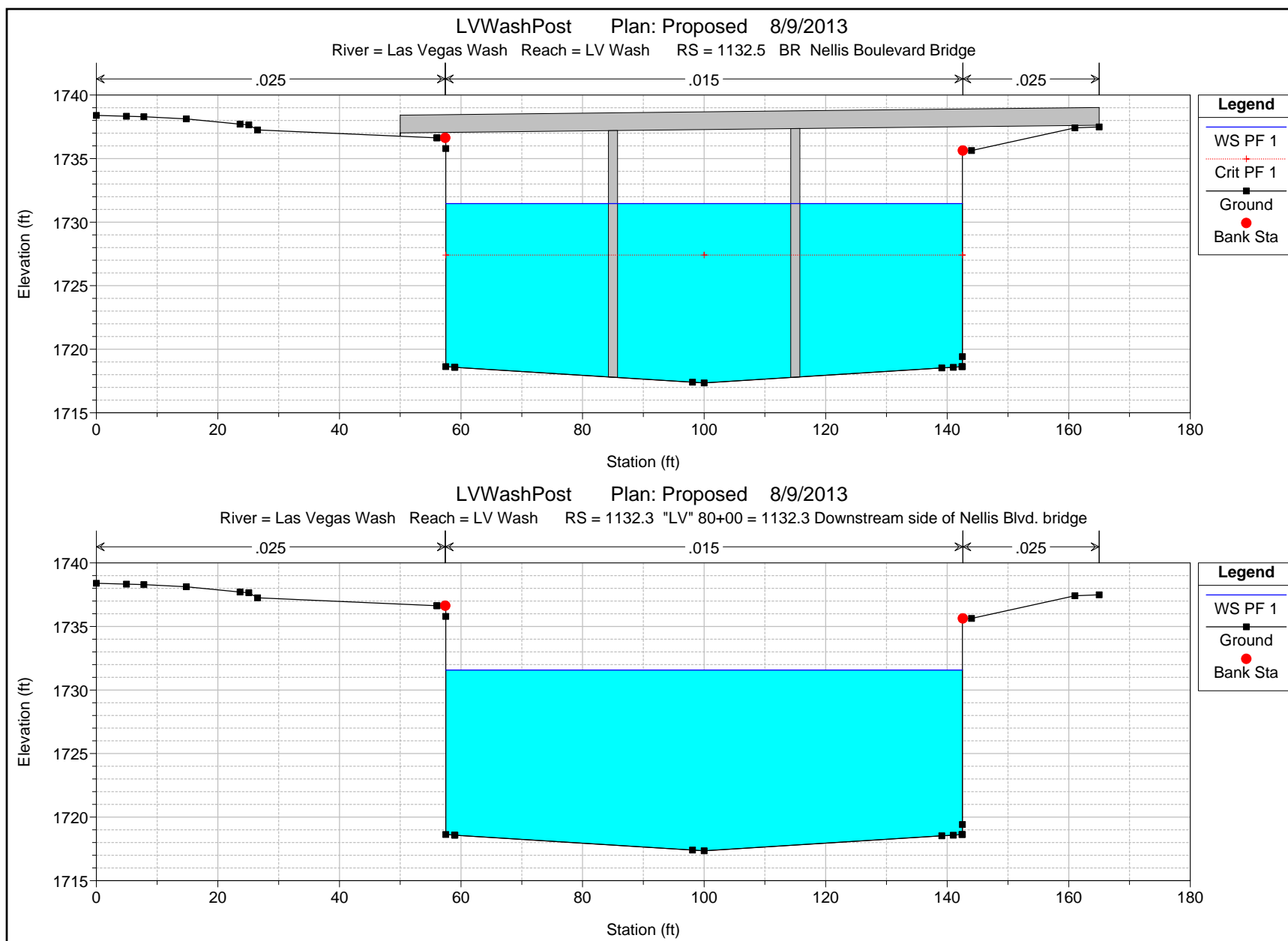


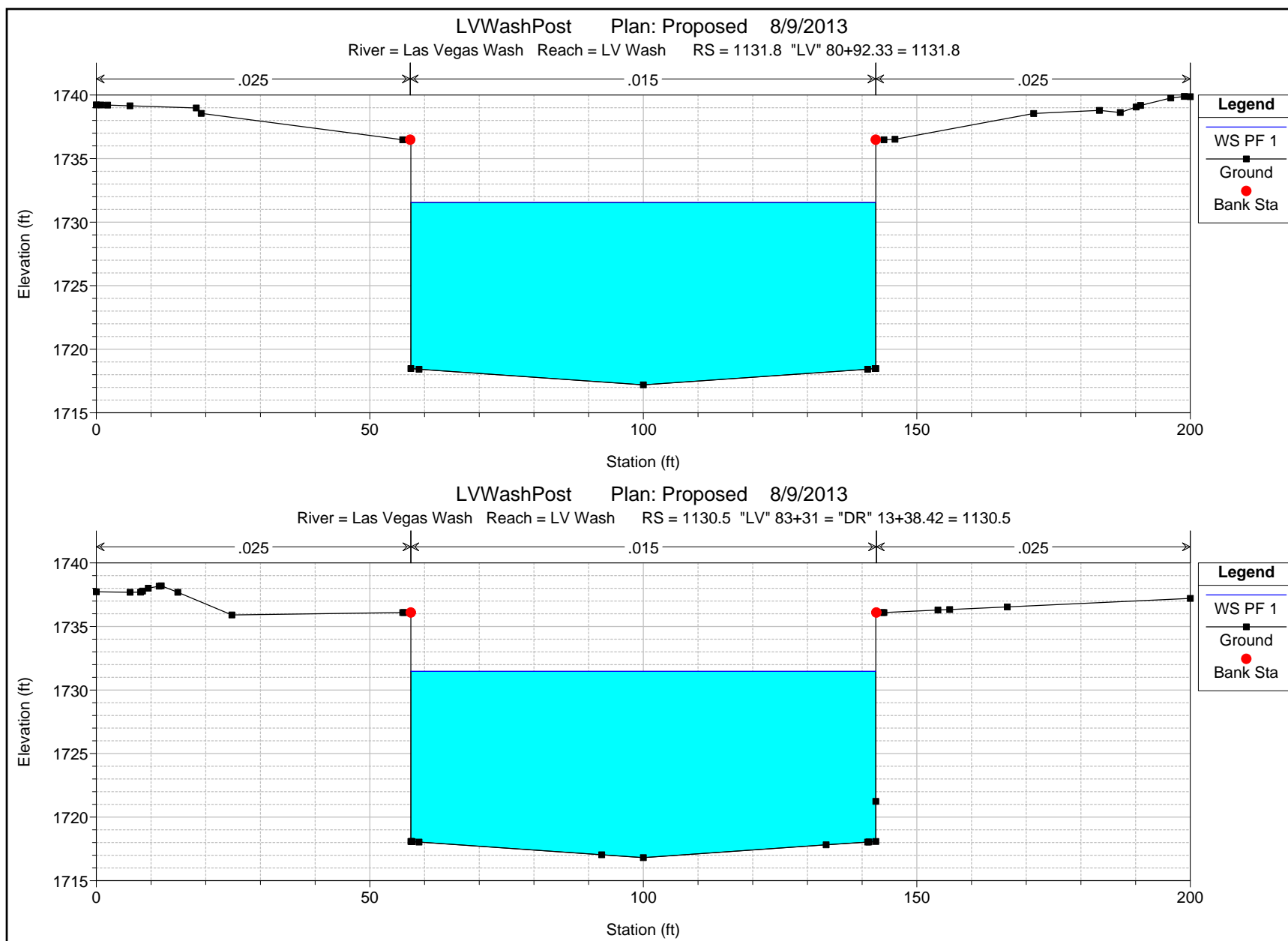


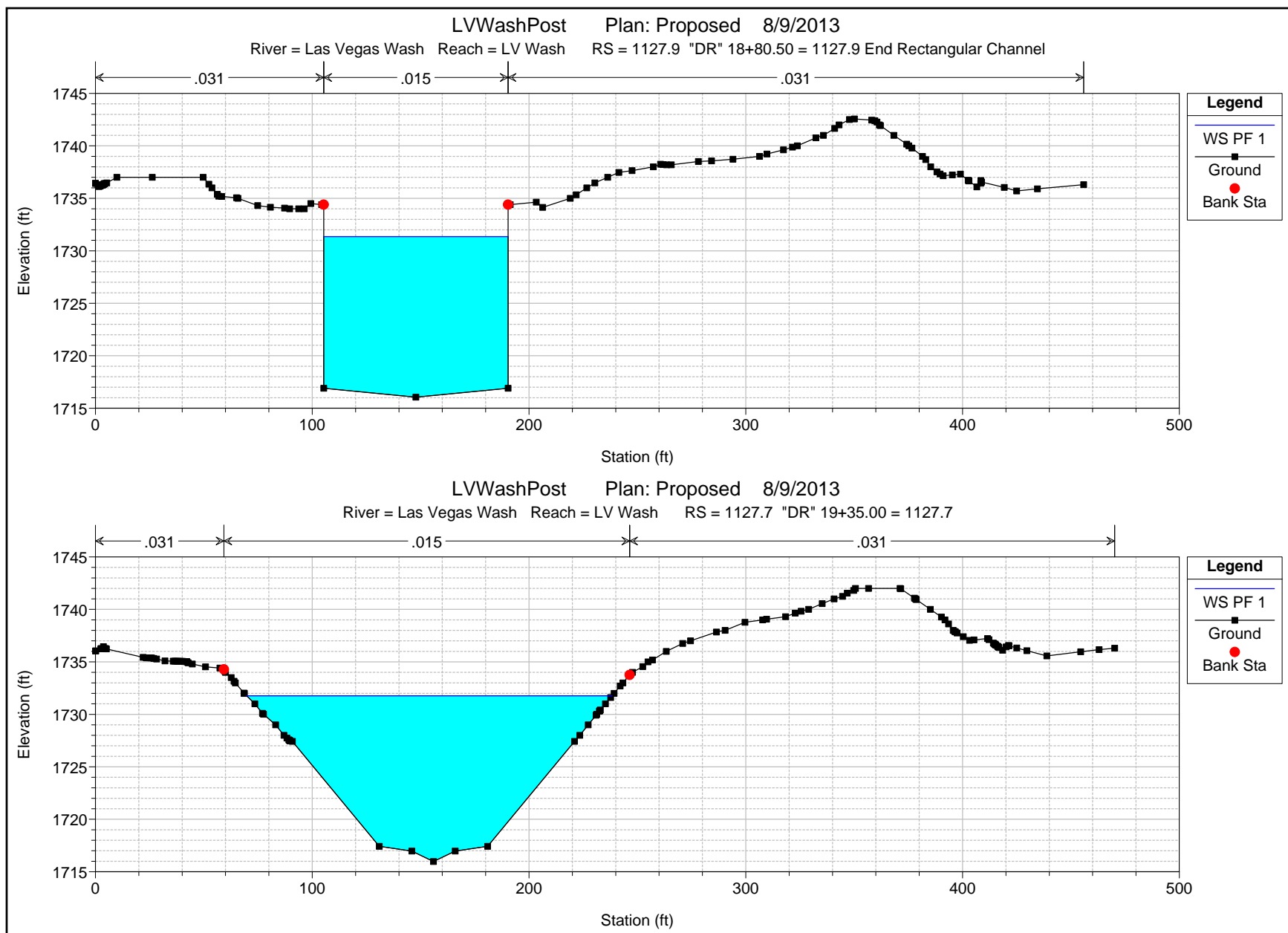


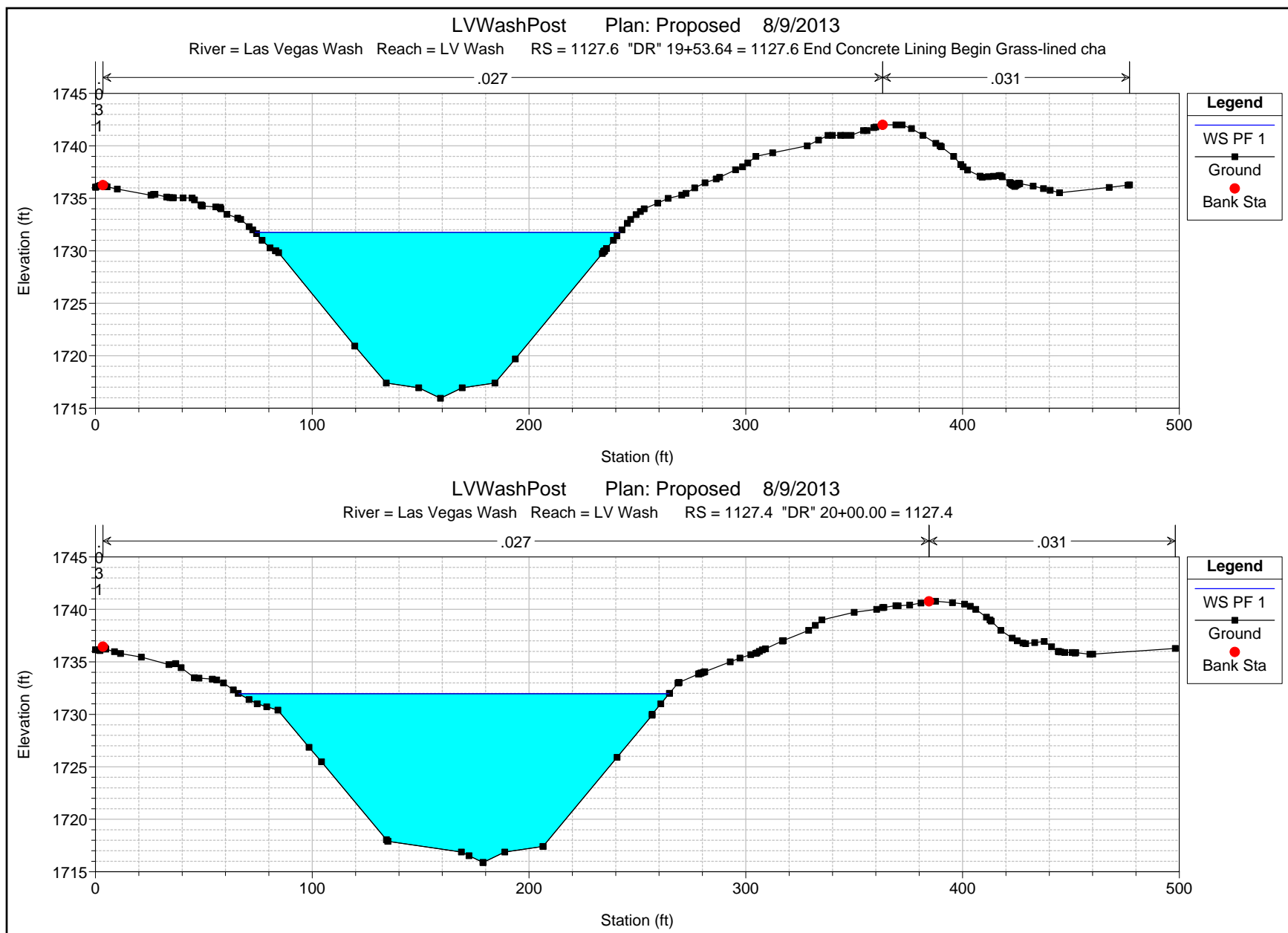


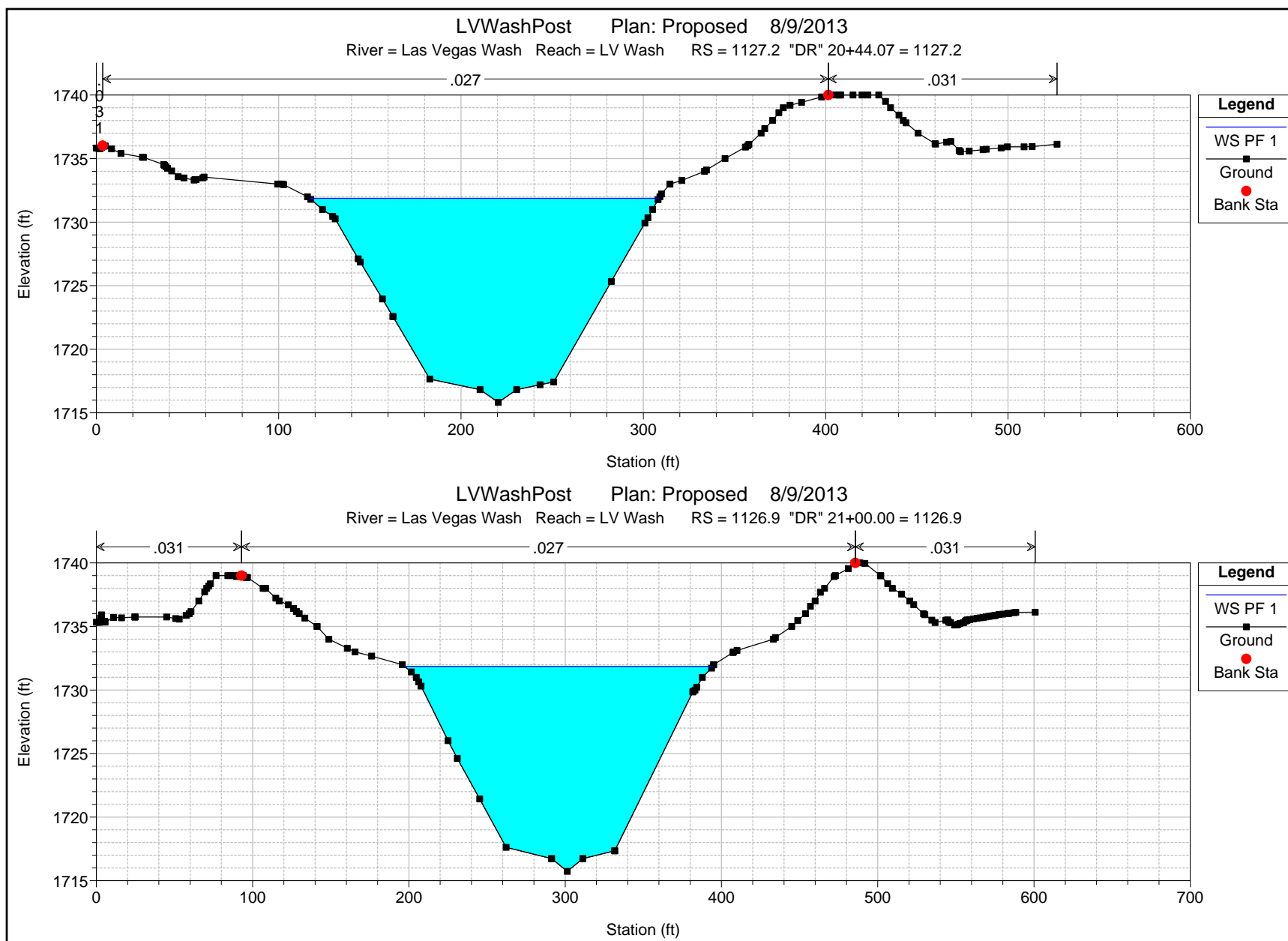




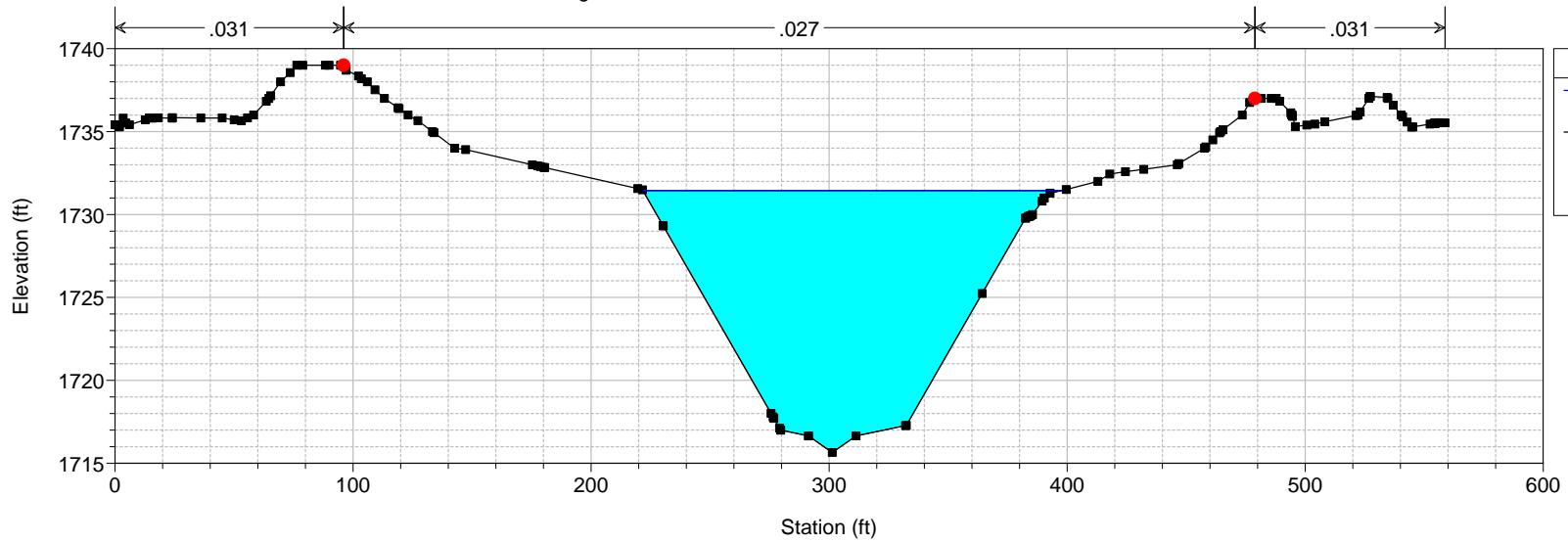




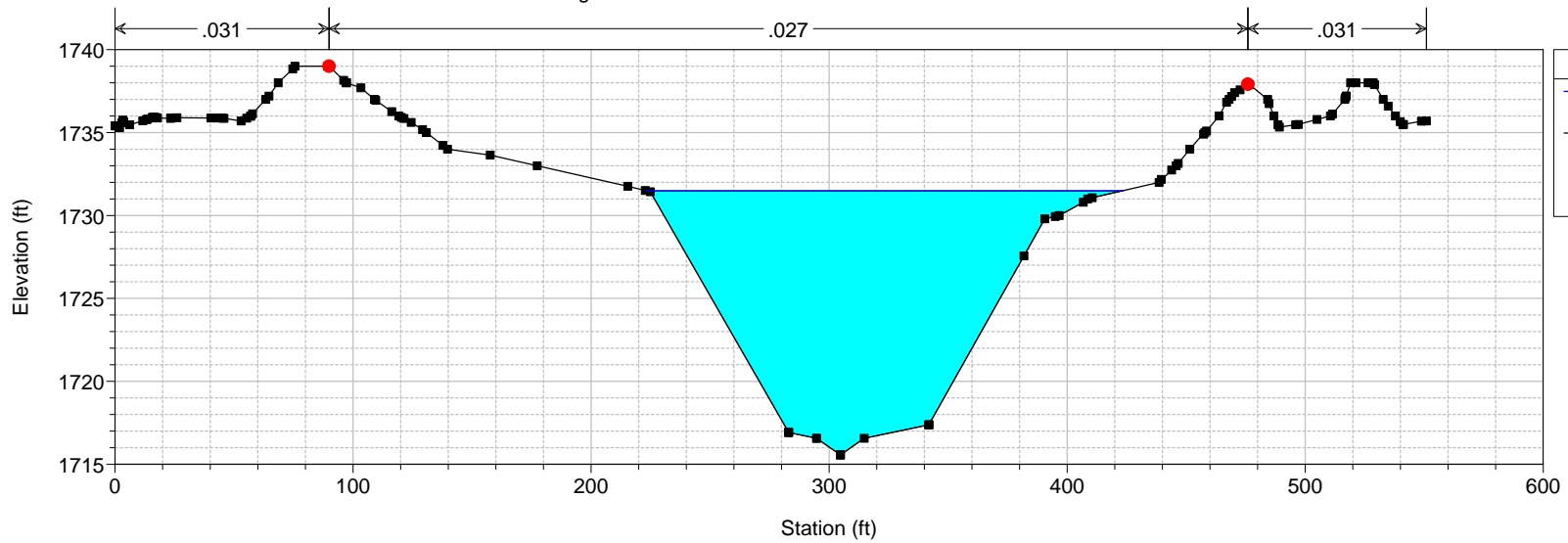




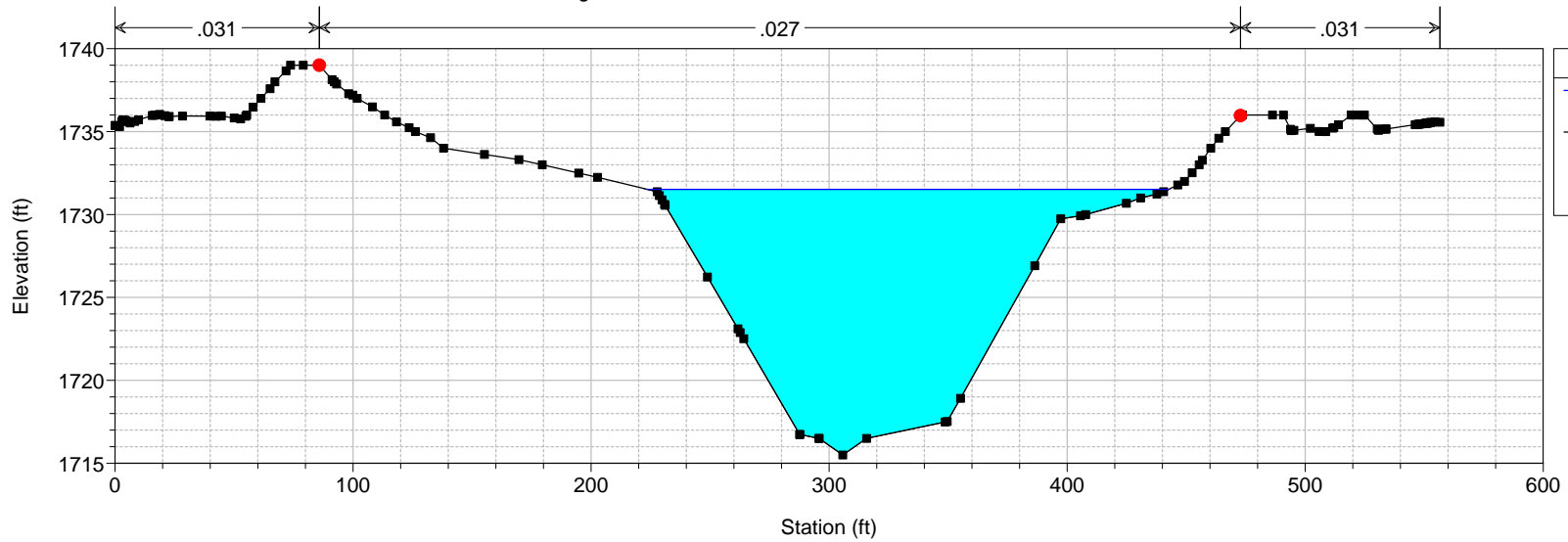
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.7 "DR" 21+66.63 = 1126.7



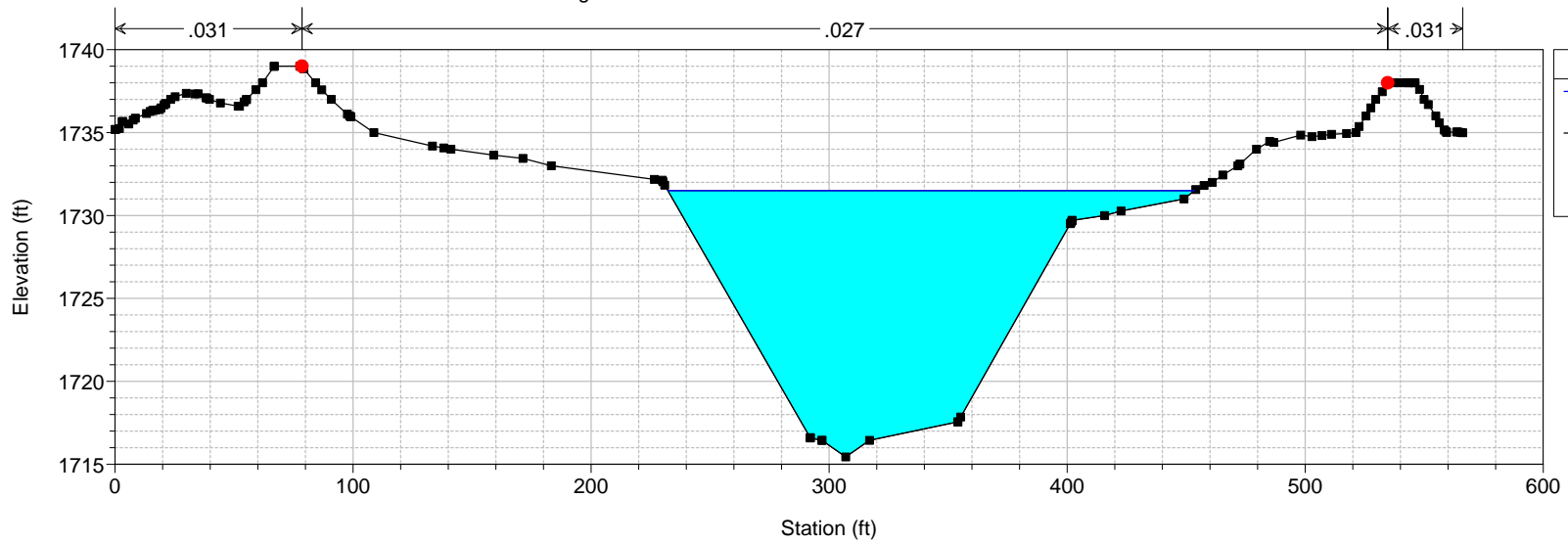
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.5 "DR" 22+00.00 = 1126.5



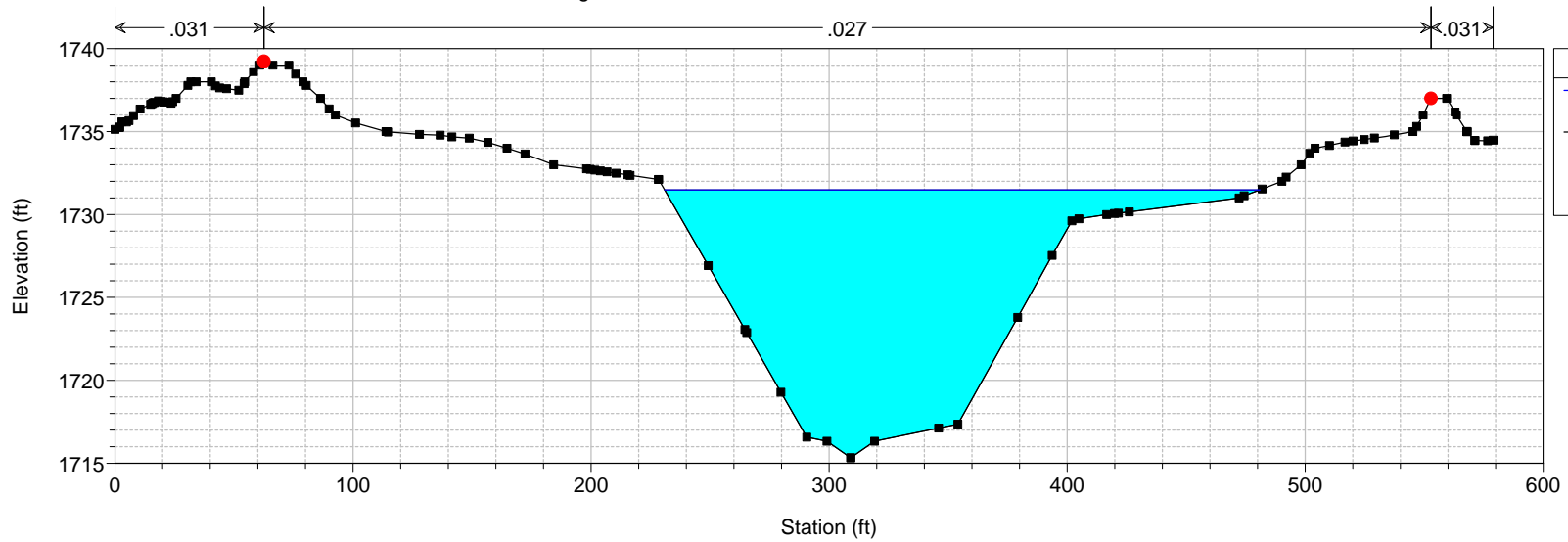
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.3 "DR" 22+27.02 = 1126.3



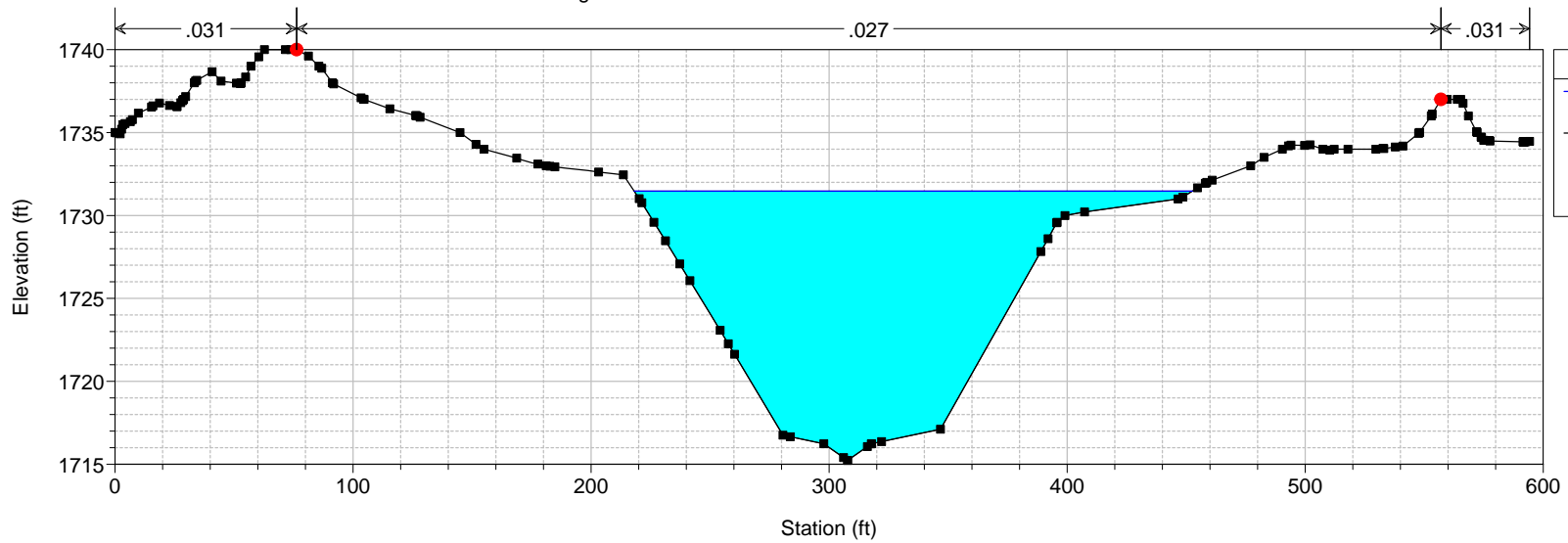
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.2 "DR" 22+50.00 = 1126.2



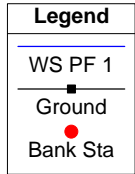
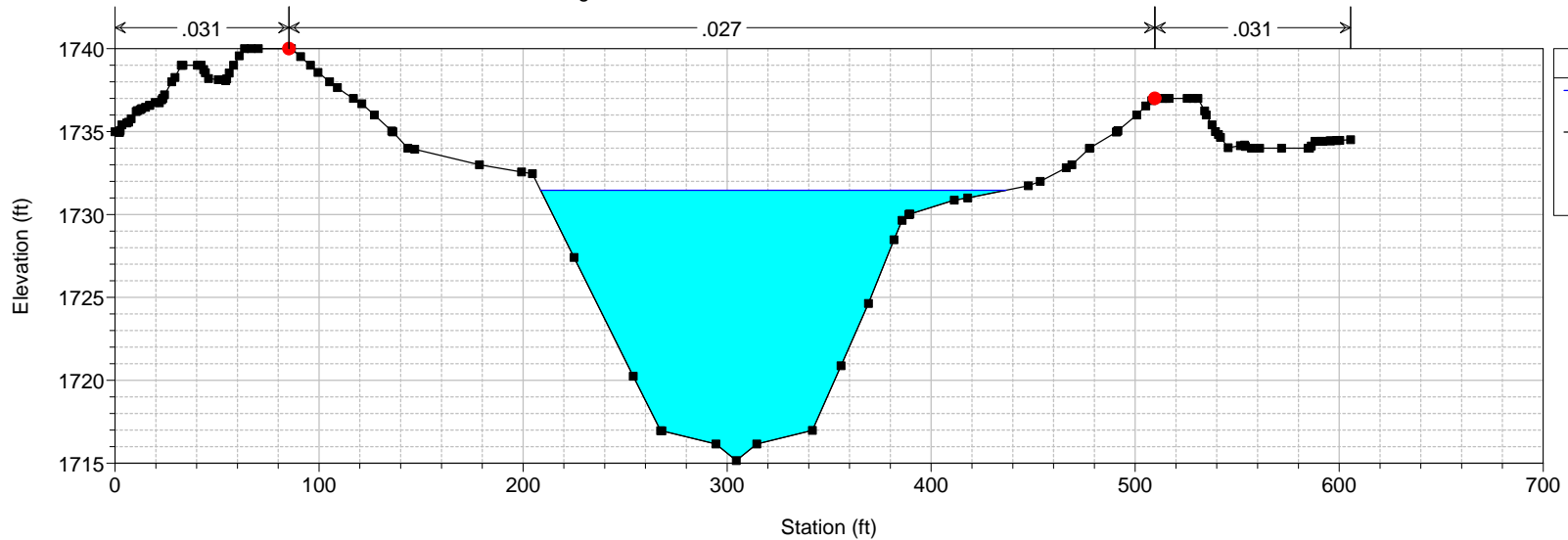
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.9 "DR" 22+97.34 = 1125.9



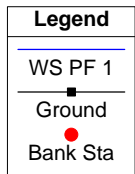
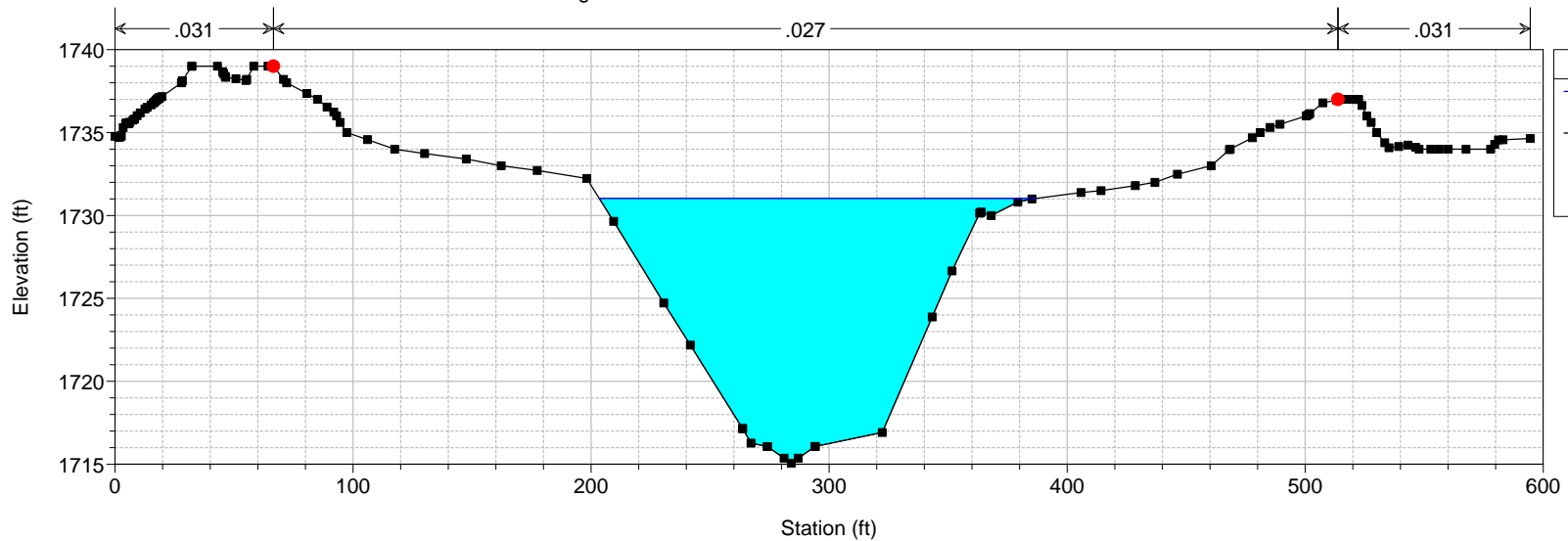
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.8 "DR" 23+31.66 = 1125.8



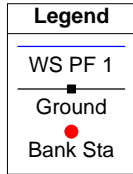
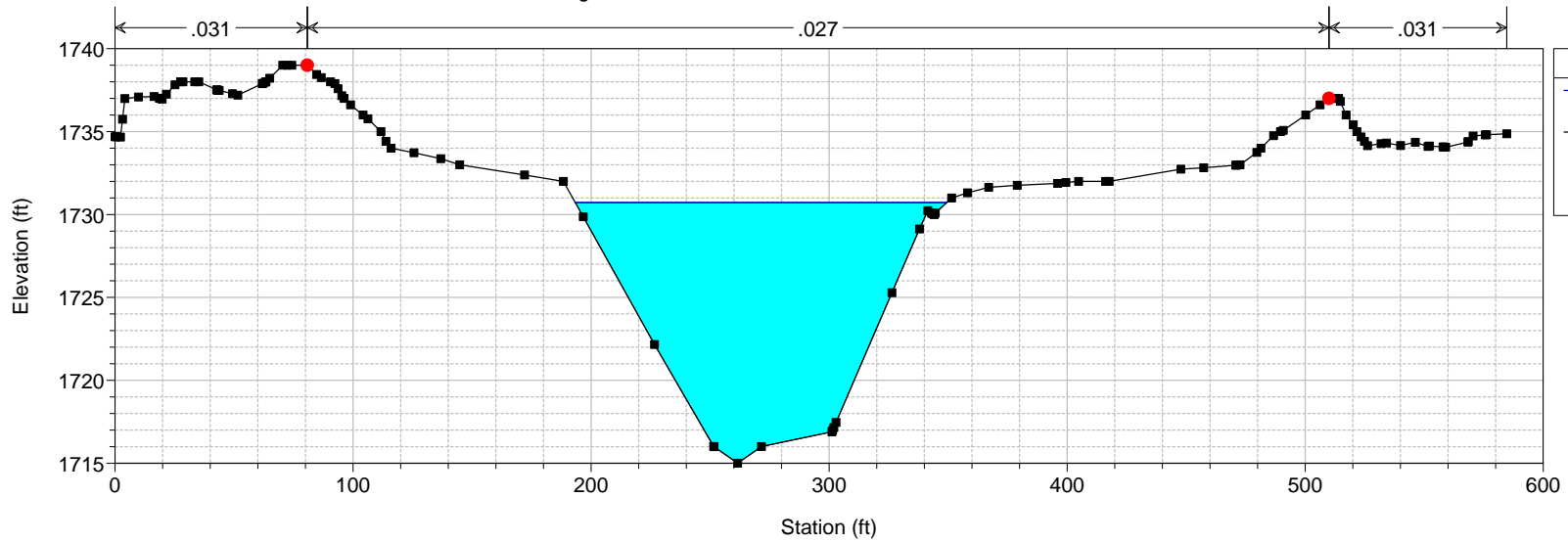
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.7 "DR" 23+65.98 = 1125.7



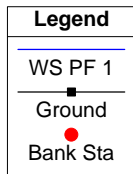
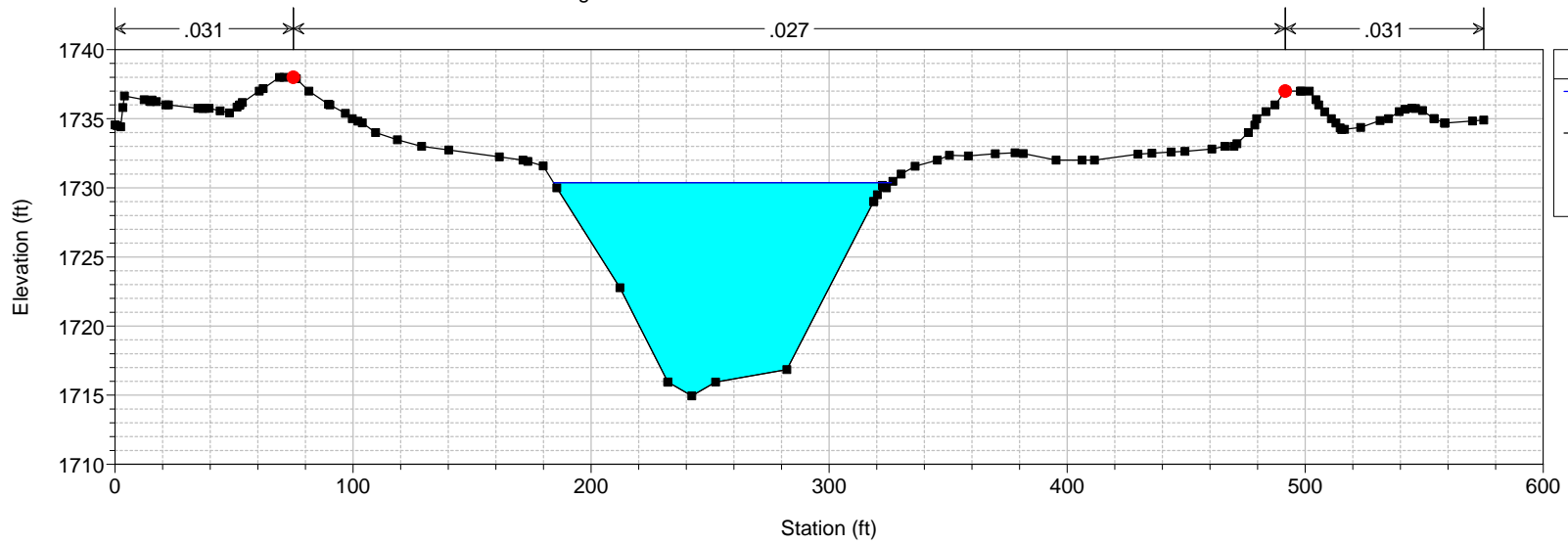
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.6 "DR" 24+00.00 = 1125.6

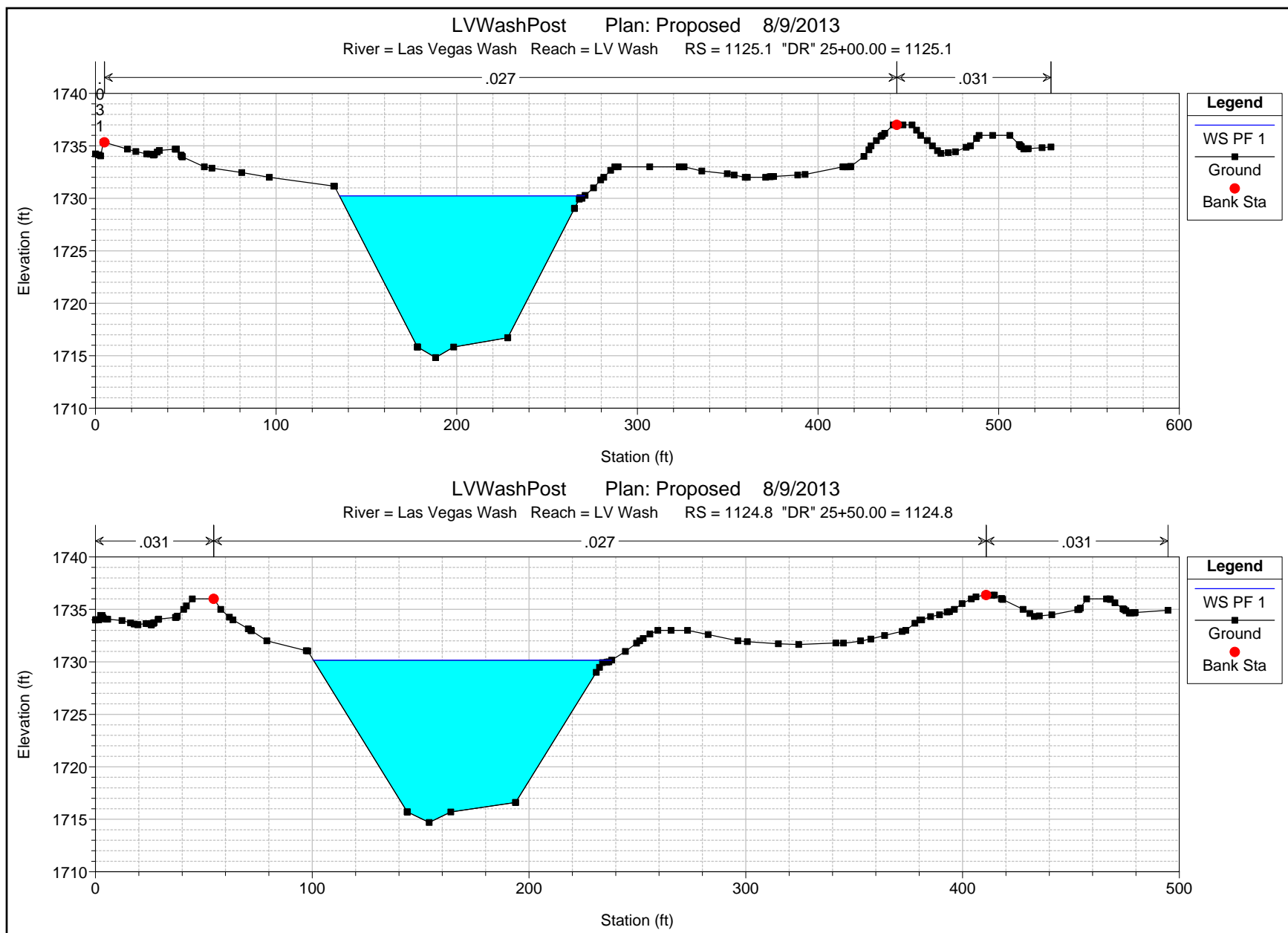


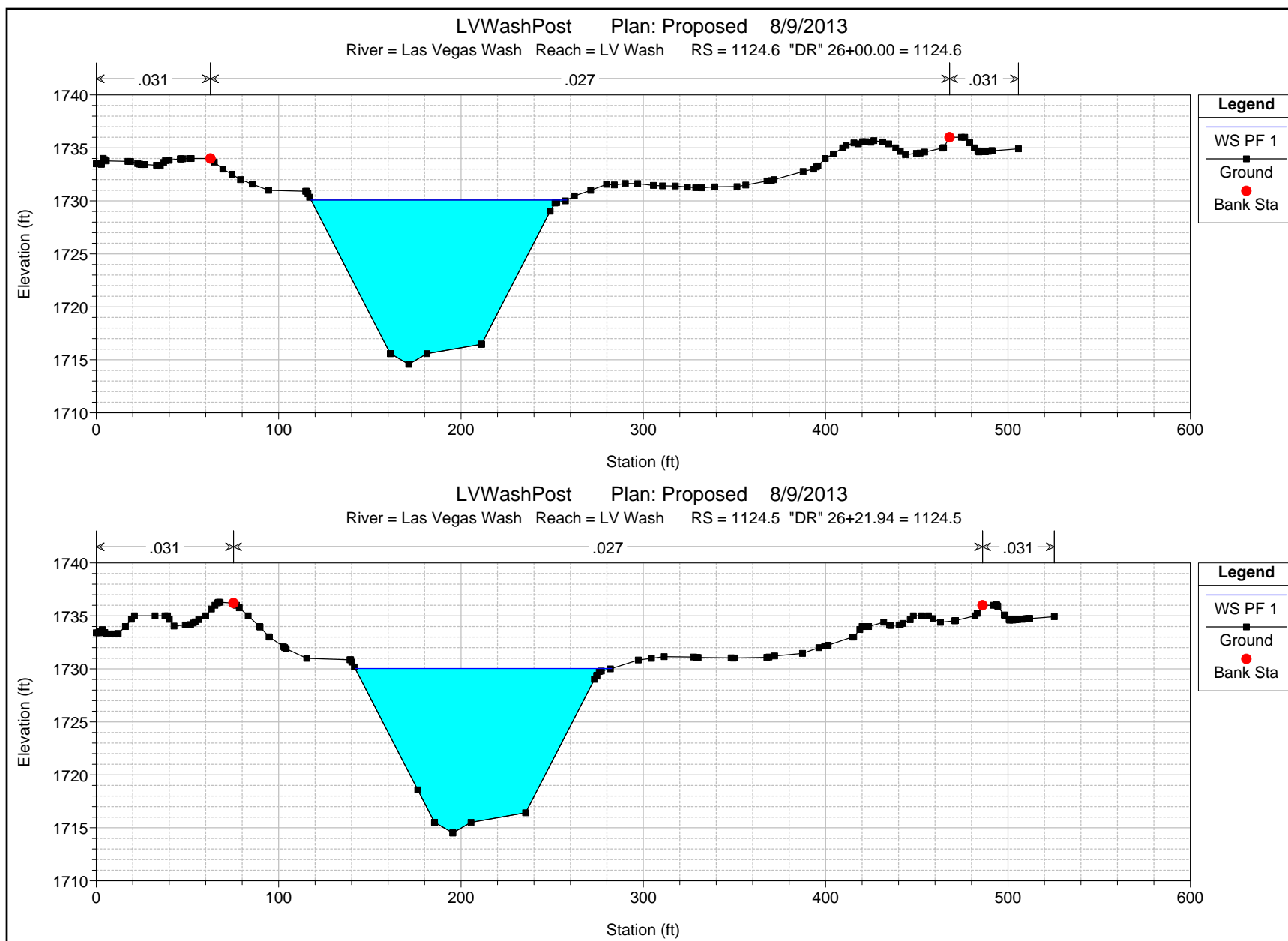
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.5 "DR" 24+26.00 = 1125.5

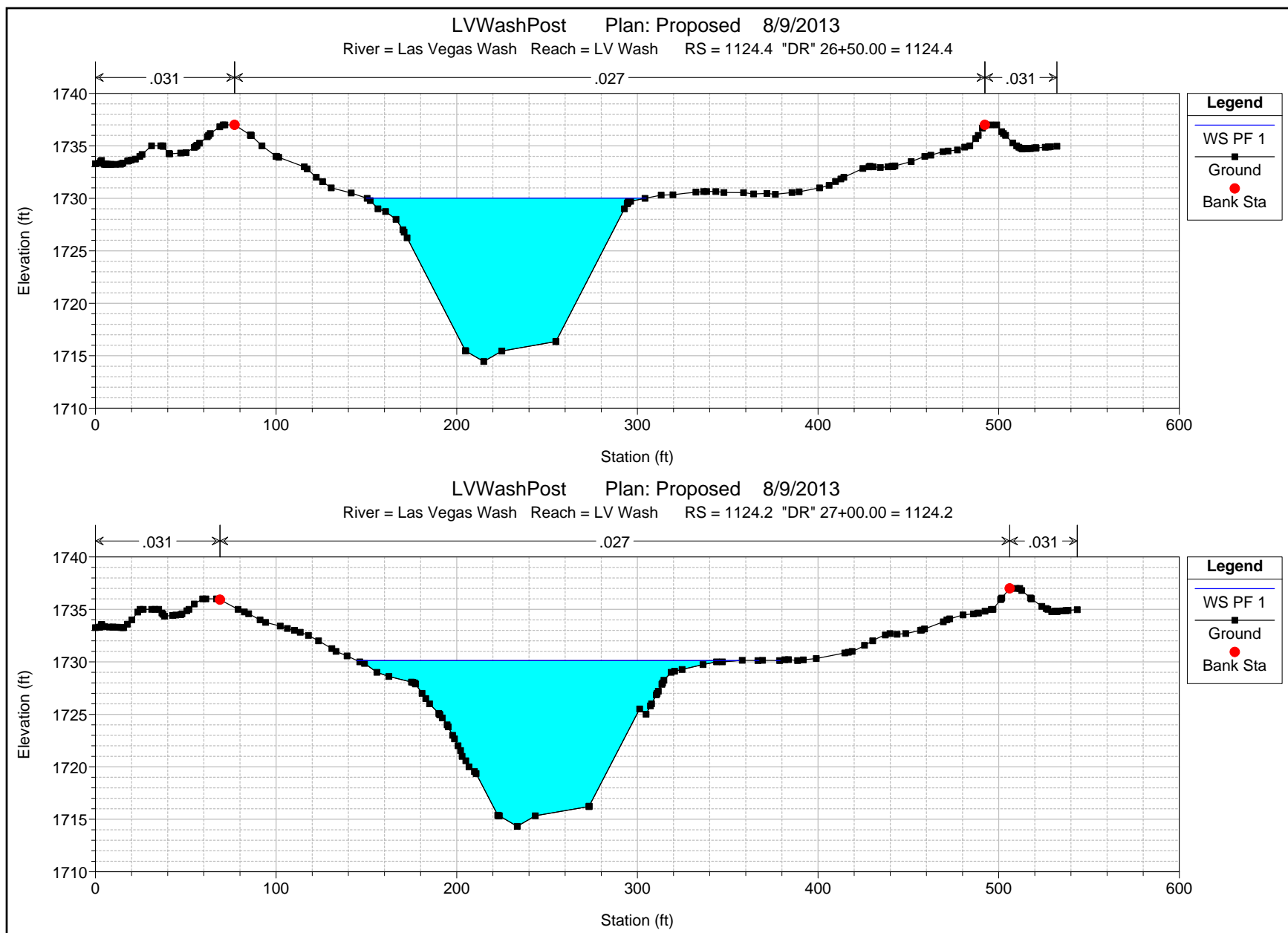


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.3 "DR" 24+50.00 = 1125.3

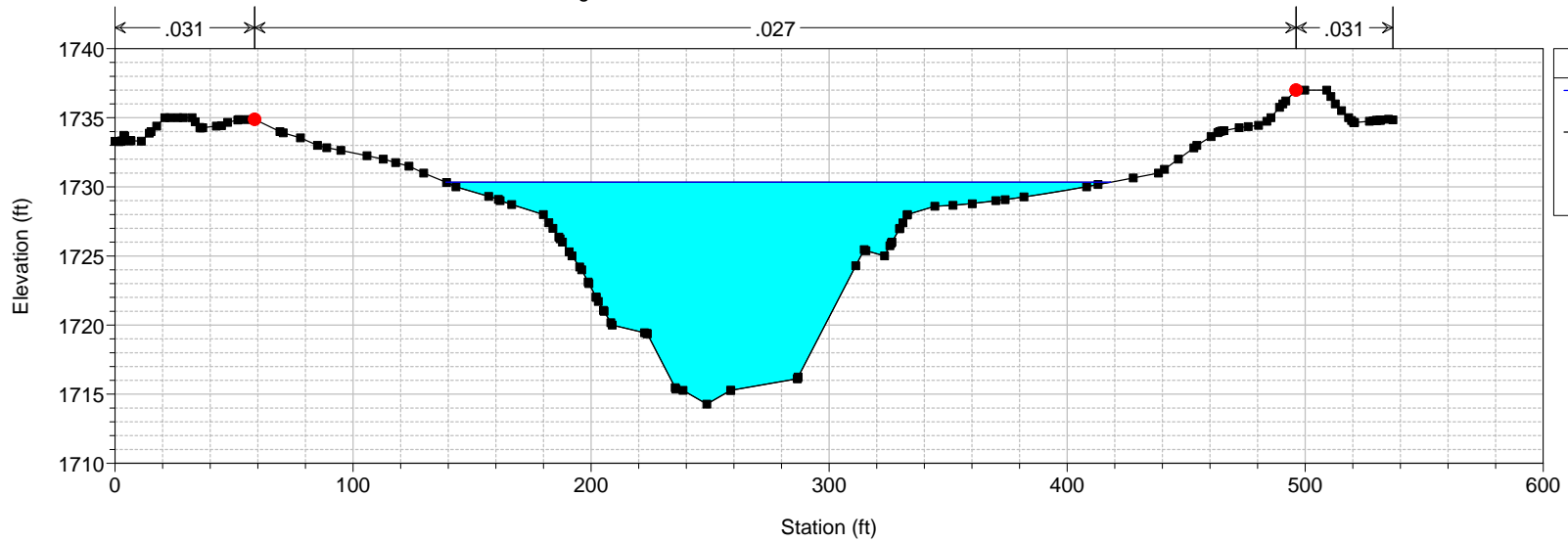




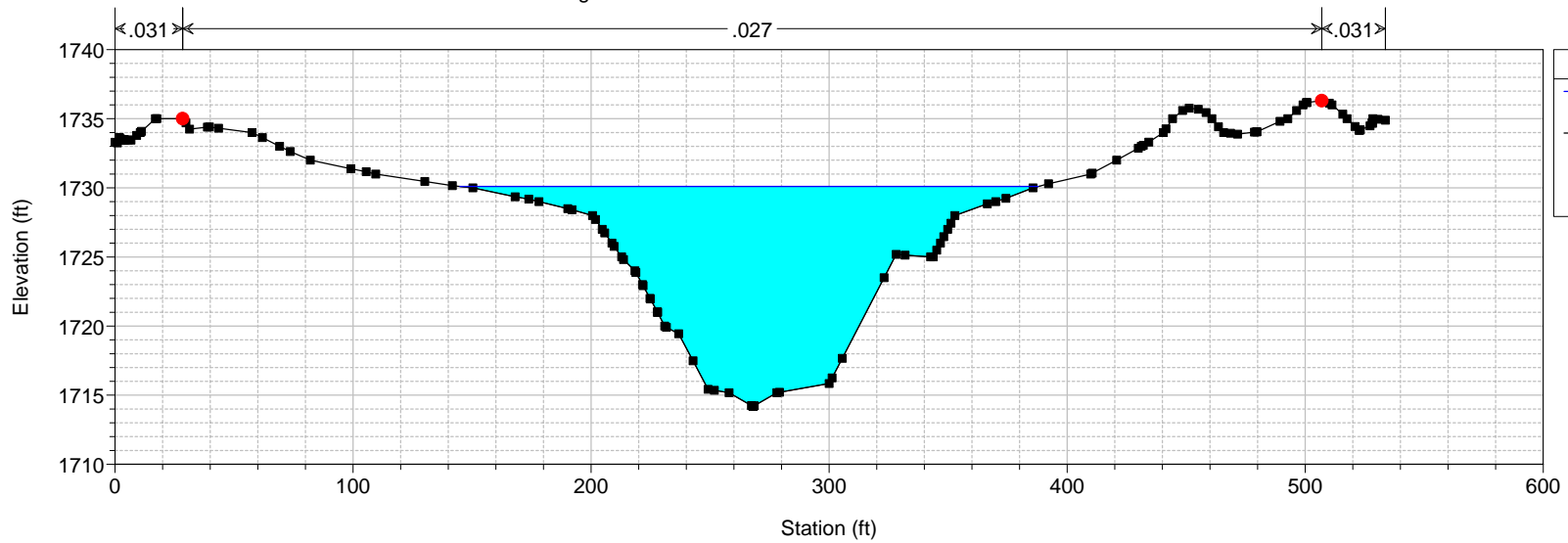




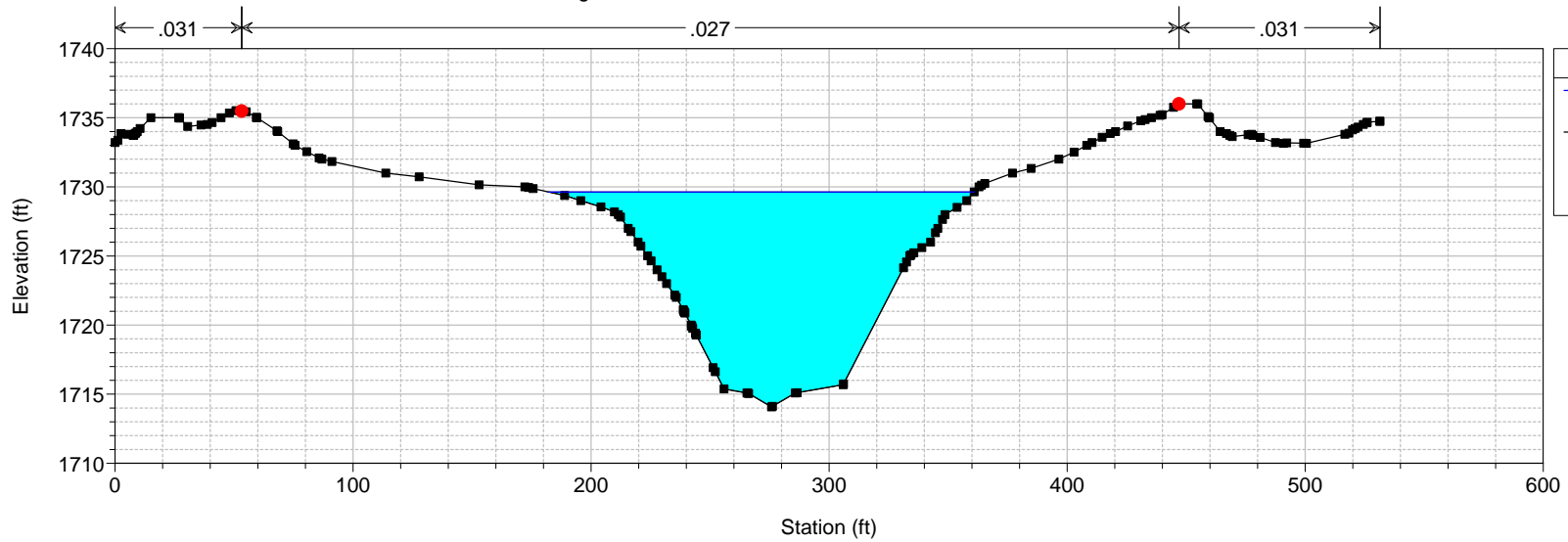
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1124.1 "DR" 27+21.30 = 1124.1



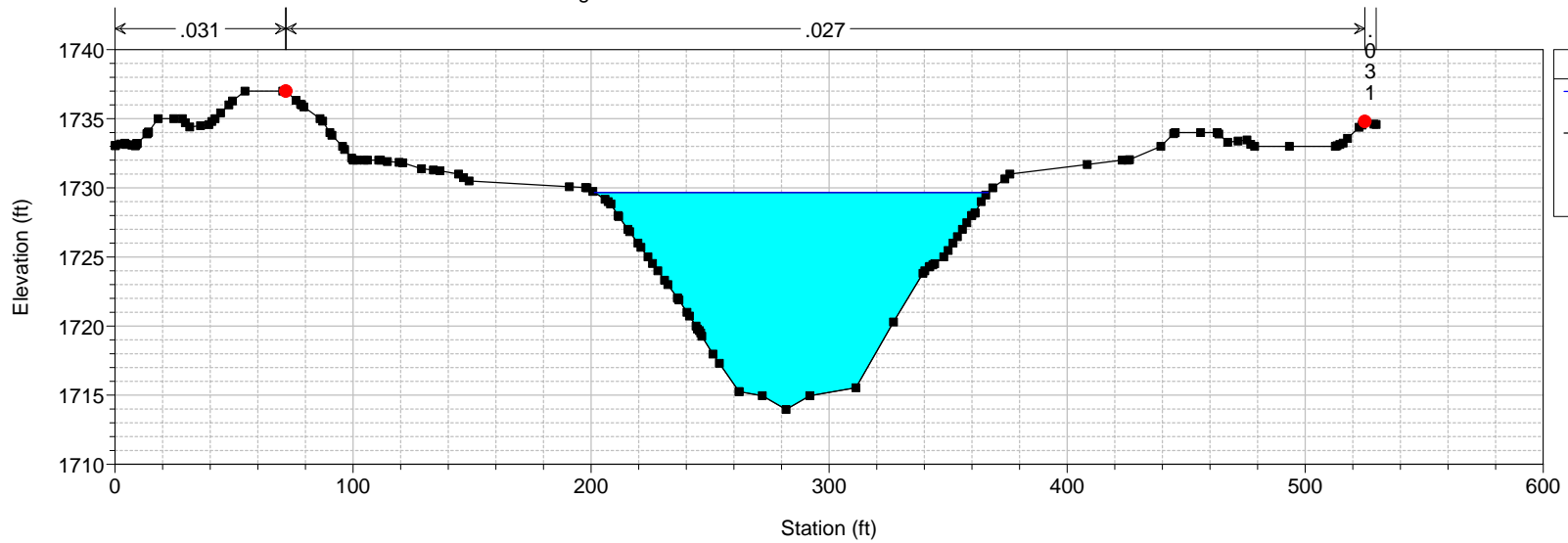
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.8 "DR" 27+60.58 = 1123.8



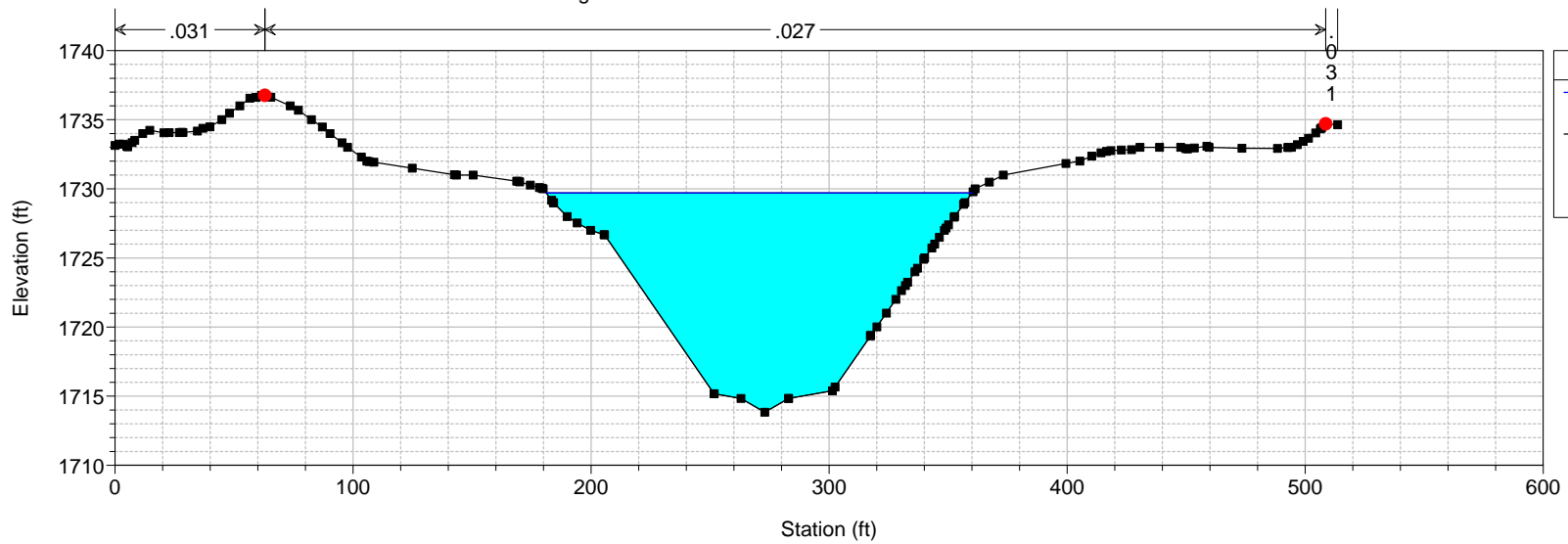
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.6 "DR" 28+00.00 = 1123.6



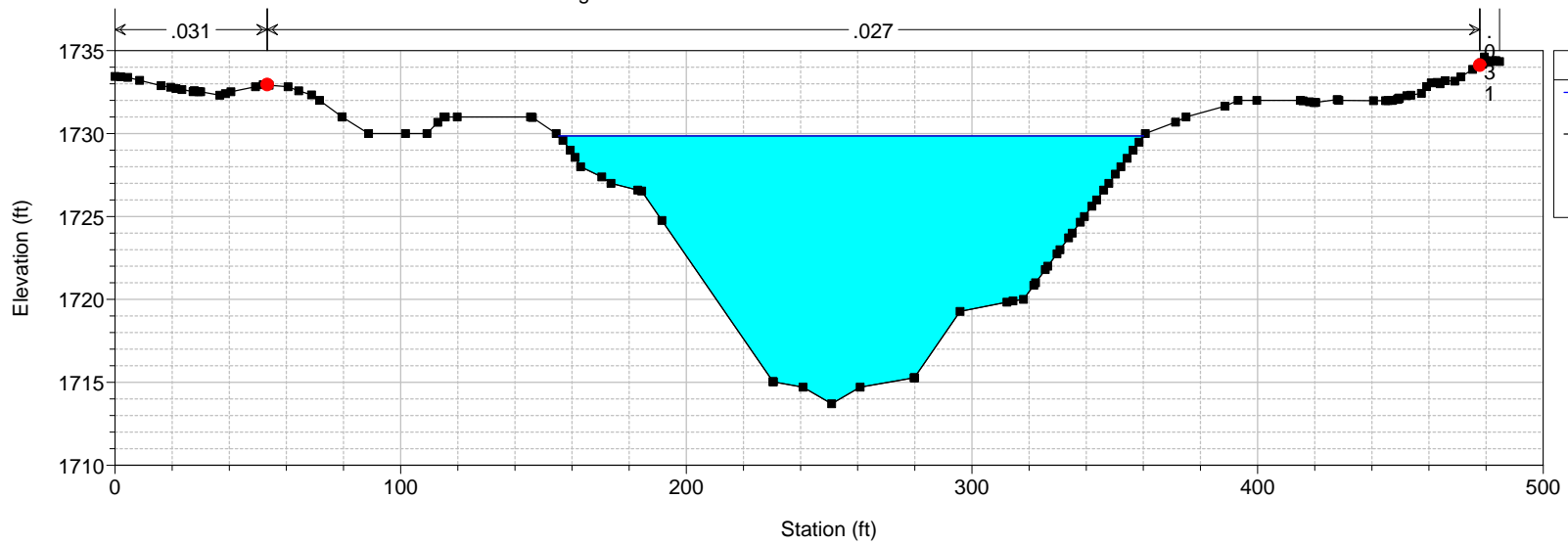
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.4 "DR" 28+50.00 = 1123.4

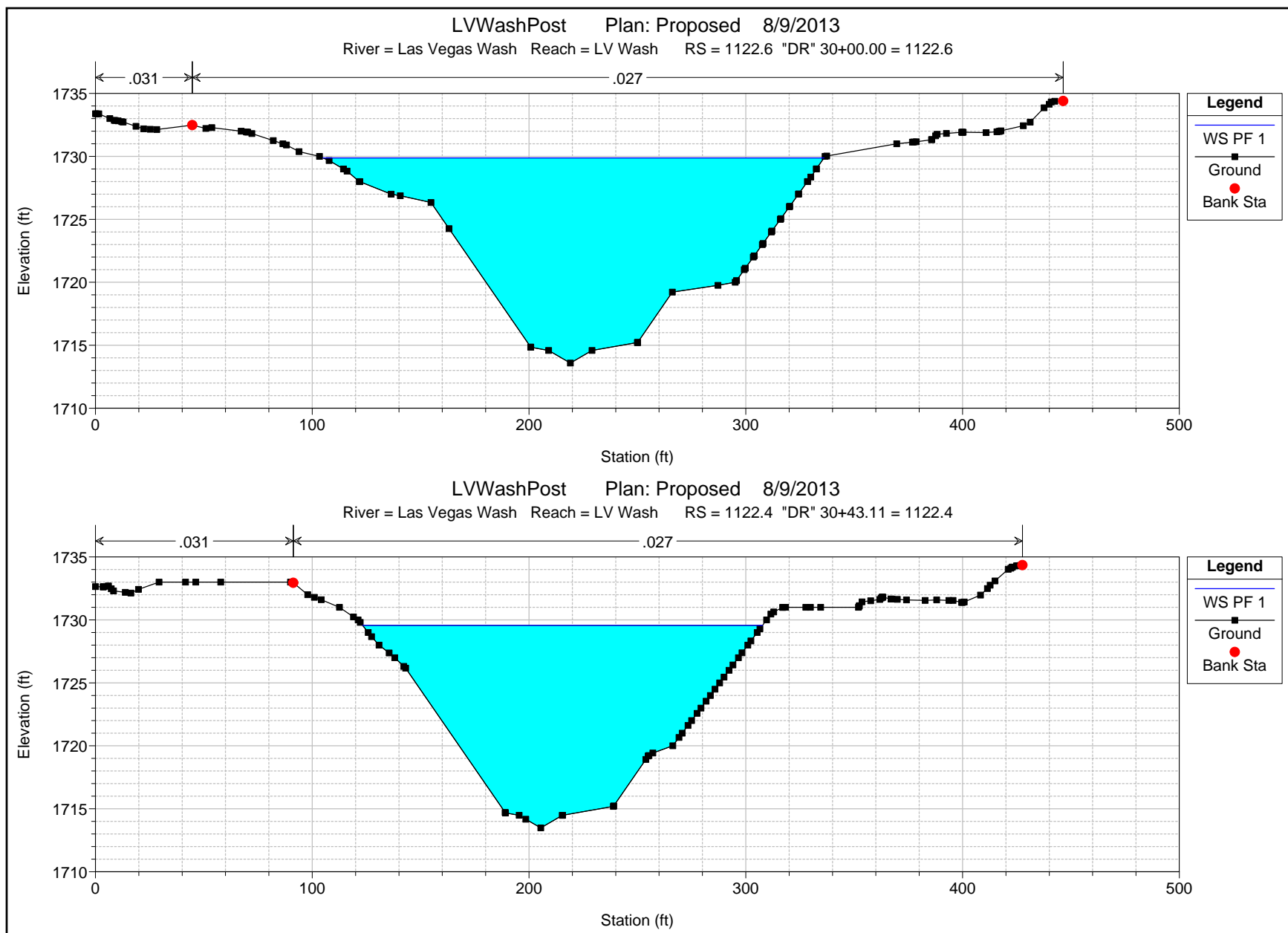


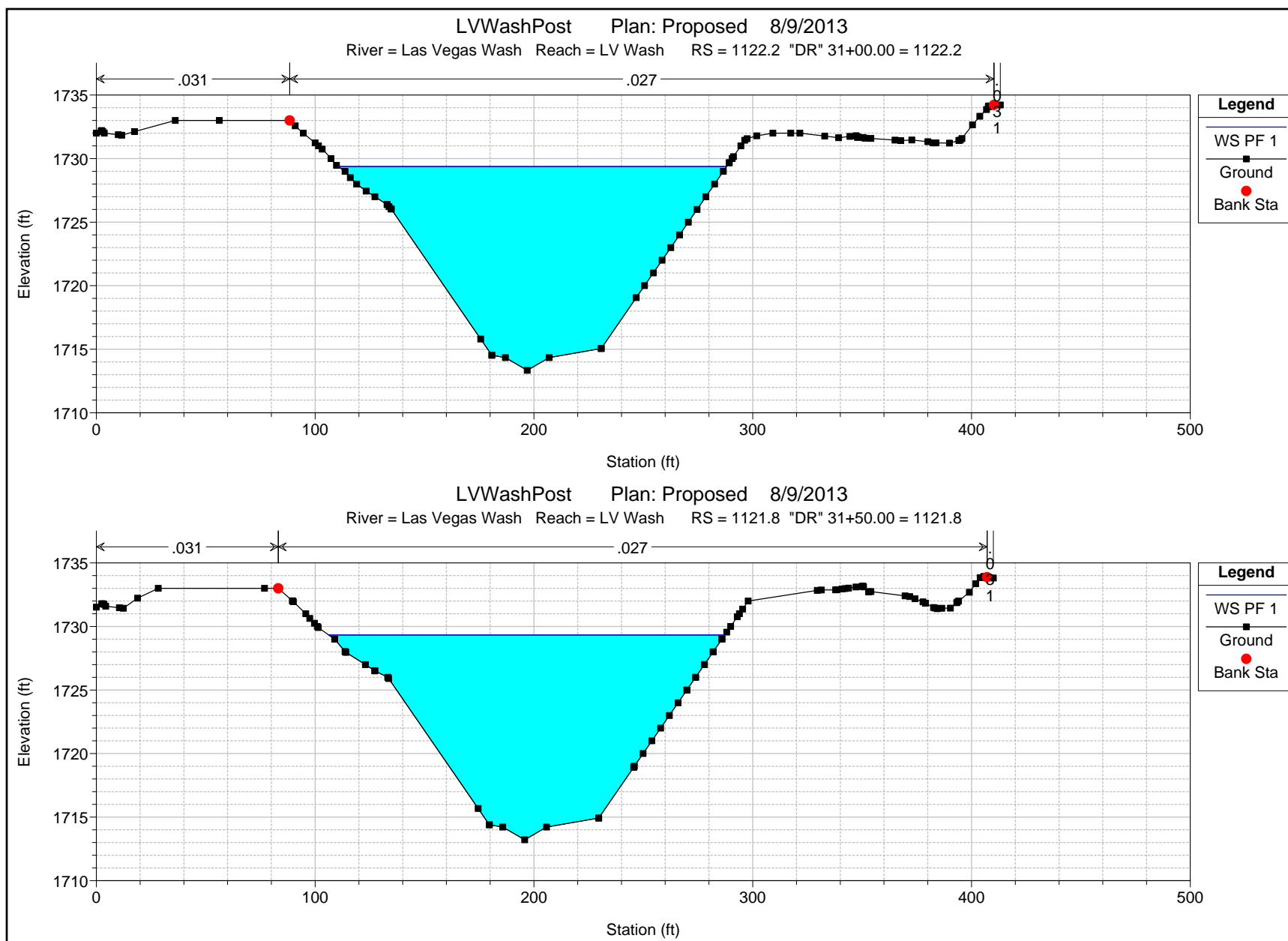
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.2 "DR" 29+00.00 = 1123.2

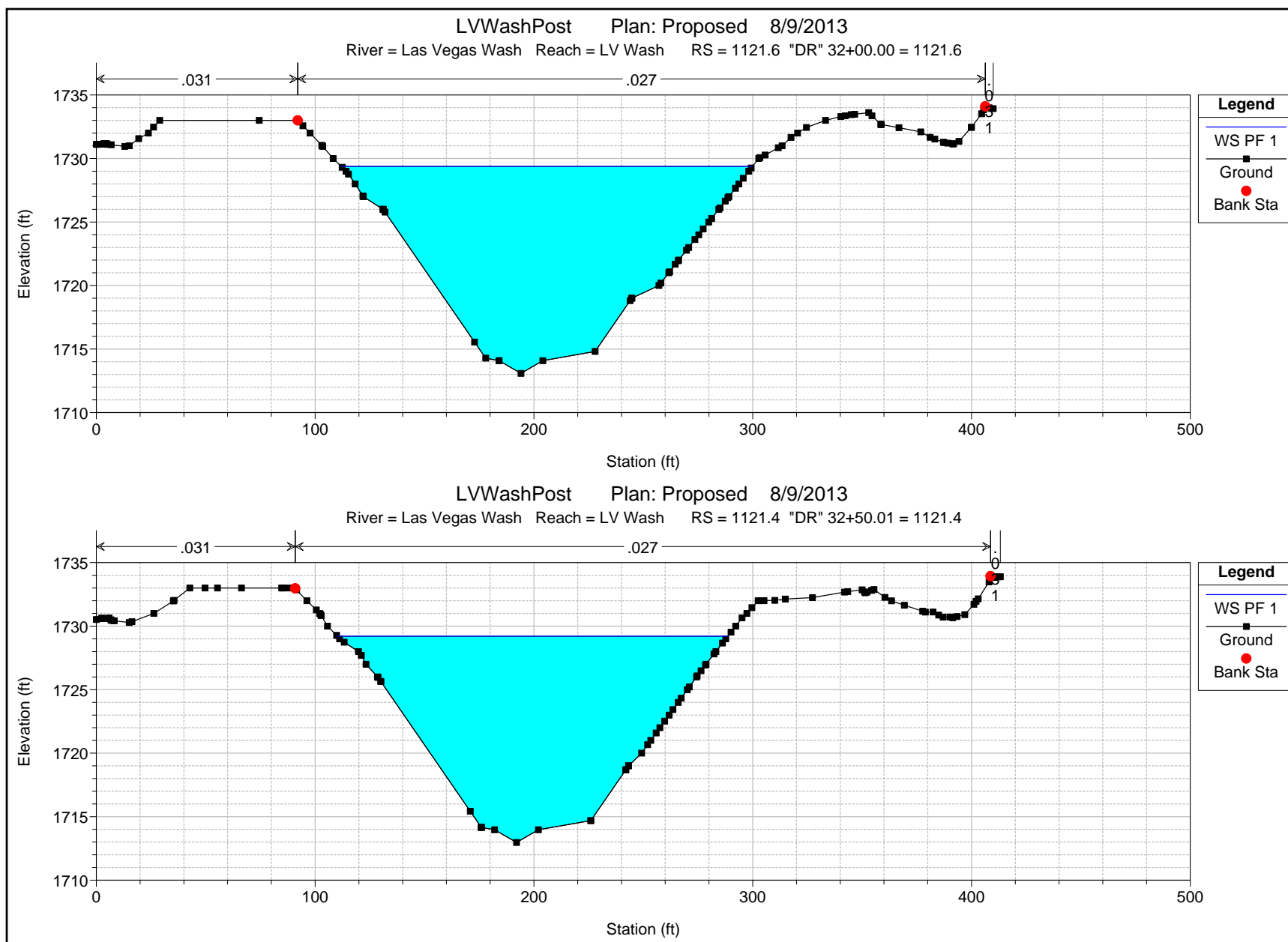


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1122.8 "DR" 29+50.00 = 1122.8

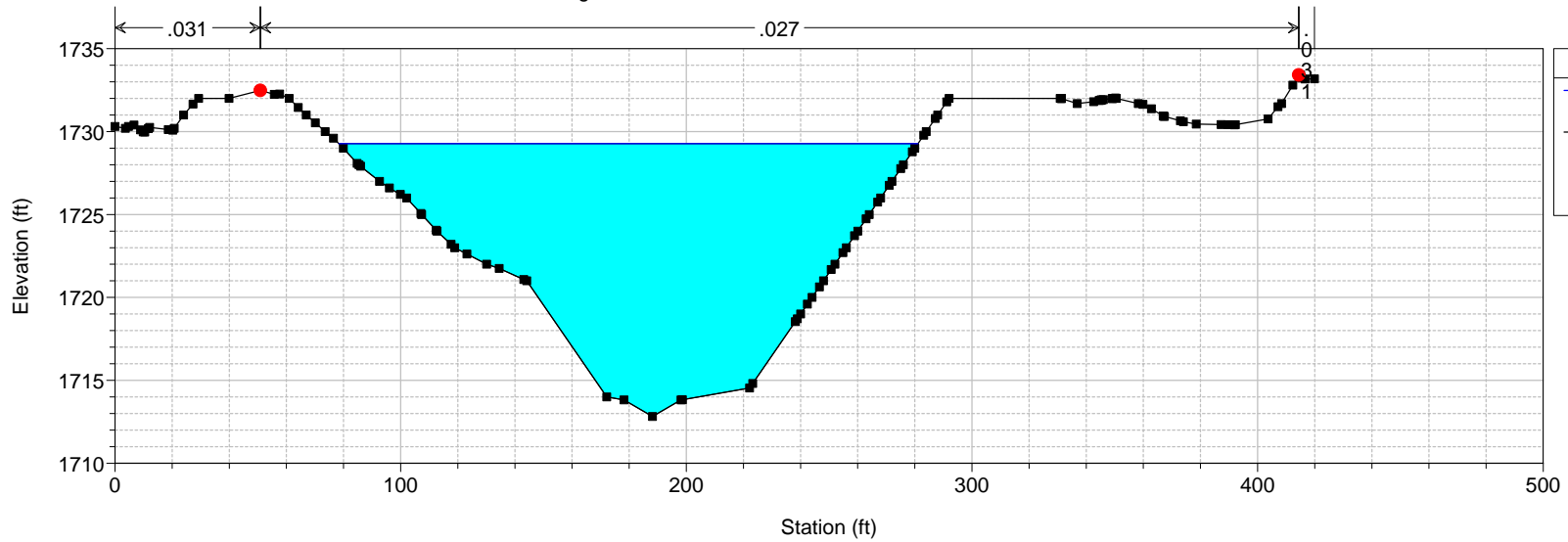




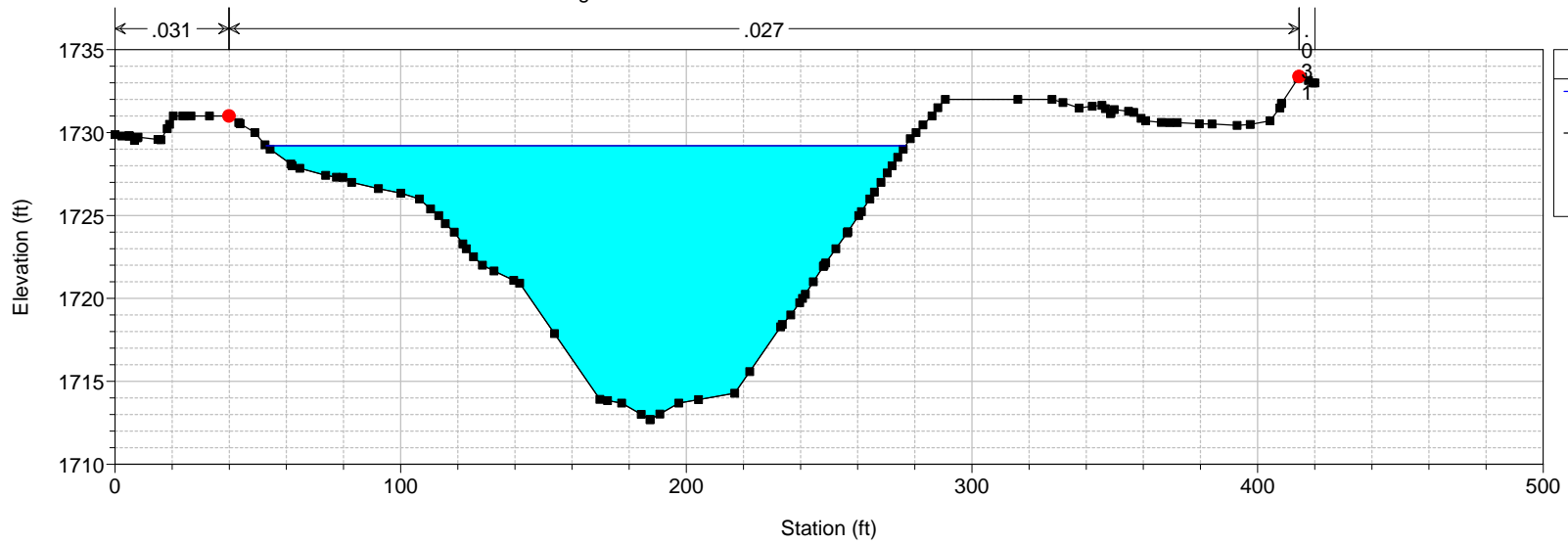




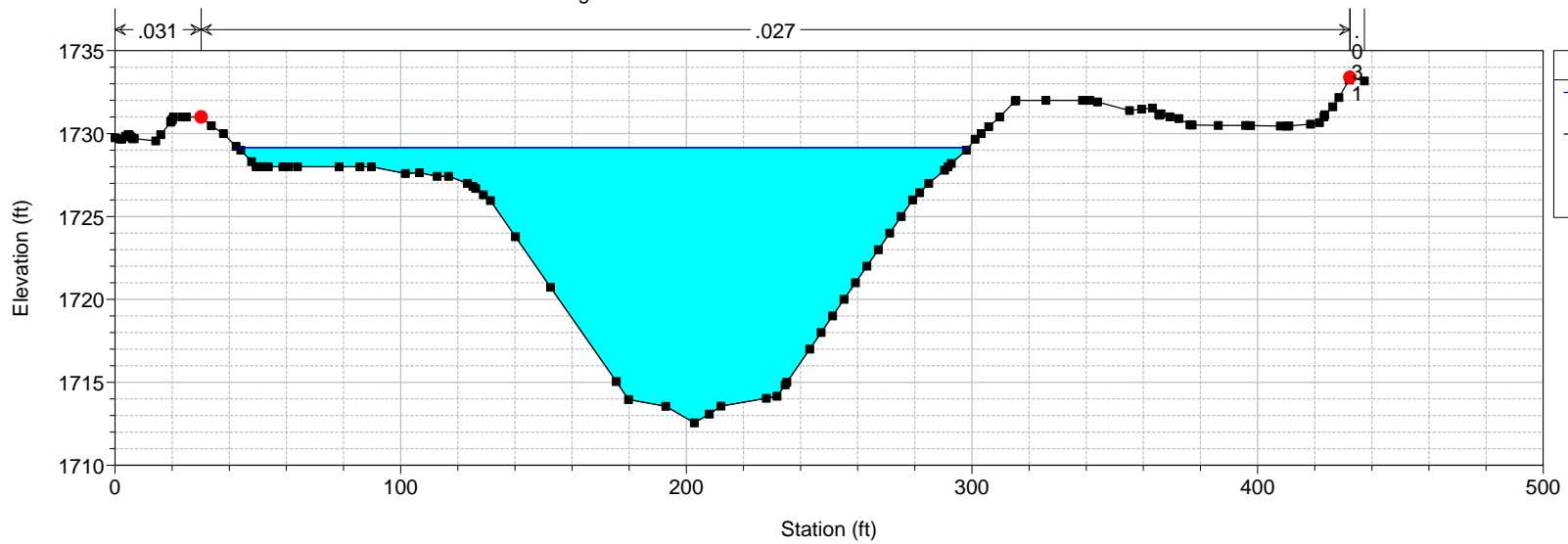
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1121.2 "DR" 33+12.37 = 1121.2



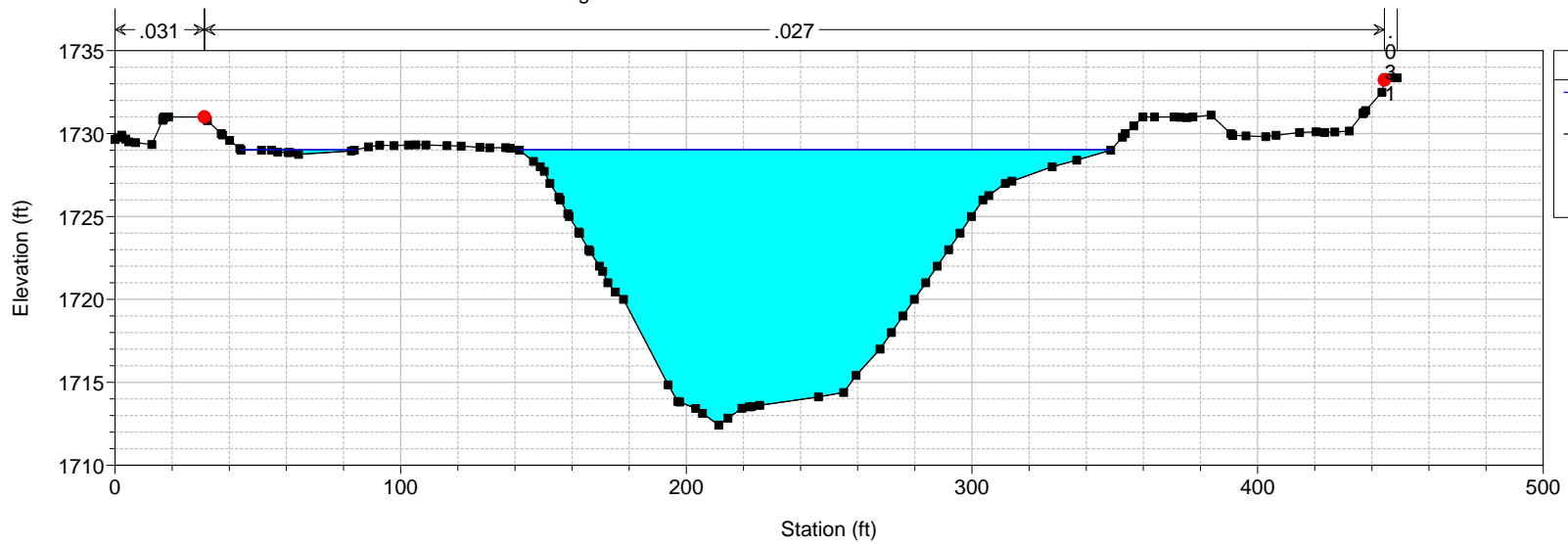
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1120.8 "DR" 33+63.25 = 1120.8

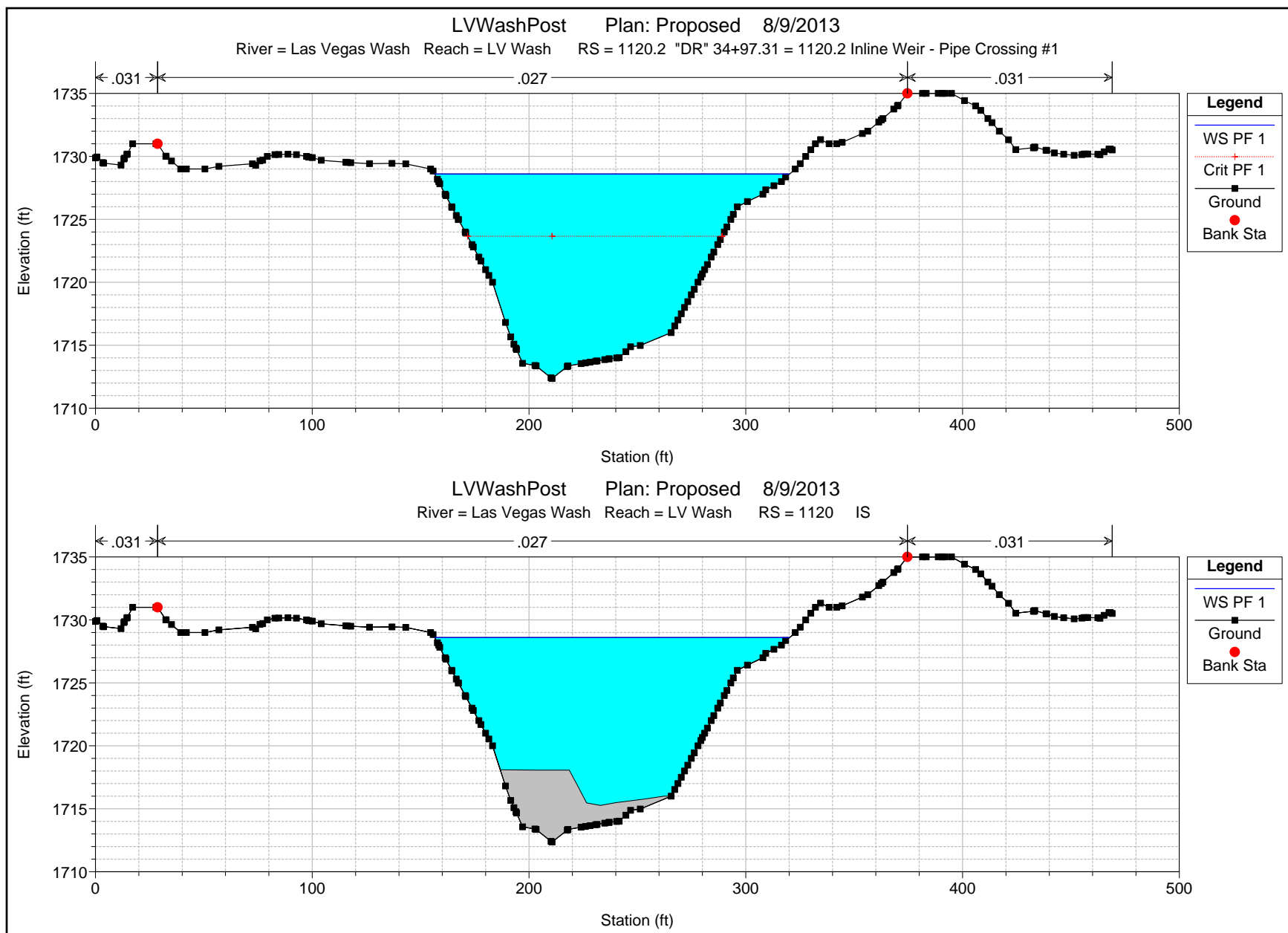


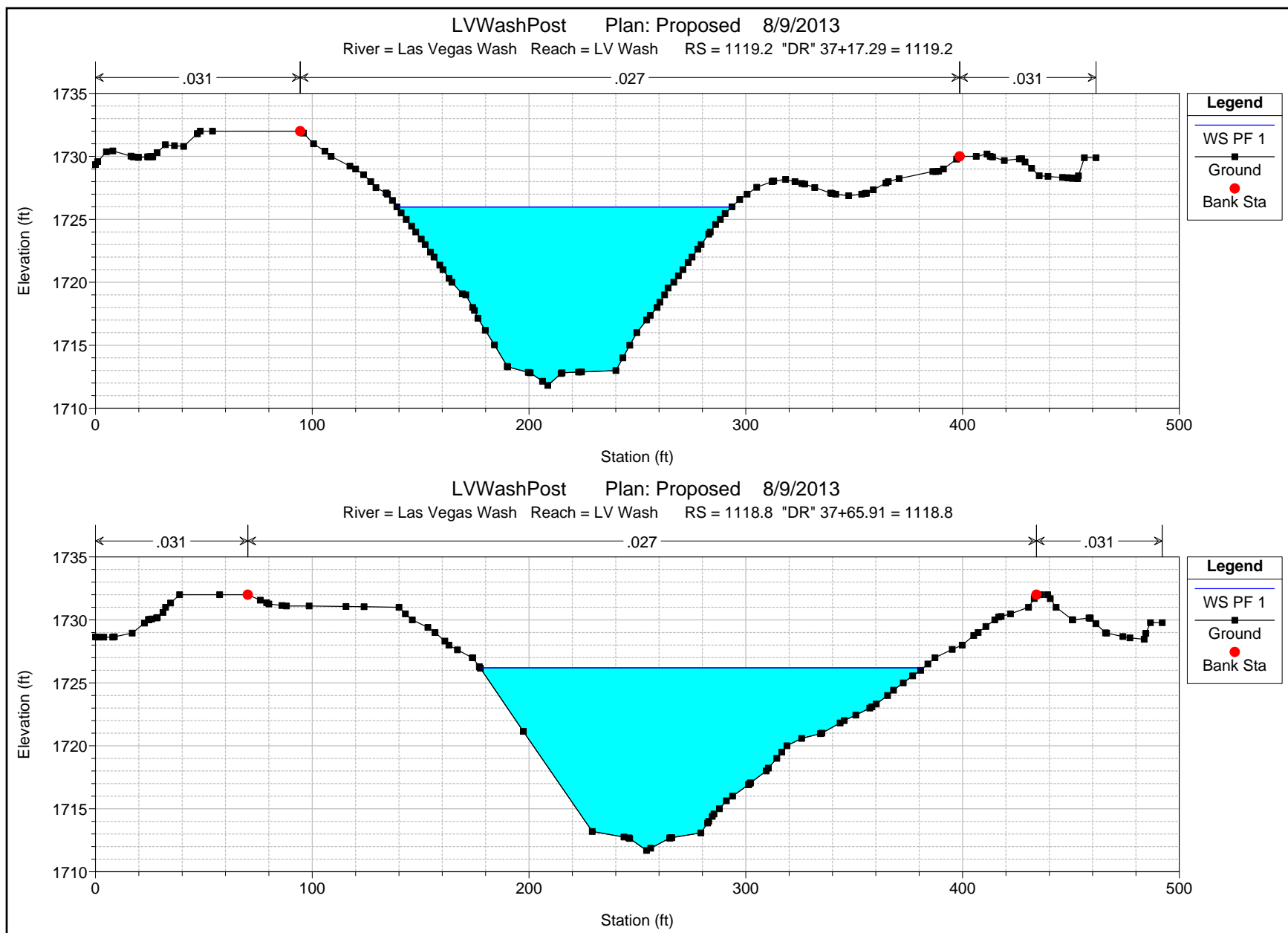
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1120.6 "DR" 34+14.14 = 1120.6

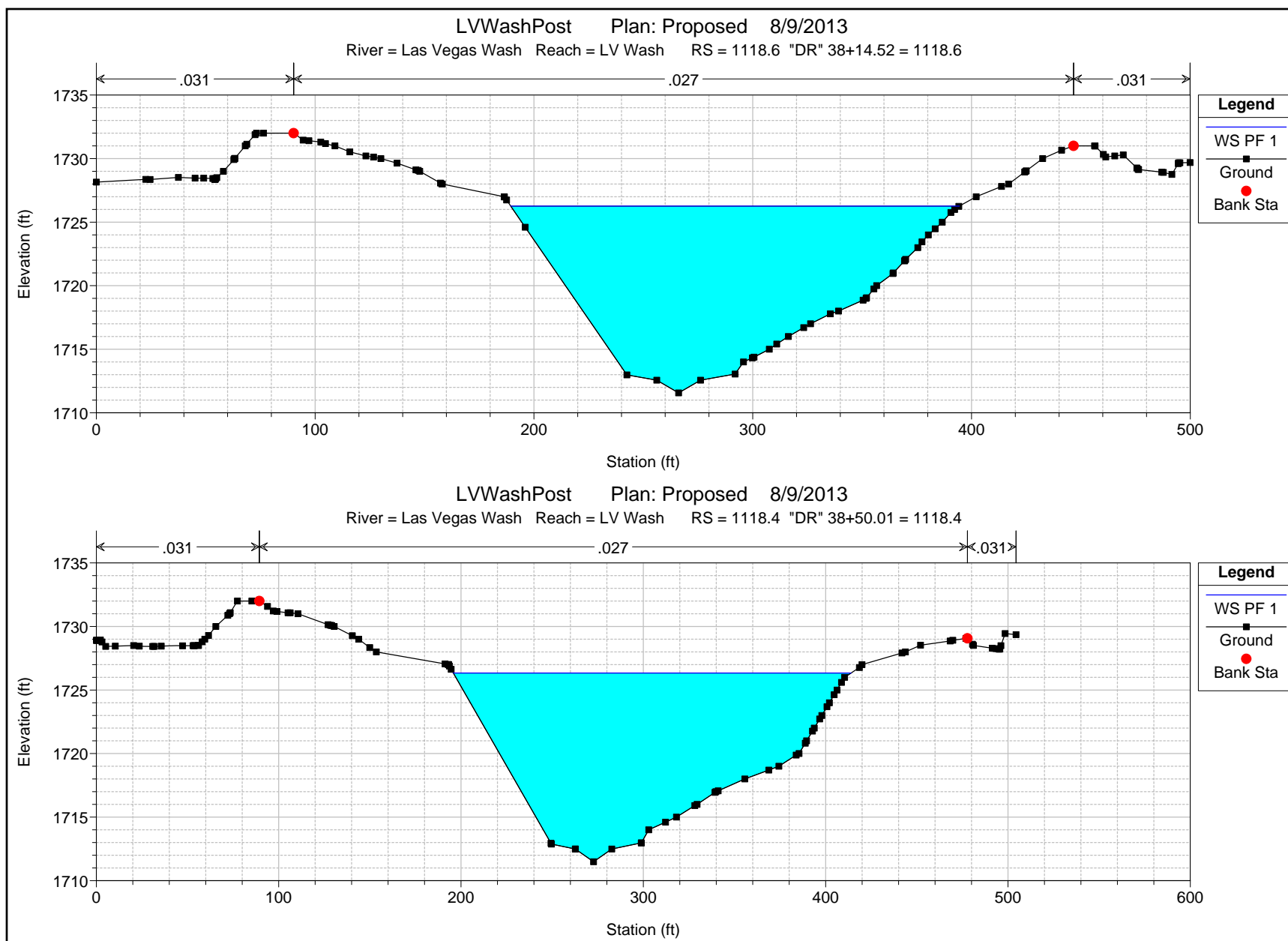


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1120.4 "DR" 34+60.74 = 1120.4

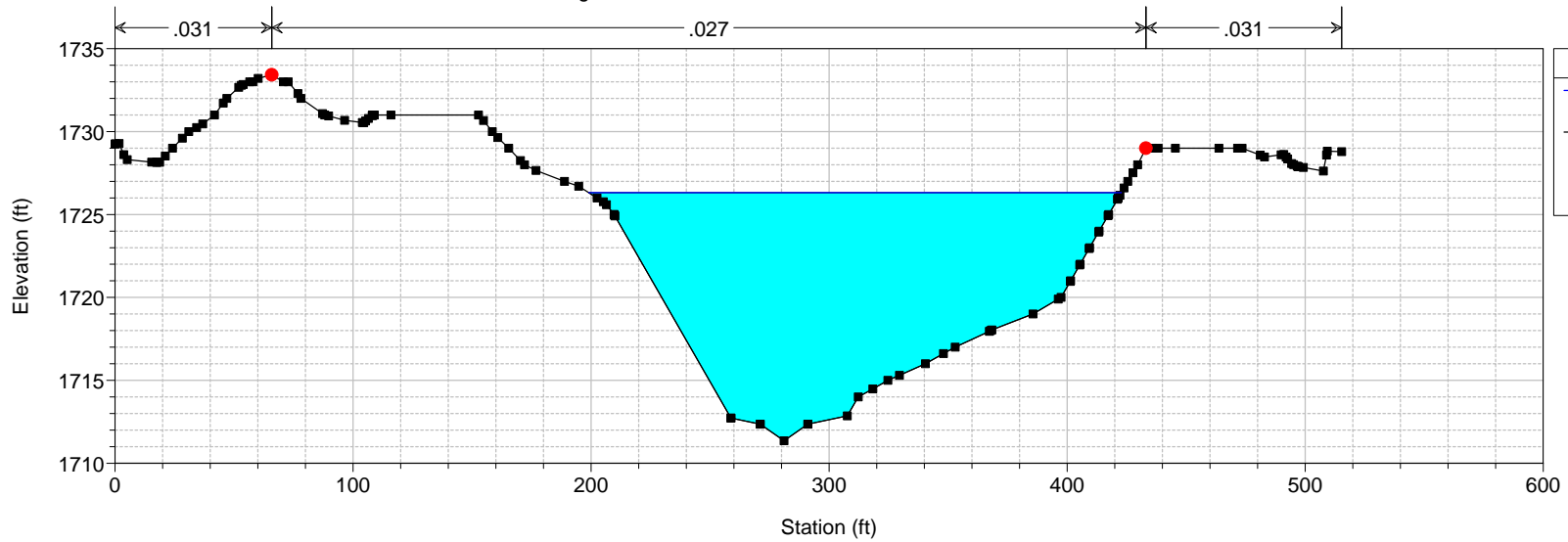




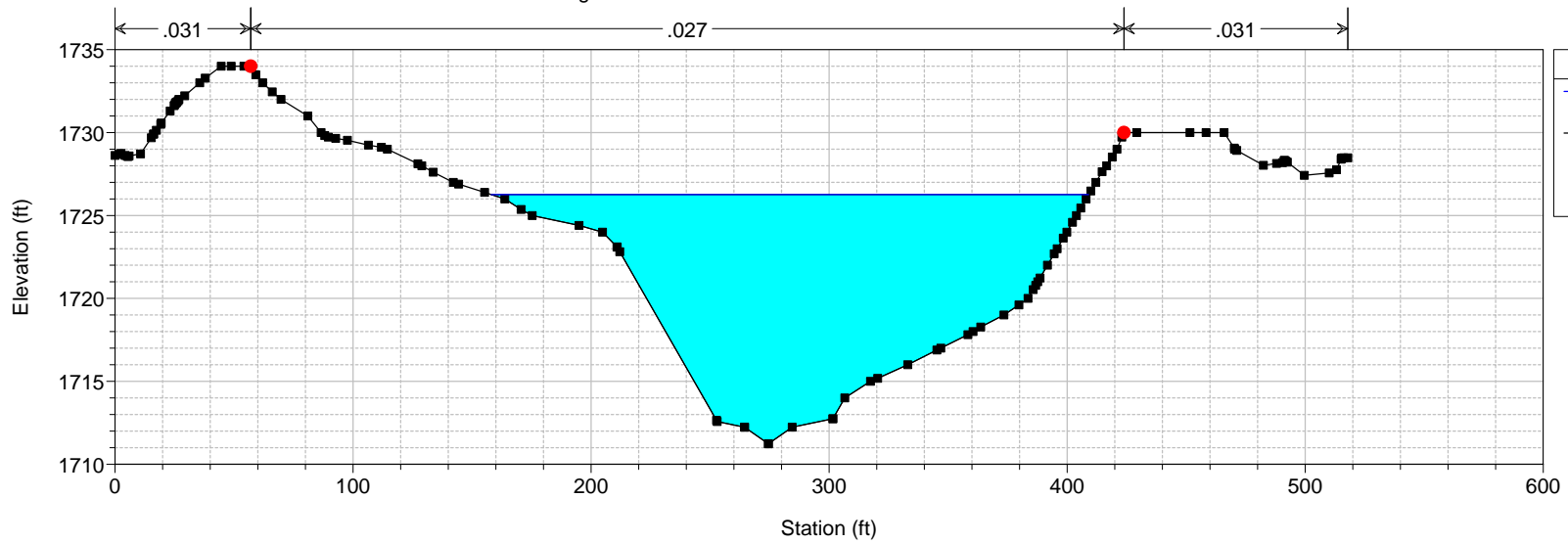


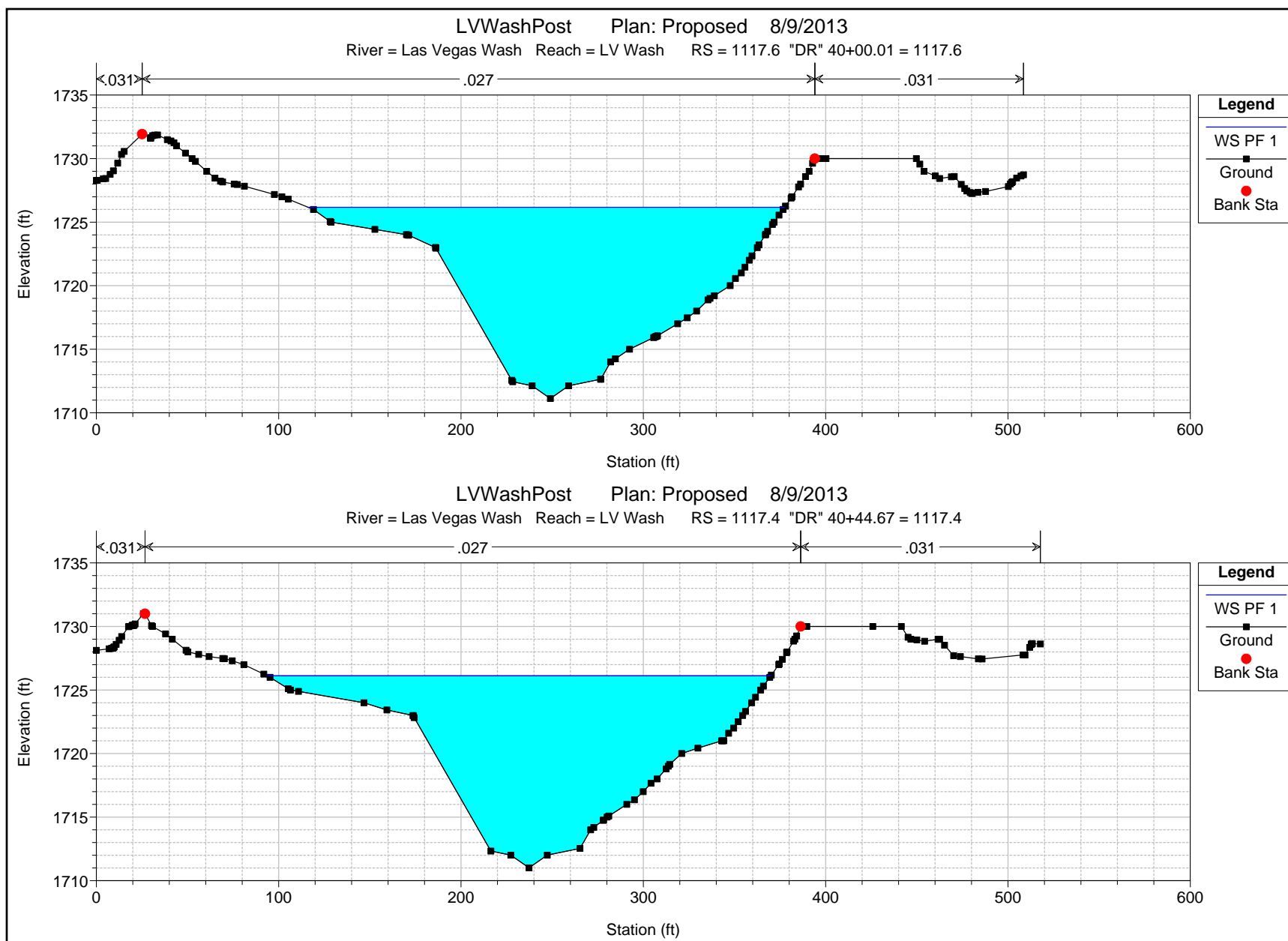


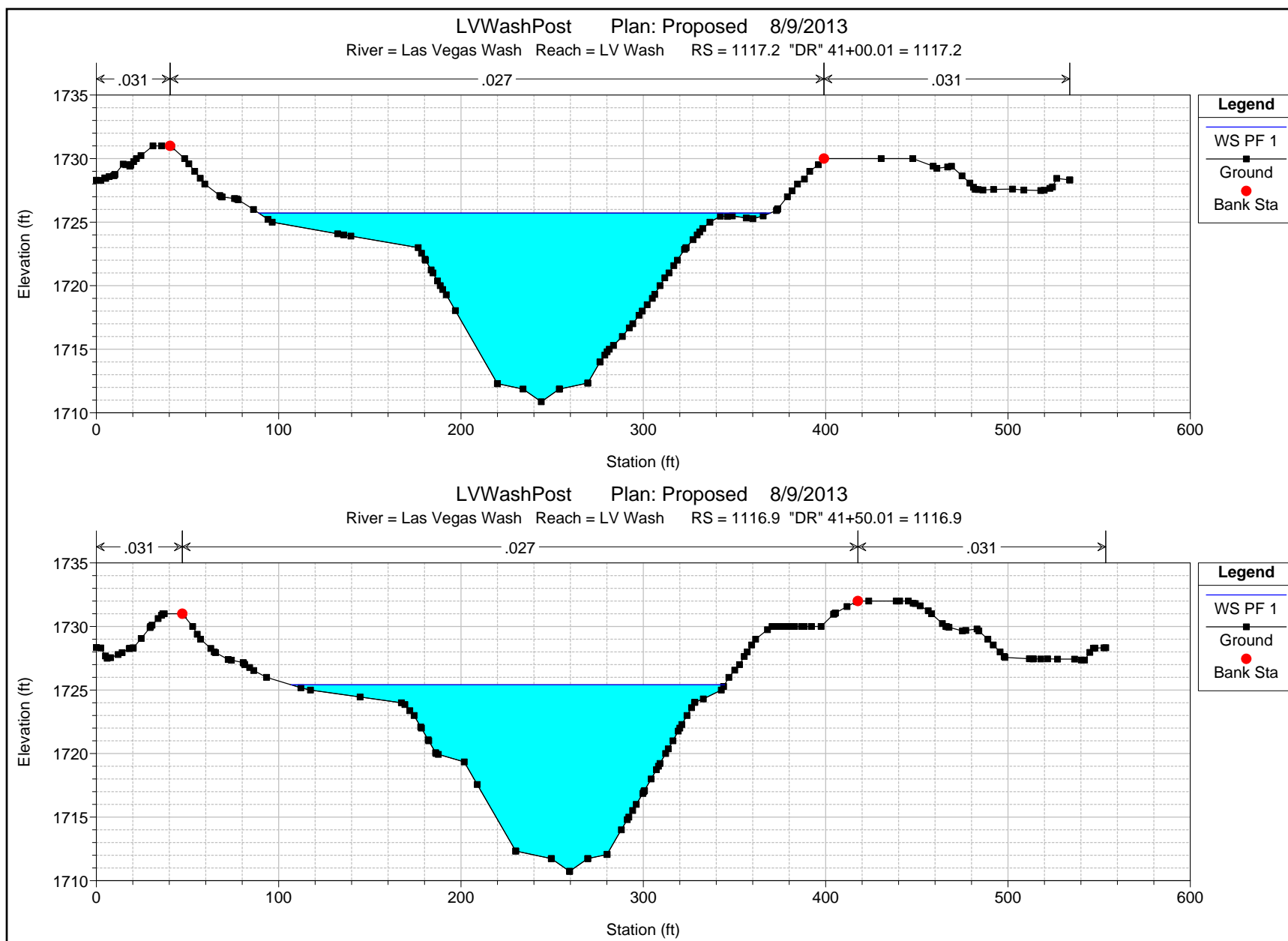
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1118.2 "DR" 39+00.01 = 1118.2

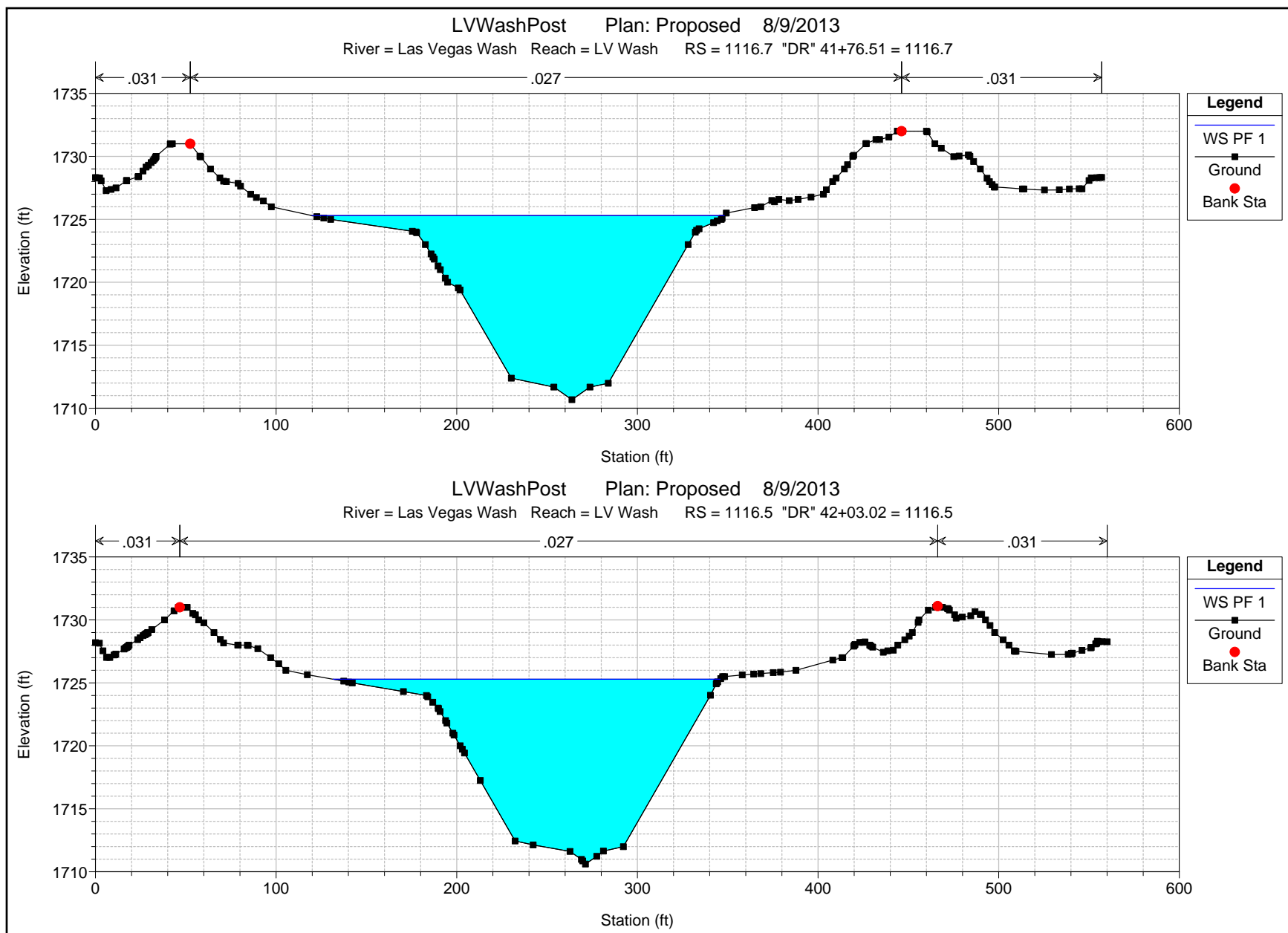


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1117.8 "DR" 39+50.01 = 1117.8

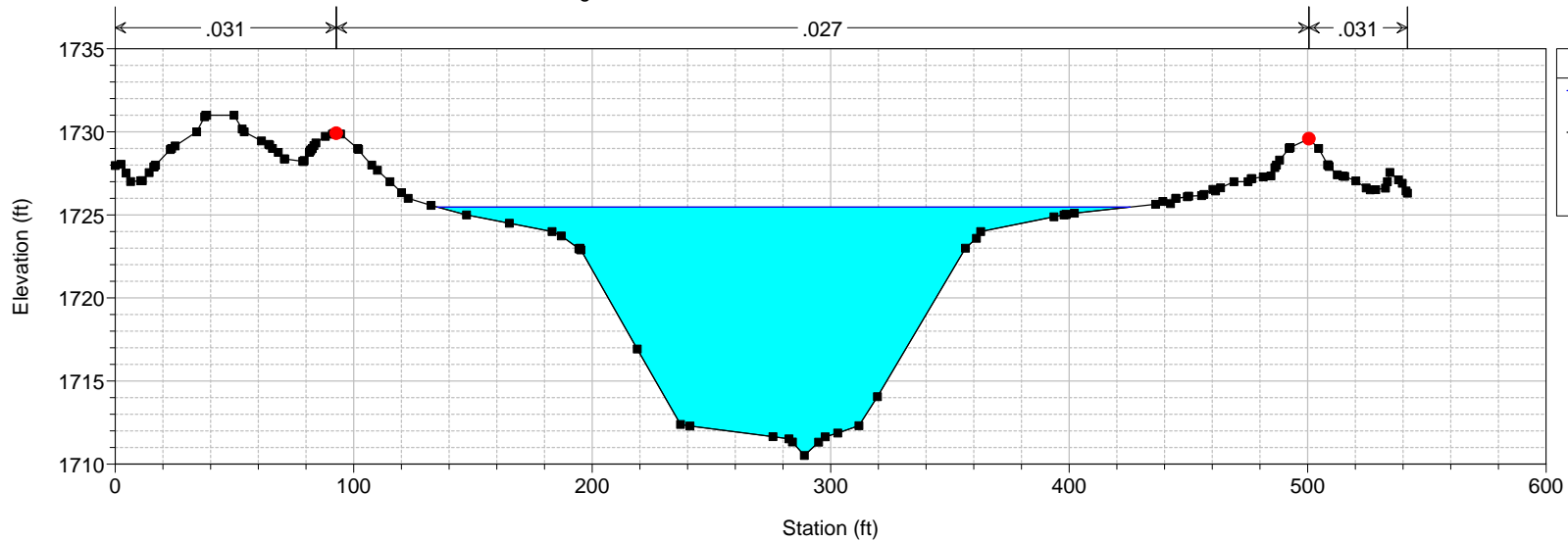




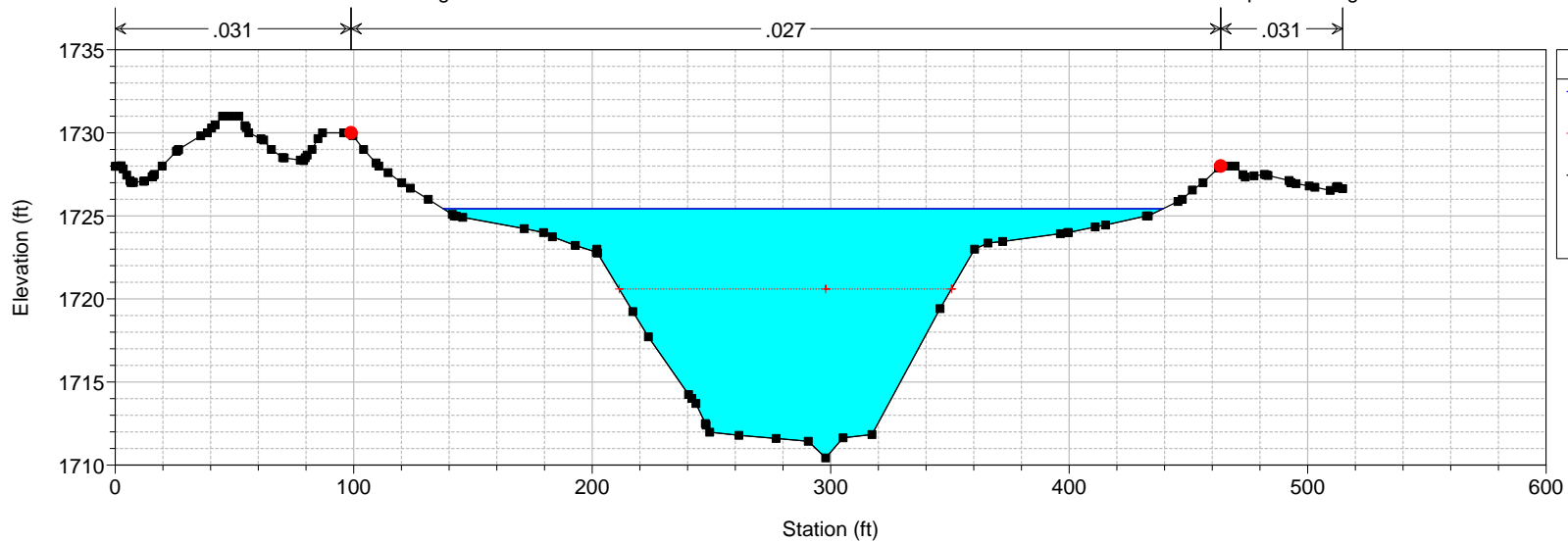




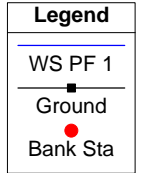
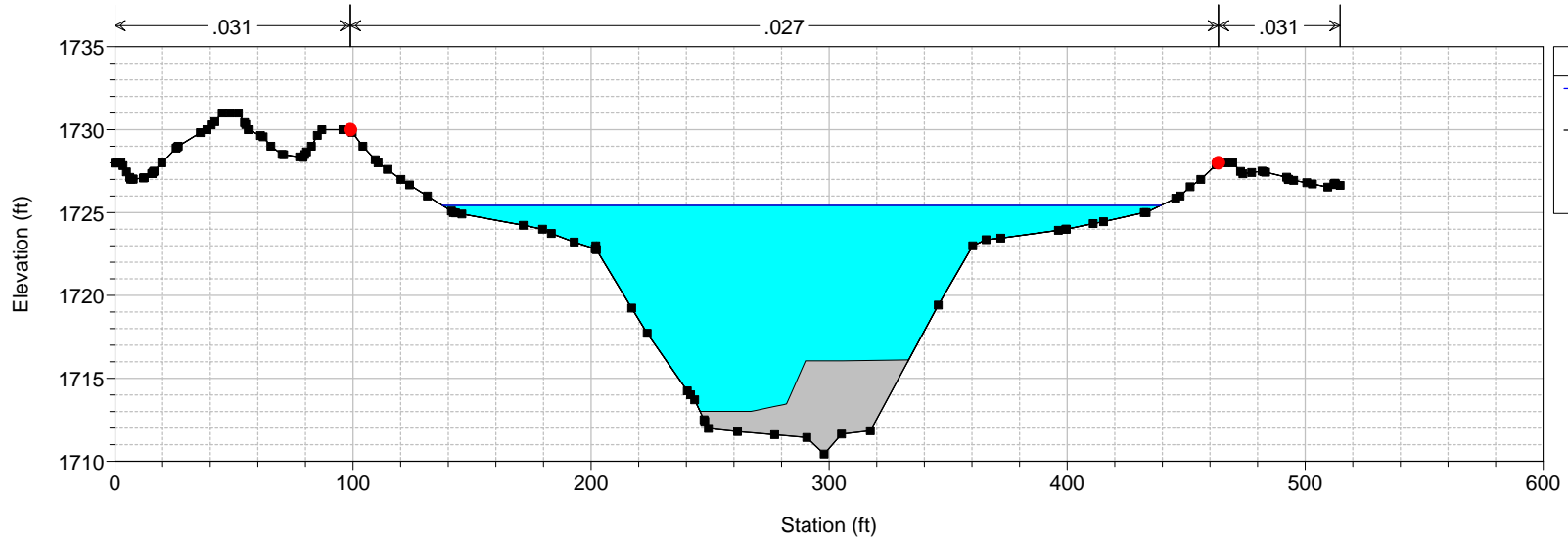
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116.3 "DR" 42+37.47 = 1116.3



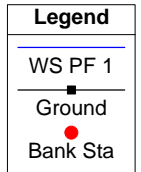
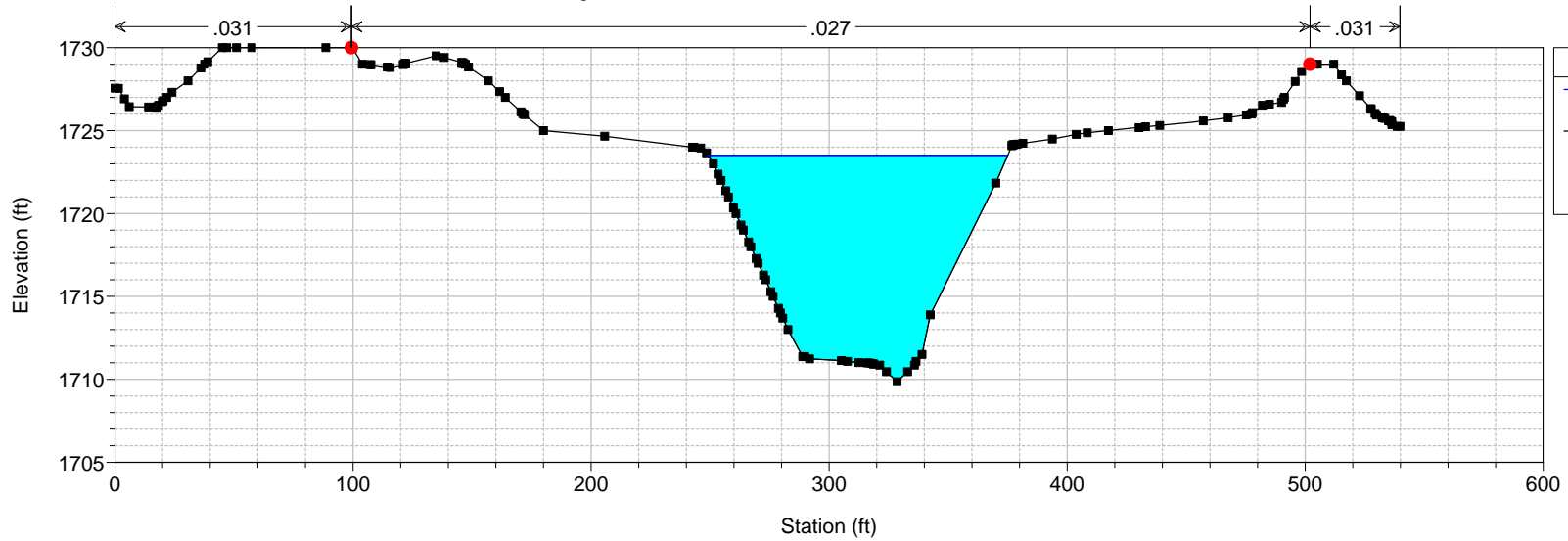
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116.2 "DR" 42+71.92 = 1116.2 - Inline Weir Pipe Crossing #2

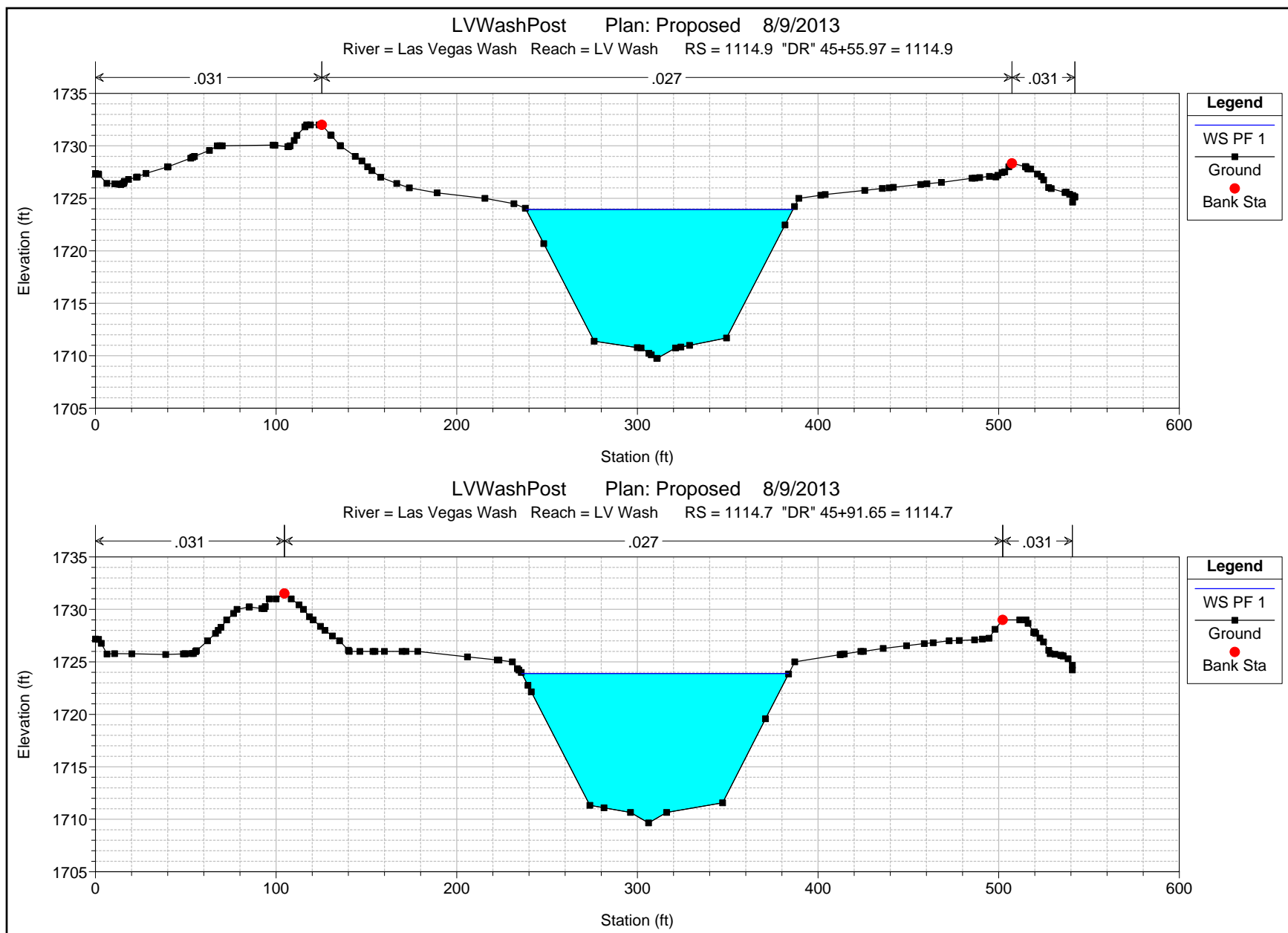


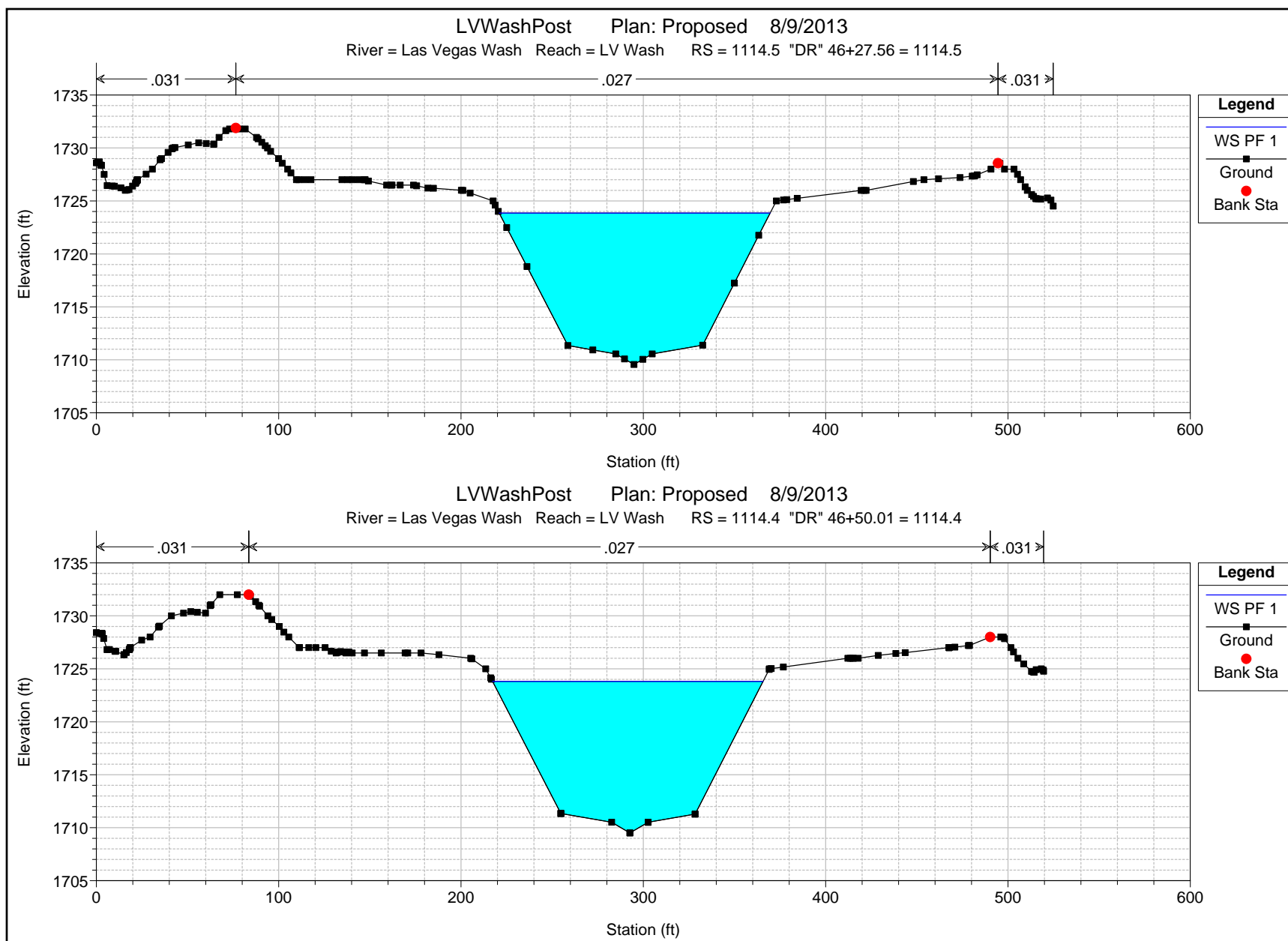
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116 IS



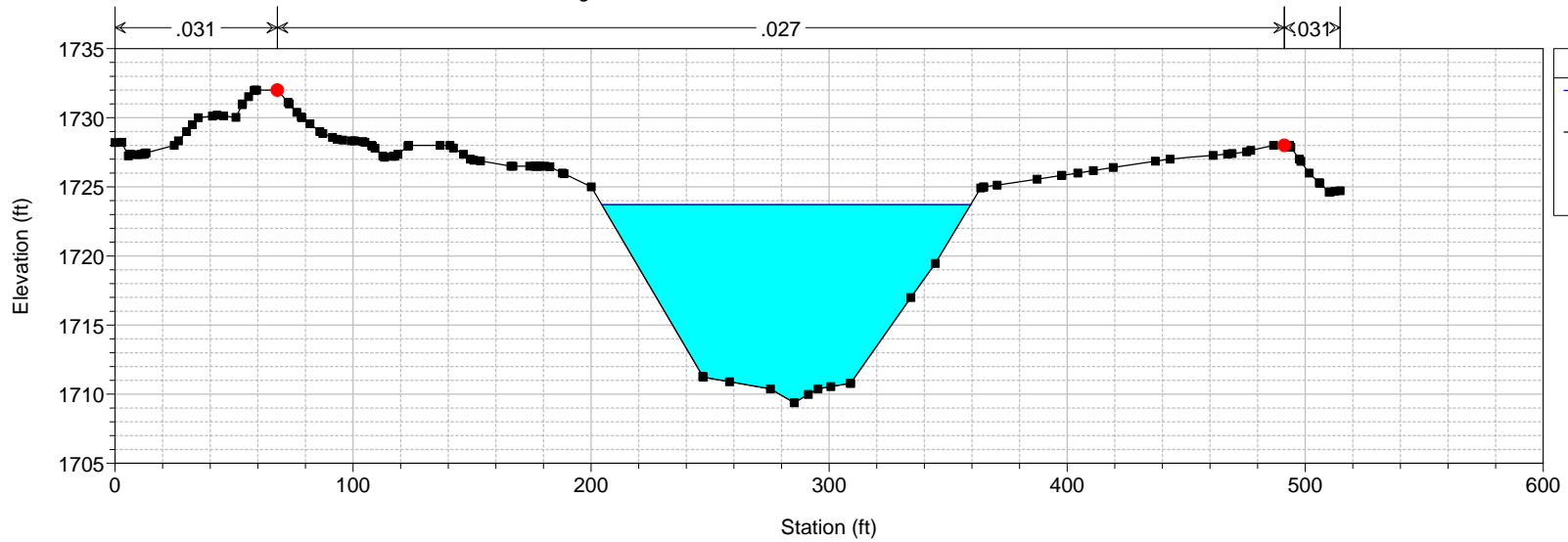
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1115.2 "DR" 45+06.50 = 1115.2



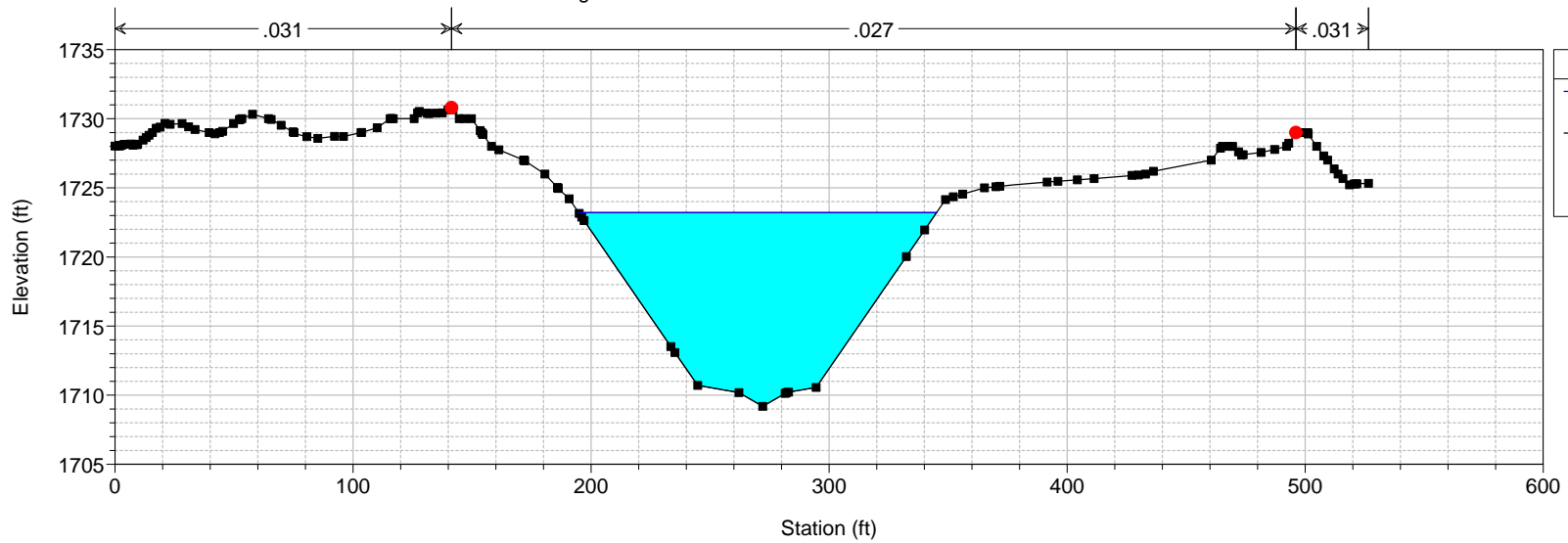


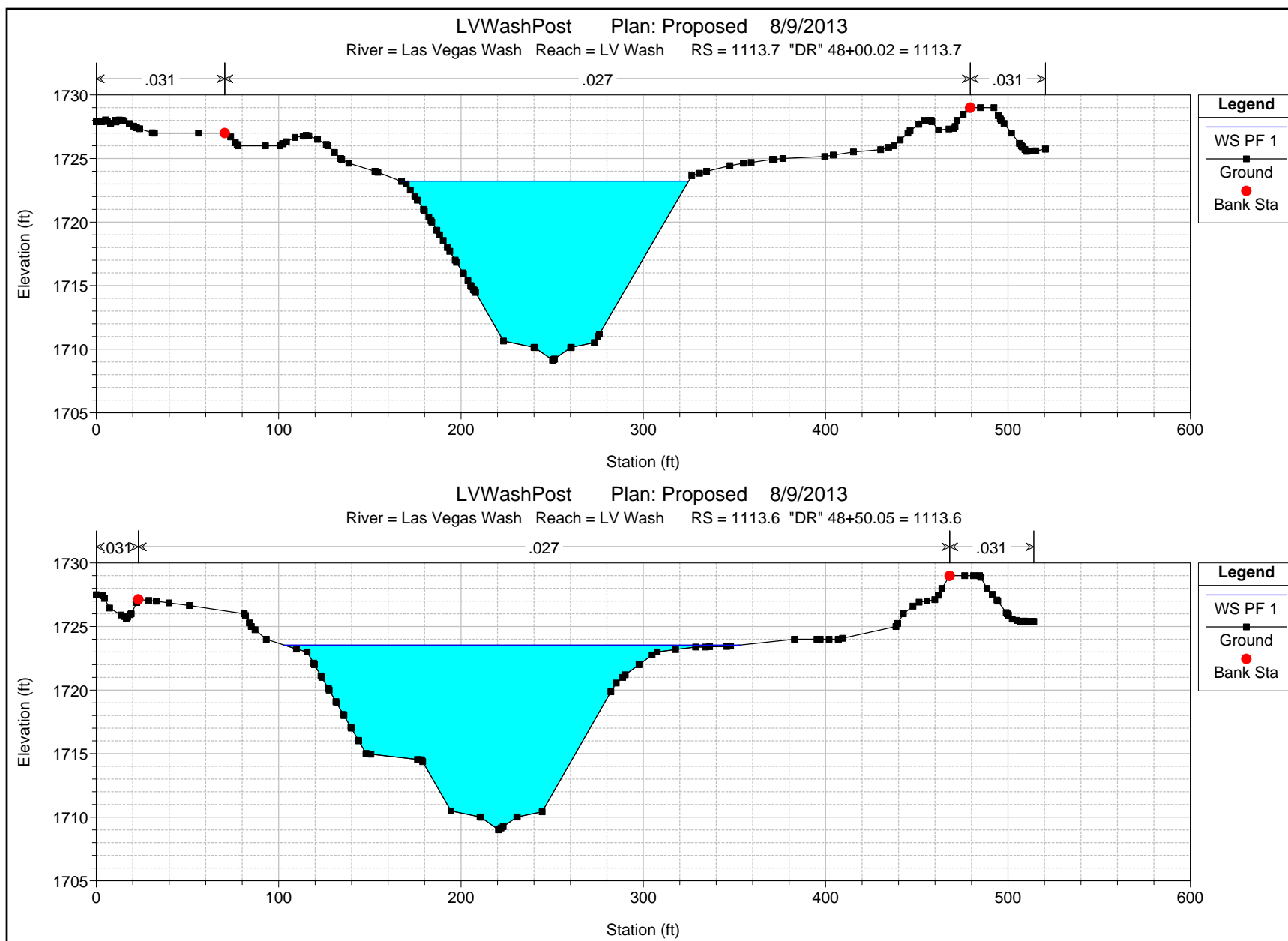


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1114.2 "DR" 47+00.01 = 1114.2

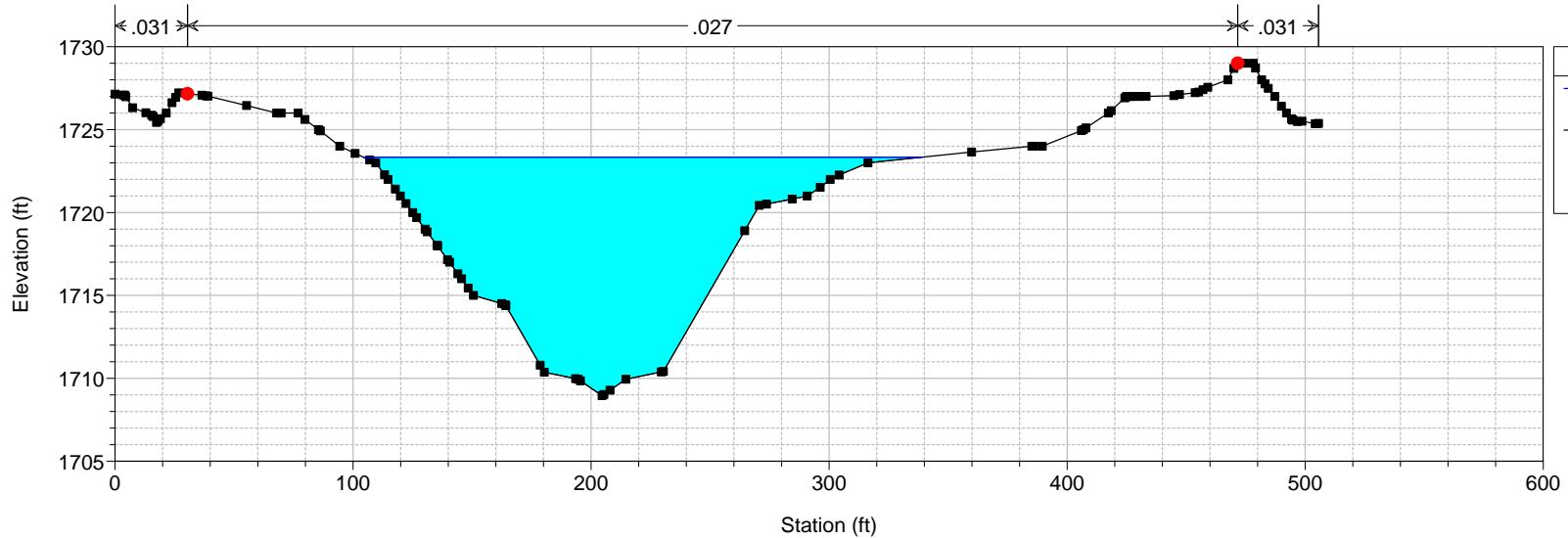


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.9 "DR" 47+79.01 = 1113.9

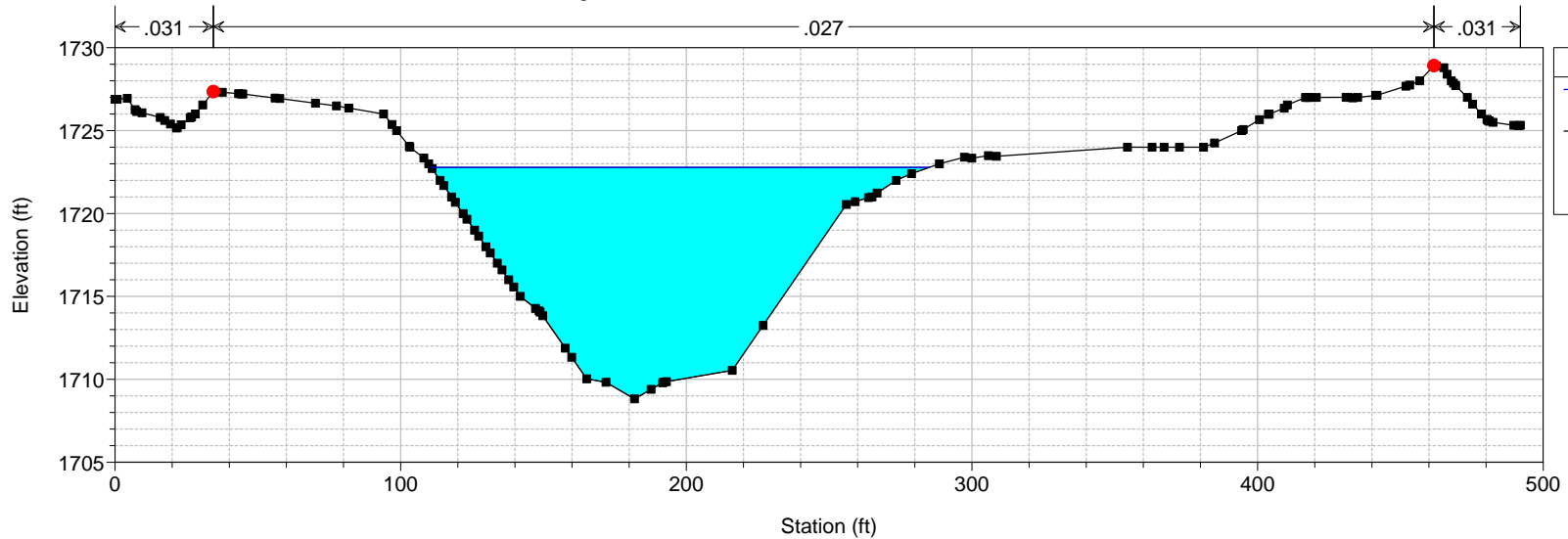




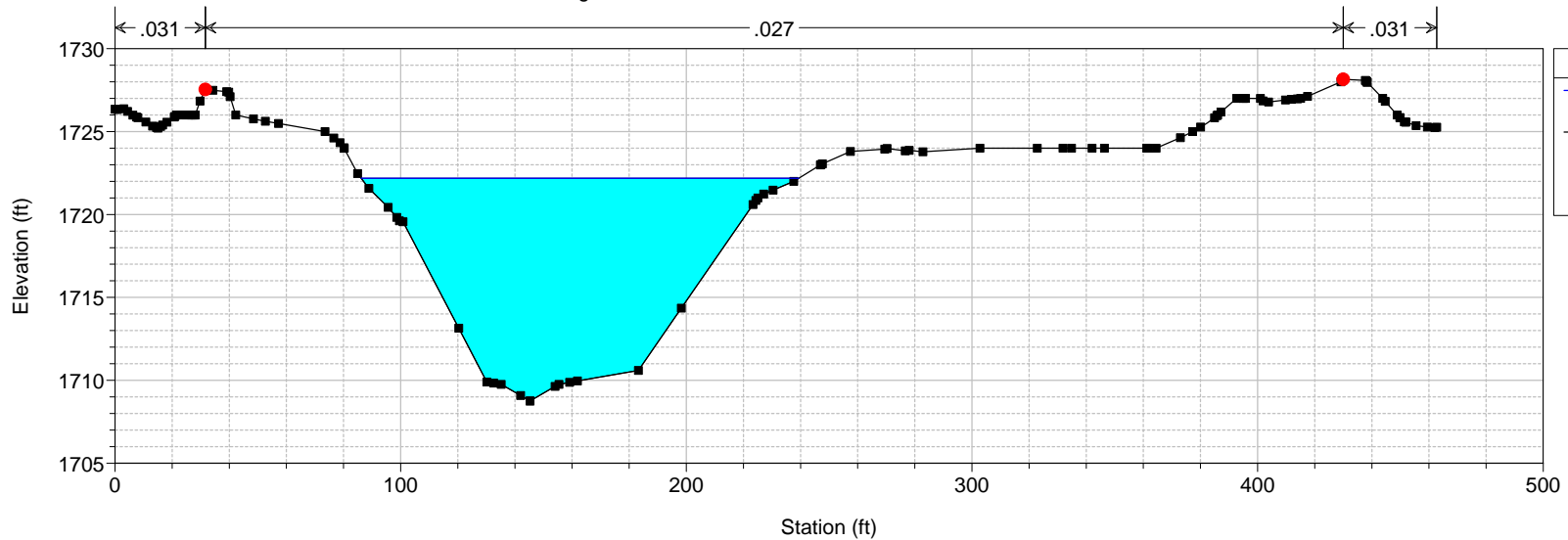
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.5 "DR" 48+77.03 = 1113.5



LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.3 "DR" 49+26.30 = 1113.3

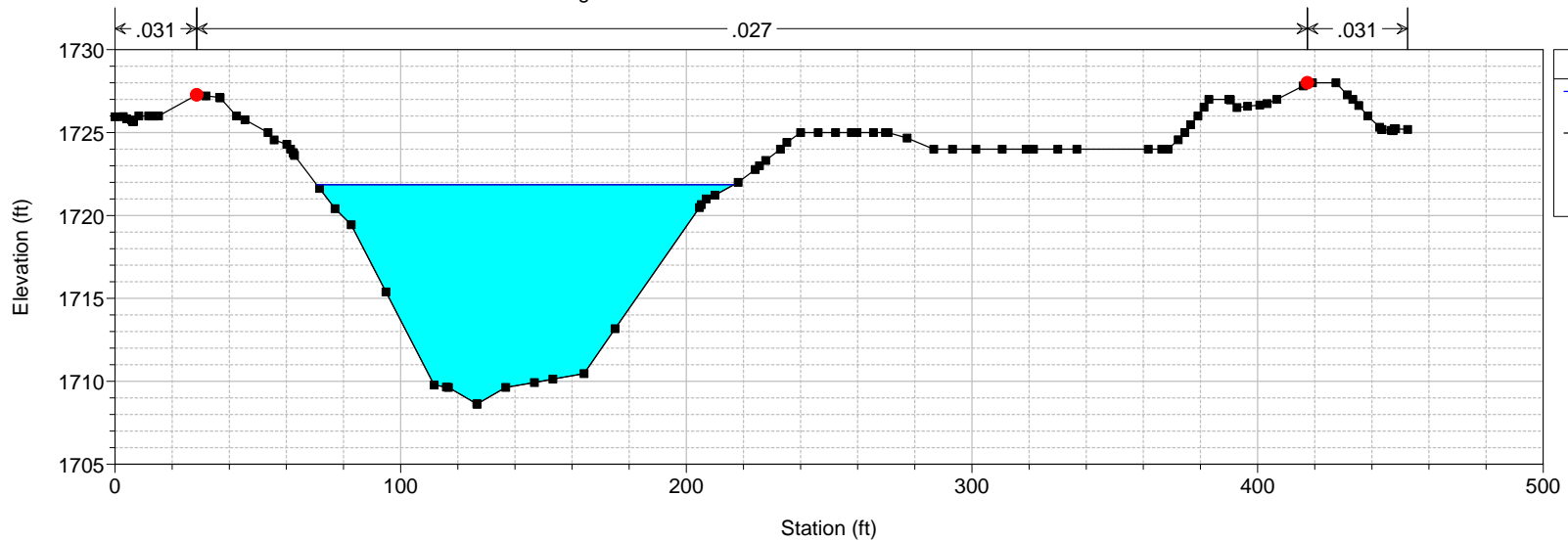


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.1 "DR" 49+52.88 = 1113.1

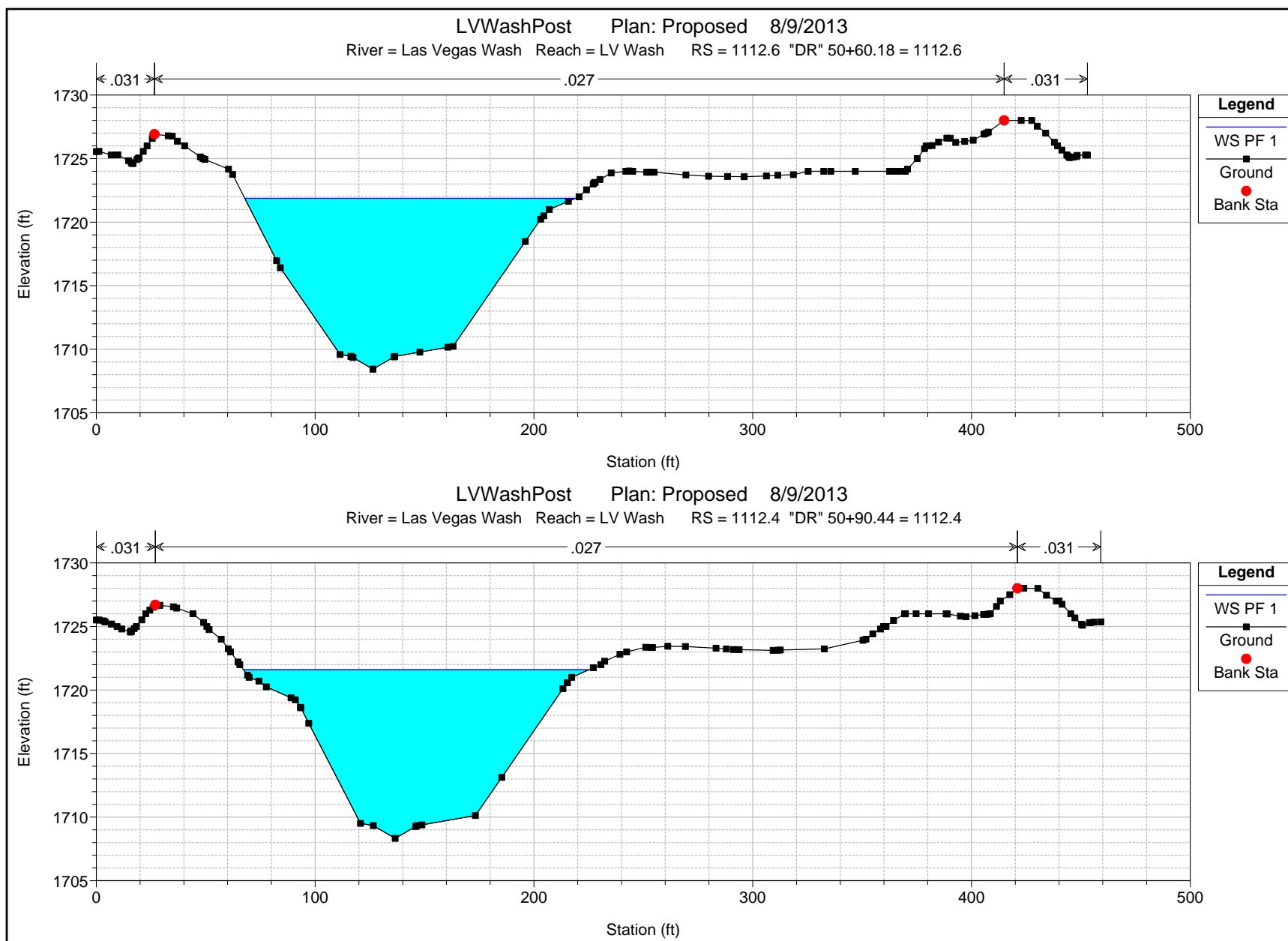


Legend	
WS PF 1	
Ground	■
Bank Sta	●

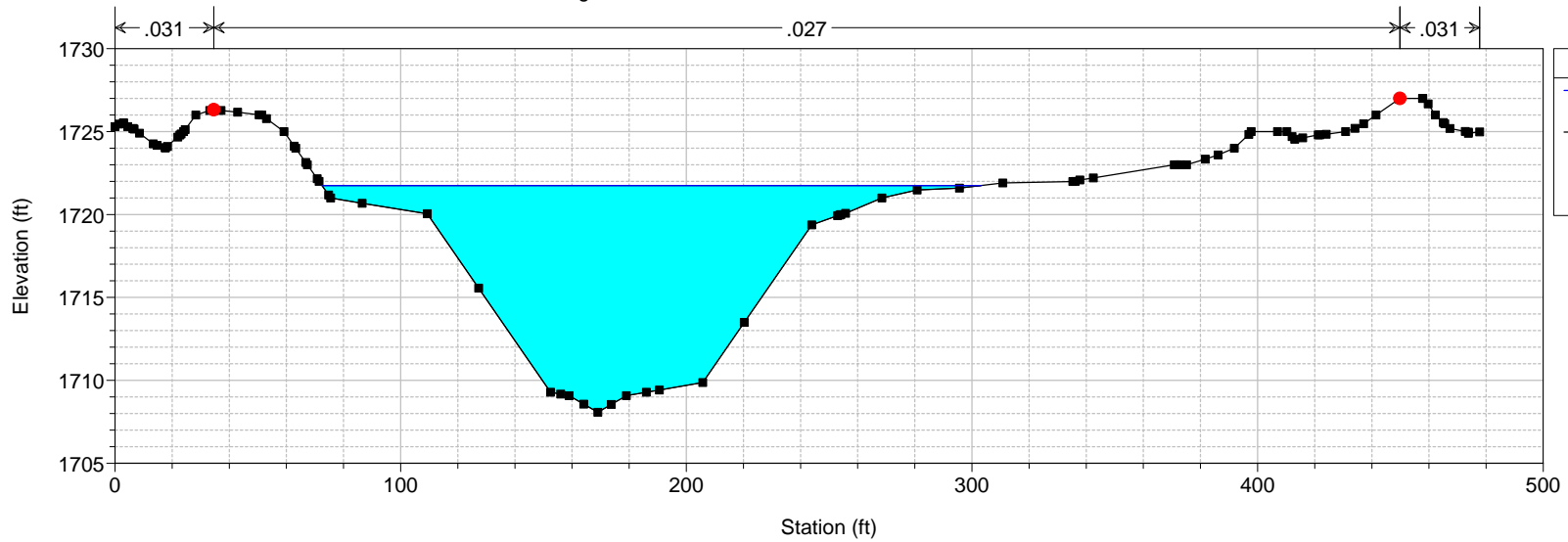
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1112.8 "DR" 50+05.00 = 1112.8



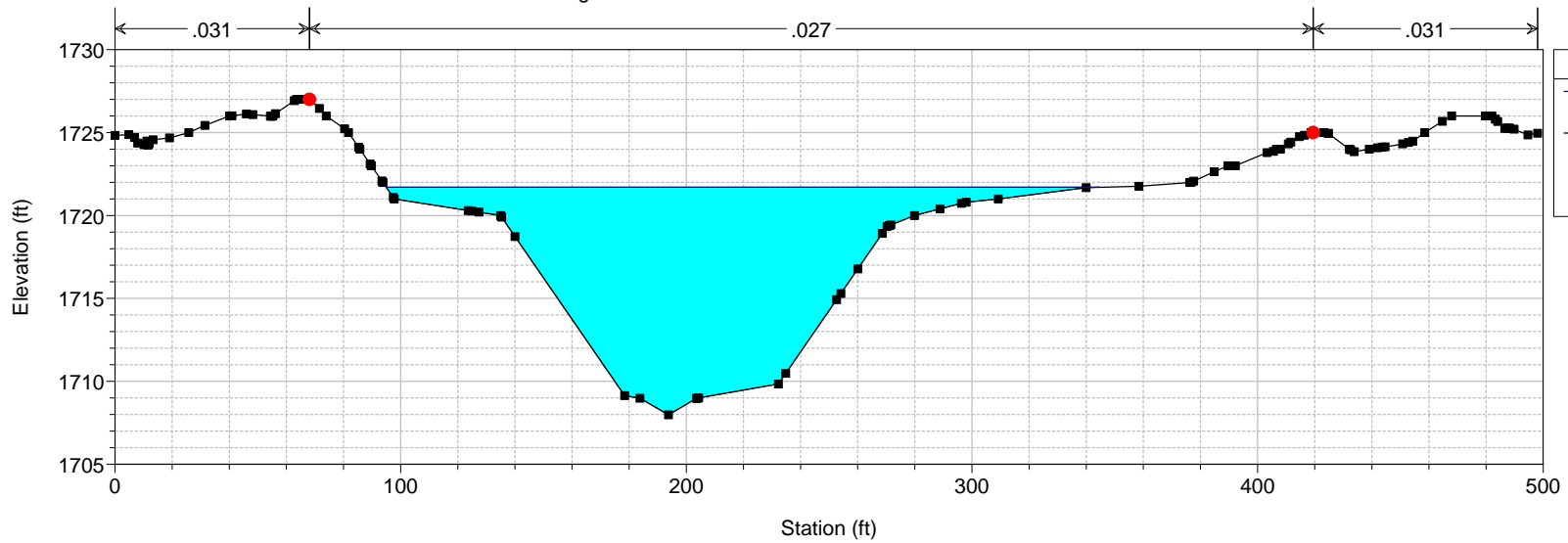
Legend	
WS PF 1	
Ground	■
Bank Sta	●



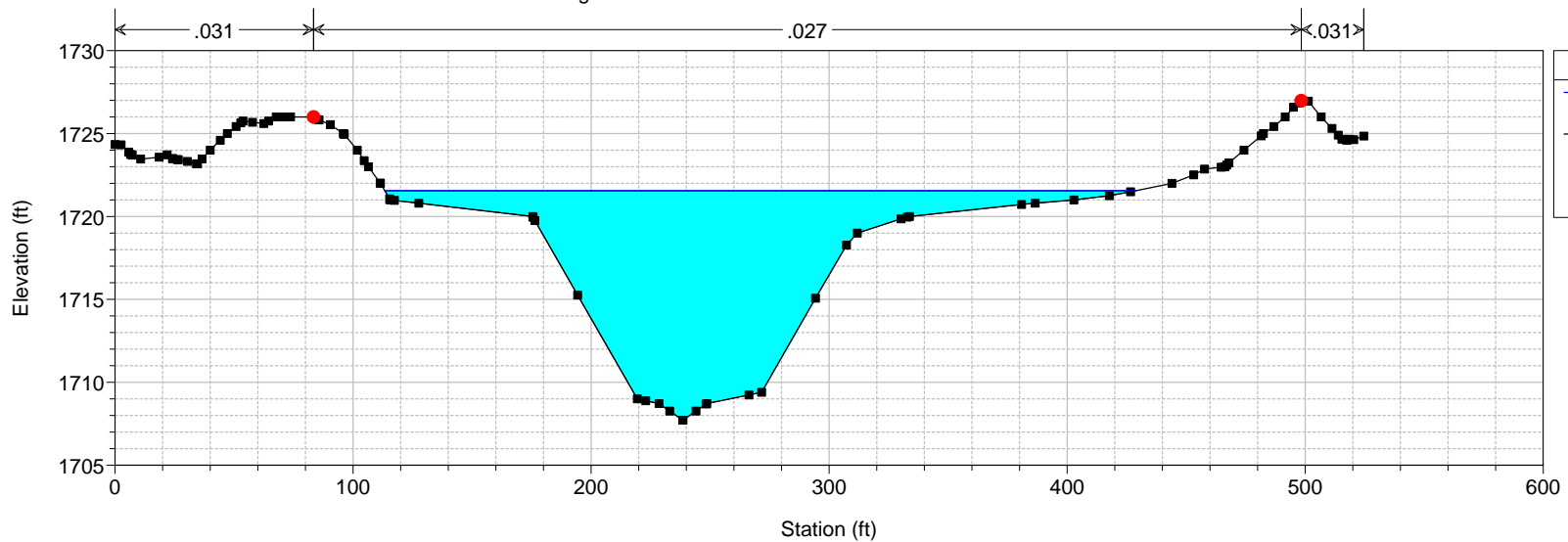
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1112.2 "DR" 51+62.97 = 1112.2



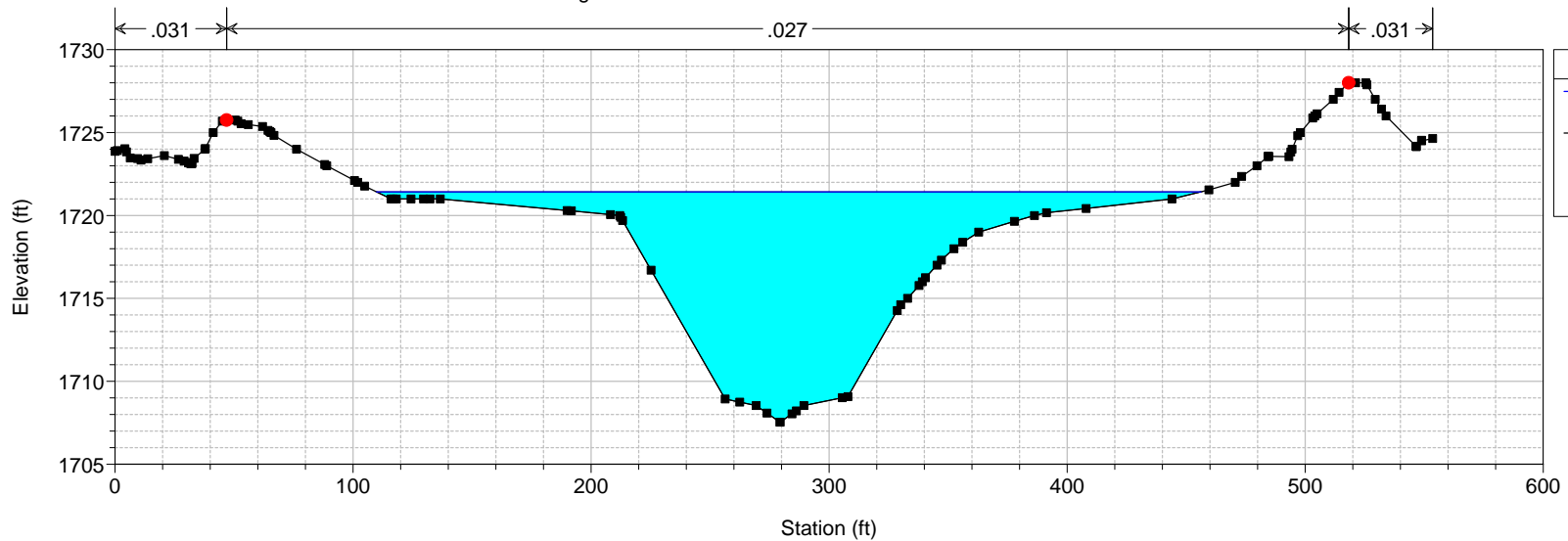
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1111.9 "DR" 51+89.80 = 1111.9

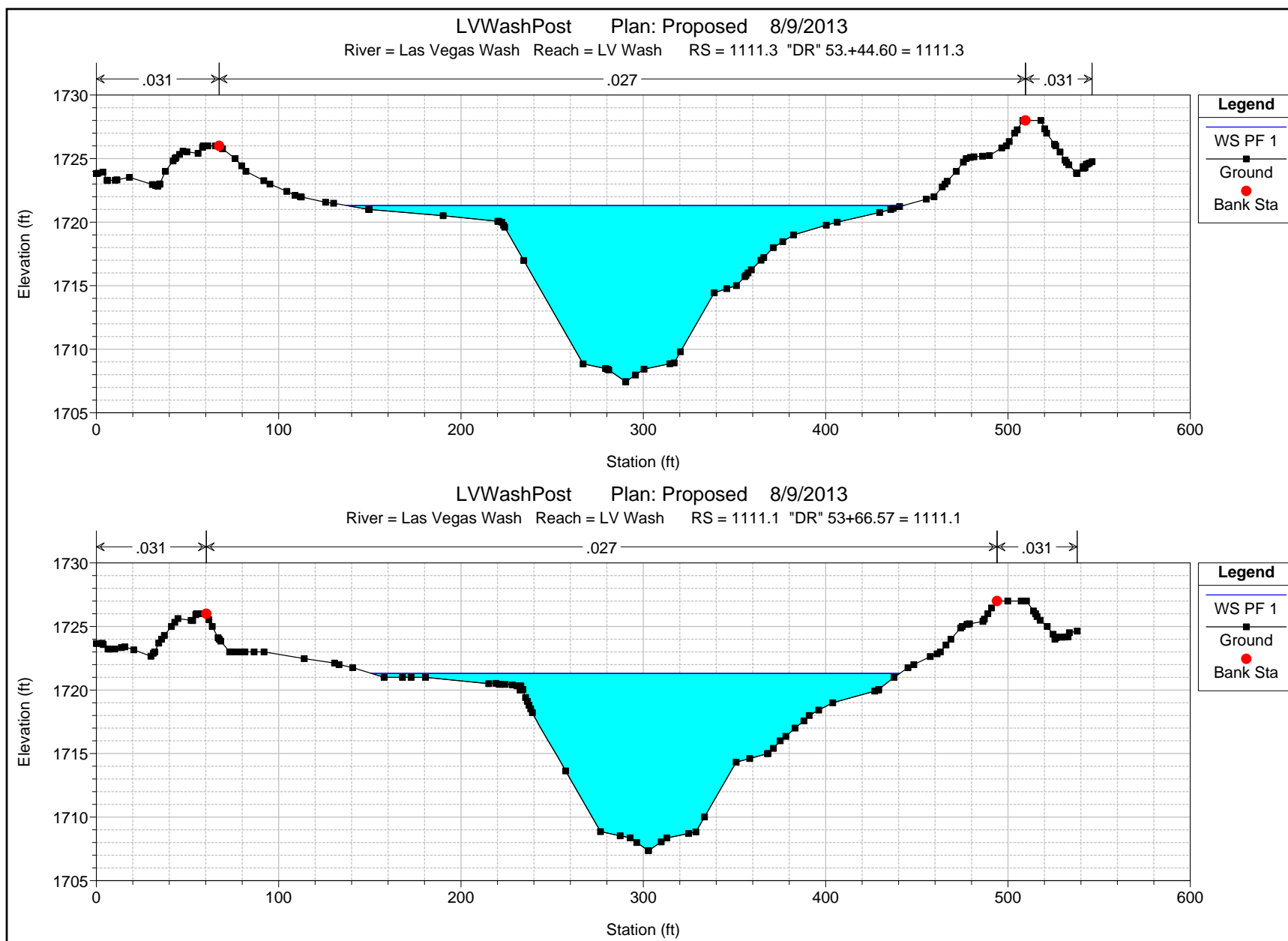


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1111.7 "DR" 52+64.94 = 1111.7

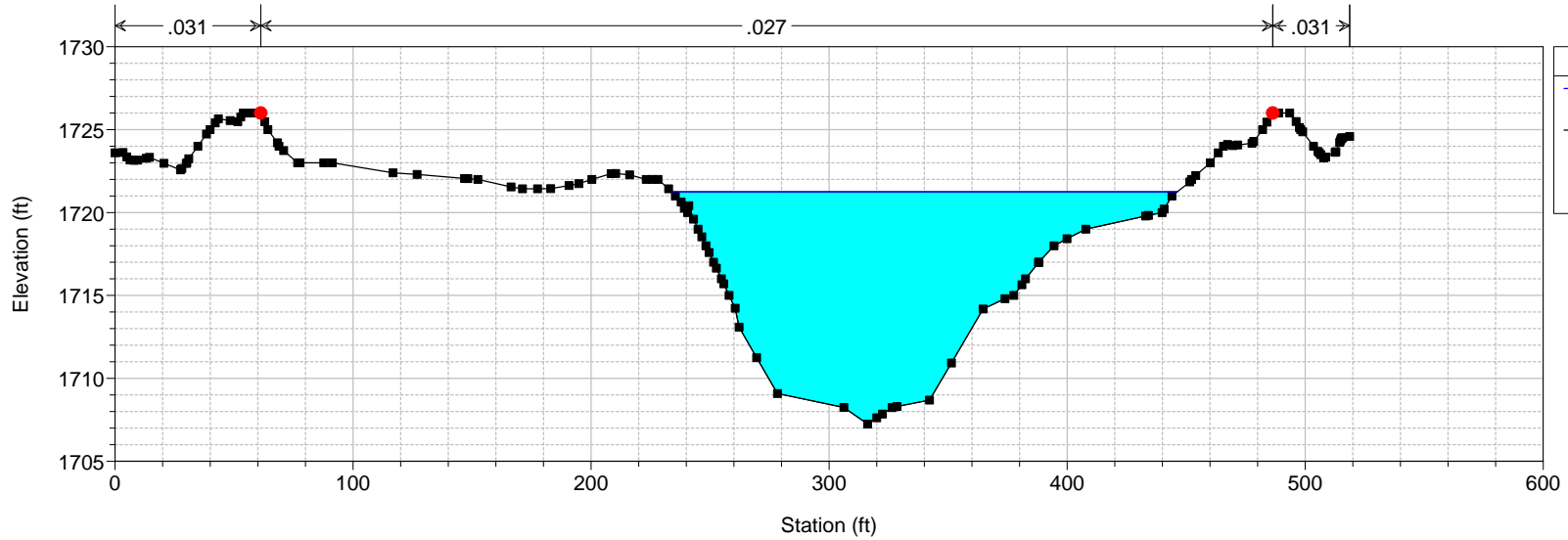


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1111.5 "DR" 53+16.09 = 1111.5

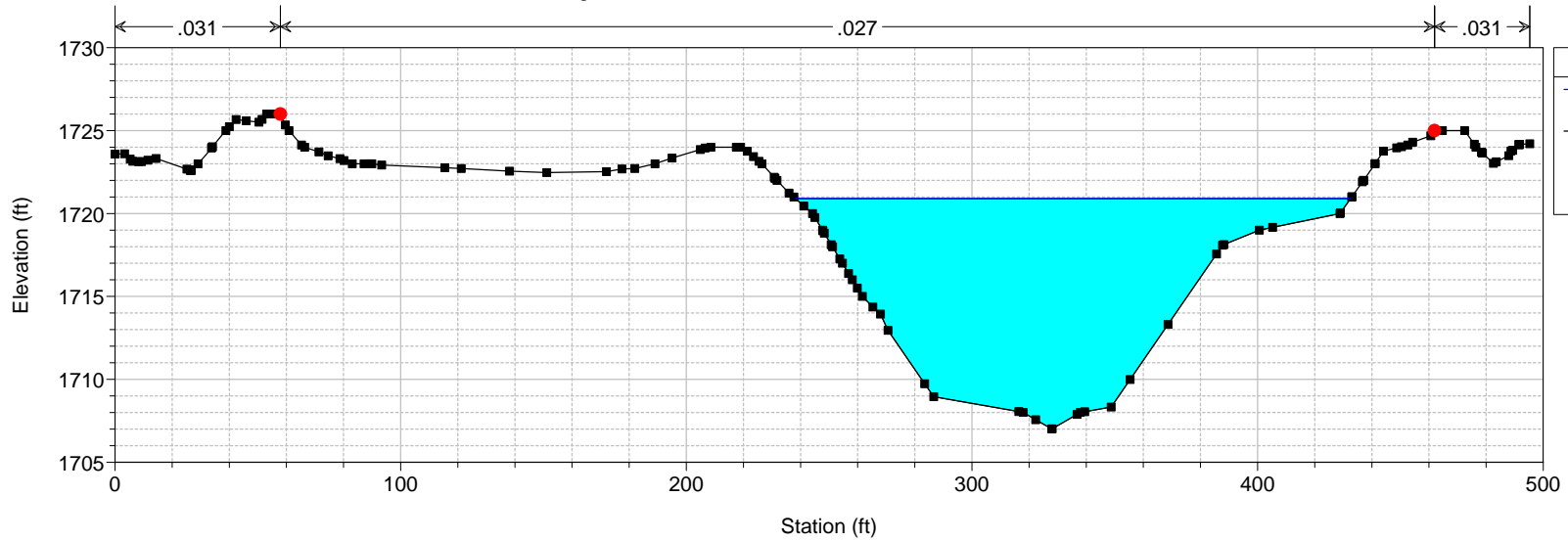




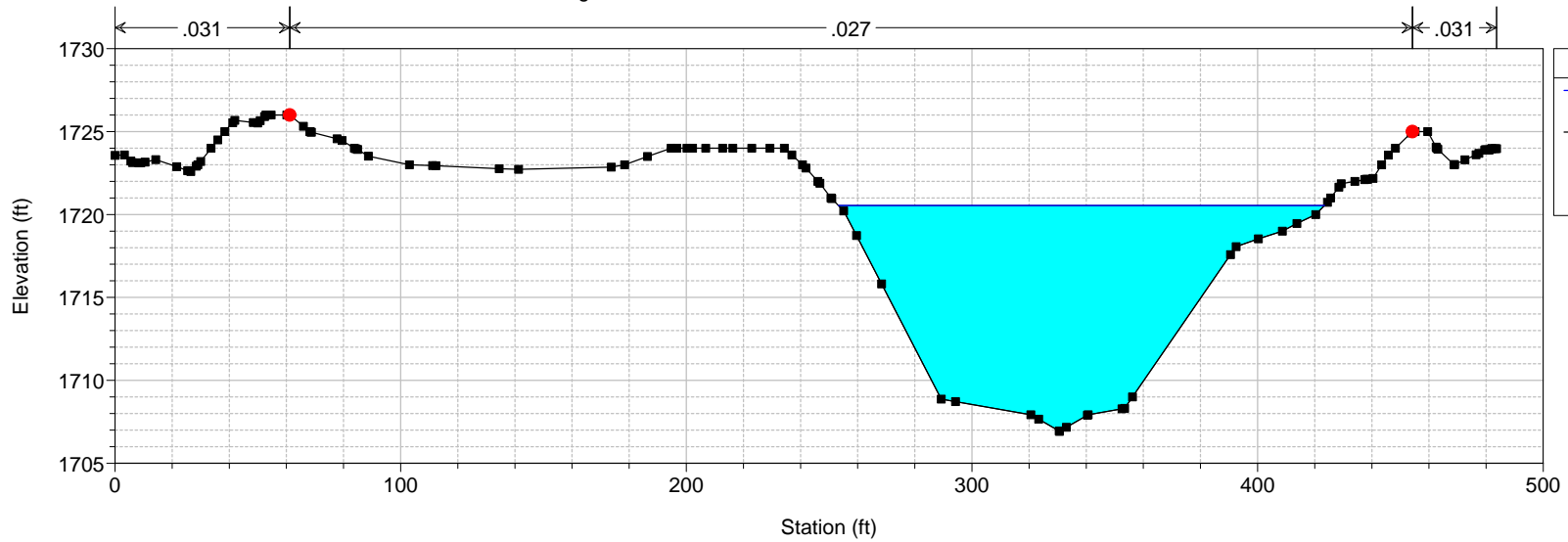
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.9 "DR" 53+98.56 = 1110.9



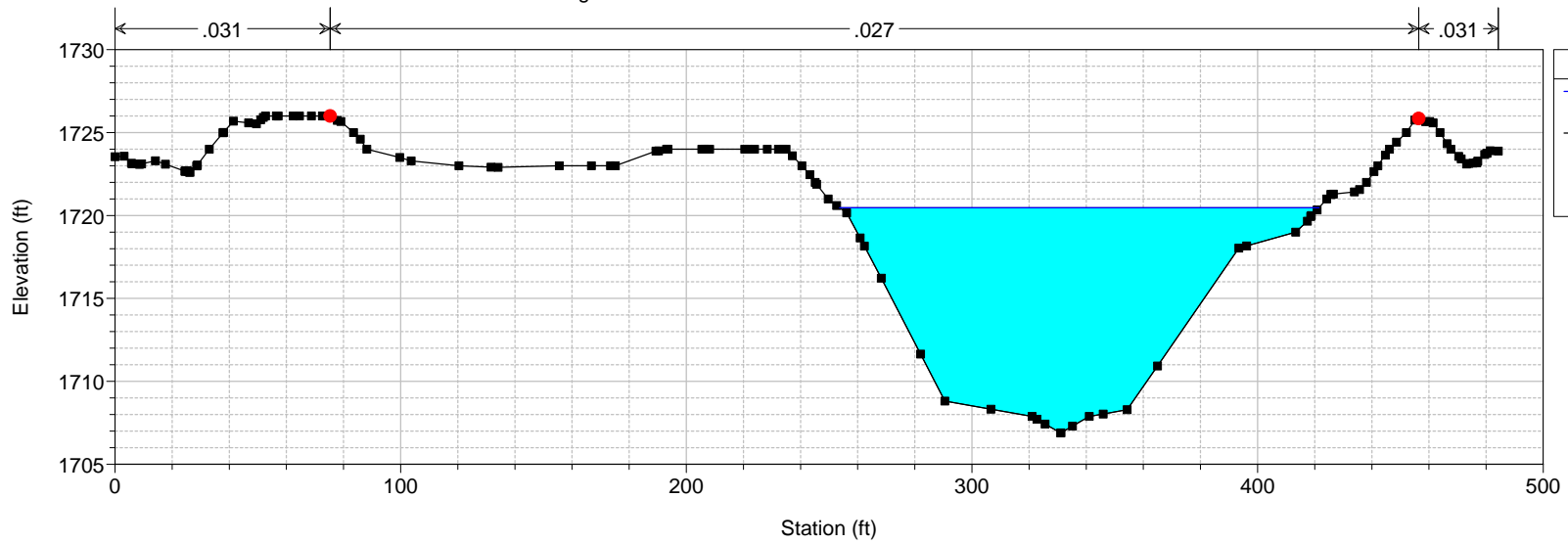
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.7 "DR" 54+68.00 = 1110.7



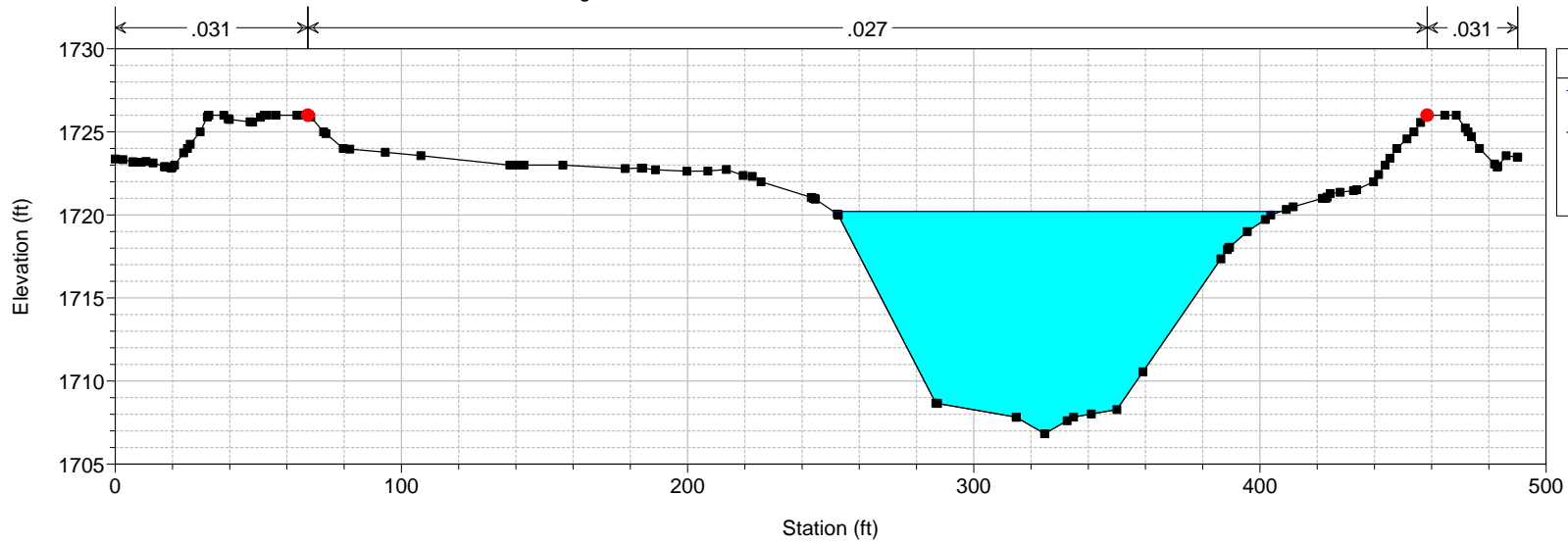
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.5 "DR" 55+19.91 = 1110.5



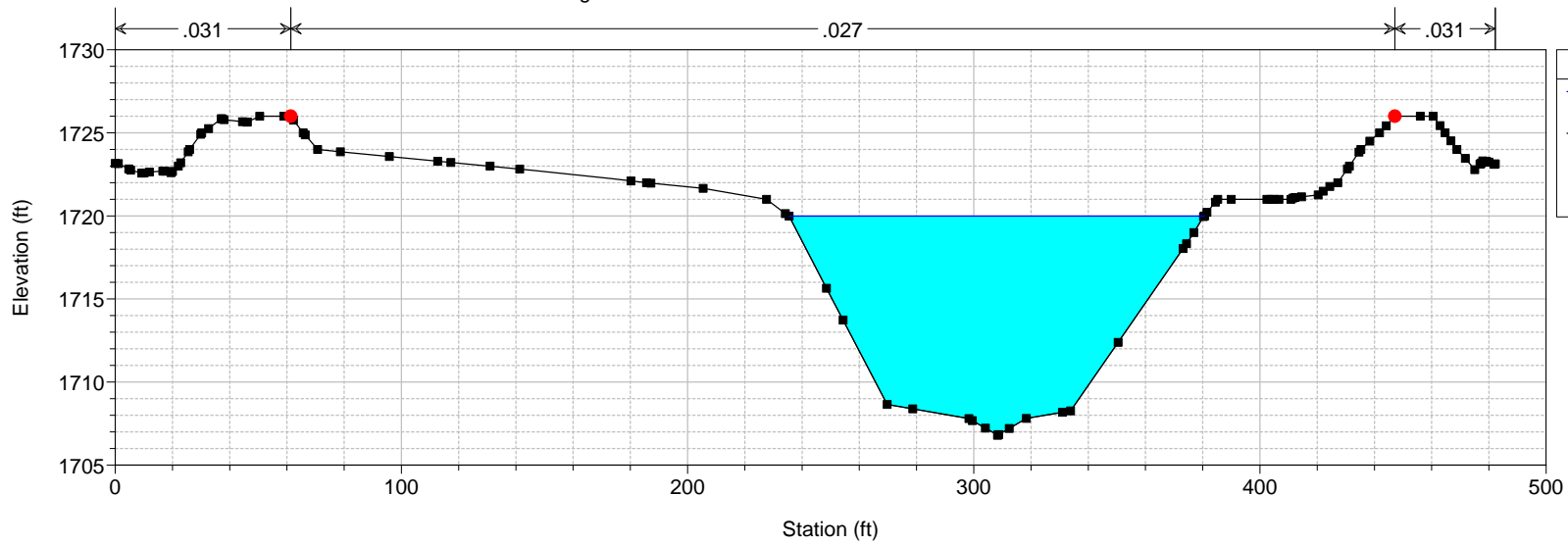
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.3 "DR" 55+45.57 = 1110.3



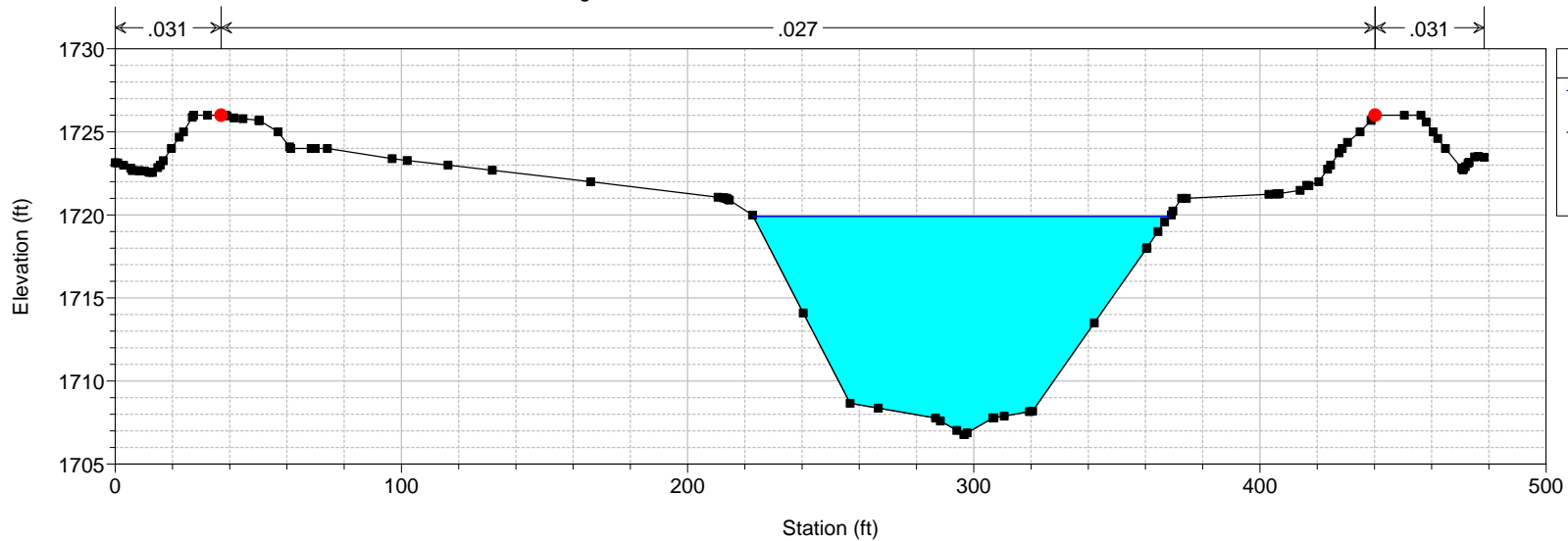
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.1 "DR" 55+85.27 = 1110.1



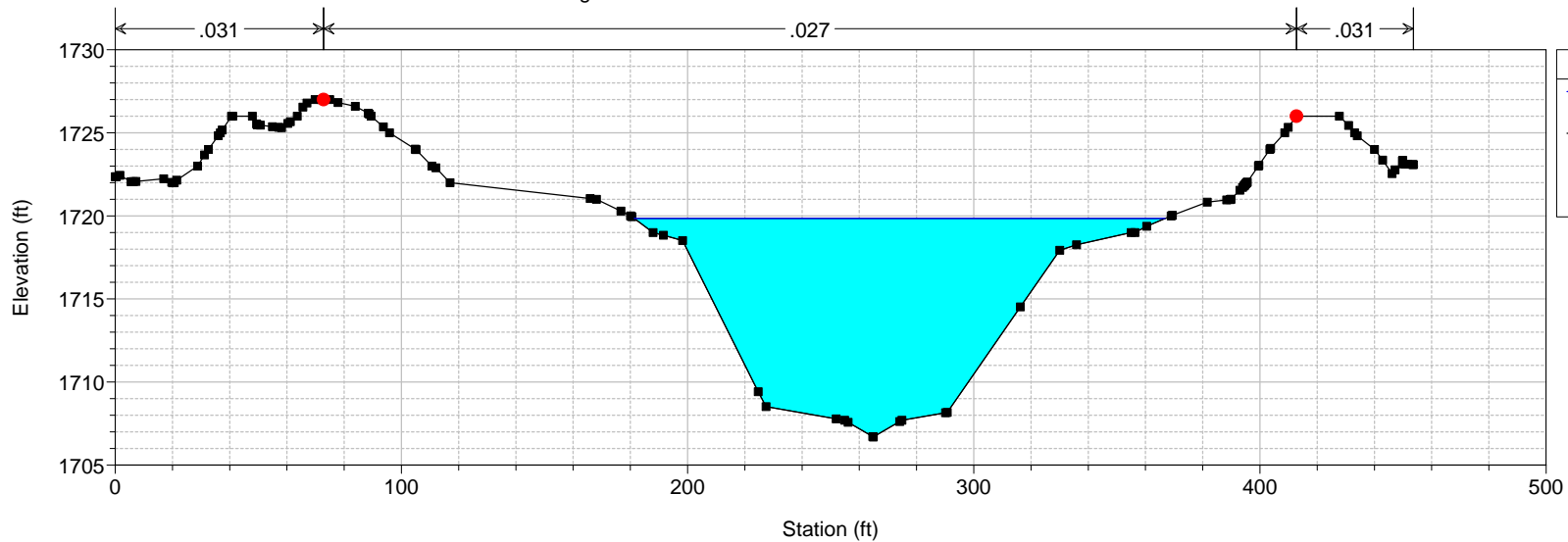
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.9 "DR" 56+00.39 = 1109.9



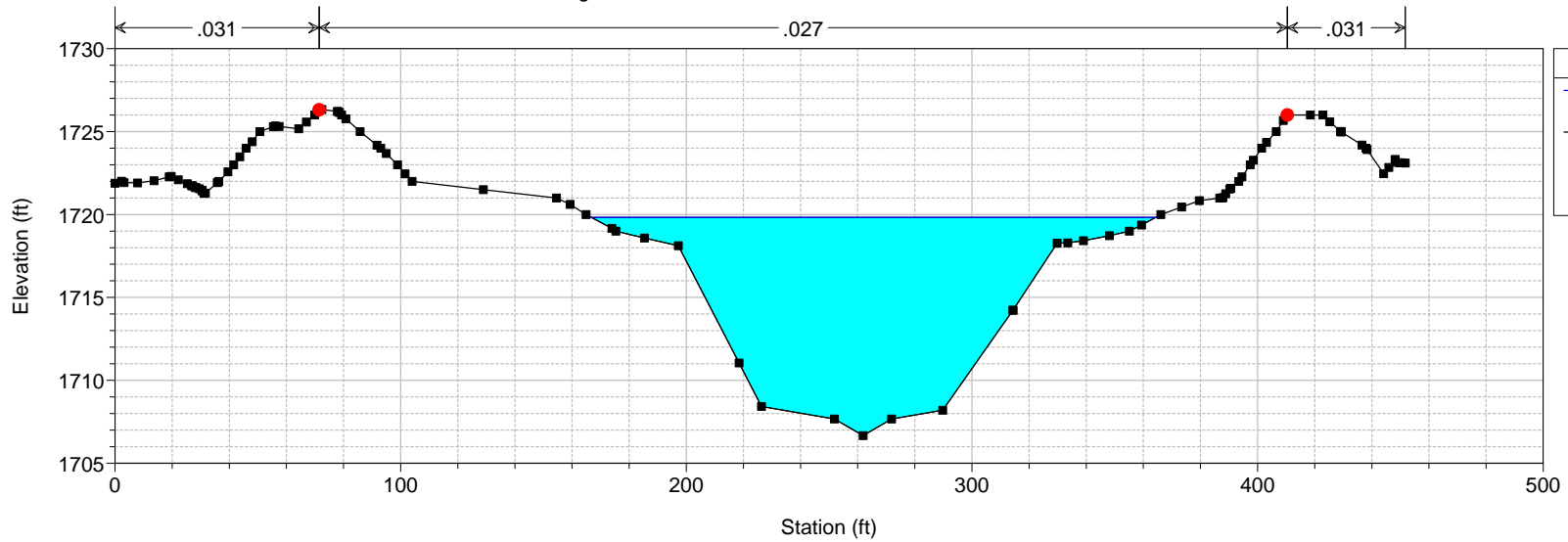
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.8 "DR" 56+21.09 = 1109.8



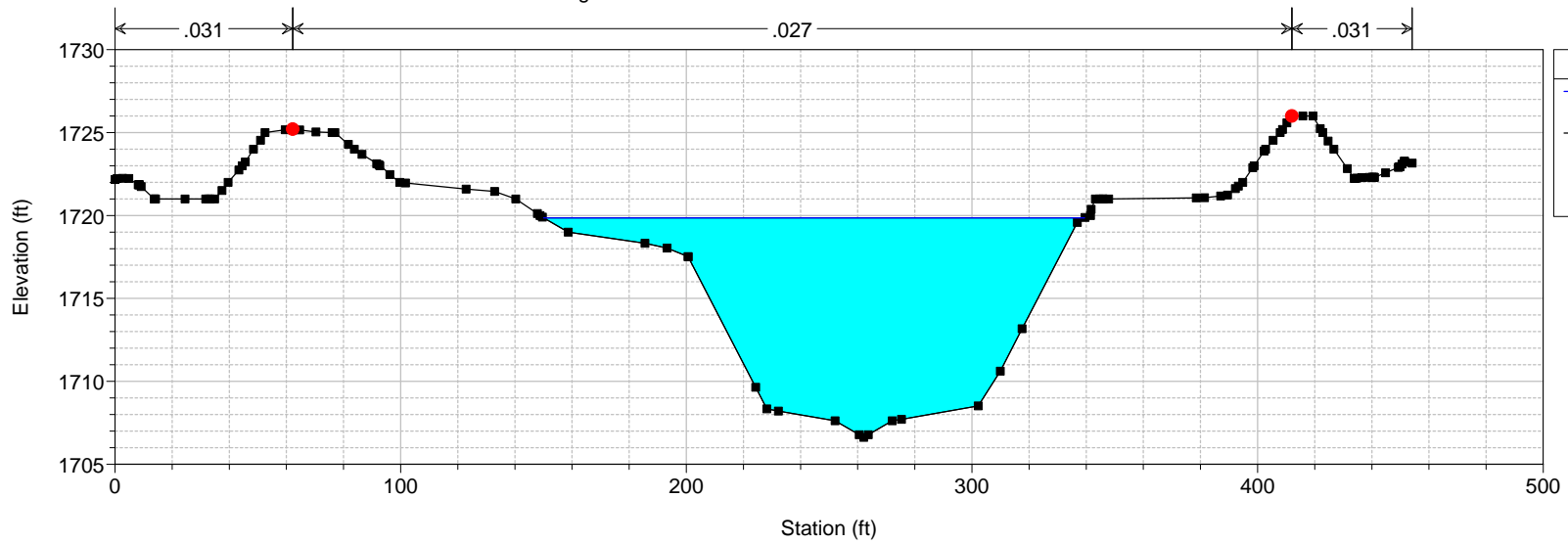
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.6 "DR" 56+70.98 = 1109.6



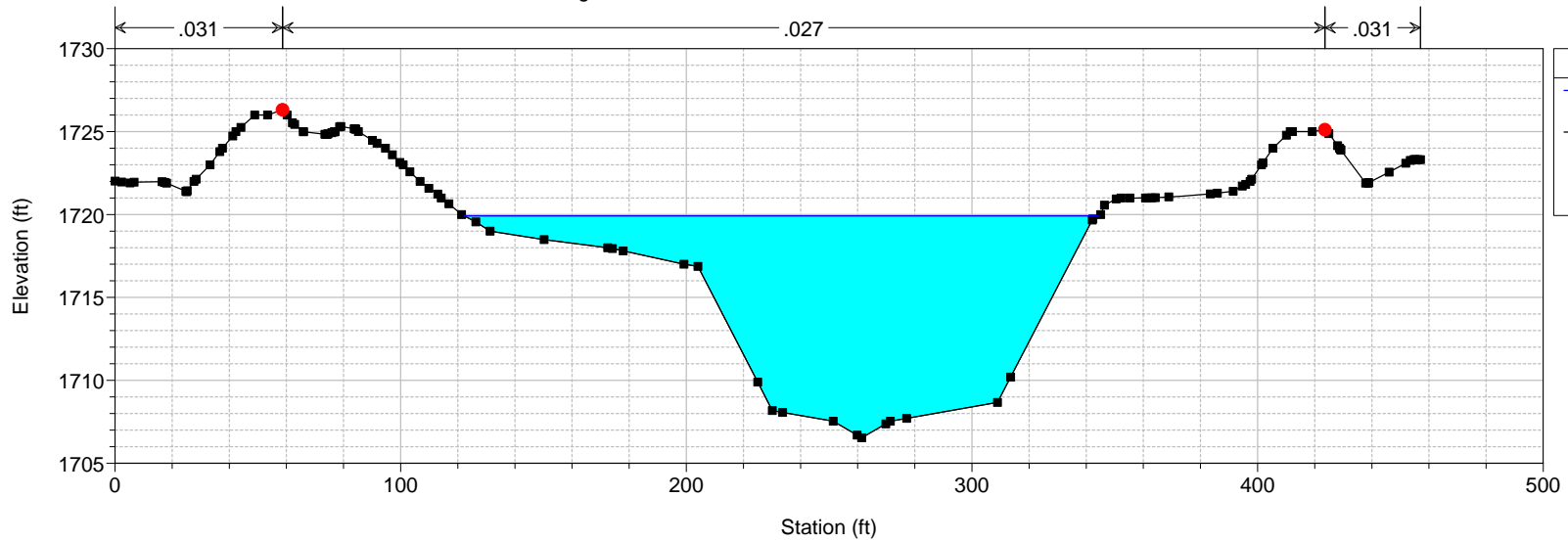
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.5 "DR" 56+90.50 = 1109.5



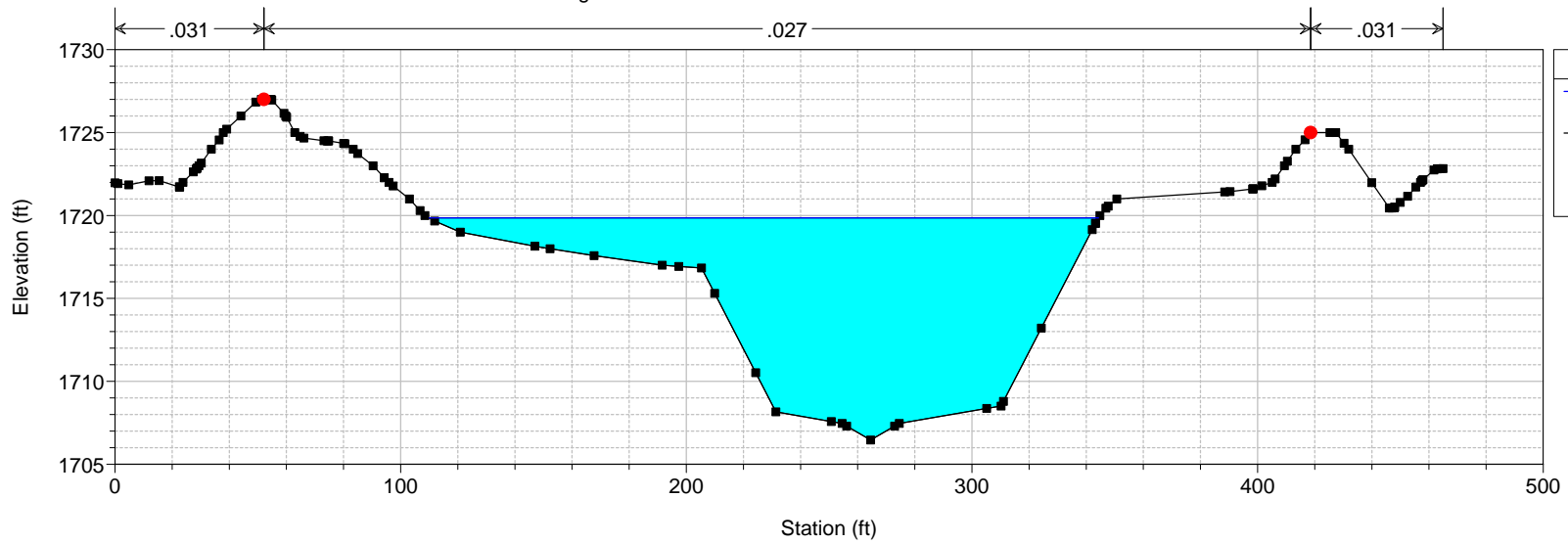
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.3 "DR" 57+20.98 = 1109.3



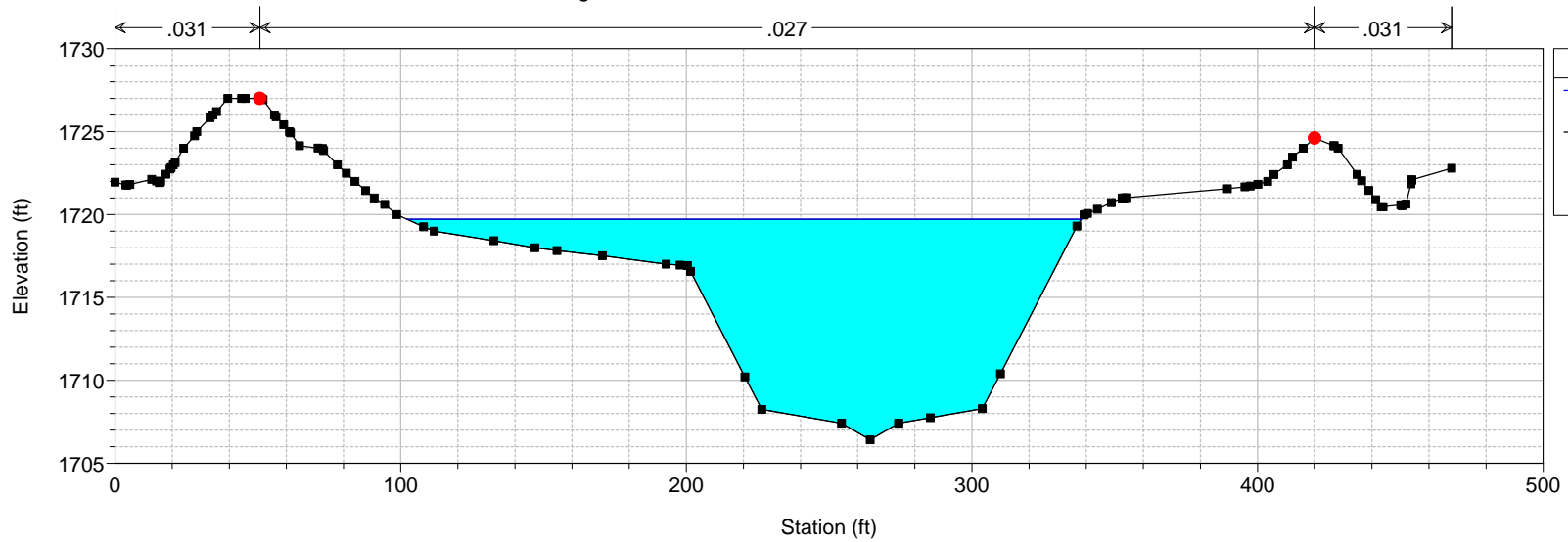
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.1 "DR" 57+70.98 = 1109.1



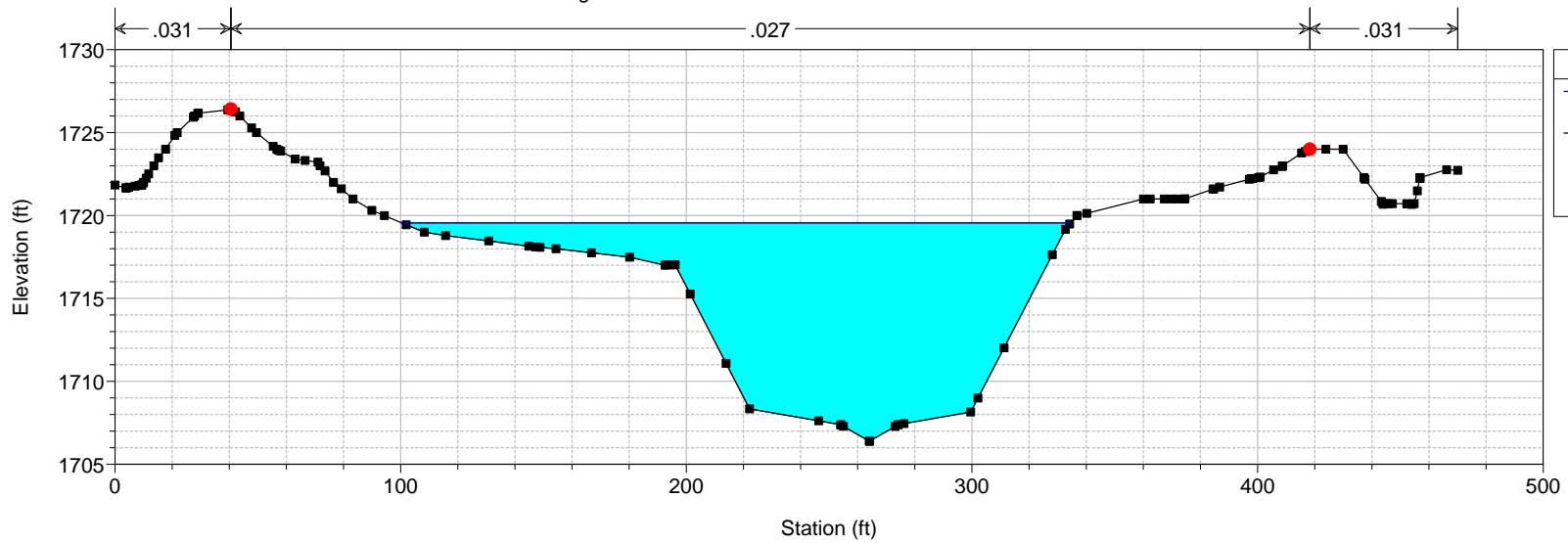
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.9 "DR" 58+20.98 = 1108.9



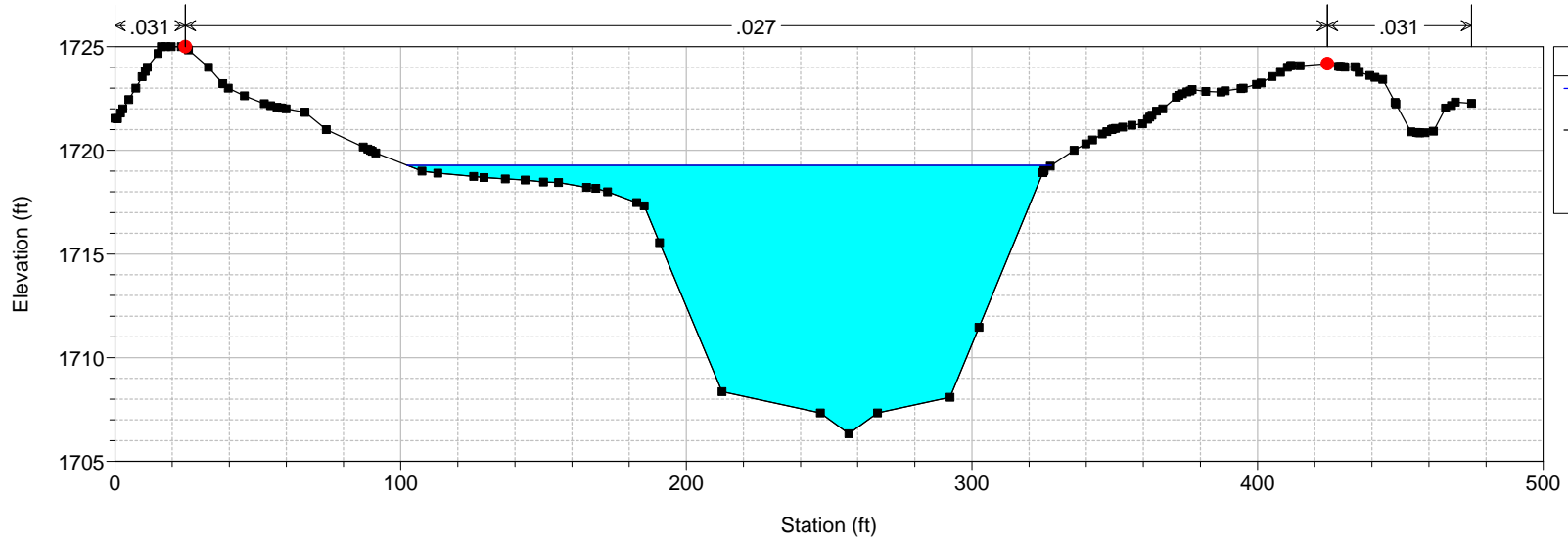
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.8 "DR" 58+48.43 = 1108.8



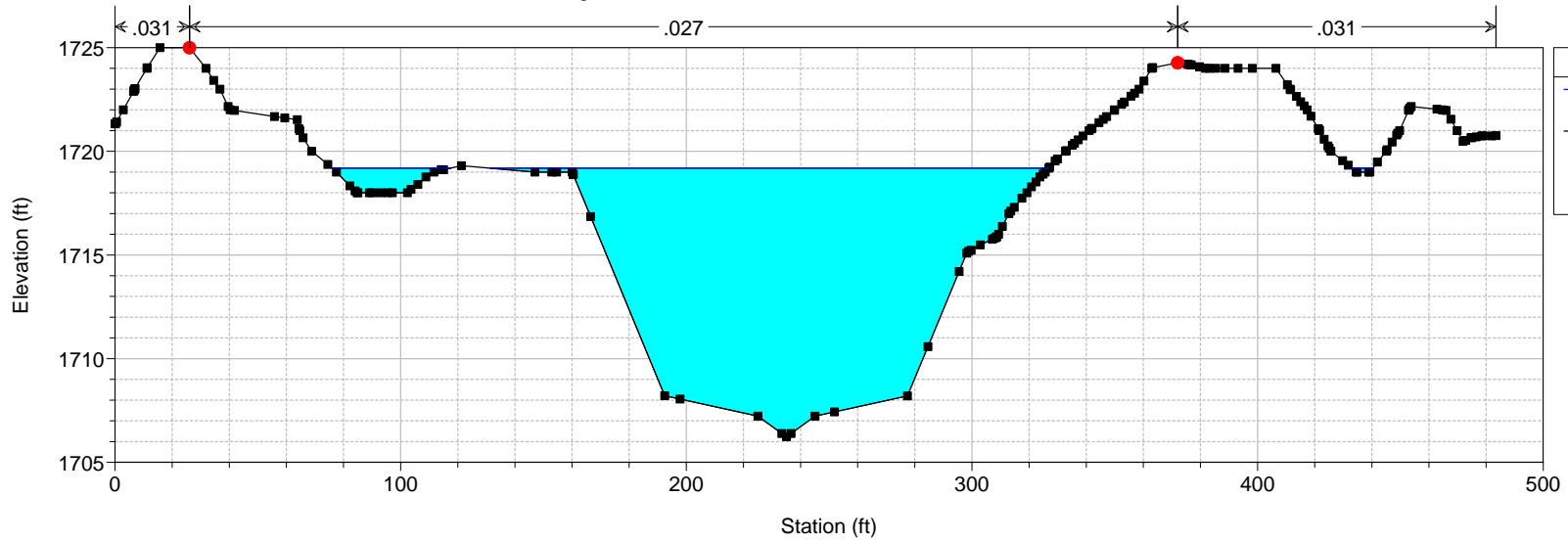
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.7 "DR" 58+70.98 = 1108.7



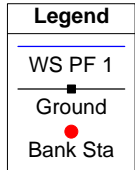
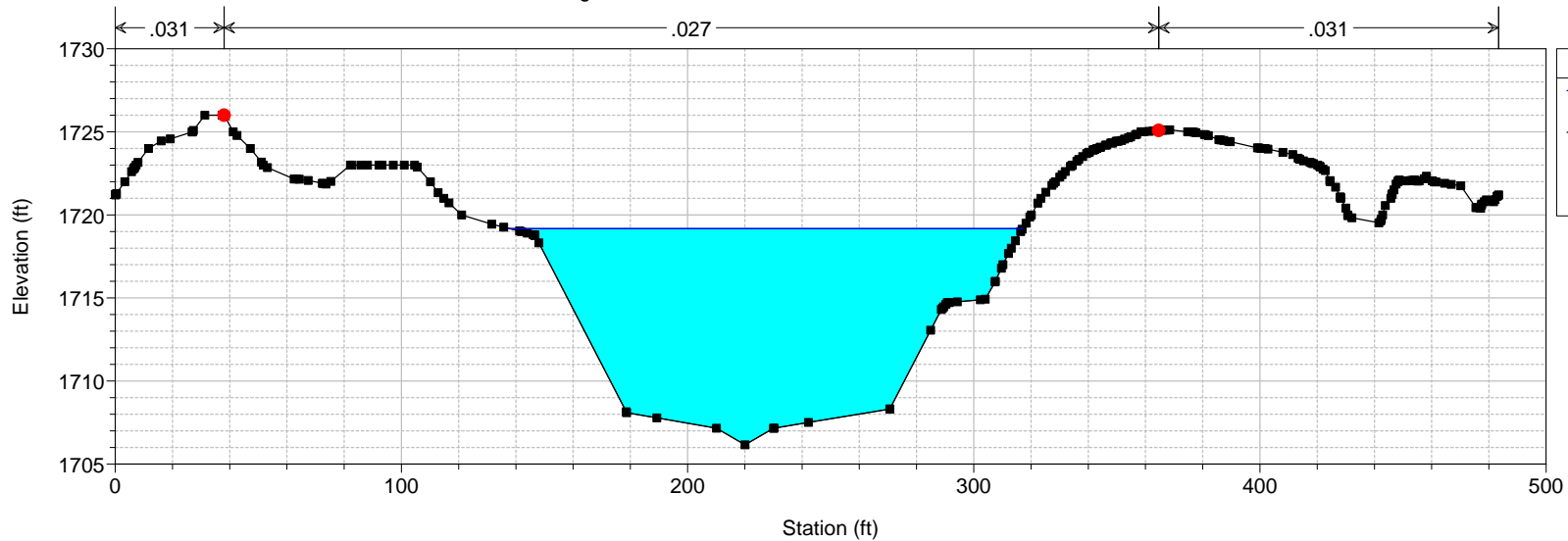
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.5 "DR" 59+06.98 = 1108.5



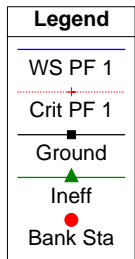
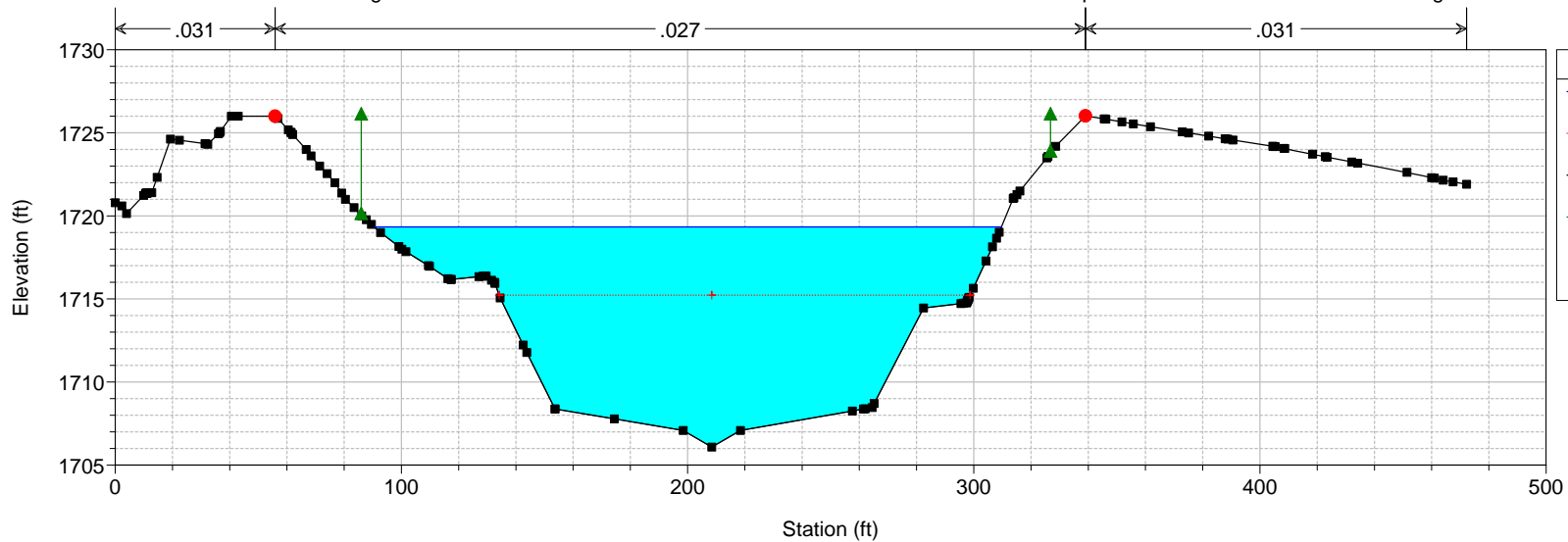
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.3 "DR" 59+70.98 = 1108.3

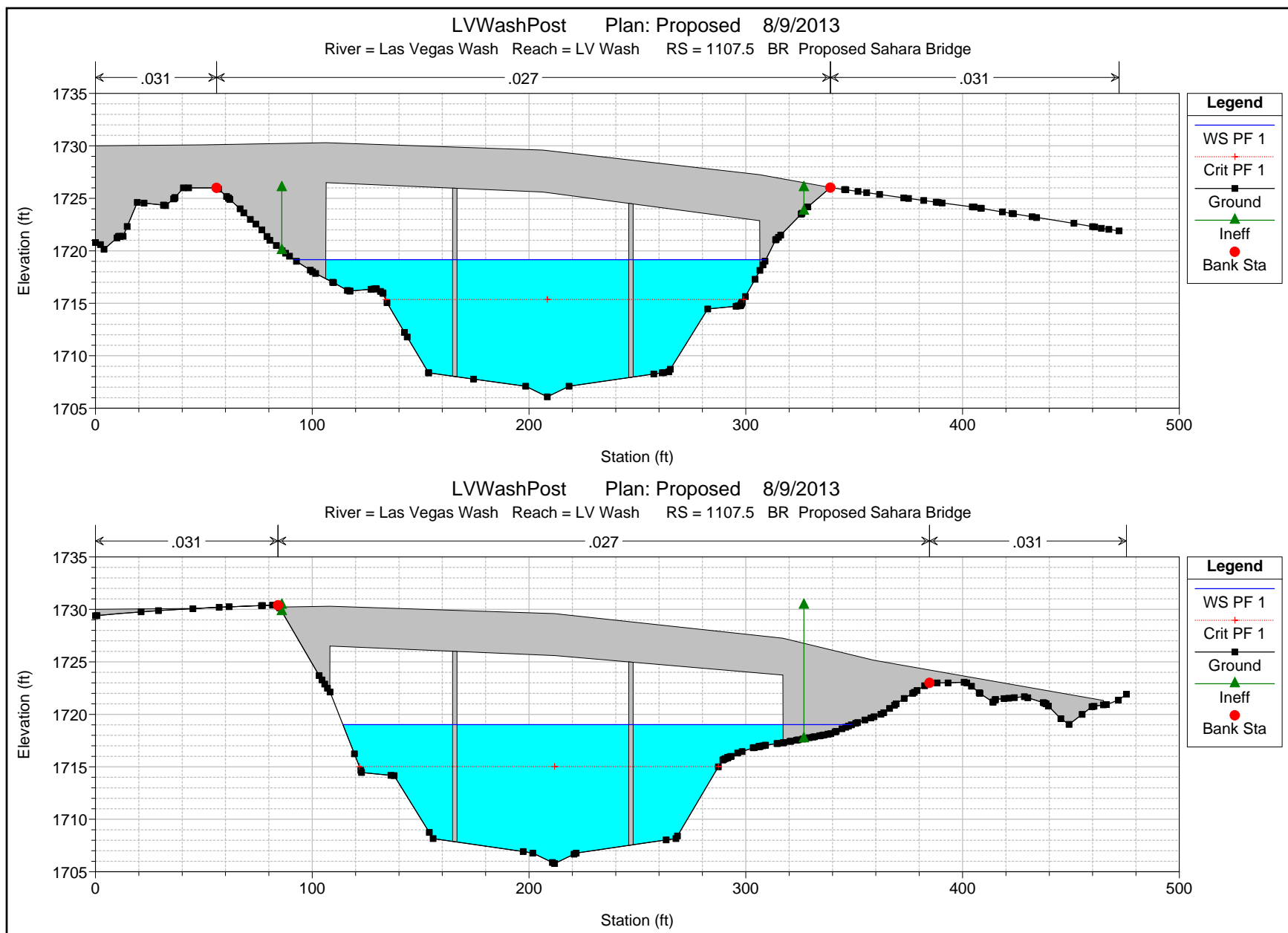


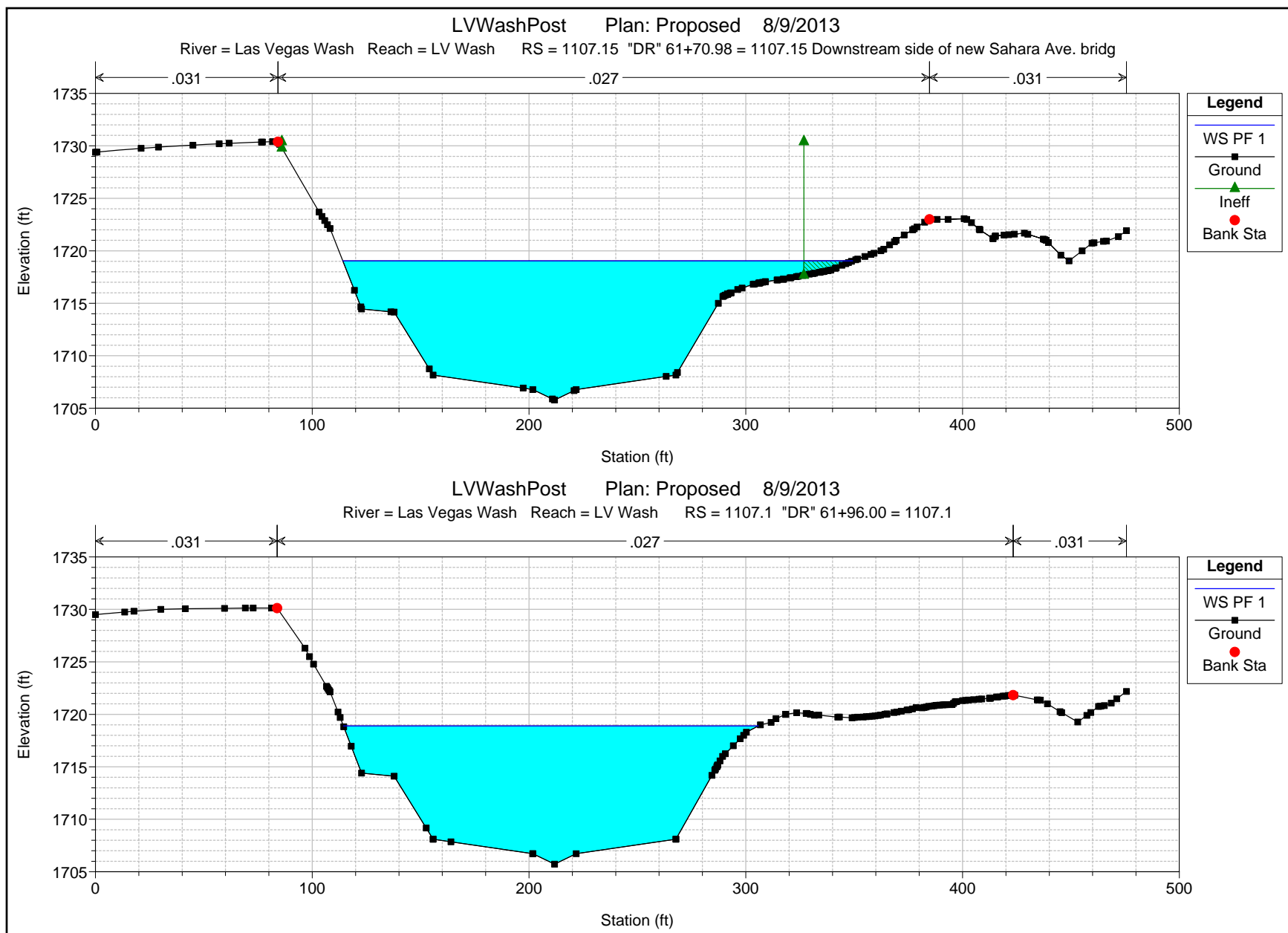
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.2 "DR" 60+16.43 = 1108.2

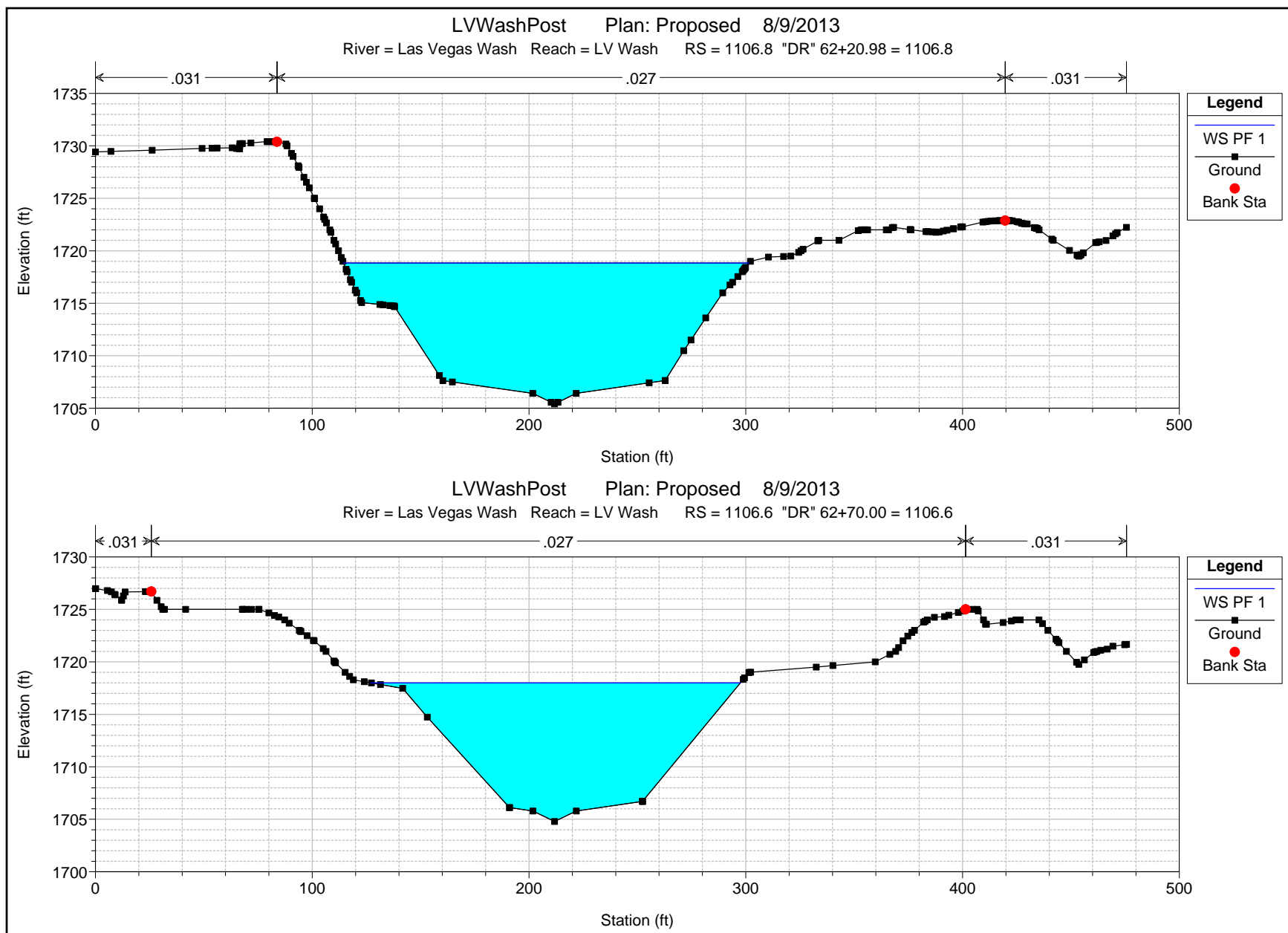


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1107.95 "DR" 60+46.86 = 1107.95 Upstream side of new Sahara Ave. Bridge



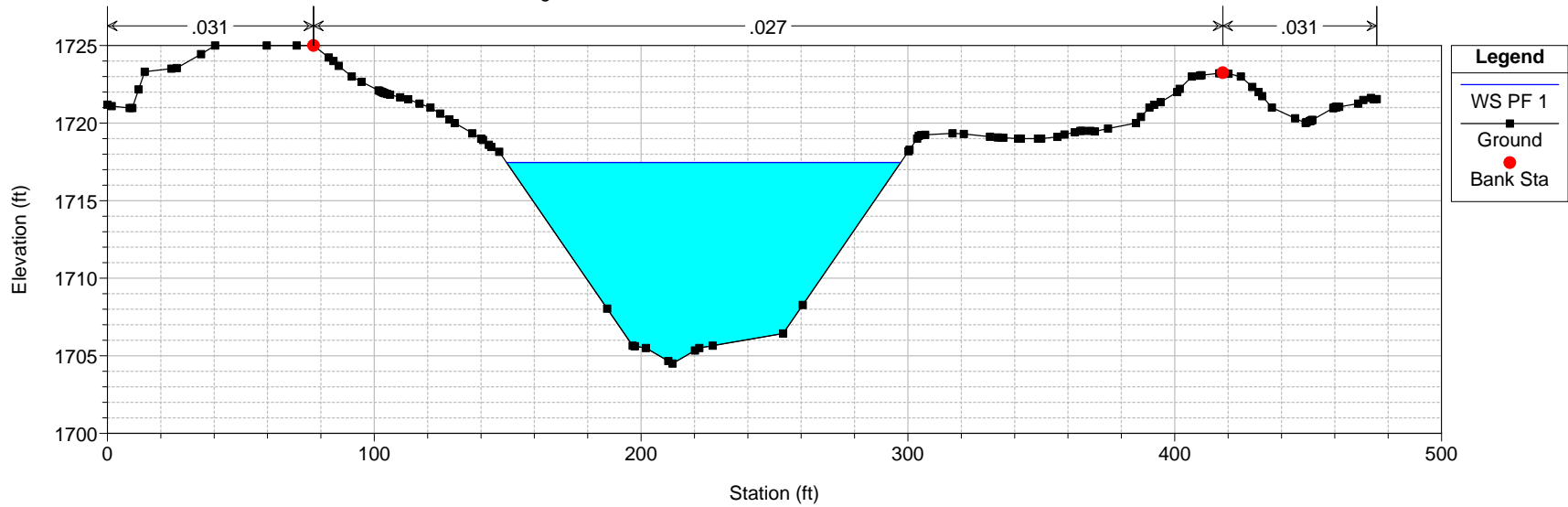






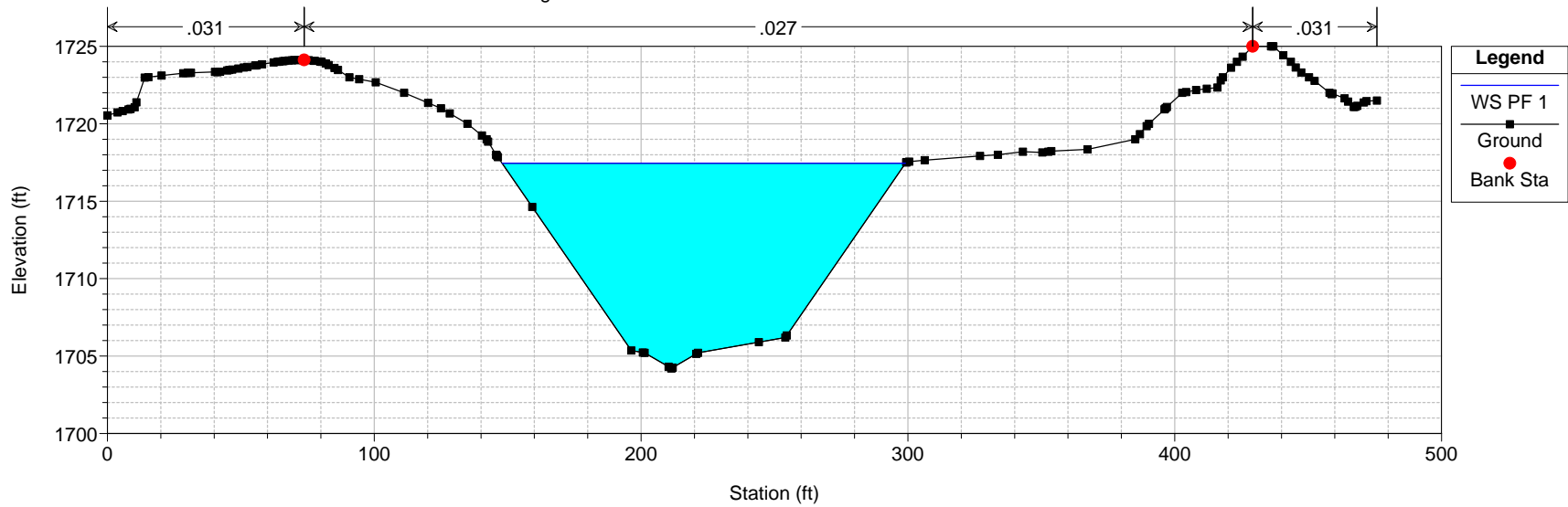
LVWashPost Plan: Proposed 8/9/2013

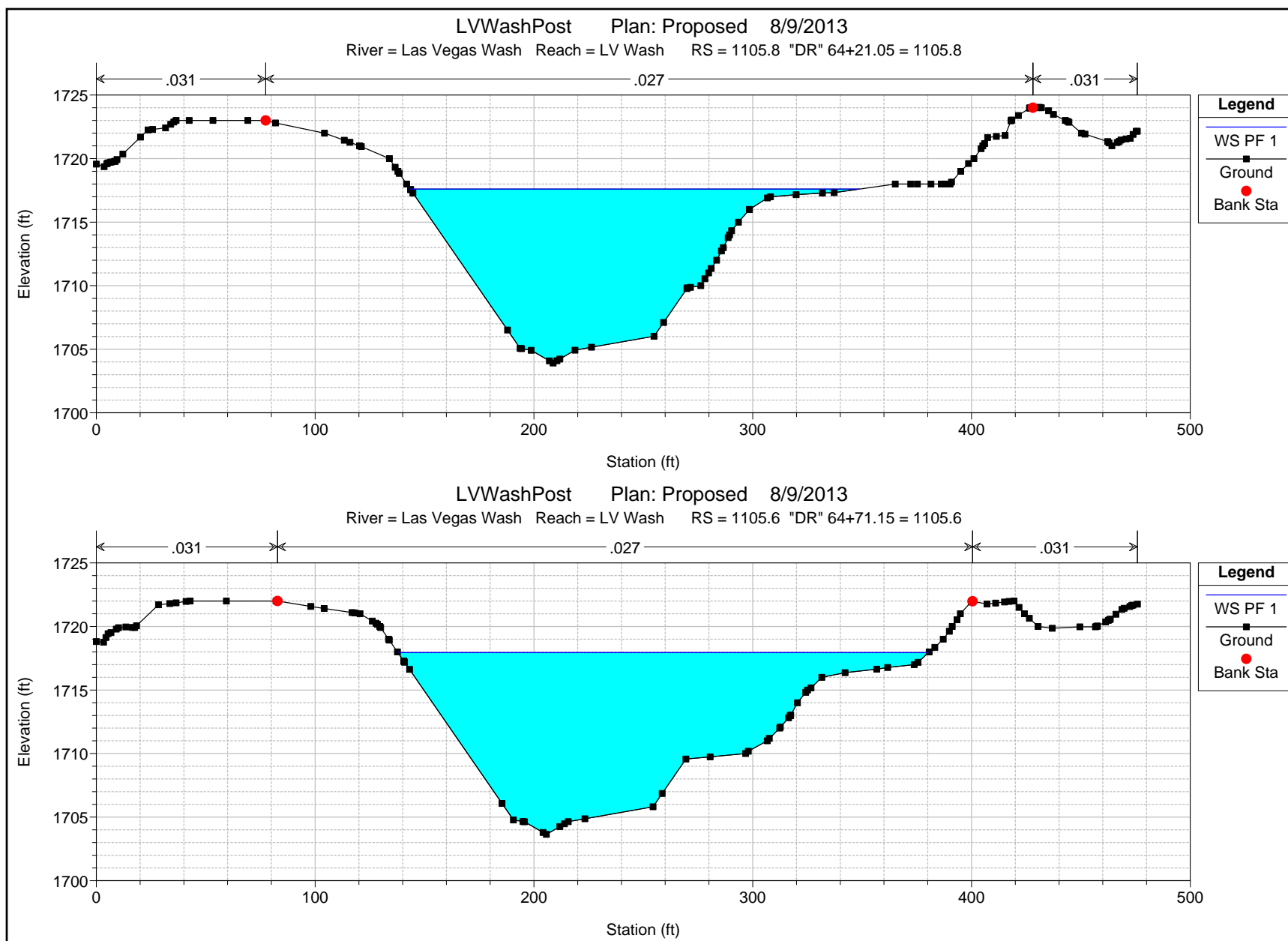
River = Las Vegas Wash Reach = LV Wash RS = 1106.4 "DR" 63+20.98 = 1106.4



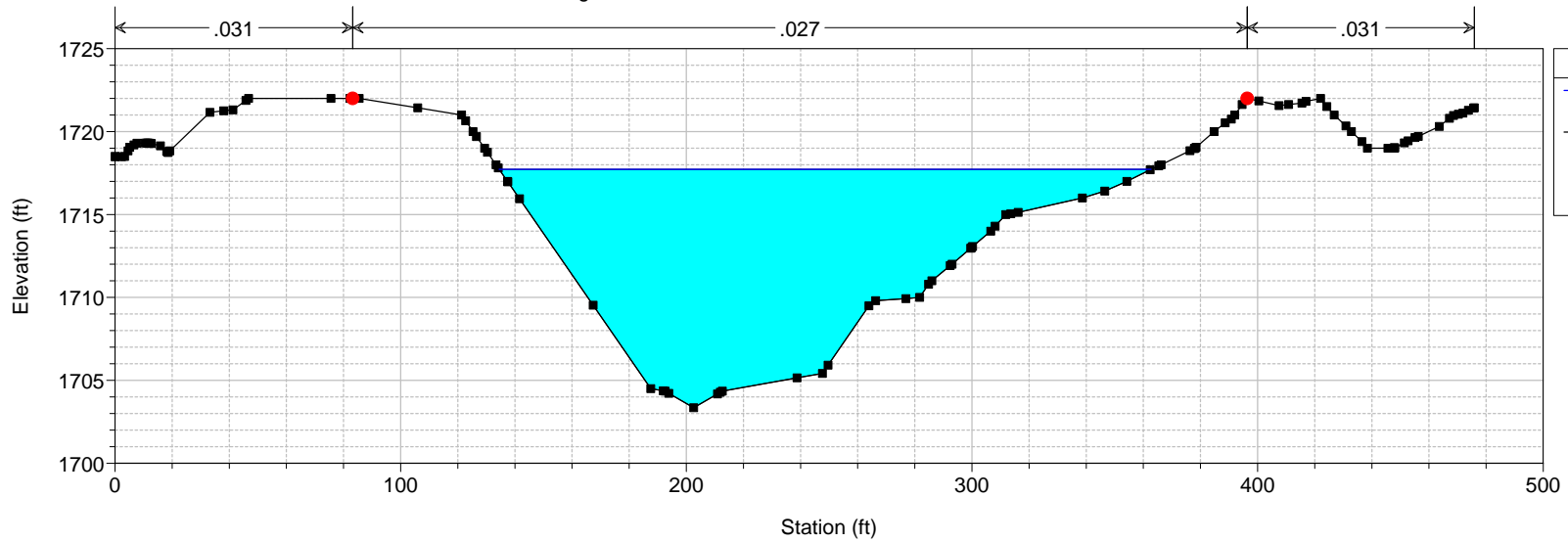
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1106.2 "DR" 63+70.98 = 1106.2

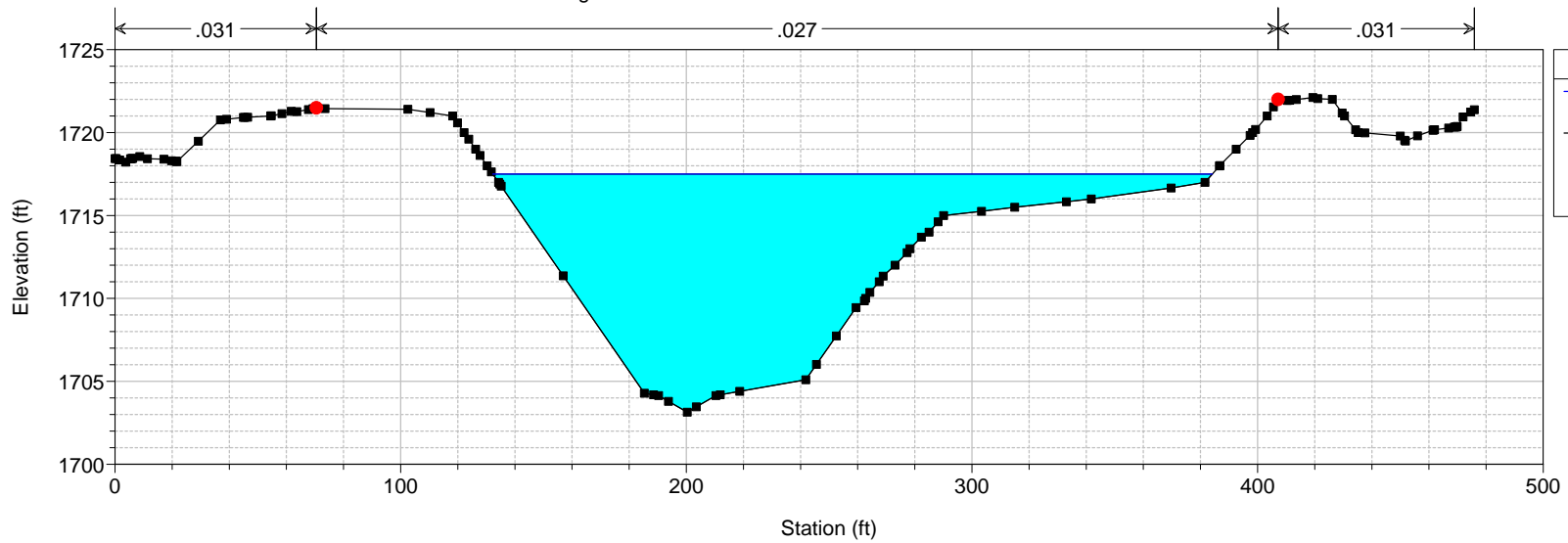


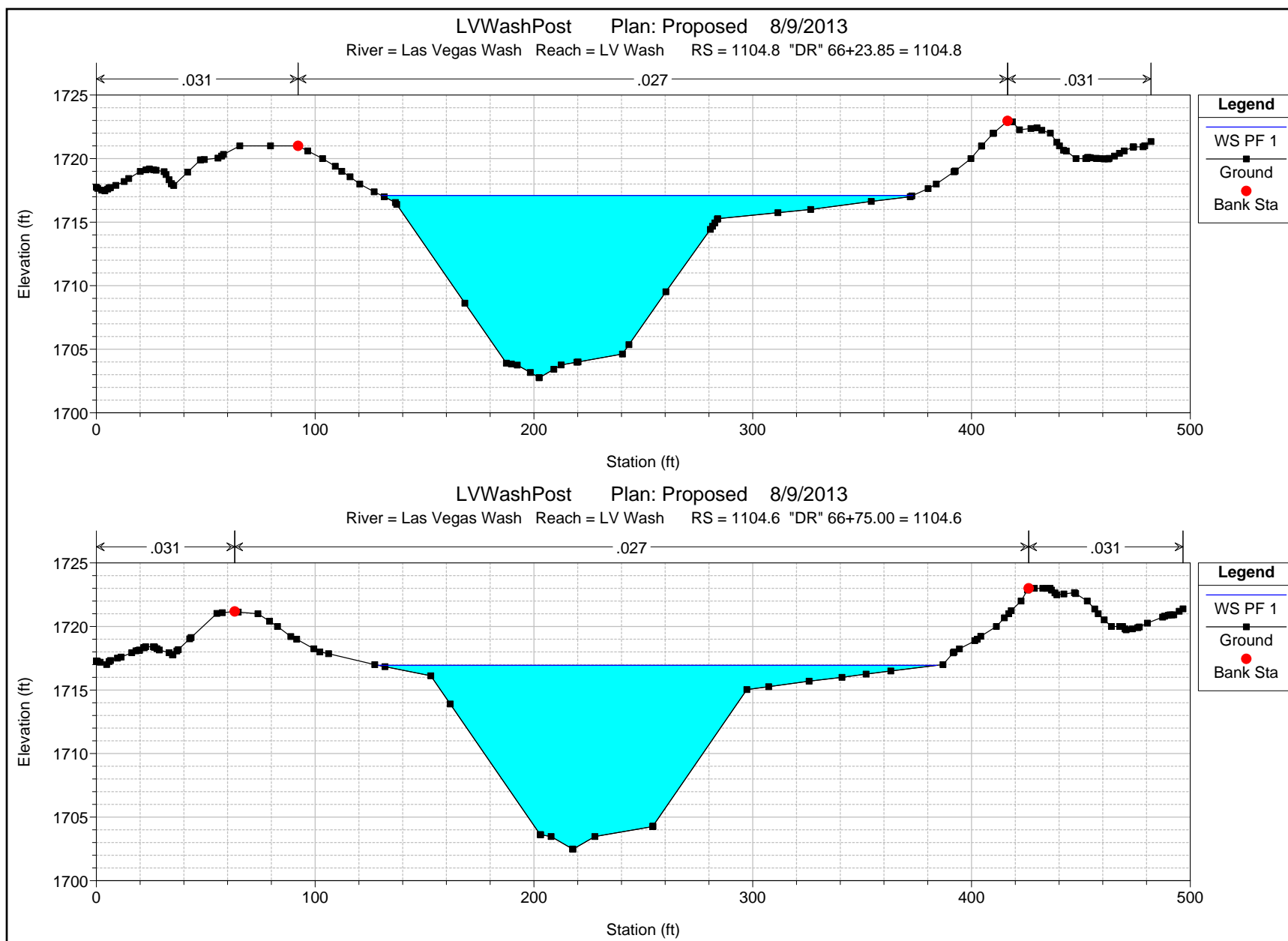


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1105.4 "DR" 65+21.24 = 1105.4

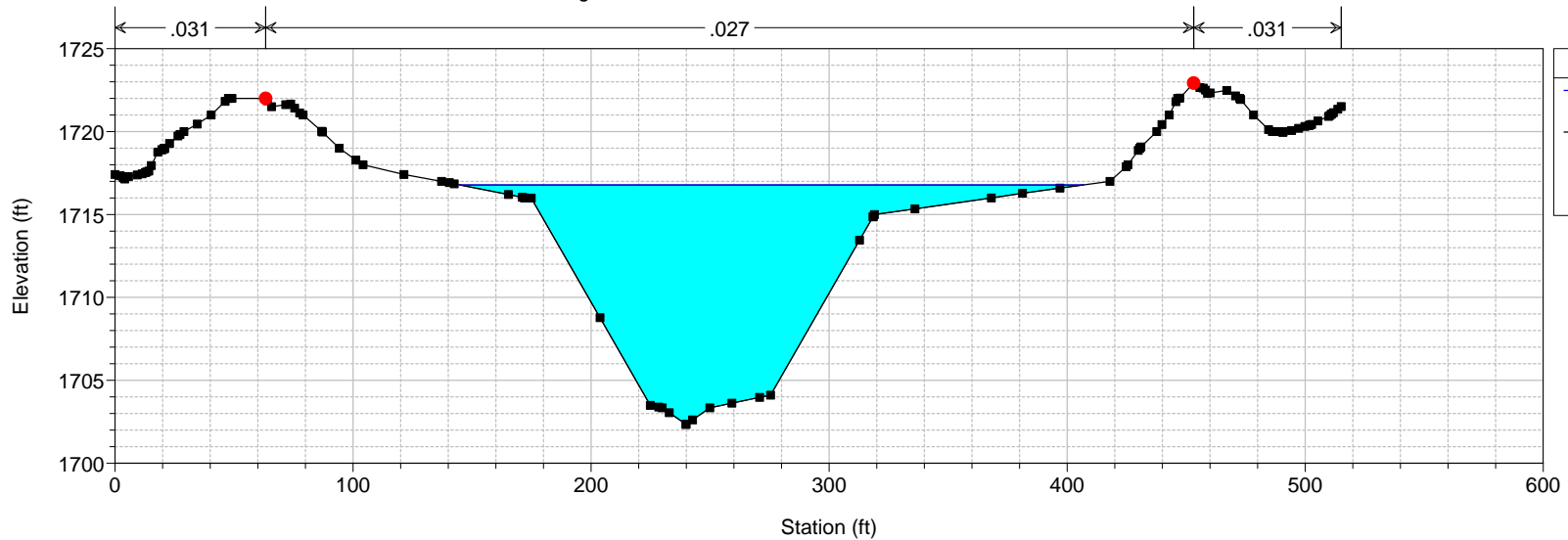


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1105.2 "DR" 65+58.16 = 1105.2

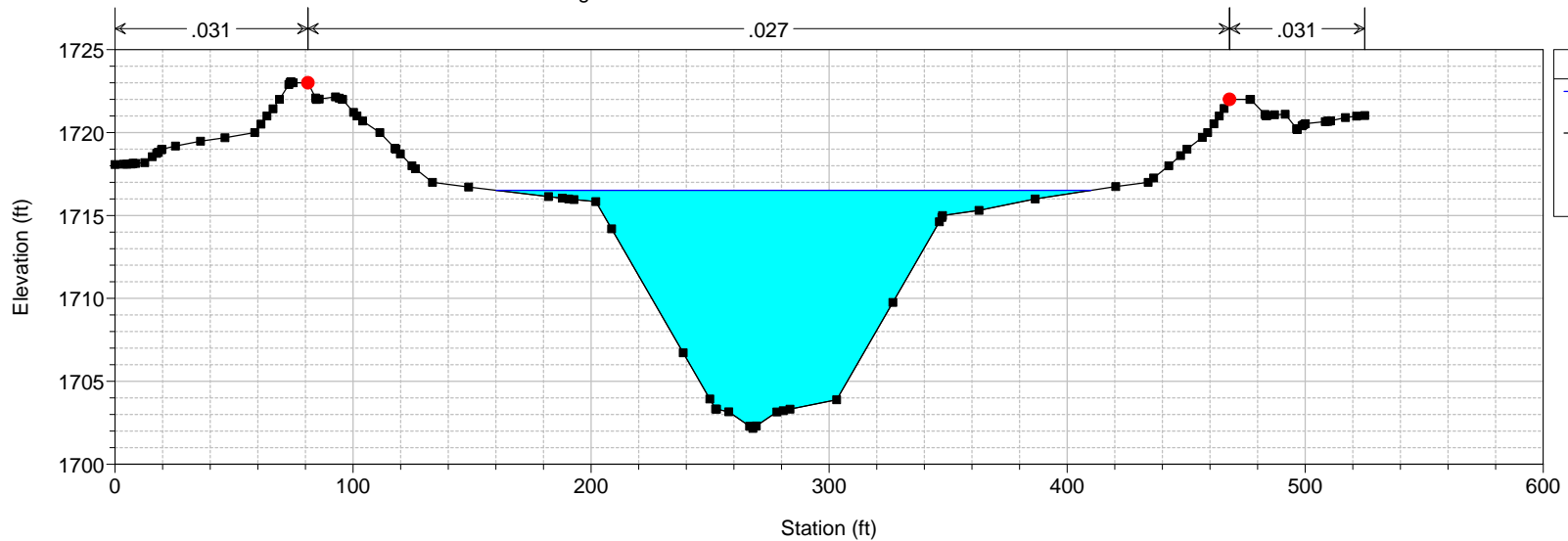




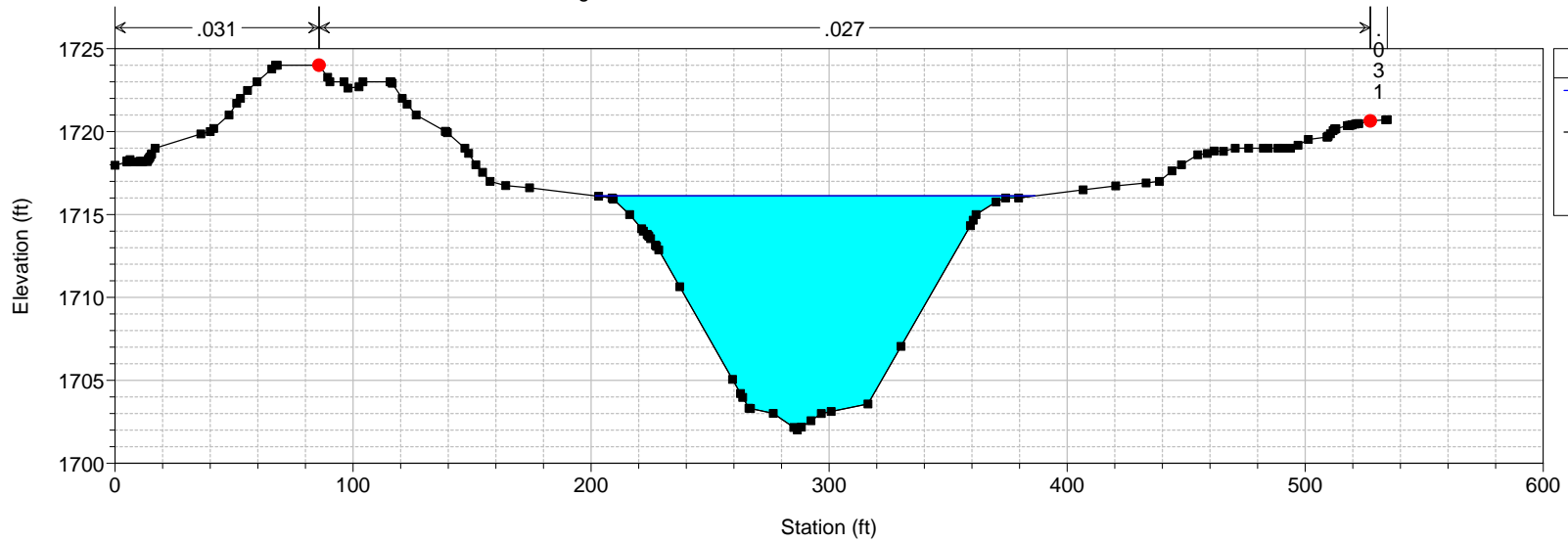
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.4 "DR" 67+17.30 = 1104.4



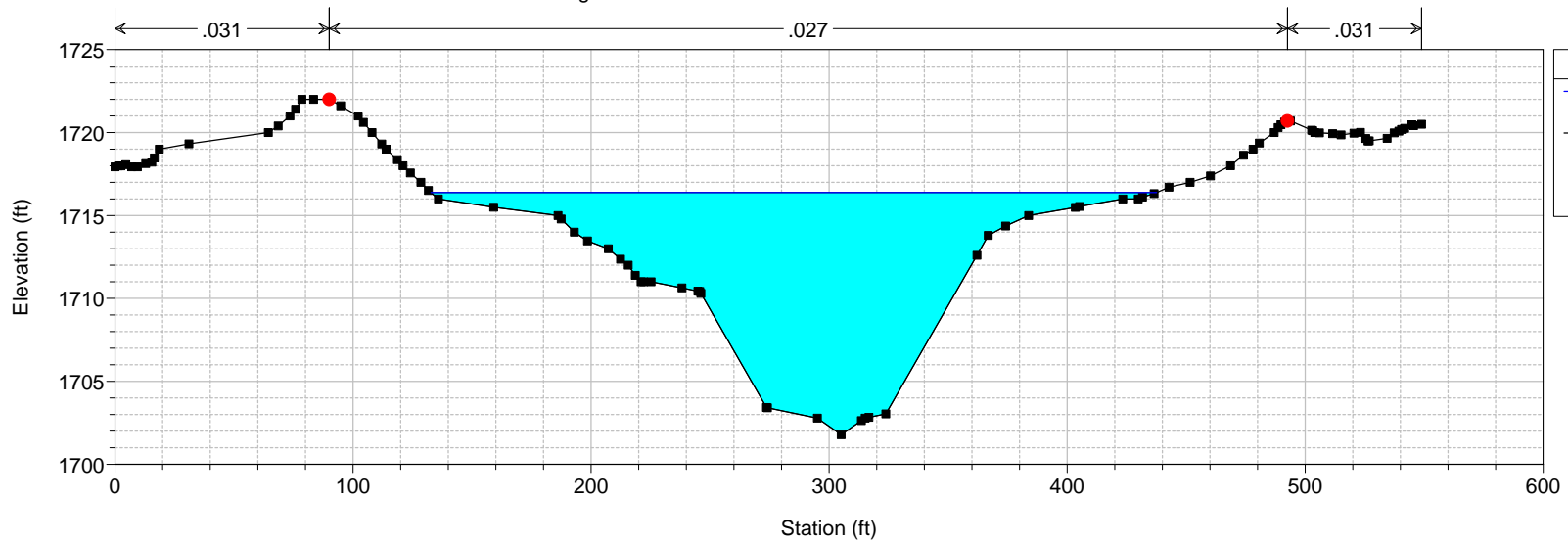
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.2 "DR" 67+78.53 = 1104.2



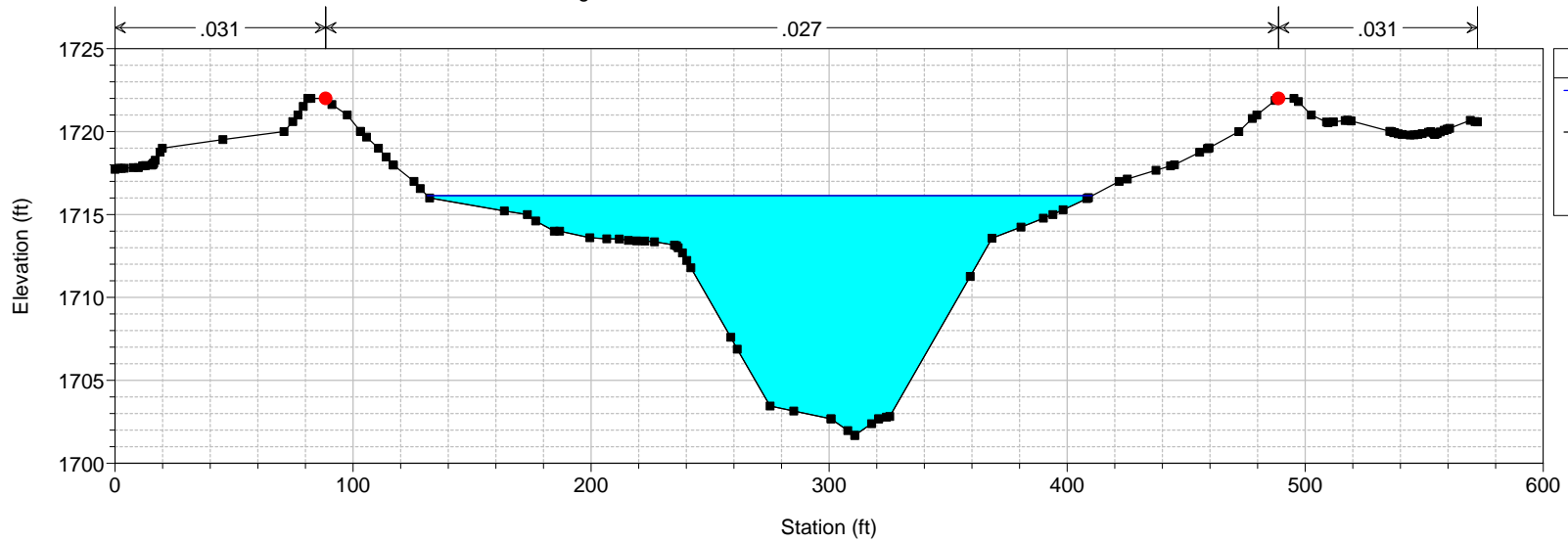
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.1 "DR" 68+29.02 = 1104.1



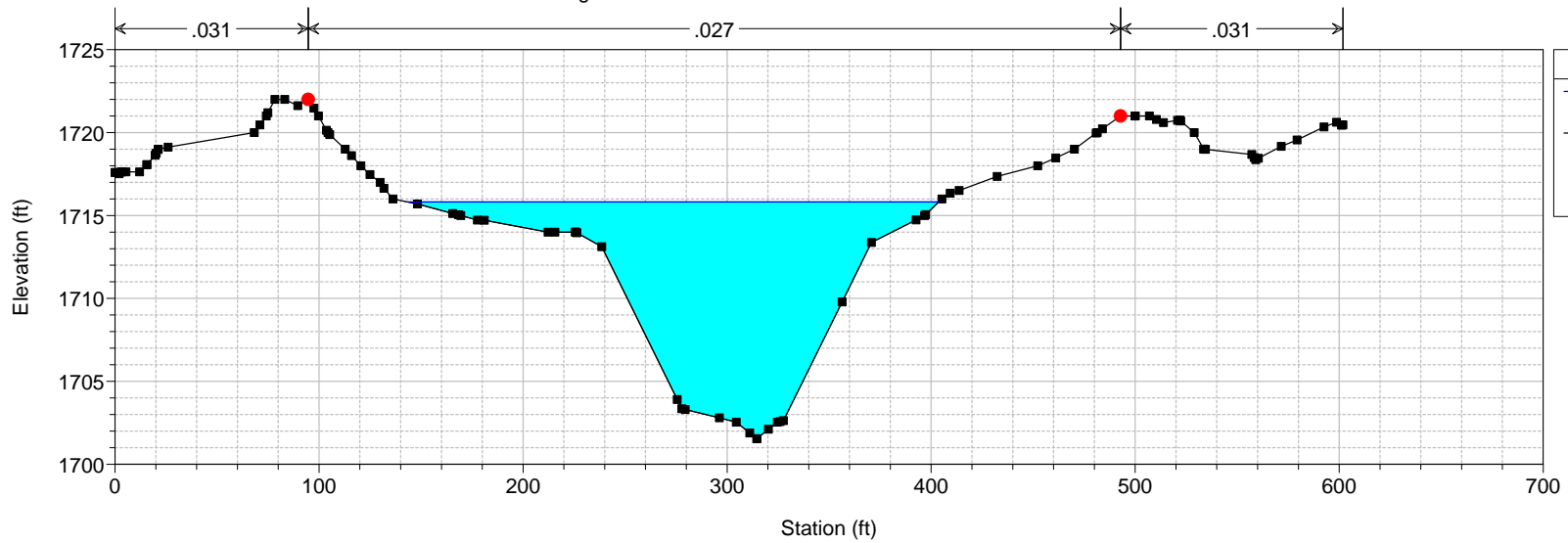
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.8 "DR" 69+03.51 = 1103.8

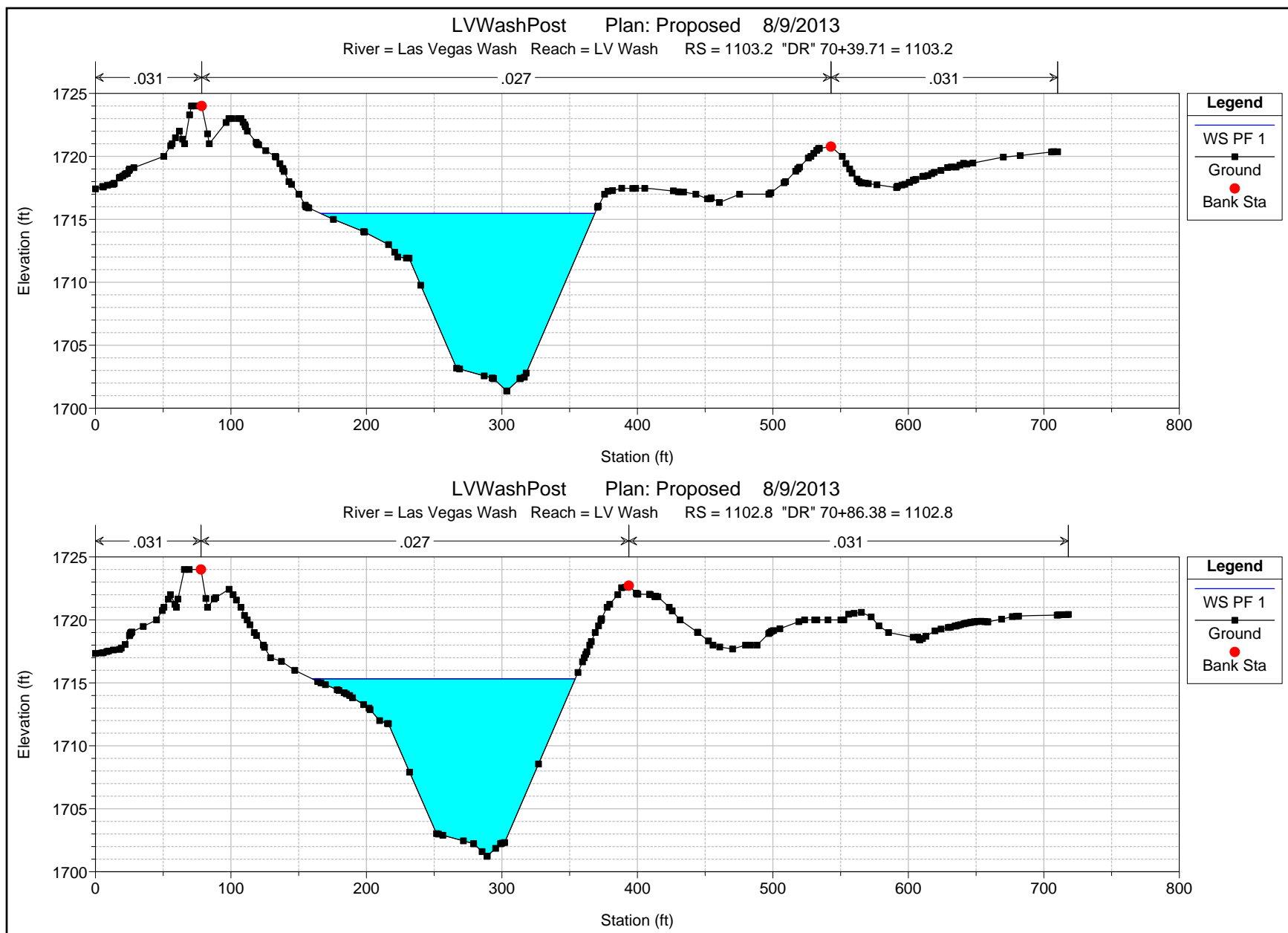


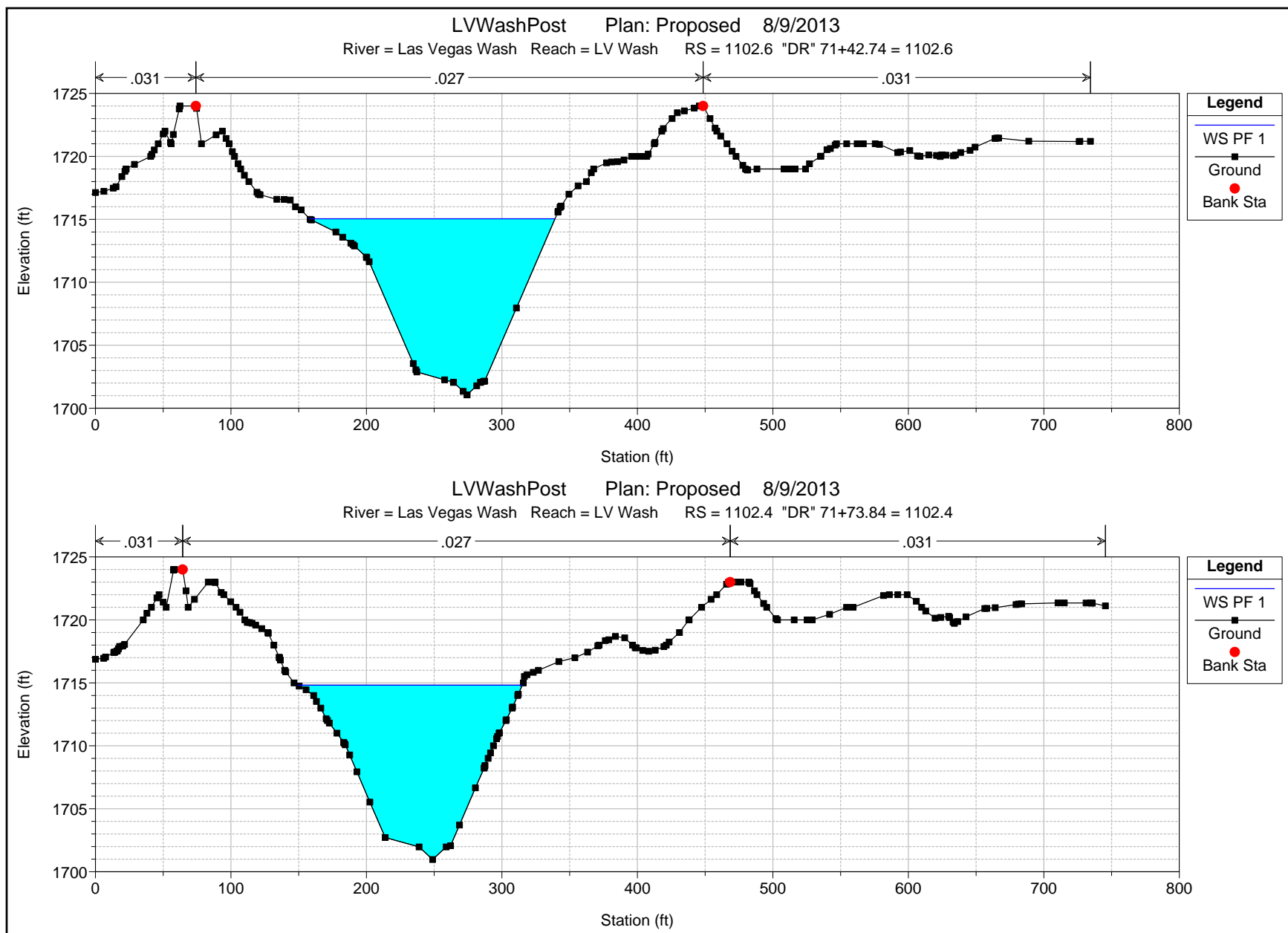
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.6 "DR" 69+37.17 = 1103.6

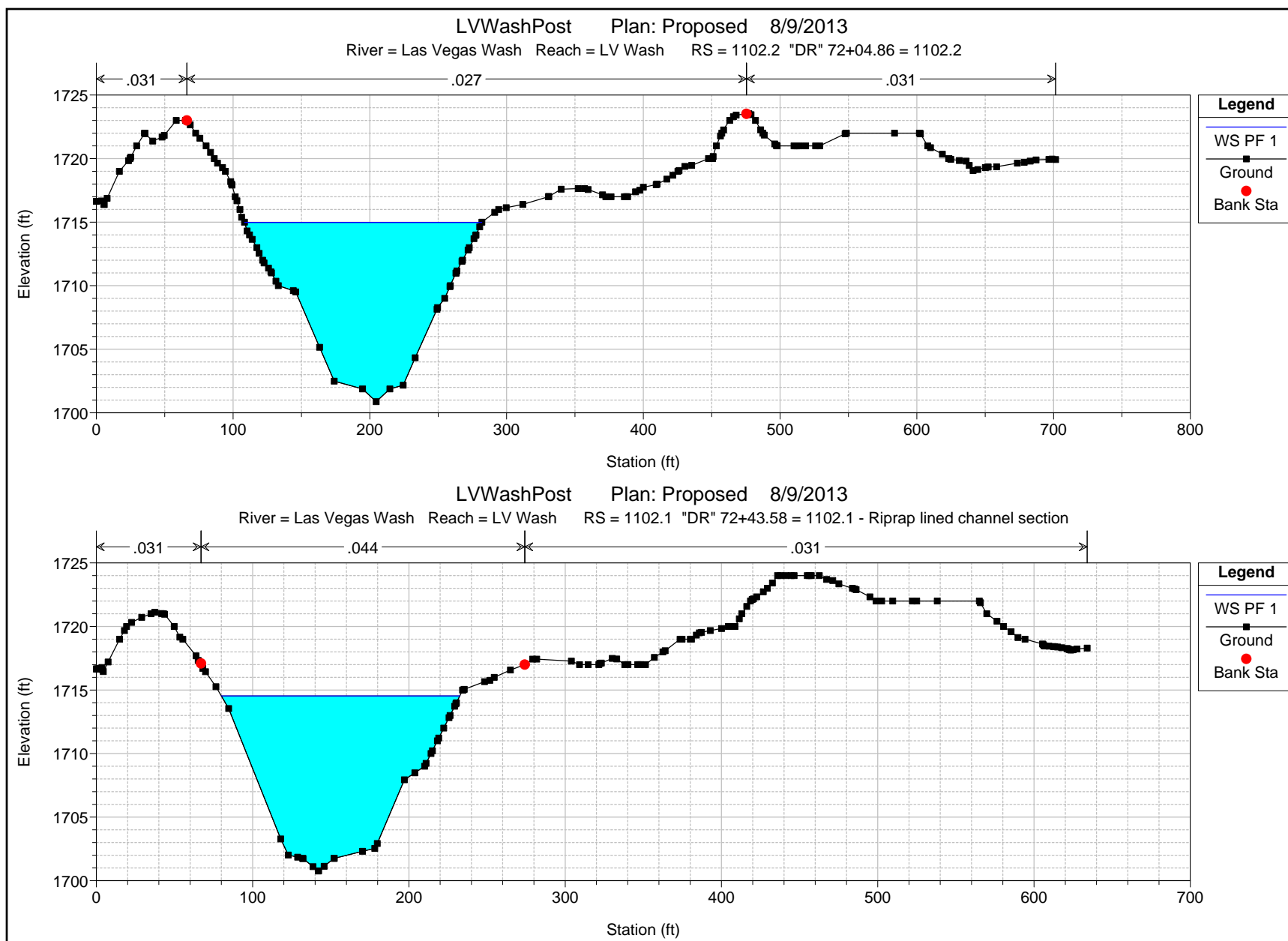


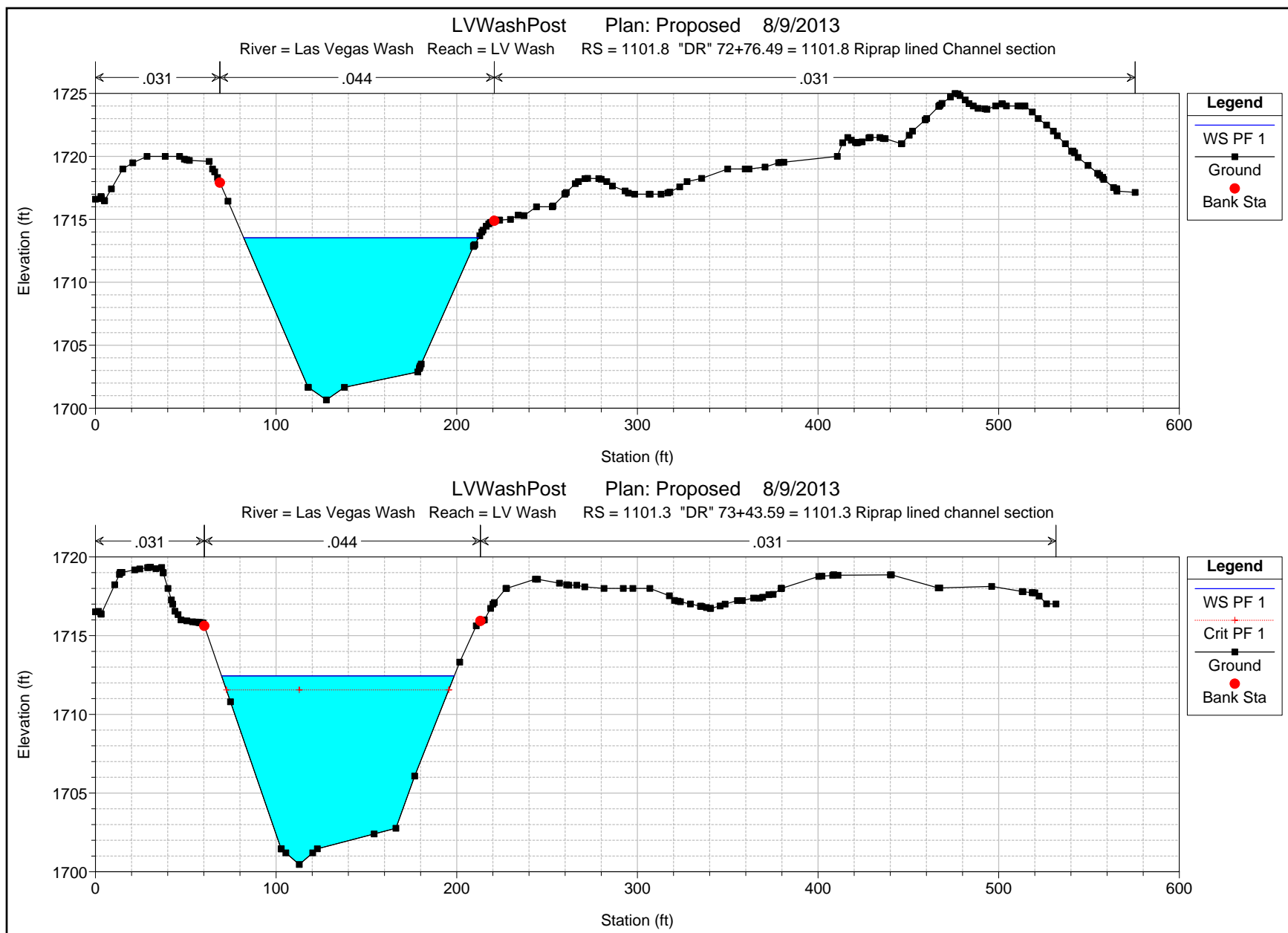
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.4 "DR" 69+83.73 = 1103.4

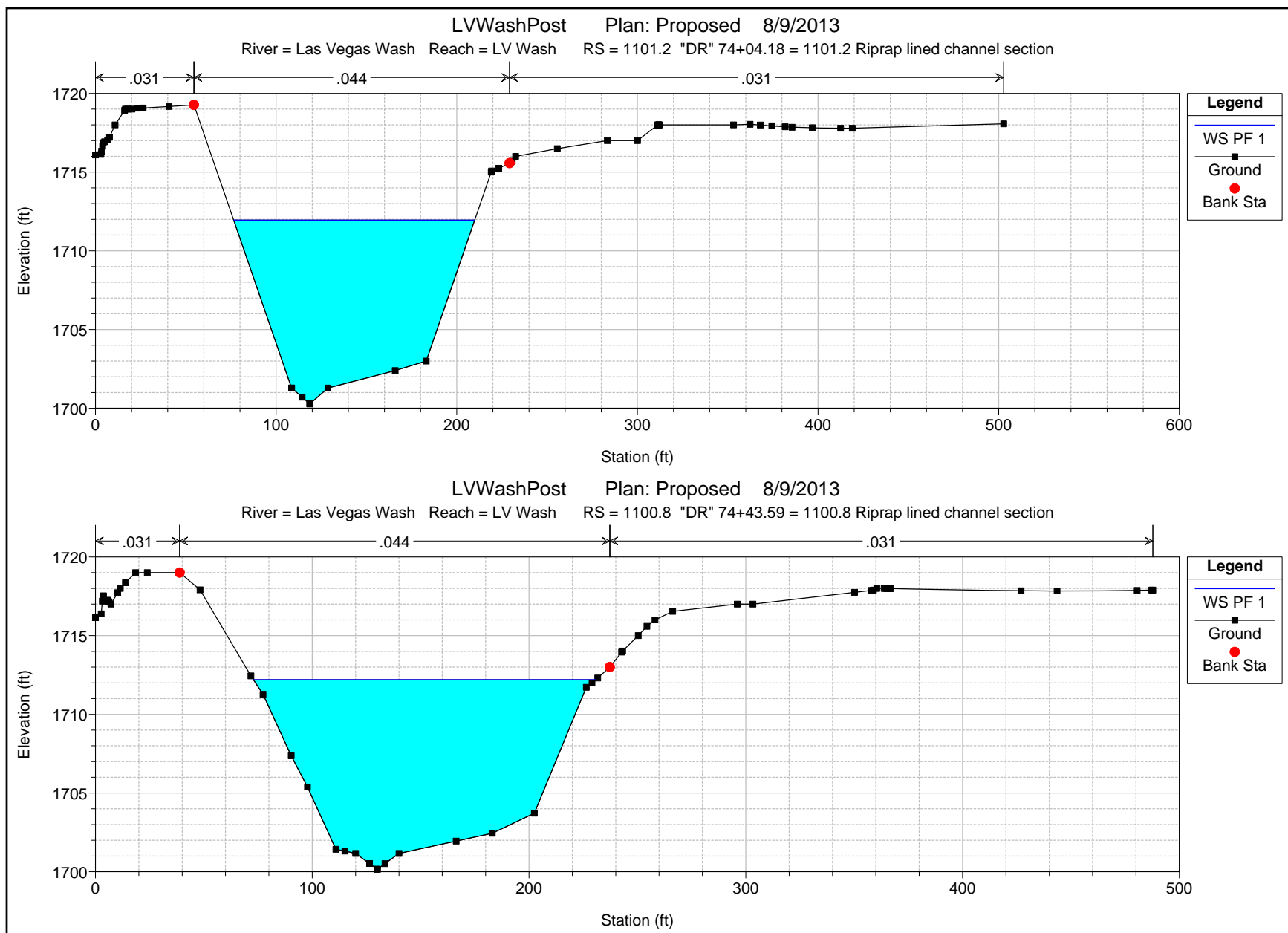




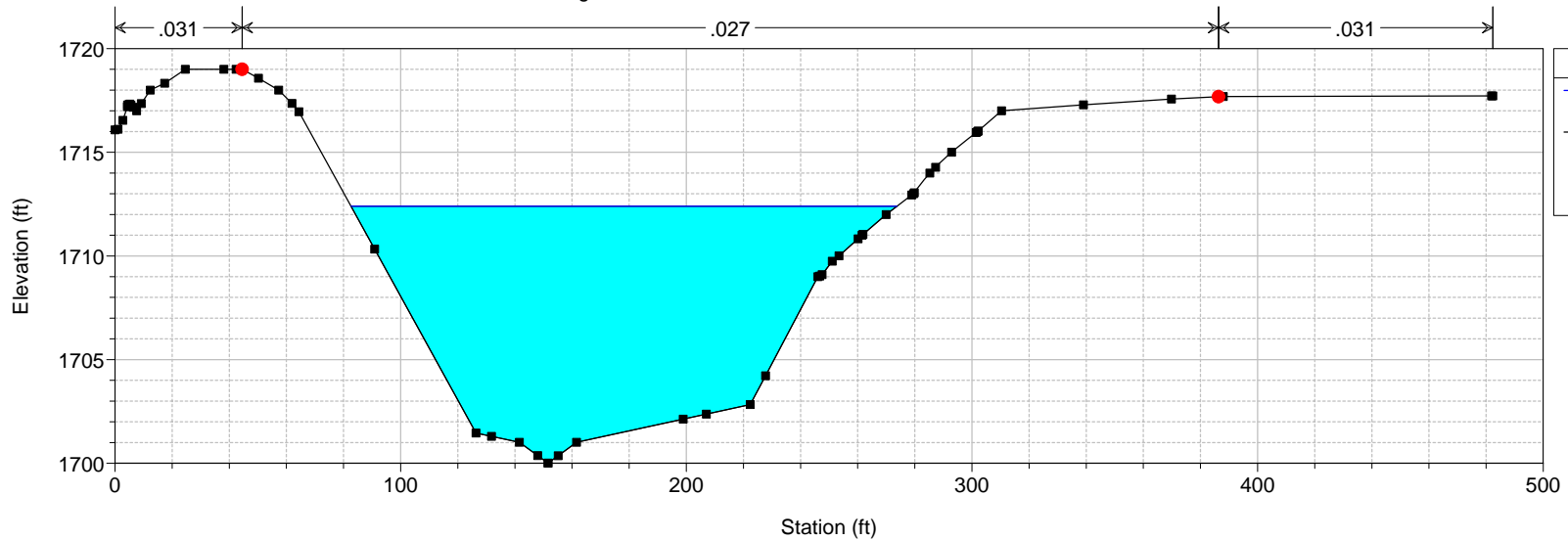




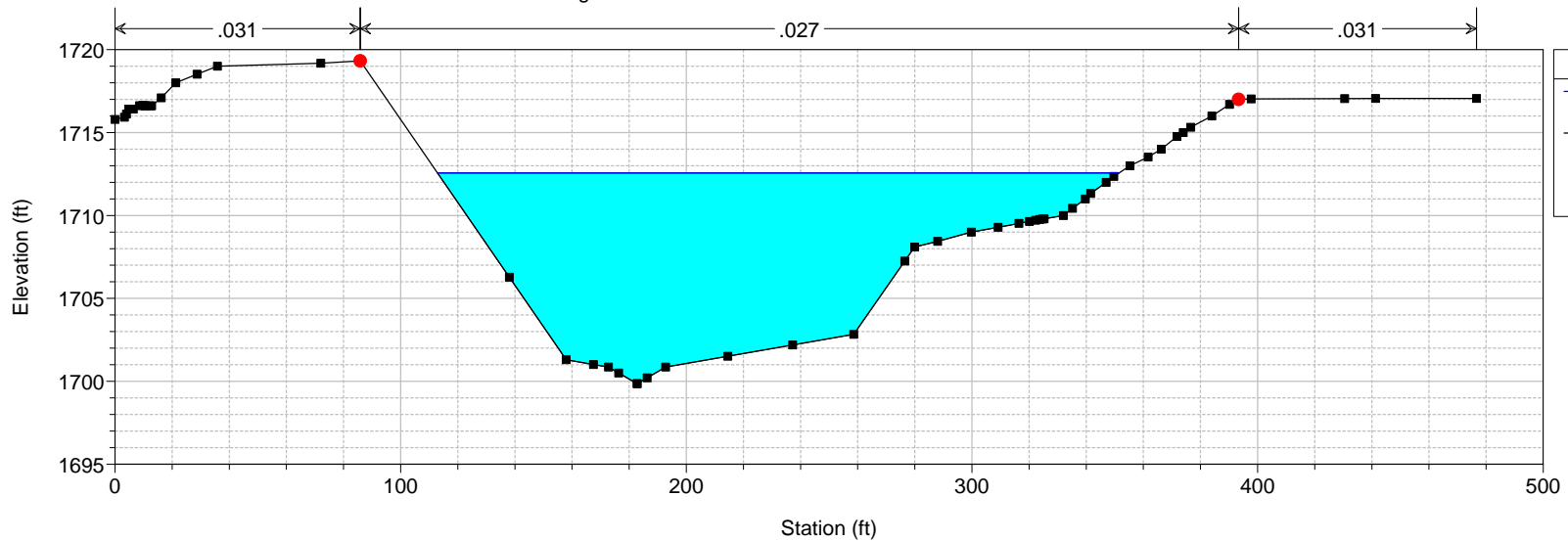




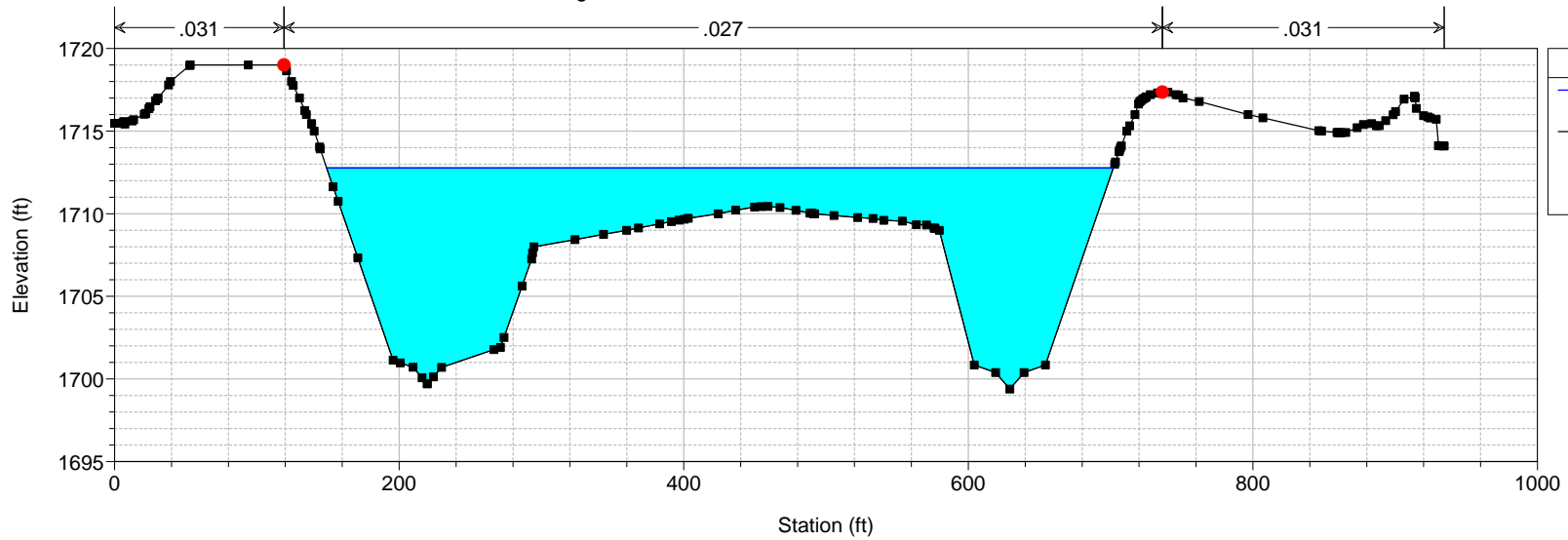
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1100.6 "DR" 74+93.59 = 1100.6



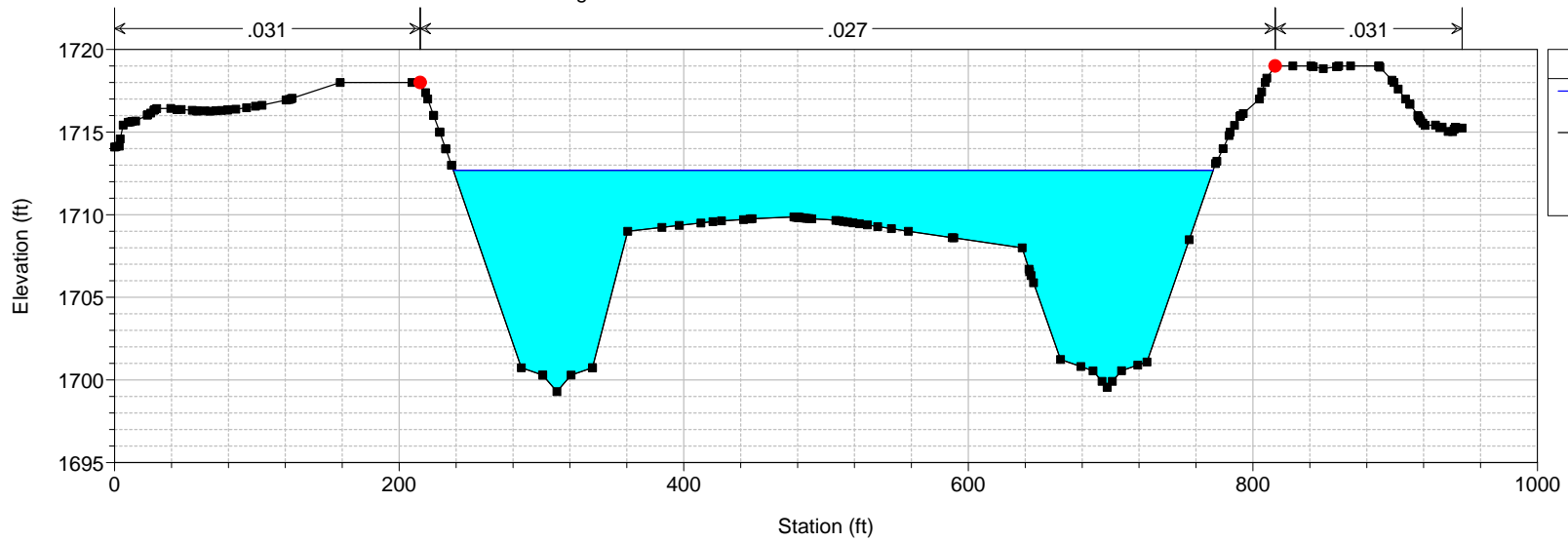
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1100.4 "DR" 75+43.59 = 1100.4



LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1100.2 "DR" 75+93.59 = 1100.2

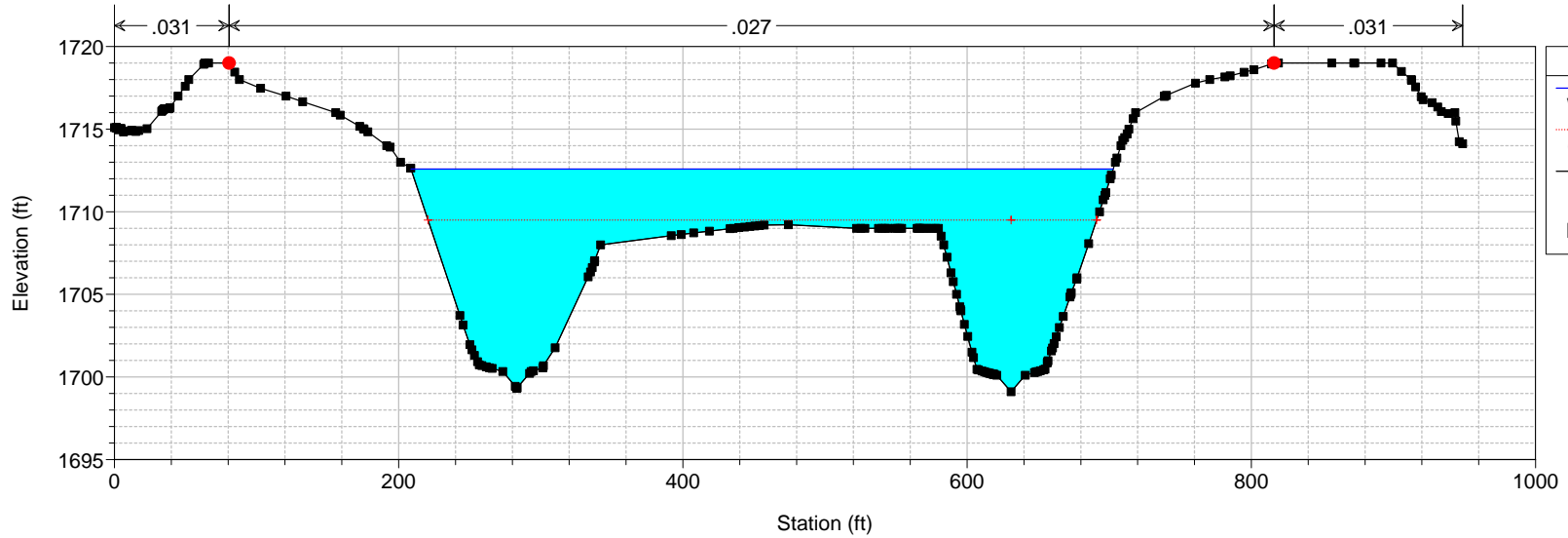


LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1099.8 "DR" 76+43.59 = 1099.8



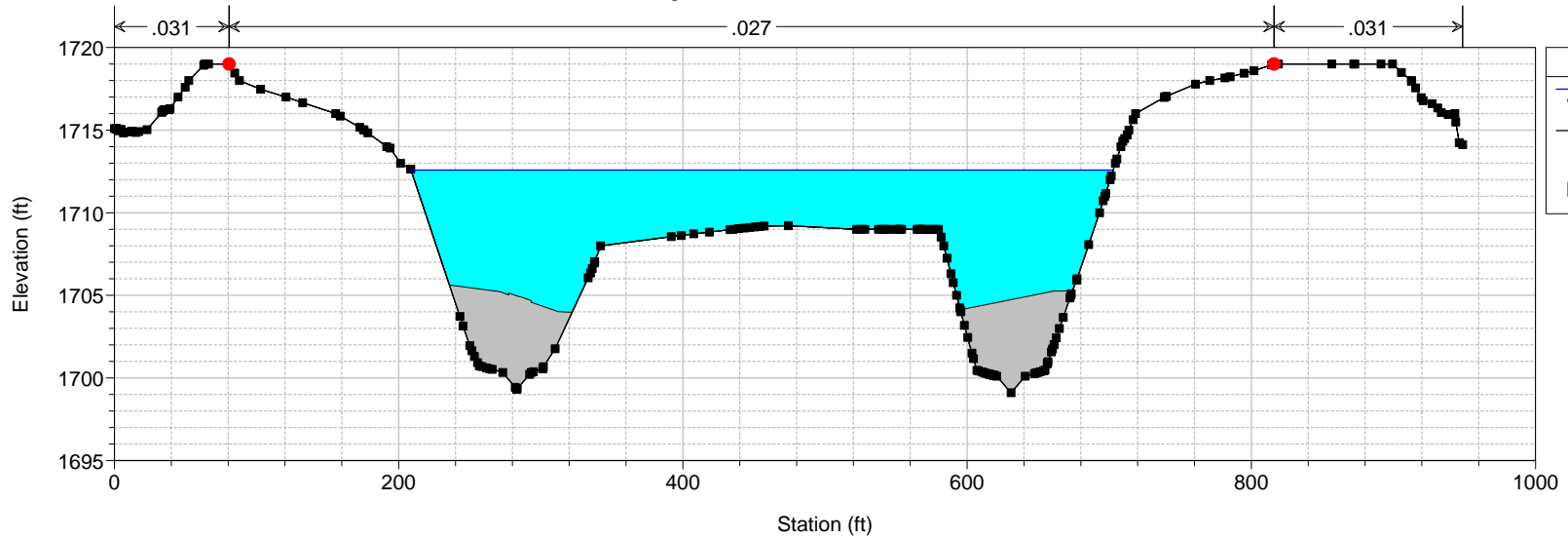
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1099.4 "DR" 77+18.89 = 1099.4 - Inline weir Pipe crossings #3 & #4

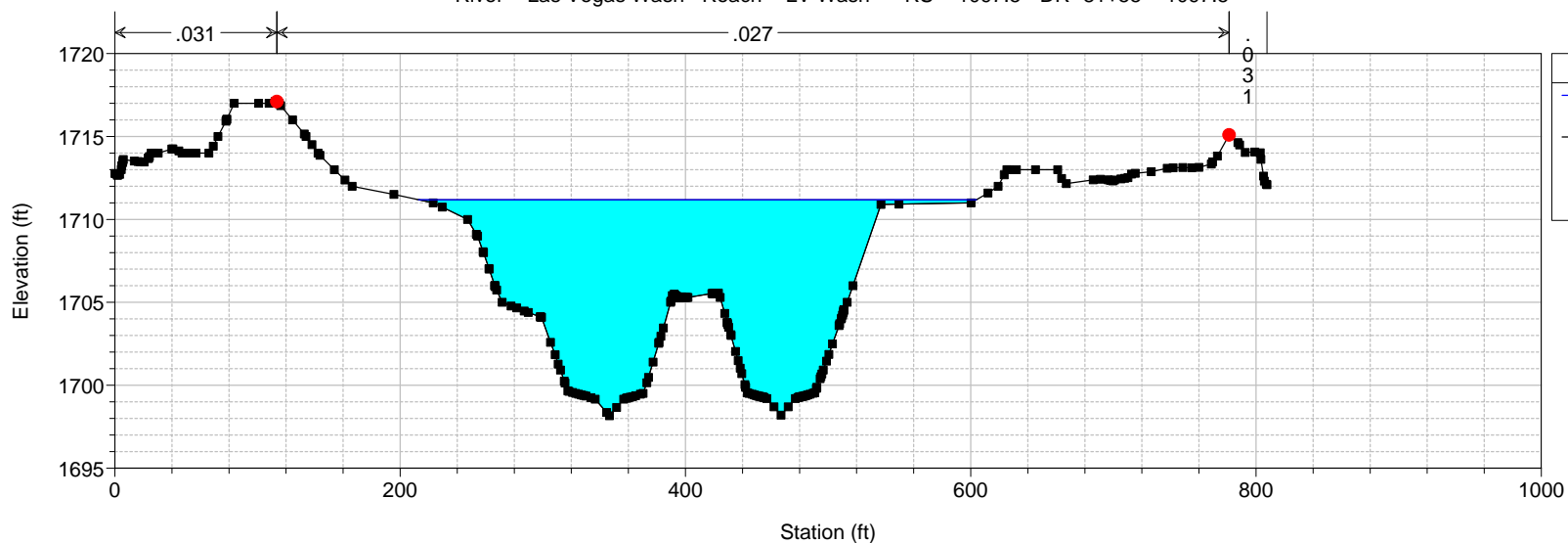


LVWashPost Plan: Proposed 8/9/2013

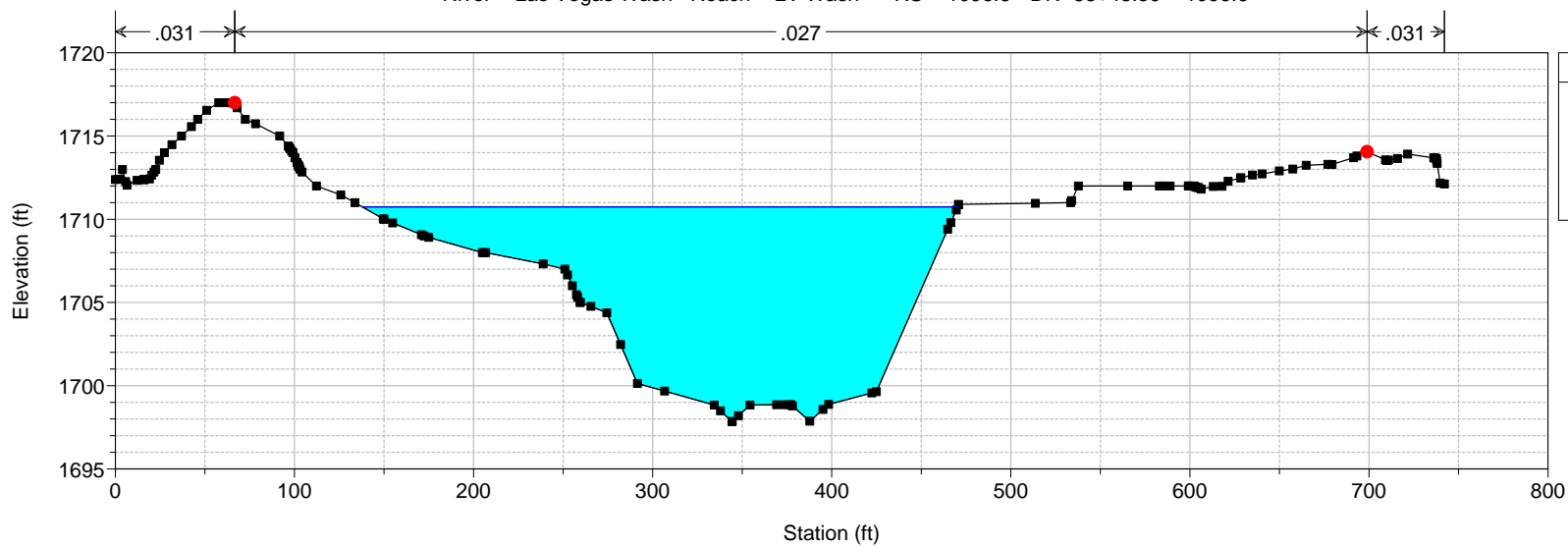
River = Las Vegas Wash Reach = LV Wash RS = 1099.3 IS



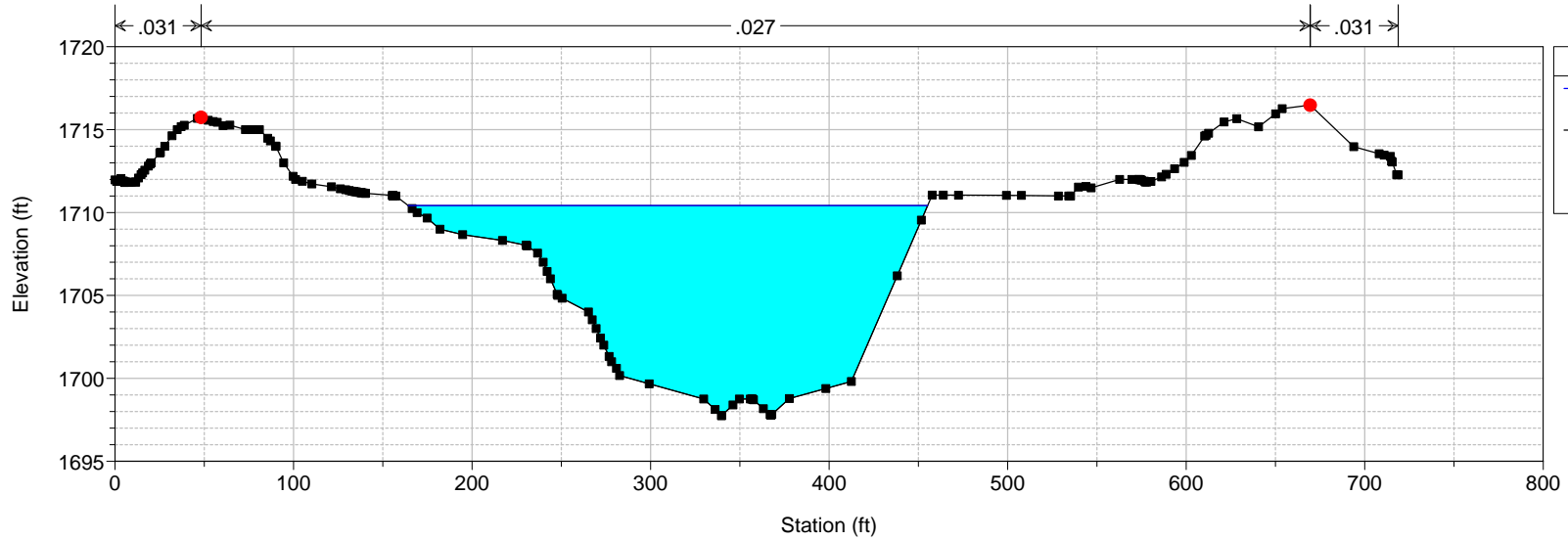
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1097.5 "DR" 81+55 = 1097.5



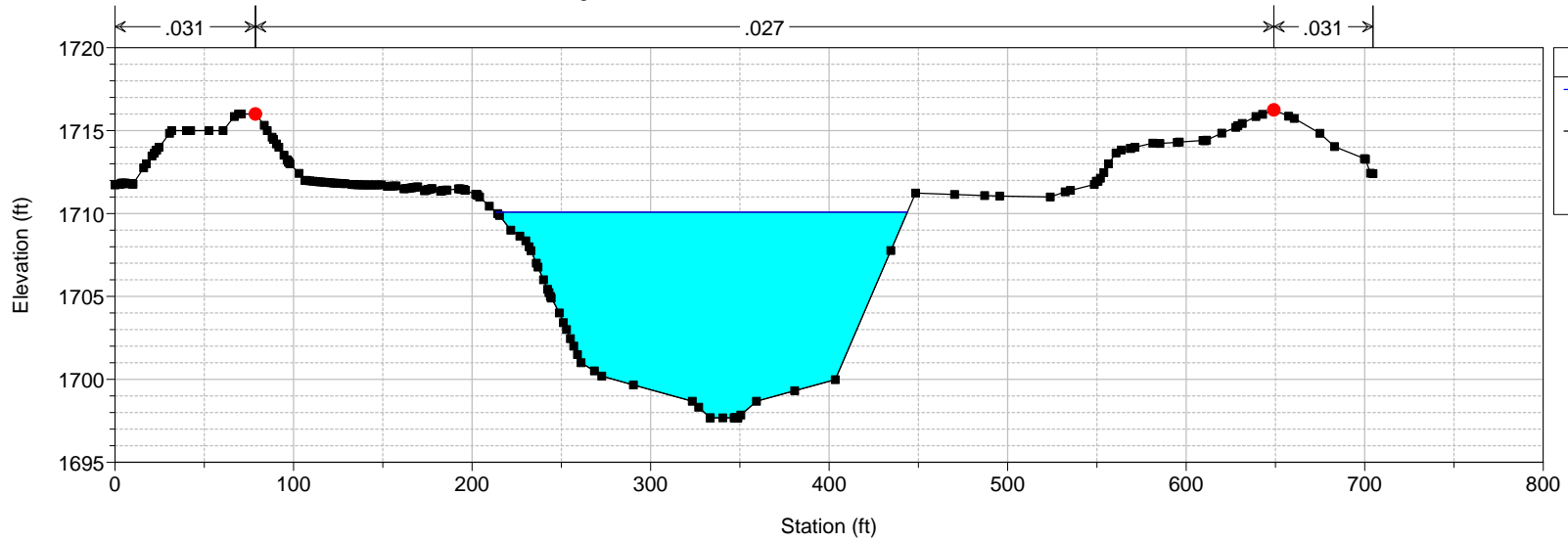
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.6 "DR" 83+43.59 = 1096.6



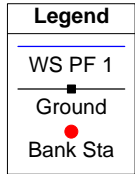
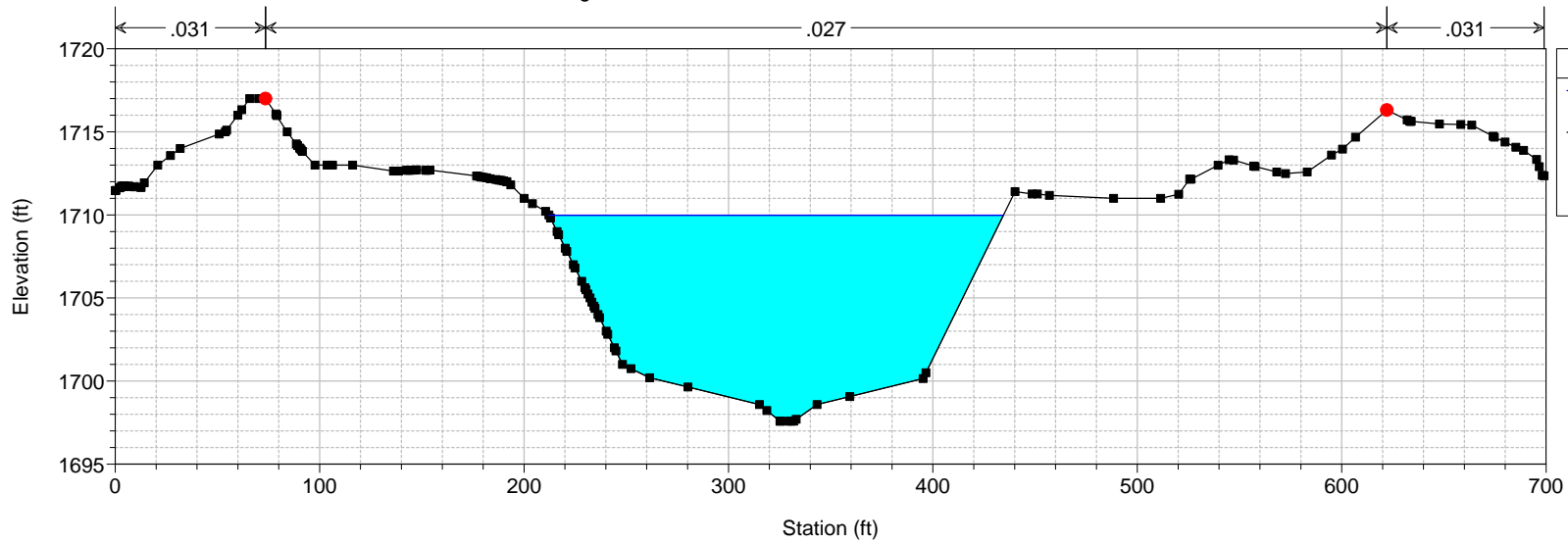
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.4 "DR" 83+93.59 = 1096.4



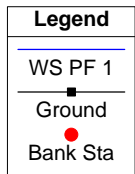
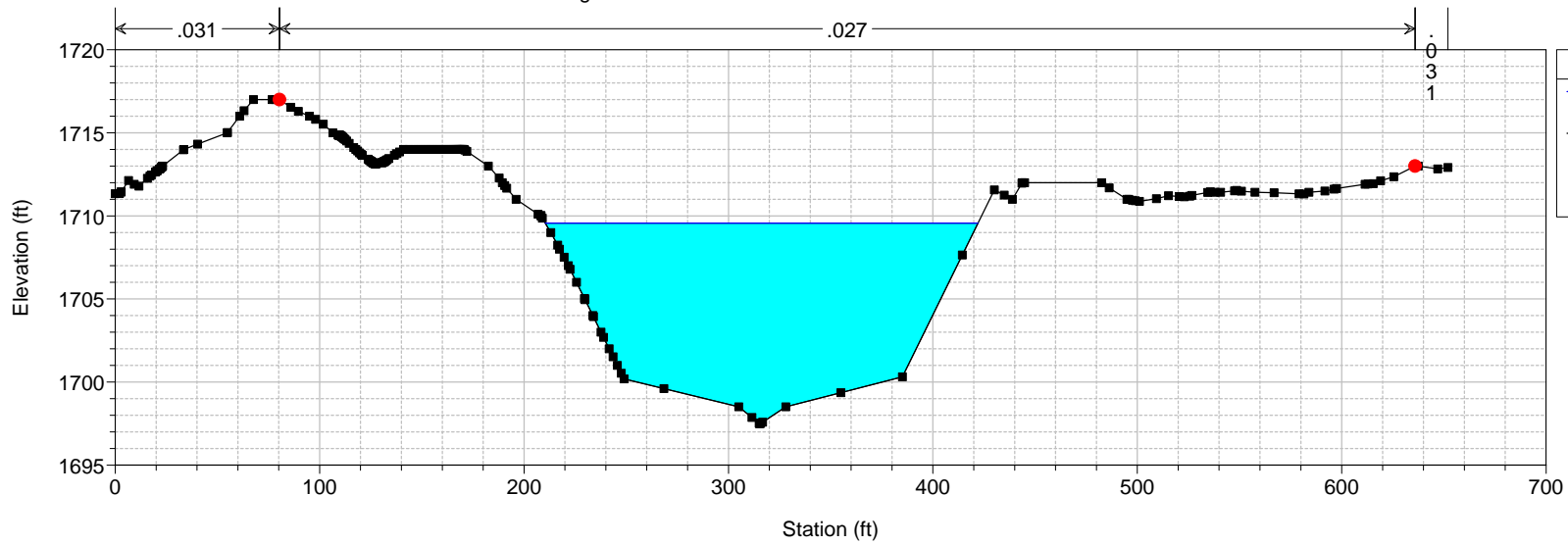
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.2 "DR" 84+43.59 = 1096.2



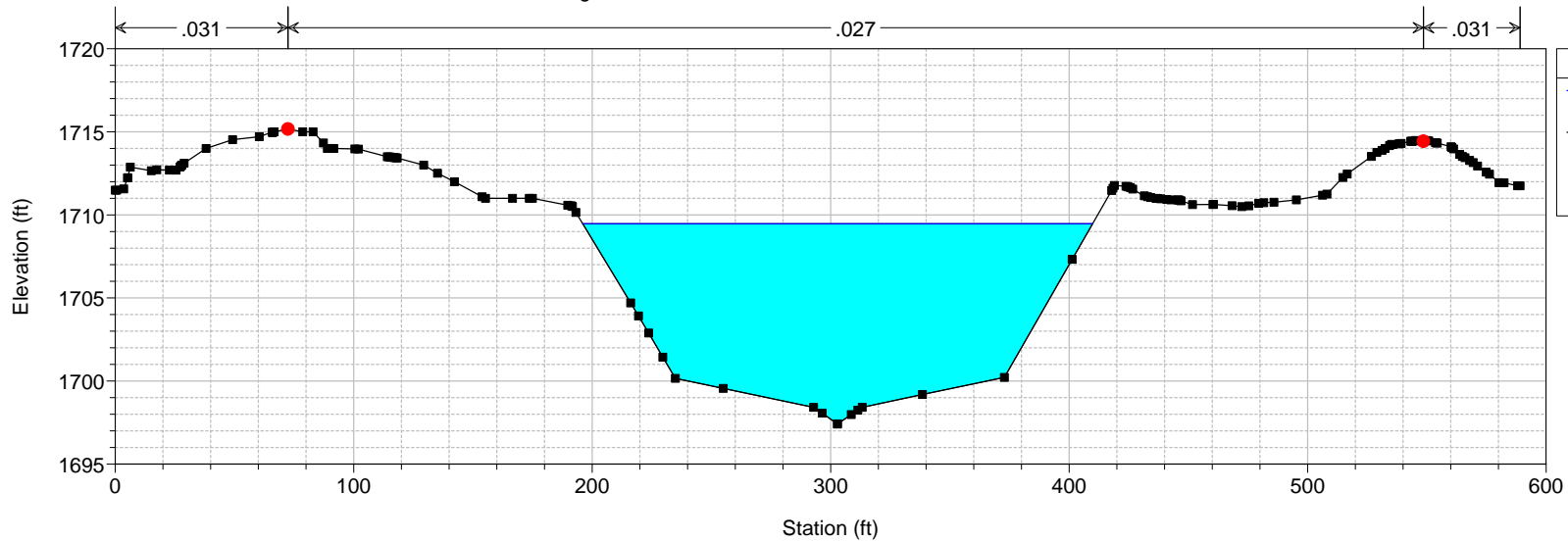
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.8 "DR" 84+93.59 = 1095.8



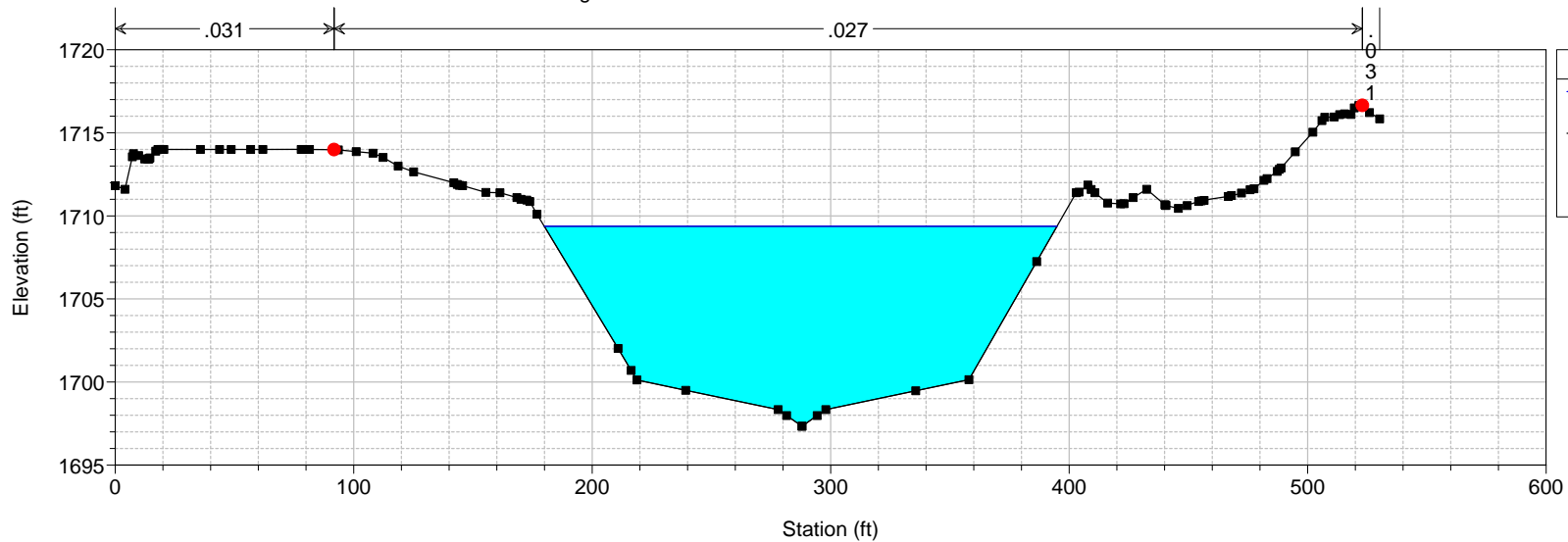
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.6 "DR" 85+43.59 = 1095.6



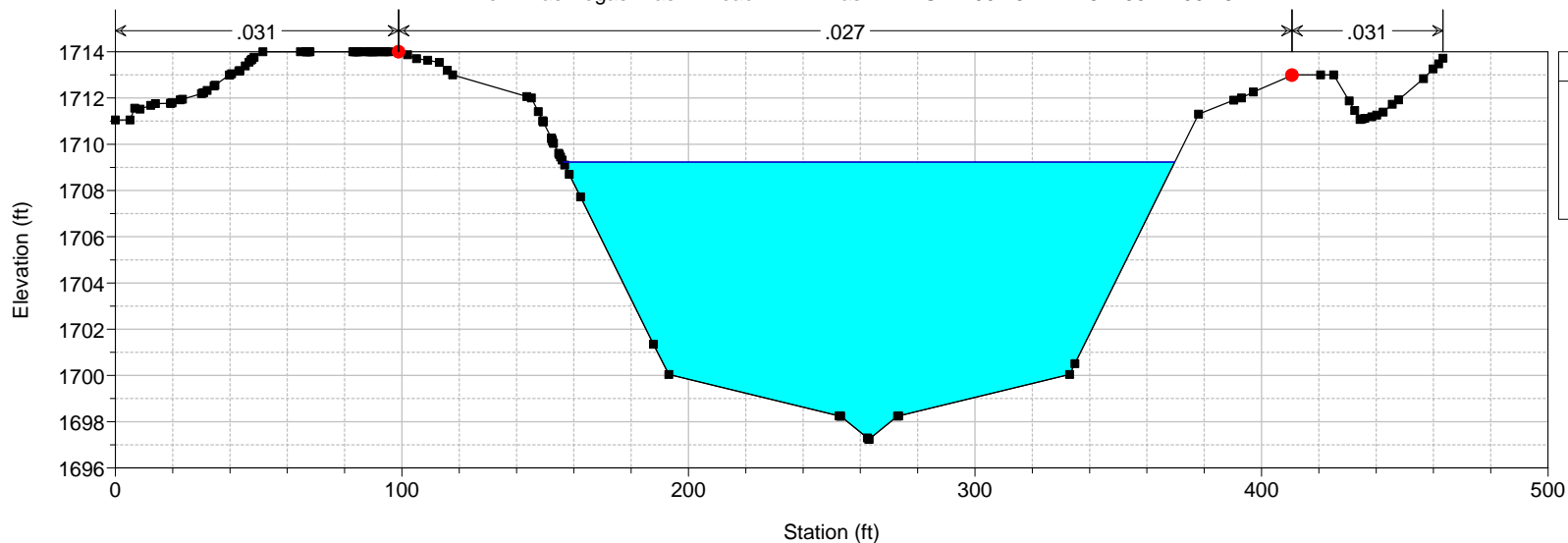
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.4 "DR" 85+93.59 = 1095.4



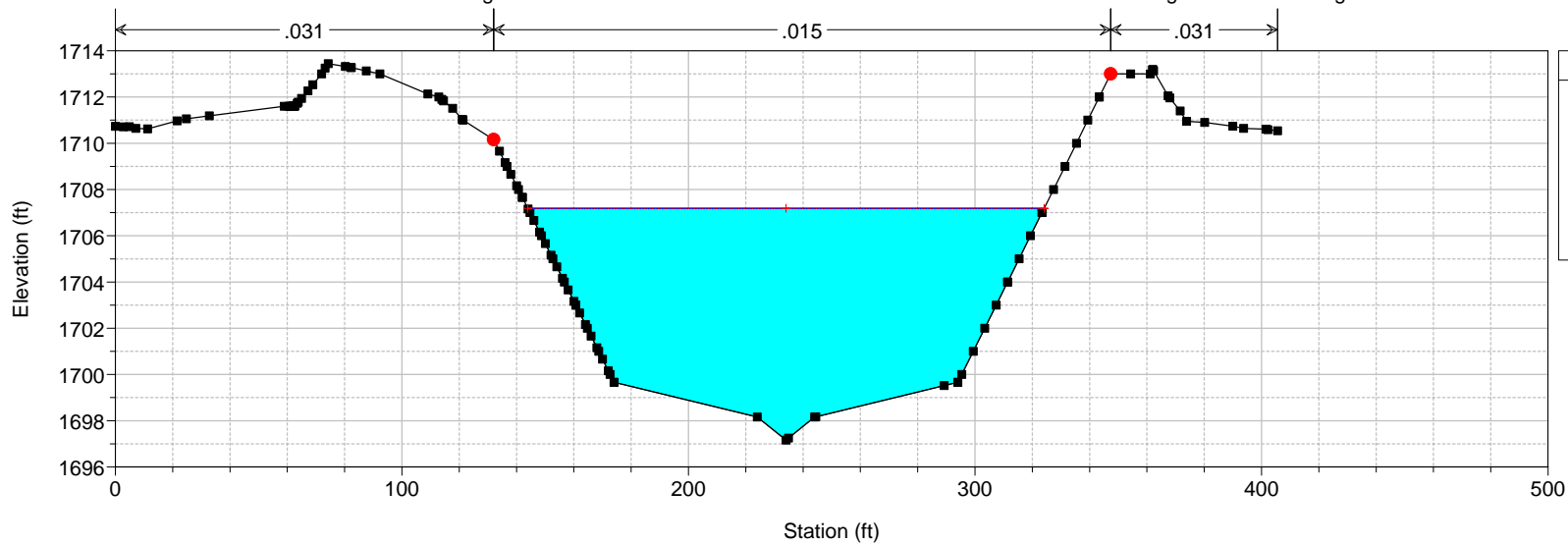
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.2 "DR" 86+43.59 = 1095.2

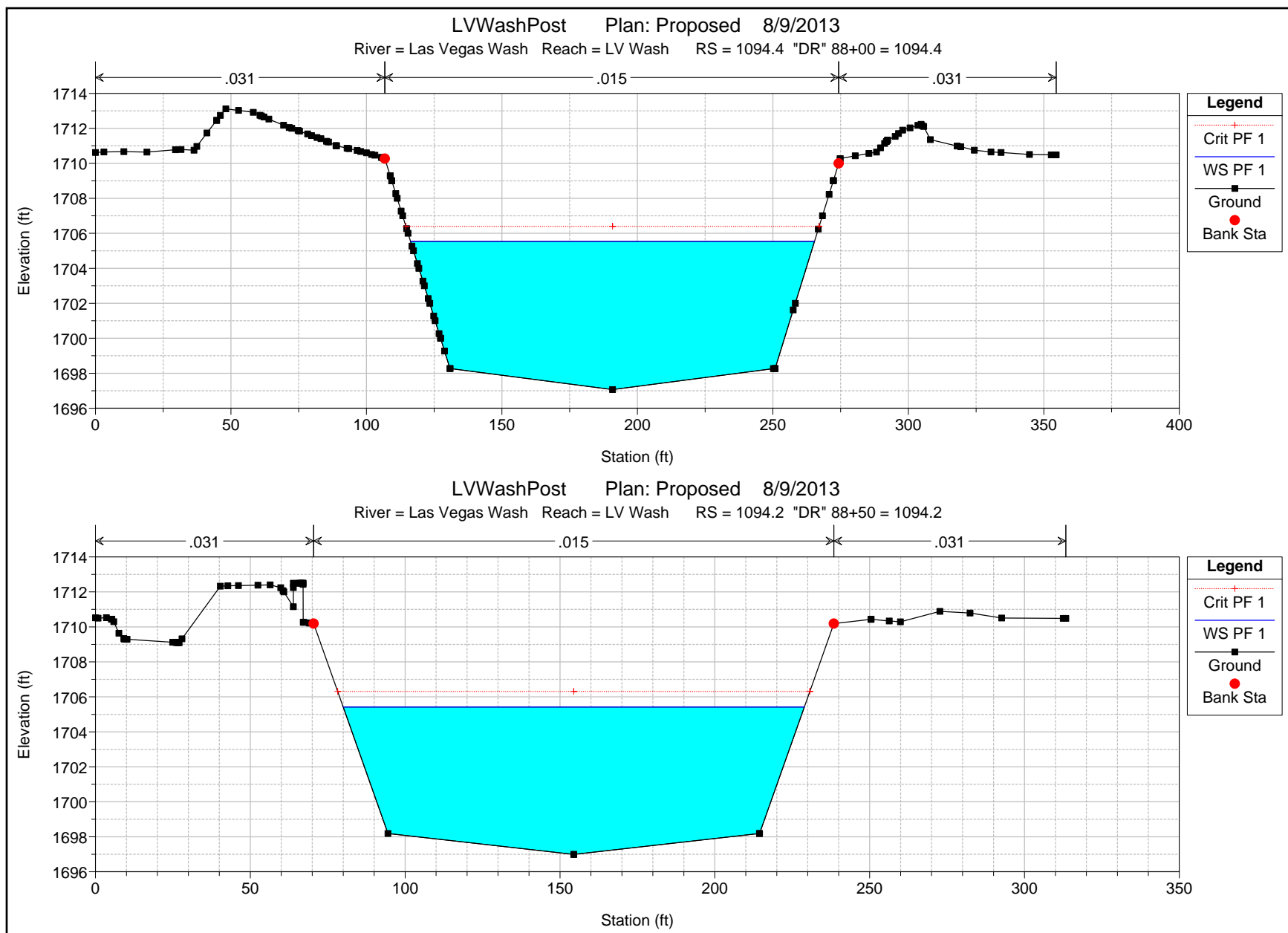


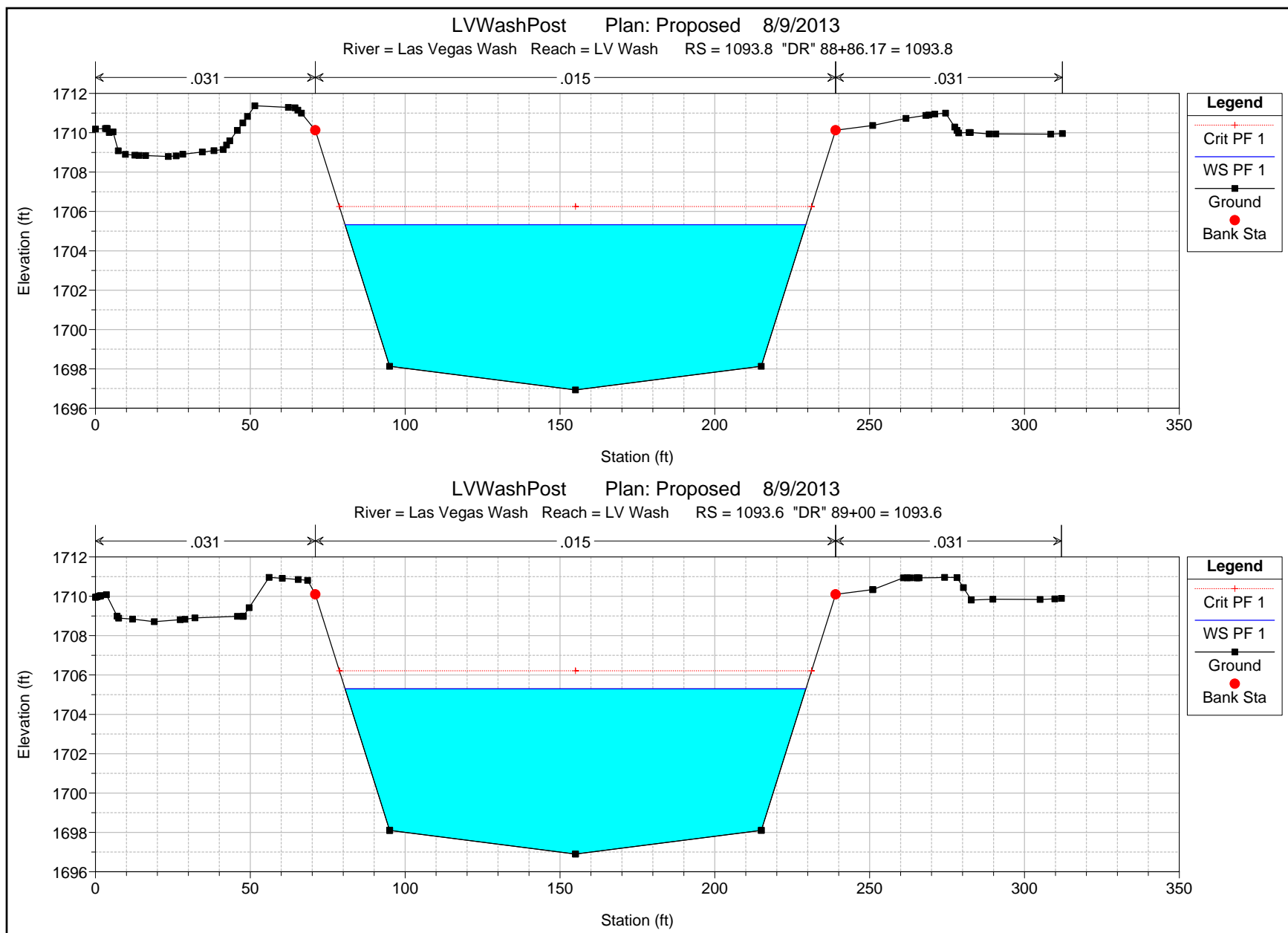
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1094.8 "DR" 87+00 = 1094.8



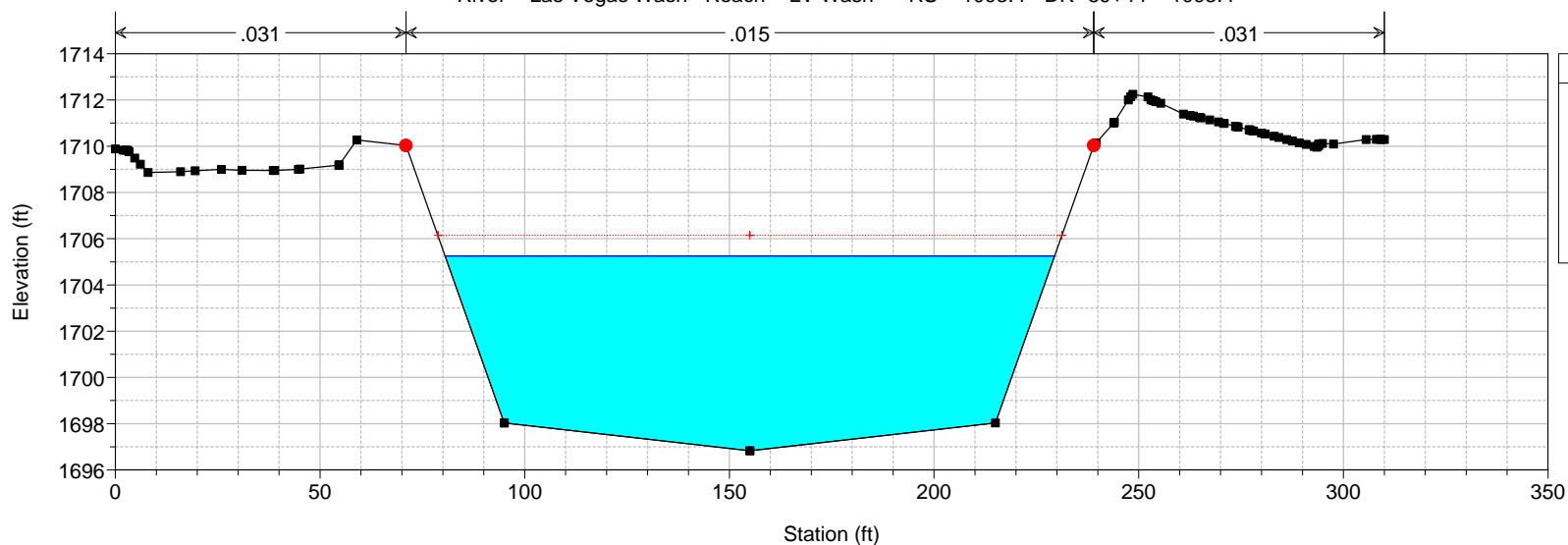
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1094.6 "DR" 87+50 = 1094.6 - Begin Concrete Lining



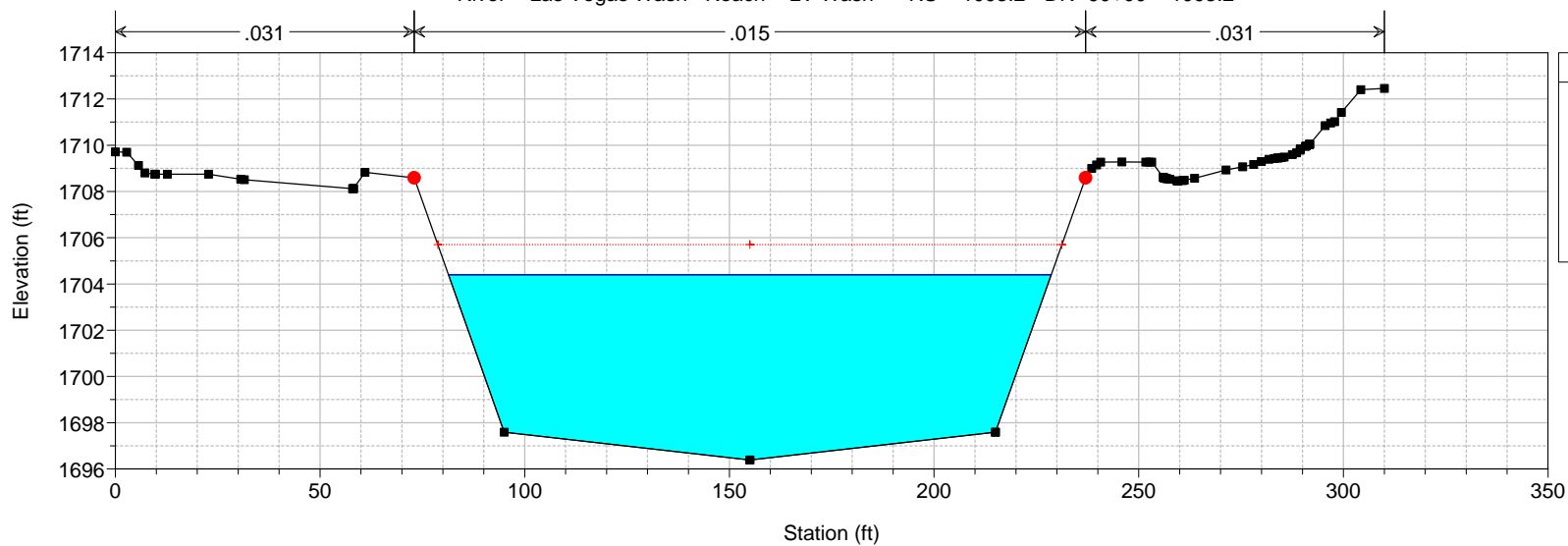


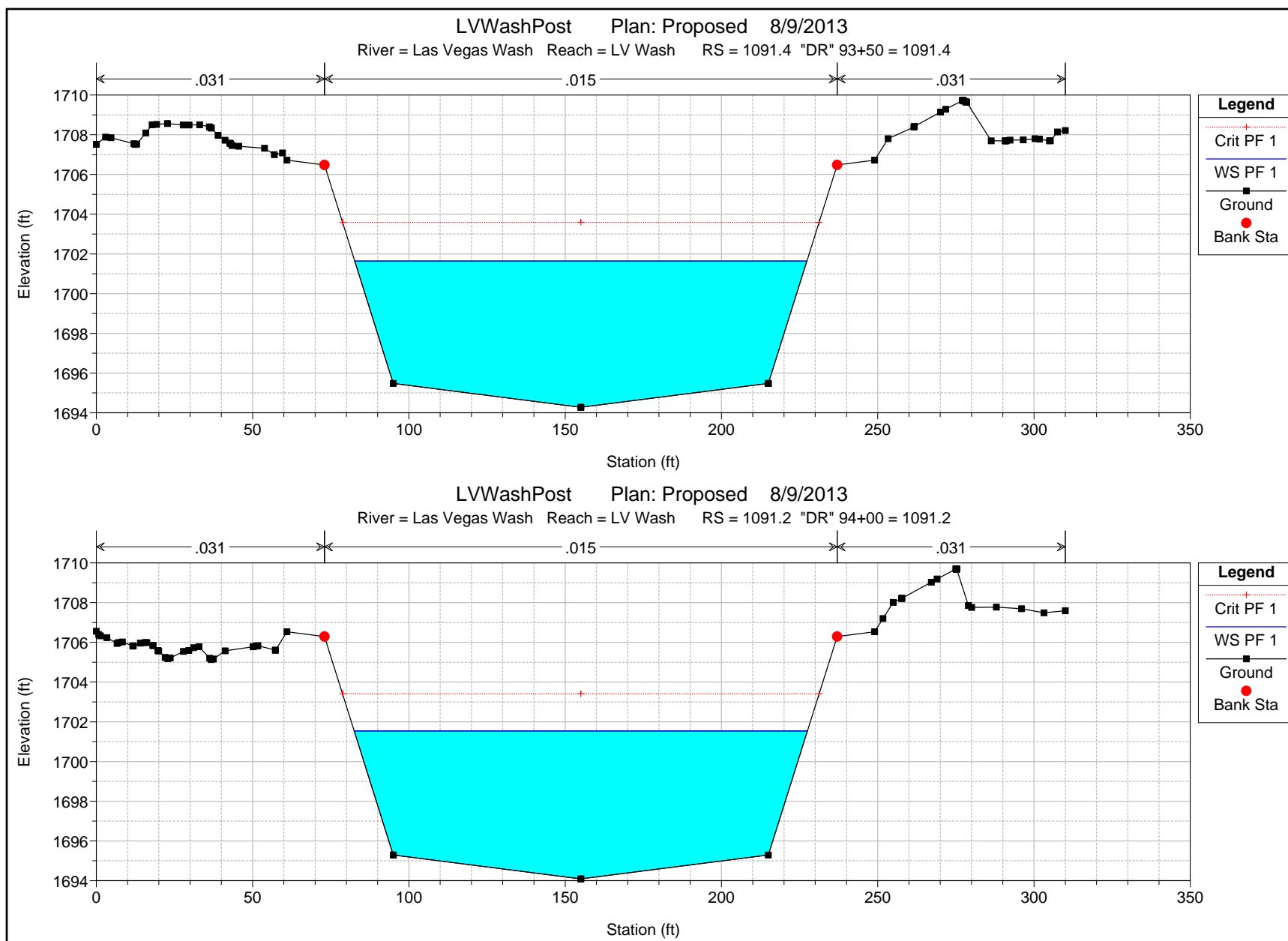


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1093.4 "DR" 89+44 = 1093.4

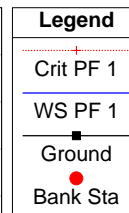
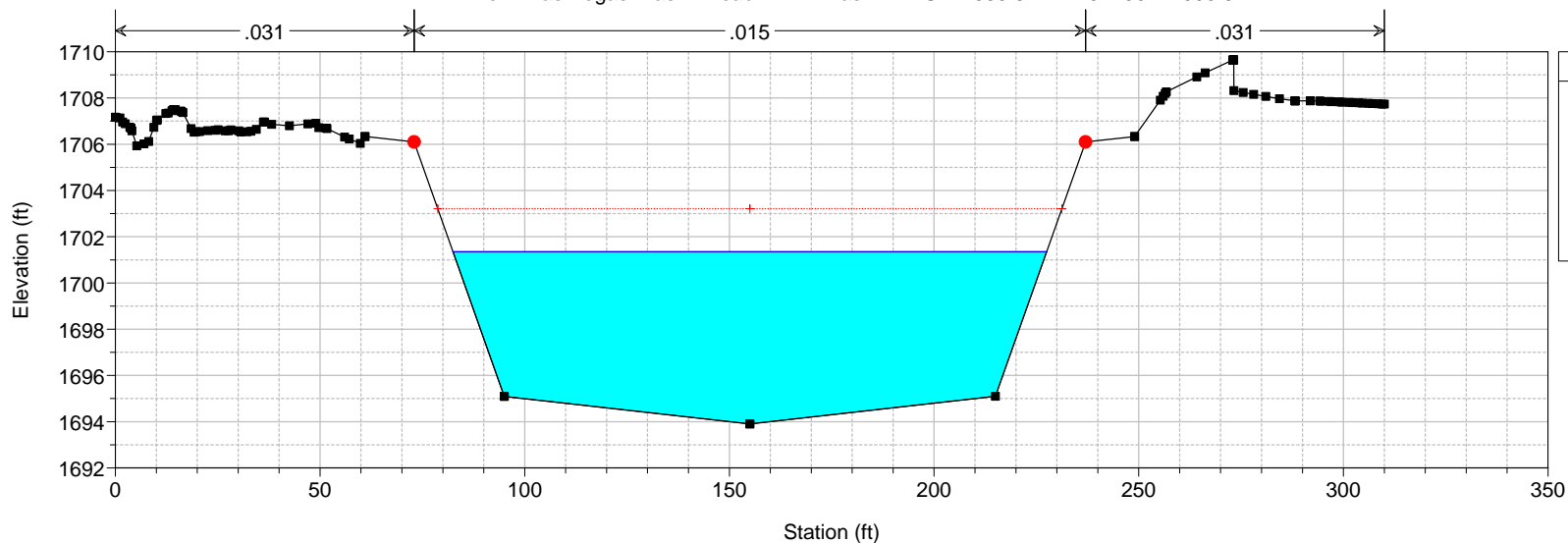


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1093.2 "DR" 90+00 = 1093.2

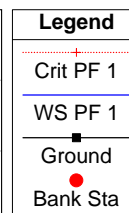
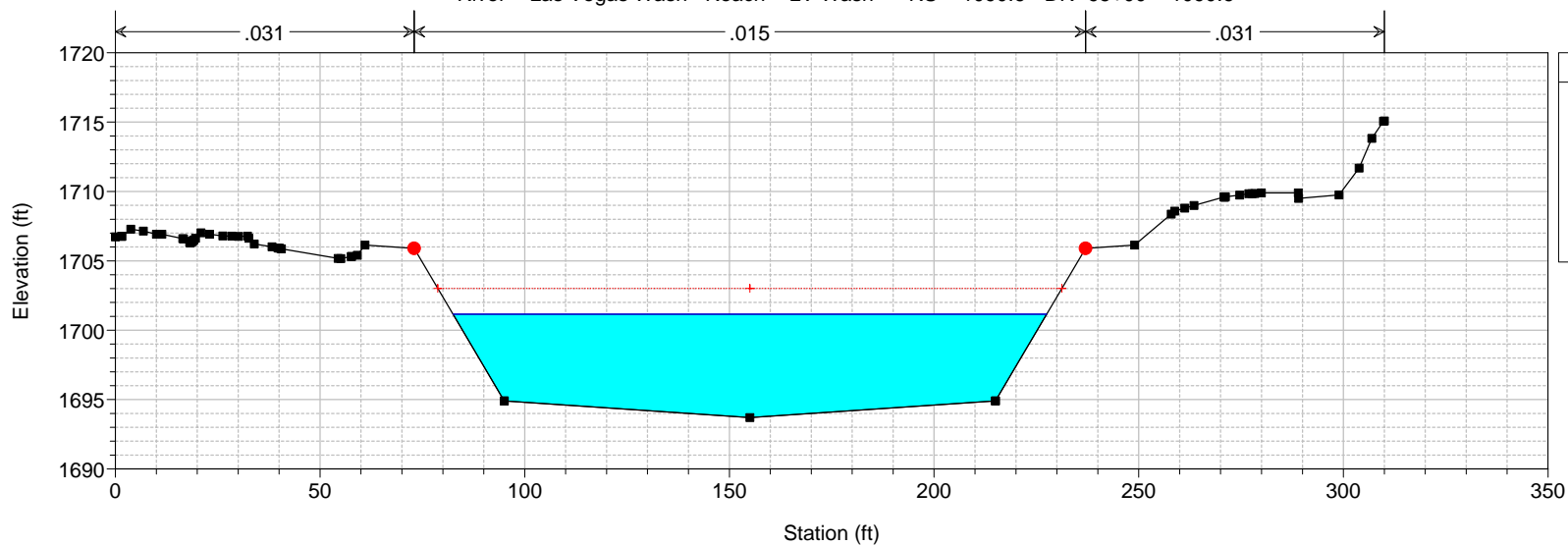


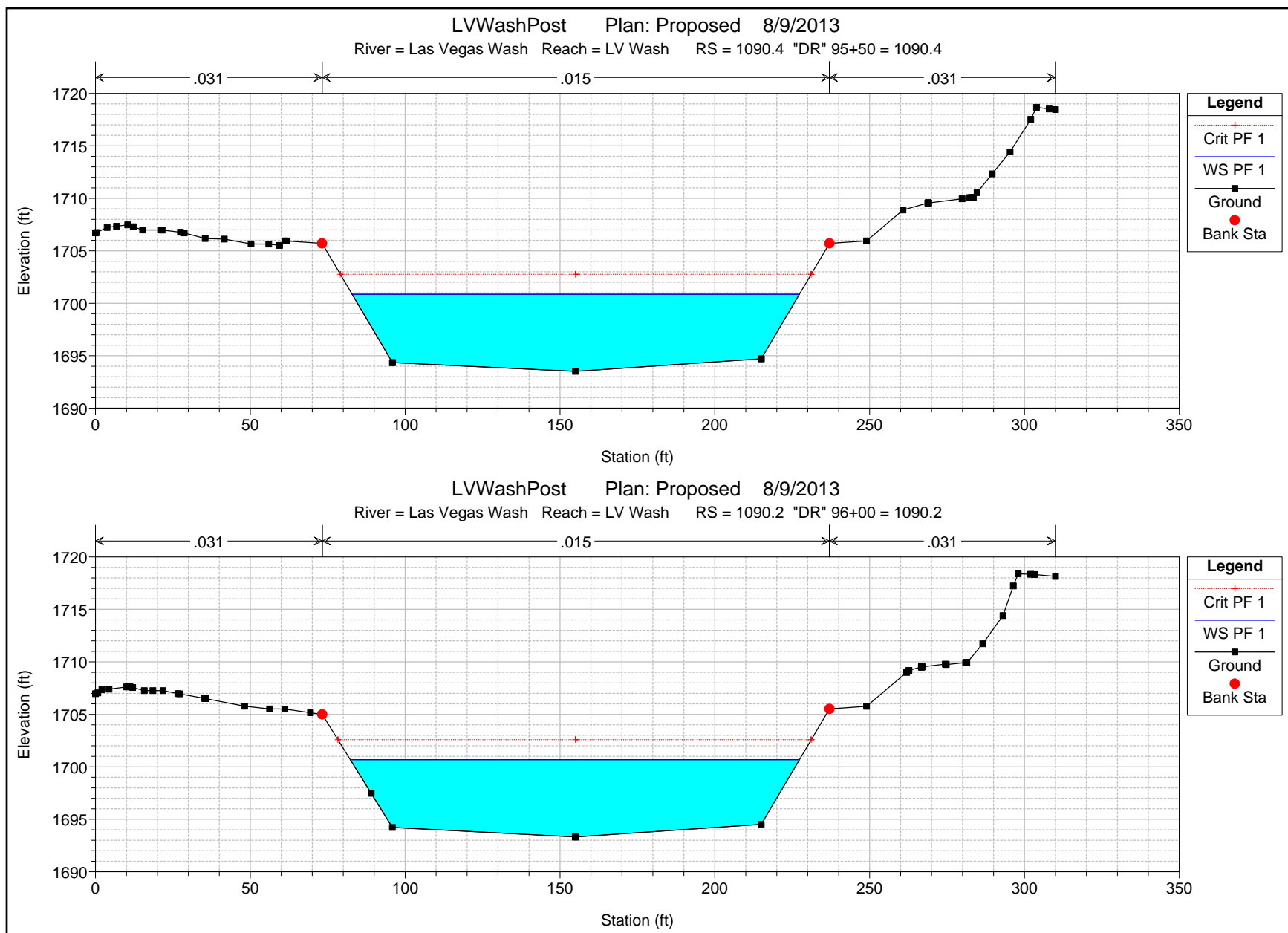


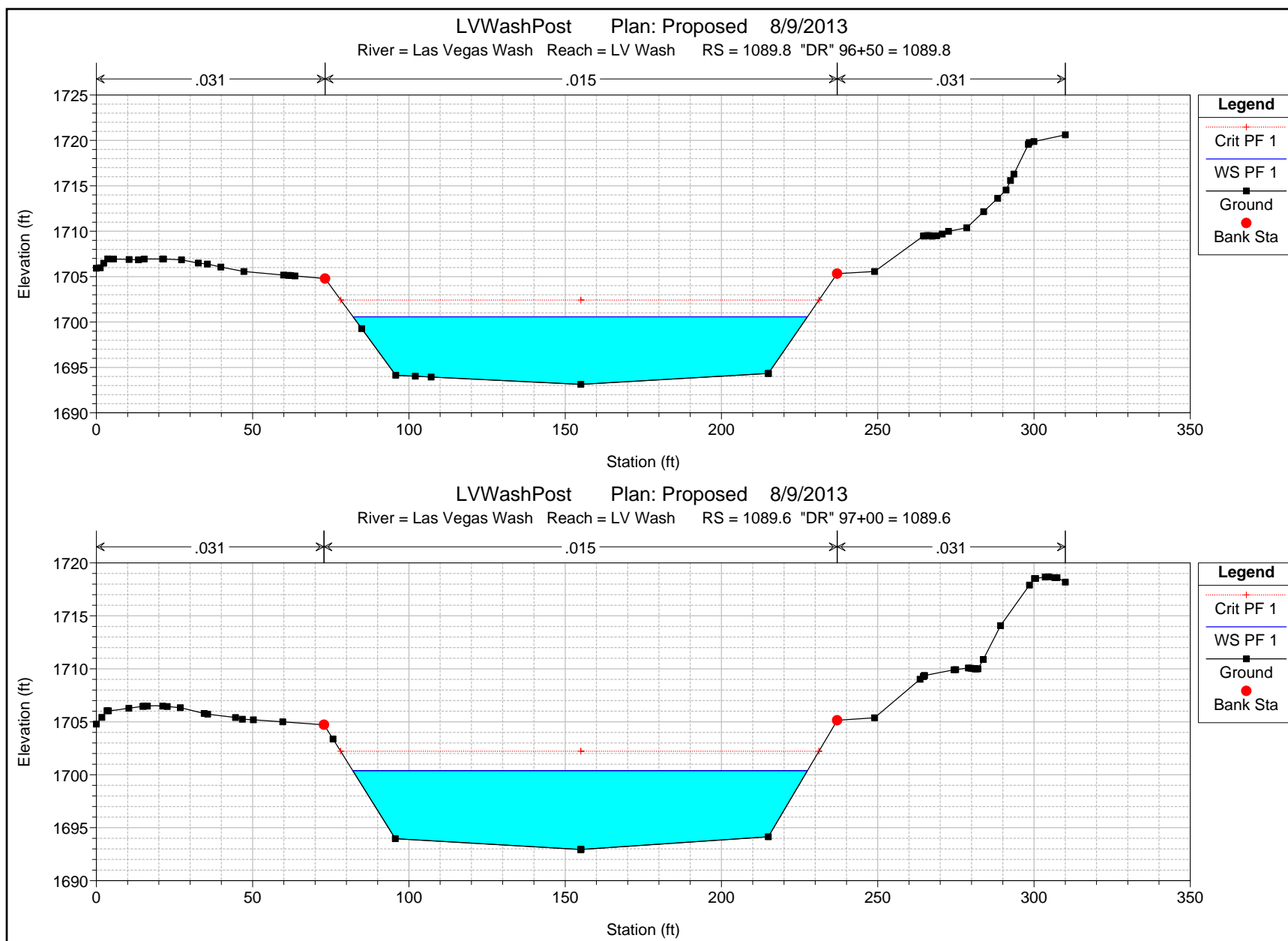
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1090.8 "DR" 94+50 = 1090.8

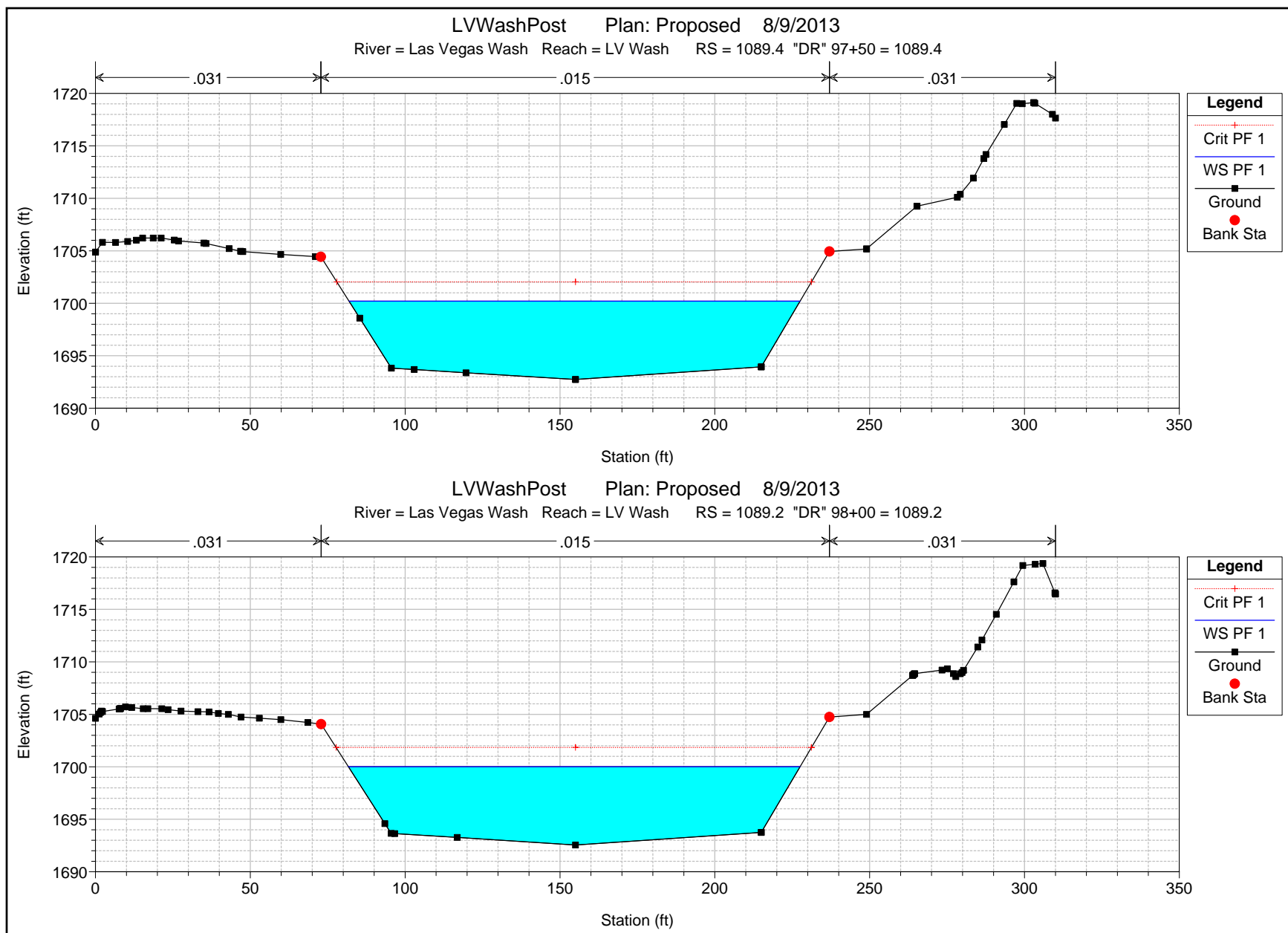


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1090.6 "DR" 95+00 = 1090.6

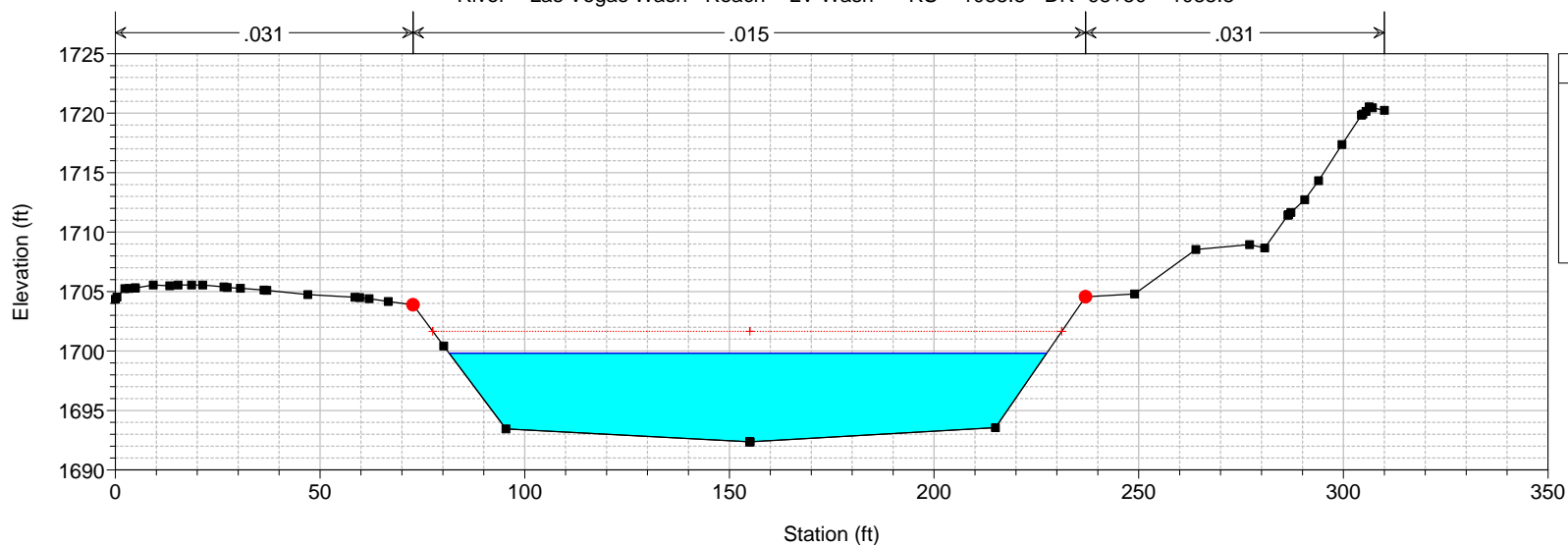






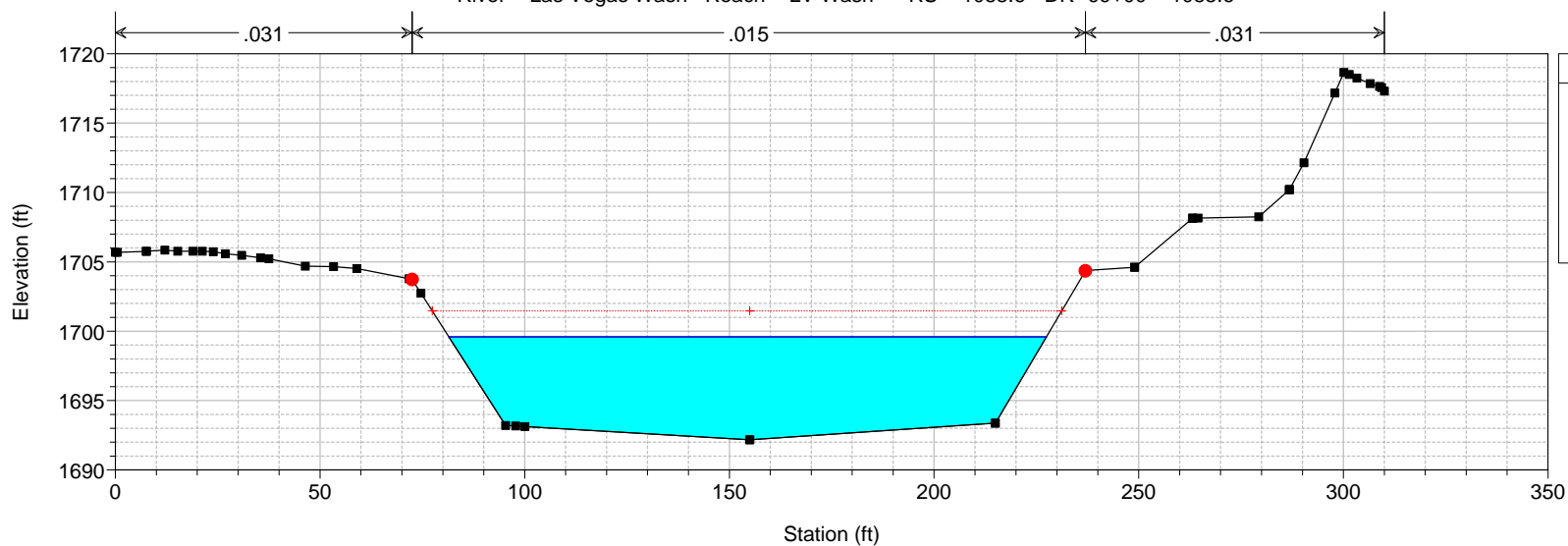


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1088.8 "DR" 98+50 = 1088.8

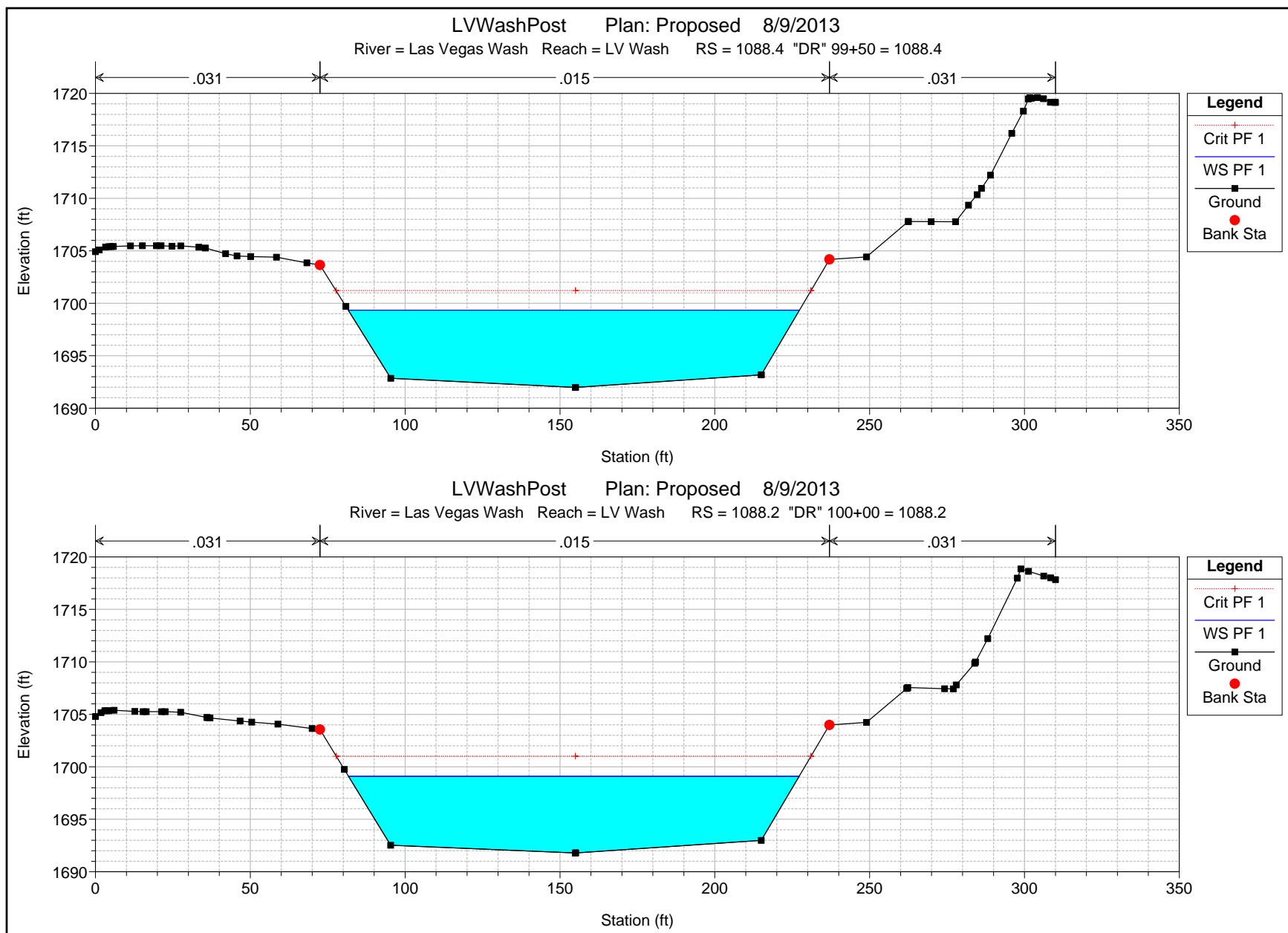


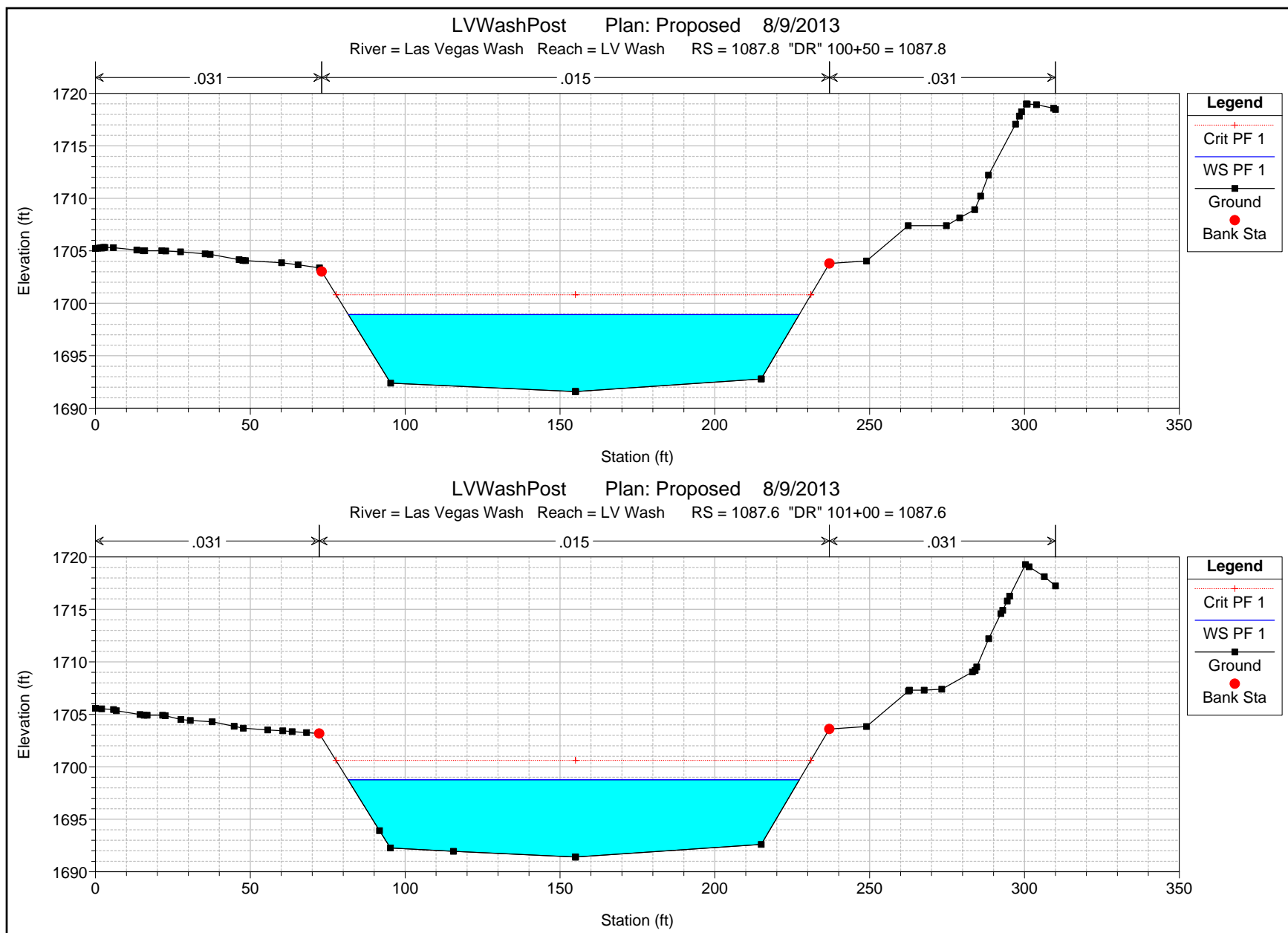
Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

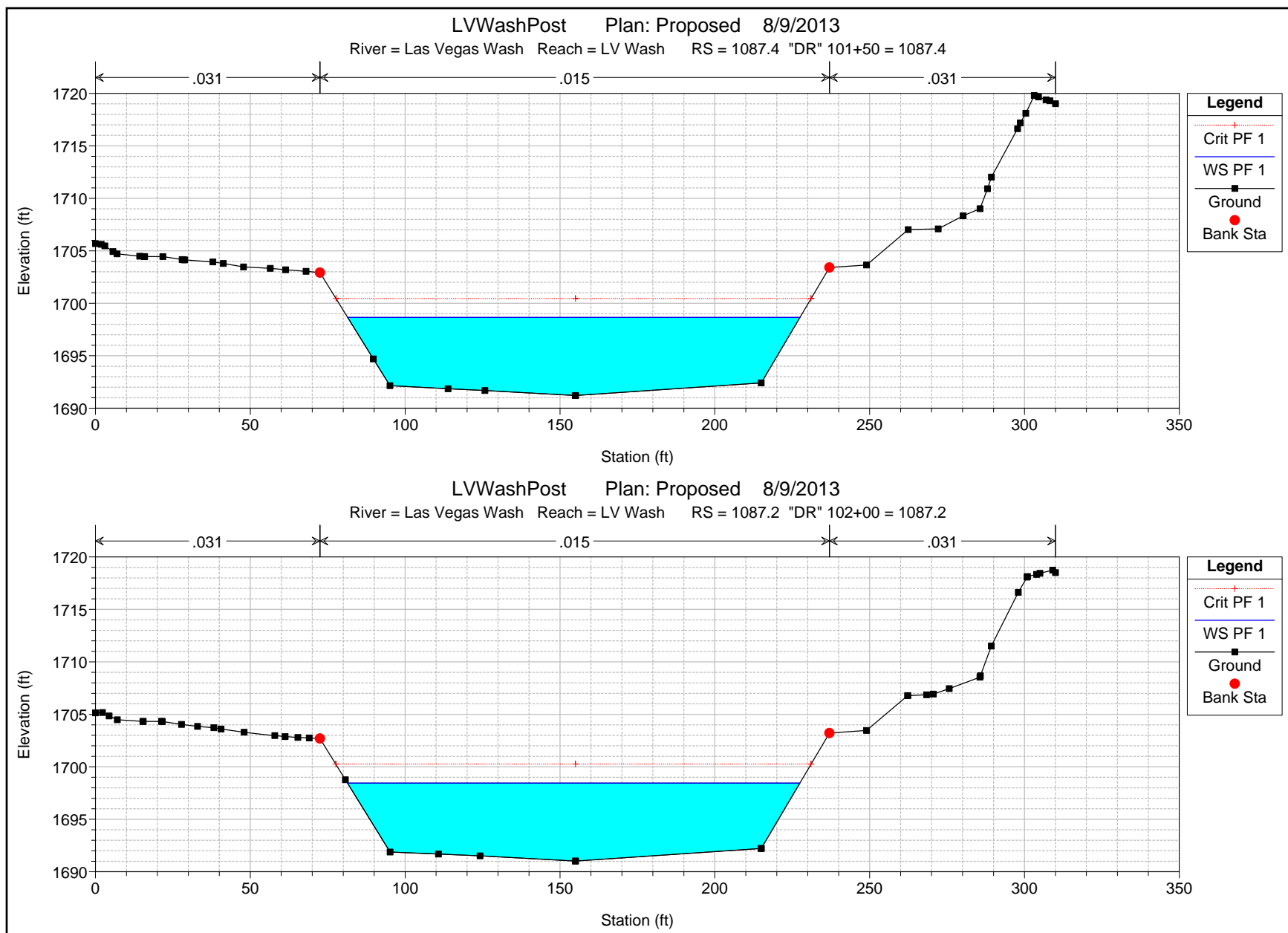
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1088.6 "DR" 99+00 = 1088.6

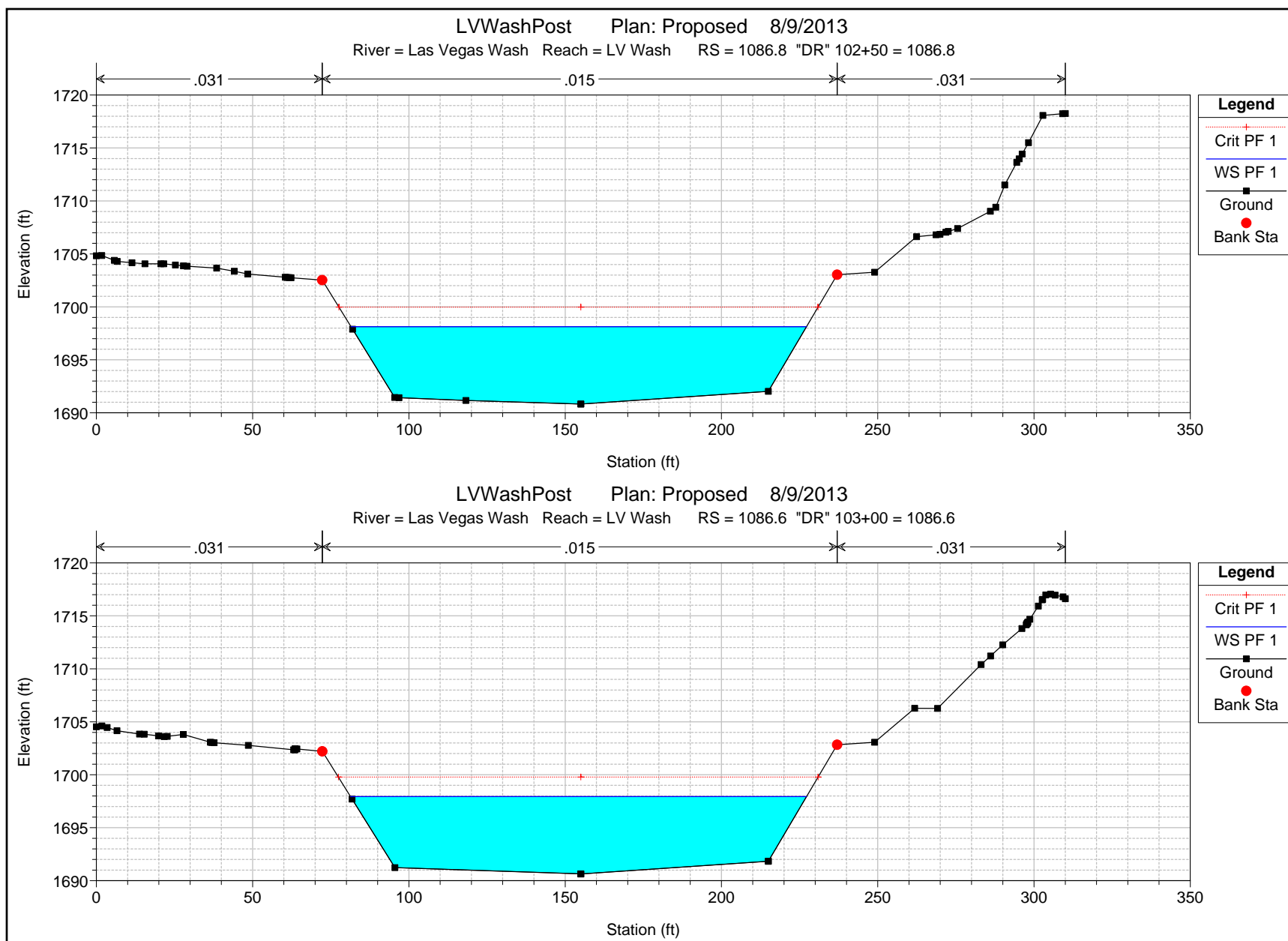


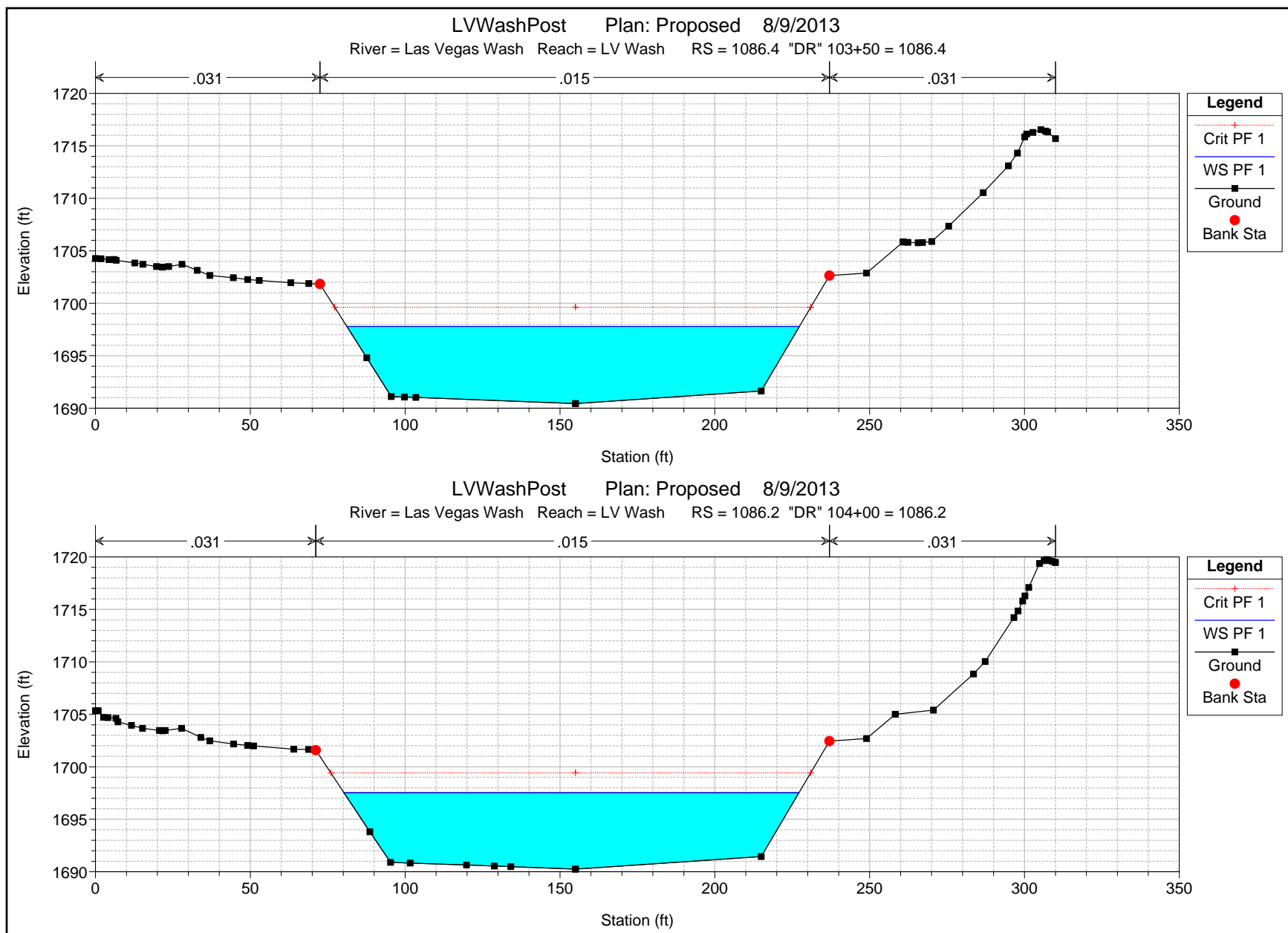
Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

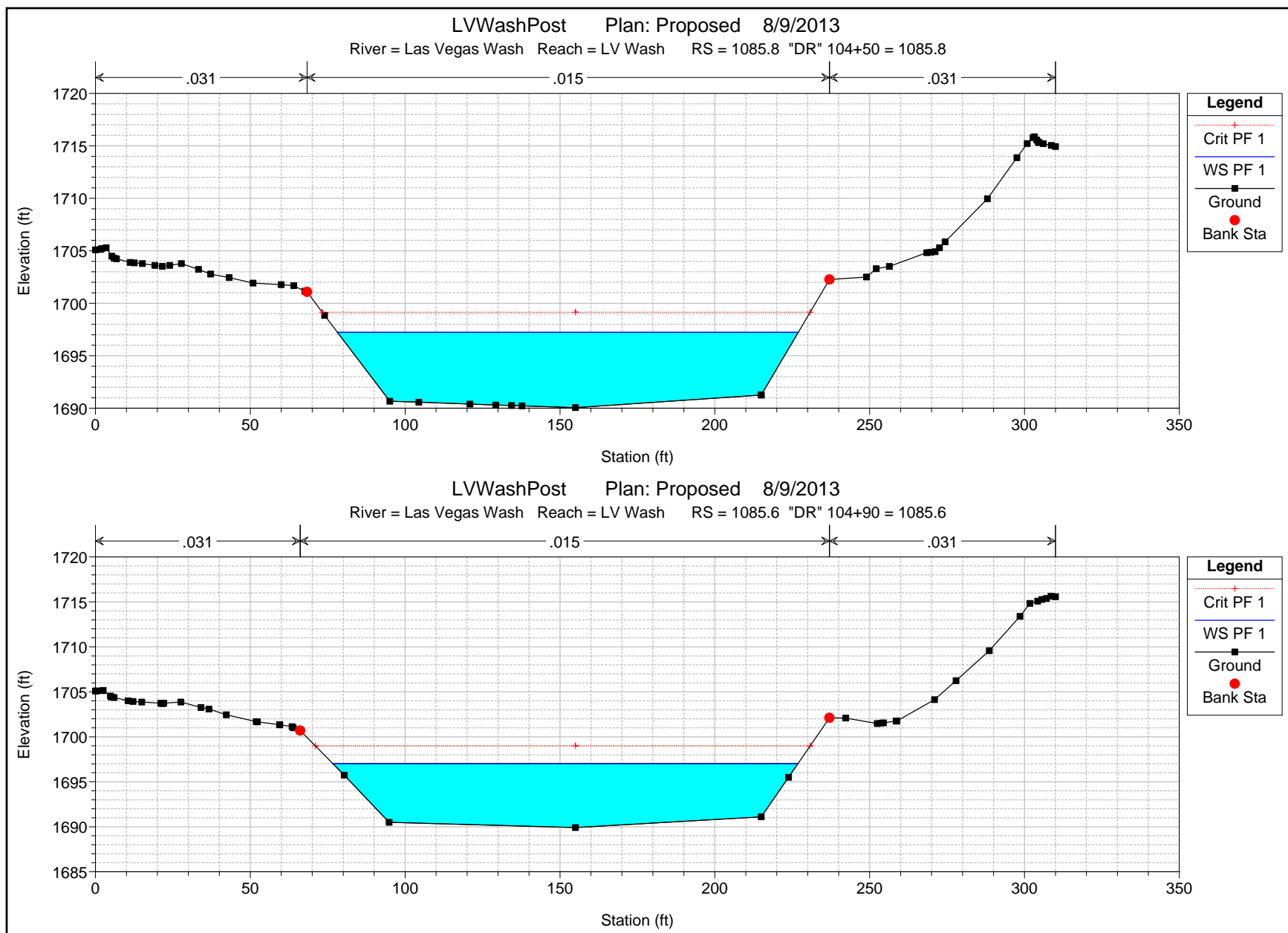


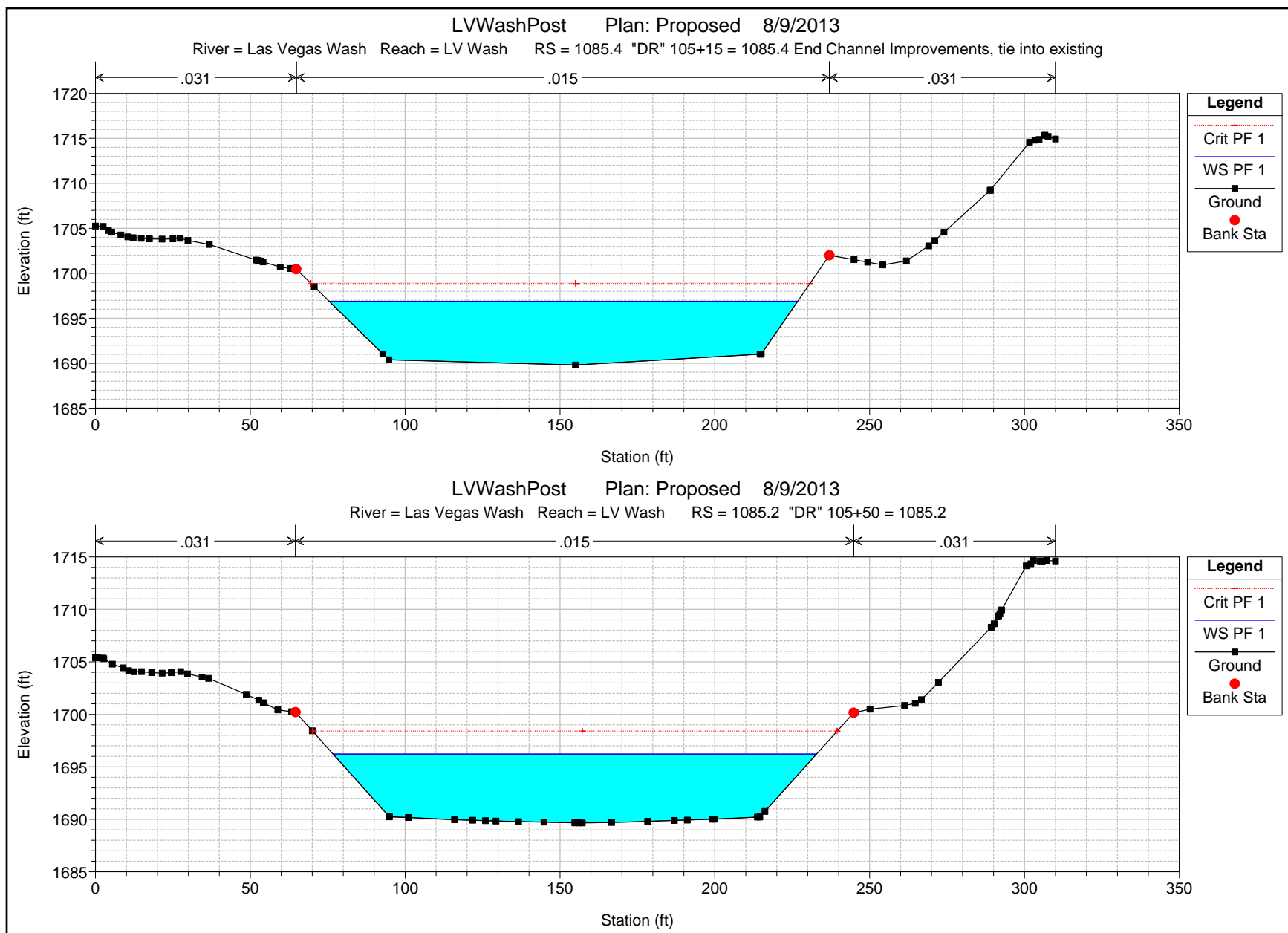


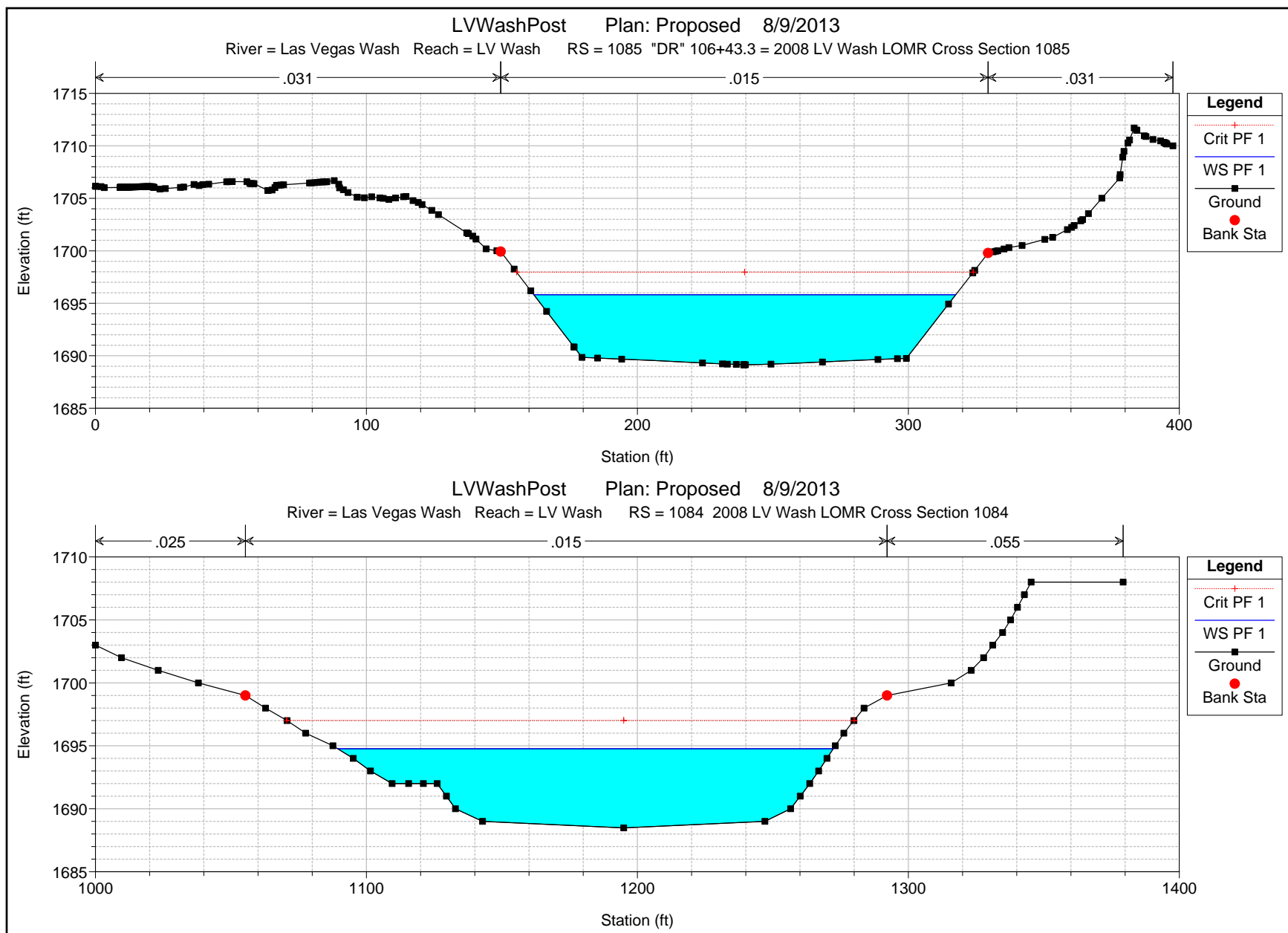


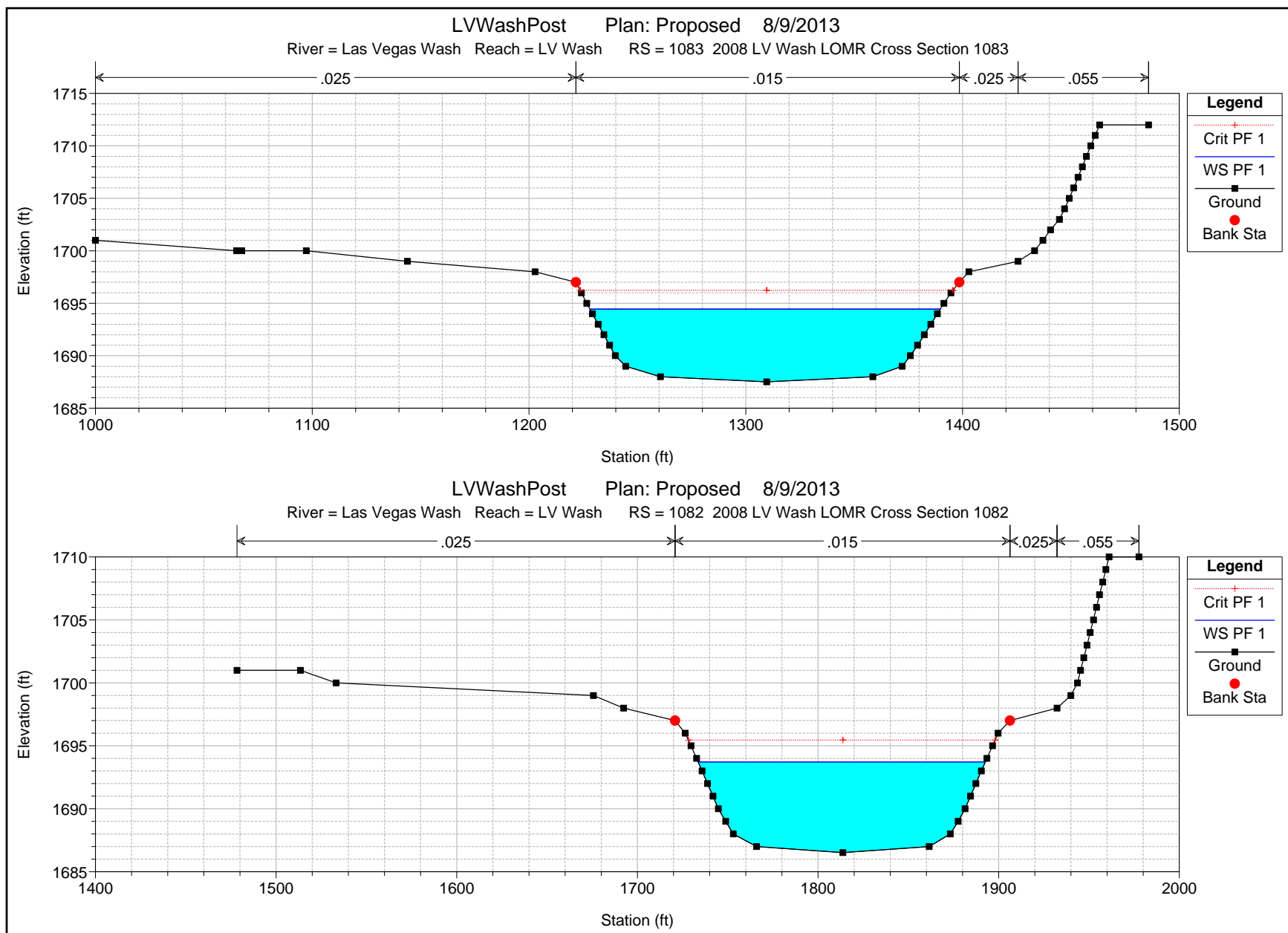


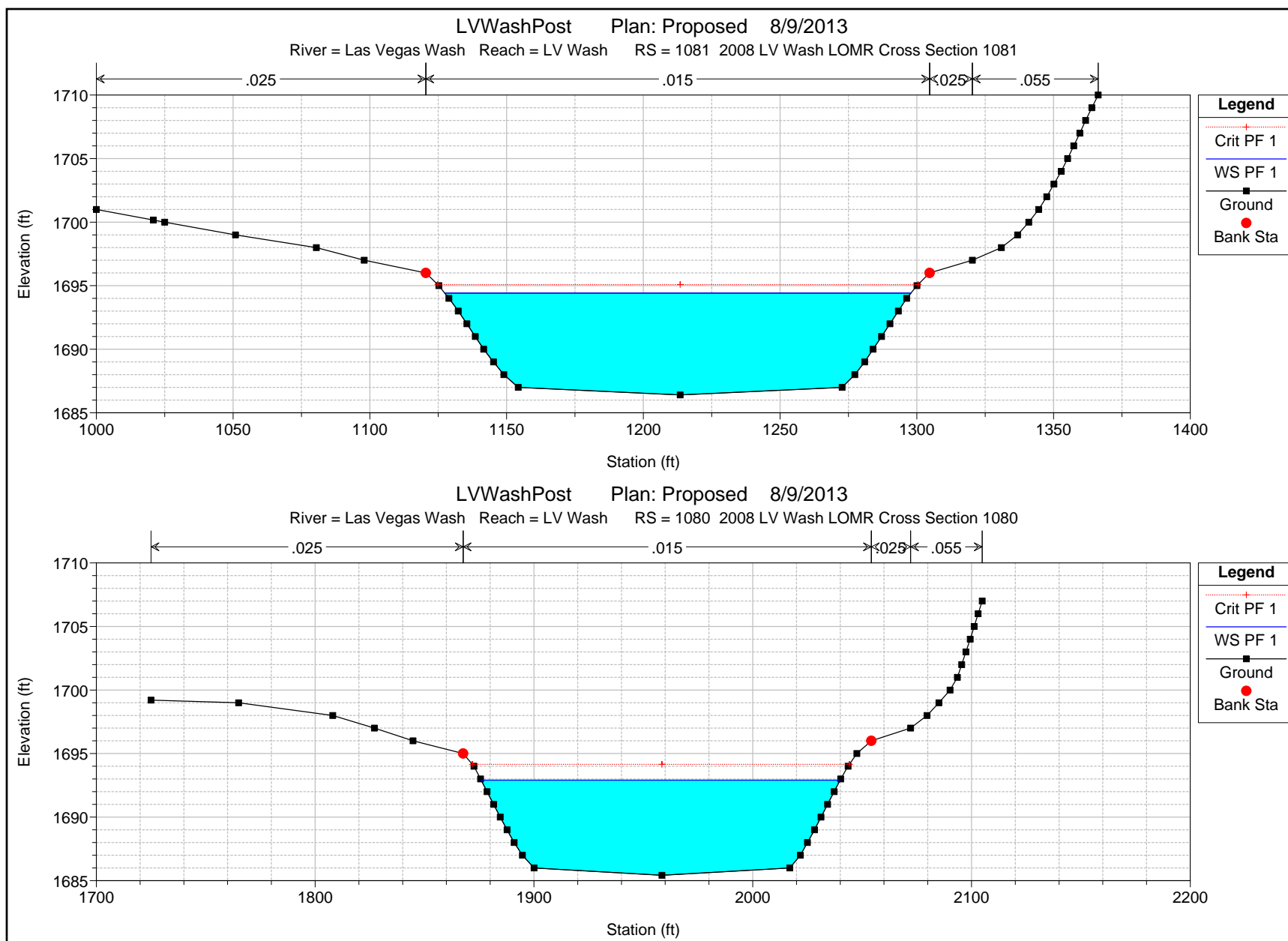


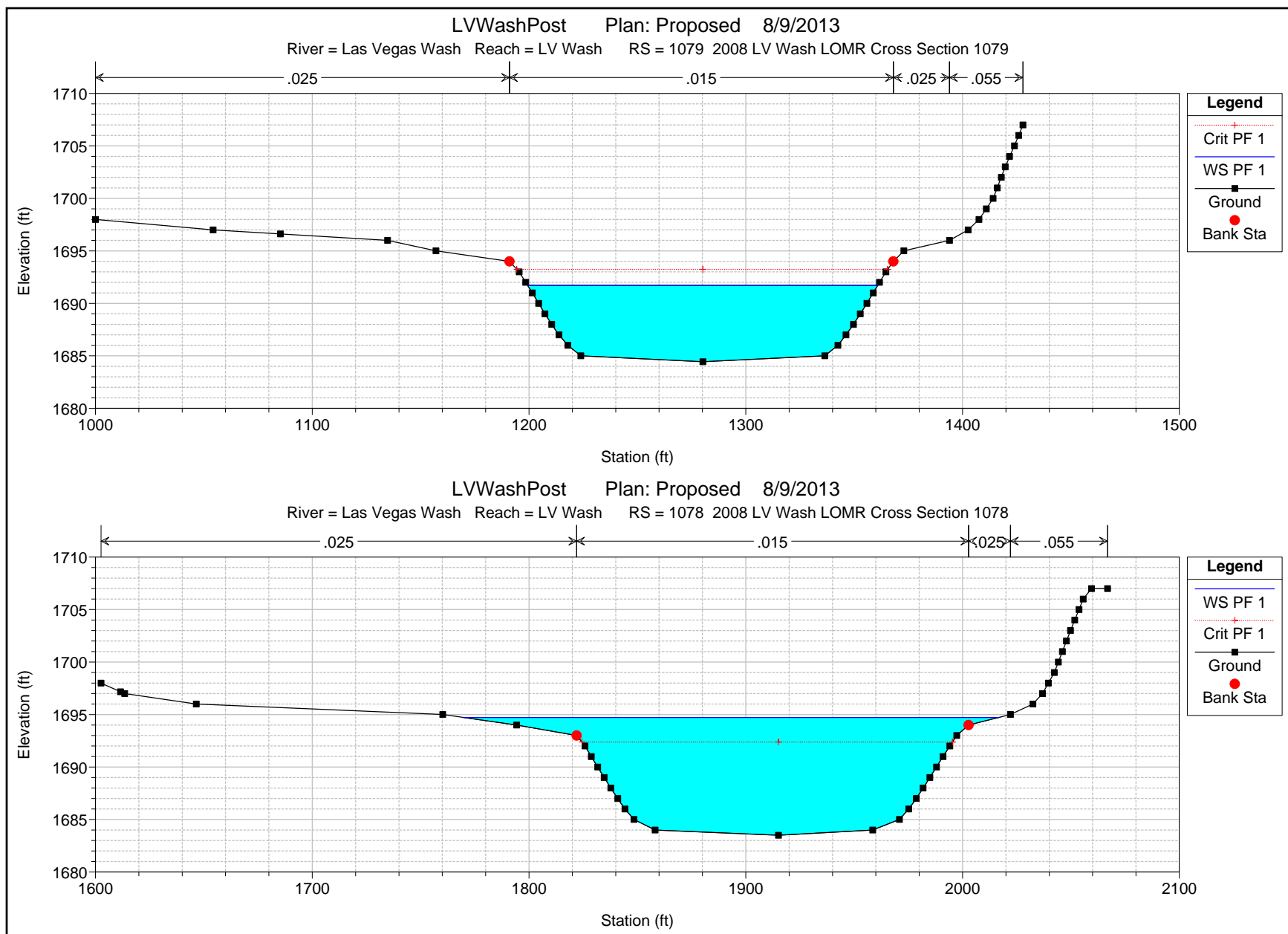


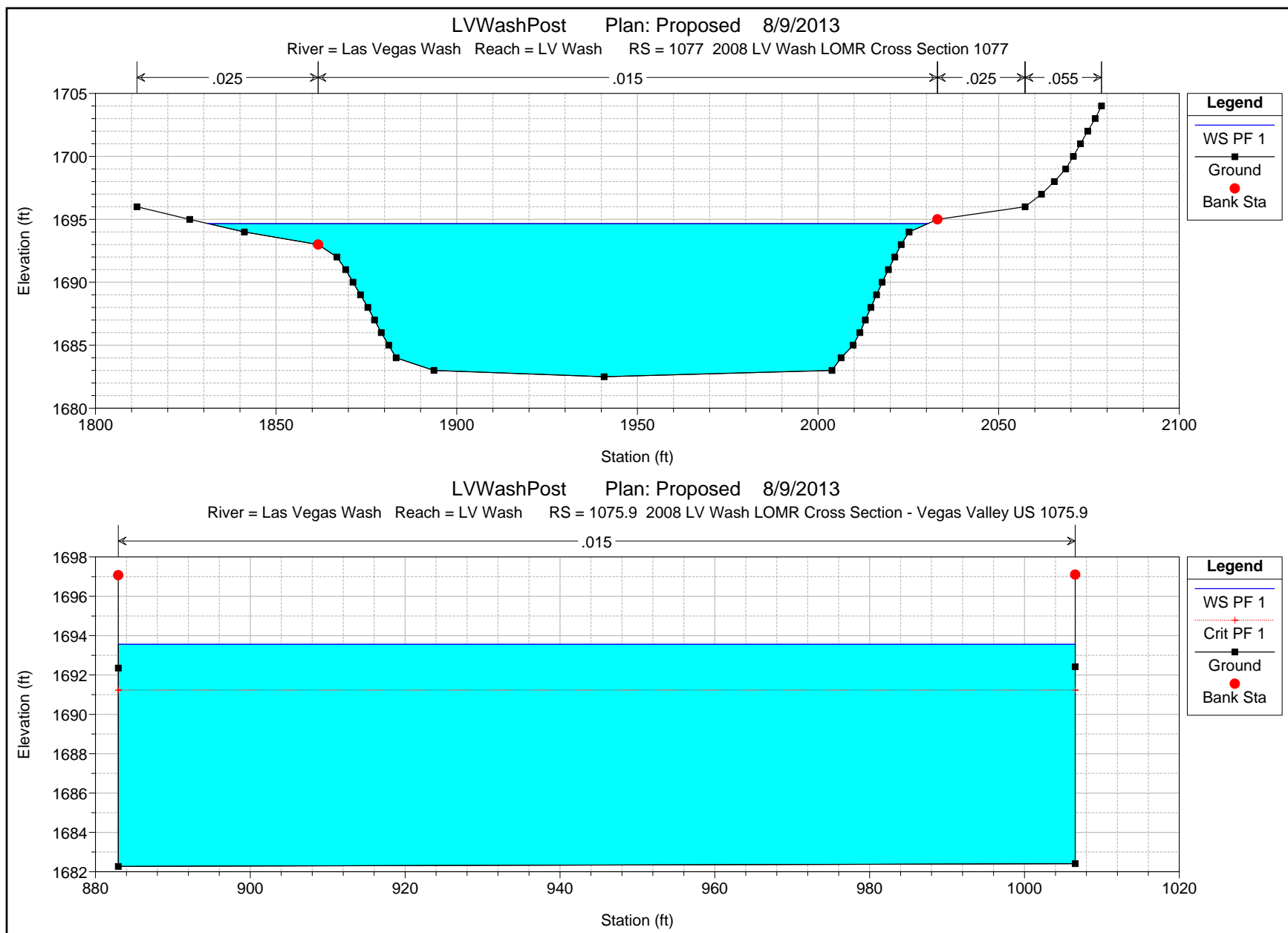


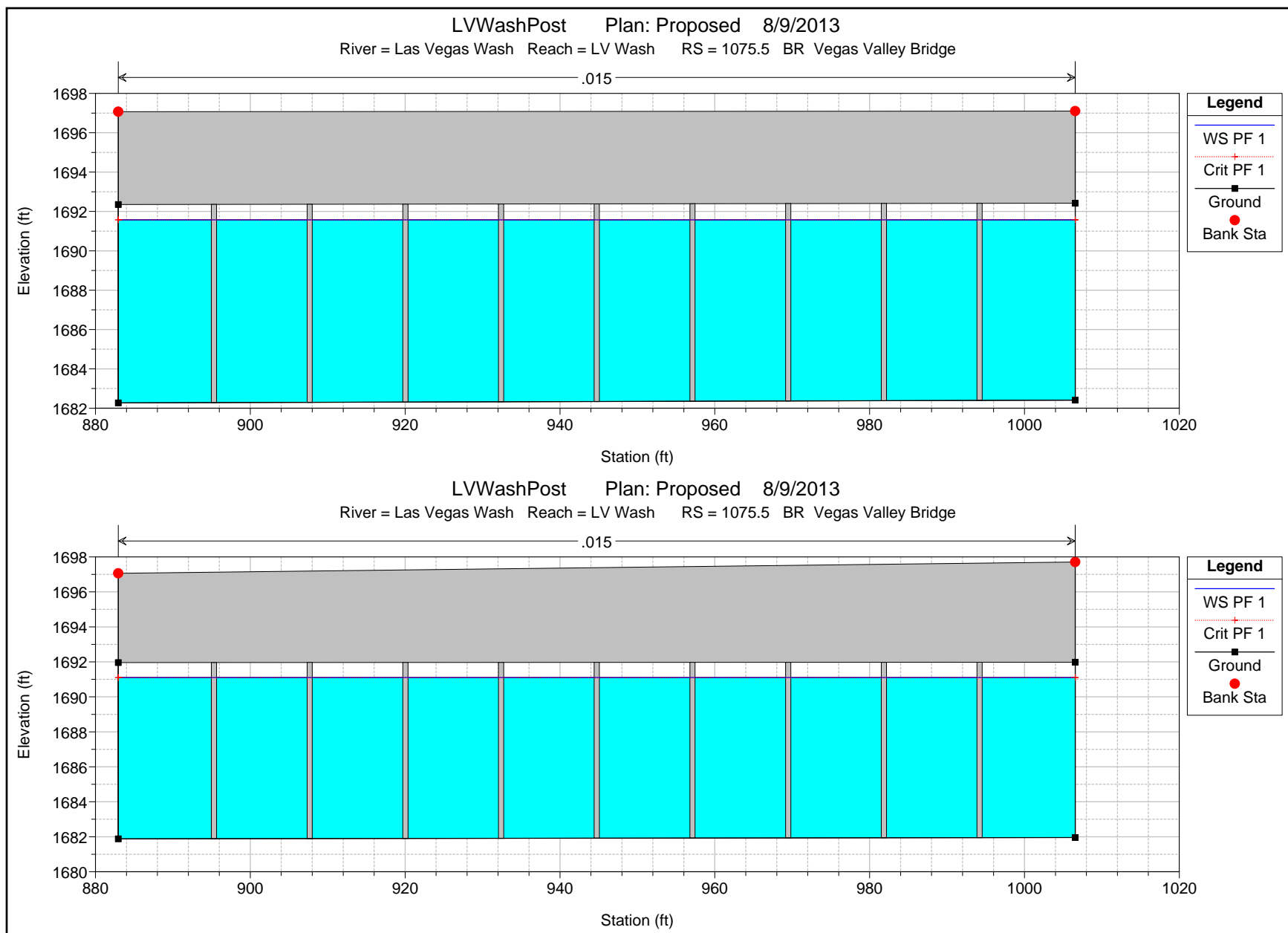






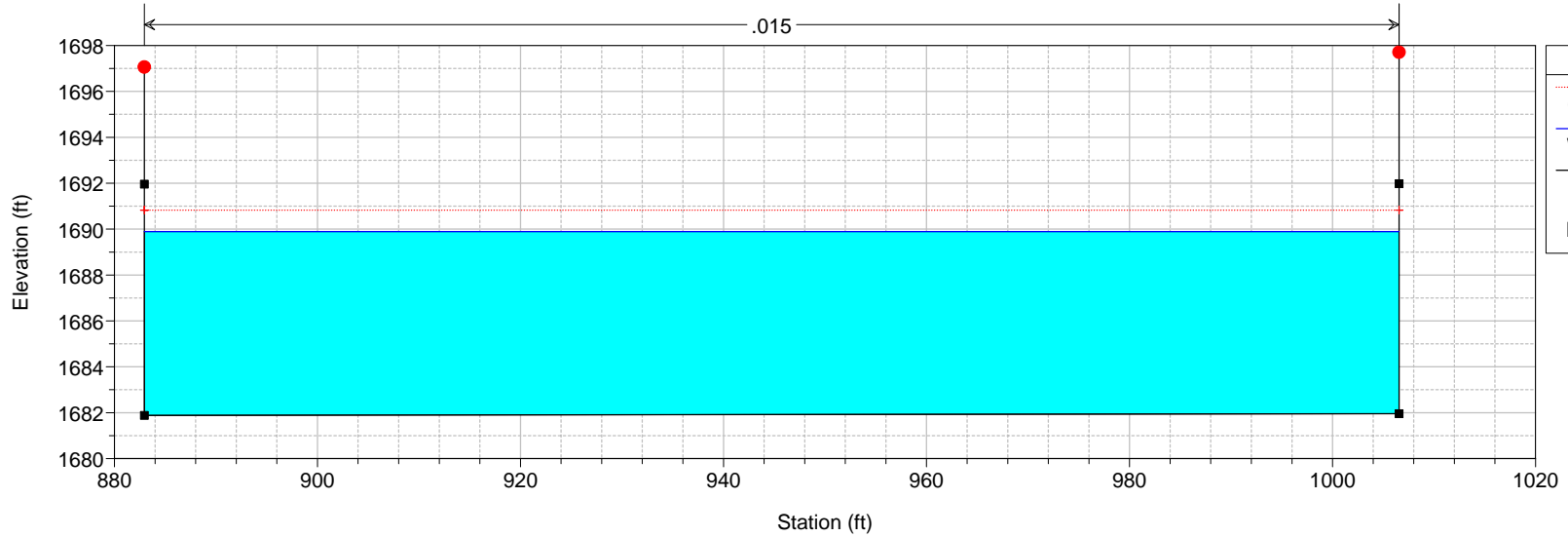






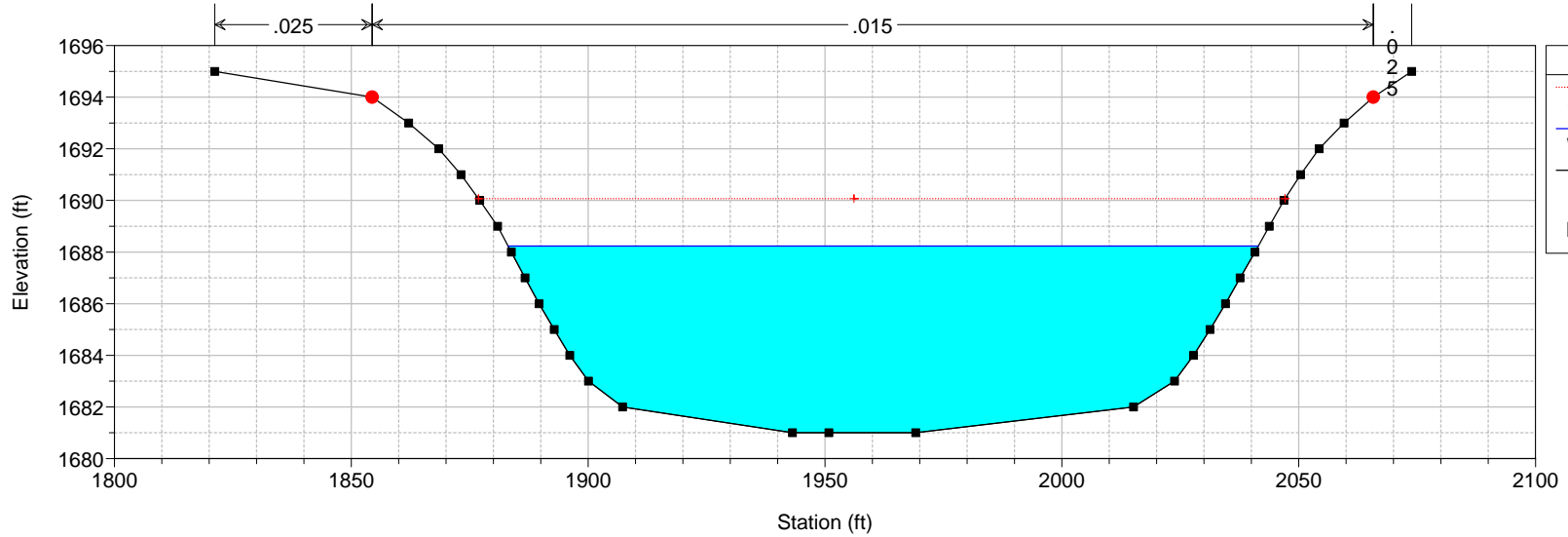
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1075.1 2008 LV Wash LOMR Cross Section - Vegas Valley DS 1075.1

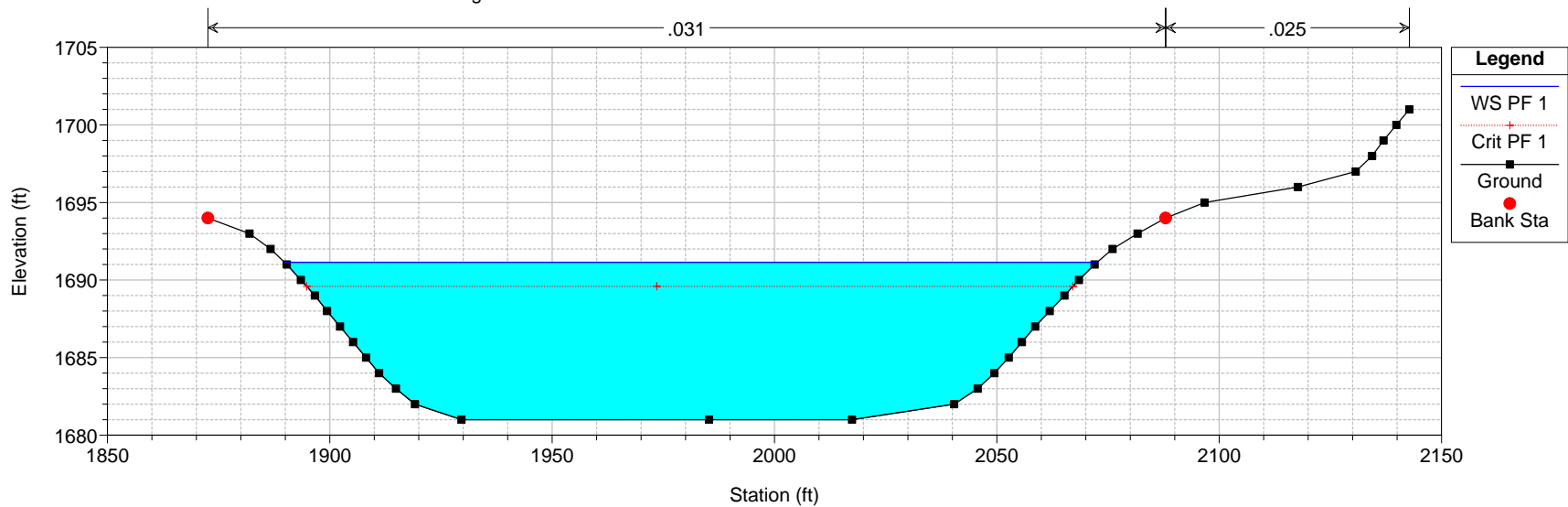


LVWashPost Plan: Proposed 8/9/2013

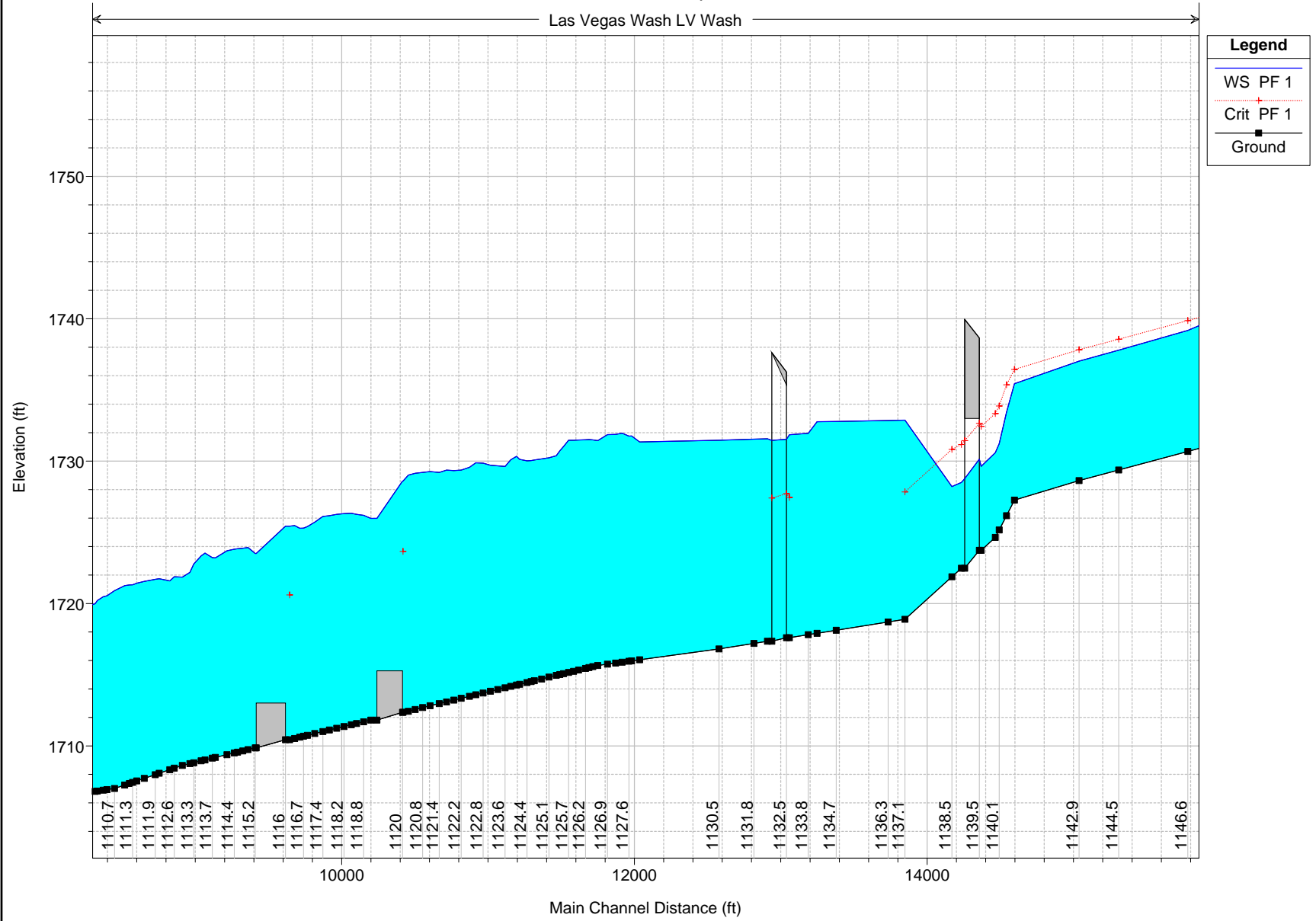
River = Las Vegas Wash Reach = LV Wash RS = 1075 2008 LV Wash LOMR Cross Section 1075



LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1074 2008 LV Wash LOMR Cross Section 1074

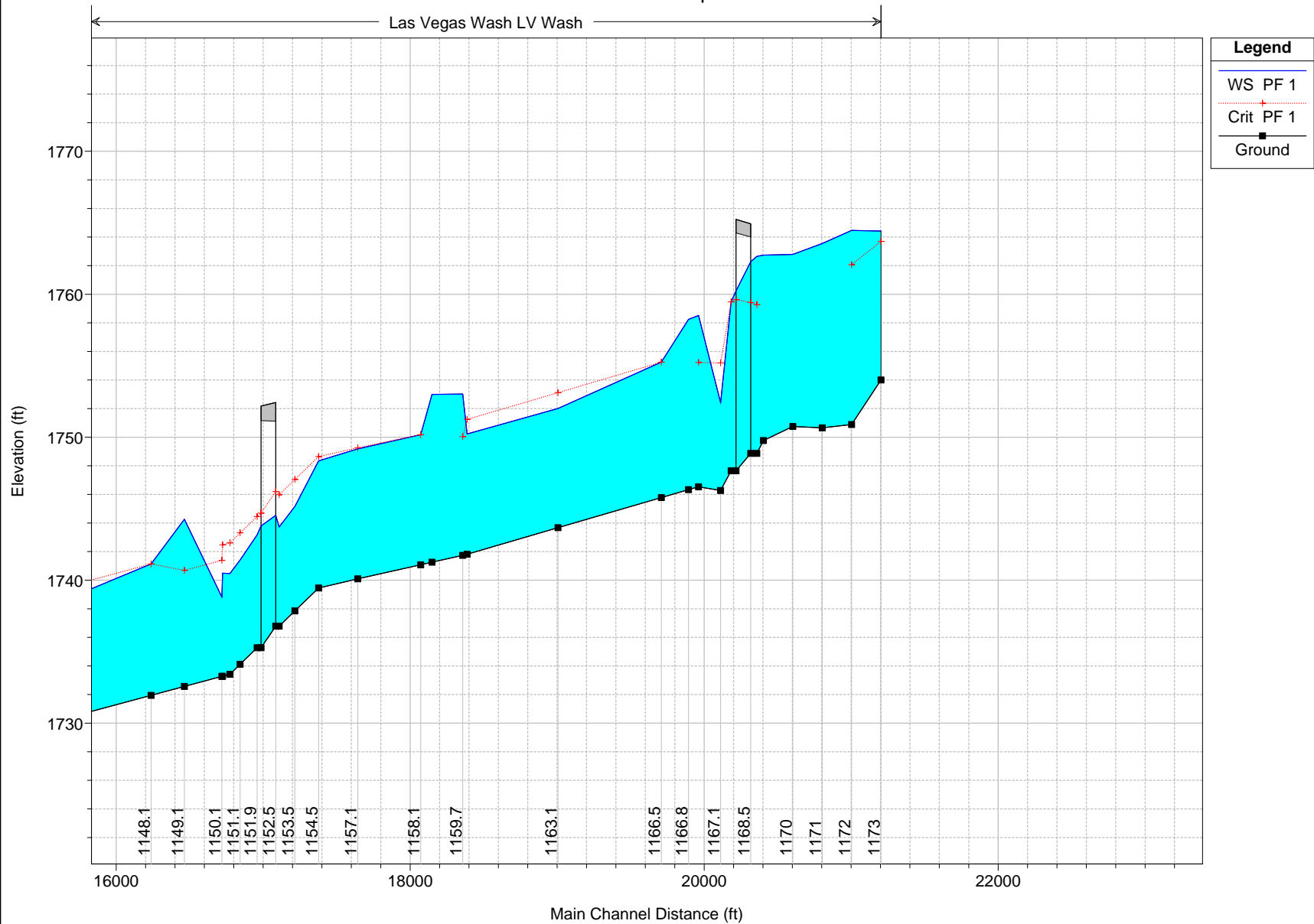


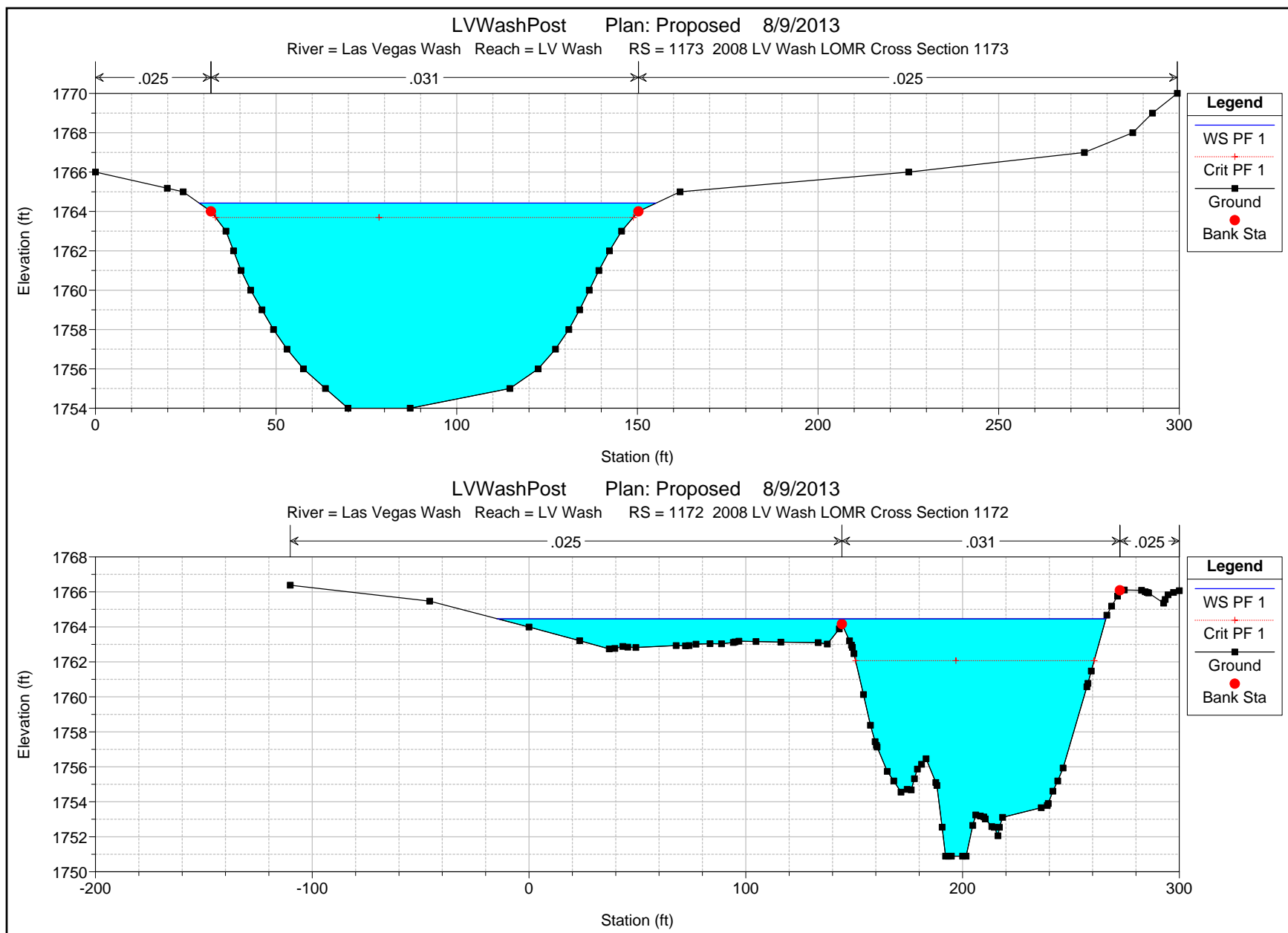
LVWashPost Plan: Proposed 8/9/2013

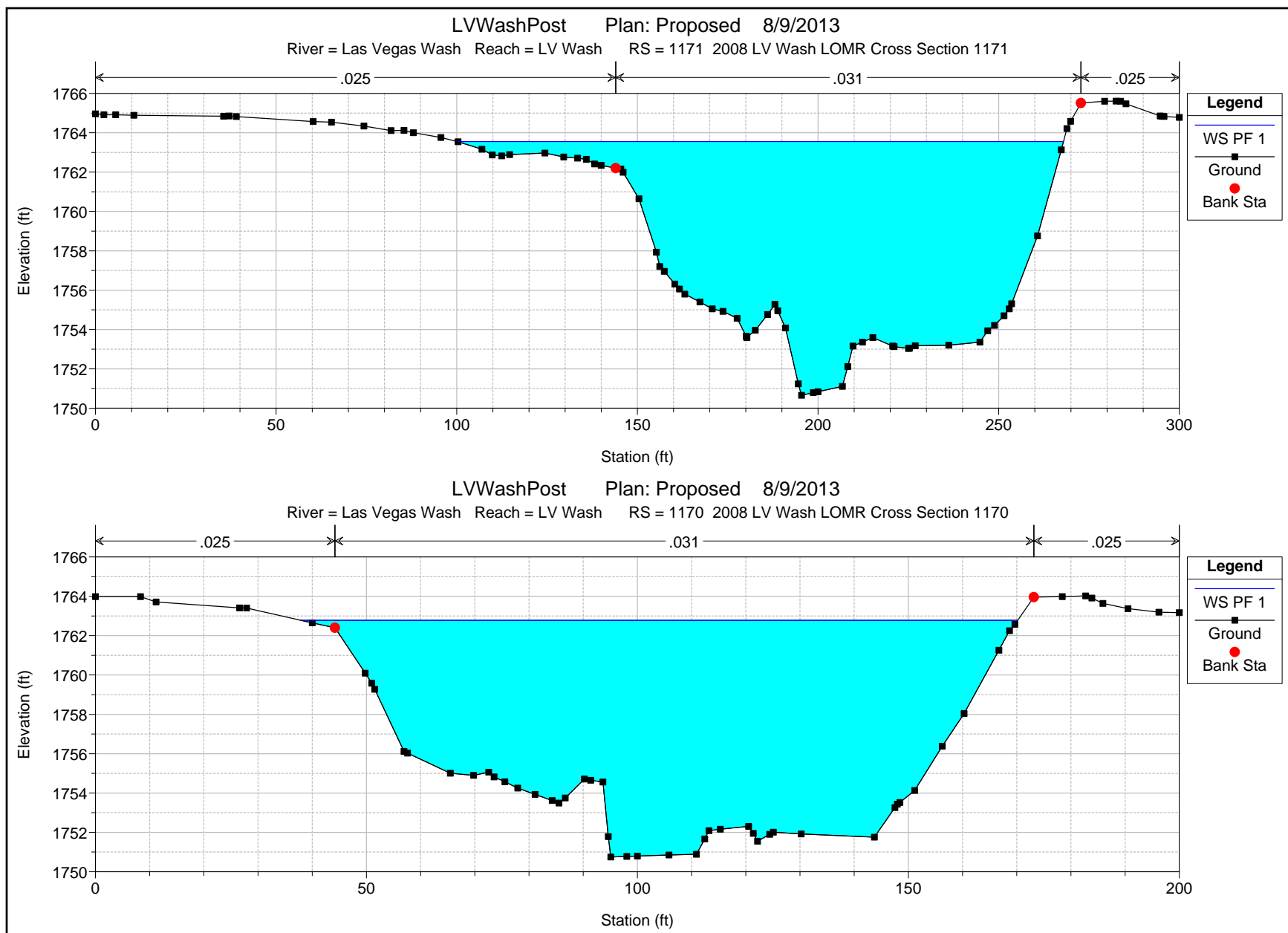


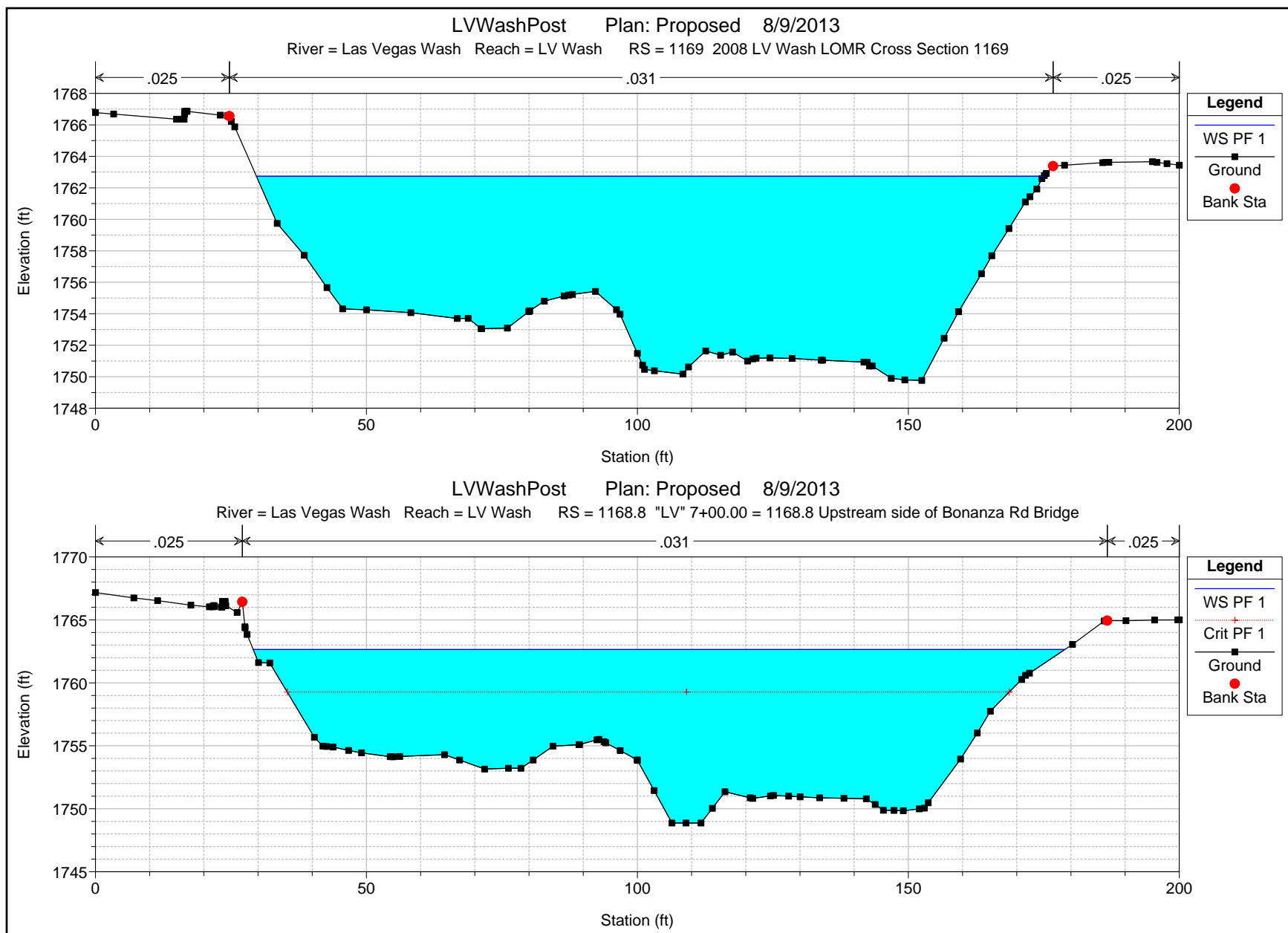
LVWashPost Plan: Proposed 8/9/2013

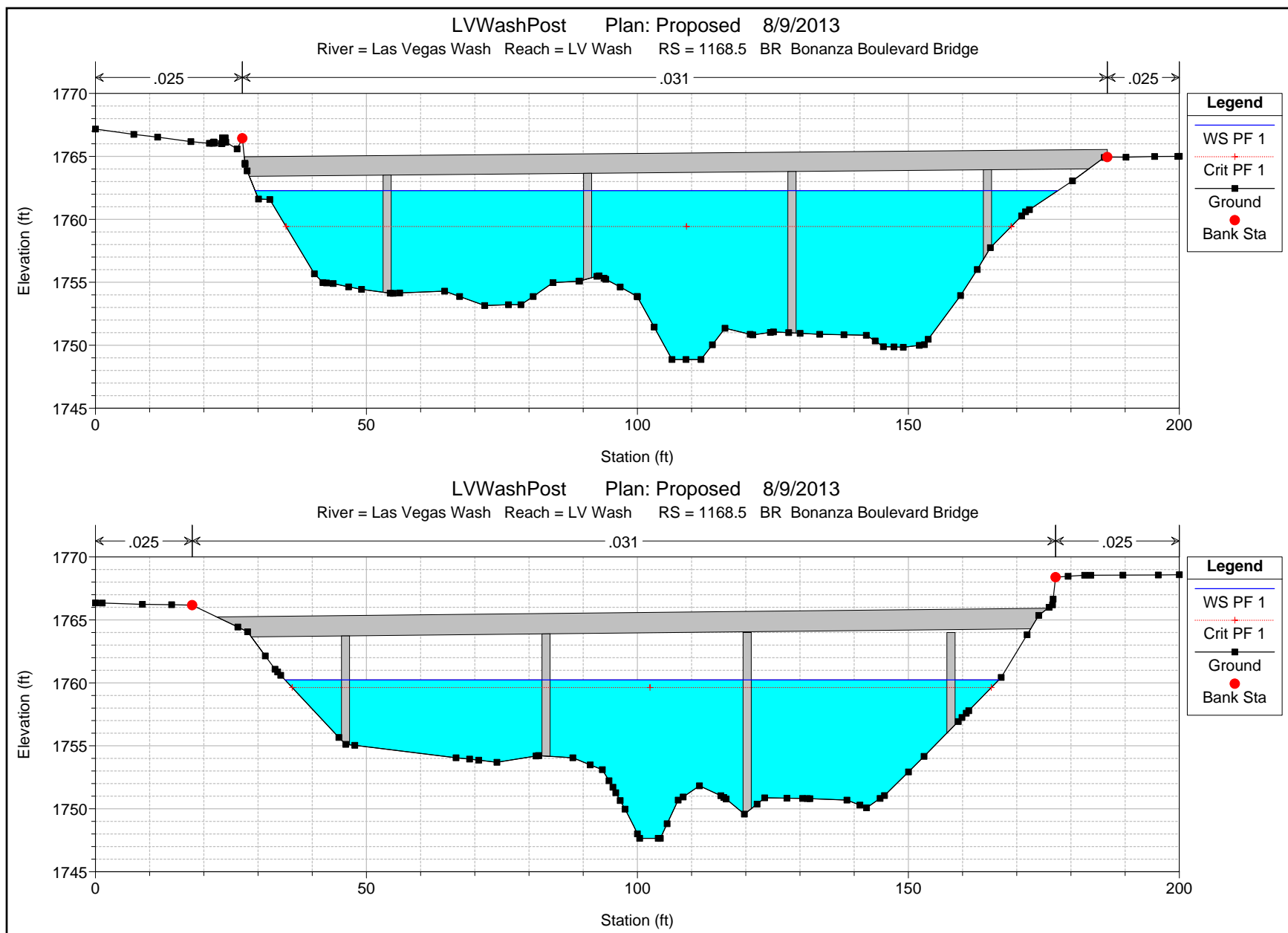
Las Vegas Wash LV Wash





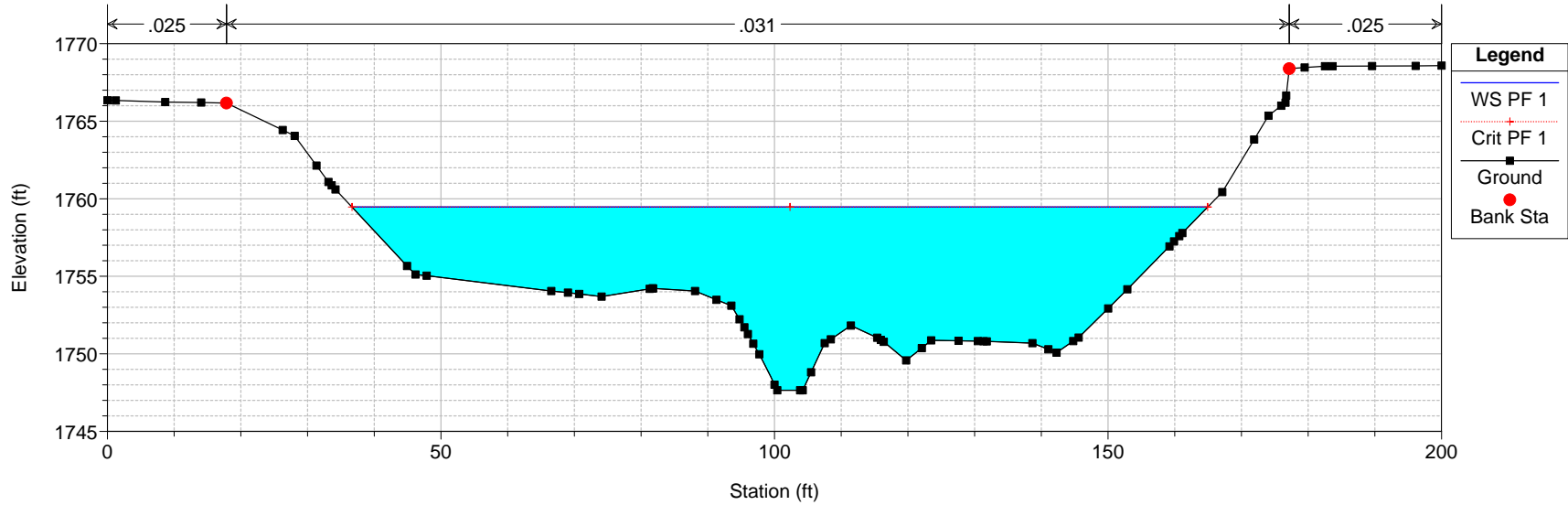






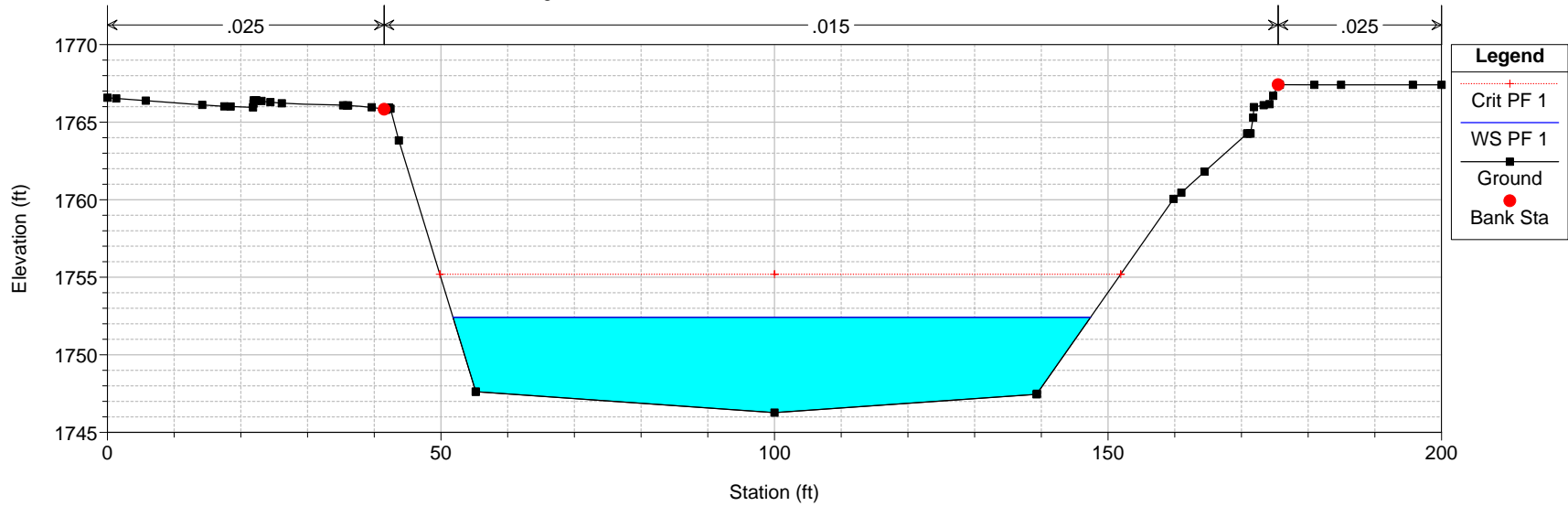
LVWashPost Plan: Proposed 8/9/2013

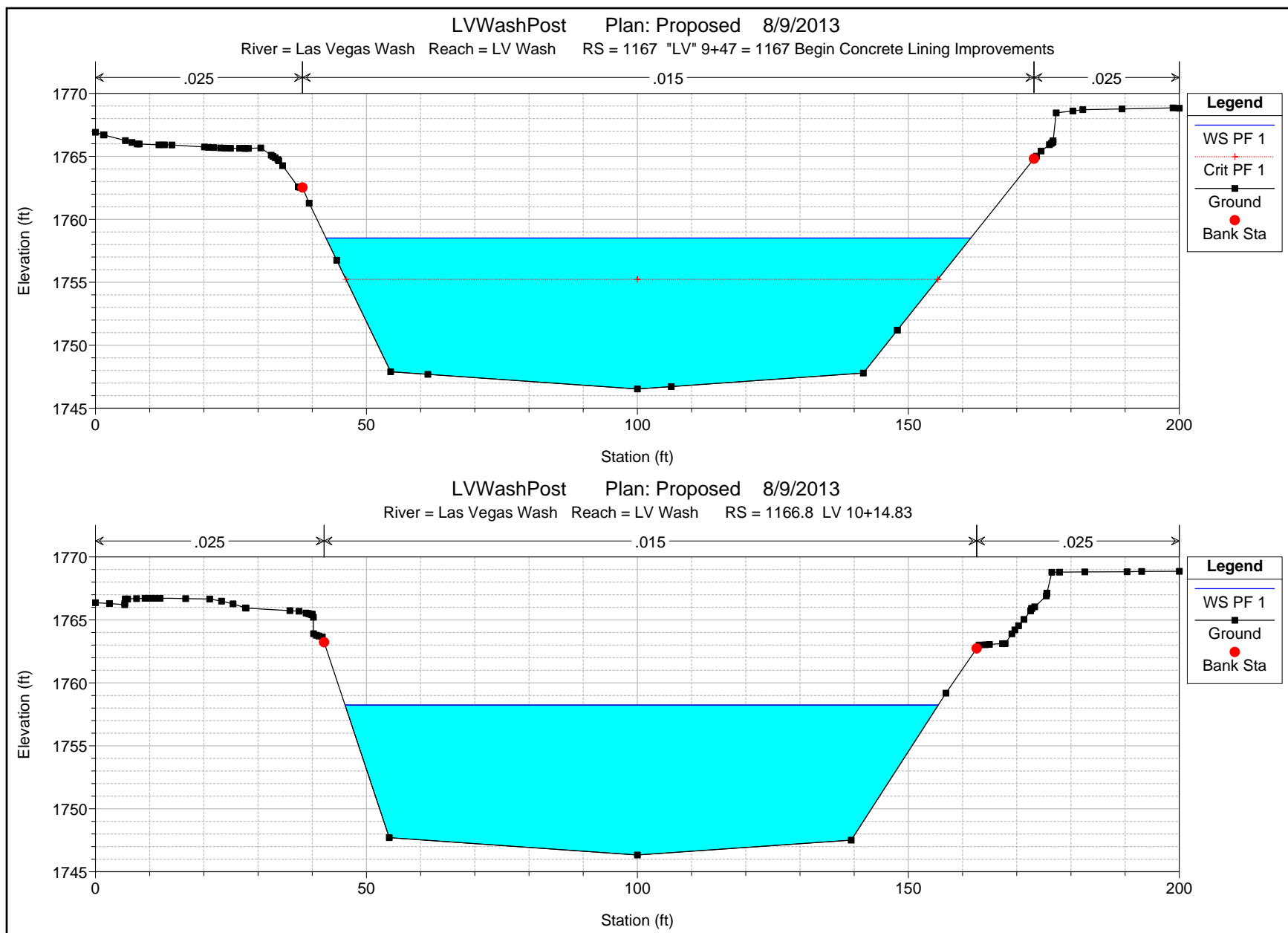
River = Las Vegas Wash Reach = LV Wash RS = 1167.8 "LV" 8+75.00 = 1167.8 Downstream Side of Bonanza Rd Bridge

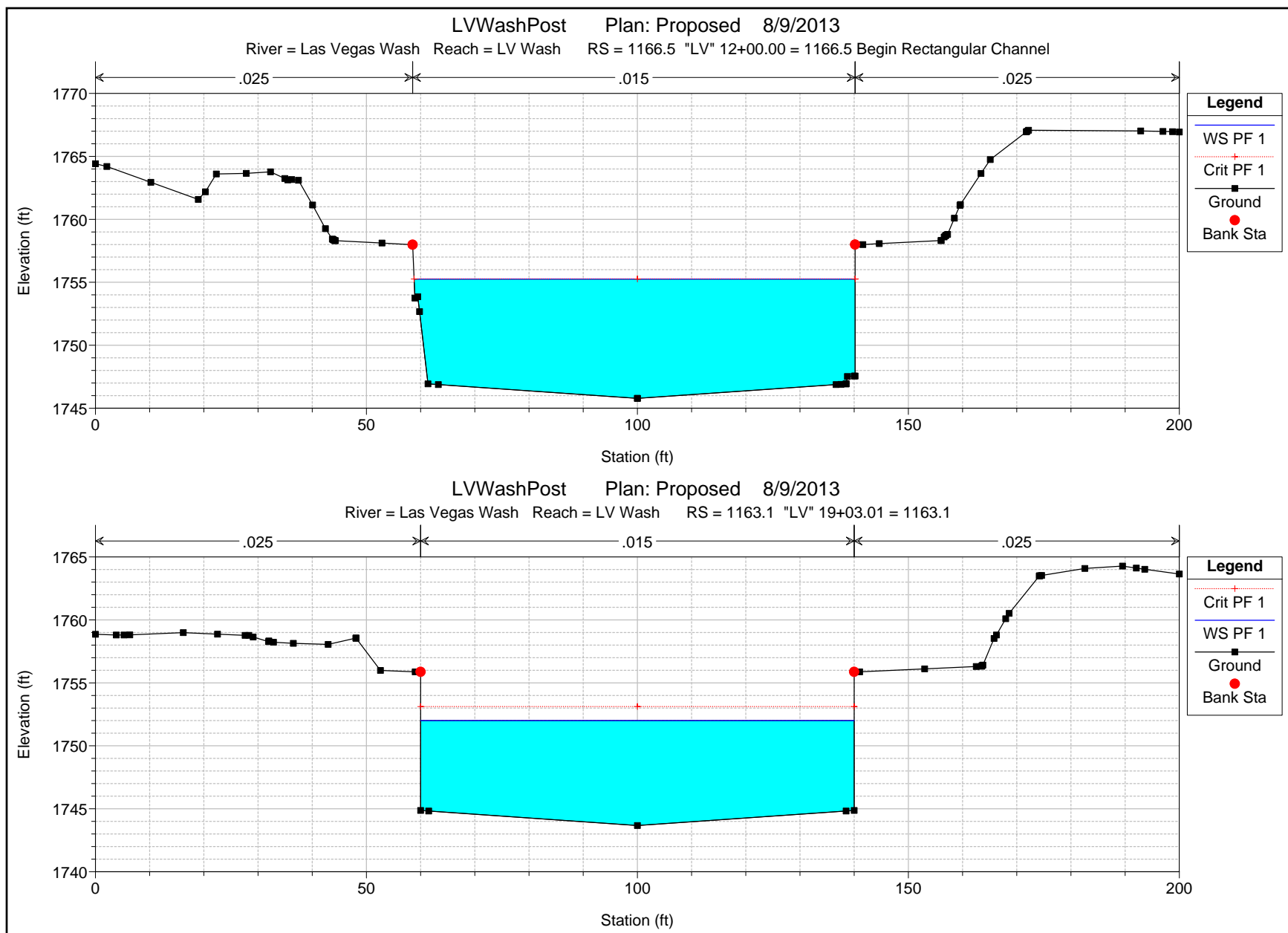


LVWashPost Plan: Proposed 8/9/2013

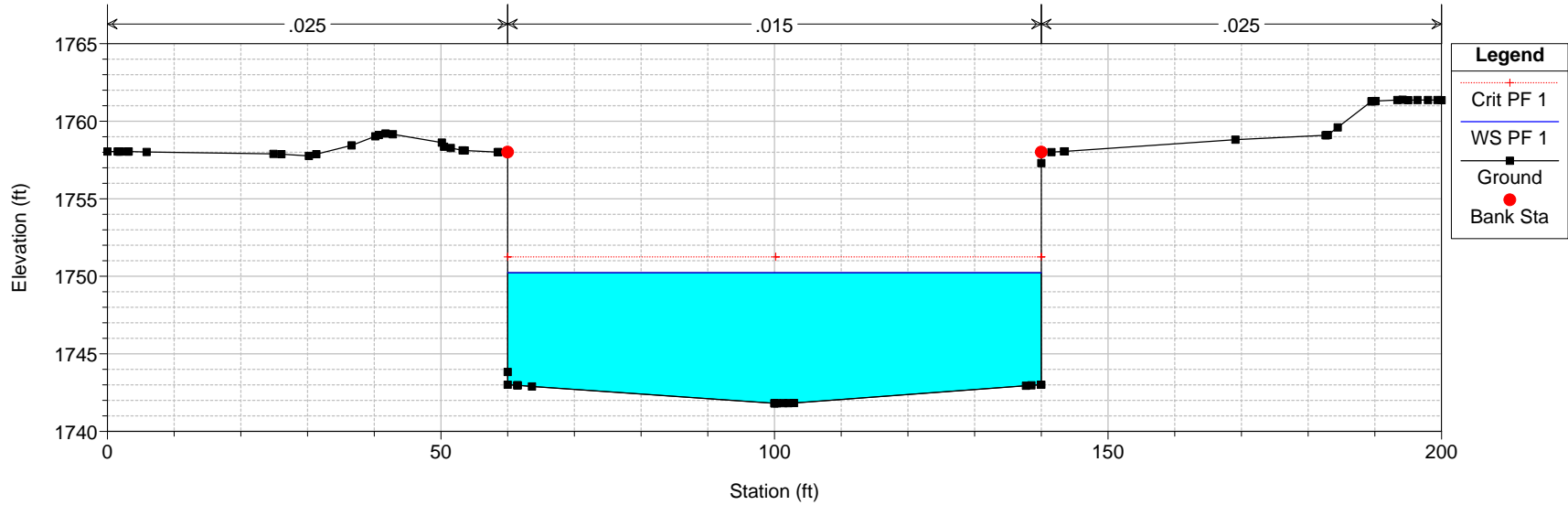
River = Las Vegas Wash Reach = LV Wash RS = 1167.1 "LV" 10+50.00 = 1167.1



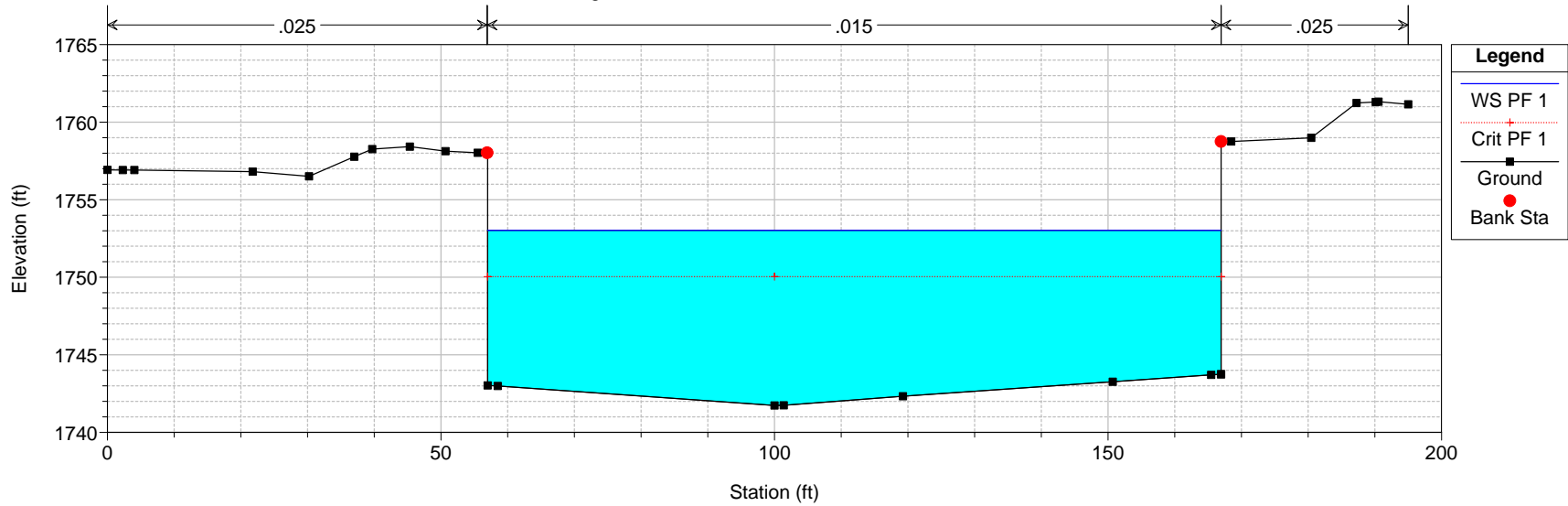




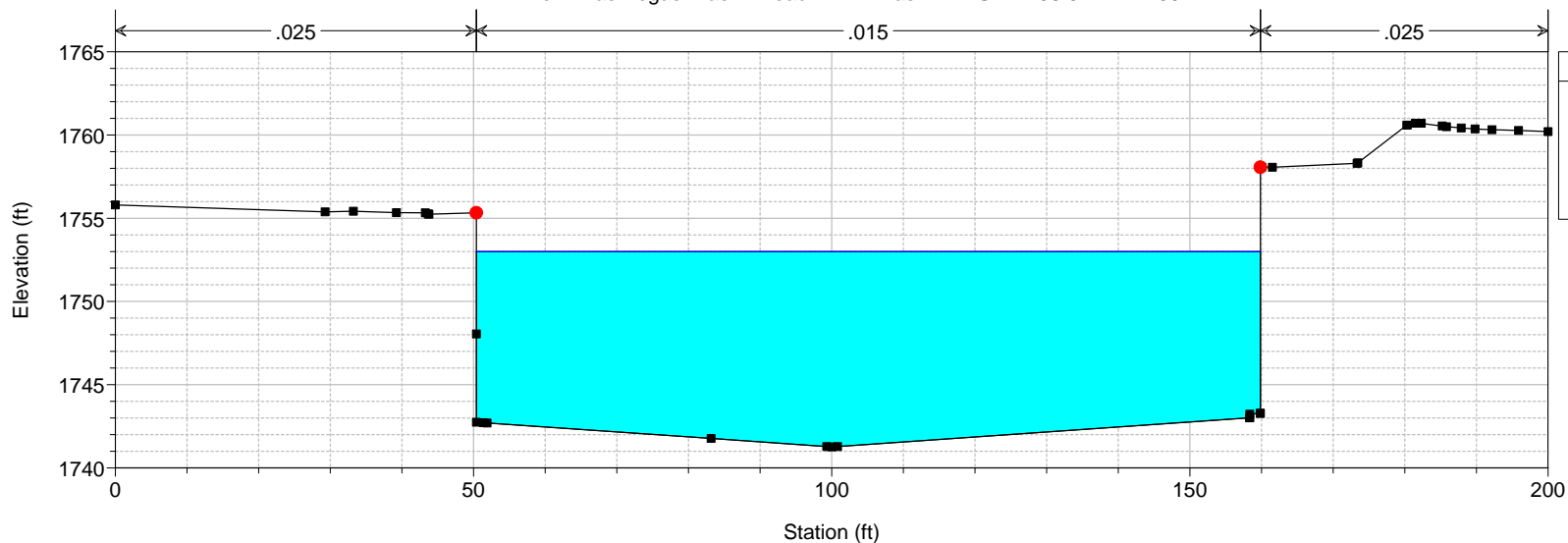
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1159.8 LV 25+21.35



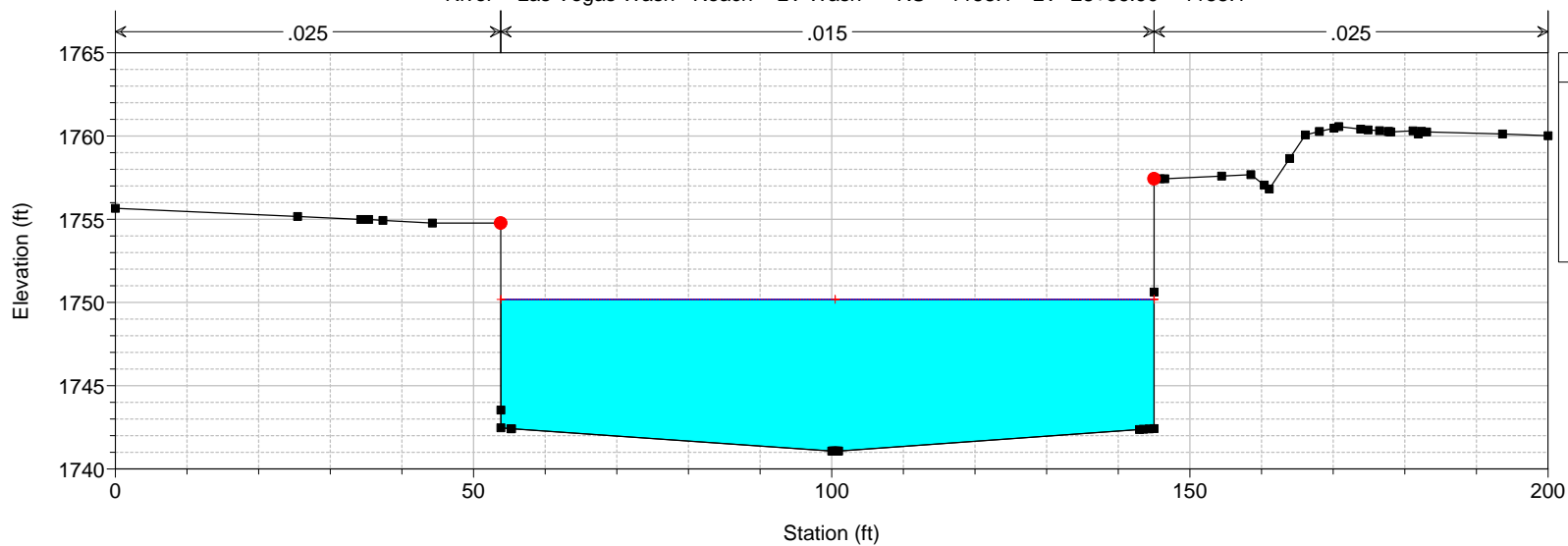
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1159.7 LV 25+51.16

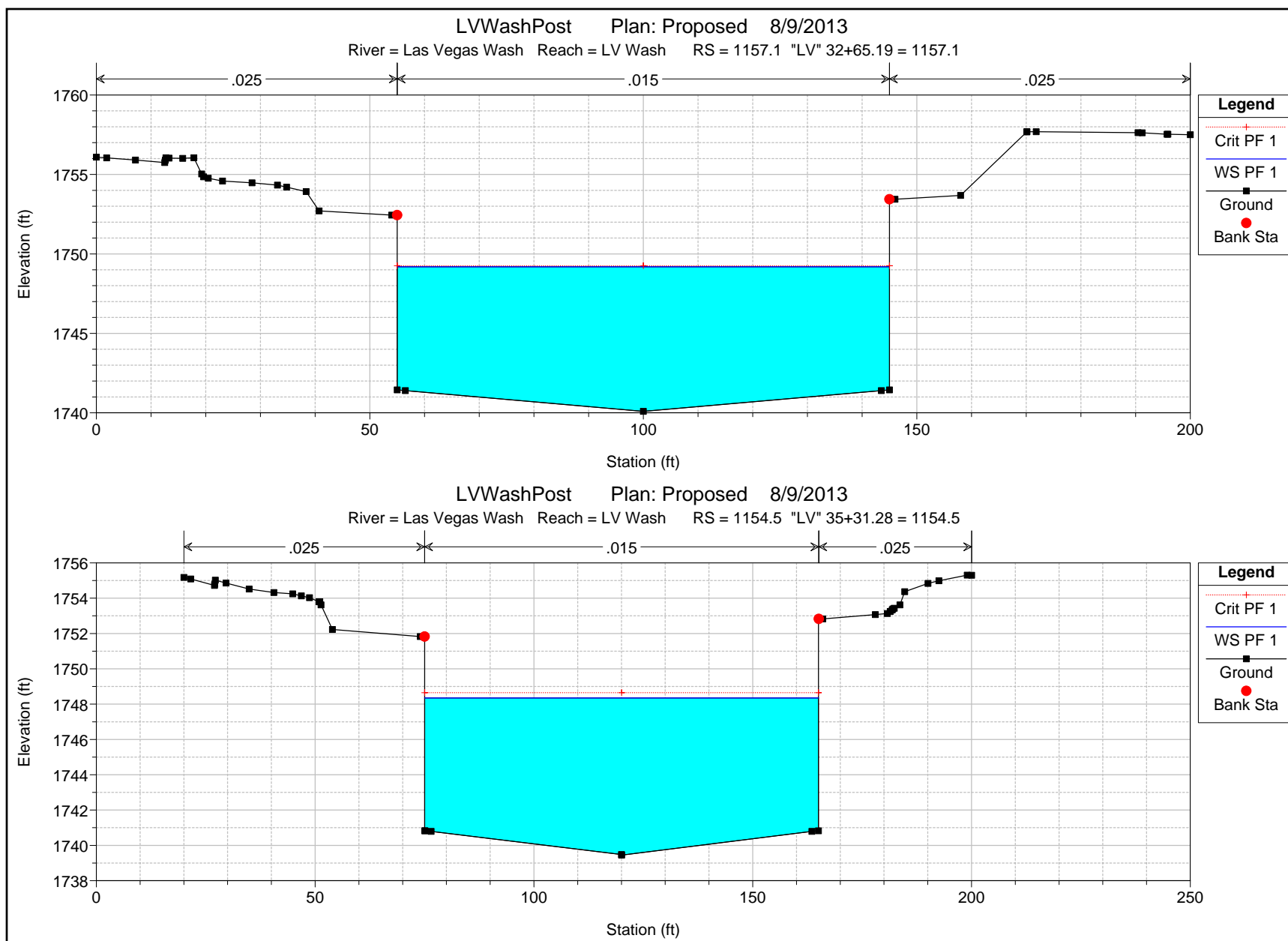


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1158.6 LV 27+60



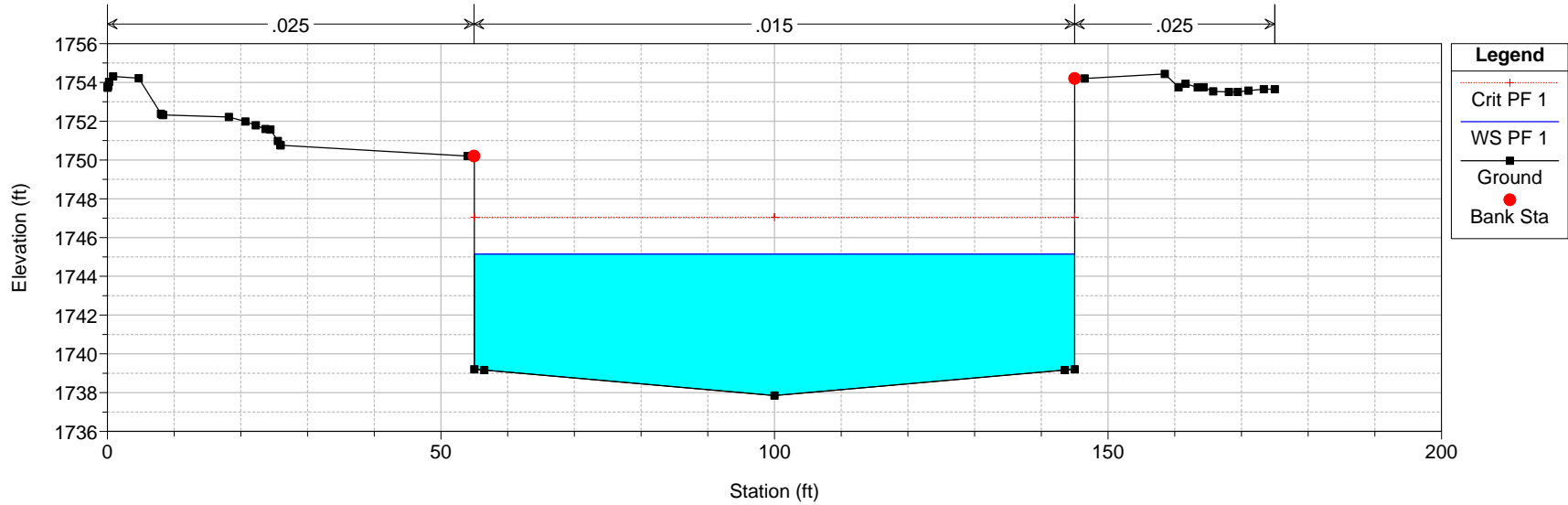
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1158.1 "LV" 28+36.90 = 1158.1





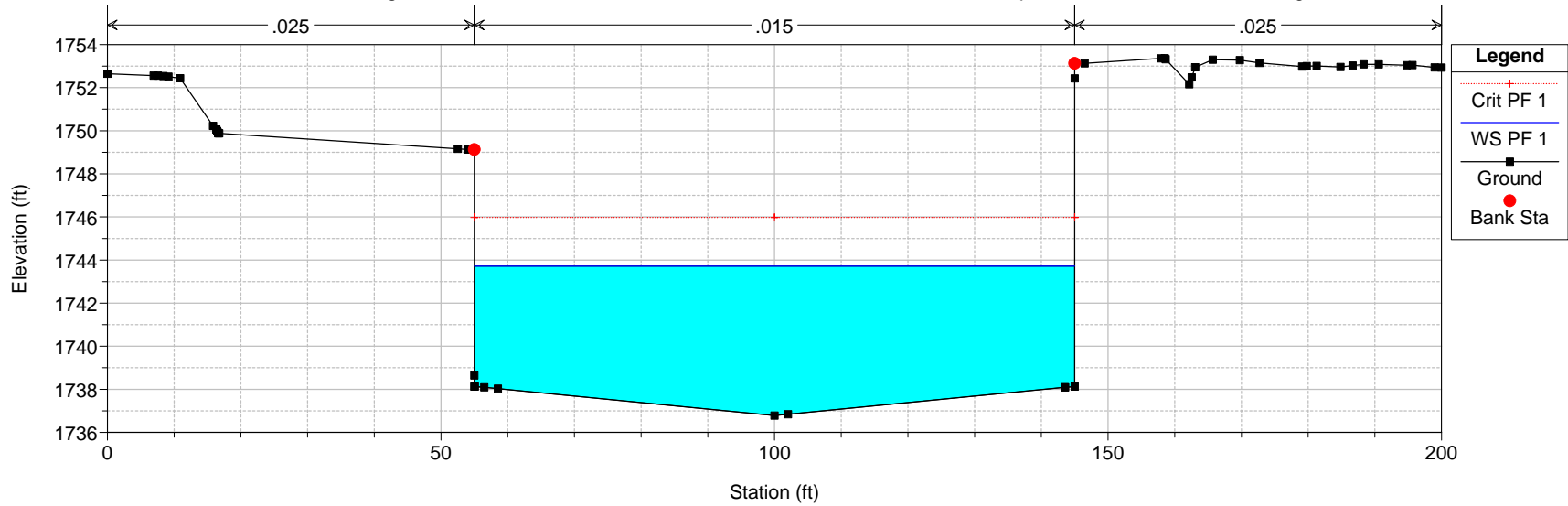
LVWashPost Plan: Proposed 8/9/2013

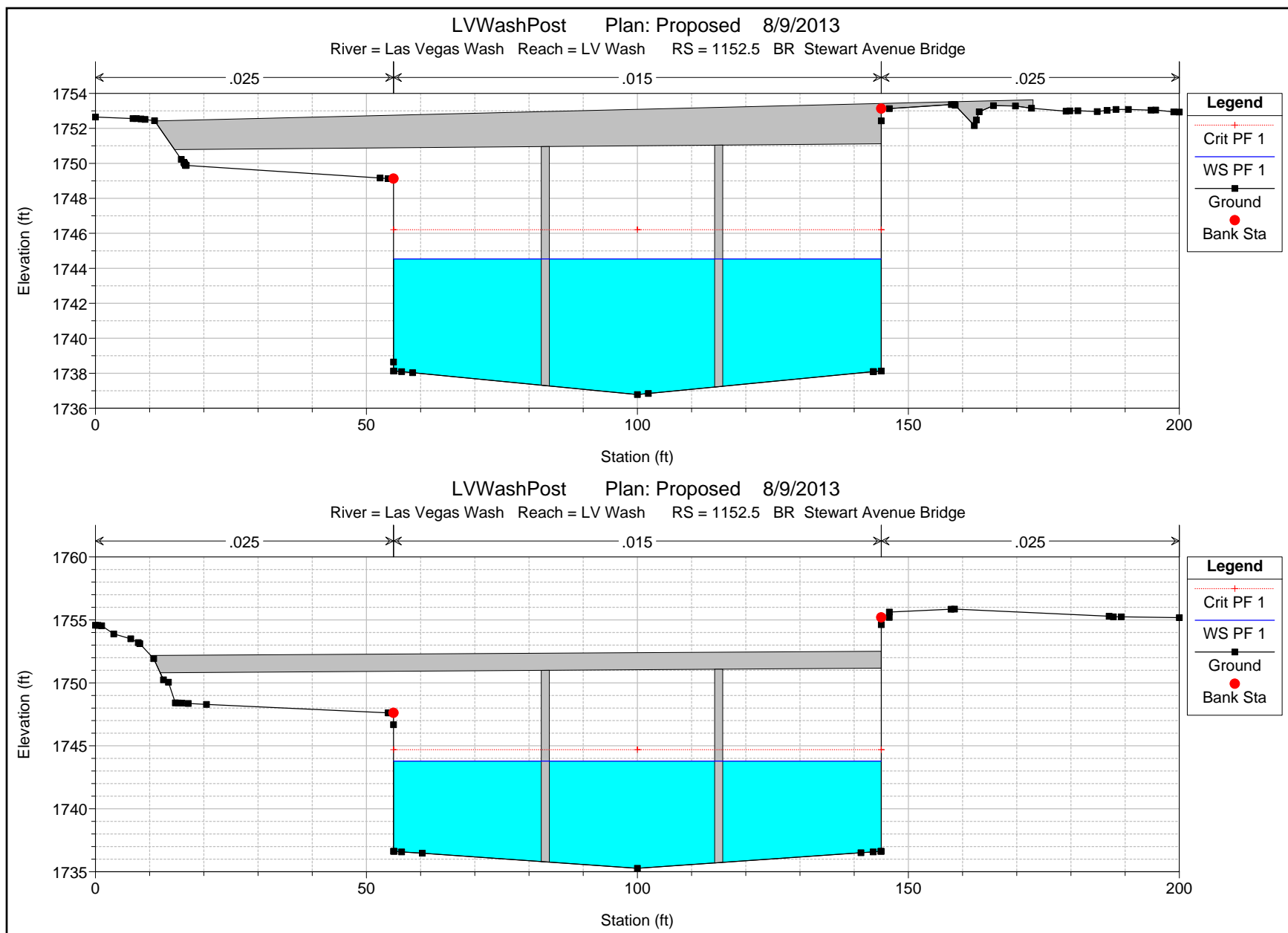
River = Las Vegas Wash Reach = LV Wash RS = 1153.5 LV 36+93.48

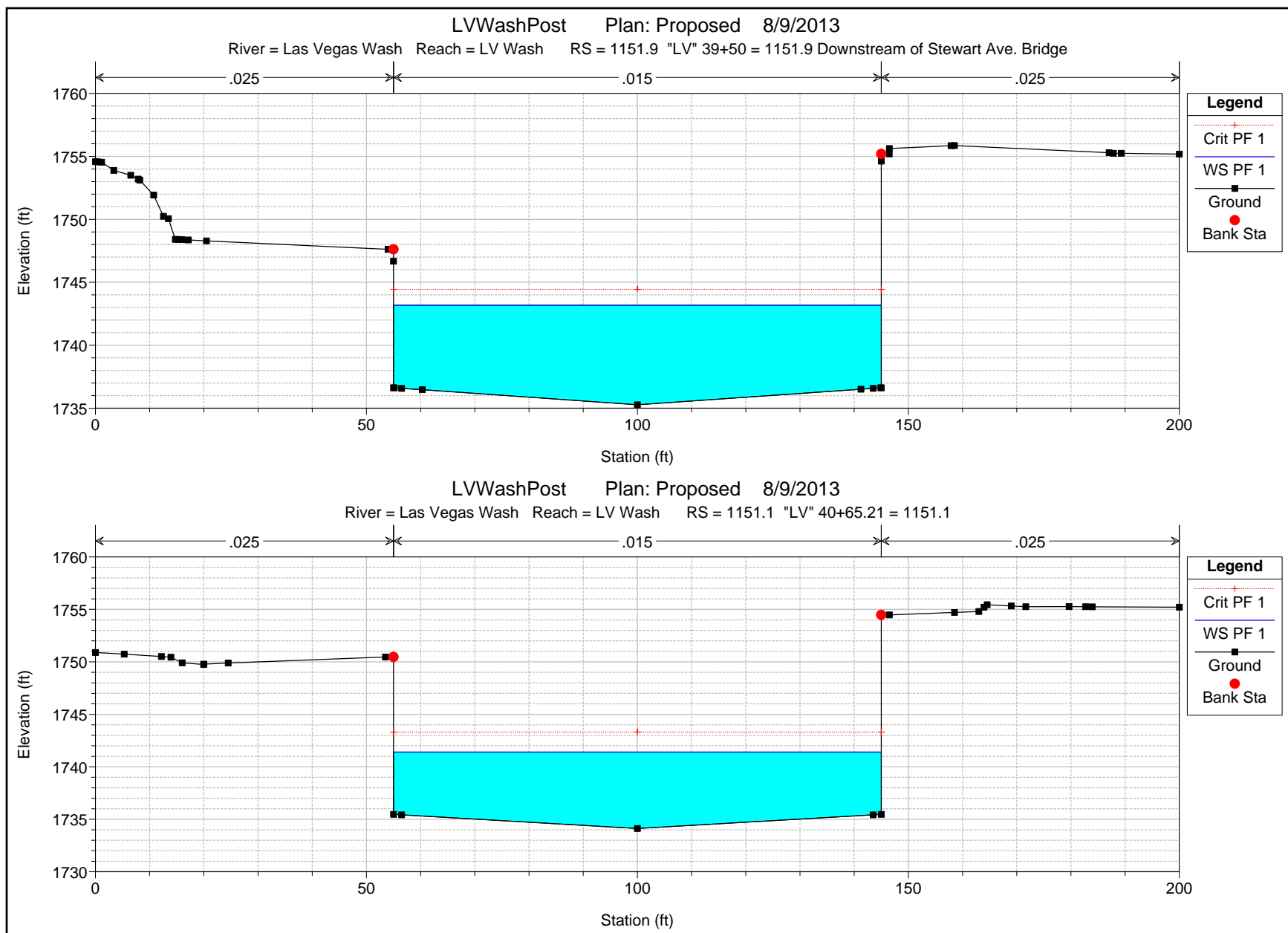


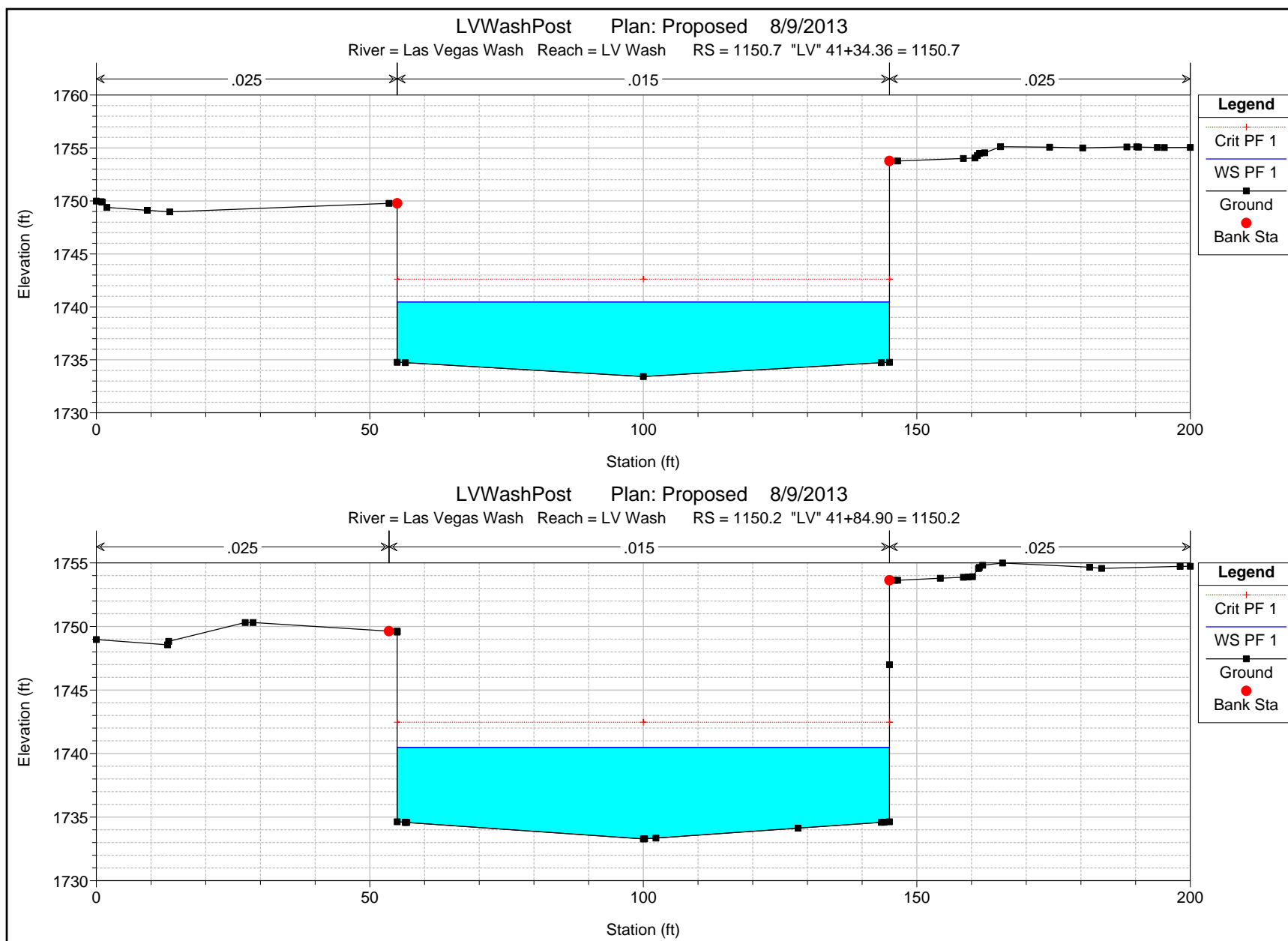
LVWashPost Plan: Proposed 8/9/2013

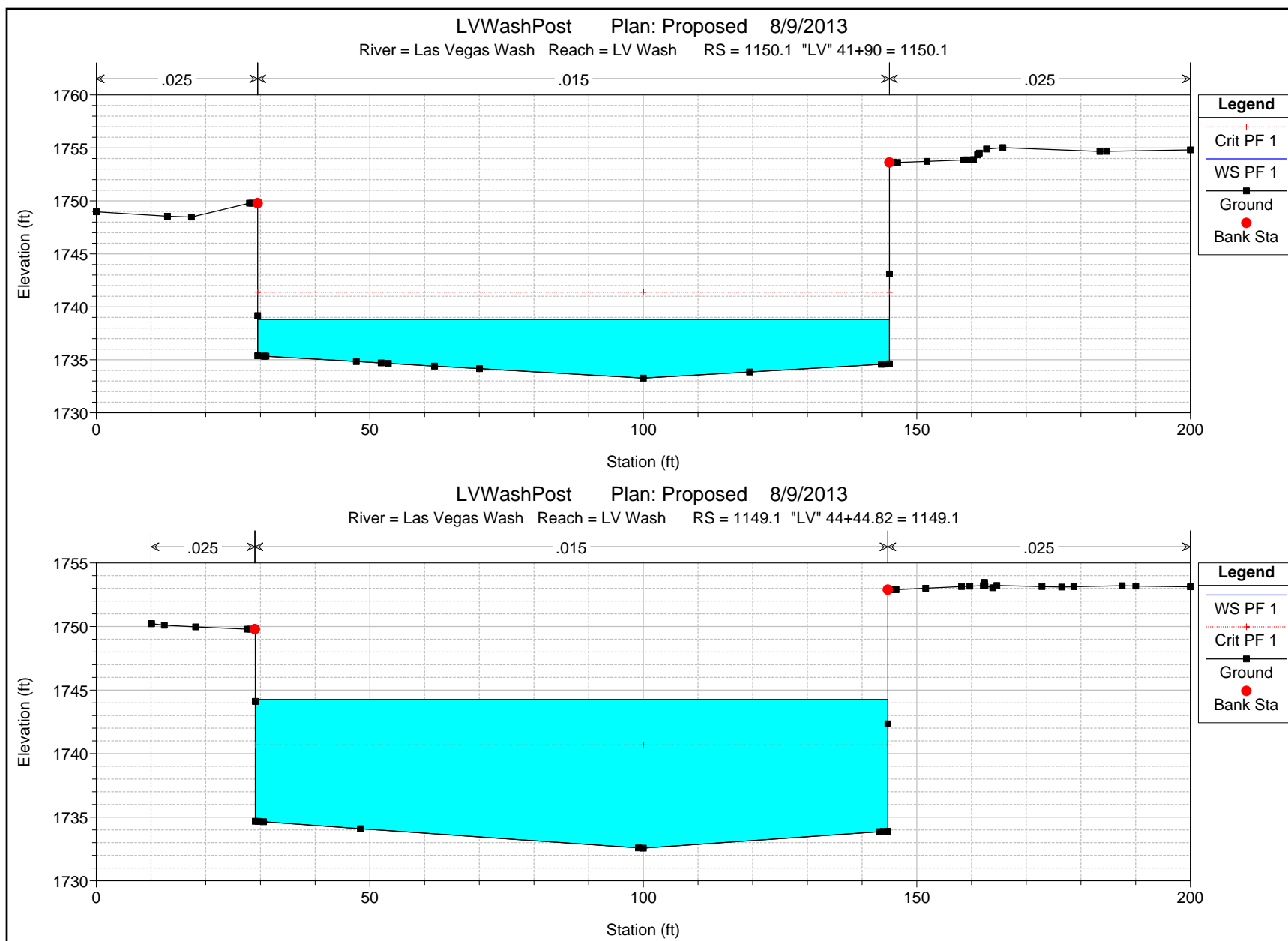
River = Las Vegas Wash Reach = LV Wash RS = 1152.95 "LV" 38+00 = 1152.95 Upstream of Stewart Avenue Bridge

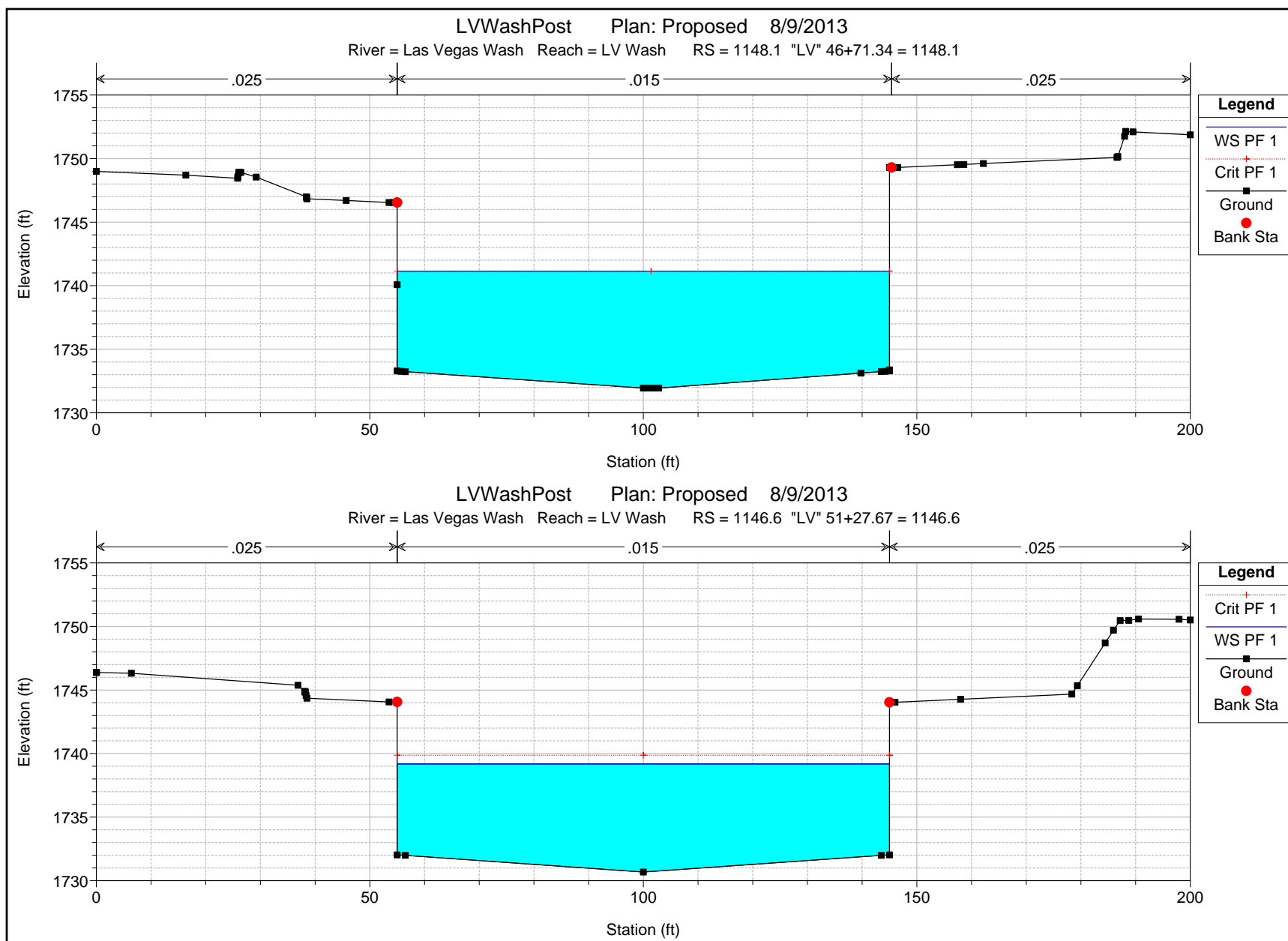


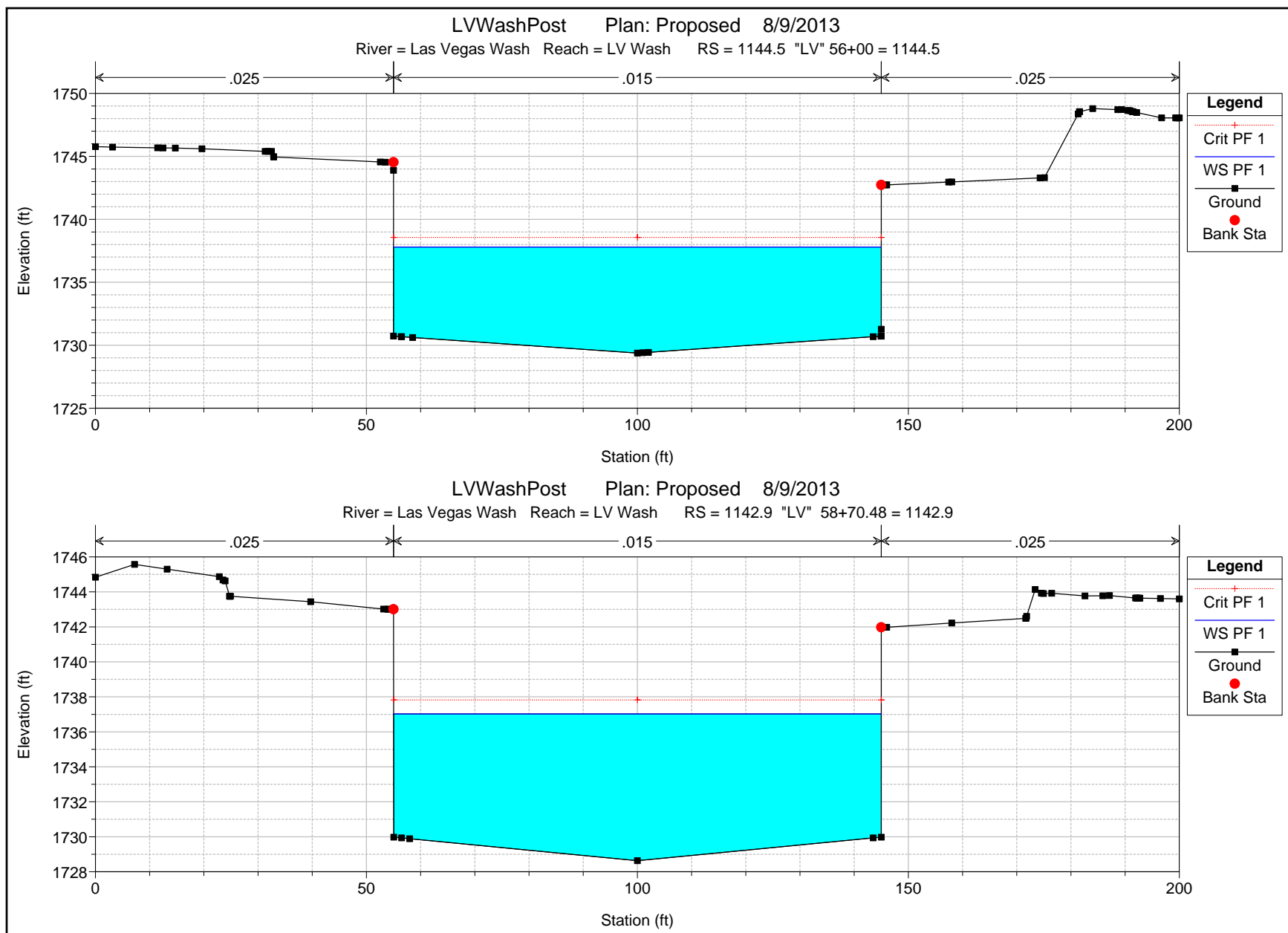


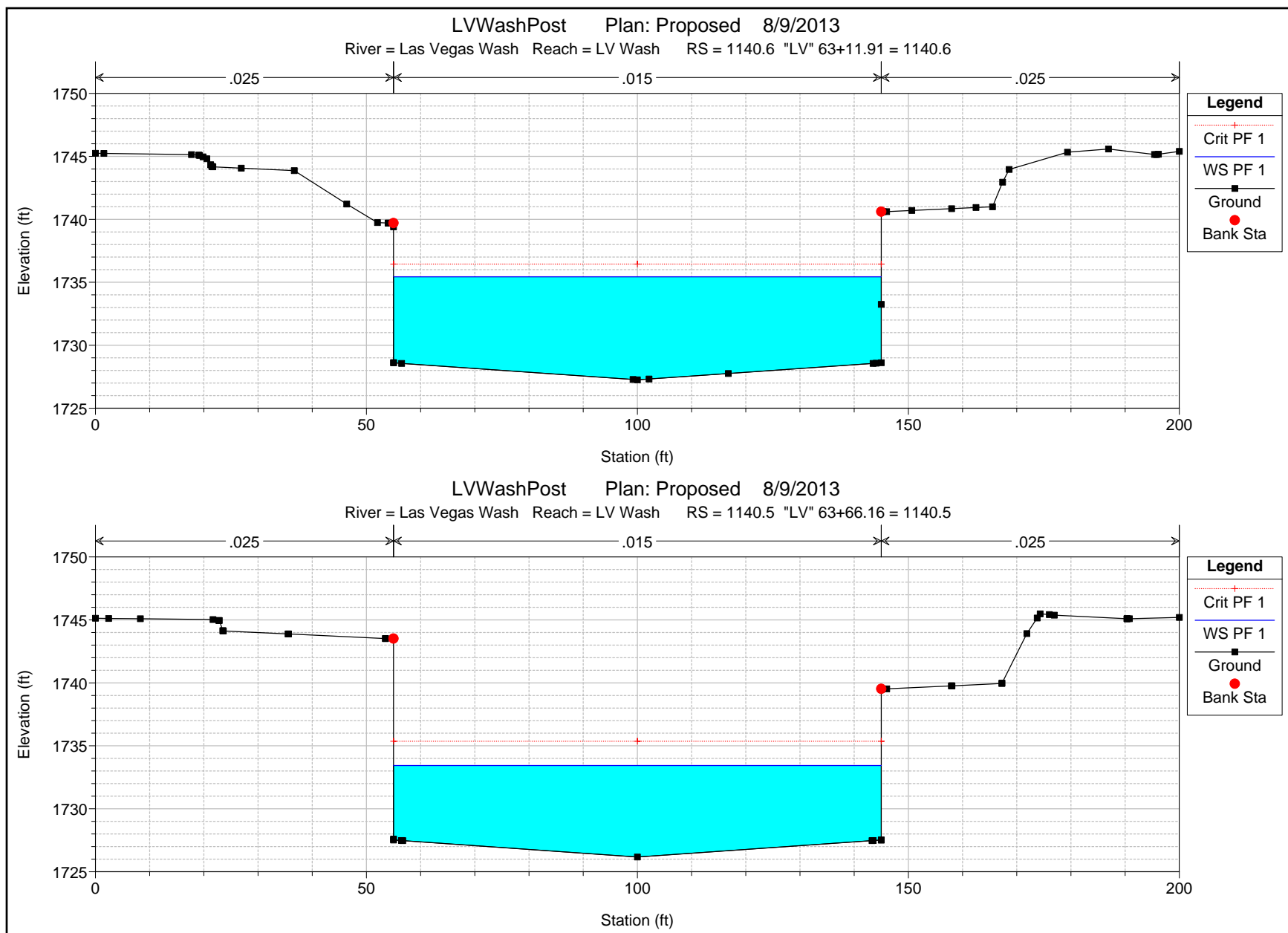


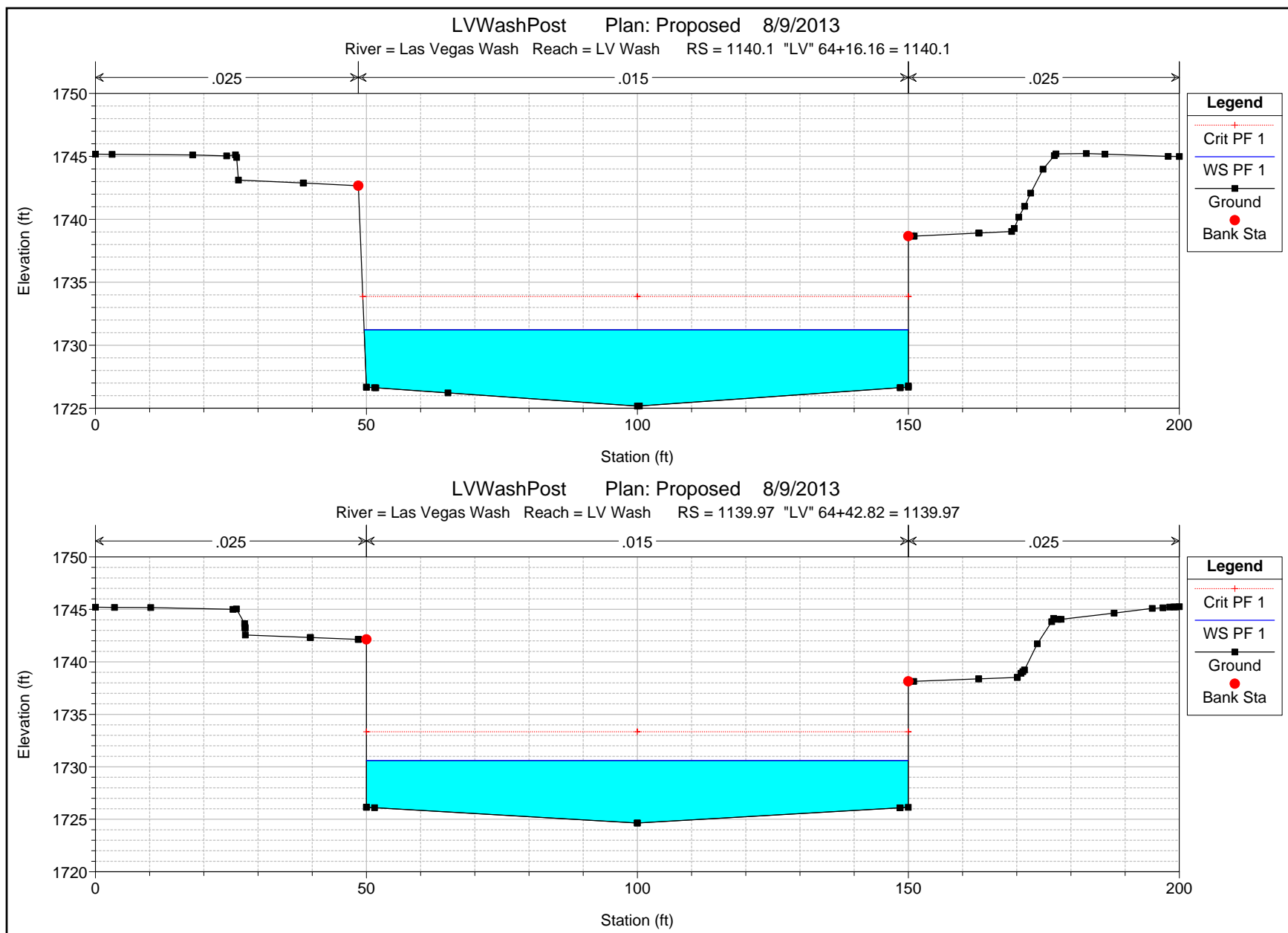






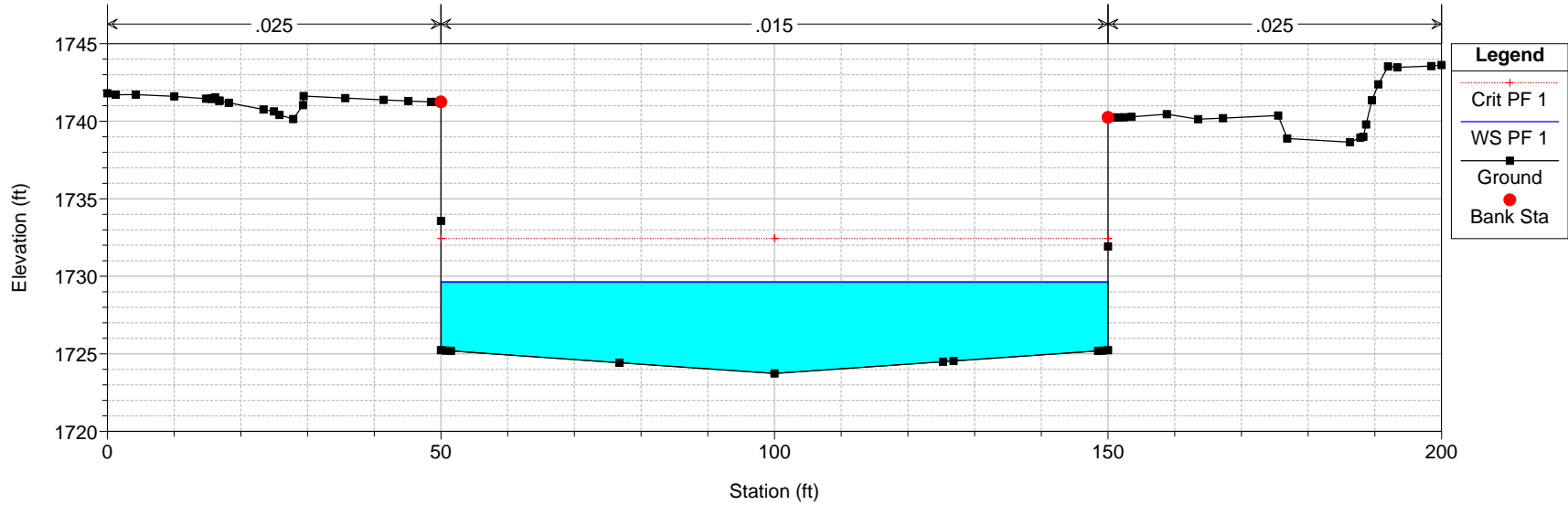






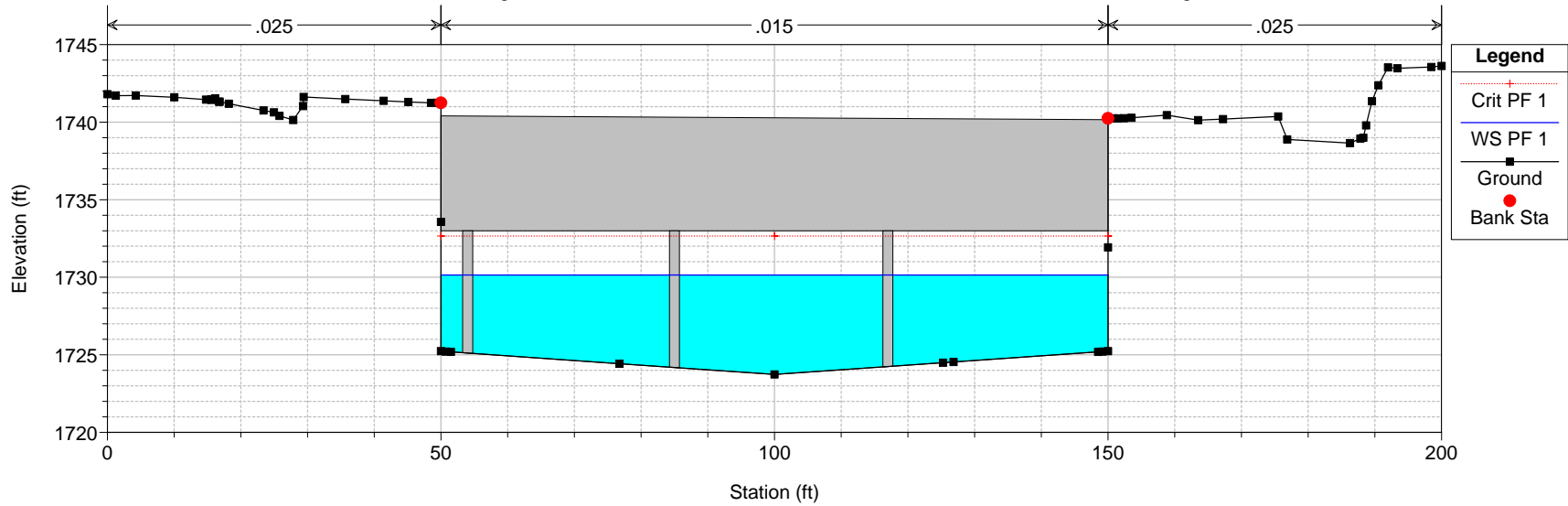
LVWashPost Plan: Proposed 8/9/2013

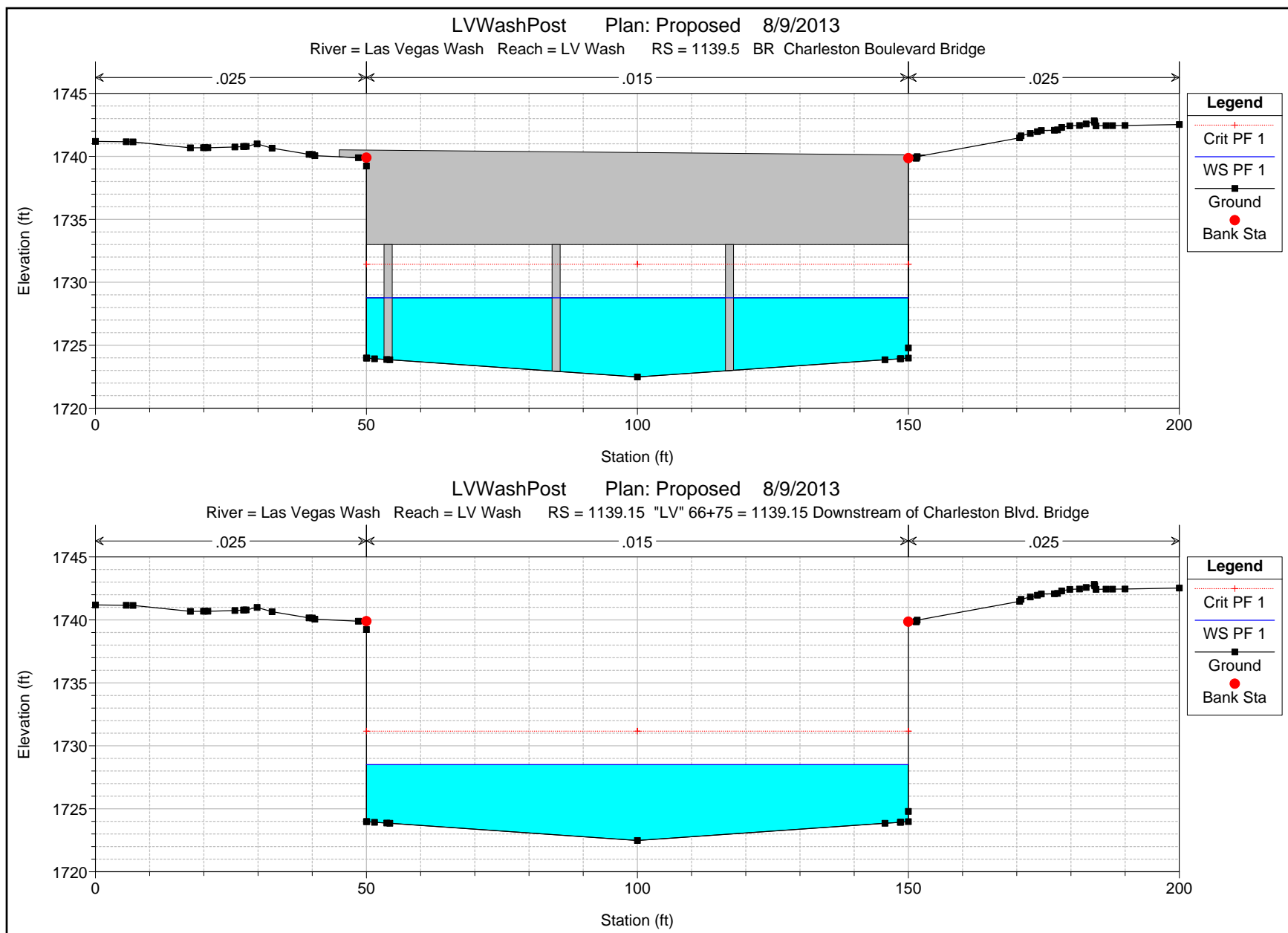
River = Las Vegas Wash Reach = LV Wash RS = 1139.95 "LV" 65+40 = 1139.95 Upstream of Charleston Blvd. bridge

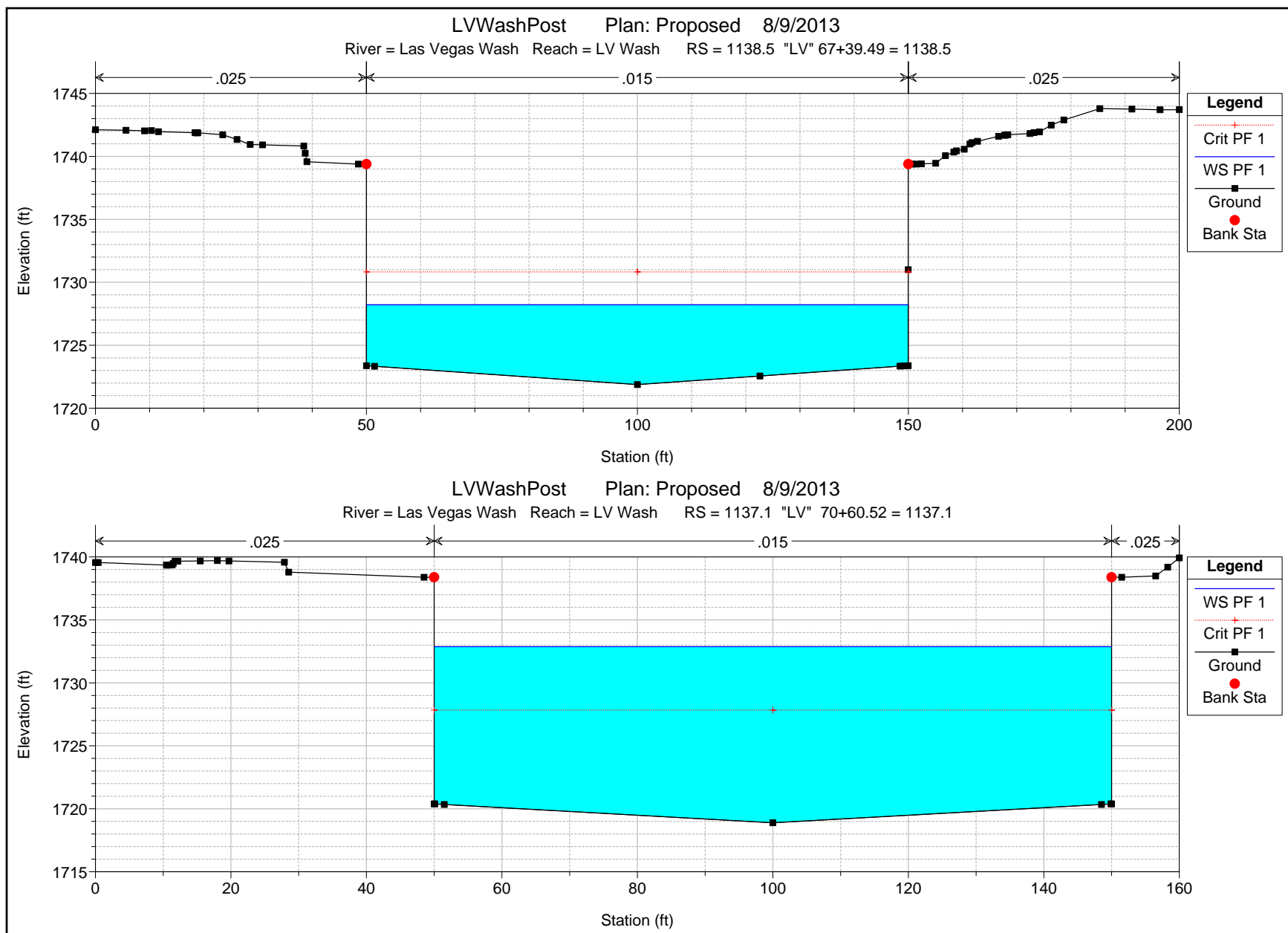


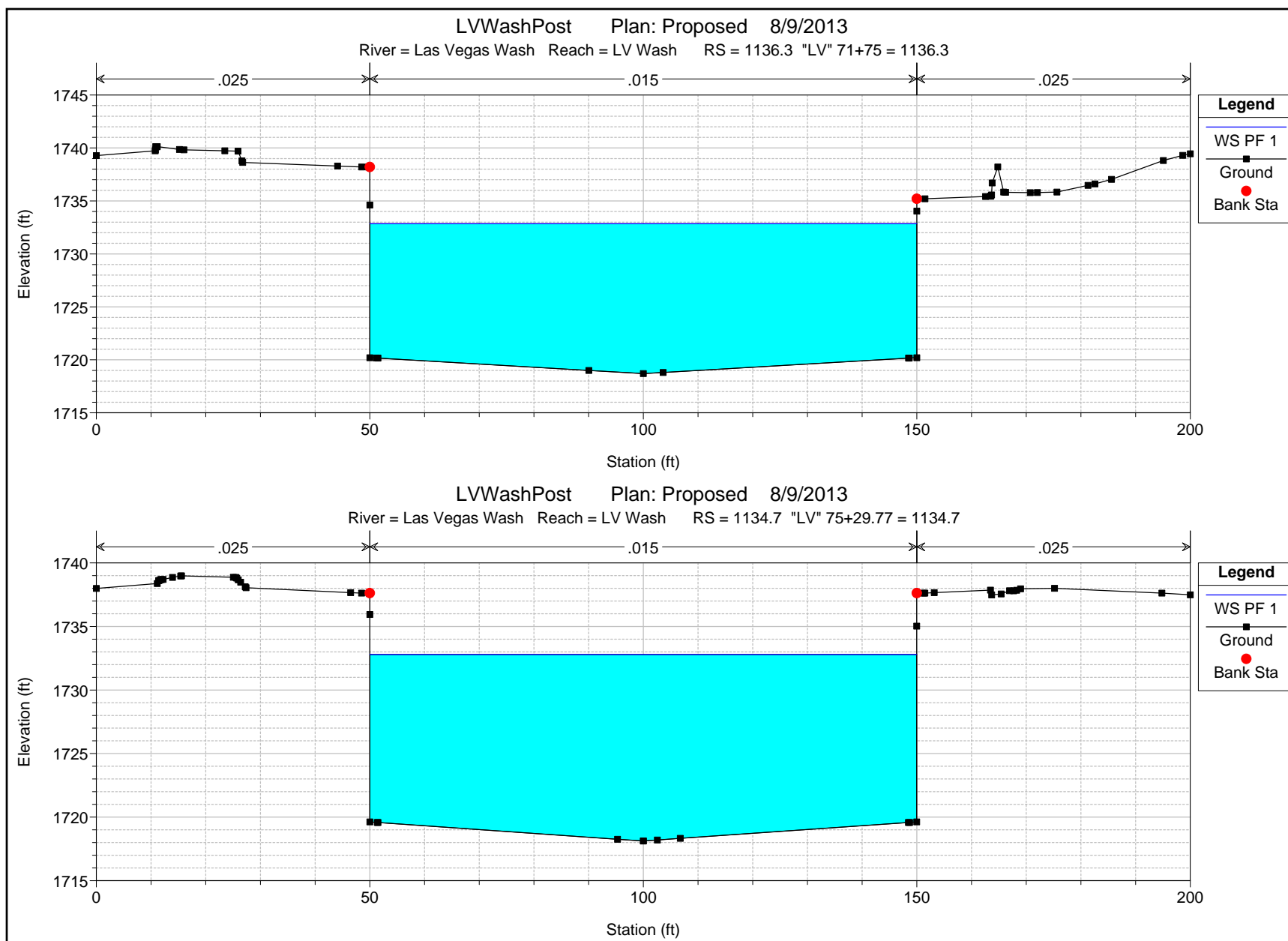
LVWashPost Plan: Proposed 8/9/2013

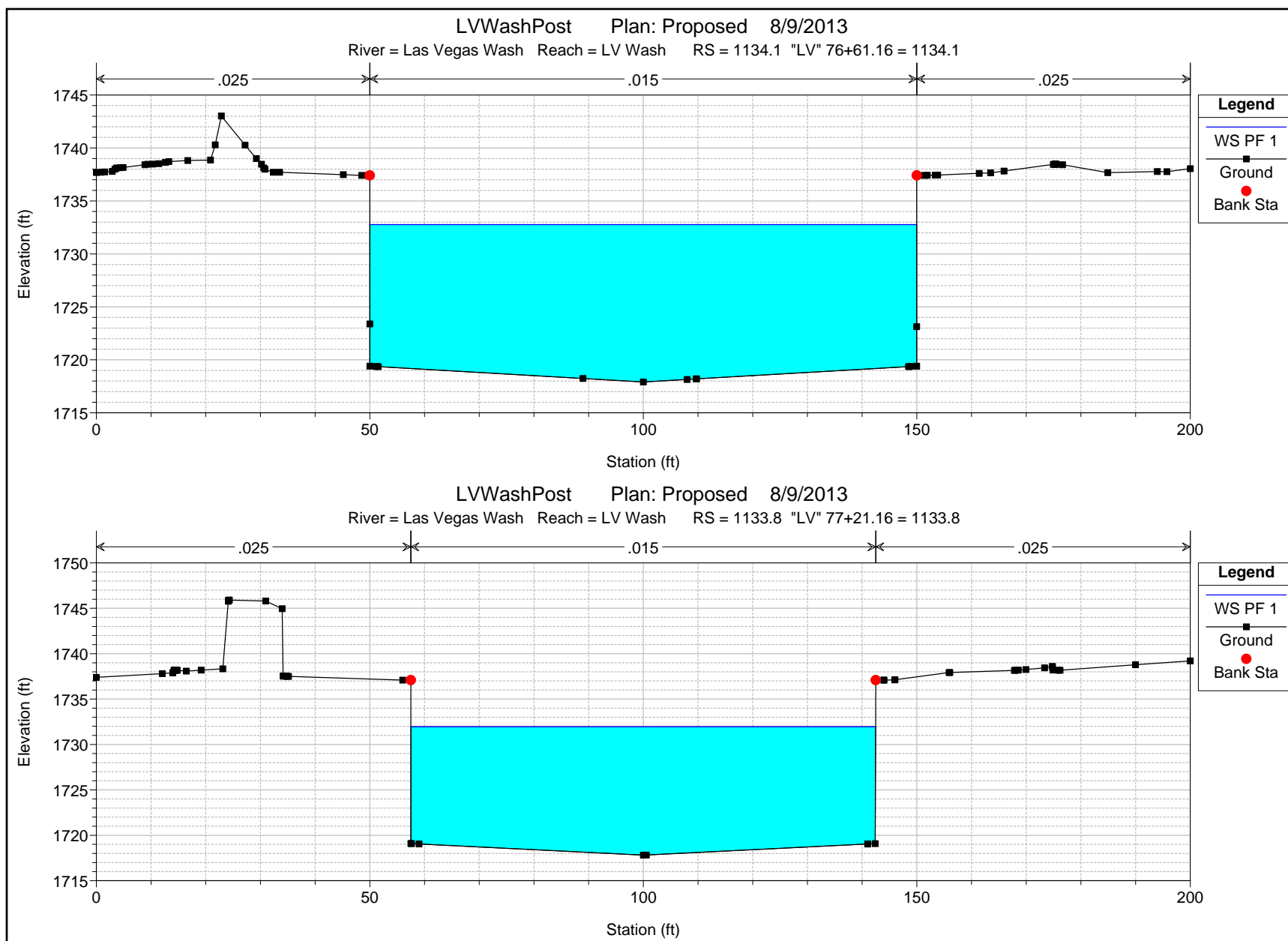
River = Las Vegas Wash Reach = LV Wash RS = 1139.5 BR Charleston Boulevard Bridge

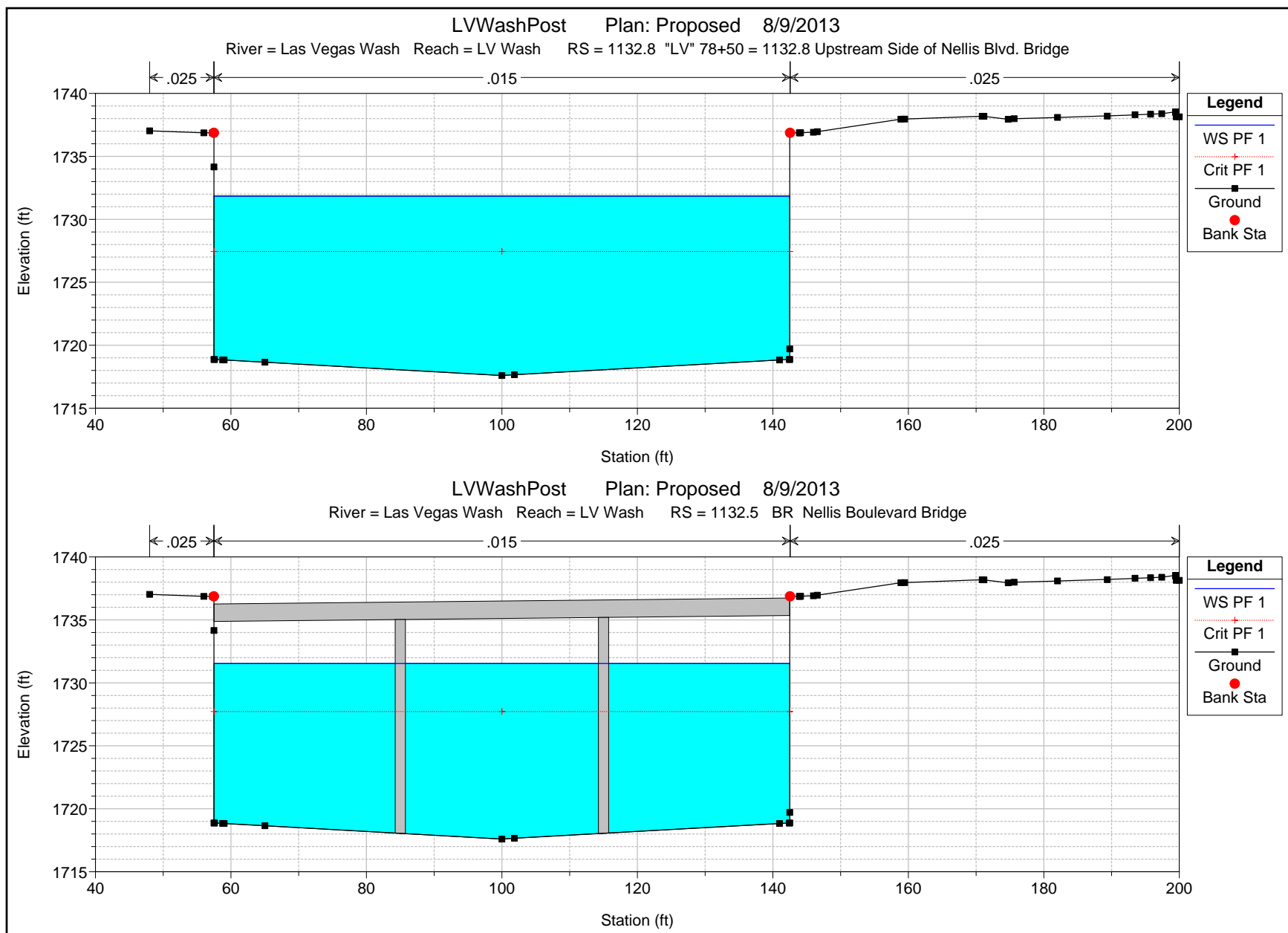


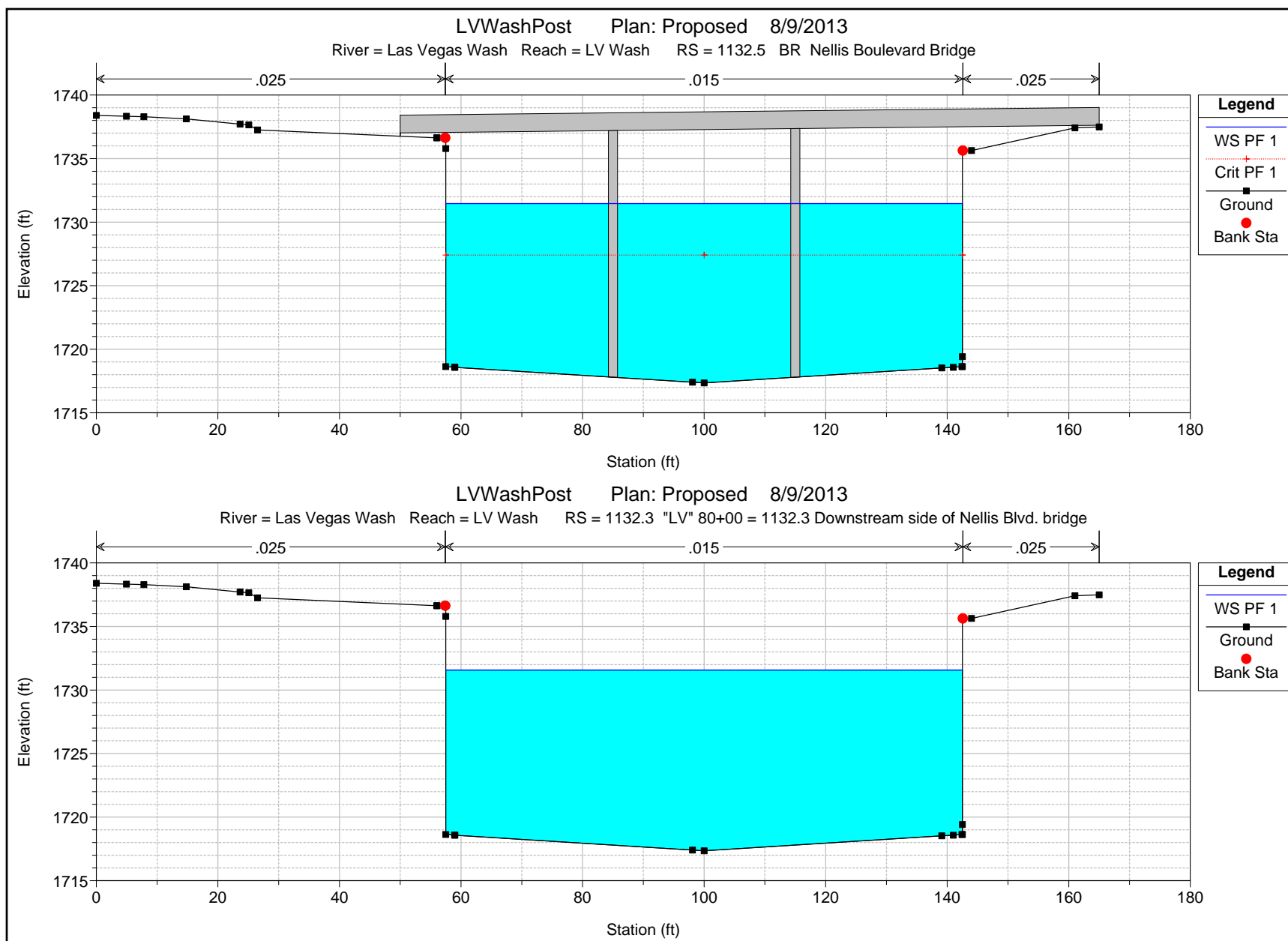


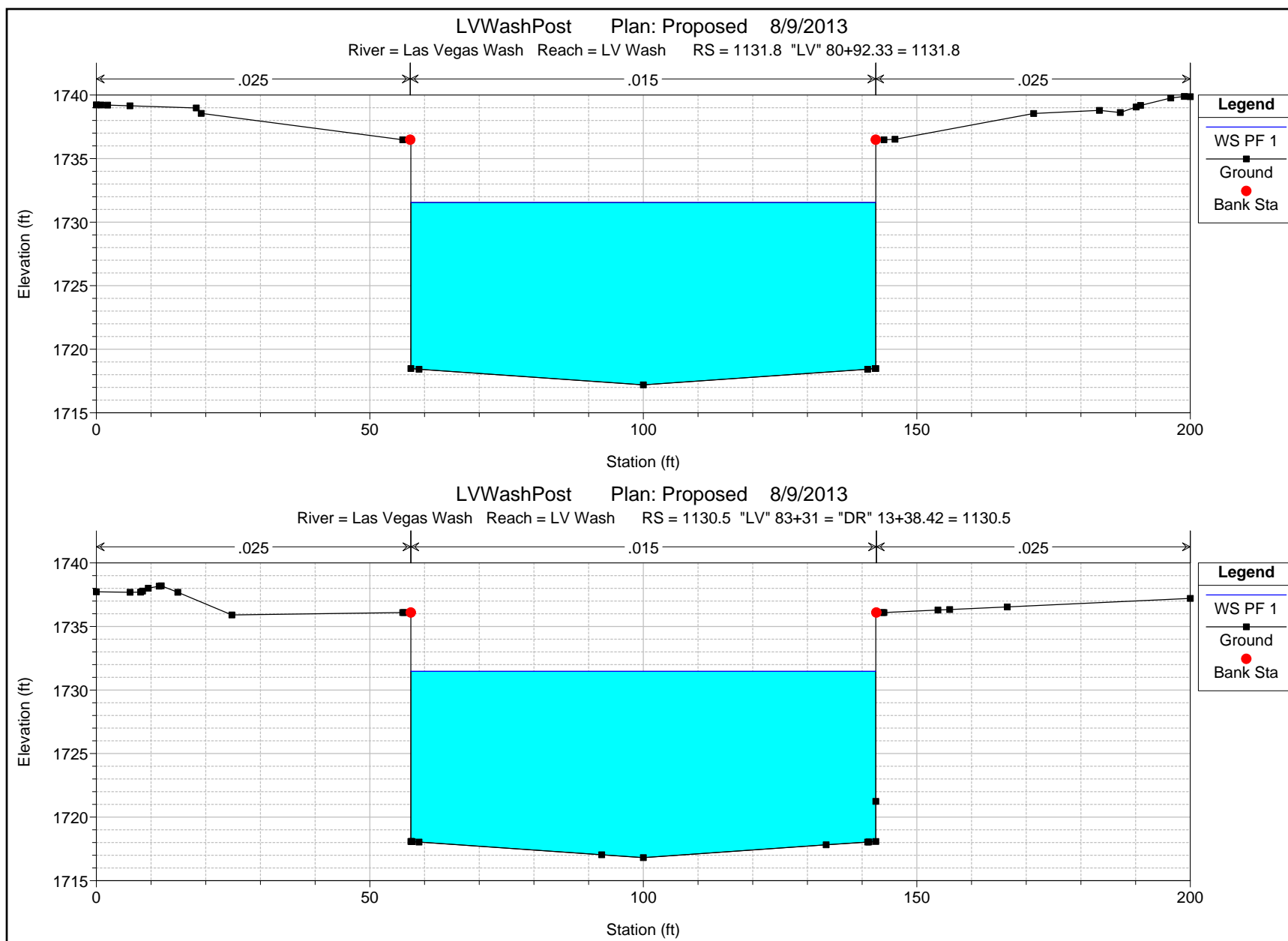


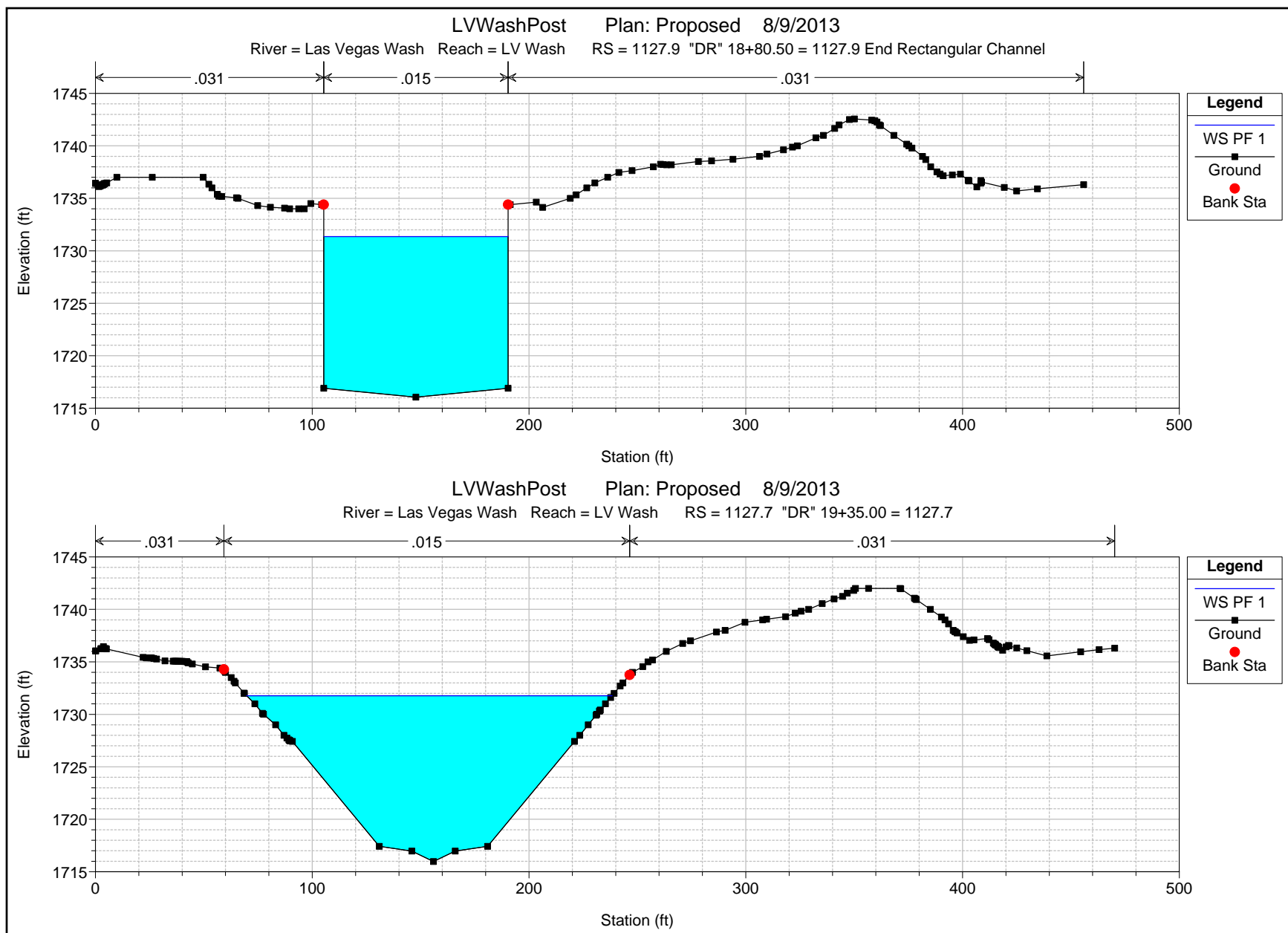


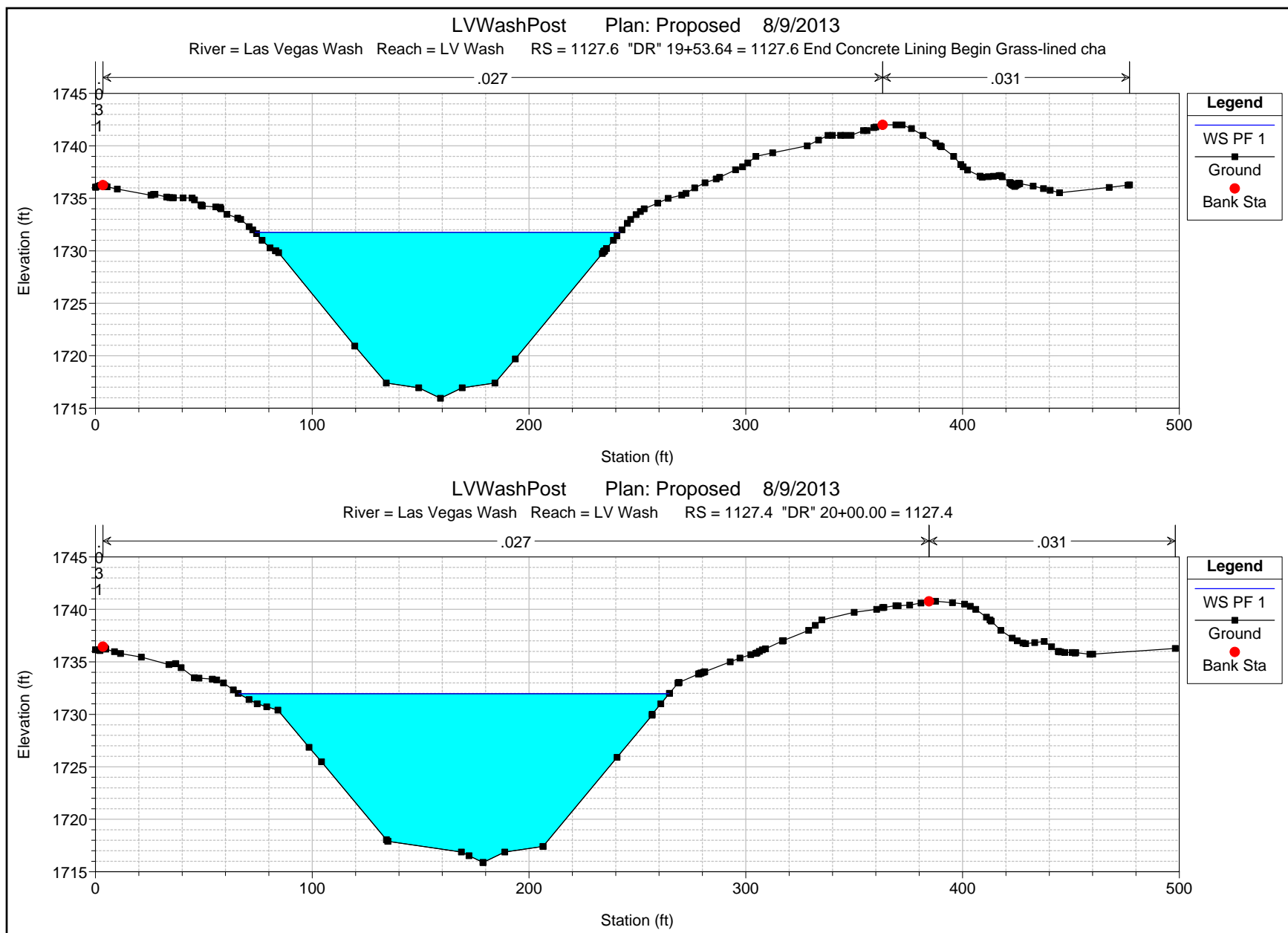


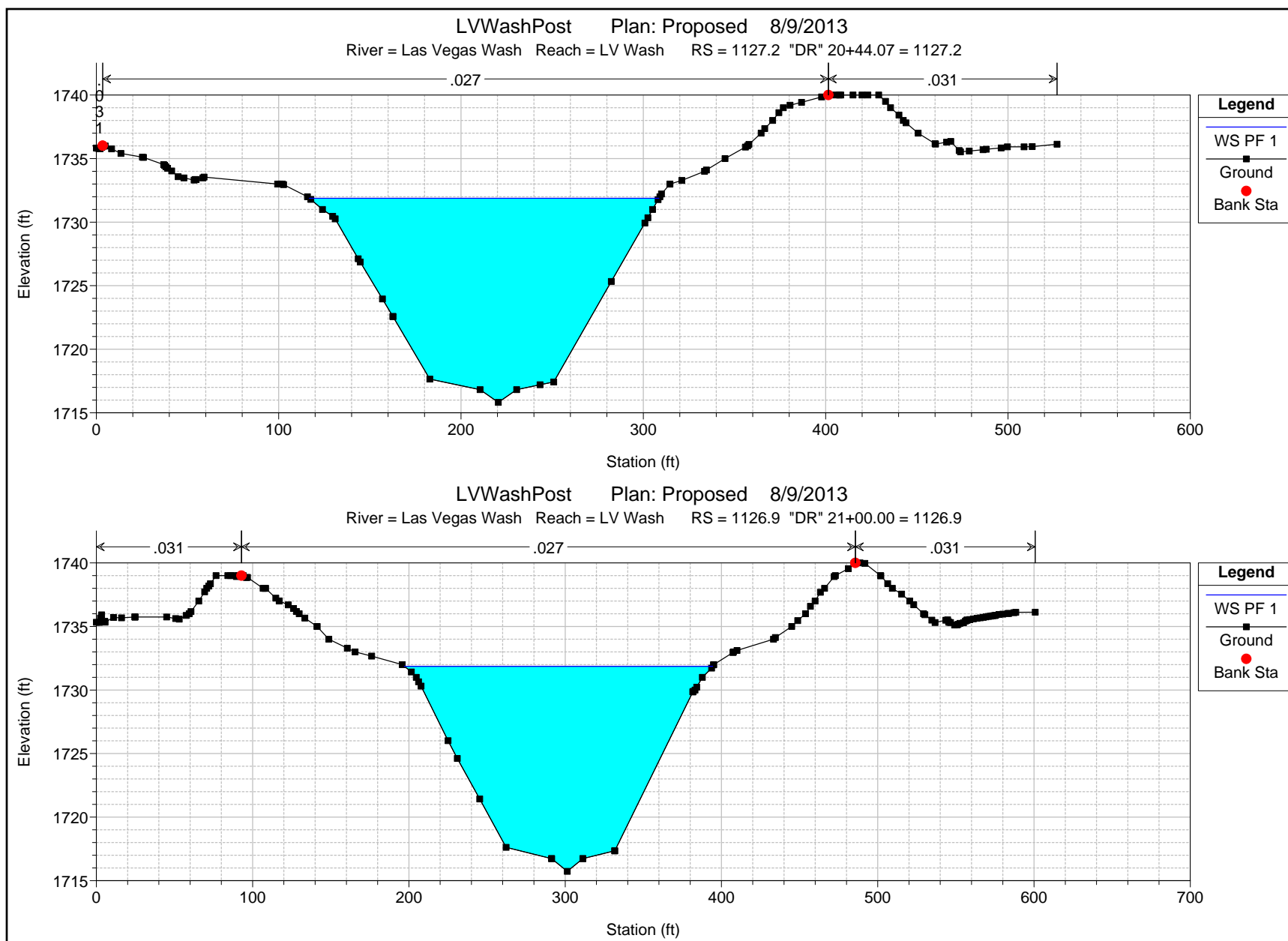


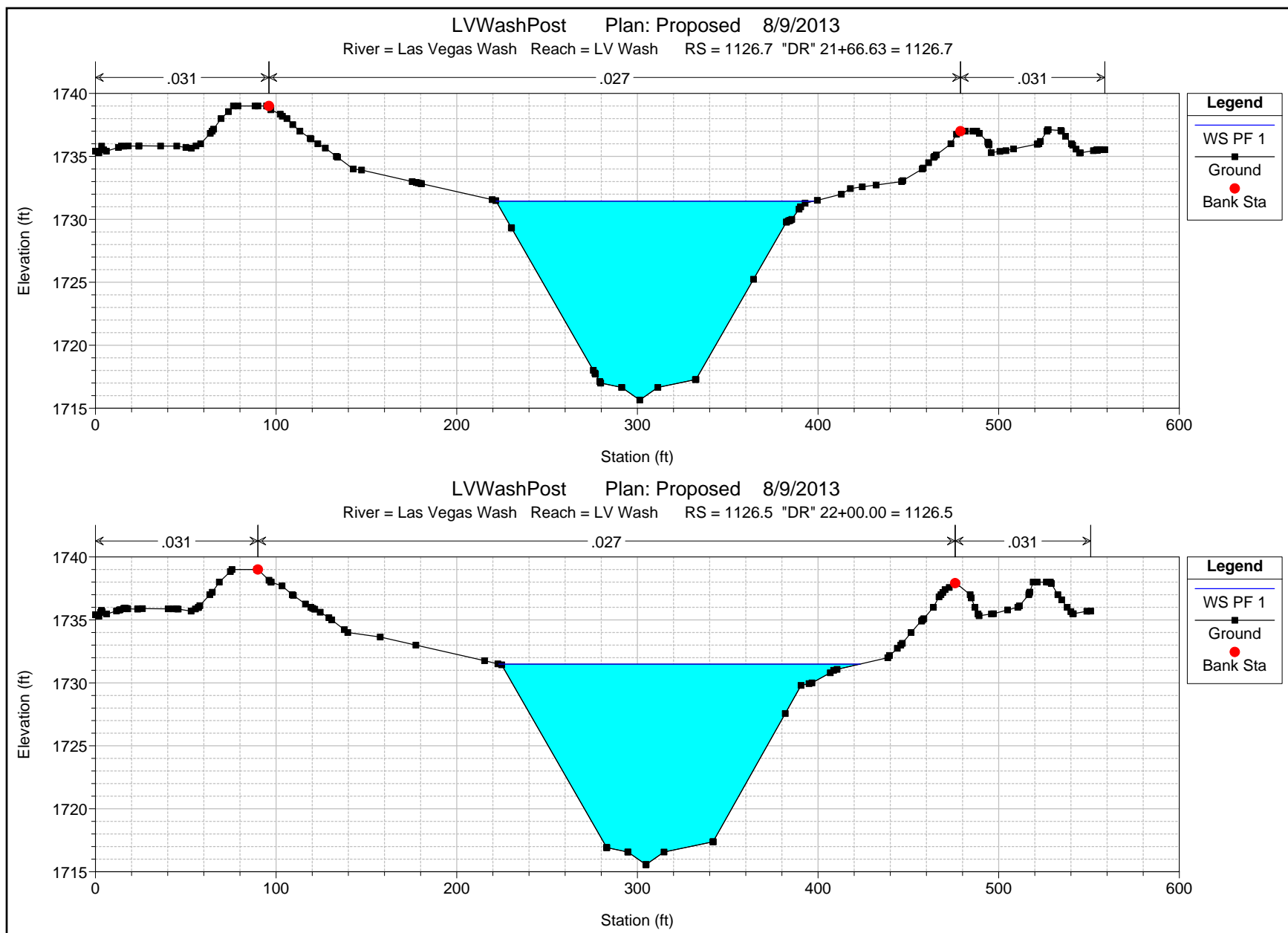




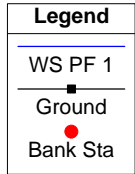
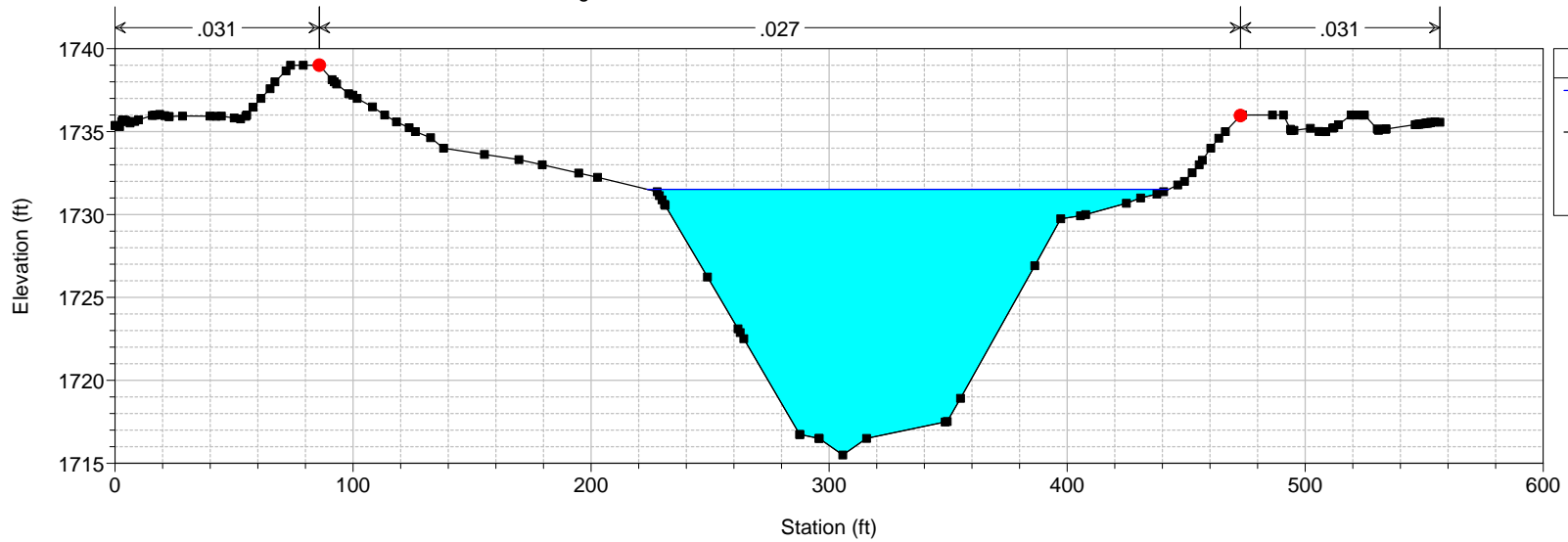




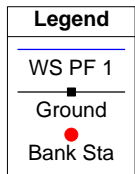
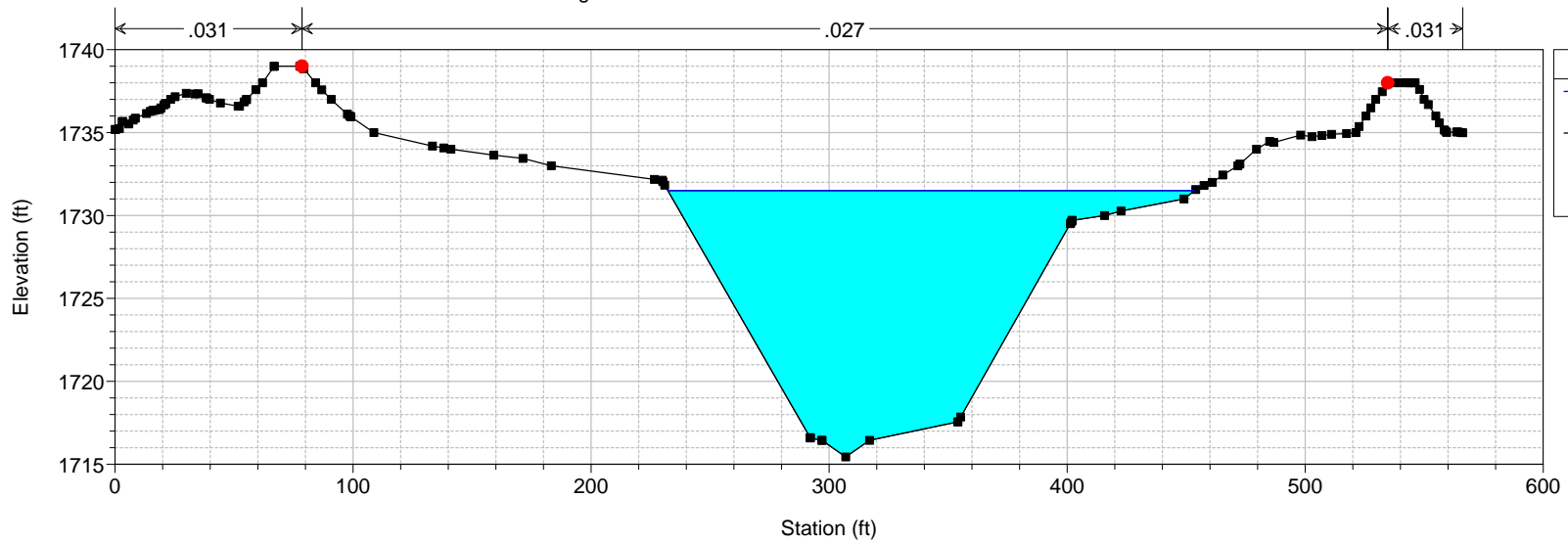




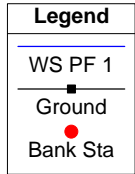
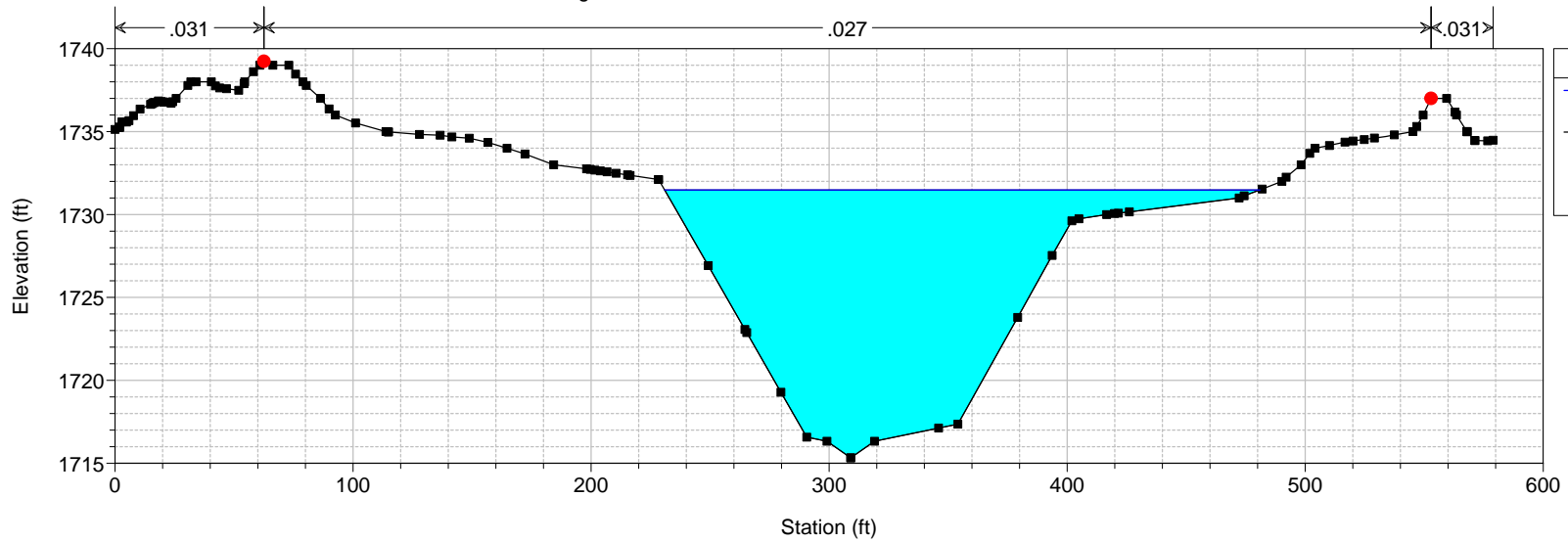
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.3 "DR" 22+27.02 = 1126.3



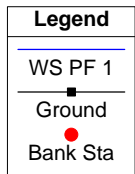
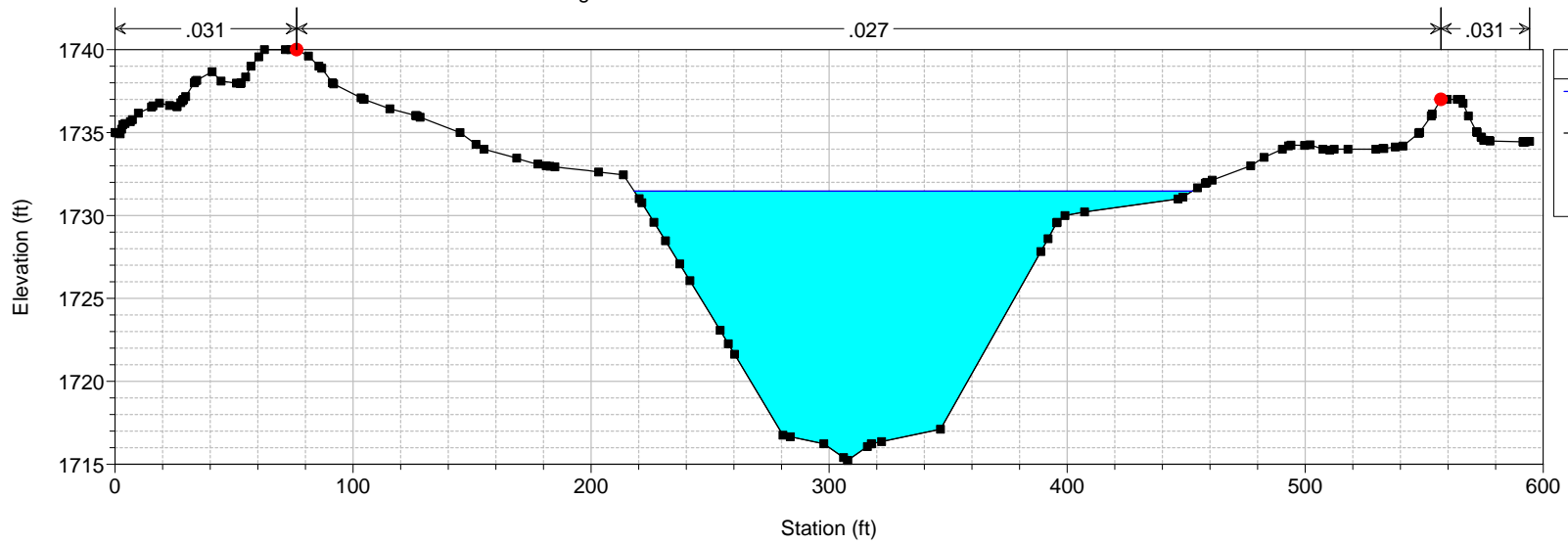
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1126.2 "DR" 22+50.00 = 1126.2



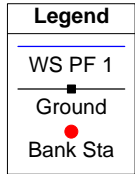
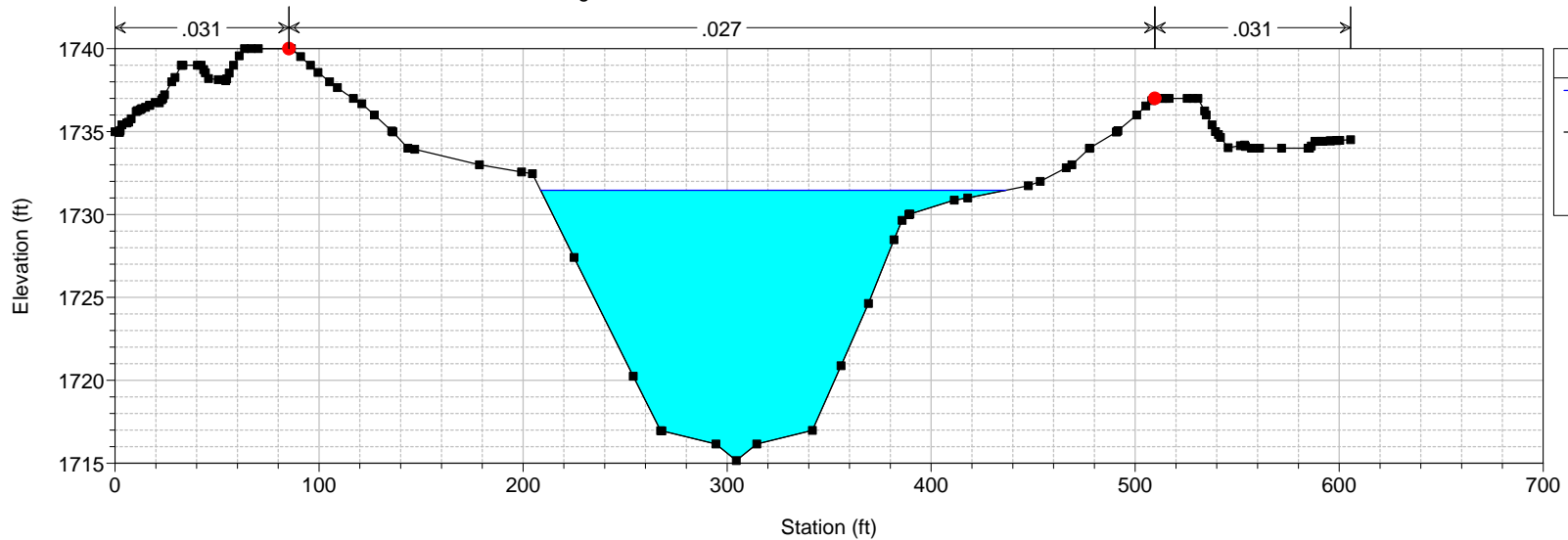
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.9 "DR" 22+97.34 = 1125.9



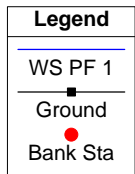
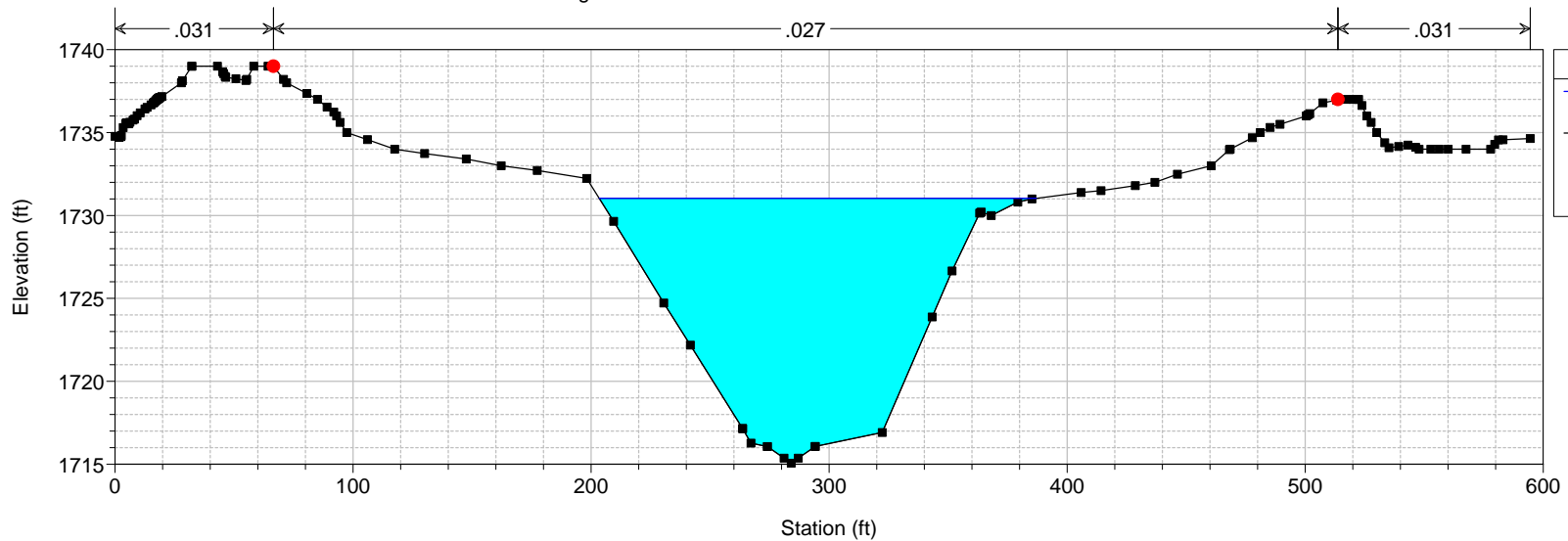
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.8 "DR" 23+31.66 = 1125.8



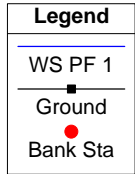
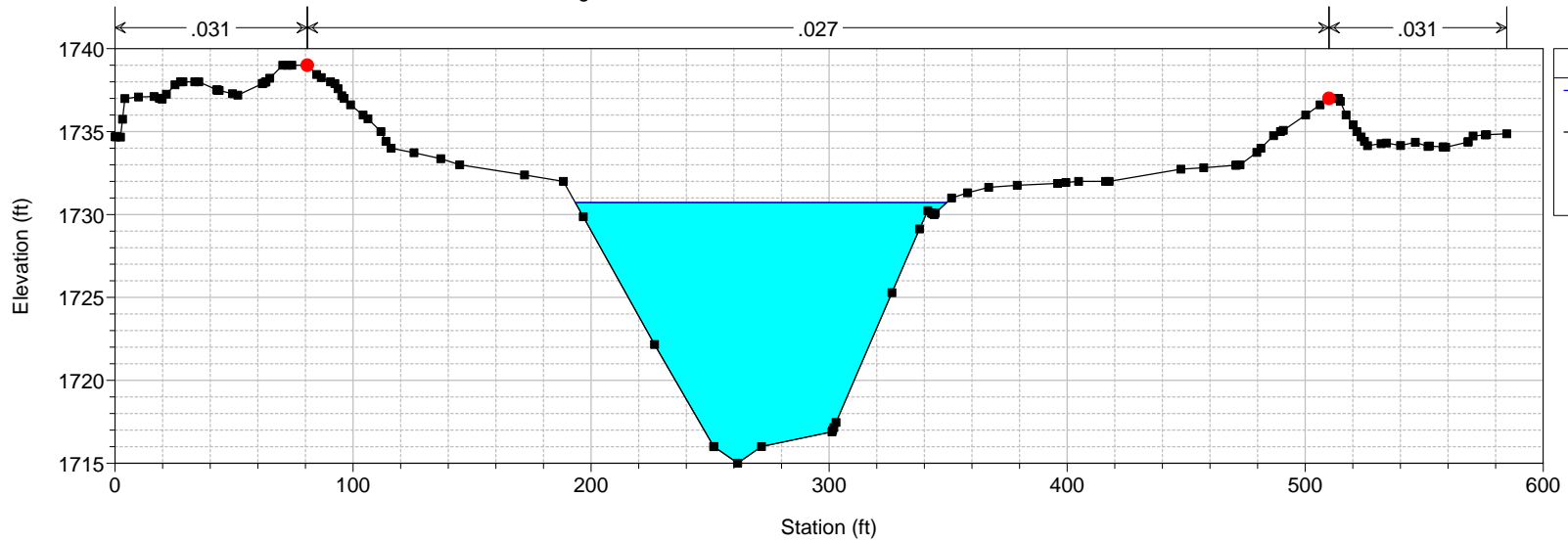
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.7 "DR" 23+65.98 = 1125.7



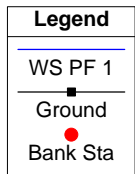
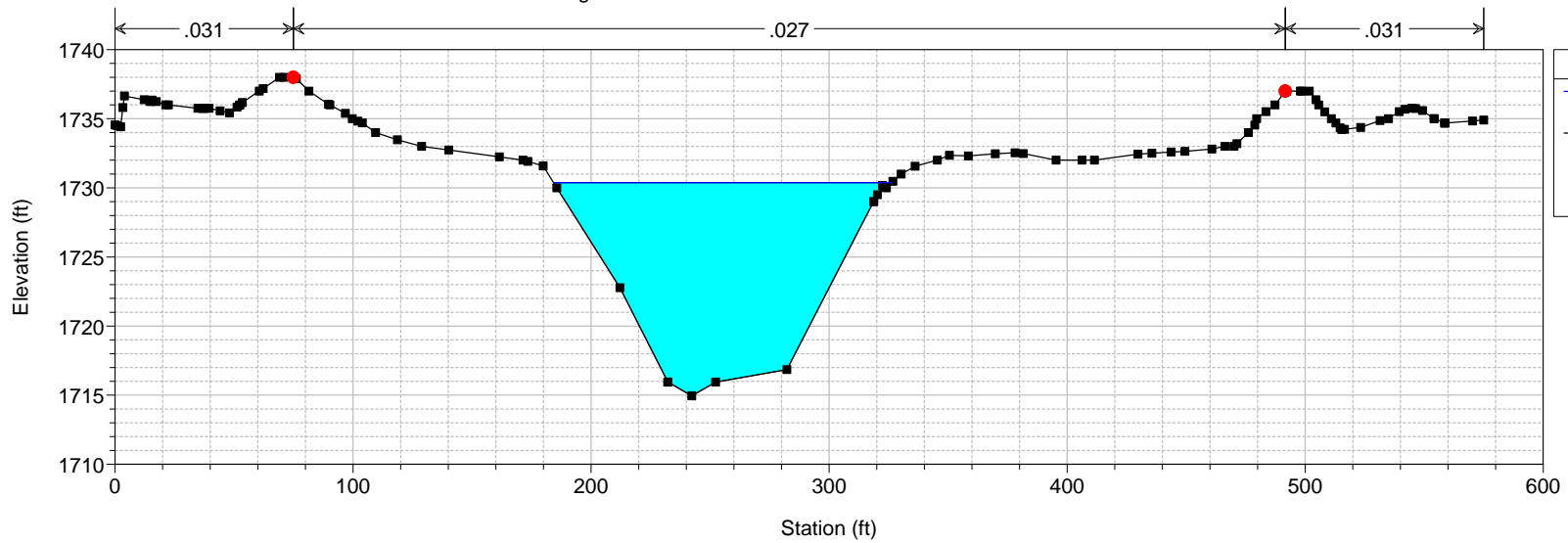
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.6 "DR" 24+00.00 = 1125.6

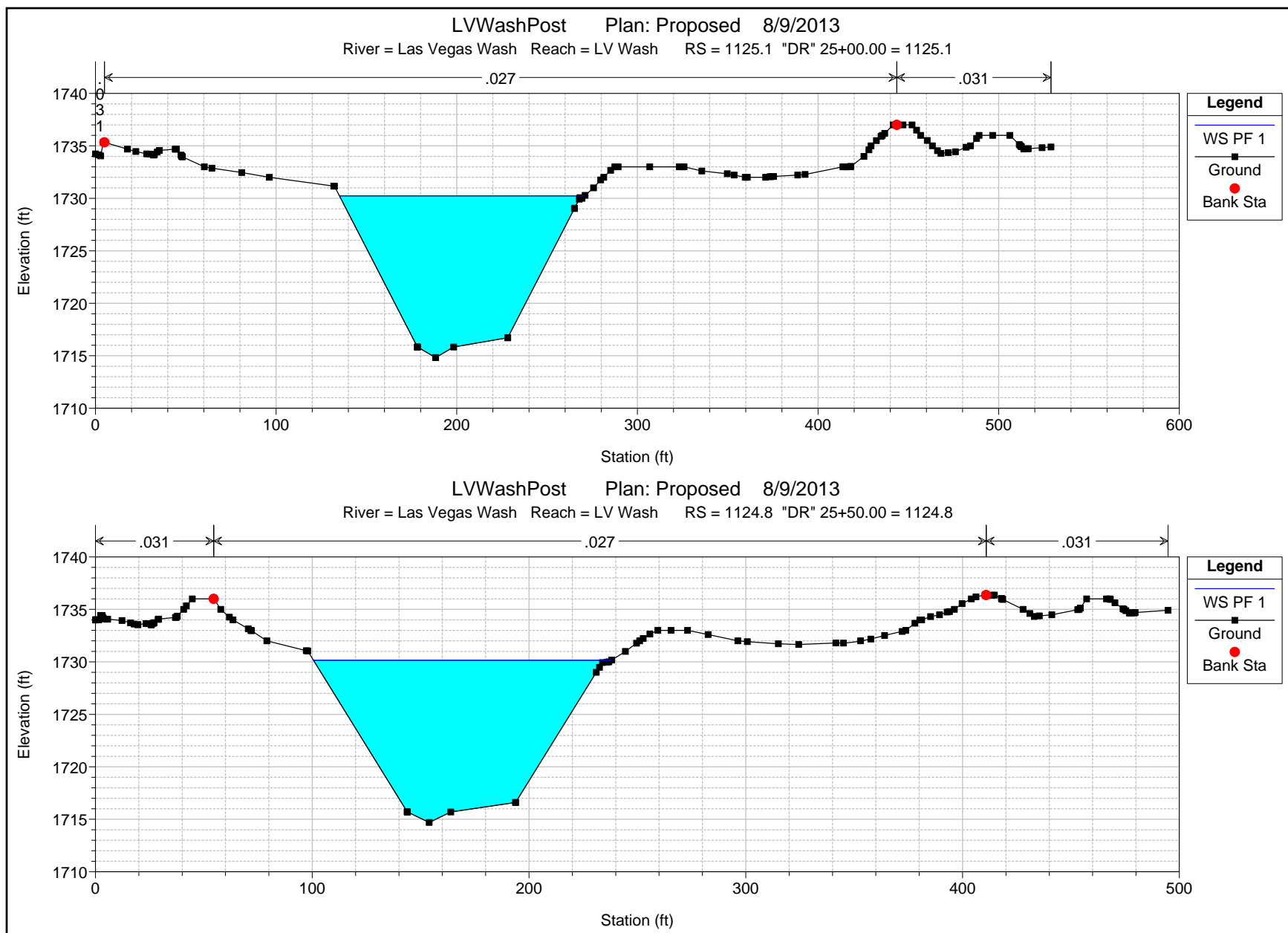


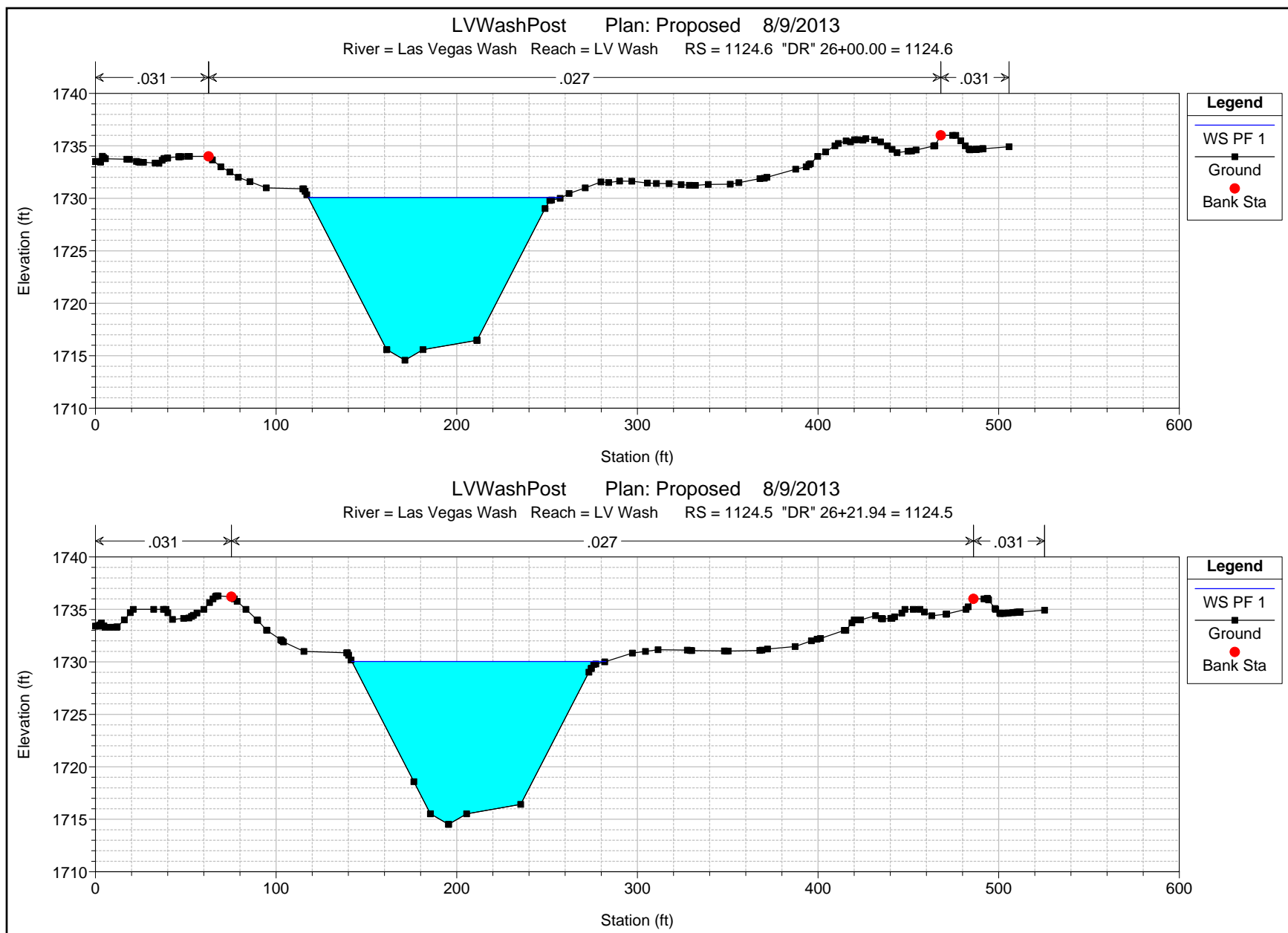
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.5 "DR" 24+26.00 = 1125.5

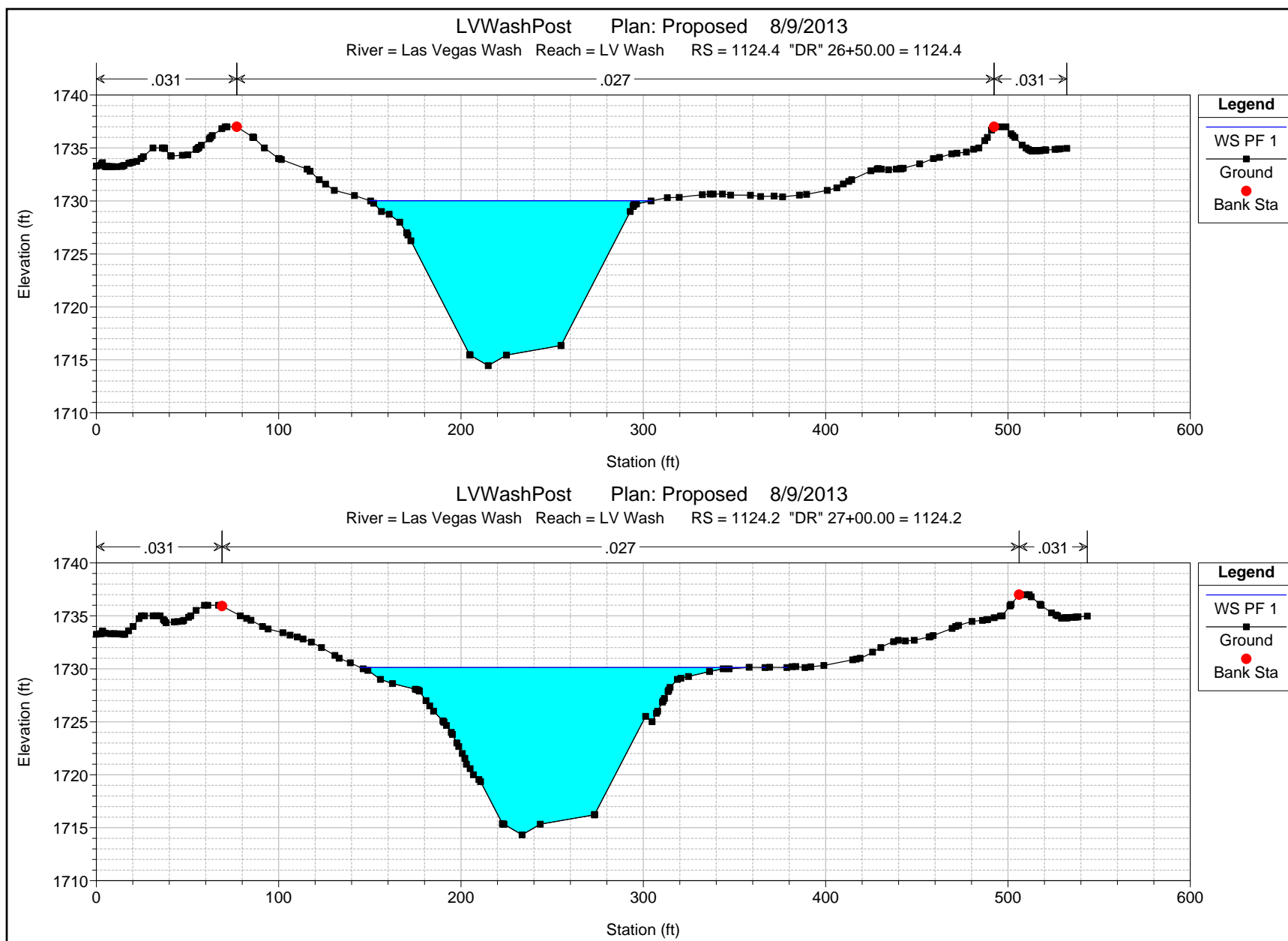


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1125.3 "DR" 24+50.00 = 1125.3

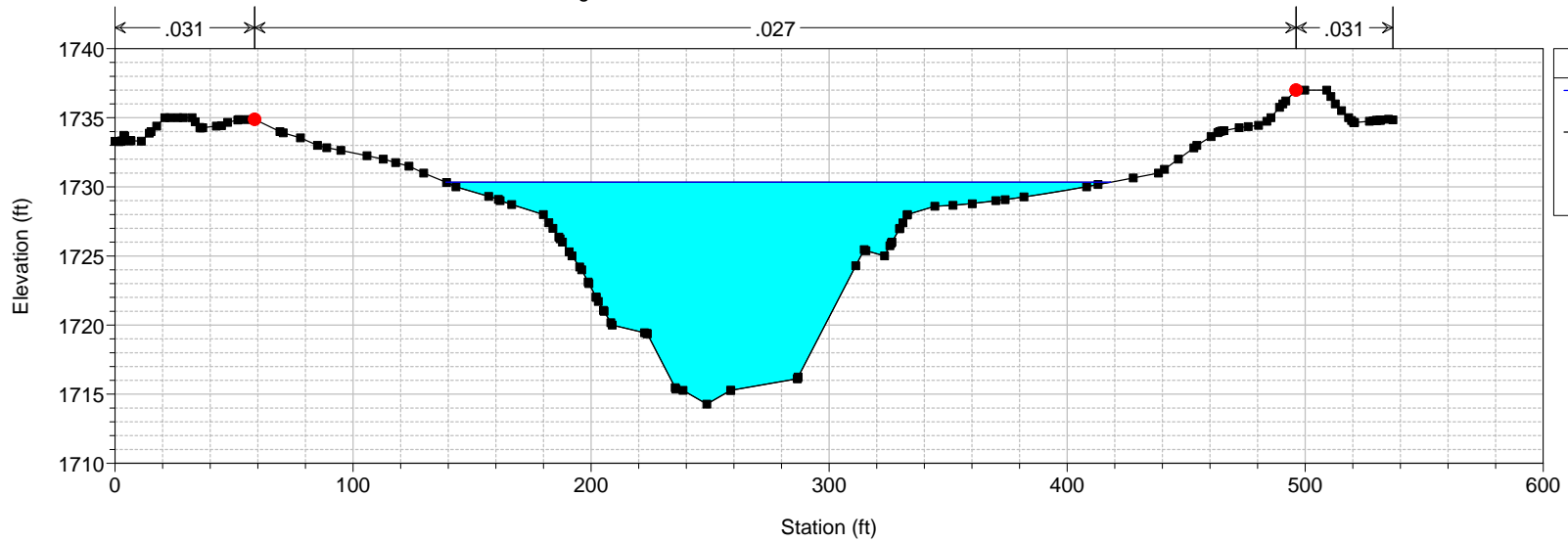




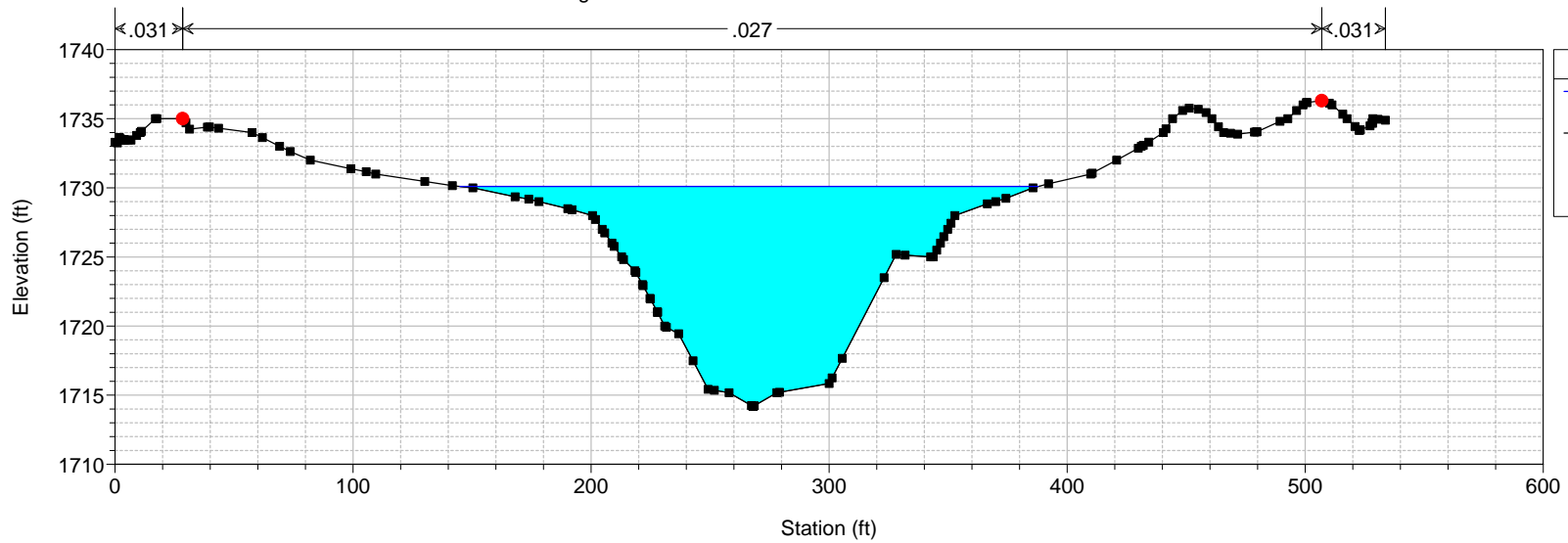




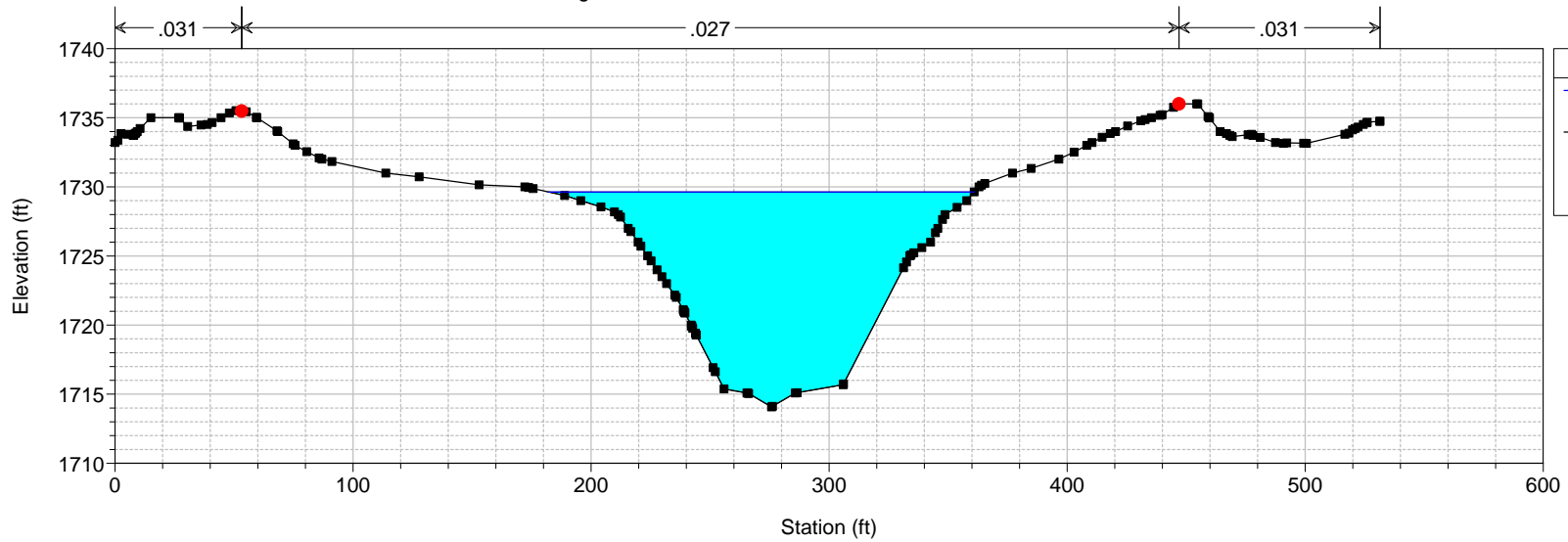
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1124.1 "DR" 27+21.30 = 1124.1



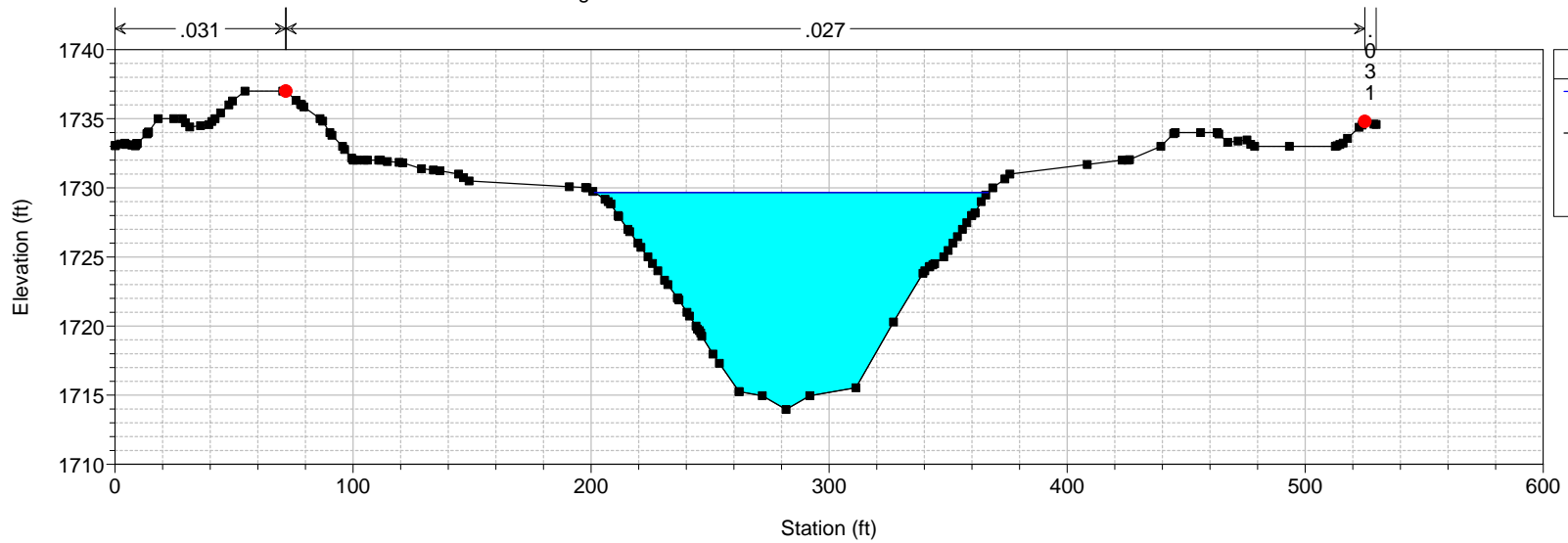
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.8 "DR" 27+60.58 = 1123.8



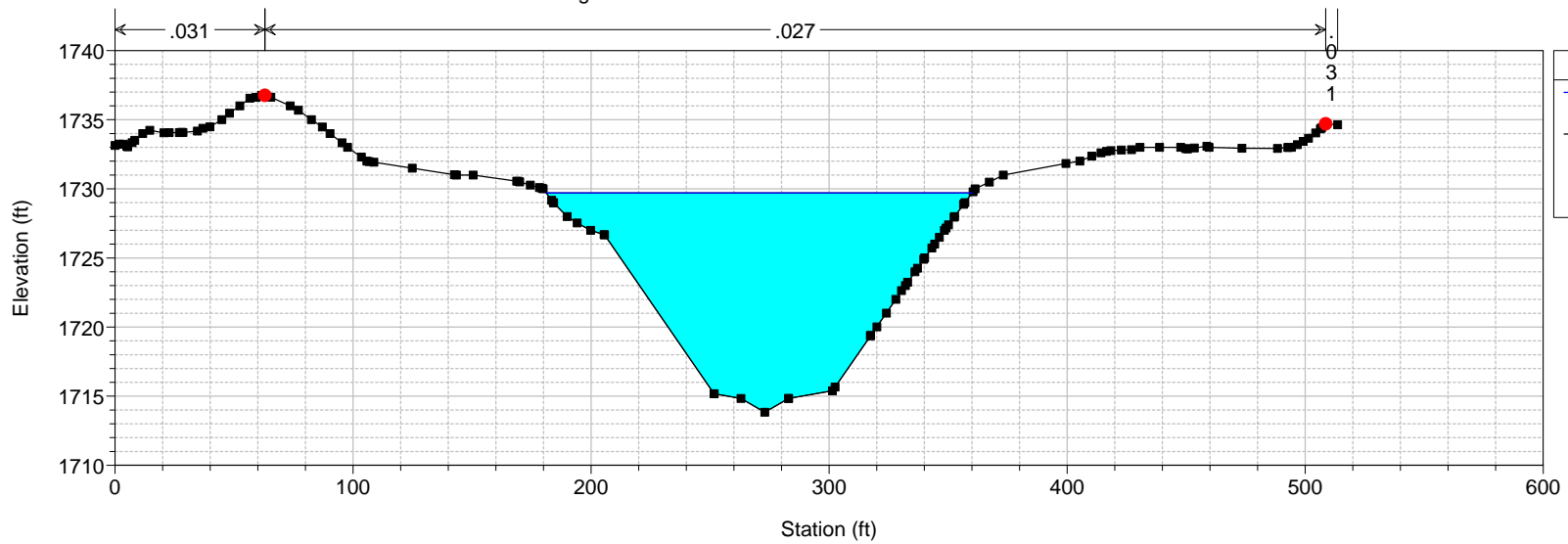
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.6 "DR" 28+00.00 = 1123.6



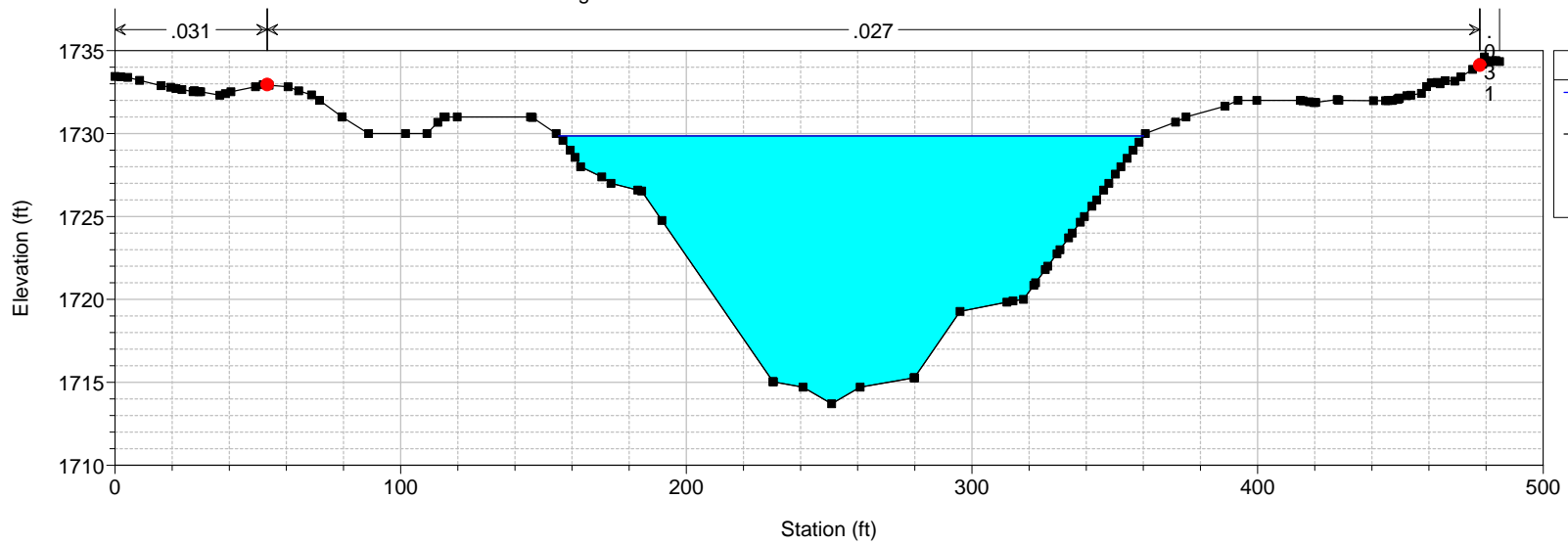
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.4 "DR" 28+50.00 = 1123.4



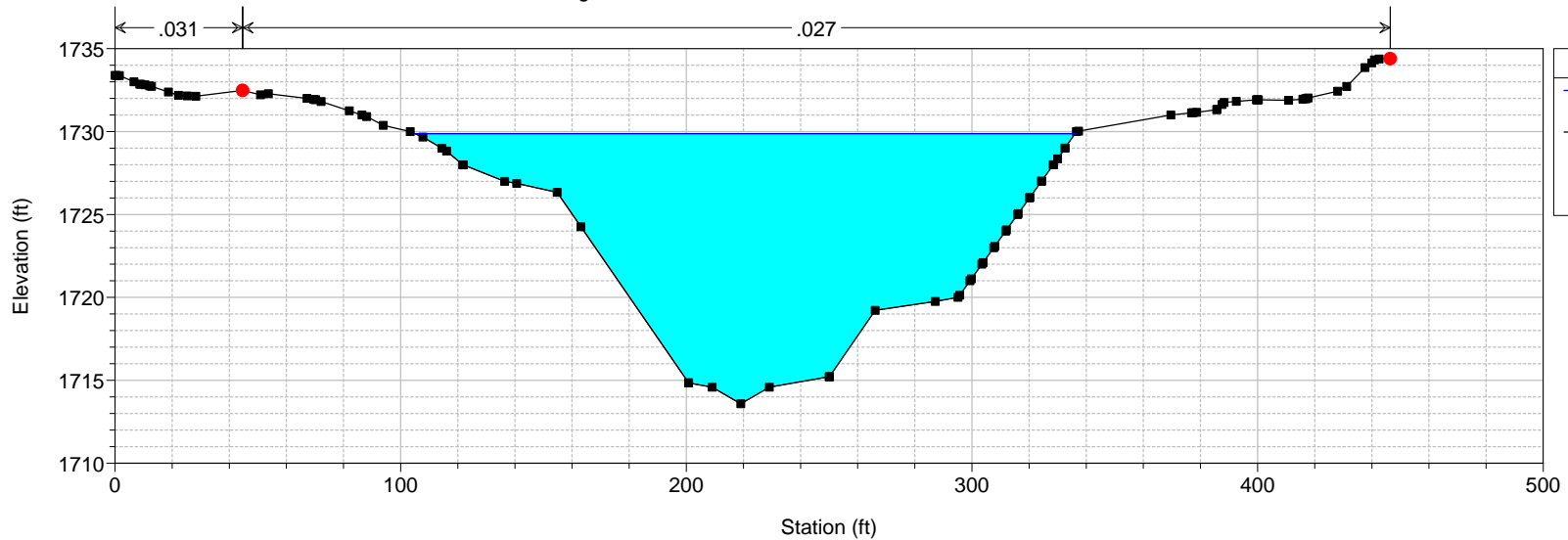
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1123.2 "DR" 29+00.00 = 1123.2



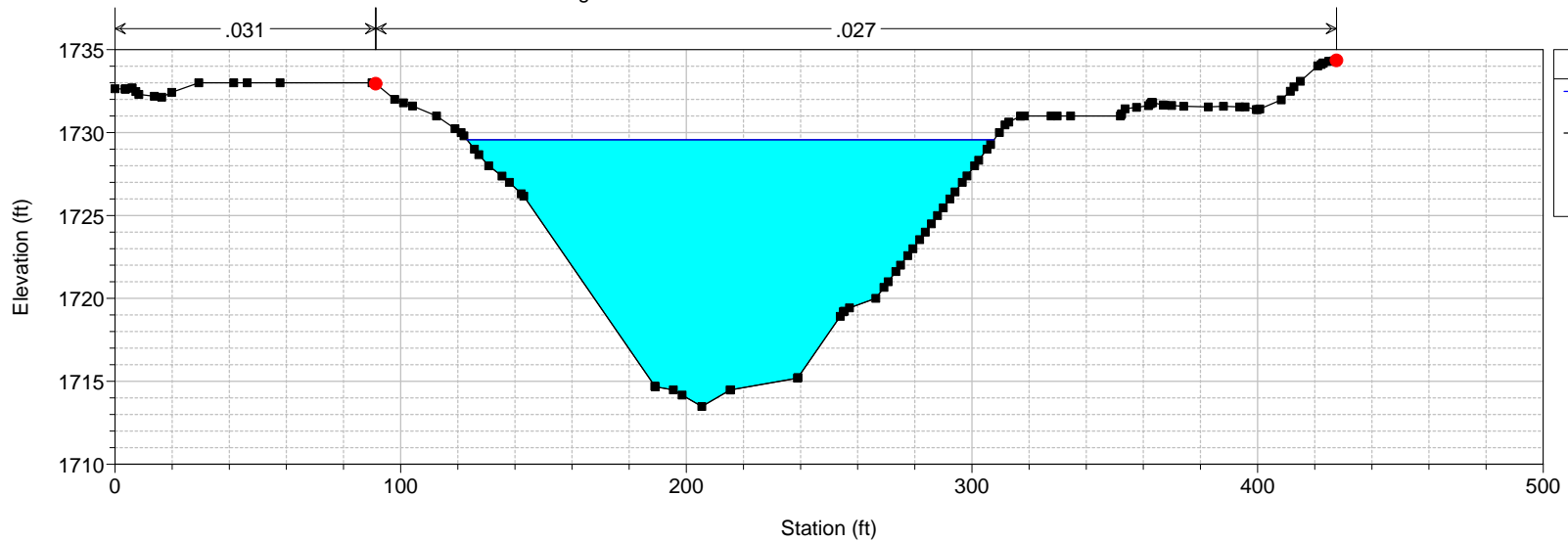
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1122.8 "DR" 29+50.00 = 1122.8

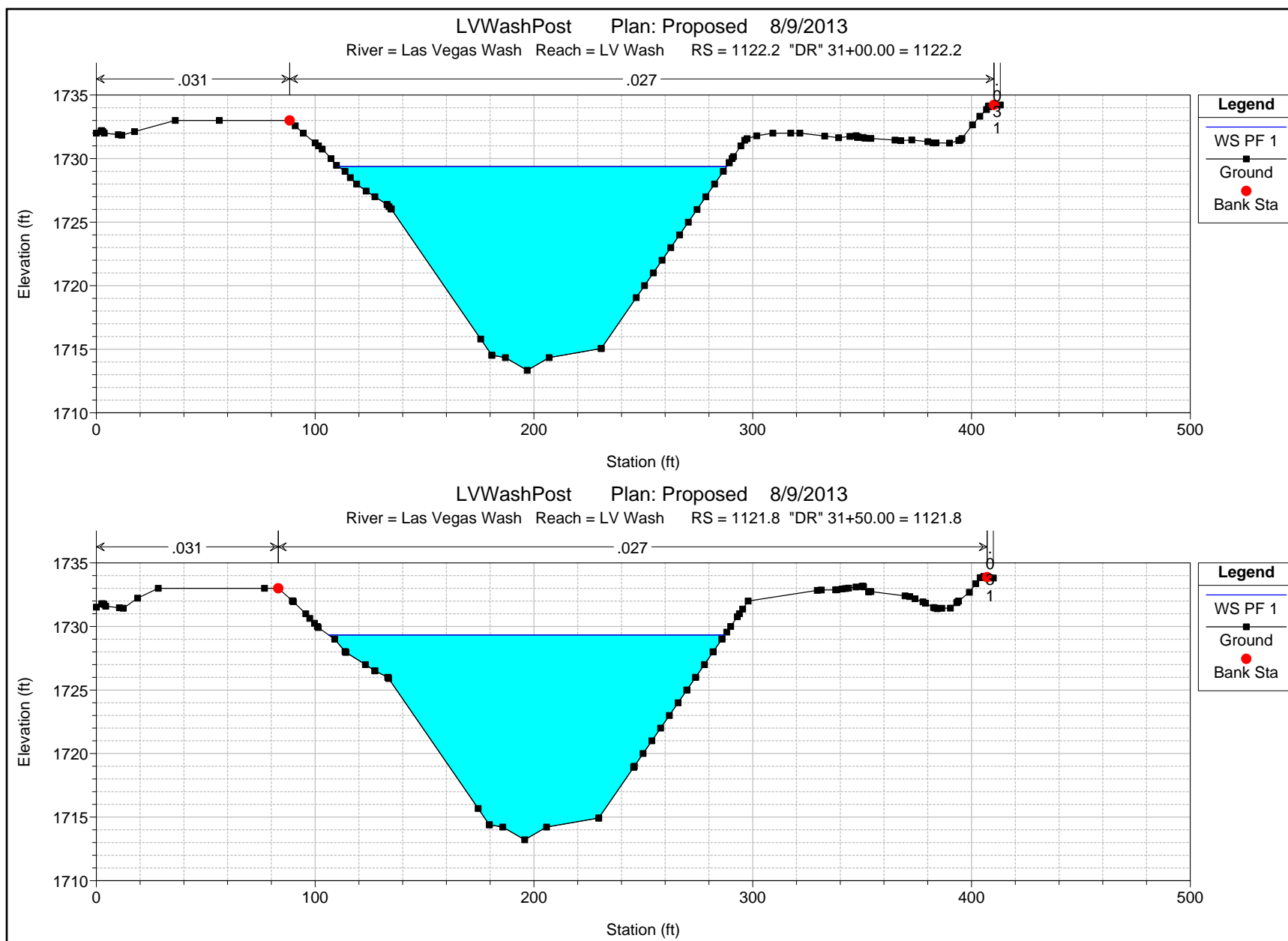


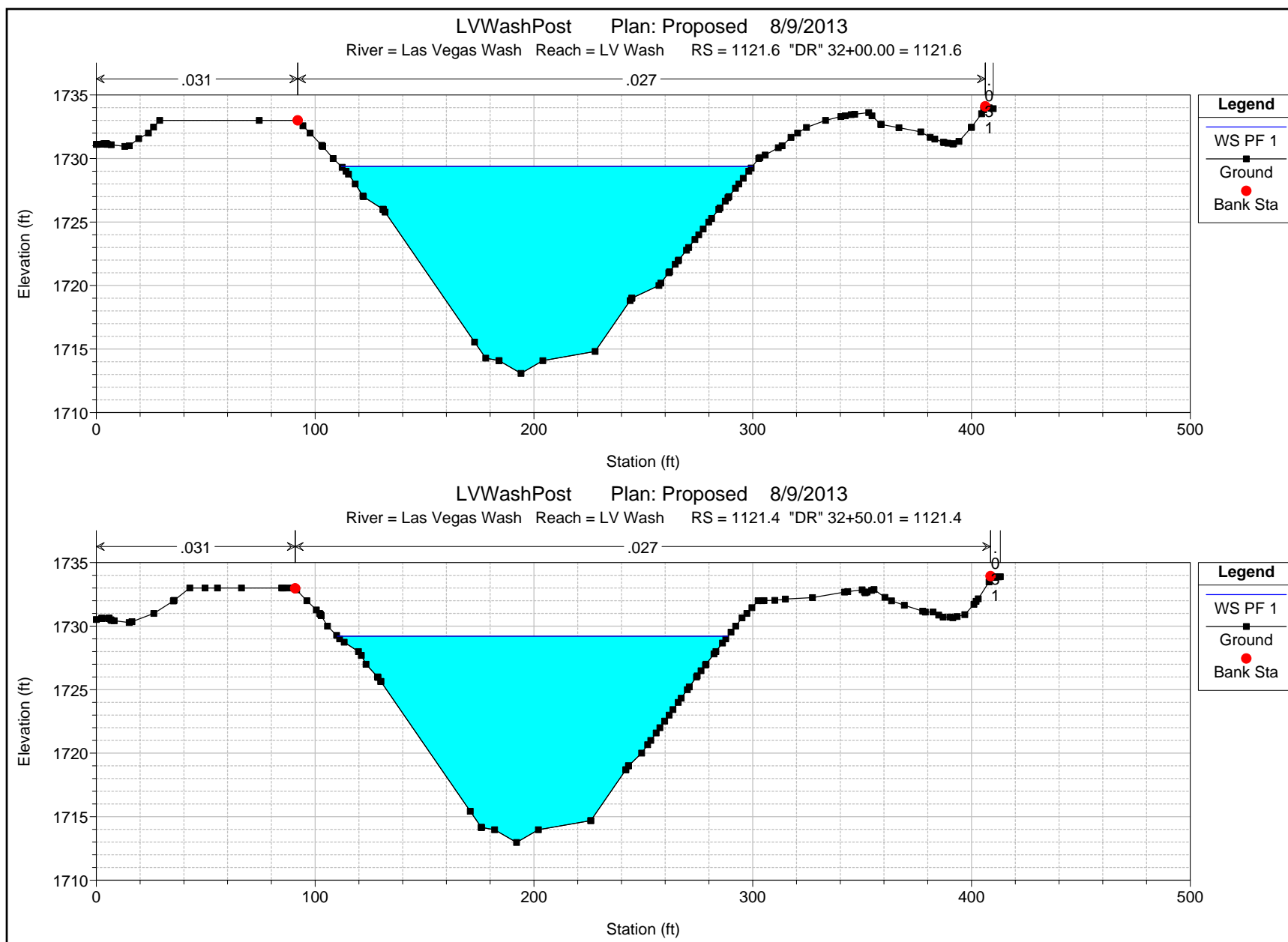
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1122.6 "DR" 30+00.00 = 1122.6



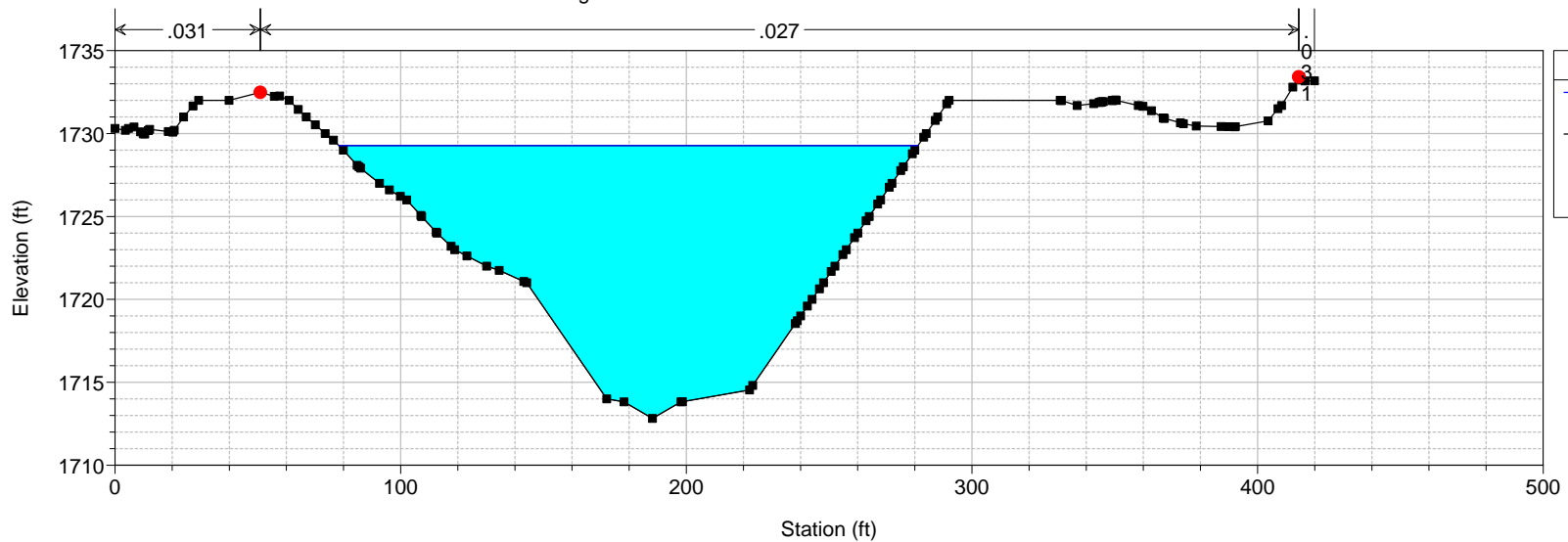
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1122.4 "DR" 30+43.11 = 1122.4



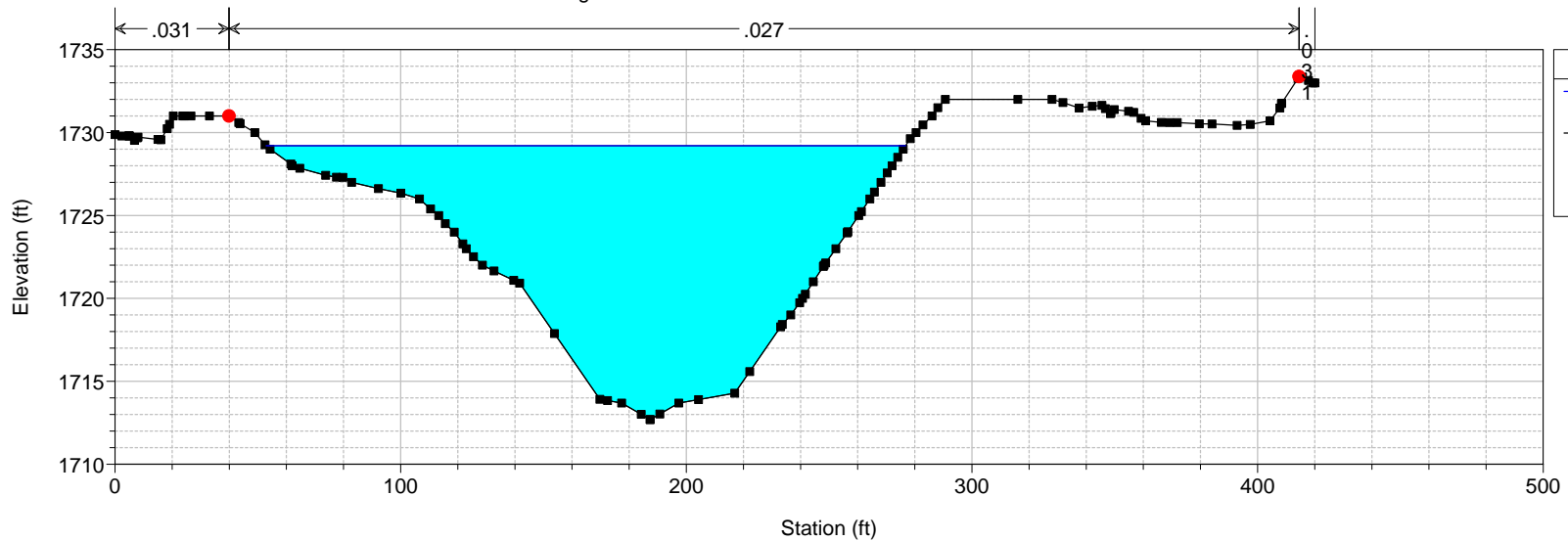




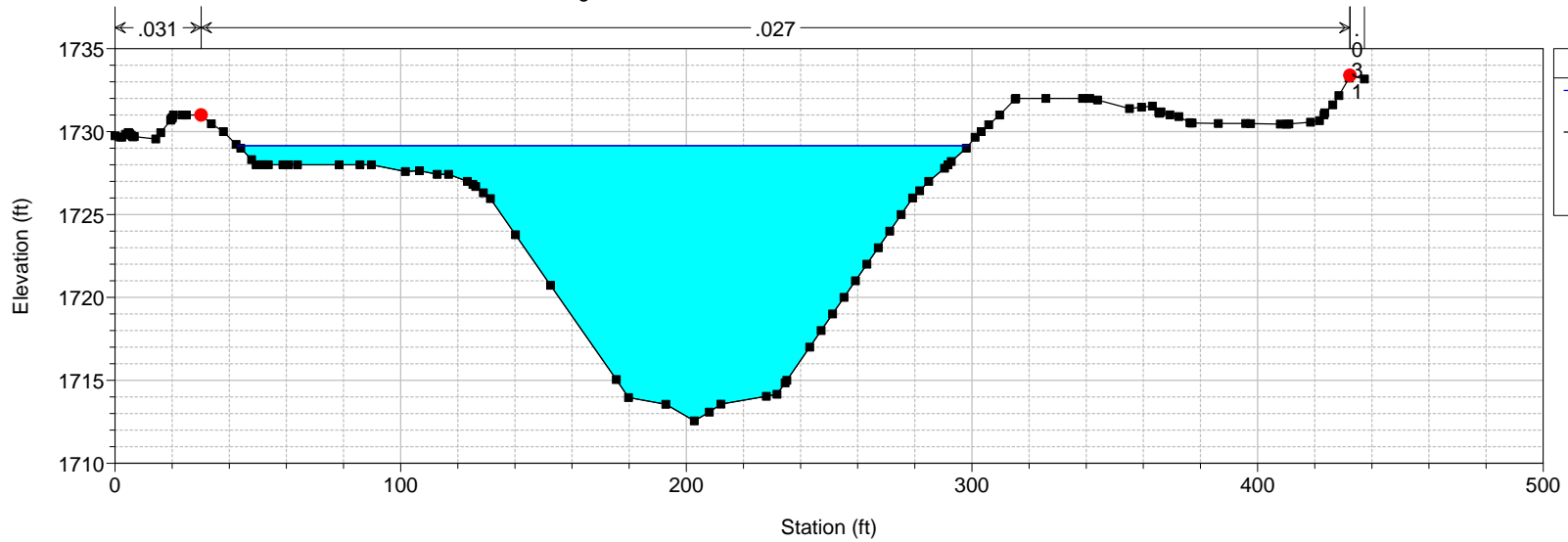
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1121.2 "DR" 33+12.37 = 1121.2



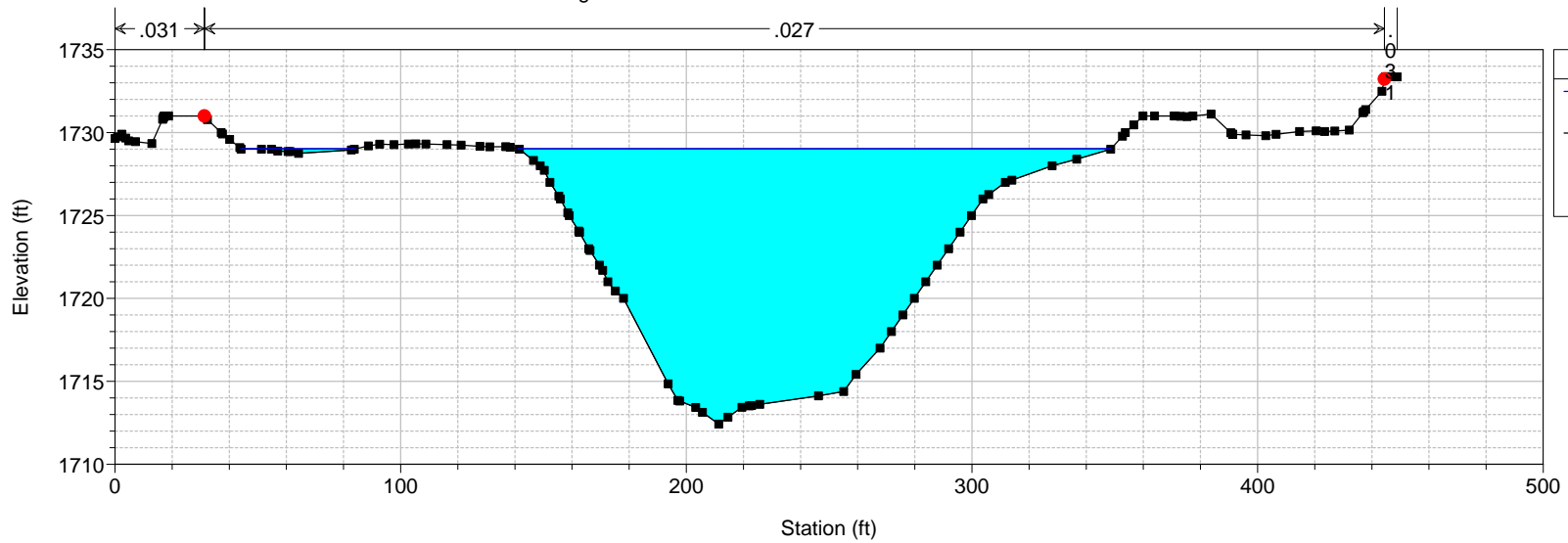
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1120.8 "DR" 33+63.25 = 1120.8

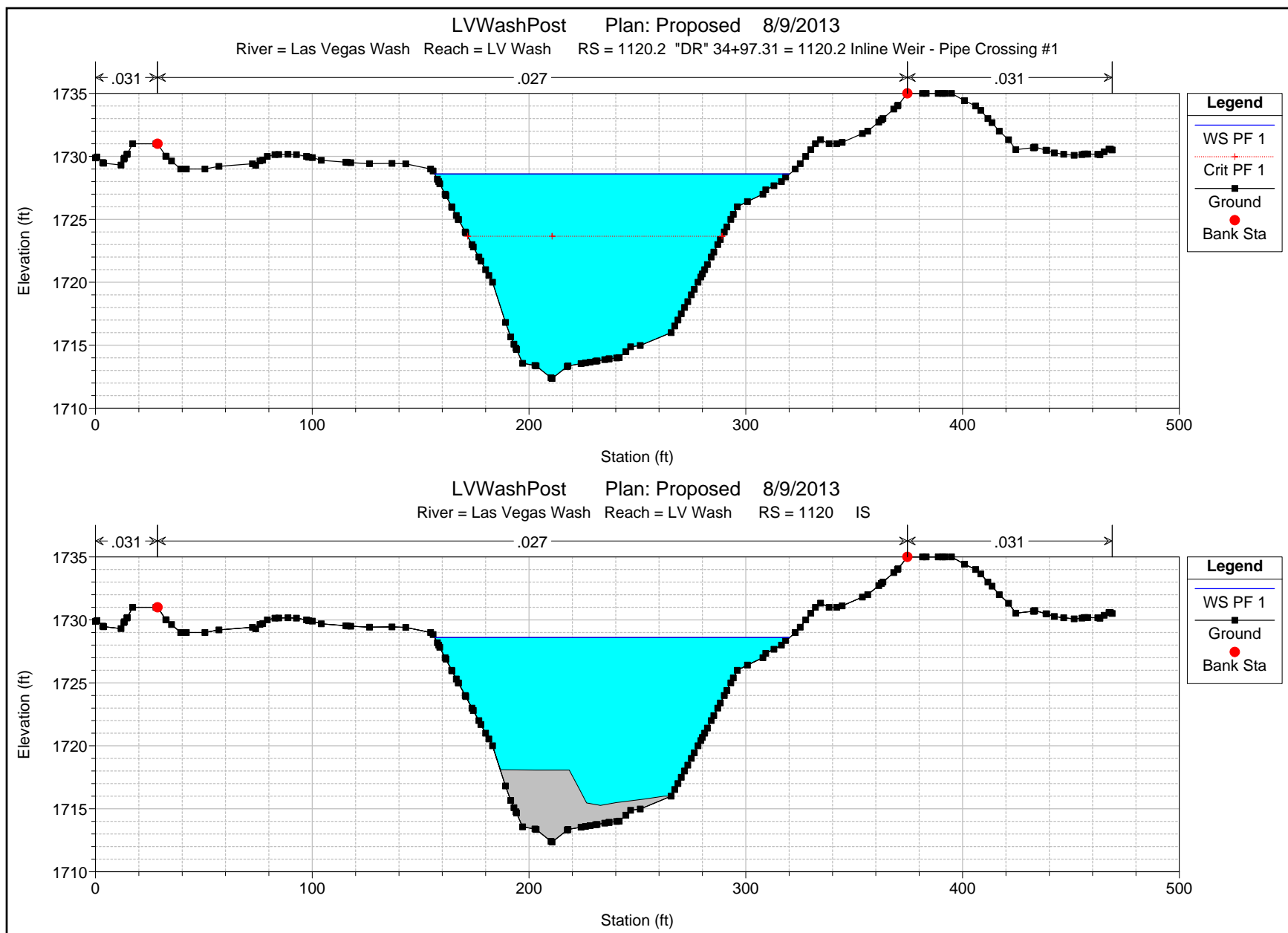


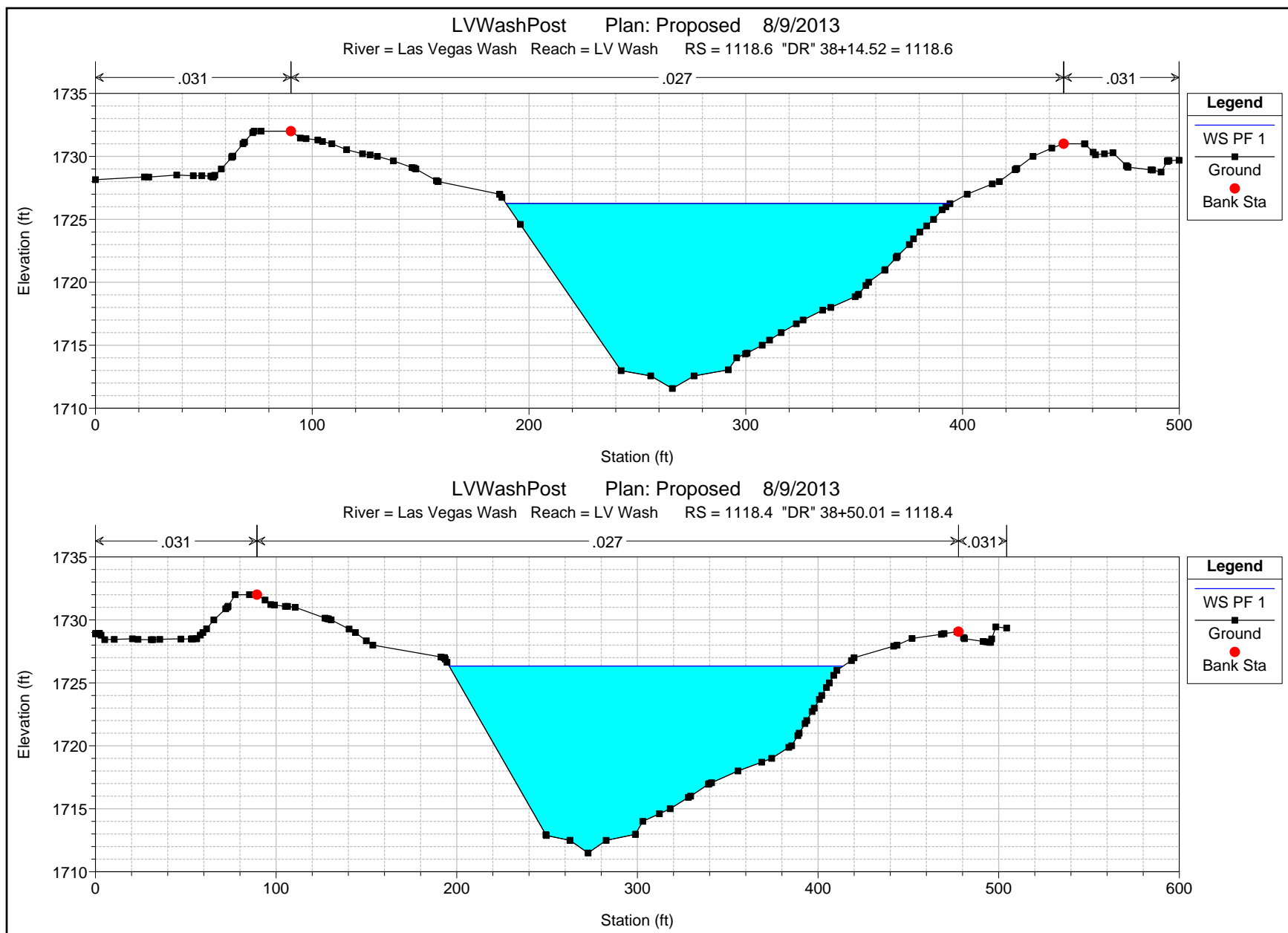
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1120.6 "DR" 34+14.14 = 1120.6



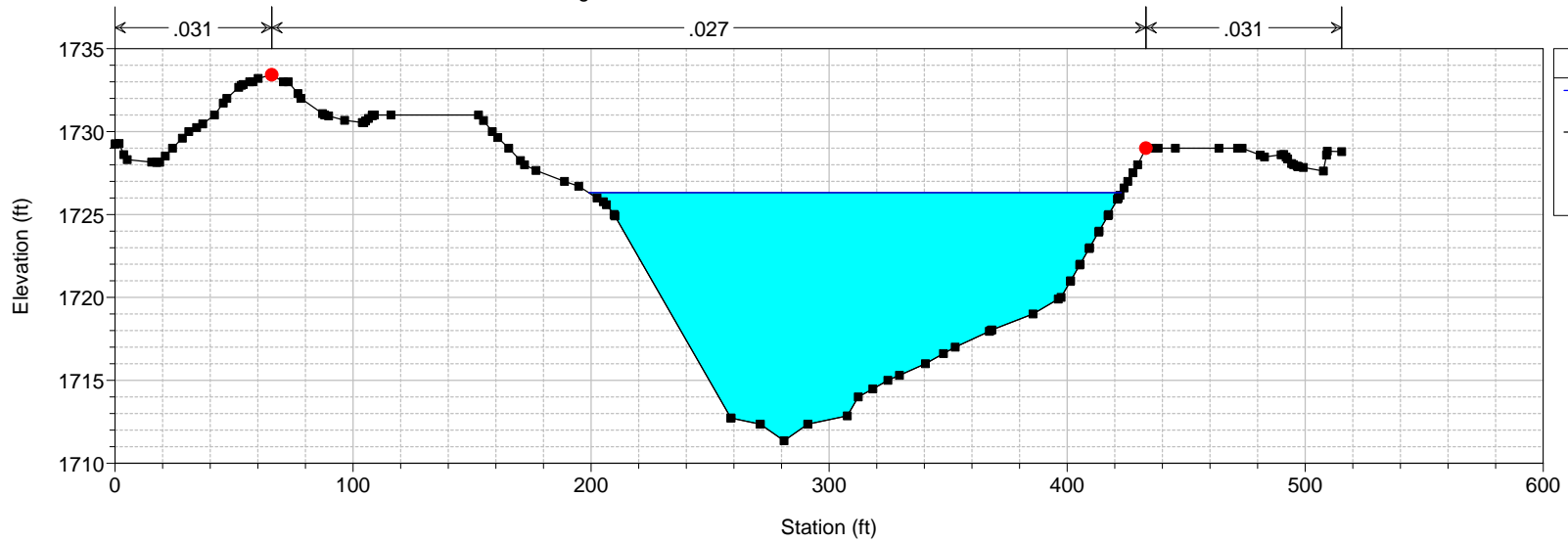
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1120.4 "DR" 34+60.74 = 1120.4



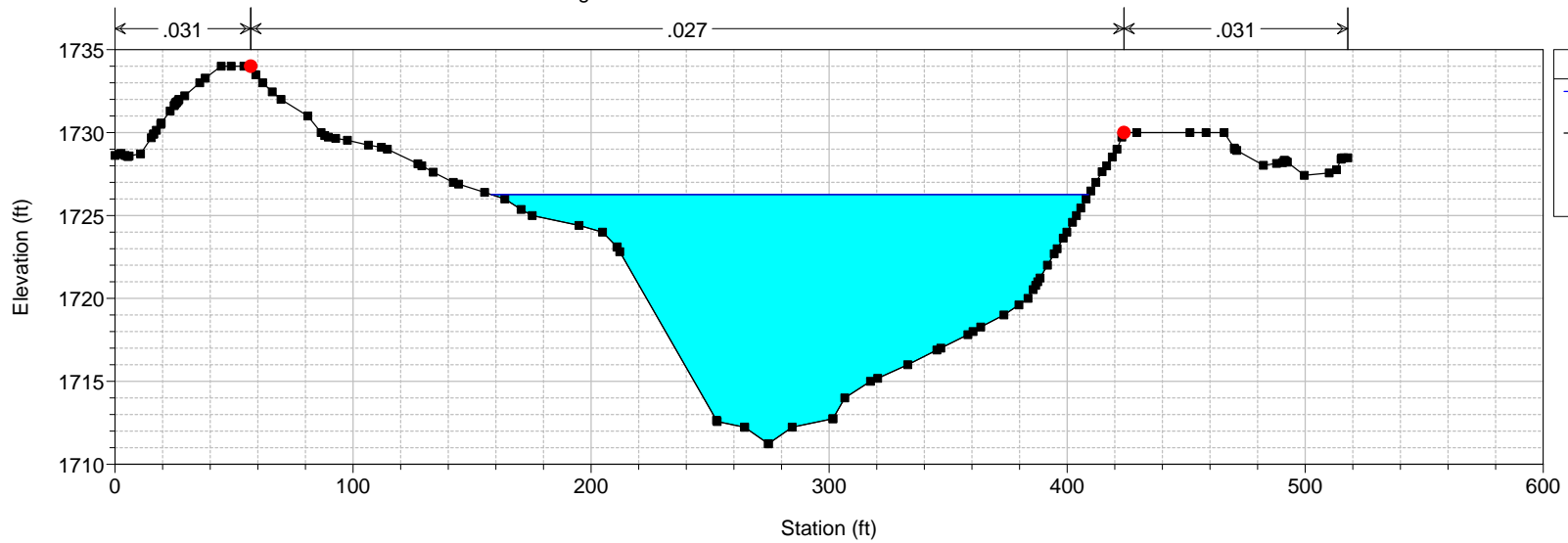


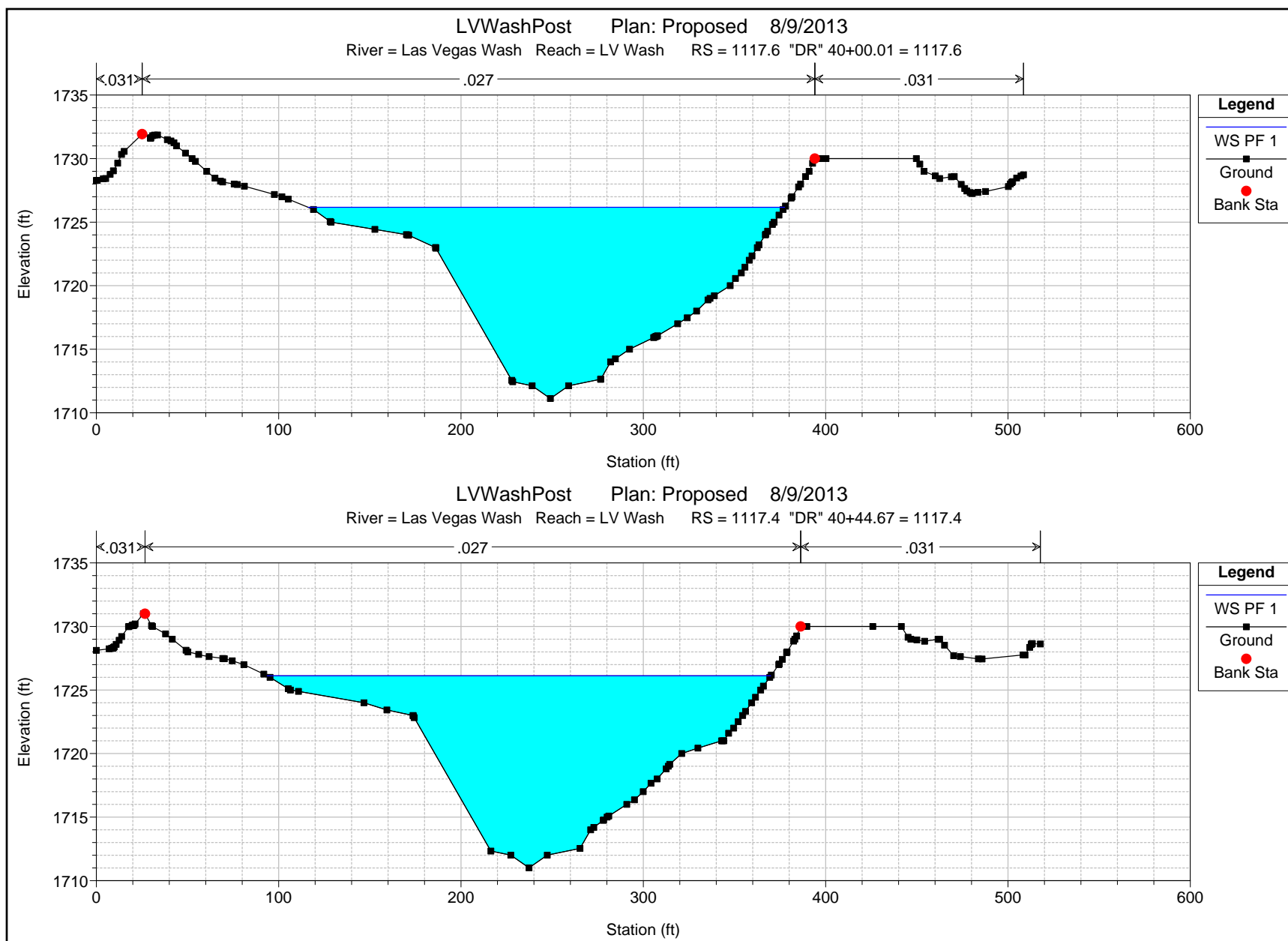


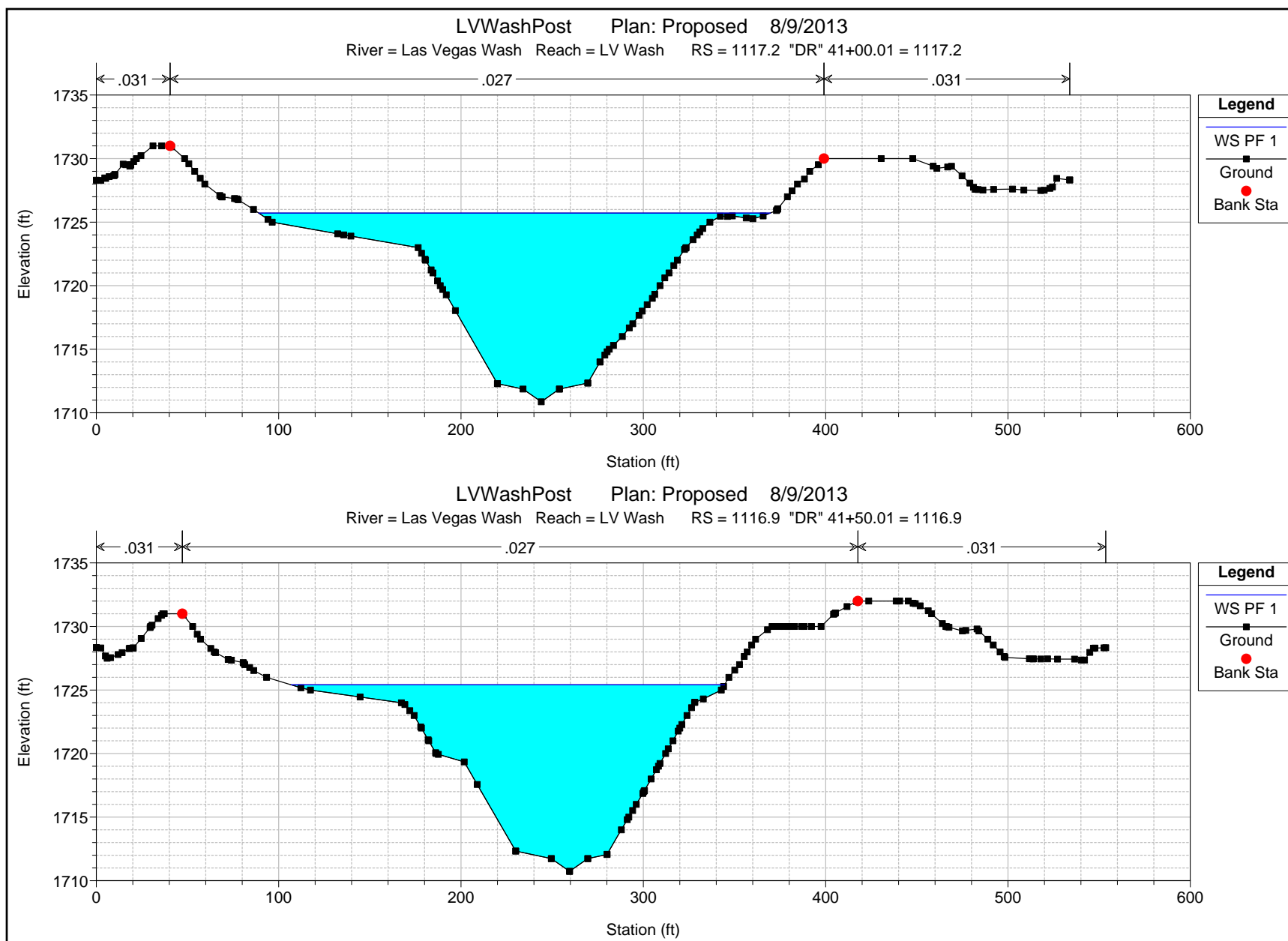
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1118.2 "DR" 39+00.01 = 1118.2



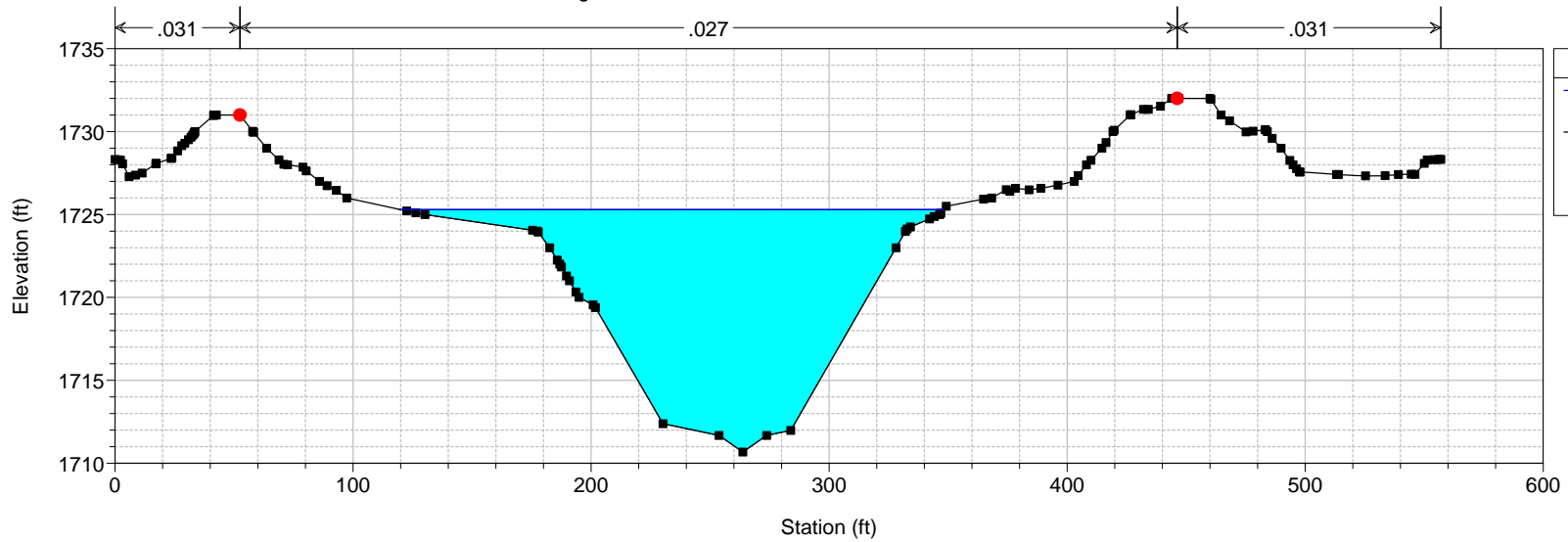
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1117.8 "DR" 39+50.01 = 1117.8



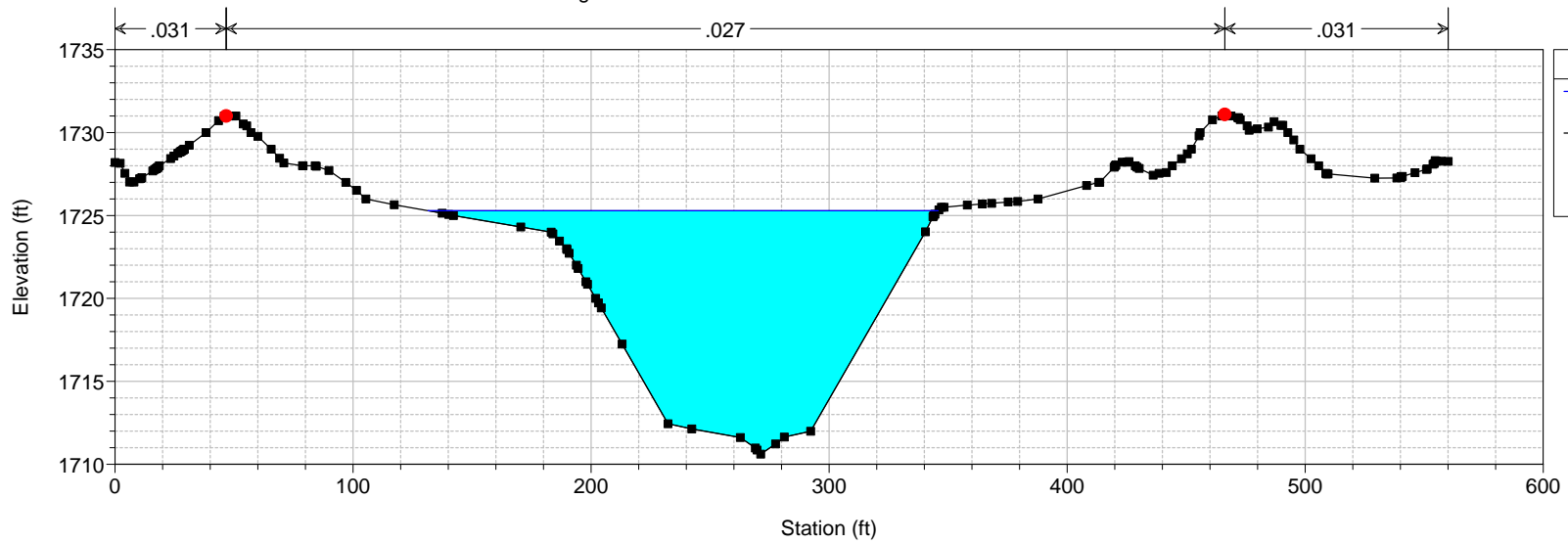




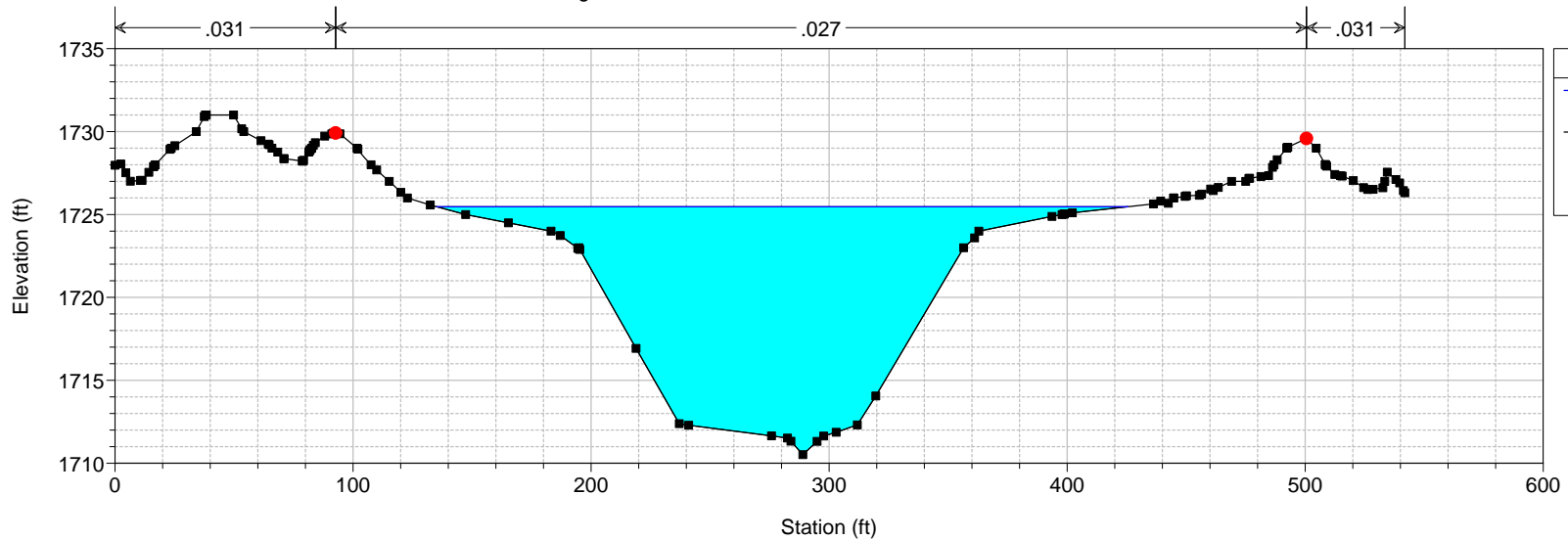
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116.7 "DR" 41+76.51 = 1116.7



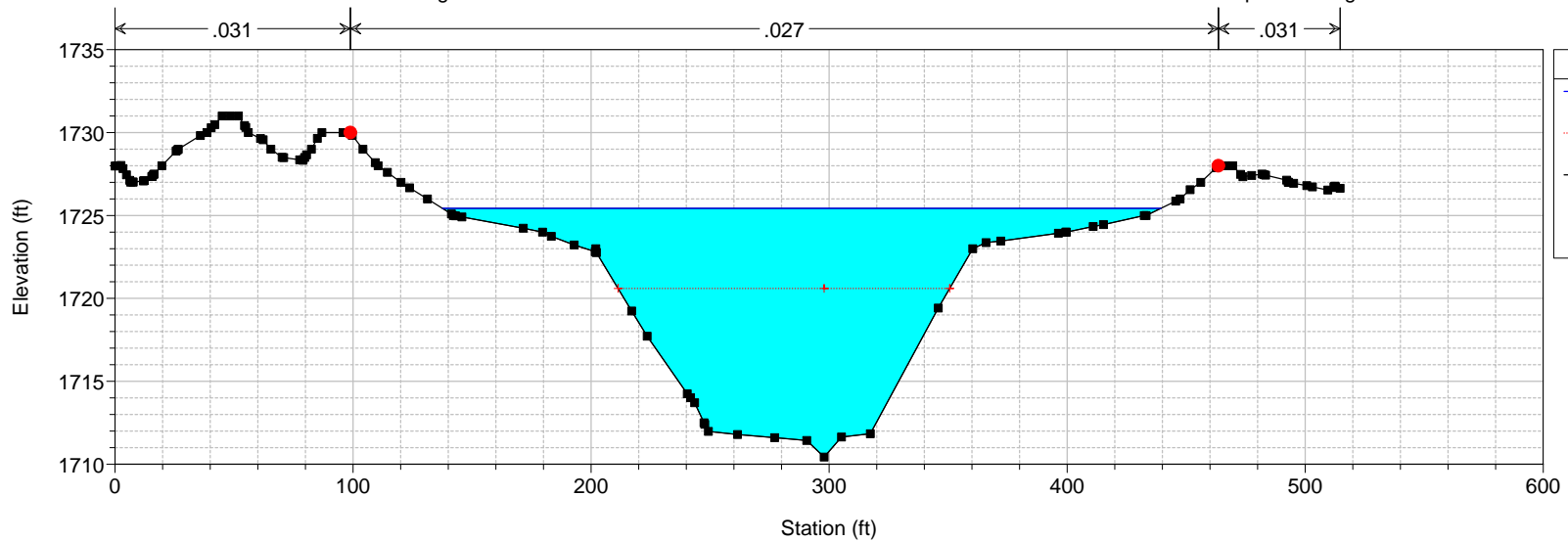
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116.5 "DR" 42+03.02 = 1116.5



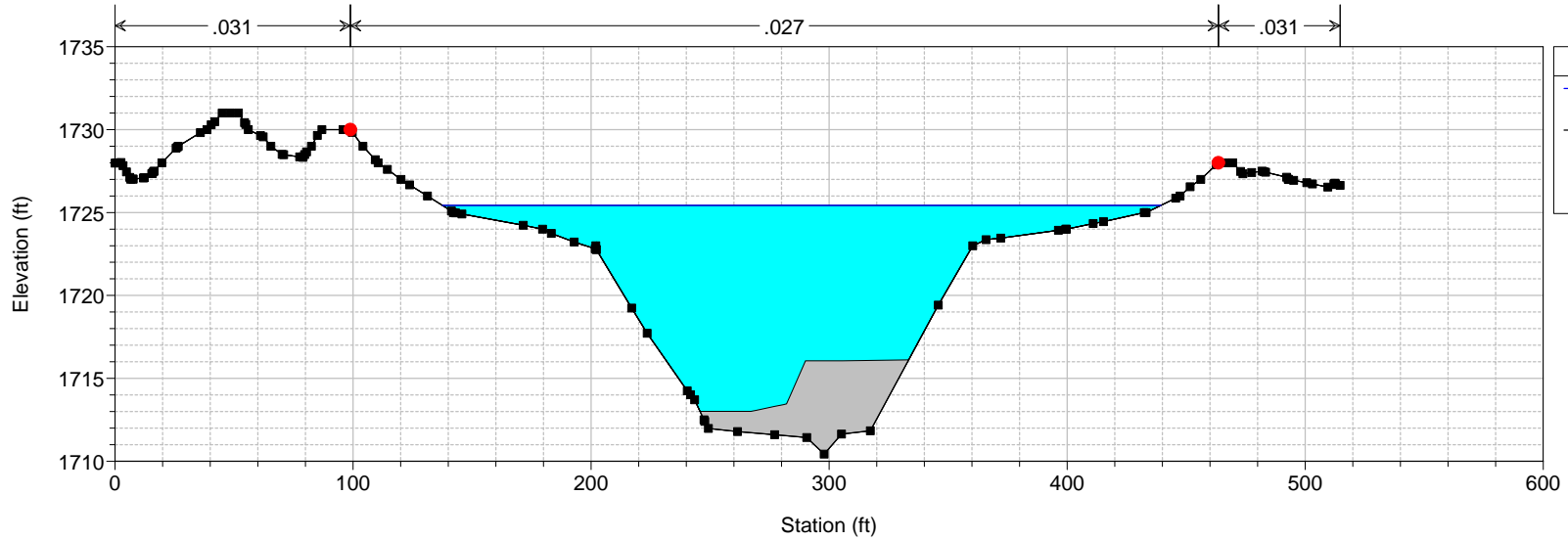
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1116.3 "DR" 42+37.47 = 1116.3



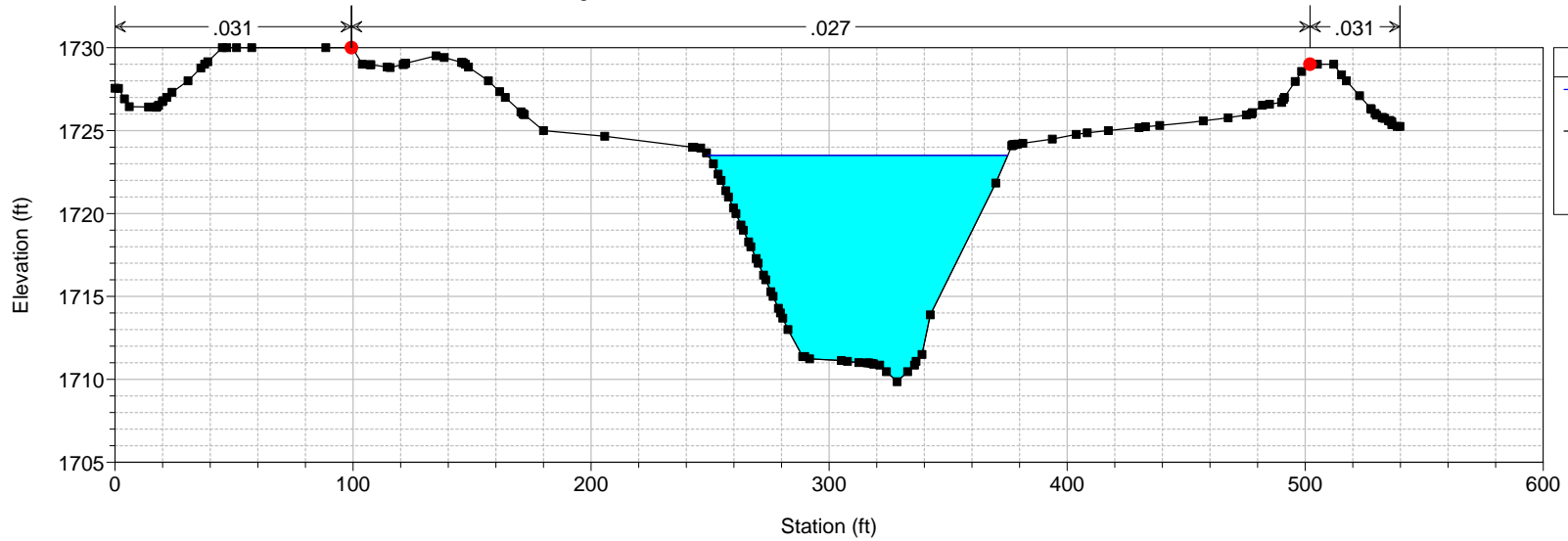
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1116.2 "DR" 42+71.92 = 1116.2 - Inline Weir Pipe Crossing #2

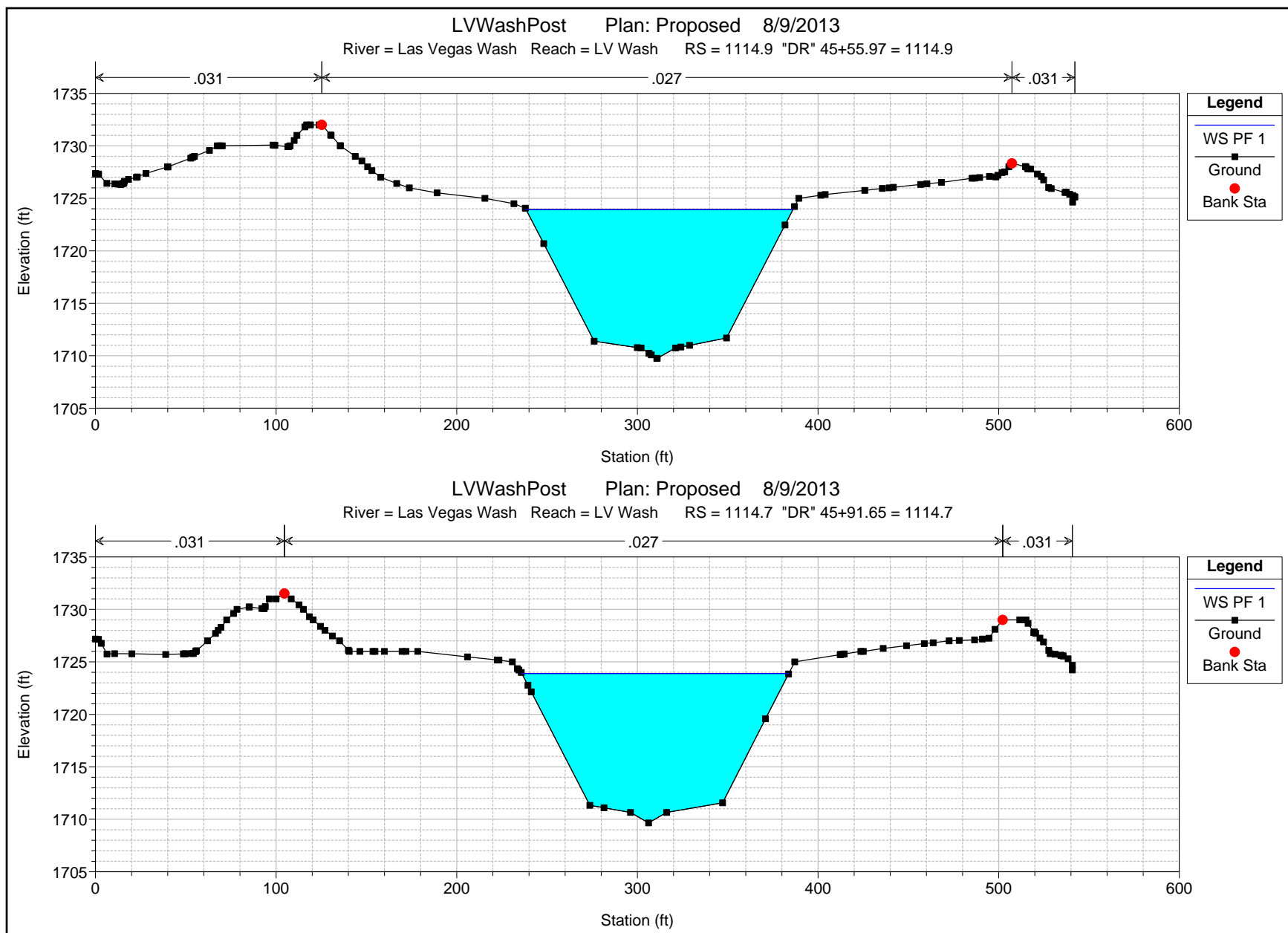


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1116 IS

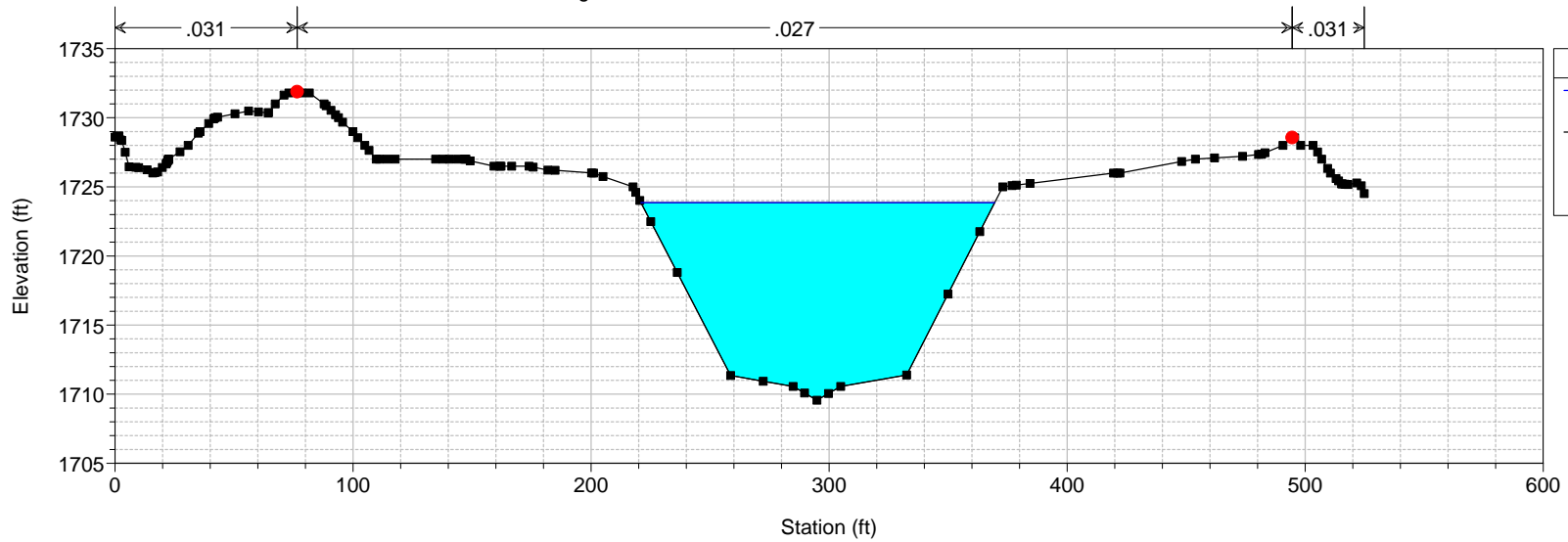


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1115.2 "DR" 45+06.50 = 1115.2

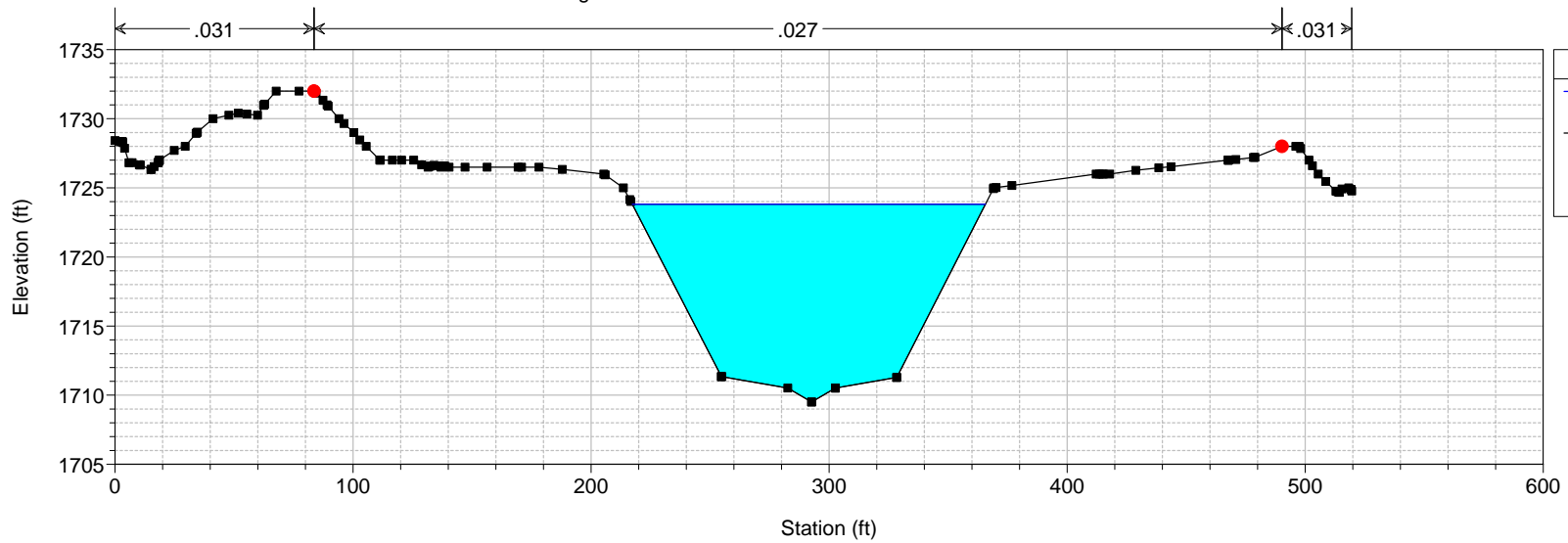




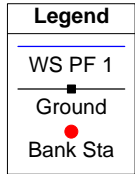
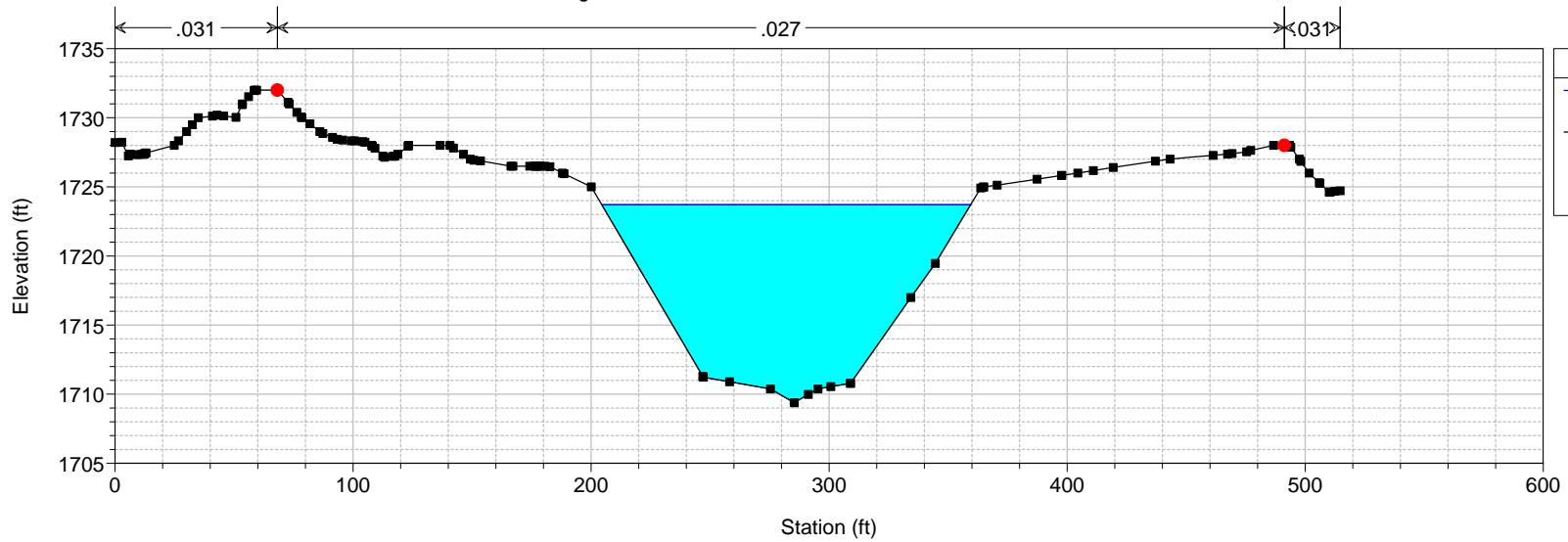
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1114.5 "DR" 46+27.56 = 1114.5



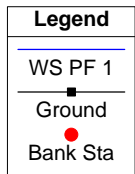
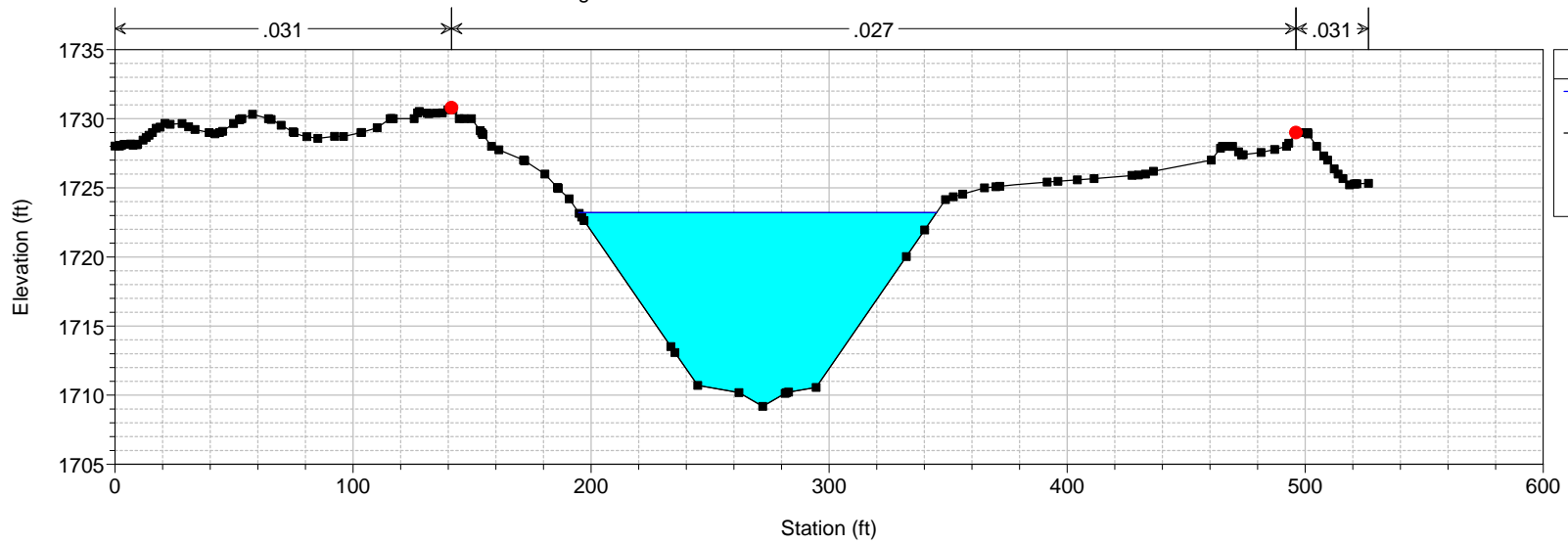
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1114.4 "DR" 46+50.01 = 1114.4

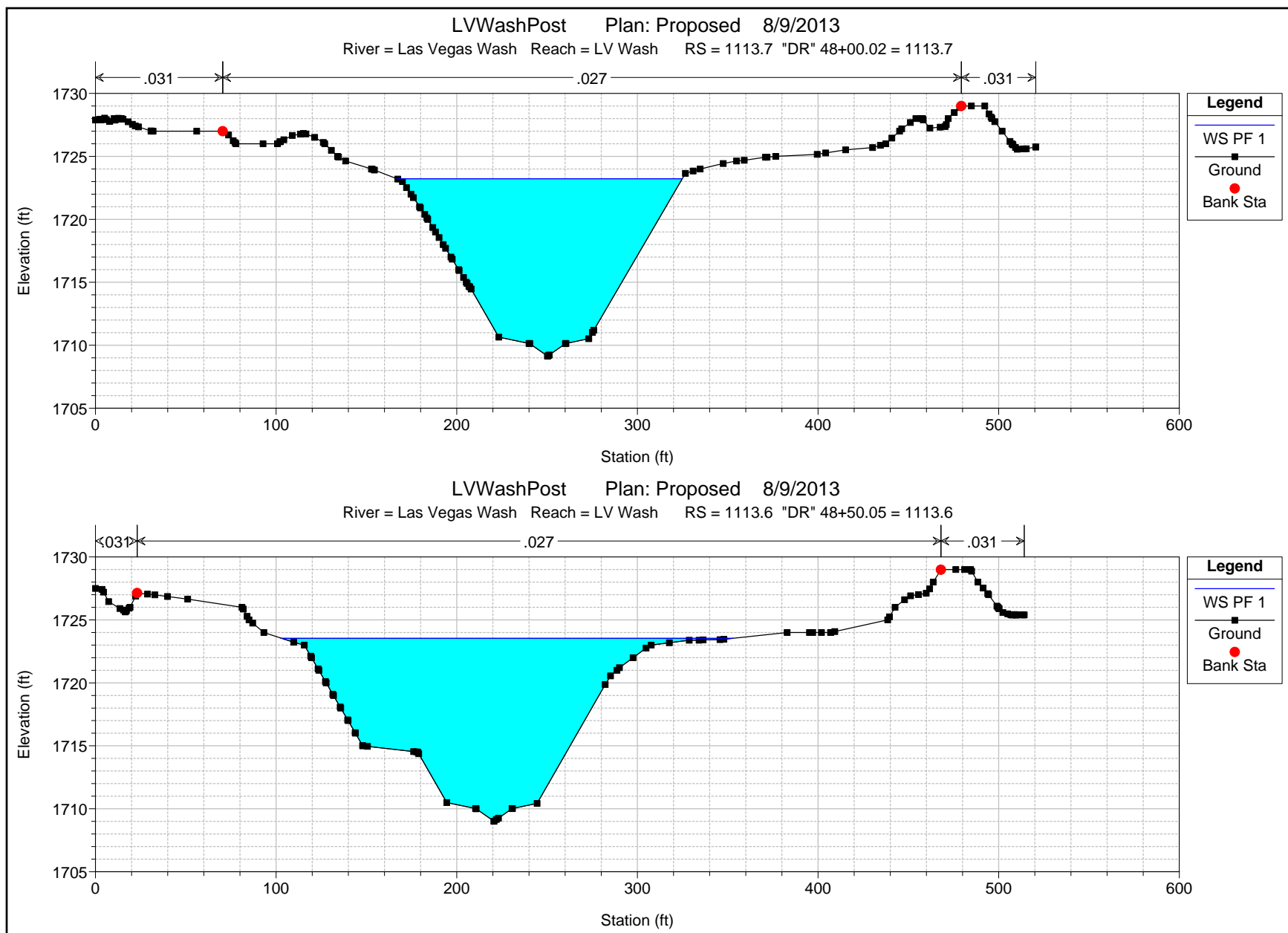


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1114.2 "DR" 47+00.01 = 1114.2

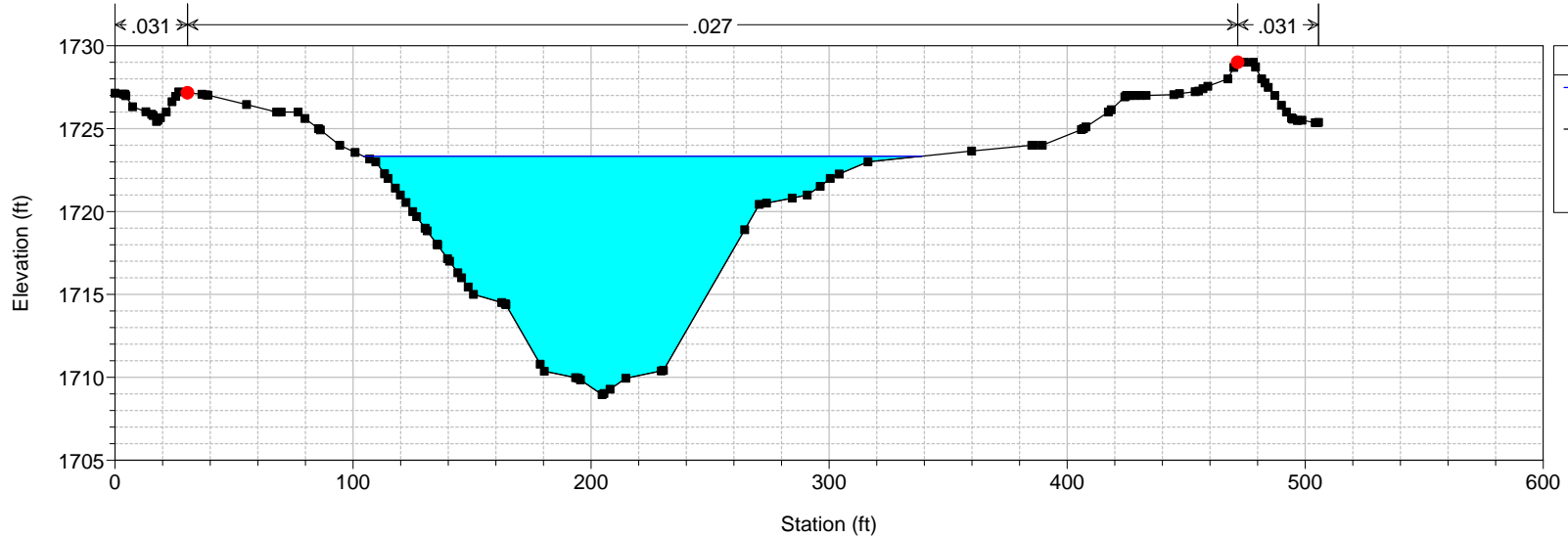


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.9 "DR" 47+79.01 = 1113.9

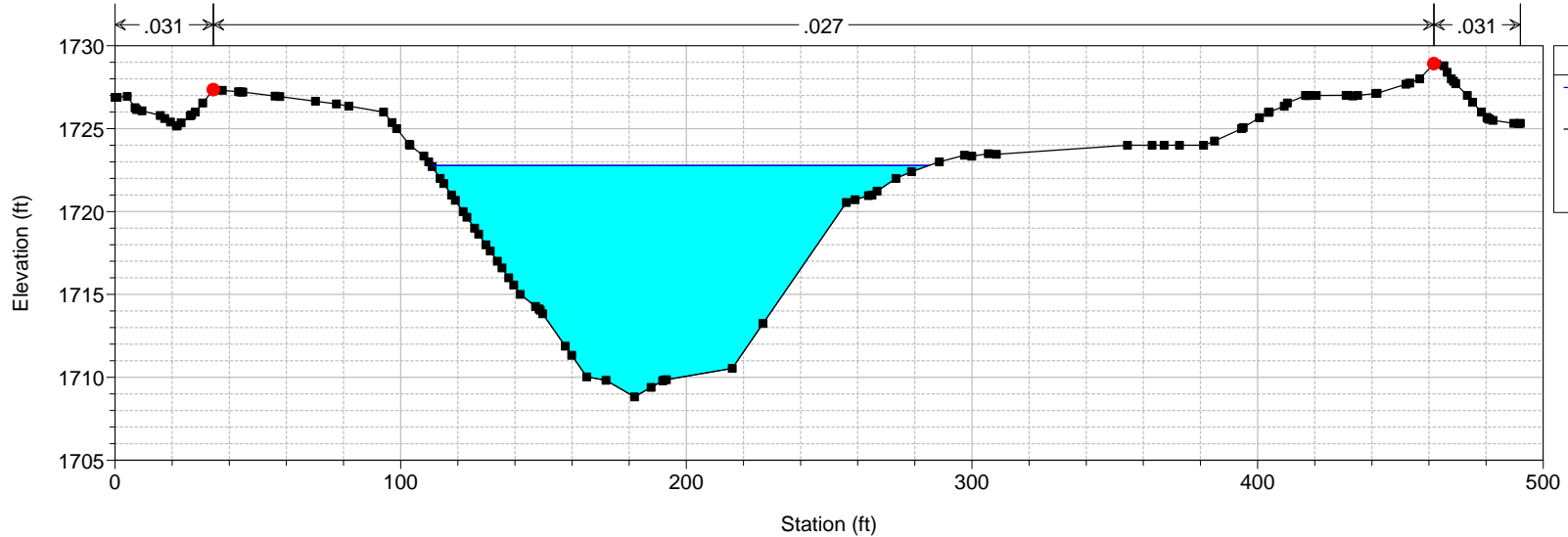




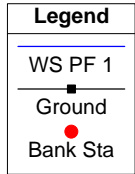
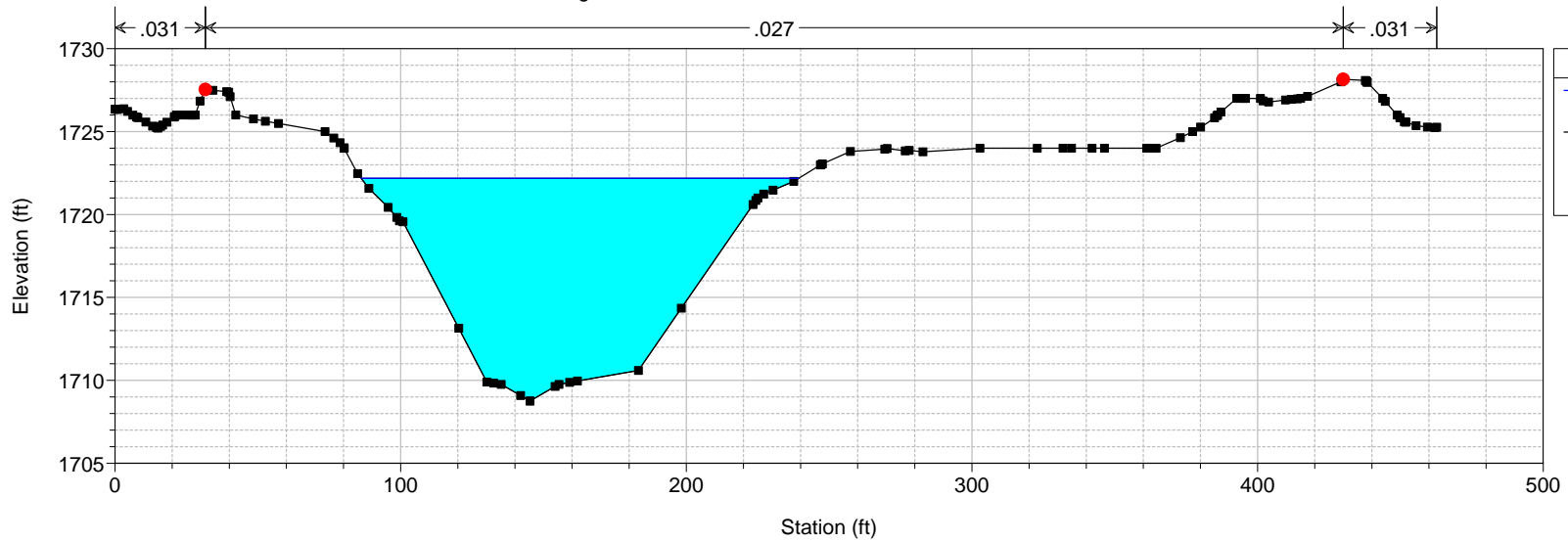
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.5 "DR" 48+77.03 = 1113.5



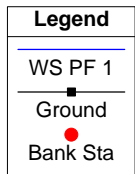
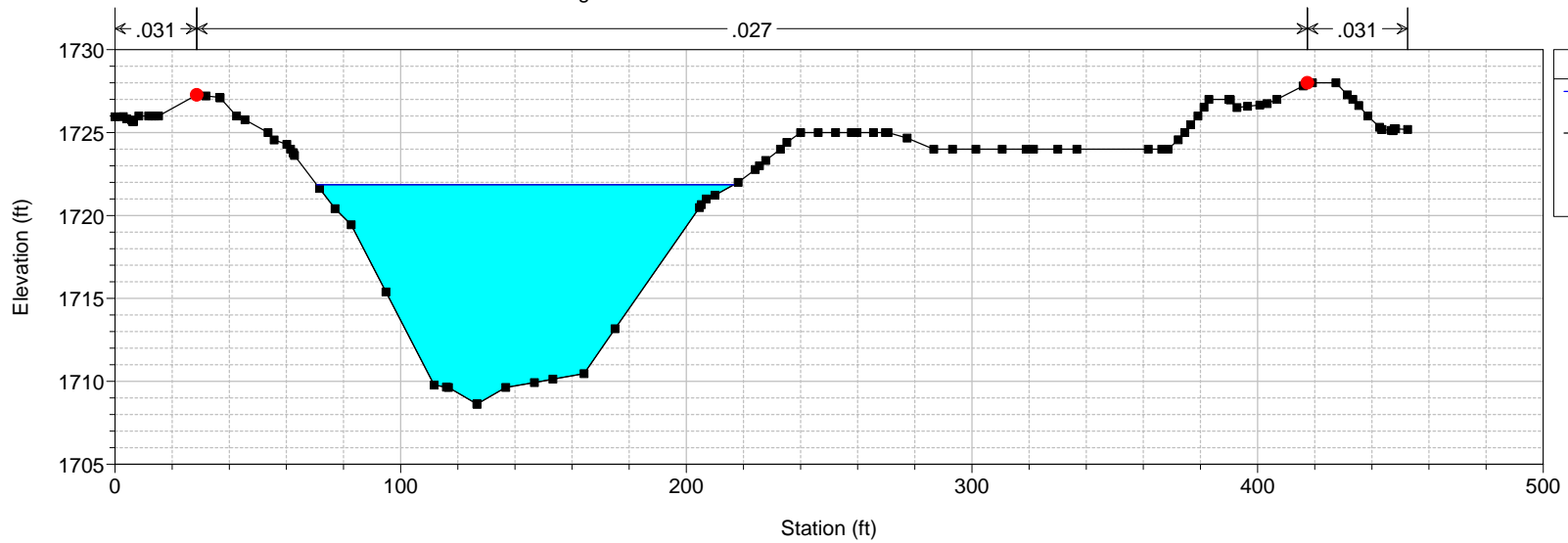
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.3 "DR" 49+26.30 = 1113.3

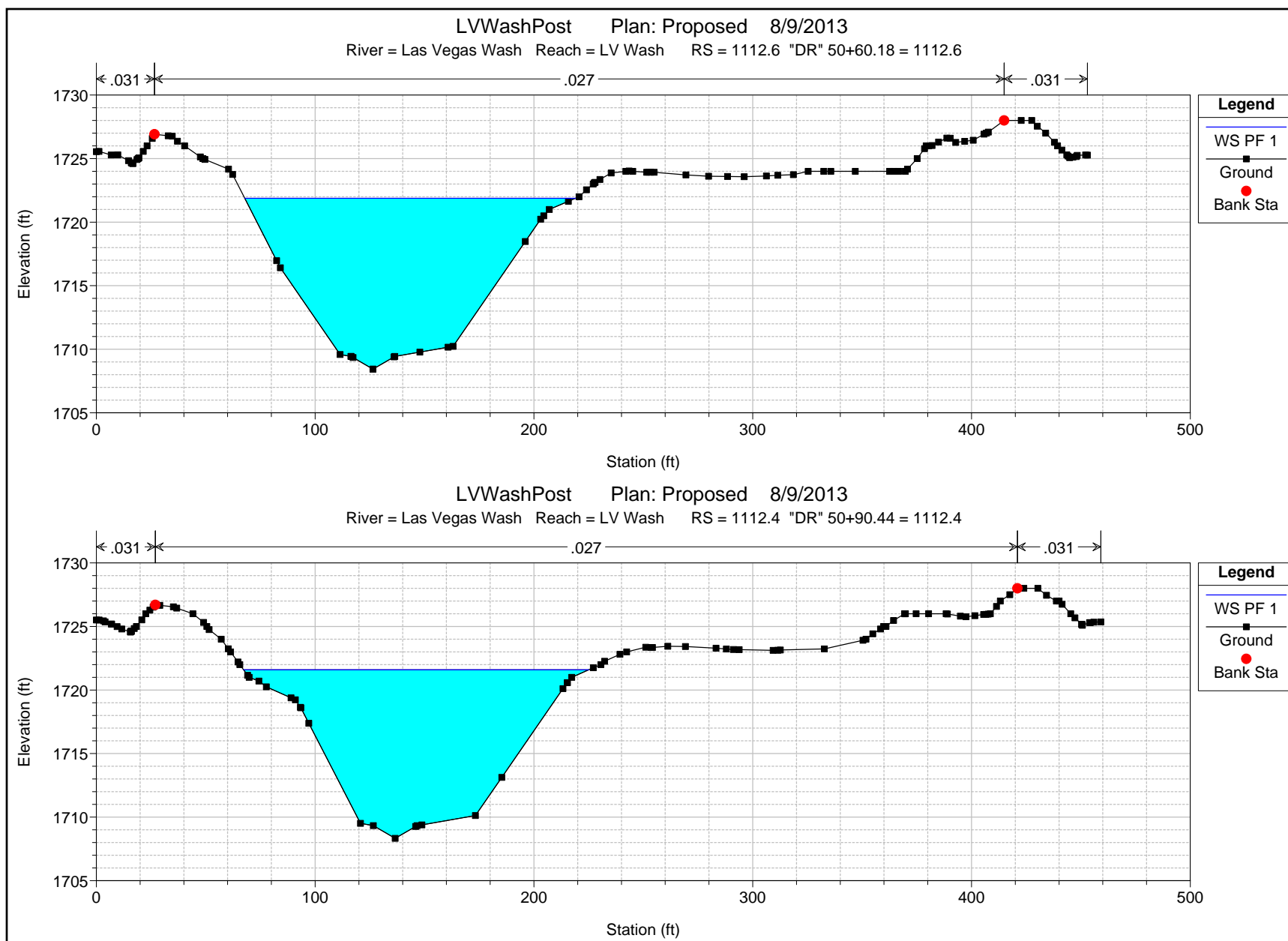


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1113.1 "DR" 49+52.88 = 1113.1

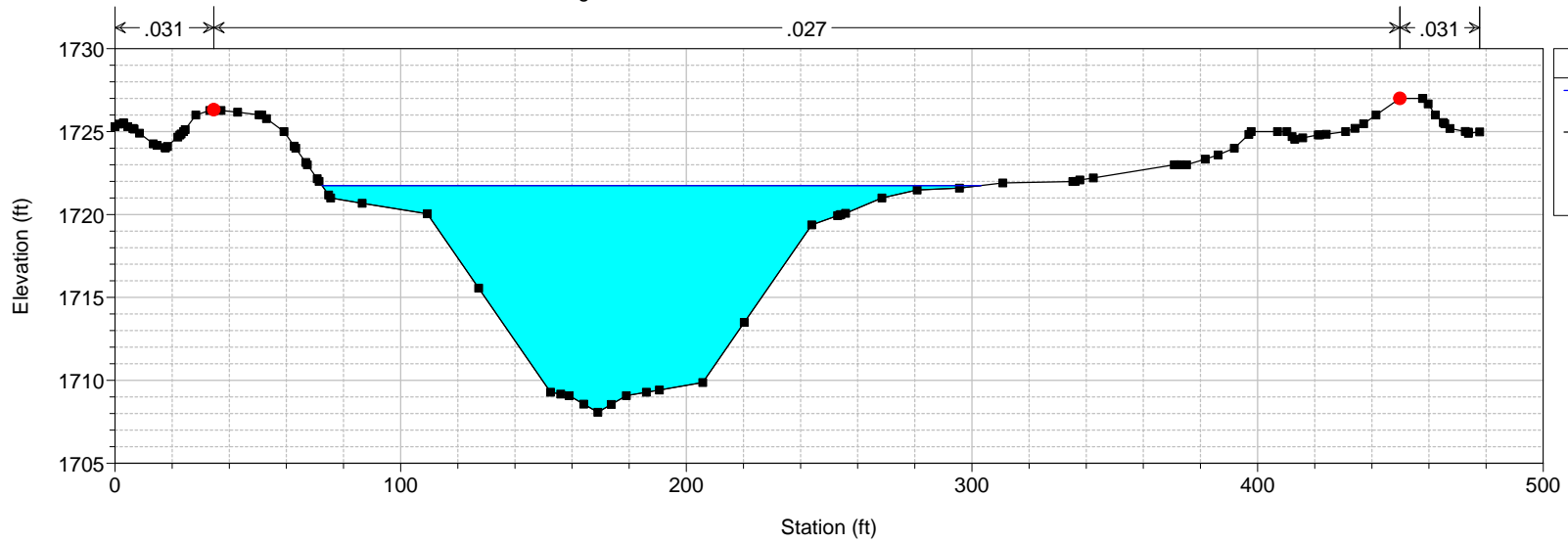


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1112.8 "DR" 50+05.00 = 1112.8

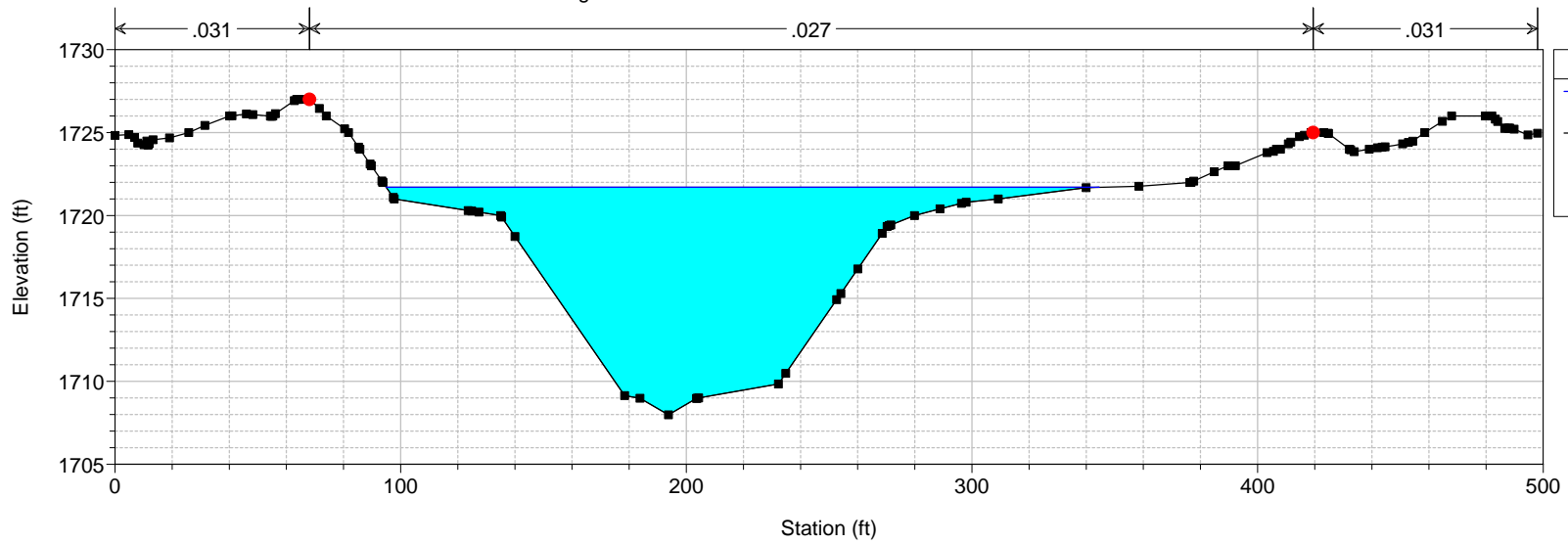




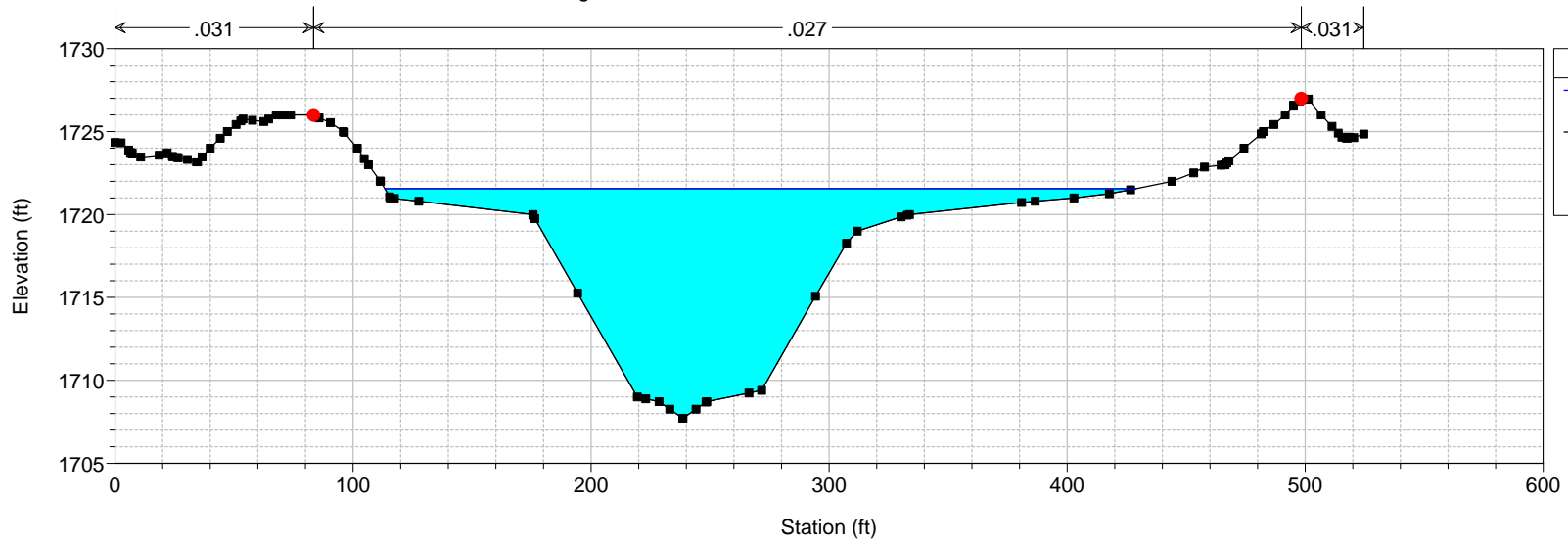
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1112.2 "DR" 51+62.97 = 1112.2



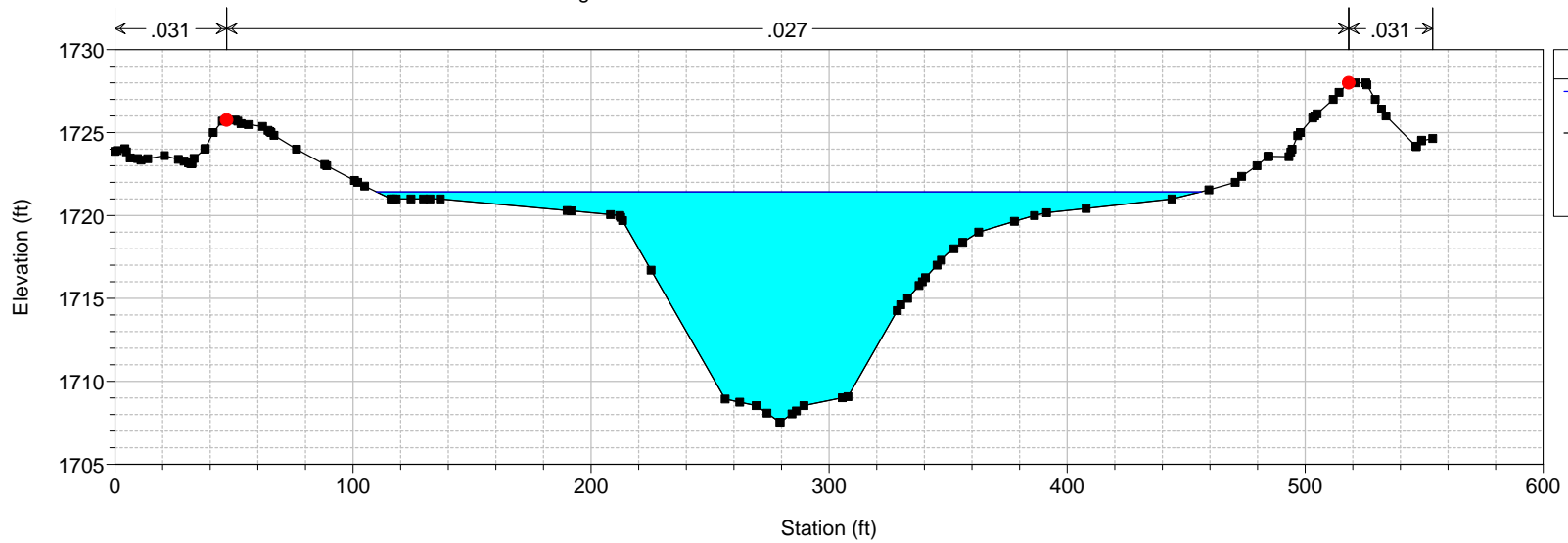
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1111.9 "DR" 51+89.80 = 1111.9



LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1111.7 "DR" 52+64.94 = 1111.7

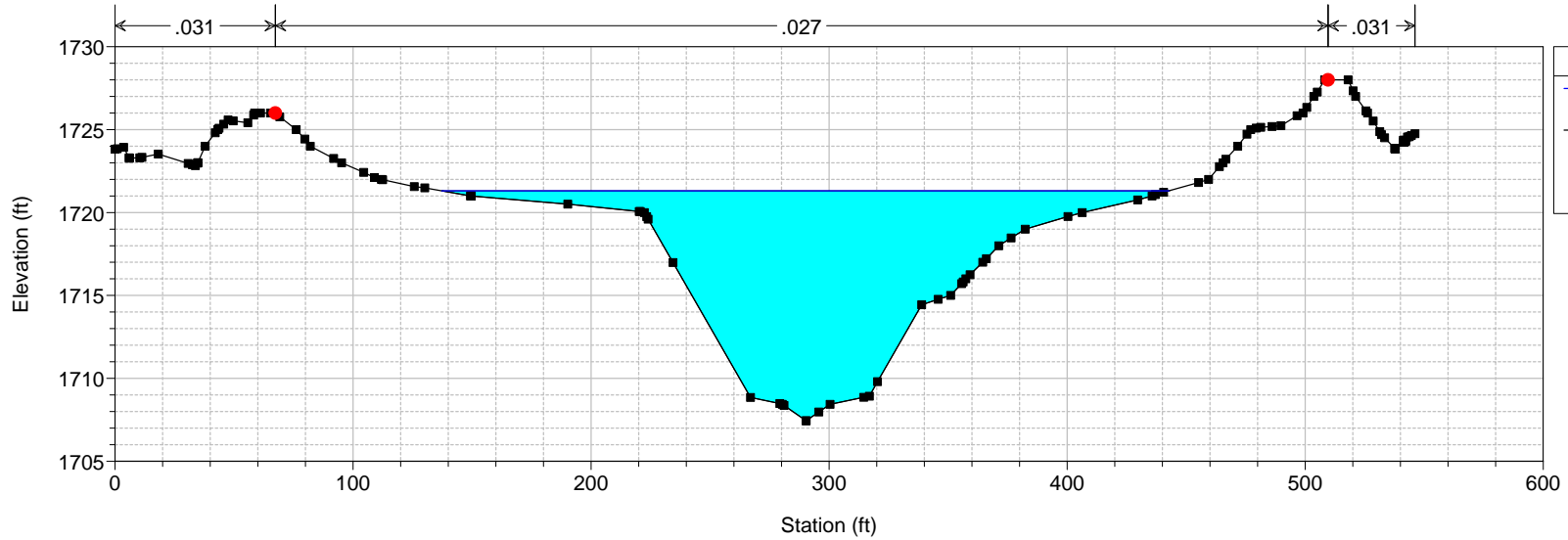


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1111.5 "DR" 53+16.09 = 1111.5



LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1111.3 "DR" 53.+44.60 = 1111.3

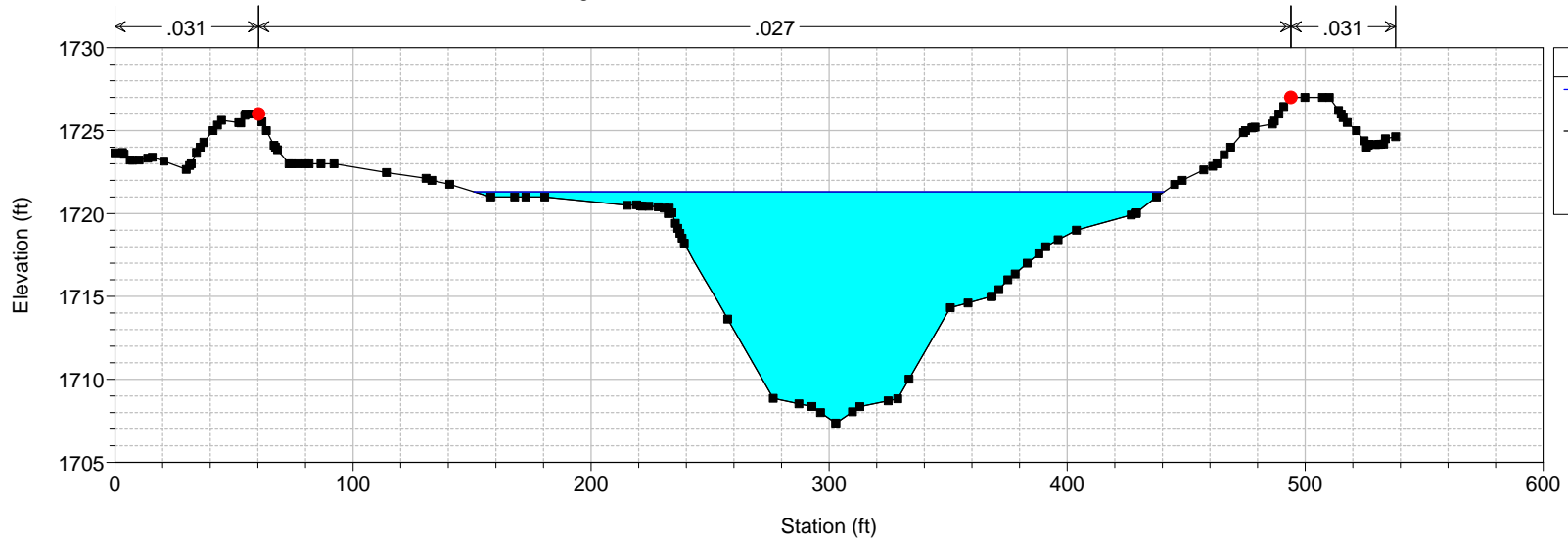


Legend

- WS PF 1
- Ground
- Bank Sta

LVWashPost Plan: Proposed 8/9/2013

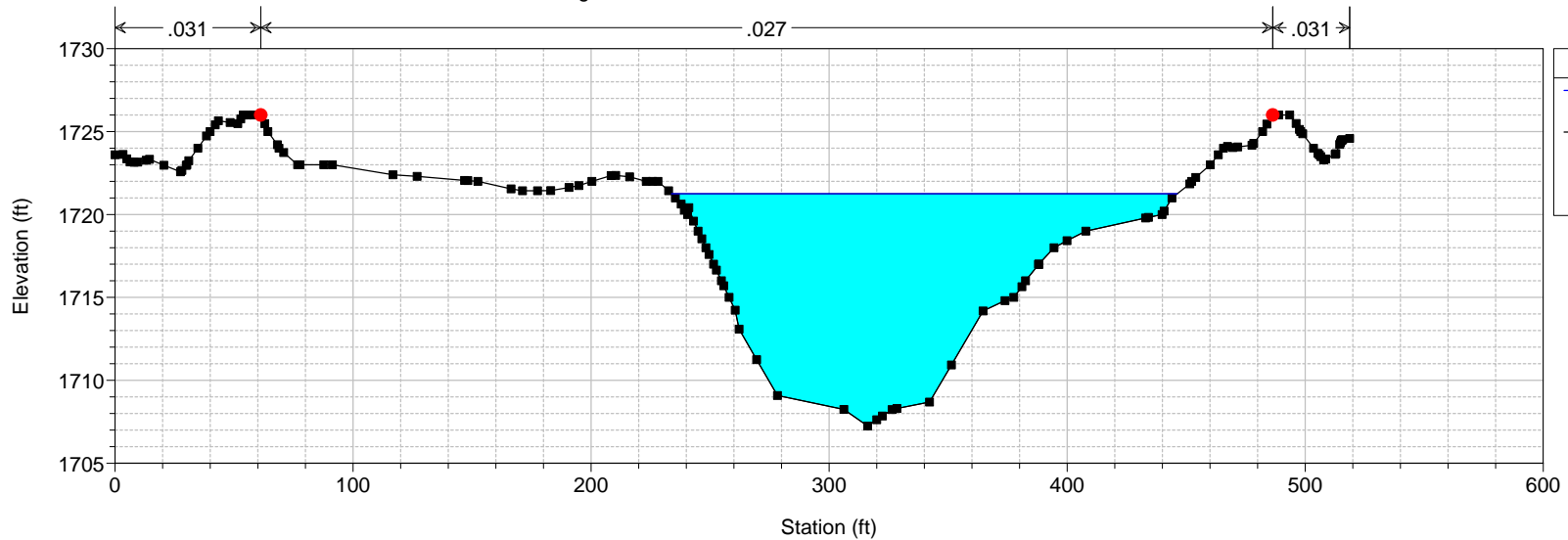
River = Las Vegas Wash Reach = LV Wash RS = 1111.1 "DR" 53.+66.57 = 1111.1



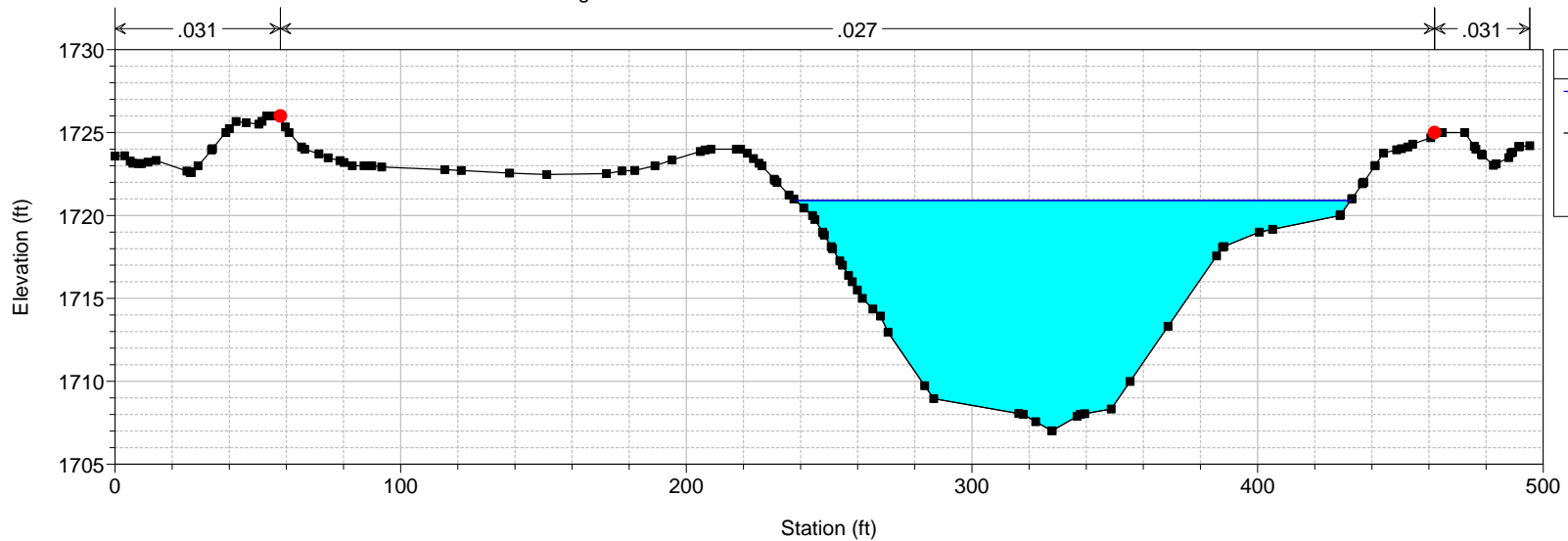
Legend

- WS PF 1
- Ground
- Bank Sta

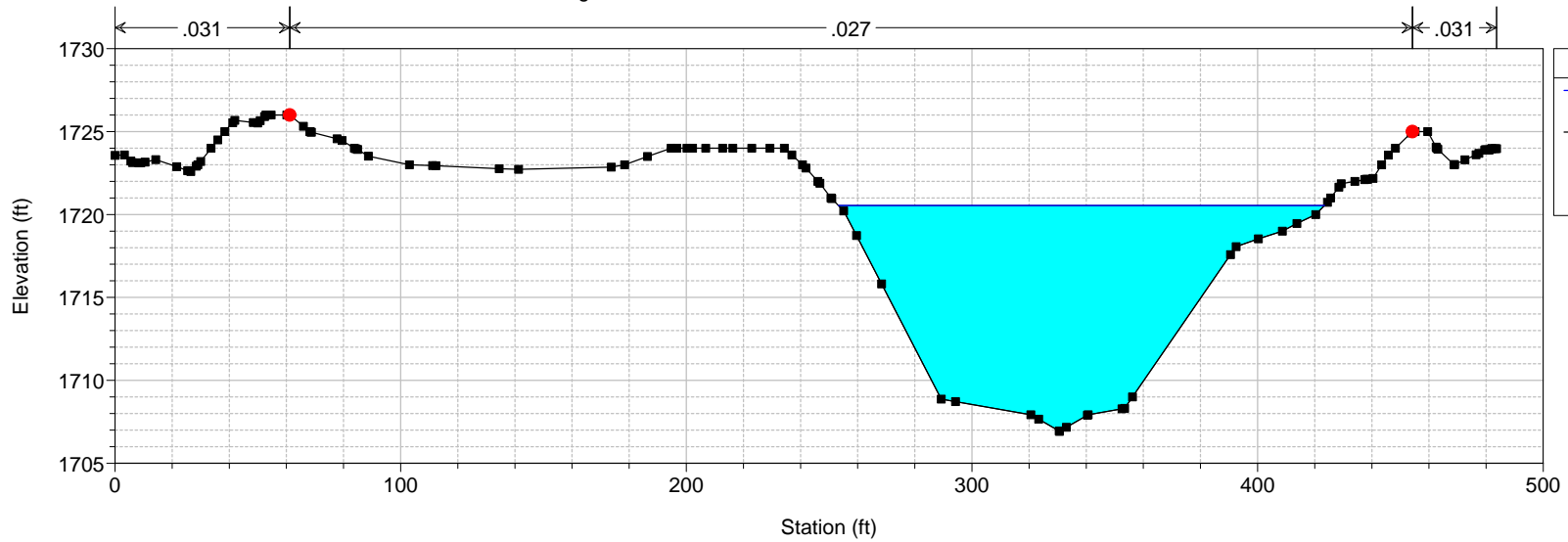
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.9 "DR" 53+98.56 = 1110.9



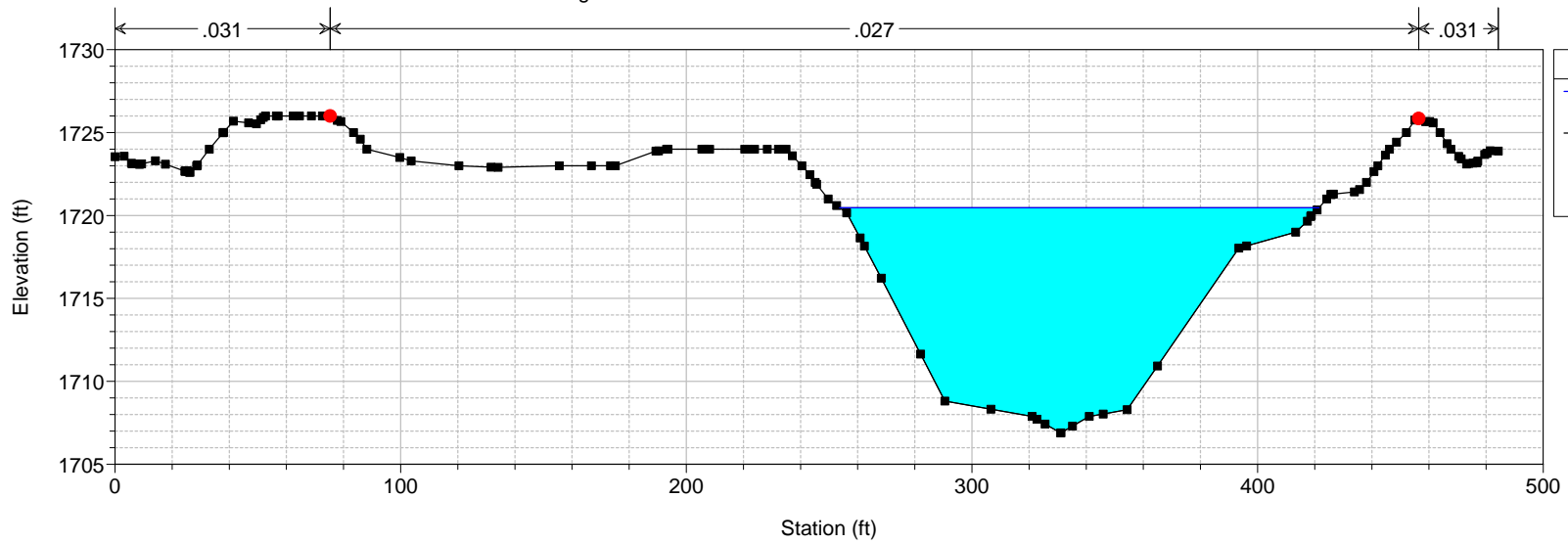
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.7 "DR" 54+68.00 = 1110.7



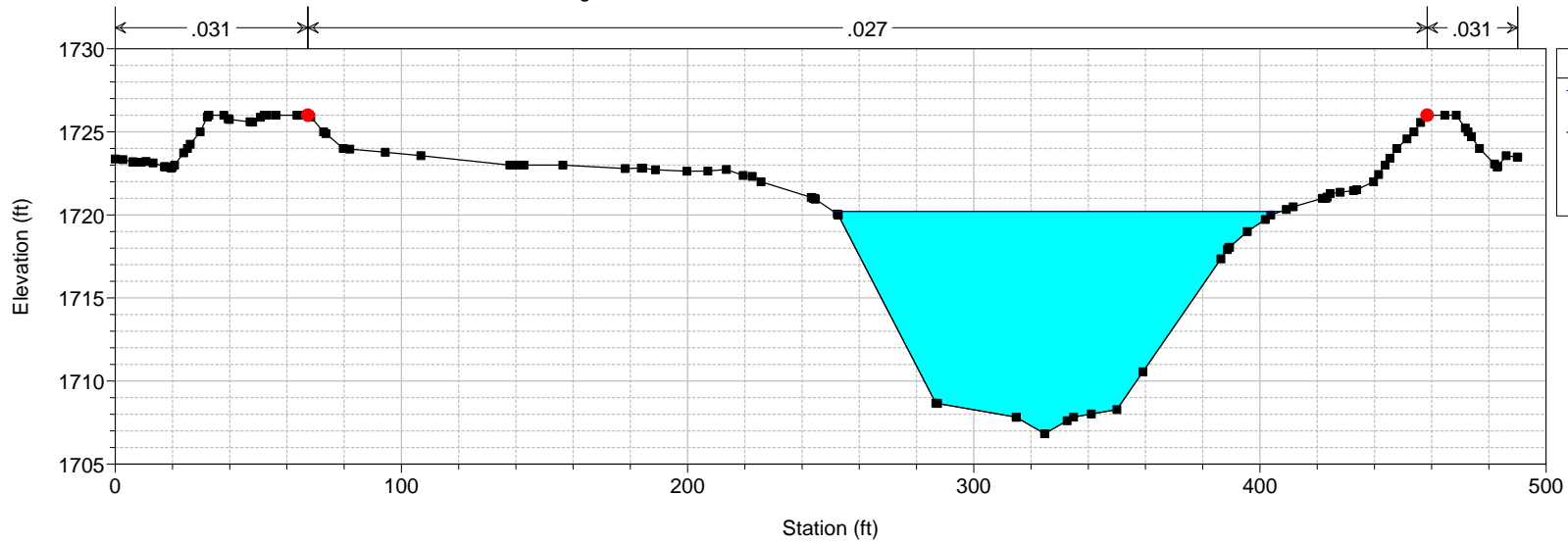
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.5 "DR" 55+19.91 = 1110.5



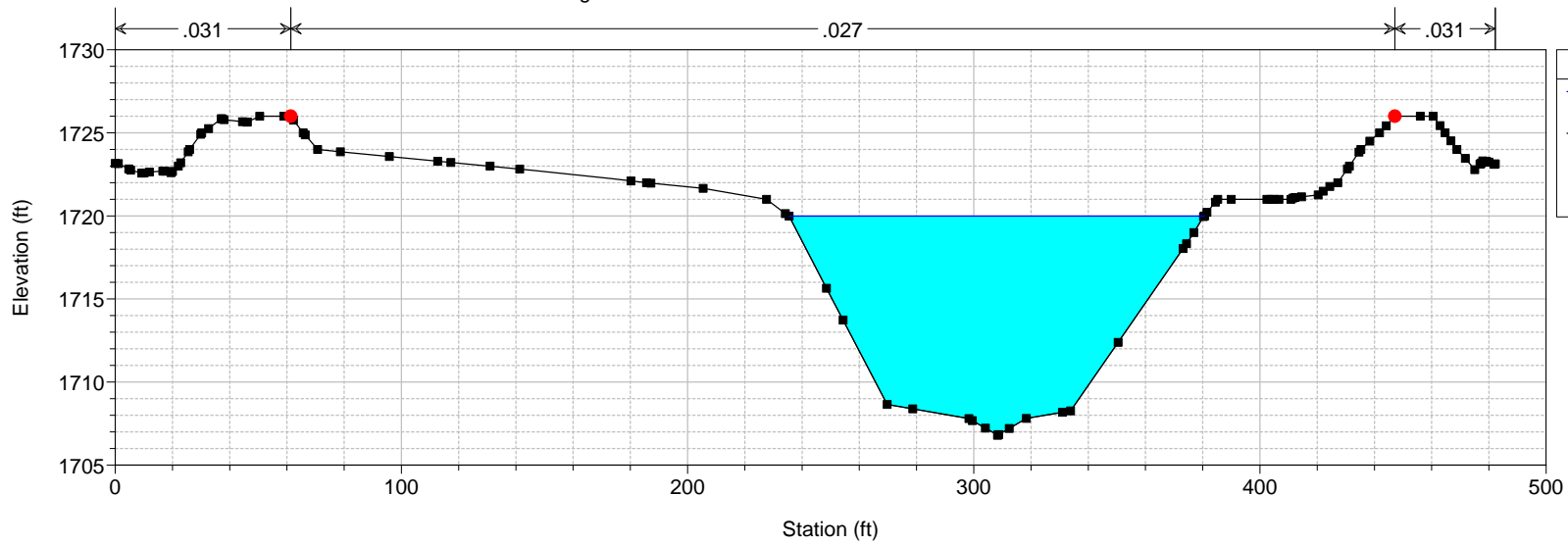
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.3 "DR" 55+45.57 = 1110.3



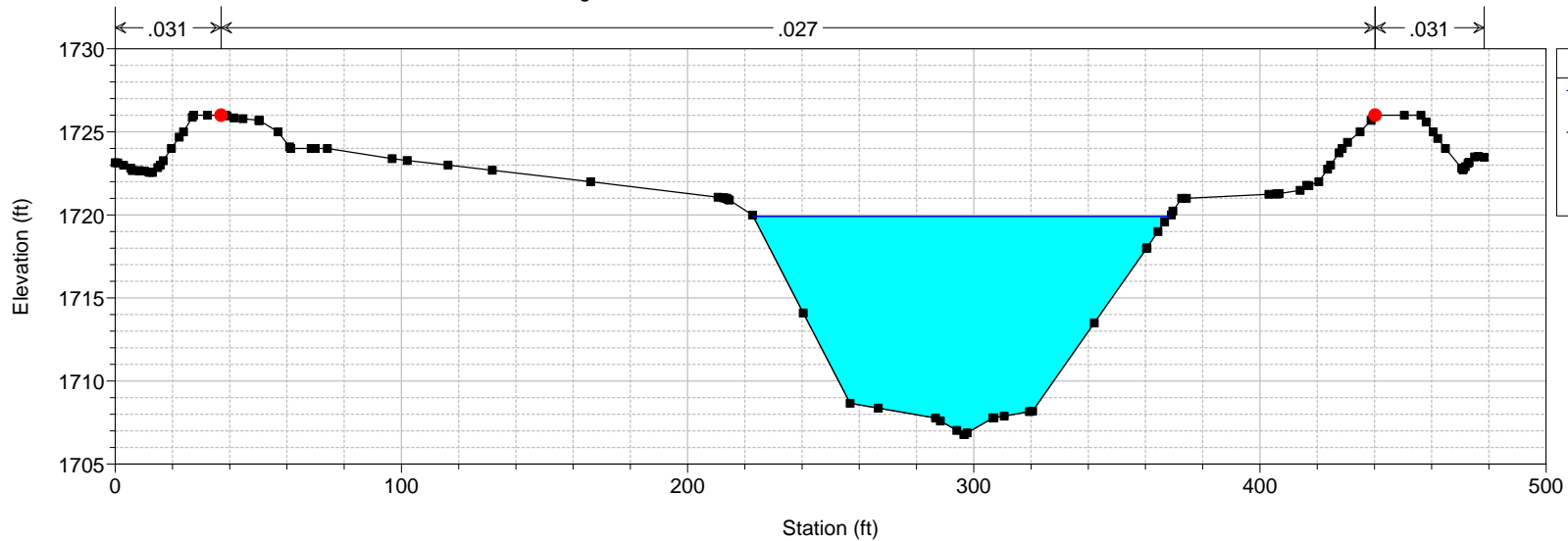
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1110.1 "DR" 55+85.27 = 1110.1



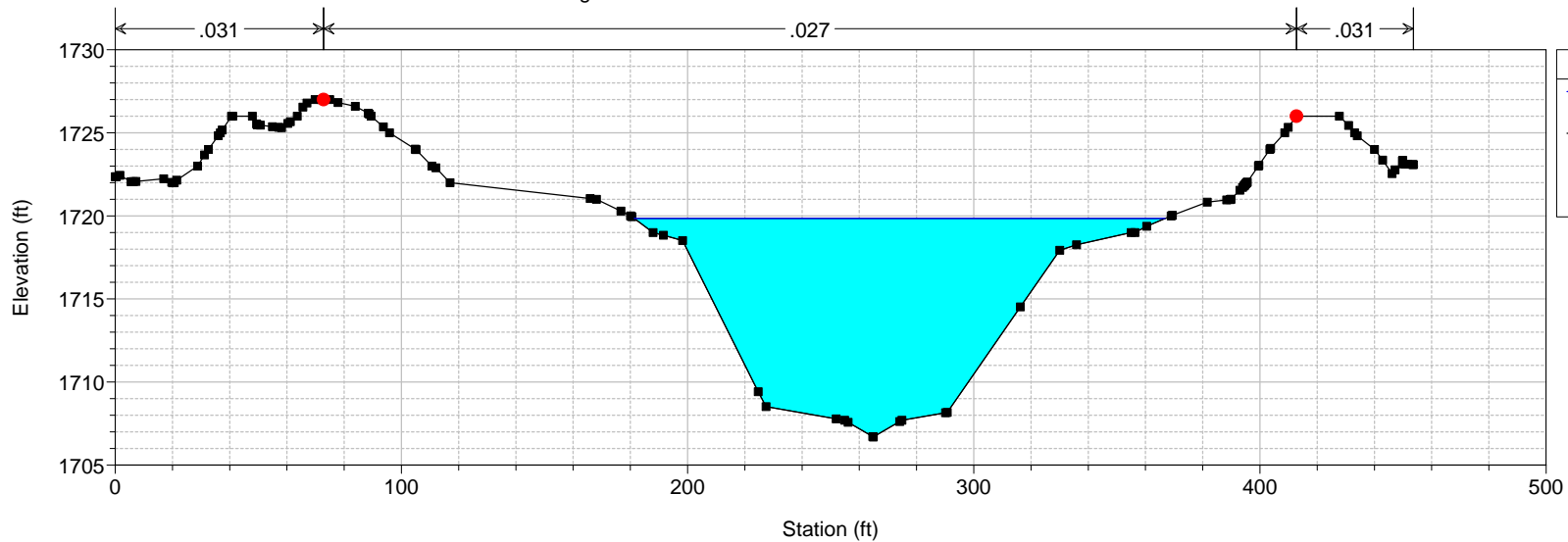
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.9 "DR" 56+00.39 = 1109.9



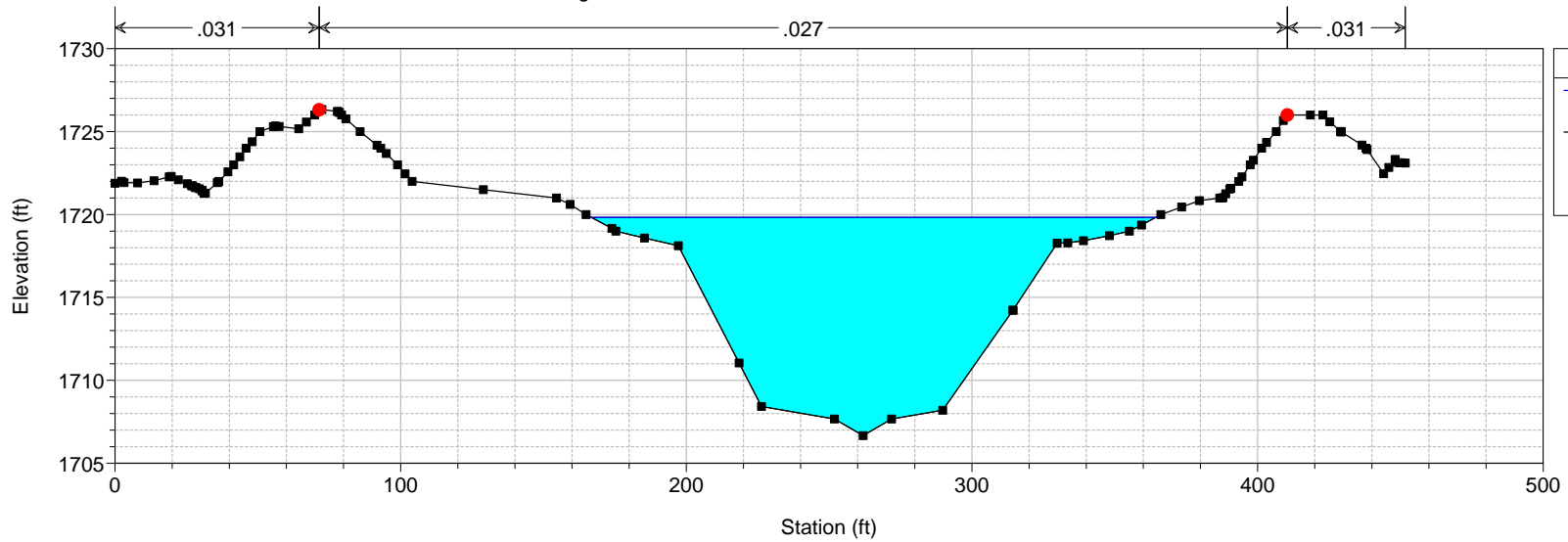
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.8 "DR" 56+21.09 = 1109.8



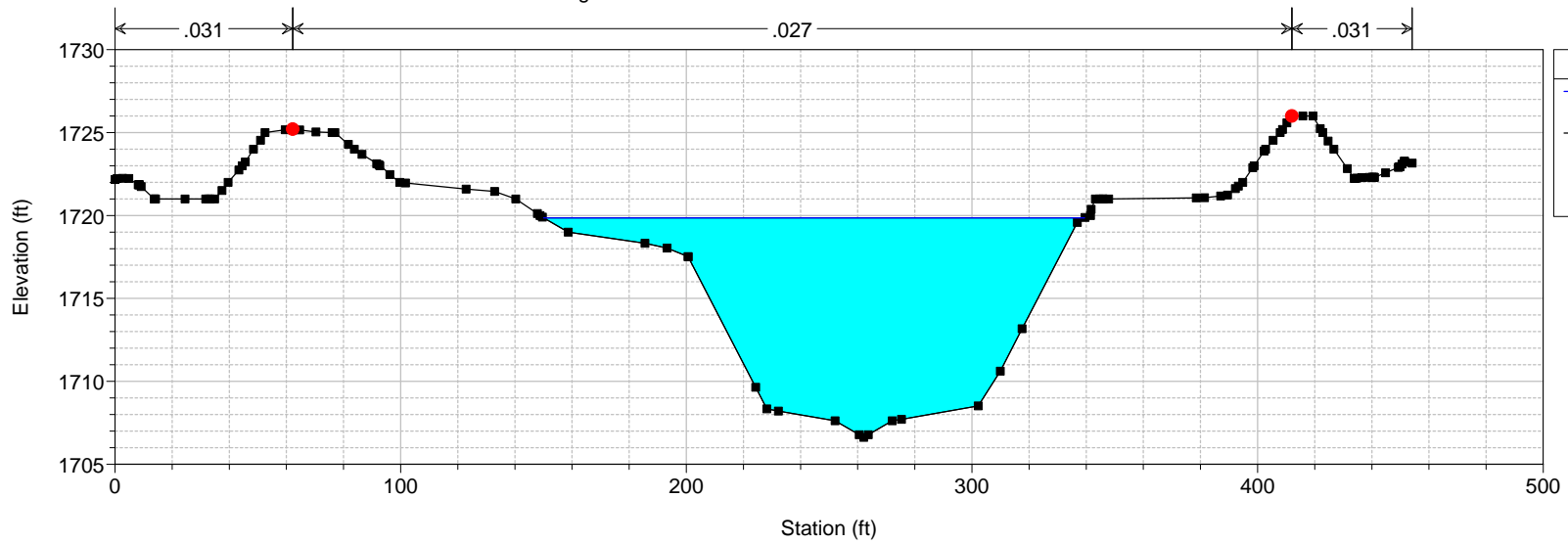
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.6 "DR" 56+70.98 = 1109.6



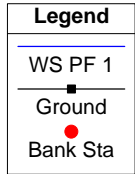
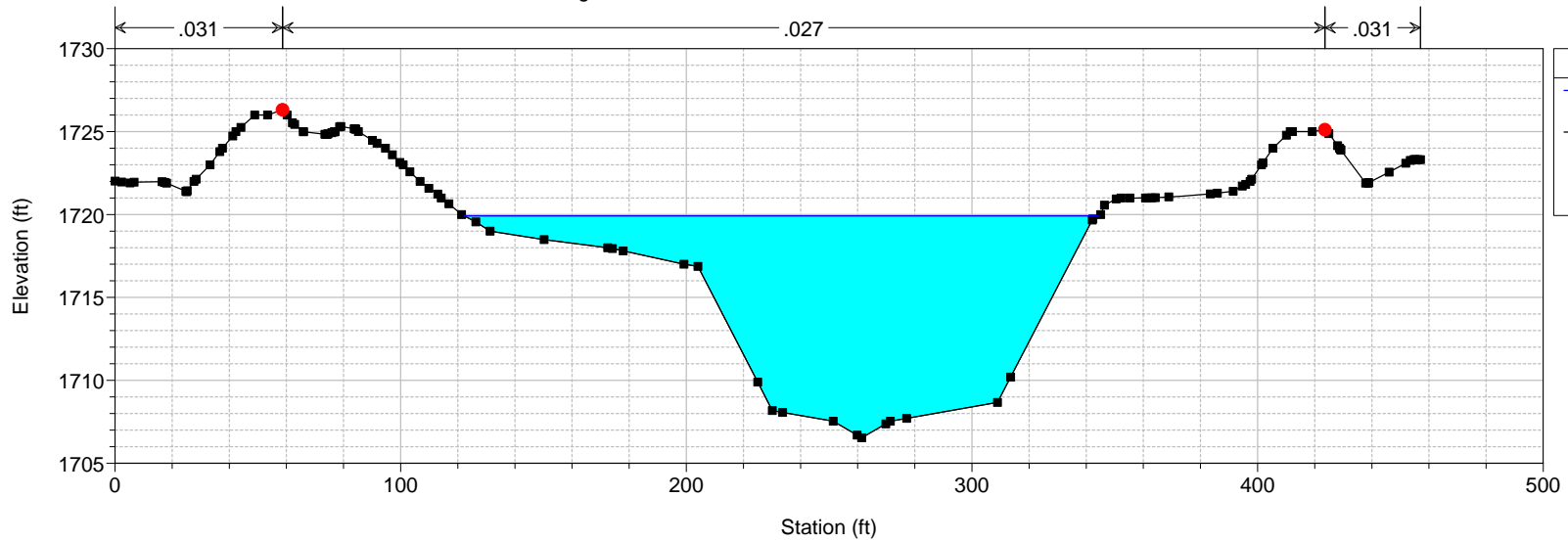
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.5 "DR" 56+90.50 = 1109.5



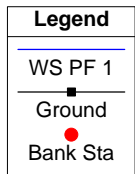
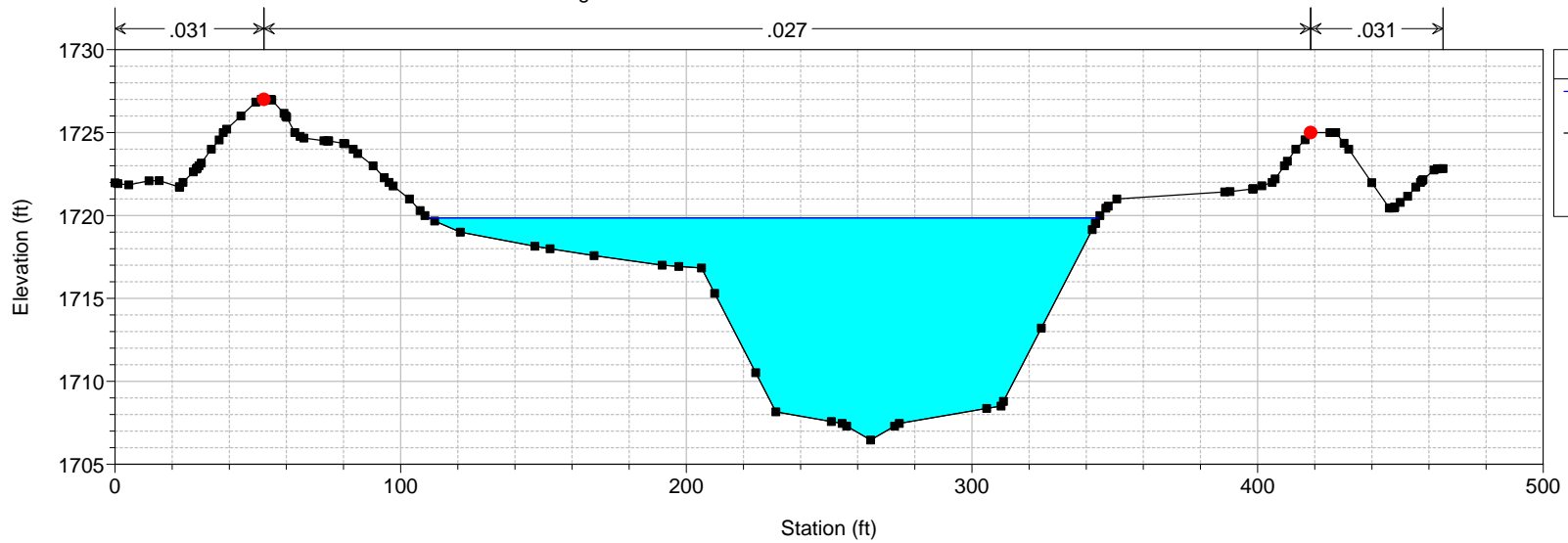
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.3 "DR" 57+20.98 = 1109.3



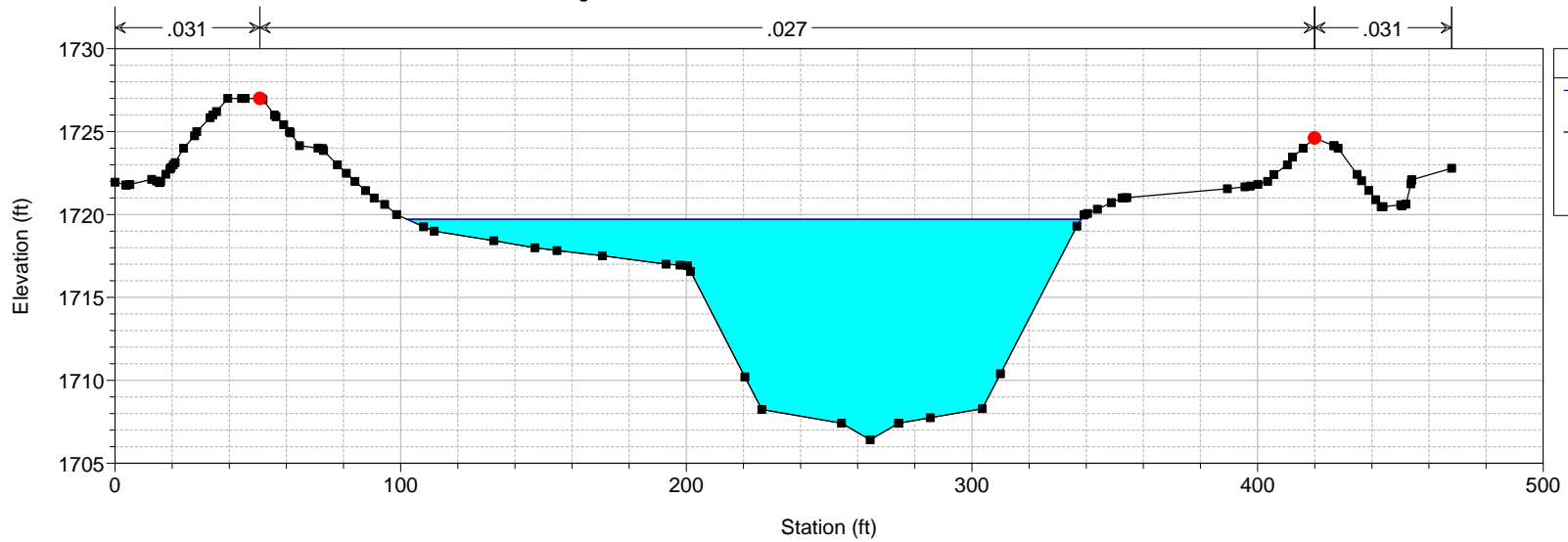
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1109.1 "DR" 57+70.98 = 1109.1



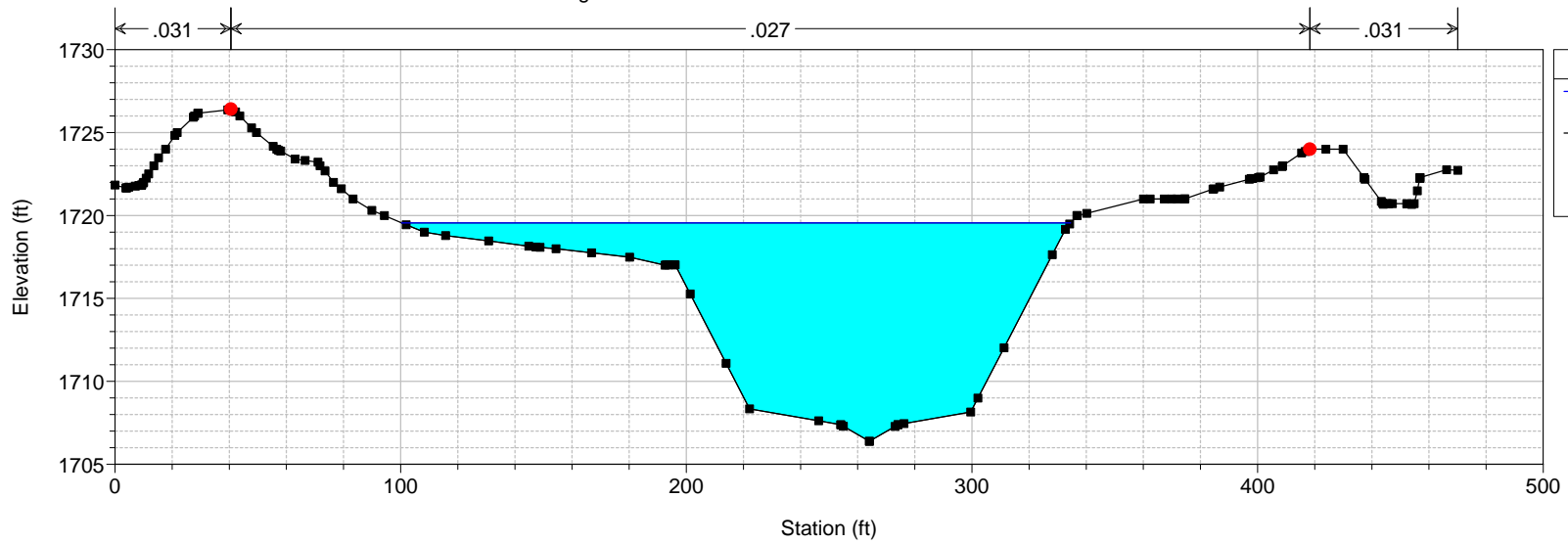
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.9 "DR" 58+20.98 = 1108.9



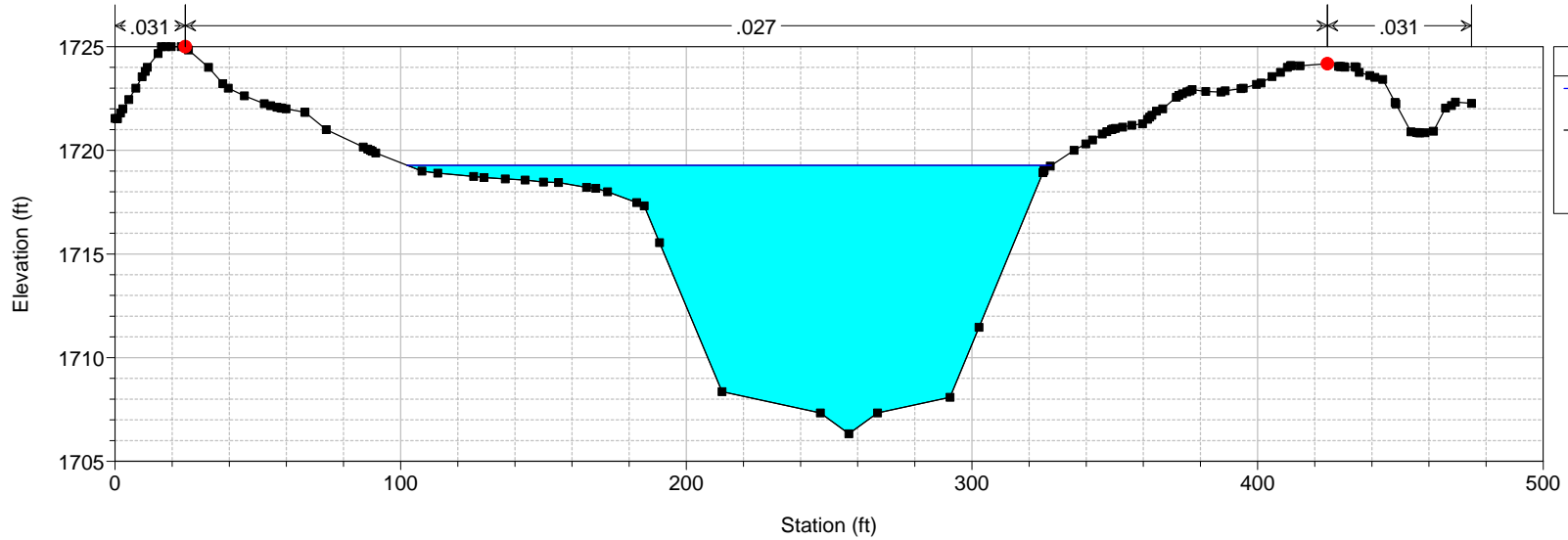
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1108.8 "DR" 58+48.43 = 1108.8



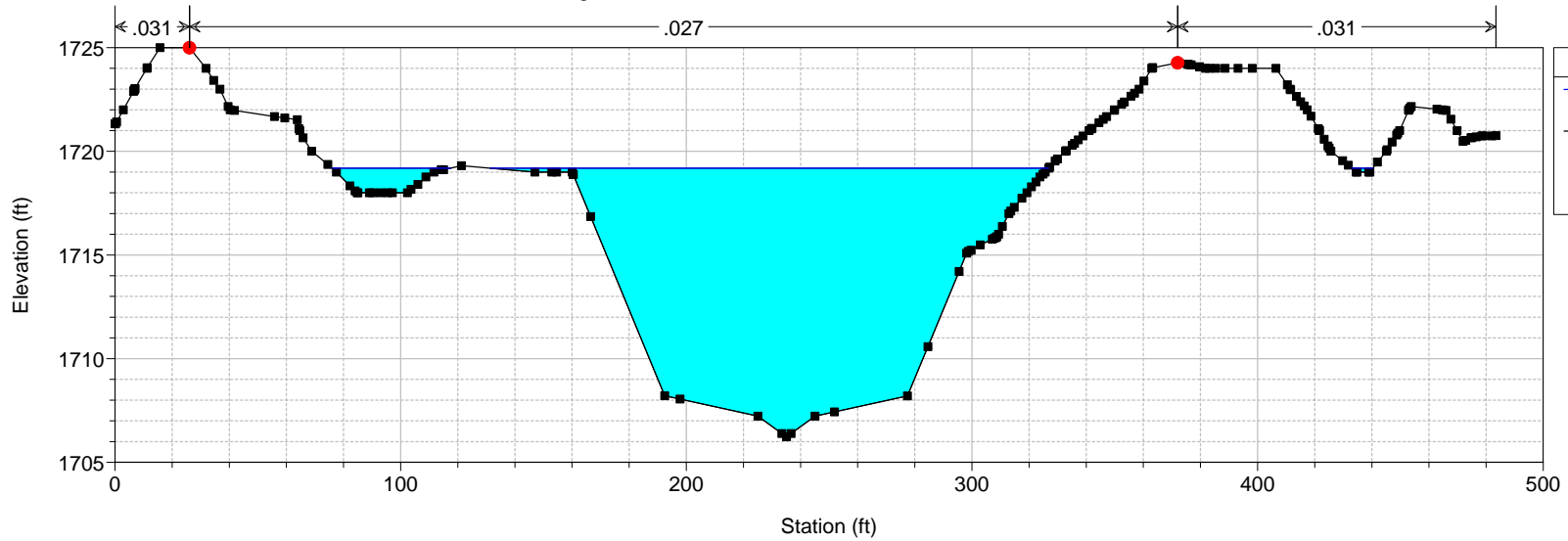
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1108.7 "DR" 58+70.98 = 1108.7



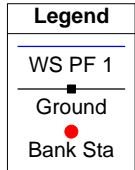
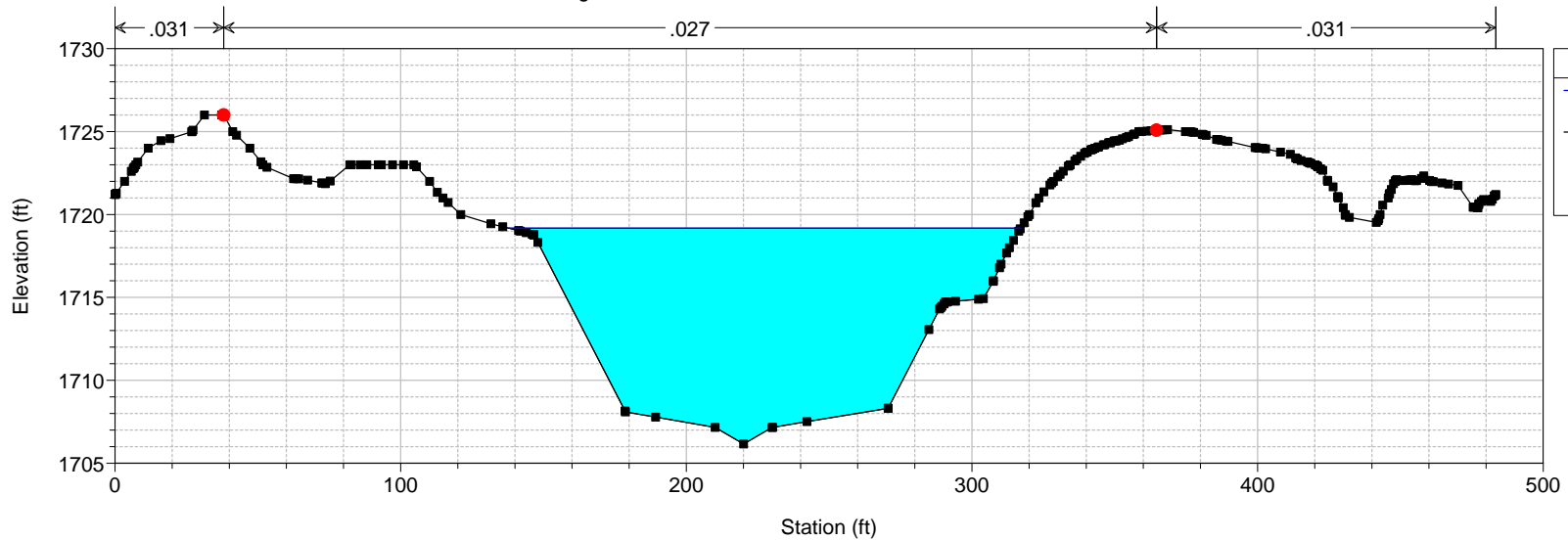
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.5 "DR" 59+06.98 = 1108.5



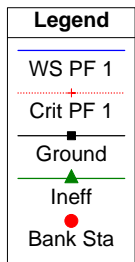
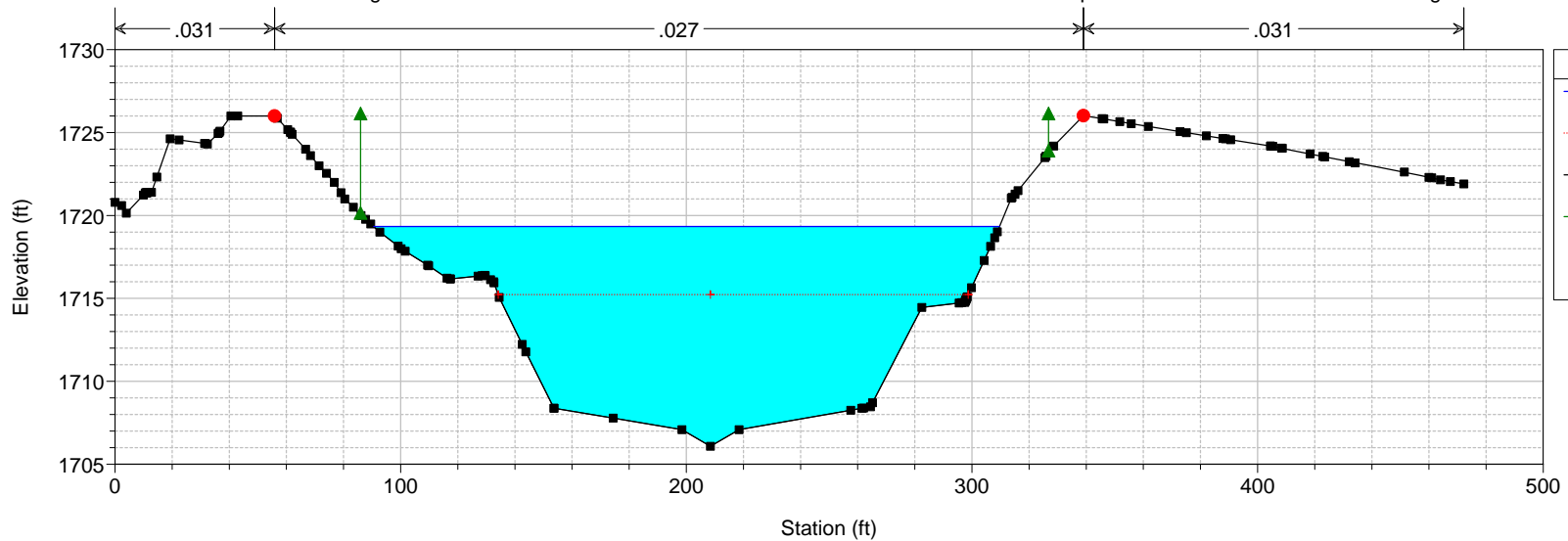
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.3 "DR" 59+70.98 = 1108.3

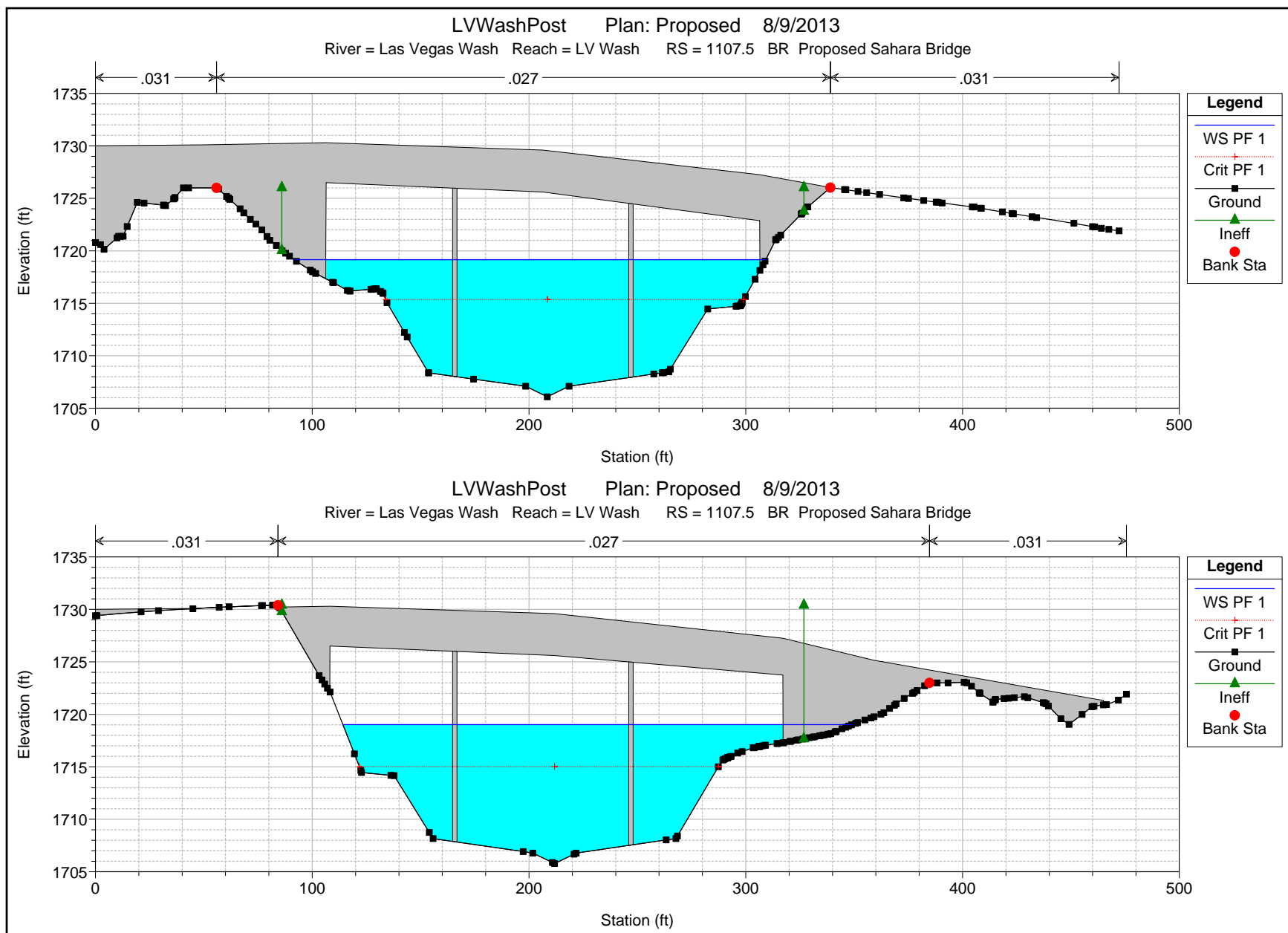


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1108.2 "DR" 60+16.43 = 1108.2



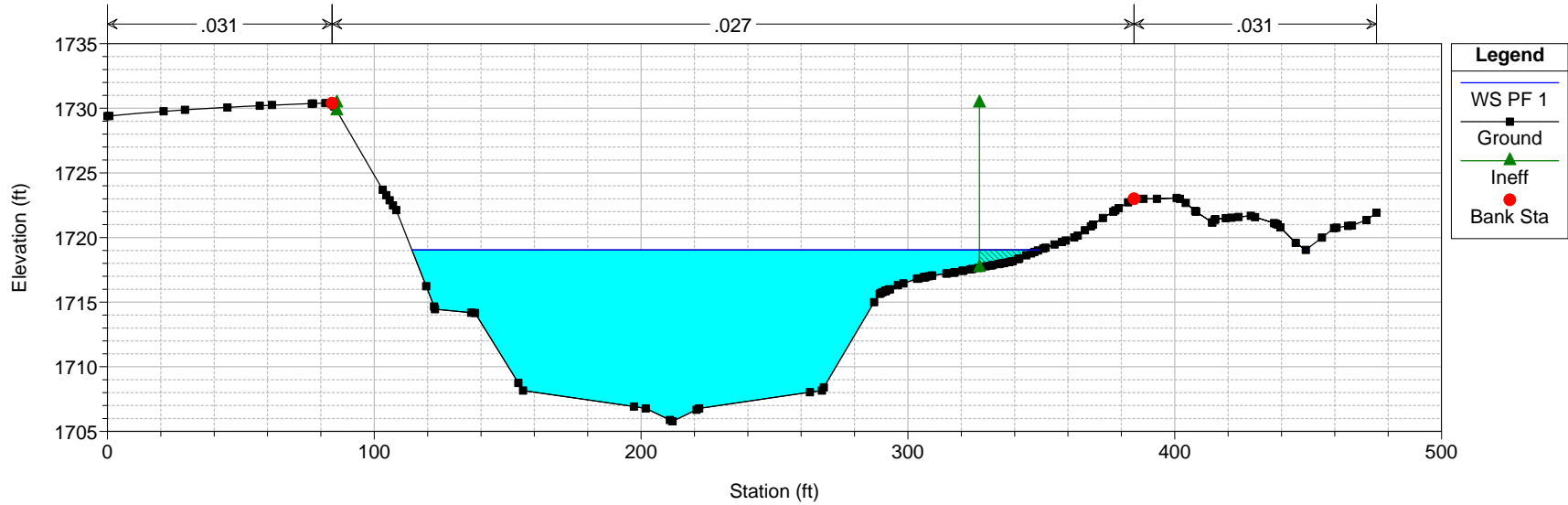
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1107.95 "DR" 60+46.86 = 1107.95 Upstream side of new Sahara Ave. Bridge





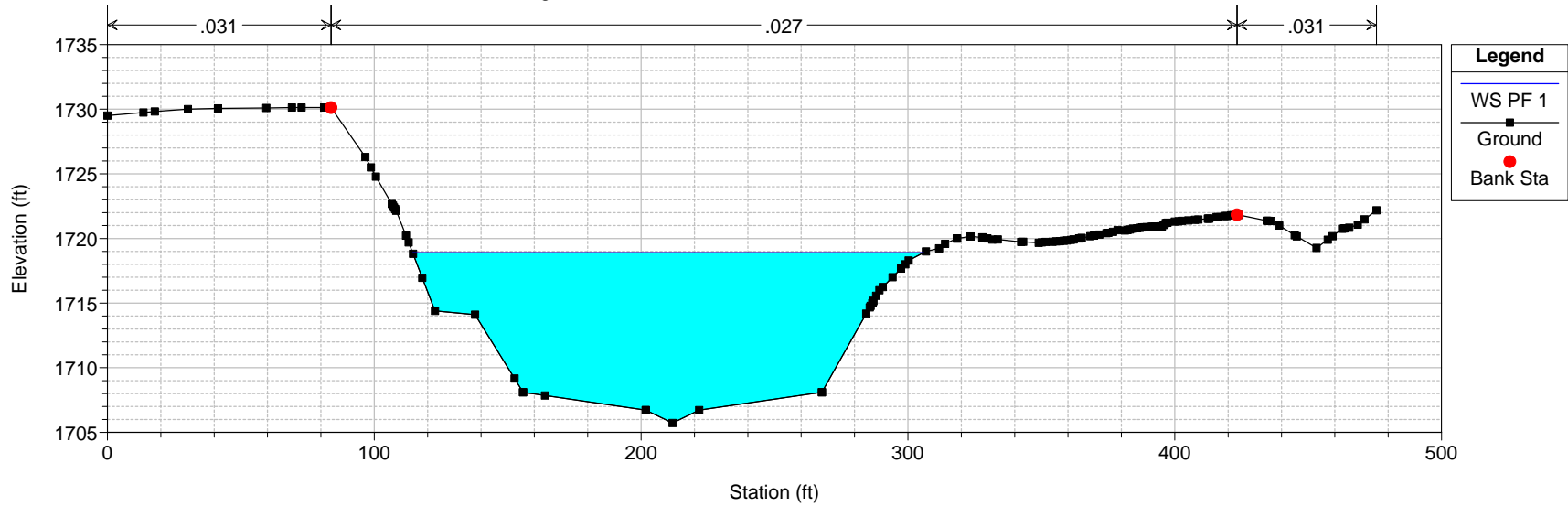
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1107.15 "DR" 61+70.98 = 1107.15 Downstream side of new Sahara Ave. bridge

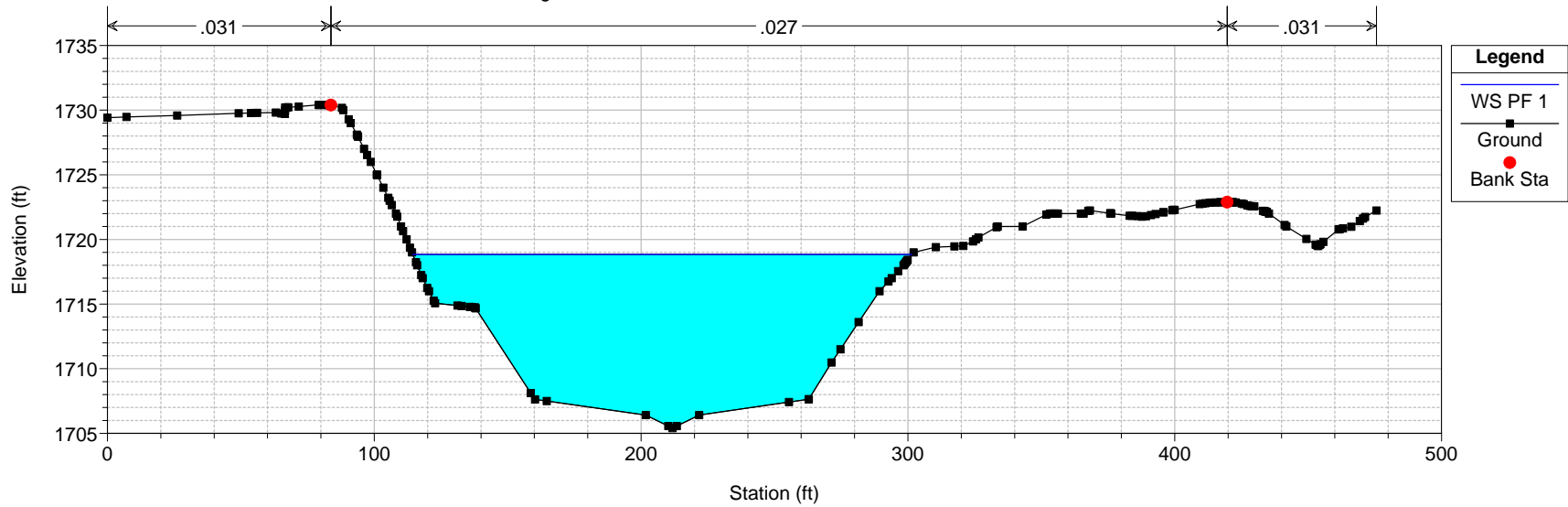


LVWashPost Plan: Proposed 8/9/2013

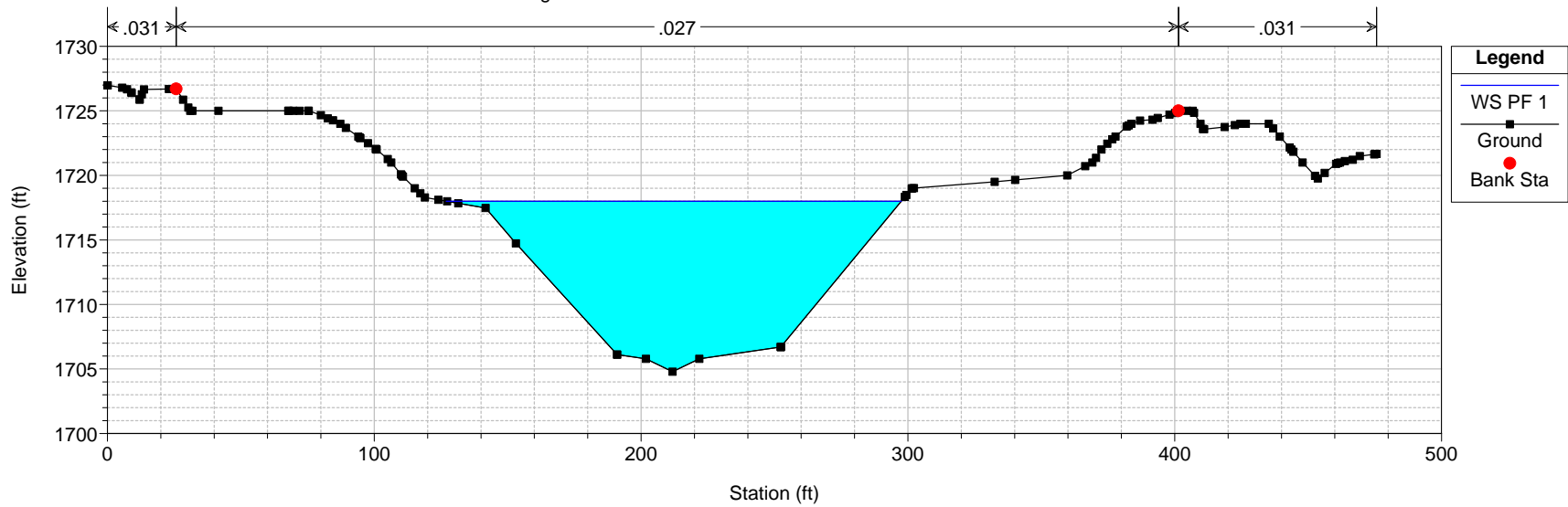
River = Las Vegas Wash Reach = LV Wash RS = 1107.1 "DR" 61+96.00 = 1107.1



LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1106.8 "DR" 62+20.98 = 1106.8

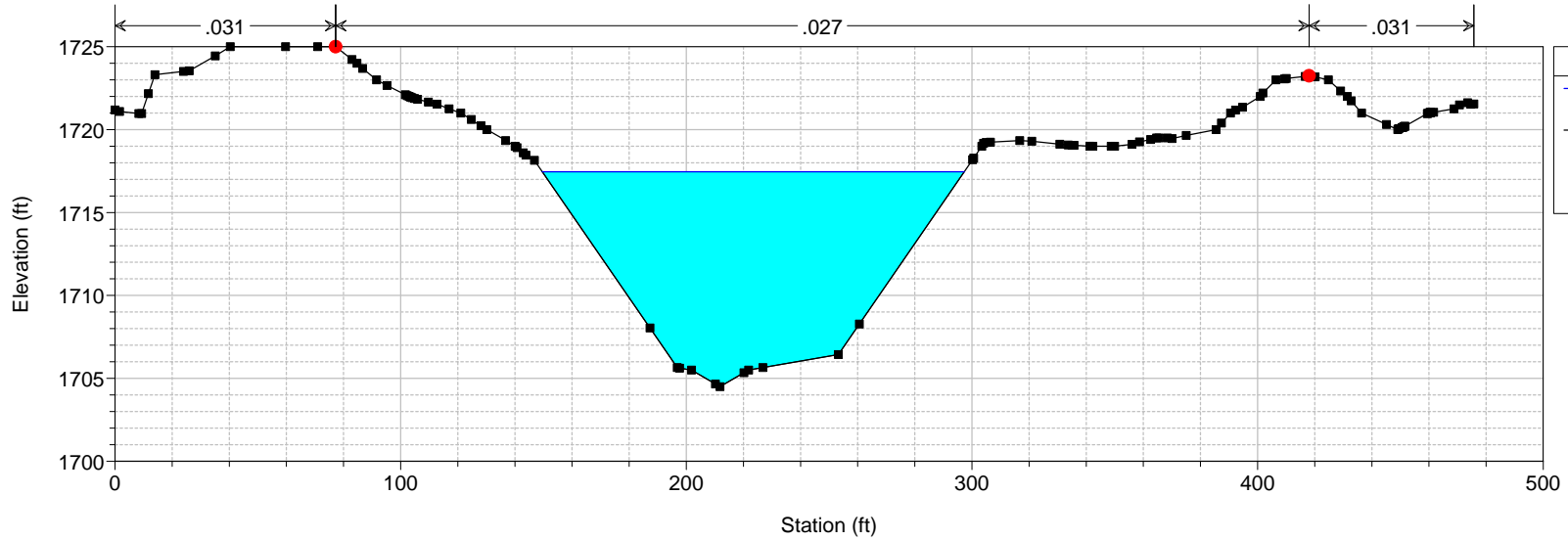


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1106.6 "DR" 62+70.00 = 1106.6



LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1106.4 "DR" 63+20.98 = 1106.4

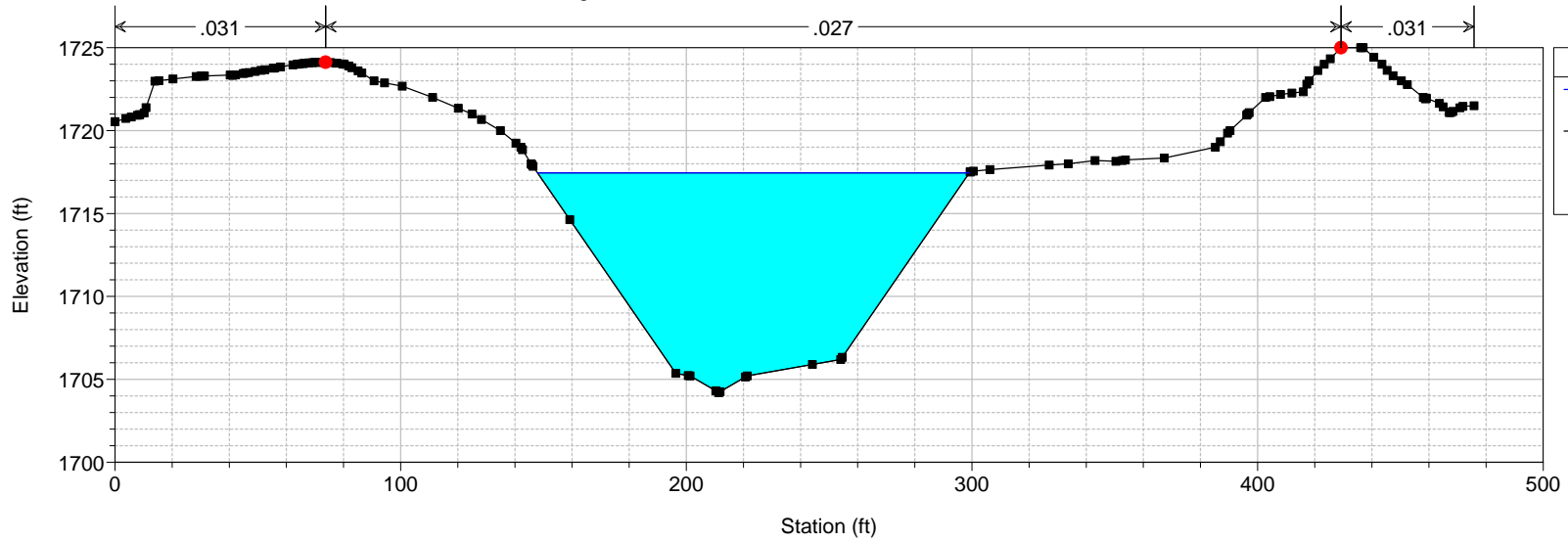


Legend

- WS PF 1
- Ground
- Bank Sta

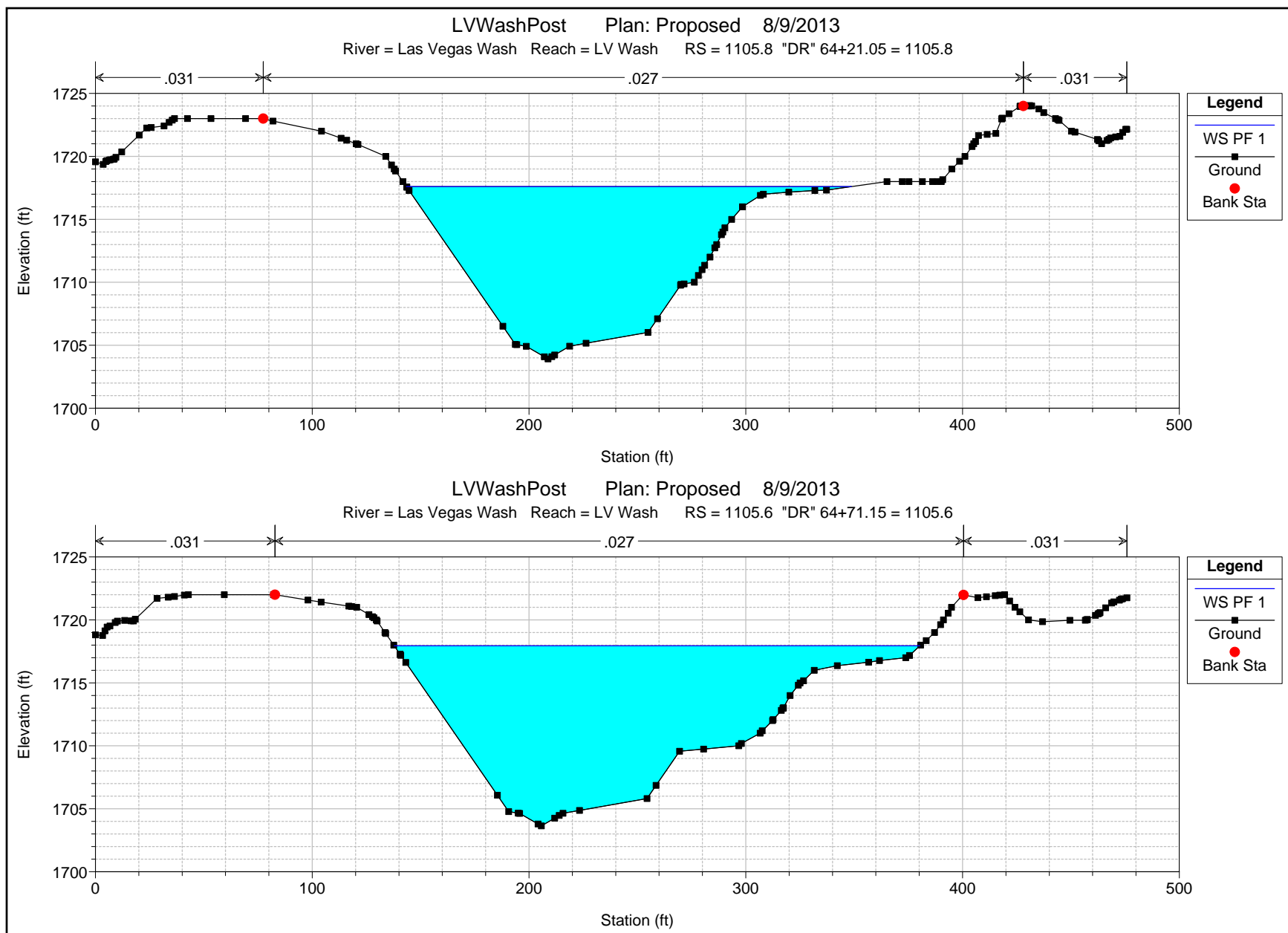
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1106.2 "DR" 63+70.98 = 1106.2

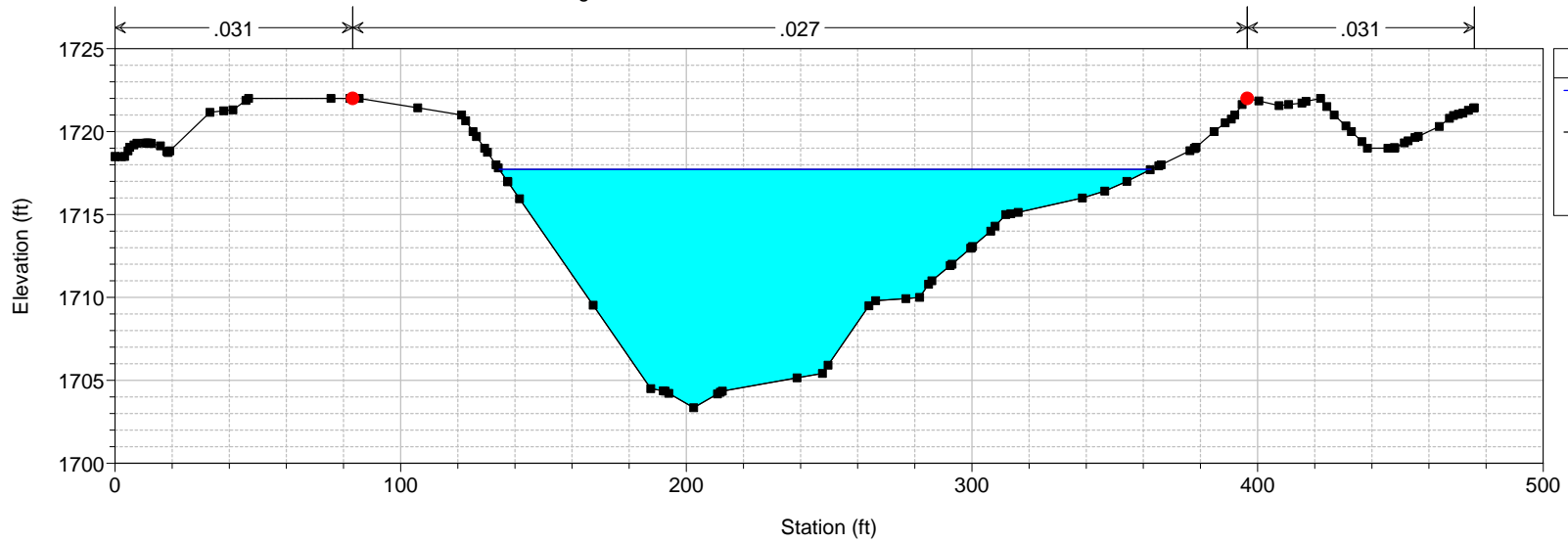


Legend

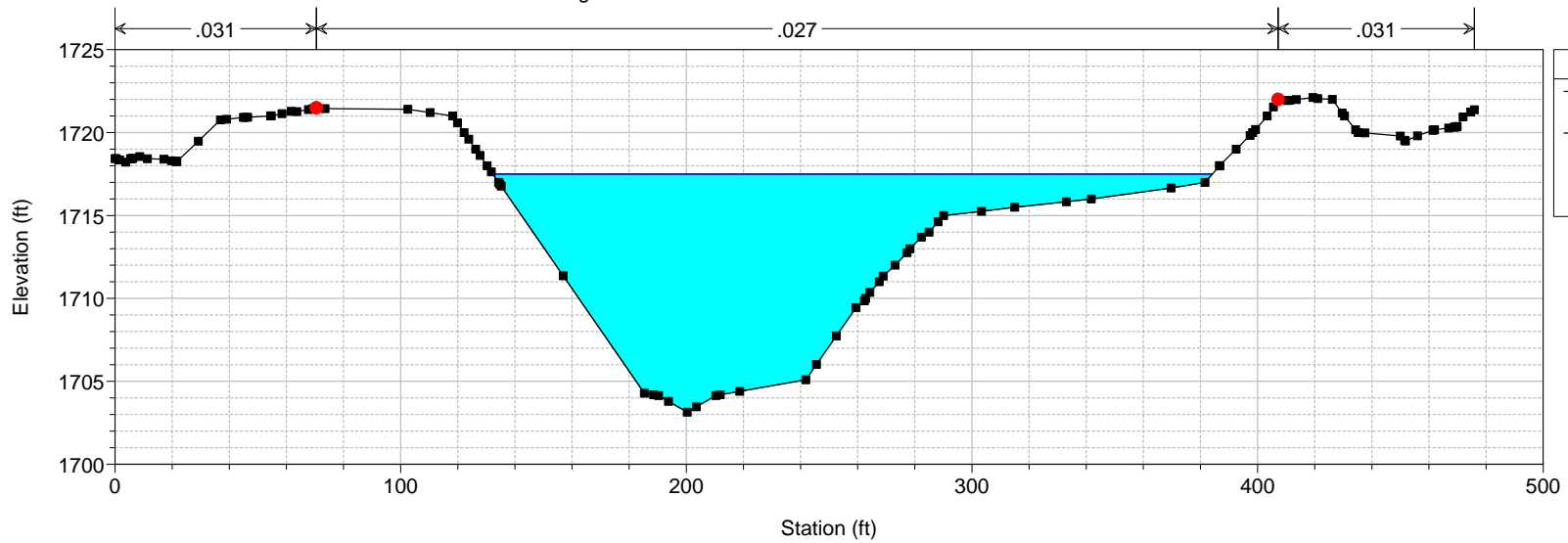
- WS PF 1
- Ground
- Bank Sta

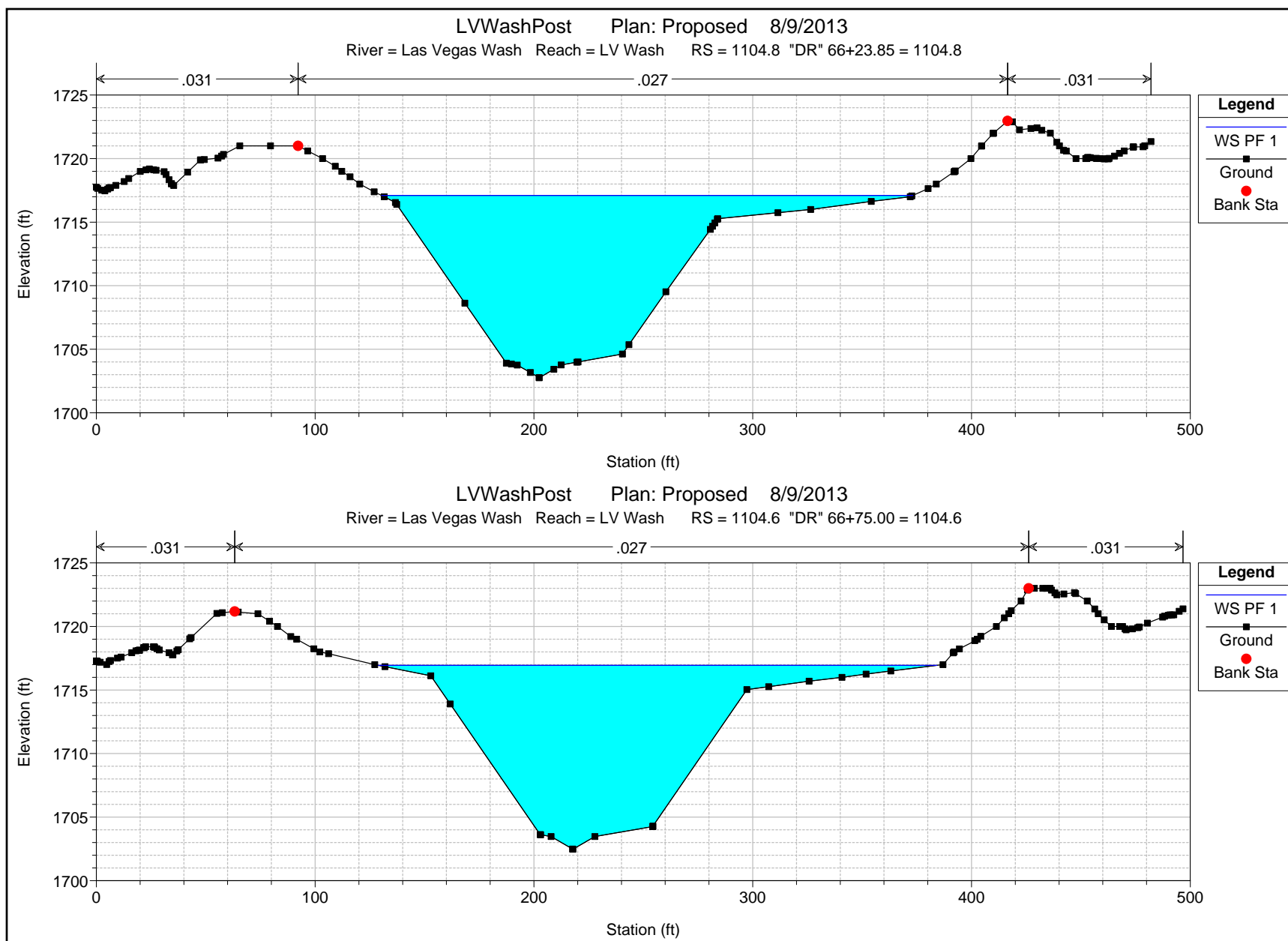


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1105.4 "DR" 65+21.24 = 1105.4

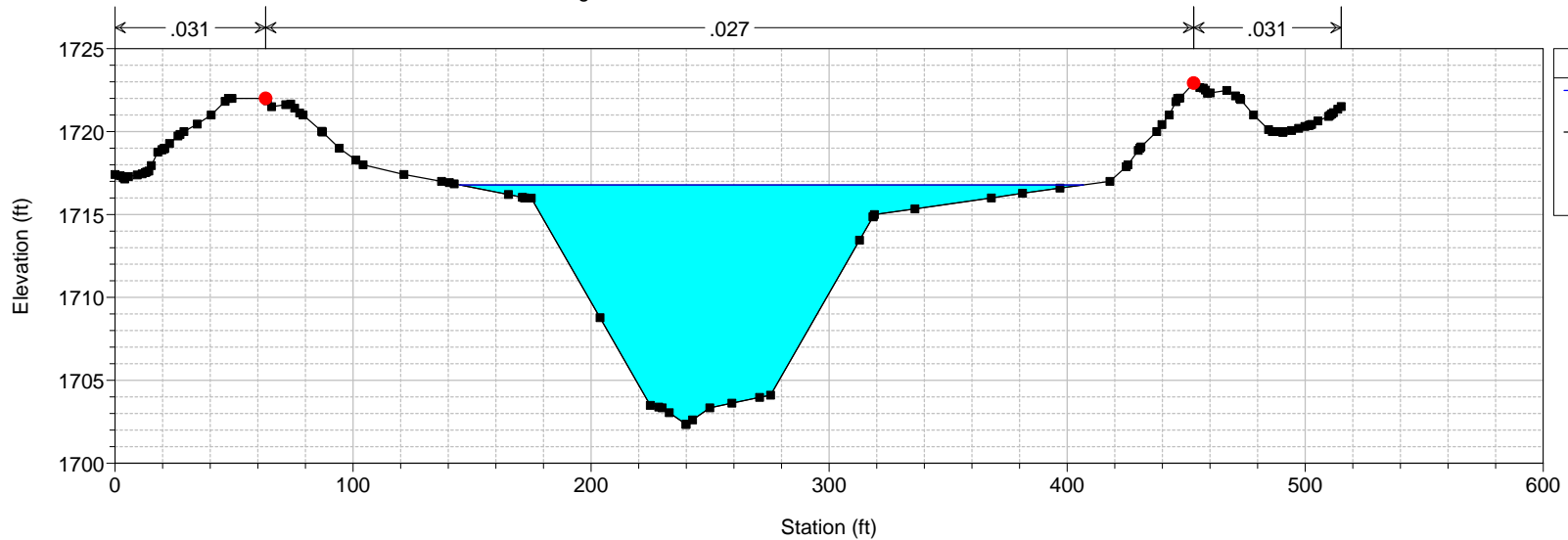


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1105.2 "DR" 65+58.16 = 1105.2

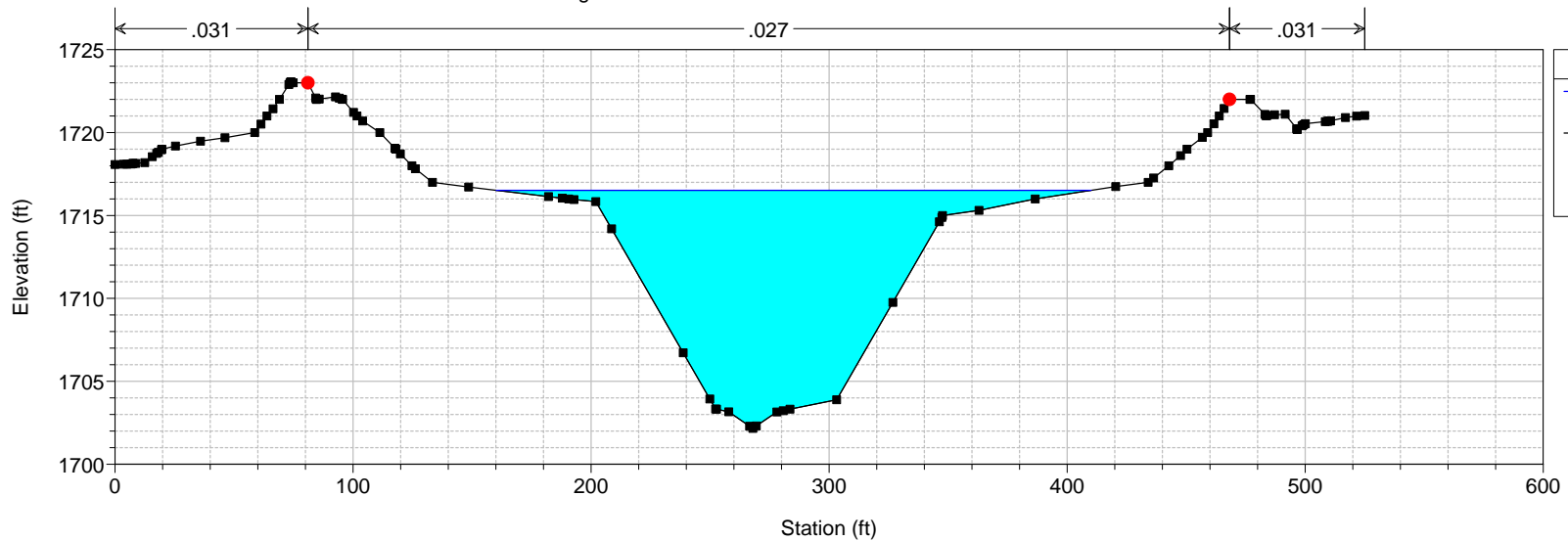




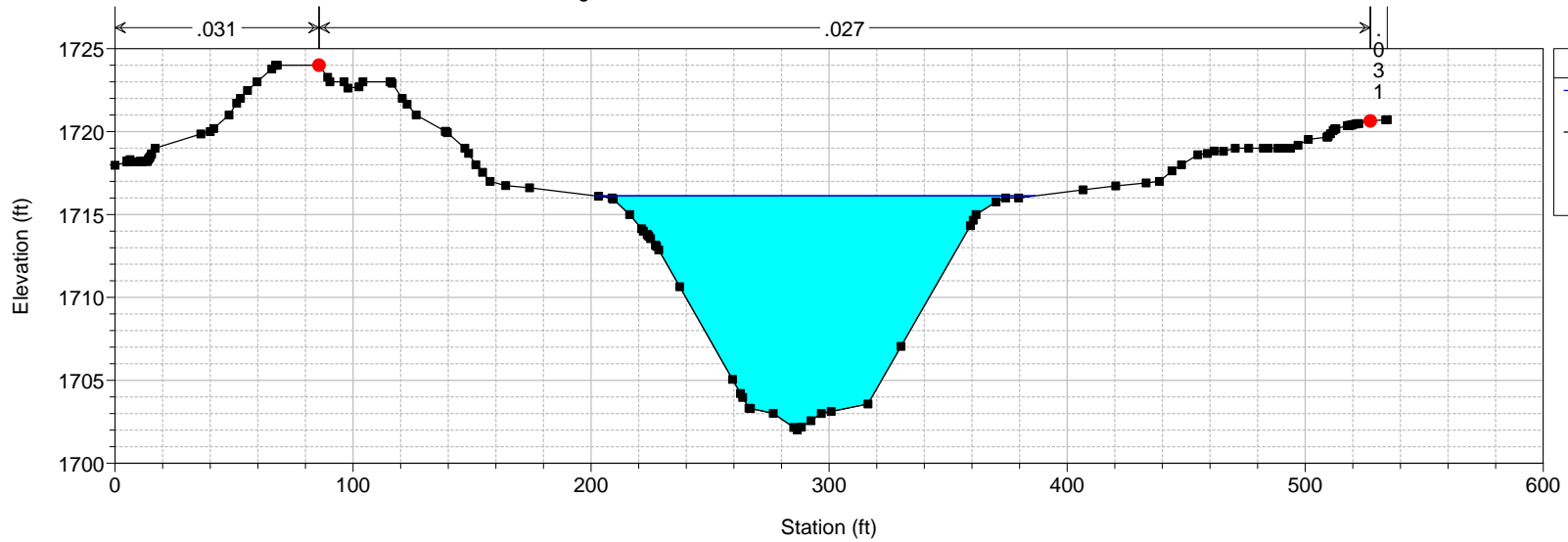
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.4 "DR" 67+17.30 = 1104.4



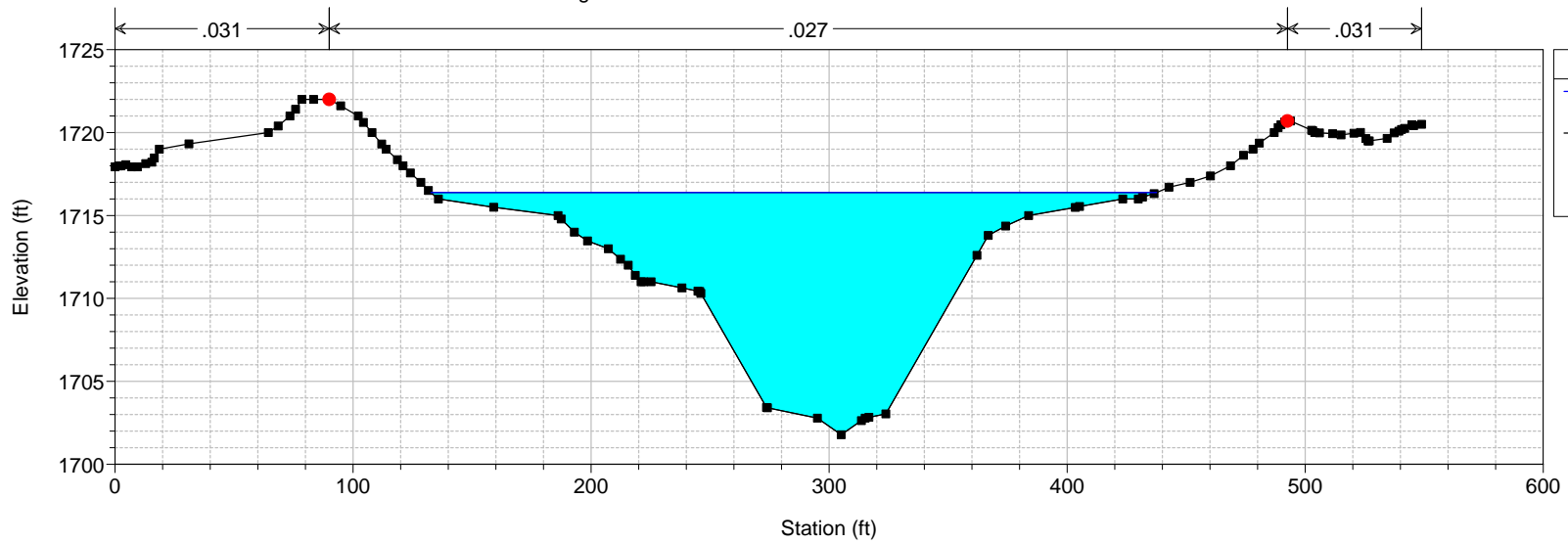
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.2 "DR" 67+78.53 = 1104.2



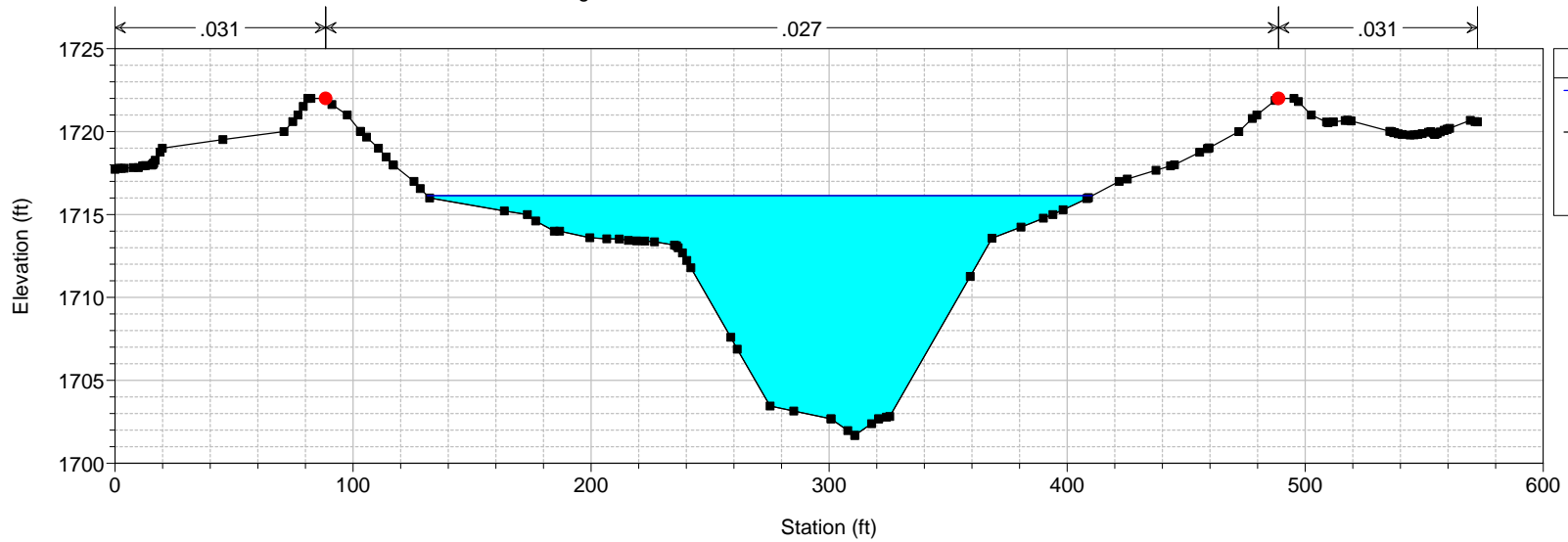
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1104.1 "DR" 68+29.02 = 1104.1



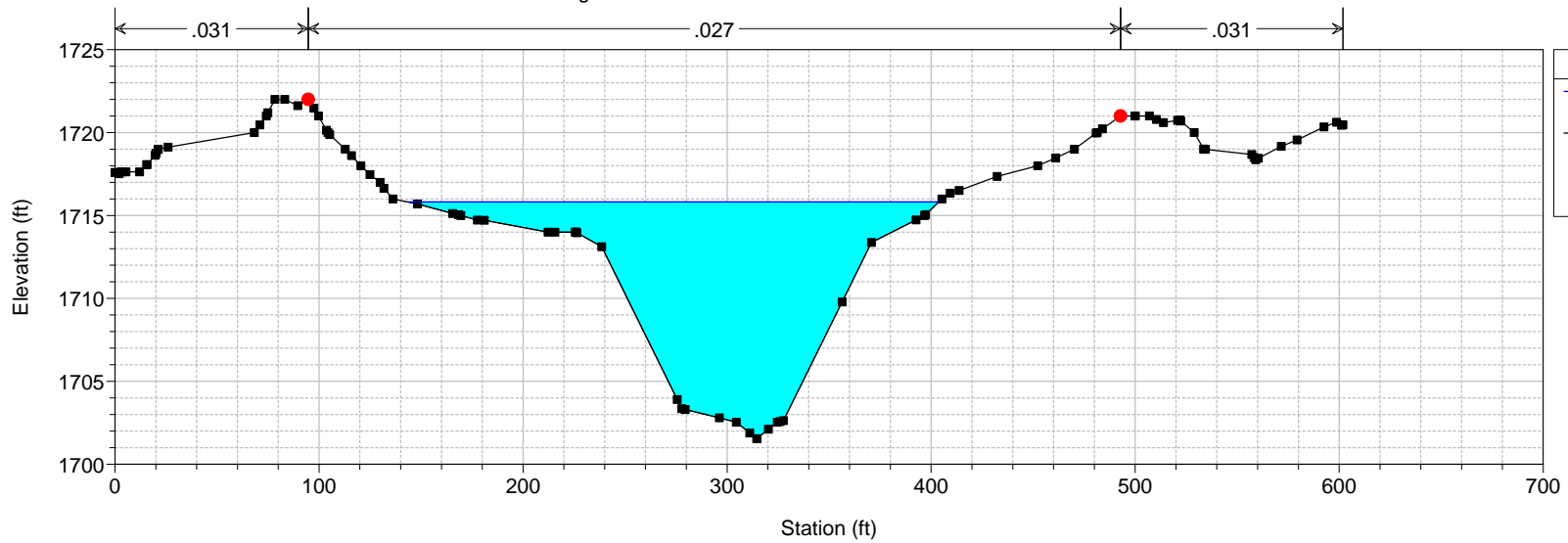
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.8 "DR" 69+03.51 = 1103.8

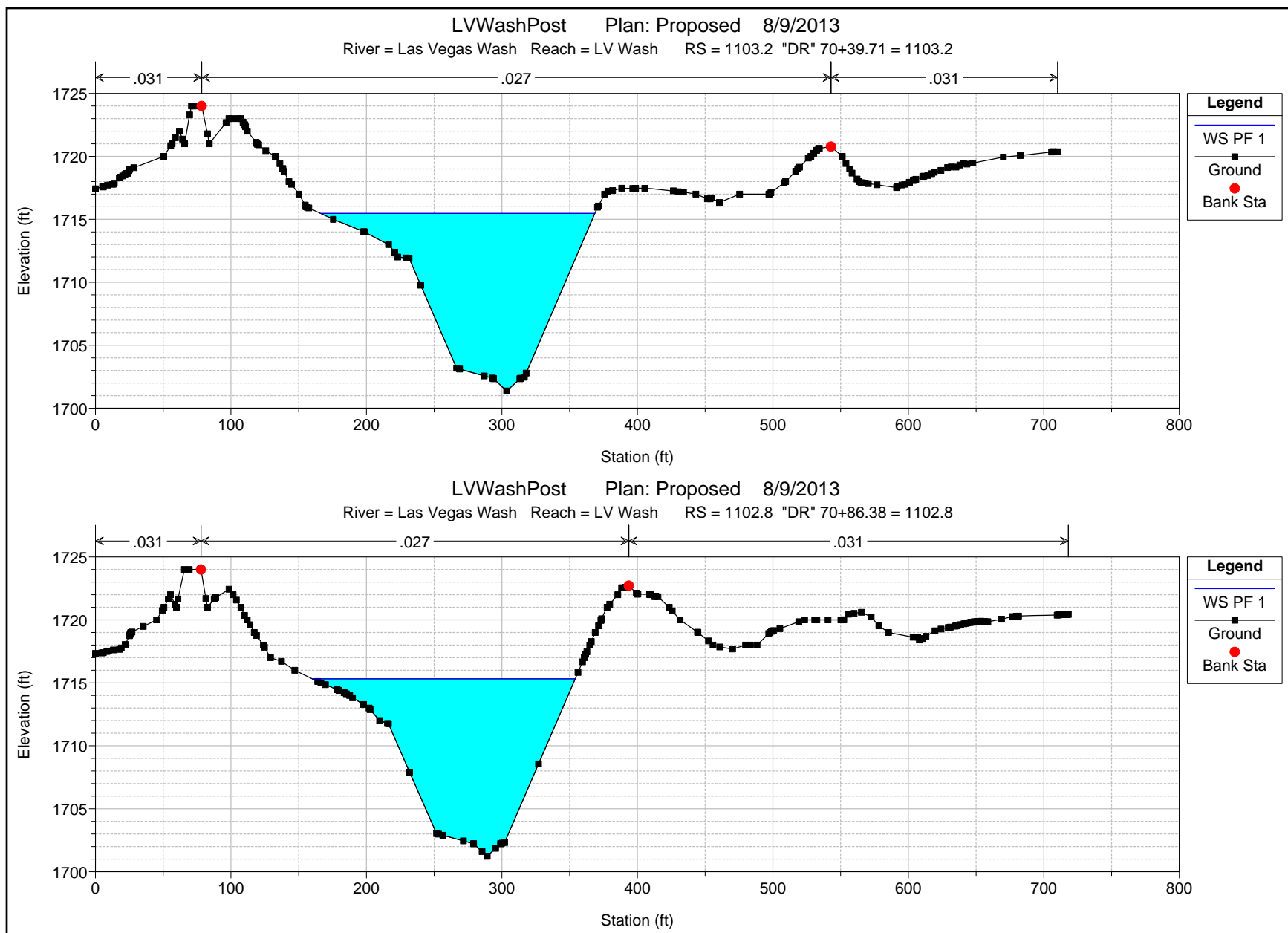


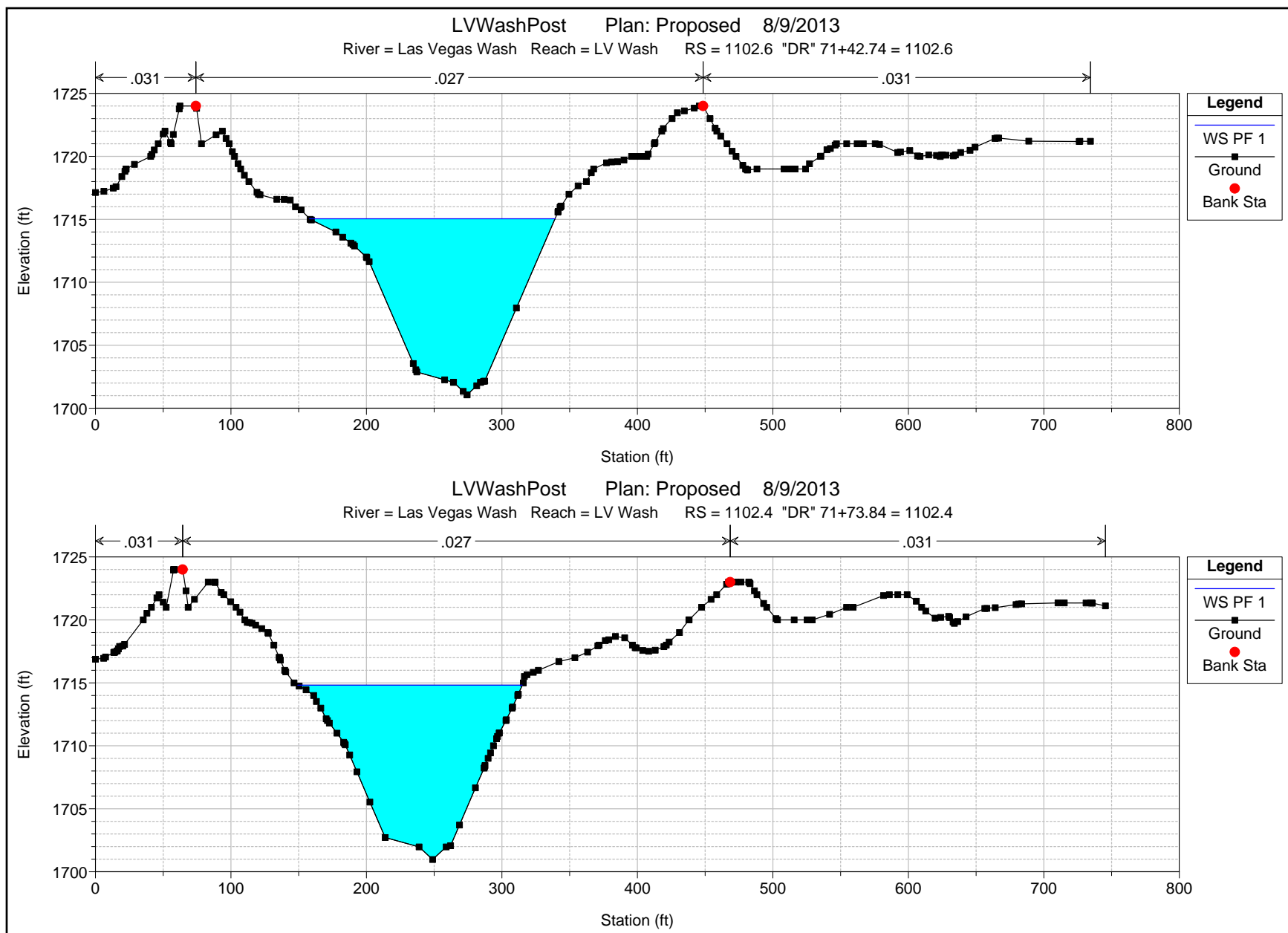
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.6 "DR" 69+37.17 = 1103.6

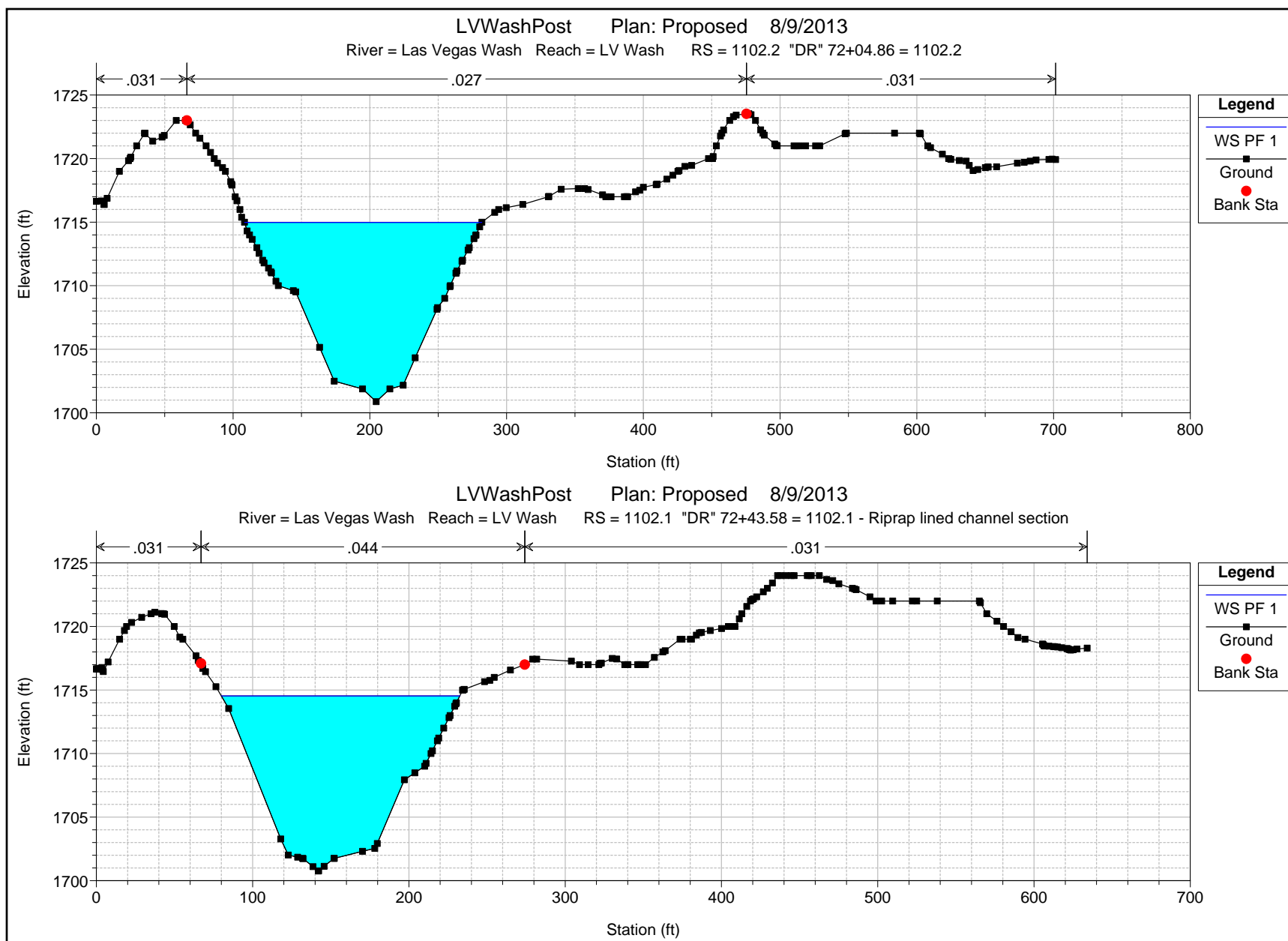


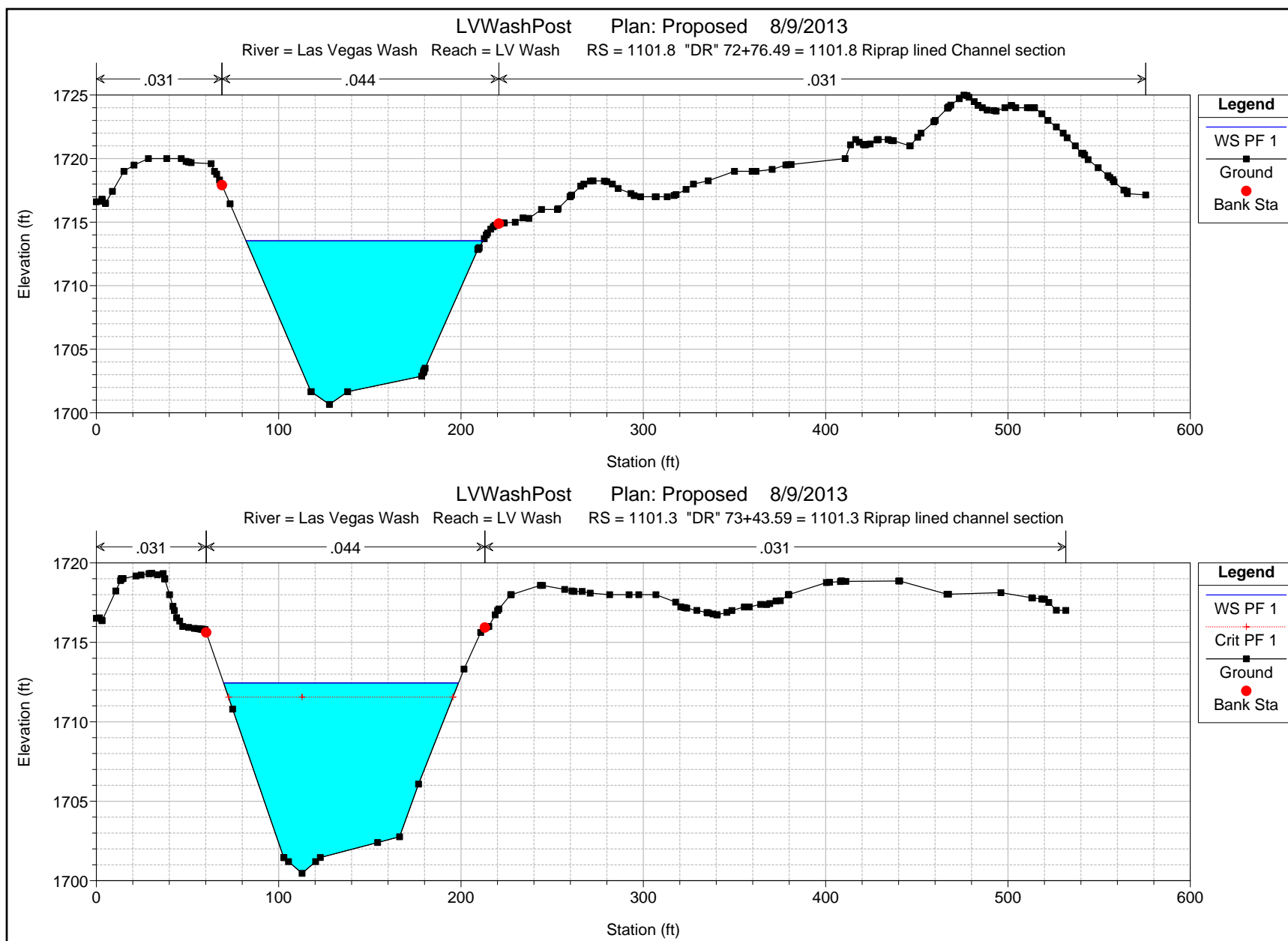
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1103.4 "DR" 69+83.73 = 1103.4

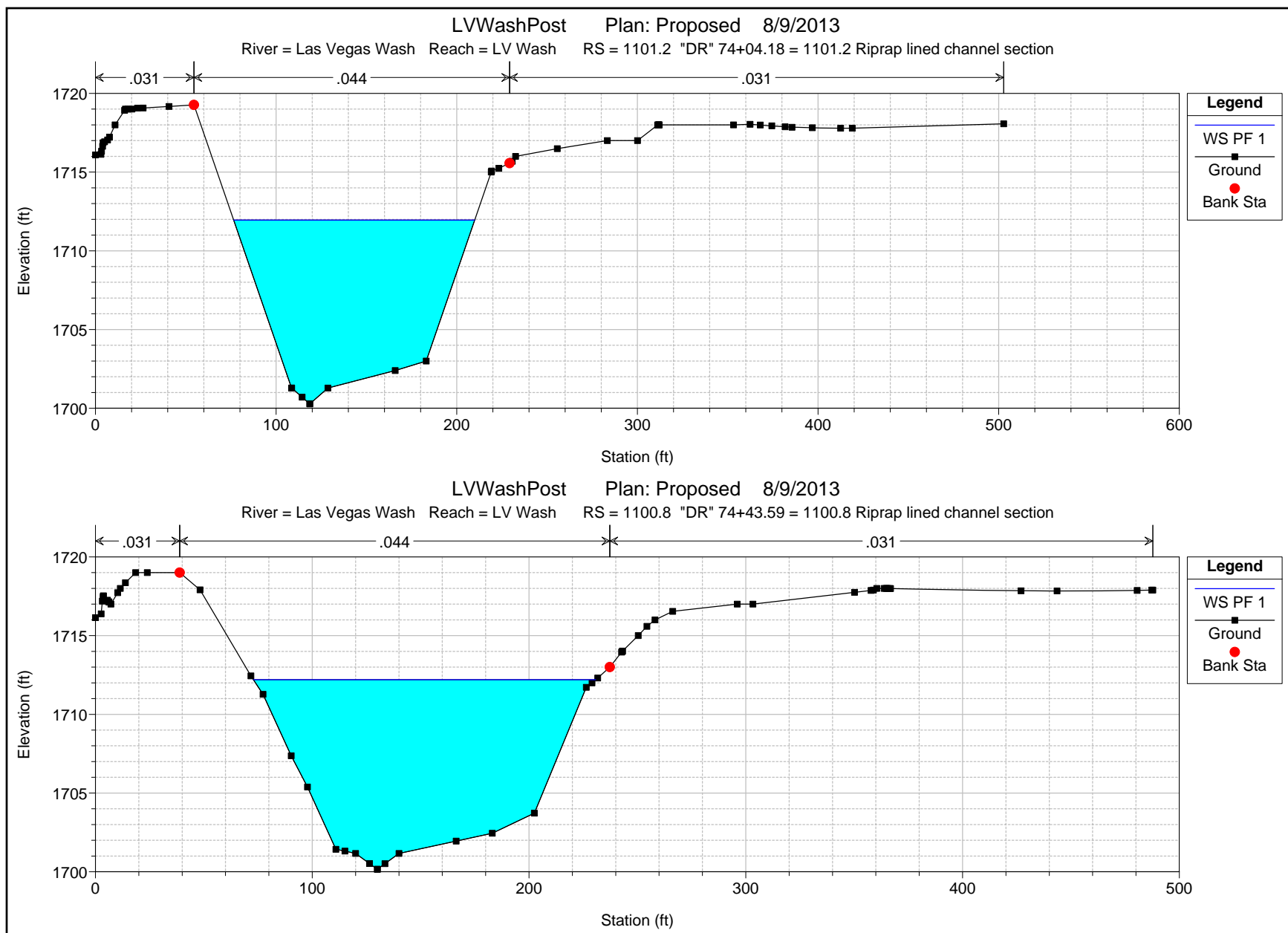




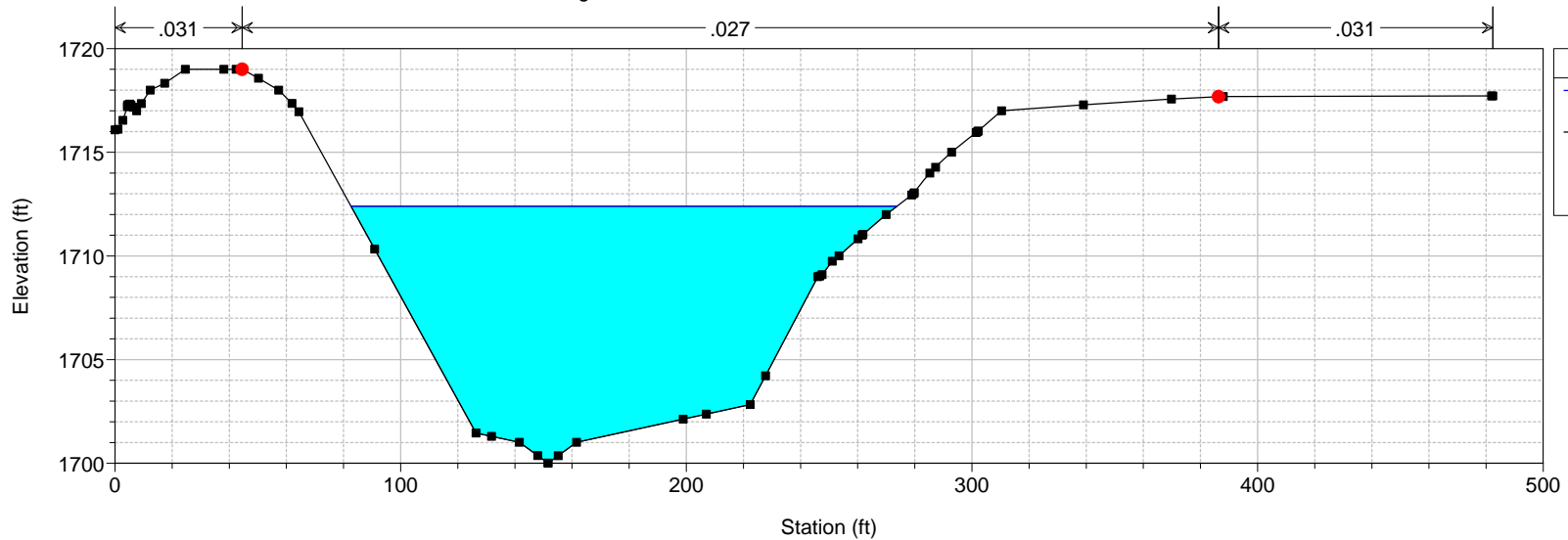






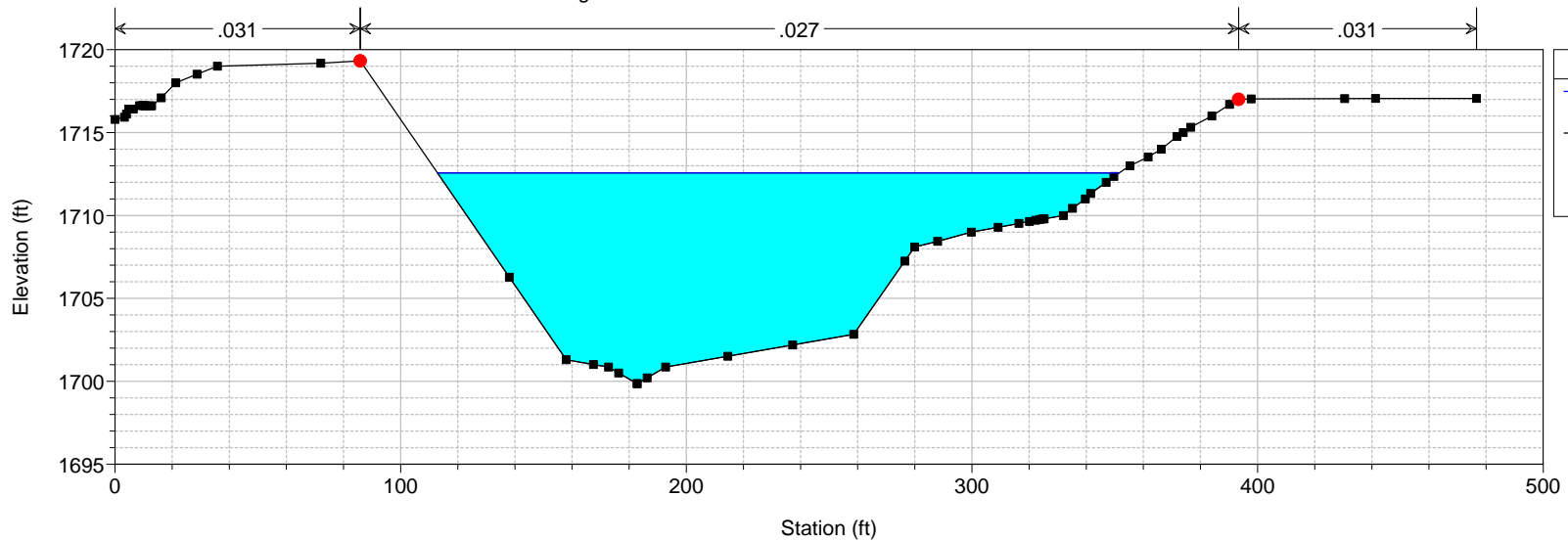


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1100.6 "DR" 74+93.59 = 1100.6

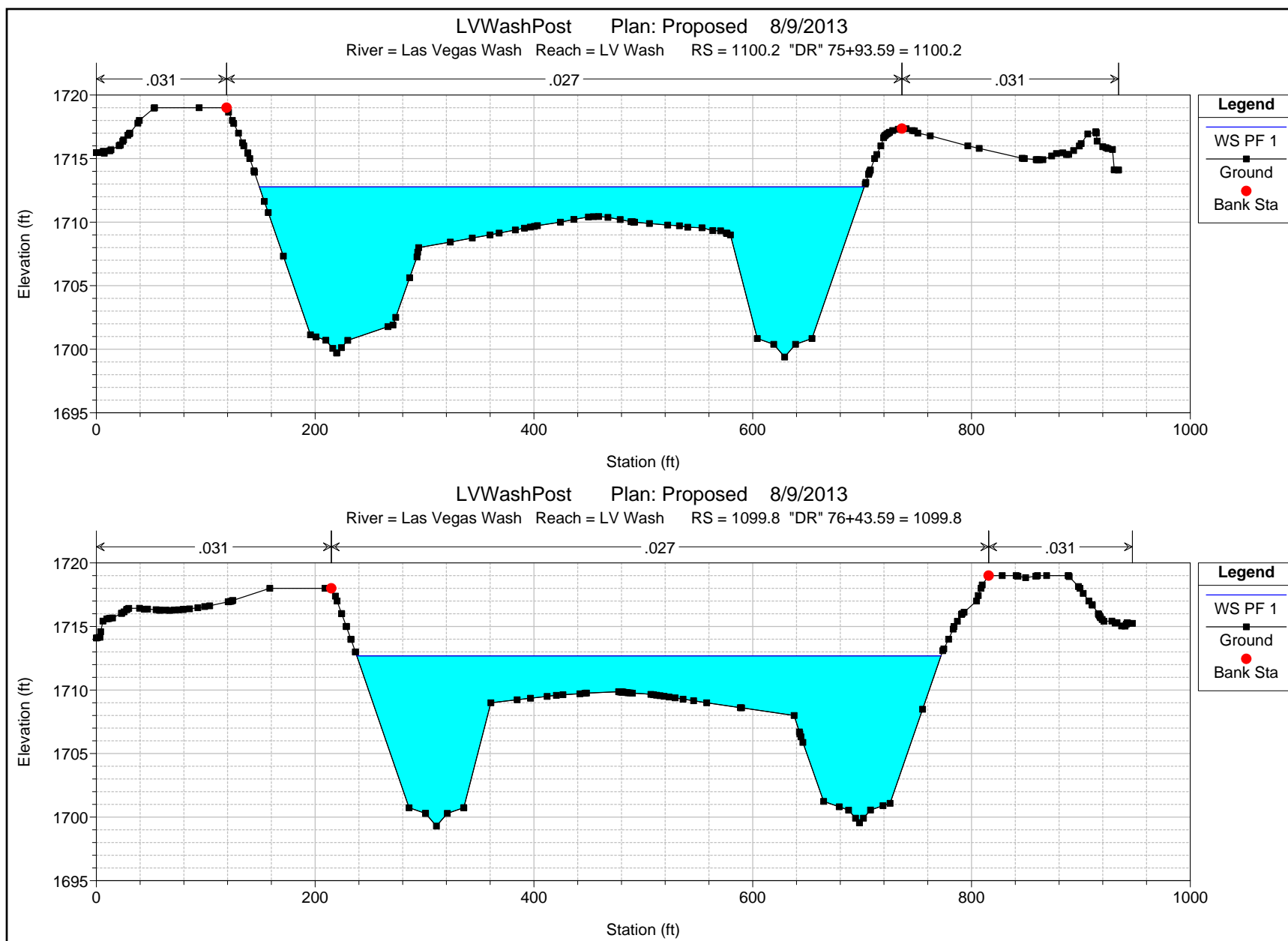


Legend
WS PF 1
Ground
Bank Sta

LVWashPost Plan: Proposed 8/9/2013
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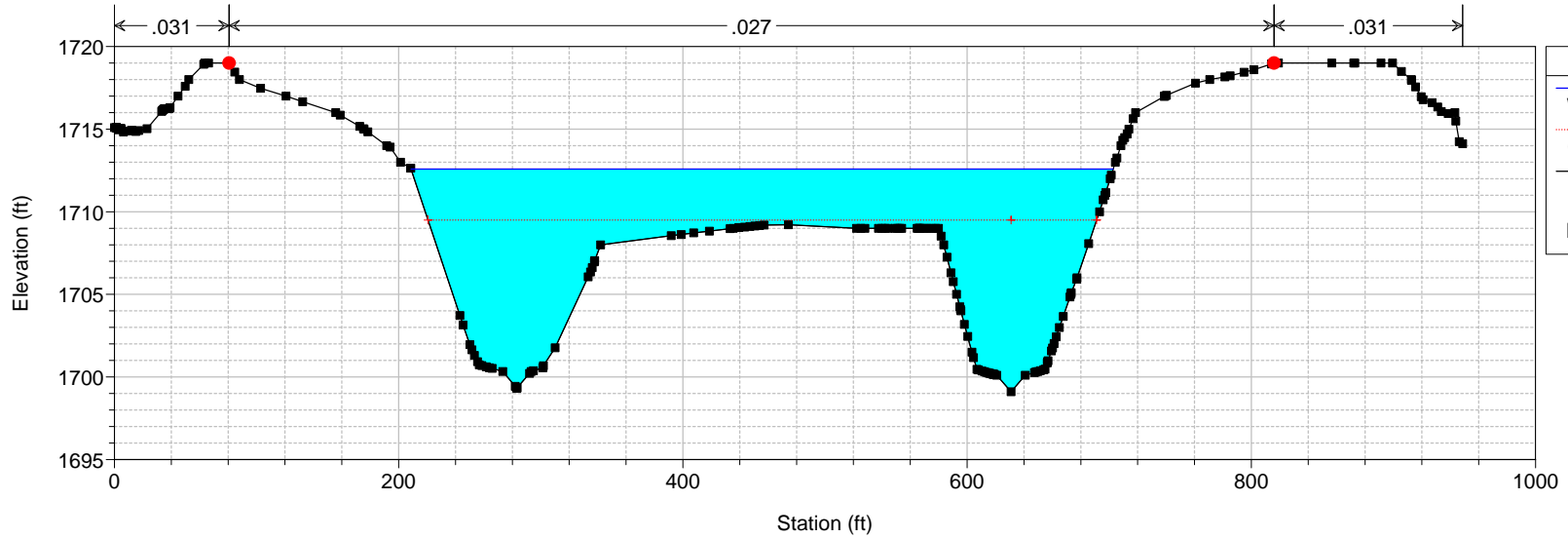


Legend
WS PF 1
Ground
Bank Sta



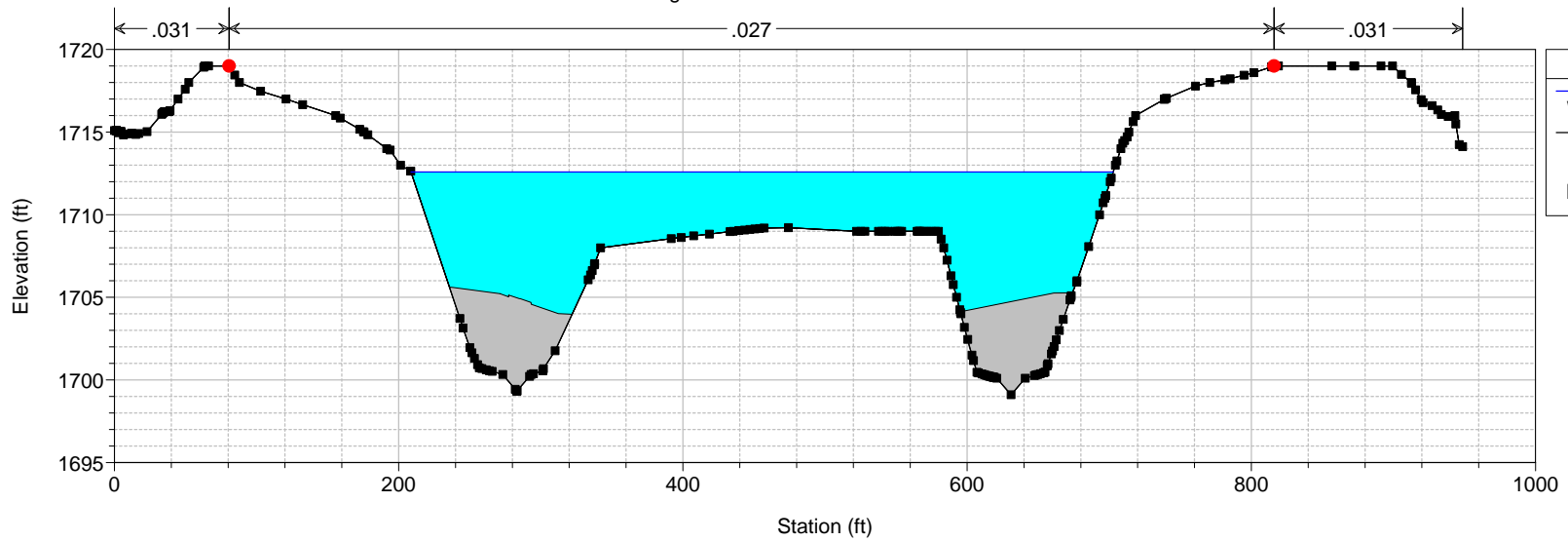
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1099.4 "DR" 77+18.89 = 1099.4 - Inline weir Pipe crossings #3 & #4

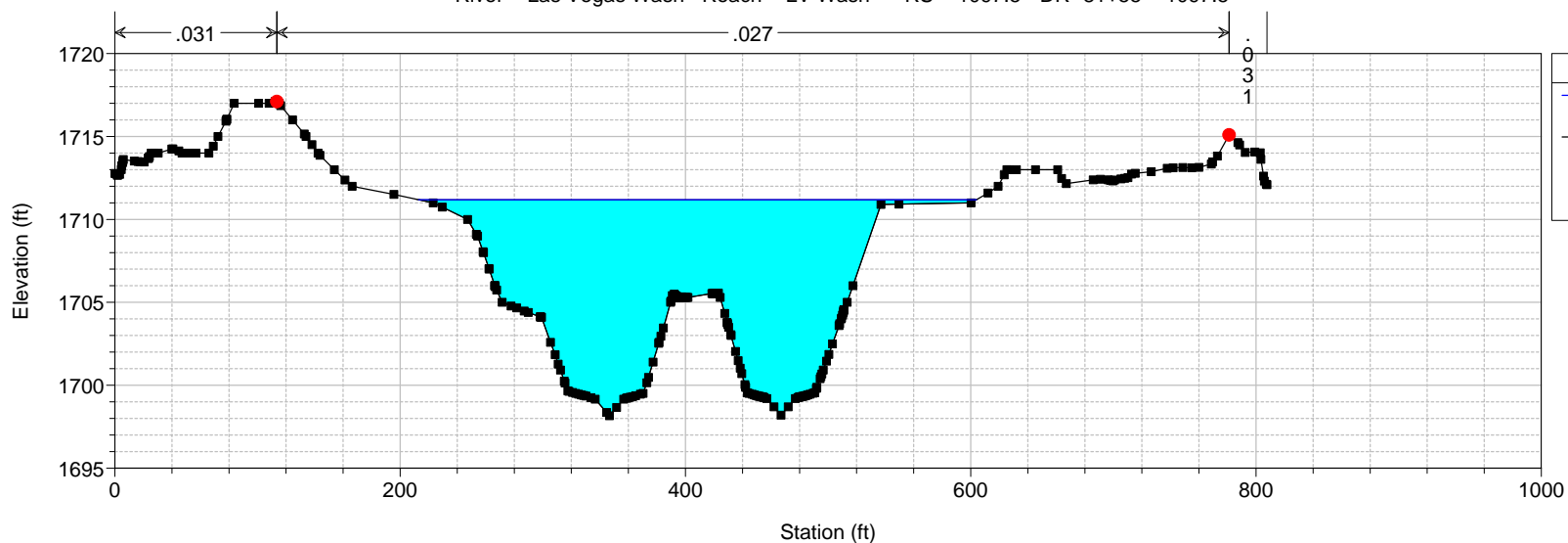


LVWashPost Plan: Proposed 8/9/2013

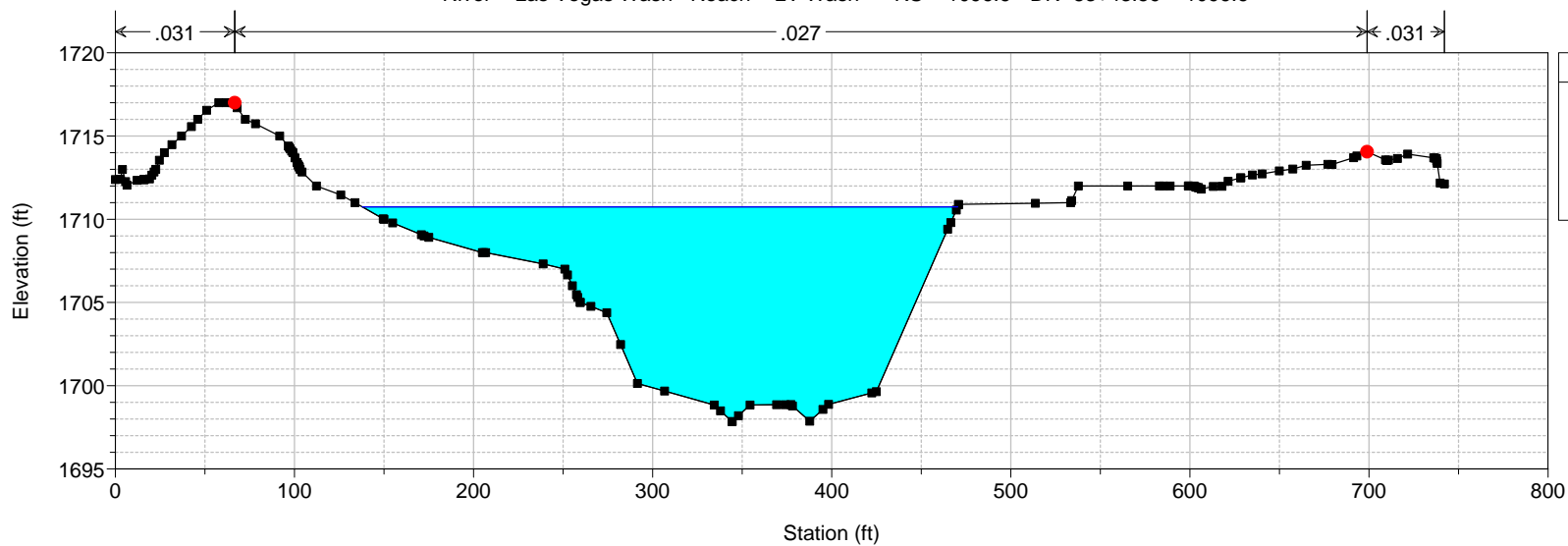
River = Las Vegas Wash Reach = LV Wash RS = 1099.3 IS



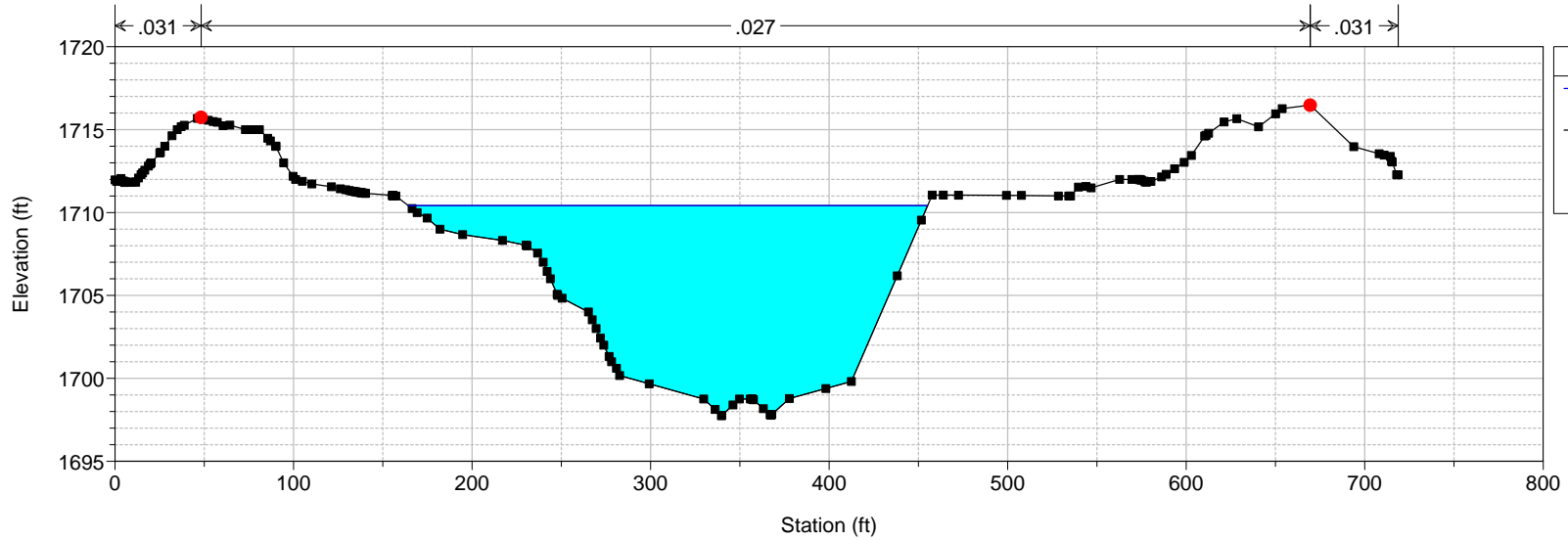
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1097.5 "DR" 81+55 = 1097.5



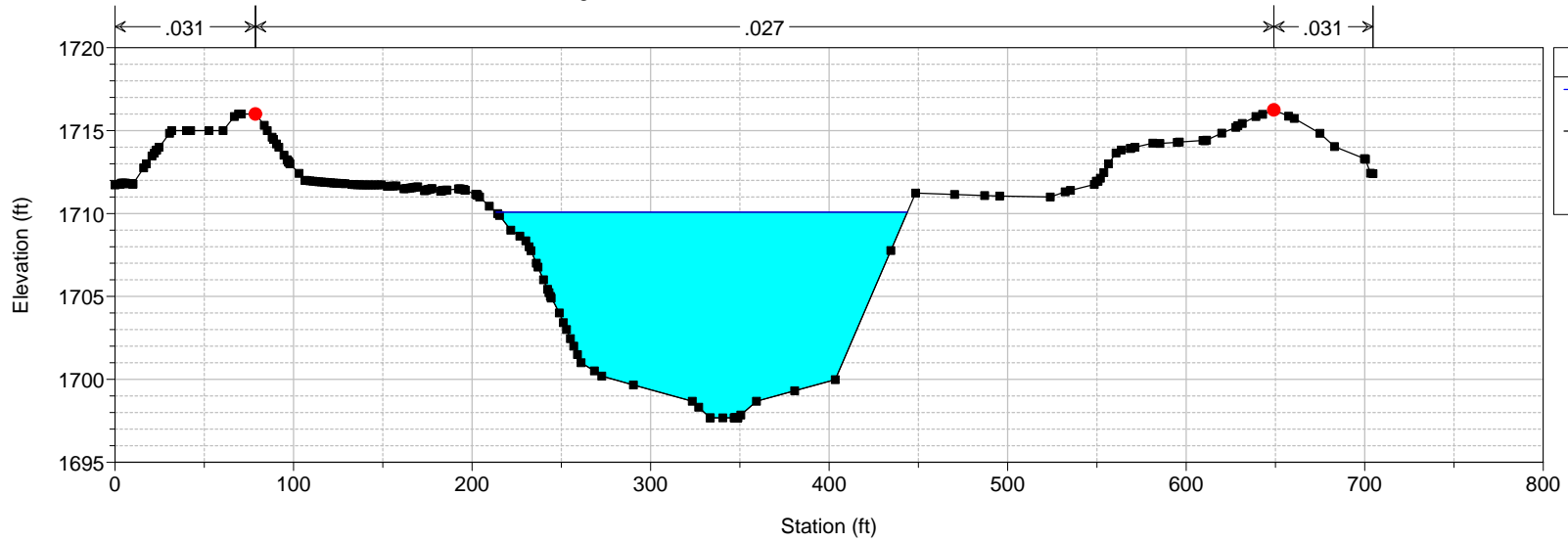
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.6 "DR" 83+43.59 = 1096.6



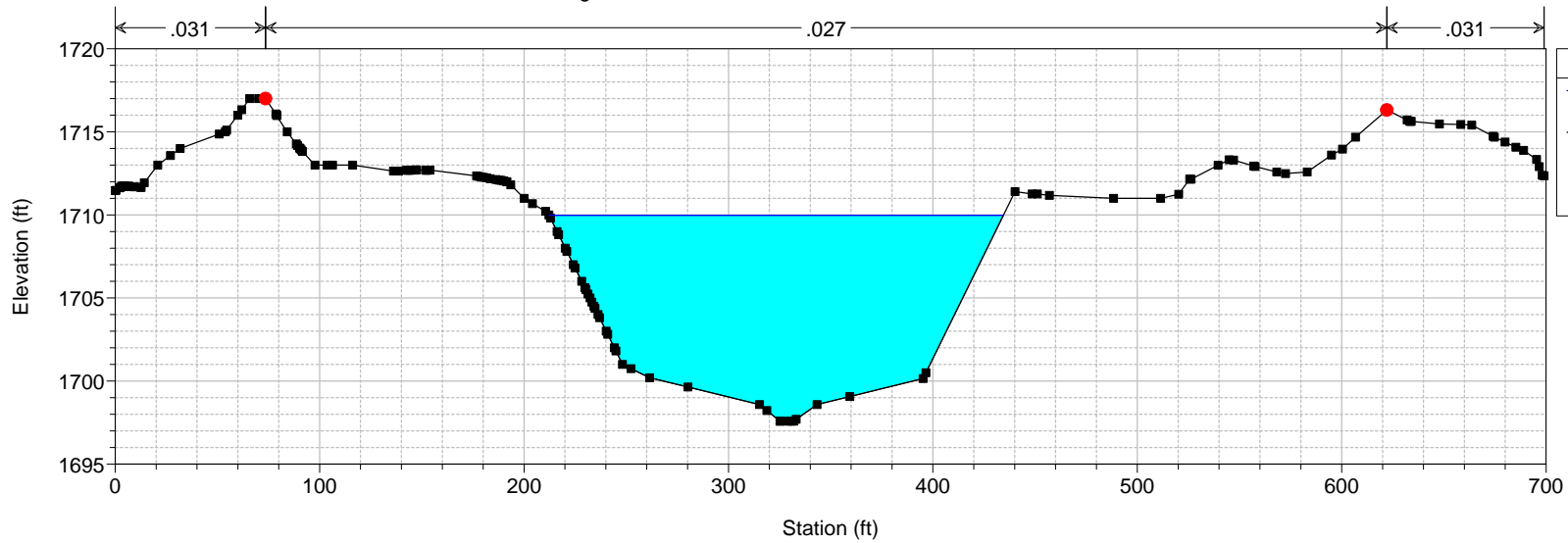
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.4 "DR" 83+93.59 = 1096.4



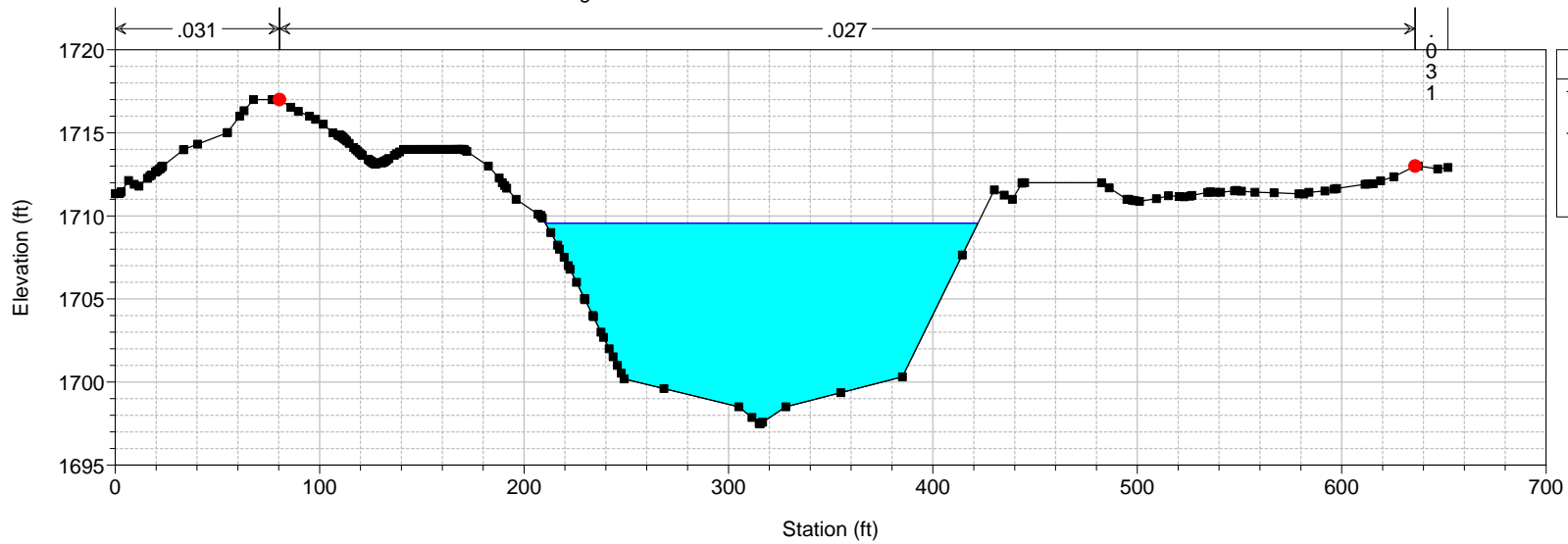
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1096.2 "DR" 84+43.59 = 1096.2



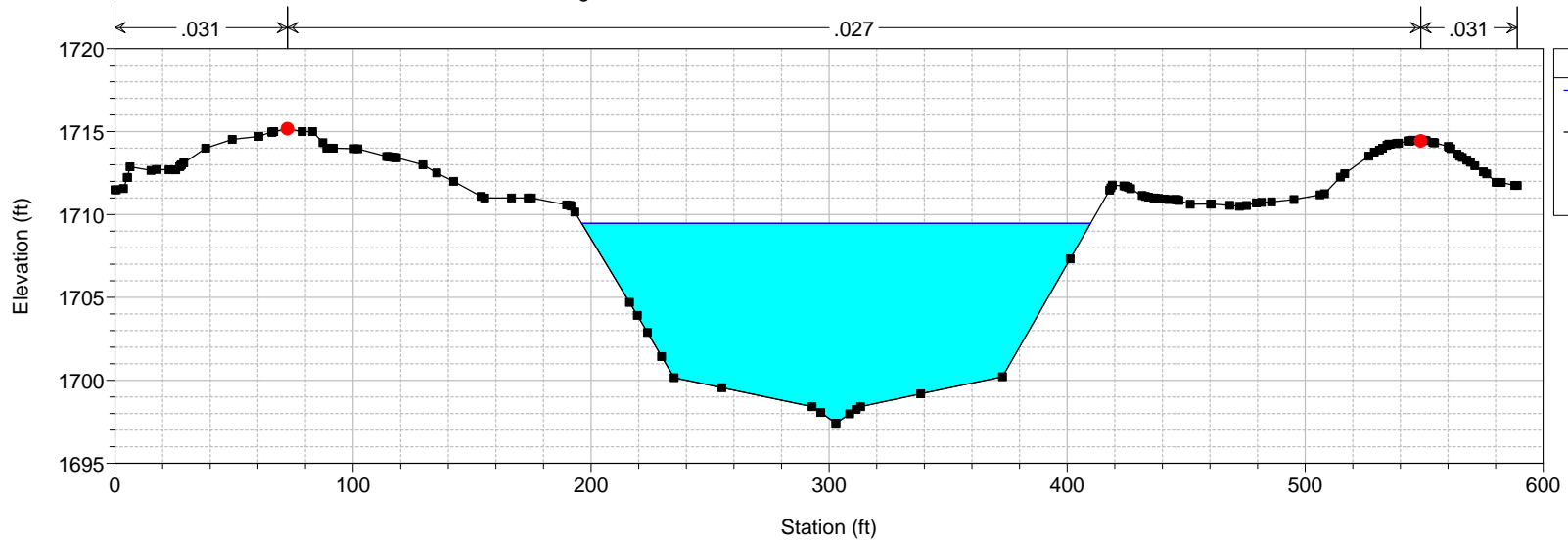
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.8 "DR" 84+93.59 = 1095.8



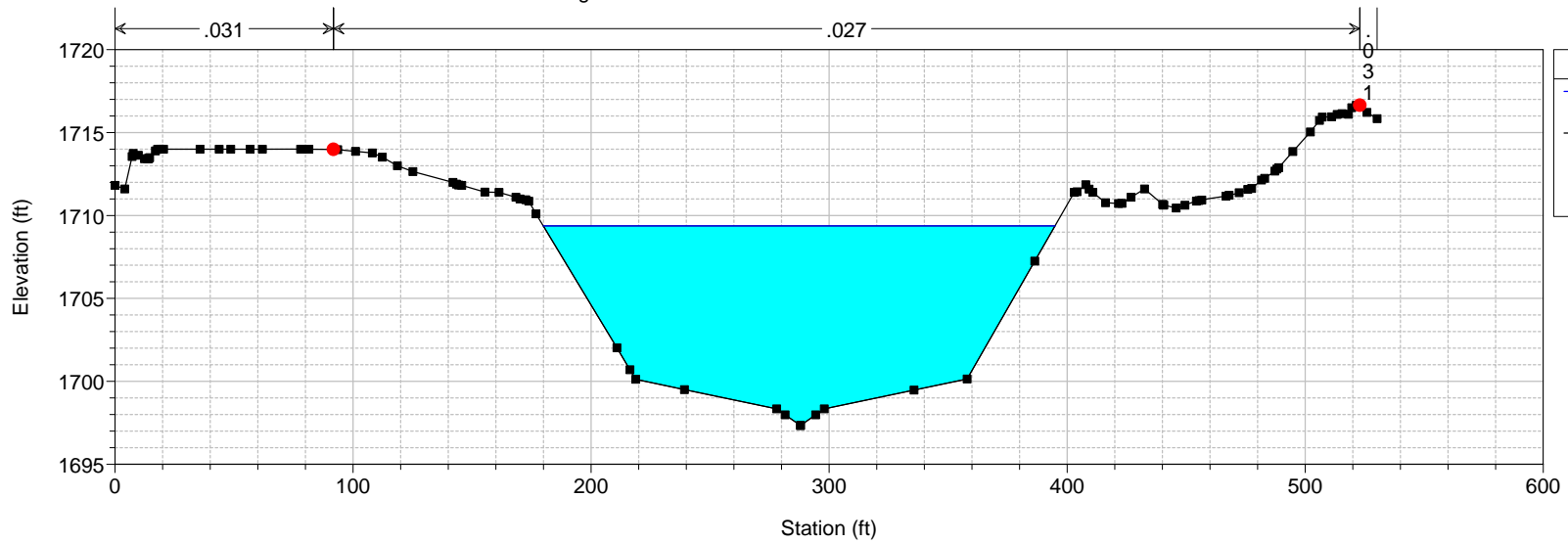
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.6 "DR" 85+43.59 = 1095.6



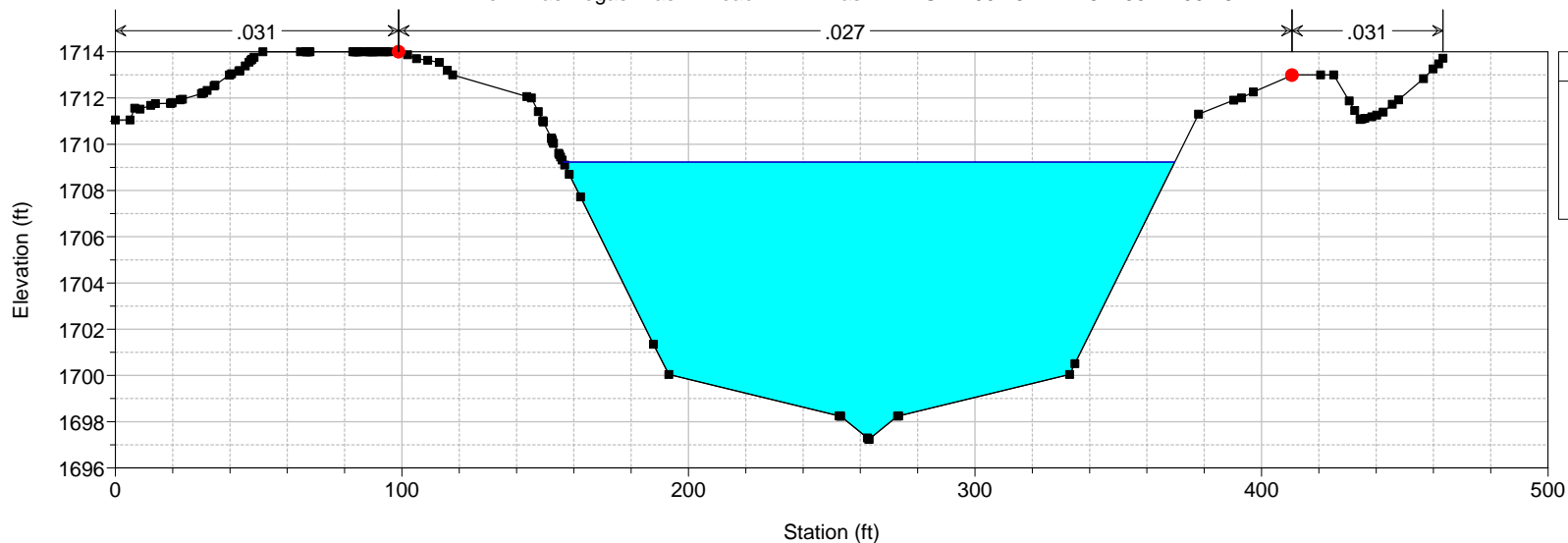
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.4 "DR" 85+93.59 = 1095.4



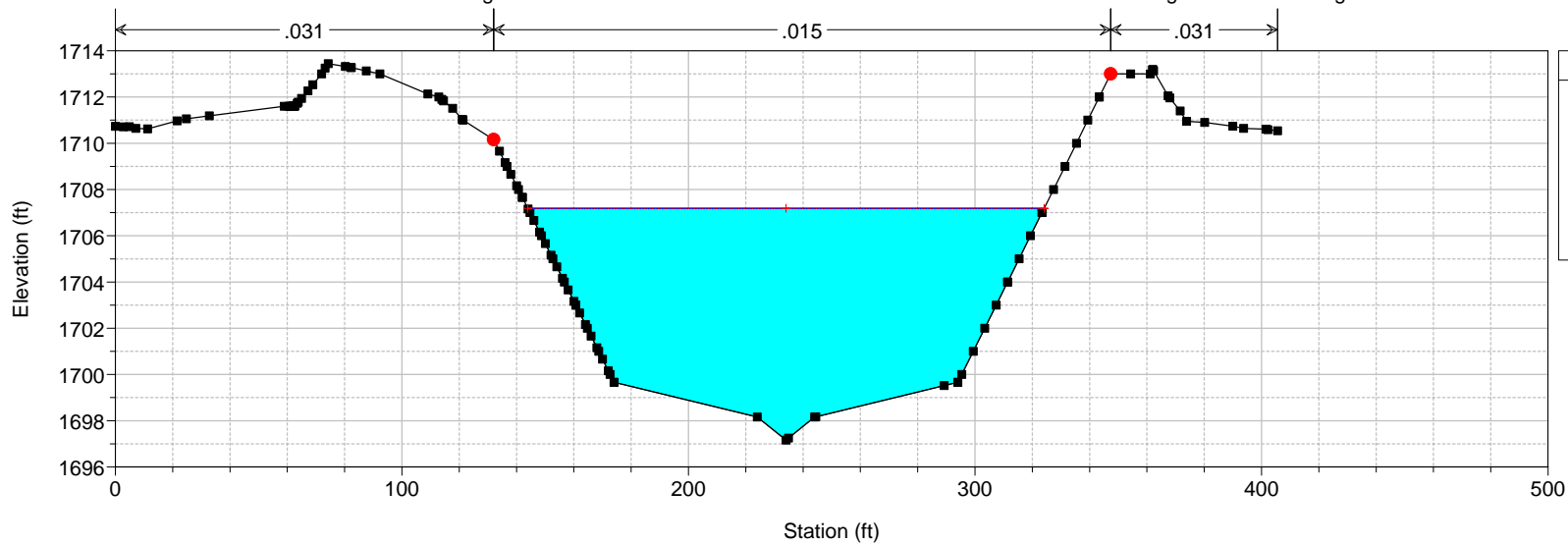
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1095.2 "DR" 86+43.59 = 1095.2

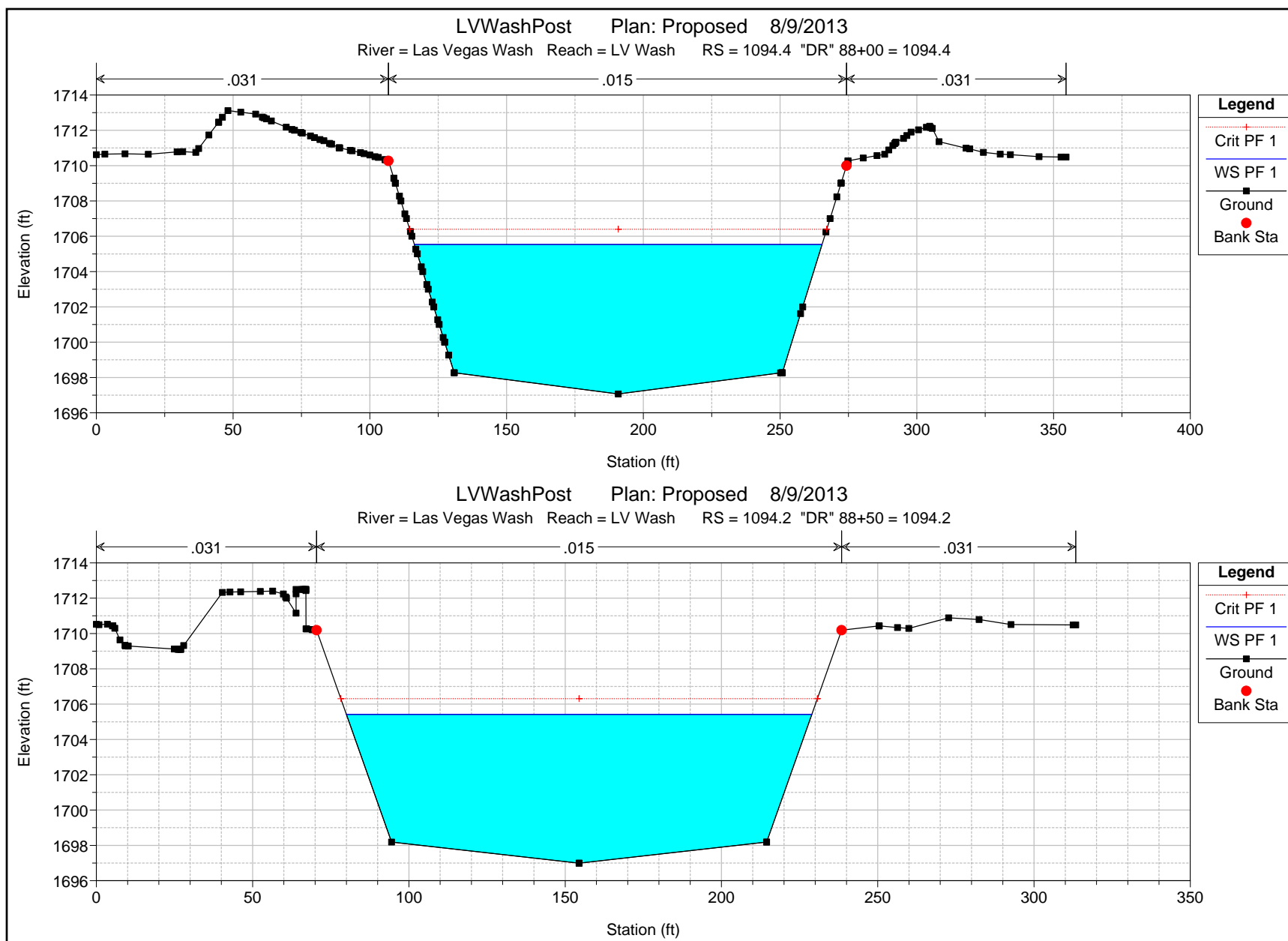


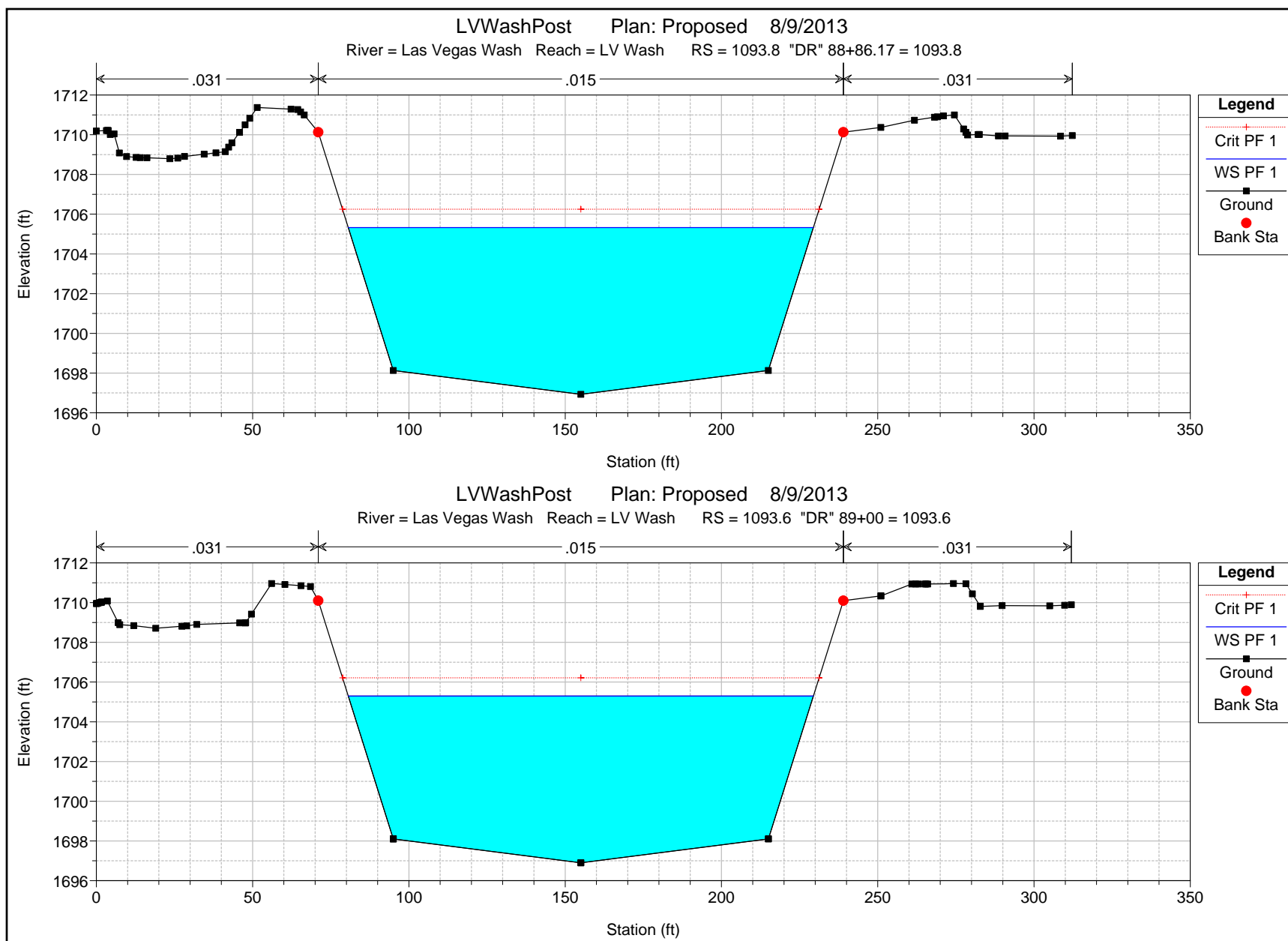
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1094.8 "DR" 87+00 = 1094.8



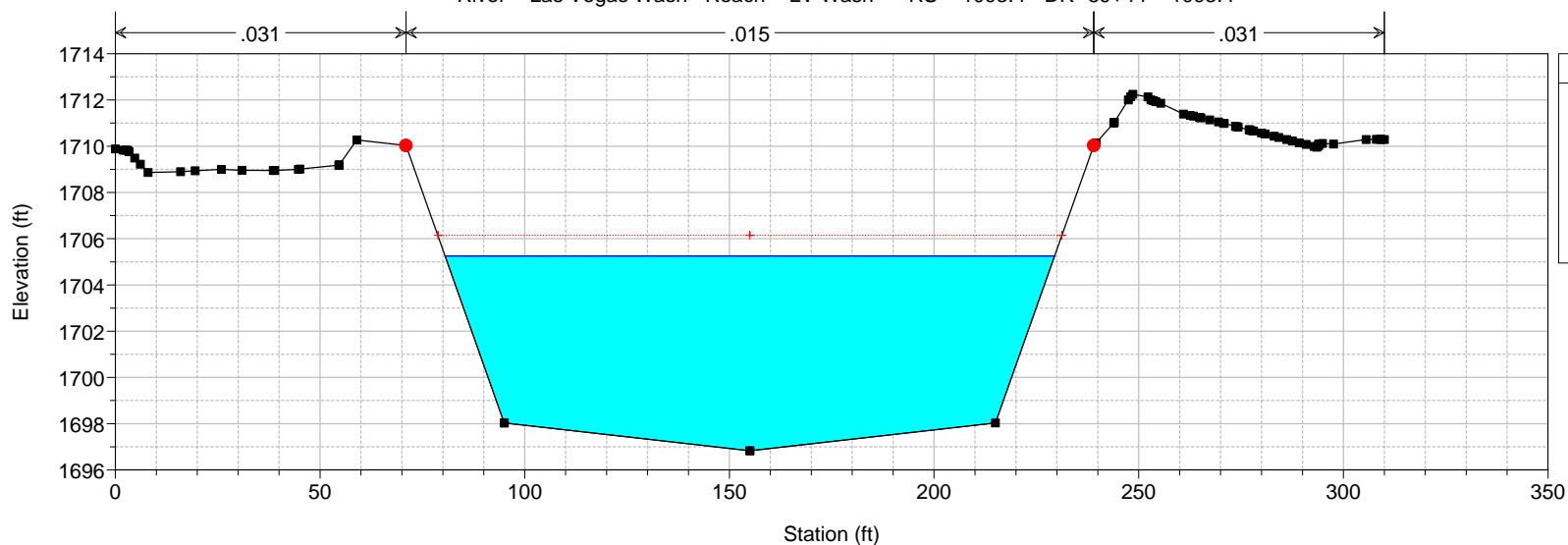
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1094.6 "DR" 87+50 = 1094.6 - Begin Concrete Lining



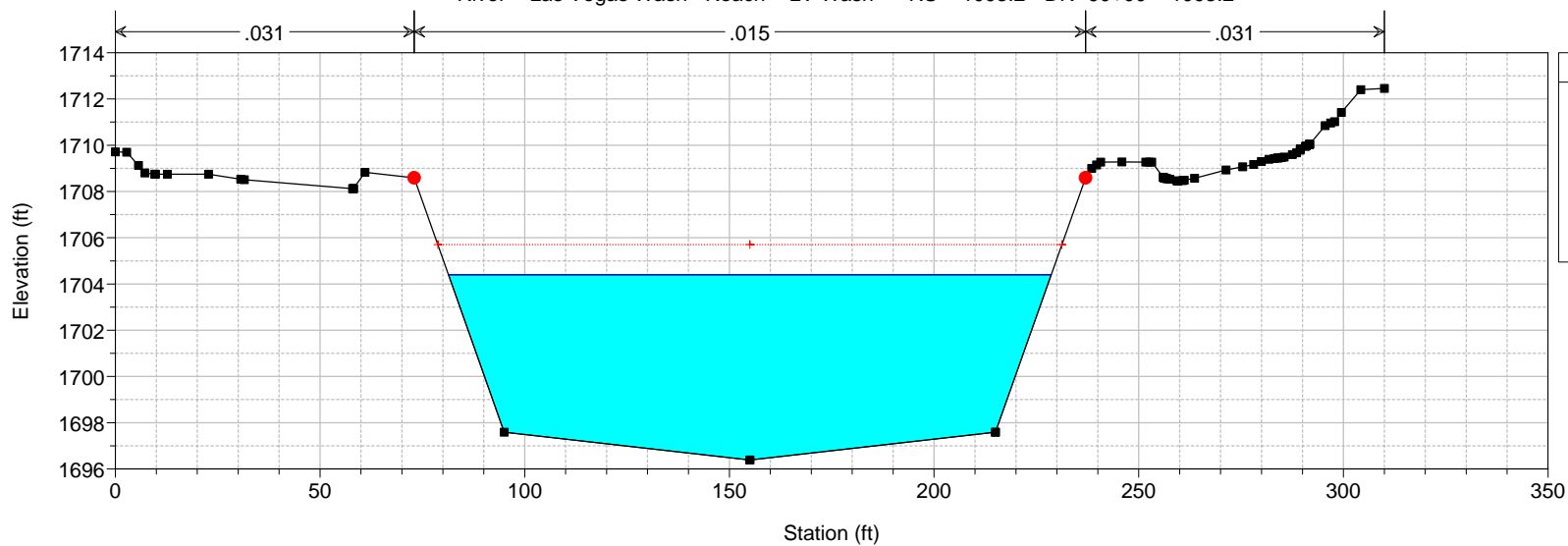


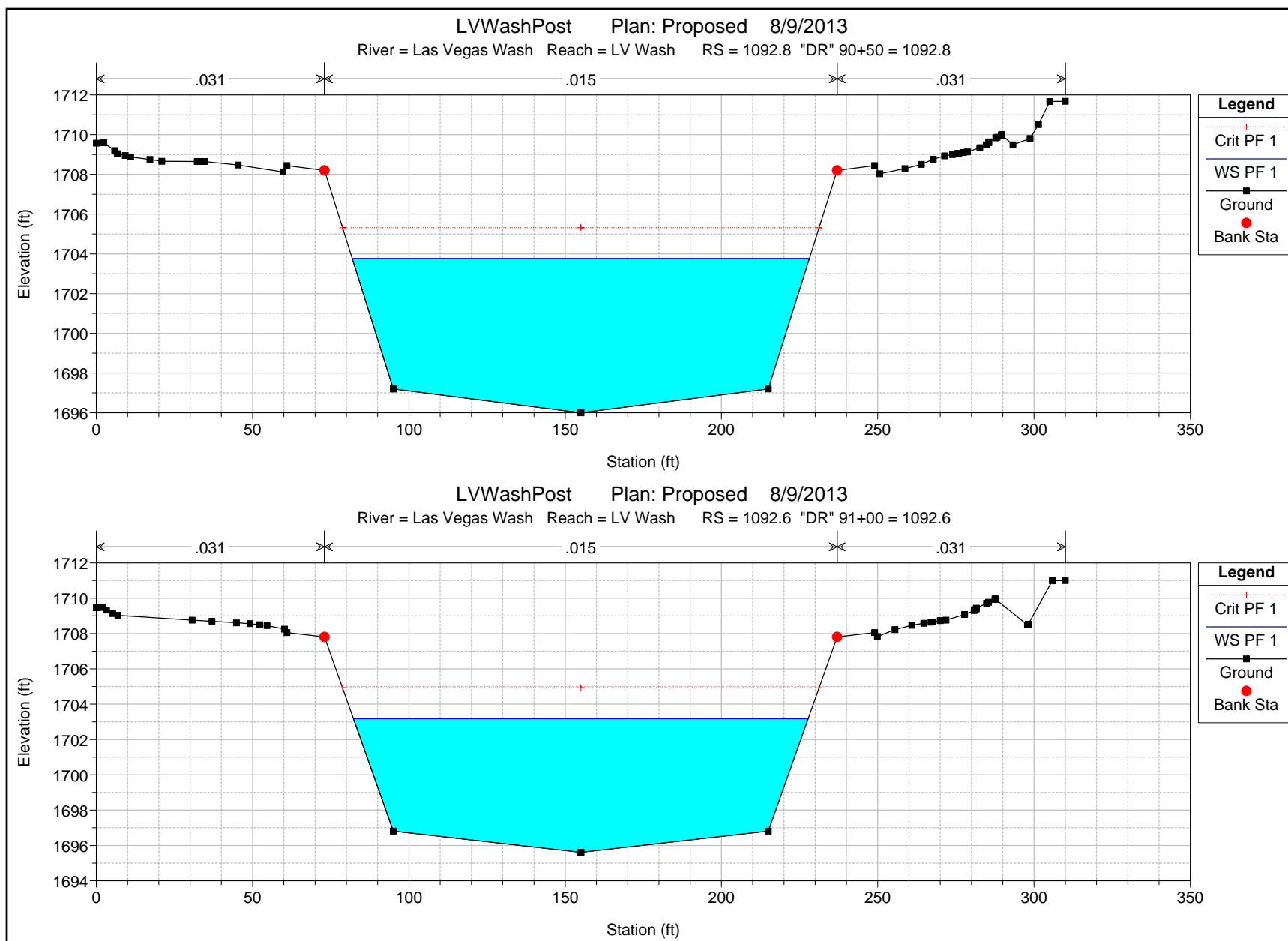


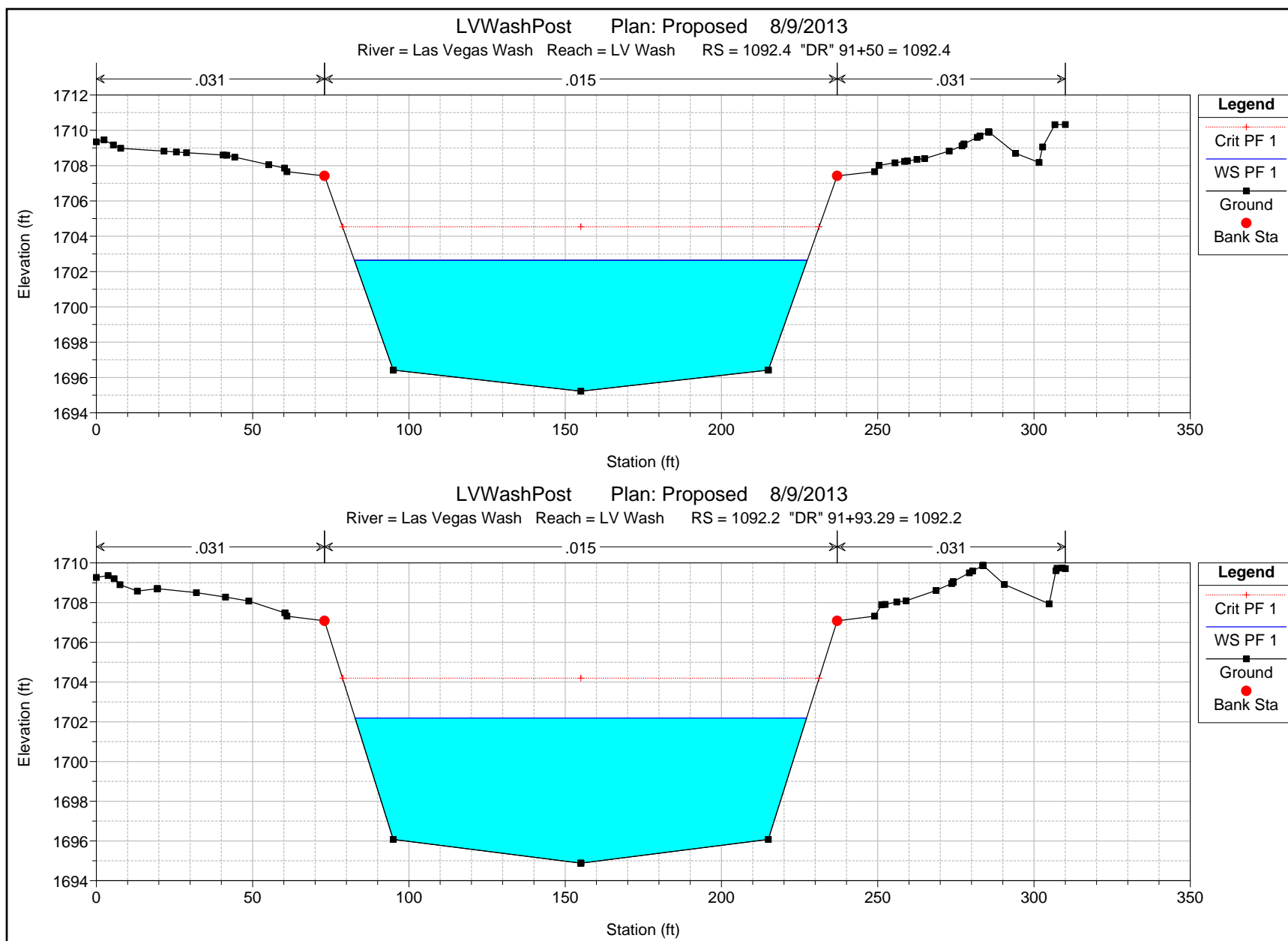
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1093.4 "DR" 89+44 = 1093.4

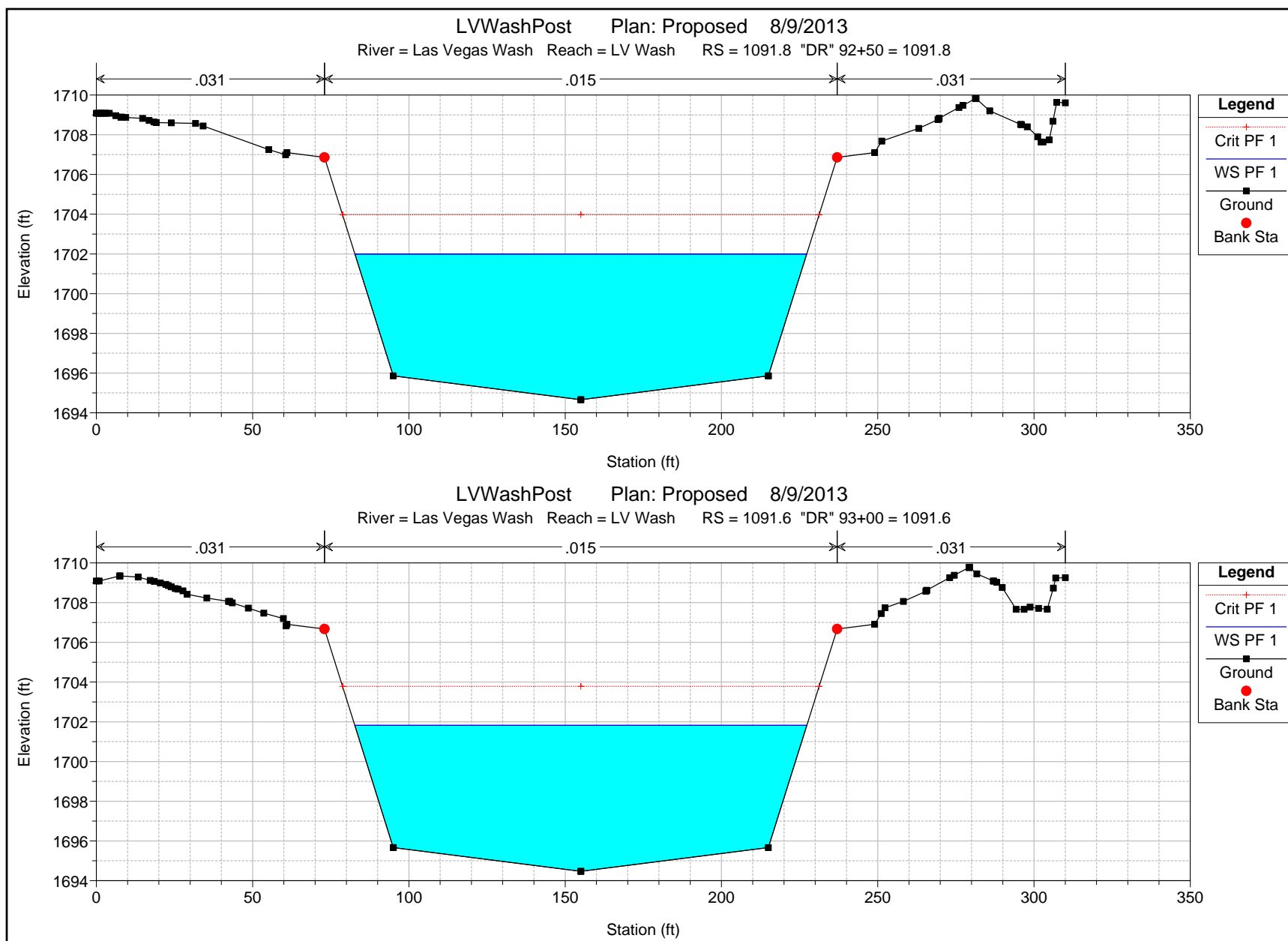


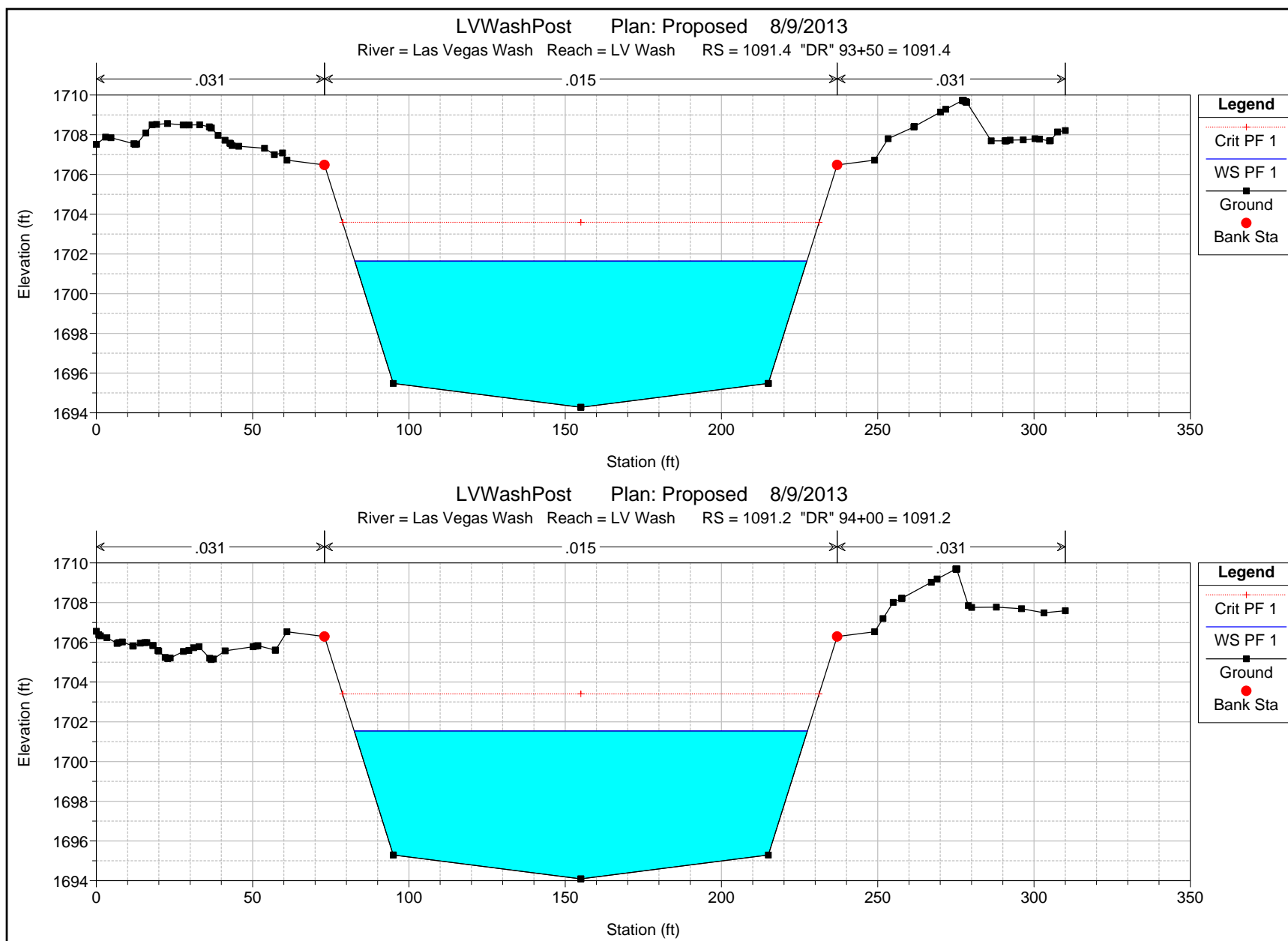
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1093.2 "DR" 90+00 = 1093.2



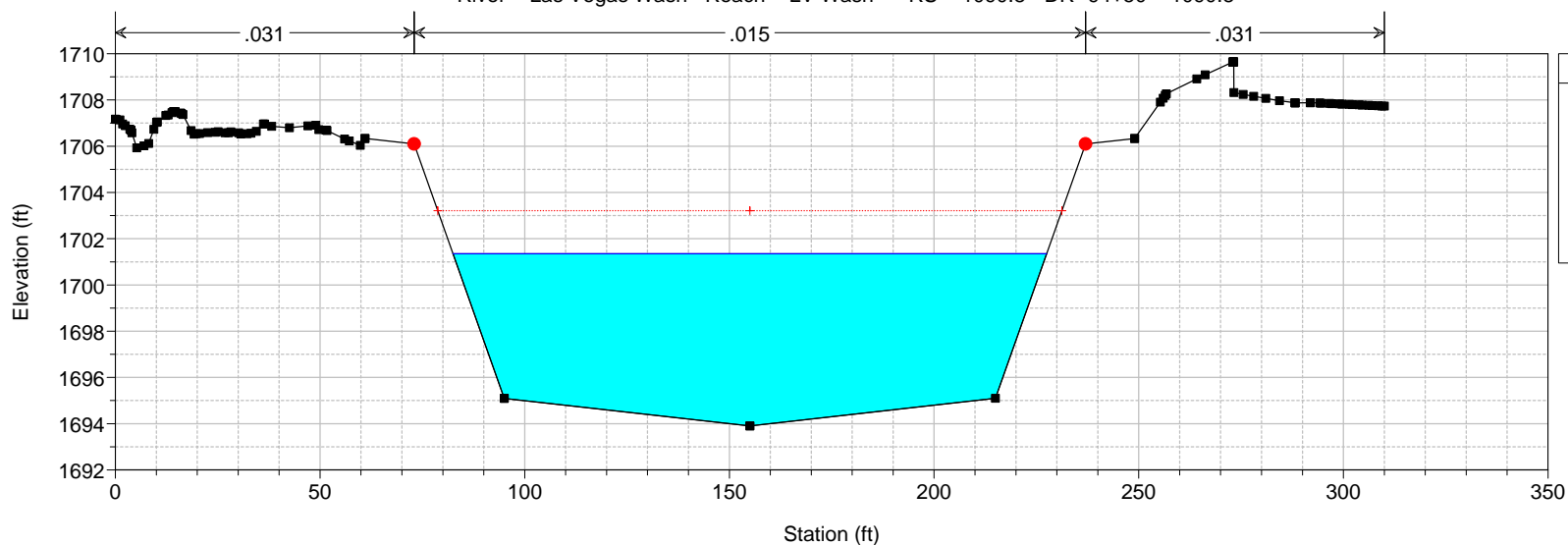




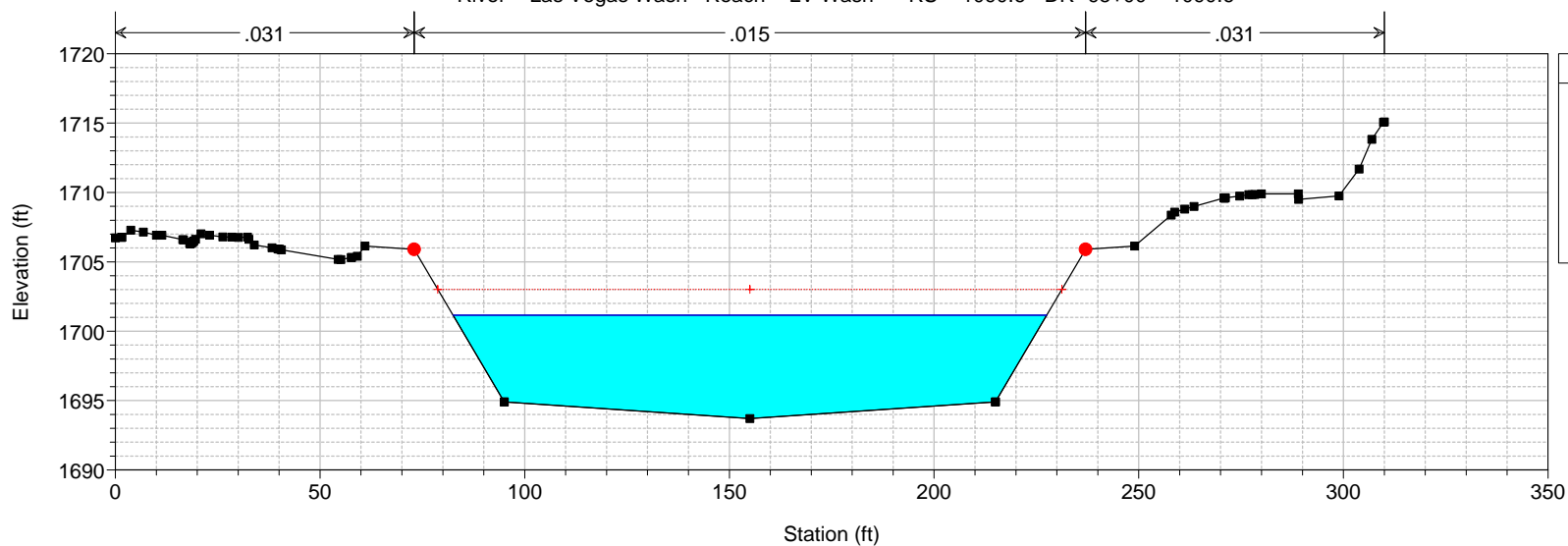


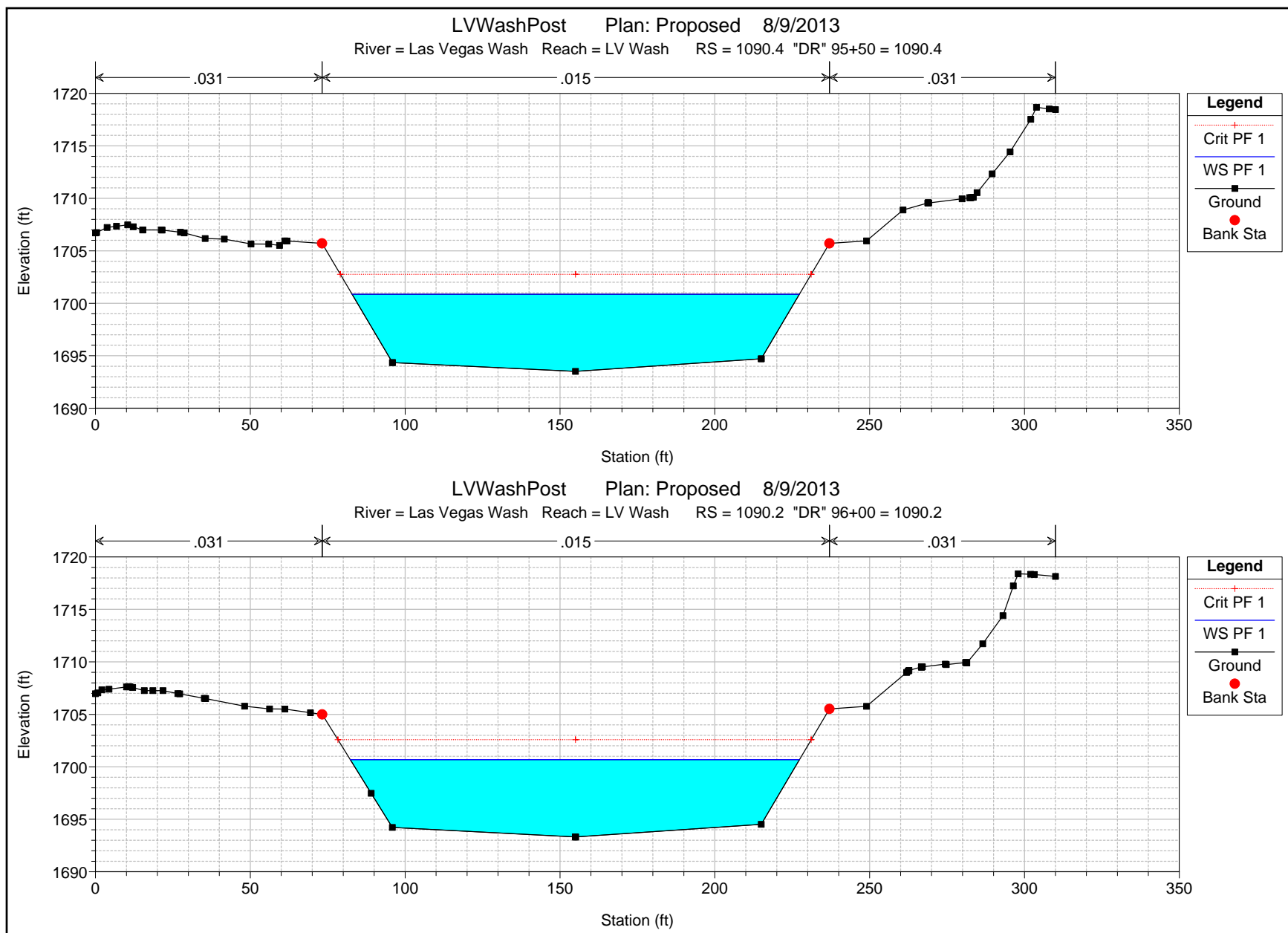


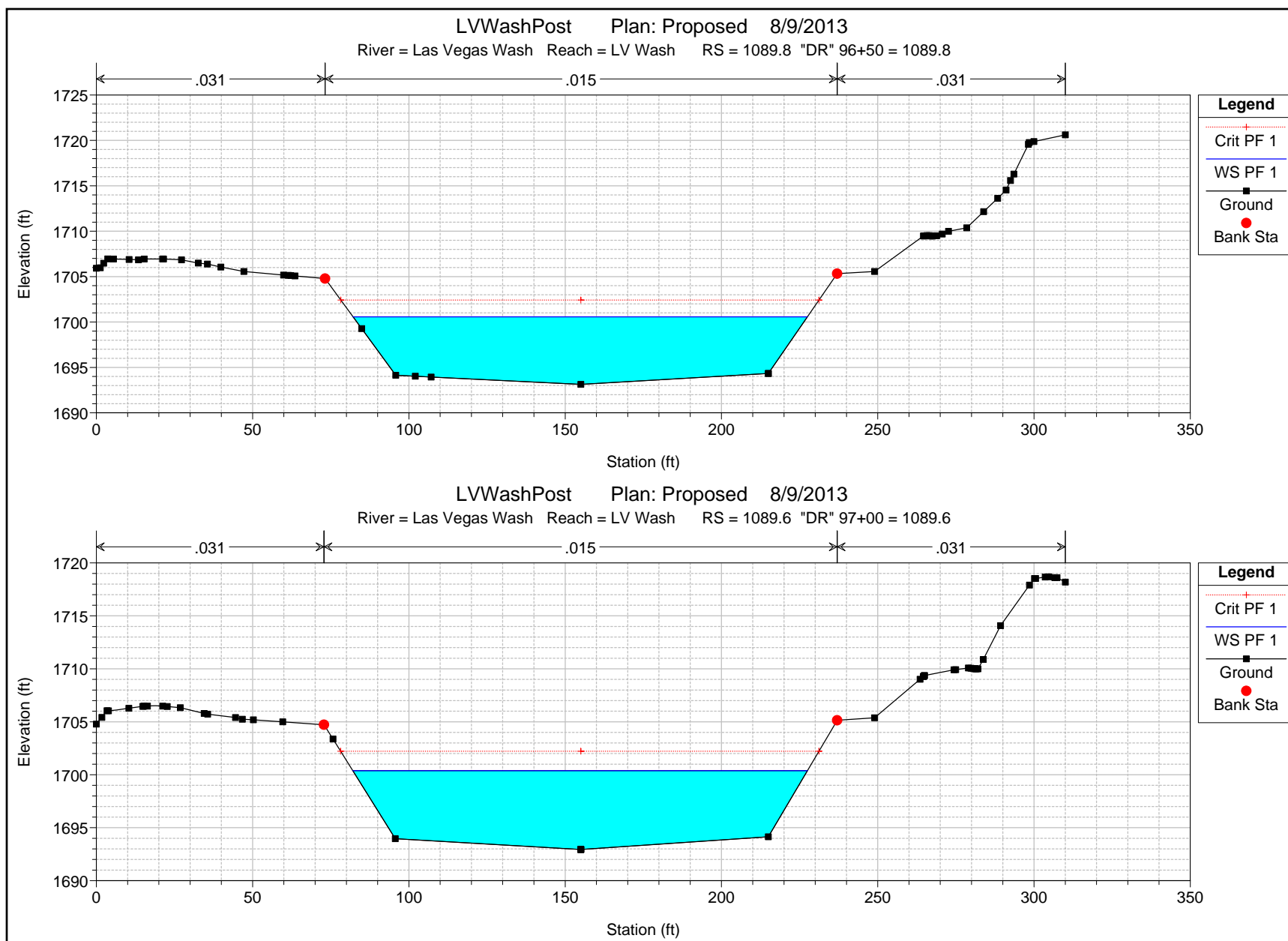
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1090.8 "DR" 94+50 = 1090.8



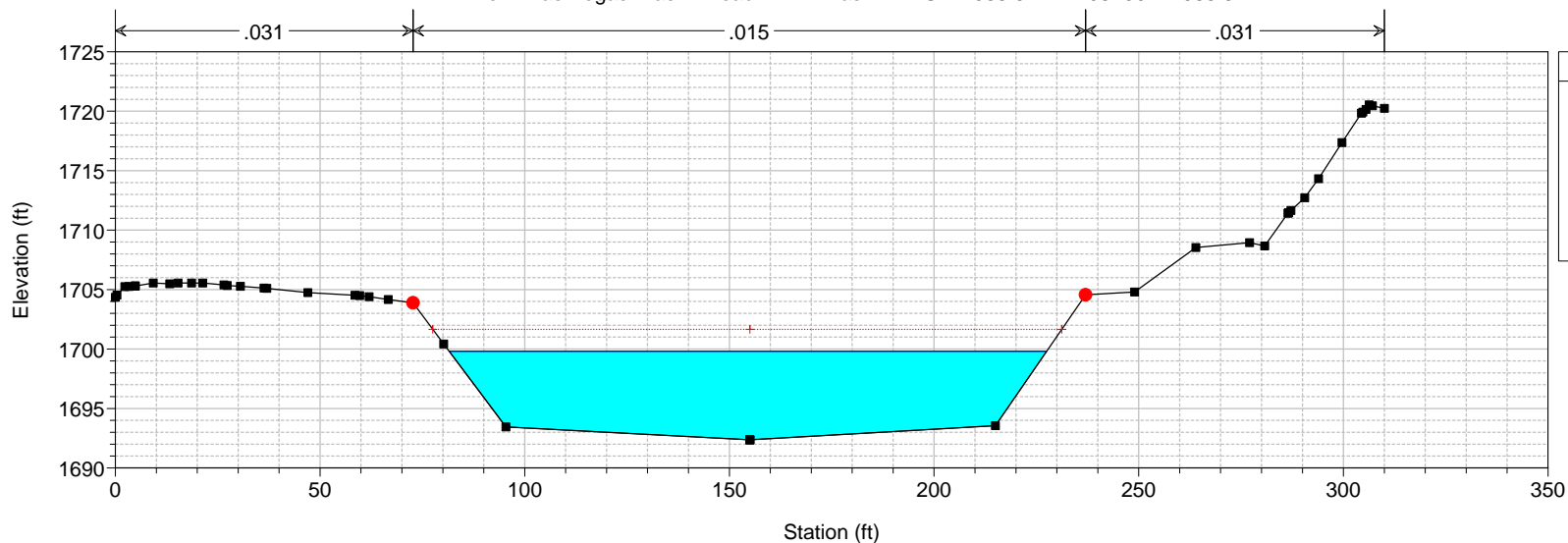
LVWashPost Plan: Proposed 8/9/2013
River = Las Vegas Wash Reach = LV Wash RS = 1090.6 "DR" 95+00 = 1090.6





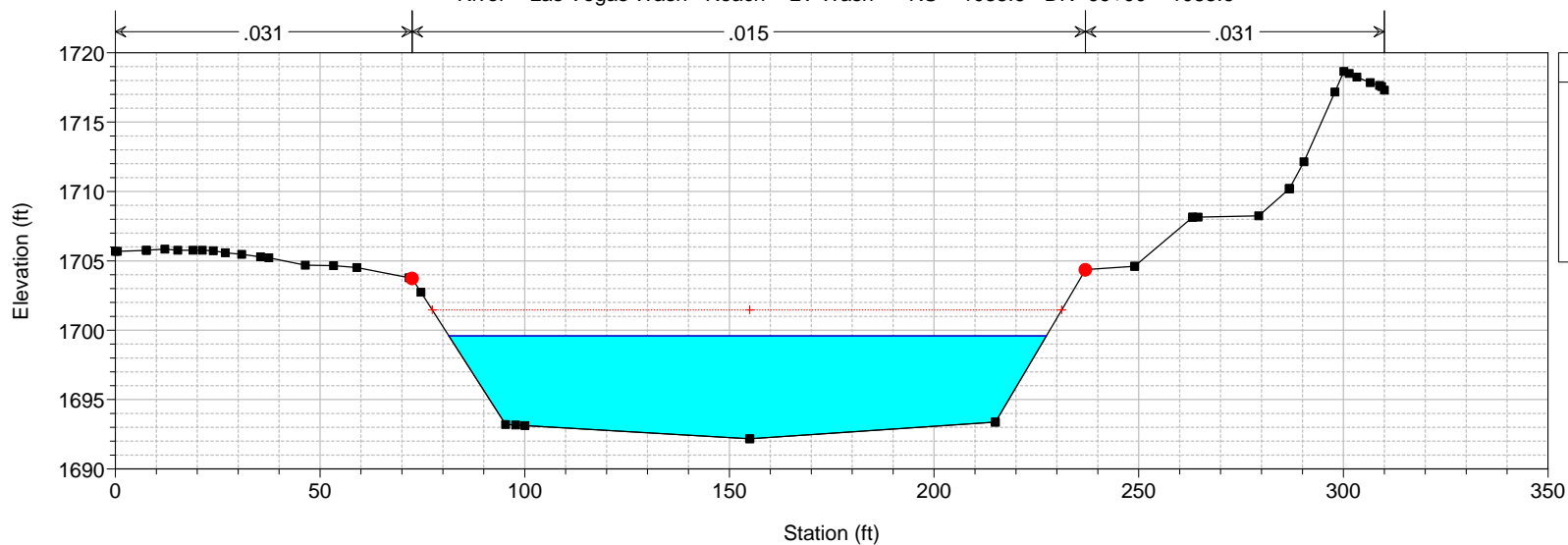


LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1088.8 "DR" 98+50 = 1088.8

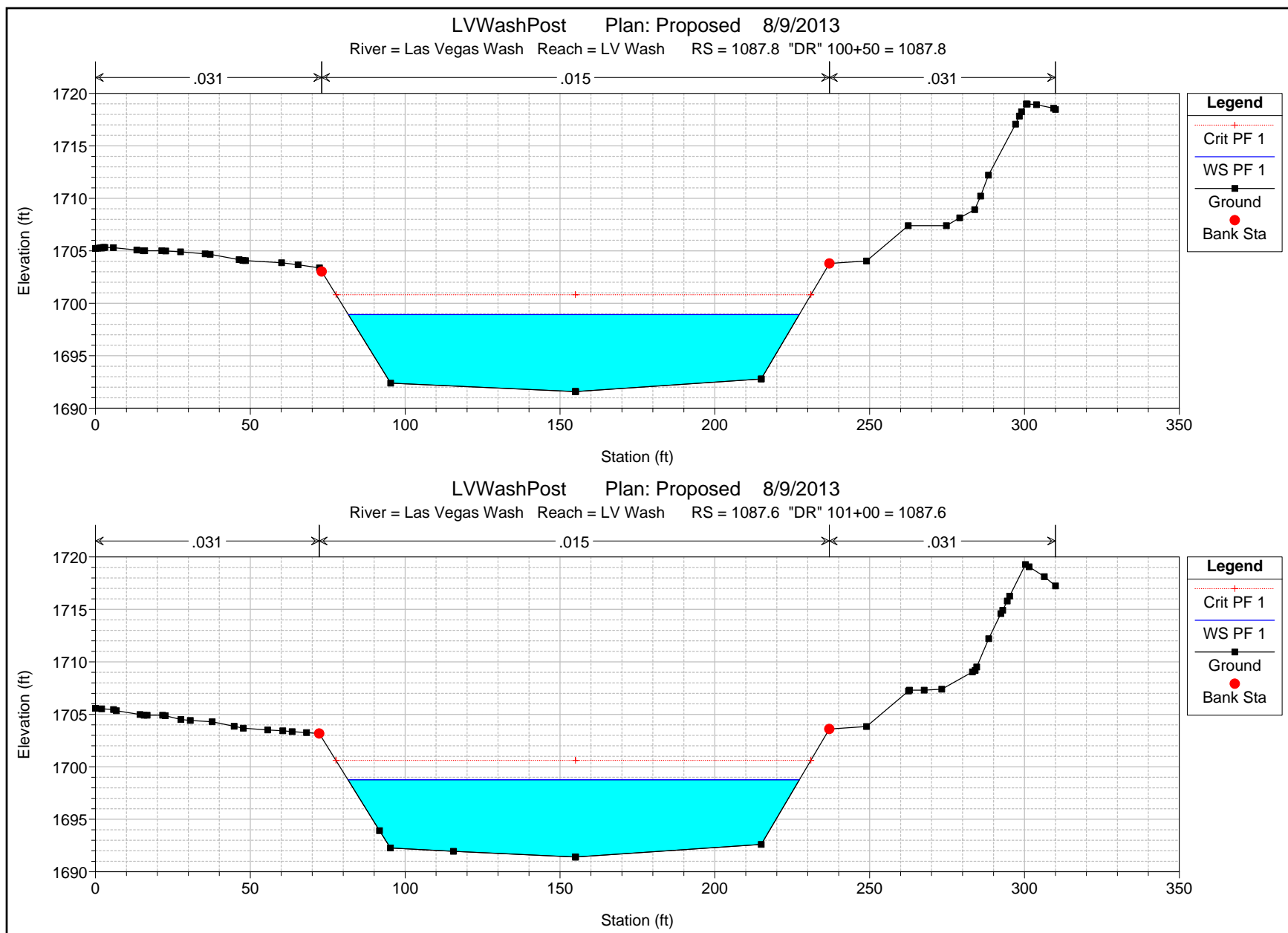


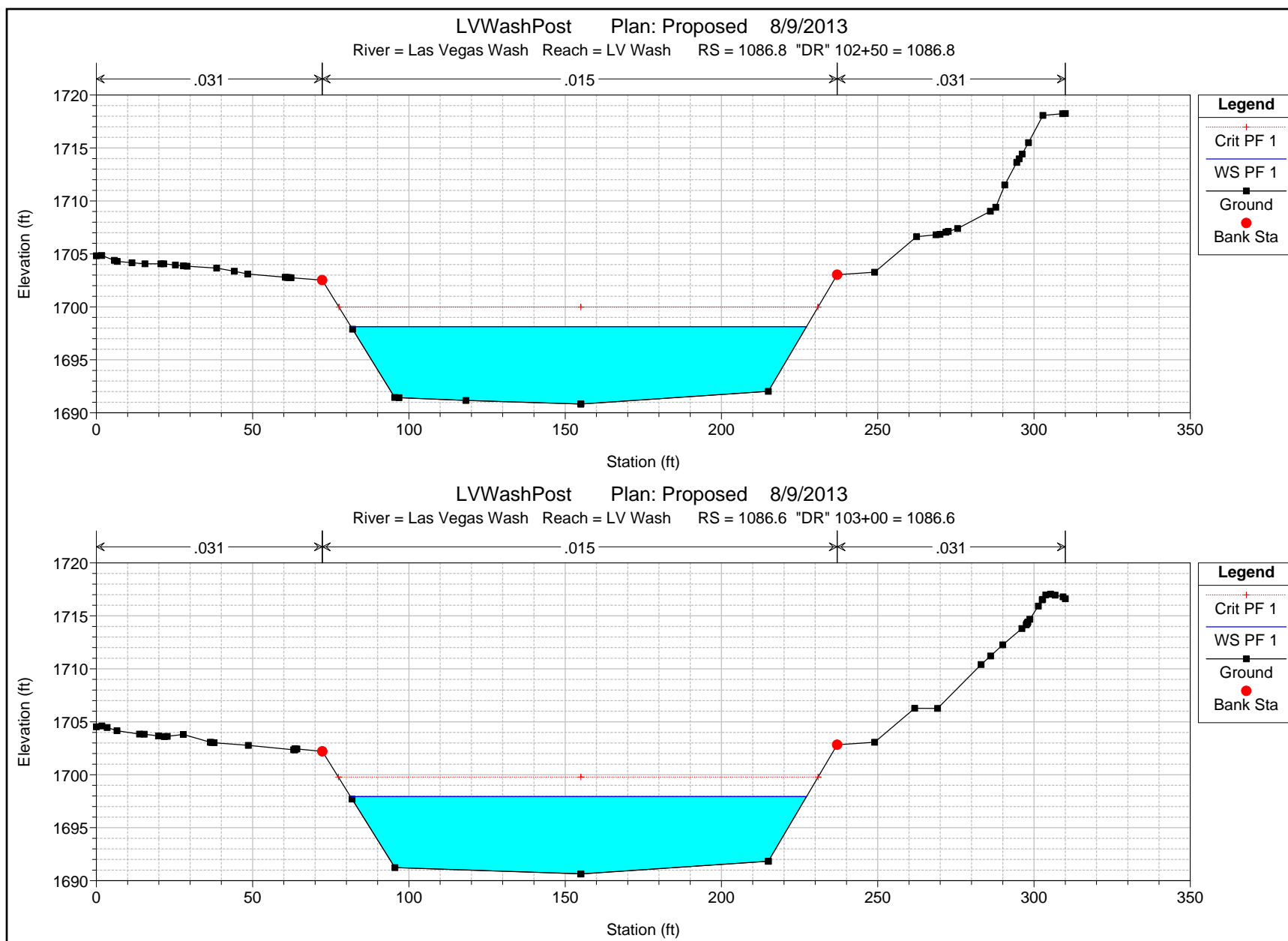
Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

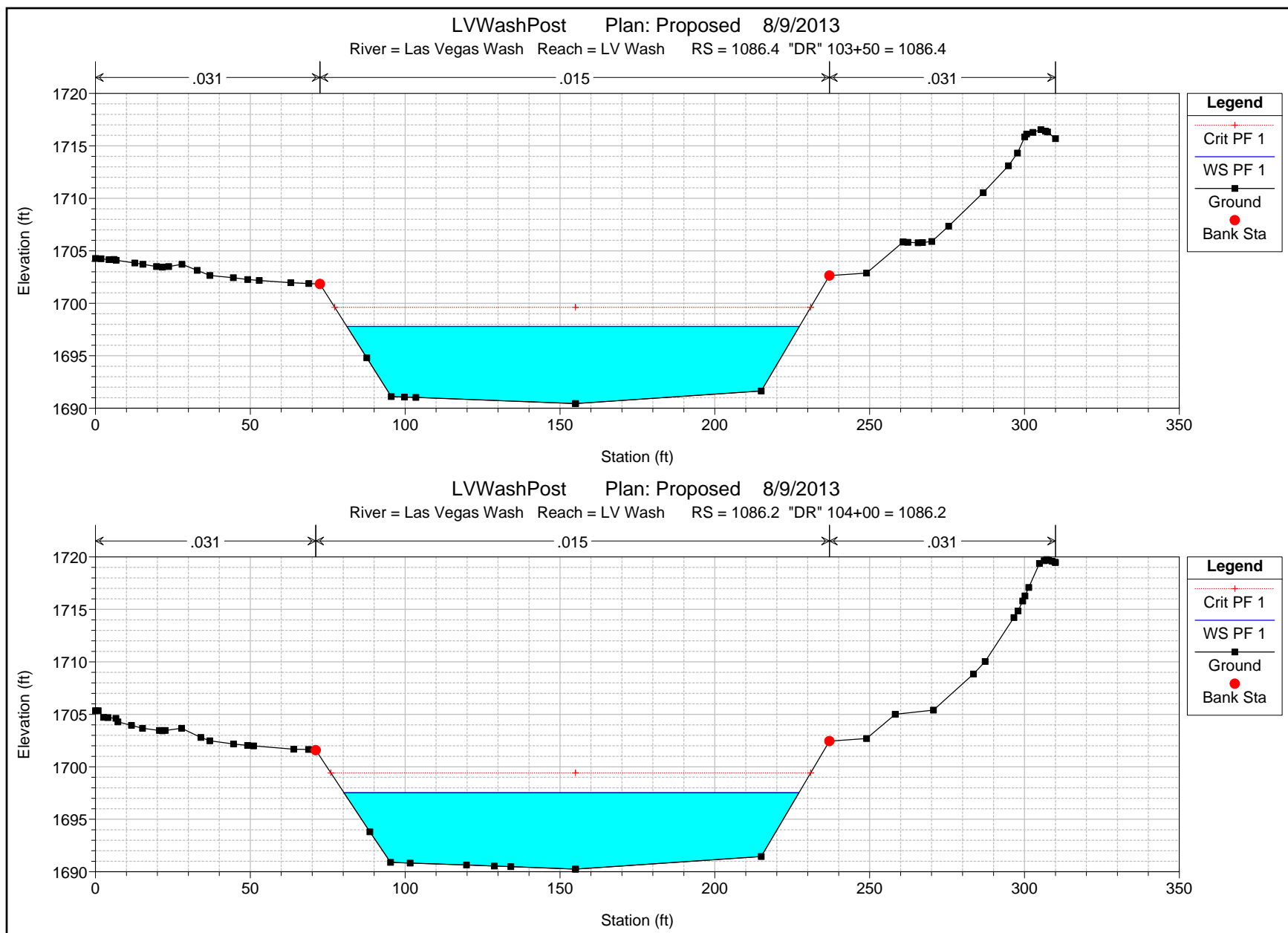
LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1088.6 "DR" 99+00 = 1088.6

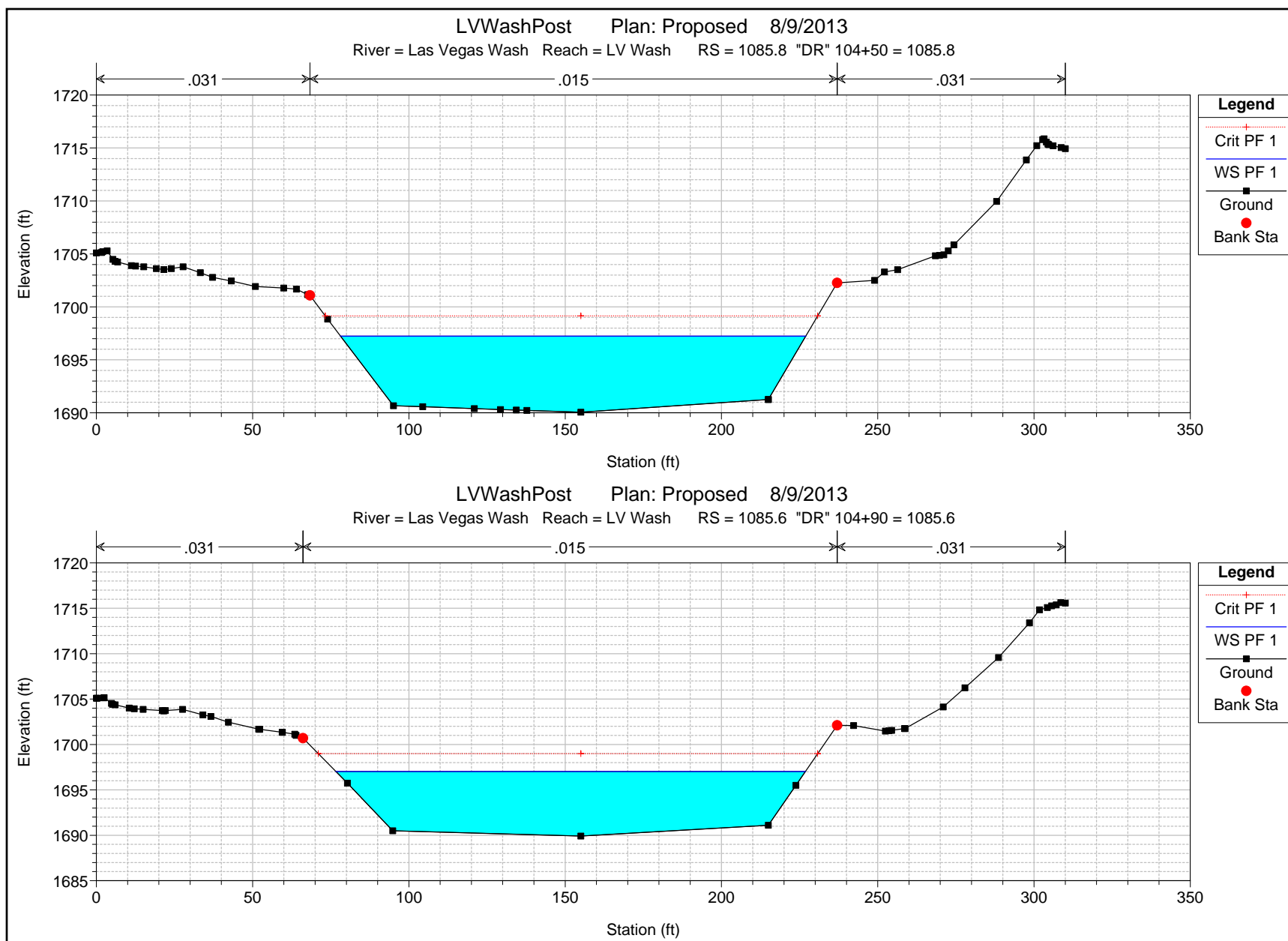


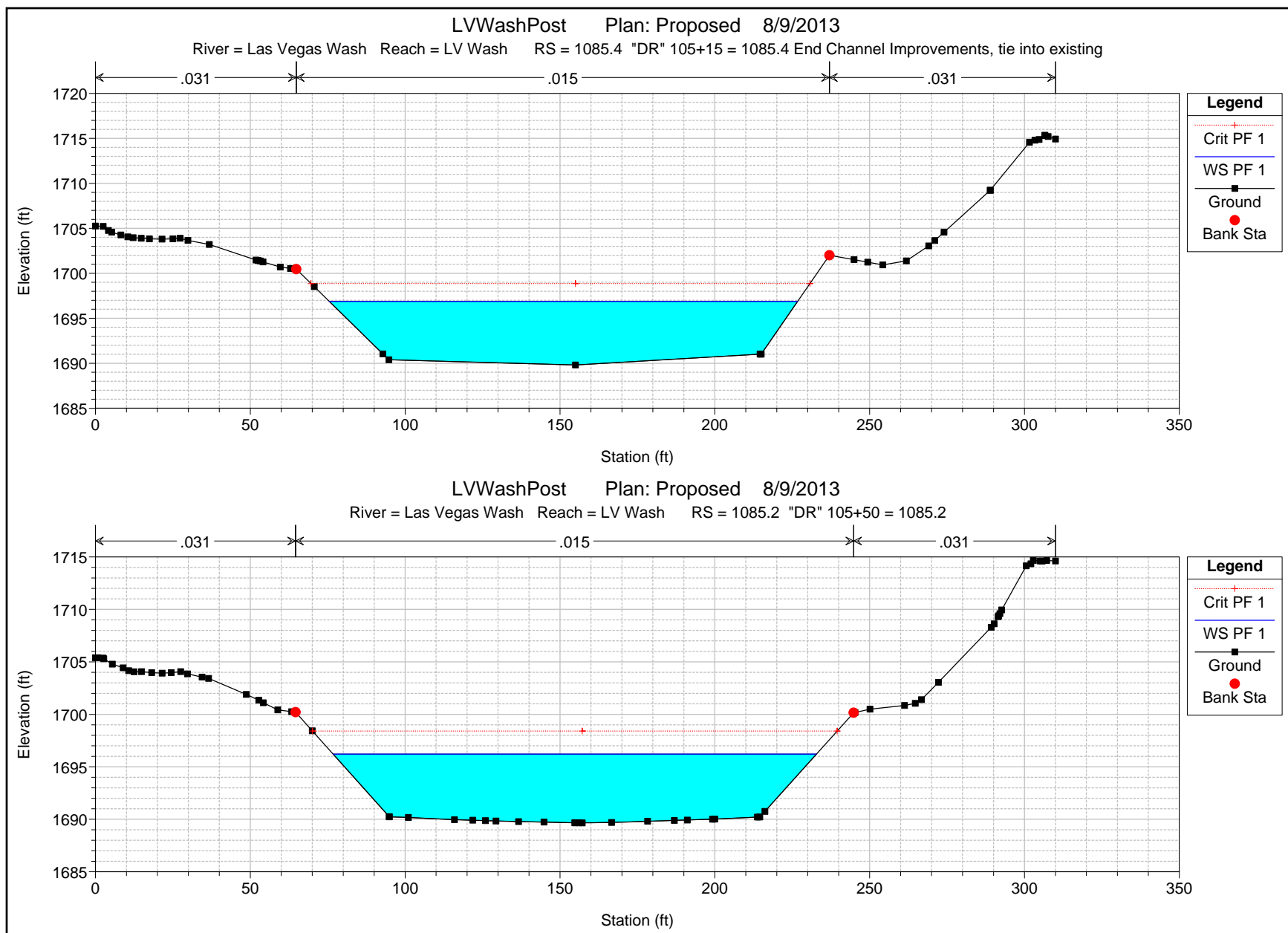
Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

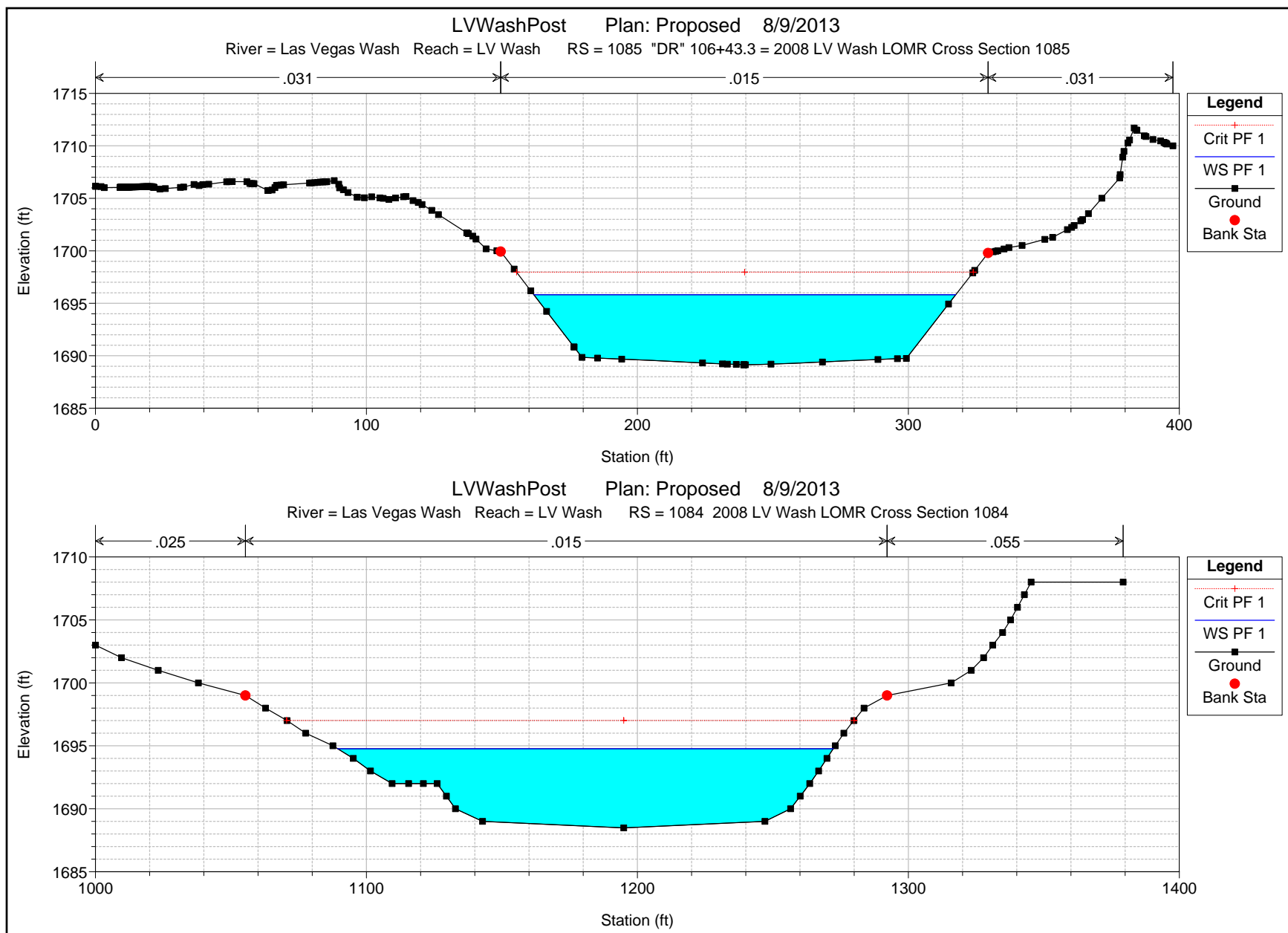


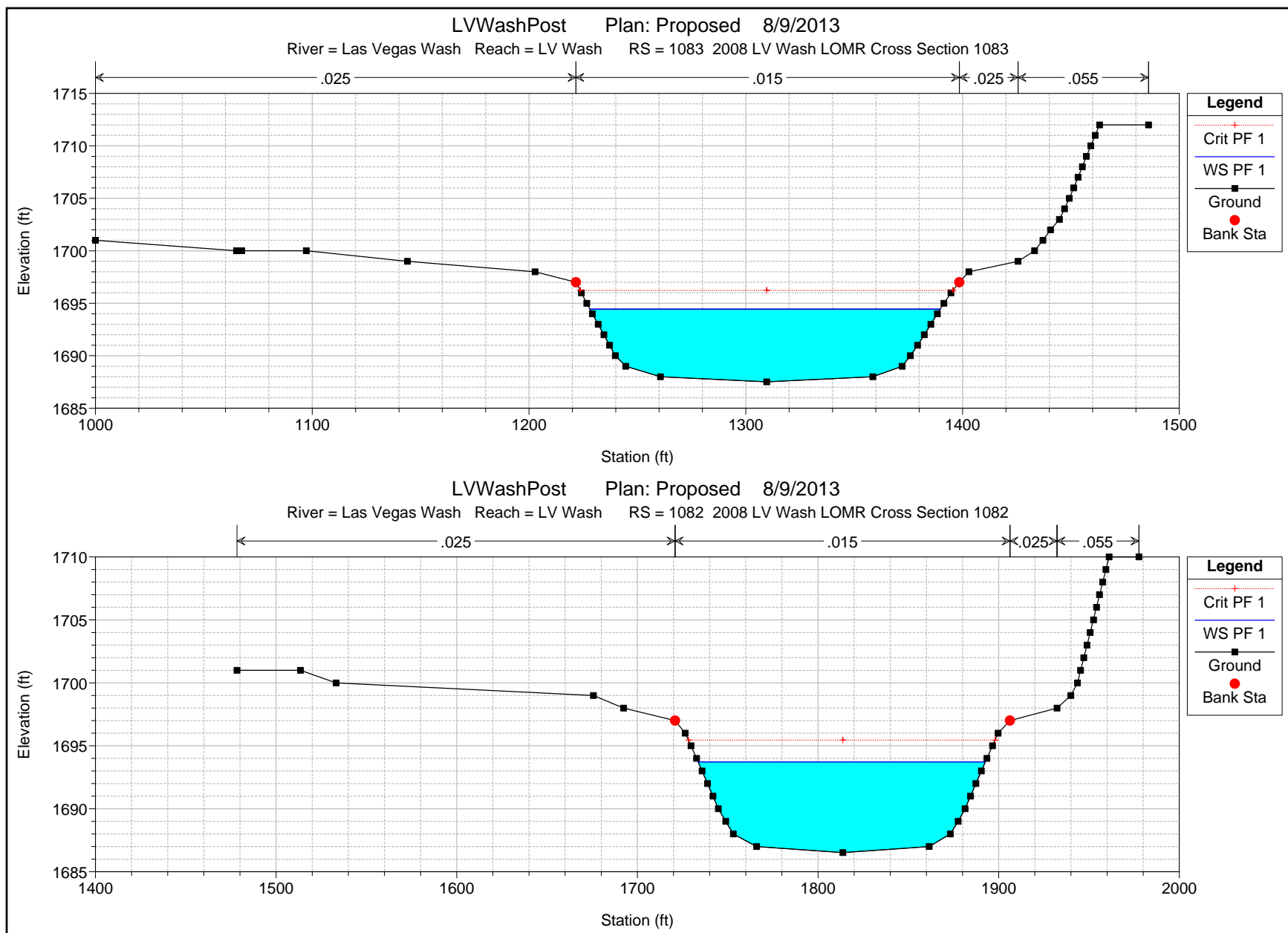


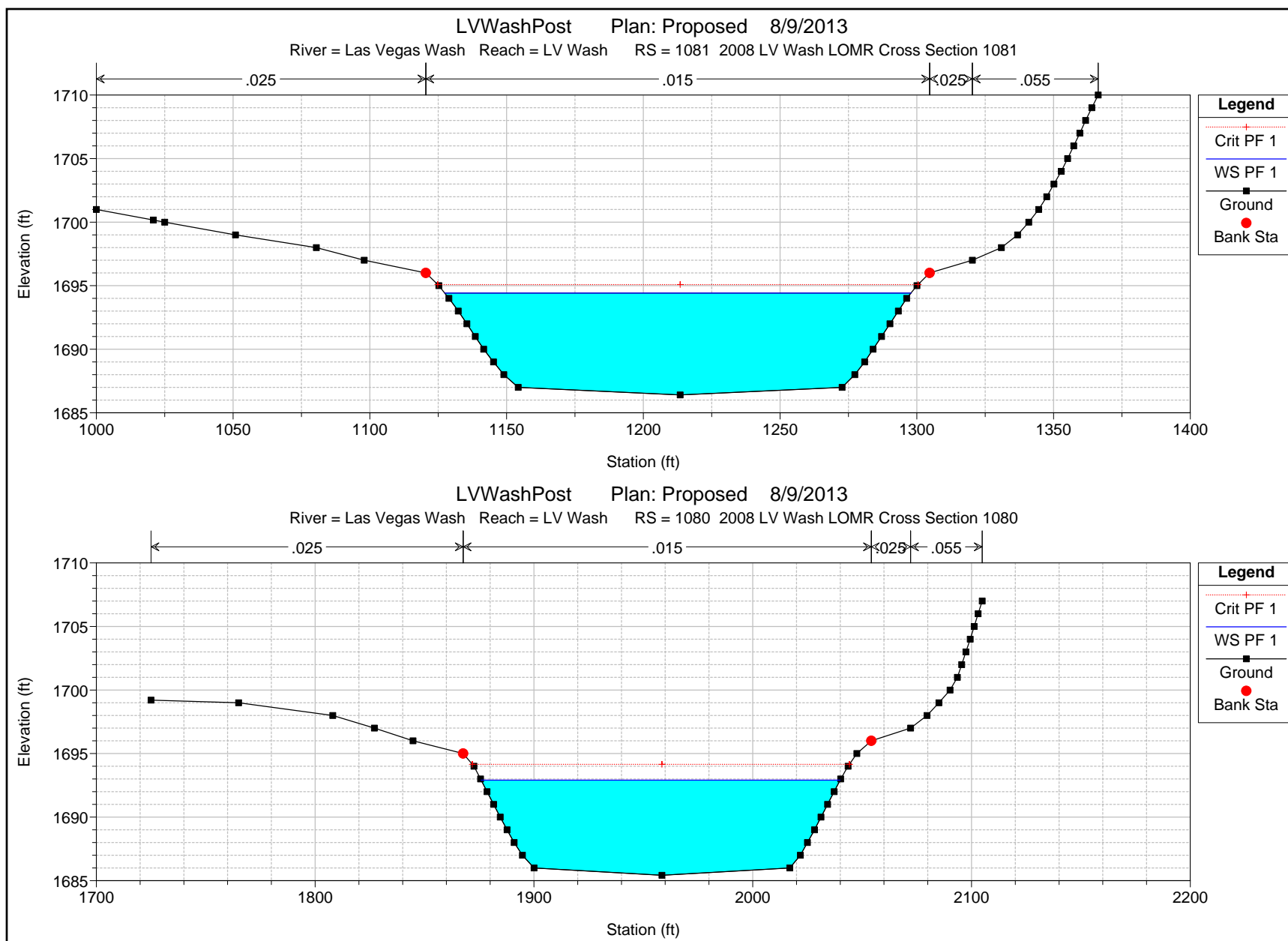


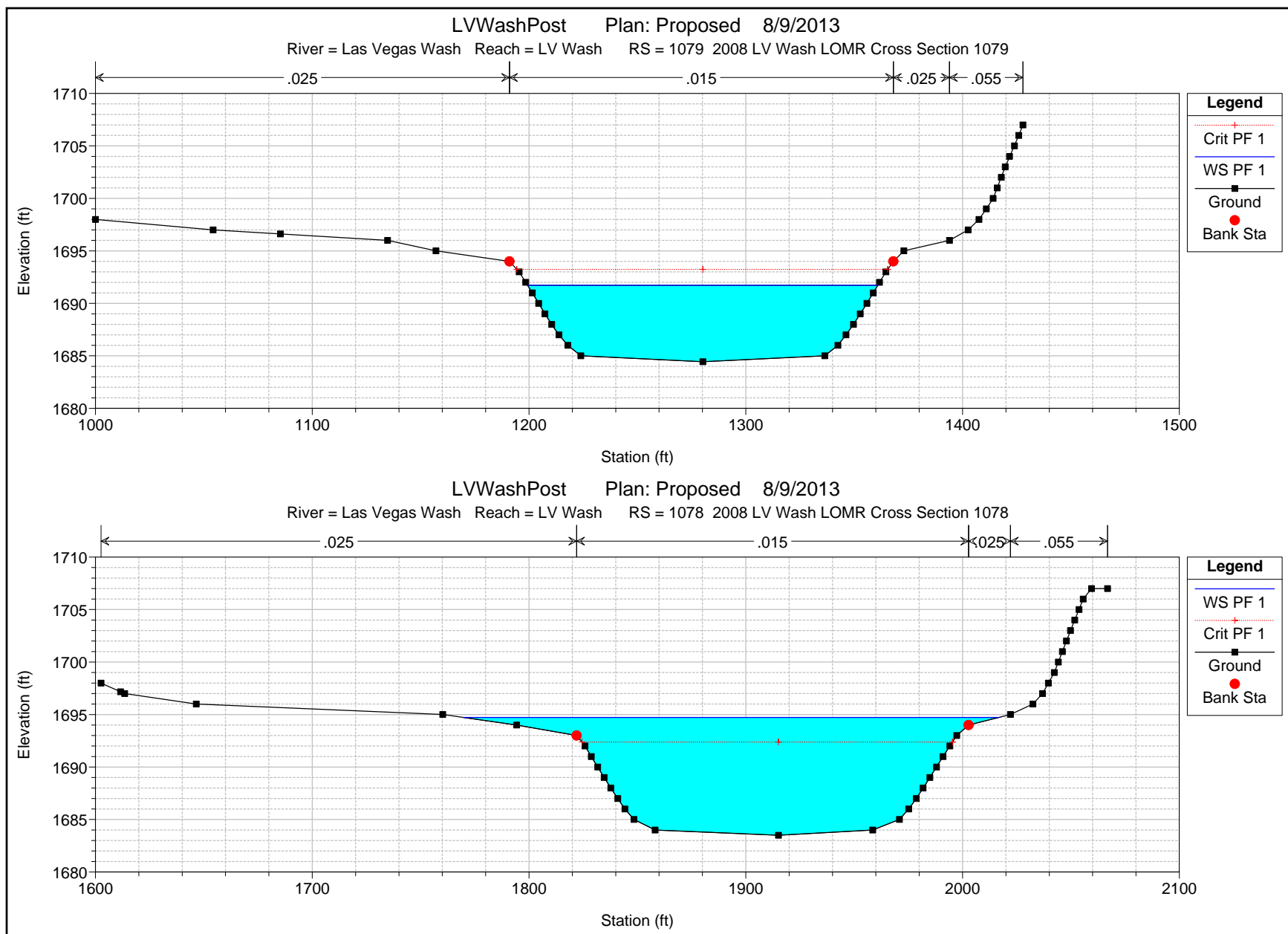


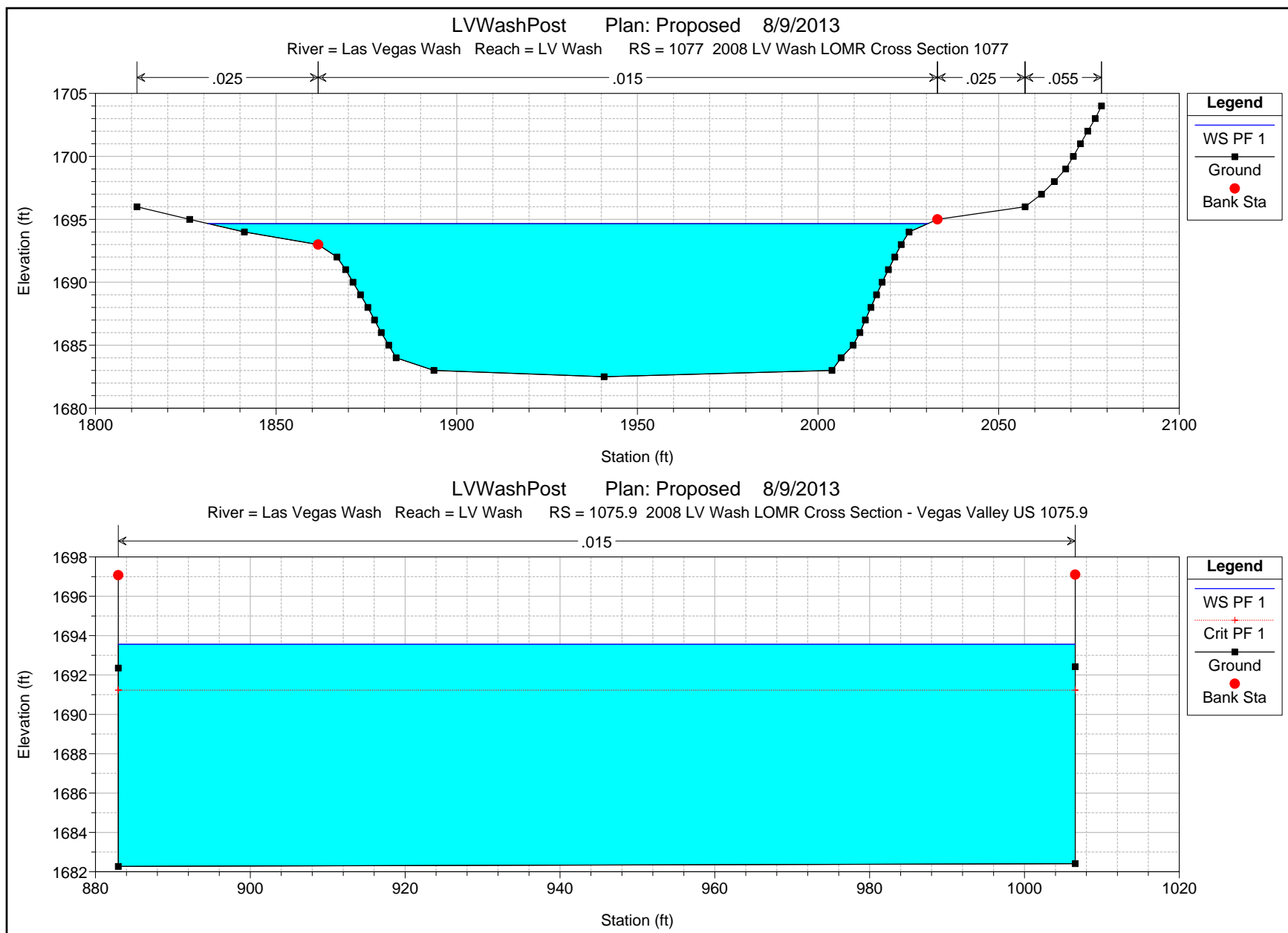






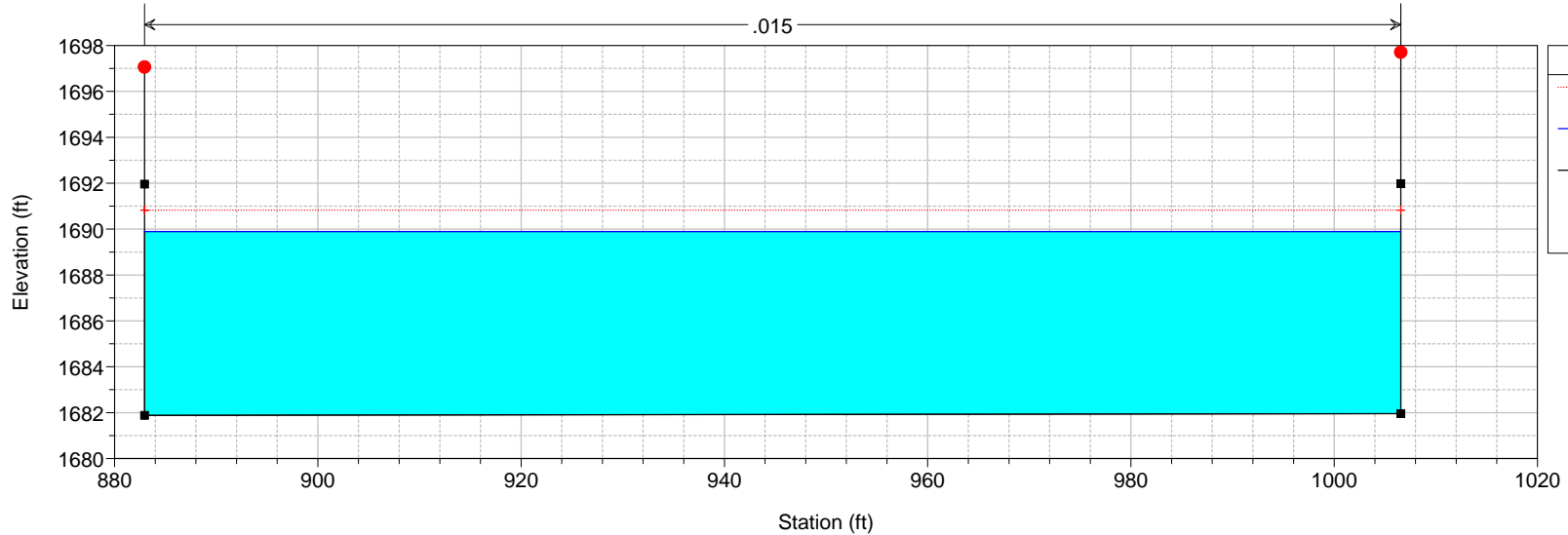






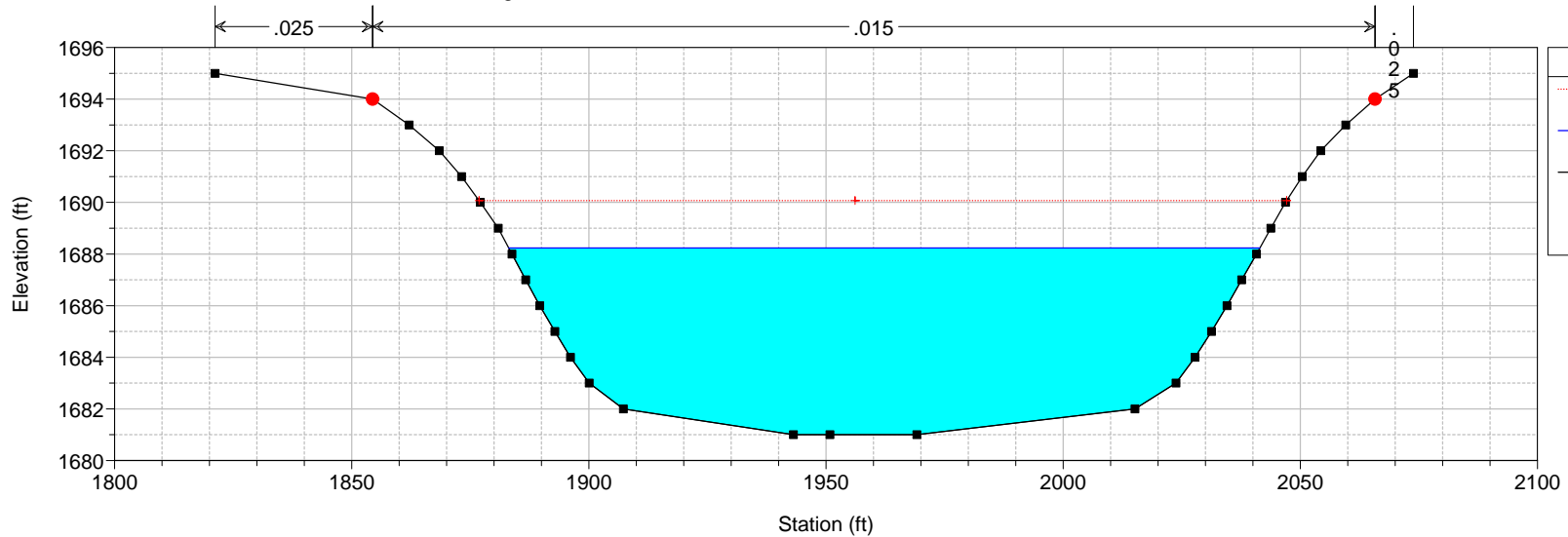
LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1075.1 2008 LV Wash LOMR Cross Section - Vegas Valley DS 1075.1

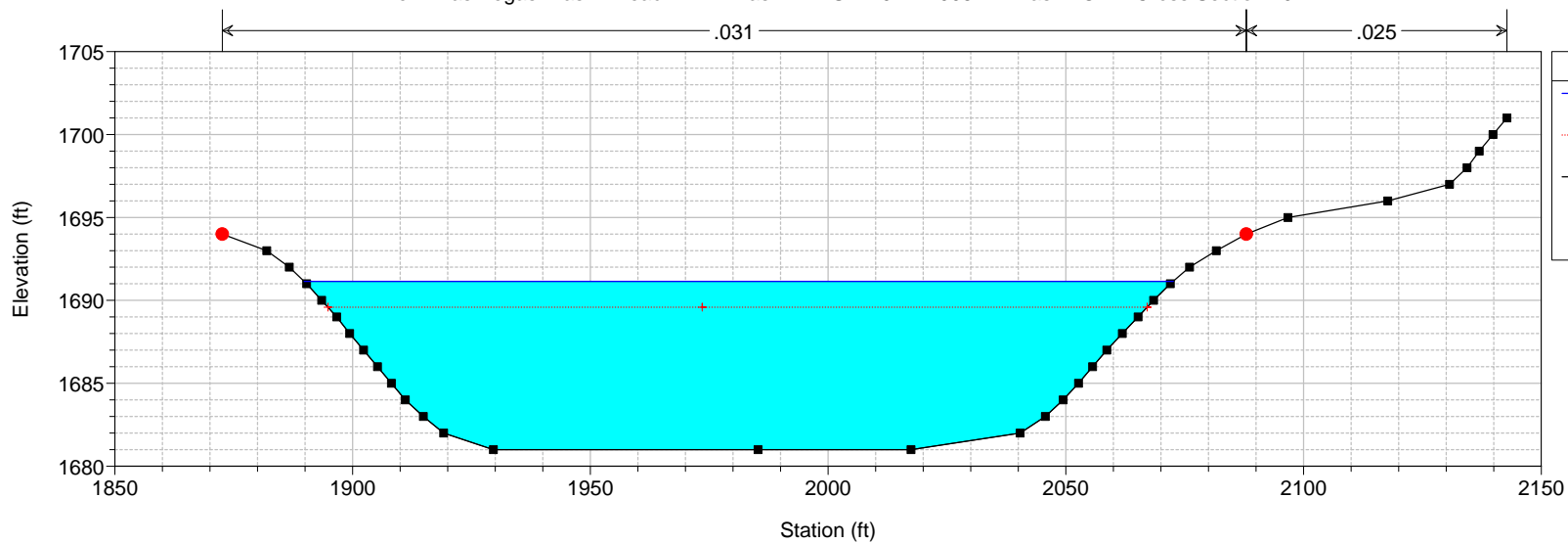


LVWashPost Plan: Proposed 8/9/2013

River = Las Vegas Wash Reach = LV Wash RS = 1075 2008 LV Wash LOMR Cross Section 1075



LVWashPost Plan: Proposed 8/9/2013
 River = Las Vegas Wash Reach = LV Wash RS = 1074 2008 LV Wash LOMR Cross Section 1074



Legend

WS PF 1

Crit PF 1

Ground

Bank Sta

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X      X XXXXXX   XXXX      XXXX      XX      XXXX
X      X X       X      X      X X      X X      X
X      X X       X      X      X X      X X      X
XXXXXXXX XXXX   X      XXX XXXX   XXXXXX   XXXX
X      X X       X      X      X X      X X      X
X      X X       X      X      X X      X X      X
X      X XXXXXX   XXXX      X      X      X      XXXXX

```

PROJECT DATA

Project Title: LVWashPost
Project File : LVWashPost.prj
Run Date and Time: 8/9/2013 1:36:43 AM

Project in English units

PLAN DATA

Plan Title: Proposed
Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Post-Project Condition\LVWashPost.p02

Geometry Title: LVWashPost
Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Post-Project Condition\LVWashPost.g02

Flow Title : LVW - FEMA
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Post-Project Condition\LVWashPost.f01

Plan Summary Information:

Number of:	Cross Sections =	232	Multiple Openings =	0
	Culverts =	0	Inline Structures =	3
	Bridges =	6	Lateral Structures =	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculation tolerance	=	0.01
Maximum number of iterations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: LVW - FEMA
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Post-Project Condition\LVWashPost.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Las Vegas Wash	LV Wash	1173	11948
Las Vegas Wash	LV Wash	1172	11948
Las Vegas Wash	LV Wash	1168.8	11948

Las Vegas Wash	LV Wash	1159.7	12706
Las Vegas Wash	LV Wash	1151.9	12754
Las Vegas Wash	LV Wash	1138.5	13326
Las Vegas Wash	LV Wash	1132.8	13515
Las Vegas Wash	LV Wash	1109.9	13861
Las Vegas Wash	LV Wash	1100.2	18601
Las Vegas Wash	LV Wash	1091.2	18672
Las Vegas Wash	LV Wash	1075	18718

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Las Vegas Wash	LV Wash	PF 1	Known WS = 1764.8	Known WS = 1691.15

GEOMETRY DATA

Geometry Title: LVWashPost
 Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Las Vegas Wash\Post-Project Condition\LVWashPost.g02

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1173

INPUT

Description: 2008 LV Wash LOMR Cross Section 1173

Station Elevation Data		num= 31							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766	19.88	1765.18	24.26	1765	31.96	1764	36.11	1763
38.21	1762	40.3	1761	42.97	1760	46.1	1759	49.29	1758
53.01	1757	57.56	1756	63.66	1755	69.89	1754	87.09	1754
114.69	1755	122.53	1756	127.34	1757	131.01	1758	134.02	1759
136.68	1760	139.34	1761	142.26	1762	145.62	1763	150.3	1764
161.81	1765	225.09	1766	273.71	1767	287.12	1768	292.56	1769
299.45	1770								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	31.96	.031	150.3	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	31.96	150.3		190	200	150	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1767.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.83	Wt. n-Val.	0.025	0.031	0.025
W.S. Elev (ft)	1764.42	Reach Len. (ft)	190.00	200.00	150.00
Crit W.S. (ft)	1763.70	Flow Area (sq ft)	0.69	884.21	1.03
E.G. Slope (ft/ft)	0.005606	Area (sq ft)	0.69	884.21	1.03
Q Total (cfs)	11948.00	Flow (cfs)	1.09	11945.28	1.63
Top Width (ft)	126.48	Top Width (ft)	3.26	118.34	4.88
Vel Total (ft/s)	13.49	Avg. Vel. (ft/s)	1.57	13.51	1.58
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)	0.21	7.47	0.21
Conv. Total (cfs)	159579.0	Conv. (cfs)	14.5	159542.7	21.8
Length Wtd. (ft)	199.69	Wetted Per. (ft)	3.29	121.06	4.90
Min Ch El (ft)	1754.00	Shear (lb/sq ft)	0.07	2.56	0.07
Alpha	1.00	Stream Power (lb/ft s)	299.45	0.00	0.00
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	1.36	547.40	0.02
C & E Loss (ft)	0.36	Cum SA (acres)	1.35	70.52	0.07

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1172

INPUT

Description: 2008 LV Wash LOMR Cross Section 1172

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-110.16	1766.383	-45.81	1765.475	0	1763.99	23.37	1763.21	37.03	1762.74
39.60	1762.7743	23.00	1762.8845	53.99	1762.8449	28.99	1762.8267	8.99	1762.93
72.2	1762.92	73.84	1762.9377	0.39	1763.0183	4.90	1763.0488	8.20	1763.03
94.25	1763.11	95.05	1763.14	96.83	1763.18	104.72	1763.16	116.17	1763.13
133.4	1763.1	137.62	1763.02	143.17	1763.88	144.36	1764.16	147.86	1763.2
148.72	1762.96	149.19	1762.83	149.91	1762.47	154.27	1760.13	157.5	1758.38
159.66	1757.44	160.25	1757.23	160.58	1757.13	165.24	1755.74	168.25	1755.19
171.62	1754.55	174.44	1754.71	176.33	1754.68	177.82	1755.32	179.18	1755.87
181.09	1756.14	183.15	1756.46	187.69	1755.1	188.18	1754.93	190.56	1752.55
192.15	1750.89	193.44	1750.89	194.85	1750.89	200	1750.89	201.66	1750.89
204.71	1752.65	206.06	1753.25	208.22	1753.19	209.82	1753.13	210.45	1753.02
213.5	1752.58	214.63	1752.54	216.33	1752.06	216.99	1752.54	218.47	1753.11
236.29	1753.66	239.11	1753.79	239.52	1753.9	241.68	1754.61	243.89	1755.19
246.36	1755.93	257.35	1760.57	257.84	1760.77	259.37	1761.48	266.57	1764.67
268.74	1765.19	271.47	1765.76	272.58	1766.09	274.63	1766.11	282.58	1766.09
284.29	1766.01	285.22	1765.97	285.79	1765.94	292.74	1765.36	293.49	1765.57
294.81	1765.83	297.31	1765.97	300	1766.07				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-110.16	.025	144.36	.031	272.58	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	144.36	272.58		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1766.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1764.46	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	1762.07	Flow Area (sq ft)	196.03	1059.68	
E.G. Slope (ft/ft)	0.002941	Area (sq ft)	196.03	1059.68	
Q Total (cfs)	11948.00	Flow (cfs)	726.19	11221.81	
Top Width (ft)	280.70	Top Width (ft)	158.96	121.74	
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)	3.70	10.59	
Max Chl Dpth (ft)	13.57	Hydr. Depth (ft)	1.23	8.70	
Conv. Total (cfs)	220321.5	Conv. (cfs)	13391.0	206930.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	159.09	128.87	
Min Ch El (ft)	1750.89	Shear (lb/sq ft)	0.23	1.51	
Alpha	1.17	Stream Power (lb/ft s)	300.00	0.00	0.00
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	0.93	542.94	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	1.00	69.97	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1171

INPUT

Description: 2008 LV Wash LOMR Cross Section 1171

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1764.96	2.32	1764.91	5.6	1764.91	10.61	1764.89	35.45	1764.84
36.99	1764.85	38.97	1764.82	60.26	1764.57	65.34	1764.54	74.31	1764.34
81.8	1764.11	85.39	1764.12	88	1764	95.63	1763.76	100.37	1763.54
106.96	1763.16	109.85	1762.87	112.43	1762.82	114.64	1762.89	124.42	1762.97
129.6	1762.77	133.47	1762.71	135.87	1762.65	138.16	1762.41	139.97	1762.34
144.02	1762.2	145.44	1762.16	146.05	1761.99	150.44	1760.64	155.25	1757.93
156.19	1757.2	157.44	1756.96	160.36	1756.31	161.66	1756.06	163.13	1755.8
167.3	1755.4	170.73	1755.05	173.7	1754.92	177.59	1754.57	180.1	1753.66
180.25	1753.6	180.32	1753.6	182.63	1753.96	186.05	1754.76	188.05	1755.28
188.85	1754.95	190.98	1754.08	194.55	1751.24	195.42	1750.66	198.69	1750.79

200	1750.84	206.75	1751.11	208.22	1752.12	209.67	1753.16	212.3	1753.36
215.18	1753.59	220.67	1753.16	220.92	1753.14	221.04	1753.13	225.02	1753.04
225.29	1753.05	226.91	1753.18	236.18	1753.2	244.8	1753.36	246.97	1753.94
248.85	1754.21	251.49	1754.7	252.92	1755.05	253.57	1755.31	260.77	1758.76
267.33	1763.13	268.88	1764.21	269.9	1764.58	272.65	1765.471	272.77	1765.51
279.32	1765.6	282.47	1765.61	283.76	1765.6	285.22	1765.47	294.72	1764.85
295.14	1764.84	295.75	1764.83	300	1764.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	144.02	.031	272.77	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	144.02	272.77		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1765.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1763.55	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	30.71	1065.99	
E.G. Slope (ft/ft)	0.003269	Area (sq ft)	30.71	1065.99	
Q Total (cfs)	11948.00	Flow (cfs)	82.20	11865.80	
Top Width (ft)	167.80	Top Width (ft)	43.88	123.91	
Vel Total (ft/s)	10.89	Avg. Vel. (ft/s)	2.68	11.13	
Max Chl Dpth (ft)	12.89	Hydr. Depth (ft)	0.70	8.60	
Conv. Total (cfs)	208966.8	Conv. (cfs)	1437.7	207529.1	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	43.93	130.23	
Min Ch El (ft)	1750.66	Shear (lb/sq ft)	0.14	1.67	
Alpha	1.04	Stream Power (lb/ft s)	300.00	0.00	0.00
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	0.41	538.06	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.53	69.40	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1170

INPUT

Description: 2008 LV Wash LOMR Cross Section 1170

Station	Elevation	Data	num=	58					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1763.988	320007	1763.981	11.17999	1763.712	60001	1763.412	7.89999	1763.4
39.99001	1762.65	44.19	1762.4	49.78	1760.095	0.99001	1759.585	1.53999	1759.27
56.92	1756.12	57.59	1756.036	5.49001	1755.01	69.78	1754.9	72.56	1755.06
73.56	1754.82	75.55	1754.57	77.91	1754.25	81.11	1753.93	84.28	1753.62
85.53	1753.49	86.69	1753.75	90.23	1754.71	91.38	1754.65	93.63	1754.56
94.63	1751.79	95.09	1750.75	98.05	1750.78	100	1750.8	105.83	1750.85
110.9	1750.89	112.43	1751.67	113.21	1752.09	115.3	1752.16	120.52	1752.31
121.38	1751.95	122.17	1751.55	124.41	1751.9	125.09	1752.01	130.23	1751.92
143.73	1751.76	147.53	1753.26	147.96	1753.43	148.44	1753.52	151.17	1754.13
156.26	1756.38	160.29	1758.04	166.72	1761.26	168.67	1762.25	169.65	1762.57
173.16	1763.96	178.39	1763.98	182.71	1764.02	183.87	1763.91	185.91	1763.64
190.53	1763.37	196.23	1763.19	200	1763.17				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	44.19	.031	173.16	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	44.19	173.16		200	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.99	Wt. n-Val.	0.025	0.031	
W.S. Elev (ft)	1762.78	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)		Flow Area (sq ft)	1.23	1054.90	
E.G. Slope (ft/ft)	0.003538	Area (sq ft)	1.23	1054.90	
Q Total (cfs)	11948.00	Flow (cfs)	1.45	11946.55	
Top Width (ft)	132.34	Top Width (ft)	6.34	126.00	
Vel Total (ft/s)	11.31	Avg. Vel. (ft/s)	1.18	11.32	
Max Chl Dpth (ft)	12.03	Hydr. Depth (ft)	0.19	8.37	

Conv. Total (cfs)	200878.2	Conv. (cfs)	24.3	200853.9	
Length Wtd. (ft)	200.00	Wetted Per. (ft)	6.36	133.25	
Min Ch El (ft)	1750.75	Shear (lb/sq ft)	0.04	1.75	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	0.34	533.19	0.02
C & E Loss (ft)	0.21	Cum SA (acres)	0.42	68.83	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1169

INPUT

Description: 2008 LV Wash LOMR Cross Section 1169

Station	Elevation	Data	num=	86					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766.783	360001	1766.691	14.960001	1766.36	15.87	1766.36	16.36	1766.36
16.42999	1766.681	6.460001	1766.86	16.77	1766.86	16.91	1766.86	23.02	1766.62
24.35001	1766.58	24.5	1766.57	24.570001	1766.57	24.63	1766.57	24.64999	1766.56
24.67	1766.56	24.710001	1766.56	24.72	1766.56	25.06	1766.22	25.7	1765.87
33.53	1759.74	38.53999	1757.72	42.73	1755.66	45.62	1754.31	50.02	1754.25
58.21001	1754.07	66.75999	1753.7	68.78	1753.71	71.17999	1753.05	71.2	1753.05
71.24001	1753.05	76	1753.09	79.96	1754.14	80.07	1754.17	80.13	1754.19
82.82	1754.8	86.49	1755.13	87.31	1755.19	88.02	1755.23	92.26	1755.42
96.15	1754.26	96.8	1753.97	100	1751.48	100.97	1750.73	101.32	1750.47
103.13	1750.38	108.39	1750.17	109.42	1750.62	112.62	1751.64	115.36	1751.37
117.57	1751.56	120.35	1751	121.34	1751.13	121.9	1751.18	124.47	1751.19
128.56	1751.16	133.92	1751.05	134.16	1751.05	141.8	1750.93	142.4	1750.92
142.83	1750.68	143.35	1750.68	146.84	1749.9	149.34	1749.8	152.48	1749.77
156.61	1752.45	159.26	1754.13	163.49	1756.54	165.39	1757.69	168.56	1759.41
171.58	1761.1	172.43	1761.43	173.7	1761.92	174.63	1762.59	175.08	1762.78
175.46	1762.92	176.71	1763.38	178.82	1763.44	185.87	1763.6	186.42	1763.62
186.65	1763.62	187	1763.62	195.04	1763.66	195.87	1763.61	197.73	1763.54
200	1763.44								

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.025	24.72	.031
		176.71	.025

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	24.72	176.71		44.31	44.31	44.31	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1764.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.		0.031	
W.S. Elev (ft)	1762.74	Reach Len. (ft)	44.31	44.31	44.31
Crit W.S. (ft)		Flow Area (sq ft)		1307.89	
E.G. Slope (ft/ft)	0.002083	Area (sq ft)		1307.89	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	145.27	Top Width (ft)		145.27	
Vel Total (ft/s)	9.14	Avg. Vel. (ft/s)		9.14	
Max Chl Dpth (ft)	12.97	Hydr. Depth (ft)		9.00	
Conv. Total (cfs)	261803.0	Conv. (cfs)		261803.0	
Length Wtd. (ft)	44.31	Wetted Per. (ft)		153.26	
Min Ch El (ft)	1749.77	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	527.77	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	68.21	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1168.8

INPUT

Description: "LV" 7+00.00 = 1168.8 Upstream side of Bonanza Rd Bridge

Station	Elevation	Data	num=	85
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1767.177	080002	1766.74	11.47	1766.531	7.60001	1766.172	1.03999	1766.04
21.57001	1766.052	1.78999	1766.05	21.8	1766.13	21.87	1766.13	21.95	1766.07
23.22	1766.022	3.35001	1766.02	23.44	1766.43	23.45	1766.47	23.81	1766.47
23.85001	1766.47	23.95	1766.46	24.05	1766.122	6.14999	1765.592	7.10001	1766.43
27.58	1764.452	7.60001	1764.372	7.99001	1763.85	30.08	1761.613	2.17999	1761.57
40.39	1755.67	41.98	1754.98	42.63	1754.95	43.86	1754.9	46.72	1754.64
49.10001	1754.44	54.39	1754.145	4.92999	1754.13	56.14	1754.156	4.42999	1754.3
67.2	1753.87	71.83	1753.15	76.21	1753.22	78.51	1753.22	80.76	1753.87
84.44	1754.98	89.22	1755.09	89.33	1755.1	92.53	1755.48	92.92	1755.51
93.83	1755.32	94.16	1755.24	96.81	1754.63	99.95	1753.88	100	1753.84
103.1	1751.45	106.38	1748.87	108.96	1748.87	111.74	1748.87	113.83	1750.04
116.16	1751.35	120.81	1750.87	121.29	1750.82	124.54	1751.02	125.1	1751.06
127.92	1751	130.03	1750.95	133.65	1750.87	138.12	1750.83	142.23	1750.79
143.88	1750.34	145.39	1749.88	147.35	1749.87	149.06	1749.84	152.01	1749.99
152.97	1750.05	153.66	1750.47	159.62	1753.95	162.73	1756.01	165.14	1757.75
170.89	1760.27	171.63	1760.6	172.35	1760.77	180.29	1763.05	186.14	1764.91
186.7	1764.94	190.16	1764.93	195.43	1764.99	199.72	1765	200	1765.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	27.10001	.031	186.7	.025

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	27.10001	186.7		175	175		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.031	
W.S. Elev (ft)	1762.65	Reach Len. (ft)	42.00	42.00	42.00
Crit W.S. (ft)	1759.27	Flow Area (sq ft)		1312.89	
E.G. Slope (ft/ft)	0.002151	Area (sq ft)		1312.89	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	149.78	Top Width (ft)		149.78	
Vel Total (ft/s)	9.10	Avg. Vel. (ft/s)		9.10	
Max Chl Dpth (ft)	13.78	Hydr. Depth (ft)		8.77	
Conv. Total (cfs)	257599.0	Conv. (cfs)		257599.0	
Length Wtd. (ft)	42.00	Wetted Per. (ft)		158.53	
Min Ch El (ft)	1748.87	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.34	526.44	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	68.06	0.06

BRIDGE

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1168.5

INPUT

Description: Bonanza Boulevard Bridge
 Distance from Upstream XS = 42
 Deck/Roadway Width = 100
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 2
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 27.1 1764.97 1763.41 186.7 1765.55 1764.02

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	85					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1767.177	080002	1766.74	11.47	1766.531	7.60001	1766.172	1.03999	1766.04
21.57001	1766.052	1.78999	1766.05	21.8	1766.13	21.87	1766.13	21.95	1766.07
23.22	1766.022	3.35001	1766.02	23.44	1766.43	23.45	1766.47	23.81	1766.47
23.85001	1766.47	23.95	1766.46	24.05	1766.122	6.14999	1765.592	7.10001	1766.43
27.58	1764.452	7.60001	1764.372	7.99001	1763.85	30.08	1761.613	2.17999	1761.57
40.39	1755.67	41.98	1754.98	42.63	1754.95	43.86	1754.9	46.72	1754.64
49.10001	1754.44	54.39	1754.145	4.92999	1754.13	56.14	1754.156	4.42999	1754.3
67.2	1753.87	71.83	1753.15	76.21	1753.22	78.51	1753.22	80.76	1753.87
84.44	1754.98	89.22	1755.09	89.33	1755.1	92.53	1755.48	92.92	1755.51
93.83	1755.32	94.16	1755.24	96.81	1754.63	99.95	1753.88	100	1753.84
103.1	1751.45	106.38	1748.87	108.96	1748.87	111.74	1748.87	113.83	1750.04

116.16	1751.35	120.81	1750.87	121.29	1750.82	124.54	1751.02	125.1	1751.06
127.92	1751	130.03	1750.95	133.65	1750.87	138.12	1750.83	142.23	1750.79
143.88	1750.34	145.39	1749.88	147.35	1749.87	149.06	1749.84	152.01	1749.99
152.97	1750.05	153.66	1750.47	159.62	1753.95	162.73	1756.01	165.14	1757.75
170.89	1760.27	171.63	1760.6	172.35	1760.77	180.29	1763.05	186.14	1764.91
186.7	1764.94	190.16	1764.93	195.43	1764.99	199.72	1765	200	1765.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02527	10001	.031	186.7	.025

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	27.10001	186.7	.1	.3	

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
20.77	1765.23	1763.61	181.77	1765.95	1764.33				

Downstream Bridge Cross Section Data

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766.35	1.25	1766.348	669998	1766.23	14.06	1766.21	17.86	1766.17
26.28	1764.43	28.08	1764.05	31.34	1762.14	33.14	1761.08	33.61	1760.86
34.19	1760.6	44.92	1755.66	46.19	1755.1247	85001	1755.04	66.53	1754.05
69.03	1753.95	70.72	1753.86	74.08	1753.69	81.3	1754.19	81.72	1754.22
81.8	1754.22	88.09	1754.05	91.3	1753.48	93.54	1753.11	94.76	1752.23
95.49	1751.71	96.01	1751.28	96.82	1750.65	97.73	1749.97	100	1748.01
100.41	1747.65	103.83	1747.65	104.23	1747.65	105.49	1748.81	107.52	1750.69
108.45	1750.94	111.45	1751.82	115.4	1751.04	115.95	1750.9	116.39	1750.78
119.74	1749.58	122.08	1750.37	123.48	1750.87	127.59	1750.84	130.48	1750.82
131.33	1750.81	131.82	1750.8	138.66	1750.69	141.05	1750.29	142.29	1750.08
144.78	1750.82	145.59	1751.05	150.02	1752.93	152.9	1754.16	159.22	1756.93
159.89	1757.25	160.67	1757.59	161.15	1757.79	167.13	1760.43	171.91	1763.82
174.05	1765.36	175.97	1766	176.61	1766.2	176.72	1766.65	177.17	1768.39
179.47	1768.46	182.52	1768.55	183.66	1768.55	189.59	1768.56	196.12	1768.57
200	1768.58								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	17.86	.031	177.17	.025

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	17.86	177.17	.1	.3	

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Piers = 4

Pier Data

Pier Station	Upstream=	Downstream=
	53.81	46.14

Upstream num= 2

Width	Elev	Width	Elev
1.5	1748	1.5	1764

Downstream num= 2

Width	Elev	Width	Elev
1.5	1748	1.5	1764

Pier Data

Pier Station	Upstream=	Downstream=
	90.81	83.14

Upstream num= 2

Width	Elev	Width	Elev
1.5	1748	1.5	1764

Downstream num= 2

Width	Elev	Width	Elev
1.5	1748	1.5	1764

Pier Data

Pier Station	Upstream=	Downstream=
	128.52	120.25

Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1748	1.5	1764	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1748	1.5	1764	

Pier Data

Pier Station	Upstream=	164.59	Downstream=	157.86
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1748	1.5	1764	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1748	1.5	1764	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 1.2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1763.93	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1762.65	E.G. Elev (ft)	1763.79	1763.05
Q Total (cfs)	11948.00	W.S. Elev (ft)	1762.28	1760.24
Q Bridge (cfs)	11948.00	Crit W.S. (ft)	1759.43	1759.63
Q Weir (cfs)		Max Chl Dpth (ft)	13.41	12.58
Weir Sta Lft (ft)		Vel Total (ft/s)	9.87	13.47
Weir Sta Rgt (ft)		Flow Area (sq ft)	1210.49	887.23
Weir Submerg		Froude # Chl	0.60	0.89
Weir Max Depth (ft)		Specif Force (cu ft)	9616.34	8634.48
Min El Weir Flow (ft)	1765.25	Hydr Depth (ft)	8.52	7.06
Min El Prs (ft)	1764.01	W.P. Total (ft)	213.02	183.19
Delta EG (ft)	1.21	Conv. Total (cfs)	184768.0	121738.3
Delta WS (ft)	3.18	Top Width (ft)	142.13	125.70
BR Open Area (sq ft)	1380.31	Frctn Loss (ft)	0.61	0.29
BR Open Vel (ft/s)	13.47	C & E Loss (ft)	0.13	0.04
Coef of Q		Shear Total (lb/sq ft)	1.48	2.91
Br Sel Method	Energy only	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1167.8

INPUT

Description: "LV" 8+75.00 = 1167.8 Downstream Side of Bonanza Rd Bridge

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766.35	1.25	1766.348.669998	1766.23	14.06	1766.21	17.86	1766.17	
26.28	1764.43	28.08	1764.05	31.34	1762.14	33.14	1761.08	33.61	1760.86
34.19	1760.6	44.92	1755.66	46.19	1755.1247.85001	1755.04	66.53	1754.05	
69.03	1753.95	70.72	1753.86	74.08	1753.69	81.3	1754.19	81.72	1754.22
81.8	1754.22	88.09	1754.05	91.3	1753.48	93.54	1753.11	94.76	1752.23

95.49	1751.71	96.01	1751.28	96.82	1750.65	97.73	1749.97	100	1748.01
100.41	1747.65	103.83	1747.65	104.23	1747.65	105.49	1748.81	107.52	1750.69
108.45	1750.94	111.45	1751.82	115.4	1751.04	115.95	1750.9	116.39	1750.78
119.74	1749.58	122.08	1750.37	123.48	1750.87	127.59	1750.84	130.48	1750.82
131.33	1750.81	131.82	1750.8	138.66	1750.69	141.05	1750.29	142.29	1750.08
144.78	1750.82	145.59	1751.05	150.02	1752.93	152.9	1754.16	159.22	1756.93
159.89	1757.25	160.67	1757.59	161.15	1757.79	167.13	1760.43	171.91	1763.82
174.05	1765.36	175.97	1766	176.61	1766.2	176.72	1766.65	177.17	1768.39
179.47	1768.46	182.52	1768.55	183.66	1768.55	189.59	1768.56	196.12	1768.57
200	1768.58								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	17.86	.031	177.17	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	17.86	177.17		72	72	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1762.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.26	Wt. n-Val.		0.031	
W.S. Elev (ft)	1759.46	Reach Len. (ft)	72.00	72.00	72.00
Crit W.S. (ft)	1759.46	Flow Area (sq ft)		825.16	
E.G. Slope (ft/ft)	0.008173	Area (sq ft)		825.16	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	128.28	Top Width (ft)		128.28	
Vel Total (ft/s)	14.48	Avg. Vel. (ft/s)		14.48	
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)		6.43	
Conv. Total (cfs)	132157.3	Conv. (cfs)		132157.3	
Length Wtd. (ft)	72.00	Wetted Per. (ft)		135.10	
Min Ch El (ft)	1747.65	Shear (lb/sq ft)		3.12	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	522.16	0.02
C & E Loss (ft)	0.44	Cum SA (acres)	0.40	67.51	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1167.1

INPUT

Description: "LV" 10+50.00 = 1167.1

Station	Elevation	Data	num=	47
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	1766.571	320007	1766.535	740005 1766.3914.21001 1766.11 17.53 1766.02
18.46001	1766.0121	82001	1765.95	21.88 1766.2 21.92 1766.4 22.19 1766.4
22.32001	1766.4	23.09	1766.37	24.42 1766.2926.14999 1766.22 35.33 1766.08
35.88	1766.07	36.08	1766.0739.60001	1765.96 41.5 1765.83 41.77 1765.8
42.14999	1765.9242	21001	1765.94	42.44 1765.87 43.69 1763.82 55.22 1747.62
55.23	1747.62	100	1746.27	139.28 1747.45 139.34 1747.49 159.83 1760.05
160.98	1760.45	164.48	1761.81	170.86 1764.26 170.91 1764.27 171.28 1764.27
171.36	1764.27	171.76	1765.29	171.87 1765.97 173.34 1766.09 174.22 1766.16
174.76	1766.7	175.5	1767.41	175.75 1767.41 180.92 1767.4 184.93 1767.4
195.71	1767.4	200	1767.4	

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .025 41.5 .015 175.5 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 41.5 175.5 153 150 153 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1761.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.16	Wt. n-Val.		0.015	
W.S. Elev (ft)	1752.42	Reach Len. (ft)	153.00	150.00	153.00
Crit W.S. (ft)	1755.20	Flow Area (sq ft)		491.96	
E.G. Slope (ft/ft)	0.007136	Area (sq ft)		491.96	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	95.58	Top Width (ft)		95.58	
Vel Total (ft/s)	24.29	Avg. Vel. (ft/s)		24.29	
Max Chl Dpth (ft)	6.15	Hydr. Depth (ft)		5.15	
Conv. Total (cfs)	141440.2	Conv. (cfs)		141440.2	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		99.50	
Min Ch El (ft)	1746.27	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	0.34	521.07	0.02
C & E Loss (ft)	0.59	Cum SA (acres)	0.40	67.33	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1167

INPUT

Description: "LV" 9+47 = 1167 Begin Concrete Lining Improvements

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766.911	460007	1766.711	580002	1766.75	529999	1766.25	6759995	1766.1
7.690002	1765.988	080002	1765.981	171001	1765.91	12.71001	1765.91	14.11	1765.9
20.11	1765.742	085001	1765.72	21.81	1765.7	23.09	1765.67	23.95	1765.65
24.92	1765.642	60001	1765.642	27.57001	1765.63	27.64999	1765.63	28.25	1765.63
30.50999	1765.673	242999	1765.09	32.75	1765.33	14999	1764.89	33.67	1764.74
33.82001	1764.65	34.55	1764.26	37.42	1762.57	37.62	1762.57	37.67	1762.57
37.69	1762.57	37.7	1762.57	37.77	1762.57	37.78999	1762.57	37.83	1762.57
38.17	1762.56	38.2	1762.53	39.42	1761.29	44.52	1756.75	54.48	1747.9
61.34	1747.69	100	1746.53	106.24	1746.72	141.69	1747.79	147.95	1751.19
147.97	1751.2	173.19	1764.81	173.23	1764.81	173.24	1764.81	173.26	1764.81
173.27	1764.81	173.41	1764.9	173.44	1764.91	173.65	1765.02	174.49	1765.42
176.03	1765.92	176.36	1766.03	176.59	1766.11	176.68	1766.14	176.7	1766.24
177.27	1768.45	180.35	1768.6	182.2	1768.71	189.44	1768.76	198.84	1768.85
200	1768.82								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .025 38.2 .015 173.19 .025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 38.2 173.19 67.96 67.83 68.65 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1758.51	Reach Len. (ft)	67.96	67.83	68.65
Crit W.S. (ft)	1755.23	Flow Area (sq ft)		1157.14	
E.G. Slope (ft/ft)	0.000564	Area (sq ft)		1157.14	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	118.98	Top Width (ft)		118.98	
Vel Total (ft/s)	10.33	Avg. Vel. (ft/s)		10.33	
Max Chl Dpth (ft)	11.98	Hydr. Depth (ft)		9.73	

Conv. Total (cfs)	503306.6	Conv. (cfs)	503306.6		
Length Wtd. (ft)	67.83	Wetted Per. (ft)	125.77		
Min Ch El (ft)	1746.53	Shear (lb/sq ft)	0.32		
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	518.23	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	66.96	0.06

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1166.8

INPUT

Description: LV 10+14.83

Station Elevation Data		num= 65									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1766.372	580002	1766.35	389999	1766.215	419998	1766.32	5.5	1766.66		
5.619995	1766.665	949997	1766.667	580002	1766.699	149994	1766.729	880005	1766.72		
10.92	1766.721	11.92999	1766.721	6.64999	1766.692	1.07001	1766.66	23.27	1766.49		
25.39	1766.27	27.67	1765.952	7.78999	1765.93	35.88	1765.733	7.57001	1765.69		
38.87	1765.55	39.2	1765.51	39.44	1765.493	9.71001	1765.45	39.78	1765.45		
39.89999	1765.44	39.98	1765.43	40	1765.43	40.02	1765.43	40.22	1765.21		
40.25	1763.940	7.5999	1763.78	41.23	1763.71	41.87	1763.65	42.2	1763.22		
54.2	1747.71	100	1746.33	139.45	1747.51	156.94	1759.18	162.6	1762.73		
163.04	1763.01	164.21	1763.03	164.96	1763.05	167.37	1763.11	167.47	1763.11		
167.53	1763.11	167.56	1763.11	167.86	1763.12	169.11	1763.89	169.64	1764.21		
170.32	1764.54	171.32	1765.04	172.56	1765.72	172.75	1765.91	172.78	1765.9		
173.31	1766.04	175.46	1766.9	175.54	1767.08	175.58	1767.13	176.46	1768.78		
177.89	1768.79	182.57	1768.81	190.35	1768.82	193.05	1768.85	200	1768.86		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	42.2	.015	162.6	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.2	162.6	182.49	185.17	190.13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1758.24	Reach Len. (ft)	182.49	185.17	190.13
Crit W.S. (ft)		Flow Area (sq ft)		1089.47	
E.G. Slope (ft/ft)	0.000632	Area (sq ft)		1089.47	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	109.48	Top Width (ft)		109.48	
Vel Total (ft/s)	10.97	Avg. Vel. (ft/s)		10.97	
Max Chl Dpth (ft)	11.91	Hydr. Depth (ft)		9.95	
Conv. Total (cfs)	475169.4	Conv. (cfs)		475169.4	
Length Wtd. (ft)	185.17	Wetted Per. (ft)		117.93	
Min Ch El (ft)	1746.33	Shear (lb/sq ft)		0.36	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	516.49	0.02
C & E Loss (ft)	0.25	Cum SA (acres)	0.40	66.78	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1166.5

INPUT

Description: "LV" 12+00.00 = 1166.5 Begin Rectangular Channel

Station Elevation Data	num= 57
------------------------	---------

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1764.412	100006	1764.2	10.23	1762.941	8.96001	1761.582	20.28999	1762.19
22.31	1763.6	27.83	1763.65	32.3	1763.77	34.94	1763.243	35.49001	1763.13
36.21001	1763.163	7.46001	1763.140	0.07001	1761.14	42.44	1759.26	43.7	1758.43
43.84	1758.4	44.02	1758.344	4.21001	1758.314	4.25999	1758.31	52.88	1758.12
58.35001	1757.995	8.53999	1757.99	58.94	1753.75	59.48	1753.85	59.8	1752.67
61.35001	1746.936	3.25999	1746.88	99.99	1745.78	100	1745.78	136.67	1746.88
137.57	1746.9	138.49	1746.93	138.52	1746.93	138.74	1747.52	140	1747.56
140.17	1747.56	140.17	1758	141.59	1758	144.62	1758.07	156.02	1758.32
156.05	1758.32	156.6	1758.6	156.85	1758.69	156.96	1758.74	157.23	1758.81
158.48	1760.09	159.51	1761.11	159.61	1761.18	163.39	1763.64	165.11	1764.74
171.76	1766.94	171.91	1766.99	172.18	1767.07	192.87	1767.02	196.98	1766.98
198.75	1766.96	200	1766.93						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02558	53999	.015	140.17	.025

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	58.53999	140.17	721.03	703.01	713.82		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1759.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.40	Wt. n-Val.		0.015	
W.S. Elev (ft)	1755.26	Reach Len. (ft)	721.03	703.01	713.82
Crit W.S. (ft)	1755.26	Flow Area (sq ft)		709.52	
E.G. Slope (ft/ft)	0.002013	Area (sq ft)		709.52	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	81.37	Top Width (ft)		81.37	
Vel Total (ft/s)	16.84	Avg. Vel. (ft/s)		16.84	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		8.72	
Conv. Total (cfs)	266328.3	Conv. (cfs)		266328.3	
Length Wtd. (ft)	703.01	Wetted Per. (ft)		96.19	
Min Ch El (ft)	1745.78	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	1.43	Cum Volume (acre-ft)	0.34	512.66	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	66.38	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1163.1

INPUT

Description: "LV" 19+03.01 = 1163.1

Station	Elevation	Data	num=	45					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1758.863	8.39996	1758.85	2.70004	1758.86	3.39996	1758.81	16.21001	1758.99
22.53	1758.87	27.61	1758.77	28.28	1758.77	29.09	1758.64	31.96001	1758.27
31.99001	1758.33	32.86	1758.22	36.52	1758.14	42.94	1758.05	48.07001	1758.55
48.08	1758.55	48.10001	1758.54	52.59	1755.99	59	1755.87	60	1755.87
60	1744.87	61.5	1744.82	100	1743.67	138.5	1744.82	140	1744.87
140	1755.87	141	1755.87	153	1756.11	162.53	1756.3	163.53	1756.32
163.6	1756.37	163.74	1756.41	165.82	1758.53	166.25	1758.8	167.96	1760.09
168.59	1760.52	174.15	1763.48	174.18	1763.5	174.24	1763.5	174.58	1763.53
182.56	1764.08	189.51	1764.27	192.07	1764.11	193.61	1764.02	200	1763.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	60	.015	140	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	60	140		632.09 618.34	604.6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1757.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.78	Wt. n-Val.		0.015	
W.S. Elev (ft)	1752.01	Reach Len. (ft)	632.09	618.34	604.60
Crit W.S. (ft)	1753.11	Flow Area (sq ft)		619.26	
E.G. Slope (ft/ft)	0.003085	Area (sq ft)		619.26	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	80.00	Top Width (ft)		80.00	
Vel Total (ft/s)	19.29	Avg. Vel. (ft/s)		19.29	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		7.74	
Conv. Total (cfs)	215105.3	Conv. (cfs)		215105.3	
Length Wtd. (ft)	618.34	Wetted Per. (ft)		94.31	
Min Ch El (ft)	1743.67	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	1.73	Cum Volume (acre-ft)	0.34	501.94	0.02
C & E Loss (ft)	0.14	Cum SA (acres)	0.40	65.07	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1159.8

INPUT

Description: LV 25+21.35

Station	Elevation	Data	num=	61						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	1758.041	529999	1758.041	770004	1758.041	910004	1758.043	080002	1758.04	
3.179993	1758.045	880005	1758.0224	899999	1757.89	26.08	1757.87	30.2	1757.76	
31.32001	1757.87	36.61	1758.44	40.16	1759.0340	679999	1759.1141	679999	1759.21	
42.78	1759.16	50.14	1758.62	50.47	1758.3651	460001	1758.2753	240001	1758.12	
53.55	1758.1158	509999	1758.01	58.59	1758.01	60	1758.01	60	1743.83	
60	1743.0161	429999	1742.9761	509999	1742.97	63.64	1742.9	100	1741.81	
100.01	1741.81	100.34	1741.81	101.31	1741.82	102.08	1741.82	102.91	1741.83	
137.69	1742.94	138.51	1742.97	139.93	1743.01	140.01	1743.01	140.01	1757.3	
140.01	1758.01	140.08	1758.01	141.51	1758.01	143.41	1758.05	143.51	1758.05	
169.11	1758.81	182.6	1759.09	182.78	1759.1	182.93	1759.11	184.43	1759.6	
189.49	1761.28	189.56	1761.28	189.71	1761.29	190.12	1761.3	193.38	1761.37	
194.17	1761.39	195	1761.36	196.39	1761.37	197.97	1761.37	199.38	1761.37	
200	1761.36									

Manning's n Values	num=	3
Sta	n Val	Sta
0	.025	60
		.015
		140.01
		.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	60	140.01		34.25 29.81	52	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1755.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1750.23	Reach Len. (ft)	34.25	29.81	52.00
Crit W.S. (ft)	1751.25	Flow Area (sq ft)		627.13	
E.G. Slope (ft/ft)	0.002966	Area (sq ft)		627.13	
Q Total (cfs)	11948.00	Flow (cfs)		11948.00	
Top Width (ft)	80.01	Top Width (ft)		80.01	
Vel Total (ft/s)	19.05	Avg. Vel. (ft/s)		19.05	
Max Chl Dpth (ft)	8.42	Hydr. Depth (ft)		7.84	
Conv. Total (cfs)	219402.3	Conv. (cfs)		219402.3	
Length Wtd. (ft)	29.81	Wetted Per. (ft)		94.49	
Min Ch El (ft)	1741.81	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00

Frctn Loss (ft)	1.87	Cum Volume (acre-ft)	0.34	493.09	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	63.94	0.06

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1159.7

INPUT

Description: LV 25+51.16

Station Elevation Data		num=		28					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1756.92	2.3	1756.91	4.03	1756.91	21.78	1756.81	30.23	1756.51
37	1757.77	39.7	1758.26	45.33	1758.42	50.67	1758.13	55.51	1758.03
56.94	1758.03	57	1758.03	57	1743.03	58.51	1742.99	100	1741.74
101.39	1741.75	119.26	1742.33	150.71	1743.27	165.46	1743.71	166.92	1743.75
166.96	1743.75	166.96	1758.75	168.46	1758.75	180.46	1758.99	187.26	1761.23
190.14	1761.3	190.54	1761.32	195	1761.15				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	56.94	.015	166.96	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	56.94	166.96		209.06	208.84	209.09	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1754.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1753.02	Reach Len. (ft)	209.06	208.84	209.09
Crit W.S. (ft)	1750.04	Flow Area (sq ft)		1145.03	
E.G. Slope (ft/ft)	0.000685	Area (sq ft)		1145.03	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	109.96	Top Width (ft)		109.96	
Vel Total (ft/s)	11.10	Avg. Vel. (ft/s)		11.10	
Max Chl Dpth (ft)	11.28	Hydr. Depth (ft)		10.41	
Conv. Total (cfs)	485583.5	Conv. (cfs)		485583.5	
Length Wtd. (ft)	208.84	Wetted Per. (ft)		129.27	
Min Ch El (ft)	1741.74	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)	195.00	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	492.49	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	63.87	0.06

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1158.6

INPUT

Description: LV 27+60

Station Elevation Data		num=		38					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1755.8	29.28	1755.38	33.22	1755.4239	24001	1755.3443	25999	1755.33
43.66	1755.26	43.78	1755.24	50.39	1755.33	50.39	1748.05	50.39	1742.75
51.36	1742.72	51.89	1742.7	83.15	1741.77	99.3	1741.28	100	1741.26
100.81	1741.28	158.34	1743.01	158.36	1743.01	158.36	1743.23	159.8	1743.28
159.84	1743.28	159.84	1758.06	159.86	1758.06	160.03	1758.06	161.51	1758.06
173.34	1758.3	173.44	1758.33	180.29	1760.59	180.33	1760.59	181.46	1760.71
182.3	1760.71	185.23	1760.55	185.82	1760.5	187.88	1760.42	189.8	1760.37
192.18	1760.32	195.88	1760.27	200	1760.21				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50.39	.015	159.84	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.39	159.84	78.1	76.9	77.28	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1754.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1752.99	Reach Len. (ft)	78.10	76.90	77.28
Crit W.S. (ft)		Flow Area (sq ft)		1193.21	
E.G. Slope (ft/ft)	0.000599	Area (sq ft)		1193.21	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	109.45	Top Width (ft)		109.45	
Vel Total (ft/s)	10.65	Avg. Vel. (ft/s)		10.65	
Max Chl Dpth (ft)	11.73	Hydr. Depth (ft)		10.90	
Conv. Total (cfs)	519036.8	Conv. (cfs)		519036.8	
Length Wtd. (ft)	76.90	Wetted Per. (ft)		129.67	
Min Ch El (ft)	1741.26	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	486.88	0.02
C & E Loss (ft)	0.25	Cum SA (acres)	0.40	63.35	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1158.1

INPUT

Description: "LV" 28+36.90 = 1158.1

Station	Elevation	Data	num=	47
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
0	1755.6625	42999	1755.1734	25999 1754.99 35.34 1754.9937
44.25999	1754.77	53.8	1754.7753	82001 1743.5453
55.31	1742.42	100	1741.08	100.17 1741.08 100.23 1741.08
100.61	1741.08	100.86	1741.08	100.96 1741.08 142.97 1742.37
144.31	1742.41	145	1742.43	145 1750.63 145 1757.43
146.5	1757.43	154.43	1757.59	158.5 1757.68 160.38 1757.05
163.92	1758.65	166.12	1760.06	168.06 1760.27 170.1 1760.47
173.83	1760.41	174.87	1760.37	176.47 1760.32 177.67 1760.27
178.04	1760.24	181.13	1760.31	181.89 1760.12 182.32 1760.28
193.63	1760.12	200	1760.02	183.05 1760.24

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .025 53.8 .015 145 .025		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
53.8	145	436.35	428.29	420.26	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1754.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1750.18	Reach Len. (ft)	436.35	428.29	420.26
Crit W.S. (ft)	1750.18	Flow Area (sq ft)		767.92	
E.G. Slope (ft/ft)	0.002007	Area (sq ft)		767.92	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	91.19	Top Width (ft)		91.19	
Vel Total (ft/s)	16.55	Avg. Vel. (ft/s)		16.55	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	283603.1	Conv. (cfs)		283603.1	
Length Wtd. (ft)	428.29	Wetted Per. (ft)		106.68	
Min Ch El (ft)	1741.08	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.86	Cum Volume (acre-ft)	0.34	485.15	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	63.17	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1157.1

INPUT

Description: "LV" 32+65.19 = 1157.1

Station Elevation Data		num=		36	
Sta	Elev	Sta	Elev	Sta	Elev
0	1756.091	880005	1756.047	149994	1755.911
12.72	1756.05	13.3	1756.03	15.78	1756.011
19.60001	1754.85	20.47	1754.76	23.06	1754.592
34.78	1754.238	35001	1753.92	40.73	1752.71
55	1741.44	56.5	1741.4	100	1740.09
145	1753.44	146	1753.44	158	1753.68
171.81	1757.69	190.43	1757.63	191.2	1757.62
200	1757.5				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		271.08 266.09	261.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1753.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	1749.19	Reach Len. (ft)	271.08	266.09	261.10
Crit W.S. (ft)	1749.26	Flow Area (sq ft)		757.89	
E.G. Slope (ft/ft)	0.002067	Area (sq ft)		757.89	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	16.77	Avg. Vel. (ft/s)		16.77	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	279452.4	Conv. (cfs)		279452.4	
Length Wtd. (ft)	266.09	Wetted Per. (ft)		105.54	
Min Ch El (ft)	1740.09	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.87	Cum Volume (acre-ft)	0.34	477.65	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	62.28	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1154.5

INPUT

Description: "LV" 35+31.28 = 1154.5

Station Elevation Data		num=		40	
Sta	Elev	Sta	Elev	Sta	Elev
20.02	1755.182	1.57001	1755.092	6.99001	1754.72
29.62001	1754.863	4.92001	1754.52	40.58	1754.32
48.70001	1754.03	50.88	1753.850	98001	1753.851
53.94	1752.23	74.02	1751.83	75.02	1751.83
76.52	1740.79	120.02	1739.48	120.04	1739.45
165.02	1752.83	165.1	1752.83	166.02	1752.83
181.42	1753.25	181.84	1753.33	182.02	1753.39
184.73	1754.37	190.04	1754.84	192.54	1754.99

Manning's n Values		num=		3	
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Sta	n Val	Sta	n Val	Sta	n Val
20.02	.025	75.02	.015	165.1	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	75.02	165.1		165.24	162.2	159.16	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1752.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.60	Wt. n-Val.		0.015	
W.S. Elev (ft)	1748.35	Reach Len. (ft)	165.24	162.20	159.16
Crit W.S. (ft)	1748.65	Flow Area (sq ft)		737.96	
E.G. Slope (ft/ft)	0.002247	Area (sq ft)		737.96	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	17.22	Avg. Vel. (ft/s)		17.22	
Max Chl Dpth (ft)	8.90	Hydr. Depth (ft)		8.20	
Conv. Total (cfs)	268062.5	Conv. (cfs)		268062.5	
Length Wtd. (ft)	162.20	Wetted Per. (ft)		105.10	
Min Ch El (ft)	1739.45	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)	200.02	0.00	0.00
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	0.34	473.08	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	61.73	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1153.5

INPUT

Description: LV 36+93.48

Station	Elevation	Data	num=	39					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1753.74	.05	1753.73	.12	1753.82	.25	1754.03	.86	1754.31
4.69	1754.22	8.02	1752.38	8.26	1752.32	8.33	1752.32	18.21	1752.22
20.67	1751.98	22.23	1751.79	23.69	1751.6	24.44	1751.57	25.55	1750.98
25.93	1750.76	25.97	1750.76	54	1750.2	54.95	1750.2	55	1750.2
55	1739.2	56.5	1739.16	100	1737.85	143.5	1739.16	145	1739.2
145	1754.2	145.07	1754.2	146.5	1754.2	158.5	1754.44	160.58	1753.75
161.62	1753.93	163.45	1753.74	164.32	1753.75	165.76	1753.54	168.12	1753.51
169.46	1753.51	171.05	1753.58	173.35	1753.65	175	1753.65		

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	54.95	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	54.95	145		106.52	106.52	106.52	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1752.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1745.15	Reach Len. (ft)	106.52	106.52	106.52
Crit W.S. (ft)	1747.05	Flow Area (sq ft)		596.00	
E.G. Slope (ft/ft)	0.004397	Area (sq ft)		596.00	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	21.32	Avg. Vel. (ft/s)		21.32	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		6.62	
Conv. Total (cfs)	191612.3	Conv. (cfs)		191612.3	
Length Wtd. (ft)	106.52	Wetted Per. (ft)		101.94	
Min Ch El (ft)	1737.85	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)	175.00	0.00	0.00
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	0.34	470.60	0.02
C & E Loss (ft)	0.25	Cum SA (acres)	0.40	61.39	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1152.95

INPUT

Description: "LV" 38+00 = 1152.95 Upstream of Stewart Avenue Bridge

Station	Elevation	Data	num=	50					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1752.656	.929993	1752.567	.539993	1752.568	.399994	1752.549	.149994	1752.51
10.91	1752.44	15.84	1750.2316	.32001	1750.06	16.45	1749.9916	.60001	1749.91
16.60001	1749.88	16.75	1749.88	52.52	1749.16	54	1749.13	54.95	1749.13
55	1749.13	55	1738.64	55	1738.1355	.07001	1738.13	56.5	1738.09
58.52	1738.03	100	1736.78	102.02	1736.84	143.5	1738.09	143.57	1738.09
145	1738.13	145	1752.43	145	1753.13	145.07	1753.13	146.5	1753.13
157.94	1753.36	158.5	1753.37	158.64	1753.32	162.18	1752.16	162.54	1752.48
163.06	1752.95	165.71	1753.3	169.75	1753.28	172.72	1753.15	179.11	1752.98
179.78	1753	181.27	1753.01	184.85	1752.96	186.67	1753.03	188.32	1753.08
190.6	1753.08	194.78	1753.04	195.64	1753.05	198.98	1752.94	200	1752.93

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145	150.27	150	149.73	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1751.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1743.72	Reach Len. (ft)	23.00	23.00	23.00
Crit W.S. (ft)	1745.97	Flow Area (sq ft)		563.56	
E.G. Slope (ft/ft)	0.005249	Area (sq ft)		563.56	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	22.55	Avg. Vel. (ft/s)		22.55	
Max Chl Dpth (ft)	6.94	Hydr. Depth (ft)		6.26	
Conv. Total (cfs)	175371.3	Conv. (cfs)		175371.3	
Length Wtd. (ft)	23.00	Wetted Per. (ft)		101.22	
Min Ch El (ft)	1736.78	Shear (lb/sq ft)		1.82	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	0.34	469.18	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.40	61.17	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1152.5

INPUT

Description: Stewart Avenue Bridge

Distance from Upstream XS = 23

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2				
Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-45	1752.01	1750.63	173	1753.63	1751.19

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	50					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1752.656	.929993	1752.567	.539993	1752.568	.399994	1752.549	.149994	1752.51
10.91	1752.44	15.84	1750.2316	.32001	1750.06	16.45	1749.9916	.60001	1749.91
16.60001	1749.88	16.75	1749.88	52.52	1749.16	54	1749.13	54.95	1749.13
55	1749.13	55	1738.64	55	1738.1355	.07001	1738.13	56.5	1738.09
58.52	1738.03	100	1736.78	102.02	1736.84	143.5	1738.09	143.57	1738.09
145	1738.13	145	1752.43	145	1753.13	145.07	1753.13	146.5	1753.13
157.94	1753.36	158.5	1753.37	158.64	1753.32	162.18	1752.16	162.54	1752.48
163.06	1752.95	165.71	1753.3	169.75	1753.28	172.72	1753.15	179.11	1752.98

179.78	1753	181.27	1753.01	184.85	1752.96	186.67	1753.03	188.32	1753.08
190.6	1753.08	194.78	1753.04	195.64	1753.05	198.98	1752.94	200	1752.93

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta: Left Right Coeff Contr. Expan.

	55	145	.1	.3
--	----	-----	----	----

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-45	1752.04	1750.64	173	1752.58	1751.24

Downstream Bridge Cross Section Data

Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1754.57	4700012	1754.56	1.139999	1754.54	3.369995	1753.88	6.509995	1753.5
7.899994	1753.28	1900002	1753.11	10.74001	1751.92	12.53999	1750.24	13.46001	1750.05
14.74001	1748.41	15.28999	1748.4	15.94	1748.39	17.13	1748.36	20.49001	1748.29
54	1747.62	54.09	1747.62	55	1747.62	55	1746.67	55	1736.62
55.13	1736.62	56.5	1736.58	60.31	1736.47	100	1735.27	141.24	1736.51
143.5	1736.58	144.92	1736.62	145	1736.62	145	1754.62	145	1755.2
145.06	1755.2	146.48	1755.2	146.5	1755.62	157.87	1755.85	158.5	1755.86
187.05	1755.29	187.83	1755.24	189.27	1755.24	200	1755.18		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta: Left Right Coeff Contr. Expan.

	55	145	.1	.3
--	----	-----	----	----

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station Upstream= 83 Downstream= 83

Upstream num= 2

Width	Elev	Width	Elev
1.5	1735	1.5	1752

Downstream num= 2

Width	Elev	Width	Elev
1.5	1735	1.5	1752

Pier Data

Pier Station Upstream= 115 Downstream= 115

Upstream num= 2

Width	Elev	Width	Elev
1.5	1735	1.5	1752

Downstream num= 2

Width	Elev	Width	Elev
1.5	1735	1.5	1752

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Momentum Cd = 1.2

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1751.61	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1743.72	E.G. Elev (ft)	1751.16	1749.19
Q Total (cfs)	12706.00	W.S. Elev (ft)	1744.53	1743.79
Q Bridge (cfs)	12706.00	Crit W.S. (ft)	1746.20	1744.69
Q Weir (cfs)		Max Chl Dpth (ft)	7.75	8.52
Weir Sta Lft (ft)		Vel Total (ft/s)	20.66	18.64
Weir Sta Rgt (ft)		Flow Area (sq ft)	614.91	681.72
Weir Submerg		Froude # Chl	1.37	1.17
Weir Max Depth (ft)		Specif Force (cu ft)	10249.56	10707.86
Min El Weir Flow (ft)	1752.44	Hydr Depth (ft)	7.07	7.84
Min El Prs (ft)	1751.12	W.P. Total (ft)	128.93	133.53
Delta EG (ft)	2.51	Conv. Total (cfs)	172596.1	200225.8
Delta WS (ft)	0.54	Top Width (ft)	87.00	87.00
BR Open Area (sq ft)	1230.18	Frctn Loss (ft)		
BR Open Vel (ft/s)	20.66	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.61	1.28
Br Sel Method	Momentum	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1151.9

INPUT

Description: "LV" 39+50 = 1151.9 Downstream of Stewart Ave. Bridge

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1754.57	12	1754.56	139999	1754.54	3369995	1753.88	6509995	1753.5
7.899994	1753.28	190002	1753.11	1074001	1751.92	1253999	1750.24	1346001	1750.05
14.74001	1748.41	1528999	1748.4	15.94	1748.39	17.13	1748.36	2049001	1748.29
54	1747.62	54.09	1747.62	55	1747.62	55	1746.67	55	1736.62
55.13	1736.62	56.5	1736.58	60.31	1736.47	100	1735.27	141.24	1736.51
143.5	1736.58	144.92	1736.62	145	1736.62	145	1754.62	145	1755.2
145.06	1755.2	146.48	1755.2	146.5	1755.62	157.87	1755.85	158.5	1755.86
187.05	1755.29	187.83	1755.24	189.27	1755.24	200	1755.18		

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		116.7	115.21	113.73	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1749.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.92	Wt. n-Val.		0.015	
W.S. Elev (ft)	1743.18	Reach Len. (ft)	116.70	115.21	113.73
Crit W.S. (ft)	1744.44	Flow Area (sq ft)		650.66	
E.G. Slope (ft/ft)	0.003335	Area (sq ft)		650.66	
Q Total (cfs)	12706.00	Flow (cfs)		12706.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	19.53	Avg. Vel. (ft/s)		19.53	
Max Chl Dpth (ft)	7.91	Hydr. Depth (ft)		7.23	
Conv. Total (cfs)	220035.6	Conv. (cfs)		220035.6	
Length Wtd. (ft)	115.21	Wetted Per. (ft)		103.16	
Min Ch El (ft)	1735.27	Shear (lb/sq ft)		1.31	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.34	468.87	0.02
C & E Loss (ft)		Cum SA (acres)	0.40	61.13	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1151.1

INPUT

Description: "LV" 40+65.21 = 1151.1

Station Elevation Data		num= 27		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1750.895	309998	1750.74	12.17	1750.51	113.92999	1750.44	16.00999	1749.91		
19.96001	1749.75	20	1749.79	24.5	1749.89	53.5	1750.47	55	1750.47		
55	1735.47	56.5	1735.42	100	1734.12	143.5	1735.42	145	1735.47		
145	1754.47	146.5	1754.47	158.5	1754.71	163	1754.8	163.97	1755.21		
164.54	1755.45	169	1755.32	171.67	1755.25	179.66	1755.27	182.72	1755.26		
183.95	1755.24	200	1755.21								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		69.15	69.15	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1741.41	Reach Len. (ft)	69.15	69.15	69.15
Crit W.S. (ft)	1743.31	Flow Area (sq ft)		595.53	
E.G. Slope (ft/ft)	0.004441	Area (sq ft)		595.53	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	21.42	Avg. Vel. (ft/s)		21.42	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		6.62	
Conv. Total (cfs)	191384.8	Conv. (cfs)		191384.8	
Length Wtd. (ft)	69.15	Wetted Per. (ft)		101.92	
Min Ch El (ft)	1734.12	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	0.34	467.22	0.02
C & E Loss (ft)	0.12	Cum SA (acres)	0.40	60.89	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1150.7

INPUT

Description: "LV" 41+34.36 = 1150.7

Station Elevation Data		num= 29		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1749.99	9100037	1749.93	1.080002	1749.89	1.940002	1749.39	9.309998	1749.12		
13.42	1748.97	53.5	1749.77	55	1749.77	55	1734.77	56.5	1734.73		
100	1733.42	143.5	1734.73	145	1734.77	145	1753.77	146.5	1753.77		
158.5	1754.01	160.61	1754.05	161.07	1754.29	161.48	1754.5	162.42	1754.54		
165.31	1755.12	174.28	1755.07	180.32	1755.01	188.4	1755.1	190.2	1755.11		
190.53	1755.08	193.98	1755.05	195.24	1755.04	200	1755.05				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		54.03	50.54	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1748.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.69	Wt. n-Val.		0.015	
W.S. Elev (ft)	1740.47	Reach Len. (ft)	54.03	50.54	50.54

Crit W.S. (ft)	1742.61	Flow Area (sq ft)		573.13
E.G. Slope (ft/ft)	0.005014	Area (sq ft)		573.13
Q Total (cfs)	12754.00	Flow (cfs)		12754.00
Top Width (ft)	90.00	Top Width (ft)		90.00
Vel Total (ft/s)	22.25	Avg. Vel. (ft/s)		22.25
Max Chl Dpth (ft)	7.05	Hydr. Depth (ft)		6.37
Conv. Total (cfs)	180110.2	Conv. (cfs)		180110.2
Length Wtd. (ft)	50.54	Wetted Per. (ft)		101.43
Min Ch El (ft)	1733.42	Shear (lb/sq ft)		1.77
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00 0.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	0.34	466.29 0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.40	60.75 0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1150.2

INPUT

Description: "LV" 41+84.90 = 1150.2

Station Elevation Data		num= 36							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1748.97	13.02	1748.55	13.22	1748.83	27.22	1750.31	28.64	1750.31
53.5	1749.63	53.50	1749.63	55	1749.63	55	1749.55	55	1734.63
56.49	1734.59	56.5	1734.59	56.75	1734.58	100	1733.28	100.25	1733.29
102.3	1733.35	128.29	1734.13	143.5	1734.59	144.02	1734.6	145	1734.63
145	1746.99	145	1753.63	145.98	1753.63	146.5	1753.63	154.3	1753.79
158.5	1753.87	159.4	1753.89	160.17	1753.91	161.28	1754.56	161.43	1754.64
162.03	1754.81	165.67	1754.99	181.61	1754.66	183.79	1754.57	198.13	1754.73
200	1754.74								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.0255	53.50	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	53.50	99.9		19.86	5.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1740.49	Reach Len. (ft)	19.86	5.10	5.10
Crit W.S. (ft)	1742.47	Flow Area (sq ft)		587.58	
E.G. Slope (ft/ft)	0.004634	Area (sq ft)		587.58	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	21.71	Avg. Vel. (ft/s)		21.71	
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)		6.53	
Conv. Total (cfs)	187351.4	Conv. (cfs)		187351.4	
Length Wtd. (ft)	5.10	Wetted Per. (ft)		101.75	
Min Ch El (ft)	1733.28	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.34	465.62	0.02
C & E Loss (ft)	0.11	Cum SA (acres)	0.40	60.64	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1150.1

INPUT

Description: "LV" 41+90 = 1150.1

Station Elevation Data		num= 36							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1748.97	13	1748.55	17.39	1748.47	28	1749.78	28.44	1749.78
29.5	1749.78	29.5	1739.17	29.5	1735.38	30.56	1735.35	30.8	1735.34
31	1735.34	47.53	1734.84	52.06	1734.71	53.38	1734.67	61.83	1734.41

70.05	1734.17	100	1733.27	119.42	1733.85	143.5	1734.57	144.33	1734.6
145	1734.62	145	1743.1	145	1753.62	145.67	1753.62	146.5	1753.62
151.86	1753.73	158.5	1753.86	159.12	1753.87	160.34	1753.9	161.1	1754.35
161.43	1754.51	162.74	1754.89	165.73	1755.03	183.46	1754.67	184.69	1754.68
200	1754.81								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	29.5	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	29.5	145		247.07	254.82		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1738.81	Reach Len. (ft)	247.07	254.82	259.86
Crit W.S. (ft)	1741.39	Flow Area (sq ft)		535.51	
E.G. Slope (ft/ft)	0.008146	Area (sq ft)		535.51	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	115.50	Top Width (ft)		115.50	
Vel Total (ft/s)	23.82	Avg. Vel. (ft/s)		23.82	
Max Chl Dpth (ft)	5.54	Hydr. Depth (ft)		4.64	
Conv. Total (cfs)	141306.7	Conv. (cfs)		141306.7	
Length Wtd. (ft)	254.82	Wetted Per. (ft)		123.18	
Min Ch El (ft)	1733.27	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	465.55	0.02
C & E Loss (ft)	0.15	Cum SA (acres)	0.40	60.63	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1149.1

INPUT

Description: "LV" 44+44.82 = 1149.1

Station	Elevation	Data	num=	37					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10	1750.22	10.11	1750.22	12.44	1750.1	18.15	1749.97	27.55	1749.79
28.12	1749.79	29	1749.79	29.06	1749.79	29.06	1744.11	29.06	1734.68
29.61	1734.67	30.56	1734.64	48.26	1734.1	99.09	1732.59	100	1732.57
143.21	1733.86	143.87	1733.88	144.71	1733.9	144.71	1742.34	144.71	1752.9
145.37	1752.9	146.2	1752.9	151.63	1753.01	158.17	1753.14	159.7	1753.17
162.18	1753.22	162.36	1753.45	162.36	1753.46	162.45	1753.19	163.88	1753.05
164.62	1753.23	172.88	1753.14	176.49	1753.1	178.7	1753.13	187.53	1753.21
190.03	1753.18	200	1753.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10	.025	29	.015	144.71	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	29	144.71		233.07	226.52		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1745.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.015	
W.S. Elev (ft)	1744.27	Reach Len. (ft)	233.07	226.52	221.43
Crit W.S. (ft)	1740.69	Flow Area (sq ft)		1248.38	
E.G. Slope (ft/ft)	0.000552	Area (sq ft)		1248.38	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	115.65	Top Width (ft)		115.65	
Vel Total (ft/s)	10.22	Avg. Vel. (ft/s)		10.22	
Max Chl Dpth (ft)	11.70	Hydr. Depth (ft)		10.79	
Conv. Total (cfs)	543077.7	Conv. (cfs)		543077.7	
Length Wtd. (ft)	226.52	Wetted Per. (ft)		135.65	
Min Ch El (ft)	1732.57	Shear (lb/sq ft)		0.32	

Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.34	460.34	0.02
C & E Loss (ft)	0.26	Cum SA (acres)	0.40	59.95	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1148.1

INPUT

Description: "LV" 46+71.34 = 1148.1

Station Elevation Data		num= 45									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1748.99	16.37	1748.7	25.83	1748.45	25.88	1748.57	26.02	1748.91		
26.13	1748.91	26.42	1748.91	29.23	1748.5438	39999	1746.9938	42999	1746.94		
38.48	1746.86	38.5	1746.8445	67999	1746.753	50999	1746.54	54.23	1746.54		
55	1746.54	55	1740.08	55	1733.2955	74001	1733.27	56.5	1733.24		
100	1731.94	100.44	1731.94	101.36	1731.94	102.03	1731.94	102.8	1731.94		
139.78	1733.12	143.5	1733.25	144.25	1733.27	144.99	1733.3	145	1733.3		
145	1733.38	145	1749.3	145.01	1749.3	145.4	1749.3	146.51	1749.3		
157.41	1749.52	158.59	1749.54	162.17	1749.61	186.6	1750.09	186.64	1750.11		
186.76	1750.16	187.98	1751.75	188.19	1752.14	189.52	1752.1	200	1751.87		

Manning's n Values

num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145.4	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145.4	456.33	456.33	456.34	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1745.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.27	Wt. n-Val.		0.015	
W.S. Elev (ft)	1741.14	Reach Len. (ft)	456.33	456.33	456.34
Crit W.S. (ft)	1741.14	Flow Area (sq ft)		769.43	
E.G. Slope (ft/ft)	0.001986	Area (sq ft)		769.43	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	16.58	Avg. Vel. (ft/s)		16.58	
Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)		8.55	
Conv. Total (cfs)	286225.2	Conv. (cfs)		286225.2	
Length Wtd. (ft)	456.33	Wetted Per. (ft)		105.74	
Min Ch El (ft)	1731.94	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	0.34	455.09	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	59.42	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1146.6

INPUT

Description: "LV" 51+27.67 = 1146.6

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1746.38	.0399	1746.376	410004	1746.32	36.86	1745.37	38.09	1744.89
38.13	1744.87	38.14	1744.8638	14999	1744.85	38.16	1744.84	38.34	1744.58
38.5	1744.35	53.5	1744.06	55	1744.06	55	1732.03	56.5	1731.99
100	1730.68	143.5	1731.99	145	1732.03	145	1744.03	146	1744.03
158	1744.27	178.34	1744.68	179.34	1745.34	184.42	1748.7	185.95	1749.71
187.18	1750.46	188.75	1750.48	190.52	1750.58	197.94	1750.56	200	1750.51

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		473.39	472.33	471.26	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1744.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.10	Wt. n-Val.		0.015	
W.S. Elev (ft)	1739.18	Reach Len. (ft)	473.39	472.33	471.26
Crit W.S. (ft)	1739.87	Flow Area (sq ft)		704.09	
E.G. Slope (ft/ft)	0.002622	Area (sq ft)		704.09	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	18.11	Avg. Vel. (ft/s)		18.11	
Max Chl Dpth (ft)	8.50	Hydr. Depth (ft)		7.82	
Conv. Total (cfs)	249066.5	Conv. (cfs)		249066.5	
Length Wtd. (ft)	472.33	Wetted Per. (ft)		104.34	
Min Ch El (ft)	1730.68	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	0.34	447.37	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.40	58.48	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1144.5

INPUT

Description: "LV" 56+00 = 1144.5

Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1745.773	149994	1745.73	11.48	1745.68	12.45	1745.67	14.73	1745.66
19.64	1745.6	31.31	1745.39	31.83	1745.39	32.47	1745.39	32.88	1744.98
32.89999	1744.9552	57001	1744.55	53.5	1744.5454	92999	1744.54	55	1744.54
55	1743.89	55	1730.7356	42999	1730.68	56.5	1730.68	58.53	1730.62
100	1729.38	101.01	1729.41	102.03	1729.44	143.5	1730.68	144.93	1730.72
145	1730.73	145	1731.28	145	1742.73	145.95	1742.73	146	1742.73
157.44	1742.96	158	1742.97	174.29	1743.29	175.1	1743.31	181.33	1748.37
181.56	1748.55	181.61	1748.55	184.02	1748.79	188.63	1748.71	189.34	1748.72
190.49	1748.64	190.87	1748.63	191.3	1748.56	191.38	1748.55	191.52	1748.54
192.13	1748.48	196.74	1748.06	199.32	1748.06	199.55	1748.06	199.72	1748.06
200	1748.06								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		271.09	270.48	269.87	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1743.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1737.79	Reach Len. (ft)	271.09	270.48	269.87
Crit W.S. (ft)	1738.57	Flow Area (sq ft)		696.73	
E.G. Slope (ft/ft)	0.002710	Area (sq ft)		696.73	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	18.31	Avg. Vel. (ft/s)		18.31	
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)		7.74	
Conv. Total (cfs)	245009.6	Conv. (cfs)		245009.6	
Length Wtd. (ft)	270.48	Wetted Per. (ft)		104.17	
Min Ch El (ft)	1729.38	Shear (lb/sq ft)		1.13	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.34	439.78	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	57.50	0.06

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1142.9

INPUT

Description: "LV" 58+70.48 = 1142.9

Station Elevation Data		num= 40							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1744.847	220001	1745.57	13.22	1745.3	22.86	1744.8723	53999	1744.68
23.92999	1744.63	24.75	1743.7524	75999	1743.75	24.92	1743.7539	71001	1743.44
53.14999	1743.02	53.98	1743.01	54.03	1743.01	55	1743.01	55.05	1729.98
56.5	1729.94	57.98	1729.89	100	1728.63	143.5	1729.94	145	1729.98
145	1741.98	146	1741.98	158	1742.22	171.67	1742.49	171.68	1742.49
171.82	1742.6	173.41	1744.14	174.53	1743.93	174.94	1743.91	176.44	1743.92
182.59	1743.77	185.88	1743.78	187.1	1743.79	191.94	1743.65	192.15	1743.65
192.27	1743.64	192.55	1743.64	192.71	1743.64	196.52	1743.62	200	1743.6

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	55	.015	145	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	55	145		468.22	441.43	443.64	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1742.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1737.03	Reach Len. (ft)	468.22	441.43	443.64
Crit W.S. (ft)	1737.82	Flow Area (sq ft)		694.48	
E.G. Slope (ft/ft)	0.002736	Area (sq ft)		694.48	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	89.98	Top Width (ft)		89.98	
Vel Total (ft/s)	18.36	Avg. Vel. (ft/s)		18.36	
Max Chl Dpth (ft)	8.40	Hydr. Depth (ft)		7.72	
Conv. Total (cfs)	243831.6	Conv. (cfs)		243831.6	
Length Wtd. (ft)	441.43	Wetted Per. (ft)		104.08	
Min Ch El (ft)	1728.63	Shear (lb/sq ft)		1.14	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	0.34	435.46	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	56.94	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1140.6

INPUT

Description: "LV" 63+11.91 = 1140.6

Station Elevation Data		num= 46		Sta		Elev		Sta		Elev		Sta		Elev	
0	1745.241	55	9998	1745.23	17.72	1745.14	19.06	1745.119	21	001	1745.07				
19.84	1744.96	20.55	1744.81	21.25	999	1744.34	21.47	1744.2	21.5	1744.2					
21.64	1744.18	21.66	1744.17	26.89	999	1744.06	36.67	999	1743.87	46.37	1741.21				
52.03	1739.74	53.99	001	1739.7	54.02	1739.7	55	1739.7	55	1739.4					
55	1728.61	55.03	1728.61	56.5	1728.56	99.18	1727.28	100	1727.26						
102.16	1727.32	116.78	1727.76	143.49	1728.56	144.07	1728.58	144.99	1728.61						
144.99	1733.25	144.99	1740.61	145.38	1740.61	145.99	1740.61	150.63	1740.7						
157.99	1740.85	162.48	1740.94	165.52	1741	167.38	1742.95	168.59	1743.96						
179.36	1745.33	186.92	1745.58	195.42	1745.15	195.78	1745.14	196.15	1745.17						
200	1745.39														

Manning's n Values		num= 3		Sta		n Val	
0	.025	55	.015	144.99	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
55	144.99		53.98	54.25	54.52	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1740.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1735.44	Reach Len. (ft)	53.98	54.25	54.52
Crit W.S. (ft)	1736.44	Flow Area (sq ft)		675.50	
E.G. Slope (ft/ft)	0.002986	Area (sq ft)		675.50	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	89.99	Top Width (ft)		89.99	
Vel Total (ft/s)	18.88	Avg. Vel. (ft/s)		18.88	
Max Chl Dpth (ft)	8.18	Hydr. Depth (ft)		7.51	
Conv. Total (cfs)	233417.1	Conv. (cfs)		233417.1	
Length Wtd. (ft)	54.25	Wetted Per. (ft)		103.68	
Min Ch El (ft)	1727.26	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	0.34	428.52	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	56.03	0.06

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1140.5

INPUT

Description: "LV" 63+66.16 = 1140.5

Station Elevation Data		num= 42		Sta		Elev		Sta		Elev		Sta		Elev	
0	1745.132	44	0002	1745.118	27	9999	1745.09	21.69	1745.03	22.77	1744.95				
22.86	1744.95	23.50	999	1744.15	23.53	1744.12	23.59	1744.12	35.53	1743.88					
35.63	1743.88	53.5	1743.52	53.50	999	1743.52	55	1743.52	55	1727.6					
55	1727.52	56.49	001	1727.48	56.5	1727.48	56.72	1727.47	100	1726.17					
143.29	1727.47	143.5	1727.48	144.99	1727.52	145	1727.52	145	1739.47						
145	1739.52	146	1739.52	157.94	1739.76	158	1739.76	158.04	1739.76						
167.23	1739.95	167.27	1739.98	171.86	1743.91	173.78	1745.15	174.32	1745.48						
176.01	1745.42	176.94	1745.38	190.32	1745.09	190.36	1745.09	190.38	1745.09						
190.78	1745.09	200	1745.2												

Manning's n Values		num= 3		Sta		n Val	
0	.025	55	.015	145	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
55	145		49.99	50	50.51	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1740.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1733.44	Reach Len. (ft)	49.99	50.00	50.51

Crit W.S. (ft)	1735.36	Flow Area (sq ft)		593.09	
E.G. Slope (ft/ft)	0.004499	Area (sq ft)		593.09	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	21.50	Avg. Vel. (ft/s)		21.50	
Max Chl Dpth (ft)	7.27	Hydr. Depth (ft)		6.59	
Conv. Total (cfs)	190136.8	Conv. (cfs)		190136.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		101.87	
Min Ch El (ft)	1726.17	Shear (lb/sq ft)		1.64	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	427.73	0.02
C & E Loss (ft)	0.16	Cum SA (acres)	0.40	55.92	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1140.1

INPUT

Description: "LV" 64+16.16 = 1140.1

Station	Elevation	Data	num=	40						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1745.183	059998	1745.161	7.92999	1745.11	24.2	1745.04	25.83	1745.12	
26.06	1744.91	26.39	1743.12	38.33	1742.88	38.39	1742.88	48.45	1742.67	
48.5	1742.674	8.50999	1742.67	50	1726.675	0.00999	1726.67	51.5	1726.63	
51.73	1726.626	5.03999	1726.22	100	1725.17	100.38	1725.18	148.49	1726.63	
148.5	1726.63	149.99	1726.67	149.99	1726.77	149.99	1738.67	150.99	1738.67	
151.08	1738.67	162.99	1738.91	163.04	1738.91	169.05	1739.03	169.53	1739.28	
170.38	1740.18	171.45	1741.03	172.57	1742.08	174.85	1743.98	176.92	1745.05	
177.24	1745.2	182.83	1745.22	186.28	1745.18	197.94	1745	200	1744.99	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.02548	50999	.015
		149.99	.025

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	48.50999	149.99		26.51	26.66	26.81		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1740.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.23	Reach Len. (ft)	26.51	26.66	26.81
Crit W.S. (ft)	1733.87	Flow Area (sq ft)		531.76	
E.G. Slope (ft/ft)	0.007100	Area (sq ft)		531.76	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	100.41	Top Width (ft)		100.41	
Vel Total (ft/s)	23.98	Avg. Vel. (ft/s)		23.98	
Max Chl Dpth (ft)	6.06	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	151363.2	Conv. (cfs)		151363.2	
Length Wtd. (ft)	26.66	Wetted Per. (ft)		109.17	
Min Ch El (ft)	1725.17	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.34	427.08	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.40	55.81	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1139.97

INPUT

Description: "LV" 64+42.82 = 1139.97

Station	Elevation	Data	num=	46					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	1745.213	509995	1745.19	10.19	1745.17	25.38	1745.0126	00999	1745.04
27.53	1743.65	27.59	1743.33	27.61	1743.25	27.61	1743.2	27.66	1742.56
39.64999	1742.32	39.66	1742.3248	49001	1742.14	48.5	1742.14	50	1742.14
50	1726.16	50	1726.14	51.5	1726.1	99.95	1724.64	100	1724.64
148.44	1726.09	148.48	1726.09	149.98	1726.14	149.98	1738.13	149.98	1738.14
150	1738.14	150.98	1738.14	162.97	1738.38	162.98	1738.38	170.08	1738.52
170.11	1738.53	170.78	1738.91	171.11	1739.07	171.43	1739.23	173.79	1741.72
176.44	1743.83	176.79	1744.15	177.61	1744.05	178.17	1744.05	187.95	1744.64
195.01	1745.1	196.98	1745.15	198.22	1745.22	198.96	1745.23	199.3	1745.23
200	1745.26								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50	.015	150	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	50	150		97.17	97.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1739.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1730.60	Reach Len. (ft)	97.17	97.18	97.18
Crit W.S. (ft)	1733.35	Flow Area (sq ft)		520.50	
E.G. Slope (ft/ft)	0.007603	Area (sq ft)		520.50	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	99.98	Top Width (ft)		99.98	
Vel Total (ft/s)	24.50	Avg. Vel. (ft/s)		24.50	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	146269.2	Conv. (cfs)		146269.2	
Length Wtd. (ft)	97.18	Wetted Per. (ft)		108.94	
Min Ch El (ft)	1724.64	Shear (lb/sq ft)		2.27	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	426.76	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	55.75	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1139.95

INPUT

Description: "LV" 65+40 = 1139.95 Upstream of Charleston Blvd. bridge

Station	Elevation	Data	num=	56						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1741.81	259995	1741.714	259995	1741.72	10.02	1741.6	14.78	1741.45	
15.55	1741.45	15.56	1741.45	15.59	1741.46	16.14	1741.54	16.73	1741.32	
16.82001	1741.3218	21001	1741.19	23.41	1740.75	24.95	1740.63	25.8	1740.4	
27.86	1740.14	29.33	1741.04	29.41	1741.62	35.66	1741.49	41.41	1741.38	
45.11	1741.3	48.5	1741.24	49.28	1741.24	50	1741.24	50	1733.57	
50	1725.24	50.72	1725.21	51.5	1725.19	76.76	1724.43	100	1723.74	
125.26	1724.49	126.85	1724.54	148.5	1725.19	149.17	1725.21	150	1725.24	
150	1731.93	150	1740.24	150.83	1740.24	151.5	1740.24	152.39	1740.25	
153.5	1740.28	158.81	1740.45	163.5	1740.13	167.23	1740.2	175.5	1740.37	
176.86	1738.88	186.28	1738.65	187.82	1738.94	188.26	1739	188.69	1739.79	
189.57	1741.35	190.53	1742.38	191.98	1743.53	193.37	1743.47	198.47	1743.56	
200	1743.62									

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50	.015	150	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	50	150		135	135	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1739.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.51	Wt. n-Val.		0.015	
W.S. Elev (ft)	1729.64	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1732.44	Flow Area (sq ft)		515.34	
E.G. Slope (ft/ft)	0.007851	Area (sq ft)		515.34	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	

Top Width (ft)	100.00	Top Width (ft)	100.00		
Vel Total (ft/s)	24.75	Avg. Vel. (ft/s)	24.75		
Max Chl Dpth (ft)	5.90	Hydr. Depth (ft)	5.15		
Conv. Total (cfs)	143945.2	Conv. (cfs)	143945.2		
Length Wtd. (ft)	12.00	Wetted Per. (ft)	108.84		
Min Ch El (ft)	1723.74	Shear (lb/sq ft)	2.32		
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	0.34	425.60	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	55.52	0.06

BRIDGE

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1139.5

INPUT

Description: Charleston Boulevard Bridge

Distance from Upstream XS = 12

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	2				
Sta	Hi	Cord	Lo	Cord	
45	1740.42	1733	155	1740.15	1733

Upstream Bridge Cross Section Data

Station Elevation Data		num=	56						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1741.81	259995	1741.714	259995	1741.72	10.02	1741.6	14.78	1741.45
15.55	1741.45	15.56	1741.45	15.59	1741.46	16.14	1741.54	16.73	1741.32
16.82001	1741.3218	21001	1741.19	23.41	1740.75	24.95	1740.63	25.8	1740.4
27.86	1740.14	29.33	1741.04	29.41	1741.62	35.66	1741.49	41.41	1741.38
45.11	1741.3	48.5	1741.24	49.28	1741.24	50	1741.24	50	1733.57
50	1725.24	50.72	1725.21	51.5	1725.19	76.76	1724.43	100	1723.74
125.26	1724.49	126.85	1724.54	148.5	1725.19	149.17	1725.21	150	1725.24
150	1731.93	150	1740.24	150.83	1740.24	151.5	1740.24	152.39	1740.25
153.5	1740.28	158.81	1740.45	163.5	1740.13	167.23	1740.2	175.5	1740.37
176.86	1738.88	186.28	1738.65	187.82	1738.94	188.26	1739	188.69	1739.79
189.57	1741.35	190.53	1742.38	191.98	1743.53	193.37	1743.47	198.47	1743.56
200	1743.62								

Manning's n Values

num=	3			
Sta	n Val	Sta	n Val	Sta
0	.025	50	.015	150
				.025

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	50	150		.1	.3

Downstream Deck/Roadway Coordinates

num=	2				
Sta	Hi	Cord	Lo	Cord	
45	1740.52	1733	155	1740.09	1733

Downstream Bridge Cross Section Data

Station Elevation Data		num=	53						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1741.195	690002	1741.166	929993	1741.15	17.53	1740.6819	92999	1740.69
20.25	1740.7	20.75	1740.69	25.73	1740.74	27.33	1740.78	27.44	1740.78
27.81	1740.79	29.83	1740.99	32.58	1740.6539	39.9999	1740.16	40.03	1740.15
40.48	1740.05	48.5	1739.8949	92999	1739.89	50	1739.89	50	1739.23
50	1723.9850	07001	1723.98	51.5	1723.93	53.75	1723.87	54.33	1723.85
100	1722.48	145.67	1723.85	148.5	1723.93	148.59	1723.94	150	1723.98
150	1724.79	150	1739.86	151.41	1739.86	151.5	1739.86	151.62	1739.98
170.53	1741.47	170.78	1741.63	172.5	1741.82	173.82	1741.96	174.53	1742.06
176.96	1742.07	177.53	1742.1	178.29	1742.3	179.79	1742.42	181.58	1742.45
182.8	1742.57	184.29	1742.82	184.39	1742.7	184.62	1742.42	186.46	1742.44
187.68	1742.44	189.97	1742.45	200	1742.53				

Manning's n Values

num=	3			
Sta	n Val	Sta	n Val	Sta
0	.025	50	.015	150
				.025

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
-----------	------	-------	-------	--------	--------

50 150 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data

Pier Station	Upstream=	54	Downstream=	54
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	

Pier Data

Pier Station	Upstream=	85	Downstream=	85
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	

Pier Data

Pier Station	Upstream=	117	Downstream=	117
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1722	1.5	1733	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1739.15	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1729.64	E.G. Elev (ft)	1738.79	1737.79
Q Total (cfs)	12754.00	W.S. Elev (ft)	1730.14	1728.77
Q Bridge (cfs)	12754.00	Crit W.S. (ft)	1732.66	1731.44
Q Weir (cfs)		Max Chl Dpth (ft)	6.40	6.29
Weir Sta Lft (ft)		Vel Total (ft/s)	23.60	24.11
Weir Sta Rgt (ft)		Flow Area (sq ft)	540.38	529.07
Weir Submerg		Froude # Chl	1.75	1.80
Weir Max Depth (ft)		Specif Force (cu ft)	10886.20	11022.68
Min El Weir Flow (ft)	1739.97	Hydr Depth (ft)	5.66	5.54
Min El Prs (ft)	1733.00	W.P. Total (ft)	139.11	138.17
Delta EG (ft)	1.57	Conv. Total (cfs)	132278.9	128278.6
Delta WS (ft)	1.13	Top Width (ft)	95.50	95.50
BR Open Area (sq ft)	813.30	Frctn Loss (ft)	0.10	0.96
BR Open Vel (ft/s)	24.11	C & E Loss (ft)	0.26	0.04
Coef of Q		Shear Total (lb/sq ft)	2.25	2.36
Br Sel Method	Energy only	Power Total (lb/ft s)	0.00	0.00

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
 Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1139.15

INPUT

Description: "LV" 66+75 = 1139.15 Downstream of Charleston Blvd. Bridge

Station Elevation Data		num=		53					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1741.195	690002	1741.166	929993	1741.15	17.53	1740.68	19.92999	1740.69
20.25	1740.7	20.75	1740.69	25.73	1740.74	27.33	1740.78	27.44	1740.78
27.81	1740.79	29.83	1740.99	32.58	1740.65	39.39999	1740.16	40.03	1740.15
40.48	1740.05	48.5	1739.89	49.92999	1739.89	50	1739.89	50	1739.23
50	1723.98	50.07001	1723.98	51.5	1723.93	53.75	1723.87	54.33	1723.85
100	1722.48	145.67	1723.85	148.5	1723.93	148.59	1723.94	150	1723.98
150	1724.79	150	1739.86	151.41	1739.86	151.5	1739.86	151.62	1739.98
170.53	1741.47	170.78	1741.63	172.5	1741.82	173.82	1741.96	174.53	1742.06
176.96	1742.07	177.53	1742.1	178.29	1742.3	179.79	1742.42	181.58	1742.45
182.8	1742.57	184.29	1742.82	184.39	1742.7	184.62	1742.42	186.46	1742.44
187.68	1742.44	189.97	1742.45	200	1742.53				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50	.015	150	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	50	150		64.49	64.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1737.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.50	Reach Len. (ft)	64.49	64.49	64.49
Crit W.S. (ft)	1731.17	Flow Area (sq ft)		527.43	
E.G. Slope (ft/ft)	0.007289	Area (sq ft)		527.43	
Q Total (cfs)	12754.00	Flow (cfs)		12754.00	
Top Width (ft)	100.00	Top Width (ft)		100.00	
Vel Total (ft/s)	24.18	Avg. Vel. (ft/s)		24.18	
Max Chl Dpth (ft)	6.02	Hydr. Depth (ft)		5.27	
Conv. Total (cfs)	149387.5	Conv. (cfs)		149387.5	
Length Wtd. (ft)	64.49	Wetted Per. (ft)		109.09	
Min Ch El (ft)	1722.48	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	425.46	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	55.50	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1138.5

INPUT

Description: "LV" 67+39.49 = 1138.5

Station Elevation Data		num=		51					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1742.115	639999	1742.079	050003	1742.03	10.33	1742.05	11.63	1741.96
18.38	1741.88	18.67999	1741.88	18.89	1741.87	23.48	1741.72	26.12	1741.34
28.55	1740.94	30.83	1740.91	38.45	1740.82	38.71001	1740.25	39.00999	1739.57
48.5	1739.38	50	1739.38	50	1723.38	51.5	1723.33	100	1721.88

122.61	1722.56	148.47	1723.34	149.19	1723.36	149.97	1723.38	149.97	1731
149.97	1739.38	150	1739.38	150.69	1739.38	151.47	1739.38	152.42	1739.4
155.04	1739.45	156.85	1740.05	158.37	1740.34	158.89	1740.44	160.3	1740.56
161.35	1740.98	161.76	1741.09	162.77	1741.2	166.64	1741.59	167.77	1741.68
167.99	1741.69	168.36	1741.72	172.44	1741.81	173.18	1741.89	174.19	1741.94
176.35	1742.48	178.69	1742.89	185.33	1743.79	191.26	1743.75	196.45	1743.7
200	1743.71								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50	.015	150	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50	150		308.44	321.03		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1737.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.21	Reach Len. (ft)	308.44	321.03	333.62
Crit W.S. (ft)	1730.83	Flow Area (sq ft)		557.90	
E.G. Slope (ft/ft)	0.006646	Area (sq ft)		557.90	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	99.97	Top Width (ft)		99.97	
Vel Total (ft/s)	23.89	Avg. Vel. (ft/s)		23.89	
Max Chl Dpth (ft)	6.33	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	163465.5	Conv. (cfs)		163465.5	
Length Wtd. (ft)	321.03	Wetted Per. (ft)		109.68	
Min Ch El (ft)	1721.88	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	0.34	424.65	0.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.40	55.35	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1137.1

INPUT

Description: "LV" 70+60.52 = 1137.1

Station Elevation Data		num=		30	
Sta	Elev	Sta	Elev	Sta	Elev
0	1739.56	.4	1739.56	10.48	1739.35
11.47	1739.47	11.75	1739.66	11.88	1739.66
12.15	1739.66	15.47	1739.68	18	1739.71
28.53	1738.79	48.5	1738.39	50	1738.39
51.5	1720.34	100	1718.89	148.5	1720.34
150	1738.39	151.5	1738.39	156.5	1738.49

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	50	.015	150	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50	150		109.99	114.48		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1732.88	Reach Len. (ft)	109.99	114.48	118.97
Crit W.S. (ft)	1727.83	Flow Area (sq ft)		1323.83	
E.G. Slope (ft/ft)	0.000444	Area (sq ft)		1323.83	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	100.00	Top Width (ft)		100.00	
Vel Total (ft/s)	10.07	Avg. Vel. (ft/s)		10.07	
Max Chl Dpth (ft)	13.99	Hydr. Depth (ft)		13.24	
Conv. Total (cfs)	632382.8	Conv. (cfs)		632382.8	
Length Wtd. (ft)	114.48	Wetted Per. (ft)		125.02	
Min Ch El (ft)	1718.89	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)	160.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	417.72	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	54.61	0.06

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1136.3

INPUT

Description: "LV" 71+75 = 1136.3

Station Elevation Data		num= 47								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1739.28	10.75	1739.99	1739.73	10.8	1739.83	10.86	1740.13	11.08	1740.11
11.14	1740.13	15.19	1739.86	16.00	1739.99	1739.82	23.48	1739.73	25.91	1739.7
26.63	1738.78	26.75	1738.64	44.11	1738.29	48.5	1738.2	49.7	1738.2	
50	1738.2	50	1734.62	50	1720.2	51.2	1720.17	51.5	1720.16	
90.04	1719	100	1718.7	103.62	1718.81	148.49	1720.16	148.61	1720.16	
149.99	1720.2	149.99	1734.04	149.99	1735.2	150.11	1735.2	151.49	1735.2	
162.56	1735.42	163.49	1735.44	163.54	1735.47	163.67	1735.57	163.78	1736.7	
164.8	1738.2	165.87	1735.84	166.22	1735.81	170.74	1735.78	172.05	1735.79	
175.62	1735.84	181.3	1736.47	182.56	1736.61	185.59	1737.04	195.06	1738.82	
198.61	1739.3	200	1739.45							

Manning's n Values

num= 3	
Sta	n Val
0	.025
50	.015
149.99	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	50	149.99		340.86	354.77	368.68	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1732.85	Reach Len. (ft)	340.86	354.77	368.68
Crit W.S. (ft)		Flow Area (sq ft)		1339.79	
E.G. Slope (ft/ft)	0.000428	Area (sq ft)		1339.79	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	99.99	Top Width (ft)		99.99	
Vel Total (ft/s)	9.95	Avg. Vel. (ft/s)		9.95	
Max Chl Dpth (ft)	14.15	Hydr. Depth (ft)		13.40	
Conv. Total (cfs)	644032.0	Conv. (cfs)		644032.0	
Length Wtd. (ft)	354.77	Wetted Per. (ft)		125.34	
Min Ch El (ft)	1718.70	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.34	414.22	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	54.35	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1134.7

INPUT

Description: "LV" 75+29.77 = 1134.7

Station Elevation Data		num= 49							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1737.99	11.14	1738.38	11.38	1738.6	11.56	1738.63	11.77	1738.69
11.88	1738.69	12.21	1738.71	13.92	1738.86	15.41	1738.97	15.58	1738.98
25.05	1738.87	25.48	1738.86	25.64	1738.8	25.95	1738.67	26.39	1738.48
27.21	1738.12	27.36	1738.05	46.5	1737.66	48.49	1737.62	49.85	1737.62
49.99	1737.62	49.99	1735.94	49.99	1719.62	51.35	1719.58	51.49	1719.58
95.29	1718.26	99.99	1718.12	100	1718.12	102.56	1718.2	106.75	1718.33
148.47	1719.58	148.68	1719.58	149.97	1719.62	149.97	1735.03	149.97	1737.62
150	1737.62	151.25	1737.62	151.47	1737.62	153.19	1737.66	163.47	1737.86
163.68	1737.48	165.42	1737.56	166.95	1737.81	167.7	1737.8	168.24	1737.85
168.96	1737.96	175.18	1738	194.8	1737.62	200	1737.49		

Manning's n Values

num= 3	
Sta	n Val
0	.025
49.99	.015
150	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.99001	150	126.24	131.39	136.54	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1732.79	Reach Len. (ft)	126.24	131.39	136.54
Crit W.S. (ft)		Flow Area (sq ft)		1390.97	
E.G. Slope (ft/ft)	0.000382	Area (sq ft)		1390.97	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	99.98	Top Width (ft)		99.98	
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)		9.58	
Max Chl Dpth (ft)	14.67	Hydr. Depth (ft)		13.91	
Conv. Total (cfs)	681870.6	Conv. (cfs)		681870.6	
Length Wtd. (ft)	131.39	Wetted Per. (ft)		126.36	
Min Ch El (ft)	1718.12	Shear (lb/sq ft)		0.26	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	403.10	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	53.54	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1134.1

INPUT

Description: "LV" 76+61.16 = 1134.1

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1737.68	8500061	1737.711	509995	1737.742	919998	1737.793	399994	1738
3.699997	1738.124	320007	1738.144	880005	1738.168	880005	1738.429	380005	1738.46
10.32001	1738.48	11.42	1738.52	12.63	1738.63	13.25	1738.71	16.7	1738.82
20.88	1738.862	1.74001	1740.3	22.86	1743.02	27.19	1740.2729	25999	1739
30.2	1738.46	30.61	1738.11	30.83	1737.99	32.34	1737.71	33.5	1737.71
45.16	1737.4848	50999	1737.4149	67999	1737.4150	00999	1737.4150	00999	1723.39
50.00999	1719.4151	17999	1719.3751	50999	1719.36	88.97	1718.24	100	1717.91
108.01	1718.15	109.69	1718.2	109.72	1718.2	148.48	1719.36	148.79	1719.37
149.98	1719.41	149.98	1723.13	149.98	1737.41	150	1737.41	150.29	1737.41
151.48	1737.41	151.9	1737.42	153.35	1737.44	153.81	1737.45	161.41	1737.61
163.48	1737.65	165.94	1737.82	174.96	1738.45	175.28	1738.48	175.33	1738.48
175.35	1738.48	175.36	1738.48	175.37	1738.47	175.37	1738.46	175.41	1738.46
176.65	1738.42	184.92	1737.67	193.96	1737.77	195.72	1737.76	200	1738.05

Manning's n Values	num=	3
Sta	n Val	Sta
0	.02550	150
	.00999	.015
		.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.00999	150	58.3	60	62.62	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.39	Wt. n-Val.		0.015	
W.S. Elev (ft)	1732.76	Reach Len. (ft)	58.30	60.00	62.62
Crit W.S. (ft)		Flow Area (sq ft)		1410.23	
E.G. Slope (ft/ft)	0.000366	Area (sq ft)		1410.23	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	99.97	Top Width (ft)		99.97	
Vel Total (ft/s)	9.45	Avg. Vel. (ft/s)		9.45	
Max Chl Dpth (ft)	14.85	Hydr. Depth (ft)		14.11	
Conv. Total (cfs)	696331.8	Conv. (cfs)		696331.8	
Length Wtd. (ft)	60.00	Wetted Per. (ft)		126.72	
Min Ch El (ft)	1717.91	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	398.87	0.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.40	53.23	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1133.8

INPUT

Description: "LV" 77+21.16 = 1133.8

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1737.39	12.06	1737.81	13.96	1737.88	13.98	1737.91	14.22	1738.18
14.24	1738.18	14.25	1738.18	14.44	1738.18	14.62	1738.18	14.78	1738.18
16.45	1738.08	19.16	1738.19	23.12	1738.33	24.13	1745.77	24.16	1745.9
24.32	1745.91	30.96	1745.83	30.96	1744.95	34.14	1737.54	34.2	1737.53
34.72	1737.52	34.85	1737.52	35.13	1737.5	56	1737.09	57.5	1737.09
57.5	1719.09	57.60	1719.08	59	1719.04	100	1717.81	100.55	1717.83
141	1719.04	141.02	1719.04	142.4	1719.08	142.5	1737.09	143.98	1737.09
144	1737.09	145.97	1737.12	146	1737.13	155.89	1737.92	156.03	1737.93
167.86	1738.16	168.03	1738.17	168.55	1738.19	169.94	1738.26	173.36	1738.44
174.78	1738.6	174.8	1738.5	174.88	1738.2	175.9	1738.17	176.18	1738.18
189.98	1738.78	200	1739.21						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	57.5	.015	142.5	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	57.5	142.5		124.54	128.84	133.13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1734.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.96	Reach Len. (ft)	124.54	128.84	133.13
Crit W.S. (ft)		Flow Area (sq ft)		1147.30	
E.G. Slope (ft/ft)	0.000608	Area (sq ft)		1147.30	
Q Total (cfs)	13326.00	Flow (cfs)		13326.00	
Top Width (ft)	84.97	Top Width (ft)		84.97	
Vel Total (ft/s)	11.62	Avg. Vel. (ft/s)		11.62	
Max Chl Dpth (ft)	14.15	Hydr. Depth (ft)		13.50	
Conv. Total (cfs)	540316.9	Conv. (cfs)		540316.9	
Length Wtd. (ft)	128.84	Wetted Per. (ft)		110.68	
Min Ch El (ft)	1717.81	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	397.11	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	53.11	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1132.8

INPUT

Description: "LV" 78+50 = 1132.8 Upstream Side of Nellis Blvd. Bridge

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
48	1737.03	56	1736.87	57.27	1736.87	57.5	1736.87	57.5	1734.16
57.5	1718.87	57.58	1718.87	58.77	1718.84	59	1718.83	65.01	1718.65
100	1717.6	101.84	1717.66	140.99	1718.83	142.42	1718.87	142.49	1718.87
142.49	1719.71	142.49	1736.87	142.54	1736.87	143.92	1736.87	143.99	1736.87
144.08	1736.88	145.99	1736.91	146.56	1736.96	158.9	1737.95	159.45	1737.96
170.9	1738.19	171.16	1738.18	174.74	1737.94	175.62	1737.99	182.01	1738.09
189.36	1738.2	193.46	1738.31	195.75	1738.35	197.41	1738.39	199.44	1738.54
199.46	1738.46	199.55	1738.14	200	1738.14				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
48	.025	57.5	.015	142.54	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	57.5	142.54		149.26	150	150.74	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.85	Reach Len. (ft)	20.00	20.00	20.00
Crit W.S. (ft)	1727.45	Flow Area (sq ft)		1156.84	
E.G. Slope (ft/ft)	0.000611	Area (sq ft)		1156.84	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	84.99	Top Width (ft)		84.99	
Vel Total (ft/s)	11.68	Avg. Vel. (ft/s)		11.68	
Max Chl Dpth (ft)	14.25	Hydr. Depth (ft)		13.61	
Conv. Total (cfs)	546817.6	Conv. (cfs)		546817.6	
Length Wtd. (ft)	20.00	Wetted Per. (ft)		110.99	
Min Ch El (ft)	1717.60	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.34	393.71	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	52.85	0.06

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1132.5

INPUT

Description: Nellis Boulevard Bridge

Distance from Upstream XS = 20

Deck/Roadway Width = 100

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
50	1736.22	1734.83			150	1736.78	1735.39		

Upstream Bridge Cross Section Data

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
48	1737.03	56	1736.87	57.27	1736.87	57.5	1736.87	57.5	1734.16
57.5	1718.87	57.58	1718.87	58.77	1718.84	59	1718.83	65.01	1718.65
100	1717.6	101.84	1717.66	140.99	1718.83	142.42	1718.87	142.49	1718.87
142.49	1719.71	142.49	1736.87	142.54	1736.87	143.92	1736.87	143.99	1736.87
144.08	1736.88	145.99	1736.91	146.56	1736.96	158.9	1737.95	159.45	1737.96
170.9	1738.19	171.16	1738.18	174.74	1737.94	175.62	1737.99	182.01	1738.09
189.36	1738.2	193.46	1738.31	195.75	1738.35	197.41	1738.39	199.44	1738.54
199.46	1738.46	199.55	1738.14	200	1738.14				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
48	.025	57.5	.015	142.54	.025

Bank Sta: Left Right Coeff Contr. Expan.

57.5	142.54	.1	.3
------	--------	----	----

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
50	1738.41	1737.02			165	1739.02	1737.62		

Downstream Bridge Cross Section Data

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1738.4	4.95	1738.33	7.81	1738.29	14.81	1738.12	23.65	1737.71
25.08	1737.65	26.52	1737.25	56	1736.63	56.07	1736.63	57.42	1736.63
57.5	1736.63	57.5	1735.79	57.5	1718.63	58.93	1718.59	59	1718.58
98.1	1717.41	100	1717.35	139.1	1718.53	141	1718.58	142.43	1718.63
142.5	1718.63	142.5	1719.42	142.5	1735.63	142.57	1735.63	144	1735.63
161.02	1737.41	165	1737.49						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-----	-------	-----	-------	-----	-------

0 .025 57.42 .015 142.57 .025

Bank Sta: Left Right Coeff Contr. Expan.
57.42 142.57 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station	Upstream=	85	Downstream=	85
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1716	1.5	1736	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1716	1.5	1738	

Pier Data

Pier Station	Upstream=	115	Downstream=	115
Upstream	num=	2		
Width	Elev	Width	Elev	
1.5	1716	1.5	1736	
Downstream	num=	2		
Width	Elev	Width	Elev	
1.5	1716	1.5	1738	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1733.97	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1731.85	E.G. Elev (ft)	1733.93	1733.79
Q Total (cfs)	13515.00	W.S. Elev (ft)	1731.54	1731.46
Q Bridge (cfs)	13515.00	Crit W.S. (ft)	1727.72	1727.41
Q Weir (cfs)		Max Chl Dpth (ft)	13.94	14.11
Weir Sta Lft (ft)		Vel Total (ft/s)	12.40	12.24
Weir Sta Rgt (ft)		Flow Area (sq ft)	1089.73	1103.85
Weir Submerg		Froude # Chl	0.60	0.59
Weir Max Depth (ft)		Specif Force (cu ft)	12452.96	12574.39
Min El Weir Flow (ft)	1736.77	Hydr Depth (ft)	13.29	13.46
Min El Prs (ft)	1735.35	W.P. Total (ft)	161.30	162.32
Delta EG (ft)	0.27	Conv. Total (cfs)	385789.4	392502.3
Delta WS (ft)	0.28	Top Width (ft)	81.99	82.00
BR Open Area (sq ft)	1382.70	Frctn Loss (ft)	0.12	0.02
BR Open Vel (ft/s)	12.40	C & E Loss (ft)	0.02	0.06
Coef of Q		Shear Total (lb/sq ft)	0.52	0.50
Br Sel Method	Energy only	Power Total (lb/ft s)	48.00	0.00

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1132.3

INPUT

Description: "LV" 80+00 = 1132.3 Downstream side of Nellis Blvd. bridge

Station Elevation Data		num= 27		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1738.4	4.95	1738.33	7.81	1738.29	14.81	1738.12	23.65	1737.71		
25.08	1737.65	26.52	1737.25	56	1736.63	56.07	1736.63	57.42	1736.63		
57.5	1736.63	57.5	1735.79	57.5	1718.63	58.93	1718.59	59	1718.58		
98.1	1717.41	100	1717.35	139.1	1718.53	141	1718.58	142.43	1718.63		
142.5	1718.63	142.5	1719.42	142.5	1735.63	142.57	1735.63	144	1735.63		
161.02	1737.41	165	1737.49								

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	57.42	.015	142.57	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	57.42	142.57		92.33	92.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.13	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.57	Reach Len. (ft)	92.33	92.33	92.33
Crit W.S. (ft)		Flow Area (sq ft)		1154.60	
E.G. Slope (ft/ft)	0.000614	Area (sq ft)		1154.60	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	85.00	Top Width (ft)		85.00	
Vel Total (ft/s)	11.71	Avg. Vel. (ft/s)		11.71	
Max Chl Dpth (ft)	14.22	Hydr. Depth (ft)		13.58	
Conv. Total (cfs)	545255.3	Conv. (cfs)		545255.3	
Length Wtd. (ft)	92.33	Wetted Per. (ft)		110.93	
Min Ch El (ft)	1717.35	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)	165.00	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	389.89	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	52.57	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1131.8

INPUT

Description: "LV" 80+92.33 = 1131.8

Station Elevation Data		num= 26		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1739.23	8399963	1739.222	059998	1739.216	130005	1739.15	18.27	1738.98		
19.17	1738.56	56	1736.48	57.39999	1736.48	57.5	1736.48	57.5	1718.48		
59	1718.43	100	1717.2	141	1718.43	142.4	1718.48	142.5	1718.48		
142.5	1736.48	144	1736.48	146	1736.52	171.37	1738.55	183.37	1738.79		
187.19	1738.62	190.08	1739.06	190.89	1739.18	196.43	1739.76	198.9	1739.89		
200	1739.87										

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	57.39999	.015	142.5	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	57.39999	142.5		221.77	238.67	255.58	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.54	Reach Len. (ft)	221.77	238.67	255.58
Crit W.S. (ft)		Flow Area (sq ft)		1165.06	
E.G. Slope (ft/ft)	0.000598	Area (sq ft)		1165.06	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	85.00	Top Width (ft)		85.00	
Vel Total (ft/s)	11.60	Avg. Vel. (ft/s)		11.60	
Max Chl Dpth (ft)	14.34	Hydr. Depth (ft)		13.71	
Conv. Total (cfs)	552712.5	Conv. (cfs)		552712.5	
Length Wtd. (ft)	238.67	Wetted Per. (ft)		111.17	

Min Ch El (ft)	1717.20	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.34	387.44	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	52.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1130.5

INPUT

Description: "LV" 83+31 = "DR" 13+38.42 = 1130.5

Station Elevation Data		num=		31	
Sta	Elev	Sta	Elev	Sta	Elev
0	1737.736	160004	1737.698	089996	1737.78
11.5	1738.17	11.87	1738.2	14.89	1737.69
56.25999	1736.09	57.5	1736.09	57.5	1718.0957
59	1718.04	92.39	1717.04	100	1716.81
141.26	1718.05	142.5	1718.09	142.5	1721.24
143.73	1736.09	144	1736.09	153.86	1736.29
200	1737.21			156	1736.33

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.025	57.5	.015	142.6	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	57.5	142.6		542.08	542.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.47	Reach Len. (ft)	542.08	542.08	542.08
Crit W.S. (ft)		Flow Area (sq ft)		1191.82	
E.G. Slope (ft/ft)	0.000559	Area (sq ft)		1191.82	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	85.00	Top Width (ft)		85.00	
Vel Total (ft/s)	11.34	Avg. Vel. (ft/s)		11.34	
Max Chl Dpth (ft)	14.66	Hydr. Depth (ft)		14.02	
Conv. Total (cfs)	571859.5	Conv. (cfs)		571859.5	
Length Wtd. (ft)	542.08	Wetted Per. (ft)		111.80	
Min Ch El (ft)	1716.81	Shear (lb/sq ft)		0.37	
Alpha	1.00	Stream Power (lb/ft s)	200.00	0.00	0.00
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.34	380.98	0.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.40	51.92	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1127.9

INPUT

Description: "DR" 18+80.50 = 1127.9 End Rectangular Channel

Station Elevation Data		num=		104	
Sta	Elev	Sta	Elev	Sta	Elev
0	1736.43	.02	1736.43	1.16	1736.29
1.62	1736.14	1.64	1736.16	1.68	1736.19
2.13	1736.19	2.19	1736.2	2.28	1736.2
3.5	1736.3	3.61	1736.33	3.76	1736.34
4.27	1736.4	5.2	1736.47	9.88	1737
52.33	1736.35	53.75	1736	56.21	1735.38
65.09	1735.06	65.76	1735	74.84	1734.31
89.61	1734	93.77	1734	96.33	1734
105.33	1734.4	105.33	1716.9	147.83	1716.05
191.33	1734.4	203.33	1734.64	206.33	1734.14
226.67	1736	230.36	1736.47	236.27	1737
257.35	1738	260.69	1738.25	261.83	1738.22
278.13	1738.51	284.23	1738.57	294.1	1738.73
317.39	1739.62	321.57	1739.88	323.77	1740
340.99	1741.66	343.04	1742	347.81	1742.51

359.53	1742.4	360.53	1742.27	361.64	1742	362.1	1741.93	368.31	1741
374.21	1740.16	375.22	1740	376.65	1739.79	381.51	1739	383.03	1738.69
385.33	1738	388.14	1737.53	389.66	1737.32	391.04	1737.15	395.29	1737.23
399.04	1737.31	402.55	1736.72	402.82	1736.68	402.93	1736.66	402.94	1736.66
402.96	1736.65	406.58	1736.09	408.38	1736.44	408.42	1736.7	408.79	1736.55
419.27	1736.04	424.93	1735.7	434.54	1735.91	455.84	1736.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	105.33	.015	190.33	.031

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	105.33	190.33	55.11	54.5	1.73		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.77	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.35	Reach Len. (ft)	55.11	54.50	1.73
Crit W.S. (ft)		Flow Area (sq ft)		1264.29	
E.G. Slope (ft/ft)	0.000470	Area (sq ft)		1264.29	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	85.00	Top Width (ft)		85.00	
Vel Total (ft/s)	10.69	Avg. Vel. (ft/s)		10.69	
Max Chl Dpth (ft)	15.30	Hydr. Depth (ft)		14.87	
Conv. Total (cfs)	623150.3	Conv. (cfs)		623150.3	
Length Wtd. (ft)	54.50	Wetted Per. (ft)		113.91	
Min Ch El (ft)	1716.05	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	455.84	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.34	365.70	0.02
C & E Loss (ft)	0.19	Cum SA (acres)	0.40	50.87	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1127.7

INPUT

Description: "DR" 19+35.00 = 1127.7

Station	Elevation	Data	num=	138					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1736.04	.19	1736.04	2.51	1736.25	2.55	1736.26	2.61	1736.26
3.69	1736.45	4.62	1736.28	5.05	1736.23	22	1735.43	23.4	1735.38
23.51	1735.38	23.86	1735.39	25.01	1735.39	25.26	1735.39	25.88	1735.37
26.85	1735.33	28.16	1735.27	32.08	1735.09	35.85	1735.07	36.53	1735.07
37.28	1735.07	38.16	1735.06	39.02	1735.06	39.77	1735.05	39.95	1735.05
40.49	1735.04	41.01	1735.03	41.44	1735.03	41.98	1735.02	42.14	1735.01
42.23	1735	42.78	1734.91	44.67	1734.8	50.78	1734.52	57.42	1734.41
59.04	1734.38	59.27	1734.29	59.76	1734.09	59.91	1734.03	60	1734
62.62	1733.51	63.91	1733.15	64.52	1733	68.55	1732.02	68.62	1732
68.65	1731.99	73.54	1731	77.05	1730.1	77.5	1730	83.11	1729
86.96	1728	88.32	1727.74	89.18	1727.57	89.49	1727.52	89.66	1727.49
89.77	1727.47	90.87	1727.42	130.94	1717.42	145.94	1716.97	155.94	1715.97
165.94	1716.97	180.94	1717.42	221.01	1727.42	223.39	1728	227.28	1729
230.94	1729.92	231.24	1730	232.46	1730.3	232.65	1730.35	232.91	1730.41
235.25	1731	237.64	1731.6	239.24	1732	242.05	1732.7	243.3	1733
246.1	1733.7	246.41	1733.75	247.73	1734	252.45	1734.55	254.86	1735
256.97	1735.18	263.32	1736	270.89	1736.75	274.51	1737	286.46	1737.84
290.44	1738	299.59	1738.77	307.77	1739	309.61	1739.06	318.37	1739.3
322.8	1739.64	325.57	1739.82	328.99	1740	335.26	1740.55	340.72	1741
344.65	1741.24	346.81	1741.55	349.79	1741.81	350.62	1742	356.62	1742
371.18	1742	371.48	1741.96	377.79	1741.07	378.28	1741	378.7	1740.94
385.16	1740	390.24	1739.27	391.91	1739	393.51	1738.61	395.66	1738
396.31	1737.9	396.69	1737.85	397.49	1737.75	400.33	1737.4	403.24	1737.05
405.24	1737.09	411.5	1737.22	412.15	1737.12	414.21	1736.79	414.71	1736.71
415.01	1736.66	415.11	1736.64	415.43	1736.59	416.2	1736.48	416.28	1736.47
416.33	1736.45	416.48	1736.41	416.76	1736.37	418.48	1736.11	420.13	1736.43
421.19	1736.56	421.44	1736.53	425.01	1736.33	429.67	1736.07	438.89	1735.57
454.51	1735.96	463	1736.17	470.16	1736.3				

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .031 59.27 .015 246.41 .031		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
59.27	246.41	18.91	18.64	4.23	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.		0.015	
W.S. Elev (ft)	1731.77	Reach Len. (ft)	18.91	18.64	4.23
Crit W.S. (ft)		Flow Area (sq ft)		1578.26	
E.G. Slope (ft/ft)	0.000389	Area (sq ft)		1578.26	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	168.59	Top Width (ft)		168.59	
Vel Total (ft/s)	8.56	Avg. Vel. (ft/s)		8.56	
Max Chl Dpth (ft)	15.80	Hydr. Depth (ft)		9.36	
Conv. Total (cfs)	684808.1	Conv. (cfs)		684808.1	
Length Wtd. (ft)	18.64	Wetted Per. (ft)		172.17	
Min Ch El (ft)	1715.97	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)	470.16	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.34	363.92	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	50.71	0.06

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1127.6

INPUT

Description: "DR" 19+53.64 = 1127.6 End Concrete Lining Begin Grass-lined channel

Station	Elevation	Data	num=	128
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev				
0 1736.06 .16 1736.06 1.18 1736.15 2.27 1736.22 3.47 1736.26				
3.79 1736.28 4.4 1736.2 5.39 1736.1 10.1 1735.88 25.62 1735.29				
26.78 1735.37 27.49 1735.38 32.83 1735.13 34.33 1735.07 35.5 1735.06				
35.98 1735.06 40.4 1735.04 44.56 1735.03 44.58 1735.03 45.69 1734.85				
48.68 1734.37 48.85 1734.35 49.08 1734.31 49.23 1734.29 49.24 1734.28				
55.47 1734.18 57.5 1734.15 57.59 1734.11 57.9 1734 60.64 1733.48				
65.65 1733.12 67.01 1733 70.9 1732.3 72.51 1732 74.26 1731.64				
76.88 1731 80.54 1730.28 83.09 1730.01 83.1 1730.01 83.12 1730				
84.47 1729.82 119.6 1720.92 134.13 1717.4 149.13 1716.95 159.13 1715.95				
169.17 1716.95 184.28 1717.4 193.71 1719.7 233.81 1729.75 234.38 1729.9				
234.51 1729.94 234.6 1729.96 234.9 1730 235.77 1730.22 238.9 1731				
240.58 1731.42 242.9 1732 245.33 1732.61 246.9 1733 249.4 1733.45				
251.37 1733.74 253.15 1734 259.4 1734.55 264.18 1735 270.46 1735.31				
272.45 1735.48 276.41 1736 281.22 1736.48 286.37 1736.85 287.92 1737				
295.26 1737.72 298.5 1738 300.91 1738.38 304.68 1739 312.4 1739.34				
328.32 1740 333.55 1740.55 337.92 1741 339.95 1741 343.76 1741				
345.71 1741 348.57 1741 354.28 1741.45 355.91 1741.45 359.05 1741.74				
360 1741.8 363.14 1742 369.22 1742 372.09 1742 376.45 1741.65				
381.74 1741 387.67 1740.24 389.63 1740 390.17 1739.92 395.9 1739				
399.19 1738.22 400.25 1738 402.29 1737.7 408.05 1737.12 409.06 1737				
411.89 1737.06 414.26 1737.11 416.81 1737.16 417.47 1737.18 418.27 1737.05				
421.81 1736.5 421.93 1736.48 422.02 1736.46 422.36 1736.41 422.65 1736.37				
422.68 1736.36 422.77 1736.34 422.99 1736.29 423.43 1736.22 424.06 1736.13				
424.67 1736.24 425.39 1736.33 425.77 1736.42 425.78 1736.43 426.15 1736.42				
426.39 1736.4 432.54 1736.17 437.34 1735.93 440.39 1735.77 444.76 1735.53				
467.67 1736.04 476.33 1736.26 477.05 1736.28				

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .031 3.47 .027 363.14 .031		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3.47	363.14	65.6	46.36	10.73	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.76	Reach Len. (ft)	65.60	46.36	10.73
Crit W.S. (ft)		Flow Area (sq ft)		1580.22	
E.G. Slope (ft/ft)	0.001254	Area (sq ft)		1580.22	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	168.25	Top Width (ft)		168.25	
Vel Total (ft/s)	8.55	Avg. Vel. (ft/s)		8.55	
Max Chl Dpth (ft)	15.81	Hydr. Depth (ft)		9.39	
Conv. Total (cfs)	381707.5	Conv. (cfs)		381707.5	
Length Wtd. (ft)	46.36	Wetted Per. (ft)		171.85	
Min Ch El (ft)	1715.95	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	477.05	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	363.24	0.02
C & E Loss (ft)	0.11	Cum SA (acres)	0.40	50.64	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1127.4

INPUT

Description: "DR" 20+00.00 = 1127.4

Station Elevation Data num= 106

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1736.16	1.3	1736.12	2.11	1736.08	3.18	1736.34	3.47	1736.45
4.4	1736.32	4.79	1736.21	8.77	1735.97	11.57	1735.79	21.15	1735.45
33.86	1734.74	36.86	1734.82	37.03	1734.83	37.06	1734.83	39.53	1734.44
45.59	1733.49	47.76	1733.45	53.91	1733.36	55.9	1733.28	59.04	1733
63.6	1732.33	65.85	1732	70.84	1731.41	74.62	1731	79.02	1730.72
84.14	1730.4	98.53	1726.86	104.29	1725.48	134.23	1718.06	134.83	1717.92
134.9	1717.9	168.8	1716.88	172.3	1716.53	178.8	1715.88	178.81	1715.88
188.8	1716.88	206.47	1717.41	206.48	1717.41	240.64	1725.91	256.78	1729.92
256.82	1730	260.82	1731	264.81	1732	264.82	1732	268.81	1733
268.82	1733	268.84	1733	269.24	1733.04	278.19	1733.84	278.31	1733.85
278.43	1733.86	279.12	1733.92	279.42	1733.94	280.42	1734	281.07	1734.06
292.84	1735	297.29	1735.36	302.29	1735.69	304.6	1735.8	305.14	1735.85
306.25	1736	307.62	1736.14	309.11	1736.25	316.88	1736.99	316.97	1737
317.01	1737	317.3	1737.03	329.01	1738	332.07	1738.48	335.09	1739
350.02	1739.72	360.38	1740	363.11	1740.17	363.69	1740.19	369.27	1740.36
370.3	1740.34	375.61	1740.41	380.83	1740.61	384.52	1740.76	387.55	1740.78
395.32	1740.64	400.92	1740.5	403.57	1740.3	406.08	1740	411	1739.26
412.65	1739	413.28	1738.89	417.65	1738	422.93	1737.26	425.24	1737
427.85	1736.79	429.12	1736.73	433.26	1736.84	437.69	1736.95	441.09	1736.44
444.17	1735.98	444.28	1735.98	444.51	1735.97	445.28	1735.94	447.13	1735.89
450.55	1735.89	451.93	1735.84	452.21	1735.88	458.74	1735.73	460.01	1735.74
498.11	1736.28								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	3.47	.027	384.52	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	3.47	384.52		82.47	44.07	36.04	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.96	Reach Len. (ft)	82.47	44.07	36.04
Crit W.S. (ft)		Flow Area (sq ft)		1904.08	
E.G. Slope (ft/ft)	0.000835	Area (sq ft)		1904.08	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	198.45	Top Width (ft)		198.45	
Vel Total (ft/s)	7.10	Avg. Vel. (ft/s)		7.10	
Max Chl Dpth (ft)	16.08	Hydr. Depth (ft)		9.59	
Conv. Total (cfs)	467612.2	Conv. (cfs)		467612.2	
Length Wtd. (ft)	44.07	Wetted Per. (ft)		201.99	
Min Ch El (ft)	1715.88	Shear (lb/sq ft)		0.49	
Alpha	1.00	Stream Power (lb/ft s)	498.11	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	361.39	0.02

Station Elevation Data		num= 140							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1735.33	1.81	1735.32	2.64	1735.66	3.39	1735.91	5.37	1735.4
5.6	1735.34	10.94	1735.71	16.1	1735.68	24.72	1735.74	24.73	1735.74
24.75	1735.74	44.98	1735.74	50.77	1735.62	53.07	1735.57	57.46	1735.87
59.44	1736	60.55	1736.17	65.57	1737	69.32	1737.73	70.61	1738
71.9	1738.18	73.02	1738.36	76.6	1739	84.13	1739	85.86	1739

87.98	1739	89.68	1738.92	91.13	1739	92.91	1739	93.24	1739
93.92	1739	95.97	1738.85	96.7	1738.86	106.68	1738	107.68	1738
108.29	1738	114.82	1737.23	116.96	1737.01	117.08	1737	122.81	1736.7
126.21	1736.41	128.05	1736.18	129.81	1736	133.42	1735.66	141.25	1735
141.26	1735	148.72	1734	160.58	1733.29	165.56	1733	176.12	1732.67
195.76	1732	201.59	1731.42	204.71	1731	206.13	1730.65	207.77	1730.31
225.08	1726.01	230.95	1724.62	245.31	1721.43	262.18	1717.62	291.31	1716.74
291.32	1716.74	301.32	1715.74	311.31	1716.74	311.32	1716.74	331.69	1717.35
331.7	1717.35	381.68	1729.85	381.7	1729.85	381.83	1729.89	383.05	1730
384.15	1730.22	387.75	1731	393.65	1731.72	394.93	1731.98	395.05	1732
407.33	1732.95	407.62	1733	409.96	1733.11	433.25	1734	434.48	1734.13
444.97	1735	448.75	1735.46	453.78	1736	456.92	1736.58	459.93	1737
463.28	1737.69	466	1738	472.14	1738.92	472.91	1739	481.17	1739.55
484.8	1739.96	485.49	1740	485.72	1740	485.84	1740	488.65	1740
491.8	1739.96	501.76	1739	502.01	1738.98	506.33	1738.37	509.31	1738
515.22	1737.55	520.47	1737	523.01	1736.71	529.29	1736	530.14	1735.92
534.6	1735.5	536.65	1735.31	543.47	1735.49	544.74	1735.52	545.31	1735.35
545.55	1735.33	546.53	1735.31	549.2	1735.11	550.73	1735.12	551.4	1735.17
552.65	1735.24	554.85	1735.29	556.09	1735.42	556.88	1735.49	557.17	1735.5
557.21	1735.5	558.84	1735.54	558.89	1735.54	561.13	1735.59	563.52	1735.64
565.63	1735.68	567.52	1735.72	569.23	1735.75	570.79	1735.79	572.21	1735.81
573.53	1735.84	574.75	1735.86	575.41	1735.88	577.55	1735.94	580.05	1735.97
583.16	1736.02	583.89	1736.03	587.07	1736.08	588.35	1736.11	600.76	1736.12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	92.91	.027	485.72	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	92.91	485.72		7.34 66.63	94.52	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.87	Reach Len. (ft)	7.34	66.63	94.52
Crit W.S. (ft)		Flow Area (sq ft)		1912.05	
E.G. Slope (ft/ft)	0.000817	Area (sq ft)		1912.05	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	197.24	Top Width (ft)		197.24	
Vel Total (ft/s)	7.07	Avg. Vel. (ft/s)		7.07	
Max Chl Dpth (ft)	16.12	Hydr. Depth (ft)		9.69	
Conv. Total (cfs)	472945.9	Conv. (cfs)		472945.9	
Length Wtd. (ft)	66.63	Wetted Per. (ft)		200.67	
Min Ch El (ft)	1715.74	Shear (lb/sq ft)		0.49	
Alpha	1.00	Stream Power (lb/ft s)	600.76	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	357.07	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	49.99	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1126.7

INPUT

Description: "DR" 21+66.63 = 1126.7

Station	Elevation	Data	num=	135					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1735.41	1.5	1735.3	1.79	1735.28	1.86	1735.3	3.39	1735.81
4.52	1735.52	6.02	1735.41	12.7	1735.71	14.35	1735.82	15.76	1735.81
18.18	1735.83	23.99	1735.81	24.08	1735.84	36.05	1735.82	45.02	1735.82
50.08	1735.71	53.1	1735.65	55.63	1735.83	58.2	1736	63.55	1736.83
64.61	1737	65.41	1737.16	69.55	1738	73.59	1738.56	76.35	1739
78.89	1739	88.37	1739	89.96	1739	94.71	1739	95.25	1739
96.05	1739	97.08	1738.7	102.27	1738.35	103.48	1738.19	105.97	1738
109.23	1737.52	113.15	1737	118.85	1736.43	119.36	1736.39	123.06	1736
127.24	1735.66	133.38	1735	134.02	1734.93	142.7	1734	147.27	1733.91
175.34	1733	177.56	1732.93	178.69	1732.89	180.03	1732.85	180.53	1732.83
219.58	1731.56	221.56	1731.49	230.18	1729.34	230.33	1729.31	275.58	1718.01
276.45	1717.79	276.75	1717.71	279.13	1717.12	279.6	1717	279.66	1717
291.29	1716.65	291.31	1716.65	301.29	1715.65	311.29	1716.65	332.11	1717.27
332.42	1717.28	364.28	1725.24	382.47	1729.78	382.59	1729.79	383.65	1729.87
384.07	1729.89	384.4	1729.91	384.67	1729.93	385.45	1730	389.49	1730.81

390.3	1730.99	390.36	1731	392.8	1731.29	399.61	1731.51	412.92	1732
417.88	1732.44	424.46	1732.58	432.18	1732.72	446.25	1733	446.91	1733.07
457.7	1734	458.23	1734.07	461.21	1734.5	464.01	1734.92	464.45	1735
465.47	1735.11	473.57	1736	476.62	1736.75	478.87	1737	481.54	1737
485.74	1737	487.8	1737	489.27	1736.83	493.98	1736.13	494.36	1736.02
494.43	1736	494.52	1735.97	494.65	1735.91	495.88	1735.3	500.63	1735.39
503.99	1735.45	508.2	1735.59	521.3	1735.97	521.53	1735.98	522.24	1736
523.09	1736.19	526.68	1737	527.24	1737.11	527.38	1737.12	534.4	1737.06
534.74	1737	536.98	1736.59	540.24	1736	540.89	1735.89	542.83	1735.57
544.73	1735.27	545.21	1735.28	552.43	1735.45	554.05	1735.49	554.06	1735.49
554.42	1735.5	554.44	1735.5	554.57	1735.5	554.63	1735.51	554.66	1735.51
554.7	1735.51	554.72	1735.51	554.73	1735.51	555.99	1735.54	558.73	1735.53

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	96.05	.027	478.87	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	96.05	478.87		4.44	33.37		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.44	Reach Len. (ft)	4.44	33.37	73.90
Crit W.S. (ft)		Flow Area (sq ft)		1606.15	
E.G. Slope (ft/ft)	0.001257	Area (sq ft)		1606.15	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	175.74	Top Width (ft)		175.74	
Vel Total (ft/s)	8.41	Avg. Vel. (ft/s)		8.41	
Max Chl Dpth (ft)	15.79	Hydr. Depth (ft)		9.14	
Conv. Total (cfs)	381271.7	Conv. (cfs)		381271.7	
Length Wtd. (ft)	33.37	Wetted Per. (ft)		179.29	
Min Ch El (ft)	1715.65	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)	558.73	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	354.38	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	49.71	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1126.5

INPUT

Description: "DR" 22+00.00 = 1126.5

Station Elevation Data		num=		122	
Sta	Elev	Sta	Elev	Sta	Elev
0	1735.4	.08	1735.41	.57	1735.4
3.3	1735.75	3.67	1735.65	6.2	1735.47
13.68	1735.81	15.62	1735.9	15.9	1735.9
17.27	1735.9	17.81	1735.88	23.38	1735.86
40.29	1735.88	43.31	1735.88	44.91	1735.88
55.33	1735.87	56.9	1735.98	57.01	1736
64.65	1737.2	68.55	1738	74.64	1738.84
89.95	1739	90.06	1738.98	96.06	1738.15
97.2	1738	103.26	1737.7	108.93	1737
119.18	1736	120.28	1735.91	121.35	1735.85
130.79	1735	137.75	1734.22	139.65	1734
215.38	1731.76	222.78	1731.51	224.87	1731.43
283	1716.92	294.71	1716.57	294.72	1716.57
304.74	1715.57	314.71	1716.57	341.86	1717.38
381.81	1727.56	390.62	1729.8	395.03	1729.94
408.62	1731	410.55	1731.07	438.63	1732
445.77	1733	446.66	1733.14	451.53	1734
458.52	1735.09	463.82	1736	466.97	1736.83
470.33	1737.4	472.61	1737.57	475.35	1737.9
484.2	1737	484.82	1736.74	486.82	1736
495.98	1735.47	497.13	1735.49	504.96	1735.79
516.67	1737	516.94	1737.11	517.23	1737.21
526.35	1738	527.67	1738	528.61	1738
534.87	1736.59	537.9	1736	539.95	1735.66
548.79	1735.69	550.92	1735.7		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 89.95 .027 475.91 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 89.95 475.91 3.26 27.02 49.28 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.97	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.49	Reach Len. (ft)	3.26	27.02	49.28
Crit W.S. (ft)		Flow Area (sq ft)		1711.23	
E.G. Slope (ft/ft)	0.001205	Area (sq ft)		1711.23	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	200.05	Top Width (ft)		200.05	
Vel Total (ft/s)	7.90	Avg. Vel. (ft/s)		7.90	
Max Chl Dpth (ft)	15.92	Hydr. Depth (ft)		8.55	
Conv. Total (cfs)	389356.6	Conv. (cfs)		389356.6	
Length Wtd. (ft)	27.02	Wetted Per. (ft)		203.56	
Min Ch El (ft)	1715.57	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)	550.92	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	353.10	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	49.57	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1126.3

INPUT

Description: "DR" 22+27.02 = 1126.3

Station Elevation Data num= 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1735.37	.12	1735.37	1.27	1735.35	1.89	1735.3	2.84	1735.6
3.25	1735.71	3.45	1735.7	4.19	1735.69	4.72	1735.64	6.33	1735.52
8.31	1735.61	9.85	1735.71	15.63	1735.97	16.51	1735.99	17.14	1736
18.74	1736.04	20.88	1735.96	22.64	1735.9	22.74	1735.9	28.33	1735.93
39.87	1735.93	42.45	1735.92	44.7	1735.93	50.06	1735.82	52.74	1735.76
54.94	1735.92	55.33	1736	57.93	1736.47	61.29	1737	65.1	1737.58
67.14	1738	71.85	1738.66	73.75	1739	79.07	1739	85.84	1739
91.16	1738.13	92.11	1738	93.09	1737.87	98.16	1737.28	99.93	1737.2
101.73	1737	108.16	1736.49	113.3	1736	118.2	1735.58	123.53	1735.23
126.21	1735	132.54	1734.63	138.04	1734	155.19	1733.62	169.64	1733.31
179.48	1733	194.81	1732.5	202.69	1732.24	227.77	1731.37	228.71	1731.14
229.79	1730.88	230.88	1730.61	231.14	1730.55	248.87	1726.23	261.69	1723.11
262.64	1722.88	264.13	1722.51	287.64	1716.74	287.68	1716.74	295.74	1716.5
295.76	1716.5	305.74	1715.5	315.74	1716.5	348.75	1717.49	349.6	1717.52
355.17	1718.92	386.41	1726.91	397.33	1729.74	405.6	1729.92	407.74	1730
424.9	1730.68	430.88	1731	437.73	1731.23	440.51	1731.37	446.46	1731.78
449.27	1732	452.5	1732.52	455.45	1733	456.8	1733.27	460.31	1734
463.7	1734.6	466.47	1735	472.82	1735.96	473.07	1736	473.28	1736
473.59	1736	486.24	1736	490.87	1736	493.83	1735.14	494.15	1735.05
495.27	1735.07	502.16	1735.2	505.78	1735.01	506.99	1735	508.58	1735
508.59	1735	508.61	1735	511.49	1735.21	512.02	1735.23	513.95	1735.41
519.28	1736	520.03	1736	520.45	1736	522.75	1736	523.91	1736
524.04	1736	524.21	1736	524.89	1736	530.26	1735.16	530.72	1735.09
530.74	1735.09	530.94	1735.09	533.63	1735.15	533.91	1735.15	533.93	1735.16
546.18	1735.41	547.06	1735.43	547.75	1735.44	547.96	1735.45	548.73	1735.46
549.15	1735.47	549.71	1735.48	550.43	1735.5	550.83	1735.51	551.26	1735.51
551.53	1735.52	551.56	1735.52	551.99	1735.53	552.19	1735.53	552.43	1735.54
552.5	1735.54	552.63	1735.54	552.65	1735.54	552.75	1735.55	552.77	1735.55
554.45	1735.58	556.58	1735.56						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 85.84 .027 472.82 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 85.84 472.82 18.82 22.99 51.67 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.52	Reach Len. (ft)	18.82	22.99	51.67
Crit W.S. (ft)		Flow Area (sq ft)		1791.78	
E.G. Slope (ft/ft)	0.001165	Area (sq ft)		1791.78	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	219.23	Top Width (ft)		219.23	
Vel Total (ft/s)	7.54	Avg. Vel. (ft/s)		7.54	
Max Chl Dpth (ft)	16.02	Hydr. Depth (ft)		8.17	
Conv. Total (cfs)	395950.5	Conv. (cfs)		395950.5	
Length Wtd. (ft)	22.99	Wetted Per. (ft)		222.69	
Min Ch El (ft)	1715.50	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)	556.58	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	352.02	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	49.44	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1126.2

INPUT

Description: "DR" 22+50.00 = 1126.2

Station	Elevation	Data	num=	113						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1735.19	.29	1735.19	1.83	1735.24	3	1735.65	3.06	1735.67	
3.29	1735.66	5.8	1735.52	7.65	1735.75	8.56	1735.87	13.24	1736.15	
14.78	1736.27	15.76	1736.33	16.13	1736.34	16.97	1736.36	18.7	1736.39	
19.34	1736.49	20.58	1736.67	21.21	1736.74	21.36	1736.74	23.38	1737	
25.24	1737.16	29.92	1737.37	33.63	1737.33	34.94	1737.34	38.29	1737.09	
38.58	1737.08	39.67	1737	44.3	1736.78	51.69	1736.59	52.32	1736.58	
54.21	1736.85	55.16	1736.98	55.26	1737	59.16	1737.58	62	1738	
66.84	1738.99	66.89	1739	77.66	1739	78.53	1739	79.37	1738.85	
84.3	1738	86.85	1737.57	90.87	1737	97.64	1736.11	98.52	1736	
99.1	1735.95	108.75	1735	133.33	1734.19	138.07	1734.07	141.15	1734	
159.08	1733.64	171.36	1733.44	183.28	1733	226.56	1732.18	229.84	1732.13	
230.2	1732.03	230.89	1731.83	292.04	1716.6	292.07	1716.6	292.1	1716.59	
296.96	1716.44	296.97	1716.44	306.96	1715.44	316.96	1716.44	354.08	1717.56	
354.09	1717.56	355.26	1717.85	401.31	1729.51	401.69	1729.6	402.07	1729.7	
402.19	1729.7	415.74	1730	422.6	1730.27	449.1	1731	454.02	1731.56	
457.51	1731.81	461.01	1732	465.38	1732.44	471.7	1733	472.57	1733.1	
479.57	1734	485.06	1734.47	486.79	1734.4	498.12	1734.85	502.86	1734.75	
507.06	1734.82	511.05	1734.89	517.4	1734.94	521.34	1735	522.66	1735.37	
525.5	1736	527.57	1736.49	529.59	1737	532.37	1737.46	534.67	1738	
537.05	1738	539.79	1738	542.89	1738	543.55	1738	545.63	1738	
546.19	1738	548.04	1737.6	549.93	1737	551.68	1736.69	554.84	1736	
556.41	1735.58	558.36	1735.16	559.04	1735.08	559.42	1735.01	563.64	1735.04	
564.1	1735.04	565.38	1735.01	566.19	1734.99					

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	78.53	.027	534.67	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
78.53	534.67	19.16	47.33	48.12	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.87	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.50	Reach Len. (ft)	19.16	47.33	48.12
Crit W.S. (ft)		Flow Area (sq ft)		1802.76	
E.G. Slope (ft/ft)	0.001156	Area (sq ft)		1802.76	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	221.28	Top Width (ft)		221.28	
Vel Total (ft/s)	7.50	Avg. Vel. (ft/s)		7.50	
Max Chl Dpth (ft)	16.06	Hydr. Depth (ft)		8.15	
Conv. Total (cfs)	397502.2	Conv. (cfs)		397502.2	
Length Wtd. (ft)	47.33	Wetted Per. (ft)		224.79	
Min Ch El (ft)	1715.44	Shear (lb/sq ft)		0.58	
Alpha	1.00	Stream Power (lb/ft s)	566.19	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	351.07	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	49.32	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1125.9

INPUT

Description: "DR" 22+97.34 = 1125.9

Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1735.13	1.84	1735.25	1.91	1735.25	1.94	1735.26	2.91	1735.58
4.81	1735.57	5.87	1735.66	7.79	1735.96	10.54	1736.36	14.91	1736.64
15.52	1736.68	15.9	1736.73	16.56	1736.75	18.25	1736.85	19.38	1736.81
20.32	1736.78	20.51	1736.78	23.57	1736.71	24.2	1736.8	25.66	1737
30.62	1737.78	31.85	1738	34.05	1738	40.44	1738	42.15	1737.75
43.94	1737.63	46.82	1737.58	51.95	1737.49	54.24	1737.89	54.48	1738
58.15	1738.61	60.79	1739	62.57	1739.24	66.29	1739	73.01	1739
75.88	1738.46	78.94	1738	80.31	1737.78	86.31	1737	89.95	1736.37
92.58	1736	101.06	1735.52	113.81	1735	114.03	1735	114.66	1734.98
114.96	1734.98	127.87	1734.83	136.59	1734.78	141.52	1734.68	148.81	1734.6
156.65	1734.35	164.68	1734	172.25	1733.65	184.25	1733	198.07	1732.75
199.68	1732.72	201.56	1732.68	203.88	1732.63	206.73	1732.57	210.55	1732.49
215.36	1732.39	216.41	1732.36	228.32	1732.11	228.38	1732.11	249.22	1726.92
264.62	1723.07	265.38	1722.88	279.76	1719.28	290.57	1716.58	299.11	1716.33
309.1	1715.33	309.11	1715.33	319.11	1716.33	346	1717.12	354.1	1717.36
379.23	1723.8	393.66	1727.53	401.96	1729.62	404.94	1729.74	416.56	1730
419.84	1730.06	421.53	1730.08	426.11	1730.16	472.23	1731	474.33	1731.13
481.9	1731.53	490.21	1732	491.98	1732.25	498.28	1733	501.91	1733.69
504.16	1734	510.21	1734.16	516.7	1734.37	520.13	1734.43	524.81	1734.52
529.09	1734.61	537.43	1734.8	545.28	1735	546.83	1735.31	549.57	1736
552.85	1736.99	552.88	1737	553.02	1737	559.39	1737	562.95	1736.18
563.55	1736	567.9	1735.01	567.93	1735	567.94	1735	567.95	1735
567.96	1734.99	571.23	1734.46	571.31	1734.46	576.66	1734.44	578.94	1734.48

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	62.57	.027	552.88	.031

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	62.57	552.88		20.28	34.32	35.32		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.48	Reach Len. (ft)	20.28	34.32	35.32
Crit W.S. (ft)		Flow Area (sq ft)		1860.87	
E.G. Slope (ft/ft)	0.001221	Area (sq ft)		1860.87	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	250.08	Top Width (ft)		250.08	
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)		7.26	
Max Chl Dpth (ft)	16.15	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	386709.6	Conv. (cfs)		386709.6	
Length Wtd. (ft)	34.32	Wetted Per. (ft)		253.61	
Min Ch El (ft)	1715.33	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)	578.94	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	349.08	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	49.06	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1125.8

INPUT

Description: "DR" 23+31.66 = 1125.8

Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1735.01	.51	1734.98	2.19	1734.92	2.76	1735.21	3.29	1735.48
4.23	1735.55	6.44	1735.66	7.32	1735.78	9.83	1736.17	15.33	1736.54
15.93	1736.61	18.69	1736.78	22.88	1736.63	25.97	1736.56	26.06	1736.56

27.61	1736.8	28.33	1736.92	28.47	1736.94	28.83	1737	29.66	1737.17
33.26	1738	33.83	1738.1	34.33	1738.15	40.77	1738.67	44.53	1738.1
50.99	1737.98	52.68	1737.95	52.77	1737.97	53.05	1738	54.84	1738.35
57.12	1739	60.42	1739.57	62.75	1740	71.55	1740	73.82	1740
76.32	1740	81.26	1739.61	85.69	1739	86.85	1738.88	91.33	1738
91.84	1737.93	103.34	1737.09	104.43	1737.01	104.51	1737.01	104.61	1737
115.48	1736.43	126.32	1736.03	126.6	1736.02	126.88	1736	128.17	1735.92
144.95	1735	151.63	1734.29	155.03	1734	168.78	1733.46	177.6	1733.1
181.1	1733	182.73	1732.97	184.82	1732.93	203.14	1732.62	213.53	1732.45
220.17	1731.02	221.3	1730.77	226.39	1729.59	231.22	1728.48	237.24	1727.08
241.52	1726.07	254.23	1723.08	257.63	1722.27	260.29	1721.63	280.61	1716.76
283.67	1716.66	297.74	1716.24	306.02	1715.41	307.74	1715.24	307.76	1715.24
316.02	1716.07	317.74	1716.24	317.76	1716.24	322.01	1716.37	346.79	1717.11
388.98	1727.83	391.98	1728.6	395.62	1729.56	395.82	1729.59	399.08	1730
407.28	1730.21	446.55	1731	448.63	1731.11	454.72	1731.67	458.03	1731.94
458.63	1732	460.89	1732.13	477.11	1733	482.7	1733.51	490.38	1734
492.97	1734.2	494	1734.24	499.71	1734.22	502.06	1734.26	507.42	1734
510.35	1733.94	512.14	1734	517.95	1734	529.64	1734	532.71	1734.05
533.03	1734.04	537.83	1734.13	541.06	1734.19	547.6	1734.95	547.87	1734.99
547.99	1735	548.05	1735.01	552.93	1736	553.34	1736.11	557.04	1737
559.66	1737	563.91	1737	565.33	1737	566.34	1736.76	568.55	1736
572	1735.05	572.23	1735	573.86	1734.73	574.09	1734.7	575.05	1734.54
575.07	1734.53	577.27	1734.53	577.66	1734.49	591.53	1734.44	591.6	1734.44
591.73	1734.44	591.75	1734.44	591.85	1734.44	591.87	1734.44	591.95	1734.44
591.96	1734.44	591.99	1734.44	592.54	1734.44	594.27	1734.47		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	76.32	.027
		557.04	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	76.32	557.04		10.03	34.32		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.47	Reach Len. (ft)	10.03	34.32	35.64
Crit W.S. (ft)		Flow Area (sq ft)		1906.60	
E.G. Slope (ft/ft)	0.001035	Area (sq ft)		1906.60	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	234.47	Top Width (ft)		234.47	
Vel Total (ft/s)	7.09	Avg. Vel. (ft/s)		7.09	
Max Chl Dpth (ft)	16.23	Hydr. Depth (ft)		8.13	
Conv. Total (cfs)	420188.8	Conv. (cfs)		420188.8	
Length Wtd. (ft)	34.32	Wetted Per. (ft)		237.92	
Min Ch El (ft)	1715.24	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	594.27	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	347.60	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	48.87	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1125.7

INPUT

Description: "DR" 23+65.98 = 1125.7

Station	Elevation	Data	num=	122			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1734.99	1.8	1734.95	2.23	1734.95	2.53	1735.06
5.77	1735.52	6.64	1735.56	7.91	1735.77	10.36	1736.21
12.34	1736.32	13.07	1736.39	14.97	1736.46	16.85	1736.57
19.75	1736.75	21.75	1736.73	22.85	1736.91	23.44	1737
27.82	1738	29.43	1738.26	32.49	1739	33	1739
40.38	1739	42.2	1739	43.48	1738.74	44.29	1738.55
50.55	1738.13	54.28	1738.07	54.7	1738.18	55.99	1738.53
60.87	1739.57	63.46	1740	66.67	1740	70.2	1740
86.42	1740	90.99	1739.52	95.8	1739	99.48	1738.57
109.01	1737.65	116.79	1737	120.94	1736.68	127.09	1736
136.02	1735	136.16	1734.98	143.5	1734	146.94	1733.93
199.27	1732.56	204.56	1732.46	225	1727.41	253.99	1720.25
267.99	1716.95	294.51	1716.16	304.51	1715.16	314.51	1716.16

355.81	1720.88	369.3	1724.64	381.79	1728.48	385.8	1729.65	389.1	1730
389.12	1730	389.16	1730	389.57	1730.02	411.31	1730.86	417.9	1731
447.65	1731.73	453.49	1732	466.24	1732.82	468.94	1733	477.63	1733.99
477.68	1734	490.73	1734.97	491.08	1735	491.53	1735.05	500.73	1736
505.22	1736.55	508.08	1736.87	509.63	1737	511.49	1737	513.45	1737
515.32	1737	516.6	1737	525.49	1737	528.31	1737	530.79	1737
534.09	1736.24	534.84	1736	537.67	1735.4	539.32	1735	540.81	1734.82
541.82	1734.65	545.56	1734.03	551.54	1734.15	553.58	1734.19	554.02	1734.1
557.03	1734	560.99	1734	571.78	1734	584.71	1734	585.33	1734
585.37	1734	586.29	1734.13	588.12	1734.4	588.17	1734.41	590.94	1734.41
592.04	1734.41	595.43	1734.44	595.81	1734.44	598.75	1734.46	598.98	1734.46
600.33	1734.47	605.58	1734.51						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	85.3	.027	509.63	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	85.3	509.63		56.09	34.03		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.46	Reach Len. (ft)	56.09	34.03	11.90
Crit W.S. (ft)		Flow Area (sq ft)		1953.40	
E.G. Slope (ft/ft)	0.000922	Area (sq ft)		1953.40	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	228.16	Top Width (ft)		228.16	
Vel Total (ft/s)	6.92	Avg. Vel. (ft/s)		6.92	
Max Chl Dpth (ft)	16.30	Hydr. Depth (ft)		8.56	
Conv. Total (cfs)	445079.0	Conv. (cfs)		445079.0	
Length Wtd. (ft)	34.03	Wetted Per. (ft)		231.88	
Min Ch El (ft)	1715.16	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)	605.58	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	346.07	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	48.69	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1125.6

INPUT

Description: "DR" 24+00.00 = 1125.6

Station Elevation Data		num=		124	
Sta	Elev	Sta	Elev	Sta	Elev
0	1734.77	1.68	1734.71	2.47	1734.75
4.48	1735.53	4.72	1735.59	5.54	1735.54
6.24	1735.62	7.55	1735.75	8.22	1735.81
12.55	1736.42	13.49	1736.52	15.15	1736.67
17.04	1736.9	17.45	1736.96	17.73	1737
18.27	1737.05	18.42	1737.08	18.47	1737.08
27.87	1738	28.28	1738.12	32.22	1739
45.19	1738.67	45.59	1738.56	46.27	1738.39
55.01	1738.14	55.34	1738.21	58.28	1739
70.81	1738.21	72.09	1738	80.57	1737.36
91.91	1736.23	93.09	1736	94.53	1735.61
117.47	1734	130.08	1733.73	147.55	1733.4
198.15	1732.23	209.45	1729.65	230.55	1724.72
263.71	1717.14	267.15	1716.27	274.02	1716.07
284.05	1715.07	287.04	1715.37	294.05	1716.07
343.28	1723.88	351.63	1726.66	363.22	1730.14
368.11	1730	379.29	1730.81	385.19	1731
428.6	1731.8	436.84	1732	446.34	1732.49
468.51	1734	477.78	1734.69	481.09	1735
500.46	1736	501.13	1736.06	501.94	1736.14
513.77	1737	517.31	1737	520.1	1737
523.84	1736.63	525.83	1736	527.68	1735.61
535.17	1734.08	539.26	1734.16	543.19	1734.24
552.76	1734	556.27	1734	560.06	1734
579.62	1734.29	581.19	1734.55	583.12	1734.56

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 66.56 .027 513.77 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
66.56 513.77 48.61 26 20.16 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.		0.027	
W.S. Elev (ft)	1731.03	Reach Len. (ft)	48.61	26.00	20.16
Crit W.S. (ft)		Flow Area (sq ft)		1606.16	
E.G. Slope (ft/ft)	0.001334	Area (sq ft)		1606.16	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	183.62	Top Width (ft)		183.62	
Vel Total (ft/s)	8.41	Avg. Vel. (ft/s)		8.41	
Max Chl Dpth (ft)	15.96	Hydr. Depth (ft)		8.75	
Conv. Total (cfs)	370003.3	Conv. (cfs)		370003.3	
Length Wtd. (ft)	26.00	Wetted Per. (ft)		187.55	
Min Ch El (ft)	1715.07	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	594.53	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	344.68	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	48.53	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1125.5

INPUT

Description: "DR" 24+26.00 = 1125.5

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1734.69	.56	1734.69	2.32	1734.67	3.15	1735.74	4.14	1736.99
9.9	1737.08	16.39	1737.11	18.69	1737.01	18.73	1737.01	19.45	1736.98
19.83	1736.96	21.59	1737.25	25.17	1737.82	27.5	1738	28.52	1738
33.5	1738	35.18	1738	42.72	1737.52	42.97	1737.5	43.19	1737.5
43.72	1737.48	49.32	1737.28	51.59	1737.2	61.83	1737.89	62.23	1737.91
63.16	1737.98	63.44	1738	64.97	1738.22	70.49	1739	72.39	1739
74.28	1739	80.79	1739	84.68	1738.44	86.67	1738.25	90.54	1738
92.37	1737.9	93.68	1737.58	95.26	1737.16	96.24	1737	98.94	1736.61
104.21	1736	106.28	1735.77	111.73	1735	113.83	1734.41	115.99	1734
125.58	1733.72	136.84	1733.37	144.78	1733	172.03	1732.38	188.36	1732
196.68	1729.86	226.62	1722.16	251.5	1716.01	251.6	1716.01	251.66	1716
261.6	1715.01	271.6	1716.01	301.2	1716.9	301.47	1716.98	301.96	1717.15
302.9	1717.46	326.4	1725.29	337.94	1729.13	341.43	1730.23	343.05	1730.09
343.3	1730.07	343.7	1730.04	343.94	1730.02	344.12	1730	344.58	1730.08
351.47	1731	358.14	1731.31	367.06	1731.64	379.04	1731.76	395.96	1731.87
399.5	1731.93	404.78	1732	416.14	1732	417.6	1732	447.74	1732.73
457.4	1732.82	470.76	1732.97	471.11	1732.98	472.6	1733	479.68	1733.74
481.4	1734	486.7	1734.75	489.58	1735	490.78	1735.07	500.22	1736
506.24	1736.61	509.97	1737	511.88	1737	512.46	1737	514.04	1737
514.73	1736.82	517.2	1736	520.21	1735.4	521.72	1735	523.5	1734.68
524.87	1734.41	526.17	1734.15	531.86	1734.27	534.17	1734.31	540.05	1734.16
546.24	1734.36	551.58	1734.1	552.18	1734.13	557.88	1734.07	558.31	1734.07
558.99	1734.05	568.37	1734.37	568.49	1734.39	570.5	1734.73	575.65	1734.8
576.21	1734.81	584.67	1734.87						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 80.79 .027 509.97 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
80.79 509.97 37.33 24 12.23 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.72	Reach Len. (ft)	37.33	24.00	12.23
Crit W.S. (ft)		Flow Area (sq ft)		1450.58	
E.G. Slope (ft/ft)	0.001519	Area (sq ft)		1450.58	

Q Total (cfs)	13515.00	Flow (cfs)	13515.00		
Top Width (ft)	156.07	Top Width (ft)	156.07		
Vel Total (ft/s)	9.32	Avg. Vel. (ft/s)	9.32		
Max Chl Dpth (ft)	15.71	Hydr. Depth (ft)	9.29		
Conv. Total (cfs)	346769.3	Conv. (cfs)	346769.3		
Length Wtd. (ft)	24.00	Wetted Per. (ft)	160.23		
Min Ch El (ft)	1715.01	Shear (lb/sq ft)	0.86		
Alpha	1.00	Stream Power (lb/ft s)	584.67	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	343.77	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	48.43	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1125.3

INPUT

Description: "DR" 24+50.00 = 1125.3

Station Elevation Data		num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1734.55	.85	1734.51	2.34	1734.42	3.31	1735.81	3.94	1736.65		
12.21	1736.38	14.67	1736.26	14.69	1736.26	14.86	1736.25	14.87	1736.25		
15.54	1736.35	17.35	1736.24	21.32	1736	22.46	1736	34.81	1735.75		
36.83	1735.74	37.96	1735.75	39.57	1735.75	44.14	1735.57	48.12	1735.42		
51.25	1735.84	52.21	1735.97	52.27	1735.98	52.43	1736	53.5	1736.17		
60.58	1737	62.22	1737.18	69.08	1738	70.96	1738	74.91	1738		
76.2	1737.89	81.43	1737	89.69	1736.05	90.27	1736	96.78	1735.39		
99.68	1735	102.06	1734.83	103.85	1734.7	109.45	1734	118.59	1733.48		
128.82	1733	140.23	1732.74	161.42	1732.24	171.41	1732	173.45	1731.91		
179.85	1731.59	185.56	1730	212.12	1722.78	232.21	1715.96	232.22	1715.95		
232.32	1715.95	232.33	1715.95	242.32	1714.95	252.32	1715.95	282.22	1716.85		
318.71	1729	318.72	1729.01	320.26	1729.5	322.39	1730.18	323.03	1730.1		
324.11	1730	326.77	1730.48	330.25	1731	336.15	1731.56	345.47	1732		
350.5	1732.35	358.48	1732.31	369.82	1732.47	378.12	1732.54	381.59	1732.48		
395.32	1732	406.26	1732	411.47	1732	429.74	1732.44	435.59	1732.5		
443.68	1732.59	449.48	1732.64	460.82	1732.81	466.27	1733	470.07	1733		
471.31	1733.19	476.14	1734	478.79	1734.54	479.61	1735	483.46	1735.51		
487.27	1736	491.36	1736.92	491.67	1737	492.16	1737	497.93	1737		
498.42	1737	501.72	1737	504.52	1736.38	505.65	1736	508.19	1735.5		
510.97	1735	512.87	1734.69	514.69	1734.34	515.31	1734.22	516.54	1734.24		
523.32	1734.37	531.45	1734.87	535.02	1735	539.48	1735.52	541.96	1735.68		
544.81	1735.77	546.29	1735.74	549.3	1735.6	554.11	1735	554.2	1735		
558.58	1734.69	558.61	1734.69	558.84	1734.69	570.28	1734.84	574.97	1734.9		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	74.91	.027	491.67	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	74.91	491.67		104.07	50	16.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.38	Reach Len. (ft)	104.07	50.00	16.76
Crit W.S. (ft)		Flow Area (sq ft)		1321.12	
E.G. Slope (ft/ft)	0.001840	Area (sq ft)		1321.12	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	142.00	Top Width (ft)		142.00	
Vel Total (ft/s)	10.23	Avg. Vel. (ft/s)		10.23	
Max Chl Dpth (ft)	15.43	Hydr. Depth (ft)		9.30	
Conv. Total (cfs)	315061.1	Conv. (cfs)		315061.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		146.46	
Min Ch El (ft)	1714.95	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)	574.97	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	343.01	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	48.35	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1125.1

INPUT

Description: "DR" 25+00.00 = 1125.1

Station	Elevation	Data	num=	108						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1734.23	1.92	1734.15	2.92	1734.04	4.36	1735.33	4.41	1735.36	
4.72	1735.35	4.97	1735.33	17.73	1734.69	22.37	1734.46	28.35	1734.24	
30.31	1734.21	32.13	1734.12	32.3	1734.15	32.33	1734.15	32.44	1734.16	
32.66	1734.19	34.18	1734.4	35.37	1734.56	44.15	1734.69	44.37	1734.69	
44.78	1734.7	47.34	1734.12	47.68	1734.03	47.75	1734.01	47.81	1734	
47.93	1733.98	48.14	1733.95	60.25	1733	64.49	1732.88	80.96	1732.46	
96.22	1732	131.89	1731.17	132.29	1731.16	178.2	1715.83	178.21	1715.83	
178.31	1715.83	188.31	1714.83	188.32	1714.83	198.31	1715.83	228.2	1716.72	
228.21	1716.72	265.15	1729.03	265.23	1729.06	267.83	1729.92	268.23	1730.06	
268.24	1730.05	269.34	1730	271.07	1730.28	275.72	1731	279.66	1731.75	
281.39	1732	285.22	1732.67	287.51	1733	289.35	1733	306.84	1733	
323.16	1733	325.02	1733	325.83	1733	335.66	1732.61	349.74	1732.34	
353.55	1732.22	359.69	1732	360.87	1732	370.97	1732	373.4	1732.06	
374.22	1732.07	375.4	1732.08	388.77	1732.22	392.83	1732.28	413.74	1733	
414.64	1733	415.95	1733	417.71	1733	417.97	1733.03	418.15	1733.04	
425.39	1734	428.19	1734.62	429.35	1735	432.33	1735.5	434.84	1735.9	
435.6	1736	436.91	1736.19	441.57	1737	443.63	1737	447.04	1737	
452.06	1737	454.55	1736.5	456.8	1736	460.47	1735.51	463.3	1735	
466.15	1734.54	468.05	1734.28	472.11	1734.36	476.06	1734.44	481.99	1734.87	
484.43	1735	487.75	1735.71	489.15	1736	496.65	1736	506.18	1736	
511.4	1735.12	512.04	1735	512.57	1734.91	513.85	1734.7	515.9	1734.72	
516.38	1734.73	524.04	1734.82	528.95	1734.89					

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	4.97	.027	443.63	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	4.97	443.63		104.53	50	7.67	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.67	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.24	Reach Len. (ft)	104.53	50.00	7.67
Crit W.S. (ft)		Flow Area (sq ft)		1302.66	
E.G. Slope (ft/ft)	0.001823	Area (sq ft)		1302.66	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	135.76	Top Width (ft)		135.76	
Vel Total (ft/s)	10.37	Avg. Vel. (ft/s)		10.37	
Max Chl Dpth (ft)	15.41	Hydr. Depth (ft)		9.60	
Conv. Total (cfs)	316539.3	Conv. (cfs)		316539.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		140.41	
Min Ch El (ft)	1714.83	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	528.95	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	341.50	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	48.19	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1124.8

INPUT

Description: "DR" 25+50.00 = 1124.8

Station	Elevation	Data	num=	124						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1733.99	.18	1734.03	1.52	1734	2.35	1734.43	3	1734.41	
3.01	1734.41	3.06	1734.41	3.33	1734.25	3.55	1734.14	3.6	1734.11	
4.96	1734.08	5.17	1734.07	5.65	1734.06	12.2	1733.94	16.2	1733.72	
17.85	1733.6	19.46	1733.55	19.6	1733.54	23.36	1733.65	24.43	1733.63	
25.77	1733.53	25.78	1733.53	26.75	1733.68	26.78	1733.69	27.11	1733.74	
28.89	1734.04	29.17	1734.08	36.89	1734.24	37.2	1734.24	37.78	1734.36	
40.68	1735	41.93	1735.33	44.69	1736	54.57	1736	54.67	1736	
54.7	1735.99	57.79	1735	61.81	1734.26	63.43	1734	70.53	1733.15	
71.72	1733	71.97	1732.97	79.03	1732	97.24	1731.07	97.9	1731.04	

[illegible]

490.83 1734.71 491.1 1734.72 491.27 1734.72 491.29 1734.72 491.32 1734.72
505.74 1734.92

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 62.63 .027 467.95 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
62.63 467.95 50.64 21.93 6.88 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.08	Reach Len. (ft)	50.64	21.93	6.88
Crit W.S. (ft)		Flow Area (sq ft)		1315.25	
E.G. Slope (ft/ft)	0.001841	Area (sq ft)		1315.25	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	140.26	Top Width (ft)		140.26	
Vel Total (ft/s)	10.28	Avg. Vel. (ft/s)		10.28	
Max Chl Dpth (ft)	15.50	Hydr. Depth (ft)		9.38	
Conv. Total (cfs)	314970.6	Conv. (cfs)		314970.6	
Length Wtd. (ft)	21.93	Wetted Per. (ft)		144.90	
Min Ch El (ft)	1714.58	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)	505.74	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	338.50	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	47.87	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1124.5

INPUT

Description: "DR" 26+21.94 = 1124.5

Station	Elevation	Data	num=	133					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.41	1.3	1733.41	1.84	1733.42	2.32	1733.52	3.32	1733.7
4.66	1733.43	5.29	1733.3	7.6	1733.3	9.31	1733.29	9.5	1733.29
11.16	1733.29	11.23	1733.29	11.73	1733.29	12.06	1733.34	16.01	1734
19.27	1734.69	20.95	1735	32.22	1735	37.61	1735	39.05	1735
40.05	1734.68	42.63	1734.04	48.81	1734.14	51.69	1734.18	53.13	1734.33
54.2	1734.44	56.19	1734.66	59.97	1735	63.16	1735.65	65.08	1736
66.42	1736.23	67.05	1736.29	67.91	1736.29	75.24	1736.21	76.82	1736
78.39	1735.77	83.26	1735	89.53	1734	89.54	1734	89.8	1733.95
94.72	1733.02	94.93	1733	102.59	1732.11	103.3	1732	104.1	1731.9
115.38	1731	139.11	1730.86	139.46	1730.86	140.15	1730.63	141.51	1730.18
176.22	1718.59	185.38	1715.53	185.48	1715.52	195.48	1714.52	195.49	1714.52
205.48	1715.52	235.38	1716.42	273.17	1729.01	274.4	1729.36	274.55	1729.4
275.8	1729.75	276.97	1729.8	281.9	1730	297.21	1730.84	304.49	1731
311.42	1731.15	327.66	1731.12	329.33	1731.09	330.08	1731.08	348.13	1731.04
348.76	1731.03	349.21	1731.02	349.54	1731.02	350.25	1731.03	367.76	1731.09
368.98	1731.12	372.01	1731.22	387.31	1731.46	396.3	1732	399.46	1732.16
401.36	1732.23	414.53	1733	415.41	1733	418.78	1733.72	420.03	1734
421.37	1734	423.54	1734	431.83	1734.41	435	1734.12	435.33	1734.13
435.75	1734.1	440.28	1734.15	440.92	1734.15	442.36	1734.29	446.39	1734.64
448.08	1735	452.69	1735	456.41	1735	458.89	1734.75	462.93	1734.39
470.83	1734.54	470.97	1734.55	471.16	1734.56	481.94	1735	483.1	1735.24
486.05	1736	491.85	1736	493.66	1736.06	493.97	1736	494.4	1735.9
497.95	1735.08	498.33	1735	500.59	1734.65	500.93	1734.6	502.45	1734.62
502.76	1734.62	503.02	1734.63	504.07	1734.64	504.09	1734.64	505.28	1734.66
507.65	1734.69	508.39	1734.7	508.45	1734.7	509.54	1734.72	510.21	1734.72
510.29	1734.73	511.2	1734.74	511.25	1734.74	511.71	1734.75	511.84	1734.75
511.88	1734.75	511.9	1734.75	525.38	1734.93				

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 75.24 .027 486.05 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
75.24 486.05 32.37 28.07 14.33 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.04	Reach Len. (ft)	32.37	28.07	14.33
Crit W.S. (ft)		Flow Area (sq ft)		1317.12	
E.G. Slope (ft/ft)	0.001839	Area (sq ft)		1317.12	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	140.67	Top Width (ft)		140.67	
Vel Total (ft/s)	10.26	Avg. Vel. (ft/s)		10.26	
Max Chl Dpth (ft)	15.52	Hydr. Depth (ft)		9.36	
Conv. Total (cfs)	315144.8	Conv. (cfs)		315144.8	
Length Wtd. (ft)	28.07	Wetted Per. (ft)		145.29	
Min Ch El (ft)	1714.52	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)	525.38	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	337.84	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	47.80	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1124.4

INPUT

Description: "DR" 26+50.00 = 1124.4

Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.29	2.1	1733.35	2.89	1733.5	3.36	1733.61	4.9	1733.26
4.97	1733.25	5.7	1733.25	5.79	1733.25	6.18	1733.24	6.48	1733.24
7	1733.24	7.7	1733.24	8.71	1733.24	11.07	1733.24	13.85	1733.25
14.53	1733.3	15.14	1733.35	17.89	1733.56	17.9	1733.56	18.53	1733.59
19.8	1733.65	22.1	1733.74	24.54	1734	25.76	1734.18	31.05	1735
36.21	1735	37.21	1735	37.34	1734.98	37.46	1734.95	40.81	1734.27
41.03	1734.23	47.18	1734.32	50.21	1734.36	54.67	1734.86	55.5	1734.95
55.93	1735	56.25	1735.06	57.65	1735.25	61.91	1735.87	62.62	1736
63.58	1736.17	68.83	1736.82	70.63	1737	71.67	1737	77.06	1737
85.78	1736.03	85.88	1736.02	86.04	1736	86.09	1736	86.16	1735.99
92.15	1735	99.97	1734.01	100.08	1734	100.24	1733.99	101.46	1733.91
115.56	1733	117.22	1732.81	122.24	1732	125.72	1731.58	130.55	1731
141.6	1730.51	150.4	1730	152.11	1729.79	156.38	1729	160.56	1728.74
166.37	1728	170.22	1727	170.23	1727	170.87	1726.78	172.5	1726.24
204.75	1715.49	204.83	1715.46	204.84	1715.46	204.94	1715.45	214.94	1714.45
224.94	1715.45	224.95	1715.45	254.84	1716.35	254.85	1716.35	292.8	1729
294.37	1729.48	294.41	1729.49	294.54	1729.53	294.7	1729.58	294.89	1729.64
295.03	1729.68	296.22	1729.72	304.22	1730	313.14	1730.31	319.67	1730.34
332.37	1730.59	336.62	1730.64	338.38	1730.64	343.45	1730.64	347.9	1730.56
358.74	1730.54	364.31	1730.42	371.74	1730.46	376.36	1730.38	385.58	1730.55
389.51	1730.62	400.88	1731	406.13	1731.23	409.68	1731.61	412.65	1731.85
414.26	1732	424.79	1732.84	428.23	1733	428.71	1733.05	428.82	1733.05
430.46	1733	434.49	1732.94	438.78	1733	440.71	1733.05	440.98	1733.04
441.28	1733.03	441.54	1733.04	442.57	1733.09	451.56	1733.5	459.11	1734
462.41	1734.11	469.15	1734.45	471.96	1734.51	477.19	1734.61	481.19	1734.88
484.01	1735	487.22	1735.68	488.7	1736	490.92	1736.68	492.38	1737
495.69	1737	498.91	1737	501.66	1736.35	502.63	1736.17	503.79	1736
507.79	1735.28	509.95	1735	511.17	1734.87	512.18	1734.78	513.09	1734.7
513.74	1734.71	515.28	1734.73	515.4	1734.73	515.48	1734.73	515.63	1734.73
515.92	1734.74	517.56	1734.76	517.57	1734.76	517.71	1734.76	517.94	1734.77
519.29	1734.78	519.31	1734.78	519.57	1734.79	519.67	1734.79	520.51	1734.8
520.56	1734.8	520.63	1734.8	520.64	1734.8	525.81	1734.87	527.49	1734.9
527.59	1734.9	528.62	1734.91	532.21	1734.96				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	77.06	.027	492.38	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
77.06	492.38	20.78	50	3.54	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.02	Reach Len. (ft)	20.78	50.00	3.54
Crit W.S. (ft)		Flow Area (sq ft)		1338.66	

E.G. Slope (ft/ft)	0.001969	Area (sq ft)	1338.66		
Q Total (cfs)	13515.00	Flow (cfs)	13515.00		
Top Width (ft)	154.81	Top Width (ft)	154.81		
Vel Total (ft/s)	10.10	Avg. Vel. (ft/s)	10.10		
Max Chl Dpth (ft)	15.57	Hydr. Depth (ft)	8.65		
Conv. Total (cfs)	304598.6	Conv. (cfs)	304598.6		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	159.23		
Min Ch El (ft)	1714.45	Shear (lb/sq ft)	1.03		
Alpha	1.00	Stream Power (lb/ft s)	532.21	0.00	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	336.98	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.40	47.70	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1124.2

INPUT

Description: "DR" 27+00.00 = 1124.2

Station	Elevation	Data	num=	167						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1733.26	2.18	1733.3	2.22	1733.3	2.33	1733.32	3.38	1733.57	
3.51	1733.54	5.06	1733.35	7.68	1733.32	9.55	1733.31	9.68	1733.31	
9.83	1733.31	11.18	1733.3	12.18	1733.29	12.29	1733.29	12.55	1733.29	
13.96	1733.27	15.08	1733.26	15.57	1733.26	17.6	1733.59	20.16	1734	
23.39	1734.74	24.67	1735	26.45	1735	31.12	1735	32.94	1735	
34.99	1735	36.79	1734.65	37.41	1734.53	38.3	1734.35	42.68	1734.43	
42.85	1734.43	44.56	1734.46	47.2	1734.5	47.9	1734.58	50.62	1734.87	
51.77	1735	54.67	1735.52	59.31	1736	61.11	1736	67.04	1736	
68.96	1735.92	78.94	1735	82.45	1734.76	84.79	1734.59	91.13	1734	
94.2	1733.76	102.29	1733.41	106.25	1733.18	110.2	1733	113.36	1732.82	
117.88	1732.53	123.47	1732	130.87	1731.27	133.19	1731	139.26	1730.57	
146.32	1730	148.98	1729.85	155.78	1729	162.44	1728.61	174.94	1728.08	
175.72	1728.04	176.65	1728	177.15	1727.89	180.79	1727	182.84	1726.5	
184.94	1726	190.09	1725.09	190.47	1725	190.69	1724.95	192	1724.66	
194.68	1724	195.25	1723.81	197.7	1723	198.73	1722.66	200.71	1722	
202.08	1721.55	202.95	1721	204.99	1720.58	206.75	1720	209.77	1719.55	
210.71	1719.35	222.72	1715.39	222.84	1715.35	223.48	1715.33	223.5	1715.33	
233.5	1714.33	243.5	1715.33	273.21	1716.22	273.22	1716.22	273.31	1716.25	
301.22	1725.51	304.77	1725	307.26	1725.81	307.85	1726	310.48	1726.85	
310.94	1727	311.56	1727.2	313.54	1727.86	313.96	1728	314.69	1728.24	
318.66	1729	320.56	1729.1	324.74	1729.27	336.34	1729.74	343.81	1730	
347.04	1730	358.05	1730.15	366.72	1730.12	369.25	1730.15	378.74	1730.12	
381.65	1730.2	383.62	1730.22	388.71	1730.13	391.81	1730.19	398.99	1730.32	
414.78	1730.85	416.78	1730.92	418.87	1731	425.71	1731.57	430.29	1732	
437.24	1732.56	439.89	1732.69	443.75	1732.63	448.53	1732.7	456.68	1733	
457.36	1733.03	458.96	1733.14	469.35	1733.82	471.32	1734	472.92	1734.1	
480.26	1734.47	486.01	1734.58	488.31	1734.63	488.79	1734.66	492.43	1734.82	
495.92	1734.98	496.86	1735	501.04	1735.93	501.3	1736	501.69	1736.08	
506.14	1737	509.73	1737	511.67	1737	512.78	1736.8	517.54	1736.09	
518.01	1736.02	518.15	1736	523.9	1735.29	526.25	1735.09	527.21	1735	
529.43	1734.78	529.46	1734.78	529.61	1734.78	529.62	1734.78	531.14	1734.8	
531.15	1734.8	531.25	1734.8	531.36	1734.8	532.3	1734.81	532.32	1734.81	
532.4	1734.82	532.41	1734.82	535.33	1734.86	537.18	1734.88	537.28	1734.88	
538.41	1734.9	543.51	1734.97							

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	68.96	.027
		506.14	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	68.96	506.14		27.02	21.29	38.82	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.13	Reach Len. (ft)	27.02	21.29	38.82
Crit W.S. (ft)		Flow Area (sq ft)		1485.80	
E.G. Slope (ft/ft)	0.002153	Area (sq ft)		1485.80	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	216.85	Top Width (ft)		216.85	
Vel Total (ft/s)	9.10	Avg. Vel. (ft/s)		9.10	

Max Chl Dpth (ft)	15.80	Hydr. Depth (ft)	6.85		
Conv. Total (cfs)	291246.2	Conv. (cfs)	291246.2		
Length Wtd. (ft)	21.29	Wetted Per. (ft)	221.03		
Min Ch El (ft)	1714.33	Shear (lb/sq ft)	0.90		
Alpha	1.00	Stream Power (lb/ft s)	543.51	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	335.36	0.02
C & E Loss (ft)	0.11	Cum SA (acres)	0.40	47.49	0.06

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1124.1

INPUT

Description: "DR" 27+21.30 = 1124.1

Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.3	1.79	1733.27	2.62	1733.28	2.83	1733.33
4.07	1733.68	4.87	1733.35	6.36	1733.34	6.48	1733.34
11.02	1733.31	14.42	1733.88	15.13	1734	17.48	1734.39
23.01	1735	26.37	1735	28.66	1735	32.34	1735
35.68	1734.3	35.88	1734.26	36.62	1734.27	36.83	1734.28
44.76	1734.43	47.27	1734.67	51.6	1734.84	52.07	1734.87
58.7	1734.88	69.27	1734	70.65	1733.91	77.89	1733.55
88.95	1732.83	94.85	1732.64	105.85	1732.25	112.67	1732
123.49	1731.49	129.67	1731	139.27	1730.32	143.23	1730
161.03	1729.09	161.76	1729	166.65	1728.72	179.91	1728
183.92	1727	186.44	1726.37	186.99	1726.24	187.94	1726
192	1725	195.23	1724.2	196.05	1724	198.72	1723.12
202.04	1722.03	202.14	1722	203.03	1721.71	205.22	1721.07
208.29	1720.17	208.87	1720	222.41	1719.44	223.39	1719.4
235.36	1715.47	235.67	1715.37	238.65	1715.28	248.65	1714.28
258.67	1715.28	286.62	1716.12	286.7	1716.14	287	1716.24
314.71	1725.46	315.43	1725.38	323.29	1725	325.52	1725.74
326.38	1726	329.58	1726.97	329.66	1727	330.97	1727.4
332.9	1728	344.39	1728.6	352.04	1728.66	360.11	1728.78
373.98	1729.07	381.85	1729.27	408.14	1730	412.99	1730.17
438.37	1731	440.86	1731.27	446.72	1732	453.25	1732.82
460.48	1733.63	463.29	1733.92	464.01	1734	464.84	1734.04
472.26	1734.28	476.06	1734.36	480.39	1734.45	483.88	1734.75
489.24	1735.75	490.6	1736	491.86	1736.22	496.18	1737
509.03	1737	510.81	1736.53	512.64	1736	515.25	1735.51
519.48	1734.8	520.34	1734.65	520.59	1734.66	520.74	1734.66
528.56	1734.78	529.83	1734.8	529.84	1734.8	530.06	1734.8
531.63	1734.83	531.74	1734.83	535.01	1734.89	536.83	1734.85

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	58.7	.027	496.18	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	58.7	496.18		29.15	39.28		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.34	Reach Len. (ft)	29.15	39.28	73.65
Crit W.S. (ft)		Flow Area (sq ft)		1752.79	
E.G. Slope (ft/ft)	0.001728	Area (sq ft)		1752.79	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	279.27	Top Width (ft)		279.27	
Vel Total (ft/s)	7.71	Avg. Vel. (ft/s)		7.71	
Max Chl Dpth (ft)	16.06	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	325147.3	Conv. (cfs)		325147.3	
Length Wtd. (ft)	39.28	Wetted Per. (ft)		283.24	
Min Ch El (ft)	1714.28	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)	536.83	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	334.57	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	47.37	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1123.8

INPUT

Description: "DR" 27+60.58 = 1123.8

Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.29	.02	1733.29	1.01	1733.25	1.73	1733.6	1.84	1733.65
2.28	1733.54	2.53	1733.46	2.83	1733.5	3.05	1733.5	3.49	1733.48
3.61	1733.48	3.63	1733.48	3.72	1733.48	4.15	1733.47	5.57	1733.46
6.68	1733.45	9.07	1733.79	10.56	1734	11.14	1734.09	16.95	1735
17.59	1735	28.41	1735	29.78	1734.7	31.3	1734.25	38.79	1734.39
39.66	1734.4	43.46	1734.32	57.59	1734	61.9	1733.64	69.15	1733
73.64	1732.63	82.03	1732	99.08	1731.38	105.53	1731.17	109.57	1731
130.15	1730.46	141.69	1730.16	150.36	1730	168.12	1729.36	173.82	1729.18
178.1	1729	190.17	1728.49	191.99	1728.41	200.61	1728	201.81	1727.71
204.69	1727	205.75	1726.74	208.77	1726	209.7	1725.77	212.85	1725
213.64	1724.81	218.42	1724	218.82	1723.87	221.59	1723	221.85	1722.92
224.75	1722	224.88	1721.96	227.82	1721.03	227.91	1721	227.92	1721
230.92	1720	231.67	1719.91	236.79	1719.44	242.82	1717.49	249.17	1715.43
251.79	1715.36	257.93	1715.18	267.34	1714.25	268.03	1714.18	268.04	1714.18
268.58	1714.24	278.03	1715.18	279.14	1715.21	299.99	1715.84	301.24	1716.25
305.51	1717.67	323.07	1723.5	328.18	1725.19	331.93	1725.13	342.6	1725.01
343.73	1725	345.21	1725.49	346.77	1726	348.18	1726.47	349.8	1727
351.16	1727.44	352.84	1728	366.48	1728.84	369.99	1729	374.26	1729.24
385.65	1730	392.17	1730.3	409.9	1731	410.54	1731.06	420.8	1732
429.89	1732.87	431.1	1733	431.99	1733.08	434.28	1733.31	440.42	1734
441.52	1734.27	444.29	1735	448.5	1735.59	451.25	1735.76	455.06	1735.69
458.35	1735.45	460.82	1735	463.57	1734.42	465.74	1734	468.63	1733.95
471.55	1733.89	478.68	1734.03	479.57	1734.05	479.72	1734.05	489.39	1734.81
492.73	1735	496.4	1735.59	499.06	1736	500.5	1736.17	500.74	1736.17
506.97	1736.31	510.13	1736.13	511.23	1736	515.76	1735.33	517.59	1735
520.95	1734.44	522.64	1734.16	523.01	1734.19	523.13	1734.19	527.21	1734.49
528.08	1734.72	528.3	1734.67	528.43	1735	530.62	1734.96	533.67	1734.89

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	28.41	.027	506.97	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	28.41	506.97		30.24 39.43	36.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.07	Wt. n-Val.		0.027	
W.S. Elev (ft)	1730.10	Reach Len. (ft)	30.24	39.43	36.18
Crit W.S. (ft)		Flow Area (sq ft)		1624.54	
E.G. Slope (ft/ft)	0.001853	Area (sq ft)		1624.54	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	242.96	Top Width (ft)		242.96	
Vel Total (ft/s)	8.32	Avg. Vel. (ft/s)		8.32	
Max Chl Dpth (ft)	15.92	Hydr. Depth (ft)		6.69	
Conv. Total (cfs)	313923.1	Conv. (cfs)		313923.1	
Length Wtd. (ft)	39.43	Wetted Per. (ft)		246.91	
Min Ch El (ft)	1714.18	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	533.67	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	333.04	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	47.13	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1123.6

INPUT

Description: "DR" 28+00.00 = 1123.6

Station Elevation Data num= 149

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
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0	1733.21	1.17	1733.38	2.51	1733.86	5	1733.8	7.67	1733.72
7.69	1733.73	7.73	1733.74	7.92	1733.77	8.42	1733.85	8.73	1733.9
9.33	1734	10.52	1734.22	15.06	1735	26.69	1735	26.96	1735
27.11	1734.97	30.52	1734.37	36.15	1734.47	38.75	1734.52	40.78	1734.66
44.53	1735	48.03	1735.34	50.81	1735.51	53.25	1735.48	55.11	1735.44
59.38	1735.03	59.46	1735.01	59.59	1735	68.03	1734.05	68.34	1734
74.84	1733.12	75.69	1733	80.51	1732.55	85.72	1732.09	86.93	1732
91.13	1731.84	113.72	1731	127.74	1730.72	152.95	1730.15	172.18	1730
173.77	1729.95	175.64	1729.87	188.87	1729.38	195.64	1729	204.16	1728.55
209.82	1728.19	211.44	1728	212.39	1727.81	215.61	1727	216.7	1726.76
219.72	1726	220.9	1725.71	223.72	1725	225.17	1724.64	227.72	1724
229.72	1723.5	231.74	1723	235.12	1722.16	235.78	1722	238.67	1721.11
238.96	1721.02	238.98	1721.01	239.02	1721	239.3	1720.91	239.36	1720.89
239.41	1720.87	242.02	1720	242.27	1719.92	242.31	1719.9	242.73	1719.76
243.8	1719.41	243.86	1719.38	244.18	1719.28	251.25	1716.92	252.17	1716.62
255.87	1715.38	265.45	1715.09	265.82	1715.08	266.19	1715.05	275.82	1714.08
276.19	1714.12	285.82	1715.08	286.56	1715.11	305.89	1715.69	306.06	1715.74
331.27	1724.14	332.51	1724.56	333.86	1725	334.08	1725.02	334.39	1725.08
335.6	1725.23	338.94	1725.61	342.61	1726	344.67	1726.68	345.66	1727
347.61	1727.64	348.7	1728	353.78	1728.52	357.86	1729	360.94	1729.64
362.98	1730	364	1730.13	365.4	1730.25	377.02	1731	384.9	1731.34
396.53	1732	402.87	1732.51	408.24	1733	410.43	1733.21	414.7	1733.59
418.09	1733.86	420.36	1734	425.39	1734.4	430.95	1734.78	432.78	1734.87
435.37	1735	439.01	1735.17	439.9	1735.22	444.65	1735.75	446.32	1735.93
446.95	1736	454.44	1736	454.86	1736	459.12	1735.08	459.68	1735
459.77	1734.98	464.27	1734	466.94	1733.86	468.31	1733.73	469.37	1733.63
476.01	1733.77	477.46	1733.8	478.03	1733.71	481.15	1733.58	487.53	1733.2
490.83	1733.15	492.26	1733.18	499.35	1733.16	500.5	1733.15	516.66	1733.8
518.36	1733.88	519.84	1734.12	520.99	1734.22	522.24	1734.33	524.43	1734.52
525.88	1734.63	526.08	1734.68	531.28	1734.75	531.42	1734.75		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	53.25	.027	446.95	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	53.25	446.95		48.52	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.62	Reach Len. (ft)	48.52	50.00	52.50
Crit W.S. (ft)		Flow Area (sq ft)		1403.93	
E.G. Slope (ft/ft)	0.002015	Area (sq ft)		1403.93	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	178.55	Top Width (ft)		178.55	
Vel Total (ft/s)	9.63	Avg. Vel. (ft/s)		9.63	
Max Chl Dpth (ft)	15.54	Hydr. Depth (ft)		7.86	
Conv. Total (cfs)	301069.7	Conv. (cfs)		301069.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		182.52	
Min Ch El (ft)	1714.08	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)	531.42	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	331.67	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	46.94	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1123.4

INPUT

Description: "DR" 28+50.00 = 1123.4

Station Elevation Data		num=		145	
Sta	Elev	Sta	Elev	Sta	Elev
0	1733.06	.23	1733.06	2.25	1733.17
7.12	1733.09	8	1733.11	8.49	1733.05
9.05	1733.18	9.26	1733.22	9.28	1733.22
13.94	1734	14.08	1734.04	18.09	1735
29.57	1734.71	31.39	1734.41	35.91	1734.5
42.07	1735	44.35	1735.43	47.85	1736
70.47	1737	71.8	1737	76.06	1736.33
79.33	1735.85	86.14	1735	87.24	1734.82
				90.28	1734
				91.15	1733.81

Station	Elevation	Data	num=		121					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1733.14	1.71	1733.24	3.56	1733.23	4.93	1733.09	4.96	1733.08	
5.33	1733.04	7.2	1733.34	8.31	1733.51	11.64	1734	14.62	1734.23	
20.54	1734.05	22.74	1734.06	27.01	1734.07	27.65	1734.08	28.02	1734.08	
28.14	1734.08	28.54	1734.08	34.6	1734.18	36.94	1734.38	39.84	1734.49	
44.9	1735	48.07	1735.47	52.41	1736	56.64	1736.56	59.2	1736.61	
61.55	1736.76	62.93	1736.76	65.44	1736.63	73.64	1736	77.04	1735.69	
82.49	1735	87.09	1734.47	90.32	1734	95.42	1733.33	97.7	1733	
103.46	1732.3	105.79	1732	106.75	1731.97	108.77	1731.92	124.88	1731.5	
142.58	1731.02	143.44	1731	150.44	1731	168.76	1730.56	169.55	1730.54	
170.02	1730.5	174.46	1730.27	178.31	1730.09	179.37	1730.04	179.9	1730	
183.39	1729.17	184.13	1729	184.27	1728.98	189.93	1728	194.16	1727.53	
199.78	1727	205.43	1726.68	205.69	1726.67	251.67	1715.18	251.69	1715.17	
262.96	1714.84	272.96	1713.84	282.96	1714.84	282.97	1714.84	301.38	1715.39	
302.48	1715.66	317.29	1719.37	317.43	1719.4	320.05	1720.01	324.05	1721.01	
328.05	1722.01	330.38	1722.64	332.02	1723	332.99	1723.24	336.05	1724	
337.11	1724.26	339.73	1724.9	340.16	1725	343.15	1725.72	344.31	1726	
346.33	1726.49	348.45	1727	349.14	1727.17	350.11	1727.4	352.5	1727.95	

352.7	1728	356.48	1728.88	357.02	1729	360.45	1729.79	361.34	1730
367.3	1730.49	373.13	1731	399.47	1731.84	405.3	1732	410.31	1732.37
414.18	1732.61	416.52	1732.71	418.33	1732.76	422.79	1732.81	427.05	1732.83
430.59	1733	438.84	1733	447.73	1733	449.79	1732.91	450.6	1732.89
453.42	1732.96	458.69	1733.08	459.58	1733	473.41	1732.93	488.38	1732.92
492.71	1732.99	492.94	1733	494.21	1733	496.68	1733.19	499.14	1733.43
501.38	1733.66	504.39	1734.04	506.39	1734.34	506.81	1734.4	508.59	1734.7
513.63	1734.63								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	62.93	.027	508.59	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	62.93	508.59		52.92	50	52.27	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.71	Reach Len. (ft)	52.92	50.00	52.27
Crit W.S. (ft)		Flow Area (sq ft)		1607.98	
E.G. Slope (ft/ft)	0.001281	Area (sq ft)		1607.98	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	178.98	Top Width (ft)		178.98	
Vel Total (ft/s)	8.40	Avg. Vel. (ft/s)		8.40	
Max Chl Dpth (ft)	15.87	Hydr. Depth (ft)		8.98	
Conv. Total (cfs)	377562.7	Conv. (cfs)		377562.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		182.46	
Min Ch El (ft)	1713.84	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)	513.63	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	328.22	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.40	46.55	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1122.8

INPUT

Description: "DR" 29+50.00 = 1122.8

Station	Elevation	Data	num=	127					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.44	1.95	1733.42	4.45	1733.39	8.59	1733.21	16.14	1732.89
19.44	1732.79	21.31	1732.72	23.4	1732.65	27.35	1732.53	27.36	1732.53
27.74	1732.58	29.23	1732.53	29.27	1732.53	30	1732.52	36.68	1732.31
38.65	1732.4	40.57	1732.52	49.16	1732.82	51.85	1732.94	53.29	1732.95
53.95	1732.91	60.6	1732.82	64.3	1732.57	68.79	1732.33	71.59	1732
79.43	1731.01	79.49	1731	79.52	1731	88.74	1730	101.71	1730
109.21	1730	113.02	1730.68	115.15	1731	115.6	1731	119.79	1731
145.46	1731	145.76	1731	146.12	1730.97	154.42	1730	156.79	1729.59
159.37	1729	161.05	1728.56	162.97	1728	170.39	1727.38	173.64	1727
182.99	1726.59	184.4	1726.53	191.47	1724.76	230.33	1715.05	230.42	1715.03
230.44	1715.03	240.86	1714.71	250.86	1713.71	260.86	1714.71	279.83	1715.28
279.84	1715.28	279.85	1715.28	295.85	1719.28	312.21	1719.83	314.37	1719.91
318.01	1720	321.63	1720.85	322.28	1721	325.68	1721.8	326.55	1722
329.75	1722.75	330.81	1723	333.83	1723.71	335.08	1724	337.92	1724.66
339.35	1725	342.02	1725.62	343.62	1726	346.12	1726.59	347.89	1727
350.23	1727.55	352.15	1728	354.35	1728.51	356.42	1729	358.48	1729.48
360.69	1730	371.26	1730.69	374.92	1731	388.61	1731.65	393.12	1732
399.73	1732	414.96	1732	415.91	1731.97	418.13	1731.91	419.73	1731.87
420.35	1731.88	427.84	1732.05	428.22	1732.02	428.43	1732	440.55	1731.98
444.8	1731.98	445.69	1731.99	446.93	1732	447.24	1732	448.98	1732.06
449.1	1732.07	449.28	1732.1	449.48	1732.14	449.62	1732.12	452.24	1732.28
453.62	1732.31	457.33	1732.42	459.16	1732.83	460.82	1733.06	462.82	1733.08
463.86	1733	465.68	1733.19	469.01	1733.16	471.17	1733.41	475.28	1733.87
477.81	1734.12	478.42	1734.27	479.39	1734.61	479.99	1734.39	480.03	1734.34
481.58	1734.35	481.62	1734.34	481.79	1734.37	482.23	1734.39	483.37	1734.39
483.45	1734.39	484.69	1734.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	53.29	.027	477.81	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
53.29	477.81	57.81	50	52.17	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.85	Reach Len. (ft)	57.81	50.00	52.17
Crit W.S. (ft)		Flow Area (sq ft)		1868.12	
E.G. Slope (ft/ft)	0.000927	Area (sq ft)		1868.12	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	204.81	Top Width (ft)		204.81	
Vel Total (ft/s)	7.23	Avg. Vel. (ft/s)		7.23	
Max Chl Dpth (ft)	16.14	Hydr. Depth (ft)		9.12	
Conv. Total (cfs)	443845.3	Conv. (cfs)		443845.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		208.26	
Min Ch El (ft)	1713.71	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	484.69	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	326.23	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	46.33	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1122.6

INPUT

Description: "DR" 30+00.00 = 1122.6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.39	.64	1733.38	1.51	1733.38	6.66	1733	8.66	1732.86
9.15	1732.85	10.47	1732.82	12.11	1732.75	12.75	1732.73	18.69	1732.39
22.23	1732.19	25.25	1732.15	28.28	1732.13	44.68	1732.48	50.91	1732.22
53.69	1732.28	67.22	1732	69.6	1731.93	70.22	1731.92	72.14	1731.81
82.04	1731.25	86.48	1731	88.08	1730.9	93.92	1730.38	103.34	1730
107.76	1729.67	114.43	1729	116.06	1728.83	121.7	1728	121.99	1727.99
136.41	1727	140.61	1726.87	154.79	1726.34	163.13	1724.26	200.76	1714.86
200.84	1714.84	209.06	1714.59	219.06	1713.59	229.06	1714.59	250.07	1715.22
250.08	1715.22	250.09	1715.22	266.11	1719.22	287.19	1719.76	295.13	1720
295.71	1720.14	299.29	1721	299.79	1721.12	303.46	1722	303.88	1722.1
307.63	1723	307.98	1723.08	311.8	1724	312.07	1724.07	315.97	1725
316.18	1725.05	320.14	1726	320.28	1726.03	324.31	1727	324.39	1727.02
328.48	1728	328.5	1728	329.97	1728.36	332.54	1729	332.58	1729.01
336.55	1730	337.34	1730.03	369.65	1731	376.86	1731.13	377.44	1731.14
378.67	1731.16	385.67	1731.32	385.79	1731.34	387.54	1731.63	388.27	1731.75
392.54	1731.82	399.59	1731.91	399.76	1731.91	400.04	1731.91	400.25	1731.91
410.84	1731.89	415.86	1731.95	416.78	1731.98	417.1	1731.99	417.73	1732.03
428.03	1732.43	431.17	1732.72	437.62	1733.86	439.96	1734.14	440.9	1734.32
442.54	1734.38	446.46	1734.4						

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	44.68	.027
		446.46	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
44.68	446.46	44.39	43.1	44.86	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.88	Reach Len. (ft)	44.39	43.10	44.86
Crit W.S. (ft)		Flow Area (sq ft)		1994.88	
E.G. Slope (ft/ft)	0.000872	Area (sq ft)		1994.88	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	231.10	Top Width (ft)		231.10	
Vel Total (ft/s)	6.77	Avg. Vel. (ft/s)		6.77	
Max Chl Dpth (ft)	16.29	Hydr. Depth (ft)		8.63	
Conv. Total (cfs)	457549.9	Conv. (cfs)		457549.9	
Length Wtd. (ft)	43.10	Wetted Per. (ft)		234.47	
Min Ch El (ft)	1713.59	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)	446.46	0.00	0.00

Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	324.01	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	46.08	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1122.4

INPUT

Description: "DR" 30+43.11 = 1122.4

Station Elevation Data		num=		110					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.64	3.57	1732.62	3.61	1732.62	3.62	1732.63	5.9	1732.69
6	1732.68	7.28	1732.47	8.32	1732.3	13.76	1732.19	16.36	1732.13
19.85	1732.42	29.31	1733	41.57	1733	46.28	1733	57.76	1733
89.96	1733	90.87	1733	91.3	1732.94	97.89	1732	100.98	1731.79
104.18	1731.6	112.54	1731	119.03	1730.23	121.17	1730	122.16	1729.8
125.84	1729	127.35	1728.67	130.79	1728	135.45	1727.37	138.03	1727
142.23	1726.31	143.11	1726.17	188.97	1714.71	189.1	1714.68	189.12	1714.67
195.43	1714.48	198.54	1714.17	205.43	1713.48	215.42	1714.48	215.43	1714.48
215.44	1714.48	238.94	1715.19	239.11	1715.23	253.87	1718.92	254.95	1719.19
255.34	1719.23	257.12	1719.43	266.33	1720	269.21	1720.66	270.66	1721
273.36	1721.62	274.98	1722	277.51	1722.58	279.31	1723	281.67	1723.54
283.64	1724	285.81	1724.5	287.96	1725	289.96	1725.46	292.29	1726
294.1	1726.42	296.61	1727	298.24	1727.38	300.94	1728	302.38	1728.33
305.26	1729	306.52	1729.29	309.59	1730	311.56	1730.46	312.86	1730.63
317.01	1730.99	317.18	1731	318.34	1731	327.7	1731	329.8	1731
334.56	1731	352	1731	352.27	1731.08	352.41	1731.13	353.6	1731.43
357.6	1731.52	361.77	1731.62	362.46	1731.73	362.91	1731.81	363.1	1731.8
363.25	1731.8	366.98	1731.66	367.02	1731.66	367.47	1731.65	369.92	1731.63
374.12	1731.58	382.73	1731.55	388.06	1731.58	393.71	1731.55	395.59	1731.55
399.58	1731.39	400	1731.39	400.77	1731.42	408.3	1731.97	411.46	1732.49
412.72	1732.75	414.99	1733.09	421.06	1734.02	422.28	1734.1	422.94	1734.18
422.95	1734.2	424.89	1734.29	425.42	1734.3	426.62	1734.32	427.61	1734.35

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	91.3	.027	427.61	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	91.3	427.61		57.63	56.9	57.21	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.57	Reach Len. (ft)	57.63	56.90	57.21
Crit W.S. (ft)		Flow Area (sq ft)		1718.46	
E.G. Slope (ft/ft)	0.001068	Area (sq ft)		1718.46	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	184.47	Top Width (ft)		184.47	
Vel Total (ft/s)	7.86	Avg. Vel. (ft/s)		7.86	
Max Chl Dpth (ft)	16.08	Hydr. Depth (ft)		9.32	
Conv. Total (cfs)	413588.1	Conv. (cfs)		413588.1	
Length Wtd. (ft)	56.90	Wetted Per. (ft)		187.91	
Min Ch El (ft)	1713.48	Shear (lb/sq ft)		0.61	
Alpha	1.00	Stream Power (lb/ft s)	427.61	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	322.17	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	45.87	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1122.2

INPUT

Description: "DR" 31+00.00 = 1122.2

Station Elevation Data		num=		91					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732	2.18	1732.18	2.43	1732.21	2.95	1732.12	3.64	1732
10.01	1731.88	11.65	1731.84	17.44	1732.12	36.08	1733	56.19	1733

[illegible]

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 83.17 .027 407.13 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 83.17 407.13 50.03 50 50.04 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.33	Reach Len. (ft)	50.03	50.00	50.04
Crit W.S. (ft)		Flow Area (sq ft)		1645.40	
E.G. Slope (ft/ft)	0.001205	Area (sq ft)		1645.40	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	181.02	Top Width (ft)		181.02	
Vel Total (ft/s)	8.21	Avg. Vel. (ft/s)		8.21	
Max Chl Dpth (ft)	16.11	Hydr. Depth (ft)		9.09	
Conv. Total (cfs)	389331.5	Conv. (cfs)		389331.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		184.56	
Min Ch El (ft)	1713.22	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)	410.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	318.11	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	45.43	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1121.6

INPUT

Description: "DR" 32+00.00 = 1121.6

Station Elevation Data		num= 106	
Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 1731.11	.24 1731.11	.76 1731.12	3.12 1731.14
3.55 1731.15	3.77 1731.16	4.34 1731.18	4.48 1731.18
4.88 1731.13	4.97 1731.11	6.79 1731.08	12.98 1730.95
19.34 1731.56	23.81 1732	26.14 1732.47	28.93 1733
92.07 1733	94.39 1732.57	97.68 1732	103.02 1731.04
103.44 1730.95	108.24 1730	112.36 1729.31	114.16 1729
118.33 1728	121.81 1727.05	122.02 1727	130.99 1726.01
131.18 1725.98	131.97 1725.78	172.87 1715.55	177.97 1714.28
184.07 1714.09	194.06 1713.09	204.06 1714.09	227.97 1714.81
244.72 1719	244.74 1719	257.15 1720	258.02 1720.19
261.98 1721.08	264.59 1721.67	265.88 1721.95	266.13 1722
270.72 1723	273.55 1723.62	275.31 1724	277.38 1724.45
281.2 1725.28	284.5 1726	285.01 1726.11	287.47 1726.65
289.07 1727	292.09 1727.66	293.62 1728	295.65 1728.44
299.3 1729.25	302.73 1730	303.28 1730.07	305.68 1730.27
313.43 1731	317.49 1731.66	320.53 1732	324.57 1732.44
340.31 1733.3	342.29 1733.36	345.01 1733.45	346.6 1733.48
354.51 1733.36	358.54 1732.68	358.66 1732.68	358.69 1732.68
376.83 1732.09	381.07 1731.67	383.23 1731.53	387.13 1731.28
389.12 1731.21	391.52 1731.14	391.75 1731.17	394.27 1731.35
399.96 1732.45	404.59 1733.52	405.52 1733.83	406.28 1734.1
409.94 1733.92			408.04 1733.99

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 92.07 .027 406.28 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 92.07 406.28 50.04 50 50.29 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.37	Reach Len. (ft)	50.04	50.00	50.29
Crit W.S. (ft)		Flow Area (sq ft)		1766.36	
E.G. Slope (ft/ft)	0.000998	Area (sq ft)		1766.36	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	

Top Width (ft)	187.88	Top Width (ft)	187.88		
Vel Total (ft/s)	7.65	Avg. Vel. (ft/s)	7.65		
Max Chl Dpth (ft)	16.28	Hydr. Depth (ft)	9.40		
Conv. Total (cfs)	427769.3	Conv. (cfs)	427769.3		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	191.35		
Min Ch El (ft)	1713.09	Shear (lb/sq ft)	0.58		
Alpha	1.00	Stream Power (lb/ft s)	409.94	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	316.16	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	45.22	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1121.4

INPUT

Description: "DR" 32+50.01 = 1121.4

Station	Elevation	Data	num=	121					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1730.52	2.46	1730.61	2.47	1730.61	2.48	1730.61	2.5	1730.61
5.6	1730.61	5.61	1730.61	5.68	1730.61	5.77	1730.61	5.89	1730.62
6.63	1730.5	6.96	1730.44	8.17	1730.42	15	1730.28	16.26	1730.35
26.27	1731	35.17	1731.98	35.33	1732	35.55	1732.03	42.7	1733
49.68	1733	55.37	1733	66.34	1733	84.7	1733	85.31	1733
87.71	1733	90.48	1733	90.91	1732.97	91.53	1732.86	96.23	1732
100.57	1731.27	102.02	1731	102.45	1730.92	102.82	1730.83	105.65	1730
109.84	1729.27	111.16	1729	113.29	1728.73	119.79	1728	121.13	1727.7
123.24	1727	128.58	1726	128.59	1726	128.74	1725.96	129.98	1725.65
130.04	1725.64	170.88	1715.43	175.95	1714.16	175.97	1714.15	175.98	1714.15
182.03	1713.97	192.03	1712.97	202.03	1713.97	225.97	1714.69	225.98	1714.69
241.97	1718.69	241.98	1718.69	243.22	1719	243.23	1719	249.21	1720
251.98	1720.66	253.39	1721	255.88	1721.59	257.58	1722	259.74	1722.52
261.76	1723	263.56	1723.43	265.94	1724	267.32	1724.33	270.13	1725
271.02	1725.21	274.31	1726	274.63	1726.08	276.37	1726.49	278.38	1726.94
278.66	1727	282.3	1727.81	283.17	1728	286.2	1728.67	287.68	1729
290.07	1729.53	292.19	1730	295.13	1730.65	297.33	1731	299.64	1731.45
302.47	1732	304.32	1732	305.15	1732.01	310.07	1732.03	314.92	1732.13
327.3	1732.24	341.97	1732.68	343.44	1732.72	349.98	1732.86	351.07	1732.68
351.42	1732.62	352.27	1732.68	354.31	1732.81	355.44	1732.88	360.44	1732.26
363.42	1731.99	369.29	1731.64	377.69	1731.18	378.91	1731.1	382.4	1731.11
384.96	1730.87	387.02	1730.71	390.15	1730.72	391.47	1730.66	393.41	1730.75
396.93	1730.9	401.07	1731.72	402.11	1731.95	403.06	1732.15	408.02	1733.48
408.71	1733.93	410.59	1733.84	410.68	1733.83	410.91	1733.85	412.36	1733.88
413.18	1733.89								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	90.91	.027	408.71	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	90.91	408.71		62.5	62.36	57.88	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.20	Reach Len. (ft)	62.50	62.36	57.88
Crit W.S. (ft)		Flow Area (sq ft)		1670.85	
E.G. Slope (ft/ft)	0.001124	Area (sq ft)		1670.85	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	178.43	Top Width (ft)		178.43	
Vel Total (ft/s)	8.09	Avg. Vel. (ft/s)		8.09	
Max Chl Dpth (ft)	16.23	Hydr. Depth (ft)		9.36	
Conv. Total (cfs)	403172.4	Conv. (cfs)		403172.4	
Length Wtd. (ft)	62.36	Wetted Per. (ft)		181.99	
Min Ch El (ft)	1712.97	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)	413.18	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	314.18	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.40	45.01	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1121.2

INPUT

Description: "DR" 33+12.37 = 1121.2

Station Elevation Data		num= 122									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1730.31	3.61	1730.2	4.74	1730.31	6.65	1730.39	8.92	1730.1		
9.86	1729.98	10.44	1729.97	11.69	1730.18	12.12	1730.25	18.63	1730.12		
20.22	1730.08	20.73	1730.2	24	1731	27.33	1731.66	29.28	1732		
39.91	1732	50.85	1732.48	55.76	1732.24	57.6	1732.26	60.99	1732		
64.12	1731.45	66.94	1731	70.13	1730.53	73.59	1730	76.46	1729.6		
79.91	1729	84.78	1728.08	85.41	1728	85.98	1727.91	92.62	1727		
96.06	1726.6	99.91	1726.21	102.07	1726	107.05	1725.06	107.37	1725		
112.45	1724.05	112.72	1724	117.68	1723.2	118.93	1723	123.21	1722.62		
130.12	1722	134.51	1721.75	143.11	1721.08	144.16	1721	172.16	1714		
178.16	1713.82	188.16	1712.82	198.16	1713.82	198.64	1713.83	222.16	1714.54		
223.23	1714.81	238.17	1718.54	238.85	1718.71	240.01	1719	242.39	1719.6		
244.01	1720	246.58	1720.64	248.01	1721	250.72	1721.68	252.01	1722		
254.82	1722.7	256.01	1723	258.9	1723.72	260.01	1724	262.96	1724.74		
264.01	1725	267.01	1725.75	268.01	1726	271.05	1726.76	272.01	1727		
275.08	1727.77	276.01	1728	279.11	1728.78	280.01	1729	283.14	1729.78		
284.01	1730	287.16	1730.79	288.01	1731	291.18	1731.79	292.01	1732		
330.88	1732	331.25	1732	331.28	1732	331.38	1731.99	336.84	1731.69		
342.58	1731.8	344.52	1731.88	345.05	1731.88	345.2	1731.91	345.4	1731.9		
346.01	1731.92	349.06	1731.99	349.31	1731.99	350.12	1732.01	350.17	1732.01		
350.24	1732.01	350.25	1732.02	350.53	1732	358.24	1731.69	359.86	1731.64		
362.83	1731.38	366.96	1730.94	366.99	1730.93	367.04	1730.93	367.37	1730.91		
372.99	1730.65	374.03	1730.59	378.49	1730.45	387.23	1730.42	389.72	1730.41		
390.73	1730.41	391.86	1730.4	392.2	1730.41	403.68	1730.76	407.15	1731.5		
408.39	1731.69	412.36	1732.8	414.41	1733.41	415.08	1733.41	415.41	1733.23		
416.59	1733.17	419.88	1733.18								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	50.85	.027	414.41	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50.85	414.41		97.81 50.88	6.35		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.27	Reach Len. (ft)	97.81	50.88	6.35
Crit W.S. (ft)		Flow Area (sq ft)		1845.77	
E.G. Slope (ft/ft)	0.000952	Area (sq ft)		1845.77	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	202.71	Top Width (ft)		202.71	
Vel Total (ft/s)	7.32	Avg. Vel. (ft/s)		7.32	
Max Chl Dpth (ft)	16.45	Hydr. Depth (ft)		9.11	
Conv. Total (cfs)	438102.2	Conv. (cfs)		438102.2	
Length Wtd. (ft)	50.88	Wetted Per. (ft)		206.08	
Min Ch El (ft)	1712.82	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)	419.88	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	311.67	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	44.73	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1120.8

INPUT

Description: "DR" 33+63.25 = 1120.8

Station Elevation Data		num= 118									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.88	2.35	1729.79	4.86	1729.8	4.93	1729.81	5.1	1729.78		
6.79	1729.54	6.87	1729.53	7.81	1729.68	8.04	1729.72	15	1729.58		
16.05	1729.56	18.25	1730.23	19.06	1730.5	20.4	1731	23.76	1731		
24.28	1731	26.58	1731	33.07	1731	39.9	1731	43.33	1730.6		
43.82	1730.54	48.95	1730	52.51	1729.26	54.3	1729	61.58	1728.1		

61.98	1728	64.71	1727.85	73.74	1727.42	77.52	1727.31	79.76	1727.3
82.83	1727	92.21	1726.62	100.04	1726.35	106.58	1726	110.48	1725.39
113.3	1725	115.6	1724.51	118.74	1724	121.76	1723.29	122.95	1723
125.52	1722.51	128.61	1722	132.69	1721.66	139.6	1721.09	141.69	1720.92
153.85	1717.88	169.74	1713.92	172.42	1713.84	177.36	1713.69	184.2	1713.01
187.31	1712.7	187.35	1712.69	190.74	1713.03	197.35	1713.69	204.28	1713.9
216.93	1714.28	222.21	1715.59	233.01	1718.29	233.63	1718.43	236.59	1719
239.71	1719.74	240.7	1720	241.64	1720.25	244.48	1721	247.99	1721.93
248.26	1722	248.8	1722.14	252.35	1723	256.29	1723.95	256.47	1724
256.52	1724.01	260.37	1725	261.27	1725.23	264.26	1726	265.86	1726.41
268.15	1727	270.32	1727.56	272.05	1728	274.04	1728.51	275.94	1729
278.38	1729.63	280.43	1730	282.84	1730.46	286.04	1731	288.05	1731.5
290.66	1732	316.06	1732	328.03	1732	331.86	1731.81	337.51	1731.48
342.08	1731.58	345.5	1731.64	346.7	1731.44	348.47	1731.14	348.67	1731.18
349.85	1731.39	354.81	1731.28	356.61	1731.22	359.22	1730.86	360.79	1730.71
366.27	1730.61	369.11	1730.6	371.89	1730.6	379.63	1730.53	384.03	1730.52
392.8	1730.43	397.41	1730.49	404.31	1730.71	407.81	1731.48	408.34	1731.74
408.47	1731.77	414.12	1733.26	414.53	1733.38	414.57	1733.4	415.72	1733.35
417.82	1733.14	419.39	1732.99	420.05	1732.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	39.9	.027	414.53	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	39.9	414.53		40.74	50.89	10.2	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.21	Reach Len. (ft)	40.74	50.89	10.20
Crit W.S. (ft)		Flow Area (sq ft)		1835.53	
E.G. Slope (ft/ft)	0.001104	Area (sq ft)		1835.53	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	223.84	Top Width (ft)		223.84	
Vel Total (ft/s)	7.36	Avg. Vel. (ft/s)		7.36	
Max Chl Dpth (ft)	16.51	Hydr. Depth (ft)		8.20	
Conv. Total (cfs)	406710.8	Conv. (cfs)		406710.8	
Length Wtd. (ft)	50.89	Wetted Per. (ft)		227.21	
Min Ch El (ft)	1712.69	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)	420.05	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	309.52	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	44.49	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1120.6

INPUT

Description: "DR" 34+14.14 = 1120.6

Station	Elevation	Data	num=	114						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1729.74	1.82	1729.67	2.39	1729.67	3.7	1729.84	4.63	1729.94	
4.77	1729.91	4.82	1729.91	4.95	1729.88	4.96	1729.88	5.1	1729.86	
5.69	1729.78	6.26	1729.7	6.27	1729.7	6.28	1729.7	6.74	1729.7	
14.28	1729.55	16.02	1729.93	19.47	1730.69	19.62	1730.73	19.98	1730.81	
20.07	1730.84	20.46	1731	23.58	1731	24.99	1731	30.17	1731	
33.71	1730.47	37.94	1730	42.36	1729.22	44	1729	47.81	1728.31	
49.4	1728	51.31	1728	52.23	1728	53.67	1728	58.78	1728	
60.64	1728	63.88	1728	78.48	1728	85.76	1728	89.75	1728	
101.67	1727.59	106.57	1727.64	112.75	1727.42	116.78	1727.42	123.35	1727	
125.3	1726.82	126.25	1726.69	128.97	1726.31	131.43	1725.96	140.21	1723.78	
152.49	1720.73	175.49	1715.05	179.75	1713.96	192.82	1713.56	202.82	1712.56	
208.07	1713.09	212.12	1713.57	228	1714.04	231.73	1714.16	234.59	1714.85	
235.19	1715	243.2	1717	247.2	1718	251.2	1719	255.2	1720	
259.2	1721	263.2	1722	267.2	1723	271.2	1724	275.2	1725	
279.2	1726	281.69	1726.43	284.88	1727	290.38	1727.79	291.6	1728	
292.75	1728.2	298.04	1729	301.1	1729.66	303.25	1730	305.89	1730.41	
309.68	1731	315.11	1731.96	315.36	1732	325.9	1732	338.72	1732	
341.21	1732	343.97	1731.9	355.13	1731.39	359.4	1731.47	363.15	1731.54	
365.39	1731.16	365.68	1731.11	365.69	1731.11	366.18	1731.19	369.31	1731.01	

372.43	1730.9	376.29	1730.54	376.56	1730.52	377.06	1730.52	386.23	1730.49
395.82	1730.49	397.56	1730.48	407.95	1730.45	410.2	1730.44	410.96	1730.46
418.52	1730.56	421.65	1730.66	423.23	1731.01	423.47	1731.13	426.33	1731.61
428.43	1732.17	432.01	1733.23	432.35	1733.39	437.37	1733.17		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	30.17	.027	432.35	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	30.17	432.35		43.67	46.6		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.15	Reach Len. (ft)	43.67	46.60	47.12
Crit W.S. (ft)		Flow Area (sq ft)		1840.78	
E.G. Slope (ft/ft)	0.001305	Area (sq ft)		1840.78	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	255.82	Top Width (ft)		255.82	
Vel Total (ft/s)	7.34	Avg. Vel. (ft/s)		7.34	
Max Chl Dpth (ft)	16.59	Hydr. Depth (ft)		7.20	
Conv. Total (cfs)	374182.9	Conv. (cfs)		374182.9	
Length Wtd. (ft)	46.60	Wetted Per. (ft)		259.31	
Min Ch El (ft)	1712.56	Shear (lb/sq ft)		0.58	
Alpha	1.00	Stream Power (lb/ft s)	437.37	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	307.37	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	44.21	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1120.4

INPUT

Description: "DR" 34+60.74 = 1120.4

Station	Elevation	Data	num=	125					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.64	.89	1729.74	2.36	1729.89	2.42	1729.89	3.73	1729.67
4.77	1729.5	7.19	1729.45	12.91	1729.34	16.69	1730.8	16.76	1730.83
16.97	1730.91	17.05	1730.94	17.06	1730.94	17.12	1730.96	17.13	1730.96
17.25	1731	17.87	1731	18.77	1731	31.29	1731	32.37	1730.78
37.19	1730	37.63	1729.91	40.11	1729.58	43.7	1729.09	44.16	1729
51.27	1729	54.75	1729	56.96	1728.88	60.6	1728.86	61.31	1728.86
64.26	1728.74	82.71	1728.95	83.79	1729	88.71	1729.2	92.63	1729.3
97.65	1729.27	102.67	1729.31	105.34	1729.32	108.82	1729.31	116.21	1729.27
121.17	1729.24	127.75	1729.17	131.21	1729.14	136.76	1729.15	138.38	1729.11
141.53	1729	146.49	1728.32	148.87	1728	150.27	1727.72	152.26	1727
155.4	1726.17	155.9	1726	158.52	1725.16	158.98	1725	162.35	1724.06
162.55	1724	162.58	1723.99	165.86	1723	166.28	1722.89	169.55	1722
170.7	1721.69	172.56	1721	175.17	1720.45	178.04	1720	193.63	1714.85
197.05	1713.85	197.69	1713.81	203.28	1713.43	205.65	1713.13	211.33	1712.43
214.56	1712.84	219.45	1713.44	222.04	1713.52	222.85	1713.54	225.71	1713.61
246.28	1714.12	255.1	1714.39	259.43	1715.42	267.82	1717	271.82	1718
275.82	1719	279.82	1720	283.82	1721	287.82	1722	291.82	1723
295.82	1724	299.82	1725	303.82	1726	305.87	1726.26	311.7	1727
313.97	1727.13	328.06	1728	336.66	1728.39	348.55	1729	352.66	1729.78
353.66	1730	356.66	1730.46	359.86	1731	363.95	1731	370.79	1731
371.09	1731	373	1730.98	375.35	1730.96	377.38	1731	383.72	1731.11
390.65	1729.99	391.24	1729.89	391.29	1729.89	391.31	1729.89	395.94	1729.86
402.83	1729.81	406.45	1729.89	414.68	1730.06	420.51	1730.1	423.48	1730.06
427.04	1730.09	432.05	1730.15	436.86	1731.2	437.19	1731.26	437.85	1731.39
443.55	1732.49	444.42	1733.23	444.72	1733.37	445.84	1733.37	448.86	1733.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	31.29	.027	444.42	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	31.29	444.42		17.17	36.57		.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.		0.027	
W.S. Elev (ft)	1729.02	Reach Len. (ft)	17.17	36.57	101.08
Crit W.S. (ft)		Flow Area (sq ft)		1783.07	
E.G. Slope (ft/ft)	0.001396	Area (sq ft)		1783.07	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	248.09	Top Width (ft)		248.09	
Vel Total (ft/s)	7.58	Avg. Vel. (ft/s)		7.58	
Max Chl Dpth (ft)	16.59	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	361756.4	Conv. (cfs)		361756.4	
Length Wtd. (ft)	36.57	Wetted Per. (ft)		251.91	
Min Ch El (ft)	1712.43	Shear (lb/sq ft)		0.62	
Alpha	1.00	Stream Power (lb/ft s)	448.86	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	305.43	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.40	43.94	0.06

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1120.2

INPUT

Description: "DR" 34+97.31 = 1120.2 Inline Weir - Pipe Crossing #1

Station Elevation Data		num= 168							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.88	.65	1729.95	3.33	1729.51	3.62	1729.46	3.79	1729.46
11.81	1729.31	13.13	1729.79	13.36	1729.86	14.49	1730.15	14.67	1730.19
17.17	1731	27.92	1731	28.65	1731	32.46	1730.02	32.6	1730
35.08	1729.63	39.29	1729	41.92	1729	50.51	1729	56.95	1729.21
72.41	1729.41	73.9	1729.29	75.88	1729.64	77.13	1729.7	79.26	1730
82.77	1730.14	84.52	1730.15	88.81	1730.17	92.7	1730.14	97.35	1730
98.37	1729.93	100.08	1729.9	104.16	1729.69	115.51	1729.54	116.15	1729.52
117.76	1729.5	126.4	1729.42	136.78	1729.44	143.12	1729.4	154.59	1729
155.76	1728.84	157.75	1728.19	158.31	1728	158.82	1727.83	161.32	1727
161.67	1726.88	164.33	1726	164.49	1725.95	166.42	1725.31	167.38	1725
167.45	1724.98	170.54	1724	170.84	1723.91	173.7	1723	174.29	1722.81
176.85	1722	177.82	1721.69	180.01	1721	181.47	1720.54	183.16	1720
189.14	1716.81	191.56	1715.66	193.01	1715.09	193.97	1714.77	194.26	1714.66
197.03	1713.57	202.72	1713.4	203.31	1713.36	210.16	1712.42	210.62	1712.36
217.65	1713.31	218	1713.36	224.04	1713.54	226.05	1713.6	228.2	1713.66
230.74	1713.74	231.44	1713.76	234.94	1713.86	236.9	1713.92	236.95	1713.93
240.41	1713.99	241.44	1714.01	241.63	1714.02	244.69	1714.49	246.85	1714.88
251.33	1714.98	265.57	1716	267.21	1716.53	268.67	1717	270.22	1717.5
271.77	1718	273.24	1718.47	274.87	1719	276.25	1719.45	277.97	1720
279.27	1720.42	280	1720.66	281.04	1721	282.27	1721.41	284.05	1722
285.27	1722.4	287.06	1723	288.27	1723.4	290.08	1724	291.27	1724.39
293.09	1725	294.26	1725.39	296.11	1726	300.79	1726.41	307.87	1727
309.19	1727.35	313.01	1727.67	316.47	1728	318.37	1728.37	322.8	1729
325.1	1729.42	327.62	1730	330	1730.53	332.15	1731	334.46	1731.33
338.43	1731	341.96	1731	344.46	1731.11	353.81	1731.81	356.24	1732
361.33	1732.73	362.52	1732.89	363.28	1733	368.25	1733.75	369.95	1734
370.24	1734.06	374.57	1735	374.69	1735	381.52	1735	383.24	1735
388.76	1735	390.72	1735	391.9	1735	394.92	1735	400.88	1734.42
406.02	1734	408.38	1733.65	411.69	1733	413.6	1732.68	416.96	1732
421.22	1731.32	424.56	1730.54	432.68	1730.69	433	1730.69	433.04	1730.7
433.33	1730.74	438.49	1730.49	438.79	1730.47	442.3	1730.27	446.67	1730.17
451.48	1730.08	455.03	1730.14	456.02	1730.18	456.43	1730.19	456.61	1730.18
457.75	1730.19	462.39	1730.17	463.38	1730.13	465.31	1730.37	467.57	1730.58
468.03	1730.57	468.21	1730.57	469.05	1730.51				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	28.65	.027	374.57	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	28.65	374.57		204.18	219.98	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.78	Element	Left OB	Channel	Right OB
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Vel Head (ft)	1.18	Wt. n-Val.	0.027	
W.S. Elev (ft)	1728.60	Reach Len. (ft)	204.18	219.98 243.03
Crit W.S. (ft)	1723.66	Flow Area (sq ft)		1551.03
E.G. Slope (ft/ft)	0.001298	Area (sq ft)		1551.03
Q Total (cfs)	13515.00	Flow (cfs)		13515.00
Top Width (ft)	163.51	Top Width (ft)		163.51
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)		8.71
Max Chl Dpth (ft)	16.24	Hydr. Depth (ft)		9.49
Conv. Total (cfs)	375161.2	Conv. (cfs)		375161.2
Length Wtd. (ft)	219.98	Wetted Per. (ft)		168.33
Min Ch El (ft)	1712.36	Shear (lb/sq ft)		0.75
Alpha	1.00	Stream Power (lb/ft s)	469.05	0.00 0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.34	304.03 0.02
C & E Loss (ft)		Cum SA (acres)	0.40	43.76 0.06

INLINE STRUCTURE

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1120

INPUT

Description:

Distance from Upstream XS = 3.36

Deck/Roadway Width = 175.02

Weir Coefficient = 2.6

Weir Embankment Coordinates num = 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.42	202.95	1718.07	203.45	1718.07	203.73	1718.07	218.59	1718.07
219.38	1717.81	219.5	1717.78	219.65	1717.73	219.86	1717.66	220.18	1717.55
220.71	1717.38	221.77	1717.03	224.95	1716	226.15	1715.6	226.59	1715.46
230.56	1715.34	231.59	1715.31	232.92	1715.27	240.24	1715.49	241.59	1715.52
253.38	1715.78	262.28	1716	471.81	1716.14				

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

E.G. Elev (ft)	1729.78	Q Gates (cfs)	
W.S. Elev (ft)	1728.60	Q Gate Group (cfs)	0.00
Q Total (cfs)	13515.00	Gate Open Ht (ft)	1725.98
Q Weir (cfs)	13515.00	Gate #Open	
Weir Flow Area (sq ft)	1597.70	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	1.68	Gate Submerg	0.00
Weir Sta Rgt (ft)	326.67	Gate Invert (ft)	0.00
Weir Max Depth (ft)	14.51	Gate Weir Coef	0.000
Weir Avg Depth (ft)	5.72		
Weir Coef (ft ^{1/2})	2.600	Q Breach (cfs)	
Weir Submerg	0.65	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1715.28	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	279.34		

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1119.2

INPUT

Description: "DR" 37+17.29 = 1119.2

Station Elevation Data num= 138

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.35	1.06	1729.58	5.04	1730.37	7.99	1730.43	16.41	1730.02
17.49	1729.95	19.72	1729.92	19.79	1729.92	24.06	1729.96	24.49	1729.96
25.18	1729.97	25.99	1729.97	26.26	1729.98	26.38	1729.97	26.45	1729.98
28.44	1730.3	32.25	1730.92	36.47	1730.85	40.68	1730.79	46.99	1731.8
47.01	1731.8	48.38	1732	53.98	1732	94.47	1732	95.93	1731.85
100.59	1731	105.88	1730.41	108.71	1730	117.4	1729.22	120.01	1729

123.68	1728.54	126.95	1728	129.39	1727.52	134.12	1727.09	134.71	1727
136.99	1726.5	139.02	1726	141.03	1725.51	143.36	1725	145.82	1724.47
147.73	1724	150.29	1723.43	152.06	1723	154.54	1722.4	156.18	1722
158.81	1721.36	160.3	1721	163.1	1720.32	164.42	1720	169.23	1719.08
170.83	1719	174.03	1718	174.85	1717.77	176.42	1717.14	179.8	1716.19
184.03	1715.03	189.98	1713.32	190.15	1713.28	199.67	1712.85	200.57	1712.81
206.23	1712.14	208.64	1711.81	214.81	1712.76	215.25	1712.81	222.88	1712.87
224.25	1712.88	240.08	1712.99	243.31	1714	246.51	1715	249.71	1716
254.25	1717	255.94	1717.37	259.08	1718	260.35	1718.42	262.56	1719
264.12	1719.54	266.77	1720	268.94	1720.51	270.99	1721	273.41	1721.57
275.2	1722	277.89	1722.64	279.41	1723	282.9	1723.83	283.62	1724
286.1	1724.59	288.29	1725	290.48	1725.46	293.65	1726	297.18	1726.57
300.58	1727	305.03	1727.54	312.12	1728	312.74	1728.04	312.9	1728.04
318.35	1728.17	322.68	1728	325.81	1727.85	327.18	1727.8	331.8	1727.53
339.14	1727.08	339.8	1727.05	341.52	1727	347.47	1726.87	353.46	1727
355.09	1727.05	355.64	1727.07	358.82	1727.35	364.64	1727.88	365.72	1728
370.73	1728.23	386.29	1728.8	387.69	1728.79	388.96	1728.82	391.2	1729
397.28	1729.78	398.68	1730	406.32	1730	411.32	1730.19	412.79	1730
413.81	1729.95	419.22	1729.67	426.2	1729.8	427.23	1729.82	428.85	1729.55
431.85	1729.05	435.35	1728.46	439.4	1728.41	446.1	1728.33	448.39	1728.3
448.73	1728.3	449.86	1728.28	450.56	1728.27	450.81	1728.26	453.09	1728.23
453.44	1728.45	456.2	1729.89	461.58	1729.89				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	94.47	.027
		398.68	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	94.47	398.68		84.98	48.62	25.64	.3
							.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.70	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.98	Reach Len. (ft)	84.98	48.62	25.64
Crit W.S. (ft)		Flow Area (sq ft)		1291.43	
E.G. Slope (ft/ft)	0.002192	Area (sq ft)		1291.43	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	154.39	Top Width (ft)		154.39	
Vel Total (ft/s)	10.47	Avg. Vel. (ft/s)		10.47	
Max Chl Dpth (ft)	14.17	Hydr. Depth (ft)		8.36	
Conv. Total (cfs)	288664.8	Conv. (cfs)		288664.8	
Length Wtd. (ft)	48.62	Wetted Per. (ft)		157.77	
Min Ch El (ft)	1711.81	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)	461.58	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	295.86	0.02
C & E Loss (ft)	0.31	Cum SA (acres)	0.40	42.96	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1118.8

INPUT

Description: "DR" 37+65.91 = 1118.8

Station Elevation Data		num= 115	
Sta	Elev	Sta	Elev
0	1728.65	1.38	1728.63
16.96	1728.95	22.58	1729.74
24.75	1730.03	26.01	1730.07
31.16	1730.59	32.35	1731
70.29	1732	76.05	1731.56
88.1	1731.1	98.6	1731.1
143	1730.48	146.15	1730
163.07	1728	167	1727.62
177.6	1726.16	197.36	1721.15
246.41	1712.64	254.23	1711.69
265.38	1712.7	265.84	1712.71
284.53	1714.4	285.29	1714.59
301.28	1716.91	301.8	1717
		302.21	1717.06
		309.42	1718
		310.41	1718.23

314.29	1719	316.62	1719.5	318.99	1720	325.78	1720.59	334.5	1720.97
335.11	1721	343.55	1721.82	345.42	1722	350.75	1722.44	357.17	1723
358.16	1723.09	360.17	1723.32	365.43	1724	368.13	1724.42	372.66	1725
376.96	1725.55	380.62	1726	384.01	1726.5	387.27	1727	395.22	1727.66
399.86	1728	405.16	1728.76	407.16	1729	410.73	1729.48	414.87	1730
416.61	1730.22	417.82	1730.27	422.09	1730.48	430.44	1731	433.05	1731.7
434.12	1732	436.07	1732	439.26	1732	440.46	1731.69	443.14	1731
450.61	1730.02	450.72	1730	450.78	1730	458.33	1730.15	458.79	1730.16
458.95	1730.13	461.51	1729.7	465.96	1728.97	466.46	1728.95	473.98	1728.68
477.21	1728.57	483.78	1728.46	484.54	1728.93	486.67	1729.78	492.08	1729.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	70.29	.027	434.12	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	70.29	434.12		74.65	48.61		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.20	Reach Len. (ft)	74.65	48.61	25.87
Crit W.S. (ft)		Flow Area (sq ft)		1618.88	
E.G. Slope (ft/ft)	0.001484	Area (sq ft)		1618.88	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	204.51	Top Width (ft)		204.51	
Vel Total (ft/s)	8.35	Avg. Vel. (ft/s)		8.35	
Max Chl Dpth (ft)	14.51	Hydr. Depth (ft)		7.92	
Conv. Total (cfs)	350786.3	Conv. (cfs)		350786.3	
Length Wtd. (ft)	48.61	Wetted Per. (ft)		207.21	
Min Ch El (ft)	1711.69	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	492.08	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	294.24	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.40	42.76	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1118.6

INPUT

Description: "DR" 38+14.52 = 1118.6

Station	Elevation	Data	num=	108						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.15	22.61	1728.37	24.58	1728.36	37.5	1728.52	45.12	1728.46	
49.06	1728.46	53.22	1728.43	54.06	1728.42	54.12	1728.36	54.25	1728.37	
54.28	1728.38	54.32	1728.38	54.49	1728.41	54.51	1728.41	55.06	1728.5	
58.04	1729	62.85	1729.92	63.12	1729.98	63.24	1730	63.32	1730.02	
68.06	1731	68.76	1731.13	72.54	1731.88	73.18	1732	76.45	1732	
90.21	1732	90.24	1732	94.54	1731.45	97.17	1731.4	102.56	1731.3	
104.74	1731.18	109.02	1731	115.84	1730.53	123.18	1730.21	126.7	1730.12	
130.03	1730	137.44	1729.64	146.06	1729.11	147.08	1729.07	147.79	1729	
157.29	1728.07	157.98	1728	158.11	1728	186.42	1727	186.5	1726.98	
187.48	1726.74	196.02	1724.6	242.49	1712.98	256.13	1712.57	266.13	1711.57	
276.13	1712.57	291.96	1713.05	295.76	1714	299.85	1714.32	300.6	1714.38	
307.54	1715	310.99	1715.41	316.31	1716	323.32	1716.7	326.43	1717	
335.48	1717.79	339.22	1718	350.46	1718.86	351.81	1719	352.02	1719.05	
355.36	1719.75	356.63	1720	364.08	1720.96	364.27	1721	369.38	1721.95	
369.59	1722	369.91	1722.07	375.42	1723	377.34	1723.45	380.27	1724	
383.41	1724.48	386.6	1725	390.58	1725.76	392.25	1726	394.2	1726.24	
402.14	1727	413.68	1727.81	416.96	1728	424.3	1728.94	424.73	1729	
425.02	1729.04	432.49	1730	441.19	1730.66	446.64	1731	456.32	1731	
456.36	1731	456.37	1731	456.38	1731	456.46	1730.99	460.25	1730.33	
461.37	1730.13	465.47	1730.21	469.37	1730.29	475.54	1729.26	476.12	1729.16	
476.38	1729.14	486.94	1728.93	487.68	1728.91	491.57	1728.75	494.44	1729.6	
494.63	1729.67	495.23	1729.67	499.87	1729.69					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	90.21	.027	446.64	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
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90.21 446.64 36.09 35.49 35.55 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.27	Reach Len. (ft)	36.09	35.49	35.55
Crit W.S. (ft)		Flow Area (sq ft)		1776.48	
E.G. Slope (ft/ft)	0.001093	Area (sq ft)		1776.48	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	205.08	Top Width (ft)		205.08	
Vel Total (ft/s)	7.61	Avg. Vel. (ft/s)		7.61	
Max Chl Dpth (ft)	14.69	Hydr. Depth (ft)		8.66	
Conv. Total (cfs)	408746.5	Conv. (cfs)		408746.5	
Length Wtd. (ft)	35.49	Wetted Per. (ft)		207.81	
Min Ch El (ft)	1711.57	Shear (lb/sq ft)		0.58	
Alpha	1.00	Stream Power (lb/ft s)	499.87	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	292.34	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	42.53	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1118.4

INPUT

Description: "DR" 38+50.01 = 1118.4

Station	Elevation	Data	num=	102						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.9	.08	1728.91	.24	1728.9	2.26	1728.93	3.07	1728.78	
5.14	1728.43	10.39	1728.45	20.48	1728.5	23.56	1728.45	30.91	1728.43	
31.79	1728.43	35.57	1728.45	47.28	1728.48	53.01	1728.49	53.46	1728.49	
53.74	1728.49	55.93	1728.51	56.08	1728.51	58.04	1728.79	59.46	1729	
61.5	1729.29	65.54	1730	72.11	1730.88	73.03	1731	73.43	1731.08	
77.35	1732	85.28	1732	89.44	1732	93.9	1731.57	97.03	1731.22	
99.06	1731.18	105.14	1731.07	106.29	1731.07	110.61	1731	127.08	1730.14	
128.35	1730.09	129.09	1730.07	130.44	1730	140.41	1729.27	143.88	1729	
149.91	1728.34	153.58	1728	191.28	1727.05	193.11	1727	193.12	1727	
193.13	1727	193.14	1727	193.6	1726.88	194.61	1726.63	249.36	1712.94	
249.61	1712.88	262.69	1712.49	262.7	1712.49	272.69	1711.49	282.69	1712.49	
298.85	1712.97	298.86	1712.97	302.97	1714	312.16	1714.61	318.14	1715	
328.23	1715.91	329.48	1716	339.26	1716.95	339.78	1717	341.03	1717.07	
355.66	1718	368.8	1718.7	374.33	1719	383.84	1719.88	385.39	1720	
388.83	1720.82	389.56	1721	392.77	1721.77	393.72	1722	396.73	1722.72	
397.89	1723	400.71	1723.68	402.06	1724	404.7	1724.63	406.23	1725	
408.71	1725.6	410.39	1726	418.47	1726.77	419.92	1727	441.85	1727.91	
443.78	1728	452.01	1728.53	468.26	1728.86	469.73	1728.91	476.88	1729.05	
477.76	1729.06	480.51	1728.6	481.05	1728.51	491.35	1728.29	493.45	1728.25	
494.93	1728.22	495.08	1728.22	495.42	1728.21	495.51	1728.24	496.09	1728.49	
498.4	1729.44	504.43	1729.36							

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	89.44	.027	477.76	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
89.44	477.76	50.72	50	50.1	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.34	Reach Len. (ft)	50.72	50.00	50.10
Crit W.S. (ft)		Flow Area (sq ft)		1950.65	
E.G. Slope (ft/ft)	0.000869	Area (sq ft)		1950.65	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	218.15	Top Width (ft)		218.15	
Vel Total (ft/s)	6.93	Avg. Vel. (ft/s)		6.93	
Max Chl Dpth (ft)	14.85	Hydr. Depth (ft)		8.94	
Conv. Total (cfs)	458488.7	Conv. (cfs)		458488.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		221.00	
Min Ch El (ft)	1711.49	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)	504.43	0.00	0.00

Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	290.82	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	42.36	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1118.2

INPUT

Description: "DR" 39+00.01 = 1118.2

Station	Elevation	Data	num=	123
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
0	1729.25	.2	1729.26	1.69 1729.28 3.7 1728.61 5.12 1728.31
15.42	1728.16	17.39	1728.15	17.66 1728.15 18.74 1728.15 21.12 1728.53
24.14	1729	28.29	1729.6	30.98 1730 34.29 1730.24 36.85 1730.46
41.76	1731	45.47	1731.72	46.96 1732 51.96 1732.67 53.1 1732.79
53.91	1732.84	56.57	1733	57.9 1733 60.14 1733.21 65.88 1733.42
70.74	1733	72.76	1733	76.87 1732.29 78.12 1732 87.2 1731.08
88.1	1731	89.76	1730.94	96.43 1730.68 103.88 1730.55 104.46 1730.54
105.26	1730.64	106.46	1730.79	108.01 1730.97 108.13 1730.98 108.26 1730.99
108.33	1730.99	108.37	1731	108.41 1731 108.96 1731 115.91 1731
152.68	1731	154.79	1730.67	158.51 1730 160.77 1729.64 165.4 1729
170.36	1728.25	172.03	1728	176.81 1727.66 188.82 1727 194.78 1726.7
202.5	1726	205.13	1725.77	206.44 1725.59 209.66 1725 209.67 1725
209.77	1724.97	210.03	1724.91	258.72 1712.73 258.74 1712.73 271.02 1712.36
271.03	1712.36	281.03	1711.36	291.02 1712.36 291.03 1712.36 307.66 1712.86
312.21	1714	318.38	1714.48	324.67 1715 329.56 1715.3 340.43 1716
348	1716.62	352.95	1717	367.31 1717.96 367.8 1718 368.33 1718.04
385.68	1719	396.23	1719.9	397.41 1720 401.3 1720.97 401.42 1721
405.27	1721.96	405.43	1722	409.23 1722.95 409.43 1723 413.2 1723.94
413.44	1724	417.16	1724.93	417.45 1725 421.14 1725.92 421.46 1726
422.15	1726.16	423.88	1726.6	425.47 1727 427.62 1727.52 429.6 1728
433.11	1729	435.91	1729	438.25 1729 445.46 1729 463.78 1729
471.61	1729	473.46	1729	481.15 1728.58 482.92 1728.47 489.9 1728.6
490.97	1728.62	491.95	1728.46	492.6 1728.35 494.29 1728.07 495.1 1728.01
496.67	1727.91	497.05	1727.88	497.1 1727.88 499.22 1727.84 507.63 1727.62
508.92	1728.58	509.3	1728.82	515.36 1728.79

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	
0 .031 65.88	.027 433.11	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
65.88	433.11	50.75	50	50.85	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1727.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.31	Reach Len. (ft)	50.75	50.00	50.85
Crit W.S. (ft)		Flow Area (sq ft)		1987.17	
E.G. Slope (ft/ft)	0.000844	Area (sq ft)		1987.17	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	223.71	Top Width (ft)		223.71	
Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)		6.80	
Max Chl Dpth (ft)	14.95	Hydr. Depth (ft)		8.88	
Conv. Total (cfs)	465120.7	Conv. (cfs)		465120.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		226.56	
Min Ch El (ft)	1711.36	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)	515.36	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	288.56	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	42.11	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1117.8

INPUT

Description: "DR" 39+50.01 = 1117.8

Station	Elevation	Data	num=	121
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.62	1.68	1728.69	2.53	1728.74	4.21	1728.62	5.16	1728.57
5.5	1728.55	5.94	1728.59	10.72	1728.71	15.29	1729.69	16.2	1729.9
16.27	1729.91	17.4	1730.14	19.18	1730.5	19.4	1730.57	23.15	1731.3
24.77	1731.62	25.14	1731.69	25.6	1731.79	25.66	1731.8	25.67	1731.8
25.96	1731.85	26.49	1731.91	26.83	1732	29.25	1732.22	35.62	1733
37.91	1733.28	44.6	1734	48.84	1734	54.17	1734	57.06	1734
59.13	1733.48	62.05	1733	66.08	1732.45	69.73	1732	81	1731
86.59	1730	88.12	1729.82	89.63	1729.72	92.69	1729.65	97.65	1729.54
106.43	1729.24	111.92	1729.11	114.41	1729	127.21	1728.12	128.87	1728
133.68	1727.61	142.08	1727	144.34	1726.89	155.24	1726.39	163.75	1726
170.6	1725.36	175.27	1725	194.95	1724.4	204.83	1724	210.86	1723.11
210.98	1723.09	212.06	1722.82	252.73	1712.65	252.99	1712.58	264.48	1712.24
264.49	1712.24	274.48	1711.24	274.49	1711.24	284.49	1712.24	301.58	1712.75
301.59	1712.75	306.58	1714	317.34	1715	320.42	1715.18	333.05	1716
345.26	1716.89	346.89	1717	358.28	1717.81	360.44	1718	363.69	1718.28
373.4	1719	379.73	1719.61	383.57	1720	385.75	1720.53	386.77	1720.79
387.64	1721	388.59	1721.23	391.71	1722	394.51	1722.69	395.78	1723
398.38	1723.64	399.85	1724	402.26	1724.59	403.91	1725	405.73	1725.45
407.98	1726	409.93	1726.48	412.05	1727	414.66	1727.64	416.6	1728
418.98	1728.53	420.9	1729	422.94	1729.72	423.86	1730	429.22	1730
451.55	1730	458.37	1730	465.91	1730	470.21	1729.06	470.42	1729
471.24	1728.92	482.41	1728.03	487.96	1728.14	490.47	1728.19	491.15	1728.3
491.34	1728.33	491.9	1728.27	492.51	1728.21	499.63	1727.42	510.06	1727.56
513.16	1727.76	515.04	1728.39	515.26	1728.43	515.36	1728.47	516.11	1728.48
517.9	1728.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	57.06	.027	423.86	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	57.06	423.86		56.23	50	52.55	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.26	Reach Len. (ft)	56.23	50.00	52.55
Crit W.S. (ft)		Flow Area (sq ft)		1979.77	
E.G. Slope (ft/ft)	0.000994	Area (sq ft)		1979.77	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	251.01	Top Width (ft)		251.01	
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)		6.83	
Max Chl Dpth (ft)	15.02	Hydr. Depth (ft)		7.89	
Conv. Total (cfs)	428648.7	Conv. (cfs)		428648.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		253.71	
Min Ch El (ft)	1711.24	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)	517.90	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	286.29	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	41.83	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1117.6

INPUT

Description: "DR" 40+00.01 = 1117.6

Station Elevation Data		num= 117							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.28	.52	1728.29	3.82	1728.41	5.14	1728.43	7.54	1728.76
9.33	1729.04	11.69	1729.64	13.79	1730.33	15.24	1730.56	25.15	1731.92
29.63	1731.62	29.68	1731.62	29.79	1731.61	29.82	1731.62	30.85	1731.8
31.88	1731.85	33.53	1731.86	38.92	1731.49	40.91	1731.39	42.57	1731.24
43.92	1731	48.85	1730.43	52.51	1730	54.31	1729.78	60.5	1729
65.07	1728.46	68.1	1728.22	69.28	1728.16	75.6	1728	77.33	1727.96
81.18	1727.83	97.65	1727.18	101.75	1727	105.29	1726.81	119.05	1726
128.2	1725.05	128.72	1725	152.77	1724.43	170.04	1724.01	170.64	1724
171.17	1723.98	171.18	1723.98	171.19	1723.98	186.08	1723	186.09	1723
186.27	1722.95	227.84	1712.56	228.34	1712.44	239.04	1712.12	249.04	1711.12
259.04	1712.12	276.61	1712.64	276.62	1712.64	282.04	1714	284.7	1714.25
292.42	1715	305.69	1715.92	306.44	1715.97	306.94	1716	307.28	1716.02

307.77	1716.06	318.82	1717	324.08	1717.47	329.19	1718	335.43	1718.88
336.55	1719	338.96	1719.21	347.64	1720	350.55	1720.57	353.72	1721
355.73	1721.46	358.12	1722	359.62	1722.34	362.53	1723	363.44	1723.21
366.93	1724	367.15	1724.05	368.19	1724.29	370.8	1724.82	371.71	1725
374.4	1725.55	376.64	1726	377.94	1726.26	381.04	1726.89	381.42	1726.98
381.54	1727	385.12	1727.77	386.22	1728	388.95	1728.58	390.9	1729
392.82	1729.63	394.07	1730	396.21	1730	396.78	1730	400.17	1730
449.76	1730	451.67	1729.56	453.98	1729	460.15	1728.64	462.48	1728.43
468.95	1728.56	470.51	1728.59	474.32	1727.97	476.23	1727.65	477.45	1727.45
479.25	1727.33	480.13	1727.27	480.38	1727.25	483.5	1727.35	487.72	1727.41
500.23	1727.8	501.34	1728.01	502.05	1728.11	502.54	1728.19	504.76	1728.47
507.09	1728.63	508.51	1728.72						

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	25.15	.027	394.07	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	25.15	394.07		46.37 44.66	49.38		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.17	Reach Len. (ft)	46.37	44.66	49.38
Crit W.S. (ft)		Flow Area (sq ft)		1931.26	
E.G. Slope (ft/ft)	0.001138	Area (sq ft)		1931.26	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	261.25	Top Width (ft)		261.25	
Vel Total (ft/s)	7.00	Avg. Vel. (ft/s)		7.00	
Max Chl Dpth (ft)	15.05	Hydr. Depth (ft)		7.39	
Conv. Total (cfs)	400664.0	Conv. (cfs)		400664.0	
Length Wtd. (ft)	44.66	Wetted Per. (ft)		263.86	
Min Ch El (ft)	1711.12	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)	508.51	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	284.04	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	41.54	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1117.4

INPUT

Description: "DR" 40+44.67 = 1117.4

Station Elevation Data			num= 113						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.12	7.02	1728.24	8.37	1728.28	8.97	1728.28	9.28	1728.33
9.49	1728.35	9.83	1728.39	10.86	1728.59	12.47	1728.91	13.86	1729.21
17.61	1729.98	17.92	1730	19.59	1730.08	19.74	1730.08	20.03	1730.08
20.1	1730.08	20.52	1730.09	20.54	1730.1	20.7	1730.1	21.28	1730.2
25.78	1731	26.73	1731	30.25	1730.06	30.76	1730	37.98	1729.41
41.67	1729	49.21	1728.13	50.22	1728	56.12	1727.8	61.85	1727.63
69.36	1727.48	69.88	1727.47	70.21	1727.46	74.54	1727.3	80.92	1727
91.87	1726.25	95.26	1726	105.27	1725.1	106.46	1725	110.84	1724.89
146.77	1724	159.31	1723.43	173.69	1723	173.79	1722.97	174.35	1722.83
216.35	1712.33	227.3	1712.01	237.3	1711.01	247.3	1712.01	265.29	1712.54
271.11	1714	272.84	1714.19	277.94	1714.75	278.24	1714.78	280.13	1715
281.02	1715.09	290.95	1716	295.15	1716.36	299.96	1717	304.19	1717.66
307.56	1718	312.5	1718.8	313.68	1719	314.48	1719.15	321.02	1720
329.93	1720.43	342.98	1721	343.43	1721	344.16	1721	346.79	1721.6
349.52	1722	352.01	1722.5	354.47	1723	356.06	1723.32	359.42	1724
361.54	1724.43	364.36	1725	365.87	1725.31	369.31	1726	370.2	1726.18
374.25	1727	374.51	1727.05	376.28	1727.41	378.54	1727.94	378.79	1728
382.43	1728.85	383.06	1729	384.08	1729.25	386.29	1730	389.7	1730
425.84	1730	441.53	1730	445.17	1729.15	446.73	1729	450.03	1728.94
454.28	1728.84	461.67	1728.99	462.3	1729	462.31	1729	462.41	1728.99
465.2	1728.53	470.2	1727.7	473.9	1727.63	483.75	1727.45	485.79	1727.44
508.29	1727.76	509.37	1727.75	511.91	1728.36	512.75	1728.57	512.88	1728.6
513.03	1728.65	513.37	1728.65	517.77	1728.62				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val

0 .031 26.73 .027 386.29 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
26.73 386.29 82.26 55.34 25.57 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.027	
W.S. Elev (ft)	1726.12	Reach Len. (ft)	82.26	55.34	25.57
Crit W.S. (ft)		Flow Area (sq ft)		1935.77	
E.G. Slope (ft/ft)	0.001215	Area (sq ft)		1935.77	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	276.21	Top Width (ft)		276.21	
Vel Total (ft/s)	6.98	Avg. Vel. (ft/s)		6.98	
Max Chl Dpth (ft)	15.11	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	387722.2	Conv. (cfs)		387722.2	
Length Wtd. (ft)	55.34	Wetted Per. (ft)		278.81	
Min Ch El (ft)	1711.01	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)	517.77	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	282.06	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	41.26	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1117.2

INPUT

Description: "DR" 41+00.01 = 1117.2

Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.3	2.45	1728.28	4.63	1728.48	5.16	1728.44	7.01	1728.58
9.51	1728.66	9.9	1728.68	10.2	1728.75	14.72	1729.56	16.1	1729.52
18.36	1729.4	18.81	1729.5	18.84	1729.51	18.85	1729.51	18.86	1729.51
18.88	1729.52	20.45	1729.76	21.98	1730	24.48	1730.23	31.04	1731
35.8	1731	39.71	1731	40.43	1731	41.25	1730.92	48.42	1730
50.74	1729.59	53.96	1729	56.97	1728.45	59.49	1728	67.71	1727.09
68.58	1727	69.01	1726.98	75.76	1726.86	77.06	1726.83	77.86	1726.76
86.19	1726	94.13	1725.21	96.47	1725	132.37	1724.08	135.66	1724
139.58	1723.9	176.49	1723	178.33	1722.55	180.26	1722.08	180.54	1722
183.6	1721.24	184.58	1721	187.13	1720.37	188.62	1720	189.94	1719.7
191.88	1719.29	196.9	1718.04	219.96	1712.29	219.97	1712.29	233.99	1711.87
243.99	1710.87	253.98	1711.87	253.99	1711.87	269.56	1712.34	269.57	1712.34
276.22	1714	276.23	1714	278.87	1714.54	280.15	1714.8	281.31	1715
283.59	1715.3	288.5	1716	292.27	1716.68	294.23	1717	297.63	1717.67
299.4	1718	302.12	1718.5	304.91	1719	306.26	1719.32	309.14	1720
311.8	1720.62	314.06	1721	316.7	1721.58	318.66	1722	322.59	1722.85
323.2	1722.96	323.47	1723	327.25	1723.62	329.52	1724	330.9	1724.23
332.55	1724.5	336.5	1725	342.21	1725.47	346.1	1725.45	348.81	1725.49
356.44	1725.33	360.05	1725.27	365.75	1725.49	373.01	1725.91	373.48	1726
373.74	1726.05	379	1727	381.55	1727.46	384.53	1728	388.37	1728.38
391.25	1729	396	1729.52	399.08	1730	430.48	1730	447.76	1730
458.93	1729.4	461.01	1729.23	466.91	1729.34	469.02	1729.39	474.78	1728.64
479.1	1728.07	481.05	1727.74	482.02	1727.58	483.61	1727.56	486.24	1727.53
492.09	1727.57	502.52	1727.6	508.66	1727.53	517.99	1727.49	519.9	1727.51
522.94	1727.66	524.42	1727.77	526.69	1728.44	533.81	1728.32	533.87	1728.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	40.43	.027	399.08	.031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
40.43 399.08 76.74 50 21.36 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.04	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.71	Reach Len. (ft)	76.74	50.00	21.36
Crit W.S. (ft)		Flow Area (sq ft)		1647.65	
E.G. Slope (ft/ft)	0.002124	Area (sq ft)		1647.65	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	

Top Width (ft)	280.52	Top Width (ft)	280.52		
Vel Total (ft/s)	8.20	Avg. Vel. (ft/s)	8.20		
Max Chl Dpth (ft)	14.84	Hydr. Depth (ft)	5.87		
Conv. Total (cfs)	293283.7	Conv. (cfs)	293283.7		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	283.25		
Min Ch El (ft)	1710.87	Shear (lb/sq ft)	0.77		
Alpha	1.00	Stream Power (lb/ft s)	533.87	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	279.78	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	40.91	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1116.9

INPUT

Description: "DR" 41+50.01 = 1116.9

Station Elevation Data num= 152

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.35	2.43	1728.31	4.99	1727.68	5.95	1727.5
11.94	1727.79	14.12	1727.94	18.01	1728.26	18.31	1728.27
19.71	1728.29	20.14	1728.31	20.24	1728.31	24.58	1729.05
29.73	1730	30.5	1730.1	33.9	1730.62	35.75	1730.88
37.23	1731	47.14	1731	47.73	1730.9	52.83	1730
57.14	1729	62.79	1728.27	64.64	1728	65.37	1727.94
74.11	1727.35	80.54	1727.16	80.77	1727.11	81.37	1727
86.3	1726.53	93.35	1726	112.14	1725.18	117.44	1725
167.33	1724	169.22	1723.85	171.9	1723.37	174.26	1723
178.27	1722	181.97	1721.08	182.28	1721	186.03	1720.07
187.55	1719.94	201.76	1719.34	208.89	1717.57	229.97	1712.33
249.54	1711.74	249.55	1711.74	259.54	1710.74	259.55	1710.74
269.55	1711.74	280.09	1712.06	280.16	1712.08	287.96	1714
292.02	1715	294.13	1715.52	296.11	1716	299.72	1716.86
300.65	1717.09	304.27	1718	307.19	1718.73	308.26	1719
312.26	1720	313.7	1720.37	316.25	1721	319.14	1721.77
321.14	1722.29	323.94	1723	326.48	1723.61	328.11	1724.02
332.89	1724.3	342.79	1725	344.04	1725.28	346.94	1726
352.75	1727	355.31	1727.64	356.98	1728	359.42	1728.54
368.09	1729.74	370.57	1730	371.64	1730	374.59	1730
379.37	1730	380.44	1730	382.83	1730	386.68	1730
392.26	1730	397.49	1730	404.31	1730.96	404.77	1731
411.71	1731.56	416.89	1731.96	417.22	1731.98	417.67	1732
438.7	1732	439.34	1732	440.56	1732	445.31	1732
449.17	1731.8	451.82	1731.62	456.24	1731.23	458.1	1731
465.95	1730	466.44	1729.98	467.65	1729.93	474.97	1729.65
483.01	1729.8	484	1729.65	488.96	1729	491.91	1728.54
497.89	1727.64	498.36	1727.56	511.71	1727.46	512.03	1727.46
513.97	1727.45	517.98	1727.44	521.74	1727.45	527.14	1727.43
540.17	1727.36	541.98	1727.36	544.88	1727.96	546.84	1728.29
552.66	1728.32	553.63	1728.33			547.72	1728.3

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	47.14	.027	417.67	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	47.14	417.67		7.89	26.5	10.71	.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.41	Reach Len. (ft)	7.89	26.50	10.71
Crit W.S. (ft)		Flow Area (sq ft)		1523.76	
E.G. Slope (ft/ft)	0.002217	Area (sq ft)		1523.76	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	237.66	Top Width (ft)		237.66	
Vel Total (ft/s)	8.87	Avg. Vel. (ft/s)		8.87	
Max Chl Dpth (ft)	14.67	Hydr. Depth (ft)		6.41	
Conv. Total (cfs)	287004.9	Conv. (cfs)		287004.9	
Length Wtd. (ft)	26.50	Wetted Per. (ft)		240.66	
Min Ch El (ft)	1710.74	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	553.63	0.00	0.00

Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	277.96	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	40.61	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1116.7

INPUT

Description: "DR" 41+76.51 = 1116.7

Station	Elevation	Data	num=	127						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.32	1.15	1728.3	2.32	1728.28	3.19	1728.05	5.9	1727.28	
8.59	1727.37	11.36	1727.5	17.16	1728.06	17.22	1728.07	17.26	1728.07	
17.33	1728.07	23.52	1728.38	23.83	1728.4	23.85	1728.4	23.9	1728.4	
26.31	1728.84	28.02	1729.15	29.31	1729.3	30.86	1729.51	31.9	1729.66	
32.61	1729.78	33.08	1729.87	33.38	1729.94	33.55	1730	41.36	1730.97	
41.59	1731	41.97	1731	42.59	1731	52.49	1731	57.85	1730.02	
57.94	1730	57.98	1729.99	58.2	1729.96	63.71	1729	68.87	1728.29	
70.89	1728.03	72.52	1728	78.95	1727.86	80.32	1727.63	85.91	1727	
89.07	1726.73	92.93	1726.46	97.38	1726	122.56	1725.21	126.4	1725.1	
130.18	1725	175.39	1724.05	177.43	1724	177.85	1723.94	182.61	1723	
185.79	1722.25	186.83	1722	187.54	1721.83	189.7	1721.3	190.9	1721	
193.62	1720.33	194.94	1720	200.88	1719.55	201.87	1719.39	230.17	1712.39	
253.74	1711.68	263.74	1710.68	273.74	1711.68	283.9	1711.98	328.11	1723	
332.06	1723.98	332.74	1724.13	334.17	1724.25	342.17	1724.73	344.23	1724.88	
346.43	1725	346.88	1725.08	349.23	1725.5	364.84	1725.93	368.31	1726	
374.41	1726.5	375.95	1726.39	378.32	1726.58	384.01	1726.49	388.95	1726.58	
396.15	1726.77	402.95	1727	404.6	1727.35	408.07	1728	410.01	1728.27	
414.62	1729	416.33	1729.34	419.22	1730	419.71	1730.08	426.54	1731	
426.6	1731.01	426.68	1731.02	432.05	1731.34	434.05	1731.34	439.24	1731.53	
443.91	1732	445.98	1732	446.28	1732	446.92	1732	460.03	1732	
460.37	1731.94	464.64	1731	468.23	1730.65	475.14	1729.98	478.11	1730.03	
483.3	1730.11	483.32	1730.11	484.07	1730	486.15	1729.59	489.87	1729	
493.56	1728.26	494.9	1728	496.35	1727.76	497.55	1727.56	497.83	1727.56	
513.18	1727.41	513.93	1727.41	525.35	1727.33	533.55	1727.35	539.17	1727.41	
544.53	1727.43	546.09	1727.42	550	1728.08	551.26	1728.29	554.19	1728.31	
555.96	1728.32	556.97	1728.33							

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	52.49	.027
		446.28	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	52.49	446.28		14.63	26.51	26.82	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.30	Reach Len. (ft)	14.63	26.51	26.82
Crit W.S. (ft)		Flow Area (sq ft)		1494.68	
E.G. Slope (ft/ft)	0.002243	Area (sq ft)		1494.68	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	228.30	Top Width (ft)		228.30	
Vel Total (ft/s)	9.04	Avg. Vel. (ft/s)		9.04	
Max Chl Dpth (ft)	14.62	Hydr. Depth (ft)		6.55	
Conv. Total (cfs)	285370.1	Conv. (cfs)		285370.1	
Length Wtd. (ft)	26.51	Wetted Per. (ft)		231.32	
Min Ch El (ft)	1710.68	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	556.97	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	277.05	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	40.47	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1116.5

INPUT

Description: "DR" 42+03.02 = 1116.5

Station Elevation Data		num= 149									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.2	2.19	1728.15	4.15	1727.54	6.1	1727.02	7.21	1727.03		
7.96	1727.02	10.34	1727.21	10.82	1727.23	11.25	1727.28	15.85	1727.69		
16.62	1727.77	17.33	1727.82	17.49	1727.84	17.83	1727.88	18	1727.9		
18.62	1728	23.35	1728.43	24.73	1728.58	26.39	1728.75	27.3	1728.83		
27.63	1728.86	27.9	1728.88	28.34	1728.92	28.67	1728.95	28.91	1728.98		
29.07	1729	29.11	1729	31.18	1729.23	38.22	1730	43.47	1730.72		
45.84	1731	46.73	1731	47.9	1731	49.57	1731	50.77	1731		
53.91	1730.52	55.35	1730.4	57.13	1730	60.01	1729.77	65.58	1729		
69.16	1728.45	70.95	1728.17	78.78	1728	78.99	1728	84.08	1728		
84.52	1727.97	89.89	1727.71	96.97	1727	101.45	1726.52	105.41	1726		
117.28	1725.65	137.43	1725.14	140.18	1725.06	142.2	1725	170.46	1724.31		
183.21	1724	183.98	1723.89	186.73	1723.46	189.73	1723	189.9	1722.95		
190.82	1722.72	193.79	1722	194.55	1721.81	197.85	1721	198.47	1720.85		
201.91	1720	203.11	1719.73	204.25	1719.43	213	1717.25	232.28	1712.44		
242.3	1712.13	262.7	1711.61	268.99	1710.98	269.74	1710.86	271.26	1710.61		
277.48	1711.23	281.19	1711.64	292.26	1711.99	340.47	1724.01	343.63	1724.92		
343.94	1725	344.45	1725.08	346.14	1725.34	347.16	1725.5	348.31	1725.5		
358.02	1725.63	364.34	1725.69	368.27	1725.73	375.2	1725.82	379.21	1725.85		
387.75	1726	408.17	1726.81	413.28	1727	413.69	1727	419.75	1727.91		
420.14	1728	420.45	1728.04	423.07	1728.21	425.1	1728.21	425.97	1728.25		
428.64	1728	429.35	1727.91	430.25	1727.84	436.11	1727.43	438.59	1727.54		
441.63	1727.59	444.14	1728	448.01	1728.42	450.49	1728.71	452.17	1729		
455.39	1729.8	455.88	1730	461.06	1730.77	465.03	1731	466.24	1731.09		
468.83	1731	471.65	1730.9	472.04	1730.88	472.69	1730.78	475.61	1730.4		
476.45	1730.14	479.85	1730.22	484.56	1730.33	486.88	1730.66	489.77	1730.43		
490.61	1730.44	492.73	1730	495.19	1729.55	497.75	1729	502.41	1728.42		
505.69	1728	508.71	1727.54	508.88	1727.52	508.93	1727.51	509.6	1727.51		
529.23	1727.25	538.51	1727.26	540.15	1727.28	540.24	1727.35	540.82	1727.36		
546.1	1727.58	550.9	1727.78	551.24	1727.81	553.68	1728.09	554.26	1728.14		
554.62	1728.31	555.05	1728.28	557.23	1728.27	560.09	1728.26				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	46.73	.027	466.24	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	46.73	466.24		21.15 34.45	81.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.20	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.29	Reach Len. (ft)	21.15	34.45	81.02
Crit W.S. (ft)		Flow Area (sq ft)		1536.37	
E.G. Slope (ft/ft)	0.001885	Area (sq ft)		1536.37	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	214.31	Top Width (ft)		214.31	
Vel Total (ft/s)	8.80	Avg. Vel. (ft/s)		8.80	
Max Chl Dpth (ft)	14.68	Hydr. Depth (ft)		7.17	
Conv. Total (cfs)	311311.6	Conv. (cfs)		311311.6	
Length Wtd. (ft)	34.45	Wetted Per. (ft)		217.47	
Min Ch El (ft)	1710.61	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	560.09	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	276.12	0.02
C & E Loss (ft)	0.10	Cum SA (acres)	0.40	40.34	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1116.3

INPUT

Description: "DR" 42+37.47 = 1116.3

Station Elevation Data		num= 126									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.97	2.41	1728.04	4.53	1727.52	6.44	1727.01	10.69	1727.05		
11.16	1727.05	11.25	1727.05	11.26	1727.05	14.18	1727.54	16.19	1727.88		
16.32	1727.9	16.92	1728	23.08	1728.93	23.64	1729	25.1	1729.15		
34.16	1730	37.53	1730.9	37.98	1731	38.36	1731	49.79	1731		
53.24	1730.17	54.07	1730	61.34	1729.45	64.32	1729.24	64.74	1729.21		
65.95	1729	68.33	1728.76	70.92	1728.37	71.04	1728.37	78.6	1728.22		

78.93	1728.21	79.21	1728.27	81.37	1728.76	81.67	1728.83	81.85	1728.87
82.06	1728.91	82.6	1729	83.26	1729.17	84.13	1729.33	88.1	1729.72
91.04	1729.86	91.63	1729.9	92.7	1729.91	94.49	1729.87	101.65	1729
102.04	1728.94	107.56	1728	109.95	1727.69	115.23	1727	120.09	1726.34
122.82	1726	132.46	1725.57	147.32	1725	165.29	1724.5	183.14	1724
177.06	1723.73	194.42	1722.97	194.69	1722.95	194.8	1722.98	194.85	1723
194.87	1722.98	195.28	1722.89	218.87	1716.93	237.07	1712.39	240.98	1712.29
275.77	1711.65	282.53	1711.52	283.92	1711.33	288.94	1710.52	294.93	1711.32
297.7	1711.64	302.97	1711.87	311.86	1712.31	319.61	1714.06	356.51	1723
361.12	1723.59	362.92	1724	393.6	1724.88	397.81	1725	398.63	1725.02
398.79	1725.02	402.15	1725.1	436.26	1725.64	439.26	1725.81	442.49	1725.68
444.74	1726	444.76	1726	449.57	1726.09	450.11	1726.13	455.54	1726.16
456.5	1726.23	460.24	1726.53	461.4	1726.44	463.47	1726.63	469.07	1727
474.97	1727	476.29	1727.18	476.62	1727.19	481.36	1727.29	484.62	1727.35
486.23	1727.85	486.89	1728	488.24	1728.3	492.26	1729	492.46	1729.05
492.71	1729.05	500.51	1729.58	504.58	1729	508.39	1728.02	508.48	1728
508.7	1727.97	509.04	1727.91	512.41	1727.41	514.83	1727.34	515.55	1727.32
520.23	1727.04	524.51	1726.62	526.23	1726.51	528.56	1726.52	532.63	1726.61
533.44	1727	534.5	1727.55	538.08	1727.11	539.66	1726.9	541.22	1726.44
541.86	1726.31								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	92.7	.027	500.51	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	92.7	500.51		9.89 34.45	78.33	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1726.33	Wt. n-Val.		0.027	
Vel Head (ft)	0.86	Reach Len. (ft)	9.89	34.45	78.33
W.S. Elev (ft)	1725.47	Flow Area (sq ft)		1818.76	
Crit W.S. (ft)		Area (sq ft)		1818.76	
E.G. Slope (ft/ft)	0.001602	Flow (cfs)		13515.00	
Q Total (cfs)	13515.00	Top Width (ft)		290.56	
Top Width (ft)	290.56	Avg. Vel. (ft/s)		7.43	
Vel Total (ft/s)	7.43	Hydr. Depth (ft)		6.26	
Max Chl Dpth (ft)	14.95	Conv. (cfs)		337691.0	
Conv. Total (cfs)	337691.0	Wetted Per. (ft)		293.50	
Length Wtd. (ft)	34.45	Shear (lb/sq ft)		0.62	
Min Ch El (ft)	1710.52	Stream Power (lb/ft s)	541.86	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)	0.34	274.80	0.02
Frctn Loss (ft)	0.05	Cum SA (acres)	0.40	40.14	0.06
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1116.2

INPUT

Description: "DR" 42+71.92 = 1116.2 - Inline Weir Pipe Crossing #2

Station	Elevation	Data	num=	118					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.98	.63	1728	2.52	1728.02	3.34	1727.83	4.81	1727.45
6.18	1727.12	6.61	1727.01	7.52	1727.02	7.62	1727.02	11.93	1727.08
12.29	1727.1	15.5	1727.35	15.51	1727.35	15.56	1727.36	15.57	1727.36
16.11	1727.45	16.46	1727.5	19.66	1728	25.69	1728.88	26.21	1728.95
26.59	1729	35.85	1729.82	38.63	1730	40.37	1730.29	41.9	1730.48
44.99	1731	48.35	1731	51.86	1731	54.41	1730.42	54.91	1730.31
55.98	1730	61.13	1729.64	62.24	1729.56	65.46	1729	70.2	1728.51
70.86	1728.49	77.58	1728.36	78.87	1728.33	79.01	1728.37	79.66	1728.5
80.47	1728.66	82.49	1729	85.03	1729.65	86.94	1730	95.81	1730
98.86	1730	99.64	1729.83	104.16	1729	109.36	1728.19	110.52	1728
114.39	1727.6	120.14	1727	123.75	1726.67	131.25	1726	141.31	1725.09
142.13	1725	143.03	1724.98	145.75	1724.91	171.5	1724.23	179.58	1724
183.28	1723.74	192.92	1723.22	201.74	1722.82	201.95	1723	201.99	1722.81
202.24	1722.76	217.04	1719.24	223.54	1717.72	240.41	1714.25	241.77	1714.01
243.46	1713.71	247.42	1712.5	247.76	1712.41	249.26	1711.98	261.49	1711.79
277.08	1711.6	290.58	1711.43	297.9	1710.43	305.22	1711.64	317.3	1711.84
345.87	1719.42	360.33	1723	365.95	1723.36	372.12	1723.46	396.32	1723.93
399.43	1724	399.64	1724	410.95	1724.34	415.24	1724.45	432.4	1725

433.19	1725	445.57	1725.86	447.46	1726	451.66	1726.55	456.09	1727
462.56	1727.87	463.54	1728	466.5	1728	469.51	1728	472.82	1727.48
473.84	1727.34	477.48	1727.41	481.9	1727.5	482.6	1727.46	483.34	1727.43
492.16	1727.13	492.86	1727.02	493.04	1726.99	495.13	1726.94	500.69	1726.8
503	1726.72	509.5	1726.53	512.06	1726.71	512.46	1726.75	512.46	1726.77
512.59	1726.74	512.76	1726.69	514.67	1726.64				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	98.86	.027	463.54	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	98.86	463.54		237.51	234.58	235.49	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.		0.027	
W.S. Elev (ft)	1725.43	Reach Len. (ft)	237.51	234.58	235.49
Crit W.S. (ft)	1720.60	Flow Area (sq ft)		1850.84	
E.G. Slope (ft/ft)	0.001591	Area (sq ft)		1850.84	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	301.85	Top Width (ft)		301.85	
Vel Total (ft/s)	7.30	Avg. Vel. (ft/s)		7.30	
Max Chl Dpth (ft)	15.00	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	338857.8	Conv. (cfs)		338857.8	
Length Wtd. (ft)	234.58	Wetted Per. (ft)		305.03	
Min Ch El (ft)	1710.43	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	514.67	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.34	273.35	0.02
C & E Loss (ft)		Cum SA (acres)	0.40	39.90	0.06

INLINE STRUCTURE

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1116

INPUT

Description:

Distance from Upstream XS = 28.09
 Deck/Roadway Width = 199.99
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1713	267.08	1713.01	269.48	1713.08	277.08	1713.31	280.88	1713.42
282.08	1713.46	284	1714.08	290.08	1716.06	293.83	1716.06	305.72	1716.06
514.67	1716.5								

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

E.G. Elev (ft)	1726.26	Q Gates (cfs)	
W.S. Elev (ft)	1725.43	Q Gate Group (cfs)	0.00
Q Total (cfs)	13515.00	Gate Open Ht (ft)	1723.51
Q Weir (cfs)	13515.00	Gate #Open	
Weir Flow Area (sq ft)	1873.23	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	128.35	Gate Submerg	0.00
Weir Sta Rgt (ft)	449.44	Gate Invert (ft)	0.00
Weir Max Depth (ft)	13.25	Gate Weir Coef	0.000
Weir Avg Depth (ft)	5.83		
Weir Coef (ft ^{1/2})	2.600	Q Breach (cfs)	
Weir Submerg	0.77	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1713.02	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	321.09		

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1115.2

INPUT

Description: "DR" 45+06.50 = 1115.2

Station Elevation		Data		num=		142			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.56	1.46	1727.55	3.96	1726.91	6.01	1726.44	14.1	1726.42
17.35	1726.4	17.61	1726.44	18.3	1726.53	19.84	1726.74	20.22	1726.8
21.7	1727	23.94	1727.31	30.66	1728	36.08	1728.77	37.6	1729
38.93	1729.15	45.09	1730	46.92	1730	51.05	1730	57.45	1730
88.57	1730	99.33	1730	99.69	1730	99.78	1729.97	103.91	1729
107.18	1728.97	107.53	1728.97	114.34	1728.83	115.59	1728.8	121.04	1728.98
121.45	1729	121.84	1729.06	122.1	1729.06	134.9	1729.51	138.31	1729.41
145.57	1729.11	146.23	1729.09	147.19	1729	148.49	1728.83	156.86	1728
161.61	1727.35	163.92	1727	170.54	1726.13	171.3	1726.03	171.5	1726
171.95	1725.96	180.03	1725	205.75	1724.66	242.55	1724	243.14	1724
246.04	1723.95	248.47	1723.66	251.35	1723	253.36	1722.37	254.61	1722
256.58	1721.37	257.73	1721	259.8	1720.34	260.85	1720	262.99	1719.31
263.97	1719	266.17	1718.29	267.09	1718	269.31	1717.29	270.21	1717
272.43	1716.29	273.33	1716	275.55	1715.29	276.45	1715	278.67	1714.29
279.57	1714	280.54	1713.69	282.69	1713	288.91	1711.37	289.75	1711.38
291.79	1711.24	305.13	1711.13	307.72	1711.09	312.47	1711.01	315.94	1710.99
316.69	1710.99	317.87	1710.96	318.7	1710.93	318.71	1710.93	321.22	1710.86
324.09	1710.46	328.53	1709.86	332.97	1710.46	335.85	1710.86	336.5	1711.09
339	1711.5	342.5	1713.89	370.02	1721.84	376.77	1724.08	376.88	1724.12
376.99	1724.13	377.22	1724.14	377.56	1724.15	378.28	1724.17	379.17	1724.19
381.39	1724.23	393.73	1724.49	403.83	1724.77	408.42	1724.87	417.29	1725
430.18	1725.18	432.89	1725.23	438.86	1725.31	457.19	1725.58	467.61	1725.77
475.26	1725.94	477.44	1726	477.84	1726.08	482.02	1726.53	485.03	1726.59
490.06	1726.7	490.85	1726.89	491.24	1727	495.81	1727.96	498.49	1728.57
502.06	1729	505.15	1729	511.95	1729	515.29	1728.36	517.32	1728
522.81	1727.1	527.5	1726.33	527.74	1726.29	529.32	1726.04	529.96	1725.93
532.29	1725.79	532.51	1725.78	532.75	1725.77	532.81	1725.76	533.34	1725.73
534.98	1725.59	535.45	1725.61	535.95	1725.56	536.38	1725.36	536.4	1725.53
538.63	1725.25	539.77	1725.25						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	99.33	.027	502.06	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	99.33	502.06		49.49	49.47	30.52	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.47	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.51	Reach Len. (ft)	49.49	49.47	30.52
Crit W.S. (ft)		Flow Area (sq ft)		1072.34	
E.G. Slope (ft/ft)	0.003150	Area (sq ft)		1072.34	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	125.94	Top Width (ft)		125.94	
Vel Total (ft/s)	12.60	Avg. Vel. (ft/s)		12.60	
Max Chl Dpth (ft)	13.65	Hydr. Depth (ft)		8.52	
Conv. Total (cfs)	240791.8	Conv. (cfs)		240791.8	
Length Wtd. (ft)	49.47	Wetted Per. (ft)		130.11	
Min Ch El (ft)	1709.86	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)	539.77	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	263.30	0.02
C & E Loss (ft)	0.53	Cum SA (acres)	0.40	38.75	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1114.9

INPUT

Description: "DR" 45+55.97 = 1114.9

Station Elevation Data		num=		108							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.37	1.57	1727.32	1.8	1727.28	6.32	1726.43	10.69	1726.38		
12.99	1726.35	14	1726.33	14.08	1726.34	14.61	1726.38	15.2	1726.42		
15.71	1726.44	15.97	1726.62	18.32	1726.8	22.72	1727	23.18	1727.04		
27.95	1727.38	39.99	1728	40.01	1728	40.03	1728	40.05	1728		
52.74	1728.83	53.86	1728.92	54.8	1729	63.1	1729.56	67.46	1730		
68.9	1730	70.18	1730	98.35	1730.07	99.36	1730.05	106.52	1729.91		
107.05	1729.94	107.76	1730	109.97	1730.52	111.52	1731	115.92	1731.81		
116.92	1732	119.04	1732	123.8	1732	125.11	1732	125.35	1732		
130.23	1731.04	130.46	1731	135.57	1730	135.58	1730	135.62	1730		
143.81	1729	147.52	1728.56	150.63	1728	153.02	1727.64	157.87	1727		
166.8	1726.41	173.78	1726	189.17	1725.52	215.62	1725	231.64	1724.49		
237.99	1724.06	248.15	1720.68	276.06	1711.39	299.95	1710.78	302.07	1710.74		
306.4	1710.23	307.71	1710.08	310.74	1709.74	310.97	1709.76	321.13	1710.74		
324.05	1710.83	328.89	1710.99	349.31	1711.69	381.71	1722.46	386.97	1724.22		
389.33	1725	401.54	1725.3	403.97	1725.36	425.87	1725.76	435.57	1725.94		
439.36	1726	441.73	1726.05	456.87	1726.32	460.27	1726.39	468.29	1726.52		
485.27	1726.91	486.85	1726.93	489.47	1726.98	494.85	1727.09	498.4	1727.04		
499.57	1727.2	501.87	1727.46	503.38	1727.52	505.58	1728	507.37	1728.33		
514.78	1728.03	514.98	1728	515.05	1727.99	516.12	1727.81	516.83	1727.8		
517.67	1727.79	521.43	1727.32	523.59	1727.08	524.88	1726.75	527.6	1726.03		
529.07	1725.93	536.74	1725.56	537.36	1725.59	539.29	1725.39	540.92	1724.64		
540.98	1725.27	542.01	1725.14	542.17	1725.14						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	125.35	.027	507.37	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	125.35	507.37		40.77 35.68	17.32	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.41	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.93	Reach Len. (ft)	40.77	35.68	17.32
Crit W.S. (ft)		Flow Area (sq ft)		1416.00	
E.G. Slope (ft/ft)	0.001533	Area (sq ft)		1416.00	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	147.73	Top Width (ft)		147.73	
Vel Total (ft/s)	9.54	Avg. Vel. (ft/s)		9.54	
Max Chl Dpth (ft)	14.19	Hydr. Depth (ft)		9.59	
Conv. Total (cfs)	345206.2	Conv. (cfs)		345206.2	
Length Wtd. (ft)	35.68	Wetted Per. (ft)		151.87	
Min Ch El (ft)	1709.74	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	542.17	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	261.89	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	38.60	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1114.7

INPUT

Description: "DR" 45+91.65 = 1114.7

Station Elevation Data		num=		101							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.18	1.71	1727.14	3.21	1726.77	6.41	1725.75	10.57	1725.78		
20.1	1725.77	38.85	1725.7	48.71	1725.76	49.62	1725.77	49.64	1725.77		
53.28	1725.79	54.22	1725.79	55.4	1725.98	55.51	1726	55.91	1726.06		
62.03	1727	66.48	1727.71	67.99	1728	69.45	1728.3	72.61	1729		
76.43	1729.61	78.37	1730	85.05	1730.23	85.18	1730.23	92.09	1730.09		
93.4	1730.07	94	1730.27	96.18	1731	100.02	1731	104.63	1731.51		
108.33	1731	112.67	1730.44	115.1	1730	118.49	1729.3	120.52	1729		
124.55	1728.39	127.05	1728	131.18	1727.47	135.11	1727	140.02	1726.11		
140.47	1726	146.35	1726	153.62	1726	154.74	1726	159.94	1726		
169.74	1726	171.94	1726	178.45	1726	205.94	1725.48	222.45	1725.18		

223.36	1725.17	230.79	1725	233.54	1724.36	234.38	1724.22	235.7	1723.99
239.38	1722.77	241.25	1722.15	273.71	1711.33	281.5	1711.09	296.17	1710.65
306.17	1709.65	316.17	1710.65	347.17	1711.57	370.94	1719.57	383.67	1723.85
387.12	1725	412.31	1725.69	412.32	1725.7	413.62	1725.73	414.57	1725.76
423.66	1726	425.08	1726	436.05	1726.28	449.01	1726.54	458.83	1726.74
463.73	1726.82	472.59	1727	478.14	1727.04	486.66	1727.09	491	1727.18
494.68	1727.25	497.97	1728.1	502.25	1729	511.67	1729	515.15	1729
516.23	1728.67	519.4	1727.79	519.78	1727.85	520.46	1727.72	522.86	1727.27
524.82	1726.9	527.67	1726.1	528.48	1725.78	531.11	1725.73	534.31	1725.62
534.63	1725.62	535.61	1725.57	535.67	1725.57	538.42	1725.29	540.76	1724.23
540.79	1724.67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	104.63	.027	502.25	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	104.63	502.25		79.87	35.91	36.37	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.89	Reach Len. (ft)	79.87	35.91	36.37
Crit W.S. (ft)		Flow Area (sq ft)		1422.27	
E.G. Slope (ft/ft)	0.001511	Area (sq ft)		1422.27	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	147.76	Top Width (ft)		147.76	
Vel Total (ft/s)	9.50	Avg. Vel. (ft/s)		9.50	
Max Chl Dpth (ft)	14.24	Hydr. Depth (ft)		9.63	
Conv. Total (cfs)	347664.3	Conv. (cfs)		347664.3	
Length Wtd. (ft)	35.91	Wetted Per. (ft)		151.94	
Min Ch El (ft)	1709.65	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	540.79	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	260.72	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	38.47	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1114.5

INPUT

Description: "DR" 46+27.56 = 1114.5

Station	Elevation	Data	num=	122						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.6	.82	1728.64	1.66	1728.69	2.31	1728.4	2.8	1728.36	
4.25	1727.5	5.89	1726.45	8.72	1726.41	9.95	1726.39	13.5	1726.24	
15.87	1726.01	16.26	1726.02	16.87	1726.04	17.9	1726.08	19.9	1726.4	
21.43	1726.65	21.78	1726.76	22.17	1726.89	22.35	1726.94	22.46	1726.98	
22.52	1727	22.53	1727	27.31	1727.54	30.7	1728	35.03	1728.88	
35.73	1729	39.31	1729.59	41.47	1729.91	42.06	1730	43.06	1730.04	
50.37	1730.29	56.12	1730.49	60.29	1730.42	64.31	1730.34	64.49	1730.38	
67.3	1731	70.96	1731.64	73.04	1731.79	76.53	1731.89	78.35	1731.8	
81.67	1731.79	87.86	1731	88.66	1730.87	90.71	1730.54	92.62	1730.22	
93.9	1730	95.58	1729.68	99.92	1729	101.98	1728.56	104.96	1728	
106.7	1727.64	109.71	1727	111.08	1727	114.25	1727	117.69	1727	
134.7	1727	137.78	1727	140.44	1727	143.94	1727	146.83	1727	
147.1	1727	147.41	1727	149.23	1726.88	159.22	1726.5	161.63	1726.5	
162.14	1726.5	166.63	1726.5	173.94	1726.5	175.64	1726.43	181.84	1726.21	
184.88	1726.2	200.18	1726.01	201.03	1726	204.97	1725.75	217.62	1725	
218.76	1724.6	220.43	1724.02	225.05	1722.49	236.16	1718.8	258.63	1711.35	
272.3	1710.94	284.84	1710.56	289.67	1710.08	294.84	1709.56	299.72	1710.05	
304.84	1710.56	332.55	1711.39	349.91	1717.24	363.32	1721.76	372.94	1725	
376.85	1725.09	378.6	1725.12	384.43	1725.25	419.49	1726	421.09	1726	
422.15	1726	448.11	1726.84	453.87	1727	461.92	1727.09	473.68	1727.21	
480.39	1727.34	481.69	1727.37	483.06	1727.47	490.63	1728	494.53	1728.57	
495.57	1728.54	498.1	1728	503.28	1728	505.23	1727.53	506.94	1727	
509.38	1726.34	510.56	1726	512.98	1725.6	514.01	1725.43	515.29	1725.22	
515.57	1725.21	516.67	1725.19	517.32	1725.18	517.99	1725.17	521.66	1725.28	
523.56	1725.08	524.81	1724.51							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	76.53	.027	494.53	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	76.53	494.53		9.52	22.45	32.84	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.37	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.85	Reach Len. (ft)	9.52	22.45	32.84
Crit W.S. (ft)		Flow Area (sq ft)		1436.63	
E.G. Slope (ft/ft)	0.001472	Area (sq ft)		1436.63	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	148.59	Top Width (ft)		148.59	
Vel Total (ft/s)	9.41	Avg. Vel. (ft/s)		9.41	
Max Chl Dpth (ft)	14.29	Hydr. Depth (ft)		9.67	
Conv. Total (cfs)	352234.1	Conv. (cfs)		352234.1	
Length Wtd. (ft)	22.45	Wetted Per. (ft)		152.78	
Min Ch El (ft)	1709.56	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)	524.81	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	259.55	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	38.35	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1114.4

INPUT

Description: "DR" 46+50.01 = 1114.4

Station	Elevation	Data	num=	118						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.42	2.18	1728.34	2.34	1728.34	3.09	1728.35	3.31	1728.27	
4.01	1727.86	5.86	1726.81	7.19	1726.82	10.23	1726.67	10.47	1726.65	
10.58	1726.65	15.08	1726.32	15.24	1726.35	16.42	1726.54	18.03	1726.81	
18.17	1726.85	18.44	1726.94	18.61	1726.99	18.64	1727	24.9	1727.71	
29.48	1728	34.08	1728.94	34.42	1729	34.6	1729.03	41.16	1730	
47.82	1730.25	51.8	1730.4	55.37	1730.33	59.89	1730.25	62.43	1730.97	
62.45	1730.98	62.54	1731	62.9	1731.06	67.72	1732	77.33	1732	
83.61	1732	84.45	1731.85	87.35	1731.34	89.05	1731	89.51	1730.91	
94.07	1730	96.21	1729.66	100.33	1729	102.85	1728.47	105.55	1728	
111.23	1727.02	111.33	1727	111.47	1727	116.5	1727	120.4	1727	
125.48	1727	128.79	1726.67	131.54	1726.5	131.98	1726.56	132.34	1726.56	
133.98	1726.63	136.2	1726.58	136.93	1726.5	138.08	1726.59	138.61	1726.56	
140.32	1726.5	147.02	1726.5	156.31	1726.5	169.36	1726.5	170.8	1726.5	
178.12	1726.5	187.9	1726.34	205.31	1726	205.94	1725.94	213.57	1725	
216.22	1724.15	216.71	1724.01	254.75	1711.35	254.77	1711.34	254.78	1711.34	
282.63	1710.51	292.62	1709.51	292.63	1709.51	302.62	1710.51	302.63	1710.51	
302.64	1710.51	328.37	1711.28	328.4	1711.29	369	1724.94	369.16	1725	
370.16	1725.02	376.76	1725.17	412.14	1726	413.49	1726	414.54	1726	
415.23	1726	417.82	1726	428.79	1726.27	438.46	1726.45	443.6	1726.53	
467.64	1727	467.66	1727	467.71	1727	467.78	1727	470.86	1727.05	
478.32	1727.2	478.86	1727.21	490.26	1728	490.3	1728	496.06	1728	
497.44	1728	498.12	1727.84	501.55	1727	503	1726.6	505.44	1726	
508.63	1725.47	512.9	1724.76	513.73	1724.71	514.37	1724.67	515.47	1724.92	
518.26	1725	519.26	1724.89	519.54	1724.77					

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	83.61	.027	490.26	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	83.61	490.26		22.32	50	72.85	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.81	Reach Len. (ft)	22.32	50.00	72.85
Crit W.S. (ft)		Flow Area (sq ft)		1434.55	
E.G. Slope (ft/ft)	0.001476	Area (sq ft)		1434.55	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	

Top Width (ft)	148.33	Top Width (ft)	148.33		
Vel Total (ft/s)	9.42	Avg. Vel. (ft/s)	9.42		
Max Chl Dpth (ft)	14.30	Hydr. Depth (ft)	9.67		
Conv. Total (cfs)	351765.7	Conv. (cfs)	351765.7		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	152.53		
Min Ch El (ft)	1709.51	Shear (lb/sq ft)	0.87		
Alpha	1.00	Stream Power (lb/ft s)	519.54	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	258.81	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	38.28	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1114.2

INPUT

Description: "DR" 47+00.01 = 1114.2

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.21	2.83	1728.23	5.59	1727.24	6.38	1727.37
11.07	1727.34	11.92	1727.37	12.09	1727.38	12.29	1727.39
12.61	1727.44	13.02	1727.46	24.87	1728	26.62	1728.33
32.52	1729.5	35.02	1730	40.89	1730.12	42.8	1730.19
50.81	1730.03	53.41	1730.95	53.56	1731	56.13	1731.52
58.61	1732	59.5	1732	68.21	1732	72.72	1731.11
76.35	1730.39	78.21	1730.06	78.57	1730	81.91	1729.56
87.27	1728.86	91.39	1728.58	93.27	1728.44	95.68	1728.39
100.67	1728.33	104.05	1728.27	104.99	1728.23	107.85	1728
109.2	1727.8	112.51	1727.23	113.25	1727.14	116.81	1727.21
118.84	1727.35	123.08	1727.95	123.3	1727.98	123.37	1728
140.74	1728	142.2	1727.81	146.35	1727.35	149.28	1727
153.54	1726.88	166.31	1726.5	167.16	1726.5	174.18	1726.5
176.95	1726.5	177.64	1726.5	178.62	1726.5	180.53	1726.5
187.98	1726	188.62	1725.95	200.04	1725	246.91	1711.3
258.13	1710.9	275.33	1710.38	285.32	1709.38	285.33	1709.38
295.33	1710.38	300.75	1710.55	308.98	1710.79	308.99	1710.79
344.62	1719.46	363.69	1724.92	364.85	1724.98	364.91	1725
387.36	1725.56	397.65	1725.83	397.75	1725.83	404.47	1726
419.36	1726.4	437.02	1726.86	443.23	1727	461.3	1727.28
469.28	1727.41	475.41	1727.54	477.11	1727.64	486.69	1728
493.4	1728	493.97	1727.86	497.54	1727	498.17	1726.85
505.93	1725.3	506.2	1725.26	510.04	1724.62	510.31	1724.63
512.51	1724.68	514.69	1724.72				

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	68.21	.027	491.23	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	68.21	491.23		31.03	79		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1725.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.70	Reach Len. (ft)	31.03	79.00	96.80
Crit W.S. (ft)		Flow Area (sq ft)		1421.87	
E.G. Slope (ft/ft)	0.001600	Area (sq ft)		1421.87	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	154.97	Top Width (ft)		154.97	
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)		9.51	
Max Chl Dpth (ft)	14.32	Hydr. Depth (ft)		9.18	
Conv. Total (cfs)	337826.8	Conv. (cfs)		337826.8	
Length Wtd. (ft)	79.00	Wetted Per. (ft)		158.51	
Min Ch El (ft)	1709.38	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	514.69	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.34	257.17	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	38.10	0.06

CROSS SECTION

RS: 1113.9

Description: "DR" 47+79.01 = 1113.9

Manning's	n	Values	num=	3	
Sta	n	Val	Sta	n	Val
0	.031	141.41	.027	496.1	.031

CROSS SECTION OUTPUT Profile #PF 1

CROSS SECTION

RS: 1113.7

Description: "DR" 48+00.02 = 1113.7

Station		Elevation		Data		num=		145	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.89	1.94	1727.91	2.19	1727.91	2.4	1727.91	2.57	1727.91
2.7	1727.91	2.8	1727.91	2.87	1727.91	2.92	1727.91	3.75	1727.94
5.06	1728.04	6.02	1727.91	7.86	1727.77	7.9	1727.77	10.36	1727.99
10.37	1727.99	10.51	1727.97	10.66	1727.93	10.86	1727.88	11.79	1727.99

12.6	1728.03	13.93	1728	14.45	1727.99	15.25	1727.95	18.1	1727.74
20.43	1727.55	22.1	1727.41	23.8	1727.34	30.73	1727.02	30.88	1727.01
30.96	1727.01	31.34	1727	31.9	1727	56.02	1727	70.45	1727
73.66	1726.7	76.26	1726.24	77.22	1726.09	77.76	1726	92.74	1726
100.73	1726	102.12	1726.16	102.41	1726.17	104.25	1726.32	108.93	1726.66
113.4	1726.76	115.07	1726.82	116.49	1726.78	121.32	1726.51	126.1	1726.1
126.93	1726	130.61	1725.48	133.99	1725	134.51	1724.94	138.49	1724.63
152.74	1724	153.2	1723.98	154.43	1723.91	167.34	1723.2	169.91	1723
172.18	1722.52	174.65	1722	175.97	1721.72	179.4	1721	179.86	1720.9
182.27	1720.39	183.47	1720.11	183.96	1720	186.72	1719.35	188.24	1719
190.18	1718.55	192.52	1718	193.79	1717.7	196.8	1717	197.52	1716.83
201.08	1716	201.34	1715.94	203.73	1715.38	205.26	1715	205.74	1714.91
206.7	1714.68	207.26	1714.64	207.97	1714.47	223.26	1710.64	240.02	1710.14
240.25	1710.14	240.38	1710.12	250.25	1709.14	250.26	1709.14	250.8	1709.19
251.17	1709.23	260.12	1710.12	260.26	1710.14	260.44	1710.14	273.09	1710.52
275.09	1711.02	275.84	1711.19	326.55	1723.65	330.84	1723.84	334.72	1724
347.47	1724.43	354.86	1724.63	359.13	1724.69	370.85	1724.93	371.8	1724.93
376.56	1725	399.55	1725.16	404.22	1725.27	415.27	1725.52	430.17	1725.7
434.55	1725.88	437.5	1726	440.86	1726.45	445.15	1727	446.33	1727.19
451.09	1727.69	454.15	1728	456.95	1728	457.9	1728	458.24	1727.9
461.9	1727.24	467.62	1727.32	470.36	1727.37	471	1727.52	472.05	1728
475.37	1728.48	478.41	1728.88	479.35	1729	484.89	1729	492.28	1729
494.65	1728.37	495.82	1728.11	496.26	1728	497.82	1727.75	501.94	1727
506.26	1726.19	507.32	1726	507.73	1725.94	507.92	1725.91	509.29	1725.71
510.28	1725.56	513.67	1725.59	515.29	1725.6	520.5	1725.74	520.52	1725.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	70.45	.027	479.35	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	70.45	479.35		57.35 50.03	48.89	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.22	Reach Len. (ft)	57.35	50.03	48.89
Crit W.S. (ft)		Flow Area (sq ft)		1315.77	
E.G. Slope (ft/ft)	0.002115	Area (sq ft)		1315.77	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	157.83	Top Width (ft)		157.83	
Vel Total (ft/s)	10.27	Avg. Vel. (ft/s)		10.27	
Max Chl Dpth (ft)	14.08	Hydr. Depth (ft)		8.34	
Conv. Total (cfs)	293896.8	Conv. (cfs)		293896.8	
Length Wtd. (ft)	50.03	Wetted Per. (ft)		160.92	
Min Ch El (ft)	1709.14	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	520.52	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	254.09	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.40	37.75	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1113.6

INPUT

Description: "DR" 48+50.05 = 1113.6

Station Elevation Data		num= 113							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.5	3.61	1727.42	4.48	1727.21	7.33	1726.45	13.58	1725.9
15.54	1725.78	16.52	1725.64	16.55	1725.64	17.19	1725.73	18.62	1725.93
19.15	1726	22.21	1726.89	23.12	1727.13	28.79	1727.05	32.87	1726.99
39.85	1726.86	51.02	1726.65	81.15	1726	81.84	1725.86	83.98	1725.28
85	1725	87.03	1724.74	93.21	1724	109.74	1723.22	115.57	1723
119.14	1722.12	119.61	1722	123.21	1721.11	123.66	1721	127.29	1720.1
127.71	1720	131.38	1719.09	131.75	1719	135.48	1718.08	135.8	1718
139.59	1717.06	139.85	1717	143.73	1716.04	143.89	1716	147.91	1715.01
147.94	1715	150.6	1714.96	176.13	1714.54	177.76	1714.52	178.47	1714.49
178.96	1714.37	194.48	1710.49	210.37	1710.02	210.58	1710.01	210.73	1710

220.59	1709.01	220.61	1709.01	221.92	1709.15	223.09	1709.26	230.6	1710.01
230.84	1710.02	244.47	1710.43	282.18	1719.86	285.11	1720.55	288.7	1721
290.06	1721.2	297.61	1722	304.79	1722.76	307.64	1723	317.68	1723.19
328.7	1723.38	334.15	1723.38	336.35	1723.41	345.71	1723.43	347.88	1723.46
382.91	1724	395.29	1724	397.07	1724	401.91	1724	406.88	1724
407.03	1724	409.26	1724.07	438.57	1725	439.56	1725.24	442.65	1726
447.9	1726.6	451.26	1726.91	455.56	1727.01	459.89	1727.11	461.8	1727.46
463.77	1728	468.05	1728.98	468.14	1729	476.22	1729	481.14	1729
484.44	1729	485.01	1728.87	488.49	1728	491.37	1727.53	493.93	1727.08
494.41	1727	499.03	1726.09	499.52	1726	500.11	1725.91	500.22	1725.89
502.28	1725.58	505.03	1725.48	506.74	1725.4	507.3	1725.39	507.74	1725.39
508.51	1725.41	508.59	1725.41	508.99	1725.42	509.79	1725.38	509.84	1725.4
513.42	1725.4	513.64	1725.39	514.15	1725.39				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	23.12	.027	468.05	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	23.12	468.05		30.93	26.98	3.61	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.04	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.54	Reach Len. (ft)	30.93	26.98	3.61
Crit W.S. (ft)		Flow Area (sq ft)		1649.42	
E.G. Slope (ft/ft)	0.001820	Area (sq ft)		1649.42	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	250.01	Top Width (ft)		250.01	
Vel Total (ft/s)	8.19	Avg. Vel. (ft/s)		8.19	
Max Chl Dpth (ft)	14.53	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	316797.0	Conv. (cfs)		316797.0	
Length Wtd. (ft)	26.98	Wetted Per. (ft)		252.99	
Min Ch El (ft)	1709.01	Shear (lb/sq ft)		0.74	
Alpha	1.00	Stream Power (lb/ft s)	514.15	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	252.38	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	37.52	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1113.5

INPUT

Description: "DR" 48+77.03 = 1113.5

Station	Elevation	Data	num=	117					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1727.14	3.47	1727.08	4.16	1727.07	4.53	1726.98	7.36	1726.32
12.98	1726.02	15.39	1725.87	15.98	1725.79	17.42	1725.43	18.02	1725.51
18.05	1725.52	19.08	1725.66	21.5	1726	23.98	1726.62	25.48	1726.94
26.75	1727.22	30.47	1727.16	36.49	1727.07	38.19	1727.04	39	1727.02
55.24	1726.45	67.88	1726	68.83	1726	69.82	1726	76.88	1726
79.79	1725.61	85.44	1725	86.25	1724.92	94.41	1724	100.86	1723.56
106.98	1723.17	109.51	1723	113.23	1722.28	114.7	1722	117.77	1721.41
119.89	1721	122.26	1720.54	125.08	1720	126.71	1719.69	130.27	1719
131.1	1718.84	135.36	1718.02	135.44	1718	135.46	1718	139.7	1717.16
140.51	1717	143.99	1716.31	145.56	1716	148.33	1715.45	150.61	1715
162.43	1714.51	163.93	1714.44	164.23	1714.38	178.63	1710.79	180.3	1710.37
193.5	1709.98	194.58	1709.95	195.51	1709.85	204.59	1708.95	205.39	1709.03
207.94	1709.28	214.59	1709.95	229.45	1710.39	230.41	1710.42	264.54	1718.9
270.68	1720.43	273.71	1720.51	284.48	1720.81	290.8	1721	296.23	1721.52
300.47	1722	304.2	1722.26	316.29	1723	359.89	1723.65	385.15	1724
386	1724	389.56	1724	405.96	1724.94	406.87	1725	407.87	1725.1
417.31	1726	418.47	1726.14	424.24	1726.91	424.93	1726.99	424.98	1727
426.1	1727	427.07	1727	428.95	1727	430.71	1727	433.14	1727
444.81	1727.05	447.16	1727.11	453.72	1727.23	455.18	1727.26	457.07	1727.4
459.08	1727.56	467.48	1728	469.98	1728.69	471.63	1729	474.45	1729
478.25	1729	479.13	1728.71	481.72	1728	483.12	1727.75	484.46	1727.49
487.25	1727	490.03	1726.4	492.1	1726	494.23	1725.65	494.59	1725.59
494.62	1725.58	494.85	1725.57	496.72	1725.49	498.6	1725.51	504.19	1725.36
504.87	1725.36	505.56	1725.38						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 30.47 .027 471.63 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 30.47 471.63 44.09 49.27 4.89 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.		0.027	
W.S. Elev (ft)	1723.34	Reach Len. (ft)	44.09	49.27	4.89
Crit W.S. (ft)		Flow Area (sq ft)		1552.67	
E.G. Slope (ft/ft)	0.002046	Area (sq ft)		1552.67	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	234.70	Top Width (ft)		234.70	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)		8.70	
Max Chl Dpth (ft)	14.39	Hydr. Depth (ft)		6.62	
Conv. Total (cfs)	298822.5	Conv. (cfs)		298822.5	
Length Wtd. (ft)	49.27	Wetted Per. (ft)		237.42	
Min Ch El (ft)	1708.95	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	505.56	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	251.39	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	37.37	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1113.3

INPUT

Description: "DR" 49+26.30 = 1113.3

Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1726.89	.75	1726.89	4.29	1726.94	7.01	1726.26	7.59	1726.15
9.44	1726.07	15.83	1725.79	17.4	1725.61	19.43	1725.39	21.51	1725.16
21.74	1725.17	23.16	1725.35	26.33	1725.77	26.82	1725.83	28.1	1726
30.72	1726.55	34.44	1727.35	37.55	1727.31	43.24	1727.23	44.23	1727.21
44.76	1727.21	56.03	1726.96	57.7	1726.93	70.15	1726.65	77.52	1726.49
81.85	1726.36	94	1726	97.01	1725.37	98.6	1725	103.02	1724.05
103.26	1724	108.09	1723.35	109.84	1723	111.02	1722.71	113.84	1722
115.08	1721.69	117.84	1721	119.14	1720.68	121.85	1720	123.21	1719.66
125.85	1719	127.28	1718.64	129.85	1718	131.37	1717.62	133.85	1717
135.46	1716.6	137.85	1716	139.57	1715.57	141.86	1715	147.23	1714.28
148.49	1714.13	148.87	1714.05	149.75	1713.83	157.61	1711.88	159.86	1711.33
165.12	1710.03	171.85	1709.82	181.85	1708.82	187.67	1709.4	191.73	1709.79
192.1	1709.83	193.05	1709.86	216.05	1710.54	226.89	1713.25	256.05	1720.54
259.11	1720.71	263.76	1720.96	265.02	1721	266.75	1721.23	273.41	1722
278.86	1722.4	288.61	1723	297.35	1723.39	299.95	1723.34	305.76	1723.49
308.54	1723.45	354.42	1724	363.05	1724	367.26	1724	372.62	1724
381.11	1724	384.9	1724.25	394.42	1725	394.93	1725.06	400.64	1725.66
403.8	1725.98	404.08	1726	409.32	1726.35	410.44	1726.55	416.77	1727
417.33	1727	417.49	1727	418.01	1727	420.57	1727	431	1727.01
431.68	1727	433.34	1726.97	435.01	1727	441.35	1727.12	441.84	1727.13
451.93	1727.68	453.22	1727.74	456.73	1728	461.75	1728.91	462.62	1728.89
465.2	1728.79	466.36	1728.4	467.81	1728	468.61	1727.86	469.37	1727.71
473.39	1727	475.27	1726.59	478.32	1726	480.32	1725.67	480.36	1725.66
480.87	1725.58	481.03	1725.57	481.14	1725.57	482.41	1725.5	489.67	1725.32
491.3	1725.3	491.97	1725.32						

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 34.44 .027 461.75 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 34.44 461.75 85.8 26.58 5.17 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.59	Wt. n-Val.		0.027	
W.S. Elev (ft)	1722.78	Reach Len. (ft)	85.80	26.58	5.17
Crit W.S. (ft)		Flow Area (sq ft)		1336.80	

E.G. Slope (ft/ft)	0.002282	Area (sq ft)	1336.80		
Q Total (cfs)	13515.00	Flow (cfs)	13515.00		
Top Width (ft)	174.32	Top Width (ft)	174.32		
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)	10.11		
Max Chl Dpth (ft)	13.96	Hydr. Depth (ft)	7.67		
Conv. Total (cfs)	282909.7	Conv. (cfs)	282909.7		
Length Wtd. (ft)	26.58	Wetted Per. (ft)	177.27		
Min Ch El (ft)	1708.82	Shear (lb/sq ft)	1.07		
Alpha	1.00	Stream Power (lb/ft s)	491.97	0.00	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	249.76	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	37.13	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1113.1

INPUT

Description: "DR" 49+52.88 = 1113.1

Station	Elevation	Data	num=	126						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1726.35	.8	1726.33	3.05	1726.38	4.4	1726.22	6.23	1725.99	
7.49	1725.88	8.03	1725.84	10.79	1725.57	13.18	1725.33	14.53	1725.24	
14.76	1725.23	15.02	1725.21	15.94	1725.31	16.64	1725.39	18.17	1725.56	
20.7	1725.88	20.94	1725.91	21.57	1726	23.12	1726	24.65	1726	
25.85	1726	26.76	1726	27.4	1726	27.82	1726	28.05	1726	
29.78	1726.84	31.48	1727.48	31.62	1727.54	31.98	1727.53	34.25	1727.49	
39.11	1727.4	39.82	1727.38	40.29	1727.1	42.27	1726	48.48	1725.76	
52.62	1725.62	57.26	1725.49	73.53	1725	76.57	1724.61	78.81	1724.33	
80.13	1724.03	80.21	1724	80.23	1724	80.23	1723.99	84.92	1722.47	
88.88	1721.57	95.59	1720.43	98.65	1719.83	99.57	1719.62	100.83	1719.56	
120.32	1713.14	130.15	1709.9	132.59	1709.83	135.2	1709.76	141.99	1709.09	
145.26	1708.76	145.31	1708.76	154.05	1709.63	155.42	1709.76	159.18	1709.88	
161.91	1709.96	183.2	1710.6	198.27	1714.35	223.38	1720.6	224.36	1720.85	
225.05	1721	227.1	1721.23	230.39	1721.47	237.63	1722	246.94	1722.99	
247.02	1723	247.14	1723.01	247.63	1723.05	257.43	1723.8	269.49	1723.94	
270.27	1723.98	276.64	1723.84	278.03	1723.87	282.85	1723.78	302.78	1724	
322.87	1724	331.85	1724	334.89	1724	342.03	1724	346.38	1724	
361.21	1724	361.71	1724	364.49	1724	372.95	1724.63	377.26	1725	
380.03	1725.27	384.9	1725.83	385.77	1725.96	386.02	1726	387.16	1726.18	
392.65	1727	395.05	1727	395.77	1727	400.96	1727	401.94	1726.85	
403.84	1726.78	409.74	1726.9	411.84	1726.94	413.92	1726.97	415.06	1727	
417.5	1727.12	429.16	1728	429.97	1728.15	437.72	1728.08	437.95	1728.07	
438.06	1728.04	438.2	1728	438.27	1727.99	438.35	1727.97	443.83	1727	
444.67	1726.82	448.85	1726	449.81	1725.84	449.83	1725.84	451.38	1725.58	
451.85	1725.57	451.88	1725.57	455.5	1725.36	459.41	1725.27	462.05	1725.24	
462.72	1725.26									

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	31.62	.027
		429.97	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	31.62	429.97		75.99	52.12	12.56	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.07	Wt. n-Val.		0.027	
W.S. Elev (ft)	1722.18	Reach Len. (ft)	75.99	52.12	12.56
Crit W.S. (ft)		Flow Area (sq ft)		1171.43	
E.G. Slope (ft/ft)	0.002999	Area (sq ft)		1171.43	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	153.18	Top Width (ft)		153.18	
Vel Total (ft/s)	11.54	Avg. Vel. (ft/s)		11.54	
Max Chl Dpth (ft)	13.42	Hydr. Depth (ft)		7.65	
Conv. Total (cfs)	246773.8	Conv. (cfs)		246773.8	
Length Wtd. (ft)	52.12	Wetted Per. (ft)		156.42	
Min Ch El (ft)	1708.76	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)	462.72	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	248.99	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	37.03	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1112.8

INPUT

Description: "DR" 50+05.00 = 1112.8

Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1725.95	2.9	1725.96	4.07	1725.83	5.81	1725.75	6.28	1725.66
6.31	1725.66	6.32	1725.66	6.34	1725.67	6.46	1725.69	8.34	1726
11.81	1726	12.82	1726	13.92	1726	15.24	1726	28.63	1727.27
28.64	1727.27	28.69	1727.28	28.74	1727.28	31.88	1727.21	36.61	1727.12
36.7	1727.11	36.81	1727.09	42.53	1726	45.52	1725.77	53.56	1725
55.72	1724.55	60.12	1724.29	61.46	1724	62.34	1723.79	62.49	1723.74
62.84	1723.62	71.62	1721.63	77.01	1720.41	82.67	1719.44	94.83	1715.39
111.72	1709.78	116.02	1709.65	116.72	1709.63	126.69	1708.63	126.74	1708.63
126.75	1708.63	136.78	1709.63	146.81	1709.93	153.3	1710.13	164.18	1710.46
175.07	1713.17	204.58	1720.48	205.28	1720.66	206.95	1721	210.02	1721.22
218.15	1722	224.14	1722.77	225.61	1723	227.8	1723.32	232.94	1724
235.19	1724.4	240.01	1725	246.18	1725	252.25	1725	257.81	1725
259.74	1725	265.49	1725	269.75	1725	270.6	1725	277.29	1724.67
286.6	1724	293.2	1724	301.39	1724	310.59	1724	318.97	1724
320.41	1724	321.57	1724	330.07	1724	336.71	1724	361.71	1724
366.45	1724	368.63	1724	372.18	1724.56	374.5	1725	376.53	1725.47
379.13	1726	381.25	1726.53	382.97	1727	389.93	1727	390.31	1727
390.45	1726.97	392.78	1726.51	396.51	1726.58	400.78	1726.66	403.35	1726.74
406.76	1727	415.93	1727.81	417.41	1728	419.19	1728	427.4	1728
431.4	1727.27	433.31	1727	435.41	1726.63	438.59	1726	442.73	1725.32
443.47	1725.19	443.54	1725.18	446.8	1725.13	447.38	1725.11	447.44	1725.12
447.85	1725.23	448.3	1725.22	452.54	1725.19				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	28.63	.027	417.41	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	28.63	417.41		78.42 55.18	5.51		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.85	Reach Len. (ft)	78.42	55.18	5.51
Crit W.S. (ft)		Flow Area (sq ft)		1130.29	
E.G. Slope (ft/ft)	0.003173	Area (sq ft)		1130.29	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	145.99	Top Width (ft)		145.99	
Vel Total (ft/s)	11.96	Avg. Vel. (ft/s)		11.96	
Max Chl Dpth (ft)	13.22	Hydr. Depth (ft)		7.74	
Conv. Total (cfs)	239910.0	Conv. (cfs)		239910.0	
Length Wtd. (ft)	55.18	Wetted Per. (ft)		149.23	
Min Ch El (ft)	1708.63	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	452.54	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	247.61	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.40	36.86	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1112.6

INPUT

Description: "DR" 50+60.18 = 1112.6

Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1725.55	1.2	1725.56	6.78	1725.28	9.64	1725.29
14.67	1724.84	15.94	1724.68	16.24	1724.64	16.35	1724.65
16.73	1724.61	18.6	1724.92	19.07	1725	19.44	1725.05
23.2	1726	25.57	1726.58	26.6	1726.91	32.83	1726.79
37.04	1726.37	40.35	1726	47.52	1725.13	48.7	1725

60.4	1724.17	62.28	1723.75	82.4	1716.97	84.1	1716.41	111.4	1709.59
116.39	1709.44	116.4	1709.44	117.32	1709.35	126.4	1708.44	126.41	1708.44
136.06	1709.4	136.41	1709.44	147.84	1709.78	160.73	1710.16	163.04	1710.23
196.08	1718.48	203.07	1720.23	204.48	1720.5	207.02	1721	215.72	1721.64
220.61	1722	224.04	1722.54	227.11	1723	227.59	1723.09	227.97	1723.13
230.18	1723.36	235.32	1723.87	242.01	1724	243.48	1724.03	245.19	1724
251.55	1723.92	252.41	1723.93	253.37	1723.93	254.96	1723.92	269.45	1723.71
279.82	1723.61	288.47	1723.59	296.1	1723.57	306.25	1723.63	311.48	1723.69
318.58	1723.73	325.34	1724	332.47	1724	335.69	1724	346.86	1724
362.57	1724	364.51	1724	366.61	1724	369.71	1724	370.71	1724.17
375.14	1725	378.53	1725.78	379.25	1726	380.41	1726	381.99	1726.03
384.92	1726.3	388.73	1726.61	390.3	1726.6	392.74	1726.27	396.86	1726.36
400.75	1726.44	405.71	1726.92	406.75	1727	407.68	1727.08	414.91	1728
422.67	1728	427.54	1728	430.04	1727.55	433.86	1727	437.87	1726.28
439.3	1726	441.26	1725.67	443.54	1725.29	444.13	1725.2	444.86	1725.07
446.32	1725.11	447.92	1725.16	448.28	1725.25	452.13	1725.28	452.96	1725.27

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	26.6	.027
		414.91	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	26.6	414.91		45.75 30.26	19.76		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.95	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.88	Reach Len. (ft)	45.75	30.26	19.76
Crit W.S. (ft)		Flow Area (sq ft)		1204.86	
E.G. Slope (ft/ft)	0.002682	Area (sq ft)		1204.86	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	151.12	Top Width (ft)		151.12	
Vel Total (ft/s)	11.22	Avg. Vel. (ft/s)		11.22	
Max Chl Dpth (ft)	13.44	Hydr. Depth (ft)		7.97	
Conv. Total (cfs)	260974.7	Conv. (cfs)		260974.7	
Length Wtd. (ft)	30.26	Wetted Per. (ft)		154.31	
Min Ch El (ft)	1708.44	Shear (lb/sq ft)		1.31	
Alpha	1.00	Stream Power (lb/ft s)	452.96	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	246.14	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	36.67	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1112.4

INPUT

Description: "DR" 50+90.44 = 1112.4

Station Elevation Data		num= 114	
Sta	Elev	Sta	Elev
0	1725.51	3.25	1725.44
6.98	1725.19	11.64	1724.8
15.82	1724.6	15.93	1724.62
18.29	1725	22.58	1726
26.44	1726.6	29	1726.66
44.11	1726	50.51	1725
60.3	1723.24	64.73	1722.2
69.85	1721	77.68	1720.25
93.25	1718.64	97.07	1717.38
136.58	1708.33	146.6	1709.33
185.28	1713.13	215.23	1720.57
227.14	1721.75	232.27	1722.26
251.1	1723.37	254.16	1723.35
283.24	1723.29	291.17	1723.19
311.51	1723.13	332.72	1723.23
354.88	1724.42	359.83	1725
369.4	1726	369.8	1726
388.38	1726	394.9	1725.81
405.52	1725.94	407.62	1725.97
413.15	1727	421.01	1728
434.25	1727.45	440.04	1727
447.25	1725.68	450.36	1725.16
		450.37	1725.16
		450.43	1725.15
		450.65	1725.09

453.94 1725.3 454.27 1725.3 455.92 1725.34 459.12 1725.36

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 27 .027 421.01 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
27 421.01 80.79 72.53 30.85 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.13	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.59	Reach Len. (ft)	80.79	72.53	30.85
Crit W.S. (ft)		Flow Area (sq ft)		1152.83	
E.G. Slope (ft/ft)	0.003284	Area (sq ft)		1152.83	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	157.69	Top Width (ft)		157.69	
Vel Total (ft/s)	11.72	Avg. Vel. (ft/s)		11.72	
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)		7.31	
Conv. Total (cfs)	235840.1	Conv. (cfs)		235840.1	
Length Wtd. (ft)	72.53	Wetted Per. (ft)		160.85	
Min Ch El (ft)	1708.33	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)	459.12	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.34	245.32	0.02
C & E Loss (ft)	0.17	Cum SA (acres)	0.40	36.56	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1112.2

INPUT

Description: "DR" 51+62.97 = 1112.2

Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1725.3	1.33	1725.45	2.97	1725.52	2.98	1725.53	4.42	1725.3
6.29	1725.19	6.31	1725.18	6.69	1725.15	8.58	1724.9	13.39	1724.26
14.77	1724.17	17.56	1724.03	17.67	1724.02	18.35	1724.1	21.96	1724.67
22.72	1724.79	23.14	1724.86	24.04	1725	24.56	1725.12	28.3	1726
33.16	1726.27	34.57	1726.32	37.13	1726.27	42.93	1726.17	50.43	1726.01
51.37	1726	53.03	1725.78	59.17	1725	62.74	1724.12	63.25	1724
66.75	1723.14	67.33	1723	70.76	1722.16	71.41	1722	74.76	1721.18
75.49	1721	86.5	1720.68	109.32	1720.04	127.29	1715.56	152.47	1709.28
156.01	1709.17	158.99	1709.08	164.11	1708.57	169	1708.08	173.74	1708.55
179.01	1709.08	186.01	1709.28	190.59	1709.42	205.75	1709.87	220.3	1713.49
243.93	1719.37	252.96	1719.93	253.75	1719.97	254.13	1720	255.74	1720.07
268.45	1721	280.83	1721.48	295.64	1721.59	310.82	1721.9	335.28	1721.99
336.11	1722	337.75	1722.08	342.5	1722.2	370.86	1723	371.88	1723
373.13	1723	375.1	1723	381.67	1723.34	386.17	1723.59	391.83	1724
396.95	1724.83	397.76	1725	406.97	1725	410.27	1725	412.07	1724.7
412.98	1724.54	415.8	1724.62	421.23	1724.8	421.77	1724.8	424.03	1724.84
430.83	1725	434.08	1725.2	437.13	1725.47	441.44	1726	449.53	1726.96
449.86	1727	457.73	1727	457.86	1727	459.69	1726.67	462.25	1726
465.03	1725.55	465.53	1725.47	467.31	1725.19	472.71	1725.01	473.77	1724.97
473.79	1724.89	477.76	1724.98						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 34.57 .027 449.86 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
34.57 449.86 50.39 26.83 18.4 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.57	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.74	Reach Len. (ft)	50.39	26.83	18.40
Crit W.S. (ft)		Flow Area (sq ft)		1342.93	

E.G. Slope (ft/ft)	0.003245	Area (sq ft)	1342.93		
Q Total (cfs)	13515.00	Flow (cfs)	13515.00		
Top Width (ft)	230.72	Top Width (ft)	230.72		
Vel Total (ft/s)	10.06	Avg. Vel. (ft/s)	10.06		
Max Chl Dpth (ft)	13.66	Hydr. Depth (ft)	5.82		
Conv. Total (cfs)	237250.3	Conv. (cfs)	237250.3		
Length Wtd. (ft)	26.83	Wetted Per. (ft)	233.49		
Min Ch El (ft)	1708.08	Shear (lb/sq ft)	1.17		
Alpha	1.00	Stream Power (lb/ft s)	477.76	0.00	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	243.24	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	36.24	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1111.9

INPUT

Description: "DR" 51+89.80 = 1111.9

Station	Elevation	Data	num=	114						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1724.83	4.81	1724.88	6.84	1724.71	7.97	1724.37	10.16	1724.27	
11.15	1724.49	11.47	1724.25	11.52	1724.26	11.68	1724.28	12.01	1724.34	
13.34	1724.56	19.09	1724.68	25.84	1725	31.46	1725.43	40.05	1726	
40.93	1726.01	46.01	1726.12	48.25	1726.08	54.39	1725.99	54.88	1725.98	
55.26	1726	56.15	1726.14	62.8	1726.92	63.61	1727	64.05	1727	
66.32	1727	68.1	1727	71.53	1726.45	73.97	1726	80.4	1725.22	
81.74	1725	85.26	1724.12	85.74	1724	89.33	1723.1	89.74	1723	
93.41	1722.08	93.74	1722	93.77	1721.99	97.41	1721.09	97.76	1721	
123.63	1720.3	124.88	1720.27	127.42	1720.2	134.98	1720	135.28	1719.93	
135.36	1719.9	140.04	1718.73	178.4	1709.14	183.77	1708.98	193.77	1707.98	
203.58	1708.97	203.77	1708.98	204.33	1709	232.23	1709.84	234.79	1710.48	
252.64	1714.93	254.1	1715.3	260.03	1716.78	268.6	1718.92	270.28	1719.34	
270.98	1719.39	271.58	1719.43	279.86	1720	288.82	1720.4	296.34	1720.73	
297.96	1720.8	309.23	1721	339.96	1721.68	358.43	1721.76	376.27	1721.99	
376.71	1722	377.61	1722.07	384.83	1722.64	389.65	1723	392.22	1723	
403.28	1723.79	405.53	1723.87	406.6	1724	408	1724	410.74	1724.32	
411.6	1724.42	414.65	1724.75	416.39	1724.84	418.71	1725	419.48	1725	
419.91	1725	423.17	1725	424.7	1724.96	424.8	1724.94	432.11	1724	
432.54	1723.96	433.82	1723.85	439.1	1724	441.94	1724.08	443.61	1724.12	
444.61	1724.14	450.75	1724.32	452.8	1724.4	454.33	1724.48	458.52	1725	
464.72	1725.68	467.92	1726	479.72	1726	482.02	1726	483.2	1725.81	
484.04	1725.67	486.54	1725.26	486.56	1725.26	487.71	1725.26	488.1	1725.26	
488.3	1725.26	489.8	1725.21	494.6	1724.86	498.02	1724.96			

Manning's n Values		num=		3
Sta	n Val	Sta	n Val	
0	.031	68.1	.027	419.48 .031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	68.1	419.48		95 75.14	45.21	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1723.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.70	Reach Len. (ft)	95.00	75.14	45.21
Crit W.S. (ft)		Flow Area (sq ft)		1371.05	
E.G. Slope (ft/ft)	0.003360	Area (sq ft)		1371.05	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	249.64	Top Width (ft)		249.64	
Vel Total (ft/s)	9.86	Avg. Vel. (ft/s)		9.86	
Max Chl Dpth (ft)	13.72	Hydr. Depth (ft)		5.49	
Conv. Total (cfs)	233156.4	Conv. (cfs)		233156.4	
Length Wtd. (ft)	75.14	Wetted Per. (ft)		252.41	
Min Ch El (ft)	1707.98	Shear (lb/sq ft)		1.14	
Alpha	1.00	Stream Power (lb/ft s)	498.02	0.00	0.00
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.34	242.40	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	36.09	0.06

CROSS SECTION

Station Elevation Data											
num=				111							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.87	.92	1723.91	4.14	1724.03	4.8	1723.84	6.36	1723.47		
9.45	1723.43	10.95	1723.34	13.75	1723.42	20.73	1723.61	26.64	1723.38		
29.04	1723.28	30.87	1723.19	30.88	1723.19	31.21	1723.17	31.49	1723.16		
31.78	1723.14	32.08	1723.13	32.23	1723.12	32.31	1723.15	33.22	1723.44		
37.74	1724	37.92	1724.04	41.22	1725	45.08	1725.69	46.9	1725.75		
50.52	1725.75	51.56	1725.69	52.94	1725.54	56.01	1725.48	61.99	1725.37		
64.26	1725.13	65.05	1725.05	65.53	1725	66.75	1724.83	76.27	1724		
88.08	1723.07	88.97	1723	100.6	1722.11	101.97	1722	104.87	1721.77		
115.98	1721	116.96	1721	118.19	1721	124.32	1721	129.59	1721		
132.29	1721	136.65	1721	189.93	1720.3	191.68	1720.28	208.19	1720.05		

212.01	1720	212.46	1719.89	213.22	1719.69	225.23	1716.7	256.31	1708.94
262.43	1708.75	269.36	1708.54	273.86	1708.09	279.37	1707.54	279.4	1707.54
284.4	1708.04	286.22	1708.22	289.44	1708.54	305.5	1709.01	307.87	1709.08
328.65	1714.27	330.06	1714.62	332.95	1715	337.78	1715.78	339.13	1716
340.43	1716.25	345.33	1717	347.16	1717.31	352.44	1718	356.09	1718.38
362.82	1719	377.81	1719.65	386.27	1720	391.33	1720.17	407.99	1720.42
443.99	1721	459.51	1721.54	470.62	1722	473.31	1722.36	479.72	1723
484.32	1723.55	484.38	1723.56	484.73	1723.56	493.15	1723.54	493.98	1723.83
494.47	1724	496.81	1724.81	497.98	1725	503.14	1725.88	504.02	1726
505.01	1726.13	511.78	1727	514.22	1727.42	518.32	1728	521.18	1728
525.48	1728	525.9	1727.88	529.41	1727	532.03	1726.41	533.94	1726
546.5	1724.18	546.62	1724.16	546.65	1724.16	548.85	1724.54	548.86	1724.5
553.52	1724.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	46.9	.027	518.32	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	46.9	518.32		7.87 28.51	33.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.24	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.43	Reach Len. (ft)	7.87	28.51	33.08
Crit W.S. (ft)		Flow Area (sq ft)		1510.08	
E.G. Slope (ft/ft)	0.003749	Area (sq ft)		1510.08	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	346.37	Top Width (ft)		346.37	
Vel Total (ft/s)	8.95	Avg. Vel. (ft/s)		8.95	
Max Chl Dpth (ft)	13.89	Hydr. Depth (ft)		4.36	
Conv. Total (cfs)	220719.6	Conv. (cfs)		220719.6	
Length Wtd. (ft)	28.51	Wetted Per. (ft)		348.89	
Min Ch El (ft)	1707.54	Shear (lb/sq ft)		1.01	
Alpha	1.00	Stream Power (lb/ft s)	553.52	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	238.22	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	35.21	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1111.3

INPUT

Description: "DR" 53.+44.60 = 1111.3

Station	Elevation	Data	num=	128					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.82	.93	1723.85	3.65	1723.93	5.89	1723.3	6.02	1723.28
6.03	1723.28	10.41	1723.3	11.31	1723.33	18.18	1723.53	30.71	1722.96
32.49	1722.88	33.73	1722.83	34.68	1722.98	34.79	1723	34.81	1723.01
37.86	1724	42.13	1724.81	43.15	1725	43.67	1725.08	45.63	1725.33
47.53	1725.58	49.66	1725.53	55.79	1725.41	58.21	1725.88	58.59	1726
59.77	1726	61.12	1726	65.34	1726	67.39	1726	69.2	1725.77
76.12	1725	79.72	1724.43	82.04	1724	91.84	1723.26	95.22	1723
104.5	1722.42	108.98	1722.11	111.93	1722	112.43	1721.98	125.71	1721.56
130.15	1721.49	149.49	1721	149.5	1721	149.53	1721	149.54	1721
149.58	1721	149.59	1721	190.23	1720.51	220.2	1720.06	220.67	1720.06
222.38	1720	223.37	1719.75	223.98	1719.6	234.4	1716.99	266.98	1708.85
279.27	1708.48	280.34	1708.44	281.06	1708.37	290.35	1707.44	290.36	1707.44
295.65	1707.97	300.37	1708.44	314.51	1708.86	316.89	1708.93	320.35	1709.8
338.9	1714.44	345.82	1714.77	351.03	1715	355.65	1715.71	356.31	1715.82
357.46	1716	359.22	1716.25	364.51	1717	366.08	1717.21	371.25	1718
376.47	1718.47	382.36	1719	400.32	1719.76	406.33	1720	429.6	1720.76
435.69	1721	437.06	1721.08	440.54	1721.22	455.2	1721.81	459.43	1722
463.93	1722.77	465.48	1723	466.64	1723.21	471.64	1724	475.52	1724.72
477.1	1725	479.39	1725.09	481.31	1725.14	486.08	1725.19	489.81	1725.23
496.59	1725.84	499.06	1726	500.64	1726.34	503.64	1727	505.06	1727.26
508.16	1728	509.6	1728	518.03	1728	520.13	1727.34	521.16	1727
525.55	1726.13	526.19	1726	528.56	1725.52	531.29	1724.88	532.06	1724.7
533.33	1724.51	537.72	1723.85	537.73	1723.84	537.74	1723.84	537.78	1723.85
537.82	1723.86	541.31	1724.36	541.34	1724.36	541.36	1724.37	541.39	1724.24
541.48	1724.24	541.58	1724.25	542.07	1724.29	542.23	1724.31	542.99	1724.55

543.73 1724.57 544.63 1724.65 546.13 1724.75

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 67.39 .027 509.6 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
67.39 509.6 18.72 21.97 36.28 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.31	Reach Len. (ft)	18.72	21.97	36.28
Crit W.S. (ft)		Flow Area (sq ft)		1499.32	
E.G. Slope (ft/ft)	0.003253	Area (sq ft)		1499.32	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	305.56	Top Width (ft)		305.56	
Vel Total (ft/s)	9.01	Avg. Vel. (ft/s)		9.01	
Max Chl Dpth (ft)	13.87	Hydr. Depth (ft)		4.91	
Conv. Total (cfs)	236973.4	Conv. (cfs)		236973.4	
Length Wtd. (ft)	21.97	Wetted Per. (ft)		308.06	
Min Ch El (ft)	1707.44	Shear (lb/sq ft)		0.99	
Alpha	1.00	Stream Power (lb/ft s)	546.13	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	237.24	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	35.00	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1111.1

INPUT

Description: "DR" 53+66.57 = 1111.1

Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.66	3.16	1723.68	3.82	1723.57	6.4	1723.22	7.36	1723.21
10.11	1723.22	13.73	1723.34	15.63	1723.39	20.52	1723.16	29.92	1722.66
31.32	1722.89	32.01	1723	34.24	1723.69	35.79	1724	37.28	1724.3
41.2	1725	43.01	1725.33	44.75	1725.62	51.99	1725.48	52.81	1725.46
54.56	1725.92	54.91	1726	57.42	1726	60.33	1726	61.73	1725.53
63.55	1725	66.76	1724.11	67.35	1724	68.21	1723.85	73.07	1723
74.1	1723	76.92	1723	80.04	1723	81.49	1723	86.51	1723
91.98	1723	114.03	1722.47	130.63	1722.12	133.07	1722	140.57	1721.76
157.81	1721	167.88	1721	172.61	1721	180.54	1721	215.22	1720.5
219.12	1720.52	220.74	1720.46	221.42	1720.44	224.29	1720.44	228.24	1720.4
230.73	1720.33	232.41	1720	232.83	1720.33	233.96	1720.04	235.42	1719.41
236.35	1719.11	237.28	1718.81	238.2	1718.51	239.12	1718.21	257.35	1713.64
276.54	1708.86	287.31	1708.53	292.75	1708.37	296.41	1708	302.79	1707.37
302.81	1707.36	309.77	1708.05	312.87	1708.36	324.83	1708.71	328.81	1708.83
333.53	1710.01	350.89	1714.32	358.36	1714.61	368.05	1714.99	368.4	1715
371.34	1715.41	375.04	1716	378.15	1716.35	383.22	1717	388.11	1717.57
390.99	1718	396.17	1718.42	403.86	1719	426.9	1719.91	428.92	1720
429.09	1720.04	437.47	1721	445.15	1721.75	448.38	1722	457.36	1722.63
461.1	1722.85	462.92	1723	465.97	1723.54	468.66	1724	474.04	1724.88
474.84	1725	477.52	1725.16	477.9	1725.18	478.1	1725.19	478.91	1725.21
486.24	1725.39	487.07	1725.57	488.97	1726	490.98	1726.45	494.01	1727
499.86	1727	507.23	1727	510.16	1727	514.04	1726.22	515.16	1726
515.94	1725.78	517.66	1725.49	521.54	1725	524.72	1724.38	525.7	1724
526.45	1724.11	526.79	1724.16	526.82	1724.17	529.62	1724.16	530.92	1724.17
531.69	1724.18	532.96	1724.19	533.67	1724.51	537.94	1724.63		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 60.33 .027 494.01 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
60.33 494.01 14.94 31.99 81.09 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.		0.027	

W.S. Elev (ft)	1721.31	Reach Len. (ft)	14.94	31.99	81.09
Crit W.S. (ft)		Flow Area (sq ft)		1553.53	
E.G. Slope (ft/ft)	0.002697	Area (sq ft)		1553.53	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	289.74	Top Width (ft)		289.74	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)		8.70	
Max Chl Dpth (ft)	13.95	Hydr. Depth (ft)		5.36	
Conv. Total (cfs)	260238.4	Conv. (cfs)		260238.4	
Length Wtd. (ft)	31.99	Wetted Per. (ft)		292.54	
Min Ch El (ft)	1707.36	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	537.94	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	236.47	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	34.85	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1110.9

INPUT

Description: "DR" 53+98.56 = 1110.9

Station	Elevation	Data	num=	133	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.6	3.33	1723.62	4.94	1723.36	6.34	1723.17	8.01	1723.15			
9.57	1723.16	13.08	1723.27	14.48	1723.33	20.53	1722.97	27.51	1722.57			
28.1	1722.66	29.93	1722.96	30.17	1723	30.97	1723.24	34.8	1724			
38.41	1724.73	39.93	1725	42.12	1725.4	43.45	1725.65	48.36	1725.55			
51.56	1725.48	52.82	1725.76	53.87	1726	55.61	1726	58.18	1726			
61.28	1726	62.92	1725.48	64.21	1725	68.2	1724.21	68.91	1724			
70.86	1723.73	76.69	1723	77.68	1723	87.72	1723	91.33	1723			
116.78	1722.39	126.93	1722.3	146.87	1722.05	148.23	1722.04	152.45	1722			
166.35	1721.54	171.2	1721.43	177.52	1721.43	183.02	1721.44	190.7	1721.63			
194.9	1721.74	200.33	1722	208.4	1722.35	210.31	1722.36	216.19	1722.27			
223.15	1722	225.76	1722	228.08	1722	232.55	1721.43	235.37	1721			
237.81	1720.63	239.17	1720.26	240.51	1720	241.04	1720.41	243	1719.6			
244.96	1719	246.49	1718.53	248.22	1718	249.54	1717.59	251.48	1717			
252.62	1716.65	254.73	1716	255.71	1715.7	257.99	1715	260.5	1714.23			
262.15	1713.09	269.56	1711.25	278.3	1709.09	306.19	1708.25	316.19	1707.25			
319.97	1707.62	322.34	1707.85	326.46	1708.24	328.47	1708.3	342.17	1708.69			
351.35	1710.93	364.68	1714.18	373.89	1714.81	377.57	1715	381	1715.65			
382.51	1716	388.01	1716.99	388.04	1717	388.06	1717	394.47	1718			
399.95	1718.42	407.8	1719	432.95	1719.79	434.16	1719.83	439.9	1720			
440.73	1720.2	444.02	1721	451.5	1721.85	452.29	1722	454.01	1722.23			
460.14	1723	463.51	1723.6	465.63	1724	467.35	1724.1	469.6	1724.04			
471.67	1724.07	477.65	1724.18	478.33	1724.29	482.11	1725	483.85	1725.45			
486.39	1726	488.89	1726	493.48	1726	496.2	1725.49	497.59	1725.13			
498.09	1725	498.94	1724.87	503.5	1724	505.34	1723.69	505.89	1723.6			
506.57	1723.49	507.75	1723.29	507.76	1723.29	508.62	1723.35	512.56	1723.63			
512.89	1723.67	514.49	1724.22	514.8	1724.33	515.05	1724.43	515.27	1724.48			
515.42	1724.49	515.75	1724.51	518.69	1724.58							

Manning's n Values	num=	3
Sta	n Val	Sta
0	.031	61.28
		.027
		486.39
		.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	61.28	486.39		5.24	69.44	59.47	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.16	Wt. n-Val.		0.027	
W.S. Elev (ft)	1721.25	Reach Len. (ft)	5.24	69.44	59.47
Crit W.S. (ft)		Flow Area (sq ft)		1566.49	
E.G. Slope (ft/ft)	0.001749	Area (sq ft)		1566.49	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	212.52	Top Width (ft)		212.52	
Vel Total (ft/s)	8.63	Avg. Vel. (ft/s)		8.63	
Max Chl Dpth (ft)	14.00	Hydr. Depth (ft)		7.37	
Conv. Total (cfs)	323159.6	Conv. (cfs)		323159.6	
Length Wtd. (ft)	69.44	Wetted Per. (ft)		215.85	
Min Ch El (ft)	1707.25	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	518.69	0.00	0.00

Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	235.32	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	34.67	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1110.7

INPUT

Description: "DR" 54+68.00 = 1110.7

Station	Elevation	Data	num=	133						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
0	1723.58	3.33	1723.6	5.32	1723.28	6.25	1723.15	8.23	1723.13	
9.26	1723.13	11.51	1723.21	14.37	1723.32	25.14	1722.68	26.33	1722.61	
26.36	1722.61	26.4	1722.61	26.62	1722.59	26.66	1722.6	29.07	1723	
33.76	1723.95	33.97	1724	34.1	1724.03	38.84	1725	40.03	1725.23	
42.38	1725.67	45.97	1725.59	50.38	1725.51	51.49	1725.68	53.05	1726	
55.8	1726	57.92	1726	59.64	1725.34	60.92	1725	65.32	1724.13	
66.37	1724	71.37	1723.71	74.61	1723.48	78.72	1723.31	80.13	1723.2	
83.06	1723	87.17	1723	89.33	1723	89.91	1723	93.34	1722.92	
115.44	1722.76	121.22	1722.71	138.1	1722.55	151.14	1722.47	172.04	1722.53	
177.46	1722.69	181.97	1722.71	189.03	1723	194.99	1723.35	204.88	1723.86	
206.57	1723.95	208.6	1724	217.47	1724	219.01	1724	221.34	1723.75	
223.5	1723.43	225.43	1723.15	226.46	1723	230.74	1722.19	231.03	1722.12	
231.73	1722	235.95	1721.23	237.69	1721	241.12	1720.45	244.17	1720	
245.03	1719.76	247.69	1719	247.83	1718.96	248.32	1718.82	250.74	1718.12	
251.18	1718	253.75	1717.26	254.66	1717	256.8	1716.38	258.14	1716	
259.89	1715.5	261.61	1715	265.31	1714.36	267.98	1713.94	270.59	1712.96	
283.47	1709.74	286.6	1708.95	316.37	1708.06	317.93	1708.01	322.34	1707.57	
327.94	1707.01	328.07	1707.02	336.76	1707.89	337.94	1708.01	339.45	1708.05	
348.72	1708.33	355.35	1709.99	368.63	1713.31	385.62	1717.56	387.73	1718.09	
388.23	1718.13	400.63	1719	405.25	1719.17	428.86	1720	429.02	1720.04	
432.97	1721	433.05	1721.02	436.7	1721.91	437.07	1722	437.09	1722	
441.1	1723	441.13	1723.01	444.1	1723.76	448.71	1723.96	450.38	1724.03	
452.57	1724.13	454.27	1724.3	460.63	1724.69	461.93	1725	464.7	1725	
472.5	1725	475.86	1724.18	476.44	1724	478.37	1723.7	478.74	1723.64	
482.57	1723.03	483.57	1723.12	487.93	1723.49	488.72	1723.77	489.32	1723.81	
491.53	1724.16	491.57	1724.16	491.58	1724.17	491.59	1724.17	491.64	1724.17	
491.67	1724.17	491.73	1724.17	495.3	1724.21					

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	57.92	.027
		461.93	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	57.92	461.93		3.7	51.91	82.42	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.		0.027	
W.S. Elev (ft)	1720.91	Reach Len. (ft)	3.70	51.91	82.42
Crit W.S. (ft)		Flow Area (sq ft)		1448.32	
E.G. Slope (ft/ft)	0.002015	Area (sq ft)		1448.32	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	194.30	Top Width (ft)		194.30	
Vel Total (ft/s)	9.33	Avg. Vel. (ft/s)		9.33	
Max Chl Dpth (ft)	13.90	Hydr. Depth (ft)		7.45	
Conv. Total (cfs)	301046.9	Conv. (cfs)		301046.9	
Length Wtd. (ft)	51.91	Wetted Per. (ft)		197.31	
Min Ch El (ft)	1707.01	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)	495.30	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	232.92	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	34.34	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1110.5

INPUT

Description: "DR" 55+19.91 = 1110.5

Station Elevation		Data	num=		128						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.56	3.28	1723.59	5.53	1723.22	6.14	1723.13	8.33	1723.11		
9.02	1723.12	10.52	1723.16	14.28	1723.31	21.58	1722.88	25.49	1722.64		
25.51	1722.64	25.67	1722.65	25.85	1722.64	25.99	1722.64	26.03	1722.64		
26.51	1722.59	28.45	1722.91	28.99	1723	29.98	1723.2	33.6	1724		
35.99	1724.5	38.43	1725	41.25	1725.54	41.95	1725.68	48.43	1725.55		
49.95	1725.52	50.8	1725.66	52.35	1725.9	52.83	1726	53.64	1726		
54.65	1726	60.12	1726	60.68	1726	60.81	1726	61.2	1726		
65.98	1725.32	68.2	1725	68.41	1724.98	68.75	1724.96	77.74	1724.56		
79.51	1724.46	83.79	1724	84.33	1723.96	84.94	1723.92	88.7	1723.52		
103.06	1723	111.19	1722.95	112.36	1722.94	134.51	1722.76	141.27	1722.72		
173.75	1722.86	178.42	1723	186.38	1723.5	194.66	1724	196.65	1724		
200.23	1724	202.17	1724	206.8	1724	212.73	1724	216.28	1724		
222.92	1724	229.29	1724	234.32	1724	236.96	1723.59	240.68	1723		
241.91	1722.8	246.07	1722	246.76	1721.88	250.68	1721	250.75	1720.99		
250.94	1720.96	255.08	1720.21	259.6	1718.73	268.37	1715.82	289.28	1708.87		
294.22	1708.72	320.64	1707.93	323.34	1707.66	330.55	1706.94	330.65	1706.93		
330.66	1706.93	333.05	1707.17	340.38	1707.9	340.66	1707.93	352.54	1708.28		
353.46	1708.31	356.2	1709	390.54	1717.58	392.49	1718.06	400.29	1718.53		
408.66	1719	413.75	1719.46	420.34	1720	424.47	1720.73	425.55	1721		
428.48	1721.65	429.3	1721.86	434.06	1722	437.52	1722.1	438	1722.13		
438.54	1722.12	440.43	1722.18	443.42	1723	445.79	1723.58	448.23	1724		
453.66	1724.91	454.2	1725	455.17	1725	459.52	1725	462.52	1724.06		
462.7	1724	463.11	1723.93	468.73	1723.01	468.95	1723.01	472.6	1723.3		
476.49	1723.6	477.44	1723.69	479.61	1723.88	479.62	1723.88	479.63	1723.88		
479.77	1723.89	479.85	1723.89	480.34	1723.89	481.04	1723.88	481.9	1723.97		
482	1723.97	483.09	1723.97	483.66	1723.97						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	61.2	.027	454.2	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	61.2	454.2		4.86	25.66	47.94	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.		0.027	
W.S. Elev (ft)	1720.55	Reach Len. (ft)	4.86	25.66	47.94
Crit W.S. (ft)		Flow Area (sq ft)		1340.37	
E.G. Slope (ft/ft)	0.002198	Area (sq ft)		1340.37	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	170.20	Top Width (ft)		170.20	
Vel Total (ft/s)	10.08	Avg. Vel. (ft/s)		10.08	
Max Chl Dpth (ft)	13.62	Hydr. Depth (ft)		7.88	
Conv. Total (cfs)	288273.4	Conv. (cfs)		288273.4	
Length Wtd. (ft)	25.66	Wetted Per. (ft)		173.50	
Min Ch El (ft)	1706.93	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	483.66	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	231.26	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	34.12	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1110.3

INPUT

Description: "DR" 55+45.57 = 1110.3

Station Elevation		Data	num=		137						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.54	3.19	1723.57	5.77	1723.15	5.97	1723.12	8.42	1723.09		
8.7	1723.09	9.3	1723.11	14.13	1723.3	17.66	1723.09	24.48	1722.67		
24.5	1722.67	24.78	1722.7	24.92	1722.69	25.22	1722.7	25.29	1722.69		
25.76	1722.64	25.85	1722.63	25.96	1722.62	26.27	1722.6	28.61	1722.99		
28.65	1723	28.83	1723.04	33.02	1724	37.82	1724.99	37.88	1725		
37.95	1725.01	41.46	1725.69	46.79	1725.58	49.48	1725.53	50.96	1725.77		
51.93	1725.91	52.67	1726	56.47	1726	56.84	1726	57.12	1726		
62.41	1726	64.61	1726	68.73	1726	72.59	1726	73.44	1726		
75.33	1726	77.81	1725.73	79.03	1725.67	83.49	1725	85.88	1724.6		

88.16	1724	99.67	1723.5	103.69	1723.29	120.37	1723	131.66	1722.91
134.09	1722.9	155.56	1723	166.77	1723	173.49	1723	175.19	1723
189.34	1723.88	190.32	1723.89	193.07	1724	193.4	1724	193.56	1724
205.42	1724	206.34	1724	206.6	1724	207.63	1724	208.16	1724
220.43	1724	221.78	1724	223.9	1724	228.36	1724	232.22	1724
233.91	1724	234.9	1724	237.1	1723.6	240.46	1723	243.23	1722.46
245.14	1722	245.64	1721.88	249.69	1721	252.64	1720.6	256.16	1720.16
260.84	1718.65	262.35	1718.16	268.23	1716.22	282.01	1711.64	290.54	1708.81
306.61	1708.32	321.07	1707.89	322.76	1707.72	325.62	1707.43	331.07	1706.89
331.14	1706.9	335.22	1707.3	341.08	1707.89	345.92	1708.03	354.33	1708.29
364.94	1710.93	393.42	1718.03	396.17	1718.17	413.31	1719	417.43	1719.66
418.56	1719.94	418.82	1720	420.81	1720.34	424.19	1721	425.68	1721.27
425.78	1721.27	426.56	1721.29	433.88	1721.42	435.69	1721.56	438.12	1722
440.73	1722.65	442.13	1723	444.72	1723.64	446.15	1724	448.64	1724.42
452.11	1725	455.07	1725.75	456.41	1725.85	458.84	1725.66	460.27	1725.67
461.46	1725.58	463.87	1725	466.36	1724.33	467.68	1724	470.37	1723.56
471.25	1723.41	473.13	1723.1	473.96	1723.14	475.46	1723.16	476.72	1723.19
476.74	1723.19	477.07	1723.28	479.5	1723.68	480.24	1723.75	480.26	1723.75
481.4	1723.9	484.28	1723.88						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	75.33	.027	456.41	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	75.33	456.41		23.36	39.7	28.18	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1720.47	Reach Len. (ft)	23.36	39.70	28.18
Crit W.S. (ft)		Flow Area (sq ft)		1332.41	
E.G. Slope (ft/ft)	0.002201	Area (sq ft)		1332.41	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	167.82	Top Width (ft)		167.82	
Vel Total (ft/s)	10.14	Avg. Vel. (ft/s)		10.14	
Max Chl Dpth (ft)	13.58	Hydr. Depth (ft)		7.94	
Conv. Total (cfs)	288047.5	Conv. (cfs)		288047.5	
Length Wtd. (ft)	39.70	Wetted Per. (ft)		171.14	
Min Ch El (ft)	1706.89	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)	484.28	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	230.47	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	34.02	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1110.1

INPUT

Description: "DR" 55+85.27 = 1110.1

Station	Elevation	Data	num=	116
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
0	1723.37	2.71	1723.33	6.16 1723.2 6.27 1723.18 6.34 1723.18
9.07	1723.17	10.73	1723.21	13.24 1723.13 17.22 1722.9 17.3 1722.89
17.58	1722.88	19.57	1722.81	19.95 1722.87 20.74 1723 23.93 1723.73
25.24	1724	26.2	1724.25	29.64 1725 32.16 1725.89 32.5 1726
32.72	1726	37.96	1726	39.48 1725.79 39.87 1725.74 47.07 1725.6
48.02	1725.58	50.72	1725.88	52.05 1726 53.01 1726 56.17 1726
63.48	1726	63.7	1726	63.99 1726 67.33 1726 67.71 1726
67.74	1726	68.31	1725.89	72.83 1725 73.62 1724.89 79.66 1724
81.96	1723.96	94.37	1723.77	106.8 1723.56 137.89 1723 140.37 1723
142.81	1723	156.43	1723	178.16 1722.79 183.82 1722.82 184.31 1722.81
188.74	1722.71	199.75	1722.63	207.07 1722.64 213.54 1722.73 219.42 1722.37
222.58	1722.32	225.64	1722	243.19 1721.05 243.84 1721.01 244.18 1721
244.23	1720.99	244.27	1720.99	244.4 1720.98 244.61 1720.95 252.33 1720.05
252.54	1720.02	252.57	1720.02	252.61 1720 286.74 1708.67 287.34 1708.65
314.8	1707.83	314.85	1707.82	324.79 1706.83 324.8 1706.83 332.63 1707.61
334.89	1707.83	341.07	1708.02	349.98 1708.28 359.12 1710.56 386.34 1717.35
388.61	1717.91	389.08	1718.03	389.34 1718.05 395.56 1719 401.87 1719.72
403.79	1720	409.21	1720.33	411.65 1720.49 421.84 1721 423 1721
423.44	1721.07	424.56	1721.29	427.99 1721.36 432.69 1721.46 433.85 1721.52

439.69	1722	441.42	1722.43	443.73	1723	445.41	1723.41	447.78	1724
451.38	1724.57	453.8	1725	456.14	1725.56	458.45	1726	464.59	1726
468.57	1726	471.78	1725.22	472.68	1725	473.89	1724.71	476.71	1724
481.96	1723.06	482.9	1722.88	483.07	1722.91	486.01	1723.56	489.91	1723.48
490.07	1723.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	67.33	.027	458.45	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	67.33	458.45		40.31	15.12		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.75	Wt. n-Val.		0.027	
W.S. Elev (ft)	1720.21	Reach Len. (ft)	40.31	15.12	30.42
Crit W.S. (ft)		Flow Area (sq ft)		1271.48	
E.G. Slope (ft/ft)	0.002344	Area (sq ft)		1271.48	
Q Total (cfs)	13515.00	Flow (cfs)		13515.00	
Top Width (ft)	156.25	Top Width (ft)		156.25	
Vel Total (ft/s)	10.63	Avg. Vel. (ft/s)		10.63	
Max Chl Dpth (ft)	13.38	Hydr. Depth (ft)		8.14	
Conv. Total (cfs)	279174.2	Conv. (cfs)		279174.2	
Length Wtd. (ft)	15.12	Wetted Per. (ft)		159.55	
Min Ch El (ft)	1706.83	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	490.07	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.34	229.28	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	33.88	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1109.9

INPUT

Description: "DR" 56+00.39 = 1109.9

Station	Elevation	Data	num=	107					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.16	1.12	1723.15	4.73	1722.83	5.39	1722.75	9.25	1722.57
10.11	1722.58	11.93	1722.64	16.59	1722.7	17.2	1722.69	19.5	1722.6
20.01	1722.68	22.06	1723	22.86	1723.2	25.51	1723.86	26	1724
29.87	1724.91	30.22	1725	32.61	1725.25	37	1725.85	37.4	1725.84
38.03	1725.79	44.47	1725.67	46.02	1725.64	46.18	1725.65	50.47	1726
58.88	1726	60.73	1726	61.35	1726	62.27	1725.76	65.7	1725
66.39	1724.88	70.73	1724	78.65	1723.86	95.79	1723.57	112.65	1723.29
117.25	1723.21	130.99	1723	141.36	1722.82	180.2	1722.1	185.65	1722
187.18	1721.97	205.45	1721.66	227.55	1721	234.14	1720.14	235.45	1719.99
248.51	1715.65	254.34	1713.73	269.73	1708.65	278.68	1708.39	298.29	1707.8
299.52	1707.68	304.03	1707.23	308.31	1706.81	308.32	1706.8	308.69	1706.84
312.41	1707.21	318.37	1707.81	331	1708.18	333.85	1708.27	350.44	1712.39
373.12	1718.03	374.35	1718.33	376.94	1719	380.29	1719.96	380.65	1720
381.45	1720.21	384.41	1720.83	385.23	1721	389.94	1721	402.4	1721
403.55	1721	404.94	1721	406.64	1721	410.82	1721	411.55	1721.07
412.27	1721.11	414.55	1721.15	420.33	1721.26	422.12	1721.49	424.39	1721.77
427.22	1722	430.56	1722.83	431.23	1723	434.6	1723.84	435.24	1724
438.39	1724.5	441.8	1725	444.14	1725.42	447.15	1726	456.01	1726
460.52	1726	462.93	1725.43	464.71	1725	466.73	1724.52	468.82	1724
471.75	1723.46	475.05	1722.78	476.93	1723.12	476.94	1723.12	477.29	1723.18
477.86	1723.31	479.09	1723.28	479.62	1723.24	480.03	1723.23	481.8	1723.1
482.06	1723.12	482.24	1723.13						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	61.35	.027	447.15	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	61.35	447.15		11.85	20.7		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.91	Element	Left OB	Channel	Right OB
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Vel Head (ft)	1.92	Wt. n-Val.	0.027		
W.S. Elev (ft)	1719.99	Reach Len. (ft)	11.85	20.70	20.87
Crit W.S. (ft)		Flow Area (sq ft)		1246.31	
E.G. Slope (ft/ft)	0.002395	Area (sq ft)		1246.31	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	145.10	Top Width (ft)		145.10	
Vel Total (ft/s)	11.12	Avg. Vel. (ft/s)		11.12	
Max Chl Dpth (ft)	13.19	Hydr. Depth (ft)		8.59	
Conv. Total (cfs)	283254.6	Conv. (cfs)		283254.6	
Length Wtd. (ft)	20.70	Wetted Per. (ft)		148.51	
Min Ch El (ft)	1706.80	Shear (lb/sq ft)		1.25	
Alpha	1.00	Stream Power (lb/ft s)	482.24	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	228.85	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	33.82	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1109.8

INPUT

Description: "DR" 56+21.09 = 1109.8

Station Elevation Data		num= 100							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.14	.86	1723.13	2.88	1722.99	5.43	1722.81	5.97	1722.67
8.33	1722.66	8.42	1722.66	10.21	1722.64	11.8	1722.57	12.07	1722.56
13.02	1722.55	14.85	1722.85	15.74	1723	16.78	1723.26	19.65	1724
22.38	1724.68	23.84	1725	26.92	1725.88	27.43	1726	32.24	1726
37.01	1726	38.32	1726	38.96	1725.96	41.43	1725.84	44.65	1725.79
50.23	1725.69	50.29	1725.69	50.37	1725.68	56.9	1725	60.89	1724.09
61.36	1724	68.47	1724	69.9	1724	74.15	1724	96.75	1723.38
102.04	1723.27	116.27	1723	131.75	1722.69	166.12	1722	210.62	1721.06
212.42	1721.03	212.92	1721.02	213.65	1721	214	1720.95	214.59	1720.89
222.7	1719.99	240.43	1714.1	256.81	1708.66	266.63	1708.37	286.61	1707.77
288.34	1707.6	294.06	1707.03	296.61	1706.77	296.62	1706.77	297.67	1706.88
306.64	1707.77	307.05	1707.79	310.63	1707.89	319.48	1708.16	320.55	1708.19
342.12	1713.49	360.36	1717.98	360.53	1718.02	364.37	1719	366.66	1719.57
369.05	1720	369.56	1720.23	372.66	1721	374.26	1721	403.1	1721.24
405.8	1721.26	405.87	1721.26	406.71	1721.28	414.04	1721.48	416.34	1721.78
417.11	1721.76	420.57	1722	423.62	1722.75	424.66	1723	427.64	1723.73
428.75	1724	430.61	1724.37	434.97	1725	438.79	1725.69	440.25	1726
450.43	1726	456.26	1726	458.06	1725.59	460.53	1725	462.14	1724.6
464.78	1724	470.48	1722.81	470.97	1722.71	471.06	1722.75	471.74	1722.9
472.67	1723.1	473.06	1723.17	475.01	1723.49	476.3	1723.52	478.35	1723.47

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	37.01	.027
		440.25	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
37.01	440.25	95.67	49.89	23.01	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.95	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.92	Reach Len. (ft)	95.67	49.89	23.01
Crit W.S. (ft)		Flow Area (sq ft)		1238.00	
E.G. Slope (ft/ft)	0.002460	Area (sq ft)		1238.00	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	145.65	Top Width (ft)		145.65	
Vel Total (ft/s)	11.20	Avg. Vel. (ft/s)		11.20	
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)		8.50	
Conv. Total (cfs)	279489.0	Conv. (cfs)		279489.0	
Length Wtd. (ft)	49.89	Wetted Per. (ft)		149.01	
Min Ch El (ft)	1706.77	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)	478.35	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.34	228.26	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	33.75	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1109.6

INPUT

Description: "DR" 56+70.98 = 1109.6

Station	Elevation	Data	num=	116					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.36	.38	1722.36	1.65	1722.44	5.51	1722.05	5.72	1722.05
6.42	1722.06	7.22	1722.07	16.96	1722.23	19.76	1722.02	20.19	1721.99
20.6	1722	21.49	1722.15	28.76	1723	31.19	1723.67	32.58	1724
36.04	1724.83	36.75	1725	37.41	1725.17	40.6	1726	41.04	1726
47.89	1726	49.41	1725.54	49.61	1725.48	50.71	1725.46	54.94	1725.37
57.12	1725.33	58.1	1725.31	60.28	1725.56	61.21	1725.67	63.62	1726
65.57	1726.55	66.97	1726.79	69.83	1727	71.89	1727	72.81	1727
74.96	1727	77.87	1726.82	83.89	1726.59	88.41	1726.18	88.84	1726.12
89.4	1726	93.72	1725.36	95.85	1725	104.82	1724.02	105.01	1724
105.08	1723.99	110.61	1723	112.06	1722.89	117.02	1722	165.96	1721.04
168.15	1721	176.7	1720.29	180.11	1720	180.17	1719.99	180.51	1719.95
187.92	1719	191.57	1718.84	198.23	1718.51	224.69	1709.42	227.43	1708.52
251.9	1707.78	254.89	1707.7	256.08	1707.58	264.67	1706.72	264.87	1706.7
264.89	1706.7	274.14	1707.62	274.89	1707.7	290.12	1708.15	290.75	1708.17
316.29	1714.52	330.04	1717.93	335.93	1718.26	355.01	1719	356.3	1719
360.41	1719.37	368.98	1720	369.39	1720.03	381.57	1720.83	388.39	1720.96
389.6	1720.98	389.78	1721	389.8	1721	392.97	1721.54	393.91	1721.71
394.33	1721.79	394.55	1721.83	394.68	1721.86	394.91	1721.91	395.08	1721.95
395.12	1721.95	395.44	1722	395.57	1722.03	399.46	1723	399.61	1723.04
403.48	1724	403.75	1724.06	408.66	1725	409.87	1725.33	412.8	1726
412.81	1726	427.76	1726	431	1725.44	433.04	1725	434	1724.82
440.03	1724	442.85	1723.36	446.14	1722.54	447.18	1722.77	449.79	1723.32
449.89	1723.34	449.89	1723.13	450.69	1723.11	451.67	1723.11	453.35	1723.09
453.6	1723.08								

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.81	.027	412.8	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	72.81	412.8		34.76 19.52	8.69		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.84	Reach Len. (ft)	34.76	19.52	8.69
Crit W.S. (ft)		Flow Area (sq ft)		1268.92	
E.G. Slope (ft/ft)	0.003102	Area (sq ft)		1268.92	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	185.51	Top Width (ft)		185.51	
Vel Total (ft/s)	10.92	Avg. Vel. (ft/s)		10.92	
Max Chl Dpth (ft)	13.14	Hydr. Depth (ft)		6.84	
Conv. Total (cfs)	248877.5	Conv. (cfs)		248877.5	
Length Wtd. (ft)	19.52	Wetted Per. (ft)		188.60	
Min Ch El (ft)	1706.70	Shear (lb/sq ft)		1.30	
Alpha	1.00	Stream Power (lb/ft s)	453.60	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	226.82	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	33.57	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1109.5

INPUT

Description: "DR" 56+90.50 = 1109.5

Station	Elevation	Data	num=	109					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.88	2.28	1722.01	3.18	1721.92	7.91	1721.9	13.67	1722.03
18.95	1722.27	19.68	1722.3	22.16	1722.09	25.33	1721.86	26.81	1721.73
27.12	1721.72	28.06	1721.63	28.36	1721.62	29.53	1721.55	30.41	1721.45
30.48	1721.44	30.52	1721.43	31.07	1721.29	31.24	1721.28	31.65	1721.28
35.81	1721.92	35.99	1721.93	36.36	1722	39.53	1722.57	41.58	1723
43.7	1723.48	45.87	1724	48.01	1724.38	50.72	1725	55.44	1725.3

56.1	1725.34	57.45	1725.31	64.29	1725.17	66.97	1725.57	69.89	1726
71.48	1726.31	72.45	1726.33	77.84	1726.22	78.29	1726.2	78.54	1726.15
79.34	1726	80.83	1725.77	85.81	1725	91.74	1724.18	93.06	1724
94.94	1723.68	98.88	1723	101.56	1722.45	103.99	1722	128.94	1721.5
154.57	1721	159.31	1720.61	164.92	1720	173.94	1719.17	175.33	1719
185.35	1718.58	197.19	1718.12	218.47	1711.05	226.34	1708.43	251.88	1707.67
261.88	1706.67	271.88	1707.67	289.73	1708.2	314.38	1714.23	314.39	1714.23
329.83	1718.27	333.54	1718.29	339.03	1718.42	348.11	1718.72	355.09	1719
359.39	1719.36	366.13	1720	373.42	1720.45	379.63	1720.84	386.72	1720.99
387.64	1721.01	387.82	1721.02	388.82	1721.25	390.25	1721.53	390.6	1721.58
393.43	1722	394.52	1722.27	397.44	1723	398.53	1723.27	401.44	1724
403.14	1724.35	406.52	1725	408.97	1725.67	410.41	1726	418.48	1726
422.88	1726	425.28	1725.59	429.08	1725.01	429.12	1725	429.14	1725
429.17	1725	429.19	1724.99	429.32	1724.98	436.53	1724.19	437.92	1724
438.31	1723.91	444.14	1722.46	445.95	1722.84	448.14	1723.3	448.21	1723.32
448.22	1723.15	449.69	1723.12	450.52	1723.12	451.68	1723.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	71.48	.027	410.41	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	71.48	410.41		30.48 30.48	30.56		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.83	Reach Len. (ft)	30.48	30.48	30.56
Crit W.S. (ft)		Flow Area (sq ft)		1292.12	
E.G. Slope (ft/ft)	0.003170	Area (sq ft)		1292.12	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	197.53	Top Width (ft)		197.53	
Vel Total (ft/s)	10.73	Avg. Vel. (ft/s)		10.73	
Max Chl Dpth (ft)	13.16	Hydr. Depth (ft)		6.54	
Conv. Total (cfs)	246195.8	Conv. (cfs)		246195.8	
Length Wtd. (ft)	30.48	Wetted Per. (ft)		200.58	
Min Ch El (ft)	1706.67	Shear (lb/sq ft)		1.27	
Alpha	1.00	Stream Power (lb/ft s)	451.68	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	226.25	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	33.48	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1109.3

INPUT

Description: "DR" 57+20.98 = 1109.3

Station	Elevation	Data	num=	115					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.17	1722.22	2.65	1722.24	4.8	1722.23	8.12	1721.85	
8.41	1721.86	8.44	1721.86	8.47	1721.86	9.18	1721.74	13.7	1721
13.95	1721	14.19	1721	24.5	1721	31.73	1721	32.68	1721
33.33	1721	34.87	1721	37.46	1721.51	39.61	1722	43.39	1722.74
44.54	1723	45.6	1723.22	48.46	1724	50.91	1724.54	52.54	1725
59.59	1725.17	62.25	1725.21	64.66	1725.16	70.34	1725.04	75.98	1725
76.98	1725	81.69	1724.29	83.79	1724	86.45	1723.69	91.62	1723.12
92.36	1723.06	92.71	1723	96.21	1722.47	99.65	1722	101.69	1721.96
122.92	1721.59	132.92	1721.45	140.29	1721	147.85	1720.12	148.77	1720
149.62	1719.9	158.68	1719	185.52	1718.33	193.26	1718.03	200.6	1717.52
200.68	1717.5	224.26	1709.64	228.17	1708.34	232.21	1708.21	252.11	1707.62
260.5	1706.78	262.11	1706.62	263.72	1706.78	272.11	1707.62	275.34	1707.71
302.22	1708.52	309.9	1710.62	317.53	1713.17	336.91	1719.58	339.6	1719.88
341.49	1720	341.73	1720.37	343.21	1721	344.65	1721	345.91	1721
345.97	1721	347.84	1721	378.52	1721.06	381.44	1721.07	387.05	1721.18
389.45	1721.23	392.2	1721.62	393.25	1721.77	394.78	1722	398.29	1722.88
398.78	1723	402.31	1723.88	402.78	1724	405.44	1724.54	407.9	1725
408.69	1725.19	410.25	1725.58	412.02	1726	415.86	1726	419.4	1726
421.95	1725.23	422.79	1725	424.67	1724.49	426.71	1724	431.39	1722.83
433.81	1722.23	434.08	1722.23	434.78	1722.25	436.46	1722.29	439.15	1722.3
440.14	1722.3	440.21	1722.3	440.7	1722.3	440.73	1722.3	440.88	1722.3
444.77	1722.57	449.31	1722.9	449.46	1722.92	449.77	1722.94	449.84	1722.94

450.57 1723.1 451.37 1723.27 451.4 1723.27 451.4 1723.21 454.1 1723.16

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 62.25 .027 412.02 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
62.25 412.02 50 50 50.13 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.86	Reach Len. (ft)	50.00	50.00	50.13
Crit W.S. (ft)		Flow Area (sq ft)		1356.89	
E.G. Slope (ft/ft)	0.002555	Area (sq ft)		1356.89	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	189.37	Top Width (ft)		189.37	
Vel Total (ft/s)	10.22	Avg. Vel. (ft/s)		10.22	
Max Chl Dpth (ft)	13.24	Hydr. Depth (ft)		7.17	
Conv. Total (cfs)	274245.8	Conv. (cfs)		274245.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		192.80	
Min Ch El (ft)	1706.62	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)	454.10	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.34	225.32	0.02
C & E Loss (ft)	0.08	Cum SA (acres)	0.40	33.34	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1109.1

INPUT

Description: "DR" 57+70.98 = 1109.1

Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.02	2.3	1721.96	5.29	1721.9	6.68	1721.95	16.43	1721.98
17.26	1721.94	17.4	1721.93	18.03	1721.89	24.85	1721.4	24.9	1721.4
25.05	1721.38	25.08	1721.38	25.25	1721.43	27.63	1722	28.38	1722.13
33.29	1723	36.69	1723.79	37.6	1724	41.21	1724.73	42.32	1725
44.06	1725.25	48.92	1726	53.38	1726	58.66	1726.31	60.27	1726
62.13	1725.53	62.9	1725.43	65.88	1725	66	1724.99	73.46	1724.84
74	1724.83	74.5	1724.86	74.52	1724.86	75.87	1724.93	76.7	1724.98
76.92	1724.99	76.99	1725	77	1725	78.61	1725.28	79.03	1725.31
83.7	1725.17	83.92	1725.17	84.18	1725.16	84.32	1725.14	85.2	1725
90.15	1724.47	91.71	1724.3	94.68	1724	97.11	1723.6	99.75	1723.14
100.89	1723	103.25	1722.57	106.79	1722	109.87	1721.58	112.97	1721.23
114.2	1721	116.87	1720.65	121.34	1720	126.34	1719.55	131.32	1719
150.24	1718.49	172.46	1718	174.13	1717.95	177.92	1717.81	199.16	1717
204.06	1716.87	224.99	1709.9	230.12	1708.18	233.73	1708.07	251.43	1707.54
259.82	1706.7	261.43	1706.54	269.82	1707.38	271.43	1707.54	277.14	1707.71
308.93	1708.67	313.56	1710.2	342.09	1719.67	342.33	1719.73	345.04	1720
346.38	1720.56	350.51	1720.94	352.17	1721	355.32	1721	360.77	1721
361.35	1721	362.95	1721.01	364.18	1721.02	368.92	1721.06	383.44	1721.24
385.91	1721.29	391.45	1721.4	394.64	1721.71	395.84	1721.82	397.38	1722
397.9	1722.13	401.39	1723	401.88	1723.12	405.4	1724	410.07	1724.78
411.41	1725	412.23	1725	419.16	1725	423.56	1725.11	423.86	1725.08
424.28	1725	424.94	1724.88	428.01	1724.15	428.66	1724	429.04	1723.91
429.18	1723.88	437.81	1721.89	438.68	1721.9	438.73	1721.91	438.8	1721.91
438.83	1721.91	446.08	1722.55	451.88	1723.09	453.46	1723.26	454.67	1723.31
455.03	1723.31	455.21	1723.31	456.16	1723.31	457	1723.31		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 58.66 .027 423.56 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
58.66 423.56 13.62 50 57.78 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.		0.027	

W.S. Elev (ft)	1719.92	Reach Len. (ft)	13.62	50.00	57.78
Crit W.S. (ft)		Flow Area (sq ft)		1484.25	
E.G. Slope (ft/ft)	0.002334	Area (sq ft)		1484.25	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	222.06	Top Width (ft)		222.06	
Vel Total (ft/s)	9.34	Avg. Vel. (ft/s)		9.34	
Max Chl Dpth (ft)	13.38	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	286917.8	Conv. (cfs)		286917.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		225.47	
Min Ch El (ft)	1706.54	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	457.00	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.34	223.69	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	33.11	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1108.9

INPUT

Description: "DR" 58+20.98 = 1108.9

Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.97	.96	1721.92	4.84	1721.85	11.88	1722.09	15.44	1722.1
22.56	1721.71	22.59	1721.71	22.64	1721.72	23.8	1722	27.43	1722.63
28.43	1722.8	28.69	1722.85	28.77	1722.86	29.37	1723	30.23	1723.16
33.74	1724	36.48	1724.55	37.86	1725	39.07	1725.21	44.06	1726
49.26	1726.84	51.2	1727	52.13	1727	54.64	1727	54.86	1726.96
59.18	1726.16	59.77	1726	60.1	1725.92	62.92	1725	64.79	1724.77
66.13	1724.67	73.16	1724.51	74.27	1724.49	74.72	1724.5	74.79	1724.5
80.02	1724.35	80.46	1724.33	83.4	1724	84.92	1723.73	90.33	1723
94.22	1722.28	95.88	1722	97.36	1721.78	103.05	1721	106.82	1720.3
108.51	1720	111.9	1719.67	120.9	1719	146.98	1718.15	152.29	1718
167.69	1717.58	191.57	1717	197.36	1716.93	205.34	1716.83	209.91	1715.31
224.27	1710.52	231.36	1708.16	250.79	1707.58	254.55	1707.46	256.16	1707.3
264.55	1706.46	272.94	1707.3	274.55	1707.46	305.15	1708.37	310.17	1708.51
311	1708.79	324.29	1713.21	342.12	1719.15	343.24	1719.52	343.27	1719.53
344.77	1720	346.86	1720.44	347.69	1720.56	350.71	1721	388.5	1721.42
390.37	1721.44	398.28	1721.6	398.37	1721.6	398.46	1721.61	401.5	1721.79
405.1	1722	406.14	1722.2	409.35	1723	410.42	1723.27	413.36	1724
416.63	1724.56	418.57	1725	425.33	1725	427.36	1725	430.25	1724.36
431.89	1724	439.99	1721.98	446.09	1720.45	447.03	1720.45	447.72	1720.47
447.77	1720.47	447.78	1720.47	448.05	1720.51	449.97	1720.79	452.53	1721.16
455.39	1721.71	457.02	1722	457.43	1722.08	457.64	1722.12	457.9	1722.16
461.73	1722.74	462.92	1722.81	462.94	1722.82	462.97	1722.82	462.98	1722.82
463.89	1722.82	464.92	1722.83						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	52.13	.027	418.57	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
52.13	418.57	22.78	27.45	38.62	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.86	Reach Len. (ft)	22.78	27.45	38.62
Crit W.S. (ft)		Flow Area (sq ft)		1526.68	
E.G. Slope (ft/ft)	0.002281	Area (sq ft)		1526.68	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	234.36	Top Width (ft)		234.36	
Vel Total (ft/s)	9.08	Avg. Vel. (ft/s)		9.08	
Max Chl Dpth (ft)	13.40	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	290234.1	Conv. (cfs)		290234.1	
Length Wtd. (ft)	27.45	Wetted Per. (ft)		237.79	
Min Ch El (ft)	1706.46	Shear (lb/sq ft)		0.91	
Alpha	1.00	Stream Power (lb/ft s)	464.92	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	221.96	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	32.85	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1108.8

INPUT

Description: "DR" 58+48.43 = 1108.8

Station	Elevation	Data	num=	112
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	1721.95	3.81	1721.78	4.11 1721.77 5.2 1721.81 12.85 1722.12
14.54	1722.02	15.53	1721.92	15.72 1721.94 15.85 1721.98 15.95 1722
17.84	1722.43	19.24	1722.74	19.65 1722.83 20.37 1723 21.07 1723.13
24.03	1724	27.84	1724.74	28.61 1725 33.27 1725.84 34.27 1726
35.54	1726.21	39.48	1727	44.32 1727 45.54 1727 50.69 1727
51.28	1727	51.79	1726.92	55.79 1726 56.38 1725.89 59.02 1725.41
61.05	1725	61.39	1724.92	64.6 1724.15 71.03 1724.01 72.63 1723.98
73.03	1723.86	77.87	1723	81 1722.49 83.99 1722 87.73 1721.44
90.72	1721	94.43	1720.61	98.56 1720 108 1719.26 111.74 1719
132.62	1718.42	146.97	1718	154.74 1717.83 170.63 1717.51 192.95 1717
197.79	1716.95	200.4	1716.92	201.46 1716.57 220.52 1710.21 226.41 1708.25
254.34	1707.42	264.34	1706.42	274.33 1707.42 274.34 1707.42 285.41 1707.75
303.63	1708.29	309.97	1710.4	336.71 1719.3 339.25 1719.97 339.38 1720
340.44	1720.06	343.89	1720.32	348.81 1720.71 352.55 1721 353.35 1721.01
354.22	1721.02	389.43	1721.55	395.55 1721.67 397.44 1721.71 400.11 1721.82
403.49	1722	405.7	1722.41	410.39 1723 412.23 1723.46 415.97 1724
419.94	1724.61	426.67	1724.15	426.79 1724.15 428.2 1724 434.79 1722.42
436.41	1722.03	438.93	1721.45	441.33 1720.89 443.23 1720.46 443.66 1720.46
443.77	1720.47	443.91	1720.47	450.1 1720.58 450.3 1720.58 450.31 1720.56
450.37	1720.56	450.41	1720.56	450.5 1720.56 450.51 1720.56 450.54 1720.56
450.56	1720.56	450.57	1720.56	450.58 1720.56 450.59 1720.56 450.63 1720.56
450.68	1720.57	451.94	1720.63	453.68 1721.85 453.95 1722.08 453.95 1722.07
453.98	1722.09	467.94	1722.79	

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	50.69	.027
		419.94	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50.69	419.94		13.86	22.55	18.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.71	Reach Len. (ft)	13.86	22.55	18.24
Crit W.S. (ft)		Flow Area (sq ft)		1483.26	
E.G. Slope (ft/ft)	0.002534	Area (sq ft)		1483.26	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	235.99	Top Width (ft)		235.99	
Vel Total (ft/s)	9.34	Avg. Vel. (ft/s)		9.34	
Max Chl Dpth (ft)	13.29	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	275359.0	Conv. (cfs)		275359.0	
Length Wtd. (ft)	22.55	Wetted Per. (ft)		239.41	
Min Ch El (ft)	1706.42	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)	467.94	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	221.01	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	32.70	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1108.7

INPUT

Description: "DR" 58+70.98 = 1108.7

Station	Elevation	Data	num=	123
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	1721.84	3.77	1721.66	4.04 1721.67 4.1 1721.67 4.83 1721.7
7.15	1721.77	8.35	1721.81	9.24 1721.83 9.27 1721.83 9.39 1721.85
9.86	1721.96	10.02	1722	10.9 1722.25 11.79 1722.51 13.61 1723
15.23	1723.48	17.7	1724	20.92 1724.83 21.76 1725 27.43 1725.92
27.87	1726	28.95	1726.16	29.16 1726.17 39.49 1726.37 40.57 1726.41

42.24	1726.24	43.67	1726	47.83	1725.28	49.5	1725	55.38	1724.17
56.61	1724	57.27	1723.92	57.99	1723.88	63.05	1723.4	66.58	1723.32
71.06	1723.21	71.74	1723	73.52	1722.69	76.48	1722	79.22	1721.61
83.33	1721	89.91	1720.31	94.31	1720	101.93	1719.44	108.27	1719
115.73	1718.79	130.82	1718.47	144.84	1718.15	147.36	1718.1	148.82	1718.08
154.39	1718	166.84	1717.75	180.14	1717.49	192.55	1717	192.98	1717.02
193.83	1717.02	195.73	1717.02	196.09	1717.02	201.36	1715.27	213.9	1711.09
222.17	1708.34	246.3	1707.62	254.08	1707.39	254.11	1707.38	255	1707.29
264.08	1706.39	264.11	1706.39	273.07	1707.28	274.08	1707.39	274.11	1707.39
276.2	1707.45	299.56	1708.15	302.08	1708.99	311.22	1712.02	328.12	1717.64
332.72	1719.17	334.19	1719.49	336.72	1720	336.83	1720	340.21	1720.13
360.06	1721	362.41	1721	367.32	1721	369.9	1721	371.79	1721
374.42	1721	374.57	1721.01	384.38	1721.59	384.66	1721.6	386.75	1721.71
397.07	1722.19	397.74	1722.22	398.32	1722.23	400.35	1722.29	400.92	1722.32
405.58	1722.75	408.61	1722.95	408.76	1723	415.4	1723.77	416.67	1723.86
417.54	1723.93	418.13	1723.98	418.32	1724	423.93	1724	429.93	1724
437.24	1722.29	437.63	1722.19	443.32	1720.85	443.79	1720.74	444.04	1720.68
445.51	1720.71	445.92	1720.71	447.19	1720.71	452.23	1720.71	452.24	1720.69
453.93	1720.67	454.8	1720.71	455.91	1721.49	456.82	1722.28	456.82	1722.23
456.91	1722.29	466.17	1722.76	470.04	1722.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	40.57	.027	418.32	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	40.57	418.32		36.7	36	33.95	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.56	Reach Len. (ft)	36.70	36.00	33.95
Crit W.S. (ft)		Flow Area (sq ft)		1439.39	
E.G. Slope (ft/ft)	0.002772	Area (sq ft)		1439.39	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	234.18	Top Width (ft)		234.18	
Vel Total (ft/s)	9.63	Avg. Vel. (ft/s)		9.63	
Max Chl Dpth (ft)	13.17	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	263260.8	Conv. (cfs)		263260.8	
Length Wtd. (ft)	36.00	Wetted Per. (ft)		237.58	
Min Ch El (ft)	1706.39	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	470.04	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	220.26	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	32.58	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1108.5

INPUT

Description: "DR" 59+06.98 = 1108.5

Station	Elevation	Data	num=	118					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.54	.75	1721.53	.81	1721.53	1.92	1721.8	2.73	1722
4.8	1722.45	7.31	1723	9.51	1723.55	10.58	1723.81	11.31	1724
15.08	1724.67	16.24	1725	17.82	1725	19.66	1725	23.18	1725
24.63	1725	25.69	1724.84	32.72	1724	37.73	1723.22	39.63	1723
45.3	1722.63	52.27	1722.25	54.48	1722.15	56.68	1722.08	58.05	1722.05
58.44	1722.03	59.85	1722	66.47	1721.84	66.49	1721.84	73.94	1721
86.91	1720.16	88.48	1720.06	89.42	1720	90	1719.96	91.27	1719.87
107.43	1719	112.98	1718.9	125.53	1718.74	129.16	1718.69	136.61	1718.62
143.59	1718.57	149.98	1718.47	155.26	1718.45	165.1	1718.21	168.31	1718.17
172.41	1718	182.62	1717.48	185.24	1717.32	190.64	1715.55	212.51	1708.36
246.92	1707.33	256.92	1706.33	266.92	1707.33	292.35	1708.09	302.46	1711.46
324.85	1718.92	325.13	1719	325.25	1719.04	327.4	1719.24	335.77	1720
339.86	1720.31	342.24	1720.5	345.63	1720.79	347.2	1720.9	348.85	1721
349.3	1721.03	350.2	1721.06	352.76	1721.12	355.99	1721.21	359.71	1721.28
361.47	1721.5	362.25	1721.6	362.99	1721.69	364.6	1721.89	366.75	1722
371.57	1722.56	372.45	1722.65	373.69	1722.73	375.28	1722.82	376.38	1722.86
377.06	1722.93	381.85	1722.84	387.17	1722.81	388.65	1722.87	394.21	1722.98
394.94	1723	399.6	1723.18	401.2	1723.25	405.03	1723.56	407.98	1723.76

410.41	1724	411.52	1724.09	411.85	1724.09	414.85	1724.08	424.47	1724.18
428.36	1724.05	428.96	1724.04	429.17	1724.04	430.21	1724.03	430.54	1724.01
434.05	1724.03	434.58	1724	435.57	1723.76	439.23	1723.61	441.06	1723.52
443.81	1723.42	448.16	1722.31	448.43	1722.24	453.69	1720.89	455.63	1720.86
456.19	1720.85	456.82	1720.84	458.61	1720.85	461.58	1720.92	465.77	1722.04
467.9	1722.16	469.25	1722.33	474.88	1722.27				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	24.63	.027	424.47	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	24.63	424.47		68.9	64		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1720.87	Element			
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.28	Reach Len. (ft)	68.90	64.00	21.10
Crit W.S. (ft)		Flow Area (sq ft)		1367.50	
E.G. Slope (ft/ft)	0.003130	Area (sq ft)		1367.50	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	225.58	Top Width (ft)		225.58	
Vel Total (ft/s)	10.14	Avg. Vel. (ft/s)		10.14	
Max Chl Dpth (ft)	12.95	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	247746.4	Conv. (cfs)		247746.4	
Length Wtd. (ft)	64.00	Wetted Per. (ft)		228.96	
Min Ch El (ft)	1706.33	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	474.88	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	219.10	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	32.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1108.3

INPUT

Description: "DR" 59+70.98 = 1108.3

Station Elevation Data		num= 180									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.33	.17	1721.32	.53	1721.41	2.89	1722	6.46	1722.89		
6.68	1722.94	6.77	1722.96	6.93	1723	7.04	1723.03	11.19	1724		
11.29	1724.03	15.76	1725	25.73	1725	26	1725	26.08	1724.99		
31.88	1724	34.53	1723.42	36.73	1723	39.59	1722.16	40.32	1722		
41.85	1721.97	55.79	1721.68	59.44	1721.61	63.81	1721.53	64.38	1721.09		
64.7	1721	65.86	1720.65	68.85	1720	74.49	1719.37	77.53	1719		
82.23	1718.33	84.04	1718.09	84.77	1718	85.02	1718	89.06	1718		
90.16	1718	92.98	1718	95.48	1718	97.11	1718	102.36	1718		
103.64	1718.17	106.01	1718.4	108.83	1718.76	111.62	1719	114.22	1719.12		
115	1719.11	121.26	1719.31	146.97	1719	152.89	1719	154.63	1719		
160.01	1719	160.35	1718.9	160.41	1718.88	160.43	1718.88	166.51	1716.85		
192.45	1708.21	197.8	1708.05	225.08	1707.23	233.47	1706.39	235.08	1706.23		
236.69	1706.39	245.08	1707.23	251.87	1707.43	277.42	1708.2	284.58	1710.58		
295.52	1714.2	298.14	1715.09	298.75	1715.18	299.72	1715.23	302.89	1715.49		
307.15	1715.76	307.83	1715.81	308.42	1715.84	308.64	1715.88	309.34	1716		
310.65	1716.38	312.93	1717	313.62	1717.12	314.79	1717.3	317.49	1717.74		
319.23	1718	320.84	1718.29	322.42	1718.52	323.82	1718.76	324.88	1718.9		
325.64	1719	326.89	1719.19	327.25	1719.24	329.13	1719.53	329.94	1719.63		
332.74	1720	332.92	1720.02	332.99	1720.03	335.08	1720.29	335.93	1720.39		
337.25	1720.55	338.87	1720.74	341.03	1721	341.75	1721.08	342.05	1721.11		
344.45	1721.38	345.92	1721.54	347.15	1721.68	349.81	1721.98	349.85	1721.99		
349.94	1722	352.4	1722.27	353.36	1722.38	355.67	1722.66	356.89	1722.8		
358.48	1723	360.22	1723.39	362.92	1724	363.2	1724.03	363.27	1724.03		
372.06	1724.27	372.6	1724.26	375.58	1724.2	375.73	1724.19	376.54	1724.17		
376.76	1724.17	379.65	1724.08	379.73	1724.07	381.73	1724	383.04	1724		
385.34	1724	388.6	1724	393.17	1724	398.16	1724	406.42	1724		
410.4	1723.21	411.35	1723	411.55	1722.97	413.59	1722.65	415.08	1722.39		
416.34	1722.19	417.39	1722	418.71	1721.69	421.22	1721.1	421.5	1721.03		
421.55	1721.02	421.64	1721	423.3	1720.58	424.6	1720.26	425.06	1720.15		
425.65	1720	429.76	1719.55	431.75	1719.33	434.46	1719	434.79	1719		
438.89	1719	439.3	1719	441.94	1719.48	445.04	1720	445.36	1720.08		
447.09	1720.45	448.68	1720.79	449.06	1720.88	449.71	1721	452.83	1721.98		

Station Elevation Data		num=		233							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.21	.09	1721.21	.15	1721.21	.44	1721.28	3.32	1722		
5.71	1722.6	6.34	1722.76	6.62	1722.82	6.77	1722.86	7.28	1723		
7.94	1723.16	11.61	1724	16.07	1724.45	19.24	1724.57	26.84	1724.99		
26.96	1725	27.3	1725.08	31.28	1726	37.32	1726	38.03	1726		
38.26	1725.94	41.23	1725	42.57	1724.78	47.21	1724	51.09	1723.18		
51.78	1723	53.17	1722.85	62.52	1722.16	63.37	1722.16	64.3	1722.15		
67.43	1722.07	72.37	1721.9	72.62	1721.89	73.62	1721.86	75.31	1722.02		
82.2	1723	82.65	1723	85.88	1723	88.15	1723	92.16	1723		
93.23	1723	97.13	1723	101.01	1723	104.63	1723	105.56	1722.87		
110.14	1722	112.85	1721.34	114.81	1721	116.6	1720.72	121.04	1720		
131.6	1719.44	135.73	1719.26	141.29	1719.03	141.88	1719	143.97	1718.9		
146.04	1718.81	146.4	1718.79	146.54	1718.78	146.61	1718.78	146.67	1718.77		
148.02	1718.32	178.54	1708.15	178.69	1708.1	189.27	1707.78	210.07	1707.16		
220.07	1706.16	230.07	1707.16	230.19	1707.16	242.22	1707.51	270.65	1708.31		
270.67	1708.32	284.92	1713.06	288.67	1714.31	289.08	1714.39	289.49	1714.47		
290.22	1714.61	290.76	1714.72	291.43	1714.72	294.24	1714.77	302.29	1714.89		
304	1714.93	307.43	1715.97	307.52	1716	309.63	1716.79	310.2	1717		
312.11	1717.67	313.13	1718	314.52	1718.44	316.4	1719	316.88	1719.14		
318.23	1719.5	319.57	1719.87	320.1	1720	322.38	1720.7	323.43	1721		
325.16	1721.36	327.32	1721.78	327.92	1721.9	328.5	1722	330.04	1722.27		
330.85	1722.42	331.99	1722.61	333.79	1722.91	333.97	1722.94	334.41	1723		
336	1723.23	336.68	1723.34	338.04	1723.51	339.44	1723.69	340.1	1723.75		
340.38	1723.77	341.68	1723.9	341.76	1723.9	342.18	1723.93	342.3	1723.94		
343.06	1724	344.15	1724.06	344.29	1724.07	346.01	1724.2	346.42	1724.21		
347.86	1724.33	348.43	1724.33	348.52	1724.33	349.73	1724.43	350.16	1724.43		
350.61	1724.44	351.62	1724.48	352.71	1724.56	354.06	1724.64	354.81	1724.7		
356.53	1724.82	356.89	1724.86	358.47	1725	359.41	1725.01	361.24	1725.03		
362.67	1725.05	364.23	1725.07	364.65	1725.08	365.97	1725.09	366.96	1725.1		
367.78	1725.11	368.15	1725.11	368.5	1725.12	374.75	1725	375.01	1725		
375.23	1725	376.25	1725	376.87	1724.98	377.61	1724.95	380.6	1724.84		
380.93	1724.82	381.94	1724.77	385.61	1724.53	386.31	1724.51	387.32	1724.48		
389.01	1724.42	389.65	1724.4	399.12	1724.04	399.65	1724.03	400.36	1724		

Station	Elevation	Data	num=	121					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.79	2.31	1720.6	3.97	1720.14	9.95	1721.23	10.58	1721.36
10.9	1721.36	10.92	1721.36	10.97	1721.36	11.29	1721.37	12.78	1721.39
14.64	1722.32	19.28	1724.62	22.41	1724.55	31.34	1724.35	31.6	1724.3
32.34	1724.31	36.05	1724.94	36.44	1725	36.75	1725.08	40.58	1726
42.97	1726	55.84	1726	56.81	1725.87	60.47	1725.18	61.33	1725.04
61.51	1725	62.03	1724.89	66.71	1724	68.42	1723.61	71.41	1723
74.04	1722.54	76.75	1722	79.1	1721.37	80.45	1721	83.45	1720.5
86.14	1720	87.71	1719.77	89.54	1719.49	92.73	1719	99.12	1718.16
100.15	1718	101.61	1717.84	109.45	1717	109.81	1716.97	116.22	1716.22
117.33	1716.17	117.44	1716.17	127.1	1716.34	128.52	1716.37	129.38	1716.39
129.59	1716.37	131.46	1716.13	132.54	1716	132.66	1715.94	134.49	1715.06
142.54	1712.23	143.8	1711.78	153.69	1708.38	153.7	1708.38	174.42	1707.78
198.46	1707.09	208.46	1706.09	218.46	1707.09	257.58	1708.26	261.46	1708.38
262.06	1708.39	264.46	1708.46	265.21	1708.71	282.46	1714.46	295.52	1714.72
296.36	1714.75	297.46	1714.76	297.62	1714.82	297.74	1714.87	297.86	1714.91
297.98	1714.96	298.1	1715	298.2	1715.04	298.35	1715.1	299.84	1715.65
304.26	1717.29	306.55	1718.14	307.95	1718.66	308.9	1719.01	313.78	1721.04
314.04	1721.09	315.06	1721.29	316.1	1721.5	325.54	1723.49	325.91	1723.57
328.61	1724.19	339.03	1726.02	339.04	1726.02	345.55	1725.84	345.94	1725.83
346.14	1725.82	351.74	1725.66	355.78	1725.54	361.73	1725.37	372.88	1725.05
375.08	1724.99	382.09	1724.8	387.85	1724.64	388.77	1724.62	390.59	1724.56
404.54	1724.19	404.56	1724.19	405.33	1724.17	408.39	1724.06	408.64	1724.05
418.36	1723.71	422.81	1723.56	423.48	1723.53	432.07	1723.24	434.18	1723.17

451.39 1722.62 459.99 1722.3 460.94 1722.27 464.04 1722.15 467.49 1722.04
472.23 1721.9

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 55.84 .027 339.03 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
55.84 339.03 124.21 124.12 124.12 .3 .5
Ineffective Flow num= 2
Sta L Sta R Elev Permanent
085.98999 F
326.8101 472.23 F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.33	Reach Len. (ft)	19.54	19.54	19.54
Crit W.S. (ft)	1715.23	Flow Area (sq ft)		1792.25	
E.G. Slope (ft/ft)	0.001224	Area (sq ft)		1792.25	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	219.11	Top Width (ft)		219.11	
Vel Total (ft/s)	7.73	Avg. Vel. (ft/s)		7.73	
Max Chl Dpth (ft)	13.24	Hydr. Depth (ft)		8.18	
Conv. Total (cfs)	396211.8	Conv. (cfs)		396211.8	
Length Wtd. (ft)	19.54	Wetted Per. (ft)		222.61	
Min Ch El (ft)	1706.09	Shear (lb/sq ft)		0.62	
Alpha	1.00	Stream Power (lb/ft s)	472.23	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	214.36	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	31.69	0.06

BRIDGE

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1107.5

INPUT

Description: Proposed Sahara Bridge
Distance from Upstream XS = 19.54
Deck/Roadway Width = 96.81
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 7
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
0 1730 50 1730.1 106.4 1730.3 1726.5
206.4 1729.6 1725.6 306.4 1727.25 1722.87 362.31 1725.16
465.03 1721.32

Upstream Bridge Cross Section Data

Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.79	2.31	1720.6	3.97	1720.14	9.95	1721.23	10.58	1721.36
10.9	1721.36	10.92	1721.36	10.97	1721.36	11.29	1721.37	12.78	1721.39
14.64	1722.32	19.28	1724.62	22.41	1724.55	31.34	1724.35	31.6	1724.34
32.34	1724.31	36.05	1724.94	36.44	1725	36.75	1725.08	40.58	1726
42.97	1726	55.84	1726	56.81	1725.87	60.47	1725.18	61.33	1725.04
61.51	1725	62.03	1724.89	66.71	1724	68.42	1723.61	71.41	1723
74.04	1722.54	76.75	1722	79.1	1721.37	80.45	1721	83.45	1720.5
86.14	1720	87.71	1719.77	89.54	1719.49	92.73	1719	99.12	1718.16
100.15	1718	101.61	1717.84	109.45	1717	109.81	1716.97	116.22	1716.22
117.33	1716.17	117.44	1716.17	127.1	1716.34	128.52	1716.37	129.38	1716.39
129.59	1716.37	131.46	1716.13	132.54	1716	132.66	1715.94	134.49	1715.06
142.54	1712.23	143.8	1711.78	153.69	1708.38	153.7	1708.38	174.42	1707.78
198.46	1707.09	208.46	1706.09	218.46	1707.09	257.58	1708.26	261.46	1708.38
262.06	1708.39	264.46	1708.46	265.21	1708.71	282.46	1714.46	295.52	1714.72
296.36	1714.75	297.46	1714.76	297.62	1714.82	297.74	1714.87	297.86	1714.91
297.98	1714.96	298.1	1715	298.2	1715.04	298.35	1715.1	299.84	1715.65
304.26	1717.29	306.55	1718.14	307.95	1718.66	308.9	1719.01	313.78	1721.04
314.04	1721.09	315.06	1721.29	316.1	1721.5	325.54	1723.49	325.91	1723.57
328.61	1724.19	339.03	1726.02	339.04	1726.02	345.55	1725.84	345.94	1725.83
346.14	1725.82	351.74	1725.66	355.78	1725.54	361.73	1725.37	372.88	1725.05
375.08	1724.99	382.09	1724.8	387.85	1724.64	388.77	1724.62	390.59	1724.56

404.54	1724.19	404.56	1724.19	405.33	1724.17	408.39	1724.06	408.64	1724.05
418.36	1723.71	422.81	1723.56	423.48	1723.53	432.07	1723.24	434.18	1723.17
451.39	1722.62	459.99	1722.3	460.94	1722.27	464.04	1722.15	467.49	1722.04
472.23	1721.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	55.84	.027	339.03	.031

Bank Sta: Left Right Coeff Contr. Expan.

	55.84	339.03		.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	85.98999		F
326.8101	472.23		F

Downstream Deck/Roadway Coordinates

num= 7

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0		1730			50		1730.1			108.18		1730.3		1726.51
211.77		1729.6		1725.6	317.13		1727.25		1723.74	359		1725.16		
465.03		1721.32												

Downstream Bridge Cross Section Data

Station Elevation Data num= 136

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.39	.73	1729.41	21.08	1729.77	29.05	1729.88	44.97	1730.06
57.07	1730.2	61.68	1730.25	76.61	1730.36	77.05	1730.37	81.7	1730.4
84.22	1730.39	84.81	1730.22	84.9	1730.18	84.99	1730.15	103.18	1723.7
104.5	1723.28	105.78	1722.88	107.02	1722.49	108.2	1722.12	119.46	1716.24
122.4	1714.66	122.77	1714.46	136.31	1714.19	137.77	1714.16	154.01	1708.75
155.77	1708.16	197.29	1706.92	201.77	1706.78	210.79	1705.88	211.77	1705.78
220.79	1706.68	221.77	1706.78	263.29	1708.03	267.77	1708.16	268.45	1708.41
287.32	1715	289.4	1715.65	289.9	1715.71	290.59	1715.78	291.53	1715.86
291.55	1715.87	291.58	1715.87	291.62	1715.87	291.67	1715.88	291.73	1715.88
291.79	1715.89	292.85	1715.97	292.87	1715.97	292.89	1715.97	293.24	1716
296.29	1716.31	298.31	1716.45	303.41	1716.81	303.68	1716.82	304	1716.83
305.93	1716.93	306.06	1716.93	306.22	1716.93	306.41	1716.94	306.64	1716.95
307.8	1717	308.93	1717.05	309.09	1717.06	314.43	1717.22	314.67	1717.22
317.23	1717.29	317.44	1717.3	317.46	1717.3	320.41	1717.42	320.83	1717.44
323.38	1717.54	324.2	1717.57	326.34	1717.65	327.59	1717.7	329.28	1717.77
331	1717.83	331.76	1717.86	334.03	1717.95	334.4	1717.97	335.54	1718.01
336.13	1718.03	337.82	1718.1	338.04	1718.11	339.23	1718.16	341.17	1718.33
341.7	1718.38	344.38	1718.62	346.16	1718.77	347.36	1718.88	348.75	1719
350.71	1719.15	351.6	1719.21	354.91	1719.46	357.72	1719.66	359.14	1719.77
362.35	1720	363.64	1720.15	366.36	1720.56	368.57	1720.87	369.35	1721
373.1	1721.51	376.95	1722	377.73	1722.1	379.02	1722.27	382.53	1722.72
384.74	1723	388.27	1723	393.29	1723	400.7	1723.06	401.93	1723
404.11	1722.68	407.65	1722.06	407.9	1722.02	408.01	1722	414	1721.17
414.08	1721.16	415.02	1721.38	415.2	1721.42	419.11	1721.5	421.29	1721.54
423.89	1721.59	428.5	1721.68	430.12	1721.58	437.23	1721.11	437.93	1721.06
438.59	1721	439.58	1720.79	445.33	1719.59	449.1	1719.04	455.13	1719.99
459.72	1720.73	460.61	1720.76	464.95	1720.9	466.41	1720.94	471.9	1721.35
475.59	1721.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	84.22	.027	384.74	.031

Bank Sta: Left Right Coeff Contr. Expan.

	84.22	384.74		.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	85.9899		F
326.8101	475.59		F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data
Pier Station Upstream= 165.75 Downstream= 165.75
Upstream num= 2
Width Elev Width Elev
2 1705 2 1730
Downstream num= 2
Width Elev Width Elev
2 1705 2 1730

Pier Data
Pier Station Upstream= 247 Downstream= 247
Upstream num= 2
Width Elev Width Elev
2 1705 2 1730
Downstream num= 2
Width Elev Width Elev
2 1705 2 1730

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth

inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1720.26	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1719.33	E.G. Elev (ft)	1720.20	1720.02
Q Total (cfs)	13861.00	W.S. Elev (ft)	1719.16	1719.02
Q Bridge (cfs)	13861.00	Crit W.S. (ft)	1715.36	1715.02
Q Weir (cfs)		Max Chl Dpth (ft)	13.07	13.24
Weir Sta Lft (ft)		Vel Total (ft/s)	8.18	8.05
Weir Sta Rgt (ft)		Flow Area (sq ft)	1694.79	1721.10
Weir Submerg		Froude # Chl	0.40	0.39
Weir Max Depth (ft)		Specif Force (cu ft)	12196.46	12420.09
Min El Weir Flow (ft)	1726.78	Hydr Depth (ft)	8.64	8.65
Min El Prs (ft)	1726.50	W.P. Total (ft)	246.99	249.64
Delta EG (ft)	0.28	Conv. Total (cfs)	336800.8	343108.4
Delta WS (ft)	0.29	Top Width (ft)	196.23	199.06
BR Open Area (sq ft)	2867.49	Frctn Loss (ft)	0.16	0.01
BR Open Vel (ft/s)	8.18	C & E Loss (ft)	0.02	0.04
Coef of Q		Shear Total (lb/sq ft)	0.73	0.70
Br Sel Method	Energy only	Power Total (lb/ft s)	0.00	0.00

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1107.15

INPUT

Description: "DR" 61+70.98 = 1107.15 Downstream side of new Sahara Ave. bridge

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.39	.73	1729.41	21.08	1729.77	29.05	1729.88	44.97	1730.06
57.07	1730.2	61.68	1730.25	76.61	1730.36	77.05	1730.37	81.7	1730.4
84.22	1730.39	84.81	1730.22	84.9	1730.18	84.99	1730.15	103.18	1723.7
104.5	1723.28	105.78	1722.88	107.02	1722.49	108.2	1722.12	119.46	1716.24
122.4	1714.66	122.77	1714.46	136.31	1714.19	137.77	1714.16	154.01	1708.75
155.77	1708.16	197.29	1706.92	201.77	1706.78	210.79	1705.88	211.77	1705.78
220.79	1706.68	221.77	1706.78	263.29	1708.03	267.77	1708.16	268.45	1708.41
287.32	1715	289.4	1715.65	289.9	1715.71	290.59	1715.78	291.53	1715.86
291.55	1715.87	291.58	1715.87	291.62	1715.87	291.67	1715.88	291.73	1715.88

291.79	1715.89	292.85	1715.97	292.87	1715.97	292.89	1715.97	293.24	1716
296.29	1716.31	298.31	1716.45	303.41	1716.81	303.68	1716.82	304	1716.83
305.93	1716.93	306.06	1716.93	306.22	1716.93	306.41	1716.94	306.64	1716.95
307.8	1717	308.93	1717.05	309.09	1717.06	314.43	1717.22	314.67	1717.22
317.23	1717.29	317.44	1717.3	317.46	1717.3	320.41	1717.42	320.83	1717.44
323.38	1717.54	324.2	1717.57	326.34	1717.65	327.59	1717.7	329.28	1717.77
331	1717.83	331.76	1717.86	334.03	1717.95	334.4	1717.97	335.54	1718.01
336.13	1718.03	337.82	1718.1	338.04	1718.11	339.23	1718.16	341.17	1718.33
341.7	1718.38	344.38	1718.62	346.16	1718.77	347.36	1718.88	348.75	1719
350.71	1719.15	351.6	1719.21	354.91	1719.46	357.72	1719.66	359.14	1719.77
362.35	1720	363.64	1720.15	366.36	1720.56	368.57	1720.87	369.35	1721
373.1	1721.51	376.95	1722	377.73	1722.1	379.02	1722.27	382.53	1722.72
384.74	1723	388.27	1723	393.29	1723	400.7	1723.06	401.93	1723
404.11	1722.68	407.65	1722.06	407.9	1722.02	408.01	1722	414	1721.17
414.08	1721.16	415.02	1721.38	415.2	1721.42	419.11	1721.5	421.29	1721.54
423.89	1721.59	428.5	1721.68	430.12	1721.58	437.23	1721.11	437.93	1721.06
438.59	1721	439.58	1720.79	445.33	1719.59	449.1	1719.04	455.13	1719.99
459.72	1720.73	460.61	1720.76	464.95	1720.9	466.41	1720.94	471.9	1721.35
475.59	1721.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	84.22	.027	384.74	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	84.22	384.74		25.02	25.02	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	85.9899		F
326.8101	475.59		F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.04	Reach Len. (ft)	25.02	25.02	25.02
Crit W.S. (ft)		Flow Area (sq ft)		1786.49	
E.G. Slope (ft/ft)	0.001191	Area (sq ft)		1804.91	0.00
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	235.22	Top Width (ft)		235.20	0.02
Vel Total (ft/s)	7.76	Avg. Vel. (ft/s)		7.76	
Max Chl Dpth (ft)	13.26	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	401723.3	Conv. (cfs)		401723.3	
Length Wtd. (ft)	25.02	Wetted Per. (ft)		216.30	
Min Ch El (ft)	1705.78	Shear (lb/sq ft)		0.61	
Alpha	1.00	Stream Power (lb/ft s)	475.59	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.34	209.47	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	31.12	0.06

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1107.1

INPUT

Description: "DR" 61+96.00 = 1107.1

Station	Elevation	Data	num=	136					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.51	13.46	1729.75	17.74	1729.83	30.16	1730	41.44	1730.06
59.54	1730.1	69.12	1730.13	72.76	1730.13	81.17	1730.13	83.8	1730.12
96.66	1726.3	98.75	1725.5	100.59	1724.79	106.57	1722.67	107	1722.54
107.42	1722.4	107.83	1722.27	108.22	1722.15	111.92	1720.22	112.89	1719.7
114.54	1718.82	117.99	1716.96	122.77	1714.4	137.77	1714.1	152.56	1709.17
155.77	1708.1	155.78	1708.1	163.99	1707.85	201.77	1706.72	201.78	1706.72
211.77	1705.72	221.77	1706.72	267.75	1708.1	267.77	1708.1	284.35	1714.18
285.68	1714.67	286.02	1714.79	286.61	1715	286.8	1715.06	286.83	1715.08
286.9	1715.11	287.08	1715.18	288.11	1715.57	289.29	1716	290.55	1716.25
294.27	1717	297.41	1717.67	298.99	1718	300.3	1718.29	306.76	1719
311.69	1719.23	313.94	1719.59	318.29	1719.99	318.35	1720	318.5	1720
323.44	1720.15	327.84	1720.09	328.23	1720.08	329.78	1720	331.63	1719.91
333.64	1719.93	342.42	1719.73	343.22	1719.74	349.02	1719.67	350.16	1719.7

Station Elevation Data				num= 166							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	1729.42	7.15	1729.47	26.16	1729.59	49.16	1729.76	53.8	1729.78		
56.11	1729.79	63.1	1729.81	65.11	1729.75	66.52	1729.71	66.57	1729.97		
66.61	1730.21	67.2	1730.21	67.75	1730.22	71.71	1730.28	79.16	1730.4		
79.44	1730.4	81.15	1730.4	82.74	1730.39	83.77	1730.39	87.87	1730.17		
88.39	1730	90.41	1729.29	91.16	1729	93.48	1728.1	93.73	1728		
93.89	1727.94	96.14	1727	97.34	1726.53	98.68	1726	100.99	1725.01		
101	1725	101.07	1724.97	103.41	1724	105.24	1723.22	105.78	1723		
106.57	1722.66	108.1	1722	108.59	1721.76	110.06	1721	110.82	1720.64		
112.13	1720	113.4	1719.36	114.12	1719	115.6	1718.24	116.07	1718		
117.59	1717.24	118.12	1717	119.87	1716.25	120.49	1716	122.28	1715.26		
122.78	1715.07	131.2	1714.89	132.73	1714.85	135.81	1714.78	136.62	1714.77		
137.78	1714.74	137.8	1714.73	138	1714.67	158.65	1708.12	160.23	1707.63		
164.62	1707.5	201.78	1706.41	210.17	1705.57	211.78	1705.41	213.39	1705.57		
221.78	1706.41	255.43	1707.42	262.81	1707.64	262.84	1707.64	271.4	1710.48		
274.71	1711.5	281.55	1713.61	289.34	1716	292.71	1716.74	293.92	1717		
296.34	1717.55	298.33	1718	298.83	1718.13	299.27	1718.25	299.61	1718.34		
299.87	1718.42	302.13	1719	310.49	1719.41	317.44	1719.46	320.79	1719.5		
324.38	1719.85	325.5	1720	326.41	1720.15	333.2	1720.95	333.57	1721		
333.63	1721	342.98	1721	351.88	1721.92	353.16	1722	353.69	1722		
354.73	1722	355.46	1722	356.22	1722	364.81	1722	365.85	1722		
367.61	1722.21	368.21	1722.24	375.82	1722.02	375.89	1722.02	376.22	1722		
383.11	1721.83	384.03	1721.83	386.06	1721.81	387.64	1721.76	389.18	1721.79		
391.11	1721.88	392.8	1721.96	395.75	1722.1	395.82	1722.1	399.14	1722.2		

399.17	1722.27	399.22	1722.27	399.39	1722.28	399.42	1722.28	399.87	1722.28
399.97	1722.28	409.36	1722.74	410.46	1722.77	411.52	1722.8	413.03	1722.84
413.7	1722.85	415.28	1722.86	416.9	1722.87	417.33	1722.88	419.16	1722.87
419.68	1722.88	421.1	1722.87	421.67	1722.88	421.9	1722.87	422.94	1722.86
425.11	1722.78	425.9	1722.73	427.25	1722.62	428.27	1722.59	429.05	1722.57
429.85	1722.55	433.08	1722.21	433.52	1722.19	433.82	1722.17	434.09	1722.16
434.35	1722.14	434.53	1722.12	435.31	1722	441.16	1721.11	441.85	1721
449.36	1720.04	452.8	1719.6	453.15	1719.56	453.68	1719.49	454.1	1719.56
454.23	1719.58	454.59	1719.63	455.7	1719.81	461.43	1720.78	461.86	1720.8
463.06	1720.85	466.15	1720.98	469.35	1721.42	470.54	1721.61	471.35	1721.74
475.63	1722.24								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	83.77	.027	419.68	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	83.77	419.68		49.02	49.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.83	Reach Len. (ft)	49.02	49.02	49.02
Crit W.S. (ft)		Flow Area (sq ft)		1683.27	
E.G. Slope (ft/ft)	0.001227	Area (sq ft)		1683.27	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	187.04	Top Width (ft)		187.04	
Vel Total (ft/s)	8.23	Avg. Vel. (ft/s)		8.23	
Max Chl Dpth (ft)	13.42	Hydr. Depth (ft)		9.00	
Conv. Total (cfs)	395644.3	Conv. (cfs)		395644.3	
Length Wtd. (ft)	49.02	Wetted Per. (ft)		190.71	
Min Ch El (ft)	1705.41	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	475.63	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	207.48	0.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.40	30.89	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1106.6

INPUT

Description: "DR" 62+70.00 = 1106.6

Station	Elevation	Data	num=	110	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1726.98	.09	1726.98	5.52	1726.79	7.36	1726.67	8.86	1726.43			
9.09	1726.39	12.06	1725.88	12.07	1725.88	12.91	1726.28	13.71	1726.66			
23	1726.69	25.77	1726.71	28.37	1725.87	30.31	1725.25	31.02	1725			
31.84	1725	41.6	1725	67.74	1725	68	1725	69.66	1725			
71.99	1725	75.3	1725	75.46	1725	79.97	1724.67	82.58	1724.42			
84.54	1724.27	87.3	1724	89.39	1723.68	94.01	1723	94.51	1722.93			
94.77	1722.89	97.62	1722.49	100.58	1722.04	100.61	1722.04	100.85	1722			
105.05	1721.27	106.35	1721	110.01	1720.08	110.31	1720	110.72	1719.91			
115.19	1719	117.27	1718.61	118.98	1718.29	124	1718.11	127.28	1717.99			
131.48	1717.84	141.74	1717.47	153.07	1714.73	191.01	1706.11	191.02	1706.11			
201.8	1705.79	211.8	1704.79	221.8	1705.79	252.36	1706.71	252.37	1706.71			
252.38	1706.71	298.83	1718.33	299.42	1718.48	301.4	1718.97	301.54	1719			
302.27	1719.01	332.49	1719.5	340.21	1719.65	359.69	1720	366.43	1720.71			
369.16	1721	370.48	1721.36	372.55	1722	374.72	1722.46	376.59	1722.8			
377.82	1723	381.96	1723.78	382.73	1723.87	383.74	1724	387.03	1724.25			
391.67	1724.31	393.64	1724.45	398.04	1724.71	400.09	1724.84	401.44	1725			
404.61	1725	406.74	1725	407.26	1724.85	409.63	1724	410.66	1723.6			
410.69	1723.58	411.04	1723.58	418.69	1723.75	422.51	1723.9	424.61	1724			
426.65	1724	435.26	1724	436.89	1723.63	439.37	1723	443.11	1722.16			
443.7	1722	444.47	1721.84	447.9	1721	452.6	1719.97	453.6	1719.76			
456.18	1720.19	460.48	1720.9	461.19	1720.95	461.97	1721	463.78	1721.11			

466.72 1721.21 469.33 1721.49 474.77 1721.63 475.07 1721.65 475.67 1721.67

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 25.77 .027 401.44 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
25.77 401.44 50.98 50.98 50.98 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.73	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.00	Reach Len. (ft)	50.98	50.98	50.98
Crit W.S. (ft)		Flow Area (sq ft)		1311.36	
E.G. Slope (ft/ft)	0.002484	Area (sq ft)		1311.36	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	170.52	Top Width (ft)		170.52	
Vel Total (ft/s)	10.57	Avg. Vel. (ft/s)		10.57	
Max Chl Dpth (ft)	13.21	Hydr. Depth (ft)		7.69	
Conv. Total (cfs)	278135.4	Conv. (cfs)		278135.4	
Length Wtd. (ft)	50.98	Wetted Per. (ft)		173.33	
Min Ch El (ft)	1704.79	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	475.67	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.34	205.80	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	30.69	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1106.4

INPUT

Description: "DR" 63+20.98 = 1106.4

Station Elevation Data num= 118

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.19	1.61	1721.09	8.32	1720.97	9.32	1720.97	11.7	1722.17
14	1723.31	23.97	1723.51	26	1723.55	35.1	1724.44	40.36	1725
59.68	1725	70.96	1725	77.25	1725	82.95	1724.23	84.68	1724
86.7	1723.69	91.54	1723	95.22	1722.66	101.64	1722.1	102.33	1722.05
102.94	1722	103.42	1721.96	103.97	1721.92	104.83	1721.88	105.9	1721.83
109.73	1721.66	112.7	1721.54	116.96	1721.25	121.07	1721	124.74	1720.61
128.1	1720.23	130.15	1720	136.73	1719.34	140.06	1719	140.73	1718.91
142.93	1718.6	143.87	1718.46	146.81	1718.15	187.28	1708.04	196.81	1705.65
197.62	1705.62	201.81	1705.5	210.2	1704.66	211.81	1704.5	220.2	1705.34
221.81	1705.5	226.81	1705.65	253.22	1706.44	260.57	1708.28	300.23	1718.19
300.61	1718.28	303.46	1719	304.07	1719.18	305	1719.22	306.41	1719.23
306.44	1719.24	316.72	1719.34	320.95	1719.3	330.75	1719.12	333.72	1719.07
335.03	1719.05	335.74	1719.05	341.29	1719	341.31	1719	341.32	1719
342.33	1719	348.72	1719	349.97	1719	356.03	1719.11	358.68	1719.26
362.56	1719.4	364.63	1719.5	365.38	1719.5	368.38	1719.5	370.07	1719.46
375	1719.65	385.45	1720	387.33	1720.39	390.51	1721	392.29	1721.18
394.72	1721.35	400.94	1722	401.89	1722.21	406.44	1723	409.42	1723.06
410.03	1723.08	416.64	1723.21	418.05	1723.24	420.1	1723.18	424.8	1723
429.07	1722.33	431.43	1722	432.81	1721.73	436.39	1721	445.11	1720.31
449.08	1720	449.36	1720.05	449.44	1720.06	450.57	1720.12	450.8	1720.13
451.09	1720.16	451.29	1720.18	451.45	1720.19	451.61	1720.21	459.45	1720.97
459.47	1720.97	459.98	1721.01	460.2	1721.02	460.39	1721.03	460.5	1721.03
460.55	1721.03	460.58	1721.03	461.64	1721.05	468.74	1721.25	470.68	1721.49
473.53	1721.62	474.63	1721.53	475.71	1721.55				

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 77.25 .027 418.05 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
77.25 418.05 50 50 50 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.10	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.46	Reach Len. (ft)	50.00	50.00	50.00

Crit W.S. (ft)		Flow Area (sq ft)	1191.00		
E.G. Slope (ft/ft)	0.002840	Area (sq ft)	1191.00		
Q Total (cfs)	13861.00	Flow (cfs)	13861.00		
Top Width (ft)	147.73	Top Width (ft)	147.73		
Vel Total (ft/s)	11.64	Avg. Vel. (ft/s)	11.64		
Max Chl Dpth (ft)	12.96	Hydr. Depth (ft)	8.06		
Conv. Total (cfs)	260113.1	Conv. (cfs)	260113.1		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	150.65		
Min Ch El (ft)	1704.50	Shear (lb/sq ft)	1.40		
Alpha	1.00	Stream Power (lb/ft s)	475.71	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	204.34	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	30.50	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1106.2

INPUT

Description: "DR" 63+70.98 = 1106.2

Station Elevation Data num= 127

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.54	.01	1720.54	3.78	1720.73	5.69	1720.82	7.91	1720.92
8.53	1720.95	8.67	1720.96	10.17	1721.06	10.83	1721.39	14	1722.98
15.36	1723.01	20.26	1723.11	28.41	1723.26	30.13	1723.29	30.27	1723.29
30.55	1723.29	31.3	1723.29	40.31	1723.35	41.23	1723.33	42.24	1723.36
44.9	1723.44	45.65	1723.47	46.79	1723.5	49.07	1723.57	51.08	1723.63
52.49	1723.67	55.38	1723.76	55.9	1723.77	57.95	1723.84	62.26	1723.96
63.75	1724	64.4	1724.02	65.76	1724.04	66.38	1724.06	67.85	1724.08
69.19	1724.09	70	1724.11	71.49	1724.11	73.03	1724.1	73.74	1724.12
75.42	1724.1	77.32	1724.07	77.69	1724.07	79.71	1724.02	80.26	1724
81.85	1723.9	82.88	1723.79	85.08	1723.6	86.39	1723.47	90.68	1723
94.33	1722.88	100.53	1722.68	111.16	1722	120.17	1721.35	124.99	1721
128.31	1720.67	134.91	1720	140.35	1719.24	142.1	1719	142.65	1718.85
145.69	1718	145.89	1717.95	146.3	1717.85	159.19	1714.63	196.34	1705.36
200.68	1705.23	201.34	1705.21	210.32	1704.31	211.34	1704.21	211.35	1704.21
211.82	1704.26	220.65	1705.14	221.35	1705.21	244.12	1705.9	254.06	1706.2
254.59	1706.33	299.38	1717.53	299.38	1717.5	300.48	1717.55	306.3	1717.65
327.01	1717.92	333.7	1718	343.08	1718.2	350.41	1718.15	352.64	1718.2
353.73	1718.23	367.31	1718.35	385.21	1719	386.95	1719.33	389.48	1719.85
390.35	1720	396.17	1720.93	396.56	1721	397.06	1721.08	402.81	1722
404.3	1722.05	408.01	1722.18	411.99	1722.26	416.01	1722.34	417.22	1722.8
418.02	1723	421.09	1723.62	423.3	1724	425.42	1724.33	429.23	1725
436.09	1725	436.55	1725	436.95	1725	440.67	1724.42	443.51	1724
445.36	1723.63	447.45	1723.31	450.31	1723	452.4	1722.77	457.98	1722
458.69	1721.92	458.89	1721.92	459.1	1721.95	463.67	1721.64	464.95	1721.43
467.13	1721.08	467.66	1721.1	467.84	1721.11	468.4	1721.16	470.85	1721.38
471.88	1721.46	475.75	1721.5						

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73.74	.027	429.23	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
73.74	429.23	50	50.07	50	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.92	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.45	Reach Len. (ft)	50.00	50.07	50.00
Crit W.S. (ft)		Flow Area (sq ft)		1246.33	
E.G. Slope (ft/ft)	0.002517	Area (sq ft)		1246.33	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	151.18	Top Width (ft)		151.18	
Vel Total (ft/s)	11.12	Avg. Vel. (ft/s)		11.12	
Max Chl Dpth (ft)	13.24	Hydr. Depth (ft)		8.24	
Conv. Total (cfs)	276287.6	Conv. (cfs)		276287.6	
Length Wtd. (ft)	50.07	Wetted Per. (ft)		154.17	
Min Ch El (ft)	1704.21	Shear (lb/sq ft)		1.27	
Alpha	1.00	Stream Power (lb/ft s)	475.75	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	202.94	0.02
C & E Loss (ft)	0.12	Cum SA (acres)	0.40	30.33	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1105.8

INPUT

Description: "DR" 64+21.05 = 1105.8

Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.56	3.57	1719.37	4.78	1719.59	5.27	1719.66	6.36	1719.71
6.89	1719.73	8.3	1719.77	8.64	1719.79	9.43	1719.92	12.13	1720.36
20.18	1721.69	23.61	1722.25	25.69	1722.29	31.64	1722.41	33.98	1722.7
35.4	1722.88	36.48	1723	42.42	1723	53.28	1723	69.26	1723
77.43	1723	81.93	1722.8	104.26	1722	113.32	1721.44	115.91	1721.28
120.3	1721	121.11	1720.94	133.93	1720	136.58	1719.32	137.81	1719
138.43	1718.84	141.82	1718	143.61	1717.56	143.63	1717.55	144.66	1717.29
187.95	1706.51	193.72	1705.07	194.38	1705.05	198.73	1704.92	207.09	1704.09
208.75	1703.92	210.5	1704.1	211.84	1704.23	218.77	1704.93	226.33	1705.16
254.9	1706.02	259.25	1707.11	269.9	1709.77	270.12	1709.83	271.52	1709.87
276.27	1710	278.12	1710.54	279.82	1711	281.04	1711.35	283.49	1712
285.67	1712.73	286.55	1713	288.77	1713.78	289.44	1714	290.33	1714.33
293.47	1715	298.44	1715.99	298.47	1716	306.75	1716.9	308.13	1717
319.87	1717.16	331.85	1717.29	337.25	1717.32	365.13	1718	372.19	1718
375.29	1718	381.49	1718	386.16	1718	388.2	1718	390.2	1718
390.86	1718.15	395.05	1719	398.64	1719.61	401.11	1720	404.39	1720.78
405.14	1721	405.95	1721.18	407.35	1721.66	411.33	1721.74	415.35	1721.82
418.05	1722.97	418.13	1723	418.38	1723.04	421.46	1723.39	426.5	1723.97
426.63	1723.98	426.75	1723.98	428.06	1724	430.55	1724	431	1724.04
431.93	1724	435.22	1723.76	437.45	1723.47	442.88	1723	443.94	1722.92
444.5	1722.86	450.2	1722	451.87	1721.92	462.22	1721.34	462.82	1721.23
464.16	1721.01	466.61	1721.26	467.48	1721.35	468.3	1721.46	470.59	1721.55
472.6	1721.59	473.84	1721.9	475.27	1722.15	475.79	1722.15		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	77.43	.027	428.06	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	77.43	428.06		50	50.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.53	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.60	Reach Len. (ft)	50.00	50.10	50.00
Crit W.S. (ft)		Flow Area (sq ft)		1396.90	
E.G. Slope (ft/ft)	0.002571	Area (sq ft)		1396.90	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	205.30	Top Width (ft)		205.30	
Vel Total (ft/s)	9.92	Avg. Vel. (ft/s)		9.92	
Max Chl Dpth (ft)	13.68	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	273368.7	Conv. (cfs)		273368.7	
Length Wtd. (ft)	50.10	Wetted Per. (ft)		208.32	
Min Ch El (ft)	1703.92	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	475.79	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	201.42	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.40	30.12	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1105.6

INPUT

Description: "DR" 64+71.15 = 1105.6

Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
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0	1718.81	3.27	1718.76	4.41	1719.13	5.4	1719.43	6.68	1719.52
9.12	1719.79	10.14	1719.9	13.48	1719.96	16.45	1719.92	17.53	1719.91
18.37	1720.05	28.42	1721.71	33.54	1721.8	36.46	1721.86	41	1721.97
42.87	1722	59.45	1722	82.12	1722	82.33	1722	82.85	1722
98.01	1721.57	104.09	1721.41	116.88	1721.09	118.16	1721.06	120.51	1721
126.13	1720.42	127.78	1720.25	128.45	1720.17	129.57	1720	129.95	1719.91
133.58	1719	133.89	1718.92	137.59	1718	140.52	1717.27	140.55	1717.26
140.84	1717.19	143.14	1716.62	185.43	1706.08	190.65	1704.78	195.02	1704.65
195.66	1704.63	204.17	1703.79	205.68	1703.64	211.85	1704.26	213.95	1704.47
215.7	1704.64	223.31	1704.87	254.43	1705.81	258.59	1706.86	269.44	1709.57
280.55	1709.74	296.76	1710	297.97	1710.18	306.64	1711	307.57	1711.19
312.35	1712	312.63	1712.08	316.41	1712.82	317.14	1712.98	317.24	1713
317.37	1713.02	320.43	1714	324.21	1714.82	325.03	1715	326.63	1715.17
331.59	1716	342.23	1716.36	356.67	1716.64	361.67	1716.77	373.78	1717
375.56	1717.18	380.64	1718	383.23	1718.36	387.05	1719	389.86	1719.62
391.2	1720	393.38	1720.53	394.88	1721	399.85	1721.93	400.17	1722
400.5	1721.98	407.07	1721.76	411.04	1721.84	415.07	1721.92	417.17	1721.97
419.4	1722	421.71	1721.5	424.17	1721	426.4	1720.64	430.44	1720
436.91	1719.86	449.48	1719.97	456.66	1719.97	457.15	1720	457.49	1720.03
457.52	1720.03	461.31	1720.36	462.52	1720.48	463.03	1720.53	463.41	1720.57
466	1720.96	468.73	1721.34	469.79	1721.43	472.37	1721.56	473.25	1721.65
473.82	1721.68	475.83	1721.75						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	82.85	.027	400.5	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	82.85	400.5		50 50.09	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.94	Reach Len. (ft)	50.00	50.09	50.00
Crit W.S. (ft)		Flow Area (sq ft)		1803.45	
E.G. Slope (ft/ft)	0.001364	Area (sq ft)		1803.45	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	242.41	Top Width (ft)		242.41	
Vel Total (ft/s)	7.69	Avg. Vel. (ft/s)		7.69	
Max Chl Dpth (ft)	14.30	Hydr. Depth (ft)		7.44	
Conv. Total (cfs)	375289.3	Conv. (cfs)		375289.3	
Length Wtd. (ft)	50.09	Wetted Per. (ft)		245.28	
Min Ch El (ft)	1703.64	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)	475.83	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	199.58	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	29.87	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1105.4

INPUT

Description: "DR" 65+21.24 = 1105.4

Station Elevation Data		num= 115							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.5	.04	1718.49	2.31	1718.49	3.37	1718.5	4.54	1718.84
5.18	1719.05	6.64	1719.2	7.66	1719.3	10.66	1719.31	11.28	1719.31
11.49	1719.3	11.8	1719.3	12.2	1719.3	12.7	1719.28	15.89	1719.14
18.09	1718.8	18.45	1718.75	18.57	1718.74	19.21	1718.84	33.24	1721.16
38.04	1721.25	41.27	1721.31	45.82	1721.88	46.75	1722	75.6	1722
82.25	1722	83.2	1722	85.45	1722	105.99	1721.43	121.33	1721
122.75	1720.65	125.34	1720	126.55	1719.7	129.36	1719	130.35	1718.75
133.37	1718	134.15	1717.81	137.38	1717	137.47	1716.98	137.48	1716.98
141.61	1715.95	167.38	1709.53	187.58	1704.5	191.96	1704.37	192.59	1704.35
193.88	1704.22	202.6	1703.35	210.91	1704.18	211.87	1704.28	212.62	1704.35
238.77	1705.15	247.64	1705.42	249.62	1705.92	263.92	1709.49	266.3	1709.81
276.84	1709.93	281.71	1710	284.8	1710.8	285.97	1711	292.4	1711.92
293.01	1712	299.56	1712.97	299.78	1713	300.21	1713.07	306.56	1714
308.11	1714.3	311.83	1715	313.62	1715.04	316.15	1715.13	338.66	1716
346.5	1716.41	354.2	1717	362.38	1717.7	365.43	1717.93	366.25	1718
376.33	1718.85	377.87	1718.98	378.02	1718.99	378.14	1719	378.43	1719.05

384.77	1720	388.66	1720.53	390.8	1720.75	392.02	1721	394.58	1721.63
396.36	1722	400.46	1721.85	407.5	1721.56	410.85	1721.63	415.51	1721.72
416.94	1721.82	422.03	1722	424.24	1721.51	426.8	1721	430.92	1720.34
432.85	1720	436.49	1719.39	438.42	1719	445.6	1719	447.62	1719
447.8	1719.03	447.89	1719.01	448.01	1719.02	451.36	1719.32	452.7	1719.44
455.08	1719.64	456.23	1719.71	463.62	1720.31	467.18	1720.8	468.61	1720.97
470.31	1721.05	471.85	1721.11	473.77	1721.28	475.58	1721.42	475.86	1721.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	83.2	.027	396.36	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	83.2	396.36		36.85	36.92		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.04	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.73	Reach Len. (ft)	36.85	36.92	36.85
Crit W.S. (ft)		Flow Area (sq ft)		1690.78	
E.G. Slope (ft/ft)	0.001562	Area (sq ft)		1690.78	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	228.23	Top Width (ft)		228.23	
Vel Total (ft/s)	8.20	Avg. Vel. (ft/s)		8.20	
Max Chl Dpth (ft)	14.38	Hydr. Depth (ft)		7.41	
Conv. Total (cfs)	350768.0	Conv. (cfs)		350768.0	
Length Wtd. (ft)	36.92	Wetted Per. (ft)		231.01	
Min Ch El (ft)	1703.35	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	475.86	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	197.57	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	29.60	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1105.2

INPUT

Description: "DR" 65+58.16 = 1105.2

Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.43	.42	1718.43	1.64	1718.35	3.79	1718.21	5.44	1718.41
5.53	1718.43	5.91	1718.43	6.2	1718.44	8.67	1718.55	11.36	1718.42
17.11	1718.39	19.77	1718.3	21.3	1718.27	21.49	1718.26	21.66	1718.25
29.14	1719.48	36.92	1720.76	39.03	1720.8	44.97	1720.91	45.46	1720.91
46.42	1720.92	54.5	1721	54.63	1721.01	54.67	1721.01	58.42	1721.14
61.69	1721.28	63.65	1721.26	67.7	1721.39	69.32	1721.44	70.49	1721.49
73.52	1721.44	102.52	1721.4	110.28	1721.21	118.21	1721	119.9	1720.58
122.23	1720	123.84	1719.6	126.24	1719	127.79	1718.62	130.26	1718
131.73	1717.63	134.27	1717	134.7	1716.89	135.22	1716.77	156.92	1711.36
185.31	1704.28	188.54	1704.19	190.32	1704.14	193.75	1703.79	200.34	1703.14
203.53	1703.46	210.36	1704.14	211.88	1704.19	218.71	1704.4	241.82	1705.1
245.55	1706.02	252.54	1707.74	259.41	1709.45	262.35	1709.85	262.78	1710
264.23	1710.36	267.52	1711	268.93	1711.34	273.1	1712	277.29	1712.76
278.27	1713	282.31	1713.69	284.96	1714	288.15	1714.62	290.08	1715
303.37	1715.25	314.97	1715.5	333.07	1715.83	341.8	1716	369.75	1716.66
381.6	1717	386.69	1717.99	386.72	1718	386.76	1718.01	392.5	1719
397.38	1719.83	398.26	1720	399.28	1720.19	403.35	1721	405.51	1721.55
407.19	1722	410.43	1721.93	411.24	1721.94	413.55	1721.99	419.34	1722.11
421.08	1722.05	426.14	1722	429.59	1721.18	430.44	1721	434.33	1720.17
435.18	1720	437.57	1719.98	449.95	1719.79	451.49	1719.54	451.77	1719.49
455.96	1719.8	461.43	1720.14	461.68	1720.16	461.94	1720.17	466.89	1720.27
468.84	1720.33	469.33	1720.34	469.52	1720.34	469.79	1720.36	469.85	1720.37
471.92	1720.94	474.55	1721.23	475.89	1721.38				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	70.49	.027	407.19	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	70.49	407.19		97.42	65.69		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.19	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.50	Reach Len. (ft)	97.42	65.69	21.63
Crit W.S. (ft)		Flow Area (sq ft)		1585.20	
E.G. Slope (ft/ft)	0.002206	Area (sq ft)		1585.20	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	251.93	Top Width (ft)		251.93	
Vel Total (ft/s)	8.74	Avg. Vel. (ft/s)		8.74	
Max Chl Dpth (ft)	14.36	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	295111.0	Conv. (cfs)		295111.0	
Length Wtd. (ft)	65.69	Wetted Per. (ft)		254.79	
Min Ch El (ft)	1703.14	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)	475.89	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	196.18	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	29.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1104.8

INPUT

Description: "DR" 66+23.85 = 1104.8

Station Elevation Data num= 116

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.74	.61	1717.66	2.48	1717.52	3.9	1717.46	5.21	1717.6
5.83	1717.7	6.32	1717.71	6.44	1717.71	8.95	1717.89	12.7	1718.2
14.78	1718.43	20.05	1718.99	22.71	1719.11	24.23	1719.19	26.13	1719.12
27.28	1719.08	31	1718.97	31.85	1718.74	33.21	1718.34	34.26	1718.03
34.36	1718.02	35.34	1717.88	41.71	1718.93	47.57	1719.89	47.58	1719.89
49.36	1719.92	55.6	1720.04	57.21	1720.2	58.11	1720.33	65.57	1721
79.62	1721	92.2	1721	96.62	1720.6	103.4	1720	109.22	1719.39
112.17	1719	115.98	1718.56	120.41	1718	126.96	1717.38	131.56	1717
136.68	1716.54	137.27	1716.39	168.43	1708.63	187.37	1703.91	189.72	1703.84
192.38	1703.76	198.36	1703.17	202.36	1702.77	202.4	1702.76	209.09	1703.43
212.42	1703.77	219.61	1703.98	220.17	1704	240.48	1704.62	243.43	1705.36
260.29	1709.52	280.66	1714.43	281.65	1714.68	282.7	1714.94	283.81	1715.22
284.01	1715.27	311.51	1715.74	326.48	1716	354.16	1716.63	372.01	1717
372.67	1717.06	380.17	1717.64	383.86	1718	392	1718.96	392.31	1719
392.54	1719.03	399.73	1720	404.53	1720.98	404.65	1721	409.88	1721.98
409.96	1722	410.04	1722	416.49	1722.96	416.99	1722.9	418.7	1722.89
421.91	1722.26	427.13	1722.37	429.92	1722.42	432.14	1722.23	436	1722
438.98	1721.28	440.21	1721	442.06	1720.66	443.3	1720.59	447.74	1720
452.19	1720	452.61	1720	452.65	1720.01	452.73	1720.02	452.9	1720.05
452.94	1720.05	453.11	1720.08	453.13	1720.08	453.95	1720.07	454.37	1720.06
456.95	1720.02	457.3	1720.01	458.53	1720	460.42	1719.98	460.89	1719.98
462.44	1719.97	462.9	1720.02	465.37	1720.2	467.59	1720.41	469.79	1720.6
473.83	1720.91	473.89	1720.91	474.08	1720.91	478.39	1720.92	479.15	1721.01
482.04	1721.34								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	92.2	.027	416.49	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
92.2	416.49	78.26	51.15	17.55	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.41	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.10	Reach Len. (ft)	78.26	51.15	17.55
Crit W.S. (ft)		Flow Area (sq ft)		1455.90	
E.G. Slope (ft/ft)	0.002793	Area (sq ft)		1455.90	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	242.84	Top Width (ft)		242.84	
Vel Total (ft/s)	9.52	Avg. Vel. (ft/s)		9.52	
Max Chl Dpth (ft)	14.34	Hydr. Depth (ft)		6.00	
Conv. Total (cfs)	262271.6	Conv. (cfs)		262271.6	
Length Wtd. (ft)	51.15	Wetted Per. (ft)		245.84	
Min Ch El (ft)	1702.76	Shear (lb/sq ft)		1.03	

Alpha	1.00	Stream Power (lb/ft s)	482.04	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.34	193.89	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	29.02	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1104.6

INPUT

Description: "DR" 66+75.00 = 1104.6

Station	Elevation	Data	num=	108					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.29	.5	1717.26	1.77	1717.19	4.73	1717.01	5.81	1717.24
6.46	1717.32	9.67	1717.51	11.34	1717.59	16.18	1717.93	18.1	1718.08
19.05	1718.11	19.63	1718.13	19.64	1718.13	19.68	1718.13	21.61	1718.33
21.94	1718.34	22.56	1718.4	26.12	1718.4	26.34	1718.39	26.5	1718.38
26.58	1718.37	27.69	1718.25	28.78	1718.15	33.2	1717.93	34.83	1717.76
34.87	1717.76	34.97	1717.78	34.99	1717.78	36.78	1718.07	37.45	1718.18
42.67	1719.03	43.33	1719.13	55.09	1721.03	57.57	1721.08	63.26	1721.18
64.85	1721.13	73.84	1721	79.15	1720.41	82.81	1720	88.85	1719.21
91.54	1719	99.38	1718.24	102.16	1718	106.14	1717.86	127.26	1717
131.9	1716.84	152.83	1716.12	161.71	1713.9	202.83	1703.62	203.07	1703.61
207.83	1703.47	217.63	1702.49	217.83	1702.47	227.83	1703.47	254.26	1704.26
254.28	1704.26	254.37	1704.29	297.34	1715.03	307.29	1715.26	325.79	1715.69
340.78	1716	351.8	1716.25	363.1	1716.5	386.97	1717	391.59	1717.92
392.07	1718	394.44	1718.23	401.49	1718.88	402.61	1719	404.22	1719.22
411.33	1720	415.03	1720.68	416.97	1721	418.15	1721.24	422.64	1722
425.54	1722.87	426.17	1723	428.73	1723	432.57	1723	434.24	1723
435.89	1723	436.55	1722.86	438.11	1722.64	439	1722.49	442.21	1722.56
447.02	1722.66	447.6	1722.58	452.9	1722	456.32	1721.38	457.91	1721
460.65	1720.52	463.92	1720	467.7	1720	469.05	1720	470.18	1719.81
470.69	1719.73	473.51	1719.81	475.97	1719.9	476.71	1719.96	480.37	1720.26
487.35	1720.73	488.25	1720.81	489.89	1720.88	490.7	1720.91	491.55	1720.9
492.45	1720.91	494.9	1721.2	496.66	1721.39				

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	63.26	.027
		426.17	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	63.26	426.17		69.31	42.3	14.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.94	Reach Len. (ft)	69.31	42.30	14.44
Crit W.S. (ft)		Flow Area (sq ft)		1451.04	
E.G. Slope (ft/ft)	0.003015	Area (sq ft)		1451.04	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	255.18	Top Width (ft)		255.18	
Vel Total (ft/s)	9.55	Avg. Vel. (ft/s)		9.55	
Max Chl Dpth (ft)	14.47	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	252427.4	Conv. (cfs)		252427.4	
Length Wtd. (ft)	42.30	Wetted Per. (ft)		258.19	
Min Ch El (ft)	1702.47	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	496.66	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	192.18	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	28.73	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1104.4

INPUT

Description: "DR" 67+17.30 = 1104.4

Station	Elevation	Data	num=	116					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.41	2.14	1717.34	3.45	1717.21	4.08	1717.14	5.64	1717.29

9.31	1717.38	11.4	1717.45	12.68	1717.53	13.32	1717.56	14.24	1717.62
15.29	1717.95	17.97	1718.76	19.68	1718.9	19.71	1718.9	20.68	1718.97
20.7	1718.97	20.77	1718.99	20.81	1719	22.92	1719.28	26.44	1719.73
27.29	1719.83	28.93	1720	34.57	1720.45	40.38	1721	46.22	1721.82
47.65	1722	49.12	1722	63.3	1722	64.01	1721.86	65.78	1721.5
71.69	1721.62	73.8	1721.66	75.47	1721.41	77.55	1721.12	79.02	1721
86.83	1720.02	86.97	1720	87.17	1719.97	94.23	1719	101.18	1718.28
104.22	1718	121.4	1717.41	137.15	1717	140.43	1716.92	142.52	1716.85
165.28	1716.2	171.13	1716.03	172.02	1716	172.14	1716	174.89	1715.99
203.73	1708.78	224.89	1703.49	228.44	1703.39	229.89	1703.34	232.82	1703.05
239.86	1702.35	239.89	1702.34	242.6	1702.61	249.89	1703.34	259.17	1703.62
270.82	1703.97	275.41	1704.11	312.78	1713.45	318.41	1714.85	318.53	1714.88
318.99	1715	336.04	1715.34	368.14	1716	381.22	1716.28	397	1716.59
417.96	1717	424.82	1717.88	425.55	1718	429.89	1718.87	430.55	1719
431.01	1719.07	437.61	1720	439.83	1720.42	442.9	1721	445.68	1721.8
446.4	1722	447.27	1722.02	453.18	1722.92	455.7	1722.65	457.18	1722.62
458.08	1722.5	458.98	1722.31	460.14	1722.33	467.05	1722.48	470.7	1722.15
472.47	1722	472.87	1721.93	478.3	1721	484.59	1720.12	486.21	1720
487.84	1720	489.34	1720	490.09	1720	490.44	1720	490.51	1719.99
490.59	1719.98	490.61	1719.97	490.67	1719.96	494.3	1720.06	497.22	1720.2
499.89	1720.31	501.52	1720.36	502.06	1720.39	502.7	1720.43	505.32	1720.64
509.83	1720.91	510.43	1720.98	511.14	1721.06	511.86	1721.14	513.69	1721.35
515.12	1721.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	63.3	.027	453.18	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	63.3	453.18		64.58 61.23	62.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.78	Reach Len. (ft)	64.58	61.23	62.02
Crit W.S. (ft)		Flow Area (sq ft)		1437.19	
E.G. Slope (ft/ft)	0.003225	Area (sq ft)		1437.19	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	262.09	Top Width (ft)		262.09	
Vel Total (ft/s)	9.64	Avg. Vel. (ft/s)		9.64	
Max Chl Dpth (ft)	14.44	Hydr. Depth (ft)		5.48	
Conv. Total (cfs)	244079.8	Conv. (cfs)		244079.8	
Length Wtd. (ft)	61.23	Wetted Per. (ft)		265.12	
Min Ch El (ft)	1702.34	Shear (lb/sq ft)		1.09	
Alpha	1.00	Stream Power (lb/ft s)	515.12	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	190.78	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	28.48	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1104.2

INPUT

Description: "DR" 67+78.53 = 1104.2

Station	Elevation	Data	num=	104						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1718.07	3.54	1718.09	4.97	1718.09	6.87	1718.1	7.56	1718.15	
7.56	1718.13	8.68	1718.14	12.52	1718.19	15.67	1718.54	17.53	1718.74	
18.14	1718.81	19.51	1718.96	19.67	1719	25.38	1719.19	35.91	1719.48	
46.18	1719.69	58.69	1720	61.33	1720.51	63.84	1721	66.41	1721.43	
69.11	1722	73.04	1722.9	73.49	1723	73.83	1723.06	73.96	1723.06	
74.9	1723	81.08	1723	84.26	1722.08	84.58	1722	84.62	1722	
85.81	1722.02	92.63	1722.15	94.22	1722.07	95.44	1722.01	95.62	1722	
100.17	1721.22	101.62	1721	104.04	1720.7	111.27	1720	117.58	1719.05	
117.94	1719	119.9	1718.71	124.75	1718	126.2	1717.82	133.37	1717	
148.56	1716.71	182.11	1716.14	187.87	1716.04	190.59	1716	192.84	1715.96	
201.97	1715.84	208.63	1714.19	238.69	1706.72	249.85	1703.94	252.28	1703.33	
252.67	1703.32	257.83	1703.16	266.58	1702.29	267.93	1702.16	269.44	1702.31	
278.03	1703.15	280.75	1703.23	283.57	1703.32	303.17	1703.89	326.8	1709.76	
346.34	1714.62	347.36	1714.88	347.64	1715	362.96	1715.31	386.57	1716	
420.41	1716.74	434	1717	436.29	1717.26	442.67	1718	447.63	1718.61	

450.34	1719	456.79	1719.71	459	1720	461.64	1720.53	463.89	1721
465.89	1721.45	468.23	1722	476.8	1722	477.01	1722	483.1	1721.09
483.5	1721.02	483.89	1721.02	487.09	1721.07	491.57	1721.1	496.47	1720.23
496.61	1720.2	496.62	1720.2	496.66	1720.19	498.66	1720.4	499.32	1720.47
500.07	1720.54	508.43	1720.66	509.36	1720.68	509.6	1720.69	510.35	1720.7
510.66	1720.71	516.89	1720.9	521.58	1720.99	524.98	1721.03		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	81.08	.027	468.23	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	81.08	468.23		51.36	50.49		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.51	Reach Len. (ft)	51.36	50.49	50.08
Crit W.S. (ft)		Flow Area (sq ft)		1405.76	
E.G. Slope (ft/ft)	0.003261	Area (sq ft)		1405.76	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	249.92	Top Width (ft)		249.92	
Vel Total (ft/s)	9.86	Avg. Vel. (ft/s)		9.86	
Max Chl Dpth (ft)	14.35	Hydr. Depth (ft)		5.62	
Conv. Total (cfs)	242725.4	Conv. (cfs)		242725.4	
Length Wtd. (ft)	50.49	Wetted Per. (ft)		252.96	
Min Ch El (ft)	1702.16	Shear (lb/sq ft)		1.13	
Alpha	1.00	Stream Power (lb/ft s)	524.98	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.34	188.78	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	28.12	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1104.1

INPUT

Description: "DR" 68+29.02 = 1104.1

Station	Elevation	Data	num=	127						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1717.97	4.97	1718.17	5.03	1718.23	6.32	1718.31	7.88	1718.18	
10.49	1718.2	10.62	1718.2	10.75	1718.2	11.37	1718.19	11.68	1718.2	
13.55	1718.2	13.57	1718.21	14.03	1718.32	14.26	1718.38	14.66	1718.47	
15.23	1718.61	15.41	1718.66	16.81	1719	36.05	1719.86	40.03	1720	
41.47	1720.19	47.9	1721	51.11	1721.71	52.72	1722	55.64	1722.48	
59.69	1723	65.84	1723.77	67.42	1724	68.19	1724	85.7	1724	
89.34	1723.27	90.25	1723	96.2	1723	97.84	1722.62	102.47	1722.7	
104.16	1723	115.55	1723	115.91	1723	116.48	1722.91	120.66	1722	
122.72	1721.65	126.49	1721	138.75	1720.02	139.02	1720	139.59	1719.93	
146.96	1719	148.57	1718.69	151.57	1718	154.44	1717.54	157.57	1717	
164.15	1716.74	174.13	1716.61	203.15	1716.1	208.84	1716	208.99	1715.99	
209.36	1715.92	216.18	1715	221.22	1714.14	222	1714	223.57	1713.81	
223.89	1713.75	224.29	1713.68	224.98	1713.54	227.01	1713.16	227.5	1713.08	
228.4	1712.86	237.21	1710.65	259.42	1705.06	262.76	1704.21	263.68	1703.97	
266.3	1703.32	266.99	1703.3	276.54	1703.01	285.11	1702.16	286.64	1702.01	
288.36	1702.18	292.4	1702.57	296.74	1703	300.84	1703.12	316.31	1703.58	
330.21	1707.05	359.31	1714.33	360.52	1714.66	361.71	1715	370.13	1715.76	
374.16	1716	379.61	1716	406.7	1716.49	420.42	1716.72	433.18	1716.9	
438.76	1717	444.01	1717.63	448.04	1718	454.86	1718.6	458.87	1718.68	
461.73	1718.83	465.65	1718.81	470.56	1719	476.24	1719	482.46	1719	
484.46	1719	488.54	1719	490.78	1719	493.81	1719	496.99	1719.18	
501.34	1719.53	509.15	1719.67	509.4	1719.68	509.7	1719.72	510.6	1719.87	
511.69	1720.05	512.27	1720.15	512.39	1720.15	512.89	1720.17	517.7	1720.36	
518.27	1720.37	518.87	1720.38	519.68	1720.4	519.8	1720.4	521.06	1720.45	
522	1720.48	522.5	1720.48	527.38	1720.64	527.4	1720.64	527.53	1720.65	
533.83	1720.71	534.48	1720.72							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	85.7	.027	527.4	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
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85.7 527.4 41.59 74.49 41.34 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.73	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.12	Reach Len. (ft)	41.59	74.49	41.34
Crit W.S. (ft)		Flow Area (sq ft)		1314.89	
E.G. Slope (ft/ft)	0.002738	Area (sq ft)		1314.89	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	184.73	Top Width (ft)		184.73	
Vel Total (ft/s)	10.54	Avg. Vel. (ft/s)		10.54	
Max Chl Dpth (ft)	14.11	Hydr. Depth (ft)		7.12	
Conv. Total (cfs)	264899.4	Conv. (cfs)		264899.4	
Length Wtd. (ft)	74.49	Wetted Per. (ft)		187.74	
Min Ch El (ft)	1702.01	Shear (lb/sq ft)		1.20	
Alpha	1.00	Stream Power (lb/ft s)	534.48	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	187.20	0.02
C & E Loss (ft)	0.19	Cum SA (acres)	0.40	27.86	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1103.8

INPUT

Description: "DR" 69+03.51 = 1103.8

Station		Elevation Data		num=		96					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.93	1.45	1717.99	2.47	1717.99	4.51	1718.06	7	1717.93		
9.38	1717.93	12.92	1718.13	15.47	1718.21	16.51	1718.47	18.64	1719		
31.03	1719.32	64.44	1720	68.55	1720.39	73.46	1721	75.83	1721.4		
78.46	1722	83.39	1722	90.02	1722	94.79	1721.61	102.15	1721		
104.33	1720.61	107.94	1720	112.02	1719.31	113.88	1719	118.65	1718.37		
120.99	1718	124.09	1717.56	128.5	1717	131.64	1716.51	135.85	1716		
159.09	1715.5	186.11	1715	187.43	1714.79	192.96	1714	198.49	1713.47		
207.26	1713	212.35	1712.36	215.59	1712	218.57	1711.39	221.01	1711		
222.11	1711	225.17	1711	238.13	1710.64	244.87	1710.44	245.69	1710.42		
246.13	1710.31	273.7	1703.43	274.1	1703.41	295.07	1702.78	305.07	1701.78		
313.58	1702.63	315.12	1702.78	316.68	1702.83	323.82	1703.04	362.08	1712.6		
366.86	1713.8	374.17	1714.36	383.84	1715	403.43	1715.49	405.18	1715.54		
423.35	1716	429.86	1716	431.63	1716.11	436.51	1716.32	442.74	1716.7		
451.62	1717	460.18	1717.38	468.63	1718	474.06	1718.63	478.11	1719		
480.74	1719.37	486.95	1720	488.59	1720.3	489.83	1720.47	491.3	1720.63		
492.59	1720.7	493.82	1720.7	502.68	1720.14	503.16	1720.11	504.04	1720		
505.99	1719.98	511.54	1719.93	515.05	1719.86	520.47	1719.96	523.23	1720.01		
525.45	1719.64	526.37	1719.49	526.88	1719.5	534.41	1719.65	537.38	1719.98		
539.34	1720.08	540.47	1720.19	541.76	1720.25	544.83	1720.47	545.54	1720.41		
548.9	1720.5										

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	90.02	.027	492.59	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.02	492.59	14.96	33.66	86.77	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.39	Reach Len. (ft)	14.96	33.66	86.77
Crit W.S. (ft)		Flow Area (sq ft)		1663.54	
E.G. Slope (ft/ft)	0.002415	Area (sq ft)		1663.54	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	304.92	Top Width (ft)		304.92	
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)		8.33	
Max Chl Dpth (ft)	14.61	Hydr. Depth (ft)		5.46	
Conv. Total (cfs)	282080.0	Conv. (cfs)		282080.0	
Length Wtd. (ft)	33.66	Wetted Per. (ft)		307.59	

Min Ch El (ft)	1701.78	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)	548.90	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	184.66	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	27.45	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1103.6

INPUT

Description: "DR" 69+37.17 = 1103.6

Station	Elevation	Data	num=	132						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1717.72	1.44	1717.79	2.69	1717.78	3.85	1717.79	7.63	1717.83	
9.8	1717.83	11.6	1717.93	11.92	1717.94	12.78	1717.95	15.45	1717.98	
15.86	1718.04	15.93	1718.02	16.1	1718.07	16.25	1718.1	16.92	1718.27	
18.92	1718.76	19.9	1719	45.36	1719.52	70.98	1720	74.64	1720.6	
76.87	1721	79.05	1721.52	80.97	1722	82.31	1722	88.47	1722	
91.09	1721.63	97.54	1721	103.07	1720.02	103.18	1720	105.66	1719.67	
110.68	1719	113.89	1718.47	116.76	1718	116.95	1717.98	125.58	1717	
128.24	1716.56	132.16	1716	163.52	1715.21	173.25	1715	176.69	1714.61	
184.57	1714	186.77	1714	199.46	1713.6	206.57	1713.53	211.83	1713.52	
215.66	1713.44	219.14	1713.41	222.58	1713.4	226.67	1713.35	235.01	1713.16	
235.86	1713.12	236.59	1713	238.36	1712.68	240.22	1712.23	241.88	1711.79	
258.66	1707.6	261.38	1706.88	275.23	1703.45	285.15	1703.15	300.76	1702.68	
300.8	1702.68	307.85	1701.97	310.76	1701.68	310.8	1701.69	317.85	1702.39	
320.76	1702.68	320.8	1702.68	324.08	1702.78	325.44	1702.82	359.27	1711.27	
368.45	1713.57	380.58	1714.24	390.03	1714.78	394.03	1715	398.26	1715.29	
408.22	1715.96	408.65	1716	408.95	1716.02	421.82	1717	425.25	1717.14	
437.33	1717.67	443.42	1717.93	445.07	1718	455.69	1718.75	458.9	1718.97	
459.34	1719	459.58	1719.02	472.1	1720	477.77	1720.79	479.65	1721	
487.39	1721.88	488.31	1721.99	488.33	1721.99	488.4	1722	488.79	1722	
495.29	1722	497.1	1721.81	502.56	1721	508.98	1720.57	509.58	1720.54	
511.83	1720.58	516.8	1720.67	517.86	1720.69	519.28	1720.64	535.55	1720.02	
536.32	1720	537.17	1719.93	537.55	1719.94	539.09	1719.87	540.75	1719.83	
544.11	1719.79	545.73	1719.8	547.37	1719.83	549.13	1719.88	551.75	1719.96	
552.75	1720	553.84	1719.9	554.28	1719.85	554.41	1719.84	554.49	1719.83	
555.34	1719.89	555.37	1719.89	556.76	1719.98	558.38	1720.07	558.41	1720.07	
559.66	1720.14	559.68	1720.14	560.63	1720.2	569.33	1720.68	571.32	1720.6	
572.27	1720.59	572.36	1720.58							

Manning's n Values			num=	3
Sta	n Val	Sta	n Val	Sta
0	.031	88.47	.027	488.79

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	88.47	488.79		13	46.56	45.84		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.14	Reach Len. (ft)	13.00	46.56	45.84
Crit W.S. (ft)		Flow Area (sq ft)		1558.63	
E.G. Slope (ft/ft)	0.002672	Area (sq ft)		1558.63	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	279.24	Top Width (ft)		279.24	
Vel Total (ft/s)	8.89	Avg. Vel. (ft/s)		8.89	
Max Chl Dpth (ft)	14.45	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	268137.7	Conv. (cfs)		268137.7	
Length Wtd. (ft)	46.56	Wetted Per. (ft)		282.01	
Min Ch El (ft)	1701.68	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)	572.36	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	183.41	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	27.22	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1103.4

INPUT

Description: "DR" 69+83.73 = 1103.4

Station Elevation Data		num= 98							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.59	.13	1717.59	2.03	1717.52	3.09	1717.63	3.58	1717.63
5.4	1717.63	12.06	1717.63	15.59	1718.06	15.65	1718.06	19.66	1718.63
20.18	1718.75	21.11	1718.98	21.2	1719	26.05	1719.12	68.26	1720
71.03	1720.46	74.11	1721	74.93	1721.2	78.33	1722	83.2	1722
89.55	1721.62	94.68	1722	97.49	1721.47	99.68	1721	103.6	1720.14
104.37	1720	105.21	1719.88	112.84	1719	115.9	1718.61	120.51	1718
124.95	1717.47	129.96	1717	131.75	1716.64	136.24	1716	148.19	1715.69
165.52	1715.12	168.41	1715.04	169.45	1715	177.59	1714.72	180.98	1714.71
212.24	1714	215.61	1714	225.66	1714	225.71	1714	225.8	1714
226.37	1713.96	238.52	1713.12	275.56	1703.91	277.79	1703.35	279.49	1703.3
296.16	1702.8	304.52	1702.54	311.05	1701.89	314.55	1701.54	314.6	1701.55
320.24	1702.11	324.59	1702.54	326	1702.58	327.59	1702.63	356.36	1709.79
370.75	1713.37	392.58	1714.73	396.72	1715	397.26	1715.05	405.25	1716
409.35	1716.35	413.72	1716.51	432.34	1717.36	452.2	1718	461.04	1718.47
470.22	1719	480.89	1719.97	481.42	1720	483.9	1720.22	492.84	1721
499.92	1721	500.05	1721	506.93	1721	510.38	1720.79	513.84	1720.6
520.75	1720.73	521.94	1720.75	522.32	1720.7	528.91	1720	533.61	1719.01
533.66	1719	534.42	1718.99	557.14	1718.68	558.29	1718.5	559.11	1718.37
560.35	1718.45	571.62	1719.17	579.38	1719.55	592.53	1720.34	598.67	1720.62
601.16	1720.45	601.33	1720.46	601.83	1720.46				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	94.68	.027	492.84	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	94.68	492.84		40.06	55.98	253.77	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.81	Reach Len. (ft)	40.06	55.98	253.77
Crit W.S. (ft)		Flow Area (sq ft)		1460.89	
E.G. Slope (ft/ft)	0.003023	Area (sq ft)		1460.89	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	260.30	Top Width (ft)		260.30	
Vel Total (ft/s)	9.49	Avg. Vel. (ft/s)		9.49	
Max Chl Dpth (ft)	14.27	Hydr. Depth (ft)		5.61	
Conv. Total (cfs)	252116.3	Conv. (cfs)		252116.3	
Length Wtd. (ft)	55.98	Wetted Per. (ft)		263.08	
Min Ch El (ft)	1701.54	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	601.83	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	181.80	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	26.93	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1103.2

INPUT

Description: "DR" 70+39.71 = 1103.2

Station Elevation Data		num= 167							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.42	5.27	1717.59	5.41	1717.59	5.5	1717.59	5.55	1717.59
5.82	1717.56	8.96	1717.71	12.57	1717.78	13.41	1717.8	13.81	1717.85
13.89	1717.86	17.66	1718.29	18.16	1718.35	20.08	1718.44	21.67	1718.56
22.67	1718.63	23.61	1718.65	24.68	1718.87	24.9	1718.92	25.2	1718.98
25.29	1719	28.31	1719.1	50.45	1720	55.54	1720.85	56.54	1721
59.02	1721.48	61.92	1722	64.28	1721.37	65.75	1721	69.46	1723.29
70.85	1724	73.4	1724	78.4	1724	82.68	1721.79	84.02	1721
96.39	1722.69	98.53	1723	100.31	1723	105.38	1723	107.48	1723
108.91	1722.72	110.27	1722.51	110.79	1722.35	112.07	1722	118.6	1721.11
119.17	1721	119.53	1720.96	120.41	1720.91	125.71	1720.45	132.71	1720
133.13	1719.95	136.11	1719.42	138.21	1719.04	138.37	1719	139.25	1718.8
142.77	1718	144.77	1717.78	150.14	1717	154.83	1716.13	155.32	1716
156.23	1715.96	157.44	1715.9	175.62	1715	197.97	1714.02	198.47	1714

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.34	4.62	1717.37	5.82	1717.39	8.38	1717.49	9.69	1717.53
13.26	1717.61	17.77	1717.66	19.04	1717.77	21.95	1718.04	25.05	1718.74
25.45	1718.83	25.98	1718.95	26.05	1718.97	26.19	1719	26.97	1719.04
35.22	1719.48	45.13	1720	49.28	1720.74	50.57	1721	53.73	1721.65
55.39	1722	58.71	1721.23	59.72	1721	60.88	1721.66	65.62	1724
69.24	1724	77.92	1724	81.45	1721.7	82.72	1721	87.6	1721.67
88.73	1721.77	98.57	1722.43	101.58	1722	104	1721.57	107.33	1721
109.98	1720.36	112.02	1720	114.02	1719.61	117.15	1719	118.82	1718.76
123.93	1718	124.77	1717.83	129.24	1717	137.27	1716.7	147.12	1716
164.05	1715.11	166.38	1715	169.76	1714.85	178.38	1714.46	179.77	1714.39
183.63	1714.21	185.21	1714.13	187.6	1714	189.74	1713.82	197.89	1713.28
201.95	1713	202.76	1712.87	209.77	1712	215.55	1711.77	216.19	1711.76
231.88	1707.91	251.72	1703.03	253.14	1702.99	256.37	1702.9	271.58	1702.45
279.05	1702.23	279.09	1702.23	285.33	1701.6	289.05	1701.23	289.09	1701.24
295.33	1701.86	299.04	1702.23	299.09	1702.23	300.14	1702.27	302.06	1702.32
327.05	1708.56	356.14	1715.83	359.49	1716.67	360.81	1717	361.86	1717.26
362.71	1717.47	364.82	1718	365.93	1718.28	368.82	1719	371.33	1719.55

373.04	1719.95	373.26	1720	373.63	1720.09	377.61	1721	379.56	1721.24
385.51	1722	388.32	1722.56	391.24	1722.59	393.71	1722.72	399.17	1722.12
399.77	1722.05	400.31	1722.05	408.96	1722.03	409.01	1722.03	409.56	1722
412.91	1721.84	413.53	1721.89	415.21	1721.84	423.55	1721	425.7	1720.72
431.53	1720	444.41	1719.02	444.53	1719.01	444.68	1719	452.49	1718.33
455.78	1718	460.75	1717.85	470.23	1717.69	479.86	1718	483.4	1718
488.3	1718	496.94	1718.91	497.86	1719	499.06	1719.09	500.43	1719.15
505.16	1719.3	519.15	1719.86	523.39	1720	530.85	1720	532.43	1720
540.7	1720	550.19	1720	551.58	1720	552.11	1720	552.34	1720.01
555.88	1720.45	559.92	1720.52	565.32	1720.6	572.5	1720.23	578.21	1719.53
585.37	1719	603.53	1718.62	606.92	1718.63	608.18	1718.44	608.44	1718.4
610.41	1718.52	612.95	1718.7	619.62	1719.13	624.09	1719.27	629.43	1719.39
630.97	1719.42	634.45	1719.51	635.35	1719.52	636.86	1719.57	638.61	1719.62
641.02	1719.69	642.16	1719.72	643.68	1719.75	645.44	1719.79	646.24	1719.81
646.42	1719.81	648.55	1719.85	648.89	1719.85	650.73	1719.87	651.2	1719.88
653.59	1719.89	656.09	1719.87	656.64	1719.86	658.46	1719.85	658.7	1719.85
668.77	1720.05	676.76	1720.26	679.7	1720.29	680.3	1720.29	680.61	1720.29
681.29	1720.3	709.85	1720.38	710.61	1720.39	711.63	1720.4	712.85	1720.41
714.17	1720.41	715.47	1720.41	716.61	1720.41	718.06	1720.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	77.92	.027	393.71	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	77.92	393.71		17.38	56.36		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.32	Reach Len. (ft)	17.38	56.36	37.61
Crit W.S. (ft)		Flow Area (sq ft)		1365.63	
E.G. Slope (ft/ft)	0.002571	Area (sq ft)		1365.63	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	193.97	Top Width (ft)		193.97	
Vel Total (ft/s)	10.15	Avg. Vel. (ft/s)		10.15	
Max Chl Dpth (ft)	14.09	Hydr. Depth (ft)		7.04	
Conv. Total (cfs)	273354.7	Conv. (cfs)		273354.7	
Length Wtd. (ft)	56.36	Wetted Per. (ft)		196.87	
Min Ch El (ft)	1701.23	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	718.06	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.34	178.50	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	26.42	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1102.6

INPUT

Description: "DR" 71+42.74 = 1102.6

Station	Elevation	Data	num=	152					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.13	6.23	1717.22	13.16	1717.48	15.14	1717.59	19.46	1718.39
21.75	1718.81	22.54	1718.98	22.64	1719	28.77	1719.37	40.82	1720
41.7	1720.16	43.45	1720.51	46.3	1721	50	1721.78	51.34	1722
55.38	1721.1	55.87	1721	57.42	1721.73	61.85	1723.76	62.37	1724
74.13	1724	74.41	1724	74.65	1723.81	78.23	1721	89.04	1721.71
93.66	1722	96.44	1721.42	98.71	1721	101.09	1720.38	102.64	1720
105.22	1719.42	107.23	1719	109.9	1718.5	113.27	1718	119.24	1717.15
120.28	1717	121.52	1716.95	133.85	1716.59	139.3	1716.58	143.77	1716.53
147.6	1716	151.88	1715.75	158.38	1715	159.41	1714.95	177.48	1714
182.42	1713.58	188.47	1713.11	190.1	1713	191.18	1712.88	199.9	1712
200.25	1711.96	201.99	1711.64	234.52	1703.55	236.51	1703.05	237.2	1702.88
257.76	1702.26	264.25	1702.06	264.28	1702.06	271.43	1701.34	274.24	1701.06
274.28	1701.07	281.43	1701.78	284.24	1702.06	284.28	1702.06	286.39	1702.13
287.31	1702.15	310.7	1707.96	341.29	1715.57	341.6	1715.64	342.93	1715.95
343.27	1716	343.73	1716.05	349.48	1717	356.23	1717.66	362.39	1718
365.94	1718.7	367.69	1719	377.18	1719.49	381	1719.55	385.34	1719.57
390.12	1719.71	395.73	1720	398.5	1720	402.24	1720	406.1	1720
406.93	1720	407.98	1720.19	412.43	1721	412.98	1721.1	417.94	1722
419.11	1722.21	425.62	1723	429.43	1723.46	434.61	1723.61	441.91	1723.83

445.7	1724	447.99	1724	448.49	1724	448.72	1723.97	453.56	1723
457.38	1722.24	458.57	1722	461.49	1721.61	466.14	1721	469.9	1720.4
472.79	1720	477.8	1719.29	479.8	1719	481	1718.92	481.41	1718.92
488.22	1719	508.27	1719	512.25	1719	514.39	1719	516.39	1719
524.14	1719	527.02	1719.41	535.2	1720	535.26	1720.01	535.32	1720.01
539.94	1720.53	542.44	1720.62	545.96	1720.89	546.89	1721	554.43	1721
562.19	1721	566.75	1721	575.49	1721	578.71	1720.95	592.07	1720.31
594.18	1720.35	601.07	1720.46	606.78	1720.04	608.6	1720	614.98	1720.11
620.75	1720.07	623.54	1719.99	624.33	1720.1	625.19	1720.12	627.77	1720.09
633.27	1720.04	634.72	1720.11	638.64	1720.31	645.57	1720.48	649.17	1720.73
663.92	1721.42	665.27	1721.45	666.66	1721.45	688.9	1721.21	726.04	1721.18
726.61	1721.2	734.38	1721.2						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	74.13	.027	448.49	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	74.13	448.49		28.64	31.1	82.69	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.71	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.05	Reach Len. (ft)	28.64	31.10	82.69
Crit W.S. (ft)		Flow Area (sq ft)		1320.00	
E.G. Slope (ft/ft)	0.002634	Area (sq ft)		1320.00	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	181.20	Top Width (ft)		181.20	
Vel Total (ft/s)	10.50	Avg. Vel. (ft/s)		10.50	
Max Chl Dpth (ft)	13.99	Hydr. Depth (ft)		7.28	
Conv. Total (cfs)	270094.6	Conv. (cfs)		270094.6	
Length Wtd. (ft)	31.10	Wetted Per. (ft)		184.12	
Min Ch El (ft)	1701.06	Shear (lb/sq ft)		1.18	
Alpha	1.00	Stream Power (lb/ft s)	734.38	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	176.77	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	26.18	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1102.4

INPUT

Description: "DR" 71+73.84 = 1102.4

Station Elevation Data		num=		172	
Sta	Elev	Sta	Elev	Sta	Elev
0	1716.87	6.09	1716.95	7.43	1717.05
14.37	1717.44	15.89	1717.53	16.17	1717.54
20.17	1717.92	21.47	1718.05	35.3	1720
45.34	1721.74	46.94	1722	50.02	1721.4
57.7	1724	57.78	1724	58.43	1724
66.87	1722.31	68.38	1721	73.1	1721.63
88.15	1723	88.35	1722.97	92.79	1722.18
103.78	1721	106.69	1720.61	110.27	1720
115.56	1719.73	118.28	1719.58	122.75	1719.31
131.67	1718	135.65	1717.03	135.75	1717
139.64	1716	140.45	1715.87	146.61	1715
161.06	1714	163.09	1713.52	166.33	1713
172.59	1711.81	178.27	1711	183.18	1710.28
187.59	1709.28	192.98	1707.94	202.55	1705.53
248.87	1700.97	258.87	1701.97	262.07	1702.07
286.8	1708.23	287.26	1708.34	287.57	1708.44
293.8	1710	296.04	1710.56	296.77	1710.75
302.99	1712	303.26	1712.07	307.55	1713
312.09	1714.1	315.76	1715	316.59	1715.51
326.89	1716	341.99	1716.69	353.84	1717
371.77	1718	376.31	1718.36	378.9	1718.42
396.38	1718	398.29	1717.79	399.18	1717.78
413.14	1717.59	419.54	1717.87	421.3	1718
438.01	1720	438.05	1720	438.12	1720.01
458.52	1722	465.8	1722.83	467.29	1723
472.85	1723	476.41	1723	482.18	1723
				482.58	1722.96
				483.17	1722.88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716.64	3.75	1716.67	5.44	1716.4	5.83	1716.38	7.9	1716.87
16.85	1719	23.5	1719.84	24.63	1720	25.16	1720.11	29.43	1721
35.32	1721.99	35.35	1722	35.43	1721.98	35.49	1721.98	35.52	1721.98
41.25	1721.38	48.04	1721.69	49.65	1721.82	58.38	1723	65.15	1723
66.26	1723	68.66	1722.65	72.63	1722	75.68	1721.6	80.24	1721
83.54	1720.49	86.25	1720	88.57	1719.64	92.25	1719.29	94.42	1719
98.27	1718.19	98.86	1718	99.17	1717.91	101.54	1717	102.77	1716.68
105.02	1716	106.21	1715.38	108.32	1715	110.22	1714.31	112.05	1714
113.95	1713.65	117.33	1713	119.05	1712.54	121.62	1712	122.67	1711.79
125.9	1711.38	127.61	1711.09	128.05	1711	131.32	1710.35	133.06	1710
144.04	1709.61	145.81	1709.51	163.27	1705.15	173.92	1702.49	194.61	1701.88
204.61	1700.88	214.61	1701.88	224.42	1702.17	233.15	1704.33	249.15	1708.14
249.56	1708.28	254.76	1709	258.63	1709.93	258.9	1710	263	1710.99
263.04	1711	263.69	1711.16	267.41	1711.92	267.81	1712	271.8	1712.81
272.71	1713	276.16	1713.7	277.42	1713.96	277.59	1714	280.34	1714.63
281.96	1715	291.31	1715.77	294.2	1716	299.75	1716.14	311.83	1716.39
330.54	1717	330.74	1717.01	330.87	1717.02	339.93	1717.59	352.38	1717.64
357.03	1717.64	359.68	1717.56	370.18	1717.15	372.56	1717	376.44	1717
386.15	1717	387.34	1717	387.68	1717	387.75	1717	388.51	1717
394.34	1717.38	397.34	1717.51	399.96	1717.74	409.38	1717.95	409.61	1717.97
410.07	1718	417.21	1718.38	421.55	1718.69	425.28	1719	426.13	1719.06
430.39	1719.38	435.33	1719.46	447.62	1720	450.58	1720	451.01	1720.16
453.4	1721	456.42	1721.78	457.34	1722	458.72	1722.25	463.14	1723
465.86	1723.29	467.91	1723.42	475.43	1723.52	477.15	1723.53	478.76	1723.45
481.99	1723	485.81	1722.26	487.34	1722	488.43	1721.85	496.07	1721.15
497.28	1721.04	497.49	1721.02	497.9	1721	510.14	1721	511.13	1721
512.35	1721	514.13	1721	518.67	1721	525.99	1721	528.96	1721
547.54	1721.95	548.16	1722	548.53	1722	583.71	1722	601.87	1722
602.24	1722	602.59	1721.94	607.97	1721	609.98	1720.86	618.69	1720.35

623.23	1720	623.55	1720	624.8	1719.94	631.05	1719.85	636.02	1719.8
638.33	1719.46	641.16	1719.05	644.59	1719.14	650.11	1719.29	651.79	1719.34
652.16	1719.34	658.31	1719.36	673.49	1719.64	678.49	1719.71	682.88	1719.8
687.16	1719.89	696.59	1719.93	698.92	1719.96	701.51	1719.92		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	66.26	.027	475.43	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	66.26	475.43		66.61 38.72	25.07		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.98	Reach Len. (ft)	66.61	38.72	25.07
Crit W.S. (ft)		Flow Area (sq ft)		1405.30	
E.G. Slope (ft/ft)	0.002020	Area (sq ft)		1405.30	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	173.49	Top Width (ft)		173.49	
Vel Total (ft/s)	9.86	Avg. Vel. (ft/s)		9.86	
Max Chl Dpth (ft)	14.10	Hydr. Depth (ft)		8.10	
Conv. Total (cfs)	308436.1	Conv. (cfs)		308436.1	
Length Wtd. (ft)	38.72	Wetted Per. (ft)		176.45	
Min Ch El (ft)	1700.88	Shear (lb/sq ft)		1.00	
Alpha	1.00	Stream Power (lb/ft s)	701.51	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.34	174.89	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	25.93	0.06

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1102.1

INPUT

Description: "DR" 72+43.58 = 1102.1 - Riprap lined channel section

Station	Elevation	Data	num=	163					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716.66	.06	1716.66	.25	1716.66	1.24	1716.67	1.87	1716.68
2.07	1716.68	3.5	1716.77	4.05	1716.58	4.43	1716.45	7.5	1717.2
14.91	1719	17.98	1719.68	19.34	1720	22.6	1720.32	29.01	1720.72
34.99	1721	37.37	1721.12	41.67	1721.02	42.31	1721	42.99	1721
43.71	1720.96	49.78	1720	53.42	1719.16	55.36	1719	63.76	1717.69
65.13	1717.33	67.04	1717.09	68.08	1716.7	69.86	1716.44	76.55	1715.26
84.66	1713.54	118	1703.28	122.83	1702.02	128.83	1701.85	132.04	1701.76
132.25	1701.74	138.6	1701.1	142.01	1700.76	142.05	1700.76	142.21	1700.77
145.75	1701.13	152.05	1701.76	152.25	1701.76	170.33	1702.31	178.13	1702.54
179.74	1702.93	197.13	1707.94	203.8	1708.48	210.05	1709	210.98	1709.23
214.12	1710	215.03	1710.22	218.19	1711	219.08	1711.22	222.25	1712
225.63	1712.83	226.32	1713	229.26	1713.72	230.03	1713.91	230.38	1714
234.39	1714.99	234.44	1715	234.7	1715.01	235.4	1715.05	248.34	1715.66
251.78	1715.76	254.63	1716	264.97	1716.57	274.18	1717	279.13	1717.43
281.74	1717.43	303.94	1717.27	309.18	1717	314.68	1717	321.54	1717
322.16	1717.09	323.13	1717.12	330.13	1717.49	332.94	1717.44	338.09	1717
339.78	1717	340.19	1717	346.42	1717	347.2	1717	348.41	1717
351.38	1717	357.06	1717.56	362.49	1718	363.96	1718.09	373.49	1719
374.82	1719	380.12	1719	380.36	1719	380.58	1719	380.78	1719
383.89	1719.32	385.86	1719.5	387.26	1719.54	392.86	1719.68	400.08	1719.84
404.41	1720	405.03	1720	408.66	1720	411.44	1720.6	413.02	1721
416.16	1721.57	418.53	1722	419.61	1722.12	420.44	1722.17	422.54	1722.33
426.79	1722.73	429.33	1723	432.62	1723.41	435.85	1724	437.76	1724
441.2	1724	444.66	1724	446.49	1724	454.91	1724	456.26	1724
457.42	1724	462.6	1724	467.27	1723.7	471.21	1723.61	475.12	1723.35
483.76	1723	485.2	1722.95	486.16	1722.9	495.01	1722.33	498.94	1722
502.51	1722	509.54	1722	522.16	1722	524.95	1722	538.04	1722
564.99	1722	565.66	1721.87	569.74	1721	576.31	1720.41	580.51	1720
585.34	1719.58	589.7	1719.13	594.24	1719	605.47	1718.62	605.81	1718.57
606.39	1718.49	606.58	1718.47	607.06	1718.46	609.48	1718.45	612.33	1718.42

613.27	1718.4	615	1718.38	617.61	1718.33	621.07	1718.26	621.35	1718.25
622.11	1718.21	622.74	1718.18	623.29	1718.16	623.44	1718.15	624.77	1718.17
625.11	1718.17	627.5	1718.22	634	1718.3				

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	67.04	.044	274.18	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	67.04	274.18		25.13 32.91	93.07		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.80	Wt. n-Val.		0.044	
W.S. Elev (ft)	1714.53	Reach Len. (ft)	25.13	32.91	93.07
Crit W.S. (ft)		Flow Area (sq ft)		1286.52	
E.G. Slope (ft/ft)	0.006105	Area (sq ft)		1286.52	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	152.55	Top Width (ft)		152.55	
Vel Total (ft/s)	10.77	Avg. Vel. (ft/s)		10.77	
Max Chl Dpth (ft)	13.77	Hydr. Depth (ft)		8.43	
Conv. Total (cfs)	177392.4	Conv. (cfs)		177392.4	
Length Wtd. (ft)	32.91	Wetted Per. (ft)		155.94	
Min Ch El (ft)	1700.76	Shear (lb/sq ft)		3.14	
Alpha	1.00	Stream Power (lb/ft s)	634.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.34	173.69	0.02
C & E Loss (ft)	0.07	Cum SA (acres)	0.40	25.79	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1101.8

INPUT

Description: "DR" 72+76.49 = 1101.8 Riprap lined Channel section

Station Elevation Data		num=		145	
Sta	Elev	Sta	Elev	Sta	Elev
0	1716.6	3.07	1716.81	3.19	1716.74
4.99	1716.48	8.79	1717.42	15.1	1719
38.62	1720	46.59	1720	49.21	1719.78
62.97	1719.6	64.78	1719	66.01	1718.77
73.33	1716.44	117.7	1701.66	117.8	1701.66
178.39	1702.88	179.25	1703.15	179.53	1703.25
209.2	1712.84	209.45	1712.9	209.53	1712.92
213.9	1714	214.52	1714.14	216.32	1714.45
219	1714.76	220.82	1714.88	221.32	1714.89
229.76	1715	234.01	1715.34	237.24	1715.3
253.32	1716.06	259.83	1717	259.98	1717.03
267.35	1718	270.99	1718.23	272.46	1718.25
283.01	1718	286.19	1717.65	293.2	1717.25
306.52	1717	307.03	1717	313.1	1717
323.39	1717.57	327.47	1718	335.59	1718.25
361.77	1719	370.64	1719.15	378.16	1719.5
410.66	1720	413.65	1721.08	416.47	1721.5
421.4	1721.07	422.08	1721.09	424.42	1721.15
428.86	1721.5	434.26	1721.5	436.06	1721.42
446.23	1721	446.3	1721.01	450.48	1721.68
460.14	1723	466.84	1723.97	467.06	1724
473.27	1724.71	475.83	1724.99	477.53	1724.96
483.54	1724.19	485.92	1724	488.53	1723.81
498.32	1724	501.78	1724.18	502.09	1724.16
511.89	1724	514.11	1724	514.53	1724
526.49	1722.49	530.27	1722	532.41	1721.63
540.51	1720.4	541.05	1720.41	541.15	1720.42
549.46	1719.28	554.8	1718.66	555.83	1718.51
563.57	1717.53	565.33	1717.43	565.35	1717.39

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val

0 .031 68.85 .044 220.82 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
68.85 220.82 51.63 67.1 57.46 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.50	Wt. n-Val.		0.044	
W.S. Elev (ft)	1713.53	Reach Len. (ft)	51.63	67.10	57.46
Crit W.S. (ft)		Flow Area (sq ft)		1093.16	
E.G. Slope (ft/ft)	0.008564	Area (sq ft)		1093.16	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	130.07	Top Width (ft)		130.07	
Vel Total (ft/s)	12.68	Avg. Vel. (ft/s)		12.68	
Max Chl Dpth (ft)	12.87	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	149776.9	Conv. (cfs)		149776.9	
Length Wtd. (ft)	67.10	Wetted Per. (ft)		133.77	
Min Ch El (ft)	1700.66	Shear (lb/sq ft)		4.37	
Alpha	1.00	Stream Power (lb/ft s)	575.51	0.00	0.00
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	0.34	172.79	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	25.68	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1101.3

INPUT

Description: "DR" 73+43.59 = 1101.3 Riprap lined channel section

Station		Elevation		Data		num=		113	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716.51	1.72	1716.54	3.01	1716.39	3.18	1716.36	10.68	1718.23
13.32	1718.89	13.76	1719	13.81	1719	13.83	1719	13.89	1719
14.27	1719.01	14.67	1719.02	21.74	1719.18	24.51	1719.24	28.86	1719.32
29.45	1719.33	30.48	1719.35	33.48	1719.25	36.66	1719.33	37.47	1719
37.5	1718.99	40.12	1718	42.02	1717.27	42.75	1717	44	1716.55
45.75	1716.34	47.35	1716	50.62	1715.94	53.74	1715.88	55.5	1715.86
56.68	1715.84	57.56	1715.83	57.71	1715.83	58.29	1715.82	58.87	1715.82
59.29	1715.81	59.56	1715.8	60.28	1715.62	74.74	1710.8	102.76	1701.46
102.83	1701.46	102.86	1701.46	105.42	1701.2	112.86	1700.46	120.29	1701.2
122.86	1701.46	154.29	1702.4	166.29	1702.76	176.71	1706.08	201.67	1713.32
210.77	1715.62	213.07	1715.93	213.42	1715.94	213.95	1715.96	214.76	1715.99
215.24	1716	218.77	1716.73	220.07	1717	220.77	1717.1	227.24	1718
227.57	1718	243.55	1718.59	244.76	1718.58	256.83	1718.33	260.87	1718.23
262.01	1718.2	266.42	1718.2	270.85	1718.1	281.5	1718	292.17	1718
297.52	1718	306.89	1718	317.68	1717.53	320.54	1717.24	322.53	1717.19
323.79	1717.15	329.35	1717.01	334.98	1716.87	335.01	1716.87	335.75	1716.85
338.22	1716.78	340.33	1716.73	340.5	1716.73	345.81	1716.88	348.54	1717
355.37	1717.23	358.08	1717.23	364.32	1717.39	367.64	1717.38	369.37	1717.44
372.76	1717.6	375.11	1717.62	379.57	1718	379.69	1718	379.74	1718
400.4	1718.76	402.2	1718.78	408.07	1718.82	408.68	1718.87	411.02	1718.84
440.08	1718.86	440.59	1718.86	466.54	1718.03	467.34	1718.03	496.11	1718.13
513.04	1717.8	513.45	1717.79	518.6	1717.73	518.65	1717.73	520.02	1717.72
522.38	1717.51	526.53	1717.02	531.7	1717.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	60.28	.044	213.07	.031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
60.28 213.07 61.19 60.59 69.78 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.91	Wt. n-Val.		0.044	
W.S. Elev (ft)	1712.44	Reach Len. (ft)	61.19	60.59	69.78
Crit W.S. (ft)	1711.55	Flow Area (sq ft)		1013.39	
E.G. Slope (ft/ft)	0.010846	Area (sq ft)		1013.39	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	128.81	Top Width (ft)		128.81	
Vel Total (ft/s)	13.68	Avg. Vel. (ft/s)		13.68	

Max Chl Dpth (ft)	11.98	Hydr. Depth (ft)	7.87		
Conv. Total (cfs)	133096.1	Conv. (cfs)	133096.1		
Length Wtd. (ft)	60.59	Wetted Per. (ft)	132.13		
Min Ch El (ft)	1700.46	Shear (lb/sq ft)	5.19		
Alpha	1.00	Stream Power (lb/ft s)	531.70	0.00	
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	0.34	171.17	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.40	25.48	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1101.2

INPUT

Description: "DR" 74+04.18 = 1101.2 Riprap lined channel section

Station	Elevation	Data	num=	50					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716.09	3.01	1716.13	3.34	1716.32	3.96	1716.64	4.23	1716.87
5.07	1716.93	6.74	1717.04	7.75	1717.22	10.86	1718	16.14	1718.92
16.59	1719	17.88	1719	20.17	1719	23.26	1719.06	26.38	1719.07
40.7	1719.17	54.52	1719.27	108.56	1701.28	108.65	1701.28	114.43	1700.7
118.65	1700.28	118.66	1700.28	128.66	1701.28	165.95	1702.39	183.09	1703
219.09	1715	219.27	1715.07	223.28	1715.24	229.28	1715.57	230.72	1715.69
232.59	1716	255.63	1716.49	283.38	1717	300.08	1717	311.2	1717.99
311.29	1718	311.66	1718	311.84	1718	312.01	1718	312.05	1718
353.24	1718	362.37	1718.04	368	1717.99	374.4	1717.94	381.76	1717.88
385.61	1717.85	396.83	1717.82	412.47	1717.79	418.97	1717.79	502.78	1718.07

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
0	.031	54.52	.044
		229.28	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	54.52	229.28		33.78	39.41	71.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.70	Wt. n-Val.		0.044	
W.S. Elev (ft)	1711.95	Reach Len. (ft)	33.78	39.41	71.91
Crit W.S. (ft)		Flow Area (sq ft)		1051.23	
E.G. Slope (ft/ft)	0.010046	Area (sq ft)		1051.23	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	133.42	Top Width (ft)		133.42	
Vel Total (ft/s)	13.19	Avg. Vel. (ft/s)		13.19	
Max Chl Dpth (ft)	11.67	Hydr. Depth (ft)		7.88	
Conv. Total (cfs)	138292.7	Conv. (cfs)		138292.7	
Length Wtd. (ft)	39.41	Wetted Per. (ft)		136.73	
Min Ch El (ft)	1700.28	Shear (lb/sq ft)		4.82	
Alpha	1.00	Stream Power (lb/ft s)	502.78	0.00	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	0.34	169.73	0.02
C & E Loss (ft)	0.25	Cum SA (acres)	0.40	25.30	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1100.8

INPUT

Description: "DR" 74+43.59 = 1100.8 Riprap lined channel section

Station	Elevation	Data	num=	61					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716.14	2.62	1716.38	3.19	1717.19	3.55	1717.44	3.64	1717.51
3.67	1717.53	5.52	1717.25	6.13	1717.15	6.26	1717.13	7.11	1717
10.26	1717.73	11.44	1718	13.8	1718.36	18.51	1719	23.91	1719
38.86	1719	38.87	1719	48.24	1717.91	71.71	1712.44	77.3	1711.27
90.31	1707.37	97.82	1705.38	110.92	1701.43	115.06	1701.31	120.02	1701.16
126.4	1700.52	130.02	1700.16	130.04	1700.16	133.57	1700.51	140.02	1701.16

166.37	1701.95	183.08	1702.45	202.45	1703.72	226.45	1711.72	229.07	1712
231.71	1712.31	237.28	1713	242.7	1713.95	243.01	1714	243.16	1714.02
250.38	1715	254.4	1715.59	258.14	1716	266.29	1716.54	296.04	1717
303.27	1717	350.15	1717.75	357.77	1717.87	358.89	1717.89	360.41	1718
363.83	1718	364.64	1718	365.14	1718	365.72	1717.99	366.41	1717.99
366.77	1717.99	426.98	1717.85	443.59	1717.84	480.53	1717.87	487.26	1717.89
487.75	1717.89								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	38.87	.044	237.28	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	38.87	237.28		44.68	50	105.29	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.		0.044	
W.S. Elev (ft)	1712.20	Reach Len. (ft)	44.68	50.00	105.29
Crit W.S. (ft)		Flow Area (sq ft)		1261.38	
E.G. Slope (ft/ft)	0.006800	Area (sq ft)		1261.38	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	157.92	Top Width (ft)		157.92	
Vel Total (ft/s)	10.99	Avg. Vel. (ft/s)		10.99	
Max Chl Dpth (ft)	12.04	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	168089.1	Conv. (cfs)		168089.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		160.92	
Min Ch El (ft)	1700.16	Shear (lb/sq ft)		3.33	
Alpha	1.00	Stream Power (lb/ft s)	487.75	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	168.69	0.02
C & E Loss (ft)	0.16	Cum SA (acres)	0.40	25.17	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1100.6

INPUT

Description: "DR" 74+93.59 = 1100.6

Station Elevation Data		num= 59	
Sta	Elev	Sta	Elev
0	1716.08	1.06	1716.11
4.75	1717.3	5.21	1717.33
9.23	1717.35	12.34	1718
42.36	1719	44.5	1719
64.37	1716.96	90.89	1710.33
147.96	1700.37	151.58	1700.01
198.93	1702.13	207.01	1702.37
246.72	1709.03	247.52	1709.1
261.5	1711	261.86	1711.04
279.83	1713.05	285.26	1714
301.95	1716	302.19	1716.03
386.33	1717.68	387.99	1717.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	44.5	.027	386.33	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	44.5	386.33		48.48	50	75.92	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.40	Reach Len. (ft)	48.48	50.00	75.92

Crit W.S. (ft)		Flow Area (sq ft)	1482.57		
E.G. Slope (ft/ft)	0.001912	Area (sq ft)	1482.57		
Q Total (cfs)	13861.00	Flow (cfs)	13861.00		
Top Width (ft)	191.13	Top Width (ft)	191.13		
Vel Total (ft/s)	9.35	Avg. Vel. (ft/s)	9.35		
Max Chl Dpth (ft)	12.39	Hydr. Depth (ft)	7.76		
Conv. Total (cfs)	316976.3	Conv. (cfs)	316976.3		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	193.62		
Min Ch El (ft)	1700.01	Shear (lb/sq ft)	0.91		
Alpha	1.00	Stream Power (lb/ft s)	482.37	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	167.11	0.02
C & E Loss (ft)	0.11	Cum SA (acres)	0.40	24.97	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1100.4

INPUT

Description: "DR" 75+43.59 = 1100.4

Station Elevation Data		num= 59							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1715.79	3.29	1715.92	4.01	1716.11	4.75	1716.41	6.42	1716.41
8.55	1716.62	9.71	1716.64	10.43	1716.61	10.56	1716.61	12.25	1716.61
12.84	1716.61	16.18	1717.09	21.25	1718	28.72	1718.52	35.88	1719
72.04	1719.18	85.87	1719.32	138.03	1706.28	157.94	1701.3	167.47	1701.01
172.76	1700.86	176.31	1700.5	182.76	1699.86	182.78	1699.86	186.31	1700.21
192.76	1700.86	214.52	1701.51	237.24	1702.19	258.59	1702.83	276.49	1707.25
279.94	1708.1	287.99	1708.44	299.79	1709	309.15	1709.29	316.46	1709.52
320.12	1709.64	322.3	1709.71	323.74	1709.76	324.75	1709.79	325.29	1709.8
332.03	1710	335.2	1710.43	339.7	1711	341.56	1711.33	346.99	1712
349.69	1712.36	355.34	1713	361.68	1713.53	366.29	1714	371.76	1714.76
373.94	1715	376.61	1715.32	383.97	1716	390.2	1716.7	393.38	1717
397.75	1717.03	430.47	1717.05	441.27	1717.06	476.63	1717.06		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	85.87	.027
		393.38	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	85.87	393.38		50.41	50	73.42	
						.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.56	Reach Len. (ft)	50.41	50.00	73.42
Crit W.S. (ft)		Flow Area (sq ft)		1728.35	
E.G. Slope (ft/ft)	0.001535	Area (sq ft)		1728.35	
Q Total (cfs)	13861.00	Flow (cfs)		13861.00	
Top Width (ft)	238.60	Top Width (ft)		238.60	
Vel Total (ft/s)	8.02	Avg. Vel. (ft/s)		8.02	
Max Chl Dpth (ft)	12.70	Hydr. Depth (ft)		7.24	
Conv. Total (cfs)	353761.2	Conv. (cfs)		353761.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		240.97	
Min Ch El (ft)	1699.86	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	476.63	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.34	165.27	0.02
C & E Loss (ft)	0.27	Cum SA (acres)	0.40	24.72	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1100.2

INPUT

Description: "DR" 75+93.59 = 1100.2

Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1715.47	5.03	1715.48	6.31	1715.57	7.25	1715.42	12.24	1715.61
13.33	1715.69	20.8	1716.02	21.72	1716.06	21.91	1716.07	24.07	1716.36
24.84	1716.47	28.88	1716.84	30.12	1716.95	30.61	1717	37.91	1717.79
39.29	1718	52.69	1718.97	53.16	1719	94	1719	119.1	1719
120.88	1718.65	124.32	1718	125.57	1717.76	129.95	1717	133.69	1716.24
134.78	1716	138.36	1715.45	138.5	1715.42	140.24	1715	144.09	1714.04
144.54	1713.92	153.54	1711.63	157.13	1710.75	170.89	1707.33	195.76	1701.13
200.8	1700.97	209.76	1700.71	216.13	1700.07	219.75	1699.71	219.77	1699.71
223.96	1700.12	229.86	1700.7	266.55	1701.78	271.2	1701.91	273.66	1702.51
286.44	1705.63	293.1	1707.26	293.78	1707.64	294.58	1708	323.56	1708.43
343.65	1708.75	359.89	1709	368.22	1709.14	382.96	1709.38	391.35	1709.52
396.74	1709.61	400.47	1709.67	403.2	1709.72	424.18	1710	436.47	1710.21
449.73	1710.4	454.27	1710.43	459.18	1710.44	467.69	1710.37	478.79	1710.2
488.74	1710.03	489.85	1710.04	491.11	1710	491.99	1710	505.64	1709.89
522.26	1709.77	533.02	1709.71	540.55	1709.6	553.63	1709.55	563.52	1709.34
570.6	1709.32	576.05	1709.13	576.11	1709.13	576.56	1709.12	579.64	1709
604.14	1700.84	619.14	1700.39	629.14	1699.39	639.14	1700.39	654.14	1700.84
702.8	1713	703.35	1713.13	705.89	1713.75	706.33	1713.86	706.94	1714
707.54	1714.1	711.35	1715	713.39	1715.32	717.06	1716	719.64	1716.64
720.53	1716.78	721.35	1716.85	722.75	1716.93	723.96	1717	725.1	1717.07
727.92	1717.21	732.97	1717.31	736.35	1717.36	740.28	1717.35	745.92	1717.21
747.77	1717.18	750.92	1717	762.24	1716.79	796.57	1716	807	1715.8
846.3	1715.03	847.8	1715.01	848.08	1715	848.14	1715	859.15	1714.91
859.61	1714.91	860.61	1714.9	862.12	1714.9	865.25	1714.91	873.3	1715.21
877.58	1715.39	883.42	1715.45	886.79	1715.32	888.81	1715.33	893.33	1715.63
898.55	1715.99	900.25	1716.18	906.22	1716.93	913.53	1717.08	913.55	1717.08
913.6	1717.08	913.61	1717.08	913.63	1717.07	913.99	1717.01	914.82	1716.38
919.95	1715.93	922.95	1715.86	924.67	1715.79	928.8	1715.72	930.5	1714.12
930.51	1714.11	930.72	1714.11	933.52	1714.1	934.46	1714.1		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	119.1	.027	736.35	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	119.1	736.35		43.37	50	67.3	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.77	Reach Len. (ft)	43.37	50.00	67.30
Crit W.S. (ft)		Flow Area (sq ft)		3386.00	
E.G. Slope (ft/ft)	0.000901	Area (sq ft)		3386.00	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	552.84	Top Width (ft)		552.84	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	13.38	Hydr. Depth (ft)		6.12	
Conv. Total (cfs)	619833.1	Conv. (cfs)		619833.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		558.15	
Min Ch El (ft)	1699.39	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)	934.46	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.34	162.33	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	24.27	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1099.8

INPUT

Description: "DR" 76+43.59 = 1099.8

Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1714.09	.95	1714.11	3.29	1714.15	3.93	1714.58	6.08	1715.42
9.54	1715.59	11.11	1715.61	12.39	1715.65	14.77	1715.67	22.91	1716.03
23.2	1716.05	25.32	1716.15	27.62	1716.32	28.15	1716.36	29.66	1716.42
39.43	1716.43	43.82	1716.36	46.82	1716.37	54.57	1716.32	57.55	1716.27
57.97	1716.28	63.48	1716.28	67.14	1716.26	71.29	1716.29	75.14	1716.31

79.43	1716.34	79.54	1716.34	85.23	1716.39	92.8	1716.47	98.98	1716.56
103.64	1716.62	120.53	1716.94	120.9	1716.94	122.54	1716.97	123.83	1717
124.81	1717.05	158.51	1718	208.99	1718	214.82	1718	218.51	1717.39
220.03	1717	224.11	1716.02	224.18	1716	228.48	1715.01	228.51	1715
228.54	1714.99	232.69	1714	232.75	1713.98	236.83	1713	236.86	1712.99
285.88	1700.74	300.88	1700.29	300.89	1700.29	310.88	1699.29	320.88	1700.29
335.88	1700.74	335.9	1700.74	360.67	1709	384.63	1709.23	396.8	1709.35
412.01	1709.5	420.45	1709.58	426.58	1709.63	441.97	1709.7	446.57	1709.74
448	1709.76	477.44	1709.86	477.88	1709.86	478.33	1709.86	478.79	1709.85
479.27	1709.85	479.78	1709.85	480.32	1709.84	480.89	1709.84	481.45	1709.83
481.54	1709.83	482.49	1709.82	483.58	1709.81	484.84	1709.8	486.3	1709.78
488	1709.77	489.99	1709.75	506.96	1709.66	509.32	1709.63	512.04	1709.59
515.21	1709.55	518.95	1709.51	523.47	1709.45	529.09	1709.38	536.3	1709.28
545.98	1709.16	557.92	1709	588.72	1708.61	589.75	1708.6	637.85	1708
642.61	1706.7	643.12	1706.55	644.04	1706.32	645.87	1705.88	664.76	1701.24
679.11	1700.81	687.63	1700.55	693.98	1699.92	697.62	1699.56	697.63	1699.56
701.26	1699.92	707.63	1700.56	719.05	1700.9	725.54	1701.09	755.25	1708.49
773.7	1713.09	774.63	1713.23	779.09	1714	783.27	1714.79	784	1715
787.07	1715.4	790.82	1715.94	791.34	1716	793.15	1716.12	804.62	1717
806.17	1717.43	808.68	1718	809.73	1718.26	815.69	1719	815.7	1719
828.04	1719	840.82	1719	841.85	1718.96	842.47	1718.95	849.48	1718.84
858.81	1718.95	859.31	1718.96	860.32	1719	868.64	1719	888.38	1719
888.56	1718.99	889.28	1718.92	897.69	1718.14	899.12	1718	902.12	1717.6
907.28	1717	910.09	1716.72	910.4	1716.68	915.87	1716	916.28	1715.94
916.82	1715.86	917.38	1715.77	917.92	1715.69	919.46	1715.55	921	1715.4
928.31	1715.42	931.27	1715.26	932.98	1715.3	937.22	1715.04	940.3	1715.03
941.42	1715.18	942.19	1715.29	942.5	1715.26	942.91	1715.24	943.16	1715.24
947.05	1715.24								

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	214.82	.027
		815.7	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	214.82	815.7		55.39	75.3	124.22	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.69	Reach Len. (ft)	55.39	75.30	124.22
Crit W.S. (ft)		Flow Area (sq ft)		3291.11	
E.G. Slope (ft/ft)	0.000946	Area (sq ft)		3291.11	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	534.04	Top Width (ft)		534.04	
Vel Total (ft/s)	5.65	Avg. Vel. (ft/s)		5.65	
Max Chl Dpth (ft)	13.40	Hydr. Depth (ft)		6.16	
Conv. Total (cfs)	604808.8	Conv. (cfs)		604808.8	
Length Wtd. (ft)	75.30	Wetted Per. (ft)		539.36	
Min Ch El (ft)	1699.29	Shear (lb/sq ft)		0.36	
Alpha	1.00	Stream Power (lb/ft s)	947.05	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.34	158.50	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	23.64	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1099.4

INPUT

Description: "DR" 77+18.89 = 1099.4 - Inline weir Pipe crossings #3 & #4

Station Elevation Data		num= 213	
Sta	Elev	Sta	Elev
0	1715.09	1.38	1715.08
1.58	1715.07	2.68	1714.96
4.44	1715.02	4.49	1715.02
11.02	1714.89	12.22	1714.93
33.21	1716.07	33.65	1716.12
38.38	1716.24	38.47	1716.23
52.35	1718	62.83	1718.92
84.62	1718.45	87.93	1718
155.66	1716	158.91	1715.85
178.34	1714.84	191.54	1714

208.46	1712.64	243.1	1703.72	245.33	1703.14	250.06	1701.96	251.49	1701.64
253.28	1701.3	255.44	1700.93	256.74	1700.74	258.56	1700.69	261.57	1700.62
263.87	1700.56	265.74	1700.52	273.2	1700.33	282.07	1699.44	283.16	1699.33
283.2	1699.33	283.21	1699.33	292.09	1700.22	293.2	1700.33	294.85	1700.38
301.47	1700.56	301.54	1700.58	301.89	1700.68	310.1	1701.77	333.34	1706.06
334.99	1706.35	336.2	1706.62	337.68	1706.97	337.94	1707.04	342.06	1708
391.8	1708.55	398.78	1708.62	407.52	1708.72	418.64	1708.83	433.22	1708.98
435.44	1709	439.33	1709.04	443.43	1709.07	447.19	1709.11	450.7	1709.14
454	1709.17	457.13	1709.19	474.2	1709.21	522.16	1709	525.22	1709
528.09	1709	537.66	1709	540.02	1709	542.22	1709	544.26	1709
549.3	1709	550.98	1709	552.52	1709	553.94	1709	564.85	1709
565.67	1709	566.41	1709	566.72	1709	569.28	1709	571.96	1709
574.78	1709	577.74	1709	579.83	1709	581.72	1708.52	583.56	1708
585.81	1707.25	588.63	1706.31	590.25	1705.77	592.56	1705	594.81	1704.25
595.27	1704.1	595.56	1704	598.08	1703.18	600.42	1702.46	603.42	1701.5
604.48	1701.17	606.96	1700.46	607.97	1700.43	610.38	1700.36	612.13	1700.32
613.46	1700.28	614.53	1700.26	615.4	1700.23	616.14	1700.22	616.78	1700.2
617.36	1700.19	617.87	1700.18	618.35	1700.16	618.67	1700.16	619.24	1700.16
620.87	1700.11	630.88	1699.11	640.88	1700.11	647.41	1700.27	648.48	1700.3
649.8	1700.33	651.51	1700.38	653.82	1700.44	654.79	1700.47	656.38	1700.85
656.6	1700.91	656.89	1700.98	659.3	1701.58	660.06	1701.76	661.13	1702.02
662.77	1702.43	664.96	1702.99	667.64	1703.66	672.34	1704.84	672.96	1705
672.98	1705.01	673.21	1705.1	677.06	1705.92	677.35	1706	685.56	1708.07
693.15	1710	695.75	1710.72	696.97	1711	697.59	1711.16	700.71	1712
701.43	1712.21	704.31	1713	705.37	1713.25	708.17	1714	709.53	1714.33
710.87	1714.49	712.59	1714.71	713.79	1715	716.8	1715.63	718.5	1716
738.66	1716.98	738.88	1717	739.14	1717.01	740.23	1717.05	760.67	1717.78
770.73	1718	781.38	1718.16	785.07	1718.23	794.88	1718.44	801.71	1718.59
814.16	1718.94	814.89	1718.96	816.04	1719	819.07	1719	856.62	1719
872.06	1719	872.79	1719	891.21	1719	899.31	1719	905.54	1718.49
912.6	1718	912.68	1717.95	915.55	1717.56	919.49	1716.96	920.78	1716.78
927.18	1716.6	931.09	1716.34	933.61	1716.06	938.49	1715.94	943.2	1716
943.85	1715.49	946.28	1714.24	948.63	1714.12				

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	80.69	.027
		816.04	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	80.69	816.04		445	436.11	476.02	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.58	Reach Len. (ft)	445.00	436.11	476.02
Crit W.S. (ft)	1709.50	Flow Area (sq ft)		3192.62	
E.G. Slope (ft/ft)	0.000944	Area (sq ft)		3192.62	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	494.08	Top Width (ft)		494.08	
Vel Total (ft/s)	5.83	Avg. Vel. (ft/s)		5.83	
Max Chl Dpth (ft)	13.47	Hydr. Depth (ft)		6.46	
Conv. Total (cfs)	605311.4	Conv. (cfs)		605311.4	
Length Wtd. (ft)	436.11	Wetted Per. (ft)		499.28	
Min Ch El (ft)	1699.11	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)	948.63	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.34	152.90	0.02
C & E Loss (ft)		Cum SA (acres)	0.40	22.76	0.06

INLINE STRUCTURE

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1099.3

INPUT

Description:

Distance from Upstream XS = 5.5
 Deck/Roadway Width = 425.61
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1707	238.18	1705.6	271.32	1705.22	271.36	1705.22	271.41	1705.21
271.46	1705.21	271.56	1705.21	277.27	1705.03	277.45	1705.14	285.02	1704.92

285.26	1704.92	285.5	1704.92	293.08	1704.69	293.26	1704.58	299	1704.41
312.34	1704.01	400	1703.7	468.64	1703.89	582.93	1703.92	661.01	1705.26
939.19	1705.5								

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

E.G. Elev (ft)	1713.11	Q Gates (cfs)	
W.S. Elev (ft)	1712.58	Q Gate Group (cfs)	0.00
Q Total (cfs)	18601.00	Gate Open Ht (ft)	1711.19
Q Weir (cfs)	18601.00	Gate #Open	
Weir Flow Area (sq ft)	2853.34	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	200.45	Gate Submerg	0.00
Weir Sta Rgt (ft)	704.76	Gate Invert (ft)	0.00
Weir Max Depth (ft)	9.13	Gate Weir Coef	0.000
Weir Avg Depth (ft)	5.66		
Weir Coef (ft ^{1/2})	2.600	Q Breach (cfs)	
Weir Submerg	0.69	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1703.99	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	504.31		

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1097.5

INPUT

Description: "DR" 81+55 = 1097.5

Station	Elevation	Data	num=	255									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1712.77	.76	1712.75	1.67	1712.67	2.13	1712.67	3.31	1712.71				
4.45	1713.01	4.68	1713.22	5.32	1713.42	5.63	1713.52	5.87	1713.61				
13.65	1713.52	16.29	1713.49	17.96	1713.47	20.45	1713.46	23.37	1713.68				
23.54	1713.69	23.62	1713.7	24.18	1713.79	25.45	1714	27.5	1714				
30.41	1714	39.86	1714.24	40.69	1714.25	44.81	1714.13	47.05	1714				
51.94	1714	56.92	1714	65.86	1714	68.93	1714.41	72.3	1715				
77.85	1715.92	78.3	1716	78.55	1716.05	83.65	1717	100.75	1717				
108.12	1717	112.3	1717.1	113.62	1717.1	115.24	1717	116.24	1716.86				
124.53	1716	132.75	1715.15	133.94	1715	138.15	1714.51	142.46	1714				
143.8	1713.87	153.87	1713	161.28	1712.37	166.31	1712	195.57	1711.51				
223.17	1711	229.5	1710.74	247.29	1710	253.43	1709.1	254.29	1709				
258.11	1708.05	258.39	1708	262.28	1707.03	262.4	1707	266.37	1706.01				
266.4	1706	266.46	1705.99	266.49	1705.98	266.53	1705.97	266.64	1705.95				
267.69	1705.74	271.47	1705	277.74	1704.78	281.67	1704.66	286.98	1704.48				
289.75	1704.39	298.17	1704.13	298.4	1704.12	298.54	1704.12	299.12	1704.1				
305.4	1702.59	308.63	1701.84	310.73	1701.28	312.36	1700.92	315.01	1700.25				
315.55	1700.13	317.55	1699.66	318.34	1699.63	320.83	1699.57	323.06	1699.51				
325.07	1699.46	326.93	1699.42	328.66	1699.39	330.3	1699.35	333.75	1699.25				
336.71	1699.16	344.72	1698.36	346.71	1698.16	351.71	1698.66	356.71	1699.16				
358.56	1699.22	359.22	1699.24	360.12	1699.25	361.34	1699.28	362.9	1699.31				
365.06	1699.37	368.46	1699.46	370.32	1699.51	372.95	1700.15	374.09	1700.47				
377.25	1701.4	381.24	1702.53	381.52	1702.59	382.81	1702.96	384.55	1703.46				
389.56	1705	389.81	1705.07	390.82	1705.41	392.06	1705.49	392.46	1705.45				
392.96	1705.41	393.45	1705.37	393.93	1705.35	394.4	1705.32	394.87	1705.31				
395.34	1705.29	395.82	1705.28	397.64	1705.33	398.29	1705.32	398.94	1705.32				
399.61	1705.31	400.29	1705.31	400.99	1705.3	401.71	1705.3	418.48	1705.53				
418.92	1705.53	419.34	1705.53	419.74	1705.53	420.12	1705.53	420.48	1705.53				
420.83	1705.53	421.17	1705.54	421.5	1705.54	421.82	1705.54	422.15	1705.54				
422.48	1705.54	422.82	1705.55	423.17	1705.55	424.39	1705.3	427.49	1704.33				
429.22	1703.79	429.39	1703.74	429.68	1703.65	430.25	1703.49	431.85	1703.05				
432.02	1703	435.12	1702.04	436.95	1701.48	438.4	1701.03	439.48	1700.7				
441.67	1700.04	442.03	1699.93	442.26	1699.87	443.38	1699.54	444.6	1699.51				
446.67	1699.46	448.25	1699.42	449.51	1699.39	450.54	1699.36	451.41	1699.34				
452.16	1699.33	452.83	1699.31	453.43	1699.3	453.99	1699.29	454.51	1699.28				
455.16	1699.26	455.17	1699.26	457.03	1699.2	462.06	1698.7	467.03	1698.2				
471.99	1698.7	477.03	1699.2	478.89	1699.26	479.55	1699.28	480.06	1699.29				
480.62	1699.3	481.22	1699.31	481.89	1699.33	482.64	1699.34	483.51	1699.36				

484.55	1699.39	485.8	1699.42	487.38	1699.46	489.46	1699.52	490.67	1699.55
491.83	1699.81	491.97	1699.84	492.14	1699.88	494.4	1700.4	494.92	1700.52
495.61	1700.68	496.59	1700.92	498.86	1701.46	500.52	1701.86	503.1	1702.49
507.66	1703.6	508.11	1703.71	509.26	1704	509.46	1704.05	510.1	1704.23
510.51	1704.35	510.78	1704.44	510.97	1704.51	511.1	1704.56	513.4	1705
517.4	1706	537.03	1710.9	549.72	1710.92	600.2	1711	612.08	1711.59
619.23	1712	623.43	1712.69	625.33	1713	626.43	1713	632.04	1713
645.41	1713	660.99	1713	663.74	1712.47	667.02	1712.16	685.88	1712.38
690.93	1712.42	696.43	1712.38	697.88	1712.36	699.57	1712.32	700.82	1712.37
705.3	1712.44	707.87	1712.48	710.21	1712.52	712.74	1712.73	715.35	1712.78
726.51	1712.87	737.75	1713.08	741.93	1713.11	748.68	1713.13	754.97	1713.11
760.01	1713.14	768.59	1713.34	769.53	1713.47	772.9	1713.82	781.12	1715.09
787.31	1714.63	788.46	1714.49	792.4	1714.04	799.1	1714.06	802.93	1714.02
803.44	1713.62	805.24	1712.61	805.78	1712.31	807.19	1712.12	807.67	1712.09

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	113.62	.027	781.12	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	113.62	781.12		134.18 188.59	63.57	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.19	Reach Len. (ft)	134.18	188.59	63.57
Crit W.S. (ft)		Flow Area (sq ft)		2504.60	
E.G. Slope (ft/ft)	0.001554	Area (sq ft)		2504.60	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	391.00	Top Width (ft)		391.00	
Vel Total (ft/s)	7.43	Avg. Vel. (ft/s)		7.43	
Max Chl Dpth (ft)	13.03	Hydr. Depth (ft)		6.41	
Conv. Total (cfs)	471859.0	Conv. (cfs)		471859.0	
Length Wtd. (ft)	188.59	Wetted Per. (ft)		395.43	
Min Ch El (ft)	1698.16	Shear (lb/sq ft)		0.61	
Alpha	1.00	Stream Power (lb/ft s)	807.67	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	0.34	124.29	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	18.32	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1096.6

INPUT

Description: "DR" 83+43.59 = 1096.6

Station	Elevation	Data	num=	132
Sta	Elev	Sta	Elev	Sta
0	1712.38	2.73	1712.4	3.99
12.12	1712.34	15.88	1712.38	16.07
19.02	1712.42	20.39	1712.65	21.54
27.33	1714	31.6	1714.48	36.92
50.97	1716.55	57.72	1717	61.88
67.96	1716.7	72.57	1716	78.23
96.99	1714.32	97.58	1714.22	98.43
101.44	1713.41	101.94	1713.28	102.23
102.68	1713.13	103.2	1713	104.22
133.76	1711	149.54	1710.02	149.96
172.35	1709	174.98	1708.91	204.91
238.89	1707.32	250.97	1707	252.42
258.17	1705.31	259.59	1705	259.6
282.1	1702.47	291.49	1700.13	306.64
344.35	1697.84	344.36	1697.85	347.91
373.98	1698.86	377.18	1698.87	378.1
398.25	1698.88	422.38	1699.57	424.93
469.53	1710.55	470.8	1710.86	470.8
533.95	1711.12	537.72	1712	565.3
588.97	1712	599.1	1712	599.2
603.08	1711.95	603.54	1711.92	604.62
613.09	1711.97	617.86	1711.98	621.34
634.94	1712.66	640.36	1712.72	649.89
677.03	1713.3	679.37	1713.29	691.42
				1713.7
				693.22
				1713.8
				698.94
				1714.05

709.17	1713.56	710.02	1713.53	710.86	1713.55	715.9	1713.65	721.6	1713.91
736.11	1713.69	736.72	1713.68	737.6	1713.65	737.84	1713.5	738.03	1713.36
739.78	1712.18	742.14	1712.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	66.7	.027	698.94	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	66.7	698.94		33.22	50	71.93	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.97	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.74	Reach Len. (ft)	33.22	50.00	71.93
Crit W.S. (ft)		Flow Area (sq ft)		2349.04	
E.G. Slope (ft/ft)	0.001542	Area (sq ft)		2349.04	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	332.44	Top Width (ft)		332.44	
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)		7.92	
Max Chl Dpth (ft)	12.90	Hydr. Depth (ft)		7.07	
Conv. Total (cfs)	473759.6	Conv. (cfs)		473759.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		334.84	
Min Ch El (ft)	1697.84	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	742.14	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.34	113.79	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	16.76	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1096.4

INPUT

Description: "DR" 83+93.59 = 1096.4

Station	Elevation	Data	num=	170					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1711.97	.91	1711.87	3.31	1711.91	3.33	1712.05	4.47	1711.9
5.08	1711.88	5.34	1711.81	5.57	1711.83	5.65	1711.83	5.71	1711.82
6.26	1711.84	7.82	1711.82	9.16	1711.84	11.48	1711.84	11.56	1711.84
13.2	1712.08	14.54	1712.28	15.43	1712.39	16.7	1712.55	18.72	1712.8
19.62	1712.92	20.28	1713	25.1	1713.59	25.48	1713.63	27.86	1714
31.91	1714.63	34.82	1715	37.01	1715.18	38.81	1715.26	46.18	1715.68
48.22	1715.73	52.17	1715.56	55.01	1715.49	57.29	1715.44	60.53	1715.23
64.29	1715.27	73.09	1715	76.46	1715	80.89	1715	85.52	1714.48
87.01	1714.32	89.97	1714.01	90.08	1714	90.11	1713.99	94.46	1713
99.73	1712.19	101.13	1712	104.9	1711.88	110.25	1711.72	121.22	1711.55
126.22	1711.43	129.2	1711.37	131.22	1711.33	132.72	1711.29	133.87	1711.27
134.8	1711.25	135.56	1711.24	136.21	1711.22	136.77	1711.21	137.26	1711.21
137.7	1711.2	138.11	1711.19	138.49	1711.19	139.18	1711.18	139.5	1711.17
139.8	1711.17	140.1	1711.16	140.39	1711.16	155.42	1711.03	155.47	1711.03
155.52	1711.02	155.57	1711.02	155.62	1711.02	155.67	1711.02	155.71	1711.02
155.76	1711.02	155.81	1711.02	157.27	1711	166.4	1710.24	169.18	1710
174.79	1709.67	182.03	1709	194.78	1708.67	217.03	1708.32	230.23	1708.02
230.34	1708.02	230.79	1708	236.69	1707.55	239.83	1707	242.04	1706.45
243.83	1706	247.63	1705.07	247.95	1705	250.45	1704.83	265.15	1704
267.26	1703.53	269.44	1703	271.96	1702.43	273.76	1702	276.79	1701.32
278.14	1701	280.88	1700.61	282.65	1700.17	299.2	1699.67	329.73	1698.76
336.12	1698.12	339.73	1697.76	339.74	1697.76	346.12	1698.4	349.73	1698.76
355.92	1698.76	356.76	1698.76	357	1698.76	357.62	1698.71	363.19	1698.17
366.96	1697.81	367.38	1697.77	367.9	1697.82	377.75	1698.78	398.18	1699.39
412.49	1699.81	438.12	1706.18	451.64	1709.54	457.72	1711.05	463.92	1711.05
472.43	1711.04	499.32	1711.03	507.7	1711.03	528.4	1711	534.21	1711
535.3	1711	539.64	1711.53	543.84	1711.57	546.78	1711.49	562.7	1712
569.57	1712	573.39	1712	573.66	1712	573.86	1711.98	573.97	1711.98
574.39	1711.99	575.01	1711.95	576.56	1711.89	577.11	1711.84	577.96	1711.84
580.27	1711.87	586.23	1712.15	588.79	1712.31	593.51	1712.64	598.83	1713.03
602.87	1713.44	610.31	1714.61	611.14	1714.66	612.53	1714.78	621.24	1715.46
628.31	1715.66	640.51	1715.17	650.07	1715.95	653.8	1716.26	668.91	1716.47
669.45	1716.47	670.03	1716.42	693.82	1713.97	708.03	1713.54	710.92	1713.46
714.4	1713.38	714.99	1713.09	715.4	1713.04	717.9	1712.28	718.78	1712.27

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 0 .031 48.22 .027 669.45 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 48.22 669.45 33.77 50 69.21 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.19	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.43	Reach Len. (ft)	33.77	50.00	69.21
Crit W.S. (ft)		Flow Area (sq ft)		2126.86	
E.G. Slope (ft/ft)	0.001800	Area (sq ft)		2126.86	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	291.02	Top Width (ft)		291.02	
Vel Total (ft/s)	8.75	Avg. Vel. (ft/s)		8.75	
Max Chl Dpth (ft)	12.66	Hydr. Depth (ft)		7.31	
Conv. Total (cfs)	438436.3	Conv. (cfs)		438436.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		293.38	
Min Ch El (ft)	1697.76	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)	718.78	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	111.22	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	16.40	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1096.2

INPUT

Description: "DR" 84+43.59 = 1096.2

Station Elevation Data		num= 205									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1711.72	2.75	1711.76	3.37	1711.8	3.77	1711.84	4.72	1711.84		
4.84	1711.8	4.91	1711.8	5.9	1711.84	9.1	1711.8	9.72	1711.79		
9.98	1711.77	10.03	1711.77	16.04	1712.75	17.58	1713	20.68	1713.47		
21.99	1713.64	23.06	1713.81	23.29	1713.83	24.62	1714	30.53	1714.84		
31.72	1715	40.01	1715	42.35	1715	52.62	1715	60.54	1715		
66.84	1715.85	69.21	1716	70.76	1716	78.71	1716	78.83	1716		
78.84	1716	78.85	1716	83.59	1715.32	85.24	1715	87.97	1714.6		
88.79	1714.47	90.46	1714.2	91.75	1714	94.69	1713.52	96.41	1713.24		
96.92	1713.16	97.16	1713.12	97.3	1713.1	97.38	1713.08	97.98	1713		
103.08	1712.42	106.47	1712	106.5	1712	107.51	1711.99	109.25	1711.97		
110.92	1711.95	112.55	1711.93	114.13	1711.91	115.62	1711.9	117.4	1711.88		
119.13	1711.87	120.81	1711.86	122.46	1711.84	124.07	1711.83	125.67	1711.82		
127.25	1711.81	128.82	1711.8	132.6	1711.75	134.18	1711.74	135.74	1711.73		
137.3	1711.73	138.86	1711.72	140.44	1711.72	142.06	1711.72	143.72	1711.72		
145.44	1711.72	147.23	1711.72	149.09	1711.73	152.53	1711.64	154.15	1711.65		
155.8	1711.66	157.46	1711.67	161.86	1711.49	162.99	1711.51	164.12	1711.52		
165.24	1711.53	166.32	1711.55	167.39	1711.57	168.46	1711.59	169.53	1711.61		
173.32	1711.37	173.88	1711.39	174.49	1711.42	175.15	1711.44	175.88	1711.46		
176.68	1711.48	177.55	1711.51	182.35	1711.35	182.87	1711.36	183.44	1711.38		
184.05	1711.39	184.68	1711.4	185.32	1711.41	185.93	1711.41	192.33	1711.49		
193.08	1711.49	193.81	1711.48	194.5	1711.46	195.14	1711.45	195.71	1711.43		
196.21	1711.4	202.01	1711.17	202.28	1711.16	202.51	1711.15	202.7	1711.14		
202.87	1711.12	203	1711.11	203.1	1711.1	204.18	1711	209.65	1710.44		
214.28	1710	215.37	1709.88	221.64	1709	226.75	1708.64	230.08	1708.35		
231.97	1708	232.95	1707.76	235.99	1707	236.94	1706.77	240.02	1706		
242.28	1705.43	243.05	1705.23	243.89	1705	244.3	1704.9	248.83	1704		
251.17	1703.42	252.89	1703	255.1	1702.46	256.96	1702	259.03	1701.49		
261.03	1701	268.5	1700.51	272.67	1700.2	290.38	1699.66	323.37	1698.68		
326.93	1698.32	333.37	1697.68	333.38	1697.68	340.45	1697.68	346.76	1697.68		
346.99	1697.68	347.22	1697.68	347.45	1697.68	347.68	1697.68	347.89	1697.68		
348.08	1697.68	348.25	1697.68	348.39	1697.68	348.51	1697.68	348.61	1697.68		
348.68	1697.68	348.74	1697.68	348.77	1697.68	348.78	1697.68	350.53	1697.85		
359.34	1698.68	380.7	1699.31	403.39	1699.98	434.53	1707.77	448.39	1711.23		
470.22	1711.15	487.11	1711.08	495.51	1711.05	523.82	1711	532.15	1711.31		
535.18	1711.39	548.47	1711.75	549.66	1711.95	550.6	1711.94	551.89	1712.13		
553.87	1712.47	556.49	1713	560.68	1713.65	563.58	1713.83	568.66	1713.92		
568.94	1713.93	571.28	1714	581.33	1714.24	585.26	1714.22	594.99	1714.29		
596.15	1714.31	609.38	1714.4	610.38	1714.38	611.44	1714.42	619.93	1714.85		
627.8	1715.2	628.95	1715.3	631.39	1715.43	639.06	1715.85	642.84	1715.98		

649.08	1716.24	657.33	1715.87	660.49	1715.73	674.88	1714.84	683.06	1714.04
699.83	1713.31	700.29	1713.29	700.35	1713.27	703.25	1712.43	704.67	1712.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	78.71	.027	649.08	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	78.71	649.08		34.52	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.08	Reach Len. (ft)	34.52	50.00	68.70
Crit W.S. (ft)		Flow Area (sq ft)		1944.77	
E.G. Slope (ft/ft)	0.001781	Area (sq ft)		1944.77	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	230.32	Top Width (ft)		230.32	
Vel Total (ft/s)	9.56	Avg. Vel. (ft/s)		9.56	
Max Chl Dpth (ft)	12.40	Hydr. Depth (ft)		8.44	
Conv. Total (cfs)	440778.3	Conv. (cfs)		440778.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		232.70	
Min Ch El (ft)	1697.68	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	704.67	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	108.88	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	16.10	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1095.8

INPUT

Description: "DR" 84+93.59 = 1095.8

Station	Elevation	Data	num=	153						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1711.46	.02	1711.46	.06	1711.46	.1	1711.46	.27	1711.48	
2.14	1711.63	2.45	1711.65	3.07	1711.71	3.4	1711.72	3.72	1711.72	
3.75	1711.72	4.22	1711.72	4.39	1711.72	4.65	1711.73	4.77	1711.73	
5.78	1711.72	6.62	1711.72	7.1	1711.71	9.46	1711.69	12.57	1711.66	
12.58	1711.66	14.2	1711.93	20.79	1713	27	1713.57	31.78	1714	
50.92	1714.87	53.87	1715	54.48	1715.1	59.98	1716	61.85	1716.33	
65.79	1717	70.16	1717	73.54	1717	78.56	1716.07	78.95	1716	
79.04	1715.98	84.15	1715	88.59	1714.27	89.26	1714.17	90.18	1714.03	
90.4	1714	90.97	1713.91	91.57	1713.82	97.68	1713	103.62	1713	
106.27	1713	116.16	1713	136.12	1712.64	136.92	1712.64	137.76	1712.64	
138.65	1712.64	142.42	1712.69	143.24	1712.69	144.09	1712.69	144.94	1712.7	
145.77	1712.7	146.58	1712.7	147.35	1712.71	151.81	1712.69	152.6	1712.69	
153.33	1712.7	153.99	1712.7	176.77	1712.35	177.73	1712.32	178.84	1712.29	
180.14	1712.26	181.65	1712.23	183.45	1712.18	186.3	1712.13	187.75	1712.09	
188.81	1712.08	190.05	1712.04	191.5	1712	191.57	1712	193.47	1711.81	
199.99	1711	204.11	1710.68	210.54	1710.21	212.16	1710	212.92	1709.81	
216.16	1709	216.92	1708.81	220.16	1708	220.92	1707.81	224.16	1707	
224.92	1706.81	228.16	1706	229.73	1705.62	230.23	1705.49	231.27	1705.24	
232.25	1705	233.21	1704.75	234.21	1704.5	234.71	1704.37	236.16	1704	
236.93	1703.81	240.16	1703	240.93	1702.81	244.16	1702	244.93	1701.81	
248.16	1701	252.28	1700.75	261.45	1700.2	280.17	1699.64	315.18	1698.59	
318.74	1698.23	325.18	1697.59	325.19	1697.59	328.85	1697.59	330.47	1697.59	
331.88	1697.59	333.13	1697.7	343.34	1698.59	359.34	1699.07	395.2	1700.15	
396.56	1700.5	440.2	1711.4	448.52	1711.26	451.05	1711.26	457.01	1711.18	
488.39	1711	511.45	1711	520.25	1711.24	525.58	1712.16	526.28	1712.15	
539.54	1712.99	544.86	1713.32	547.11	1713.3	556.91	1712.94	557.63	1712.91	
568.24	1712.58	572.49	1712.49	583.1	1712.58	594.98	1713.6	600.35	1713.96	
606.73	1714.68	622.06	1716.31	631.98	1715.72	633.25	1715.64	633.51	1715.63	
634.01	1715.63	647.83	1715.47	658.28	1715.44	663.65	1715.4	674.05	1714.73	
674.67	1714.68	679.86	1714.38	685.18	1714.07	688.93	1713.88	695.35	1713.34	
696.63	1712.9	698.05	1712.38	699.03	1712.36					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73.54	.027	622.06	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
73.54	622.06	35.47	50	82.83	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.98	Reach Len. (ft)	35.47	50.00	82.83
Crit W.S. (ft)		Flow Area (sq ft)		1935.37	
E.G. Slope (ft/ft)	0.001728	Area (sq ft)		1935.37	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	222.25	Top Width (ft)		222.25	
Vel Total (ft/s)	9.61	Avg. Vel. (ft/s)		9.61	
Max Chl Dpth (ft)	12.39	Hydr. Depth (ft)		8.71	
Conv. Total (cfs)	447503.9	Conv. (cfs)		447503.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		224.73	
Min Ch El (ft)	1697.59	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	699.03	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	106.66	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	15.84	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1095.6

INPUT

Description: "DR" 85+43.59 = 1095.6

Station	Elevation	Data	num=	254
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	1711.34	2.11	1711.35	2.83 1711.44 2.92 1711.44 6.53 1712.13
9.25	1711.9	11.56	1711.79	15.75 1712.26 16.99 1712.39 17.67 1712.46
19.63	1712.64	20.36	1712.7	20.63 1712.73 21.66 1712.82 22.11 1712.86
22.56	1712.92	22.91	1712.97	22.95 1712.97 23.16 1713 33.41 1713.98
33.57	1714	40.29	1714.32	54.78 1715 54.89 1715.02 60.84 1716
63	1716.33	67.6	1717	76.74 1717 78.26 1717 80.34 1717
85.88	1716.54	89.55	1716.29	95.03 1716 98.05 1715.81 101.81 1715.52
106.48	1715	109.01	1714.87	109.15 1714.87 109.28 1714.87 109.4 1714.86
109.52	1714.86	109.62	1714.86	109.73 1714.85 109.83 1714.85 109.94 1714.84
110.05	1714.83	110.15	1714.83	110.27 1714.82 110.39 1714.81 110.52 1714.8
110.66	1714.79	110.82	1714.77	111.01 1714.75 111.24 1714.73 111.53 1714.7
111.91	1714.65	112.43	1714.6	113.19 1714.51 114.42 1714.37 116.7 1714.11
117.69	1714	118.55	1713.9	119.5 1713.79 120.27 1713.71 120.91 1713.64
123.75	1713.41	124.34	1713.35	124.79 1713.31 125.15 1713.28 125.44 1713.25
125.69	1713.23	125.9	1713.21	126.09 1713.2 126.25 1713.19 126.4 1713.18
126.53	1713.17	126.66	1713.17	126.78 1713.16 126.89 1713.16 126.99 1713.15
127.09	1713.15	127.19	1713.15	127.29 1713.15 127.39 1713.15 127.48 1713.15
127.58	1713.15	127.69	1713.15	127.8 1713.16 130.43 1713.2 130.57 1713.21
130.71	1713.21	130.88	1713.22	131.07 1713.24 131.29 1713.25 131.57 1713.27
131.92	1713.3	132.38	1713.33	133 1713.38 133.87 1713.45 136.55 1713.65
137.64	1713.74	139.08	1713.85	141.01 1714 141.04 1714 141.05 1714
142.38	1714	143.52	1714	143.8 1714 144.88 1714 145.82 1714
146.29	1714	147.18	1714	147.98 1714 148.7 1714 149.35 1714
150.05	1714	150.71	1714	151.32 1714 151.91 1714 152.47 1714
153.03	1714	153.8	1714	154.35 1714 154.9 1714 155.43 1714
155.97	1714	156.5	1714	157.25 1714 157.78 1714 158.31 1714
158.84	1714	159.39	1714	160.06 1714 160.59 1714 161.13 1714
161.73	1714	162.26	1714	162.79 1714 163.3 1714 163.82 1714
164.25	1714	164.76	1714	165.27 1714 165.61 1714 166.1 1714
166.39	1714	166.66	1714	167.1 1714 167.32 1714 167.53 1714
167.73	1714	167.92	1714	168.12 1714 168.45 1714 168.63 1714
168.81	1714	169.08	1714	169.24 1714 169.49 1714 169.62 1714
169.83	1714	169.94	1714	170.12 1714 170.2 1714 170.35 1714
170.4	1714	170.51	1714	170.58 1714 171.03 1713.96 172.02 1713.88
182.51	1713	187.81	1712.28	189.34 1712 190.47 1711.83 191.49 1711.67
196.12	1711	206.87	1710.1	208.26 1710.02 208.31 1710 208.95 1709.86
213.06	1709	216.41	1708.24	217.31 1708 219.61 1707.51 221.64 1707
222.49	1706.79	225.64	1706	229.54 1705.03 229.64 1705 229.8 1704.96
233.65	1704	233.91	1703.94	237.65 1703 238.89 1702.69 241.65 1702
243.58	1701.52	245.65	1701	247.54 1700.53 248.89 1700.19 268.39 1699.61
305.06	1698.51	311.45	1697.87	315.06 1697.51 315.07 1697.51 315.32 1697.51
315.66	1697.51	316.71	1697.59	328.04 1698.51 354.98 1699.36 385.07 1700.31
414.43	1707.65	430.07	1711.56	434.86 1711.25 438.85 1711 443.53 1711.97

443.69	1712	444.87	1712	482.54	1712	486.27	1711.69	494.88	1711
495.8	1711	497.63	1710.94	498.98	1710.91	501.03	1710.87	509.35	1711.03
515.23	1711.21	520.46	1711.17	522.96	1711.15	525.68	1711.19	526.7	1711.23
534.44	1711.41	535.72	1711.45	538.03	1711.42	540.75	1711.42	547.6	1711.51
548.6	1711.53	550.96	1711.49	557.56	1711.42	566.89	1711.39	579.11	1711.33
581.5	1711.32	583.92	1711.42	591.78	1711.5	596.34	1711.61	597.49	1711.65
611.44	1711.9	612.88	1711.92	615.43	1711.94	618.99	1712.11	625.5	1712.36
635.93	1713	637.41	1713	646.93	1712.83	651.95	1712.91		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	80.34	.027	635.93	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	80.34	635.93		36.64	50	82.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.56	Reach Len. (ft)	36.64	50.00	82.86
Crit W.S. (ft)		Flow Area (sq ft)		1766.02	
E.G. Slope (ft/ft)	0.002198	Area (sq ft)		1766.02	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	211.70	Top Width (ft)		211.70	
Vel Total (ft/s)	10.53	Avg. Vel. (ft/s)		10.53	
Max Chl Dpth (ft)	12.05	Hydr. Depth (ft)		8.34	
Conv. Total (cfs)	396764.2	Conv. (cfs)		396764.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		214.11	
Min Ch El (ft)	1697.51	Shear (lb/sq ft)		1.13	
Alpha	1.00	Stream Power (lb/ft s)	651.95	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	104.53	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	15.59	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1095.4

INPUT

Description: "DR" 85+93.59 = 1095.4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1711.49	58	1711.49	3.58	1711.56	5.17	1712.23	5.18	1712.23
6.3	1712.87	15.14	1712.66	17.46	1712.71	22.69	1712.7	25.34	1712.7
25.54	1712.7	27.14	1712.88	27.61	1712.95	27.91	1713	28.91	1713.11
38.1	1714	49.21	1714.53	60.38	1714.71	65.79	1714.98	65.98	1714.95
66.67	1715	72.43	1715.17	78.59	1715	82.99	1715	87.28	1714.33
88.97	1714	89.82	1714	90.79	1714	91.66	1714	100.49	1713.97
101.98	1713.96	114.06	1713.5	114.77	1713.49	115.48	1713.48	116.19	1713.46
116.89	1713.45	117.58	1713.44	118.24	1713.42	129.33	1713	135.12	1712.51
142.22	1712	153.83	1711.09	155.24	1711	166.57	1711	173.61	1711
174.95	1711	189.73	1710.58	191.11	1710.55	191.72	1710.51	193.17	1710.15
216.12	1704.7	219.38	1703.92	223.68	1702.89	229.63	1701.44	234.84	1700.16
254.92	1699.56	292.85	1698.42	296.42	1698.07	302.85	1697.42	302.86	1697.42
308.61	1697.98	311.36	1698.25	313.22	1698.42	338.5	1699.19	372.85	1700.22
401.28	1707.33	417.85	1711.47	418.35	1711.61	418.95	1711.77	423.84	1711.72
424.66	1711.69	425.66	1711.65	426.66	1711.55	431.49	1711.15	432.87	1711.09
434.18	1711.04	436.41	1711	437.02	1710.99	438.34	1710.97	440.95	1710.93
442.61	1710.9	445.5	1710.9	445.97	1710.89	446.3	1710.88	446.89	1710.85
451.73	1710.62	460.26	1710.63	460.51	1710.63	468.26	1710.55	472.4	1710.5
475.31	1710.54	479.48	1710.69	481.58	1710.73	485.85	1710.76	495.24	1710.9
506.22	1711.19	508.11	1711.25	514.76	1712.25	516.6	1712.46	526.72	1713.52
528.99	1713.76	531.18	1713.88	532.48	1714	534.34	1714.17	535.16	1714.24
535.71	1714.23	538.35	1714.28	538.69	1714.28	539.21	1714.3	543.2	1714.43
543.52	1714.43	543.85	1714.43	545.27	1714.48	545.54	1714.47	546.64	1714.45
548.52	1714.43	549.98	1714.48	550.8	1714.45	553.62	1714.35	553.87	1714.34
554.37	1714.32	560.13	1714.1	560.49	1714.05	561.17	1713.97	563.73	1713.64
564.84	1713.52	565.96	1713.44	567.92	1713.28	569.41	1713.15	571.24	1712.94
574.88	1712.57	576.25	1712.45	580.22	1711.94	581.34	1711.93	582.38	1711.93
588.01	1711.75	589.07	1711.75						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.43	.027	548.52	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	72.43	548.52		38.24	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.47	Reach Len. (ft)	38.24	50.00	76.99
Crit W.S. (ft)		Flow Area (sq ft)		1781.59	
E.G. Slope (ft/ft)	0.002163	Area (sq ft)		1781.59	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	213.83	Top Width (ft)		213.83	
Vel Total (ft/s)	10.44	Avg. Vel. (ft/s)		10.44	
Max Chl Dpth (ft)	12.05	Hydr. Depth (ft)		8.33	
Conv. Total (cfs)	399991.5	Conv. (cfs)		399991.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		216.22	
Min Ch El (ft)	1697.42	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	589.07	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	102.50	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	15.35	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1095.2

INPUT

Description: "DR" 86+43.59 = 1095.2

Station	Elevation	Data	num=	101						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1711.82	4.1	1711.6	7.2	1713.55	7.6	1713.74	9.8	1713.63	
12.4	1713.42	13.65	1713.42	14.09	1713.42	14.23	1713.45	14.52	1713.49	
16.98	1713.89	17.92	1713.99	18.03	1714	18.77	1714	19.06	1714	
19.76	1714	20.37	1714	35.71	1714	43.78	1714	48.61	1714	
56.76	1714	61.9	1714	77.98	1714	78.71	1714	81.48	1714	
91.76	1713.99	93.56	1713.97	101.04	1713.87	108.07	1713.77	112.33	1713.52	
118.65	1713	125.12	1712.65	141.95	1712	143.4	1711.89	144.32	1711.84	
145.63	1711.82	155.42	1711.41	161.34	1711.39	168.42	1711.1	170.13	1711	
172.54	1710.95	173.8	1710.86	176.84	1710.1	210.84	1702.02	216.32	1700.7	
218.72	1700.12	239.19	1699.5	277.98	1698.34	281.54	1697.98	287.98	1697.34	
287.99	1697.34	294.37	1697.98	297.98	1698.34	335.66	1699.47	357.98	1700.14	
386.41	1707.25	402.98	1711.39	404.13	1711.43	407.8	1711.86	409.2	1711.59	
410.8	1711.39	416.15	1710.77	421.58	1710.72	423.03	1710.73	426.85	1711.1	
432.5	1711.6	440.15	1710.67	440.35	1710.65	440.4	1710.64	440.43	1710.64	
440.48	1710.63	440.55	1710.63	445.82	1710.45	449.49	1710.62	454.29	1710.86	
455.39	1710.9	456.61	1710.93	466.72	1711.17	468.01	1711.22	472.25	1711.37	
475.84	1711.57	477.51	1711.63	481.67	1712.14	482.95	1712.24	487.22	1712.68	
488.12	1712.8	488.91	1712.88	494.82	1713.86	502.18	1715.04	505.98	1715.73	
507.15	1715.93	511.11	1715.95	513.43	1716.09	515.48	1716.14	518.15	1716.1	
519.57	1716.5	521.43	1716.64	521.87	1716.58	522.93	1716.65	525.92	1716.22	
530.23	1715.84									

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	91.76	.027	522.93	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	91.76	522.93		49.35	56.41		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.37	Reach Len. (ft)	49.35	56.41	79.52
Crit W.S. (ft)		Flow Area (sq ft)		1789.30	
E.G. Slope (ft/ft)	0.002147	Area (sq ft)		1789.30	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	215.00	Top Width (ft)		215.00	
Vel Total (ft/s)	10.40	Avg. Vel. (ft/s)		10.40	
Max Chl Dpth (ft)	12.03	Hydr. Depth (ft)		8.32	

Conv. Total (cfs)	401444.5	Conv. (cfs)	401444.5		
Length Wtd. (ft)	56.41	Wetted Per. (ft)	217.38		
Min Ch El (ft)	1697.34	Shear (lb/sq ft)	1.10		
Alpha	1.00	Stream Power (lb/ft s)	530.23	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.34	100.45	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	15.10	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1094.8

INPUT

Description: "DR" 87+00 = 1094.8

Station Elevation Data		num= 115									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1711.05	5.1	1711.05	6.73	1711.56	8.59	1711.52	12.34	1711.68		
13.96	1711.76	19.23	1711.77	19.33	1711.77	19.77	1711.79	22.66	1711.92		
23.39	1711.95	30.04	1712.19	30.53	1712.21	30.82	1712.23	32	1712.33		
34.42	1712.52	34.75	1712.55	39.79	1712.99	39.92	1713	40.56	1713.05		
43.08	1713.17	43.34	1713.18	43.4	1713.17	45.35	1713.39	46.67	1713.55		
47.33	1713.64	47.67	1713.68	48.41	1713.76	51.47	1714	64.56	1714		
66.53	1714	66.74	1714	67.14	1714	67.54	1714	67.94	1714		
82.85	1714	83.36	1714	83.87	1714	84.36	1714	84.84	1714		
85.32	1714	87.78	1714	88.35	1714	88.95	1714	89.6	1714		
90.32	1714	91.1	1714	91.97	1714	93.73	1714	94.49	1714		
95.34	1714	98.44	1714	98.84	1714	98.85	1714	101.98	1713.87		
105.08	1713.7	109.01	1713.63	113.04	1713.54	115.85	1713.2	117.72	1713		
143.58	1712.06	145.19	1712	147.57	1711.41	149.16	1711.01	149.21	1711		
149.33	1710.96	152.14	1710.27	152.15	1710.26	152.24	1710.24	152.48	1710.18		
152.57	1710.12	152.88	1710.04	154.7	1709.61	154.98	1709.55	155.36	1709.45		
155.92	1709.32	156.79	1709.1	158.4	1708.7	162.35	1707.72	187.8	1701.35		
193.12	1700.04	252.59	1698.25	252.99	1698.24	253.05	1698.24	262.45	1697.3		
262.98	1697.24	262.99	1697.24	272.99	1698.24	273.38	1698.25	332.99	1700.04		
334.86	1700.51	377.99	1711.3	390.32	1711.91	392.99	1712	397.16	1712.26		
410.24	1712.96	410.62	1712.99	410.7	1712.99	410.9	1713	420.62	1713		
425.17	1713	430.57	1711.87	432.51	1711.46	434.36	1711.07	435.05	1711.09		
436.02	1711.12	438.5	1711.19	440.17	1711.26	442.46	1711.39	445.64	1711.73		
447.78	1711.92	456.54	1712.84	459.89	1713.26	461.79	1713.48	463.3	1713.72		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	98.85	.027	410.62	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	98.85	410.62		46.1	50	67.56	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.70	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.23	Reach Len. (ft)	46.10	50.00	67.56
Crit W.S. (ft)		Flow Area (sq ft)		1777.15	
E.G. Slope (ft/ft)	0.002176	Area (sq ft)		1777.15	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	213.43	Top Width (ft)		213.43	
Vel Total (ft/s)	10.47	Avg. Vel. (ft/s)		10.47	
Max Chl Dpth (ft)	11.99	Hydr. Depth (ft)		8.33	
Conv. Total (cfs)	398795.0	Conv. (cfs)		398795.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.84	
Min Ch El (ft)	1697.24	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)	463.30	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	98.14	0.02
C & E Loss (ft)	0.18	Cum SA (acres)	0.40	14.83	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1094.6

INPUT

Description: "DR" 87+50 = 1094.6 - Begin Concrete Lining

Station Elevation Data		Data		num=		119					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1710.73	2.78	1710.71	4.87	1710.72	7.12	1710.64	11.22	1710.62		
21.55	1710.97	24.77	1711.06	32.79	1711.19	58.92	1711.6	60.45	1711.6		
61.18	1711.59	61.29	1711.59	61.55	1711.6	61.56	1711.6	61.76	1711.6		
61.9	1711.6	62.44	1711.61	62.48	1711.61	62.53	1711.61	62.56	1711.61		
63.47	1711.73	63.84	1711.78	64.99	1711.94	67.24	1712.27	68.94	1712.53		
71.98	1713	73.17	1713.25	74.28	1713.44	80.28	1713.32	82.14	1713.28		
82.33	1713.27	87.53	1713.13	92.35	1713	109.06	1712.13	112.87	1712		
113.91	1711.9	114.53	1711.83	117.73	1711.51	121.06	1711.03	121.19	1711.02		
121.3	1711	131.99	1710.16	132.01	1710.16	132.02	1710.16	132.03	1710.16		
134.02	1709.66	136.02	1709.16	136.66	1709	138.02	1708.66	140.02	1708.16		
140.66	1708	142.02	1707.66	142.03	1707.66	144.03	1707.16	144.67	1707		
146.03	1706.66	148.03	1706.16	148.67	1706	150.03	1705.66	152.03	1705.16		
152.67	1705	154.03	1704.66	156.03	1704.16	156.67	1704	158.03	1703.66		
160.03	1703.16	160.67	1703	160.68	1703	162.03	1702.66	164.03	1702.16		
164.67	1702	166.03	1701.66	168.03	1701.16	168.67	1701	170.03	1700.66		
172.02	1700.16	172.66	1700	174.02	1699.66	174.07	1699.66	224.02	1698.16		
234.02	1697.16	234.93	1697.25	244	1698.16	244.49	1698.17	289.23	1699.52		
293.97	1699.66	294.03	1699.66	295.39	1700	299.38	1701	303.38	1702		
307.38	1703	311.37	1704	311.38	1704	315.38	1705	319.38	1706		
323.38	1707	323.39	1707	327.39	1708	331.39	1709	335.39	1710		
339.39	1711	343.38	1712	343.39	1712	347.38	1713	354.34	1713		
361.18	1713	361.96	1713.17	362.08	1713.19	362.31	1713.14	367.38	1712.05		
367.96	1711.96	371.59	1711.4	373.84	1710.95	380.17	1710.9	389.97	1710.74		
393.73	1710.64	401.51	1710.61	402.2	1710.59	405.58	1710.54				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	132.03	.015	347.38	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	132.03	347.38		58.47	50	58.89	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1707.19	Reach Len. (ft)	58.47	50.00	58.89
Crit W.S. (ft)	1707.19	Flow Area (sq ft)		1244.49	
E.G. Slope (ft/ft)	0.001757	Area (sq ft)		1244.49	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	180.20	Top Width (ft)		180.20	
Vel Total (ft/s)	14.95	Avg. Vel. (ft/s)		14.95	
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)		6.91	
Conv. Total (cfs)	443797.2	Conv. (cfs)		443797.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		182.20	
Min Ch El (ft)	1697.16	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)	405.58	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	96.40	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	14.60	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1094.4

INPUT

Description: "DR" 88+00 = 1094.4

Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1710.62	3.1	1710.65	10.5	1710.67	18.99	1710.64	29.5	1710.78
31.56	1710.79	36.38	1710.75	37.41	1710.97	41.15	1711.74	44.69	1712.46
44.72	1712.46	46.09	1712.74	48.11	1713.12	52.79	1713.03	58.23	1712.92
60.72	1712.75	61.26	1712.71	62.19	1712.65	64.01	1712.53	69.42	1712.18
71.51	1712.05	72.47	1712	74.77	1711.88	75.32	1711.84	78.28	1711.68
79.72	1711.59	81.77	1711.48	83.19	1711.41	85.25	1711.26	86.01	1711.22
88.78	1711.01	88.82	1711.01	88.97	1711	92.84	1710.87	93.52	1710.84
96.59	1710.74	97.91	1710.68	100.01	1710.6	101.9	1710.51	103.1	1710.47
105.52	1710.34	105.65	1710.34	106.82	1710.27	108.78	1709.29	108.81	1709.28
109.35	1709.01	109.35	1709	109.36	1709	110.82	1708.27	111.36	1708
112.82	1707.27	113.36	1707	114.82	1706.27	115.36	1706	116.82	1705.27
117.36	1705	118.82	1704.27	119.36	1704	120.82	1703.27	121.36	1703
122.82	1702.27	123.36	1702	124.82	1701.27	125.36	1701	126.82	1700.27
127.36	1700	127.37	1700	128.82	1699.27	130.82	1698.27	130.89	1698.27
190.82	1697.07	250.18	1698.26	250.66	1698.27	250.8	1698.27	250.82	1698.27
257.51	1701.62	258.28	1702	266.77	1706.25	268.28	1707	270.75	1708.23
272.28	1709	272.31	1709.01	272.31	1709.02	274.28	1710	274.29	1710
274.82	1710.27	274.83	1710.27	280.38	1710.43	285.46	1710.57	288.25	1710.64
289.75	1710.89	291.21	1711.14	291.88	1711.25	292.18	1711.3	292.35	1711.33
295.13	1711.54	296.36	1711.7	297.91	1711.9	300.61	1712.03	303.51	1712.17
304.7	1712.23	305	1712.16	305.66	1712.11	308.12	1711.36	318	1710.99
319.34	1710.95	324.33	1710.75	330.48	1710.65	334.2	1710.62	344.69	1710.51
352.73	1710.49	354.56	1710.49						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	106.82	.015	274.29	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	106.82	274.29		61.44	50	58.26	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1705.54	Reach Len. (ft)	61.44	50.00	58.26
Crit W.S. (ft)	1706.39	Flow Area (sq ft)		1049.44	
E.G. Slope (ft/ft)	0.002446	Area (sq ft)		1049.44	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	149.06	Top Width (ft)		149.06	
Vel Total (ft/s)	17.72	Avg. Vel. (ft/s)		17.72	
Max Chl Dpth (ft)	8.47	Hydr. Depth (ft)		7.04	
Conv. Total (cfs)	376090.1	Conv. (cfs)		376090.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		152.52	
Min Ch El (ft)	1697.07	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	354.56	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	95.09	0.02
C & E Loss (ft)	0.14	Cum SA (acres)	0.40	14.41	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1094.2

INPUT

Description: "DR" 88+50 = 1094.2

Station	Elevation	Data	num=	56					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1710.52	.85	1710.5	3.52	1710.53	5.16	1710.43	5.31	1710.44
5.92	1710.3	7.55	1709.64	9.16	1709.33	9.27	1709.3	10.07	1709.29
10.22	1709.29	24.93	1709.12	26.02	1709.11	26.27	1709.11	26.4	1709.11
26.89	1709.1	27.03	1709.1	27.92	1709.32	40.35	1712.33	42.75	1712.35
46.15	1712.36	52.47	1712.38	56.4	1712.4	59.82	1712.24	60.56	1712.07
60.82	1712	63.88	1711.15	63.89	1712.25	63.89	1712.5	65.77	1712.5
66.04	1712.5	66.53	1712.5	67	1712.5	67.04	1712.5	67.05	1712.43
67.09	1710.26	67.27	1710.26	69.05	1710.22	69.19	1710.22	70.44	1710.19
70.45	1710.19	94.45	1698.19	154.43	1696.99	154.45	1696.99	214.43	1698.19
214.45	1698.19	238.45	1710.19	250.44	1710.43	250.45	1710.43	256.31	1710.34
259.94	1710.29	272.68	1710.89	282.43	1710.79	292.63	1710.51	312.51	1710.49

313.34 1710.49

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 70.45 .015 238.45 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 70.45 238.45 30.58 36.17 41.92 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1705.42	Reach Len. (ft)	30.58	36.17	41.92
Crit W.S. (ft)	1706.31	Flow Area (sq ft)		1043.47	
E.G. Slope (ft/ft)	0.002489	Area (sq ft)		1043.47	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	148.90	Top Width (ft)		148.90	
Vel Total (ft/s)	17.83	Avg. Vel. (ft/s)		17.83	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	372818.9	Conv. (cfs)		372818.9	
Length Wtd. (ft)	36.17	Wetted Per. (ft)		152.34	
Min Ch El (ft)	1696.99	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	313.34	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.34	93.88	0.02
C & E Loss (ft)	0.30	Cum SA (acres)	0.40	14.24	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1093.8

INPUT

Description: "DR" 88+86.17 = 1093.8

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1710.19	3.22	1710.21	3.59	1710.22	3.81	1710.21	4.44	1710.01
5.68	1710.04	7.38	1709.08	9.69	1708.9	12.69	1708.86	14.03	1708.85
16.2	1708.84	23.51	1708.79	26.05	1708.82	28.19	1708.91	34.52	1709.02
38.27	1709.09	41.26	1709.15	42.34	1709.38	43.35	1709.59	45.82	1710.12
47.58	1710.5	49.09	1710.83	51.46	1711.37	62.27	1711.29	64.44	1711.27
65.34	1711.15	66.52	1711	71	1710.13	95	1698.13	155	1696.93
215	1698.13	239	1710.13	251	1710.37	261.72	1710.73	268.16	1710.88
269.09	1710.9	271.01	1710.95	274.5	1711	277.48	1710.29	278.21	1710.12
278.75	1709.99	282.1	1710.01	282.51	1710.01	288.58	1709.94	290.76	1709.94
308.48	1709.93	312.22	1709.96						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .031 71 .015 239 .031

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 71 239 13.83 13.83 13.83 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1705.33	Reach Len. (ft)	13.83	13.83	13.83
Crit W.S. (ft)	1706.25	Flow Area (sq ft)		1038.98	
E.G. Slope (ft/ft)	0.002522	Area (sq ft)		1038.98	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	148.78	Top Width (ft)		148.78	
Vel Total (ft/s)	17.90	Avg. Vel. (ft/s)		17.90	
Max Chl Dpth (ft)	8.40	Hydr. Depth (ft)		6.98	
Conv. Total (cfs)	370369.0	Conv. (cfs)		370369.0	
Length Wtd. (ft)	13.83	Wetted Per. (ft)		152.20	
Min Ch El (ft)	1696.93	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)	312.22	0.00	0.00

[illegible]

265.2	1711.23	267.34	1711.14	269.47	1711.05	270.73	1710.99	270.83	1710.99
270.85	1710.99	273.63	1710.86	273.89	1710.85	274.27	1710.83	276.95	1710.71
277.06	1710.71	277.51	1710.68	278.06	1710.66	280.01	1710.57	280.9	1710.53
283.08	1710.43	284.22	1710.38	286.14	1710.29	287.54	1710.23	289.2	1710.15
290.88	1710.08	292.8	1709.99	293.5	1709.96	293.89	1710.01	293.92	1710.07
293.99	1710.08	294.01	1710.08	294.05	1710.08	294.88	1710.12	297.56	1710.09
305.56	1710.29	308.07	1710.3	309.04	1710.3	309.07	1710.3	310	1710.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	71	.015	239	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	71	239		56 56	56.01	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1705.26	Reach Len. (ft)	56.00	56.00	56.01
Crit W.S. (ft)	1706.15	Flow Area (sq ft)		1043.48	
E.G. Slope (ft/ft)	0.002489	Area (sq ft)		1043.48	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	148.90	Top Width (ft)		148.90	
Vel Total (ft/s)	17.83	Avg. Vel. (ft/s)		17.83	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	372823.2	Conv. (cfs)		372823.2	
Length Wtd. (ft)	56.00	Wetted Per. (ft)		152.34	
Min Ch El (ft)	1696.83	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.34	91.64	0.02
C & E Loss (ft)	0.33	Cum SA (acres)	0.40	13.92	0.06

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1093.2

INPUT

Description: "DR" 90+00 = 1093.2

Station Elevation Data		num= 68							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1709.71	2.75	1709.7	5.64	1709.13	7.22	1708.8	9.65	1708.75
9.8	1708.75	12.71	1708.75	22.77	1708.75	30.61	1708.53	31.51	1708.51
57.96	1708.12	58.14	1708.12	58.15	1708.12	58.16	1708.12	61	1708.83
73	1708.59	95	1697.59	154.99	1696.39	155	1696.39	214.99	1697.59
215	1697.59	237	1708.59	237.01	1708.59	238.52	1709	239.7	1709.15
240.7	1709.27	245.9	1709.28	251.72	1709.27	252.49	1709.27	253.19	1709.27
255.99	1708.62	256.07	1708.6	256.09	1708.6	256.34	1708.58	256.73	1708.56
256.98	1708.55	257.57	1708.53	259.33	1708.46	259.6	1708.45	260.7	1708.47
261.12	1708.49	263.65	1708.57	271.34	1708.93	275.41	1709.07	278.07	1709.17
279.98	1709.3	281.81	1709.39	283.11	1709.43	283.89	1709.45	284.11	1709.45
284.89	1709.47	285.52	1709.49	287.53	1709.6	288.57	1709.67	289.45	1709.79
289.48	1709.85	290.69	1709.95	290.93	1709.97	291.71	1710.04	291.72	1710.04
291.73	1710.04	291.74	1710.04	295.56	1710.85	296.88	1710.96	297.86	1711.02
299.51	1711.42	304.25	1712.4	310	1712.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		50 50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1704.40	Reach Len. (ft)	50.00	50.00	50.00

Crit W.S. (ft)	1705.70	Flow Area (sq ft)		981.42	
E.G. Slope (ft/ft)	0.003004	Area (sq ft)		981.42	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	147.23	Top Width (ft)		147.23	
Vel Total (ft/s)	18.95	Avg. Vel. (ft/s)		18.95	
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)		6.67	
Conv. Total (cfs)	339396.8	Conv. (cfs)		339396.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		150.46	
Min Ch El (ft)	1696.39	Shear (lb/sq ft)		1.22	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.34	90.34	0.02
C & E Loss (ft)	0.06	Cum SA (acres)	0.40	13.73	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1092.8

INPUT

Description: "DR" 90+50 = 1092.8

Station	Elevation	Data	num=	49						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1709.57	2.42	1709.59	5.86	1709.2	6.71	1709.04	9.26	1708.95	
10.97	1708.88	17.16	1708.75	20.97	1708.66	32.29	1708.65	34.15	1708.65	
34.56	1708.65	45.36	1708.47	59.71	1708.12	59.72	1708.12	61	1708.44	
73	1708.2	95	1697.2	95.01	1697.2	155	1696	155.01	1696	
215	1697.2	237	1708.2	249	1708.44	250.66	1708.03	258.71	1708.29	
263.97	1708.5	267.74	1708.76	271.35	1708.93	273.91	1709	275.46	1709.05	
275.9	1709.05	277.44	1709.1	278.68	1709.13	282.64	1709.34	284.71	1709.49	
285.48	1709.59	285.51	1709.64	287.75	1709.84	288.19	1709.87	289.63	1709.99	
289.64	1709.99	289.65	1709.99	289.67	1709.99	289.68	1709.99	293.23	1709.49	
298.74	1709.81	301.41	1710.51	305.01	1711.67	310	1711.68			

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	73	.015
		237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.01	Wt. n-Val.		0.015	
W.S. Elev (ft)	1703.76	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1705.31	Flow Area (sq ft)		945.67	
E.G. Slope (ft/ft)	0.003366	Area (sq ft)		945.67	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	146.25	Top Width (ft)		146.25	
Vel Total (ft/s)	19.67	Avg. Vel. (ft/s)		19.67	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	320590.6	Conv. (cfs)		320590.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		149.37	
Min Ch El (ft)	1696.00	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	89.23	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	13.56	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1092.6

INPUT

Description: "DR" 91+00 = 1092.6

Station	Elevation	Data	num=	45					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1709.46	1.95	1709.48	3.28	1709.33	5.23	1709.13	6.92	1709.03

30.65	1708.76	37.01	1708.7	44.82	1708.6	49.16	1708.56	52.28	1708.5
54.62	1708.45	60.18	1708.25	61	1708.05	73	1707.81	95	1696.81
154.99	1695.61	155	1695.61	155.01	1695.61	215	1696.81	237	1707.81
249	1708.05	249.87	1707.83	255.5	1708.22	260.89	1708.47	264.72	1708.58
267.03	1708.64	267.69	1708.66	269.99	1708.73	271.83	1708.76	277.76	1709.08
280.84	1709.3	281.51	1709.39	281.54	1709.44	284.8	1709.72	285.45	1709.77
287.54	1709.95	287.55	1709.95	287.56	1709.95	287.58	1709.95	287.62	1709.95
297.88	1708.49	298.08	1708.5	298.17	1708.53	305.84	1710.99	310	1711

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.38	Wt. n-Val.		0.015	
W.S. Elev (ft)	1703.18	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1704.92	Flow Area (sq ft)		917.84	
E.G. Slope (ft/ft)	0.003691	Area (sq ft)		917.84	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	145.49	Top Width (ft)		145.49	
Vel Total (ft/s)	20.27	Avg. Vel. (ft/s)		20.27	
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	306189.0	Conv. (cfs)		306189.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.52	
Min Ch El (ft)	1695.61	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.34	88.16	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	13.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1092.4

INPUT

Description: "DR" 91+50 = 1092.4

Station	Elevation	Data	num=	42					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1709.35	2.46	1709.46	5.46	1709.17	7.78	1708.98	21.64	1708.82
25.59	1708.77	28.86	1708.73	40.56	1708.6	41.7	1708.59	44.28	1708.48
55.15	1708.05	60.21	1707.86	61	1707.66	73	1707.42	95	1696.42
95.01	1696.42	155	1695.22	214.99	1696.42	215	1696.42	237	1707.42
249	1707.66	250.43	1708.02	255.53	1708.16	258.59	1708.24	259.48	1708.26
262.54	1708.35	264.99	1708.4	272.87	1708.83	276.98	1709.12	277.55	1709.2
277.57	1709.23	281.86	1709.6	282.7	1709.68	285.46	1709.91	285.47	1709.91
285.49	1709.91	285.56	1709.91	294.08	1708.7	301.62	1708.18	302.77	1709.06
306.67	1710.32	310	1710.33						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73	237		43.29	43.29		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.69	Wt. n-Val.		0.015	
W.S. Elev (ft)	1702.64	Reach Len. (ft)	43.29	43.29	43.29
Crit W.S. (ft)	1704.53	Flow Area (sq ft)		895.85	
E.G. Slope (ft/ft)	0.003977	Area (sq ft)		895.85	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	144.88	Top Width (ft)		144.88	
Vel Total (ft/s)	20.76	Avg. Vel. (ft/s)		20.76	
Max Chl Dpth (ft)	7.42	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	294960.9	Conv. (cfs)		294960.9	
Length Wtd. (ft)	43.29	Wetted Per. (ft)		147.84	

Min Ch El (ft)	1695.22	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	87.12	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	13.23	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1092.2

INPUT

Description: "DR" 91+93.29 = 1092.2

Station Elevation Data		num=		44					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1709.27	3.75	1709.36	5.69	1709.2	7.55	1708.9	13.11	1708.58
19.5	1708.7	19.51	1708.7	19.53	1708.7	32.01	1708.5	41.32	1708.28
48.78	1708.08	60.34	1707.48	60.36	1707.48	61	1707.32	73	1707.08
95	1696.08	154.99	1694.88	155	1694.88	155.01	1694.88	215	1696.08
237	1707.08	249	1707.32	251.29	1707.89	251.3	1707.89	252.37	1707.91
256.08	1708.03	259.07	1708.09	268.65	1708.61	273.63	1708.96	274.11	1709.03
274.13	1709.06	279.31	1709.5	280.33	1709.59	283.65	1709.87	283.66	1709.87
283.67	1709.87	283.68	1709.87	283.78	1709.87	290.5	1708.91	304.82	1707.94
307	1709.61	307.38	1709.73	309.06	1709.74	310	1709.71		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		56.71 56.71	56.71	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1702.19	Reach Len. (ft)	56.71	56.71	56.71
Crit W.S. (ft)	1704.19	Flow Area (sq ft)		879.64	
E.G. Slope (ft/ft)	0.004207	Area (sq ft)		879.64	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	144.43	Top Width (ft)		144.43	
Vel Total (ft/s)	21.15	Avg. Vel. (ft/s)		21.15	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		6.09	
Conv. Total (cfs)	286767.6	Conv. (cfs)		286767.6	
Length Wtd. (ft)	56.71	Wetted Per. (ft)		147.34	
Min Ch El (ft)	1694.88	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.34	86.24	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	13.08	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1091.8

INPUT

Description: "DR" 92+50 = 1091.8

Station Elevation Data		num=		52					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1709.08	.59	1709.08	1.29	1709.08	1.64	1709.08	2.38	1709.08
3.04	1709.08	4.16	1709.08	6.2	1708.96	7.87	1708.88	7.9	1708.88
8.18	1708.88	9.42	1708.87	14.83	1708.82	16.89	1708.72	18.42	1708.64
19.18	1708.61	24	1708.6	31.74	1708.57	34.15	1708.44	55.14	1707.25
60.57	1706.99	61	1707.1	73	1706.86	95	1695.86	154.99	1694.66
155	1694.66	214.99	1695.86	215	1695.86	237	1706.86	249	1707.1
251.31	1707.68	263.11	1708.32	269.25	1708.76	269.61	1708.8	269.63	1708.83
275.97	1709.37	277.22	1709.48	281.29	1709.82	281.3	1709.82	281.31	1709.82
281.44	1709.82	285.82	1709.2	295.71	1708.52	296.02	1708.51	297.83	1708.4
301.17	1707.9	302.26	1707.63	302.87	1707.63	304.86	1707.74	306.07	1708.68
307.25	1709.63	310	1709.61						

Manning's n Values	num=	3
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Sta	n Val	Sta	n Val	Sta	n Val		
0	.031	73	.015	237	.031		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.99	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.97	Flow Area (sq ft)		882.73	
E.G. Slope (ft/ft)	0.004162	Area (sq ft)		882.73	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	144.52	Top Width (ft)		144.52	
Vel Total (ft/s)	21.07	Avg. Vel. (ft/s)		21.07	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		6.11	
Conv. Total (cfs)	288324.3	Conv. (cfs)		288324.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.44	
Min Ch El (ft)	1694.66	Shear (lb/sq ft)		1.56	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.34	85.09	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	12.89	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1091.6

INPUT

Description: "DR" 93+00 = 1091.6

Station	Elevation	Data	num=	58						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1709.09	.87	1709.09	7.44	1709.34	7.49	1709.34	7.55	1709.34	
13.38	1709.29	17.23	1709.12	18.55	1709.07	20.45	1708.99	22.22	1708.92	
23.06	1708.86	23.96	1708.79	25.27	1708.71	26.14	1708.68	27.69	1708.59	
29.07	1708.42	35.34	1708.23	42.29	1708.06	42.69	1708.06	43.49	1707.99	
48.61	1707.72	53.57	1707.47	59.84	1707.2	60.7	1706.83	61	1706.91	
73	1706.67	95	1695.67	95.01	1695.67	155	1694.47	155.01	1694.47	
215	1695.67	237	1706.67	249	1706.91	251.15	1707.45	252.32	1707.74	
258.22	1708.06	265.39	1708.57	265.65	1708.61	265.66	1708.62	273.02	1709.26	
274.47	1709.38	279.2	1709.77	279.21	1709.77	279.23	1709.77	279.38	1709.78	
281.7	1709.45	286.93	1709.09	287.09	1709.08	288.05	1709.02	289.81	1708.76	
294.28	1707.66	296.8	1707.66	298.73	1707.77	301.44	1707.71	304.22	1707.67	
306.16	1708.73	306.93	1709.24	310	1709.26					

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.82	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.78	Flow Area (sq ft)		885.81	
E.G. Slope (ft/ft)	0.004118	Area (sq ft)		885.81	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	144.60	Top Width (ft)		144.60	
Vel Total (ft/s)	21.00	Avg. Vel. (ft/s)		21.00	
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	289877.3	Conv. (cfs)		289877.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.53	
Min Ch El (ft)	1694.47	Shear (lb/sq ft)		1.54	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.34	84.08	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	12.73	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1091.4

INPUT

Description: "DR" 93+50 = 1091.4

Station	Elevation	Data	num=	62					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1707.52	2.97	1707.88	4.69	1707.85	12.03	1707.55	12.39	1707.51
12.88	1707.53	15.81	1708.09	17.86	1708.5	19.26	1708.52	22.74	1708.56
27.79	1708.49	29.66	1708.49	33.03	1708.5	36.14	1708.4	36.64	1708.34
36.81	1708.34	38.94	1707.97	41.18	1707.72	42.67	1707.58	42.99	1707.55
43.46	1707.46	45.56	1707.42	53.82	1707.32	56.97	1707	59.56	1707.08
61	1706.72	73	1706.48	95	1695.48	154.99	1694.28	155	1694.28
214.99	1695.48	215	1695.48	237	1706.48	249	1706.72	253.34	1707.8
261.53	1708.39	261.68	1708.41	261.69	1708.42	270.08	1709.14	271.73	1709.28
277.12	1709.73	277.13	1709.73	277.14	1709.73	277.32	1709.74	277.57	1709.7
278.14	1709.66	278.15	1709.66	278.26	1709.65	278.45	1709.63	286.3	1707.69
290.73	1707.69	290.82	1707.7	290.95	1707.69	291.13	1707.69	292.32	1707.73
296.55	1707.74	300.29	1707.8	301.77	1707.78	304.95	1707.69	305.2	1707.7
307.5	1708.14	310	1708.21						

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	73	.015
		237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.82	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.64	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.59	Flow Area (sq ft)		887.34	
E.G. Slope (ft/ft)	0.004096	Area (sq ft)		887.34	
Q Total (cfs)	18601.00	Flow (cfs)		18601.00	
Top Width (ft)	144.65	Top Width (ft)		144.65	
Vel Total (ft/s)	20.96	Avg. Vel. (ft/s)		20.96	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	290649.1	Conv. (cfs)		290649.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.58	
Min Ch El (ft)	1694.28	Shear (lb/sq ft)		1.54	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.34	83.06	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	12.56	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1091.2

INPUT

Description: "DR" 94+00 = 1091.2

Station	Elevation	Data	num=	65					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1706.56	.77	1706.39	1.32	1706.33	3.38	1706.24	6.65	1705.95
7.13	1705.99	8.34	1706.02	11.67	1705.82	11.71	1705.81	11.83	1705.82
14.09	1705.96	15.51	1705.99	16.17	1705.99	18.06	1705.84	18.16	1705.84
19.69	1705.59	19.94	1705.56	22.02	1705.24	22.83	1705.18	23.63	1705.21
27.85	1705.54	29.59	1705.59	31.12	1705.73	32.86	1705.78	36.25	1705.2
36.76	1705.13	37.46	1705.16	41.23	1705.57	50.16	1705.78	50.99	1705.81
51.51	1705.82	51.71	1705.83	57.25	1705.61	57.31	1705.6	61	1706.53
73	1706.29	95	1695.29	95.01	1695.29	155	1694.09	155.01	1694.09
215	1695.29	237	1706.29	249	1706.53	251.69	1707.2	254.93	1708.01
257.66	1708.21	257.71	1708.21	257.72	1708.22	267.13	1709.03	268.99	1709.19
275.03	1709.69	275.04	1709.69	275.05	1709.69	275.2	1709.69	275.21	1709.69
275.22	1709.69	275.23	1709.69	275.24	1709.69	275.26	1709.69	279.01	1707.85
280.05	1707.76	287.93	1707.77	296	1707.69	303.18	1707.49	310	1707.59

Manning's n Values		num=	3
Sta	n Val	Sta	n Val

0 .031 73 .015 237 .031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.54	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.41	Flow Area (sq ft)		900.01	
E.G. Slope (ft/ft)	0.003951	Area (sq ft)		900.01	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.00	Top Width (ft)		145.00	
Vel Total (ft/s)	20.75	Avg. Vel. (ft/s)		20.75	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	297071.8	Conv. (cfs)		297071.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.97	
Min Ch El (ft)	1694.09	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	82.03	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	12.40	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1090.8

INPUT

Description: "DR" 94+50 = 1090.8

Station Elevation Data		num=	103						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1707.17	.19	1707.16	1.11	1707.14	1.76	1706.96	2.43	1706.89
3.54	1706.74	3.75	1706.7	3.83	1706.69	4.04	1706.58	5.23	1705.93
6.97	1706.02	8.12	1706.12	9.42	1706.73	10.07	1707.03	10.15	1707.04
10.23	1707.05	12.32	1707.33	12.9	1707.35	13.81	1707.45	14.2	1707.5
14.63	1707.5	15.92	1707.44	16.17	1707.41	16.5	1707.37	18.51	1706.68
19.24	1706.52	19.77	1706.54	20.57	1706.55	22.53	1706.59	24.39	1706.6
25.09	1706.63	26.78	1706.58	27.64	1706.58	28.22	1706.62	30.11	1706.58
30.63	1706.53	32.17	1706.54	33.12	1706.56	34.42	1706.64	36.15	1706.96
36.47	1706.96	38.17	1706.86	42.53	1706.8	47	1706.88	48.97	1706.91
49.7	1706.72	51.48	1706.7	51.51	1706.7	51.7	1706.68	56.01	1706.31
57.13	1706.23	59.83	1706.04	61	1706.33	61	1706.34	73	1706.1
73	1706.09	95	1695.1	95.01	1695.09	155	1693.9	155.01	1693.9
215	1695.1	237	1706.1	249	1706.33	249	1706.34	255.29	1707.91
255.97	1708.08	256.46	1708.2	256.74	1708.27	264.19	1708.91	266.24	1709.09
272.95	1709.64	272.96	1709.64	273.09	1709.65	273.1	1709.65	273.11	1709.65
273.13	1709.65	273.16	1709.65	273.2	1709.65	273.23	1708.32	275.5	1708.24
278.09	1708.16	281.03	1708.07	284.37	1707.97	288.15	1707.88	288.19	1707.87
288.27	1707.87	291.9	1707.88	291.91	1707.88	294.2	1707.87	294.54	1707.86
296.64	1707.85	297.13	1707.84	299.06	1707.83	299.66	1707.82	301.45	1707.81
302.15	1707.8	303.82	1707.79	304.6	1707.78	306.16	1707.77	307.01	1707.76
308.48	1707.75	309.39	1707.74	310	1707.74				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1708.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.35	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.21	Flow Area (sq ft)		900.35	
E.G. Slope (ft/ft)	0.003946	Area (sq ft)		900.35	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.01	Top Width (ft)		145.01	
Vel Total (ft/s)	20.74	Avg. Vel. (ft/s)		20.74	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	297242.6	Conv. (cfs)		297242.6	

Length Wtd. (ft)	50.00	Wetted Per. (ft)	147.99		
Min Ch El (ft)	1693.90	Shear (lb/sq ft)	1.50		
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	81.00	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	12.23	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1090.6

INPUT

Description: "DR" 95+00 = 1090.6

Station	Elevation	Data	num=	70					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1706.73	1.55	1706.76	1.59	1706.77	3.78	1707.28	6.85	1707.15
10.03	1706.92	11.35	1706.92	16.46	1706.6	16.66	1706.58	18.16	1706.33
18.3	1706.29	18.39	1706.33	18.52	1706.36	18.58	1706.37	18.67	1706.39
18.78	1706.41	18.93	1706.44	19.16	1706.5	19.59	1706.62	20.9	1707.02
23.02	1706.92	26.25	1706.8	28.42	1706.78	30.05	1706.76	32.26	1706.78
32.63	1706.62	33.94	1706.22	38.27	1706.01	39.71	1705.92	40.12	1705.91
40.55	1705.87	54.43	1705.17	55.06	1705.16	57.66	1705.31	57.67	1705.31
59.11	1705.4	61	1706.14	73	1705.9	95	1694.9	95.01	1694.9
155	1693.7	214.99	1694.9	215	1694.9	237	1705.9	249	1706.14
257.92	1708.37	258.76	1708.58	261.24	1708.8	263.5	1708.99	270.86	1709.6
270.87	1709.6	270.97	1709.6	270.98	1709.6	271	1709.6	271.02	1709.6
271.06	1709.6	271.09	1709.61	271.14	1709.61	274.68	1709.74	276.88	1709.84
277.7	1709.84	278.35	1709.85	279.95	1709.9	288.99	1709.9	289.04	1709.5
298.93	1709.75	303.82	1711.69	306.93	1713.83	309.79	1715.06	310	1715.09

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	73	.015
		237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1701.15	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1703.02	Flow Area (sq ft)		900.38	
E.G. Slope (ft/ft)	0.003945	Area (sq ft)		900.38	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.01	Top Width (ft)		145.01	
Vel Total (ft/s)	20.74	Avg. Vel. (ft/s)		20.74	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	297263.3	Conv. (cfs)		297263.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.98	
Min Ch El (ft)	1693.70	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	79.97	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	12.06	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1090.4

INPUT

Description: "DR" 95+50 = 1090.4

Station	Elevation	Data	num=	49					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1706.7	.38	1706.74	3.77	1707.22	6.8	1707.34	10.41	1707.47
12.2	1707.29	15.25	1706.99	15.33	1706.99	21.25	1706.99	21.53	1706.98
27.45	1706.77	28.65	1706.71	35.42	1706.17	41.59	1706.11	50.24	1705.65
55.96	1705.64	59.43	1705.52	61.18	1705.95	61.87	1705.94	73.18	1705.71
95.9	1694.35	95.91	1694.35	155	1693.51	214.99	1694.71	215	1694.71
237	1705.71	249	1705.95	260.76	1708.89	268.78	1709.56	268.85	1709.56
268.86	1709.56	268.87	1709.56	268.88	1709.56	268.91	1709.56	268.93	1709.56

269.07	1709.56	279.83	1709.95	282.28	1710.07	282.52	1710.04	282.84	1710.08
283.41	1710.1	283.46	1710.1	284.69	1710.54	289.56	1712.33	295.35	1714.43
302.01	1717.53	303.86	1718.67	307.97	1718.52	310	1718.46		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73.18	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.18	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.86	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1702.76	Flow Area (sq ft)		895.09	
E.G. Slope (ft/ft)	0.004004	Area (sq ft)		895.09	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	144.43	Top Width (ft)		144.43	
Vel Total (ft/s)	20.86	Avg. Vel. (ft/s)		20.86	
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	295083.1	Conv. (cfs)		295083.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.44	
Min Ch El (ft)	1693.51	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	78.94	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	11.90	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1090.2

INPUT

Description: "DR" 96+00 = 1090.2

Station Elevation Data		num=		54	
Sta	Elev	Sta	Elev	Sta	Elev
0	1706.97	.77	1707.04	2.09	1707.34
10.5	1707.63	10.8	1707.63	11.04	1707.63
15.79	1707.26	18.54	1707.26	21.79	1707.26
35.14	1706.52	35.38	1706.51	35.56	1706.5
61.17	1705.5	69.44	1705.15	73.21	1704.99
154.98	1693.32	154.99	1693.32	155.01	1693.32
237	1705.52	249	1705.76	261.94	1708.99
266.69	1709.51	266.73	1709.51	266.74	1709.51
267.01	1709.52	274.44	1709.79	274.74	1709.74
281.28	1709.93	281.4	1709.9	286.51	1711.72
297.97	1718.39	301.99	1718.35	303.17	1718.32
				310	1718.14

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	73.21	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	73.21	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.74	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.68	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1702.58	Flow Area (sq ft)		896.33	
E.G. Slope (ft/ft)	0.004005	Area (sq ft)		896.33	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.04	Top Width (ft)		145.04	
Vel Total (ft/s)	20.83	Avg. Vel. (ft/s)		20.83	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	295054.0	Conv. (cfs)		295054.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		147.97	
Min Ch El (ft)	1693.32	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	77.91	0.02

C & E Loss (ft) 0.01 Cum SA (acres) 0.40 11.73 0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1089.8

INPUT

Description: "DR" 96+50 = 1089.8

Station	Elevation	Data	num=	50						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1705.92	1.28	1705.97	2.33	1706.47	3.66	1706.95	5.5	1706.94	
10.47	1706.88	13.48	1706.85	15.31	1706.94	21.21	1706.94	21.31	1706.94	
21.5	1706.94	27.25	1706.84	32.61	1706.49	35.52	1706.38	39.83	1706.05	
47.22	1705.56	59.9	1705.17	61.43	1705.14	62.22	1705.11	63.54	1705.07	
73.2	1704.79	84.9	1699.27	95.78	1694.13	102.04	1694.03	107.11	1693.94	
155	1693.13	214.99	1694.33	215	1694.33	237	1705.33	249	1705.57	
264.61	1709.47	264.95	1709.48	265.74	1709.51	265.77	1709.5	266.51	1709.52	
266.88	1709.47	267.5	1709.46	268.83	1709.5	270.63	1709.69	272.62	1709.99	
278.48	1710.38	283.88	1712.16	288.38	1713.62	291.05	1714.54	292.48	1715.58	
293.54	1716.29	298.18	1719.57	298.46	1719.77	299.94	1719.88	310	1720.61	

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	73.2	.015
		237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73.2	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.62	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.57	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1702.42	Flow Area (sq ft)		904.46	
E.G. Slope (ft/ft)	0.003897	Area (sq ft)		904.46	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.34	Top Width (ft)		145.34	
Vel Total (ft/s)	20.64	Avg. Vel. (ft/s)		20.64	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	299107.1	Conv. (cfs)		299107.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.28	
Min Ch El (ft)	1693.13	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	76.87	0.02
C & E Loss (ft)	0.04	Cum SA (acres)	0.40	11.56	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1089.6

INPUT

Description: "DR" 97+00 = 1089.6

Station	Elevation	Data	num=	53						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1704.78	1.78	1705.41	3.41	1706.05	3.87	1706.04	10.4	1706.27	
14.85	1706.46	15.23	1706.48	16.36	1706.48	21.23	1706.48	22.7	1706.44	
26.88	1706.33	34.52	1705.79	35.6	1705.72	44.5	1705.4	46.71	1705.24	
50.24	1705.19	59.63	1704.99	72.57	1704.72	72.85	1704.72	75.71	1703.37	
95.62	1693.96	154.98	1692.94	154.99	1692.94	155	1692.94	155.01	1692.94	
215	1694.14	237	1705.13	237	1705.14	249	1705.38	263.54	1709.01	
264.58	1709.27	264.67	1709.29	264.89	1709.35	264.97	1709.37	274.4	1709.91	
274.93	1709.92	278.99	1710.08	279.79	1710.06	280.46	1710.02	281.01	1710.01	
281.17	1710.01	281.53	1709.99	282.08	1710	283.75	1710.88	289.28	1714.08	
298.53	1717.9	300.16	1718.53	300.51	1718.53	303.55	1718.66	304.7	1718.69	
306.65	1718.61	307.38	1718.61	310	1718.19					

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.031	72.85	.015
		237	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.85	237	50	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.38	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1702.22	Flow Area (sq ft)		904.80	
E.G. Slope (ft/ft)	0.003896	Area (sq ft)		904.80	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.46	Top Width (ft)		145.46	
Vel Total (ft/s)	20.64	Avg. Vel. (ft/s)		20.64	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	299140.7	Conv. (cfs)		299140.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.40	
Min Ch El (ft)	1692.94	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	75.84	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	11.40	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1089.4

INPUT

Description: "DR" 97+50 = 1089.4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.87	.03	1704.88	2.28	1705.81	6.5	1705.8
13.19	1706.01	15.24	1706.22	18.64	1706.22	21.24	1706.22
26.84	1705.94	35.01	1705.74	35.69	1705.7	43.18	1705.21
47.21	1704.94	47.57	1704.93	59.82	1704.66	70.99	1704.45
85.36	1698.58	95.57	1693.82	102.91	1693.69	119.67	1693.38
155	1692.74	214.99	1693.94	215	1693.94	237	1704.94
249	1705.19	265.27	1709.25	265.28	1709.25	265.3	1709.25
279.29	1710.4	283.5	1711.92	286.88	1713.79	287.56	1714.18
297.51	1719.05	299.25	1719.02	302.95	1719.13	303.08	1719.11
309.03	1718.01	310	1717.65			303.34	1719.06

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.8	.015	237	.031

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.8	237	50	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.60	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.20	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1702.04	Flow Area (sq ft)		905.51	
E.G. Slope (ft/ft)	0.003891	Area (sq ft)		905.51	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.63	Top Width (ft)		145.63	
Vel Total (ft/s)	20.62	Avg. Vel. (ft/s)		20.62	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	299333.0	Conv. (cfs)		299333.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.55	
Min Ch El (ft)	1692.74	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	74.80	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	11.23	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1089.2

INPUT

Description: "DR" 98+00 = 1089.2

Station Elevation Data		num= 56		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.62	1.18	1705.03	1.6	1705.17	1.95	1705.31	2.28	1705.27		
7.62	1705.52	7.86	1705.53	7.98	1705.54	8.09	1705.56	9.72	1705.71		
11.72	1705.65	15.42	1705.54	16.94	1705.54	21.42	1705.54	23.46	1705.45		
27.63	1705.31	33.1	1705.26	36.68	1705.23	39.69	1705.08	42.89	1704.99		
47.01	1704.75	52.92	1704.63	59.88	1704.5	68.57	1704.22	72.89	1704.06		
93.46	1694.59	95.47	1693.66	96.65	1693.64	116.83	1693.27	155	1692.55		
214.99	1693.75	215	1693.75	237	1704.75	249	1704.99	263.89	1708.71		
263.89	1708.72	264.15	1708.78	264.37	1708.84	264.54	1708.88	273.36	1709.22		
275.08	1709.34	277.03	1708.88	277.83	1708.6	279.26	1708.87	279.83	1708.99		
280.32	1709.2	284.93	1711.42	286.24	1712.08	290.88	1714.53	296.56	1717.62		
299.44	1719.19	303.45	1719.3	305.94	1719.38	309.83	1716.58	309.99	1716.47		
310	1716.47										

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.89	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	72.89	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1700.02	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1701.85	Flow Area (sq ft)		906.30	
E.G. Slope (ft/ft)	0.003887	Area (sq ft)		906.30	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.86	Top Width (ft)		145.86	
Vel Total (ft/s)	20.60	Avg. Vel. (ft/s)		20.60	
Max Chl Dpth (ft)	7.47	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	299484.1	Conv. (cfs)		299484.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.76	
Min Ch El (ft)	1692.55	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	73.76	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	11.06	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1088.8

INPUT

Description: "DR" 98+50 = 1088.8

Station Elevation Data		num= 47		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.35	.39	1704.54	2.29	1705.25	3.32	1705.26	4.79	1705.3		
4.85	1705.3	4.88	1705.3	9.26	1705.55	13.26	1705.48	15.33	1705.55		
18.62	1705.55	21.33	1705.55	26.5	1705.39	27.33	1705.34	30.54	1705.27		
36.31	1705.13	36.98	1705.1	47.02	1704.75	58.51	1704.52	59.67	1704.5		
61.98	1704.4	66.68	1704.17	72.71	1703.88	80.22	1700.42	95.39	1693.45		
154.97	1692.36	154.99	1692.36	155	1692.36	155.01	1692.36	215	1693.56		
237	1704.56	249	1704.8	263.97	1708.54	277.09	1708.95	280.77	1708.67		
286.45	1711.42	286.62	1711.47	287.18	1711.66	290.57	1712.73	293.93	1714.32		
299.65	1717.36	304.4	1719.84	304.75	1719.92	305.53	1720.15	306.27	1720.53		
307.09	1720.46	310	1720.24								

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.71	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	72.71	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.41	Element	Left OB	Channel	Right OB
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Vel Head (ft)	6.60	Wt. n-Val.		0.015	
W.S. Elev (ft)	1699.81	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1701.66	Flow Area (sq ft)		905.95	
E.G. Slope (ft/ft)	0.003895	Area (sq ft)		905.95	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.96	Top Width (ft)		145.96	
Vel Total (ft/s)	20.61	Avg. Vel. (ft/s)		20.61	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	299168.2	Conv. (cfs)		299168.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.85	
Min Ch El (ft)	1692.36	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	72.72	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	10.89	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1088.6

INPUT

Description: "DR" 99+00 = 1088.6

Station Elevation Data		num=	47							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1705.68	.49	1705.68	7.55	1705.75	7.55	1705.77	12.08	1705.84	
15.23	1705.76	18.96	1705.76	21.23	1705.76	23.92	1705.73	26.88	1705.58	
30.86	1705.47	35.47	1705.29	37.48	1705.22	46.39	1704.69	53.3	1704.65	
58.97	1704.52	71.75	1703.78	72.49	1703.73	74.63	1702.74	95.32	1693.21	
97.79	1693.17	100.06	1693.13	154.91	1692.17	155	1692.17	214.9	1693.37	
215	1693.37	236.97	1704.35	237	1704.37	248.98	1704.61	249	1704.61	
263.1	1708.13	263.13	1708.14	263.18	1708.15	264.5	1708.15	279.3	1708.25	
286.8	1710.19	286.81	1710.2	286.83	1710.21	290.35	1712.14	297.93	1717.17	
300.12	1718.65	301.43	1718.5	303.3	1718.25	306.57	1717.85	308.81	1717.64	
309.32	1717.57	310	1717.3							

Manning's n Values		num=	3	
Sta	n Val	Sta	n Val	Sta
0	.031	72.49	.015	236.97

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	72.49	236.97		50	50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1699.60	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1701.47	Flow Area (sq ft)		904.90	
E.G. Slope (ft/ft)	0.003912	Area (sq ft)		904.90	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	146.01	Top Width (ft)		146.01	
Vel Total (ft/s)	20.63	Avg. Vel. (ft/s)		20.63	
Max Chl Dpth (ft)	7.43	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	298521.6	Conv. (cfs)		298521.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.90	
Min Ch El (ft)	1692.17	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	71.68	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	10.73	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1088.4

INPUT

Description: "DR" 99+50 = 1088.4

Station Elevation Data		num=	47							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1704.92	1.21	1705.09	3.27	1705.36	4.31	1705.4	5.1	1705.4	
5.8	1705.41	11.32	1705.47	15.17	1705.48	19.7	1705.48	21.17	1705.48	

24.73	1705.44	27.54	1705.47	33.37	1705.35	35.49	1705.27	42.01	1704.72
45.71	1704.51	50.12	1704.45	58.44	1704.39	68.28	1703.85	72.49	1703.65
80.86	1699.71	95.37	1692.85	154.98	1691.98	154.99	1691.98	155	1691.98
214.99	1693.18	215	1693.18	237	1704.18	249	1704.42	262.48	1707.79
262.49	1707.79	269.86	1707.78	277.74	1707.77	281.93	1709.35	284.71	1710.35
286.09	1710.95	289	1712.21	295.88	1716.19	299.63	1718.3	301.23	1719.47
301.68	1719.59	302.21	1719.54	304.17	1719.6	306.12	1719.49	308.37	1719.15
309.83	1719.15	310	1719.14						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.49	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	72.49	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1699.34	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1701.21	Flow Area (sq ft)		901.28	
E.G. Slope (ft/ft)	0.003955	Area (sq ft)		901.28	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.68	Top Width (ft)		145.68	
Vel Total (ft/s)	20.72	Avg. Vel. (ft/s)		20.72	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	296910.8	Conv. (cfs)		296910.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.61	
Min Ch El (ft)	1691.98	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	70.64	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	10.56	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1088.2

INPUT

Description: "DR" 100+00 = 1088.2

Station	Elevation	Data	num=	45					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.79	1.81	1705.16	3.02	1705.34	3.68	1705.35	4.35	1705.35
6.04	1705.39	12.71	1705.28	15.38	1705.25	16.39	1705.25	21.38	1705.25
22.54	1705.25	27.5	1705.2	35.97	1704.7	36.19	1704.69	37	1704.66
46.72	1704.36	50.46	1704.26	58.91	1704.07	69.98	1703.65	72.48	1703.56
80.37	1699.75	95.34	1692.53	154.96	1691.79	154.99	1691.79	155	1691.79
155.01	1691.79	215	1692.99	237	1703.99	249	1704.23	261.95	1707.46
262.1	1707.5	262.19	1707.52	262.3	1707.55	274.22	1707.44	277	1707.43
277.96	1707.8	283.91	1709.86	284.17	1709.99	288.13	1712.21	297.69	1717.98
298.83	1718.86	301.31	1718.63	306.23	1718.18	308.44	1718.01	310	1717.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.48	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	72.48	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.70	Wt. n-Val.		0.015	
W.S. Elev (ft)	1699.10	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1701.01	Flow Area (sq ft)		898.61	
E.G. Slope (ft/ft)	0.003988	Area (sq ft)		898.61	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.50	Top Width (ft)		145.50	
Vel Total (ft/s)	20.78	Avg. Vel. (ft/s)		20.78	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	295655.9	Conv. (cfs)		295655.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.46	

Min Ch El (ft)	1691.79	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	69.61	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	10.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1087.8

INPUT

Description: "DR" 100+50 = 1087.8

Station Elevation Data		num= 46							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.22	.75	1705.26	1.68	1705.28	2.06	1705.27	2.37	1705.31
2.63	1705.32	3.03	1705.32	5.81	1705.3	13.35	1705.07	15.41	1705.01
15.88	1705.01	21.41	1705.01	22.7	1704.98	27.46	1704.9	35.44	1704.71
37.05	1704.67	46.4	1704.16	47.58	1704.09	48.44	1704.07	60.08	1703.86
65.42	1703.67	72.33	1703.37	73.07	1703.02	95.31	1692.39	154.95	1691.59
154.99	1691.59	155	1691.59	155.01	1691.59	215	1692.79	215	1692.8
237	1703.79	249	1704.03	262.47	1707.4	274.79	1707.4	279.09	1708.14
283.9	1708.92	285.83	1710.21	288.36	1712.21	297.1	1717.07	298.36	1717.84
299.03	1718.25	300.61	1718.99	300.88	1718.98	303.87	1718.92	309.41	1718.59
310	1718.47								

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.031	73.07	.015
		237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73.07	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.92	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1700.81	Flow Area (sq ft)		899.93	
E.G. Slope (ft/ft)	0.003973	Area (sq ft)		899.93	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.61	Top Width (ft)		145.61	
Vel Total (ft/s)	20.75	Avg. Vel. (ft/s)		20.75	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	296239.4	Conv. (cfs)		296239.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.57	
Min Ch El (ft)	1691.59	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	68.58	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	10.23	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1087.6

INPUT

Description: "DR" 101+00 = 1087.6

Station Elevation Data		num= 45							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.57	2	1705.53	5.84	1705.46	6.74	1705.34	14.38	1704.98
15.7	1704.91	16.69	1704.91	21.7	1704.91	22.54	1704.87	27.59	1704.51
30.62	1704.42	37.69	1704.29	44.8	1703.86	47.74	1703.68	55.6	1703.51
60.47	1703.43	63.51	1703.35	68.14	1703.26	72.25	1703.17	91.74	1693.92
95.25	1692.26	115.61	1691.95	154.98	1691.4	155	1691.4	155.02	1691.4
215	1692.6	236.99	1703.6	237	1703.6	249	1703.84	262.53	1707.23
262.85	1707.3	267.6	1707.31	273.27	1707.4	283.19	1709.04	284.07	1709.18
284.57	1709.51	288.44	1712.21	292.35	1714.6	292.99	1714.91	294.44	1715.8
295.21	1716.26	300.32	1719.27	301.5	1719.06	306.41	1718.12	310	1717.24

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val

0 .031 72.25 .015 236.99 .031

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	72.25	236.99		50	50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.76	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1700.61	Flow Area (sq ft)		902.95	
E.G. Slope (ft/ft)	0.003934	Area (sq ft)		902.95	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.78	Top Width (ft)		145.78	
Vel Total (ft/s)	20.68	Avg. Vel. (ft/s)		20.68	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	297695.8	Conv. (cfs)		297695.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.72	
Min Ch El (ft)	1691.40	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	67.54	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	10.06	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1087.4

INPUT

Description: "DR" 101+50 = 1087.4

Station	Elevation	Data	num=	42					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.69	1.84	1705.62	3.04	1705.47	5.65	1704.93	6.99	1704.71
14.29	1704.49	15.76	1704.45	15.9	1704.45	21.76	1704.45	27.97	1704.17
28.36	1704.15	28.81	1704.13	37.9	1703.94	41.29	1703.79	47.81	1703.46
56.45	1703.33	61.42	1703.19	68.01	1703.05	72.48	1702.92	89.73	1694.7
95.08	1692.15	113.86	1691.86	125.76	1691.69	155	1691.21	155.01	1691.21
215	1692.41	237	1703.41	249	1703.65	262.46	1707.02	272.15	1707.09
280.2	1708.34	285.64	1709.01	288.06	1710.92	289.31	1712.03	297.78	1716.64
298.65	1717.19	300.41	1718.11	303.13	1719.8	304.52	1719.66	306.94	1719.39
308.22	1719.3	310	1719.02						

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.48	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	72.48	237		50	50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.65	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1700.45	Flow Area (sq ft)		910.95	
E.G. Slope (ft/ft)	0.003830	Area (sq ft)		910.95	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	146.04	Top Width (ft)		146.04	
Vel Total (ft/s)	20.50	Avg. Vel. (ft/s)		20.50	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.24	
Conv. Total (cfs)	301712.1	Conv. (cfs)		301712.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		149.01	
Min Ch El (ft)	1691.21	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	66.50	0.02
C & E Loss (ft)	0.03	Cum SA (acres)	0.40	9.89	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1087.2

INPUT

Description: "DR" 102+00 = 1087.2

Station Elevation Data		num=		44					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.14	2.26	1705.17	4.42	1704.85	7.05	1704.49	15.31	1704.33
15.44	1704.33	21.34	1704.33	21.44	1704.33	21.59	1704.32	27.77	1704.04
32.97	1703.85	38.21	1703.73	40.57	1703.6	48.01	1703.29	57.9	1702.98
61.26	1702.88	65.37	1702.8	69.04	1702.75	72.48	1702.7	80.71	1698.77
95.14	1691.88	110.74	1691.69	124.2	1691.52	154.99	1691.02	155	1691.02
214.99	1692.22	215	1692.22	237	1703.22	249	1703.46	262.28	1706.78
262.29	1706.78	268.36	1706.86	270.56	1706.93	275.7	1707.45	285.59	1708.54
285.77	1708.68	289.28	1711.51	297.98	1716.63	300.82	1718.08	300.94	1718.13
303.92	1718.33	304.97	1718.44	309.08	1718.74	310	1718.5		

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.48	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	72.48	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1704.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.53	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.45	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1700.26	Flow Area (sq ft)		910.45	
E.G. Slope (ft/ft)	0.003838	Area (sq ft)		910.45	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	146.06	Top Width (ft)		146.06	
Vel Total (ft/s)	20.51	Avg. Vel. (ft/s)		20.51	
Max Chl Dpth (ft)	7.43	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	301392.6	Conv. (cfs)		301392.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		149.04	
Min Ch El (ft)	1691.02	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	65.45	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	9.72	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1086.8

INPUT

Description: "DR" 102+50 = 1086.8

Station Elevation Data		num=		44					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.82	1.73	1704.85	5.75	1704.39	6.67	1704.29	11.38	1704.17
15.55	1704.06	20.64	1704.06	21.55	1704.06	25.28	1703.95	27.88	1703.87
29.05	1703.84	38.48	1703.66	44.15	1703.36	48.42	1703.1	60.46	1702.8
61.11	1702.78	61.73	1702.76	62.3	1702.75	72.27	1702.52	81.96	1697.89
95.43	1691.45	96.81	1691.43	118.24	1691.17	155	1690.83	155.01	1690.83
215	1692.03	237	1703.03	249	1703.27	262.42	1706.62	268.63	1706.81
269.91	1706.85	271.78	1707.04	272.55	1707.12	275.53	1707.4	286.01	1709.03
287.76	1709.41	290.63	1711.51	294.48	1713.64	295.25	1713.98	296.2	1714.43
298.24	1715.5	302.82	1718.07	309.12	1718.23	310	1718.26		

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.27	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	72.27	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1704.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1698.13	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1699.98	Flow Area (sq ft)		903.26	
E.G. Slope (ft/ft)	0.003929	Area (sq ft)		903.26	

Q Total (cfs)	18672.00	Flow (cfs)	18672.00		
Top Width (ft)	145.73	Top Width (ft)	145.73		
Vel Total (ft/s)	20.67	Avg. Vel. (ft/s)	20.67		
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)	6.20		
Conv. Total (cfs)	297883.9	Conv. (cfs)	297883.9		
Length Wtd. (ft)	50.00	Wetted Per. (ft)	148.70		
Min Ch El (ft)	1690.83	Shear (lb/sq ft)	1.49		
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.34	64.41	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	9.56	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1086.6

INPUT

Description: "DR" 103+00 = 1086.6

Station Elevation Data		num= 48							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.53	1.76	1704.61	3.47	1704.46	6.59	1704.16	13.81	1703.84
15.32	1703.83	19.89	1703.67	21.71	1703.6	22.68	1703.62	27.84	1703.8
36.46	1703.07	36.91	1703.05	37.7	1703.02	48.63	1702.77	63.12	1702.35
63.57	1702.35	63.6	1702.46	64.18	1702.44	72.32	1702.21	81.83	1697.7
95.53	1691.23	154.96	1690.64	154.99	1690.63	155	1690.63	214.99	1691.83
215	1691.83	237	1702.83	249	1703.07	261.8	1706.27	269.15	1706.26
283.07	1710.41	286.1	1711.21	289.99	1712.26	296.1	1713.8	297.51	1714.16
297.69	1714.25	297.76	1714.28	297.88	1714.34	298.04	1714.42	298.66	1714.68
301.37	1715.92	302.59	1716.51	302.75	1716.56	303.75	1716.98	305.29	1717.05
306.73	1716.95	309.28	1716.79	310	1716.61				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.32	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	72.32	237		50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1704.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.93	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1699.79	Flow Area (sq ft)		903.26	
E.G. Slope (ft/ft)	0.003934	Area (sq ft)		903.26	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	145.87	Top Width (ft)		145.87	
Vel Total (ft/s)	20.67	Avg. Vel. (ft/s)		20.67	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	297712.9	Conv. (cfs)		297712.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		148.83	
Min Ch El (ft)	1690.63	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	63.38	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	9.39	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1086.4

INPUT

Description: "DR" 103+50 = 1086.4

Station Elevation Data		num= 45							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1704.27	1.81	1704.25	4.37	1704.16	5.94	1704.18	6.67	1704.1
12.7	1703.84	15.33	1703.72	19.71	1703.5	21.62	1703.44	23.63	1703.5
27.94	1703.72	32.84	1703.14	36.95	1702.65	44.51	1702.43	49.16	1702.26
52.9	1702.18	63.08	1701.96	68.87	1701.88	72.48	1701.84	87.62	1694.8
95.54	1691.11	99.78	1691.07	103.45	1691.03	155	1690.44	155.01	1690.44
215	1691.64	237	1702.64	249	1702.88	260.82	1705.84	260.83	1705.84

262.35	1705.81	265.64	1705.76	267.05	1705.79	270.06	1705.89	275.52	1707.35
286.67	1710.54	294.83	1713.1	297.72	1714.32	300.08	1715.86	300.7	1716.13
302.71	1716.28	305.28	1716.55	306.75	1716.41	307.43	1716.32	310	1715.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	72.48	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	72.48	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1704.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.79	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1699.62	Flow Area (sq ft)		907.41	
E.G. Slope (ft/ft)	0.003882	Area (sq ft)		907.41	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	146.11	Top Width (ft)		146.11	
Vel Total (ft/s)	20.58	Avg. Vel. (ft/s)		20.58	
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	299699.8	Conv. (cfs)		299699.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		149.05	
Min Ch El (ft)	1690.44	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	62.34	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	9.22	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1086.2

INPUT

Description: "DR" 104+00 = 1086.2

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.35	.88	1705.35	2.62	1704.71	4.03	1704.69	6.59	1704.62
7.27	1704.28	11.62	1703.95	15.2	1703.67	20.65	1703.47	21.6	1703.43
22.51	1703.47	27.81	1703.67	34.04	1702.8	36.93	1702.48	44.59	1702.17
49.11	1702.04	51.07	1701.99	64.05	1701.68	68.82	1701.65	71.14	1701.59
88.6	1693.8	95.3	1690.9	101.64	1690.83	119.82	1690.64	128.78	1690.54
134.11	1690.49	155	1690.25	155.01	1690.25	215	1691.45	237	1702.45
249	1702.69	258.26	1705.01	258.27	1705.01	270.59	1705.4	283.52	1708.85
287.28	1710.03	296.59	1714.22	297.94	1714.85	299.42	1715.8	300.14	1716.29
301.39	1717.09	304.84	1719.38	306.38	1719.64	307.18	1719.75	307.78	1719.68
308.85	1719.59	309.83	1719.49	310	1719.47				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	71.14	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	71.14	237		50	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1704.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.54	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1699.42	Flow Area (sq ft)		903.91	
E.G. Slope (ft/ft)	0.003958	Area (sq ft)		903.91	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	146.95	Top Width (ft)		146.95	
Vel Total (ft/s)	20.66	Avg. Vel. (ft/s)		20.66	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	296787.3	Conv. (cfs)		296787.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		149.79	
Min Ch El (ft)	1690.25	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	61.30	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	9.05	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1085.8

INPUT

Description: "DR" 104+50 = 1085.8

Station	Elevation	Data	num=	52					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.1	1.64	1705.13	2.02	1705.21	3.45	1705.29	5.29	1704.49
5.97	1704.3	6.8	1704.24	11.2	1703.9	12.54	1703.85	15.14	1703.78
19.2	1703.61	21.61	1703.52	24	1703.61	27.74	1703.78	33.28	1703.23
37.18	1702.79	43.17	1702.45	50.87	1701.93	59.93	1701.78	64	1701.68
67.59	1701.16	68.35	1701.09	73.98	1698.84	95.05	1690.67	104.41	1690.58
120.91	1690.4	129.28	1690.31	134.34	1690.26	137.73	1690.23	155	1690.06
214.99	1691.26	215	1691.26	237	1702.26	249	1702.5	252.15	1703.29
256.35	1703.51	268.46	1704.82	269.75	1704.86	271.13	1704.91	272.57	1705.29
274.35	1705.85	288.04	1709.96	297.55	1713.87	300.88	1715.22	302.75	1715.79
303.21	1715.87	303.95	1715.56	304.45	1715.37	304.7	1715.31	306.1	1715.21
308.65	1715.04	310	1714.94						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	68.35	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	68.35	237		40	40	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.71	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.24	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	1699.15	Flow Area (sq ft)		898.35	
E.G. Slope (ft/ft)	0.004102	Area (sq ft)		898.35	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	148.85	Top Width (ft)		148.85	
Vel Total (ft/s)	20.78	Avg. Vel. (ft/s)		20.78	
Max Chl Dpth (ft)	7.18	Hydr. Depth (ft)		6.04	
Conv. Total (cfs)	291539.8	Conv. (cfs)		291539.8	
Length Wtd. (ft)	40.00	Wetted Per. (ft)		151.50	
Min Ch El (ft)	1690.06	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.34	60.26	0.02
C & E Loss (ft)	0.01	Cum SA (acres)	0.40	8.88	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1085.6

INPUT

Description: "DR" 104+90 = 1085.6

Station	Elevation	Data	num=	47					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.1	.28	1705.1	2.39	1705.13	2.5	1705.16	4.82	1704.53
5.18	1704.42	6.01	1704.37	10.51	1704.01	12.14	1703.94	14.97	1703.87
21.09	1703.73	21.57	1703.7	22.08	1703.73	27.58	1703.87	34.09	1703.26
36.65	1703.09	42.25	1702.45	51.94	1701.69	52.14	1701.67	52.28	1701.67
59.45	1701.35	59.52	1701.35	63.48	1701.13	63.9	1701	66.11	1700.7
80.32	1695.74	94.84	1690.5	155	1689.91	215	1691.11	223.8	1695.51
237	1702.11	242.29	1702.08	252.46	1701.48	253.59	1701.51	254.43	1701.56
258.55	1701.75	258.75	1701.76	270.93	1704.13	277.9	1706.25	288.64	1709.57
298.54	1713.4	301.75	1714.84	304.24	1715.09	305.63	1715.27	307.11	1715.37
308.54	1715.63	310	1715.58						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	66.11	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	66.11	237		25 25	25	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.75	Wt. n-Val.		0.015	
W.S. Elev (ft)	1697.03	Reach Len. (ft)	25.00	25.00	25.00
Crit W.S. (ft)	1698.99	Flow Area (sq ft)		895.74	
E.G. Slope (ft/ft)	0.004188	Area (sq ft)		895.74	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	150.21	Top Width (ft)		150.21	
Vel Total (ft/s)	20.85	Avg. Vel. (ft/s)		20.85	
Max Chl Dpth (ft)	7.12	Hydr. Depth (ft)		5.96	
Conv. Total (cfs)	288544.2	Conv. (cfs)		288544.2	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		152.75	
Min Ch El (ft)	1689.91	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	0.34	59.44	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	8.75	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1085.4

INPUT

Description: "DR" 105+15 = 1085.4 End Channel Improvements, tie into existing concrete lining

Station	Elevation	Data	num=	44			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.25	2.48	1705.21	4.19	1704.77	5.25	1704.57
10.43	1704.05	12.17	1703.96	14.77	1703.89	17.41	1703.83
25.02	1703.83	27.38	1703.89	29.84	1703.66	36.75	1703.21
52.5	1701.43	53.21	1701.37	54.11	1701.27	59.68	1700.7
64.84	1700.46	70.64	1698.51	92.8	1691.04	94.74	1690.39
214.62	1691.01	215	1691.01	237	1702.01	244.97	1701.51
254.25	1700.94	261.83	1701.38	269.07	1703.05	271.01	1703.64
288.93	1709.23	288.94	1709.23	301.61	1714.55	303.37	1714.8
306.55	1715.33	306.59	1715.33	307.62	1715.21	310	1714.93

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	64.84	.015	237	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	64.84	237		35 35	35	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1696.88	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	1698.86	Flow Area (sq ft)		892.98	
E.G. Slope (ft/ft)	0.004266	Area (sq ft)		892.98	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	151.25	Top Width (ft)		151.25	
Vel Total (ft/s)	20.91	Avg. Vel. (ft/s)		20.91	
Max Chl Dpth (ft)	7.07	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	285874.0	Conv. (cfs)		285874.0	
Length Wtd. (ft)	35.00	Wetted Per. (ft)		153.71	
Min Ch El (ft)	1689.81	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.34	58.93	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	8.66	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1085.2

INPUT

Description: "DR" 105+50 = 1085.2

Station Elevation		Data		num=		65									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1705.38	.72	1705.38	2.46	1705.36	2.69	1705.3	5.46	1704.79						
8.96	1704.43	10.7	1704.16	12.48	1704.06	14.89	1704.07	18.16	1703.97						
21.52	1703.92	24.48	1703.97	27.5	1704.07	29.71	1703.86	34.41	1703.55						
36.52	1703.43	48.69	1701.9	52.74	1701.35	54.18	1701.1	58.86	1700.43						
63.35	1700.26	64.63	1700.21	70.01	1698.43	94.84	1690.26	94.91	1690.23						
101.04	1690.18	115.92	1689.96	121.85	1689.91	125.95	1689.87	129.33	1689.84						
136.62	1689.78	144.83	1689.73	154.77	1689.67	155	1689.67	156.15	1689.67						
157.18	1689.66	166.68	1689.7	178.3	1689.81	186.95	1689.89	191.1	1689.93						
199.27	1690.01	199.99	1690.02	213.76	1690.21	214.53	1690.22	216.16	1690.75						
244.84	1700.15	245.25	1700.18	250.09	1700.49	261.26	1700.84	264.72	1701.05						
266.72	1701.4	272.2	1703.05	289.24	1708.29	290.21	1708.62	291.48	1709.3						
291.67	1709.39	292.04	1709.6	292.63	1709.95	300.58	1714.15	302.06	1714.34						
302.83	1714.67	304.99	1714.62	305.71	1714.6	307.17	1714.66	310	1714.61						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.031	64.63	.015	244.84	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	64.63	244.84		90.18	93.33	96.48	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1703.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1696.21	Reach Len. (ft)	90.18	93.33	96.48
Crit W.S. (ft)	1698.41	Flow Area (sq ft)		864.20	
E.G. Slope (ft/ft)	0.004936	Area (sq ft)		864.20	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	156.07	Top Width (ft)		156.07	
Vel Total (ft/s)	21.61	Avg. Vel. (ft/s)		21.61	
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)		5.54	
Conv. Total (cfs)	265776.0	Conv. (cfs)		265776.0	
Length Wtd. (ft)	93.33	Wetted Per. (ft)		157.99	
Min Ch El (ft)	1689.66	Shear (lb/sq ft)		1.69	
Alpha	1.00	Stream Power (lb/ft s)	310.00	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.34	58.22	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	8.54	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash

RS: 1085

INPUT

Description: "DR" 106+43.3 = 2008 LV Wash LOMR Cross Section 1085

Station Elevation		Data		num=		186									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1706.15	.07	1706.14	2.04	1706.12	3.23	1706.02	9.04	1706.04						
9.14	1706.05	9.24	1706.05	9.34	1706.05	9.45	1706.05	9.57	1706.05						
9.68	1706.05	9.8	1706.05	9.93	1706.05	10.06	1706.06	10.19	1706.06						
10.33	1706.06	10.47	1706.06	10.62	1706.06	10.78	1706.06	10.94	1706.06						
11.11	1706.07	11.29	1706.07	11.47	1706.07	11.66	1706.07	11.86	1706.07						
12.07	1706.07	12.29	1706.08	12.48	1706.08	12.61	1706.08	12.62	1706.08						
13.33	1706.08	13.92	1706.09	14.06	1706.09	14.6	1706.09	15.06	1706.09						
15.3	1706.1	15.71	1706.1	16.01	1706.1	16.37	1706.1	16.69	1706.1						
17.05	1706.1	17.32	1706.11	17.55	1706.11	17.96	1706.11	18.15	1706.11						
18.62	1706.11	18.77	1706.11	18.9	1706.11	19.4	1706.11	19.49	1706.11						
19.56	1706.11	20.09	1706.11	20.13	1706.11	20.7	1706.11	20.71	1706.11						
20.77	1706.11	20.97	1706.1	21.17	1706.08	21.34	1706.06	21.48	1706.05						
21.61	1706.04	23.76	1705.88	25.78	1705.93	31.36	1706.04	32.53	1706.08						
36.37	1706.32	38.24	1706.21	39.62	1706.31	41.78	1706.35	48.43	1706.57						
49.39	1706.59	50.48	1706.6	55.89	1706.58	56.98	1706.42	57.65	1706.4						
57.93	1706.39	58.25	1706.39	58.49	1706.4	63.58	1705.75	63.79	1705.75						
65.19	1705.79	66.21	1706.02	66.81	1706.23	67.15	1706.25	67.71	1706.25						
68.45	1706.27	69.42	1706.29	79.01	1706.46	79.71	1706.47	80.91	1706.5						
82.01	1706.52	82.98	1706.55	83.94	1706.56	84.69	1706.57	85.2	1706.58						
85.4	1706.59	88.13	1706.69	89.79	1706.35	90.08	1706	91.5	1705.81						
93.22	1705.55	96.6	1705.11	96.62	1705.1	99.26	1705.06	101.92	1705.15						

104.97	1705.04	106.19	1705	108.27	1704.9	110.73	1705.03	113.7	1705.15
114.59	1705.18	117.18	1704.78	119.12	1704.6	120.52	1704.41	124.11	1703.86
126.57	1703.45	137.02	1701.72	137.63	1701.64	139.26	1701.4	140.43	1701.11
144.17	1700.19	148.14	1700	148.19	1700	149.55	1699.93	154.51	1698.26
160.67	1696.19	166.5	1694.23	176.58	1690.84	176.64	1690.83	179.56	1689.85
185.3	1689.78	194.19	1689.68	224.05	1689.31	231.42	1689.22	233.21	1689.2
236.48	1689.18	239.22	1689.15	239.28	1689.15	239.34	1689.15	239.37	1689.15
239.86	1689.15	249.28	1689.2	268.27	1689.41	288.78	1689.64	295.95	1689.72
299.24	1689.75	314.81	1694.93	323.75	1697.9	324.47	1698.14	329.43	1699.79
329.72	1699.81	331.3	1699.9	332.3	1699.96	332.98	1700	335.32	1700.17
337.1	1700.31	341.97	1700.52	350.36	1701.09	353.24	1701.29	358.69	1702.02
360.27	1702.24	361.18	1702.42	363.65	1702.86	364.29	1702.97	366.43	1703.54
371.42	1705.01	377.98	1706.94	378.16	1707.26	379.12	1708.92	379.58	1709.47
381.03	1710.27	381.62	1710.56	383.32	1711.7	384.18	1711.51	384.34	1711.48
387.08	1710.96	387.68	1710.89	390.28	1710.61	393.05	1710.47	394.34	1710.33
394.66	1710.29	394.83	1710.26	394.9	1710.25	395.15	1710.23	395.41	1710.17
397.61	1710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.031	149.55	.015	329.43	.031

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	149.55	329.43		71.55	197.25	187.76	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1702.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1695.81	Reach Len. (ft)	71.55	197.25	187.76
Crit W.S. (ft)	1697.96	Flow Area (sq ft)		868.46	
E.G. Slope (ft/ft)	0.004841	Area (sq ft)		868.46	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	155.67	Top Width (ft)		155.67	
Vel Total (ft/s)	21.50	Avg. Vel. (ft/s)		21.50	
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	268365.4	Conv. (cfs)		268365.4	
Length Wtd. (ft)	197.25	Wetted Per. (ft)		157.63	
Min Ch El (ft)	1689.15	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)	397.61	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	0.34	56.36	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	8.20	0.06

CROSS SECTION

RIVER: Las Vegas Wash
 REACH: LV Wash RS: 1084

INPUT

Description: 2008 LV Wash LOMR Cross Section 1084

Station	Elevation	Data	num=	40
Sta	Elev	Sta	Elev	Sta
1000	1703	1009.6	1702	1023.14
1062.76	1698	1070.69	1697	1077.6
1101.47	1693	1109.46	1692	1115.59
1129.51	1691	1132.85	1690	1142.86
1256.54	1690	1260.1	1691	1263.6
1273.02	1695	1276.19	1696	1279.91
1315.8	1700	1323.22	1701	1327.76
1337.74	1705	1340.27	1706	1342.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1055.35	.015	1292.15	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1055.35	1292.15		215	200	193	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1701.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.76	Reach Len. (ft)	215.00	200.00	193.00

Crit W.S. (ft)	1697.01	Flow Area (sq ft)		868.63	
E.G. Slope (ft/ft)	0.005954	Area (sq ft)		868.63	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	182.90	Top Width (ft)		182.90	
Vel Total (ft/s)	21.50	Avg. Vel. (ft/s)		21.50	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		4.75	
Conv. Total (cfs)	241978.5	Conv. (cfs)		241978.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		184.19	
Min Ch El (ft)	1688.48	Shear (lb/sq ft)		1.75	
Alpha	1.00	Stream Power (lb/ft s)	1379.26	0.00	0.00
Frctn Loss (ft)	1.06	Cum Volume (acre-ft)	0.34	52.43	0.02
C & E Loss (ft)	0.00	Cum SA (acres)	0.40	7.44	0.06

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1083

INPUT

Description: 2008 LV Wash LOMR Cross Section 1083

Station Elevation Data		num= 44							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1701	1065.05	1700	1065.34	1700	1067.48	1700	1097.27	1700
1143.9	1699	1202.78	1698	1221.67	1697	1224.17	1696	1226.67	1695
1229.24	1694	1231.89	1693	1234.53	1692	1237.17	1691	1239.81	1690
1244.62	1689	1260.66	1688	1309.63	1687.51	1358.6	1688	1372.13	1689
1375.93	1690	1379.21	1691	1382.36	1692	1385.38	1693	1388.39	1694
1391.39	1695	1394.63	1696	1398.52	1697	1402.89	1698	1425.61	1699
1433.21	1700	1437.08	1701	1440.58	1702	1444.69	1703	1447.02	1704
1449.21	1705	1451.26	1706	1453.31	1707	1455.28	1708	1457.13	1709
1459.16	1710	1461.18	1711	1463.2	1712	1485.82	1712		

Manning's n Values		num= 4							
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1221.67	.015	1398.52	.025	1425.61	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1221.67	1398.52		212.32	201.49	190.66	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1700.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.44	Reach Len. (ft)	212.32	201.49	190.66
Crit W.S. (ft)	1696.23	Flow Area (sq ft)		930.74	
E.G. Slope (ft/ft)	0.004033	Area (sq ft)		930.74	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	161.62	Top Width (ft)		161.62	
Vel Total (ft/s)	20.06	Avg. Vel. (ft/s)		20.06	
Max Chl Dpth (ft)	6.93	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	294017.1	Conv. (cfs)		294017.1	
Length Wtd. (ft)	201.49	Wetted Per. (ft)		163.44	
Min Ch El (ft)	1687.51	Shear (lb/sq ft)		1.43	
Alpha	1.00	Stream Power (lb/ft s)	1485.82	0.00	0.00
Frctn Loss (ft)	0.97	Cum Volume (acre-ft)	0.34	48.30	0.02
C & E Loss (ft)	0.28	Cum SA (acres)	0.40	6.64	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1082

INPUT

Description: 2008 LV Wash LOMR Cross Section 1082

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1478.378	1701	1513.48	1701	1533.21	1700	1675.64	1699	1692.34	1698
1720.86	1697	1726.48	1696	1729.68	1695	1732.76	1694	1735.81	1693
1738.81	1692	1741.81	1691	1744.83	1690	1748.87	1689	1753.07	1688
1765.96	1687	1813.74	1686.52	1861.52	1687	1873.2	1688	1877.59	1689
1881.35	1690	1884.39	1691	1887.39	1692	1890.39	1693	1893.48	1694
1896.57	1695	1899.7	1696	1906.28	1697	1932.28	1698	1939.94	1699
1943.59	1700	1945.35	1701	1947.11	1702	1948.9	1703	1950.69	1704
1952.49	1705	1954.16	1706	1955.81	1707	1957.59	1708	1959.36	1709
1961.14	1710	1977.65	1710						

Manning's n Values

num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1478.378	.025	1720.86	.015	1906.28	.025	1932.28	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1720.86	1906.28		200.29	200.52	200.84	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1699.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1693.72	Reach Len. (ft)	200.29	200.52	200.84
Crit W.S. (ft)	1695.46	Flow Area (sq ft)		936.97	
E.G. Slope (ft/ft)	0.003858	Area (sq ft)		936.97	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	158.98	Top Width (ft)		158.98	
Vel Total (ft/s)	19.93	Avg. Vel. (ft/s)		19.93	
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)		5.89	
Conv. Total (cfs)	300616.6	Conv. (cfs)		300616.6	
Length Wtd. (ft)	200.52	Wetted Per. (ft)		160.75	
Min Ch El (ft)	1686.52	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)	1977.65	0.00	0.00
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	0.34	43.98	0.02
C & E Loss (ft)	0.02	Cum SA (acres)	0.40	5.90	0.06

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1081

INPUT

Description: 2008 LV Wash LOMR Cross Section 1081

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1701	1020.82	1700.17	1024.99	1700	1050.88	1699	1080.43	1698
1097.94	1697	1120.48	1696	1125.23	1695	1128.9	1694	1132.33	1693
1135.48	1692	1138.56	1691	1141.64	1690	1145.2	1689	1148.98	1688
1154.26	1687	1213.47	1686.41	1272.68	1687	1277.31	1688	1280.9	1689
1284.01	1690	1287.12	1691	1290.18	1692	1293.23	1693	1296.28	1694
1300.06	1695	1304.69	1696	1320.29	1697	1330.91	1698	1336.86	1699
1340.94	1700	1344.58	1701	1347.49	1702	1350.14	1703	1352.79	1704
1355.15	1705	1357.38	1706	1359.61	1707	1361.69	1708	1363.99	1709
1366.32	1710								

Manning's n Values

num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1120.48	.015	1304.69	.025	1320.29	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1120.48	1304.69		263.95	199.61	135.18	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1698.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1694.42	Reach Len. (ft)	263.95	199.61	135.18
Crit W.S. (ft)	1695.09	Flow Area (sq ft)		1119.67	
E.G. Slope (ft/ft)	0.002343	Area (sq ft)		1119.67	

Q Total (cfs)	18672.00	Flow (cfs)	18672.00		
Top Width (ft)	170.52	Top Width (ft)	170.52		
Vel Total (ft/s)	16.68	Avg. Vel. (ft/s)	16.68		
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	6.57		
Conv. Total (cfs)	385719.9	Conv. (cfs)	385719.9		
Length Wtd. (ft)	199.61	Wetted Per. (ft)	172.65		
Min Ch El (ft)	1686.41	Shear (lb/sq ft)	0.95		
Alpha	1.00	Stream Power (lb/ft s)	1366.32	0.00	0.00
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	0.34	39.25	0.02
C & E Loss (ft)	0.55	Cum SA (acres)	0.40	5.14	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1080

INPUT

Description: 2008 LV Wash LOMR Cross Section 1080

Station Elevation Data			num=	38						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta
1725	1699.2	1765.04	1699	1808.05	1698	1827.1	1697	1844.74	1696	
1867.67	1695	1872.61	1694	1875.6	1693	1878.59	1692	1881.59	1691	
1884.58	1690	1887.7	1689	1890.93	1688	1894.72	1687	1900.05	1686	
1958.5	1685.42	2016.95	1686	2021.77	1687	2025	1688	2028.23	1689	
2031.22	1690	2034.21	1691	2037.2	1692	2040.2	1693	2043.56	1694	
2047.58	1695	2054.24	1696	2072.15	1697	2079.65	1698	2085.09	1699	
2090.17	1700	2093.55	1701	2095.5	1702	2097.45	1703	2099.39	1704	
2101.21	1705	2103.04	1706	2104.86	1707					

Manning's n Values			num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1725	.025	1867.67	.015	2054.24	.025	2072.15	.055		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1867.67	2054.24		221	200	185	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1698.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1692.91	Reach Len. (ft)	221.00	200.00	185.00
Crit W.S. (ft)	1694.16	Flow Area (sq ft)		1019.16	
E.G. Slope (ft/ft)	0.003045	Area (sq ft)		1019.16	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	164.05	Top Width (ft)		164.05	
Vel Total (ft/s)	18.32	Avg. Vel. (ft/s)		18.32	
Max Chl Dpth (ft)	7.49	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	338370.3	Conv. (cfs)		338370.3	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		166.10	
Min Ch El (ft)	1685.42	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	2104.86	0.00	0.00
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	0.34	34.35	0.02
C & E Loss (ft)	0.09	Cum SA (acres)	0.40	4.38	0.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1079

INPUT

Description: 2008 LV Wash LOMR Cross Section 1079

Station Elevation Data	num=	39
------------------------	------	----

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1698	1054.26	1697	1085.3	1696.61	1134.75	1696	1157.09	1695
1191.03	1694	1195.44	1693	1198.48	1692	1201.51	1691	1204.44	1690
1207.37	1689	1210.49	1688	1213.82	1687	1217.95	1686	1223.92	1685
1280.19	1684.44	1336.46	1685	1342.51	1686	1346.19	1687	1349.65	1688
1352.78	1689	1355.86	1690	1358.83	1691	1361.7	1692	1364.63	1693
1368.08	1694	1372.93	1695	1393.98	1696	1402.58	1697	1407.56	1698
1410.97	1699	1414.09	1700	1415.99	1701	1417.89	1702	1419.69	1703
1421.67	1704	1423.98	1705	1425.91	1706	1427.85	1707		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1191.03	.015	1368.08	.025	1393.98	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1191.03	1368.08		250	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1697.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.70	Wt. n-Val.		0.015	
W.S. Elev (ft)	1691.72	Reach Len. (ft)	250.00	200.00	170.00
Crit W.S. (ft)	1693.24	Flow Area (sq ft)		974.36	
E.G. Slope (ft/ft)	0.003463	Area (sq ft)		974.36	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	161.58	Top Width (ft)		161.58	
Vel Total (ft/s)	19.16	Avg. Vel. (ft/s)		19.16	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	317276.2	Conv. (cfs)		317276.2	
Length Wtd. (ft)	200.08	Wetted Per. (ft)		163.49	
Min Ch El (ft)	1684.44	Shear (lb/sq ft)		1.29	
Alpha	1.00	Stream Power (lb/ft s)	1427.85	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	0.34	29.77	0.02
C & E Loss (ft)	0.05	Cum SA (acres)	0.40	3.63	0.06

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1078

INPUT

Description: 2008 LV Wash LOMR Cross Section 1078

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1602.58	1698	1611.57	1697.174	1613.47	1697	1646.48	1696	1760.21	1695
1794.28	1694	1821.97	1693	1825.83	1692	1828.74	1691	1831.67	1690
1834.67	1689	1837.7	1688	1840.97	1687	1844.27	1686	1848.39	1685
1858.16	1684	1915.06	1683.5	1958.58	1684	1970.9	1685	1975.19	1686
1978.66	1687	1981.81	1688	1984.93	1689	1987.97	1690	1991.02	1691
1994.16	1692	1997.31	1693	2002.8	1694	2022.08	1695	2032.44	1696
2036.91	1697	2039.61	1698	2042.32	1699	2044.21	1700	2046.06	1701
2047.93	1702	2049.8	1703	2051.76	1704	2053.71	1705	2055.67	1706
2059.51	1707	2066.88	1708						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1602.58	.025	1821.97	.015	2002.8	.025	2022.08	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1821.97	2002.8		215	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1696.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.98	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1694.72	Reach Len. (ft)	215.00	200.00	190.00
Crit W.S. (ft)	1692.38	Flow Area (sq ft)	42.79	1644.28	5.04
E.G. Slope (ft/ft)	0.000701	Area (sq ft)	42.79	1644.28	5.04
Q Total (cfs)	18672.00	Flow (cfs)	58.85	18609.13	4.03
Top Width (ft)	247.11	Top Width (ft)	52.34	180.83	13.95
Vel Total (ft/s)	11.03	Avg. Vel. (ft/s)	1.38	11.32	0.80
Max Chl Dpth (ft)	11.22	Hydr. Depth (ft)	0.82	9.09	0.36
Conv. Total (cfs)	705295.9	Conv. (cfs)	2223.0	702920.9	152.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
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882.948 1006.56 92 92 92 .3 .5
 Skew Angle = 28

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1696.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1693.56	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1691.23	Flow Area (sq ft)		1386.96	
E.G. Slope (ft/ft)	0.000918	Area (sq ft)		1386.96	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	13.46	Avg. Vel. (ft/s)		13.46	
Max Chl Dpth (ft)	11.29	Hydr. Depth (ft)		11.22	
Conv. Total (cfs)	616128.4	Conv. (cfs)		616128.4	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		146.05	
Min Ch El (ft)	1682.27	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		12.22	
C & E Loss (ft)		Cum SA (acres)		1.67	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

BRIDGE

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1075.5

INPUT

Description: Vegas Valley Bridge

Distance from Upstream XS = 1

Deck/Roadway Width = 90

Weir Coefficient = 2.6

Bridge Deck/Roadway Skew = 28

Upstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

882.948 1697.07 1692.35 1006.56 1697.1 1692.42

Upstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

882.948 1697.07 882.948 1692.35 882.948 1682.27 1006.56 1682.41 1006.56 1692.42

1006.56 1697.1

Manning's n Values

num= 3

Sta n Val Sta n Val Sta n Val

882.948 .055 882.948 .015 1006.56 .055

Bank Sta: Left Right Coeff Contr. Expan.

882.948 1006.56 .3 .5

Skew Angle = 28

Downstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

882.948 1697.06 1691.96 1006.56 1697.71 1691.98

Downstream Bridge Cross Section Data

Station Elevation Data num= 6

Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

882.948 1697.06 882.948 1691.96 882.948 1681.88 1006.56 1681.96 1006.56 1691.98

1006.56 1697.71

Manning's n Values

num= 3

Sta n Val Sta n Val Sta n Val

882.948 .055 882.948 .015 1006.56 .055

Bank Sta: Left Right Coeff Contr. Expan.

882.948 1006.56 .3 .5
Skew Angle = 28

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 9

Pier Data

Pier Station Upstream= 895.309 Downstream= 895.309

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 907.67 Downstream= 907.67

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 920.031 Downstream= 920.031

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 932.393 Downstream= 932.393

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 944.754 Downstream= 944.754

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 957.115 Downstream= 957.115

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data

Pier Station Upstream= 969.476 Downstream= 969.476

Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 981.838 Downstream= 981.838
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Pier Data
Pier Station Upstream= 994.199 Downstream= 994.199
Upstream num= 2
Width Elev Width Elev
.67 1680 .67 1700
Downstream num= 2
Width Elev Width Elev
.67 1680 .67 1700

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = 2
Yarnell KVal = 1.25

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1696.38	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1693.56	E.G. Elev (ft)	1696.17	1695.75
Q Total (cfs)	18672.00	W.S. Elev (ft)	1691.57	1691.10
Q Bridge (cfs)	18672.00	Crit W.S. (ft)	1691.57	1691.10
Q Weir (cfs)		Max Chl Dpth (ft)	9.30	9.22
Weir Sta Lft (ft)		Vel Total (ft/s)	17.20	17.30
Weir Sta Rgt (ft)		Flow Area (sq ft)	1085.44	1079.53
Weir Submerg		Froude # Chl	1.00	1.01
Weir Max Depth (ft)		Specif Force (cu ft)	14985.30	14985.44
Min El Weir Flow (ft)	1697.08	Hydr Depth (ft)	9.23	9.18
Min El Prs (ft)	1692.42	W.P. Total (ft)	302.21	301.20
Delta EG (ft)	0.57	Conv. Total (cfs)	252178.1	250449.7
Delta WS (ft)	3.67	Top Width (ft)	117.58	117.58
BR Open Area (sq ft)	1181.09	Frctn Loss (ft)		
BR Open Vel (ft/s)	17.30	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.23	1.24
Br Sel Method	Momentum	Power Total (lb/ft s)	882.95	882.95

Warning: The momentum, Class B, supercritical, water surface downstream of the bridge had a higher energy than the upstream

cross section. This is not physically possible. The downstream water surface has been computed by taking the

momentum result inside of the bridge and performing an energy balance.

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: The momentum method has computed a class B profile.

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water

surface that had the least amount of error between computed and assumed values.

Note: The energy method has computed a class B profile.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1075.1

INPUT

Description: 2008 LV Wash LOMR Cross Section - Vegas Valley DS 1075.1

Station	Elevation	Data	num=	6					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
882.948	1697.06	882.948	1691.96	882.948	1681.88	1006.56	1681.96	1006.56	1691.98
1006.56	1697.71								

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
882.948	.055	882.948	.015	1006.56	.055

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	882.948	1006.56		180	198		.3	.5

Skew Angle = 28

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1695.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1689.90	Reach Len. (ft)	180.00	198.00	220.00
Crit W.S. (ft)	1690.82	Flow Area (sq ft)		985.75	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		985.75	
Q Total (cfs)	18672.00	Flow (cfs)		18672.00	
Top Width (ft)	123.61	Top Width (ft)		123.61	
Vel Total (ft/s)	18.94	Avg. Vel. (ft/s)		18.94	
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)		7.97	
Conv. Total (cfs)	359477.9	Conv. (cfs)		359477.9	
Length Wtd. (ft)	198.00	Wetted Per. (ft)		139.56	
Min Ch El (ft)	1681.88	Shear (lb/sq ft)		1.19	
Alpha	1.00	Stream Power (lb/ft s)	1006.56	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		9.94	
C & E Loss (ft)		Cum SA (acres)		1.42	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Note: The energy method has computed a class B profile.

CROSS SECTION

RIVER: Las Vegas Wash
REACH: LV Wash RS: 1075

INPUT

Description: 2008 LV Wash LOMR Cross Section 1075

Station	Elevation	Data	num=	31					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1821.2	1695	1854.41	1694	1862.1	1693	1868.46	1692	1873.15	1691
1877.11	1690	1880.88	1689	1883.78	1688	1886.67	1687	1889.65	1686
1892.83	1685	1896.12	1684	1900.06	1683	1907.28	1682	1943.12	1681
1950.82	1681	1969.14	1681	2015.14	1682	2023.78	1683	2027.78	1684
2031.27	1685	2034.53	1686	2037.64	1687	2040.76	1688	2043.79	1689
2046.88	1690	2050.38	1691	2054.3	1692	2059.57	1693	2065.77	1694
2073.84	1695								

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1821.2	.025	1854.41	.015	2065.77	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1854.41	2065.77		201	200		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1694.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.35	Wt. n-Val.		0.015	
W.S. Elev (ft)	1688.23	Reach Len. (ft)	201.00	200.00	200.00
Crit W.S. (ft)	1690.07	Flow Area (sq ft)		925.85	

E.G. Slope (ft/ft)	0.004012	Area (sq ft)	925.85
Q Total (cfs)	18718.00	Flow (cfs)	18718.00
Top Width (ft)	158.36	Top Width (ft)	158.36
Vel Total (ft/s)	20.22	Avg. Vel. (ft/s)	20.22
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)	5.85
Conv. Total (cfs)	295517.9	Conv. (cfs)	295517.9
Length Wtd. (ft)	200.00	Wetted Per. (ft)	160.08
Min Ch El (ft)	1681.00	Shear (lb/sq ft)	1.45
Alpha	1.00	Stream Power (lb/ft s)	2073.84
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	5.59
C & E Loss (ft)	0.23	Cum SA (acres)	0.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Las Vegas Wash

REACH: LV Wash RS: 1074

INPUT

Description: 2008 LV Wash LOMR Cross Section 1074

Station	Elevation	Data	num=	36
Sta	Elev	Sta	Elev	Sta
1872.61	1694	1881.94	1693	1886.68
1896.65	1689	1899.39	1688	1902.31
1911.09	1684	1914.87	1683	1919.14
2017.45	1681	2040.41	1682	2045.68
2055.63	1686	2058.61	1687	2061.89
2071.98	1691	2076.03	1692	2081.64
2117.7	1696	2130.69	1697	2134.37
2142.75	1701			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1872.61	.025	1872.61	.031
		2087.97	.025

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1872.61	2087.97	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1693.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.39	Wt. n-Val.		0.031	
W.S. Elev (ft)	1691.15	Reach Len. (ft)			
Crit W.S. (ft)	1689.58	Flow Area (sq ft)		1509.72	
E.G. Slope (ft/ft)	0.004090	Area (sq ft)		1509.72	
Q Total (cfs)	18718.00	Flow (cfs)		18718.00	
Top Width (ft)	182.80	Top Width (ft)		182.80	
Vel Total (ft/s)	12.40	Avg. Vel. (ft/s)		12.40	
Max Chl Dpth (ft)	10.15	Hydr. Depth (ft)		8.26	
Conv. Total (cfs)	292699.1	Conv. (cfs)		292699.1	
Length Wtd. (ft)		Wetted Per. (ft)		185.59	
Min Ch El (ft)	1681.00	Shear (lb/sq ft)		2.08	
Alpha	1.00	Stream Power (lb/ft s)	2142.75	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

SUMMARY OF MANNING'S N VALUES

River: Las Vegas Wash

Reach	River Sta.	n1	n2	n3	n4
LV Wash	1173	.025	.031	.025	
LV Wash	1172	.025	.031	.025	
LV Wash	1171	.025	.031	.025	

LV Wash	1170	.025	.031	.025
LV Wash	1169	.025	.031	.025
LV Wash	1168.8	.025	.031	.025
LV Wash	1168.5	Bridge		
LV Wash	1167.8	.025	.031	.025
LV Wash	1167.1	.025	.015	.025
LV Wash	1167	.025	.015	.025
LV Wash	1166.8	.025	.015	.025
LV Wash	1166.5	.025	.015	.025
LV Wash	1163.1	.025	.015	.025
LV Wash	1159.8	.025	.015	.025
LV Wash	1159.7	.025	.015	.025
LV Wash	1158.6	.025	.015	.025
LV Wash	1158.1	.025	.015	.025
LV Wash	1157.1	.025	.015	.025
LV Wash	1154.5	.025	.015	.025
LV Wash	1153.5	.025	.015	.025
LV Wash	1152.95	.025	.015	.025
LV Wash	1152.5	Bridge		
LV Wash	1151.9	.025	.015	.025
LV Wash	1151.1	.025	.015	.025
LV Wash	1150.7	.025	.015	.025
LV Wash	1150.2	.025	.015	.025
LV Wash	1150.1	.025	.015	.025
LV Wash	1149.1	.025	.015	.025
LV Wash	1148.1	.025	.015	.025
LV Wash	1146.6	.025	.015	.025
LV Wash	1144.5	.025	.015	.025
LV Wash	1142.9	.025	.015	.025
LV Wash	1140.6	.025	.015	.025
LV Wash	1140.5	.025	.015	.025
LV Wash	1140.1	.025	.015	.025
LV Wash	1139.97	.025	.015	.025
LV Wash	1139.95	.025	.015	.025
LV Wash	1139.5	Bridge		
LV Wash	1139.15	.025	.015	.025
LV Wash	1138.5	.025	.015	.025
LV Wash	1137.1	.025	.015	.025
LV Wash	1136.3	.025	.015	.025
LV Wash	1134.7	.025	.015	.025
LV Wash	1134.1	.025	.015	.025
LV Wash	1133.8	.025	.015	.025
LV Wash	1132.8	.025	.015	.025
LV Wash	1132.5	Bridge		
LV Wash	1132.3	.025	.015	.025
LV Wash	1131.8	.025	.015	.025
LV Wash	1130.5	.025	.015	.025
LV Wash	1127.9	.031	.015	.031
LV Wash	1127.7	.031	.015	.031
LV Wash	1127.6	.031	.027	.031
LV Wash	1127.4	.031	.027	.031
LV Wash	1127.2	.031	.027	.031
LV Wash	1126.9	.031	.027	.031
LV Wash	1126.7	.031	.027	.031
LV Wash	1126.5	.031	.027	.031
LV Wash	1126.3	.031	.027	.031
LV Wash	1126.2	.031	.027	.031
LV Wash	1125.9	.031	.027	.031
LV Wash	1125.8	.031	.027	.031
LV Wash	1125.7	.031	.027	.031
LV Wash	1125.6	.031	.027	.031
LV Wash	1125.5	.031	.027	.031
LV Wash	1125.3	.031	.027	.031
LV Wash	1125.1	.031	.027	.031
LV Wash	1124.8	.031	.027	.031
LV Wash	1124.6	.031	.027	.031
LV Wash	1124.5	.031	.027	.031
LV Wash	1124.4	.031	.027	.031
LV Wash	1124.2	.031	.027	.031
LV Wash	1124.1	.031	.027	.031
LV Wash	1123.8	.031	.027	.031
LV Wash	1123.6	.031	.027	.031
LV Wash	1123.4	.031	.027	.031
LV Wash	1123.2	.031	.027	.031
LV Wash	1122.8	.031	.027	.031

LV Wash	1122.6	.031	.027	.031
LV Wash	1122.4	.031	.027	.031
LV Wash	1122.2	.031	.027	.031
LV Wash	1121.8	.031	.027	.031
LV Wash	1121.6	.031	.027	.031
LV Wash	1121.4	.031	.027	.031
LV Wash	1121.2	.031	.027	.031
LV Wash	1120.8	.031	.027	.031
LV Wash	1120.6	.031	.027	.031
LV Wash	1120.4	.031	.027	.031
LV Wash	1120.2	.031	.027	.031
LV Wash	1120	Inl Struct		
LV Wash	1119.2	.031	.027	.031
LV Wash	1118.8	.031	.027	.031
LV Wash	1118.6	.031	.027	.031
LV Wash	1118.4	.031	.027	.031
LV Wash	1118.2	.031	.027	.031
LV Wash	1117.8	.031	.027	.031
LV Wash	1117.6	.031	.027	.031
LV Wash	1117.4	.031	.027	.031
LV Wash	1117.2	.031	.027	.031
LV Wash	1116.9	.031	.027	.031
LV Wash	1116.7	.031	.027	.031
LV Wash	1116.5	.031	.027	.031
LV Wash	1116.3	.031	.027	.031
LV Wash	1116.2	.031	.027	.031
LV Wash	1116	Inl Struct		
LV Wash	1115.2	.031	.027	.031
LV Wash	1114.9	.031	.027	.031
LV Wash	1114.7	.031	.027	.031
LV Wash	1114.5	.031	.027	.031
LV Wash	1114.4	.031	.027	.031
LV Wash	1114.2	.031	.027	.031
LV Wash	1113.9	.031	.027	.031
LV Wash	1113.7	.031	.027	.031
LV Wash	1113.6	.031	.027	.031
LV Wash	1113.5	.031	.027	.031
LV Wash	1113.3	.031	.027	.031
LV Wash	1113.1	.031	.027	.031
LV Wash	1112.8	.031	.027	.031
LV Wash	1112.6	.031	.027	.031
LV Wash	1112.4	.031	.027	.031
LV Wash	1112.2	.031	.027	.031
LV Wash	1111.9	.031	.027	.031
LV Wash	1111.7	.031	.027	.031
LV Wash	1111.5	.031	.027	.031
LV Wash	1111.3	.031	.027	.031
LV Wash	1111.1	.031	.027	.031
LV Wash	1110.9	.031	.027	.031
LV Wash	1110.7	.031	.027	.031
LV Wash	1110.5	.031	.027	.031
LV Wash	1110.3	.031	.027	.031
LV Wash	1110.1	.031	.027	.031
LV Wash	1109.9	.031	.027	.031
LV Wash	1109.8	.031	.027	.031
LV Wash	1109.6	.031	.027	.031
LV Wash	1109.5	.031	.027	.031
LV Wash	1109.3	.031	.027	.031
LV Wash	1109.1	.031	.027	.031
LV Wash	1108.9	.031	.027	.031
LV Wash	1108.8	.031	.027	.031
LV Wash	1108.7	.031	.027	.031
LV Wash	1108.5	.031	.027	.031
LV Wash	1108.3	.031	.027	.031
LV Wash	1108.2	.031	.027	.031
LV Wash	1107.95	.031	.027	.031
LV Wash	1107.5	Bridge		
LV Wash	1107.15	.031	.027	.031
LV Wash	1107.1	.031	.027	.031
LV Wash	1106.8	.031	.027	.031
LV Wash	1106.6	.031	.027	.031
LV Wash	1106.4	.031	.027	.031
LV Wash	1106.2	.031	.027	.031
LV Wash	1105.8	.031	.027	.031
LV Wash	1105.6	.031	.027	.031

LV Wash	1105.4	.031	.027	.031
LV Wash	1105.2	.031	.027	.031
LV Wash	1104.8	.031	.027	.031
LV Wash	1104.6	.031	.027	.031
LV Wash	1104.4	.031	.027	.031
LV Wash	1104.2	.031	.027	.031
LV Wash	1104.1	.031	.027	.031
LV Wash	1103.8	.031	.027	.031
LV Wash	1103.6	.031	.027	.031
LV Wash	1103.4	.031	.027	.031
LV Wash	1103.2	.031	.027	.031
LV Wash	1102.8	.031	.027	.031
LV Wash	1102.6	.031	.027	.031
LV Wash	1102.4	.031	.027	.031
LV Wash	1102.2	.031	.027	.031
LV Wash	1102.1	.031	.044	.031
LV Wash	1101.8	.031	.044	.031
LV Wash	1101.3	.031	.044	.031
LV Wash	1101.2	.031	.044	.031
LV Wash	1100.8	.031	.044	.031
LV Wash	1100.6	.031	.027	.031
LV Wash	1100.4	.031	.027	.031
LV Wash	1100.2	.031	.027	.031
LV Wash	1099.8	.031	.027	.031
LV Wash	1099.4	.031	.027	.031
LV Wash	1099.3	Inl Struct		
LV Wash	1097.5	.031	.027	.031
LV Wash	1096.6	.031	.027	.031
LV Wash	1096.4	.031	.027	.031
LV Wash	1096.2	.031	.027	.031
LV Wash	1095.8	.031	.027	.031
LV Wash	1095.6	.031	.027	.031
LV Wash	1095.4	.031	.027	.031
LV Wash	1095.2	.031	.027	.031
LV Wash	1094.8	.031	.027	.031
LV Wash	1094.6	.031	.015	.031
LV Wash	1094.4	.031	.015	.031
LV Wash	1094.2	.031	.015	.031
LV Wash	1093.8	.031	.015	.031
LV Wash	1093.6	.031	.015	.031
LV Wash	1093.4	.031	.015	.031
LV Wash	1093.2	.031	.015	.031
LV Wash	1092.8	.031	.015	.031
LV Wash	1092.6	.031	.015	.031
LV Wash	1092.4	.031	.015	.031
LV Wash	1092.2	.031	.015	.031
LV Wash	1091.8	.031	.015	.031
LV Wash	1091.6	.031	.015	.031
LV Wash	1091.4	.031	.015	.031
LV Wash	1091.2	.031	.015	.031
LV Wash	1090.8	.031	.015	.031
LV Wash	1090.6	.031	.015	.031
LV Wash	1090.4	.031	.015	.031
LV Wash	1090.2	.031	.015	.031
LV Wash	1089.8	.031	.015	.031
LV Wash	1089.6	.031	.015	.031
LV Wash	1089.4	.031	.015	.031
LV Wash	1089.2	.031	.015	.031
LV Wash	1088.8	.031	.015	.031
LV Wash	1088.6	.031	.015	.031
LV Wash	1088.4	.031	.015	.031
LV Wash	1088.2	.031	.015	.031
LV Wash	1087.8	.031	.015	.031
LV Wash	1087.6	.031	.015	.031
LV Wash	1087.4	.031	.015	.031
LV Wash	1087.2	.031	.015	.031
LV Wash	1086.8	.031	.015	.031
LV Wash	1086.6	.031	.015	.031
LV Wash	1086.4	.031	.015	.031
LV Wash	1086.2	.031	.015	.031
LV Wash	1085.8	.031	.015	.031
LV Wash	1085.6	.031	.015	.031
LV Wash	1085.4	.031	.015	.031
LV Wash	1085.2	.031	.015	.031
LV Wash	1085	.031	.015	.031

LV Wash	1084	.025	.015	.055	
LV Wash	1083	.025	.015	.025	.055
LV Wash	1082	.025	.015	.025	.055
LV Wash	1081	.025	.015	.025	.055
LV Wash	1080	.025	.015	.025	.055
LV Wash	1079	.025	.015	.025	.055
LV Wash	1078	.025	.015	.025	.055
LV Wash	1077	.025	.015	.025	.055
LV Wash	1075.9	.055	.015	.055	
LV Wash	1075.5	Bridge			
LV Wash	1075.1	.055	.015	.055	
LV Wash	1075	.025	.015	.025	
LV Wash	1074	.025	.031	.025	

SUMMARY OF REACH LENGTHS

River: Las Vegas Wash

Reach	River Sta.	Left	Channel	Right
LV Wash	1173	190	200	150
LV Wash	1172	200	200	200
LV Wash	1171	200	200	200
LV Wash	1170	200	200	200
LV Wash	1169	44.31	44.31	44.31
LV Wash	1168.8	175	175	175
LV Wash	1168.5	Bridge		
LV Wash	1167.8	72	72	72
LV Wash	1167.1	153	150	153
LV Wash	1167	67.96	67.83	68.65
LV Wash	1166.8	182.49	185.17	190.13
LV Wash	1166.5	721.03	703.01	713.82
LV Wash	1163.1	632.09	618.34	604.6
LV Wash	1159.8	34.25	29.81	52
LV Wash	1159.7	209.06	208.84	209.09
LV Wash	1158.6	78.1	76.9	77.28
LV Wash	1158.1	436.35	428.29	420.26
LV Wash	1157.1	271.08	266.09	261.1
LV Wash	1154.5	165.24	162.2	159.16
LV Wash	1153.5	106.52	106.52	106.52
LV Wash	1152.95	150.27	150	149.73
LV Wash	1152.5	Bridge		
LV Wash	1151.9	116.7	115.21	113.73
LV Wash	1151.1	69.15	69.15	69.15
LV Wash	1150.7	54.03	50.54	50.54
LV Wash	1150.2	19.86	5.1	5.1
LV Wash	1150.1	247.07	254.82	259.86
LV Wash	1149.1	233.07	226.52	221.43
LV Wash	1148.1	456.33	456.33	456.34
LV Wash	1146.6	473.39	472.33	471.26
LV Wash	1144.5	271.09	270.48	269.87
LV Wash	1142.9	468.22	441.43	443.64
LV Wash	1140.6	53.98	54.25	54.52
LV Wash	1140.5	49.99	50	50.51
LV Wash	1140.1	26.51	26.66	26.81
LV Wash	1139.97	97.17	97.18	97.18
LV Wash	1139.95	135	135	135
LV Wash	1139.5	Bridge		
LV Wash	1139.15	64.49	64.49	64.49
LV Wash	1138.5	308.44	321.03	333.62
LV Wash	1137.1	109.99	114.48	118.97
LV Wash	1136.3	340.86	354.77	368.68
LV Wash	1134.7	126.24	131.39	136.54
LV Wash	1134.1	58.3	60	62.62
LV Wash	1133.8	124.54	128.84	133.13
LV Wash	1132.8	149.26	150	150.74
LV Wash	1132.5	Bridge		
LV Wash	1132.3	92.33	92.33	92.33
LV Wash	1131.8	221.77	238.67	255.58
LV Wash	1130.5	542.08	542.08	542.08
LV Wash	1127.9	55.11	54.5	1.73
LV Wash	1127.7	18.91	18.64	4.23

LV Wash	1127.6	65.6	46.36	10.73
LV Wash	1127.4	82.47	44.07	36.04
LV Wash	1127.2	105.38	55.93	32.27
LV Wash	1126.9	7.34	66.63	94.52
LV Wash	1126.7	4.44	33.37	73.9
LV Wash	1126.5	3.26	27.02	49.28
LV Wash	1126.3	18.82	22.99	51.67
LV Wash	1126.2	19.16	47.33	48.12
LV Wash	1125.9	20.28	34.32	35.32
LV Wash	1125.8	10.03	34.32	35.64
LV Wash	1125.7	56.09	34.03	11.9
LV Wash	1125.6	48.61	26	20.16
LV Wash	1125.5	37.33	24	12.23
LV Wash	1125.3	104.07	50	16.76
LV Wash	1125.1	104.53	50	7.67
LV Wash	1124.8	77.97	50	6.02
LV Wash	1124.6	50.64	21.93	6.88
LV Wash	1124.5	32.37	28.07	14.33
LV Wash	1124.4	20.78	50	3.54
LV Wash	1124.2	27.02	21.29	38.82
LV Wash	1124.1	29.15	39.28	73.65
LV Wash	1123.8	30.24	39.43	36.18
LV Wash	1123.6	48.52	50	52.5
LV Wash	1123.4	48.88	50	52.38
LV Wash	1123.2	52.92	50	52.27
LV Wash	1122.8	57.81	50	52.17
LV Wash	1122.6	44.39	43.1	44.86
LV Wash	1122.4	57.63	56.9	57.21
LV Wash	1122.2	50.01	50	50.05
LV Wash	1121.8	50.03	50	50.04
LV Wash	1121.6	50.04	50	50.29
LV Wash	1121.4	62.5	62.36	57.88
LV Wash	1121.2	97.81	50.88	6.35
LV Wash	1120.8	40.74	50.89	10.2
LV Wash	1120.6	43.67	46.6	47.12
LV Wash	1120.4	17.17	36.57	101.08
LV Wash	1120.2	204.18	219.98	243.03
LV Wash	1120	Inl Struct		
LV Wash	1119.2	84.98	48.62	25.64
LV Wash	1118.8	74.65	48.61	25.87
LV Wash	1118.6	36.09	35.49	35.55
LV Wash	1118.4	50.72	50	50.1
LV Wash	1118.2	50.75	50	50.85
LV Wash	1117.8	56.23	50	52.55
LV Wash	1117.6	46.37	44.66	49.38
LV Wash	1117.4	82.26	55.34	25.57
LV Wash	1117.2	76.74	50	21.36
LV Wash	1116.9	7.89	26.5	10.71
LV Wash	1116.7	14.63	26.51	26.82
LV Wash	1116.5	21.15	34.45	81.02
LV Wash	1116.3	9.89	34.45	78.33
LV Wash	1116.2	237.51	234.58	235.49
LV Wash	1116	Inl Struct		
LV Wash	1115.2	49.49	49.47	30.52
LV Wash	1114.9	40.77	35.68	17.32
LV Wash	1114.7	79.87	35.91	36.37
LV Wash	1114.5	9.52	22.45	32.84
LV Wash	1114.4	22.32	50	72.85
LV Wash	1114.2	31.03	79	96.8
LV Wash	1113.9	42.22	21.01	40.02
LV Wash	1113.7	57.35	50.03	48.89
LV Wash	1113.6	30.93	26.98	3.61
LV Wash	1113.5	44.09	49.27	4.89
LV Wash	1113.3	85.8	26.58	5.17
LV Wash	1113.1	75.99	52.12	12.56
LV Wash	1112.8	78.42	55.18	5.51
LV Wash	1112.6	45.75	30.26	19.76
LV Wash	1112.4	80.79	72.53	30.85
LV Wash	1112.2	50.39	26.83	18.4
LV Wash	1111.9	95	75.14	45.21
LV Wash	1111.7	90.79	51.15	17.45
LV Wash	1111.5	7.87	28.51	33.08
LV Wash	1111.3	18.72	21.97	36.28
LV Wash	1111.1	14.94	31.99	81.09
LV Wash	1110.9	5.24	69.44	59.47

LV Wash	1110.7	3.7	51.91	82.42
LV Wash	1110.5	4.86	25.66	47.94
LV Wash	1110.3	23.36	39.7	28.18
LV Wash	1110.1	40.31	15.12	30.42
LV Wash	1109.9	11.85	20.7	20.87
LV Wash	1109.8	95.67	49.89	23.01
LV Wash	1109.6	34.76	19.52	8.69
LV Wash	1109.5	30.48	30.48	30.56
LV Wash	1109.3	50	50	50.13
LV Wash	1109.1	13.62	50	57.78
LV Wash	1108.9	22.78	27.45	38.62
LV Wash	1108.8	13.86	22.55	18.24
LV Wash	1108.7	36.7	36	33.95
LV Wash	1108.5	68.9	64	21.1
LV Wash	1108.3	43.26	45.45	12.92
LV Wash	1108.2	83.99	30.43	67.54
LV Wash	1107.95	124.21	124.12	124.12
LV Wash	1107.5	Bridge		
LV Wash	1107.15	25.02	25.02	25.02
LV Wash	1107.1	24.98	24.98	24.98
LV Wash	1106.8	49.02	49.02	49.02
LV Wash	1106.6	50.98	50.98	50.98
LV Wash	1106.4	50	50	50
LV Wash	1106.2	50	50.07	50
LV Wash	1105.8	50	50.1	50
LV Wash	1105.6	50	50.09	50
LV Wash	1105.4	36.85	36.92	36.85
LV Wash	1105.2	97.42	65.69	21.63
LV Wash	1104.8	78.26	51.15	17.55
LV Wash	1104.6	69.31	42.3	14.44
LV Wash	1104.4	64.58	61.23	62.02
LV Wash	1104.2	51.36	50.49	50.08
LV Wash	1104.1	41.59	74.49	41.34
LV Wash	1103.8	14.96	33.66	86.77
LV Wash	1103.6	13	46.56	45.84
LV Wash	1103.4	40.06	55.98	253.77
LV Wash	1103.2	20.55	46.67	70.43
LV Wash	1102.8	17.38	56.36	37.61
LV Wash	1102.6	28.64	31.1	82.69
LV Wash	1102.4	51.78	31.02	62.82
LV Wash	1102.2	66.61	38.72	25.07
LV Wash	1102.1	25.13	32.91	93.07
LV Wash	1101.8	51.63	67.1	57.46
LV Wash	1101.3	61.19	60.59	69.78
LV Wash	1101.2	33.78	39.41	71.91
LV Wash	1100.8	44.68	50	105.29
LV Wash	1100.6	48.48	50	75.92
LV Wash	1100.4	50.41	50	73.42
LV Wash	1100.2	43.37	50	67.3
LV Wash	1099.8	55.39	75.3	124.22
LV Wash	1099.4	445	436.11	476.02
LV Wash	1099.3	Inl Struct		
LV Wash	1097.5	134.18	188.59	63.57
LV Wash	1096.6	33.22	50	71.93
LV Wash	1096.4	33.77	50	69.21
LV Wash	1096.2	34.52	50	68.7
LV Wash	1095.8	35.47	50	82.83
LV Wash	1095.6	36.64	50	82.86
LV Wash	1095.4	38.24	50	76.99
LV Wash	1095.2	49.35	56.41	79.52
LV Wash	1094.8	46.1	50	67.56
LV Wash	1094.6	58.47	50	58.89
LV Wash	1094.4	61.44	50	58.26
LV Wash	1094.2	30.58	36.17	41.92
LV Wash	1093.8	13.83	13.83	13.83
LV Wash	1093.6	44	44	44.01
LV Wash	1093.4	56	56	56.01
LV Wash	1093.2	50	50	50
LV Wash	1092.8	50	50	50
LV Wash	1092.6	50	50	50
LV Wash	1092.4	43.29	43.29	43.29
LV Wash	1092.2	56.71	56.71	56.71
LV Wash	1091.8	50	50	50
LV Wash	1091.6	50	50	50
LV Wash	1091.4	50	50	50

LV Wash	1091.2	50	50	50
LV Wash	1090.8	50	50	50
LV Wash	1090.6	50	50	50
LV Wash	1090.4	50	50	50
LV Wash	1090.2	50	50	50
LV Wash	1089.8	50	50	50
LV Wash	1089.6	50	50	50
LV Wash	1089.4	50	50	50
LV Wash	1089.2	50	50	50
LV Wash	1088.8	50	50	50
LV Wash	1088.6	50	50	50
LV Wash	1088.4	50	50	50
LV Wash	1088.2	50	50	50
LV Wash	1087.8	50	50	50
LV Wash	1087.6	50	50	50
LV Wash	1087.4	50	50	50
LV Wash	1087.2	50	50	50
LV Wash	1086.8	50	50	50
LV Wash	1086.6	50	50	50
LV Wash	1086.4	50	50	50
LV Wash	1086.2	50	50	50
LV Wash	1085.8	40	40	40
LV Wash	1085.6	25	25	25
LV Wash	1085.4	35	35	35
LV Wash	1085.2	90.18	93.33	96.48
LV Wash	1085	71.55	197.25	187.76
LV Wash	1084	215	200	193
LV Wash	1083	212.32	201.49	190.66
LV Wash	1082	200.29	200.52	200.84
LV Wash	1081	263.95	199.61	135.18
LV Wash	1080	221	200	185
LV Wash	1079	250	200	170
LV Wash	1078	215	200	190
LV Wash	1077	140	110	80
LV Wash	1075.9	92	92	92
LV Wash	1075.5	Bridge		
LV Wash	1075.1	180	198	220
LV Wash	1075	201	200	200
LV Wash	1074			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Las Vegas Wash

Reach	River Sta.	Contr.	Expan.
LV Wash	1173	.1	.3
LV Wash	1172	.1	.3
LV Wash	1171	.1	.3
LV Wash	1170	.1	.3
LV Wash	1169	.1	.3
LV Wash	1168.8	.1	.3
LV Wash	1168.5	Bridge	
LV Wash	1167.8	.1	.3
LV Wash	1167.1	.1	.3
LV Wash	1167	.1	.3
LV Wash	1166.8	.1	.3
LV Wash	1166.5	.1	.3
LV Wash	1163.1	.1	.3
LV Wash	1159.8	.1	.3
LV Wash	1159.7	.1	.3
LV Wash	1158.6	.1	.3
LV Wash	1158.1	.1	.3
LV Wash	1157.1	.1	.3
LV Wash	1154.5	.1	.3
LV Wash	1153.5	.1	.3
LV Wash	1152.95	.1	.3
LV Wash	1152.5	Bridge	
LV Wash	1151.9	.1	.3
LV Wash	1151.1	.1	.3
LV Wash	1150.7	.1	.3
LV Wash	1150.2	.1	.3

LV Wash	1150.1	.1	.3
LV Wash	1149.1	.1	.3
LV Wash	1148.1	.1	.3
LV Wash	1146.6	.1	.3
LV Wash	1144.5	.1	.3
LV Wash	1142.9	.1	.3
LV Wash	1140.6	.1	.3
LV Wash	1140.5	.1	.3
LV Wash	1140.1	.1	.3
LV Wash	1139.97	.1	.3
LV Wash	1139.95	.1	.3
LV Wash	1139.5	Bridge	
LV Wash	1139.15	.1	.3
LV Wash	1138.5	.1	.3
LV Wash	1137.1	.1	.3
LV Wash	1136.3	.1	.3
LV Wash	1134.7	.1	.3
LV Wash	1134.1	.1	.3
LV Wash	1133.8	.1	.3
LV Wash	1132.8	.1	.3
LV Wash	1132.5	Bridge	
LV Wash	1132.3	.1	.3
LV Wash	1131.8	.1	.3
LV Wash	1130.5	.1	.3
LV Wash	1127.9	.1	.3
LV Wash	1127.7	.1	.3
LV Wash	1127.6	.1	.3
LV Wash	1127.4	.1	.3
LV Wash	1127.2	.1	.3
LV Wash	1126.9	.1	.3
LV Wash	1126.7	.1	.3
LV Wash	1126.5	.1	.3
LV Wash	1126.3	.1	.3
LV Wash	1126.2	.1	.3
LV Wash	1125.9	.1	.3
LV Wash	1125.8	.1	.3
LV Wash	1125.7	.1	.3
LV Wash	1125.6	.1	.3
LV Wash	1125.5	.1	.3
LV Wash	1125.3	.1	.3
LV Wash	1125.1	.1	.3
LV Wash	1124.8	.1	.3
LV Wash	1124.6	.1	.3
LV Wash	1124.5	.1	.3
LV Wash	1124.4	.1	.3
LV Wash	1124.2	.1	.3
LV Wash	1124.1	.1	.3
LV Wash	1123.8	.1	.3
LV Wash	1123.6	.1	.3
LV Wash	1123.4	.1	.3
LV Wash	1123.2	.1	.3
LV Wash	1122.8	.1	.3
LV Wash	1122.6	.1	.3
LV Wash	1122.4	.1	.3
LV Wash	1122.2	.1	.3
LV Wash	1121.8	.1	.3
LV Wash	1121.6	.1	.3
LV Wash	1121.4	.1	.3
LV Wash	1121.2	.1	.3
LV Wash	1120.8	.1	.3
LV Wash	1120.6	.1	.3
LV Wash	1120.4	.3	.5
LV Wash	1120.2	.3	.5
LV Wash	1120	Inl Struct	
LV Wash	1119.2	.3	.5
LV Wash	1118.8	.1	.3
LV Wash	1118.6	.1	.3
LV Wash	1118.4	.1	.3
LV Wash	1118.2	.1	.3
LV Wash	1117.8	.1	.3
LV Wash	1117.6	.1	.3
LV Wash	1117.4	.1	.3
LV Wash	1117.2	.1	.3
LV Wash	1116.9	.1	.3
LV Wash	1116.7	.1	.3

LV Wash	1116.5	.1	.3
LV Wash	1116.3	.3	.5
LV Wash	1116.2	.3	.5
LV Wash	1116	Inl Struct	
LV Wash	1115.2	.3	.5
LV Wash	1114.9	.1	.3
LV Wash	1114.7	.1	.3
LV Wash	1114.5	.1	.3
LV Wash	1114.4	.1	.3
LV Wash	1114.2	.1	.3
LV Wash	1113.9	.1	.3
LV Wash	1113.7	.1	.3
LV Wash	1113.6	.1	.3
LV Wash	1113.5	.1	.3
LV Wash	1113.3	.1	.3
LV Wash	1113.1	.1	.3
LV Wash	1112.8	.1	.3
LV Wash	1112.6	.1	.3
LV Wash	1112.4	.1	.3
LV Wash	1112.2	.1	.3
LV Wash	1111.9	.1	.3
LV Wash	1111.7	.1	.3
LV Wash	1111.5	.1	.3
LV Wash	1111.3	.1	.3
LV Wash	1111.1	.1	.3
LV Wash	1110.9	.1	.3
LV Wash	1110.7	.1	.3
LV Wash	1110.5	.1	.3
LV Wash	1110.3	.1	.3
LV Wash	1110.1	.1	.3
LV Wash	1109.9	.1	.3
LV Wash	1109.8	.1	.3
LV Wash	1109.6	.1	.3
LV Wash	1109.5	.1	.3
LV Wash	1109.3	.1	.3
LV Wash	1109.1	.1	.3
LV Wash	1108.9	.1	.3
LV Wash	1108.8	.1	.3
LV Wash	1108.7	.1	.3
LV Wash	1108.5	.1	.3
LV Wash	1108.3	.1	.3
LV Wash	1108.2	.3	.5
LV Wash	1107.95	.3	.5
LV Wash	1107.5	Bridge	
LV Wash	1107.15	.3	.5
LV Wash	1107.1	.1	.3
LV Wash	1106.8	.1	.3
LV Wash	1106.6	.1	.3
LV Wash	1106.4	.1	.3
LV Wash	1106.2	.1	.3
LV Wash	1105.8	.1	.3
LV Wash	1105.6	.1	.3
LV Wash	1105.4	.1	.3
LV Wash	1105.2	.1	.3
LV Wash	1104.8	.1	.3
LV Wash	1104.6	.1	.3
LV Wash	1104.4	.1	.3
LV Wash	1104.2	.1	.3
LV Wash	1104.1	.1	.3
LV Wash	1103.8	.1	.3
LV Wash	1103.6	.1	.3
LV Wash	1103.4	.1	.3
LV Wash	1103.2	.1	.3
LV Wash	1102.8	.1	.3
LV Wash	1102.6	.1	.3
LV Wash	1102.4	.1	.3
LV Wash	1102.2	.1	.3
LV Wash	1102.1	.1	.3
LV Wash	1101.8	.1	.3
LV Wash	1101.3	.1	.3
LV Wash	1101.2	.1	.3
LV Wash	1100.8	.1	.3
LV Wash	1100.6	.1	.3
LV Wash	1100.4	.3	.5
LV Wash	1100.2	.3	.5

LV Wash	1099.8	.3	.5
LV Wash	1099.4	.3	.5
LV Wash	1099.3	Inl Struct	
LV Wash	1097.5	.3	.5
LV Wash	1096.6	.1	.3
LV Wash	1096.4	.1	.3
LV Wash	1096.2	.1	.3
LV Wash	1095.8	.1	.3
LV Wash	1095.6	.1	.3
LV Wash	1095.4	.1	.3
LV Wash	1095.2	.1	.3
LV Wash	1094.8	.1	.3
LV Wash	1094.6	.1	.3
LV Wash	1094.4	.1	.3
LV Wash	1094.2	.1	.3
LV Wash	1093.8	.1	.3
LV Wash	1093.6	.1	.3
LV Wash	1093.4	.1	.3
LV Wash	1093.2	.1	.3
LV Wash	1092.8	.1	.3
LV Wash	1092.6	.1	.3
LV Wash	1092.4	.1	.3
LV Wash	1092.2	.1	.3
LV Wash	1091.8	.1	.3
LV Wash	1091.6	.1	.3
LV Wash	1091.4	.1	.3
LV Wash	1091.2	.1	.3
LV Wash	1090.8	.1	.3
LV Wash	1090.6	.1	.3
LV Wash	1090.4	.1	.3
LV Wash	1090.2	.1	.3
LV Wash	1089.8	.1	.3
LV Wash	1089.6	.1	.3
LV Wash	1089.4	.1	.3
LV Wash	1089.2	.1	.3
LV Wash	1088.8	.1	.3
LV Wash	1088.6	.1	.3
LV Wash	1088.4	.1	.3
LV Wash	1088.2	.1	.3
LV Wash	1087.8	.1	.3
LV Wash	1087.6	.1	.3
LV Wash	1087.4	.1	.3
LV Wash	1087.2	.1	.3
LV Wash	1086.8	.1	.3
LV Wash	1086.6	.1	.3
LV Wash	1086.4	.1	.3
LV Wash	1086.2	.1	.3
LV Wash	1085.8	.1	.3
LV Wash	1085.6	.1	.3
LV Wash	1085.4	.1	.3
LV Wash	1085.2	.1	.3
LV Wash	1085	.1	.3
LV Wash	1084	.1	.3
LV Wash	1083	.1	.3
LV Wash	1082	.1	.3
LV Wash	1081	.1	.3
LV Wash	1080	.1	.3
LV Wash	1079	.1	.3
LV Wash	1078	.1	.3
LV Wash	1077	.1	.3
LV Wash	1075.9	.3	.5
LV Wash	1075.5	Bridge	
LV Wash	1075.1	.3	.5
LV Wash	1075	.1	.3
LV Wash	1074	.1	.3



CHECK-RAS Output – Post-Project Conditions Las Vegas Wash

Group By Message ID

BR LF 01	SECNO: 1168.5 This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1763.93 is less than or equal to MinTopRd of 1765.255. 2. EGEL 3 of 1763.93 is less than MxLoCdU of 1763.995.
BR LF 01	SECNO: 1132.5 This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1733.97 is less than or equal to MinTopRd of 1737.25. 2. EGEL 3 of 1733.97 is less than MxLoCdU of 1735.348.
BR LF 01	SECNO: 1107.5 This is (Bridge-UP). The selected profile is 1%-annual-chance. Type of flow is low flow because, 1. EGEL 3 of 1720.26 is less than or equal to MinTopRd of 1727.25. 2. EGEL 3 of 1720.26 is less than MxLoCdU of 1726.5.
BR PF 01	SECNO: 1152.5 This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1751.61 is less than or equal to MinTopRd of 1753.602 . 2. EGEL 3 of 1751.61 is greater than or equal to MxLoCdU of 1751.188 . 3. WSEL 2 of 1743.18 is less than MxLoCdD of 1751.238 .
BR PF 01	SECNO: 1139.5 This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1739.15 is less than or equal to MinTopRd of 1740.14 . 2. EGEL 3 of 1739.15 is greater than or equal to MxLoCdU of 1733 . 3. WSEL 2 of 1728.5 is less than MxLoCdD of 1733 .
BR PF 01	SECNO: 1075.5 This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1696.37 is less than or equal to MinTopRd of 1697.07 . 2. EGEL 3 of 1696.37 is greater than or equal to MxLoCdU of 1692.42 . 3. WSEL 2 of 1689.89 is less than MxLoCdD of 1691.98 .
IW TF 01f	SECNO: 1120 This is an InlineWeir section. The selected profile is 1%-annual-chance. Type of flow is weir flow because, 1. Weir flow discharge is equal to 13515 . 2. Gate flow discharge is zero.
IW TF 01f	SECNO: 1116 This is an InlineWeir section. The selected profile is 1%-annual-chance. Type of flow is weir flow because, 1. Weir flow discharge is equal to 13515 . 2. Gate flow discharge is zero.
IW TF 01f	SECNO: 1099.3 This is an InlineWeir section. The selected profile is 1%-annual-chance. Type of flow is weir flow because, 1. Weir flow discharge is equal to 18601 . 2. Gate flow discharge is zero.
MP KW 01U	The name of the stream is (Las Vegas Wash, LV Wash). The flow regime is mixed flow or supercritical. The upstream starting WSEL, SWSEL, is computed from known WSEL. SWSEL of the 1%-annual-chance is at 1691.15 The starting water-surface elevations are not in an increasing order. The SWSELs should be fixed or use energy slope or provide an explanation.
MP SW 01DK	The name of the stream is (Las Vegas Wash, LV Wash). The flow regime is subcritical or mixed flow. Starting water-surface elevations are computed from Known WSELs as the downstream boundary condition. Provide backup information on Known water-surface elevations or use same energy slope for all the profiles as the starting boundary condition and rerun the plan.
NT RC 05	SECNO: 1173

CHECK-RAS Output – Post-Project Conditions Las Vegas Wash

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1172

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1171

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1170

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1169

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1168.8

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1168.5

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1168.5

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1167.8

The left overbank n-value of 0.025 and the right overbank n-value of 0.025 are less than or equal to the channel n-value of 0.031. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1102.1

The left overbank n-value of 0.031 and the right overbank n-value of 0.031 are less than or equal to the channel n-value of 0.044. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the

CHECK-RAS Output – Post-Project Conditions Las Vegas Wash

channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1101.8

The left overbank n-value of 0.031 and the right overbank n-value of 0.031 are less than or equal to the channel n-value of 0.044. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1101.3

The left overbank n-value of 0.031 and the right overbank n-value of 0.031 are less than or equal to the channel n-value of 0.044. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1101.2

The left overbank n-value of 0.031 and the right overbank n-value of 0.031 are less than or equal to the channel n-value of 0.044. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 1100.8

The left overbank n-value of 0.031 and the right overbank n-value of 0.031 are less than or equal to the channel n-value of 0.044. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RS
02BDC](#)

SECNO: 1152.5

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS
02BDC](#)

SECNO: 1139.5

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS
02BDC](#)

SECNO: 1132.5

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS
02BDC](#)

SECNO: 1107.5

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This is the Downstream Bridge Section (BRD). The channel n value of 0.027 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.027 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS](#)
[02BDC](#)

SECNO: 1075.5

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1168.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.031 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.031 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1152.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1139.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1132.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1107.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.027 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.027 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between

CHECK-RAS Output – Post-Project Conditions Las Vegas Wash

Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS](#)
[02BUC](#)

SECNO: 1075.5

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT TL 01S2](#)

SECNO: 1167.8

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#)

SECNO: 1151.9

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#)

SECNO: 1139.15

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#)

SECNO: 1132.3

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 1168.8

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 1152.95

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 1139.95

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 1132.8

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S4](#)

SECNO: 1169

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This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 1153.5

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 1139.97

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 1133.8

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 1077

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 02](#) SECNO: 1100.4

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 02](#) SECNO: 1100.2

Contraction and expansion loss coefficients are 0.3 and 0.5, respectively. However, this cross section is not at a hydraulic structure. They should be equal to 0.1 and 0.3 according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[ST DT 01B](#) SECNO: 1132.5

This is (Bridge-UP). 'Upstream Dist' of 20 in "Bridge Width Table" is less than the height of the bridge opening of 20.02. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#) SECNO: 1107.5

This is (Bridge-UP). 'Upstream Dist' of 19.54 in "Bridge Width Table" is less than the height of the bridge opening of 20.42. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#) SECNO: 1075.5

This is (Bridge-UP). 'Upstream Dist' of 1 in "Bridge Width Table" is less than the height of the bridge opening of 10.15. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

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ST DT 02B	SECNO: 1107.5 This is (Bridge-DN). 'Downstream Dist' of 7.77 in 'Bridge Width Table' is less than the height of the bridge opening of 20.42. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.
ST DT 02B	SECNO: 1075.5 This is (Bridge-DN). 'Downstream Dist' of 1 in 'Bridge Width Table' is less than the height of the bridge opening of 10.15. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.
ST DT 03	SECNO: 1139.5 This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 97.18 is longer than Section 2 channel distance of 64.49. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.
ST DT 03	SECNO: 1132.5 This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 128.84 is longer than Section 2 channel distance of 92.33. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.
ST DT 03	SECNO: 1107.5 This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 30.43 is longer than Section 2 channel distance of 25.02. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.
ST IF 01S2L	SECNO: 1168.5 This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1759.46. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).
ST IF 01S2L	SECNO: 1152.5 This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1743.18. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).
ST IF 01S2L	SECNO: 1139.5 This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1728.5. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).
ST IF 01S2L	SECNO: 1132.5 This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1731.57. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).
ST IF 01S2L	SECNO: 1075.5 This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should

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be inserted. The left ineffective flow elevation should be equal to wsel2 of 1689.89. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1168.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1759.46. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1152.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1743.18. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1139.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1728.5. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1132.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1731.57. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 1075.5

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1689.89. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1168.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1764.97. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1152.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1753.6. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1139.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1740.14. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 1132.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1736.26. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

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[ST IF 01S3L](#) SECNO: 1075.5

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to Imntprdu of 1697.07. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1168.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1764.93. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1152.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1752.93. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1139.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1738.65. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1132.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1736.26. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 1075.5

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1697.07. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2L](#) SECNO: 1120

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, left ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be less than the wsel2 of 1725.98 of the 1%-annual-chance profile. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2L](#) SECNO: 1116

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, left ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be less than the wsel2 of 1723.51 of the 1%-annual-chance profile. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2L](#) SECNO: 1099.3

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This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, left ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be less than the wsel2 of 1711.19 of the 1%-annual-chance profile. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2R](#) SECNO: 1120

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be less than the wsel2 of 1725.98 of the 1%-annual-chance profile. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2R](#) SECNO: 1116

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be less than the wsel2 of 1723.51 of the 1%-annual-chance profile. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S2R](#) SECNO: 1099.3

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be less than the wsel2 of 1711.19 of the 1%-annual-chance profile. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3L](#) SECNO: 1120

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir-UP). However, left ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1715.27. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3L](#) SECNO: 1116

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir-UP). However, left ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1713.01. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3L](#) SECNO: 1099.3

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir-UP). However, left ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1703.76. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3R](#) SECNO: 1120

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1715.27. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 02S3R](#) SECNO: 1116

This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1713.46. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

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ST IF 02S3R	SECNO: 1099.3 <p>This is Section 3. The selected profile is 1%-annual-chance. Weir flow occurs at (InlineWeir). However, right ineffective flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmtprdu of 1703.76. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).</p>
XS DC 03	SECNO: 1132.8 <p>Discharge is different between the upstream side and downstream side of the structure for 1%-annual-chance flood. They should be the same.</p>
XS DT 01	SECNO: 1108.2 <p>Both the right overbank distance of 67.54 and the left overbank distance of 83.99 are longer than the channel distance of 30.43 . Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences among the distances.</p>
XS DT 02L	SECNO: 1150.2 <p>The Left overbank distance of 19.86 is greater than the channel distance of 5.1 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1125.3 <p>The Left overbank distance of 104.07 is greater than the channel distance of 50 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1125.1 <p>The Left overbank distance of 104.53 is greater than the channel distance of 50 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1124.6 <p>The Left overbank distance of 50.64 is greater than the channel distance of 21.93 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1114.7 <p>The Left overbank distance of 79.87 is greater than the channel distance of 35.91 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1113.9 <p>The Left overbank distance of 42.22 is greater than the channel distance of 21.01 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.</p>
XS DT 02L	SECNO: 1113.3 <p>The Left overbank distance of 85.8 is greater than the channel distance of 26.58 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank</p>

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distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02L](#)

SECNO: 1110.1

The Left overbank distance of 40.31 is greater than the channel distance of 15.12 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02L](#)

SECNO: 1108.2

The Left overbank distance of 83.99 is greater than the channel distance of 30.43 by more than two times. The Left overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1126.7

The Right overbank distance of 73.9 is greater than the channel distance of 33.37 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1126.3

The Right overbank distance of 51.67 is greater than the channel distance of 22.99 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1120.4

The Right overbank distance of 101.08 is greater than the channel distance of 36.57 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1116.5

The Right overbank distance of 81.02 is greater than the channel distance of 34.45 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1116.3

The Right overbank distance of 78.33 is greater than the channel distance of 34.45 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1111.1

The Right overbank distance of 81.09 is greater than the channel distance of 31.99 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1110.1

The Right overbank distance of 30.42 is greater than the channel distance of 15.12 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

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[XS DT 02R](#)

SECNO: 1108.2

The Right overbank distance of 67.54 is greater than the channel distance of 30.43 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1103.8

The Right overbank distance of 86.77 is greater than the channel distance of 33.66 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1103.4

The Right overbank distance of 253.77 is greater than the channel distance of 55.98 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1102.6

The Right overbank distance of 82.69 is greater than the channel distance of 31.1 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1102.4

The Right overbank distance of 62.82 is greater than the channel distance of 31.02 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1102.1

The Right overbank distance of 93.07 is greater than the channel distance of 32.91 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS DT 02R](#)

SECNO: 1100.8

The Right overbank distance of 105.29 is greater than the channel distance of 50 by more than two times. The Right overbank distance may be in error. Please review the creation of left overbank, channel and right overbank distances. The HEC-RAS geometry file may need to be recreated using a GIS program. Please resolve the differences between the distances.

[XS EC 01R](#)

SECNO: 1075.9

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1693.56 is higher than the ending GR station elevation of 1682.41. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 1075.1

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1689.89 is higher than the ending GR station elevation of 1681.96. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS Output – Post-Project Conditions Las Vegas Wash

[XS FR 02](#)

The profile is computed as mixed flow regime. It is acceptable if part of the stream is an engineered channel. For Flood Insurance Studies a subcritical flow regime should be selected, for natural streams. Supercritical flow regime should be selected if the entire stream is an engineered channel. The flow regime should be changed appropriately or justify the selection of mixed flow regime.

[XS IF 03L](#)

SECNO: 1107.95

The Left Ineffective Flow Station is within the channel. The Left Ineffective Flow Station of 85.98999 is greater than the LeftBankSta of 55.84. The Left Ineffective Flow Station or the LeftBankSta should be adjusted.

[XS IF 03L](#)

SECNO: 1107.15

The Left Ineffective Flow Station is within the channel. The Left Ineffective Flow Station of 85.9899 is greater than the LeftBankSta of 84.22. The Left Ineffective Flow Station or the LeftBankSta should be adjusted.

[XS IF 03R](#)

SECNO: 1107.95

The Right Ineffective Flow Station is within the channel. The Right Ineffective Flow Station of 326.8101 is less than the RightBankSta of 339.03. The Right Ineffective Flow Station or the RightBankSta should be adjusted.

[XS IF 03R](#)

SECNO: 1107.15

The Right Ineffective Flow Station is within the channel. The Right Ineffective Flow Station of 326.8101 is less than the RightBankSta of 384.74. The Right Ineffective Flow Station or the RightBankSta should be adjusted.

[XS SW 01DK](#)

SECNO: 1074

The name of the stream is Las Vegas Wash, LV Wash. The flow regime is subcritical or mixed flow. Starting WSEL is computed from Known WSEL as the downstream boundary for 1%-annual-chance flood. Provide backup information on Known WSEL or use energy slope as the downstream boundary.

[XS SW 01UK](#)

SECNO: 1173

The name of the stream is Las Vegas Wash, LV Wash. The flow regime is supercritical or mixed flow. Starting WSEL is computed from Known WSEL as the upstream boundary for 1%-annual-chance flood. Provide backup information on Known WSEL or use critical depth as the upstream boundary.



APPENDIX D

HYDRAULICS – FLAMINGO WASH



Flamingo Wash HEC-RAS Output

Standard Table 1

Corrected Effective Model

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	390	PF 1	6300	1786.51	1793.18	1793.18	1796.43	0.002698	14.47	435.43	67.00	1.00
Reach-1	380	PF 1	6300	1784.01	1790.68	1790.68	1793.93	0.002698	14.47	435.42	67.00	1.00
Reach-1	370	PF 1	6300	1780.56	1787.23	1787.23	1790.48	0.002698	14.47	435.43	67.00	1.00
Reach-1	360	PF 1	6300	1779.41	1786.07	1786.07	1789.32	0.002698	14.47	435.42	67.00	1.00
Reach-1	350	PF 1	6300	1777.83	1784.50	1784.50	1787.75	0.002698	14.47	435.43	67.00	1.00
Reach-1	340	PF 1	6300	1775.65	1783.98		1785.96	0.001056	11.27	558.93	70.00	0.70
Reach-1	338	PF 1	6300	1775.17	1784.21		1785.75	0.000728	9.95	633.10	70.00	0.58
Reach-1	337	PF 1	6300	1774.80	1784.67		1785.49	0.000333	7.28	885.37	163.59	0.44
Reach-1	335	PF 1	6300	1774.45	1784.11		1785.40	0.003034	9.11	691.87	78.96	0.54
Reach-1	334	PF 1	6300	1774.40	1782.79	1782.79	1785.09	0.011144	12.16	518.26	113.75	1.00
Reach-1	330	PF 1	6300	1772.85	1779.43	1779.43	1782.43	0.011170	13.90	453.31	75.88	1.00
Reach-1	320	PF 1	6300	1771.50	1778.93		1780.55	0.002203	10.22	616.30	121.21	0.80
Reach-1	310	PF 1	6300	1770.04	1779.56		1779.98	0.000176	5.23	1247.58	198.80	0.32
Reach-1	300	PF 1	6300	1769.18	1779.43	1774.07	1779.95	0.000192	5.86	1135.64	147.13	0.32
Reach-1	295		Lamb Boulevard Bridge									
Reach-1	290	PF 1	6300	1768.81	1773.71	1773.71	1776.13	0.002162	12.50	503.95	102.93	1.00
Reach-1	280	PF 1	6300	1768.26	1773.14	1773.14	1775.56	0.002150	12.47	505.21	105.61	1.00
Reach-1	270	PF 1	6300	1764.26	1769.11	1769.11	1771.54	0.002167	12.50	503.93	104.79	1.00
Reach-1	260	PF 1	6300	1764.26	1769.25	1769.25	1771.38	0.002172	11.71	537.97	128.69	1.01
Reach-1	250	PF 1	6300	1760.26	1765.30	1765.30	1767.65	0.002116	12.30	512.06	110.06	1.01
Reach-1	240	PF 1	6300	1759.69	1764.89	1764.89	1767.14	0.003621	12.02	524.20	116.90	1.00
Reach-1	230	PF 1	6300	1752.38	1760.70	1760.70	1763.45	0.003443	13.29	473.88	86.42	1.00
Reach-1	220	PF 1	6300	1746.22	1754.23	1754.23	1756.87	0.003498	13.05	482.88	91.43	1.00
Reach-1	210	PF 1	6300	1739.78	1749.13	1749.13	1751.94	0.003463	13.45	468.30	83.90	1.00
Reach-1	200	PF 1	6300	1738.96	1745.15	1745.15	1747.57	0.003543	12.48	504.83	104.43	1.00
Reach-1	190	PF 1	6300	1735.05	1741.78	1741.78	1744.14	0.003560	12.32	511.36	108.54	1.00
Reach-1	180	PF 1	6300	1731.86	1737.44	1737.29	1739.44	0.003334	11.34	555.38	127.67	0.96
Reach-1	170	PF 1	6300	1729.56	1735.63	1735.63	1737.71	0.003684	11.58	544.26	130.94	1.00
Reach-1	160	PF 1	6300	1727.87	1735.00		1736.27	0.001716	9.05	696.07	135.91	0.70
Reach-1	150	PF 1	6300	1725.79	1734.75		1735.56	0.000815	7.25	893.00	169.72	0.50
Reach-1	140	PF 1	6400	1724.86	1734.94	1730.23	1735.28	0.000140	5.01	1684.86	343.83	0.29
Reach-1	130	PF 1	6400	1724.79	1734.72	1729.61	1735.25	0.000202	5.90	1160.36	174.35	0.33
Reach-1	125		Nellis Boulevard Bridge									
Reach-1	120	PF 1	6400	1724.16	1728.98	1728.98	1731.37	0.002156	12.40	516.19	107.00	0.99
Reach-1	110	PF 1	6400	1722.76	1728.05	1728.05	1730.48	0.002034	12.52	511.37	106.32	1.01
Reach-1	100	PF 1	6400	1720.96	1728.67		1730.08	0.003222	9.51	673.24	104.31	0.66
Reach-1	90	PF 1	6400	1717.45	1727.03		1728.89	0.004781	10.93	586.46	110.92	0.80
Reach-1	80	PF 1	6400	1716.64	1725.48		1726.83	0.003327	9.32	686.83	115.54	0.67
Reach-1	70	PF 1	6400	1714.26	1721.78	1721.78	1724.39	0.008008	12.95	494.02	97.06	1.01
Reach-1	60	PF 1	6400	1712.20	1721.94		1722.48	0.001217	6.52	1304.71	396.88	0.42
Reach-1	50	PF 1	6400	1711.16	1720.64		1721.59	0.002491	7.83	817.62	143.21	0.58
Reach-1	40	PF 1	6400	1709.46	1718.53	1718.08	1720.45	0.004994	11.30	604.59	153.78	0.82
Reach-1	30	PF 1	6400	1708.11	1715.62	1715.26	1717.75	0.006016	11.71	555.73	125.09	0.89
Reach-1	20	PF 1	6400	1705.38	1713.00		1714.81	0.005415	10.82	591.53	114.06	0.84
Reach-1	10	PF 1	6400	1702.59	1710.97	1709.67	1712.45	0.004002	9.76	655.85	119.62	0.73

Flamingo Wash HEC-RAS Output
Standard Table 2
Corrected Effective Model

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	390	PF 1	1796.43	1793.18	3.25	1.14	0.00		6300.00		67.00
Reach-1	380	PF 1	1793.93	1790.68	3.25	0.46	0.00		6300.00		67.00
Reach-1	370	PF 1	1790.48	1787.23	3.25	0.63	0.00		6300.00		67.00
Reach-1	360	PF 1	1789.32	1786.07	3.25	0.85	0.00		6300.00		67.00
Reach-1	350	PF 1	1787.75	1784.50	3.25	0.70	0.38		6300.00		67.00
Reach-1	340	PF 1	1785.96	1783.98	1.97	0.07	0.13		6300.00		70.00
Reach-1	338	PF 1	1785.75	1784.21	1.54	0.05	0.21		6300.00		70.00
Reach-1	337	PF 1	1785.49	1784.67	0.82	0.05	0.05	5.84	6288.53	5.63	163.59
Reach-1	335	PF 1	1785.40	1784.11	1.29	0.21	0.10		6300.00		78.96
Reach-1	334	PF 1	1785.09	1782.79	2.29	2.34	0.07		6300.00		113.75
Reach-1	330	PF 1	1782.43	1779.43	3.00	1.45	0.41		6300.00		75.88
Reach-1	320	PF 1	1780.55	1778.93	1.62	0.21	0.36		6300.00		121.21
Reach-1	310	PF 1	1779.98	1779.56	0.42	0.02	0.01	24.70	6248.25	27.05	198.80
Reach-1	300	PF 1	1779.95	1779.43	0.52			77.86	6182.30	39.84	147.13
Reach-1	295		Lamb Boulevard Bridge								
Reach-1	290	PF 1	1776.13	1773.71	2.43	0.03	0.00		6300.00		102.93
Reach-1	280	PF 1	1775.56	1773.14	2.41	0.00	0.00		6300.00		105.61
Reach-1	270	PF 1	1771.54	1769.11	2.43	0.05	0.09		6300.00		104.79
Reach-1	260	PF 1	1771.38	1769.25	2.13	0.00	0.02		6299.89	0.11	128.69
Reach-1	250	PF 1	1767.65	1765.30	2.35	0.16	0.03		6300.00		110.06
Reach-1	240	PF 1	1767.14	1764.89	2.24	1.74	0.05		6300.00		116.90
Reach-1	230	PF 1	1763.45	1760.70	2.74	1.72	0.03		6300.00		86.42
Reach-1	220	PF 1	1756.87	1754.23	2.64	1.66	0.02		6300.00		91.43
Reach-1	210	PF 1	1751.94	1749.13	2.81	1.75	0.12		6300.00		83.90
Reach-1	200	PF 1	1747.57	1745.15	2.42	1.76	0.02		6300.00		104.43
Reach-1	190	PF 1	1744.14	1741.78	2.36	1.71	0.11		6300.00		108.54
Reach-1	180	PF 1	1739.44	1737.44	2.00	1.72	0.01		6300.00		127.67
Reach-1	170	PF 1	1737.71	1735.63	2.08	1.18	0.24		6300.00		130.94
Reach-1	160	PF 1	1736.27	1735.00	1.27	0.57	0.14		6300.00		135.91
Reach-1	150	PF 1	1735.56	1734.75	0.81	0.14	0.14	18.39	6232.03	49.58	169.72
Reach-1	140	PF 1	1735.28	1734.94	0.33	0.01	0.02	673.44	5378.54	348.02	343.83
Reach-1	130	PF 1	1735.25	1734.72	0.53			69.05	6270.35	60.60	174.35
Reach-1	125		Nellis Boulevard Bridge								
Reach-1	120	PF 1	1731.37	1728.98	2.39	0.19	0.00		6400.00		107.00
Reach-1	110	PF 1	1730.48	1728.05	2.43	0.06	0.31		6400.00		106.32
Reach-1	100	PF 1	1730.08	1728.67	1.40	1.15	0.04		6400.00		104.31
Reach-1	90	PF 1	1728.89	1727.03	1.85	1.91	0.15	0.38	6399.62		110.92
Reach-1	80	PF 1	1726.83	1725.48	1.35	2.32	0.13	0.00	6400.00		115.54
Reach-1	70	PF 1	1724.39	1721.78	2.61	1.25	0.62		6400.00		97.06
Reach-1	60	PF 1	1722.48	1721.94	0.54	0.84	0.04	490.08	5020.71	889.21	396.88
Reach-1	50	PF 1	1721.59	1720.64	0.95	1.04	0.10		6400.00		143.21
Reach-1	40	PF 1	1720.45	1718.53	1.93	2.69	0.02	1.28	6196.01	202.71	153.78
Reach-1	30	PF 1	1717.75	1715.62	2.12	2.84	0.09	27.39	6372.61		125.09
Reach-1	20	PF 1	1714.81	1713.00	1.82	2.26	0.10		6400.00		114.06
Reach-1	10	PF 1	1712.45	1710.97	1.48				6399.95	0.05	119.62

Flamingo Wash HEC-RAS Output
Standard Table 2
Corrected Effective Model

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach-1	390	PF 1	1796.43	1793.18	3.25	1.14	0.00		6300.00		67.00
Reach-1	380	PF 1	1793.93	1790.68	3.25	0.46	0.00		6300.00		67.00
Reach-1	370	PF 1	1790.48	1787.23	3.25	0.63	0.00		6300.00		67.00
Reach-1	360	PF 1	1789.32	1786.07	3.25	0.85	0.00		6300.00		67.00
Reach-1	350	PF 1	1787.75	1784.50	3.25	0.70	0.38		6300.00		67.00
Reach-1	340	PF 1	1785.96	1783.98	1.97	0.07	0.13		6300.00		70.00
Reach-1	338	PF 1	1785.75	1784.21	1.54	0.05	0.21		6300.00		70.00
Reach-1	337	PF 1	1785.49	1784.67	0.82	0.05	0.05	5.84	6288.53	5.63	163.59
Reach-1	335	PF 1	1785.40	1784.11	1.29	0.21	0.10		6300.00		78.96
Reach-1	334	PF 1	1785.09	1782.79	2.29	2.34	0.07		6300.00		113.75
Reach-1	330	PF 1	1782.43	1779.43	3.00	1.45	0.41		6300.00		75.88
Reach-1	320	PF 1	1780.55	1778.93	1.62	0.21	0.36		6300.00		121.21
Reach-1	310	PF 1	1779.98	1779.56	0.42	0.02	0.01	24.70	6248.25	27.05	198.80
Reach-1	300	PF 1	1779.95	1779.43	0.52			77.86	6182.30	39.84	147.13
Reach-1	295		Lamb Boulevard Bridge								
Reach-1	290	PF 1	1776.13	1773.71	2.43	0.03	0.00		6300.00		102.93
Reach-1	280	PF 1	1775.56	1773.14	2.41	0.00	0.00		6300.00		105.61
Reach-1	270	PF 1	1771.54	1769.11	2.43	0.05	0.09		6300.00		104.79
Reach-1	260	PF 1	1771.38	1769.25	2.13	0.00	0.02		6299.89	0.11	128.69
Reach-1	250	PF 1	1767.65	1765.30	2.35	0.16	0.03		6300.00		110.06
Reach-1	240	PF 1	1767.14	1764.89	2.24	1.74	0.05		6300.00		116.90
Reach-1	230	PF 1	1763.45	1760.70	2.74	1.72	0.03		6300.00		86.42
Reach-1	220	PF 1	1756.87	1754.23	2.64	1.66	0.02		6300.00		91.43
Reach-1	210	PF 1	1751.94	1749.13	2.81	1.75	0.12		6300.00		83.90
Reach-1	200	PF 1	1747.57	1745.15	2.42	1.76	0.02		6300.00		104.43
Reach-1	190	PF 1	1744.14	1741.78	2.36	1.71	0.11		6300.00		108.54
Reach-1	180	PF 1	1739.44	1737.44	2.00	1.72	0.01		6300.00		127.67
Reach-1	170	PF 1	1737.71	1735.63	2.08	1.18	0.24		6300.00		130.94
Reach-1	160	PF 1	1736.27	1735.00	1.27	0.57	0.14		6300.00		135.91
Reach-1	150	PF 1	1735.56	1734.75	0.81	0.14	0.14	18.39	6232.03	49.58	169.72
Reach-1	140	PF 1	1735.28	1734.94	0.33	0.01	0.02	673.44	5378.54	348.02	343.83
Reach-1	130	PF 1	1735.25	1734.72	0.53			69.05	6270.35	60.60	174.35
Reach-1	125		Nellis Boulevard Bridge								
Reach-1	120	PF 1	1731.37	1728.98	2.39	0.19	0.00		6400.00		107.00
Reach-1	110	PF 1	1730.48	1728.05	2.43	0.06	0.31		6400.00		106.32
Reach-1	100	PF 1	1730.08	1728.67	1.40	1.15	0.04		6400.00		104.31
Reach-1	90	PF 1	1728.89	1727.03	1.85	1.91	0.15	0.38	6399.62		110.92
Reach-1	80	PF 1	1726.83	1725.48	1.35	2.32	0.13	0.00	6400.00		115.54
Reach-1	70	PF 1	1724.39	1721.78	2.61	1.25	0.62		6400.00		97.06
Reach-1	60	PF 1	1722.48	1721.94	0.54	0.84	0.04	490.08	5020.71	889.21	396.88
Reach-1	50	PF 1	1721.59	1720.64	0.95	1.04	0.10		6400.00		143.21
Reach-1	40	PF 1	1720.45	1718.53	1.93	2.69	0.02	1.28	6196.01	202.71	153.78
Reach-1	30	PF 1	1717.75	1715.62	2.12	2.84	0.09	27.39	6372.61		125.09
Reach-1	20	PF 1	1714.81	1713.00	1.82	2.26	0.10		6400.00		114.06
Reach-1	10	PF 1	1712.45	1710.97	1.48				6399.95	0.05	119.62

FlamWashEX Plan: EX 8/9/2013

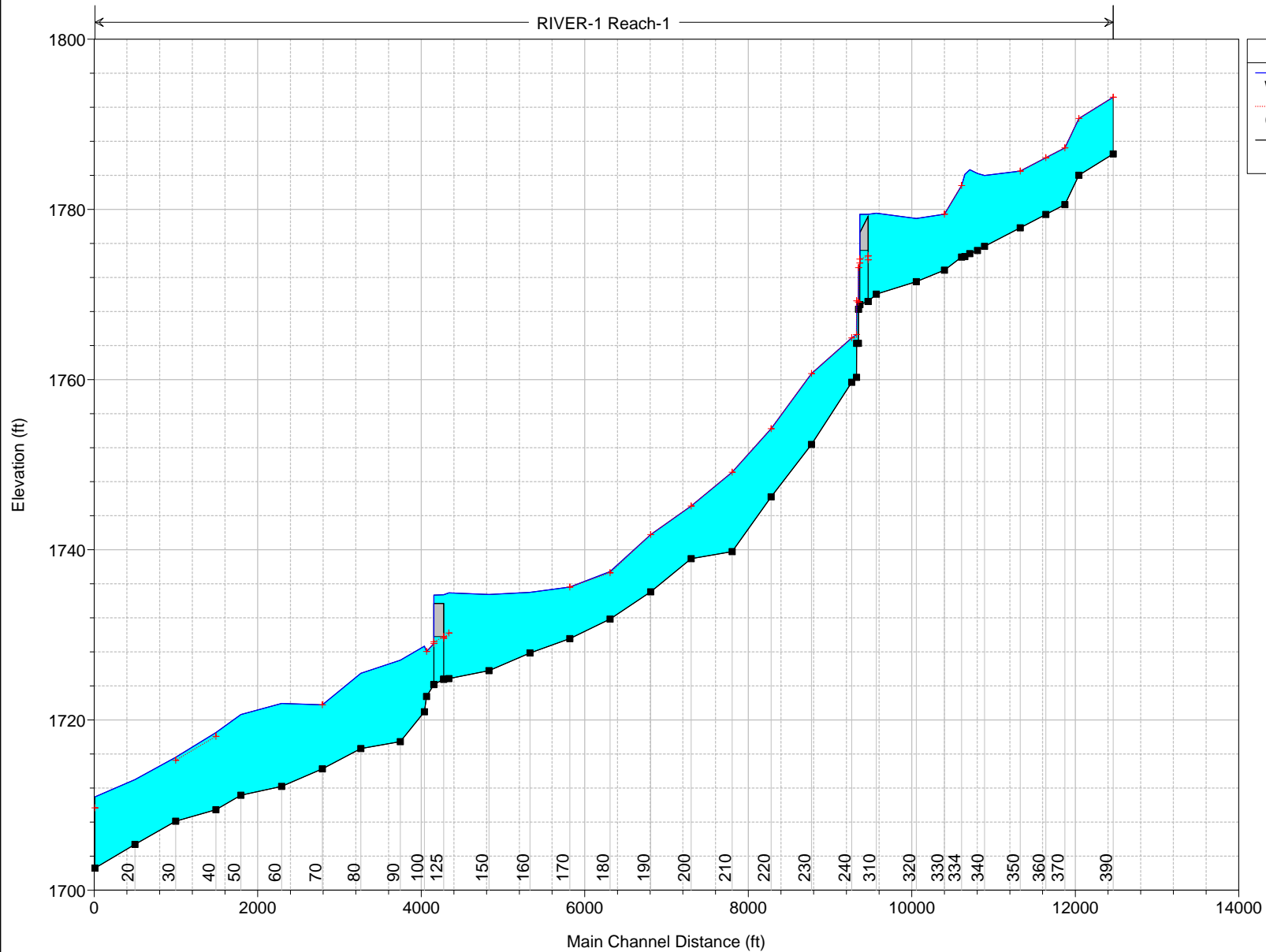
RIVER-1 Reach-1

Legend

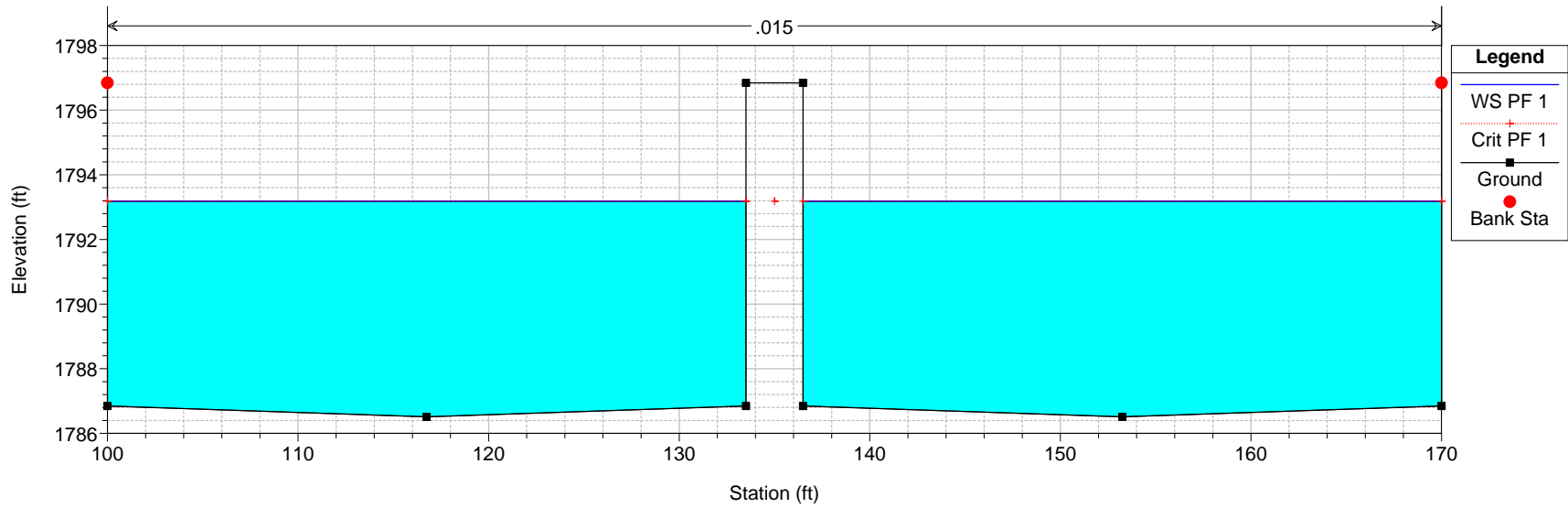
WS PF 1

Crit PF 1

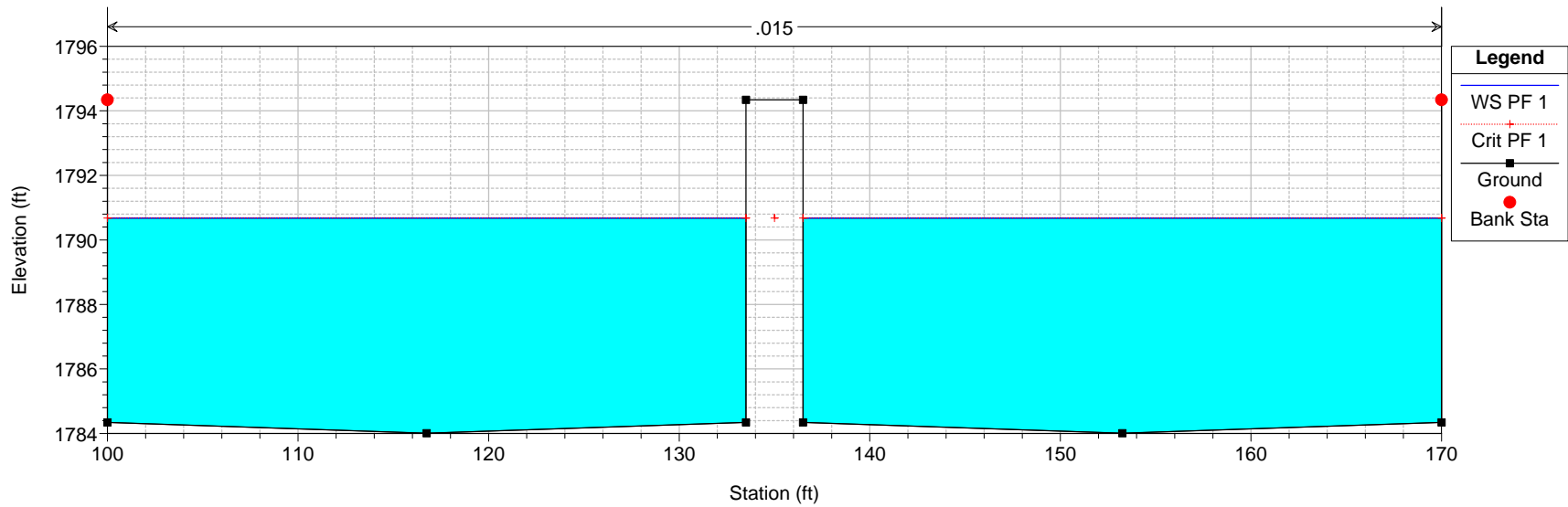
Ground



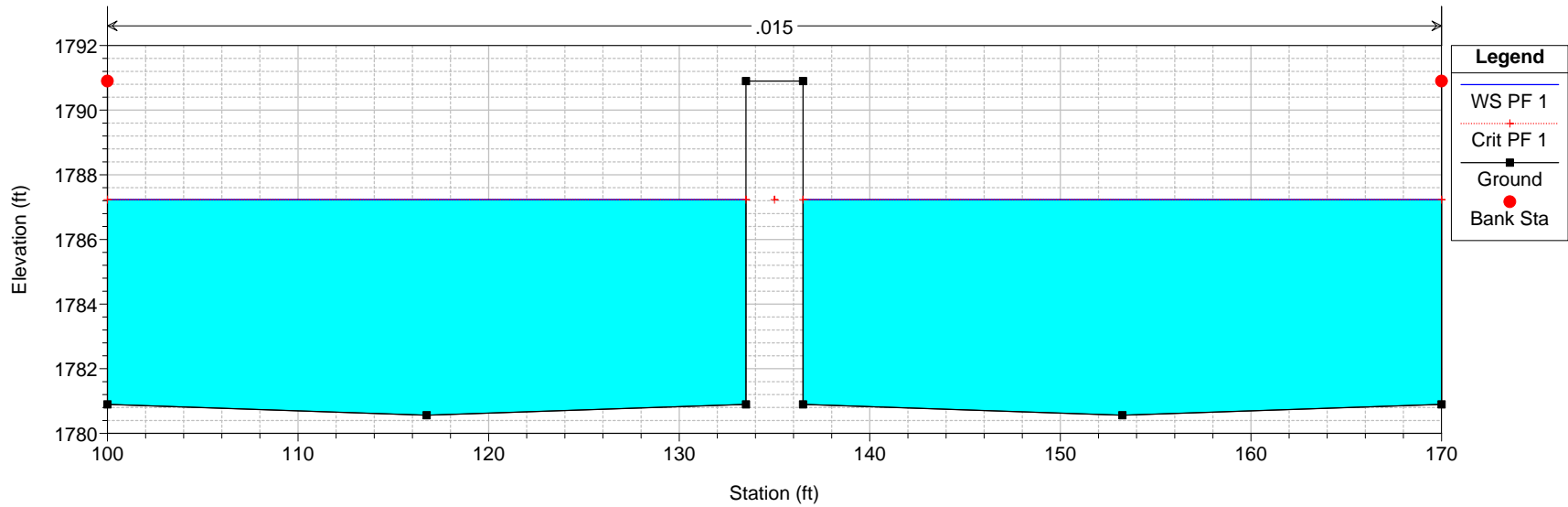
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 390



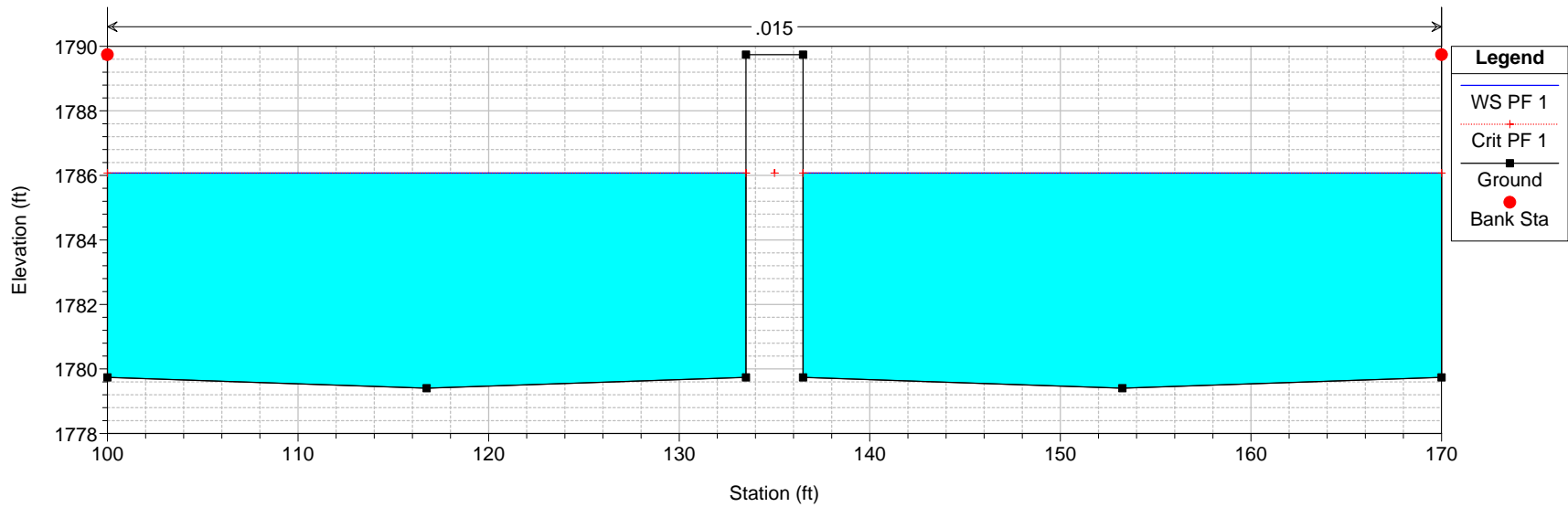
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 380



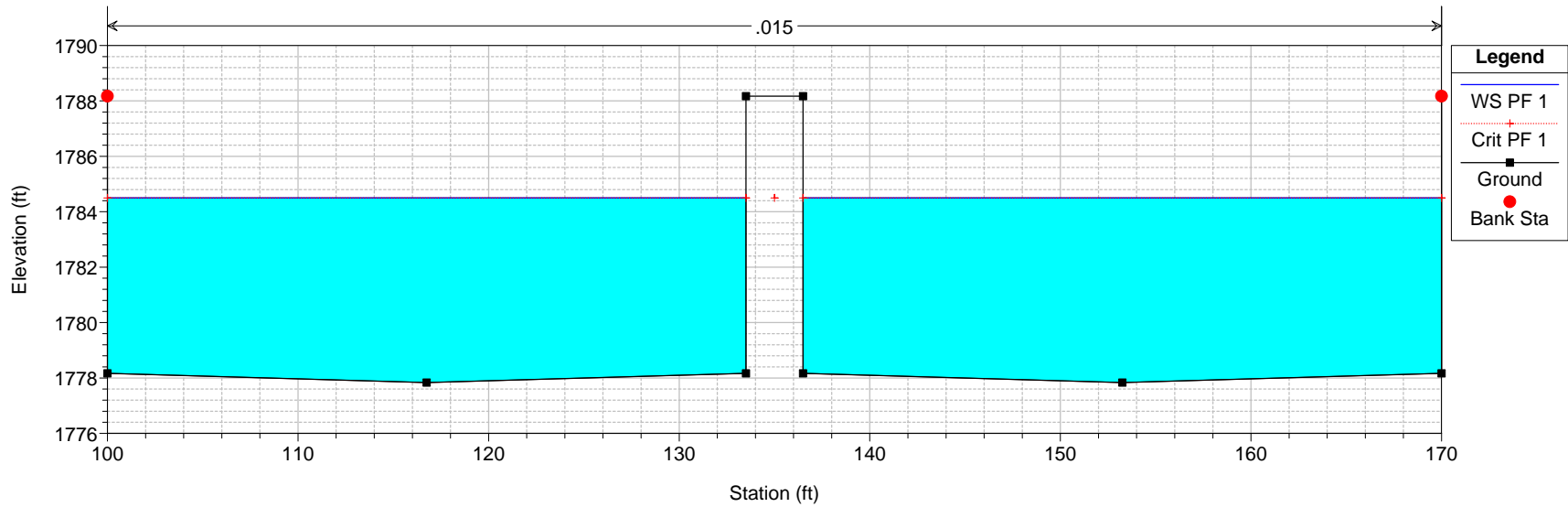
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 370



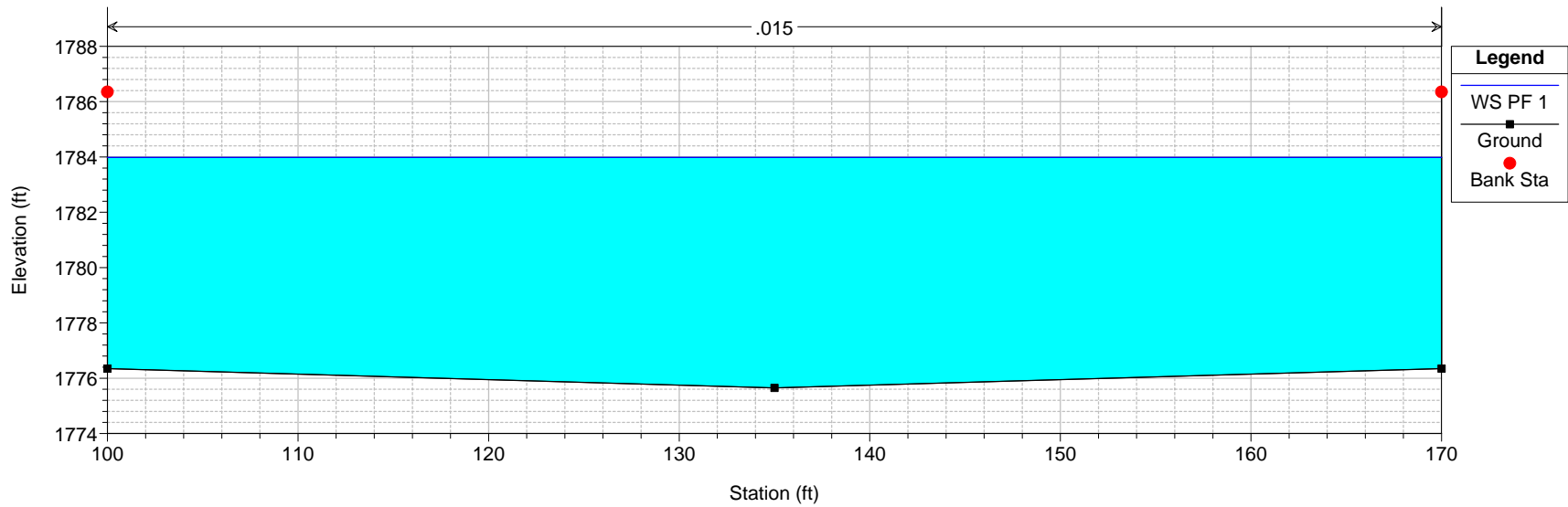
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 360



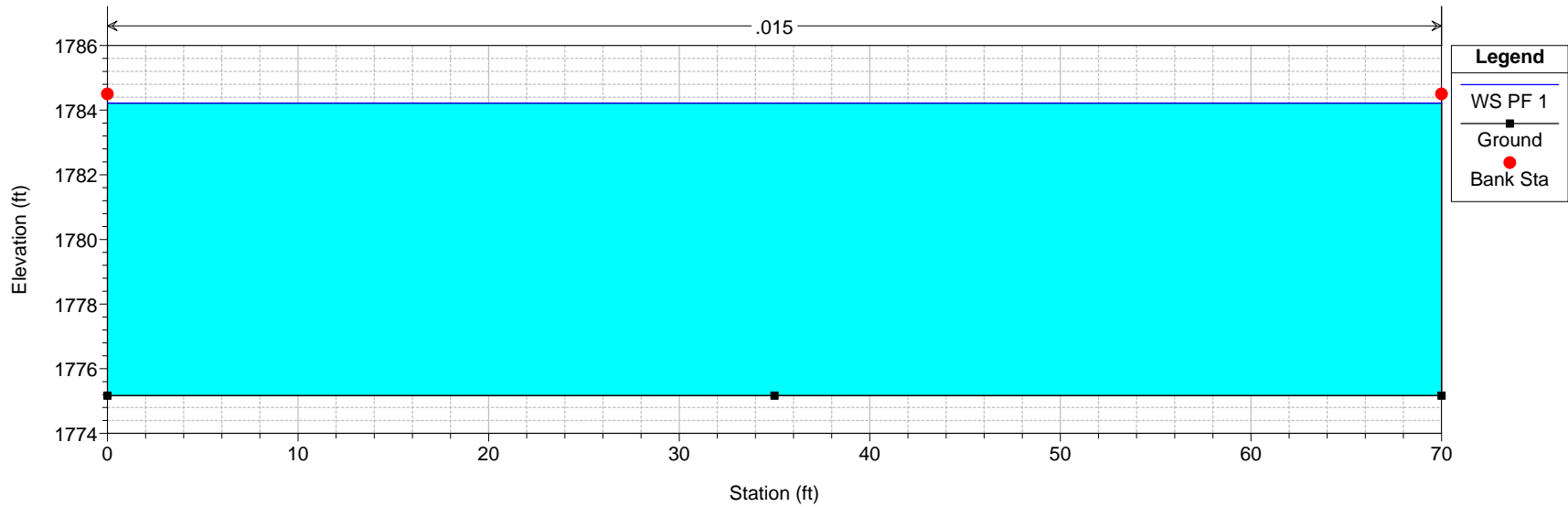
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 350



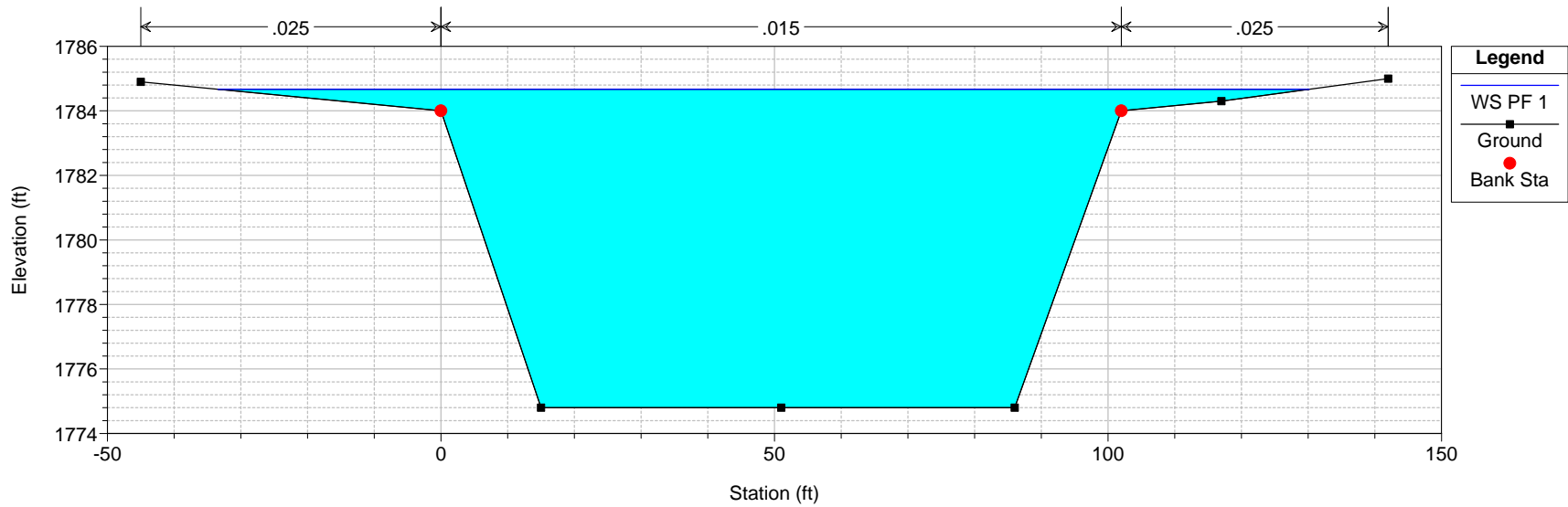
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 340



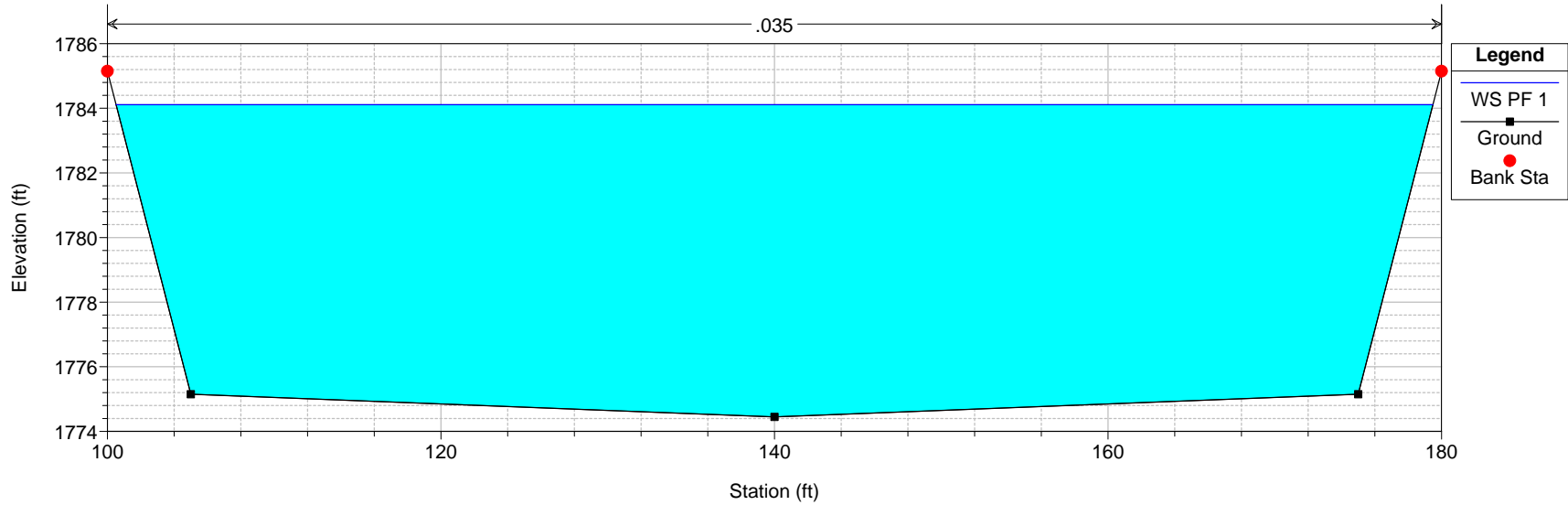
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 338



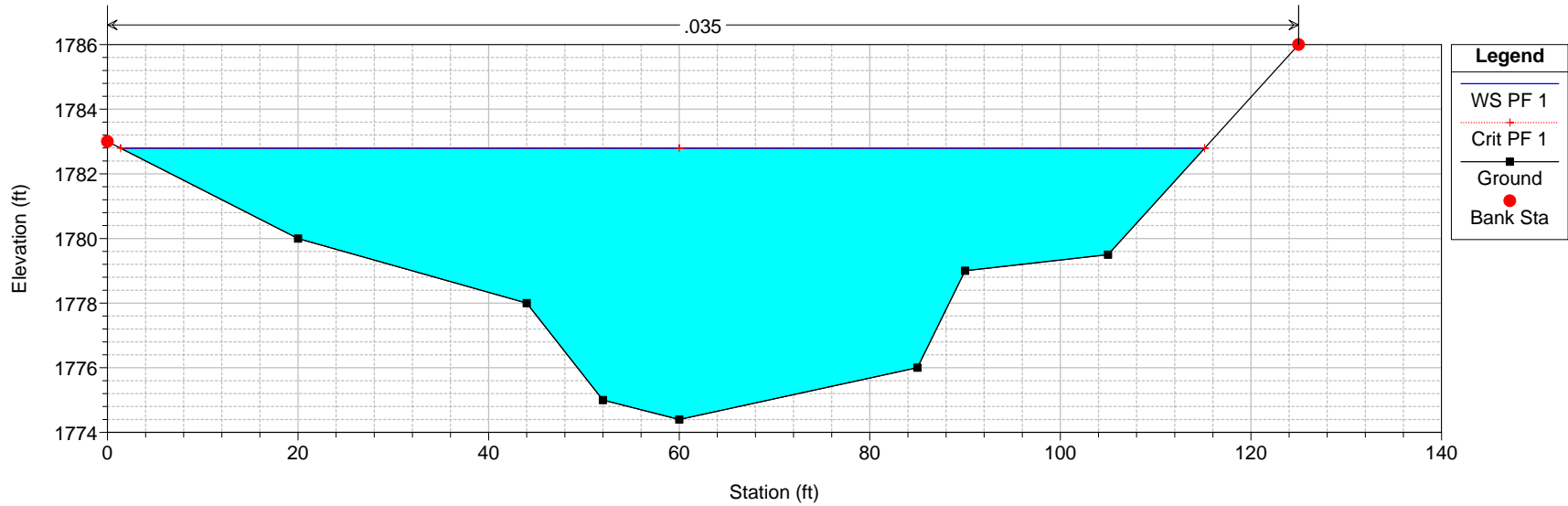
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 337



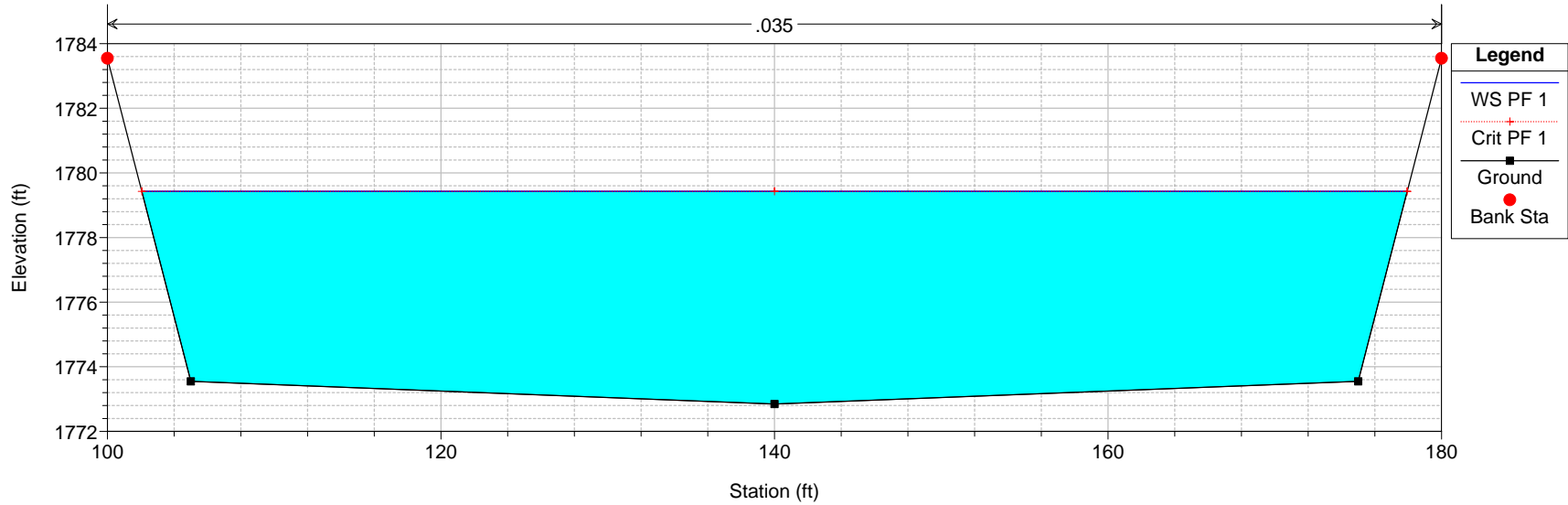
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 335



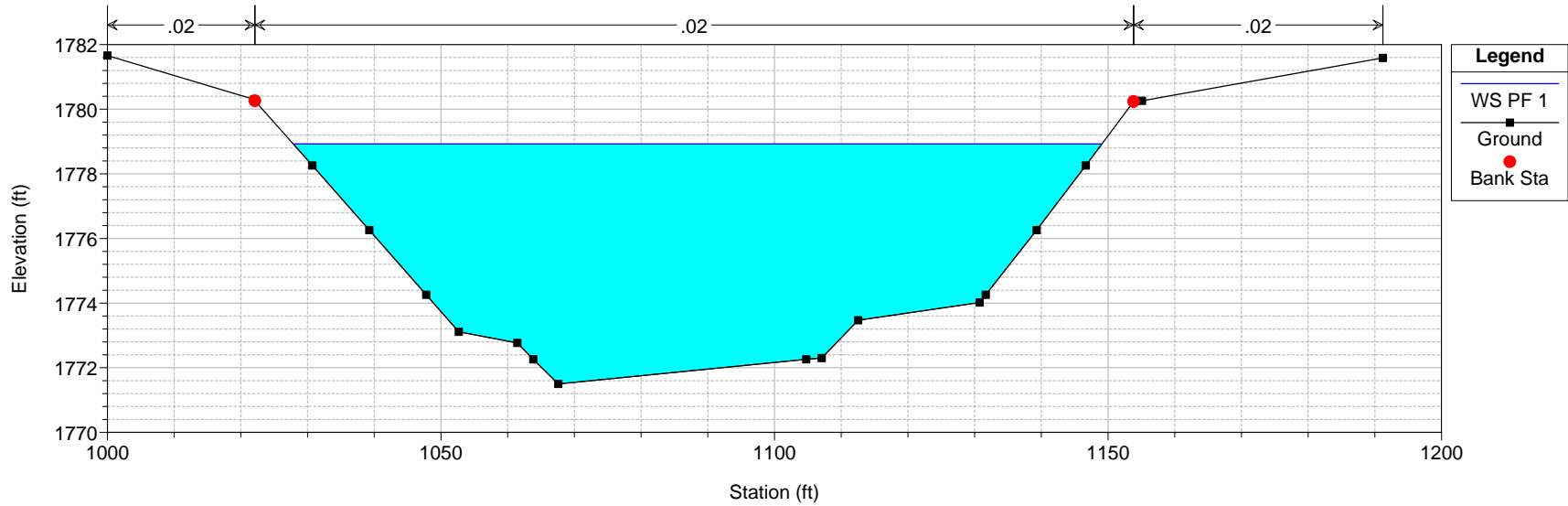
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 334



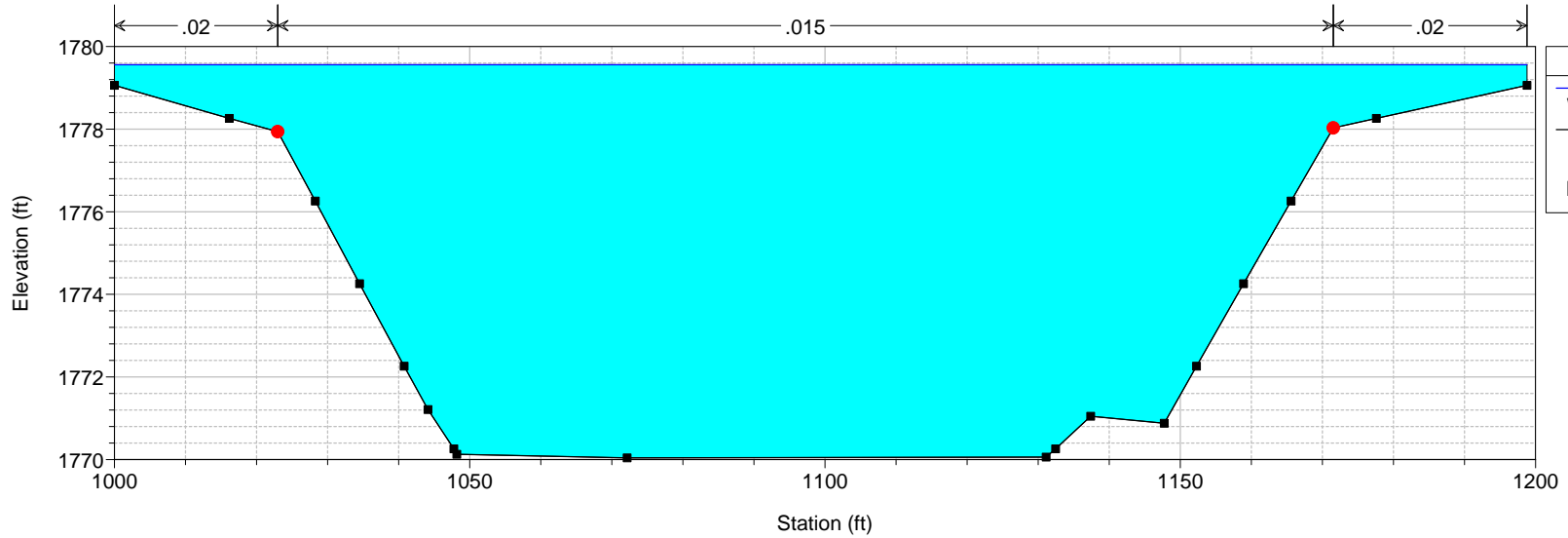
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 330



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 320



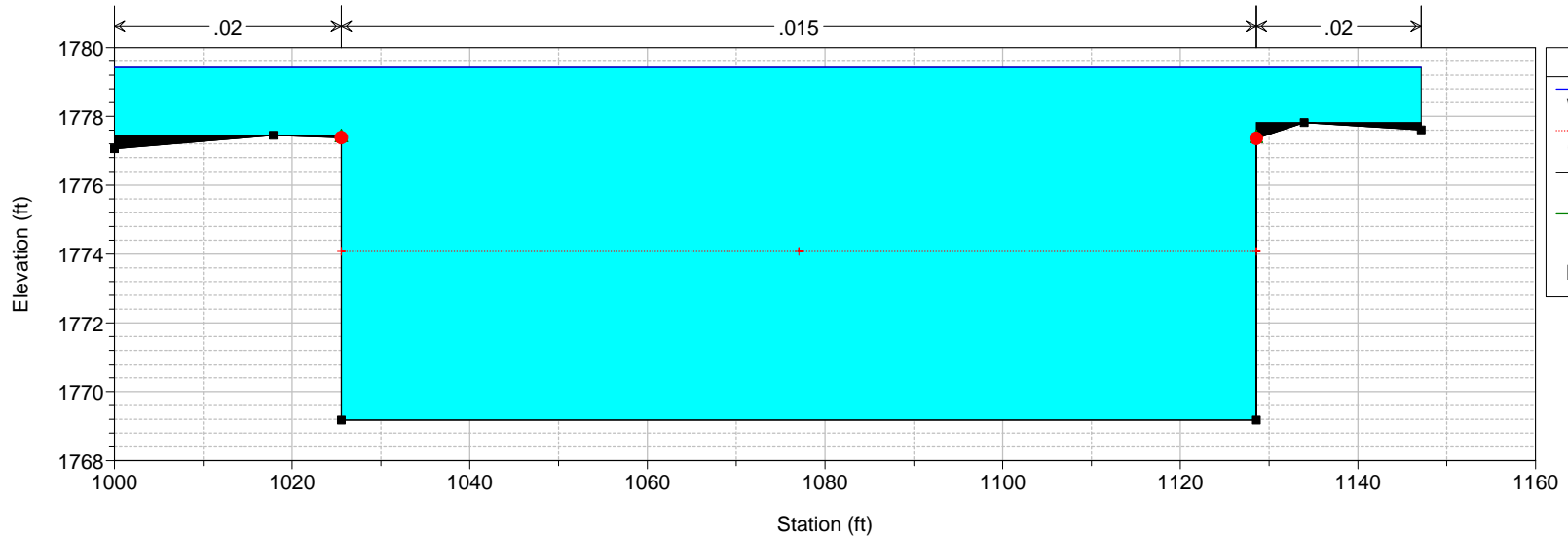
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 310



Legend

- WS PF 1
- Ground
- Bank Sta

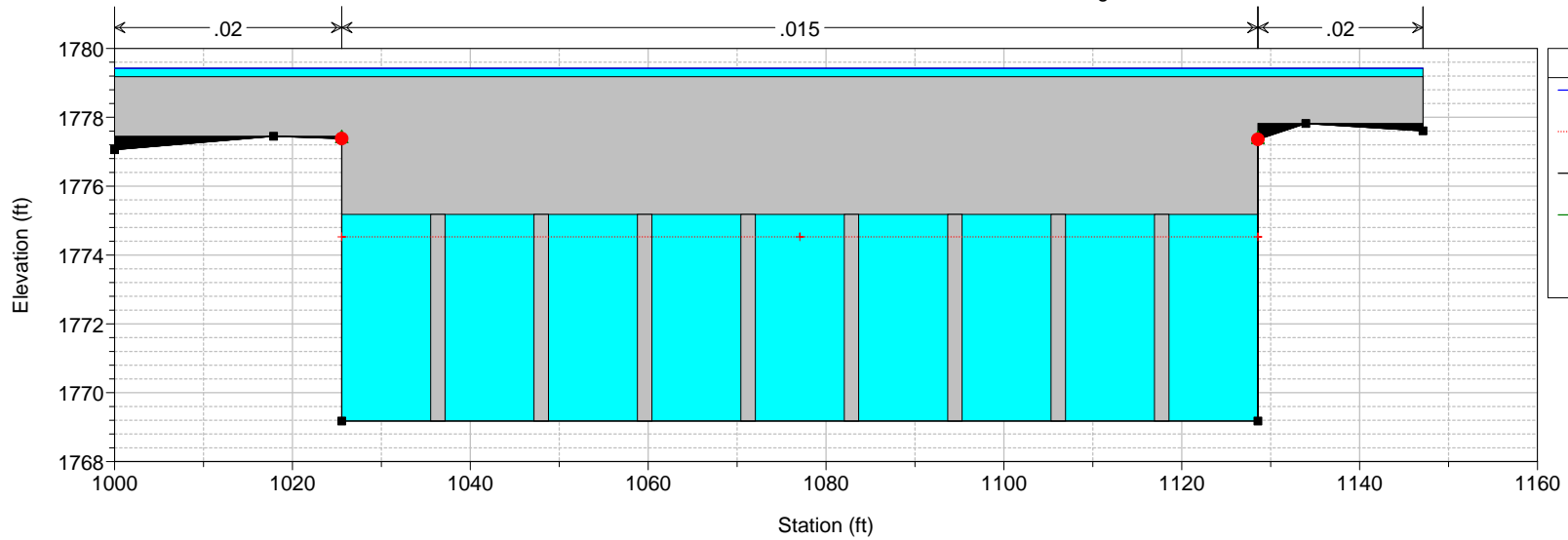
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 300



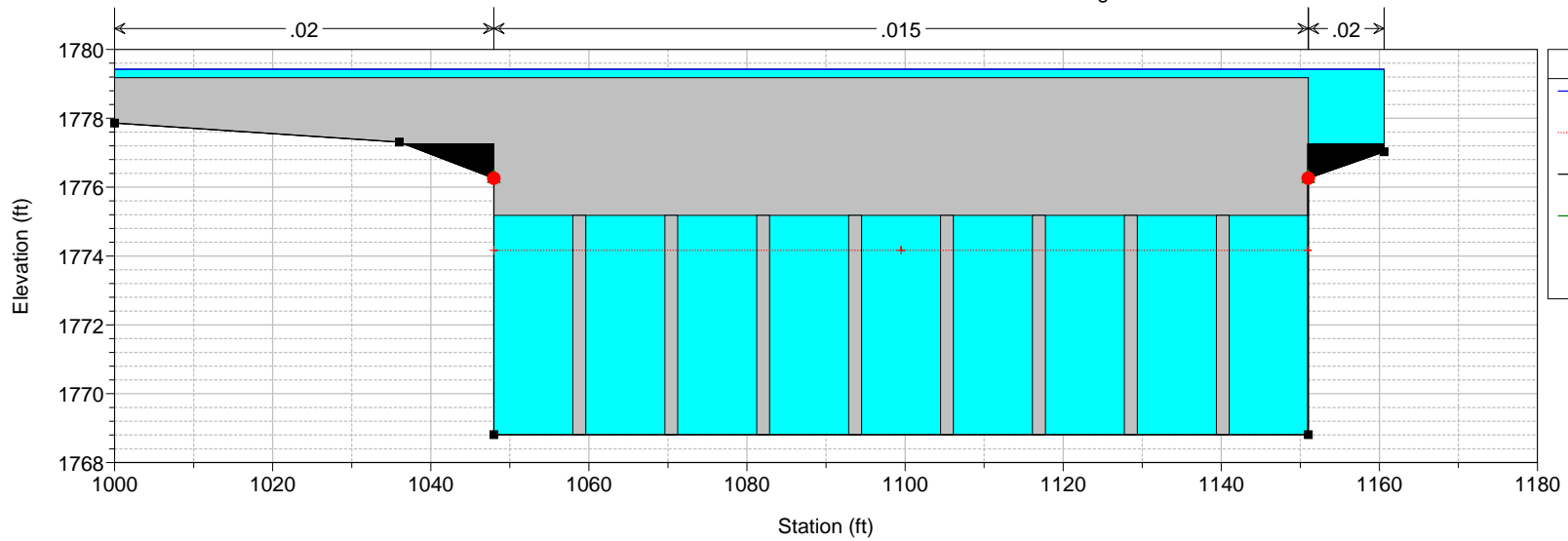
Legend

- WS PF 1
- Crit PF 1
- Ground
- Ineff
- Bank Sta

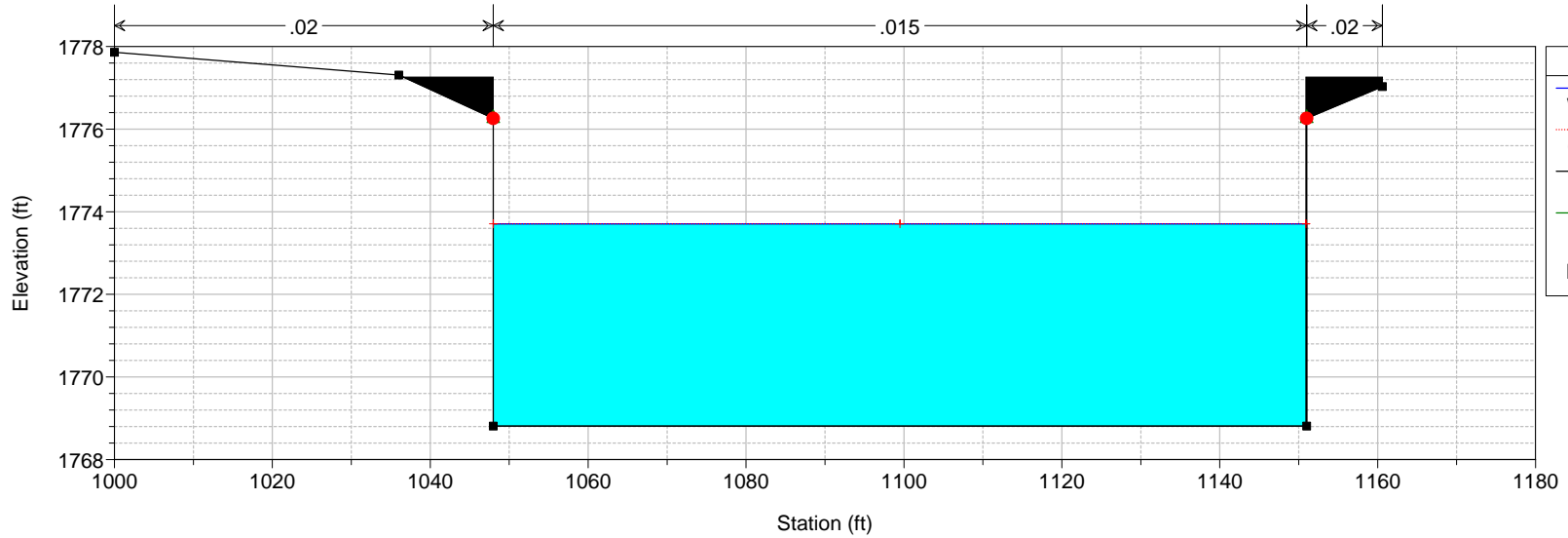
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 295 BR Bridge #2



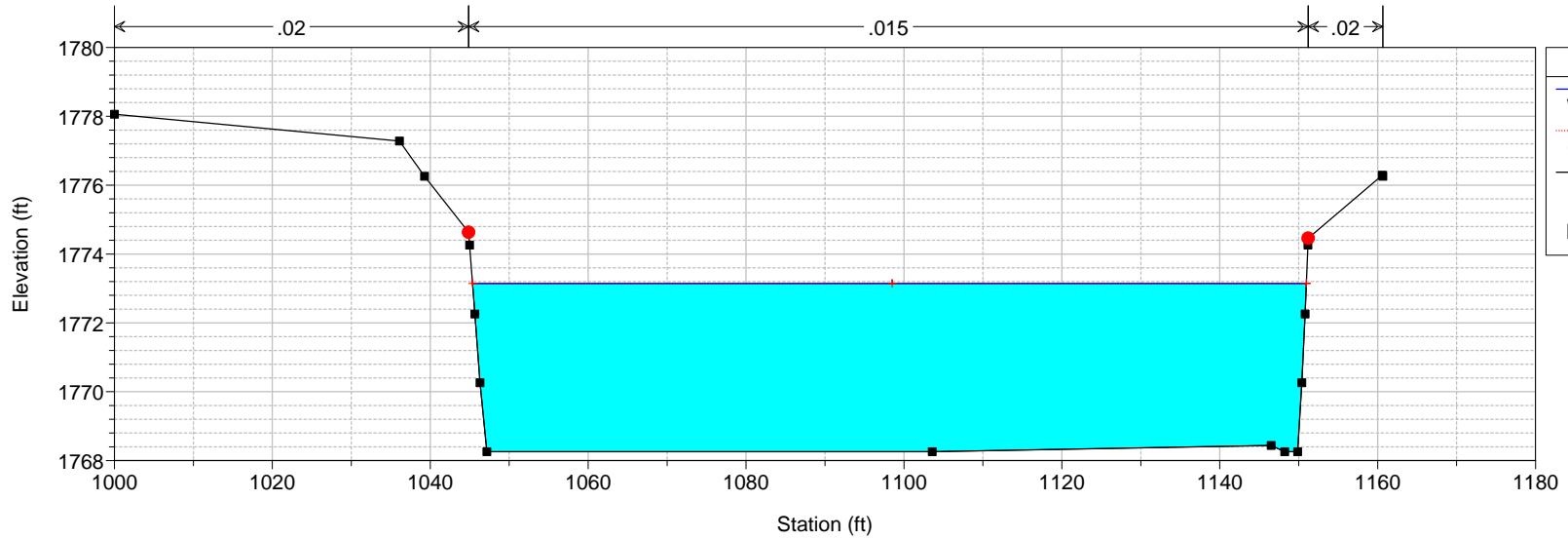
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 295 BR Bridge #2



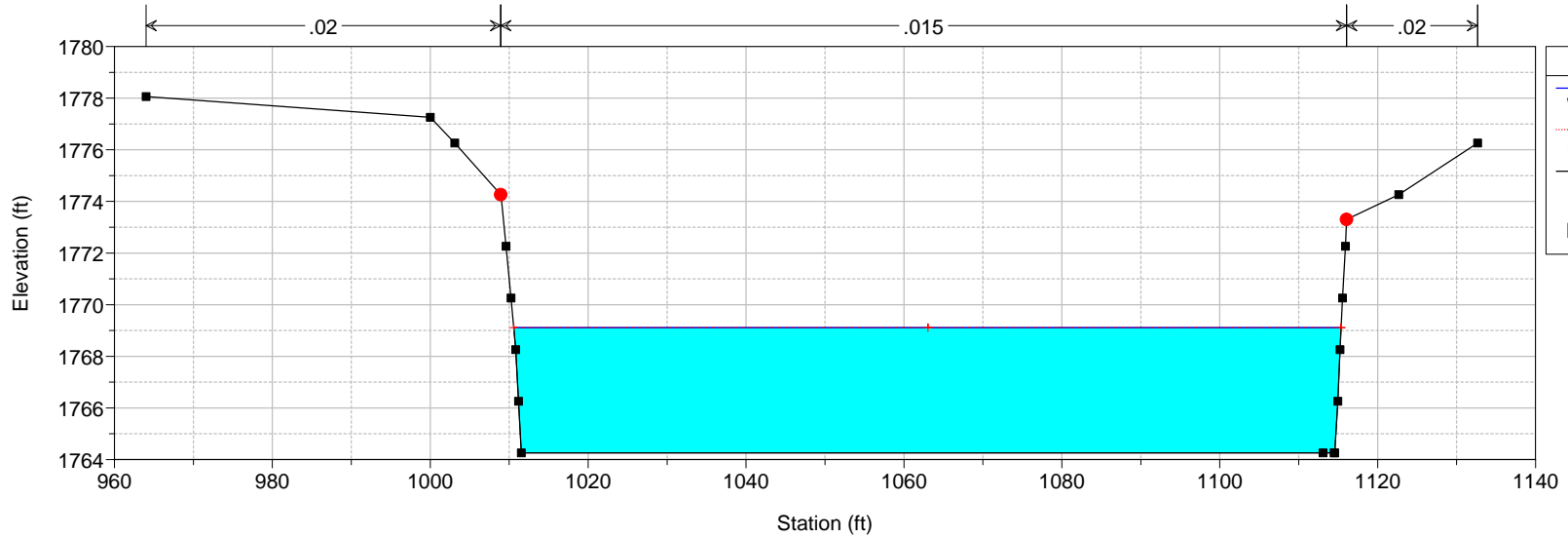
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 290



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 280



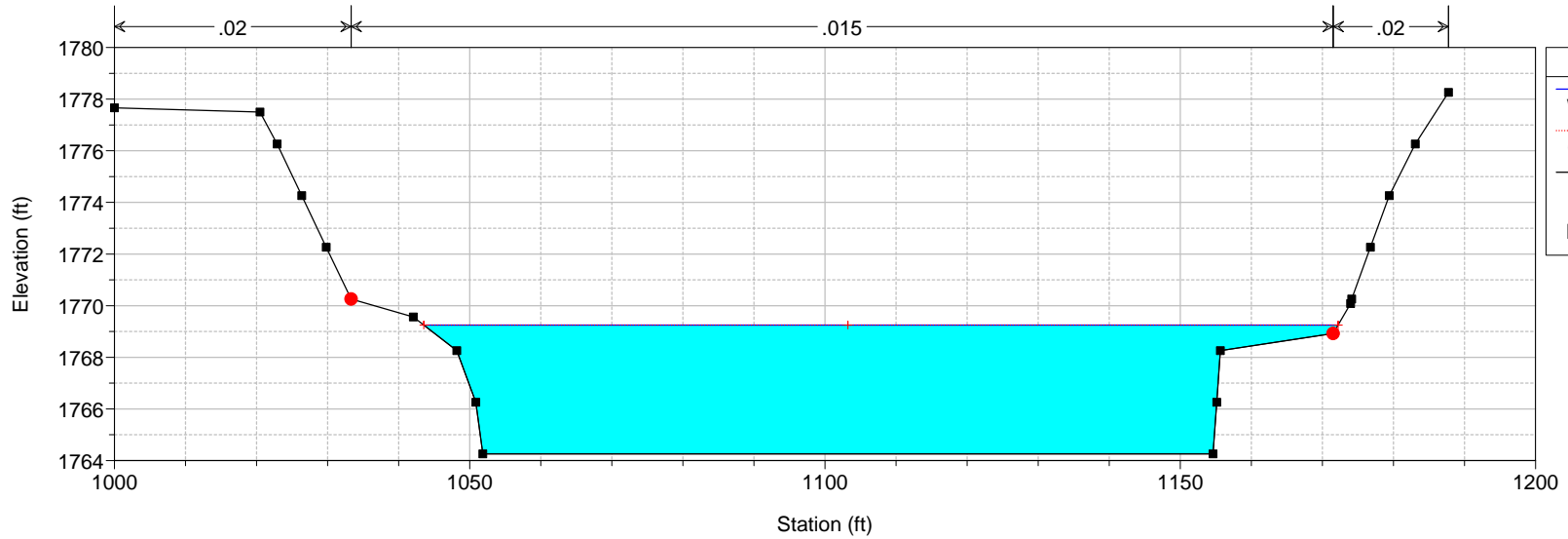
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 270



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

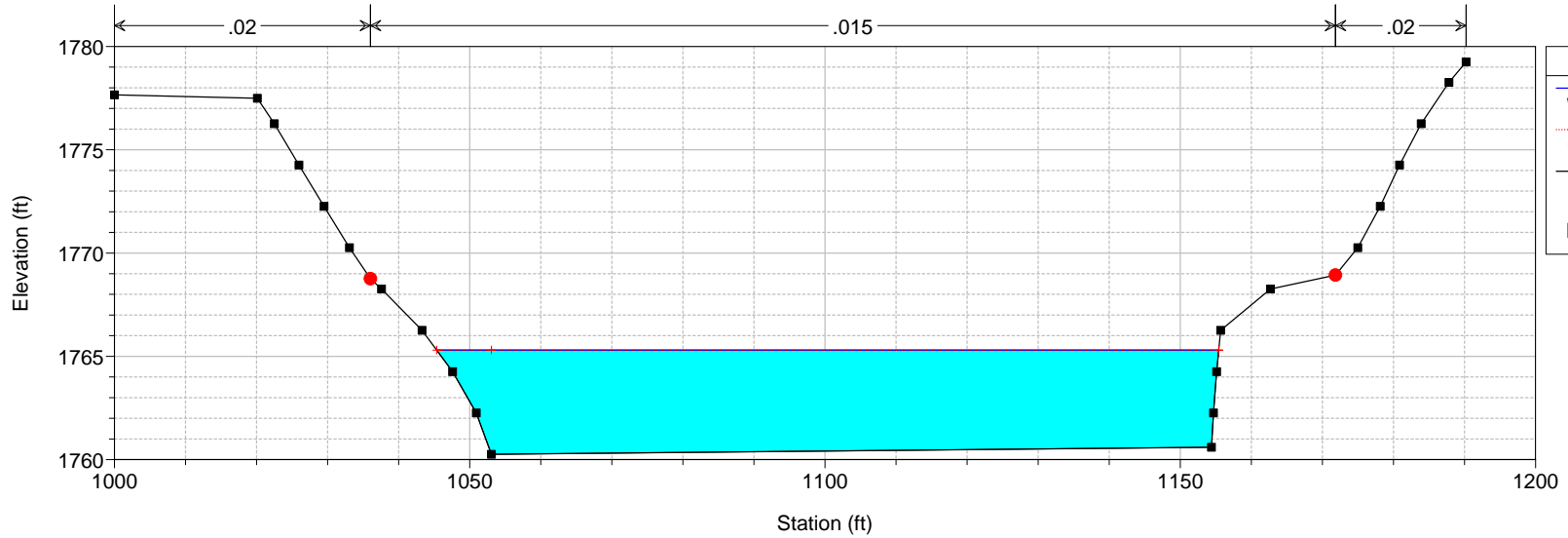
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 260



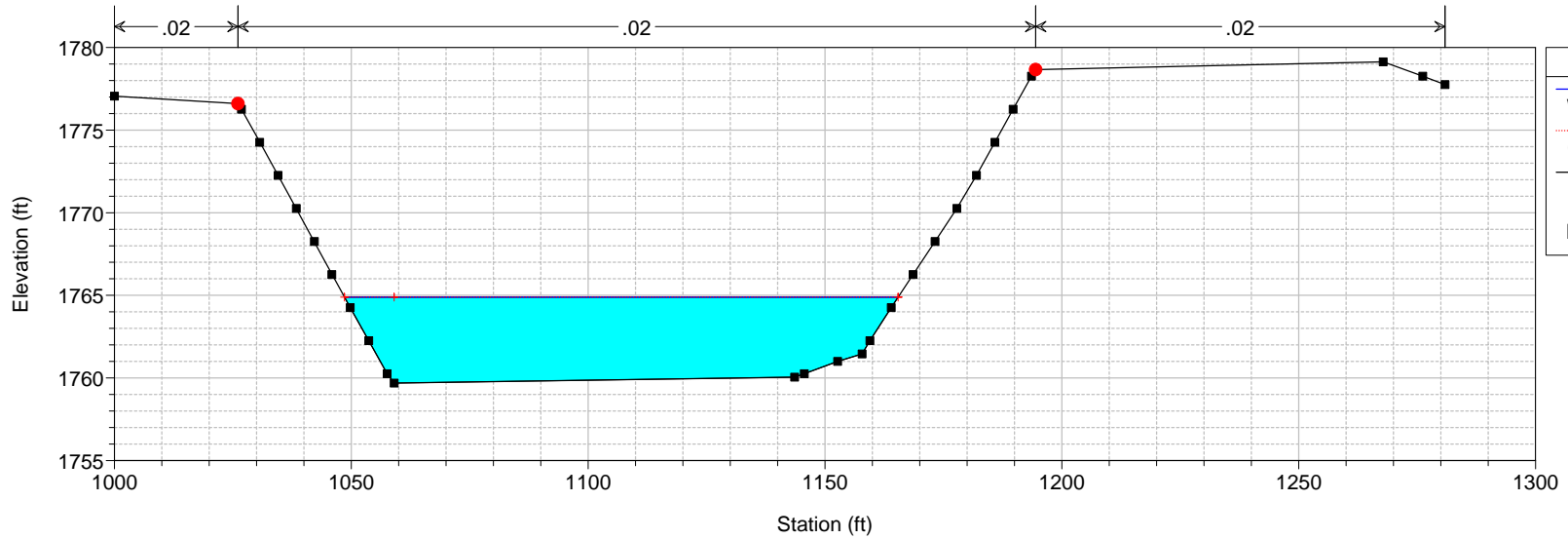
Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

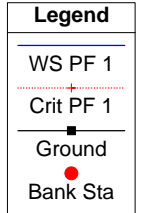
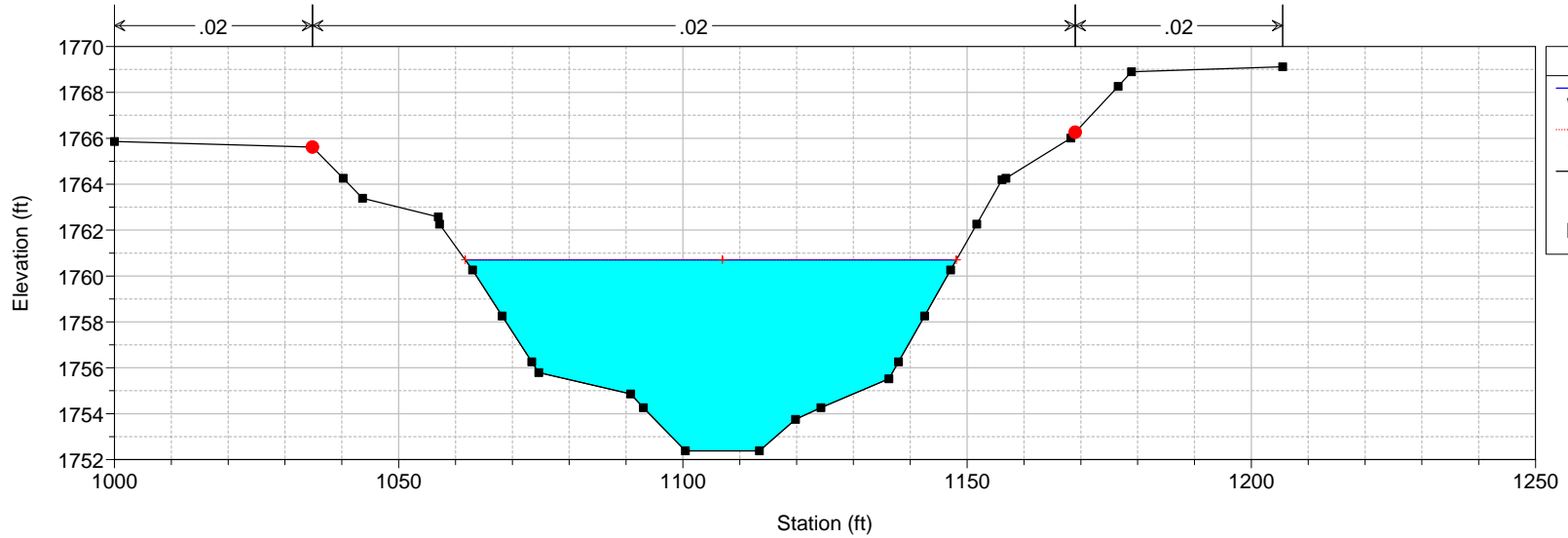
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 250



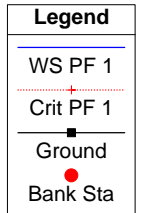
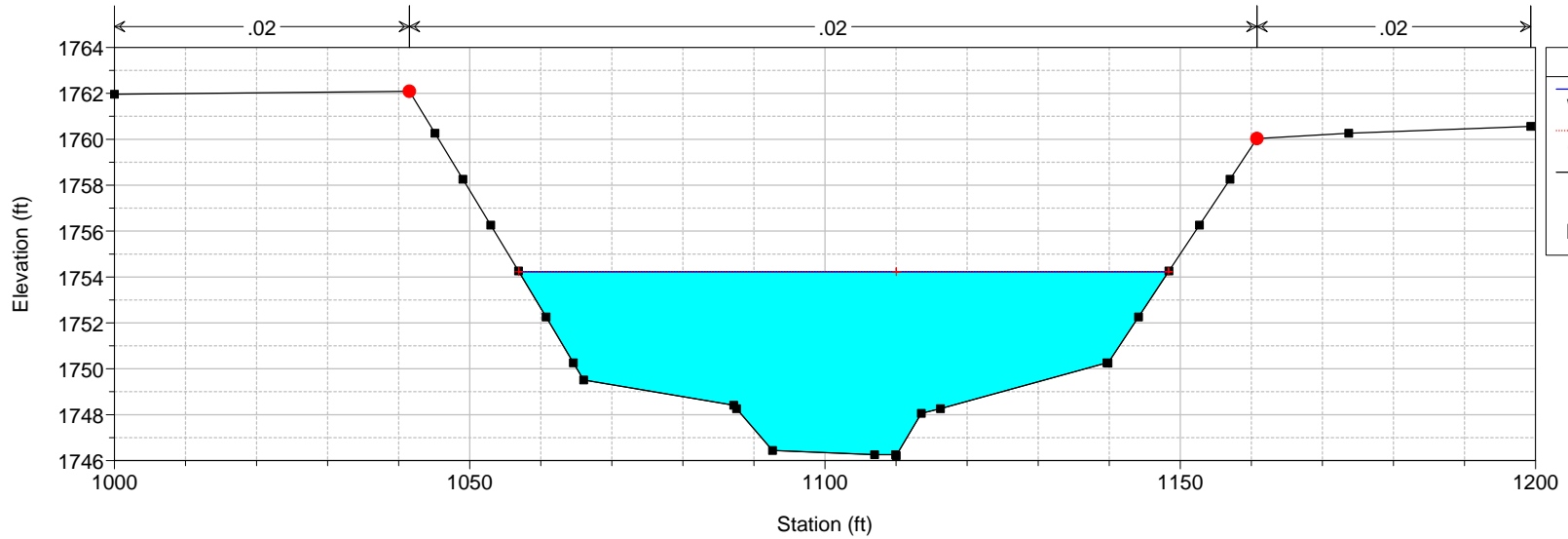
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 240



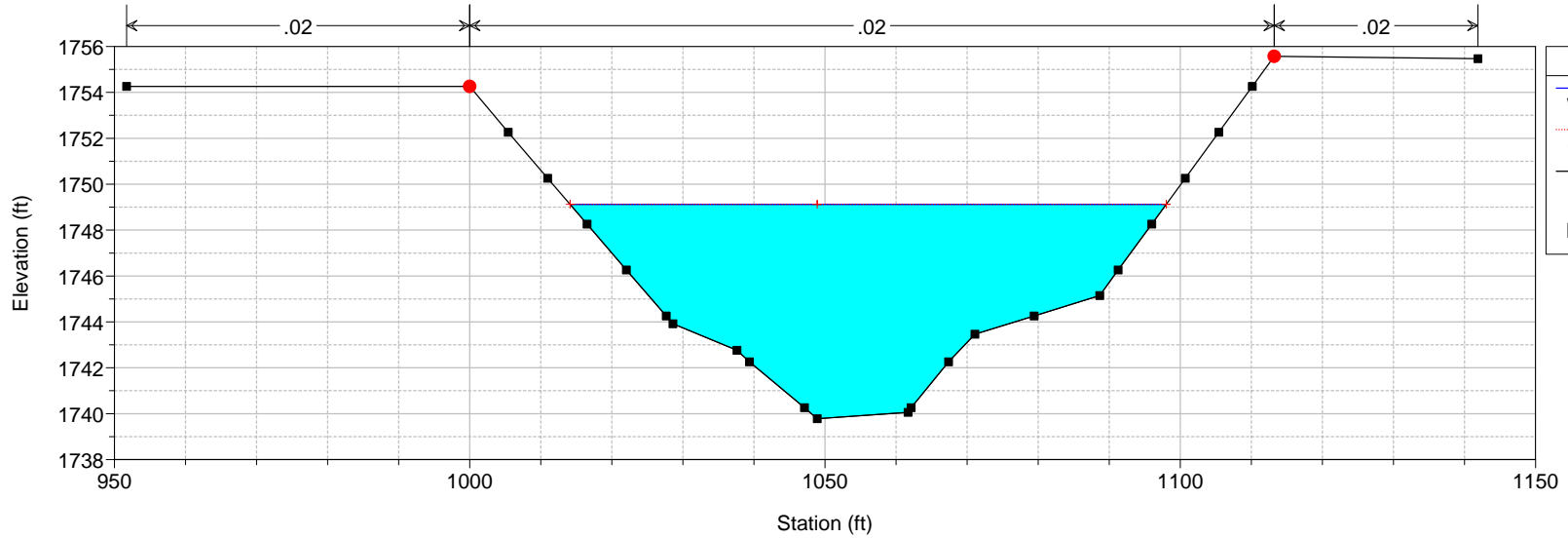
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 230



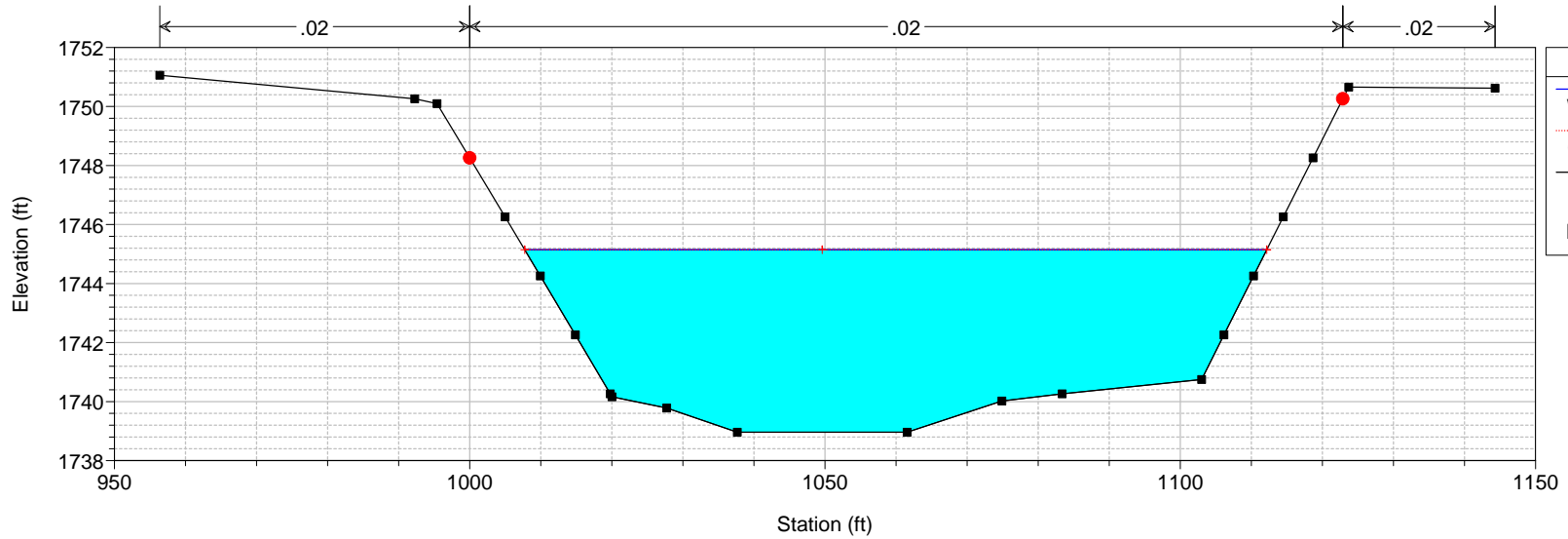
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 220



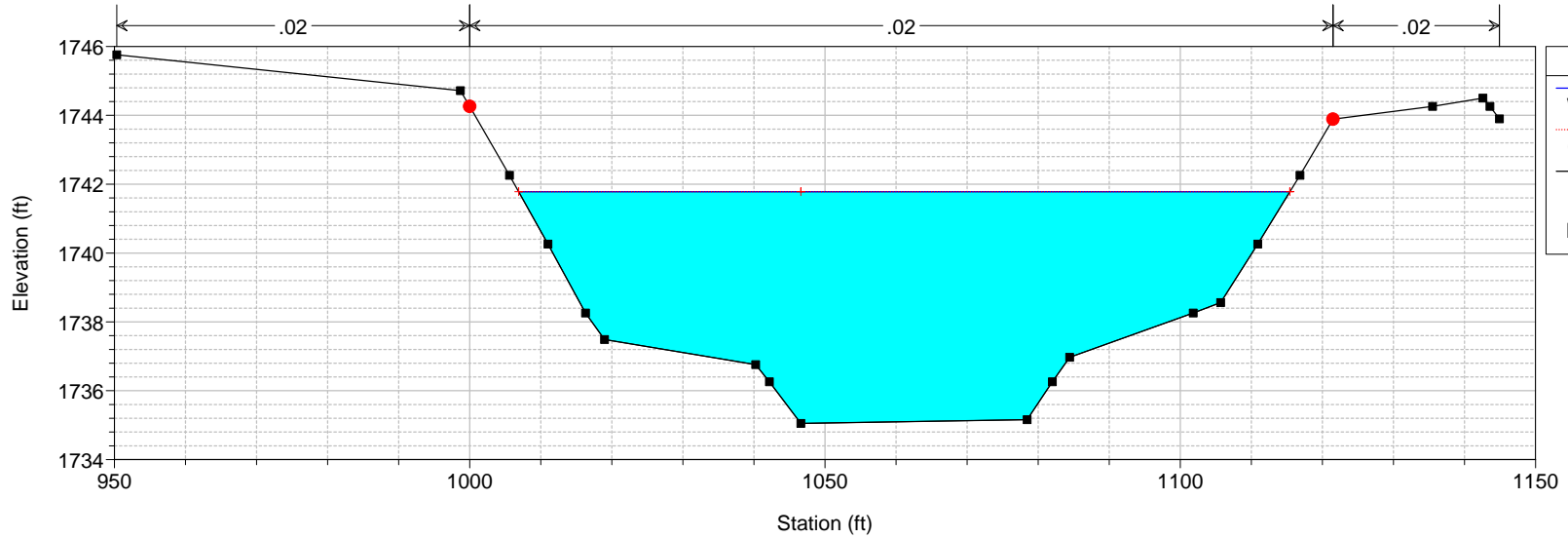
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 210



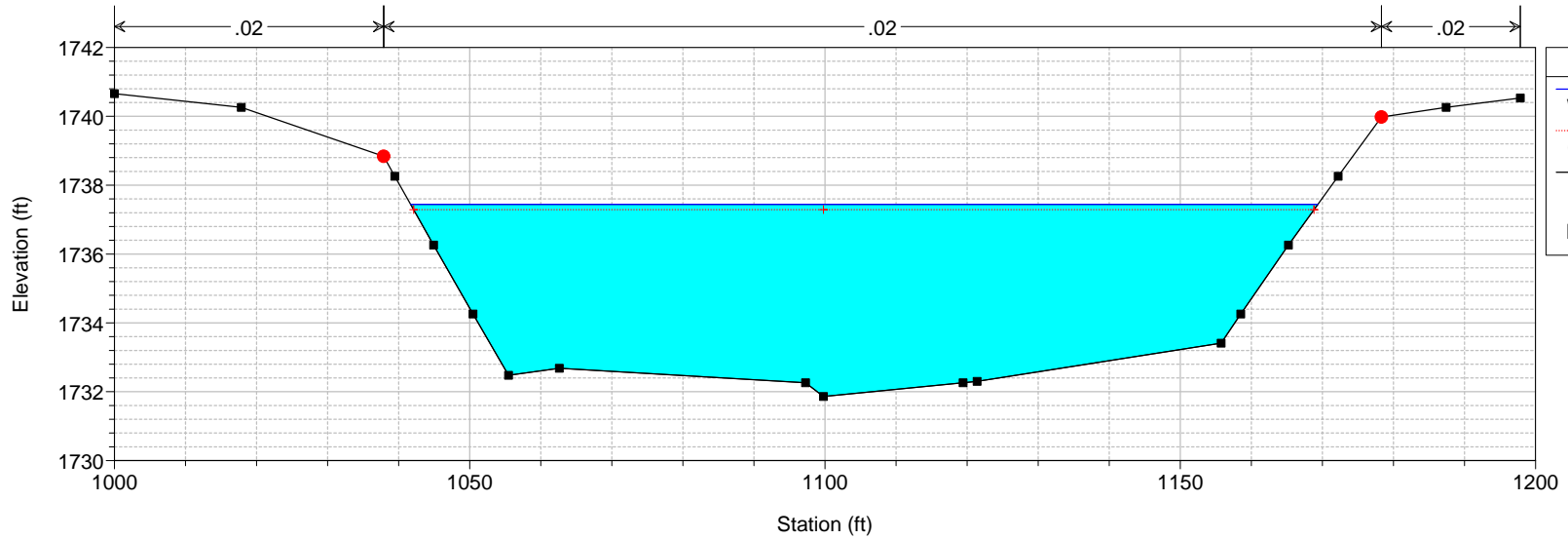
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 200



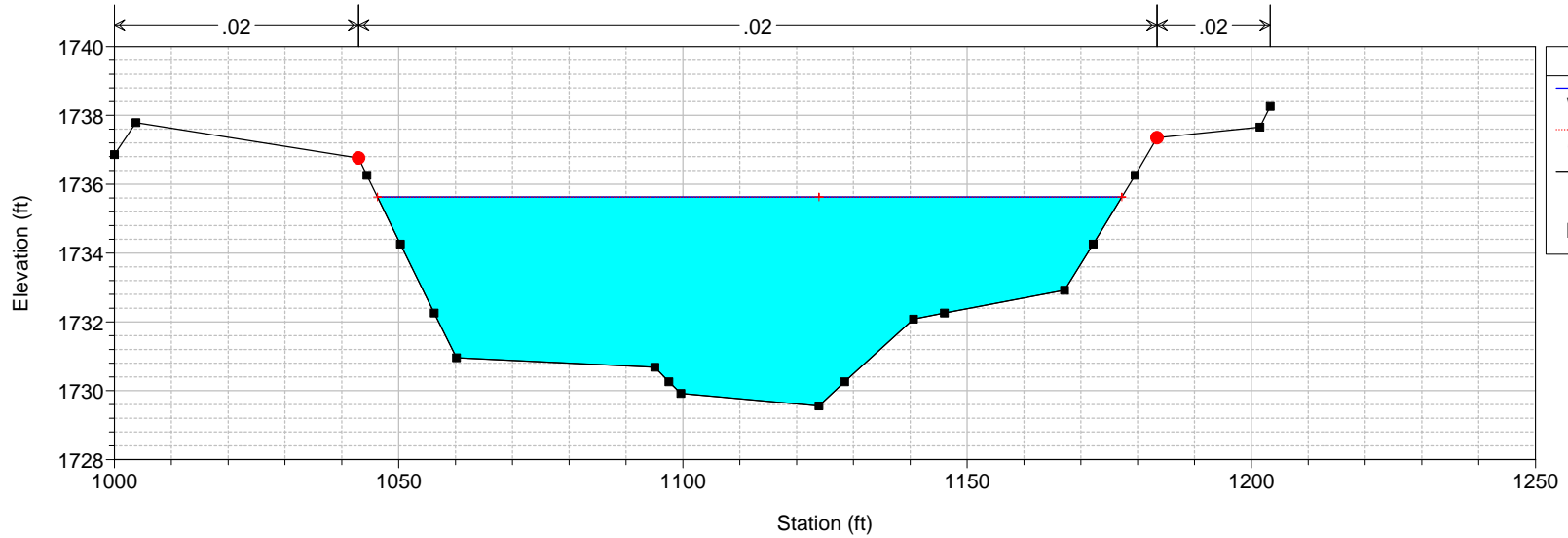
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 190



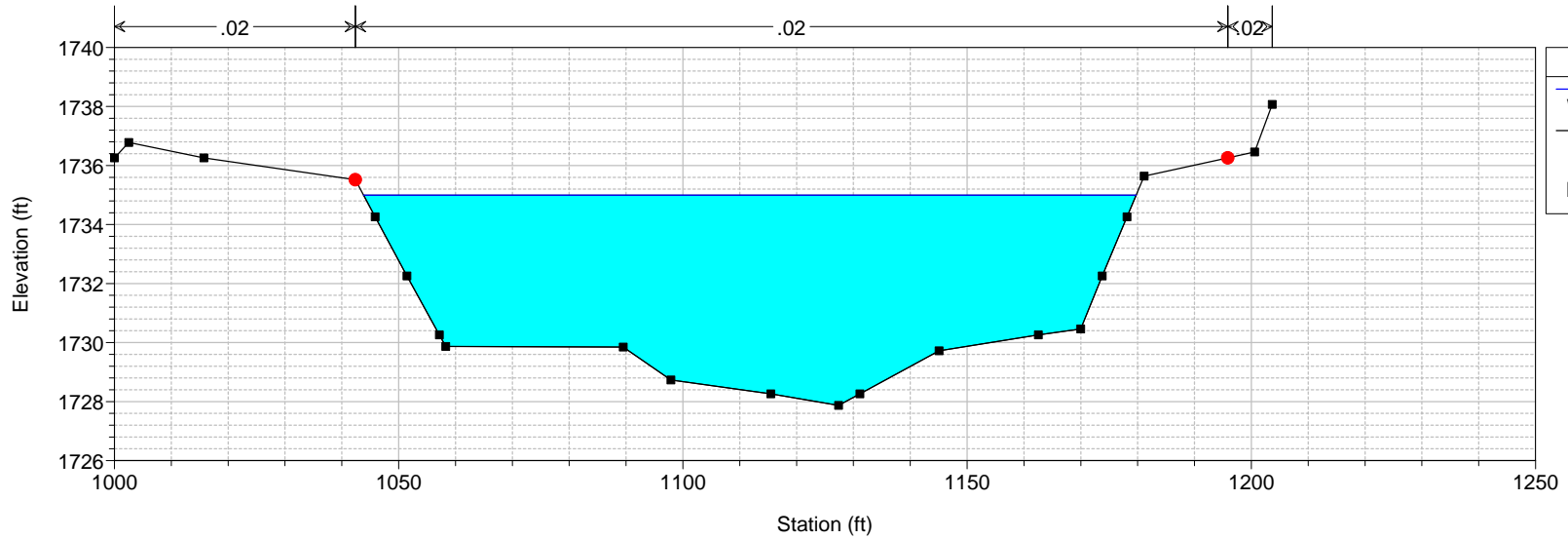
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 180

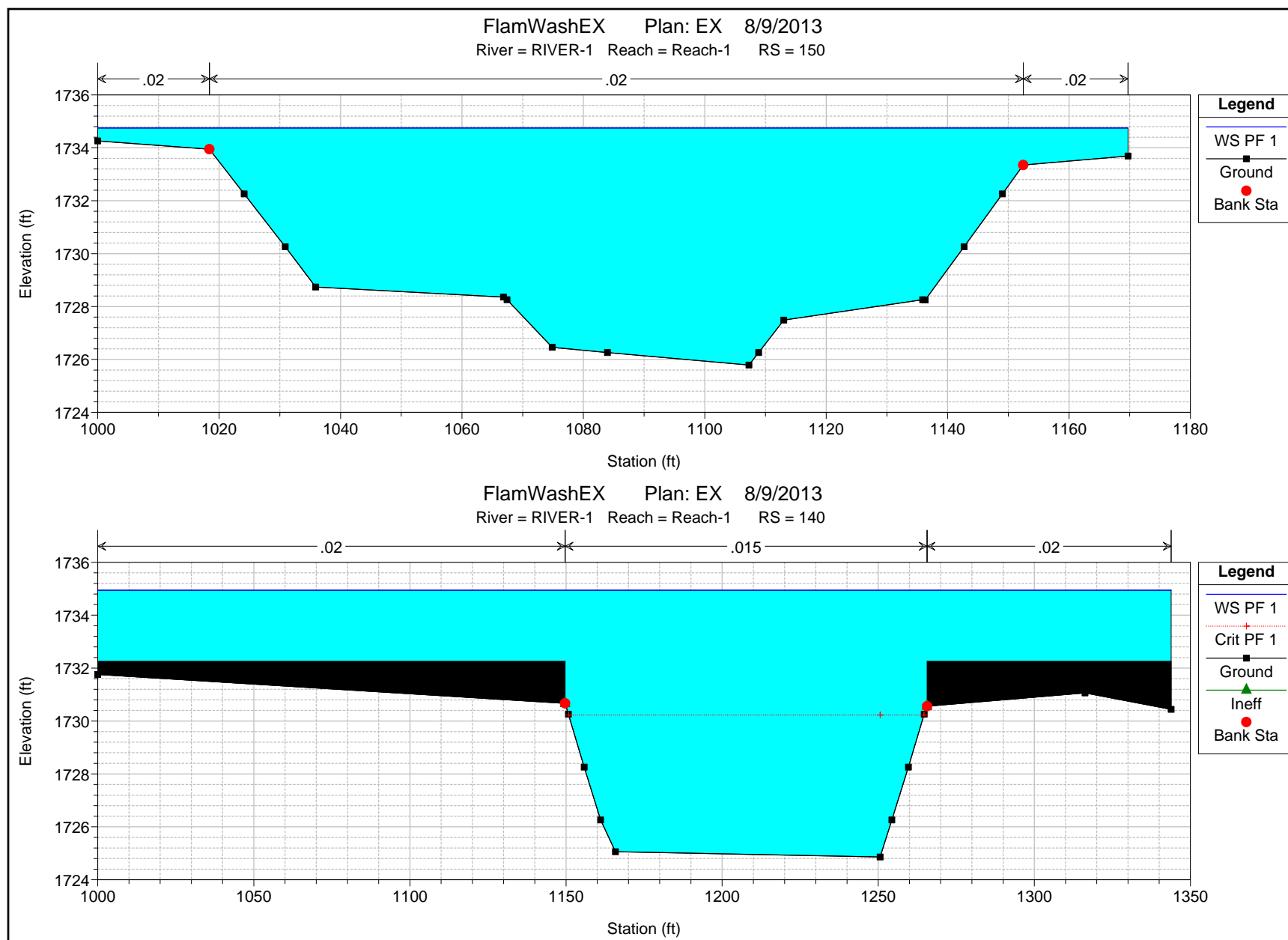


FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 170

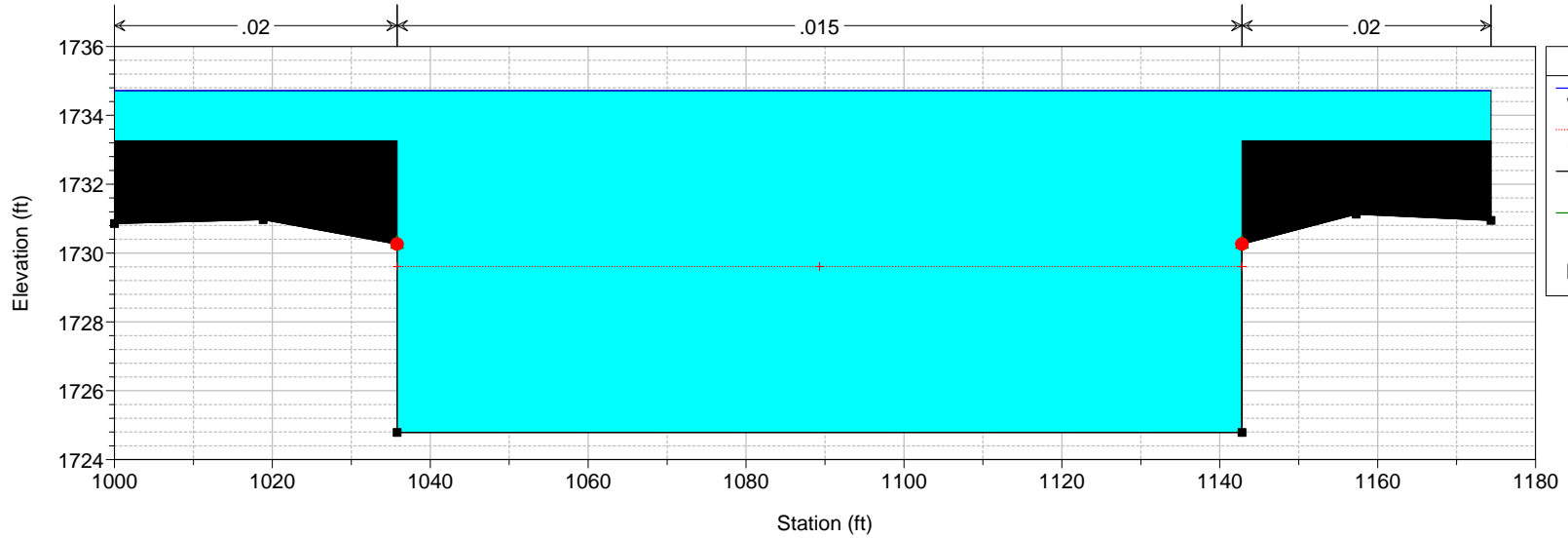


FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 160

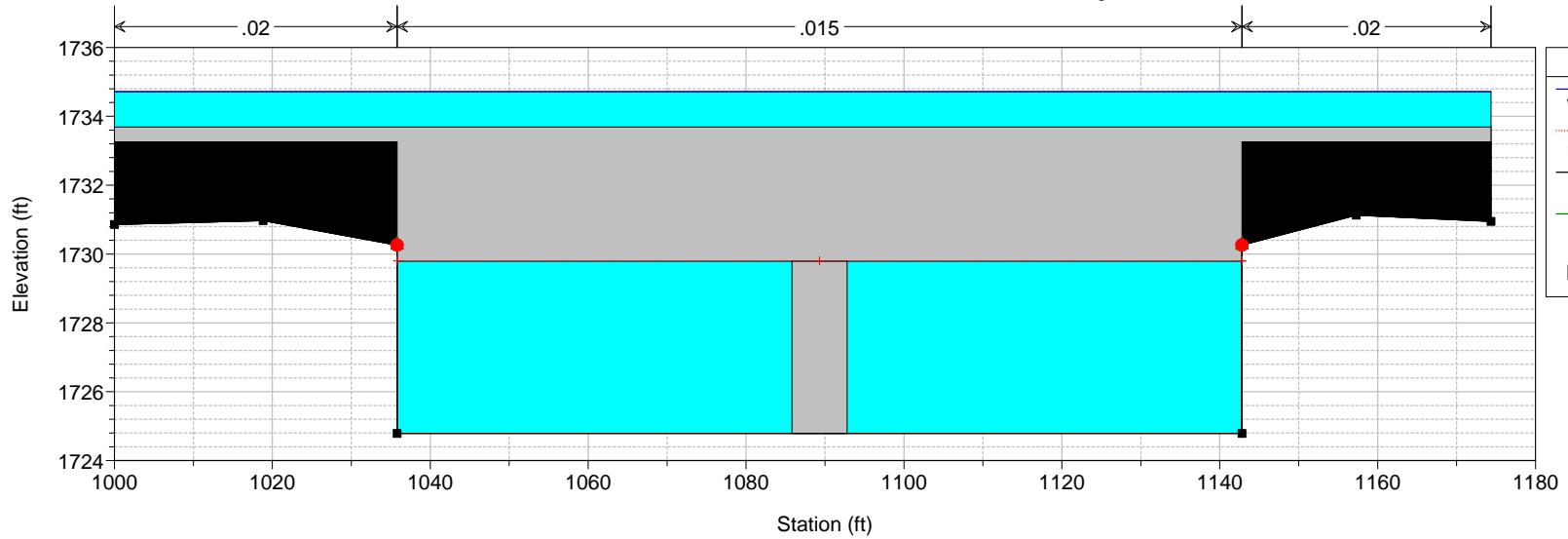




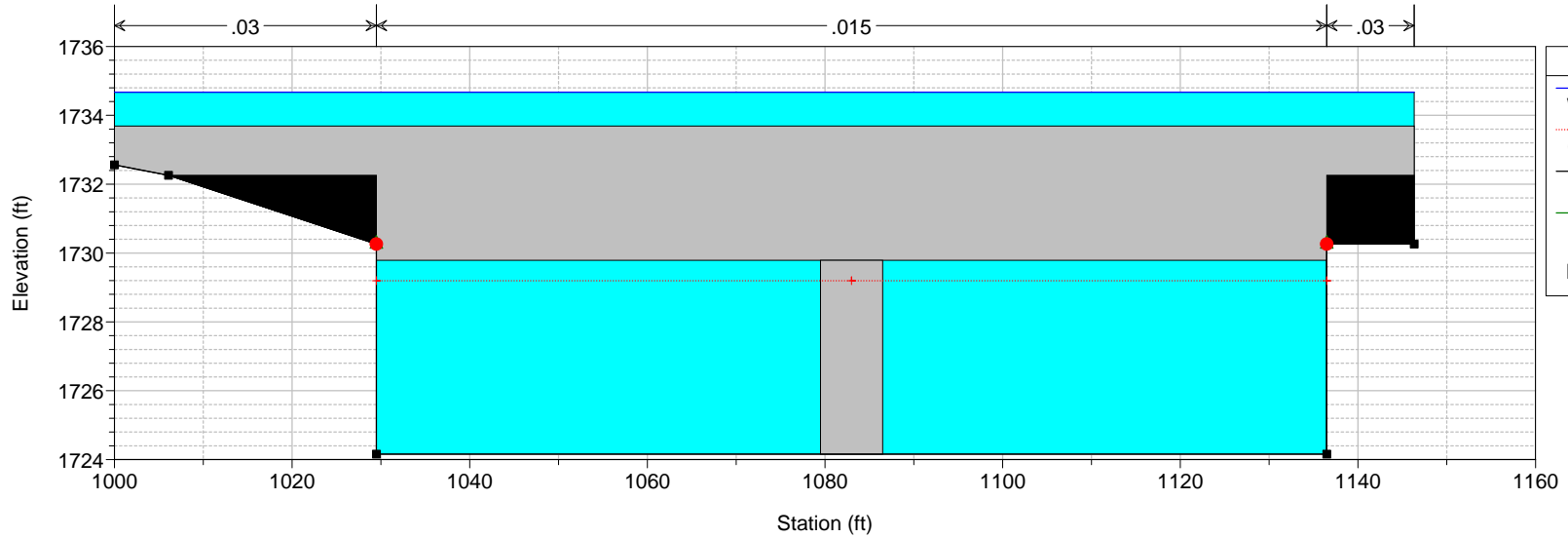
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 130



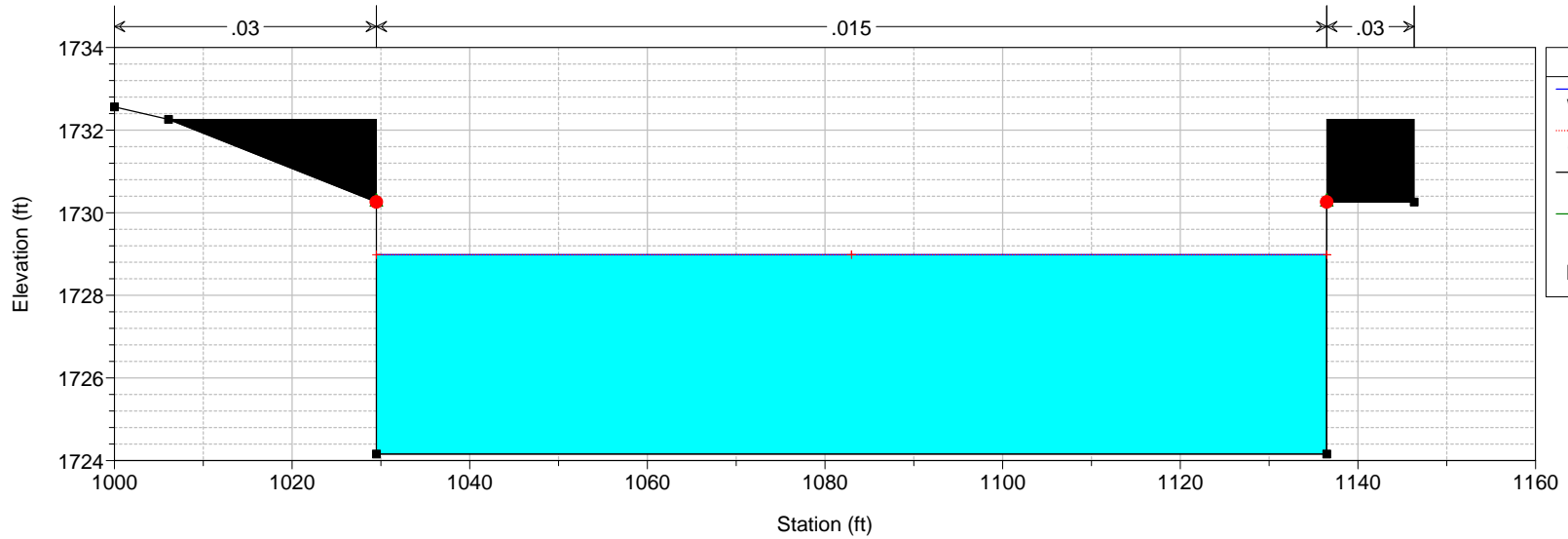
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 125 BR Bridge #1



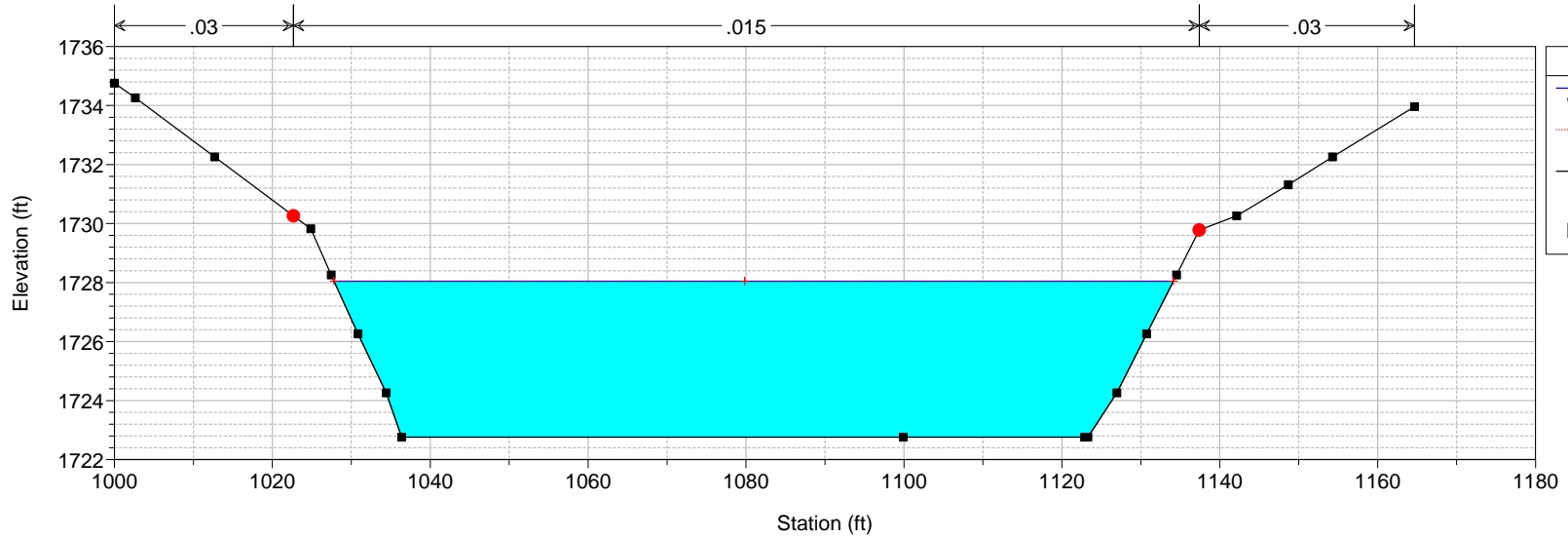
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 125 BR Bridge #1



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 120



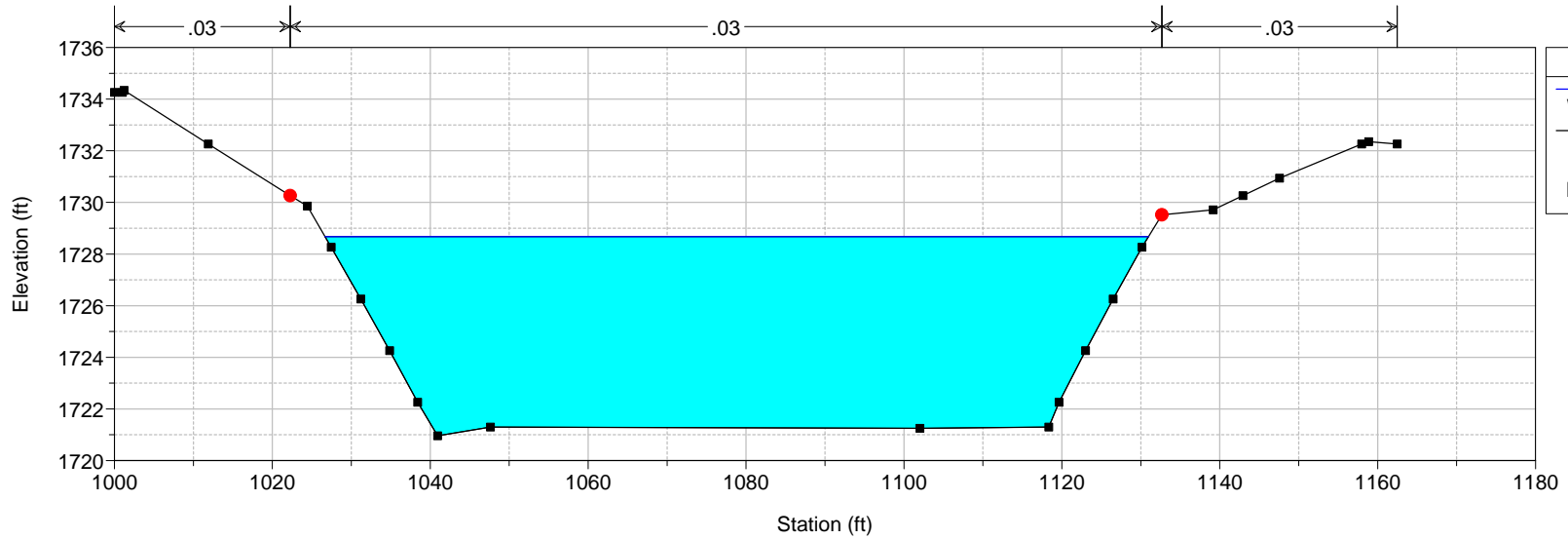
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 110



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

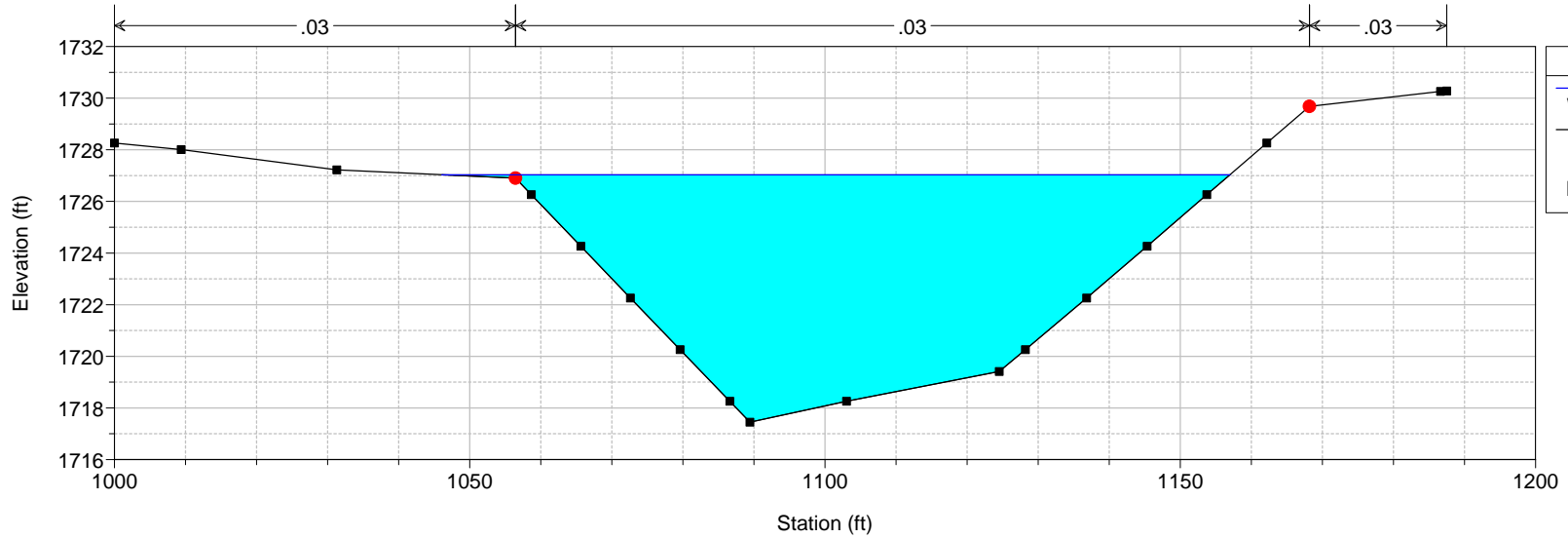
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 100



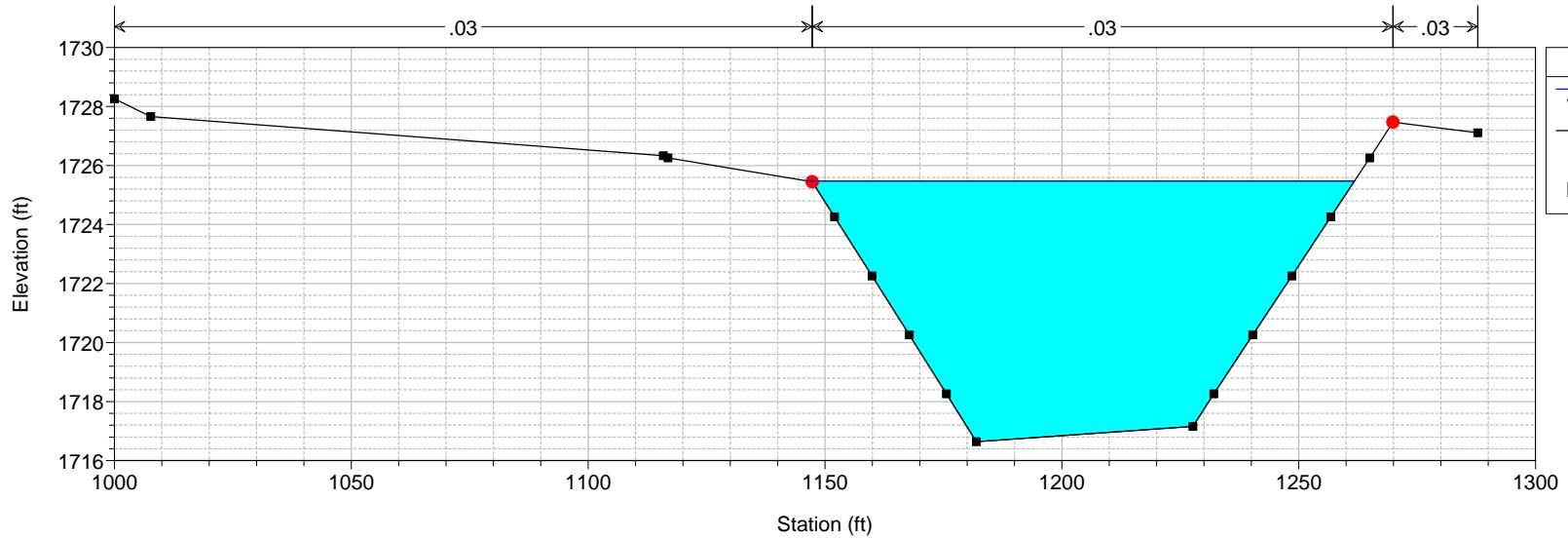
Legend

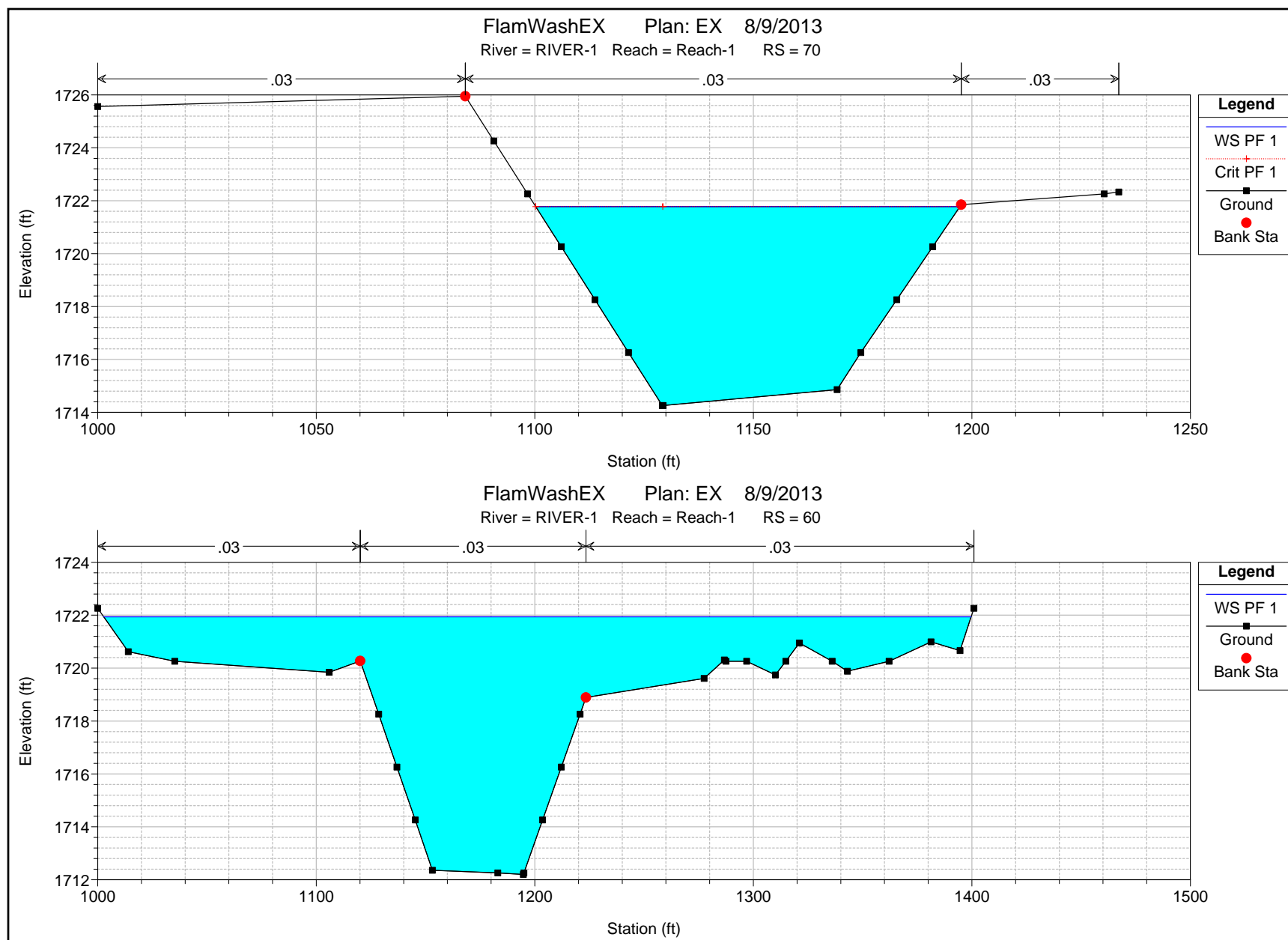
- WS PF 1
- Ground
- Bank Sta

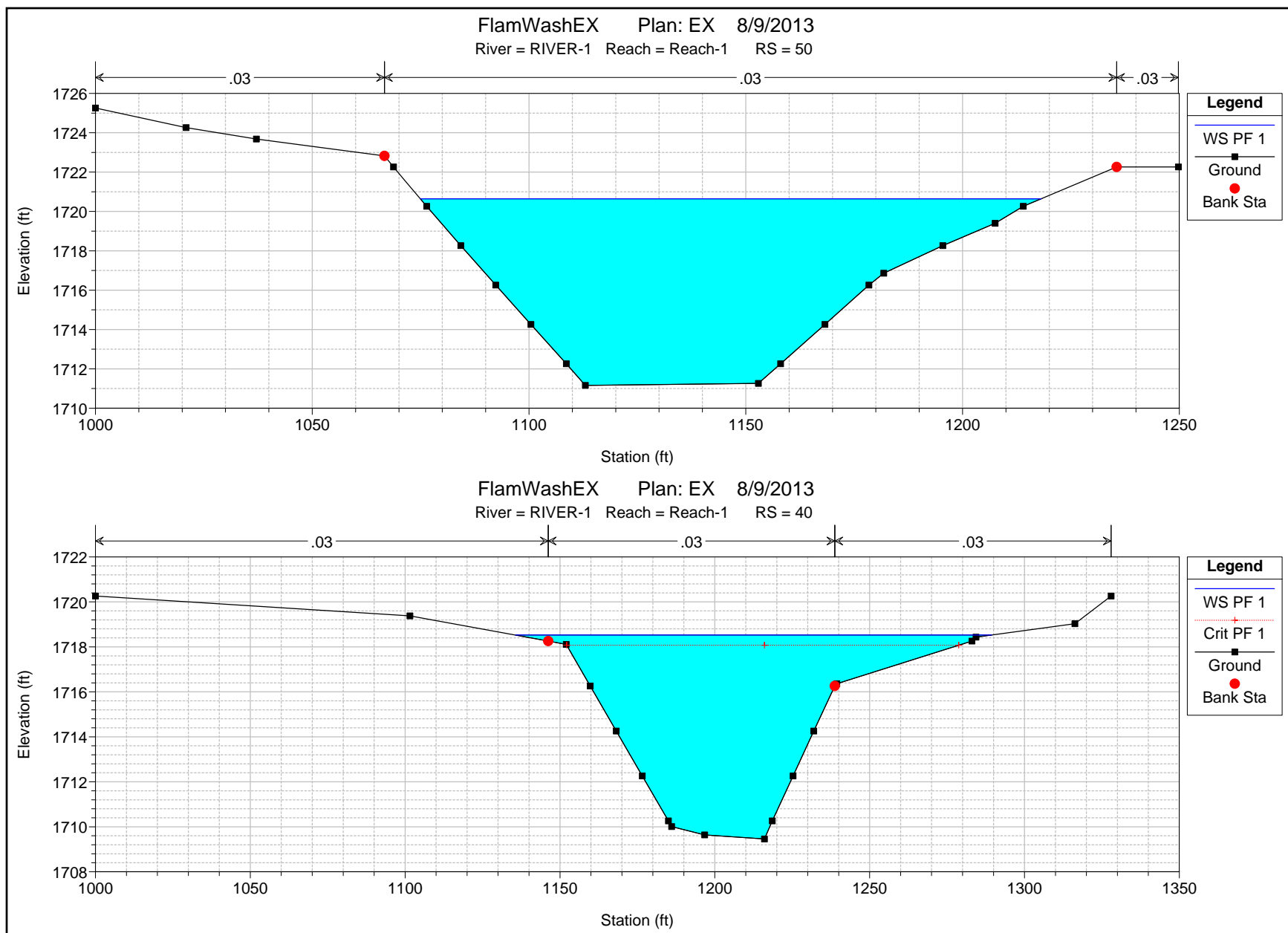
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 90



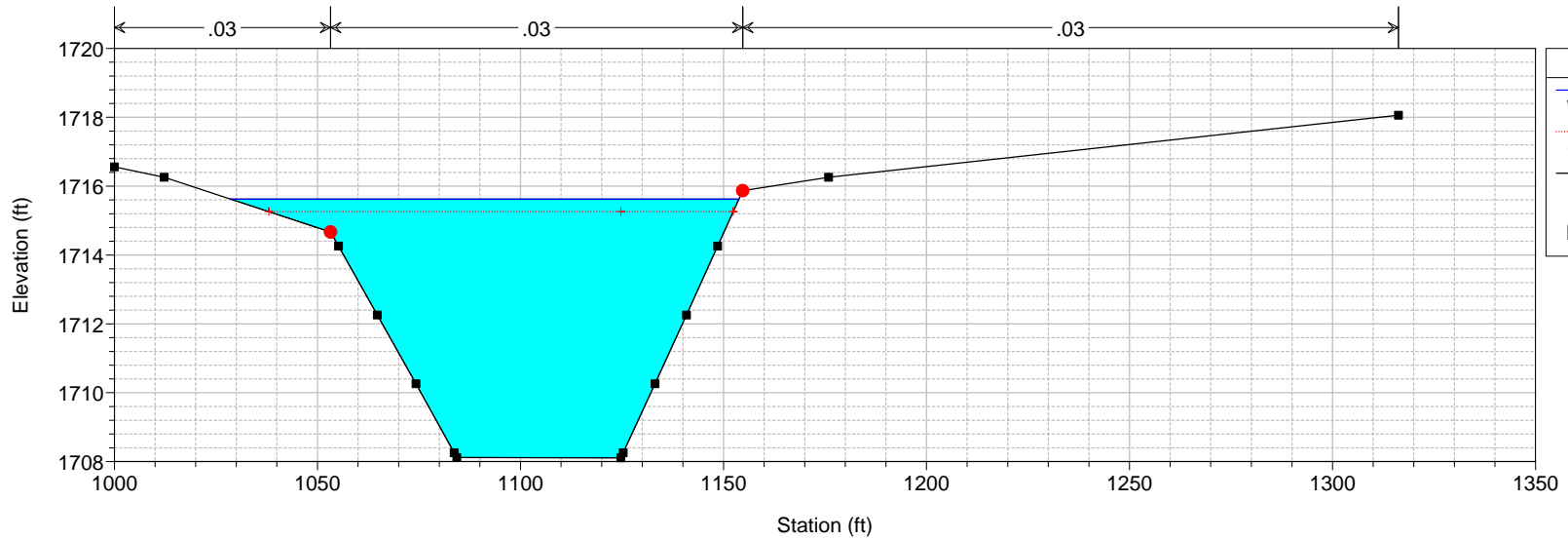
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 80



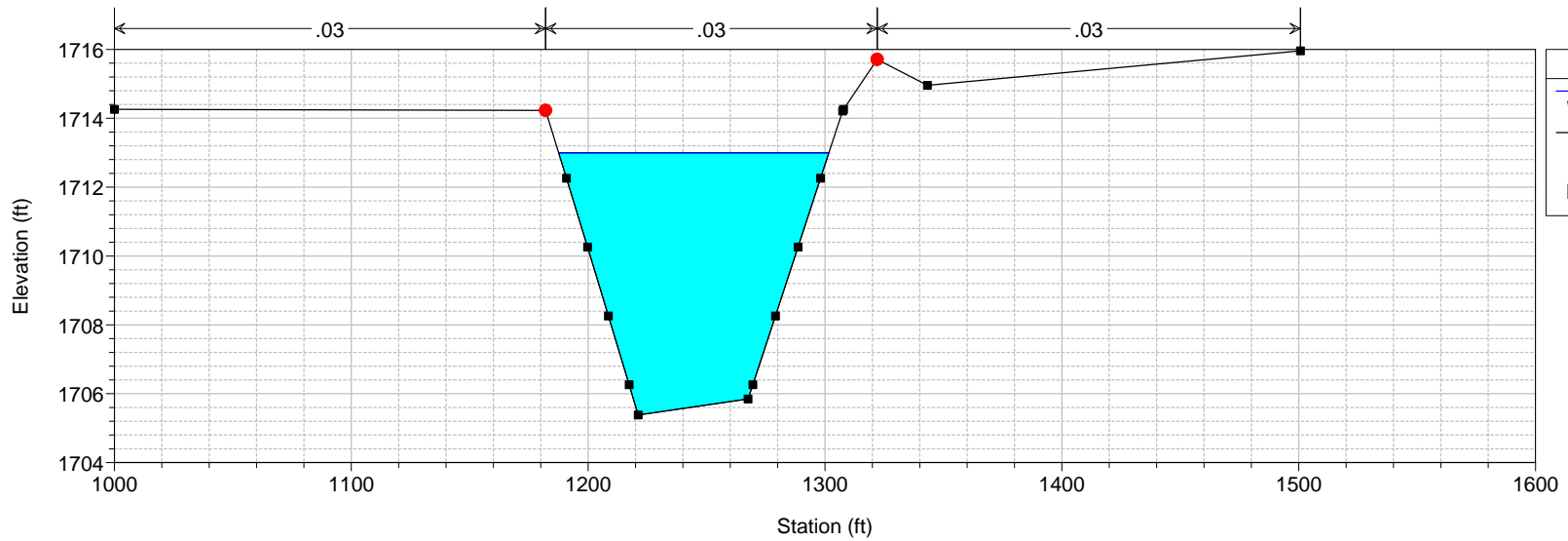




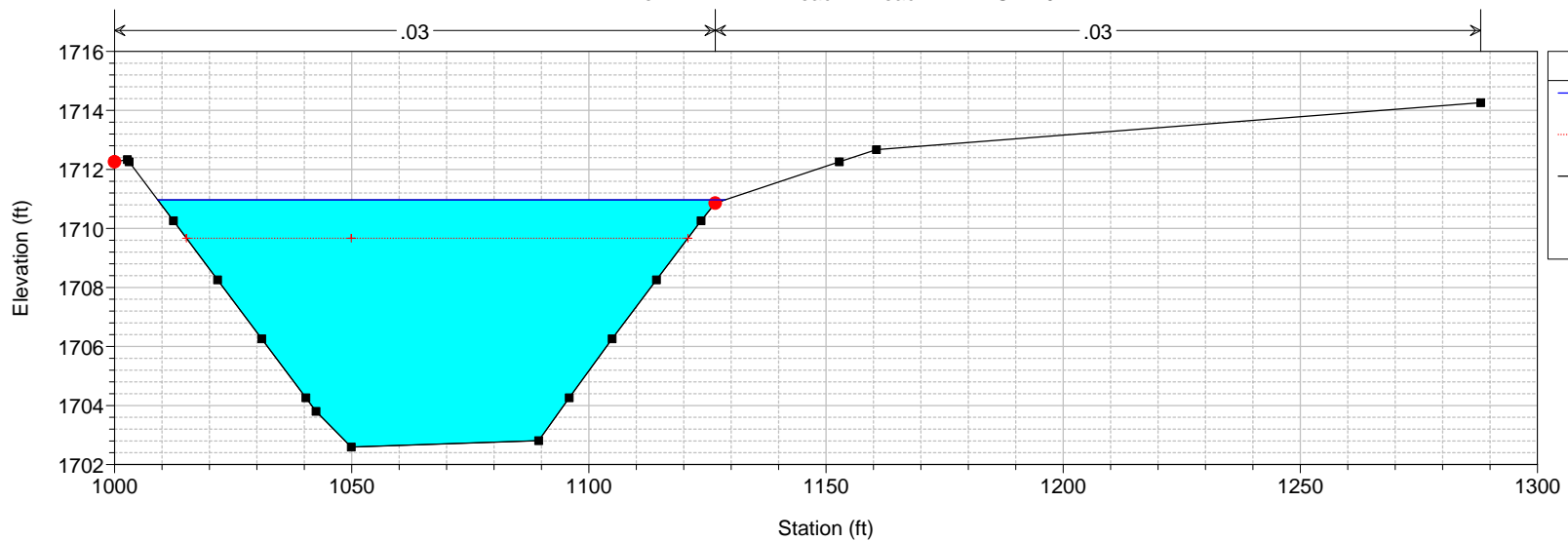
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 30



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 20

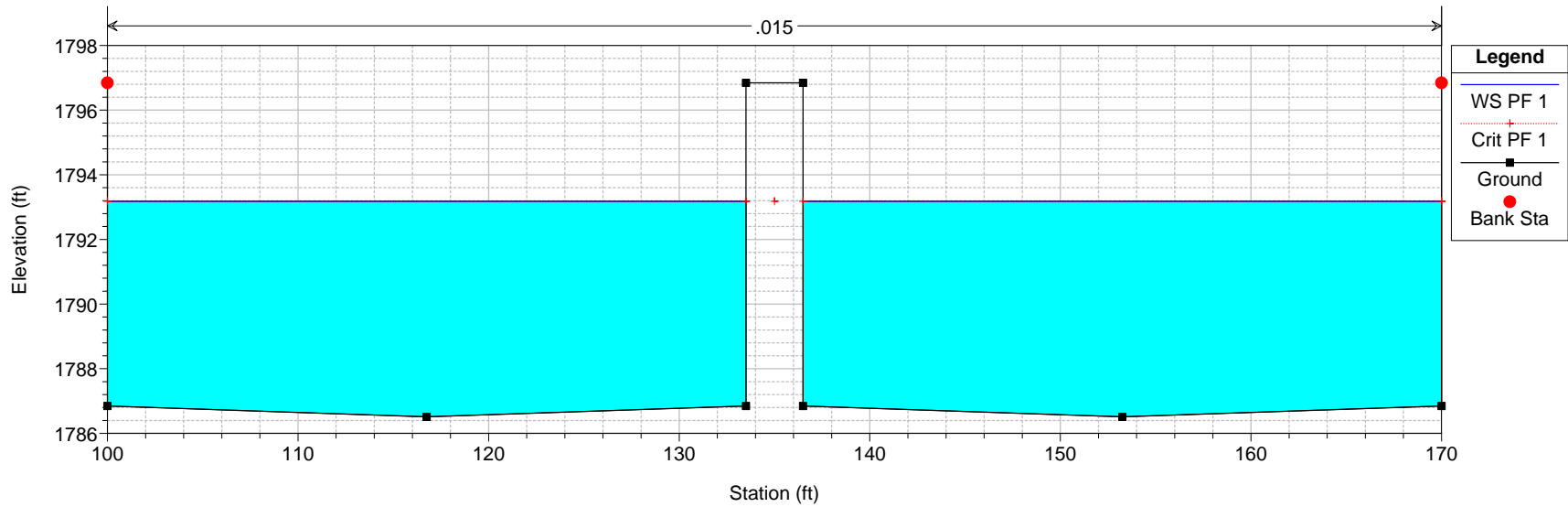


FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 10

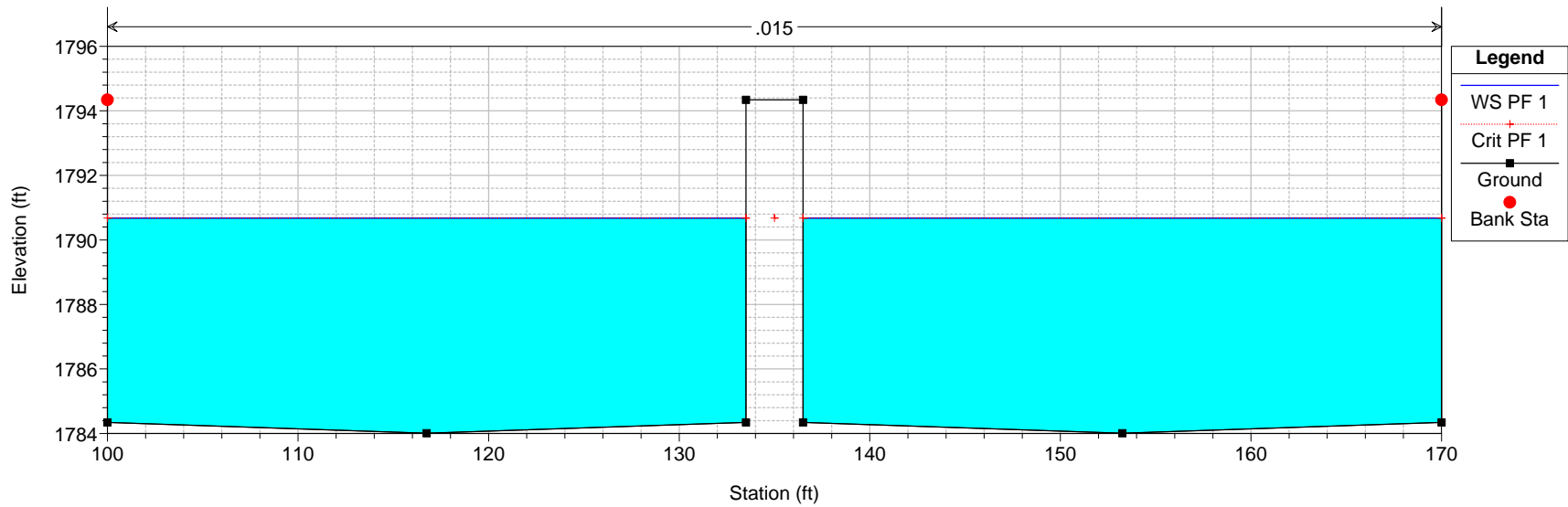


- Legend**
- WS PF 1
 - Crit PF 1
 - Ground
 - Bank Sta

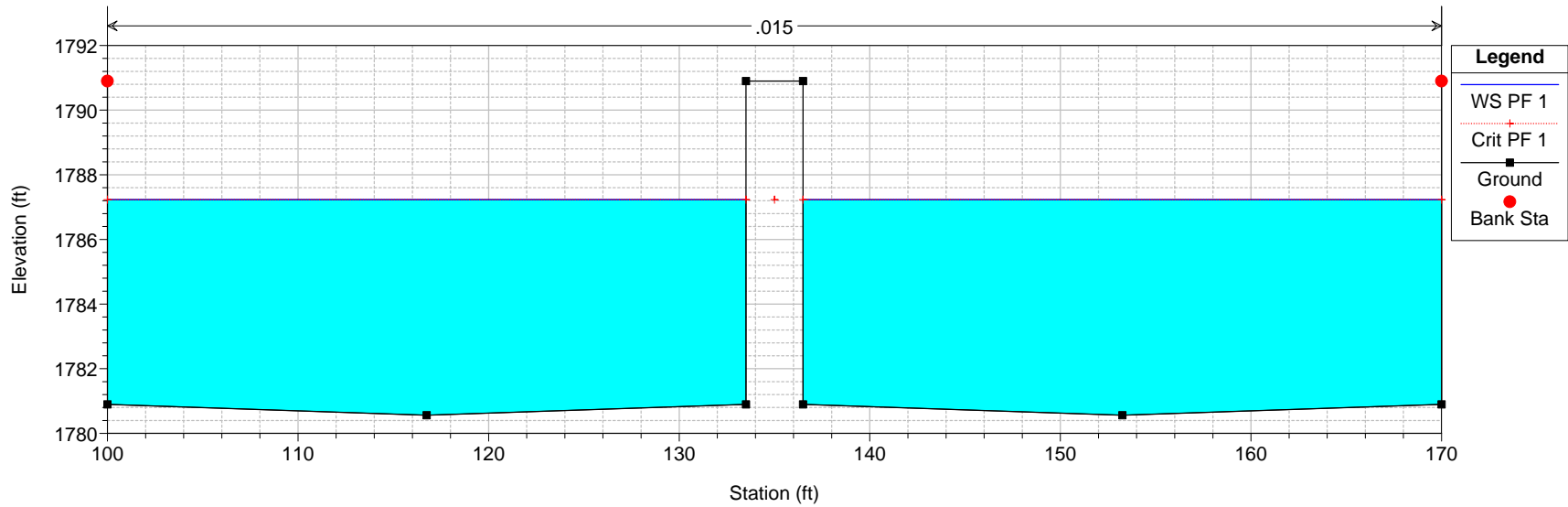
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 390



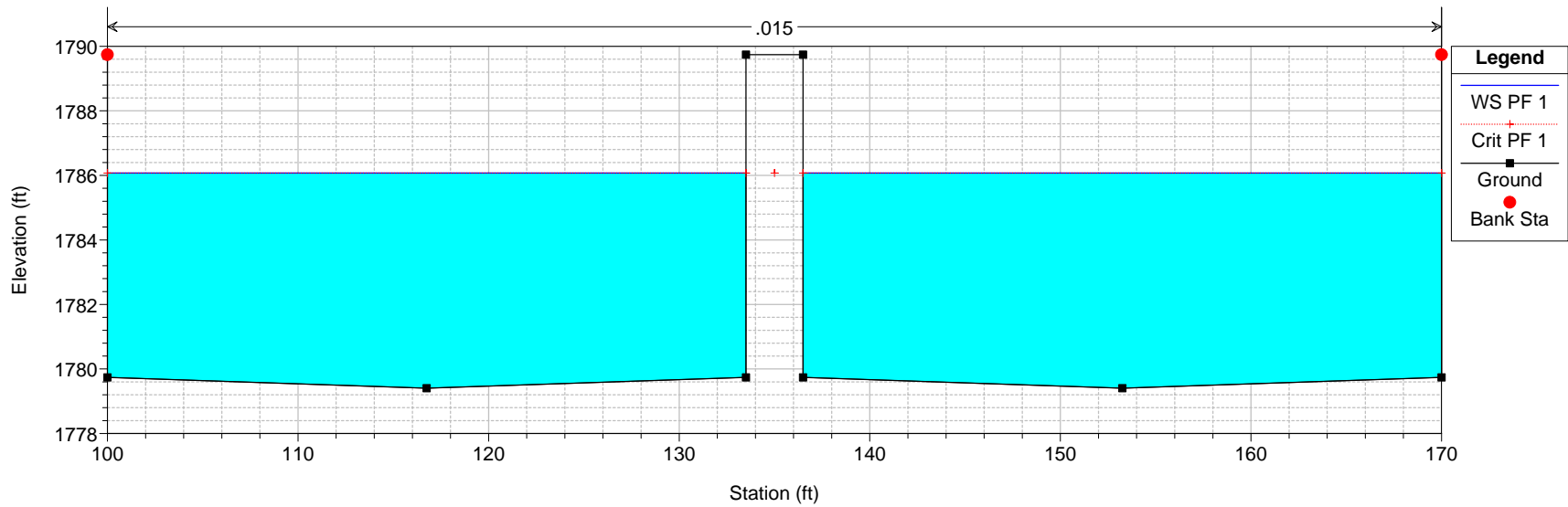
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 380



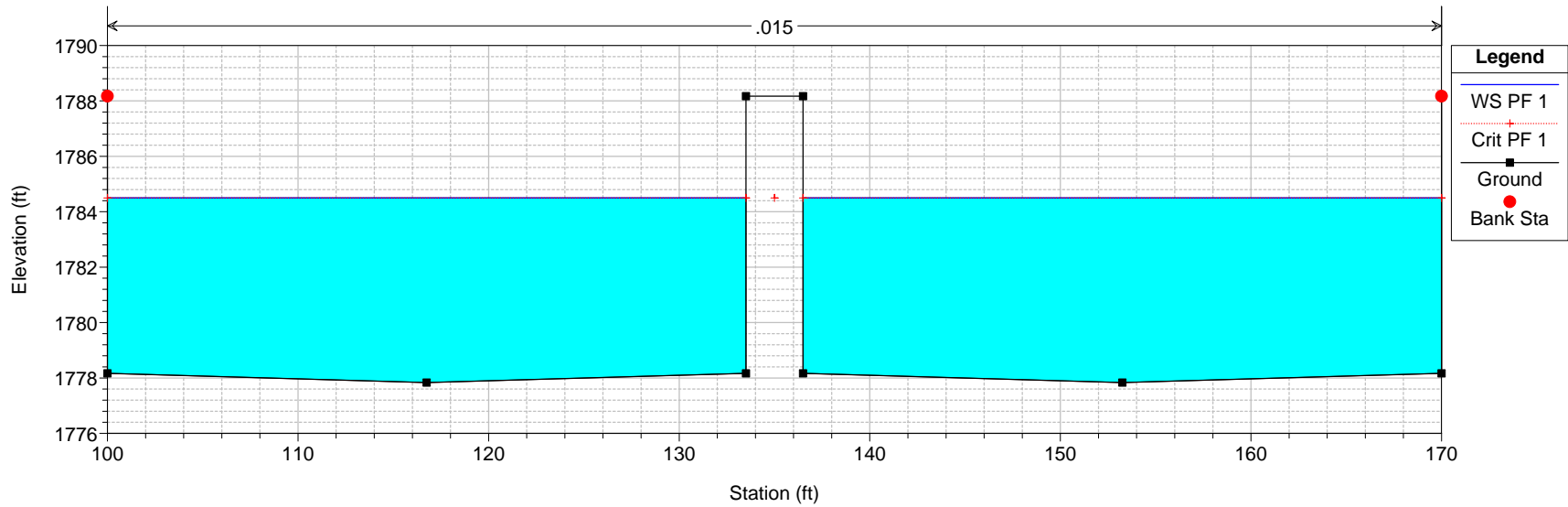
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 370



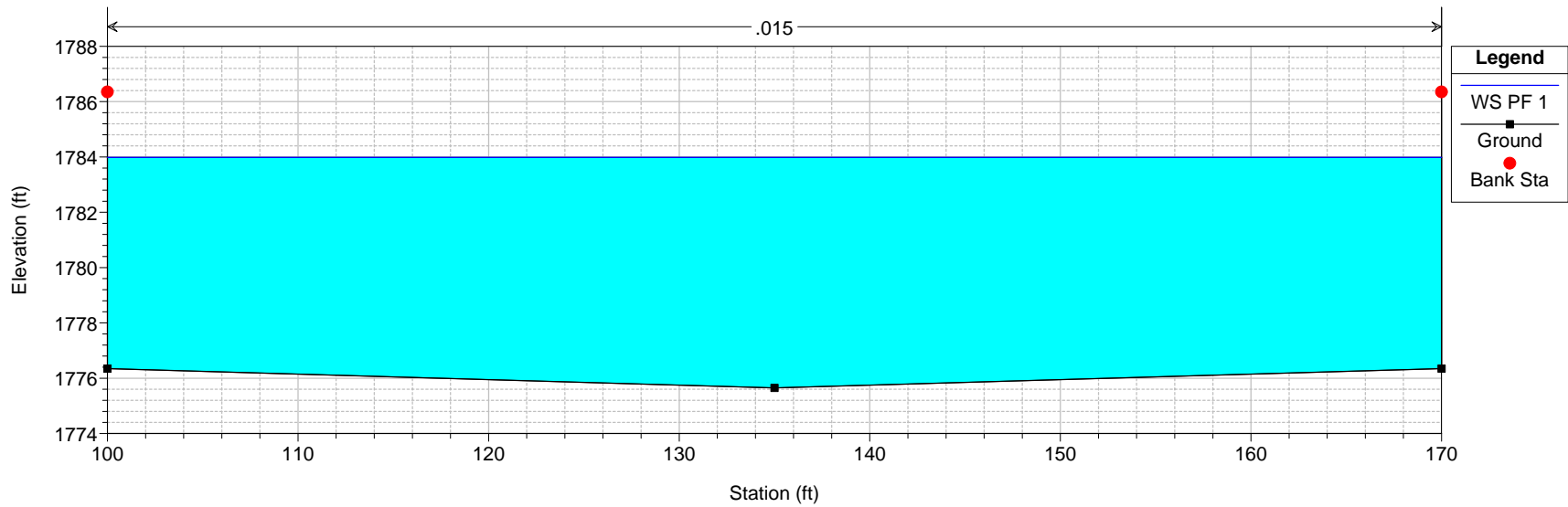
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 360



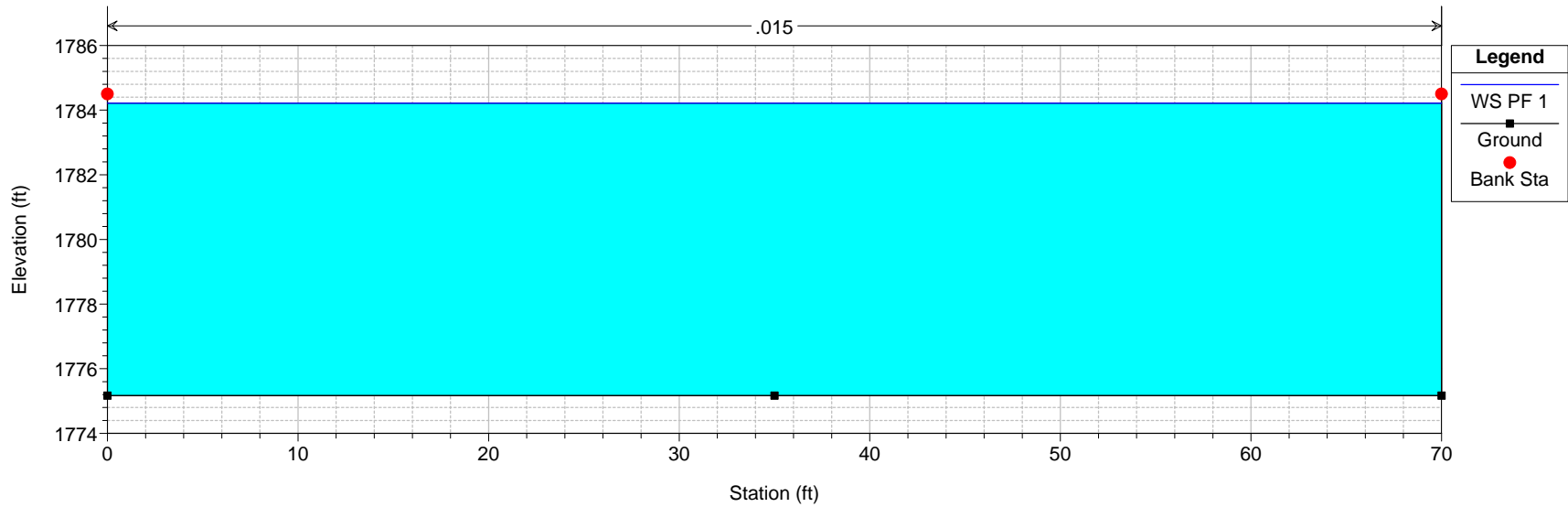
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 350



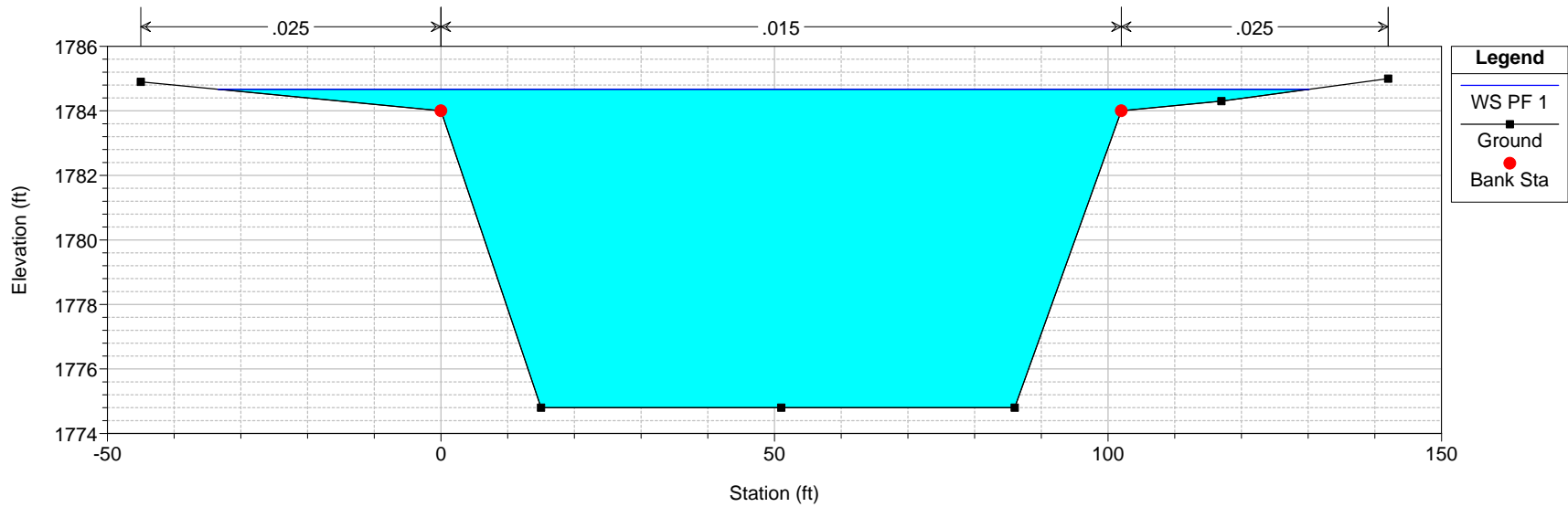
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 340



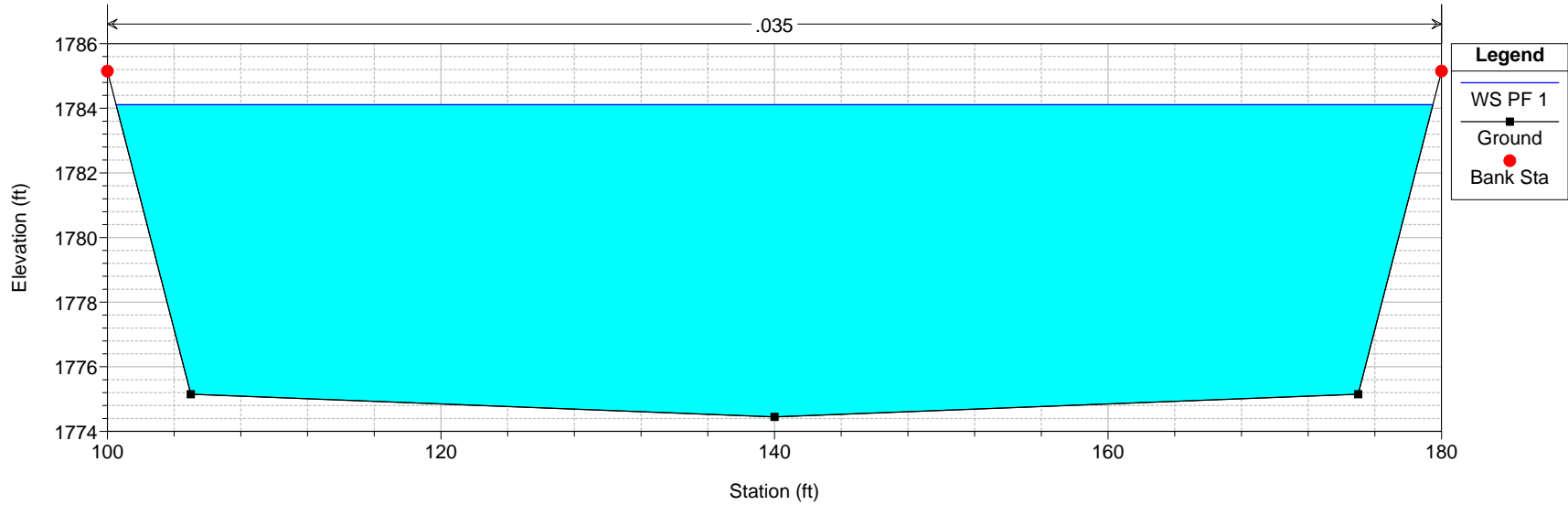
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 338



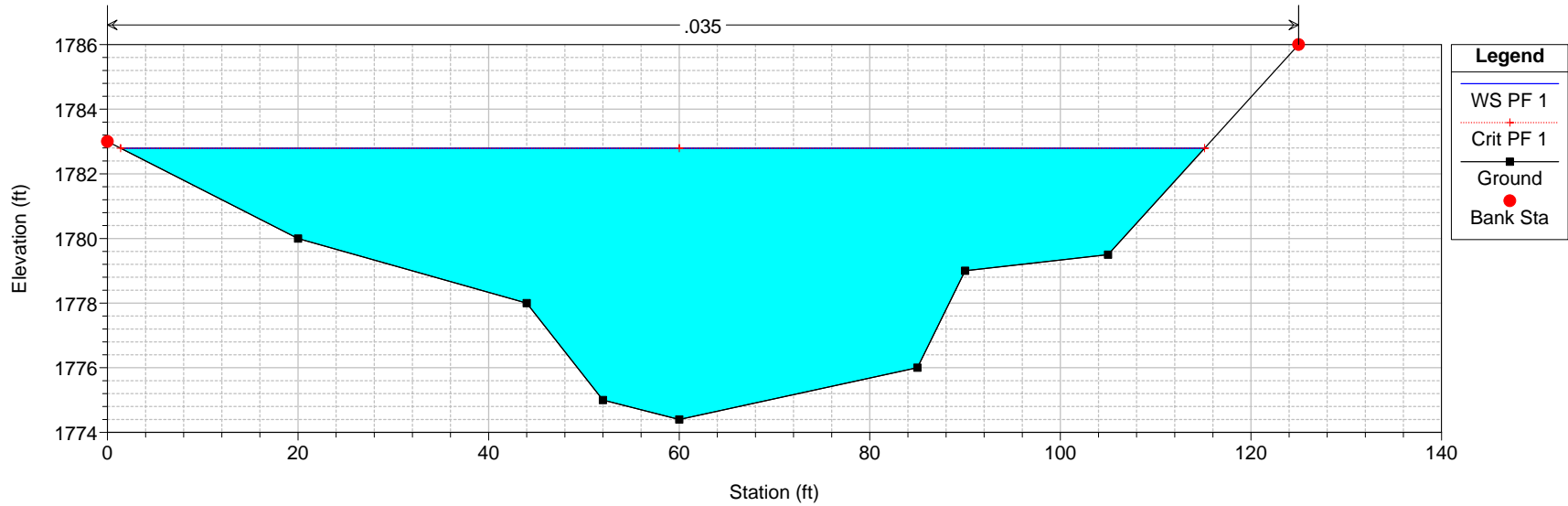
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 337



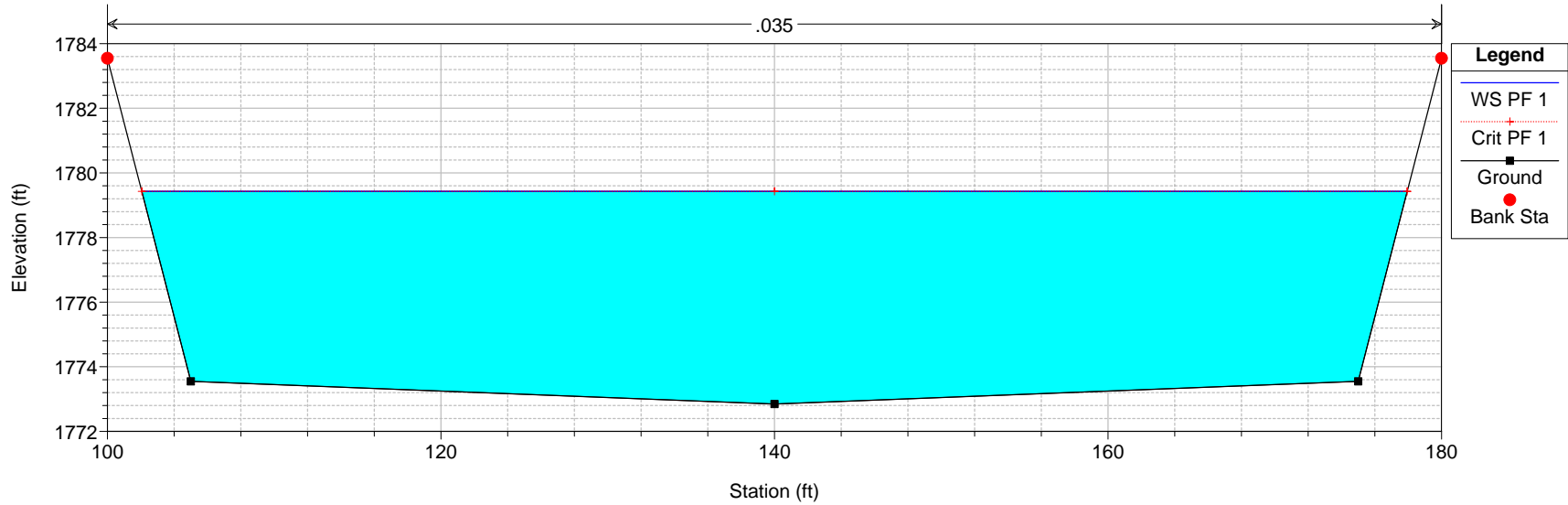
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 335



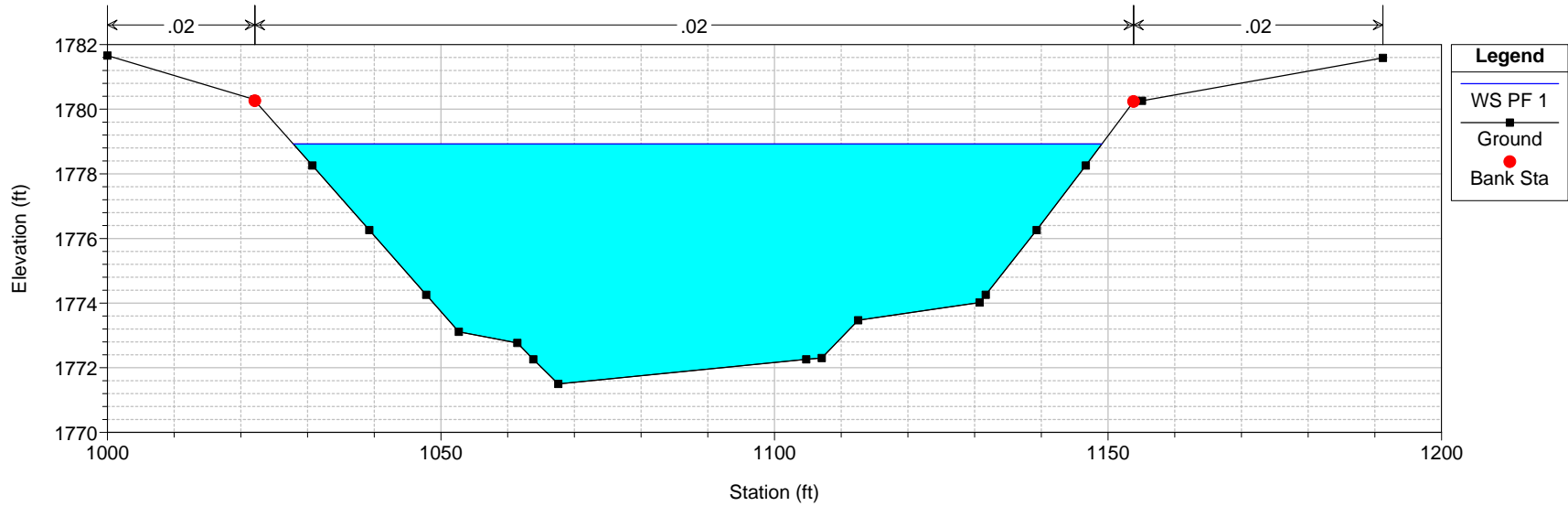
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 334



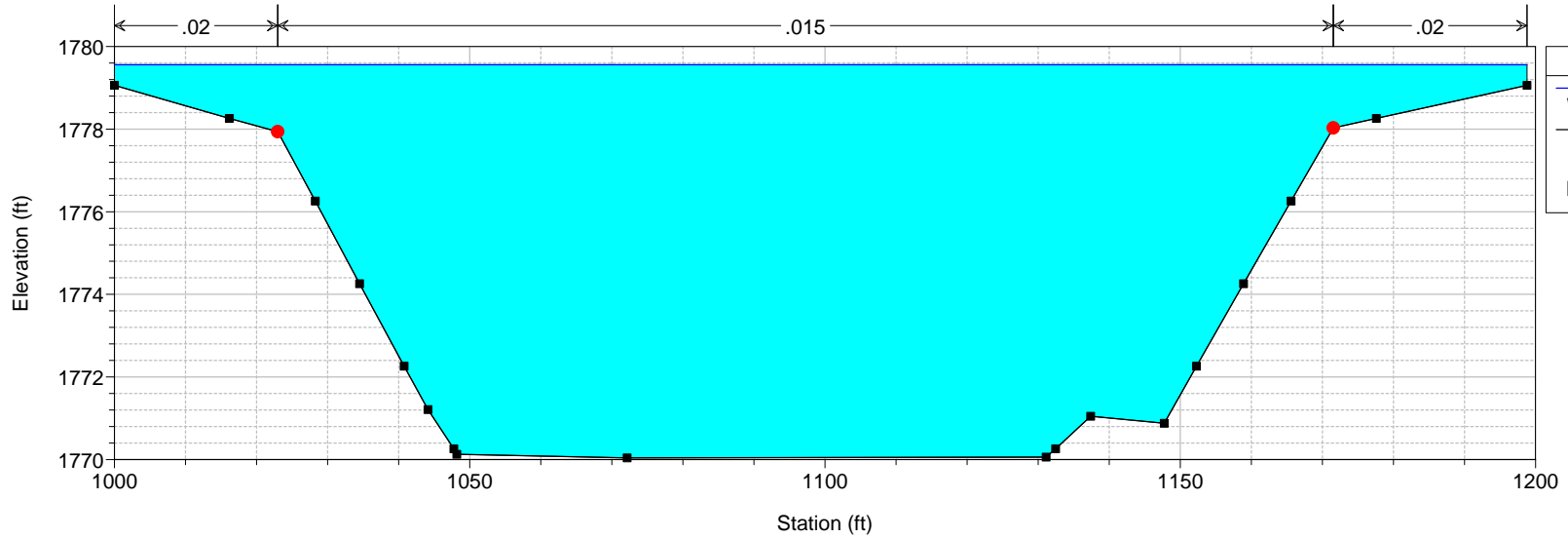
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 330



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 320



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 310



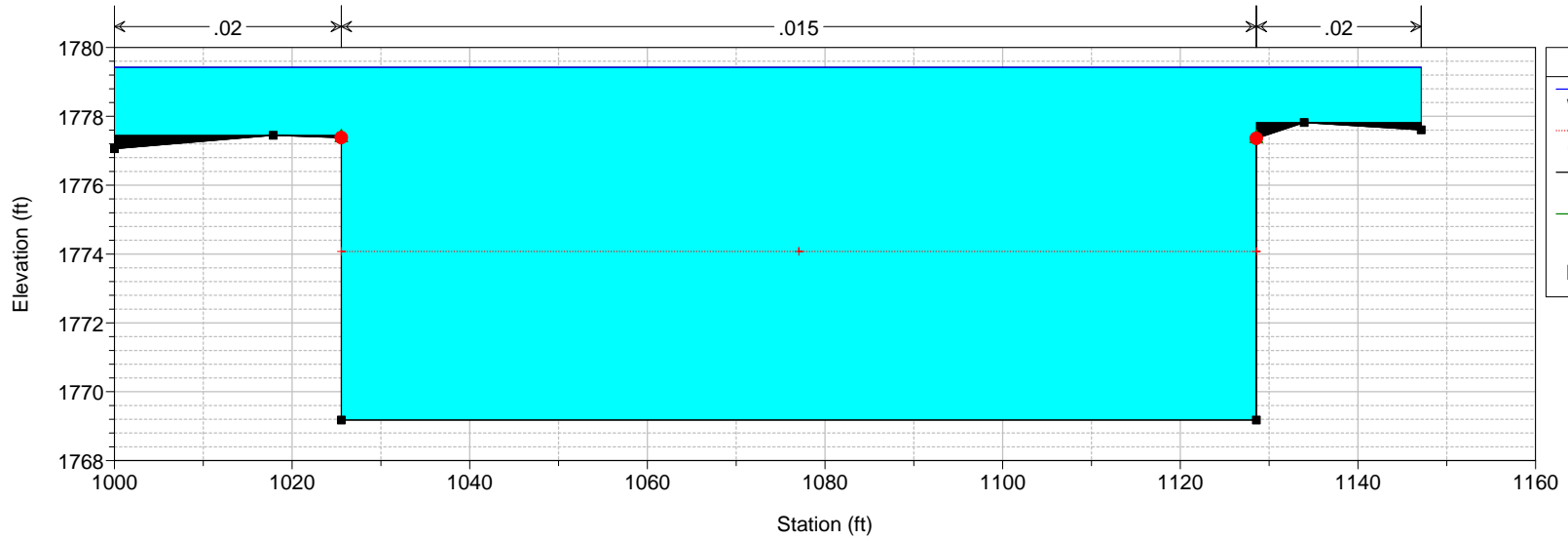
Legend

WS PF 1

Ground

Bank Sta

FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 300



Legend

WS PF 1

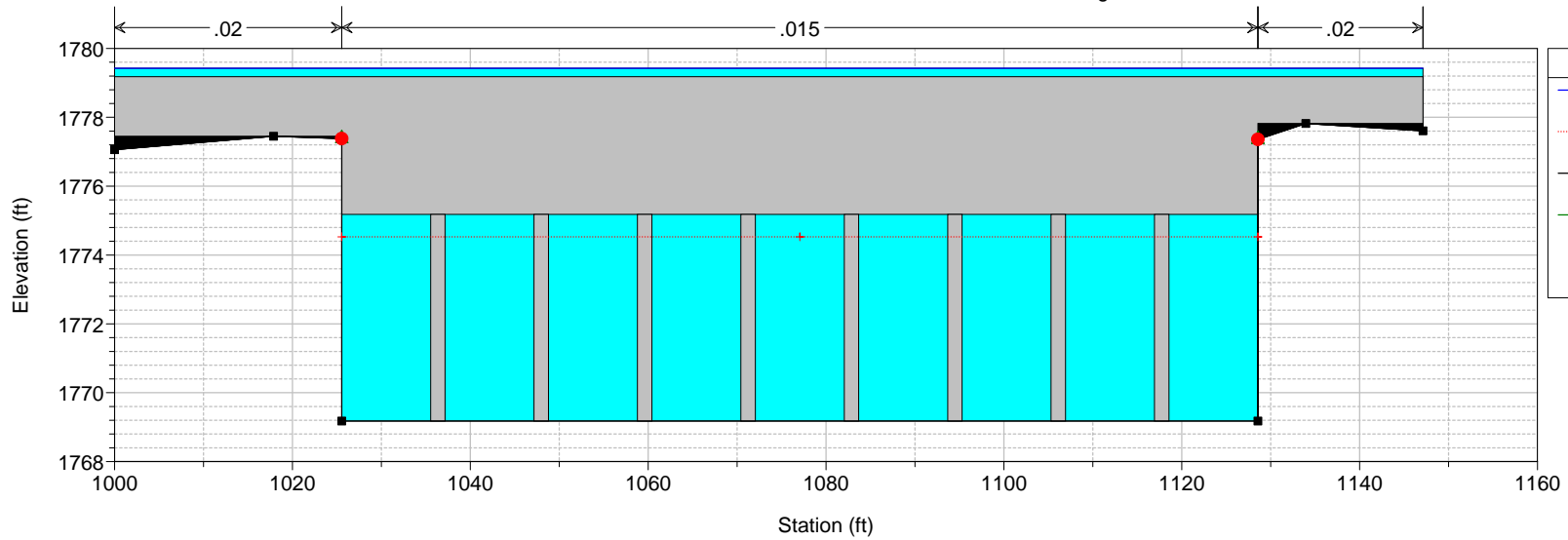
Crit PF 1

Ground

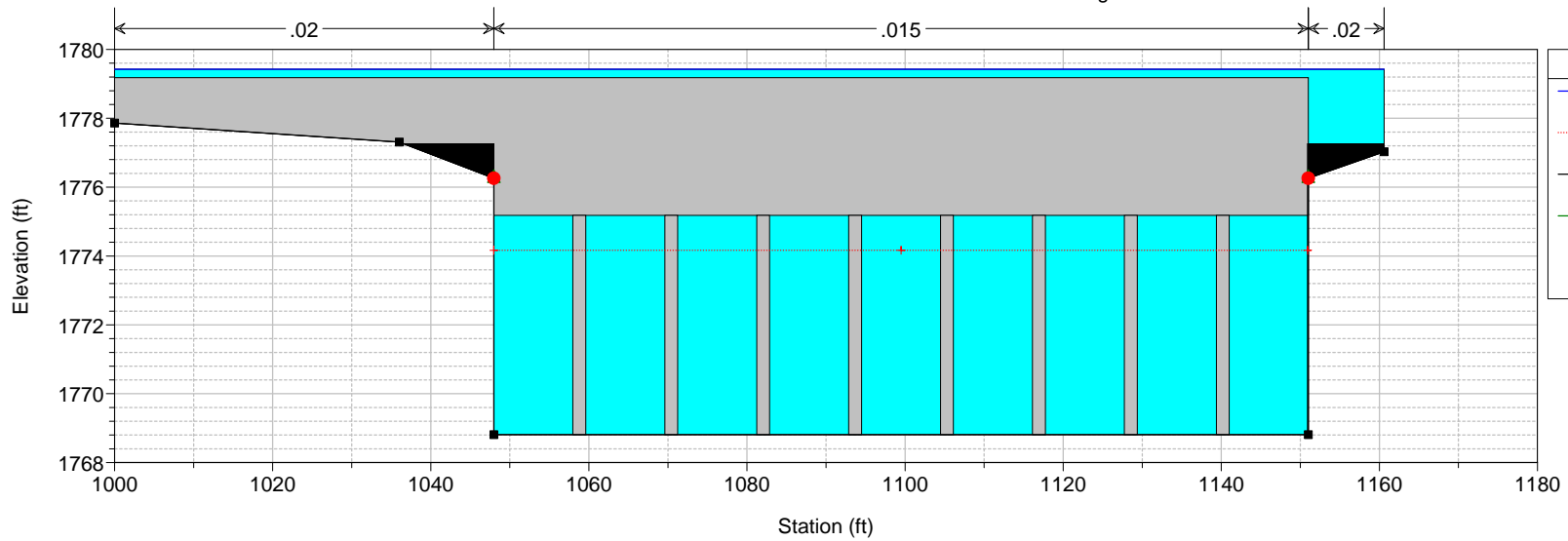
Ineff

Bank Sta

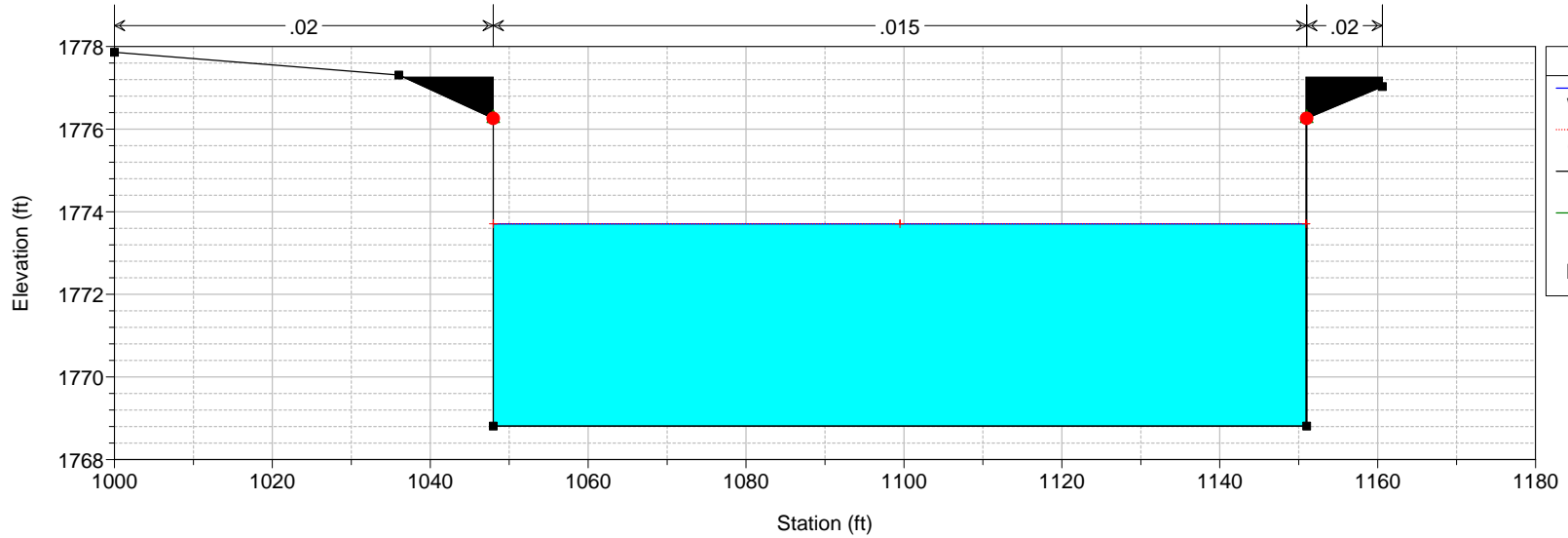
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 295 BR Bridge #2



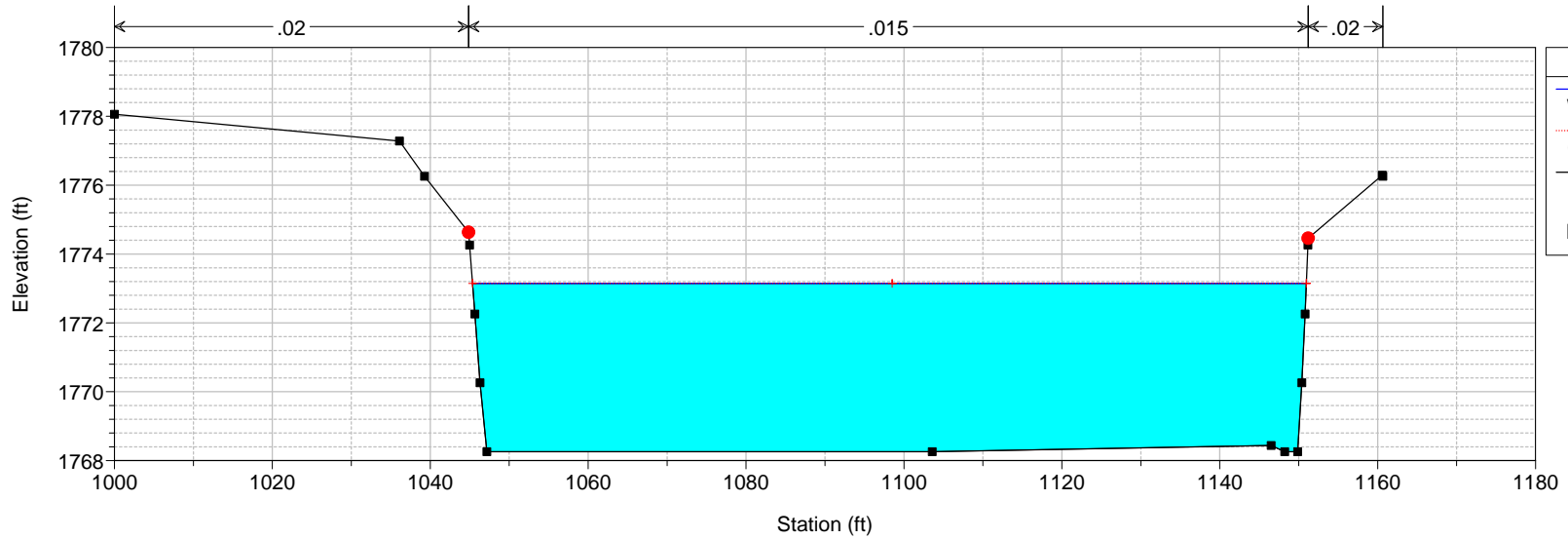
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 295 BR Bridge #2



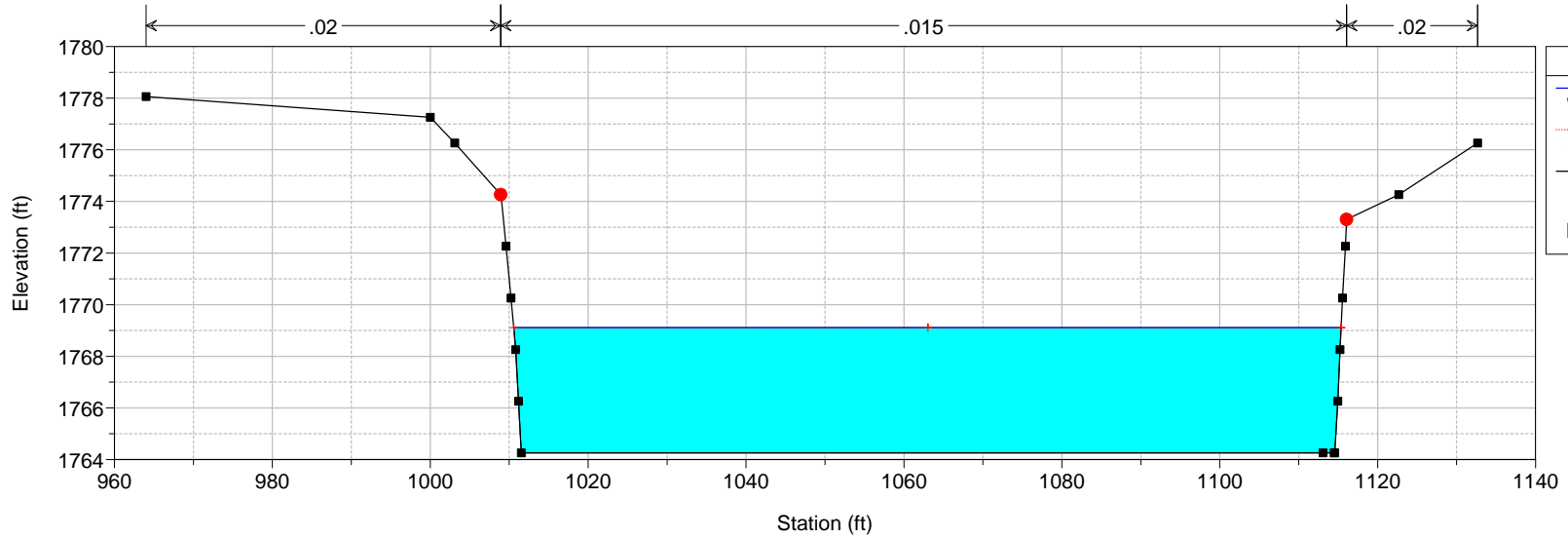
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 290



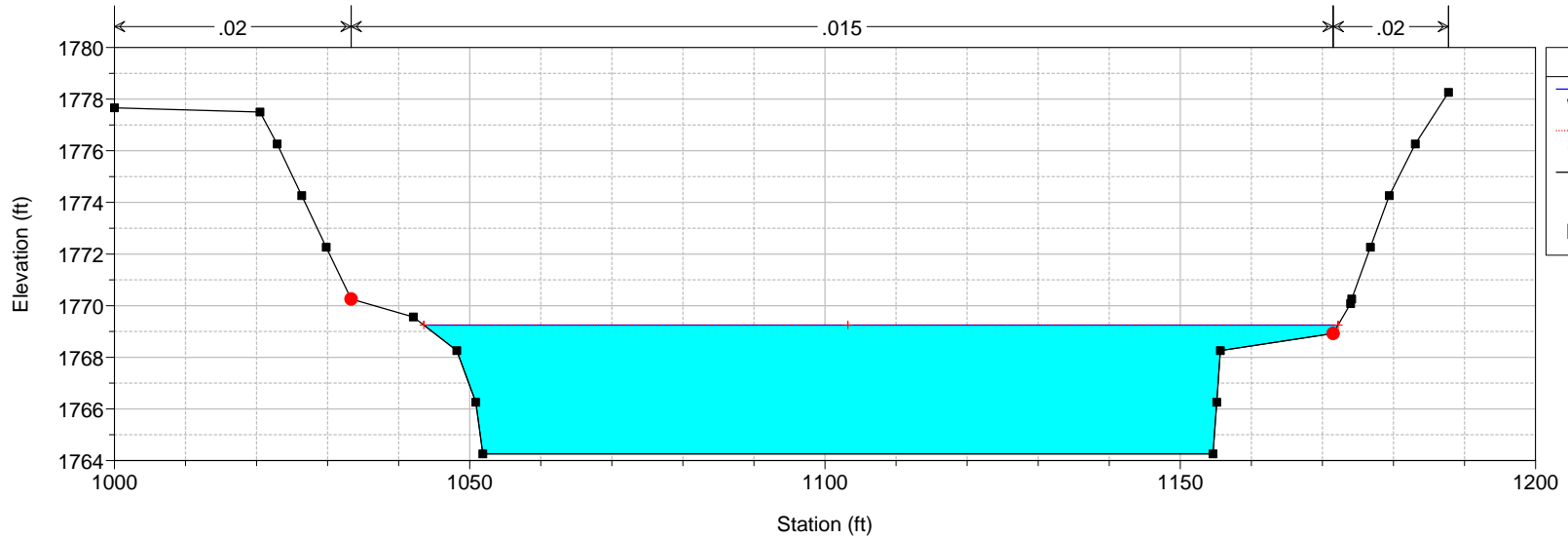
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 280



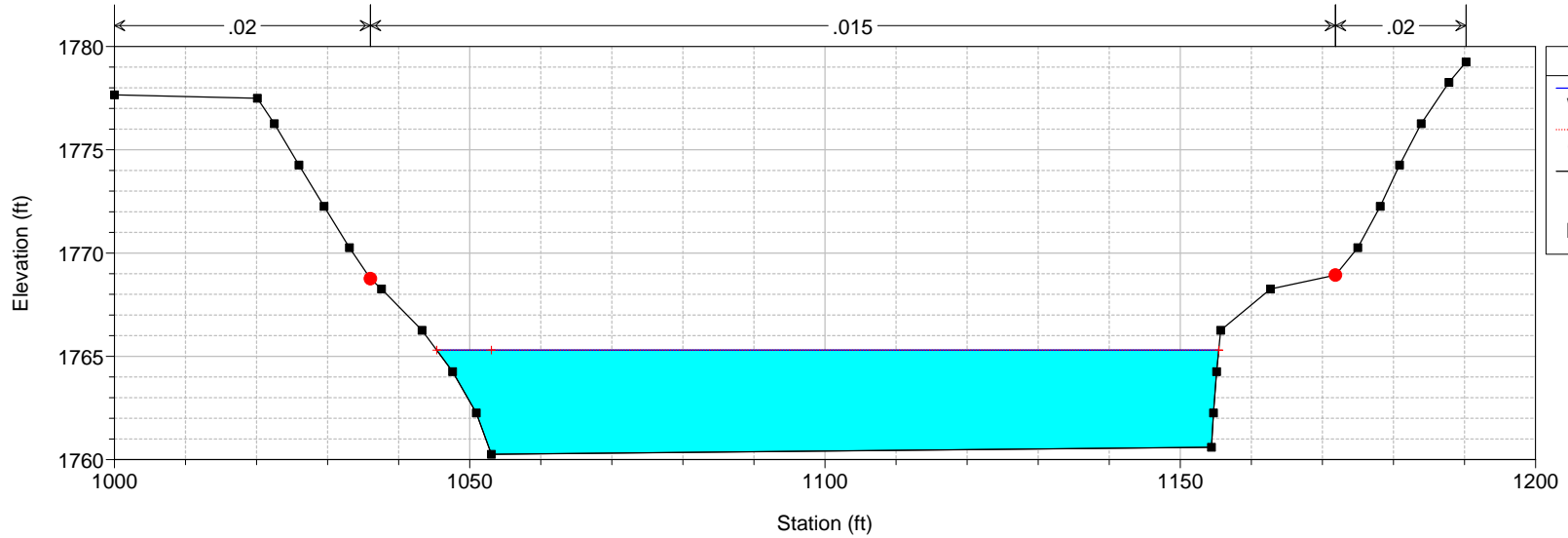
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 270



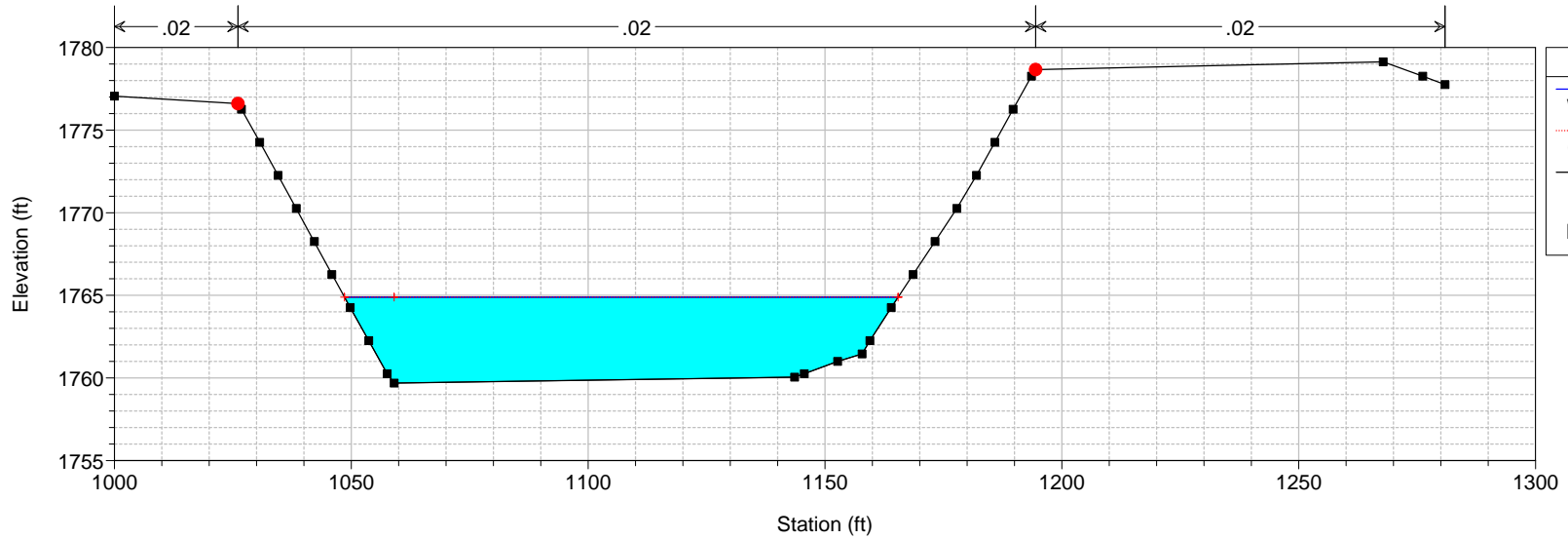
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 260



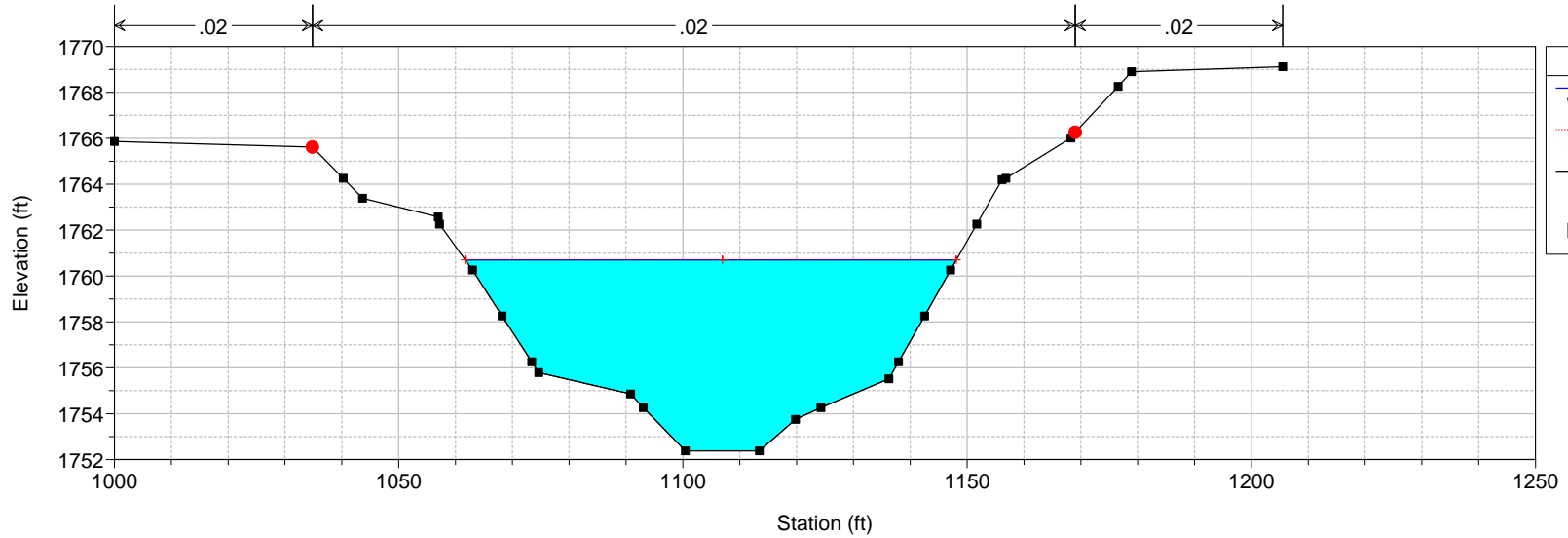
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 250



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 240



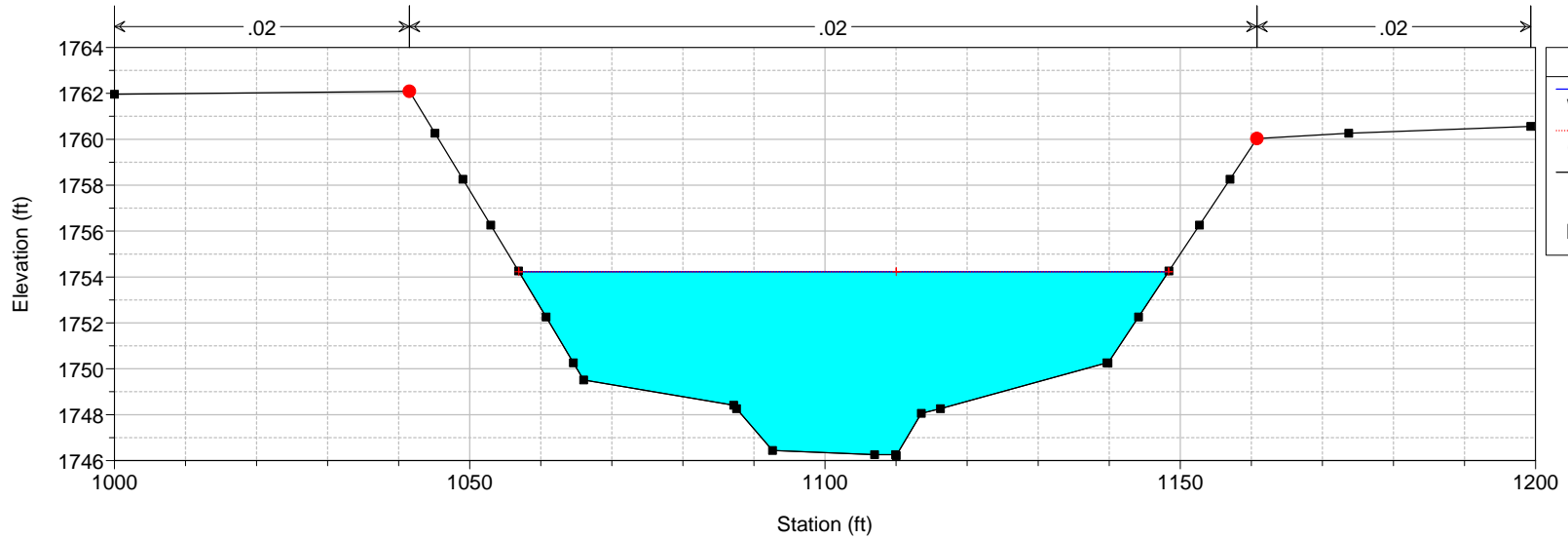
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 230



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

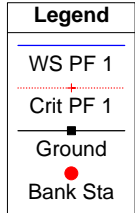
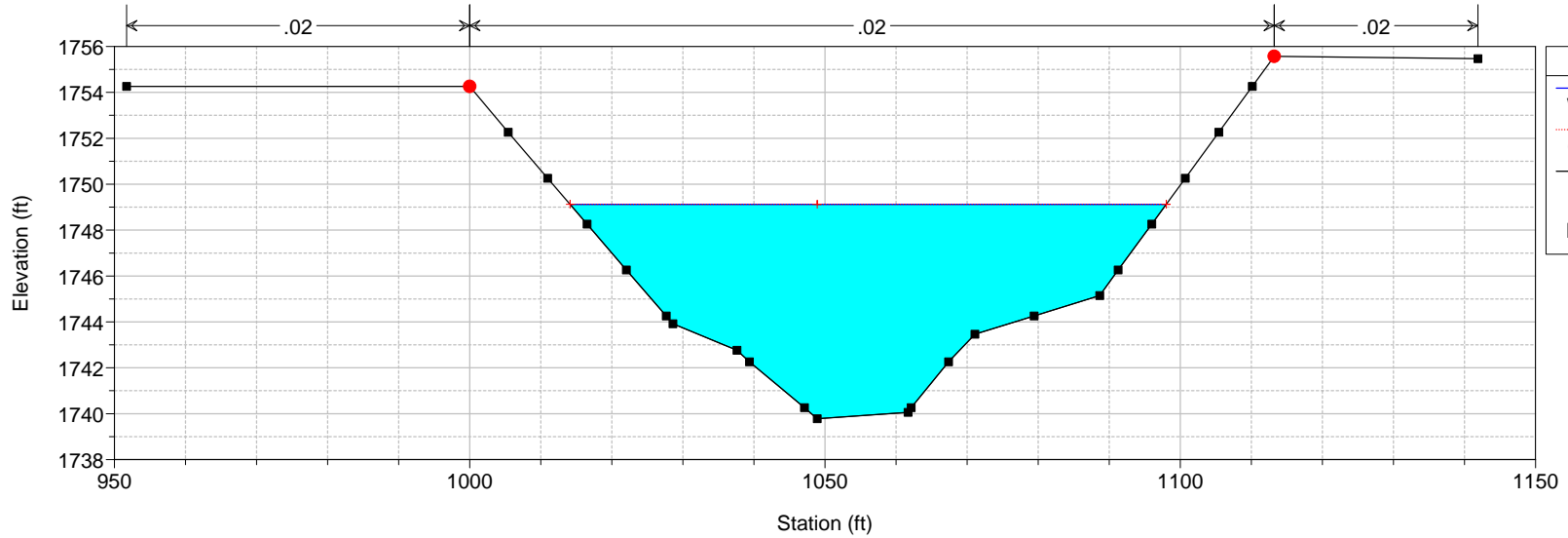
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 220



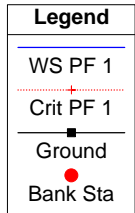
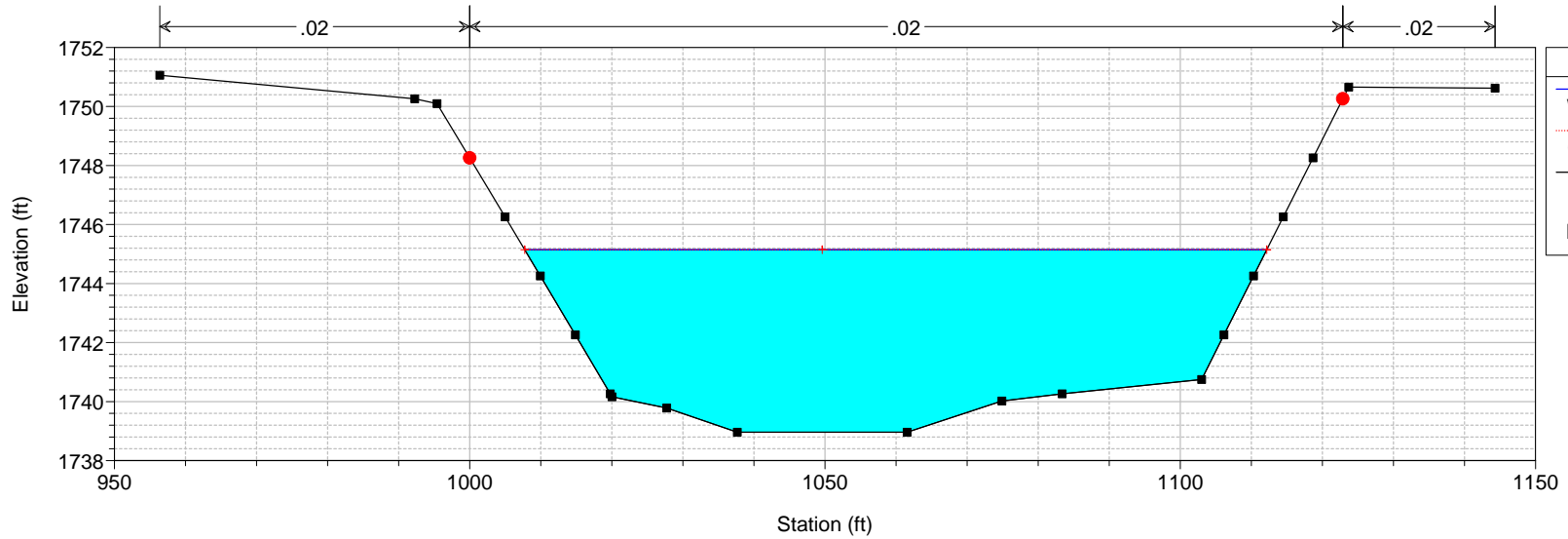
Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

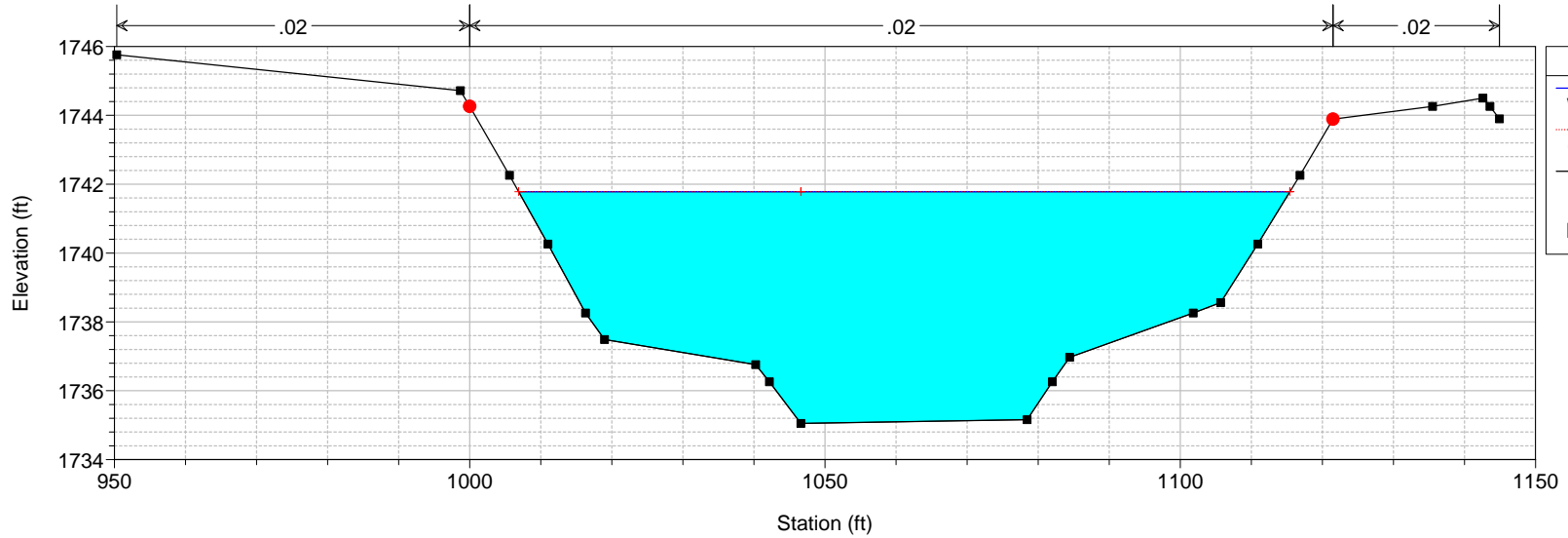
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 210



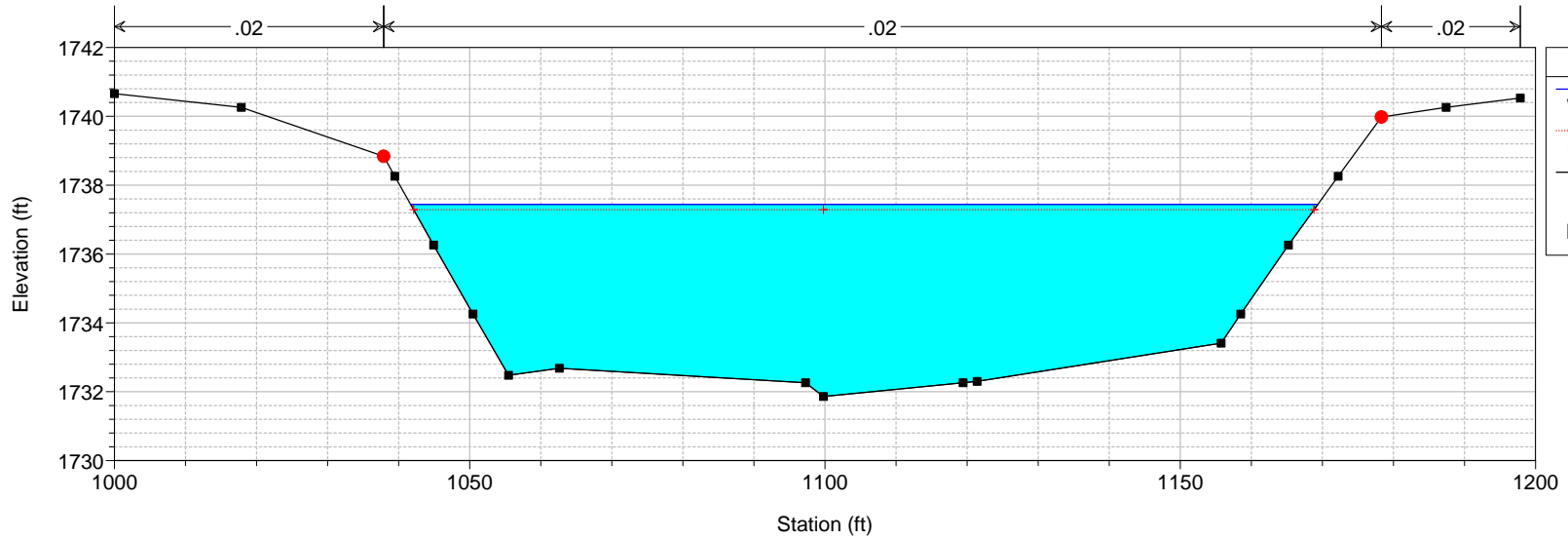
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 200



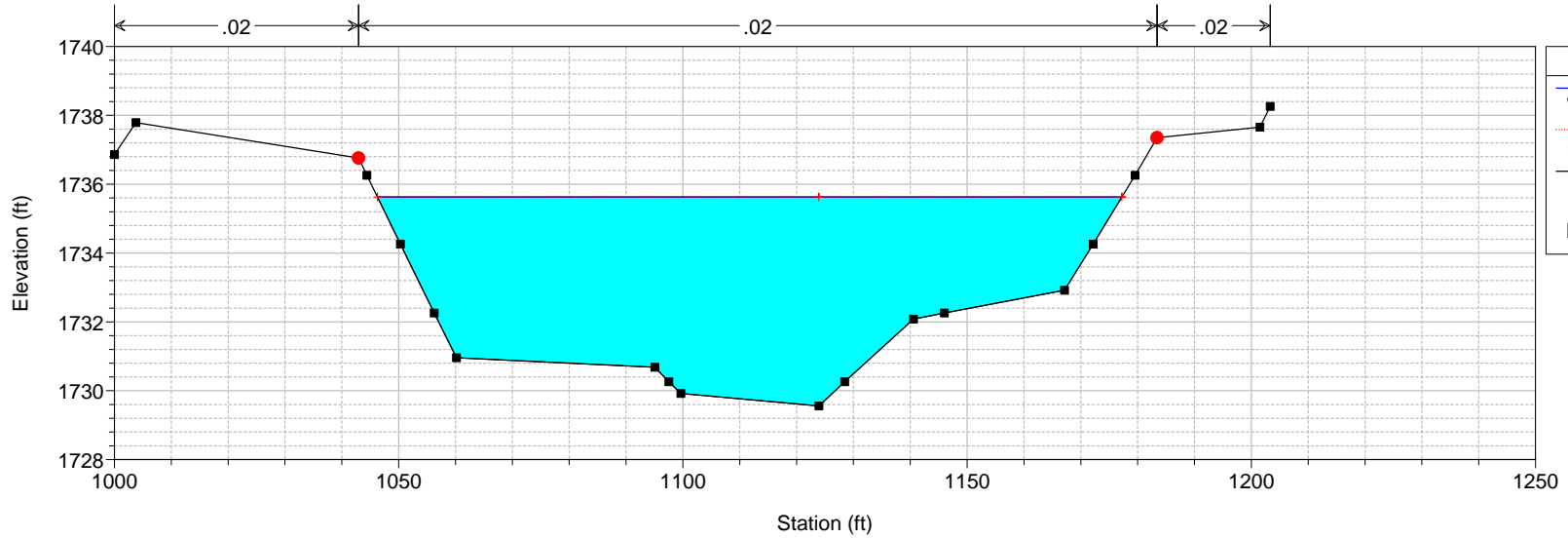
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 190



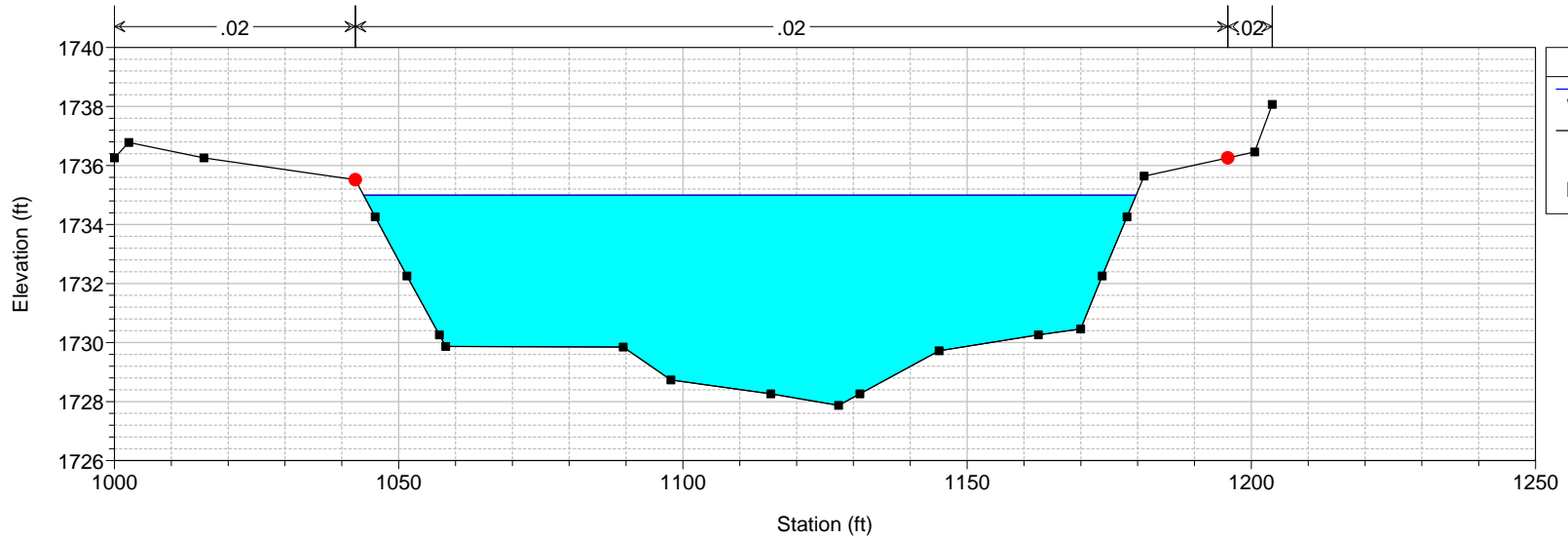
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 180

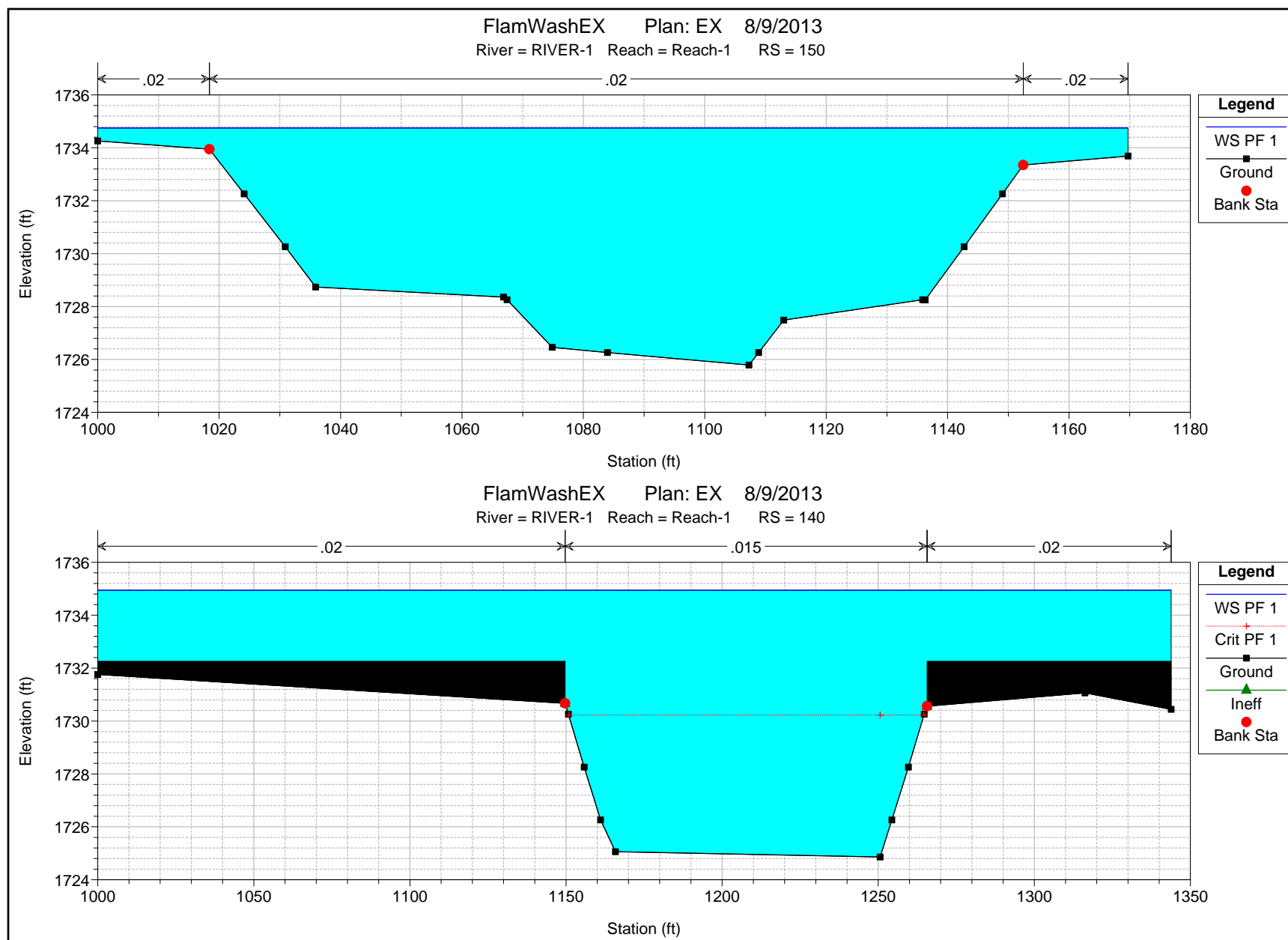


FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 170

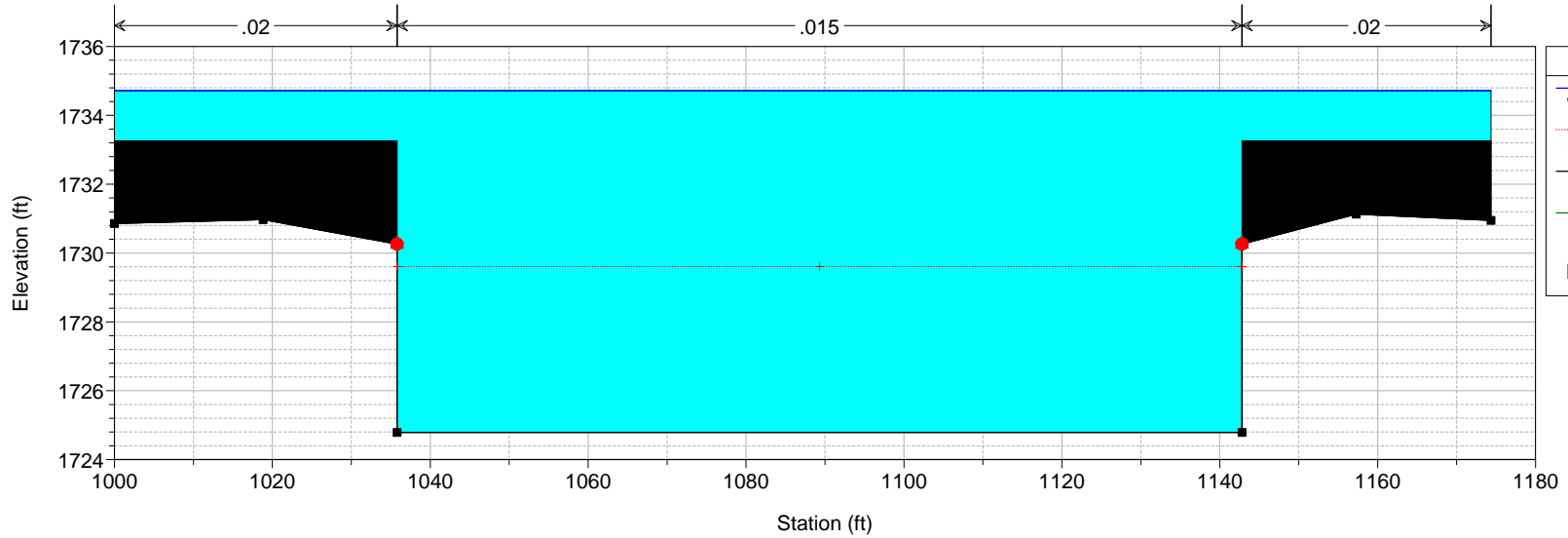


FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 160

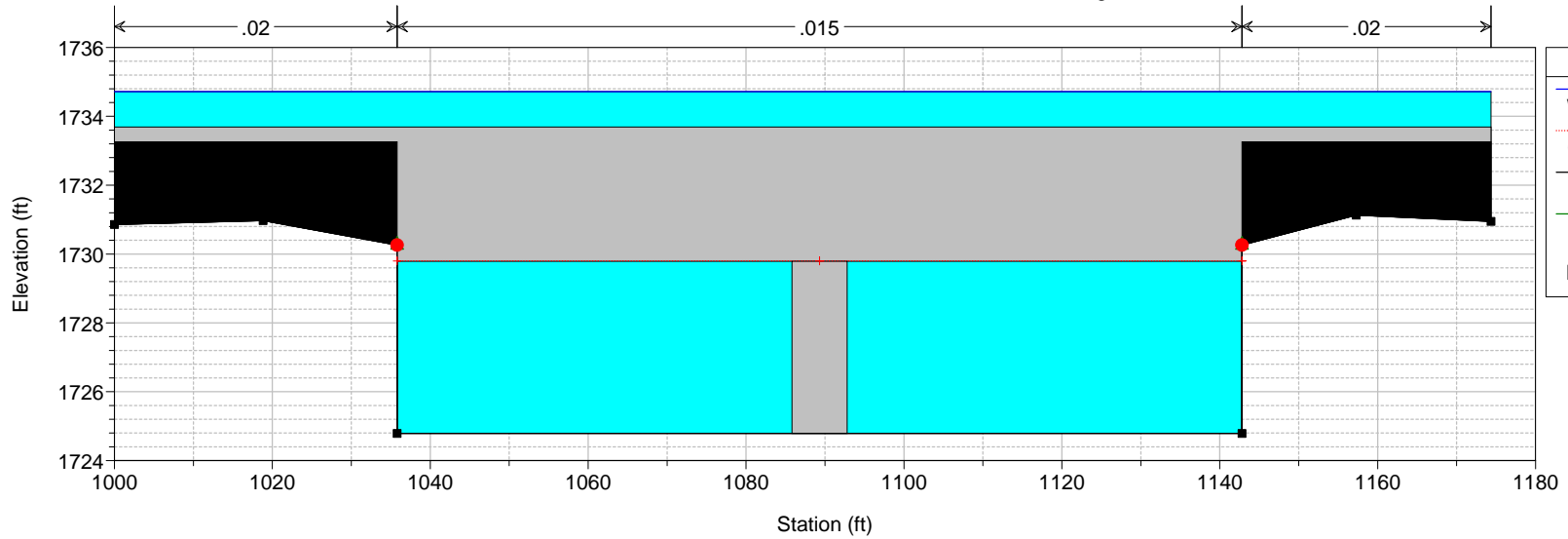




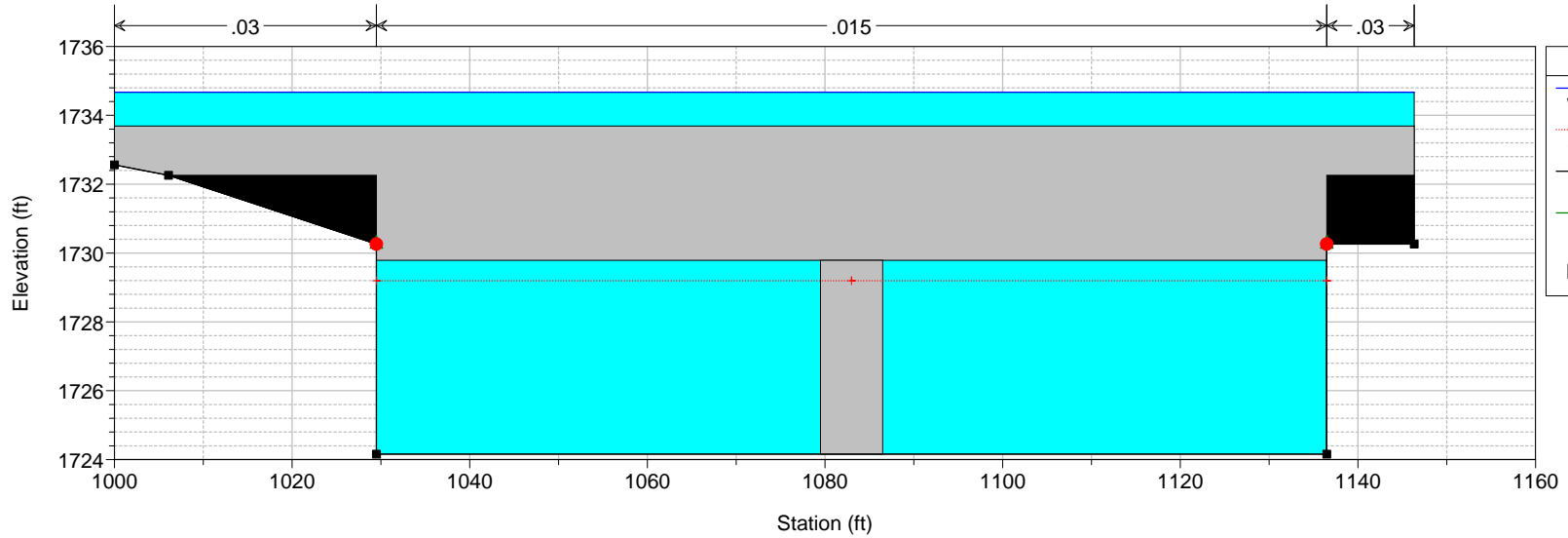
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 130



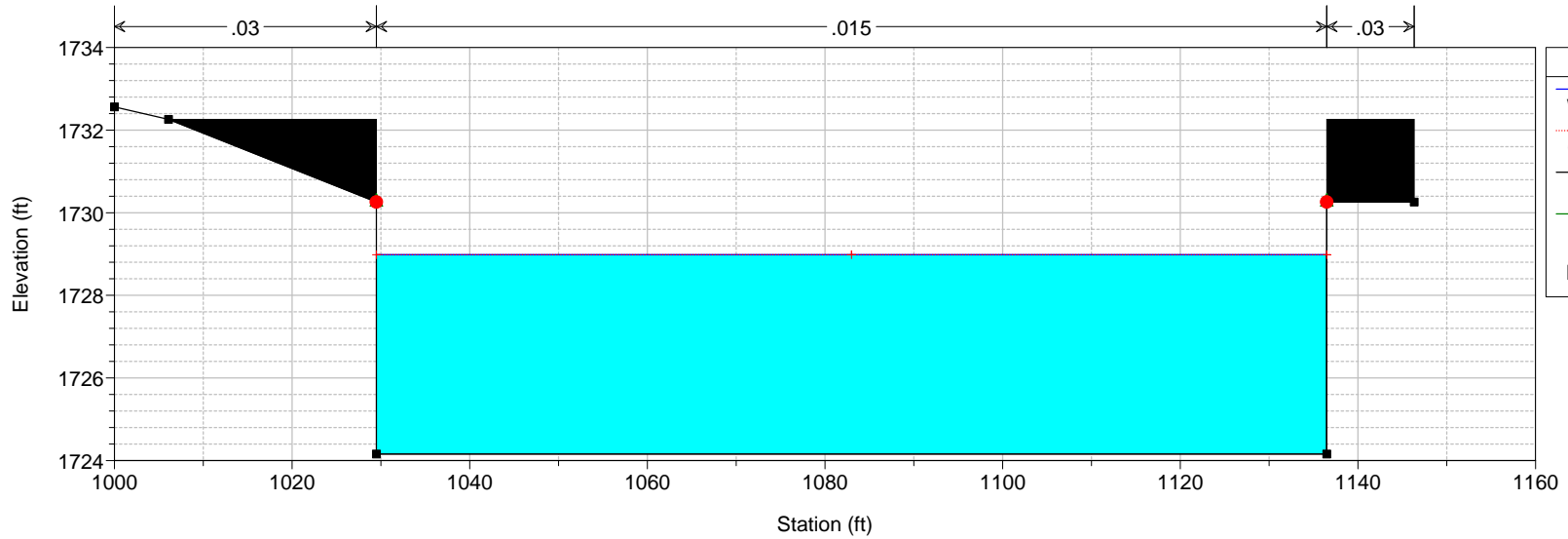
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 125 BR Bridge #1



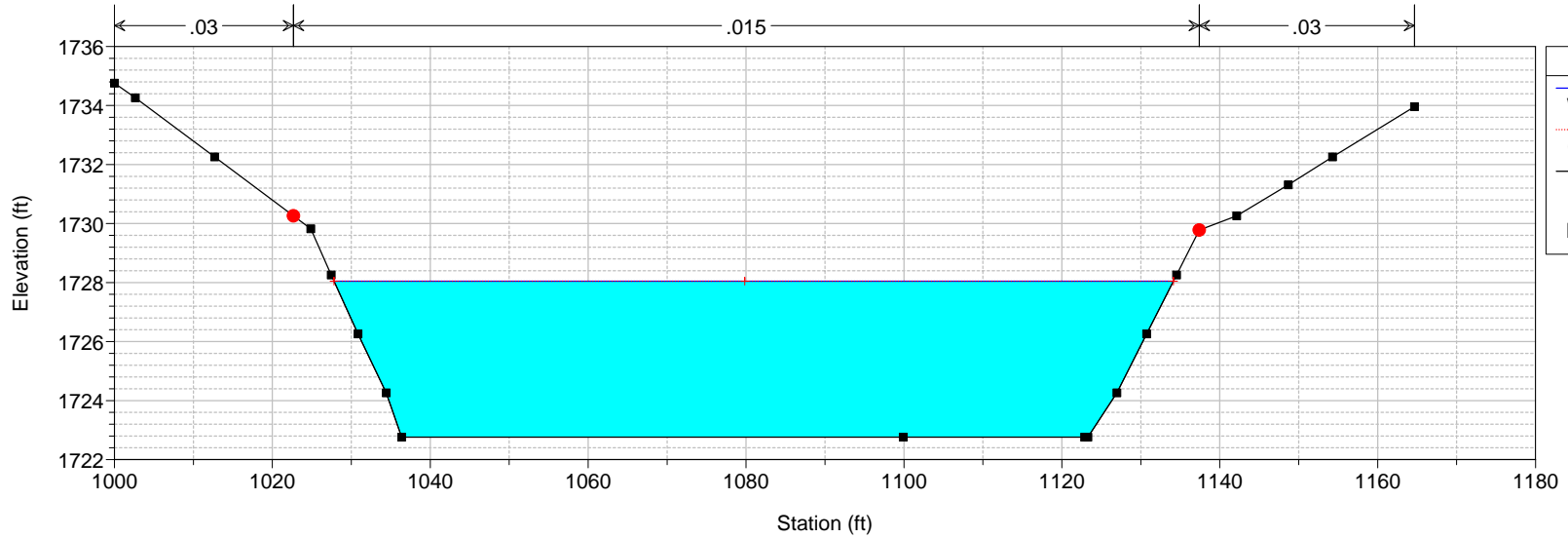
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 125 BR Bridge #1



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 120



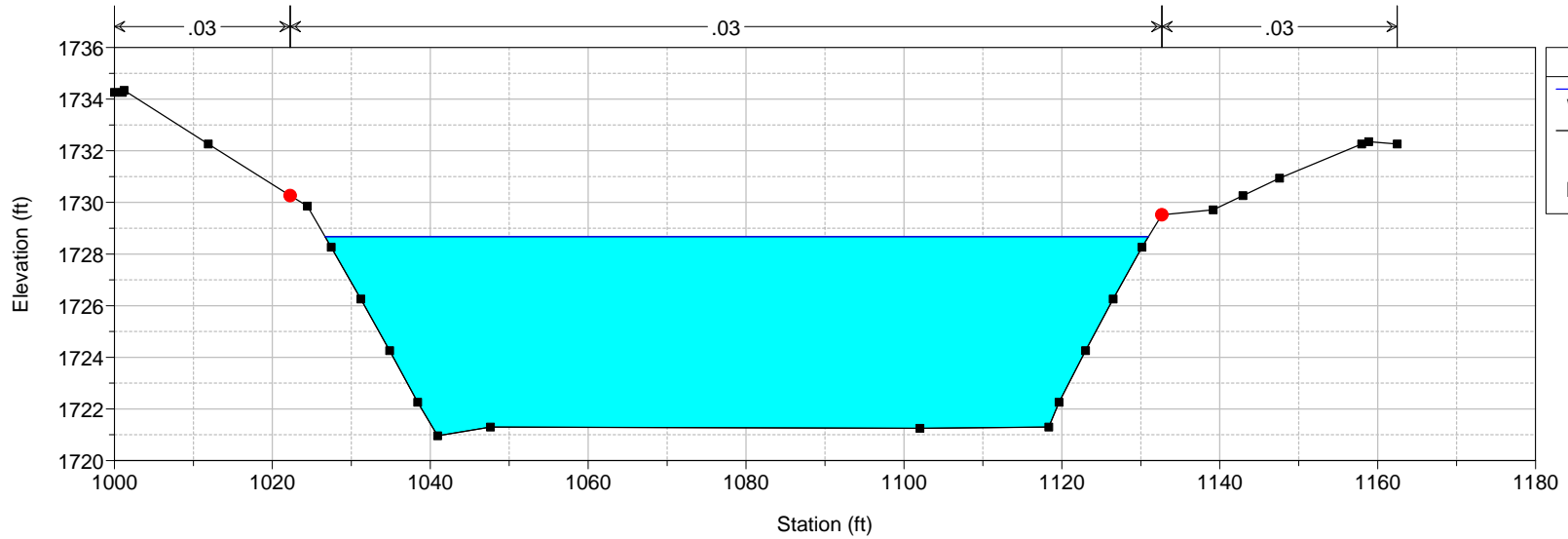
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 110



Legend

- WS PF 1
- Crit PF 1
- Ground
- Bank Sta

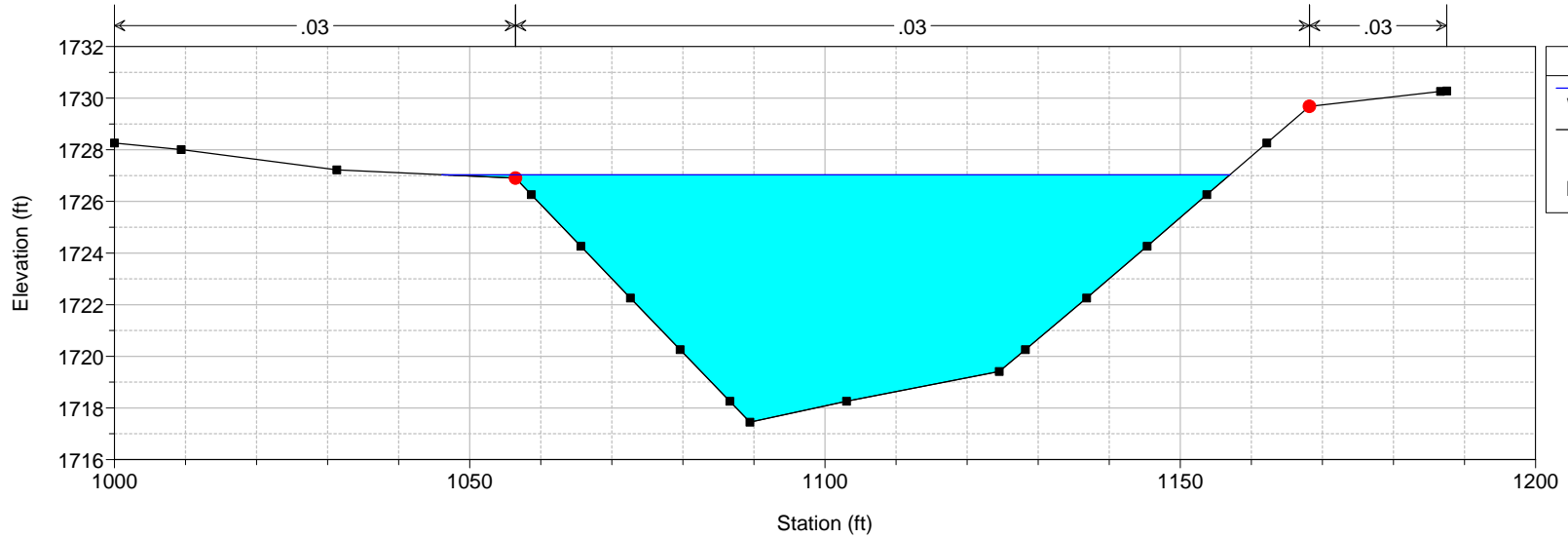
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 100



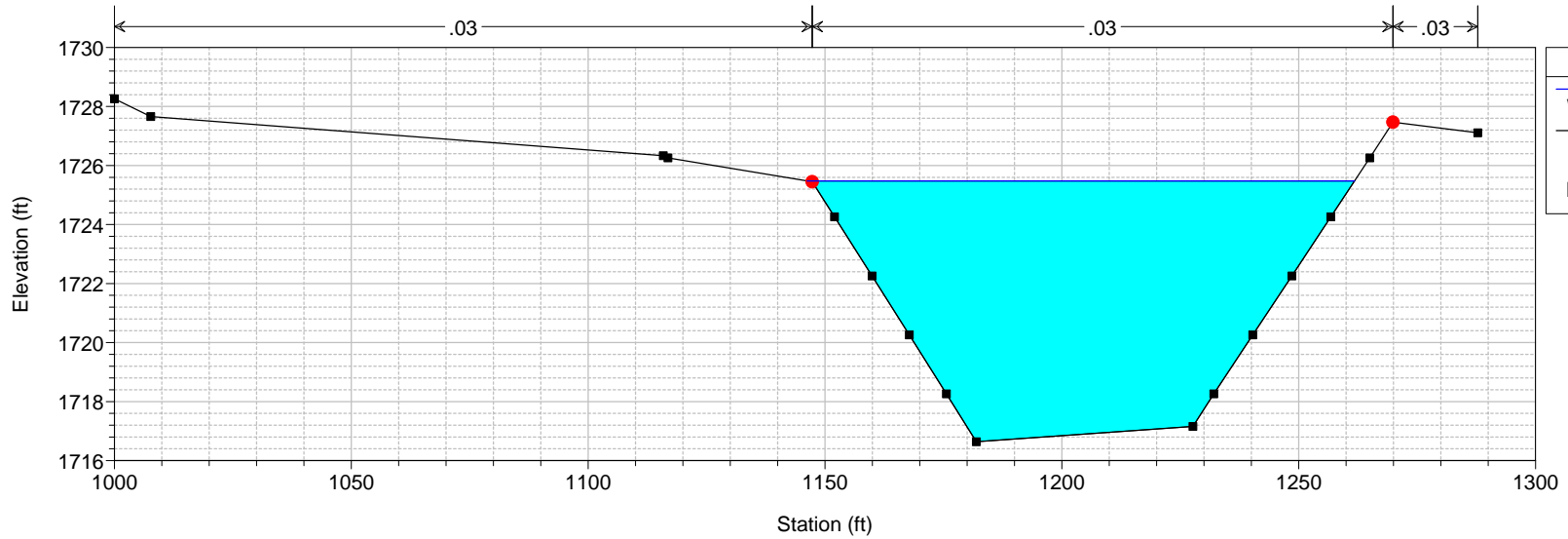
Legend

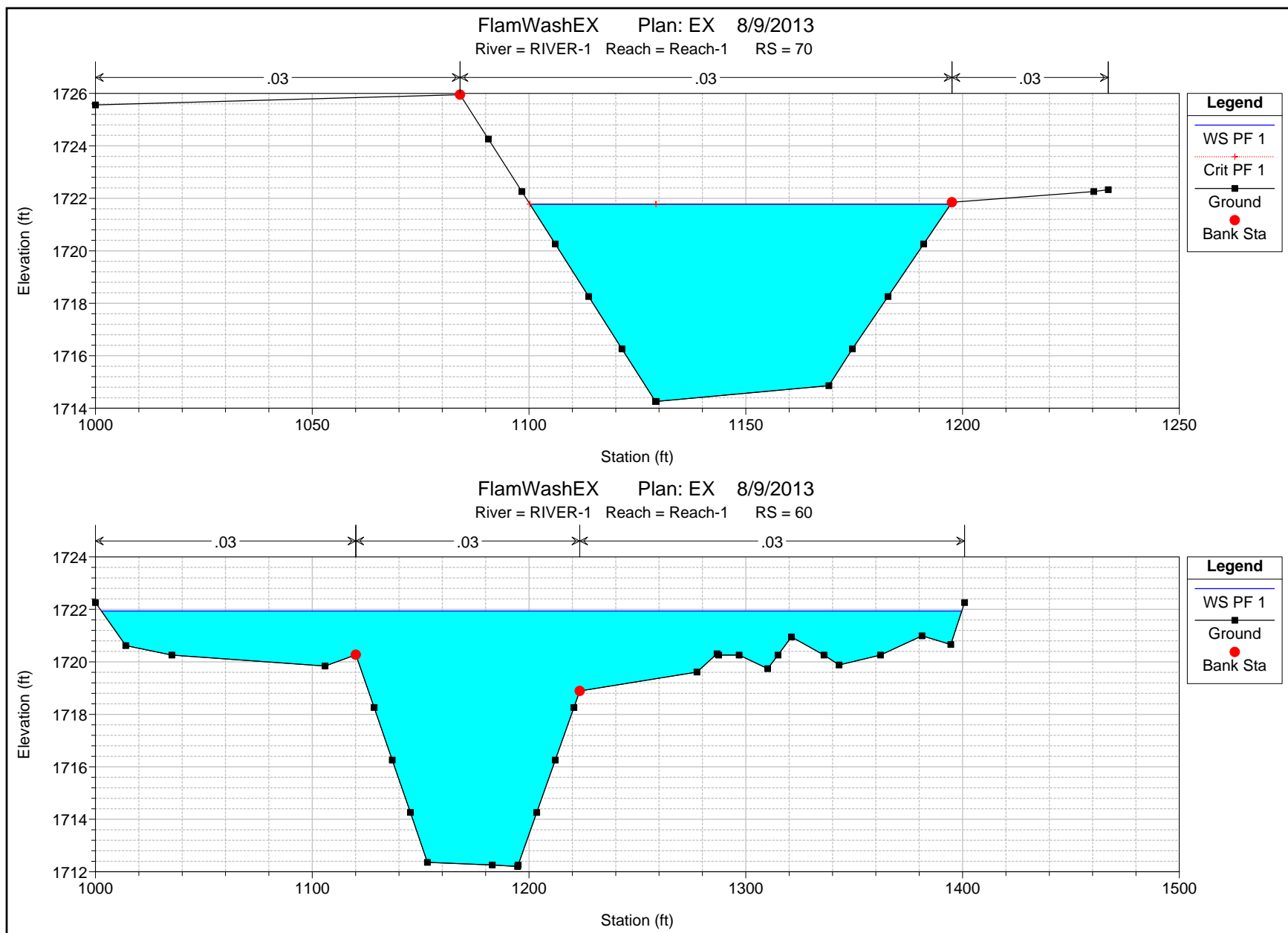
- WS PF 1
- Ground
- Bank Sta

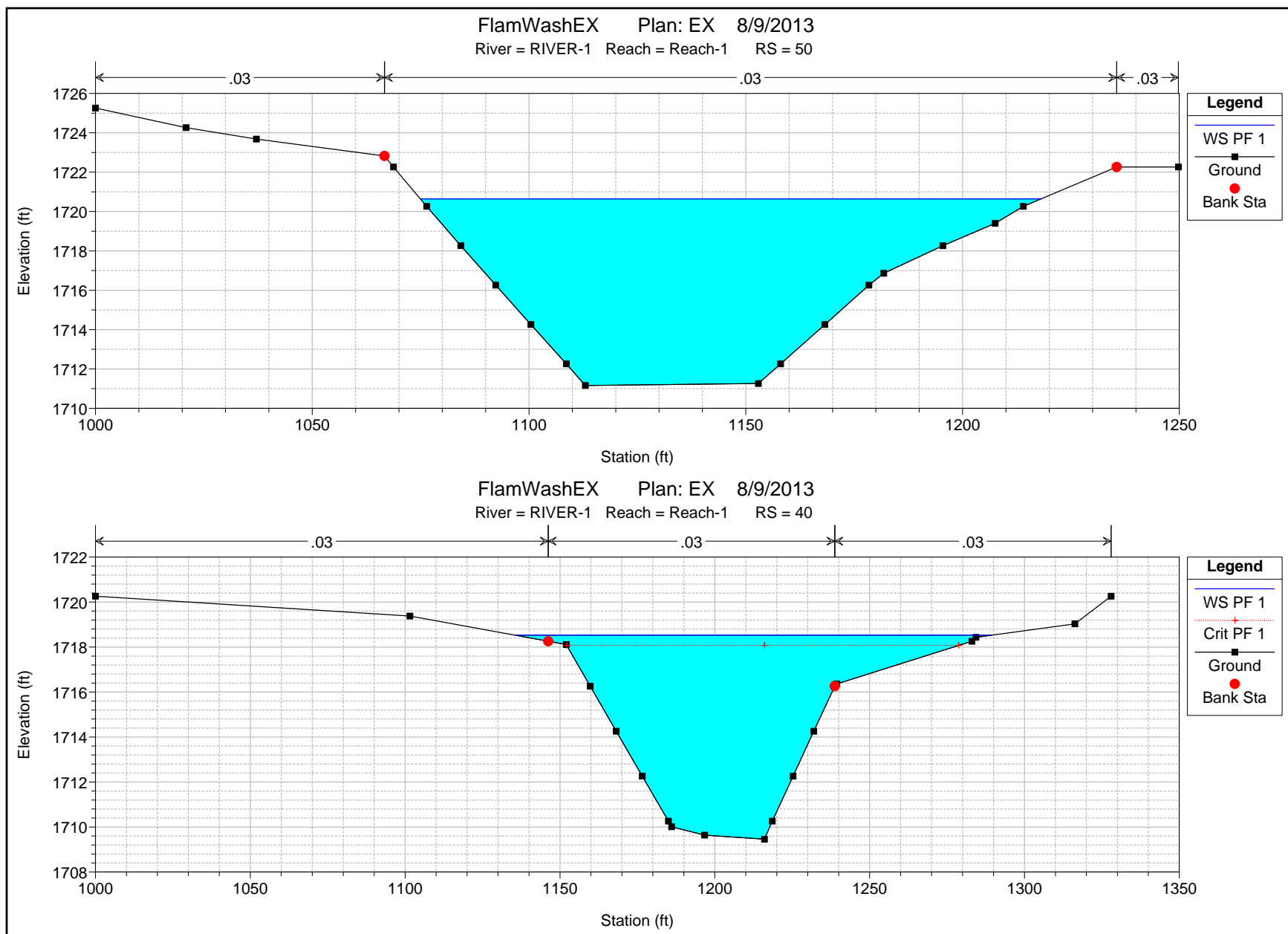
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 90



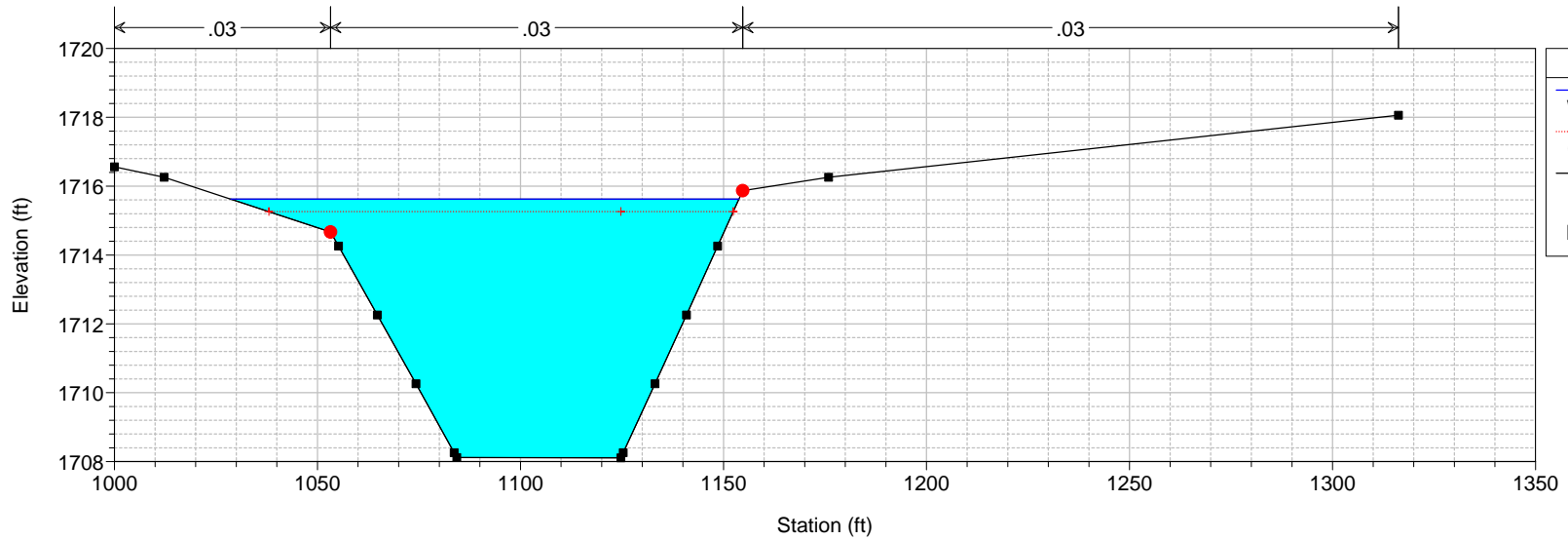
FlamWashEX Plan: EX 8/9/2013
River = RIVER-1 Reach = Reach-1 RS = 80



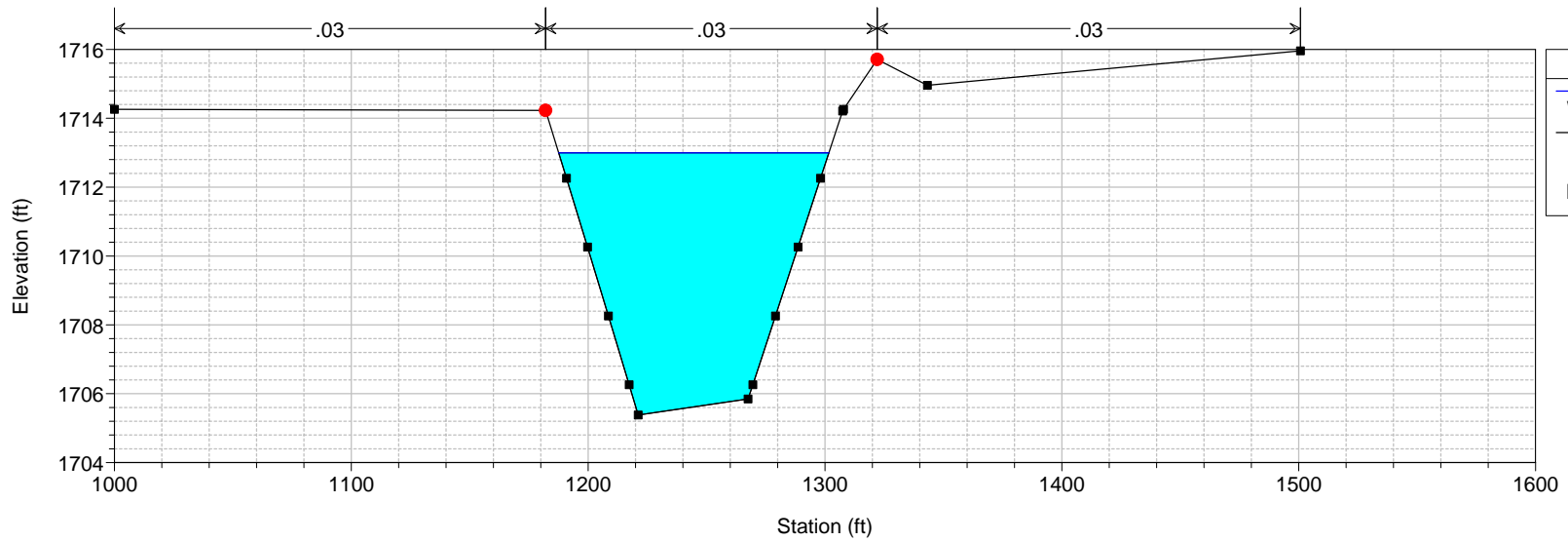




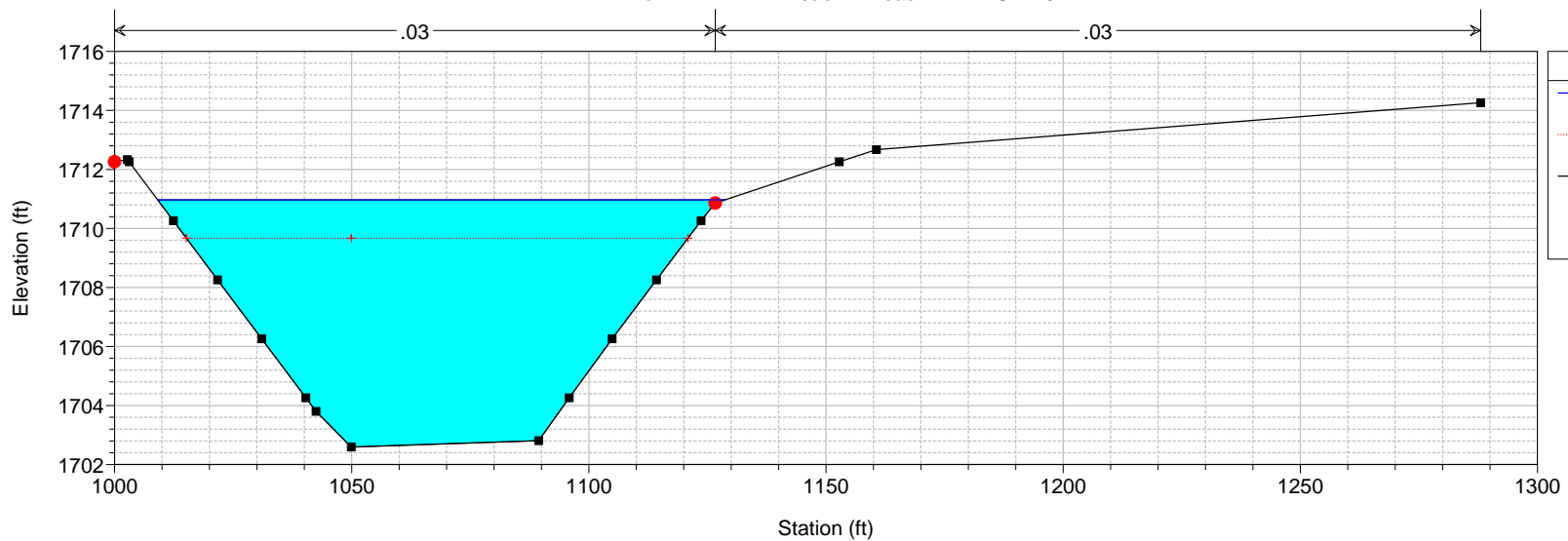
FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 30



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 20



FlamWashEX Plan: EX 8/9/2013
 River = RIVER-1 Reach = Reach-1 RS = 10



Legend	
WS PF 1	
Crit PF 1	
Ground	
Bank Sta	

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X       X   X   X   X
X   X   X       X       X   X   X   X   X
XXXXXXX XXXX   X       XXX XXXX   XXXXXX   XXXX
X   X   X       X       X   X   X   X   X
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X   X   XXXXXX   XXXX       X   X   X   X   XXXXX

```

PROJECT DATA
Project Title: FlamWashEX
Project File : FlamWashEX.prj
Run Date and Time: 8/9/2013 3:26:16 AM

Project in English units

Project Description:
FLAMINGO WASH
PRE-PROJECT CONDITIONS MODEL
DATUM - NAVD88
FILE:
FlamWashPre.prj
STARTING WSE = NORMAL DEPTH
SUBCRITICAL RUN
FLAMINGO
WASH FIS RESTUDY
PHASE 1,2,3 OF FLAMINGO WASH INCLUDED

PLAN DATA

Plan Title: EX
Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Corrected
Effective\FlamWashEX.p03
Geometry Title: FlamWashEX
Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Corrected
Effective\FlamWashEX.g01

Flow Title : FlamWashEX
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Corrected
Effective\FlamWashEX.f01

Plan Summary Information:
Number of: Cross Sections = 43 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: FlamWashEX
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Corrected
Effective\FlamWashEX.f01

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	390	6300
RIVER-1	Reach-1	140	6400

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
-------	-------	---------	----------	------------

RIVER-1 Reach-1 PF 1 Normal S = 0.004 Normal S = 0.004

GEOMETRY DATA

Geometry Title: FlamWashEX

Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Corrected Effective\FlamWashEX.g01

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 390

INPUT

Description:

Station Elevation Data		num=	10						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001796.847		1001786.847		116.751786.512		133.51786.847		133.51796.847	
136.51796.847		136.51786.847		153.251786.512		1701786.847		1701796.847	

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		420.9	420.21	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1796.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1793.18	Reach Len. (ft)	420.90	420.90	420.21
Crit W.S. (ft)	1793.18	Flow Area (sq ft)		435.43	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		435.43	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	14.47	Avg. Vel. (ft/s)		14.47	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	121295.6	Conv. (cfs)		121295.6	
Length Wtd. (ft)	420.90	Wetted Per. (ft)		92.34	
Min Ch El (ft)	1786.51	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	1.14	Cum Volume (acre-ft)	5.52	172.54	6.27
C & E Loss (ft)	0.00	Cum SA (acres)	3.44	29.95	3.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 380

INPUT

Description:

Station Elevation Data		num=	10						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001794.344		1001784.344		116.751784.009		133.51784.344		133.51794.344	
136.51794.344		136.51784.344		153.251784.009		1701784.344		1701794.344	

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		170	170.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1793.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1790.68	Reach Len. (ft)	170.00	170.96	173.00
Crit W.S. (ft)	1790.68	Flow Area (sq ft)		435.42	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		435.42	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	14.47	Avg. Vel. (ft/s)		14.47	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	121290.3	Conv. (cfs)		121290.3	
Length Wtd. (ft)	170.96	Wetted Per. (ft)		92.34	
Min Ch El (ft)	1784.01	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	5.52	168.33	6.27

C & E Loss (ft)	0.00	Cum SA (acres)	3.44	29.30	3.54
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Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 370

INPUT

Description:

Station	Elevation	Data	num=	10					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1790.899	100	1780.899	116.75	1780.564	133.51	1780.899	133.51	1790.899
136.51	1790.899	136.51	1780.899	153.25	1780.564	170	1780.899	170	1790.899

Manning's n	Values	num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	100	170		222 232.15	238		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1790.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1787.23	Reach Len. (ft)	222.00	232.15	238.00
Crit W.S. (ft)	1787.23	Flow Area (sq ft)		435.43	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		435.43	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	14.47	Avg. Vel. (ft/s)		14.47	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	121295.6	Conv. (cfs)		121295.6	
Length Wtd. (ft)	232.15	Wetted Per. (ft)		92.34	
Min Ch El (ft)	1780.56	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	5.52	166.62	6.27
C & E Loss (ft)	0.00	Cum SA (acres)	3.44	29.04	3.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 360

INPUT

Description:

Station	Elevation	Data	num=	10					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1789.74	100	1779.74	116.75	1779.405	133.5	1779.74	133.5	1789.74
136.5	1789.74	136.5	1779.74	153.25	1779.405	170	1779.74	170	1789.74

Manning's n	Values	num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	100	170		323 314.29	310		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1789.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1786.07	Reach Len. (ft)	323.00	314.29	310.00
Crit W.S. (ft)	1786.07	Flow Area (sq ft)		435.42	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		435.42	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	14.47	Avg. Vel. (ft/s)		14.47	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	121290.3	Conv. (cfs)		121290.3	
Length Wtd. (ft)	314.29	Wetted Per. (ft)		92.34	
Min Ch El (ft)	1779.41	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00

Frctn Loss (ft)	0.85	Cum Volume (acre-ft)	5.52	164.30	6.27
C & E Loss (ft)	0.00	Cum SA (acres)	3.44	28.68	3.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 350

INPUT

Description:

Station Elevation Data		num=	10						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001788.169		1001778.169		116.751777.834		133.51778.169		133.51788.169	
136.51788.169		136.51778.169		153.251777.834		1701778.169		1701788.169	

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		439	436.71	435	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1787.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.25	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.50	Reach Len. (ft)	439.00	436.71	435.00
Crit W.S. (ft)	1784.50	Flow Area (sq ft)		435.43	
E.G. Slope (ft/ft)	0.002698	Area (sq ft)		435.43	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	14.47	Avg. Vel. (ft/s)		14.47	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	121293.7	Conv. (cfs)		121293.7	
Length Wtd. (ft)	436.71	Wetted Per. (ft)		92.34	
Min Ch El (ft)	1777.83	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	5.52	161.16	6.27
C & E Loss (ft)	0.38	Cum SA (acres)	3.44	28.20	3.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 340

INPUT

Description:

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001786.349		1001776.349		1351775.649		1701776.349		1701786.349	

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.025	100	.015	170	.025

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		85	85	85	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1783.98	Reach Len. (ft)	85.00	85.00	85.00
Crit W.S. (ft)		Flow Area (sq ft)		558.93	
E.G. Slope (ft/ft)	0.001056	Area (sq ft)		558.93	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	11.27	Avg. Vel. (ft/s)		11.27	
Max Chl Dpth (ft)	8.33	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	193906.3	Conv. (cfs)		193906.3	

Length Wtd. (ft)	85.00	Wetted Per. (ft)	85.28		
Min Ch El (ft)	1775.65	Shear (lb/sq ft)	0.43		
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	5.52	156.17	6.27
C & E Loss (ft)	0.13	Cum SA (acres)	3.44	27.51	3.54

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 338

INPUT

Description:

Station	Elevation	Data	num=	5					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1784.5	0	1775.17	35	1775.17	70	1775.17	70	1784.5

Manning's n	Values	num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	0	.015	70	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	70	95	95	95		.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.21	Reach Len. (ft)	95.00	95.00	95.00
Crit W.S. (ft)		Flow Area (sq ft)		633.10	
E.G. Slope (ft/ft)	0.000728	Area (sq ft)		633.10	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	9.95	Avg. Vel. (ft/s)		9.95	
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)		9.04	
Conv. Total (cfs)	233568.0	Conv. (cfs)		233568.0	
Length Wtd. (ft)	95.00	Wetted Per. (ft)		88.09	
Min Ch El (ft)	1775.17	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)	70.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	5.52	155.01	6.27
C & E Loss (ft)	0.21	Cum SA (acres)	3.44	27.37	3.54

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 337

INPUT

Description:

Station	Elevation	Data	num=	8					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-45	1784.9	0	1784	15	1774.8	51	1774.8	86	1774.8
102	1784	117	1784.3	142	1785				

Manning's n	Values	num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-45	.025	0	.015	102	.025				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	102	60	60	60		.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1784.67	Reach Len. (ft)	60.00	60.00	60.00
Crit W.S. (ft)		Flow Area (sq ft)	11.17	863.99	10.20
E.G. Slope (ft/ft)	0.000333	Area (sq ft)	11.17	863.99	10.20
Q Total (cfs)	6300.00	Flow (cfs)	5.84	6288.53	5.63
Top Width (ft)	163.59	Top Width (ft)	33.43	102.00	28.16
Vel Total (ft/s)	7.12	Avg. Vel. (ft/s)	0.52	7.28	0.55
Max Chl Dpth (ft)	9.87	Hydr. Depth (ft)	0.33	8.47	0.36
Conv. Total (cfs)	344993.8	Conv. (cfs)	319.9	344365.8	308.2
Length Wtd. (ft)	60.00	Wetted Per. (ft)	33.43	107.05	28.17
Min Ch El (ft)	1774.80	Shear (lb/sq ft)	0.01	0.17	0.01
Alpha	1.04	Stream Power (lb/ft s)	142.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	5.51	153.38	6.26
C & E Loss (ft)	0.05	Cum SA (acres)	3.40	27.19	3.51

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1

REACH: Reach-1 RS: 335

INPUT

Description:

Station	Elevation	Data	num=	5					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
100	1785.15	105	1775.15	140	1774.45	175	1775.15	180	1785.15

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.035	100	.035	180	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	100	180		40	40		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.035	
W.S. Elev (ft)	1784.11	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)		Flow Area (sq ft)		691.87	
E.G. Slope (ft/ft)	0.003034	Area (sq ft)		691.87	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	78.96	Top Width (ft)		78.96	
Vel Total (ft/s)	9.11	Avg. Vel. (ft/s)		9.11	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		8.76	
Conv. Total (cfs)	114369.9	Conv. (cfs)		114369.9	
Length Wtd. (ft)	40.00	Wetted Per. (ft)		90.05	
Min Ch El (ft)	1774.45	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	180.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	5.50	152.31	6.25
C & E Loss (ft)	0.10	Cum SA (acres)	3.38	27.06	3.49

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1

REACH: Reach-1 RS: 334

INPUT

Description:

Station	Elevation	Data	num=	9					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1783	20	1780	44	1778	52	1775	60	1774.4
85	1776	90	1779	105	1779.5	125	1786		

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	125	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	125		210	210		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.		0.035	
W.S. Elev (ft)	1782.79	Reach Len. (ft)	210.00	210.00	210.00
Crit W.S. (ft)		Flow Area (sq ft)		518.26	
E.G. Slope (ft/ft)	0.011144	Area (sq ft)		518.26	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	113.75	Top Width (ft)		113.75	
Vel Total (ft/s)	12.16	Avg. Vel. (ft/s)		12.16	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	59677.8	Conv. (cfs)		59677.8	
Length Wtd. (ft)	210.00	Wetted Per. (ft)		116.02	
Min Ch El (ft)	1774.40	Shear (lb/sq ft)		3.11	
Alpha	1.00	Stream Power (lb/ft s)	125.00	0.00	0.00
Frctn Loss (ft)	2.34	Cum Volume (acre-ft)	5.50	151.75	6.25
C & E Loss (ft)	0.07	Cum SA (acres)	3.38	26.97	3.49

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1

REACH: Reach-1 RS: 330

INPUT

Description:

Station	Elevation	Data	num=	5
---------	-----------	------	------	---

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001783.549		1051773.549		1401772.849		1751773.549		1801783.549	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.035	100	.035	180	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	100	180		343.49	343.49		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1782.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.00	Wt. n-Val.		0.035	
W.S. Elev (ft)	1779.43	Reach Len. (ft)	343.49	343.49	343.49
Crit W.S. (ft)	1779.43	Flow Area (sq ft)		453.31	
E.G. Slope (ft/ft)	0.011170	Area (sq ft)		453.31	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	75.88	Top Width (ft)		75.88	
Vel Total (ft/s)	13.90	Avg. Vel. (ft/s)		13.90	
Max Chl Dpth (ft)	6.58	Hydr. Depth (ft)		5.97	
Conv. Total (cfs)	59609.1	Conv. (cfs)		59609.1	
Length Wtd. (ft)	343.49	Wetted Per. (ft)		83.16	
Min Ch El (ft)	1772.85	Shear (lb/sq ft)		3.80	
Alpha	1.00	Stream Power (lb/ft s)	180.00	0.00	0.00
Frctn Loss (ft)	1.45	Cum Volume (acre-ft)	5.50	149.41	6.25
C & E Loss (ft)	0.41	Cum SA (acres)	3.38	26.52	3.49

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 320

INPUT

Description:

Station Elevation Data	num=	20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1781.66 1022.01 1780.3 1022.11 1780.26 1030.73 1778.26 1039.26 1776.26		
1047.79 1774.26 1052.67 1773.11 1061.45 1772.77 1063.83 1772.26 1067.59 1771.5		
1104.76 1772.26 1107.08 1772.3 1112.55 1773.47 1130.75 1774.02 1131.67 1774.26		
1139.29 1776.26 1146.67 1778.26 1153.84 1780.24 1155.09 1780.26 1191.2 1781.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1022.11	.02	1153.84	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1022.11	1153.84		489.89	489.1		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1780.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.020	
W.S. Elev (ft)	1778.93	Reach Len. (ft)	489.89	489.10	487.69
Crit W.S. (ft)		Flow Area (sq ft)		616.30	
E.G. Slope (ft/ft)	0.002203	Area (sq ft)		616.30	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	121.21	Top Width (ft)		121.21	
Vel Total (ft/s)	10.22	Avg. Vel. (ft/s)		10.22	
Max Chl Dpth (ft)	7.43	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	134214.1	Conv. (cfs)		134214.1	
Length Wtd. (ft)	489.10	Wetted Per. (ft)		122.81	
Min Ch El (ft)	1771.50	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	1191.20	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	5.50	145.19	6.25
C & E Loss (ft)	0.36	Cum SA (acres)	3.38	25.74	3.49

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 310

INPUT

Description:

Station Elevation Data	num=	20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		

1000 1779.06 1016.17 1778.26 1022.98 1777.94 1028.26 1776.26 1034.5 1774.26
 1040.77 1772.26 1044.12 1771.21 1047.77 1770.26 1048.18 1770.13 1072.14 1770.04
 1131.12 1770.06 1132.45 1770.26 1137.38 1771.05 1147.75 1770.88 1152.28 1772.26
 1158.91 1774.26 1165.6 1776.26 1171.53 1778.03 1177.59 1778.26 1198.8 1779.06

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 1000 .02 1022.98 .015 1171.53 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1022.98 1171.53 102.64 100.28 105.7 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1779.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.020	0.015	0.020
W.S. Elev (ft)	1779.56	Reach Len. (ft)	102.64	100.28	105.70
Crit W.S. (ft)		Flow Area (sq ft)	24.42	1195.59	27.57
E.G. Slope (ft/ft)	0.000176	Area (sq ft)	24.42	1195.59	27.57
Q Total (cfs)	6300.00	Flow (cfs)	24.70	6248.25	27.05
Top Width (ft)	198.80	Top Width (ft)	22.98	148.55	27.27
Vel Total (ft/s)	5.05	Avg. Vel. (ft/s)	1.01	5.23	0.98
Max Chl Dpth (ft)	9.52	Hydr. Depth (ft)	1.06	8.05	1.01
Conv. Total (cfs)	474668.9	Conv. (cfs)	1860.9	470770.1	2037.9
Length Wtd. (ft)	100.33	Wetted Per. (ft)	23.50	150.87	27.79
Min Ch El (ft)	1770.04	Shear (lb/sq ft)	0.01	0.09	0.01
Alpha	1.06	Stream Power (lb/ft s)	1198.80	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	5.36	135.02	6.09
C & E Loss (ft)	0.01	Cum SA (acres)	3.25	24.22	3.34

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 300

INPUT

Description:

Station Elevation Data num= 8
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 1000 1777.06 1017.87 1777.45 1025.54 1777.38 1025.54 1769.18 1128.56 1769.18
 1128.56 1777.36 1133.94 1777.82 1147.13 1777.61

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 1000 .02 1025.54 .015 1128.56 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1025.54 1128.56 102.54 102.75 98.55 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1000 1025.54 1777.38 F
 1128.56 1147.13 1777.36 F
 Blocked Obstructions num= 2
 Sta L Sta R Elev Sta L Sta R Elev
 1000 1025.54 1777.45 1128.56 1147.13 1777.82

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1779.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.020	0.015	0.020
W.S. Elev (ft)	1779.43	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1774.07	Flow Area (sq ft)	50.43	1055.40	29.80
E.G. Slope (ft/ft)	0.000192	Area (sq ft)	50.43	1055.40	29.80
Q Total (cfs)	6300.00	Flow (cfs)	77.86	6182.30	39.84
Top Width (ft)	147.13	Top Width (ft)	25.54	103.02	18.57
Vel Total (ft/s)	5.55	Avg. Vel. (ft/s)	1.54	5.86	1.34
Max Chl Dpth (ft)	10.24	Hydr. Depth (ft)	1.97	10.24	1.60
Conv. Total (cfs)	454121.8	Conv. (cfs)	5612.3	445638.0	2871.6
Length Wtd. (ft)	0.10	Wetted Per. (ft)	27.51	119.93	20.17
Min Ch El (ft)	1769.18	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.10	Stream Power (lb/ft s)	1147.13	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	5.28	132.43	6.03
C & E Loss (ft)		Cum SA (acres)	3.19	23.94	3.28

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: RIVER-1
 REACH: Reach-1 RS: 295

INPUT

Description: Bridge #2

Distance from Upstream XS = .1
 Deck/Roadway Width = 102.55
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

```

num=      6
Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
1000 1779.18 1768.81 1025.54 1779.18 1768.81 1025.54 1779.18 1775.18
1128.56 1779.18 1775.18 1128.56 1779.18 1768.81 1147.13 1779.18 1768.81

```

Upstream Bridge Cross Section Data

```

Station Elevation Data      num=      8
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
1000 1777.06 1017.87 1777.45 1025.54 1777.38 1025.54 1769.18 1128.56 1769.18
1128.56 1777.36 1133.94 1777.82 1147.13 1777.61

```

Manning's n Values

```

num=      3
Sta      n Val      Sta      n Val      Sta      n Val
1000      .02 1025.54      .015 1128.56      .02

```

```

Bank Sta: Left      Right      Coeff Contr.      Expan.
1025.54 1128.56      .1      .3

```

Ineffective Flow

```

num=      2
Sta L      Sta R      Elev      Permanent
1000 1025.54 1777.38      F
1128.56 1147.13 1777.36      F

```

Blocked Obstructions

```

num=      2
Sta L      Sta R      Elev      Sta L      Sta R      Elev
1000 1025.54 1777.45 1128.56 1147.13 1777.82

```

Downstream Deck/Roadway Coordinates

```

num=      5
Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
1000 1779.18 1768.81 1047.98 1779.18 1768.81 1047.98 1779.18 1775.18
1147.13 1779.18 1775.18      1151 1779.18 1775.18

```

Downstream Bridge Cross Section Data

```

Station Elevation Data      num=      7
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
1000 1777.86 1036.02 1777.31 1047.98 1776.26 1047.98 1768.81      1151 1768.81
1151 1776.26 1160.59 1777.03

```

Manning's n Values

```

num=      3
Sta      n Val      Sta      n Val      Sta      n Val
1000      .02 1047.98      .015 1151      .02

```

```

Bank Sta: Left      Right      Coeff Contr.      Expan.
1047.98 1151      .1      .3

```

Ineffective Flow

```

num=      2
Sta L      Sta R      Elev      Permanent
1000 1047.98 1776.26      F
1151 1160.59 1776.26      F

```

Blocked Obstructions

```

num=      2
Sta L      Sta R      Elev      Sta L      Sta R      Elev
1000 1047.98 1777.26 1150.91 1160.59 1777.26

```

```

Upstream Embankment side slope      =      0 horiz. to 1.0 vertical
Downstream Embankment side slope      =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow      =      .95
Elevation at which weir flow begins      =      1779.18
Energy head used in spillway design      =
Spillway height used in design      =
Weir crest shape      =      Broad Crested

```

Number of Piers = 8

Pier Data

```

Pier Station      Upstream= 1036.35      Downstream= 1058.79
Upstream      num=      2
Width      Elev      Width      Elev
1.6275 1769.18 1.6275 1775.18
Downstream      num=      2
Width      Elev      Width      Elev
1.6275 1768.81 1.6275 1775.18

```

Pier Data

```

Pier Station      Upstream= 1047.98      Downstream= 1070.42
Upstream      num=      2
Width      Elev      Width      Elev
1.628 1769.18 1.628 1775.18
Downstream      num=      2
Width      Elev      Width      Elev
1.628 1768.81 1.628 1775.18

```

Pier Data

```

Pier Station      Upstream= 1059.61      Downstream= 1082.05
Upstream      num=      2
Width      Elev      Width      Elev
1.628 1769.18 1.628 1775.18
Downstream      num=      2
Width      Elev      Width      Elev
1.628 1768.81 1.628 1775.18

```

Pier Data

```

Pier Station      Upstream= 1071.24      Downstream= 1093.68
Upstream      num=      2
Width      Elev      Width      Elev
1.628 1769.18 1.628 1775.18
Downstream      num=      2
Width      Elev      Width      Elev

```

1.628 1768.81 1.628 1775.18

Pier Data
Pier Station Upstream= 1082.86 Downstream= 1105.3
Upstream num= 2
Width Elev Width Elev
1.628 1769.18 1.628 1775.18
Downstream num= 2
Width Elev Width Elev
1.628 1768.81 1.628 1775.18

Pier Data
Pier Station Upstream= 1094.49 Downstream= 1116.93
Upstream num= 2
Width Elev Width Elev
1.628 1769.18 1.628 1775.18
Downstream num= 2
Width Elev Width Elev
1.628 1768.81 1.628 1775.18

Pier Data
Pier Station Upstream= 1106.12 Downstream= 1128.56
Upstream num= 2
Width Elev Width Elev
1.628 1769.18 1.628 1775.18
Downstream num= 2
Width Elev Width Elev
1.628 1768.81 1.628 1775.18

Pier Data
Pier Station Upstream= 1117.75 Downstream= 1140.19
Upstream num= 2
Width Elev Width Elev
1.628 1769.18 1.628 1775.18
Downstream num= 2
Width Elev Width Elev
1.628 1768.81 1.628 1775.18

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Yarnell KVal = .9
Selected Low Flow Methods = Yarnell

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1779.95	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1779.43	E.G. Elev (ft)	1779.95	1779.80
Q Total (cfs)	6300.00	W.S. Elev (ft)	1779.43	1779.43
Q Bridge (cfs)	6039.50	Crit W.S. (ft)	1774.53	1774.17
Q Weir (cfs)	260.50	Max Chl Dpth (ft)	10.24	10.61
Weir Sta Lft (ft)	1000.00	Vel Total (ft/s)	9.65	8.82
Weir Sta Rgt (ft)	1147.13	Flow Area (sq ft)	652.99	714.46
Weir Submerg	0.00	Froude # Chl	0.61	0.55
Weir Max Depth (ft)	0.77	Specif Force (cu ft)	6080.56	6263.25
Min El Weir Flow (ft)	1779.19	Hydr Depth (ft)	4.44	4.45
Min El Prs (ft)	1775.18	W.P. Total (ft)	435.61	459.39
Delta EG (ft)	3.82	Conv. Total (cfs)		
Delta WS (ft)	5.72	Top Width (ft)	147.13	160.59
BR Open Area (sq ft)	539.98	Frctn Loss (ft)		
BR Open Vel (ft/s)	11.18	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has

been disregarded.

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used for pressure flow.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Note: For the cross section inside the bridge at the downstream end, the energy is based on critical depth over the weir. The water surface has been projected.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 290

INPUT

Description:

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1777.86	1036.02	1777.31	1047.98	1776.26	1047.98	1768.81	1151	1768.81
1151	1776.26	1160.59	1777.03						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1047.98	.015	1151	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1047.98 1151 14.68 14.95 12.7 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1047.98	1776.26	F
1151	1160.59	1776.26	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1047.98	1777.26	1150.91	1160.59	1777.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1776.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1773.71	Reach Len. (ft)	14.68	14.95	12.70
Crit W.S. (ft)	1773.71	Flow Area (sq ft)		503.95	
E.G. Slope (ft/ft)	0.002162	Area (sq ft)		503.95	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	102.93	Top Width (ft)		102.93	
Vel Total (ft/s)	12.50	Avg. Vel. (ft/s)		12.50	
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)		4.90	
Conv. Total (cfs)	135478.4	Conv. (cfs)		135478.4	
Length Wtd. (ft)	14.95	Wetted Per. (ft)		112.72	
Min Ch El (ft)	1768.81	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1160.59	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	5.25	131.06	6.00
C & E Loss (ft)	0.00	Cum SA (acres)	3.11	23.69	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 280

INPUT

Description:

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1778.06	1036.1	1777.28	1039.28	1776.26	1044.87	1774.63	1044.99	1774.26
1045.65	1772.26	1046.31	1770.26	1047.17	1768.26	1103.57	1768.26	1146.5	1768.44
1148.22	1768.26	1149.86	1768.26	1150.4	1770.26	1150.81	1772.26	1151.16	1774.26
1151.21	1774.46	1160.57	1776.29	1160.65	1776.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1044.87	.015	1151.21	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1044.87 1151.21 1 1 1 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1775.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.41	Wt. n-Val.		0.015	
W.S. Elev (ft)	1773.14	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1773.14	Flow Area (sq ft)		505.21	
E.G. Slope (ft/ft)	0.002150	Area (sq ft)		505.21	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	105.61	Top Width (ft)		105.61	
Vel Total (ft/s)	12.47	Avg. Vel. (ft/s)		12.47	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)		4.78	
Conv. Total (cfs)	135884.0	Conv. (cfs)		135884.0	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		112.93	
Min Ch El (ft)	1768.26	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1160.65	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	5.25	130.88	6.00
C & E Loss (ft)	0.00	Cum SA (acres)	3.11	23.66	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 270

INPUT

Description:

Station	Elevation	Data	num=	20
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
964	1778.06	1000	1777.26	1003.1 1776.26 1008.92 1774.26 1008.94 1774.3
1009.59	1772.26	1010.24	1770.26	1010.83 1768.26 1011.18 1766.26 1011.54 1764.26
1113.08	1764.26	1114.49	1764.26	1114.56 1764.26 1114.95 1766.26 1115.24 1768.26
1115.55	1770.26	1115.92	1772.26	1116.05 1773.3 1122.67 1774.26 1132.66 1776.26

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
964	.02	1008.92	.015
		1116.05	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1008.92	1116.05		33.84	21.92	8.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1771.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1769.11	Reach Len. (ft)	33.84	21.92	8.99
Crit W.S. (ft)	1769.11	Flow Area (sq ft)		503.93	
E.G. Slope (ft/ft)	0.002167	Area (sq ft)		503.93	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.79	Top Width (ft)		104.79	
Vel Total (ft/s)	12.50	Avg. Vel. (ft/s)		12.50	
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	135338.4	Conv. (cfs)		135338.4	
Length Wtd. (ft)	21.92	Wetted Per. (ft)		112.89	
Min Ch El (ft)	1764.26	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1132.66	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	5.25	130.87	6.00
C & E Loss (ft)	0.09	Cum SA (acres)	3.11	23.65	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 260

INPUT

Description:

Station	Elevation	Data	num=	20
Sta	Elev	Sta	Elev	Sta Elev Sta Elev Sta Elev
1000	1777.66	1020.49	1777.5	1022.9 1776.26 1026.35 1774.26 1029.81 1772.26
1033.31	1770.26	1042.07	1769.56	1048.18 1768.26 1050.85 1766.26 1051.85 1764.26
1154.61	1764.26	1155.13	1766.26	1155.64 1768.26 1171.52 1768.92 1173.98 1770.08
1174.12	1770.26	1176.75	1772.26	1179.4 1774.26 1183.08 1776.26 1187.74 1778.26

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.02	1033.31	.015
		1171.52	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1033.31	1171.52		1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1771.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.13	Wt. n-Val.		0.015	0.020
W.S. Elev (ft)	1769.25	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1769.25	Flow Area (sq ft)		537.85	0.11
E.G. Slope (ft/ft)	0.002172	Area (sq ft)		537.85	0.11
Q Total (cfs)	6300.00	Flow (cfs)		6299.89	0.11
Top Width (ft)	128.69	Top Width (ft)		127.99	0.70
Vel Total (ft/s)	11.71	Avg. Vel. (ft/s)		11.71	0.97
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)		4.20	0.16
Conv. Total (cfs)	135169.6	Conv. (cfs)		135167.2	2.4
Length Wtd. (ft)	1.00	Wetted Per. (ft)		133.11	0.77
Min Ch El (ft)	1764.26	Shear (lb/sq ft)		0.55	0.02
Alpha	1.00	Stream Power (lb/ft s)	1187.74	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	5.25	130.61	6.00
C & E Loss (ft)	0.02	Cum SA (acres)	3.11	23.60	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 250

INPUT

Description:

Station Elevation Data		num= 24		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1777.66	1020.11	1777.49	1022.51	1776.26	1025.97	1774.26	1029.5	1772.26		
1033.08	1770.26	1036.04	1768.76	1037.59	1768.26	1043.3	1766.26	1047.58	1764.26		
1050.92	1762.26	1053.04	1760.26	1154.39	1760.6	1154.67	1762.26	1155.12	1764.26		
1155.69	1766.26	1162.7	1768.26	1171.85	1768.93	1174.97	1770.26	1178.13	1772.26		
1180.86	1774.26	1183.9	1776.26	1187.8	1778.26	1190.22	1779.25				

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1036.04	.015	1171.85	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1036.04	1171.85		57.45	58.6	58.44	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1767.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.35	Wt. n-Val.		0.015	
W.S. Elev (ft)	1765.30	Reach Len. (ft)	57.45	58.60	58.44
Crit W.S. (ft)	1765.30	Flow Area (sq ft)		512.06	
E.G. Slope (ft/ft)	0.002116	Area (sq ft)		512.06	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	110.06	Top Width (ft)		110.06	
Vel Total (ft/s)	12.30	Avg. Vel. (ft/s)		12.30	
Max Chl Dpth (ft)	5.04	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	136953.5	Conv. (cfs)		136953.5	
Length Wtd. (ft)	58.60	Wetted Per. (ft)		115.42	
Min Ch El (ft)	1760.26	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)	1190.22	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	5.25	130.60	6.00
C & E Loss (ft)	0.03	Cum SA (acres)	3.11	23.59	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 240

INPUT

Description:

Station Elevation Data		num= 29		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1777.06	1026.08	1776.6	1026.81	1776.26	1030.67	1774.26	1034.53	1772.26		
1038.38	1770.26	1042.19	1768.26	1045.88	1766.26	1049.77	1764.26	1053.67	1762.26		
1057.57	1760.26	1059.06	1759.69	1143.57	1760.05	1145.62	1760.26	1152.68	1761		
1157.83	1761.46	1159.46	1762.26	1163.99	1764.26	1168.57	1766.26	1173.21	1768.26		
1177.84	1770.26	1181.98	1772.26	1185.85	1774.26	1189.72	1776.26	1193.59	1778.26		
1194.47	1778.66	1267.84	1779.13	1276.18	1778.26	1280.88	1777.75				

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1026.08	.02	1194.47	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1026.08	1194.47		496.31	492	488.69	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1767.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.24	Wt. n-Val.		0.020	
W.S. Elev (ft)	1764.89	Reach Len. (ft)	496.31	492.00	488.69
Crit W.S. (ft)	1764.89	Flow Area (sq ft)		524.20	
E.G. Slope (ft/ft)	0.003621	Area (sq ft)		524.20	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	116.90	Top Width (ft)		116.90	
Vel Total (ft/s)	12.02	Avg. Vel. (ft/s)		12.02	
Max Chl Dpth (ft)	5.20	Hydr. Depth (ft)		4.48	
Conv. Total (cfs)	104694.6	Conv. (cfs)		104694.6	
Length Wtd. (ft)	492.00	Wetted Per. (ft)		118.93	
Min Ch El (ft)	1759.69	Shear (lb/sq ft)		1.00	

Alpha	1.00	Stream Power (lb/ft s)	1280.88	0.00	0.00
Frctn Loss (ft)	1.74	Cum Volume (acre-ft)	5.25	129.90	6.00
C & E Loss (ft)	0.05	Cum SA (acres)	3.11	23.44	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 230

INPUT

Description:

Station	Elevation	Data	num=	28
Sta	Elev	Sta	Elev	Sta
1000	1765.86	1034.85	1765.62	1040.25
1057.18	1762.26	1062.98	1760.26	1068.2
1090.81	1754.86	1093.04	1754.26	1100.45
1124.28	1754.26	1136.24	1755.52	1137.93
1151.69	1762.26	1156.15	1764.2	1156.82
1176.57	1768.26	1178.93	1768.9	1205.52

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.02	1034.85	.02
1057.18	.02	1062.98	.02
1090.81	.02	1093.04	.02
1124.28	.02	1136.24	.02
1151.69	.02	1156.15	.02
1176.57	.02	1178.93	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
1034.85	1169.03	490.46	494.76	498.91	.1	.3		

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1763.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.74	Wt. n-Val.	0.020		
W.S. Elev (ft)	1760.70	Reach Len. (ft)	490.46	494.76	498.91
Crit W.S. (ft)	1760.70	Flow Area (sq ft)	473.88		
E.G. Slope (ft/ft)	0.003443	Area (sq ft)	473.88		
Q Total (cfs)	6300.00	Flow (cfs)	6300.00		
Top Width (ft)	86.42	Top Width (ft)	86.42		
Vel Total (ft/s)	13.29	Avg. Vel. (ft/s)	13.29		
Max Chl Dpth (ft)	8.32	Hydr. Depth (ft)	5.48		
Conv. Total (cfs)	107365.3	Conv. (cfs)	107365.3		
Length Wtd. (ft)	494.76	Wetted Per. (ft)	88.99		
Min Ch El (ft)	1752.38	Shear (lb/sq ft)	1.14		
Alpha	1.00	Stream Power (lb/ft s)	1205.52	0.00	0.00
Frctn Loss (ft)	1.72	Cum Volume (acre-ft)	5.25	124.27	6.00
C & E Loss (ft)	0.03	Cum SA (acres)	3.11	22.29	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 220

INPUT

Description:

Station	Elevation	Data	num=	26
Sta	Elev	Sta	Elev	Sta
1000	1761.96	1041.51	1762.09	1045.1
1056.86	1754.26	1060.75	1752.26	1064.59
1087.54	1748.26	1092.6	1746.44	1106.98
1113.56	1748.06	1116.26	1748.26	1139.68
1148.41	1754.26	1152.7	1756.26	1156.99
1199.32	1760.56			

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.02	1041.51	.02
1056.86	.02	1060.75	.02
1087.54	.02	1092.6	.02
1113.56	.02	1116.26	.02
1148.41	.02	1152.7	.02
1199.32	.02		.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
1041.51	1160.79	464.69	476.72	489.34	.1	.3		

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1756.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.64	Wt. n-Val.	0.020		
W.S. Elev (ft)	1754.23	Reach Len. (ft)	464.69	476.72	489.34
Crit W.S. (ft)	1754.23	Flow Area (sq ft)	482.88		

E.G. Slope (ft/ft)	0.003498	Area (sq ft)	482.88		
Q Total (cfs)	6300.00	Flow (cfs)	6300.00		
Top Width (ft)	91.43	Top Width (ft)	91.43		
Vel Total (ft/s)	13.05	Avg. Vel. (ft/s)	13.05		
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	5.28		
Conv. Total (cfs)	106513.0	Conv. (cfs)	106513.0		
Length Wtd. (ft)	476.72	Wetted Per. (ft)	94.39		
Min Ch El (ft)	1746.22	Shear (lb/sq ft)	1.12		
Alpha	1.00	Stream Power (lb/ft s)	1199.32	0.00	0.00
Frctn Loss (ft)	1.66	Cum Volume (acre-ft)	5.25	118.83	6.00
C & E Loss (ft)	0.02	Cum SA (acres)	3.11	21.28	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 210

INPUT

Description:

Station Elevation Data		num=	25								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
951.7	1754.26	1000	1754.26	1005.42	1752.26	1010.97	1750.26	1016.52	1748.26		
1022.03	1746.26	1027.65	1744.26	1028.59	1743.92	1037.62	1742.76	1039.36	1742.26		
1047.1	1740.26	1048.91	1739.78	1061.69	1740.06	1062.13	1740.26	1067.4	1742.26		
1071.1	1743.46	1079.44	1744.26	1088.66	1745.15	1091.26	1746.26	1095.98	1748.26		
1100.7	1750.26	1105.41	1752.26	1110.13	1754.26	1113.22	1755.57	1141.88	1755.47		

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
951.7	.02	1000	.02	1113.22	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1113.22		499.74	500.38	500.05	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1751.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.81	Wt. n-Val.		0.020	
W.S. Elev (ft)	1749.13	Reach Len. (ft)	499.74	500.38	500.05
Crit W.S. (ft)	1749.13	Flow Area (sq ft)		468.30	
E.G. Slope (ft/ft)	0.003463	Area (sq ft)		468.30	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	83.90	Top Width (ft)		83.90	
Vel Total (ft/s)	13.45	Avg. Vel. (ft/s)		13.45	
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	107059.3	Conv. (cfs)		107059.3	
Length Wtd. (ft)	500.38	Wetted Per. (ft)		86.76	
Min Ch El (ft)	1739.78	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	1141.88	0.00	0.00
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	5.25	113.63	6.00
C & E Loss (ft)	0.12	Cum SA (acres)	3.11	20.32	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 200

INPUT

Description:

Station Elevation Data		num=	22								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
956.38	1751.06	992.25	1750.26	995.39	1750.1	1000	1748.26	1004.98	1746.26		
1009.94	1744.26	1014.87	1742.26	1019.77	1740.26	1020.02	1740.16	1027.73	1739.78		
1037.66	1738.96	1061.55	1738.96	1074.9	1740.02	1083.37	1740.26	1103	1740.75		
1106.13	1742.26	1110.31	1744.26	1114.5	1746.26	1118.68	1748.26	1122.87	1750.26		
1123.7	1750.66	1144.3	1750.62								

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
956.38	.02	1000	.02	1122.87	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1122.87		494.16	495.37	496.56	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1747.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.42	Wt. n-Val.		0.020	
W.S. Elev (ft)	1745.15	Reach Len. (ft)	494.16	495.37	496.56
Crit W.S. (ft)	1745.15	Flow Area (sq ft)		504.83	
E.G. Slope (ft/ft)	0.003543	Area (sq ft)		504.83	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.43	Top Width (ft)		104.43	
Vel Total (ft/s)	12.48	Avg. Vel. (ft/s)		12.48	
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)		4.83	
Conv. Total (cfs)	105840.7	Conv. (cfs)		105840.7	
Length Wtd. (ft)	495.37	Wetted Per. (ft)		106.50	
Min Ch El (ft)	1738.96	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)	1144.30	0.00	0.00
Frctn Loss (ft)	1.76	Cum Volume (acre-ft)	5.25	108.04	6.00
C & E Loss (ft)	0.02	Cum SA (acres)	3.11	19.24	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 190

INPUT

Description:

Station Elevation Data		num=	22						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
950.33	1745.76	998.69	1744.72	1000	1744.26	1005.6	1742.26	1011	1740.26
1016.29	1738.26	1018.97	1737.49	1040.24	1736.76	1042.17	1736.26	1046.61	1735.05
1078.44	1735.16	1082	1736.26	1084.43	1736.97	1101.82	1738.26	1105.68	1738.56
1110.9	1740.26	1116.85	1742.26	1121.49	1743.89	1135.5	1744.26	1142.58	1744.5
1143.57	1744.26	1144.92	1743.9						

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
950.33	.02	1000	.02	1121.49	.02	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1000	1121.49		499.18	497.74	497.1	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1744.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.36	Wt. n-Val.		0.020	
W.S. Elev (ft)	1741.78	Reach Len. (ft)	499.18	497.74	497.10
Crit W.S. (ft)	1741.78	Flow Area (sq ft)		511.36	
E.G. Slope (ft/ft)	0.003560	Area (sq ft)		511.36	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	108.54	Top Width (ft)		108.54	
Vel Total (ft/s)	12.32	Avg. Vel. (ft/s)		12.32	
Max Chl Dpth (ft)	6.73	Hydr. Depth (ft)		4.71	
Conv. Total (cfs)	105589.9	Conv. (cfs)		105589.9	
Length Wtd. (ft)	497.74	Wetted Per. (ft)		110.37	
Min Ch El (ft)	1735.05	Shear (lb/sq ft)		1.03	
Alpha	1.00	Stream Power (lb/ft s)	1144.92	0.00	0.00
Frctn Loss (ft)	1.71	Cum Volume (acre-ft)	5.25	102.26	6.00
C & E Loss (ft)	0.11	Cum SA (acres)	3.11	18.03	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 180

INPUT

Description:

Station Elevation Data		num=	19						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1740.66	1017.86	1740.26	1037.9	1738.84	1039.45	1738.26	1044.91	1736.26
1050.47	1734.26	1055.47	1732.48	1062.62	1732.68	1097.25	1732.26	1099.77	1731.86
1119.42	1732.26	1121.41	1732.3	1155.75	1733.41	1158.51	1734.26	1165.22	1736.26
1172.22	1738.26	1178.31	1739.98	1187.42	1740.26	1197.86	1740.53		

Manning's n Values		num=	3			
Sta	n Val	Sta	n Val	Sta	n Val	
1000	.02	1037.9	.02	1178.31	.02	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1037.9	1178.31	490.6	491.83 492.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1739.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.020	
W.S. Elev (ft)	1737.44	Reach Len. (ft)	490.60	491.83	492.37
Crit W.S. (ft)	1737.29	Flow Area (sq ft)		555.38	
E.G. Slope (ft/ft)	0.003334	Area (sq ft)		555.38	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	127.67	Top Width (ft)		127.67	
Vel Total (ft/s)	11.34	Avg. Vel. (ft/s)		11.34	
Max Chl Dpth (ft)	5.58	Hydr. Depth (ft)		4.35	
Conv. Total (cfs)	109100.3	Conv. (cfs)		109100.3	
Length Wtd. (ft)	491.83	Wetted Per. (ft)		129.18	
Min Ch El (ft)	1731.86	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	1197.86	0.00	0.00
Frctn Loss (ft)	1.72	Cum Volume (acre-ft)	5.25	96.16	6.00
C & E Loss (ft)	0.01	Cum SA (acres)	3.11	16.68	3.25

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 170

INPUT

Description:

Station Elevation Data	num=	20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1736.86 1003.78 1737.79 1042.95 1736.76 1044.42 1736.26 1050.31 1734.26		
1056.26 1732.26 1060.18 1730.96 1095.07 1730.68 1097.52 1730.26 1099.65 1729.92		
1123.92 1729.56 1128.46 1730.26 1140.57 1732.08 1146.01 1732.26 1167.12 1732.92		
1172.19 1734.26 1179.55 1736.26 1183.42 1737.35 1201.5 1737.66 1203.33 1738.26		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .02 1042.95 .02 1183.42 .02		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1042.95	1183.42	486.67	487.26 487.82	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1737.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.08	Wt. n-Val.		0.020	
W.S. Elev (ft)	1735.63	Reach Len. (ft)	486.67	487.26	487.82
Crit W.S. (ft)	1735.63	Flow Area (sq ft)		544.26	
E.G. Slope (ft/ft)	0.003684	Area (sq ft)		544.26	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	130.94	Top Width (ft)		130.94	
Vel Total (ft/s)	11.58	Avg. Vel. (ft/s)		11.58	
Max Chl Dpth (ft)	6.07	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	103801.6	Conv. (cfs)		103801.6	
Length Wtd. (ft)	487.26	Wetted Per. (ft)		132.33	
Min Ch El (ft)	1729.56	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)	1203.33	0.00	0.00
Frctn Loss (ft)	1.18	Cum Volume (acre-ft)	5.25	89.96	6.00
C & E Loss (ft)	0.24	Cum SA (acres)	3.11	15.22	3.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 160

INPUT

Description:

Station Elevation Data	num=	22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1736.26 1002.52 1736.78 1015.73 1736.26 1042.38 1735.52 1045.87 1734.26		
1051.46 1732.26 1057.16 1730.26 1058.29 1729.87 1089.49 1729.85 1097.9 1728.73		
1115.47 1728.26 1127.39 1727.87 1131.14 1728.26 1145.07 1729.72 1162.54 1730.26		
1169.98 1730.46 1173.77 1732.26 1178.13 1734.26 1181.15 1735.64 1195.86 1736.26		
1200.57 1736.46 1203.67 1738.07		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		

1000 .02 1042.38 .02 1195.86 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1042.38 1195.86 501.43 501.51 502.7 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1736.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.020	
W.S. Elev (ft)	1735.00	Reach Len. (ft)	501.43	501.51	502.70
Crit W.S. (ft)		Flow Area (sq ft)		696.07	
E.G. Slope (ft/ft)	0.001716	Area (sq ft)		696.07	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	135.91	Top Width (ft)		135.91	
Vel Total (ft/s)	9.05	Avg. Vel. (ft/s)		9.05	
Max Chl Dpth (ft)	7.13	Hydr. Depth (ft)		5.12	
Conv. Total (cfs)	152105.1	Conv. (cfs)		152105.1	
Length Wtd. (ft)	501.51	Wetted Per. (ft)		137.99	
Min Ch El (ft)	1727.87	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)	1203.67	0.00	0.00
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	5.25	83.02	6.00
C & E Loss (ft)	0.14	Cum SA (acres)	3.11	13.73	3.25

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 150

INPUT

Description:

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1734.26	1018.39	1733.95	1024.12	1732.26	1030.88	1730.26	1035.9	1728.74
1066.83	1728.36	1067.43	1728.26	1074.87	1726.46	1083.96	1726.26	1107.26	1725.79
1108.86	1726.26	1113.02	1727.49	1135.88	1728.26	1136.31	1728.25	1142.71	1730.26
1149.03	1732.26	1152.46	1733.35	1169.72	1733.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1018.39	.02	1152.46	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1018.39 1152.46 491.39 489.94 488.88 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.020	0.020
W.S. Elev (ft)	1734.75	Reach Len. (ft)	491.39	489.94	488.88
Crit W.S. (ft)		Flow Area (sq ft)	11.84	859.95	21.21
E.G. Slope (ft/ft)	0.000815	Area (sq ft)	11.84	859.95	21.21
Q Total (cfs)	6300.00	Flow (cfs)	18.39	6232.03	49.58
Top Width (ft)	169.72	Top Width (ft)	18.39	134.07	17.26
Vel Total (ft/s)	7.05	Avg. Vel. (ft/s)	1.55	7.25	2.34
Max Chl Dpth (ft)	8.96	Hydr. Depth (ft)	0.64	6.41	1.23
Conv. Total (cfs)	220740.0	Conv. (cfs)	644.4	218358.3	1737.3
Length Wtd. (ft)	489.99	Wetted Per. (ft)	18.88	136.11	18.32
Min Ch El (ft)	1725.79	Shear (lb/sq ft)	0.03	0.32	0.06
Alpha	1.04	Stream Power (lb/ft s)	1169.72	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	5.19	74.06	5.87
C & E Loss (ft)	0.14	Cum SA (acres)	3.00	12.17	3.15

Warning: The cross-section end points had to be extended vertically for the computed water surface.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 140

INPUT

Description:

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1731.76	1149.72	1730.67	1150.76	1730.26	1155.81	1728.26	1161.07	1726.26
1165.81	1725.06	1250.59	1724.86	1254.37	1726.26	1259.66	1728.26	1264.74	1730.26
1265.63	1730.56	1316.23	1731.06	1343.83	1730.44				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1149.72	.015	1265.63	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 1149.72 1265.63 64.74 64.14 64.09 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1000 1149.72 1730.67 F

1265.63 1343.83 1730.56 F
Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
1000 1149.72 1732.26 1265.63 1343.83 1732.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.020	0.015	0.020
W.S. Elev (ft)	1734.94	Reach Len. (ft)	64.74	64.14	64.09
Crit W.S. (ft)	1730.23	Flow Area (sq ft)	401.79	1073.21	209.86
E.G. Slope (ft/ft)	0.000140	Area (sq ft)	401.79	1073.21	209.86
Q Total (cfs)	6400.00	Flow (cfs)	673.44	5378.54	348.02
Top Width (ft)	343.83	Top Width (ft)	149.72	115.91	78.20
Vel Total (ft/s)	3.80	Avg. Vel. (ft/s)	1.68	5.01	1.66
Max Chl Dpth (ft)	10.08	Hydr. Depth (ft)	2.68	9.26	2.68
Conv. Total (cfs)	541387.4	Conv. (cfs)	56967.8	454980.1	29439.5
Length Wtd. (ft)	64.17	Wetted Per. (ft)	152.40	121.22	80.88
Min Ch El (ft)	1724.86	Shear (lb/sq ft)	0.02	0.08	0.02
Alpha	1.49	Stream Power (lb/ft s)	1343.83	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.85	63.19	4.58
C & E Loss (ft)	0.02	Cum SA (acres)	2.05	10.77	2.61

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 130

INPUT

Description:
Station Elevation Data num= 8
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
1000 1730.86 1018.83 1730.97 1035.81 1730.26 1035.81 1724.79 1142.81 1724.79
1142.81 1730.26 1157.29 1731.13 1174.35 1730.95

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
1000 .02 1035.81 .015 1142.81 .02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1035.81 1142.81 120.77 119.69 117.86 .1 .3

Ineffective Flow num= 2
Sta L Sta R Elev Permanent
1000 1035.81 1730.26 F
1142.81 1174.35 1730.26 F

Blocked Obstructions num= 2
Sta L Sta R Elev Sta L Sta R Elev
1000 1035.81 1733.26 1142.81 1174.35 1733.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1735.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.020	0.015	0.020
W.S. Elev (ft)	1734.72	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1729.61	Flow Area (sq ft)	52.19	1062.22	45.96
E.G. Slope (ft/ft)	0.000202	Area (sq ft)	52.19	1062.22	45.96
Q Total (cfs)	6400.00	Flow (cfs)	69.05	6270.35	60.60
Top Width (ft)	174.35	Top Width (ft)	35.81	107.00	31.54
Vel Total (ft/s)	5.52	Avg. Vel. (ft/s)	1.32	5.90	1.32
Max Chl Dpth (ft)	9.93	Hydr. Depth (ft)	1.46	9.93	1.46
Conv. Total (cfs)	449785.8	Conv. (cfs)	4852.8	440673.9	4259.1
Length Wtd. (ft)	0.10	Wetted Per. (ft)	37.27	123.94	33.00
Min Ch El (ft)	1724.79	Shear (lb/sq ft)	0.02	0.11	0.02
Alpha	1.12	Stream Power (lb/ft s)	1174.35	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.52	61.62	4.39
C & E Loss (ft)		Cum SA (acres)	1.91	10.60	2.53

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 125

INPUT

Description: Bridge #1

Distance from Upstream XS = .1
Deck/Roadway Width = 119.49
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
1000 1733.69 1724.16 1035.81 1733.69 1724.16 1035.81 1733.69 1729.79
1142.81 1733.69 1729.79 1142.81 1733.69 1724.16 1174.35 1733.69 1724.16

Upstream Bridge Cross Section Data

Station Elevation Data		num= 8	
Sta	Elev	Sta	Elev
1000	1730.86	1018.83	1730.97
1142.81	1730.26	1157.29	1731.13
1174.35	1730.95		

Manning's n Values

num= 3	
Sta	n Val
1000	.02
1035.81	.015
1142.81	.02

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1035.81	1142.81		.1	.3

Ineffective Flow

num= 2	
Sta L	Sta R
1000	1035.81
1142.81	1174.35

Blocked Obstructions

num= 2	
Sta L	Sta R
1000	1035.81
1142.81	1174.35

Downstream Deck/Roadway Coordinates

num= 6				
Sta	Hi	Cord	Lo	Cord
1000	1733.69	1724.16	1029.49	1733.69
1136.49	1733.69	1729.79	1136.49	1733.69

Downstream Bridge Cross Section Data

Station Elevation Data		num= 7	
Sta	Elev	Sta	Elev
1000	1732.56	1006.09	1732.26
1136.49	1730.26	1146.34	1730.26

Manning's n Values

num= 3	
Sta	n Val
1000	.03
1029.49	.015
1136.49	.03

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	1029.49	1136.49		.1	.3

Ineffective Flow

num= 2	
Sta L	Sta R
1000	1029.49
1136.49	1146.34

Blocked Obstructions

num= 2	
Sta L	Sta R
1000	1029.49
1136.49	1146.34

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .95
 Elevation at which weir flow begins = 1733.69
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station	Upstream=	Downstream=
	1089.31	1082.99

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Yarnell	KVal =
	.9

High Flow Method

Pressure and Weir flow	
Submerged Inlet Cd	=
Submerged Inlet + Outlet Cd	= .8
Max Low Cord	=

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

	1735.25	Element	Inside BR US	Inside BR DS
E.G. US. (ft)	1734.72	E.G. Elev (ft)	1735.25	1735.16
W.S. US. (ft)	6400.00	W.S. Elev (ft)	1734.72	1734.68
Q Total (cfs)	5663.65	Crit W.S. (ft)	1729.80	1729.20
Q Bridge (cfs)	736.35	Max Chl Dpth (ft)	9.93	10.51
Q Weir (cfs)	1000.00	Vel Total (ft/s)	8.29	8.09
Weir Sta Lft (ft)	1146.34	Flow Area (sq ft)	771.63	791.00
Weir Sta Rgt (ft)	0.00	Froude # Chl	0.54	0.51
Weir Submerg	1.56	Specif Force (cu ft)	5727.52	6254.39

Min El Weir Flow (ft)	1733.70	Hydr Depth (ft)	4.43	5.41
Min El Prs (ft)	1729.79	W.P. Total (ft)	396.40	370.83
Delta EG (ft)	3.88	Conv. Total (cfs)		
Delta WS (ft)	5.73	Top Width (ft)	174.35	146.34
BR Open Area (sq ft)	500.00	Frctn Loss (ft)		
BR Open Vel (ft/s)	11.33	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	1000.00	1000.00

Note: Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow. The Yarnell answer has been disregarded.

Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used for pressure flow.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 120

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1732.56	1006.09	1732.26	1029.49	1730.26	1029.49	1724.16	1136.49	1724.16
1136.49	1730.26	1146.34	1730.26						

Manning's n	Val	Sta	n Val	Sta	n Val
1000	.03	1029.49	.015	1136.49	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
1029.49	1136.49		88.77	90.11	93.13	.1	.3

Ineffective Flow	num=	2
Sta L Sta R Elev Permanent		
1000 1029.49 1730.26		F
1136.49 1146.34 1730.26		F

Blocked Obstructions	num=	2
Sta L Sta R Elev		
1000 1029.49 1732.26		1136.49 1146.34 1732.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.39	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.98	Reach Len. (ft)	88.77	90.11	93.13
Crit W.S. (ft)	1728.98	Flow Area (sq ft)		516.19	
E.G. Slope (ft/ft)	0.002156	Area (sq ft)		516.19	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	107.00	Top Width (ft)		107.00	
Vel Total (ft/s)	12.40	Avg. Vel. (ft/s)		12.40	
Max Chl Dpth (ft)	4.82	Hydr. Depth (ft)		4.82	
Conv. Total (cfs)	137827.5	Conv. (cfs)		137827.5	
Length Wtd. (ft)	90.11	Wetted Per. (ft)		116.65	
Min Ch El (ft)	1724.16	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1146.34	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	2.43	59.86	4.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.82	10.31	2.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 110

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1734.76	1002.64	1734.26	1012.69	1732.26	1022.67	1730.26	1024.87	1729.82
1027.45	1728.26	1030.85	1726.26	1034.42	1724.26	1036.37	1722.76	1099.9	1722.76
1122.88	1722.76	1123.19	1722.76	1123.29	1722.76	1126.96	1724.26	1130.74	1726.26
1134.53	1728.26	1137.41	1729.78	1142.14	1730.26	1148.68	1731.31	1154.29	1732.26
1164.66	1733.96								

Manning's n	Values	num=	3
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Sta	n Val	Sta	n Val	Sta	n Val
1000	.03 1022.67	.015 1137.41	.03		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1022.67	1137.41		25.99	25.69	26.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.05	Reach Len. (ft)	25.99	25.69	26.18
Crit W.S. (ft)	1728.05	Flow Area (sq ft)		511.37	
E.G. Slope (ft/ft)	0.002034	Area (sq ft)		511.37	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	106.32	Top Width (ft)		106.32	
Vel Total (ft/s)	12.52	Avg. Vel. (ft/s)		12.52	
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	141902.9	Conv. (cfs)		141902.9	
Length Wtd. (ft)	25.69	Wetted Per. (ft)		109.07	
Min Ch El (ft)	1722.76	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)	1164.66	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	2.43	58.80	4.33
C & E Loss (ft)	0.31	Cum SA (acres)	1.82	10.09	2.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 100

INPUT

Description:

Station	Elevation	Data	num=	25					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1734.26	1001	1734.26	1001.22	1734.34	1011.88	1732.26	1022.27	1730.26
1024.44	1729.86	1027.45	1728.26	1031.2	1726.26	1034.85	1724.26	1038.4	1722.26
1040.93	1720.96	1047.62	1721.3	1102.02	1721.25	1118.34	1721.3	1119.65	1722.26
1123	1724.26	1126.5	1726.26	1130.15	1728.26	1132.68	1729.52	1139.16	1729.71
1142.93	1730.26	1147.57	1730.94	1157.98	1732.26	1158.86	1732.35	1162.48	1732.26

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.03 1022.27	.03 1132.68	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1022.27	1132.68		289.86	295.13	299.75	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.030	
W.S. Elev (ft)	1728.67	Reach Len. (ft)	289.86	295.13	299.75
Crit W.S. (ft)		Flow Area (sq ft)		673.24	
E.G. Slope (ft/ft)	0.003222	Area (sq ft)		673.24	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	104.31	Top Width (ft)		104.31	
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)		9.51	
Max Chl Dpth (ft)	7.71	Hydr. Depth (ft)		6.45	
Conv. Total (cfs)	112750.5	Conv. (cfs)		112750.5	
Length Wtd. (ft)	295.13	Wetted Per. (ft)		108.28	
Min Ch El (ft)	1720.96	Shear (lb/sq ft)		1.25	
Alpha	1.00	Stream Power (lb/ft s)	1162.48	0.00	0.00
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	2.43	58.45	4.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.82	10.03	2.48

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 90

INPUT

Description:

Station	Elevation	Data	num=	20					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728.26	1009.38	1728.01	1031.29	1727.22	1056.45	1726.9	1058.67	1726.26
1065.64	1724.26	1072.62	1722.26	1079.6	1720.26	1086.6	1718.26	1089.42	1717.45
1103.03	1718.26	1124.51	1719.41	1128.2	1720.26	1136.83	1722.26	1145.32	1724.26
1153.73	1726.26	1162.18	1728.26	1168.18	1729.68	1186.62	1730.26	1187.5	1730.28

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
1000	.03 1056.45	.03 1168.18	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1056.45	1168.18	495.14 482.19	465.14	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1727.03	Reach Len. (ft)	495.14	482.19	465.14
Crit W.S. (ft)		Flow Area (sq ft)	0.68	585.78	
E.G. Slope (ft/ft)	0.004781	Area (sq ft)	0.68	585.78	
Q Total (cfs)	6400.00	Flow (cfs)	0.38	6399.62	
Top Width (ft)	110.92	Top Width (ft)	10.38	100.54	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)	0.56	10.93	
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	0.07	5.83	
Conv. Total (cfs)	92563.7	Conv. (cfs)	5.5	92558.1	
Length Wtd. (ft)	482.19	Wetted Per. (ft)	10.38	102.81	
Min Ch El (ft)	1717.45	Shear (lb/sq ft)	0.02	1.70	
Alpha	1.00	Stream Power (lb/ft s)	1187.50	0.00	0.00
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	2.42	54.19	4.33
C & E Loss (ft)	0.15	Cum SA (acres)	1.79	9.33	2.48

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 80

INPUT

Description:

Station Elevation Data	num=	18
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1728.26 1007.66 1727.66 1115.85 1726.33 1116.84 1726.26 1147.29 1725.45		
1152.02 1724.26 1159.92 1722.26 1167.78 1720.26 1175.62 1718.26 1181.94 1716.64		
1227.68 1717.16 1232.07 1718.26 1240.31 1720.26 1248.54 1722.26 1256.76 1724.26		
1264.99 1726.26 1269.91 1727.47 1287.78 1727.11		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .03 1147.29 .03 1269.91 .03		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1147.29	1269.91	455.76 470.68	481.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1725.48	Reach Len. (ft)	455.76	470.68	481.96
Crit W.S. (ft)		Flow Area (sq ft)	0.01	686.82	
E.G. Slope (ft/ft)	0.003327	Area (sq ft)	0.01	686.82	
Q Total (cfs)	6400.00	Flow (cfs)	0.00	6400.00	
Top Width (ft)	115.54	Top Width (ft)	1.06	114.48	
Vel Total (ft/s)	9.32	Avg. Vel. (ft/s)	0.17	9.32	
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)	0.01	6.00	
Conv. Total (cfs)	110961.9	Conv. (cfs)	0.0	110961.8	
Length Wtd. (ft)	470.68	Wetted Per. (ft)	1.06	116.59	
Min Ch El (ft)	1716.64	Shear (lb/sq ft)	0.00	1.22	
Alpha	1.00	Stream Power (lb/ft s)	1287.78	0.00	0.00
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	2.42	47.14	4.33
C & E Loss (ft)	0.13	Cum SA (acres)	1.73	8.14	2.48

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 70

INPUT

Description:

Station Elevation Data	num=	17
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1725.56 1084.1 1725.95 1090.63 1724.26 1098.35 1722.26 1106.05 1720.26		
1113.75 1718.26 1121.45 1716.26 1129.17 1714.26 1129.24 1714.26 1129.36 1714.26		
1169.17 1714.86 1174.59 1716.26 1182.8 1718.26 1191.03 1720.26 1197.56 1721.85		
1230.27 1722.26 1233.61 1722.33		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .03 1084.1 .03 1197.56 .03		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1084.1	1197.56	493.27 497.95	498.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.61	Wt. n-Val.		0.030	
W.S. Elev (ft)	1721.78	Reach Len. (ft)	493.27	497.95	498.08
Crit W.S. (ft)	1721.78	Flow Area (sq ft)		494.02	
E.G. Slope (ft/ft)	0.008008	Area (sq ft)		494.02	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	97.06	Top Width (ft)		97.06	
Vel Total (ft/s)	12.95	Avg. Vel. (ft/s)		12.95	
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	71518.3	Conv. (cfs)		71518.3	
Length Wtd. (ft)	497.78	Wetted Per. (ft)		98.87	
Min Ch El (ft)	1714.26	Shear (lb/sq ft)		2.50	
Alpha	1.00	Stream Power (lb/ft s)	1233.61	0.00	0.00
Frctn Loss (ft)	1.25	Cum Volume (acre-ft)	2.42	40.76	4.33
C & E Loss (ft)	0.62	Cum SA (acres)	1.72	7.00	2.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 60

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1722.26	1013.98	1720.62	1035.26	1720.26	1105.92	1719.84	1119.77	1720.26
1120.01	1720.26	1120.14	1720.27	1128.57	1718.26	1136.9	1716.26	1145.29	1714.26
1153.14	1712.36	1183.08	1712.26	1194.72	1712.2	1194.99	1712.26	1203.55	1714.26
1212.13	1716.26	1220.71	1718.26	1223.41	1718.89	1277.47	1719.61	1286.74	1720.31
1287.48	1720.26	1296.95	1720.26	1310.09	1719.74	1314.87	1720.26	1321.04	1720.95
1336.07	1720.26	1343.02	1719.88	1362.12	1720.26	1381.28	1720.99	1394.59	1720.66
1400.91	1722.26								

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1120.14	.03	1223.41	.03

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	1120.14	1223.41	499.62	499.27	502.1	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	1721.94	Reach Len. (ft)	499.62	499.27	502.10
Crit W.S. (ft)		Flow Area (sq ft)	199.37	769.87	335.48
E.G. Slope (ft/ft)	0.001217	Area (sq ft)	199.37	769.87	335.48
Q Total (cfs)	6400.00	Flow (cfs)	490.08	5020.71	889.21
Top Width (ft)	396.88	Top Width (ft)	117.39	103.27	176.23
Vel Total (ft/s)	4.91	Avg. Vel. (ft/s)	2.46	6.52	2.65
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)	1.70	7.45	1.90
Conv. Total (cfs)	183480.4	Conv. (cfs)	14049.9	143937.8	25492.7
Length Wtd. (ft)	499.48	Wetted Per. (ft)	117.48	104.97	176.54
Min Ch El (ft)	1712.20	Shear (lb/sq ft)	0.13	0.56	0.14
Alpha	1.45	Stream Power (lb/ft s)	1400.91	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	1.29	33.54	2.41
C & E Loss (ft)	0.04	Cum SA (acres)	1.05	5.85	1.47

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 50

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1725.26	1020.92	1724.26	1037.11	1723.68	1066.67	1722.82	1068.75	1722.26
1076.4	1720.26	1084.26	1718.26	1092.32	1716.26	1100.45	1714.26	1108.62	1712.26
1112.98	1711.16	1152.91	1711.26	1158.04	1712.26	1168.25	1714.26	1178.41	1716.26
1181.82	1716.86	1195.46	1718.26	1207.5	1719.4	1214.02	1720.26	1235.55	1722.26
1249.78	1722.26								

Manning's n Values

num=	3
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Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1066.67	.03	1235.55	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1066.67	1235.55		334.29	305.6	277.63	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.		0.030	
W.S. Elev (ft)	1720.64	Reach Len. (ft)	334.29	305.60	277.63
Crit W.S. (ft)		Flow Area (sq ft)		817.62	
E.G. Slope (ft/ft)	0.002491	Area (sq ft)		817.62	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	143.21	Top Width (ft)		143.21	
Vel Total (ft/s)	7.83	Avg. Vel. (ft/s)		7.83	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	128232.2	Conv. (cfs)		128232.2	
Length Wtd. (ft)	305.16	Wetted Per. (ft)		145.11	
Min Ch El (ft)	1711.16	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	1249.78	0.00	0.00
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	0.15	24.44	0.48
C & E Loss (ft)	0.10	Cum SA (acres)	0.38	4.44	0.45

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 40

INPUT

Description:
 Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1720.26	1101.53	1719.38	1146.2	1718.26	1152.03	1718.11	1159.77	1716.26
1168.18	1714.26	1176.59	1712.26	1185.01	1710.26	1186.07	1710.01	1196.73	1709.64
1216.01	1709.46	1218.57	1710.26	1225.27	1712.26	1231.97	1714.26	1238.76	1716.26
1239.39	1716.36	1283.03	1718.26	1284.32	1718.43	1316.26	1719.03	1327.96	1720.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1146.2	.03	1238.76	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1146.2	1238.76		500.14	491.57	481.13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.93	Wt. n-Val.		0.030	0.030
W.S. Elev (ft)	1718.53	Reach Len. (ft)	500.14	491.57	481.13
Crit W.S. (ft)	1718.08	Flow Area (sq ft)	1.40	548.27	54.91
E.G. Slope (ft/ft)	0.004994	Area (sq ft)	1.40	548.27	54.91
Q Total (cfs)	6400.00	Flow (cfs)	1.28	6196.01	202.71
Top Width (ft)	153.78	Top Width (ft)	10.58	92.56	50.64
Vel Total (ft/s)	10.59	Avg. Vel. (ft/s)	0.91	11.30	3.69
Max Chl Dpth (ft)	9.07	Hydr. Depth (ft)	0.13	5.92	1.08
Conv. Total (cfs)	90560.6	Conv. (cfs)	18.1	87674.1	2868.4
Length Wtd. (ft)	491.42	Wetted Per. (ft)	10.59	94.51	50.70
Min Ch El (ft)	1709.46	Shear (lb/sq ft)	0.04	1.81	0.34
Alpha	1.11	Stream Power (lb/ft s)	1327.96	0.00	0.00
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	0.14	19.65	0.30
C & E Loss (ft)	0.02	Cum SA (acres)	0.34	3.62	0.29

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
 REACH: Reach-1 RS: 30

INPUT

Description:
 Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1716.56	1012.26	1716.26	1053.23	1714.67	1055.19	1714.26	1064.74	1712.26
1074.25	1710.26	1083.68	1708.26	1084.33	1708.12	1124.71	1708.11	1125.31	1708.26
1133.14	1710.26	1140.87	1712.26	1148.55	1714.26	1154.72	1715.87	1175.89	1716.26
1316.21	1718.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1053.23	.03	1154.72	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
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1053.23 1154.72 494.86 498.03 503.84 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.12	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1715.62	Reach Len. (ft)	494.86	498.03	503.84
Crit W.S. (ft)	1715.26	Flow Area (sq ft)	11.70	544.04	
E.G. Slope (ft/ft)	0.006016	Area (sq ft)	11.70	544.04	
Q Total (cfs)	6400.00	Flow (cfs)	27.39	6372.61	
Top Width (ft)	125.09	Top Width (ft)	24.55	100.54	
Vel Total (ft/s)	11.52	Avg. Vel. (ft/s)	2.34	11.71	
Max Chl Dpth (ft)	7.51	Hydr. Depth (ft)	0.48	5.41	
Conv. Total (cfs)	82515.6	Conv. (cfs)	353.2	82162.5	
Length Wtd. (ft)	498.02	Wetted Per. (ft)	24.57	102.18	
Min Ch El (ft)	1708.11	Shear (lb/sq ft)	0.18	2.00	
Alpha	1.03	Stream Power (lb/ft s)	1316.21	0.00	0.00
Frctn Loss (ft)	2.84	Cum Volume (acre-ft)	0.07	13.49	0.00
C & E Loss (ft)	0.09	Cum SA (acres)	0.14	2.53	0.01

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 20

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1714.26	1182.02	1714.23	1190.86	1712.26	1199.75	1710.26	1208.56	1708.26
1217.31	1706.26	1221.12	1705.38	1267.53	1705.85	1269.51	1706.26	1279.06	1708.26
1288.6	1710.26	1298.12	1712.26	1307.42	1714.21	1307.8	1714.26	1322.04	1715.71
1343.21	1714.96	1500.75	1715.96						

Manning's n	Val	Sta	n Val	Sta	n Val
1000	.03	1182.02	.03	1322.04	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1182.02	1322.04		483.22	488.53		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.82	Wt. n-Val.		0.030	
W.S. Elev (ft)	1713.00	Reach Len. (ft)	483.22	488.53	497.54
Crit W.S. (ft)		Flow Area (sq ft)		591.53	
E.G. Slope (ft/ft)	0.005415	Area (sq ft)		591.53	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	114.06	Top Width (ft)		114.06	
Vel Total (ft/s)	10.82	Avg. Vel. (ft/s)		10.82	
Max Chl Dpth (ft)	7.62	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	86970.7	Conv. (cfs)		86970.7	
Length Wtd. (ft)	488.53	Wetted Per. (ft)		115.66	
Min Ch El (ft)	1705.38	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)	1500.75	0.00	0.00
Frctn Loss (ft)	2.26	Cum Volume (acre-ft)		6.99	0.00
C & E Loss (ft)	0.10	Cum SA (acres)		1.30	0.01

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 10

INPUT

Description:

Station	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1712.26	1002.71	1712.33	1003.06	1712.26	1012.39	1710.26	1021.7	1708.26
1031.01	1706.26	1040.32	1704.26	1042.48	1703.8	1049.9	1702.59	1089.4	1702.81
1095.84	1704.26	1104.89	1706.26	1114.24	1708.26	1123.66	1710.26	1126.64	1710.86
1152.79	1712.26	1160.64	1712.67	1288.04	1714.26				

Manning's n	Val	Sta	n Val	Sta	n Val
1000	.03	1000	.03	1126.64	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1126.64		0	0		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.48	Wt. n-Val.		0.030	0.030
W.S. Elev (ft)	1710.97	Reach Len. (ft)			

Crit W.S. (ft)	1709.67	Flow Area (sq ft)	655.74	0.11
E.G. Slope (ft/ft)	0.004002	Area (sq ft)	655.74	0.11
Q Total (cfs)	6400.00	Flow (cfs)	6399.95	0.05
Top Width (ft)	119.62	Top Width (ft)	117.56	2.06
Vel Total (ft/s)	9.76	Avg. Vel. (ft/s)	9.76	0.45
Max Chl Dpth (ft)	8.38	Hydr. Depth (ft)	5.58	0.06
Conv. Total (cfs)	101168.4	Conv. (cfs)	101167.5	0.8
Length Wtd. (ft)		Wetted Per. (ft)	119.28	2.06
Min Ch El (ft)	1702.59	Shear (lb/sq ft)	1.37	0.01
Alpha	1.00	Stream Power (lb/ft s)	1288.04	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		
C & E Loss (ft)		Cum SA (acres)		

SUMMARY OF MANNING'S N VALUES

River: RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	390	.025	.015	.025
Reach-1	380	.025	.015	.025
Reach-1	370	.025	.015	.025
Reach-1	360	.025	.015	.025
Reach-1	350	.025	.015	.025
Reach-1	340	.025	.015	.025
Reach-1	338	.025	.015	.025
Reach-1	337	.025	.015	.025
Reach-1	335	.035	.035	.035
Reach-1	334	.035	.035	.035
Reach-1	330	.035	.035	.035
Reach-1	320	.02	.02	.02
Reach-1	310	.02	.015	.02
Reach-1	300	.02	.015	.02
Reach-1	295	Bridge		
Reach-1	290	.02	.015	.02
Reach-1	280	.02	.015	.02
Reach-1	270	.02	.015	.02
Reach-1	260	.02	.015	.02
Reach-1	250	.02	.015	.02
Reach-1	240	.02	.02	.02
Reach-1	230	.02	.02	.02
Reach-1	220	.02	.02	.02
Reach-1	210	.02	.02	.02
Reach-1	200	.02	.02	.02
Reach-1	190	.02	.02	.02
Reach-1	180	.02	.02	.02
Reach-1	170	.02	.02	.02
Reach-1	160	.02	.02	.02
Reach-1	150	.02	.02	.02
Reach-1	140	.02	.015	.02
Reach-1	130	.02	.015	.02
Reach-1	125	Bridge		
Reach-1	120	.03	.015	.03
Reach-1	110	.03	.015	.03
Reach-1	100	.03	.03	.03
Reach-1	90	.03	.03	.03
Reach-1	80	.03	.03	.03
Reach-1	70	.03	.03	.03
Reach-1	60	.03	.03	.03
Reach-1	50	.03	.03	.03
Reach-1	40	.03	.03	.03
Reach-1	30	.03	.03	.03
Reach-1	20	.03	.03	.03
Reach-1	10	.03	.03	.03

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	390	420.9	420.9	420.21
Reach-1	380	170	170.96	173
Reach-1	370	222	232.15	238
Reach-1	360	323	314.29	310
Reach-1	350	439	436.71	435
Reach-1	340	85	85	85
Reach-1	338	95	95	95
Reach-1	337	60	60	60
Reach-1	335	40	40	40
Reach-1	334	210	210	210
Reach-1	330	343.49	343.49	343.49
Reach-1	320	489.89	489.1	487.69
Reach-1	310	102.64	100.28	105.7
Reach-1	300	102.54	102.75	98.55
Reach-1	295	Bridge		
Reach-1	290	14.68	14.95	12.7
Reach-1	280	1	1	1
Reach-1	270	33.84	21.92	8.99

Reach-1	260	1	1	1
Reach-1	250	57.45	58.6	58.44
Reach-1	240	496.31	492	488.69
Reach-1	230	490.46	494.76	498.91
Reach-1	220	464.69	476.72	489.34
Reach-1	210	499.74	500.38	500.05
Reach-1	200	494.16	495.37	496.56
Reach-1	190	499.18	497.74	497.1
Reach-1	180	490.6	491.83	492.37
Reach-1	170	486.67	487.26	487.82
Reach-1	160	501.43	501.51	502.7
Reach-1	150	491.39	489.94	488.88
Reach-1	140	64.74	64.14	64.09
Reach-1	130	120.77	119.69	117.86
Reach-1	125	Bridge		
Reach-1	120	88.77	90.11	93.13
Reach-1	110	25.99	25.69	26.18
Reach-1	100	289.86	295.13	299.75
Reach-1	90	495.14	482.19	465.14
Reach-1	80	455.76	470.68	481.96
Reach-1	70	493.27	497.95	498.08
Reach-1	60	499.62	499.27	502.1
Reach-1	50	334.29	305.6	277.63
Reach-1	40	500.14	491.57	481.13
Reach-1	30	494.86	498.03	503.84
Reach-1	20	483.22	488.53	497.54
Reach-1	10	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	390	.1	.3
Reach-1	380	.1	.3
Reach-1	370	.1	.3
Reach-1	360	.1	.3
Reach-1	350	.1	.3
Reach-1	340	.1	.3
Reach-1	338	.1	.3
Reach-1	337	.1	.3
Reach-1	335	.1	.3
Reach-1	334	.1	.3
Reach-1	330	.1	.3
Reach-1	320	.1	.3
Reach-1	310	.1	.3
Reach-1	300	.1	.3
Reach-1	295	Bridge	
Reach-1	290	.1	.3
Reach-1	280	.1	.3
Reach-1	270	.1	.3
Reach-1	260	.1	.3
Reach-1	250	.1	.3
Reach-1	240	.1	.3
Reach-1	230	.1	.3
Reach-1	220	.1	.3
Reach-1	210	.1	.3
Reach-1	200	.1	.3
Reach-1	190	.1	.3
Reach-1	180	.1	.3
Reach-1	170	.1	.3
Reach-1	160	.1	.3
Reach-1	150	.1	.3
Reach-1	140	.1	.3
Reach-1	130	.1	.3
Reach-1	125	Bridge	
Reach-1	120	.1	.3
Reach-1	110	.1	.3
Reach-1	100	.1	.3
Reach-1	90	.1	.3
Reach-1	80	.1	.3
Reach-1	70	.1	.3
Reach-1	60	.1	.3
Reach-1	50	.1	.3
Reach-1	40	.1	.3
Reach-1	30	.1	.3
Reach-1	20	.1	.3
Reach-1	10	.1	.3



CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

Group By Message ID

[BR PW 01](#)

SECNO: 295

This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure and weir flow because, 1. EGEL 3 of 1779.95 is greater than MinTopRd of 1779.18 . 2. EGEL 3 of 1779.95 is equal to or greater than MxLoCdU of 1775.18. 3. WSEL 2 of 1773.71 is less than MxLoCdD of 1775.18 .

[BR PW 01](#)

SECNO: 125

This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure and weir flow because, 1. EGEL 3 of 1735.25 is greater than MinTopRd of 1733.69 . 2. EGEL 3 of 1735.25 is equal to or greater than MxLoCdU of 1729.79. 3. WSEL 2 of 1728.98 is less than MxLoCdD of 1729.79 .

[NT RC 01L](#)

SECNO: 320

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 310

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 300

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 295

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 295

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 290

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01L](#)

SECNO: 280

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 270

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 260

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 250

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 240

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 230

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 220

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 210

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01L](#)

SECNO: 200

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 190

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 180

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 170

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 160

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 150

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 140

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 130

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01L](#)

SECNO: 125

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01L](#)

SECNO: 125

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01R](#)

SECNO: 320

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 310

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 300

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 295

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 290

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 280

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01R](#)

SECNO: 270

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 260

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 250

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 240

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 230

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 220

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 210

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 200

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01R](#)

SECNO: 190

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 180

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 170

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 160

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 150

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 140

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 130

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 125

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 01R](#)

SECNO: 125

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 05](#)

SECNO: 320

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 240

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 230

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 220

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 210

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 200

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 190

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 05](#)

SECNO: 180

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 170

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 160

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 150

The left overbank n-value of 0.02 and the right overbank n-value of 0.02 are less than or equal to the channel n-value of 0.02. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 100

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 90

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 80

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 70

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RC 05](#)

SECNO: 60

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 50

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 40

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 30

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 20

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RS 02BDC](#)

SECNO: 295

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS 02BDC](#)

SECNO: 125

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS 02BUC](#)

SECNO: 295

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[NT RS 02BUC](#) SECNO: 125

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT TL 01S2](#) SECNO: 290

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#) SECNO: 120

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#) SECNO: 300

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#) SECNO: 130

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S4](#) SECNO: 310

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 140

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[ST DT 01B](#) SECNO: 295

This is (Bridge-UP). 'Upstream Dist' of 0.1 in "Bridge Width Table" is less than the height of the bridge opening of 6. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#) SECNO: 125

This is (Bridge-UP). 'Upstream Dist' of 0.1 in "Bridge Width Table" is less than the height of the bridge opening of 5. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[ST DT 02B](#)

SECNO: 295

This is (Bridge-DN). 'Downstream Dist' of 0.1 in 'Bridge Width Table' is less than the height of the bridge opening of 6. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

[ST DT 02B](#)

SECNO: 125

This is (Bridge-DN). 'Downstream Dist' of 0.1 in 'Bridge Width Table' is less than the height of the bridge opening of 5. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

[ST DT 03](#)

SECNO: 295

This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 100.28 is longer than Section 2 channel distance of 14.95. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.

[ST IF 03S2L](#)

SECNO: 290

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-DN). However, the left ineffective flow elevation of 1776.26 at the left ineffective flow station 1047.98 is equal to or higher than the WSEL of 1773.71. The ineffective flow elevation should be lower than the WSEL at Section 2.

[ST IF 03S2L](#)

SECNO: 120

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-DN). However, the left ineffective flow elevation of 1730.26 at the left ineffective flow station 1029.49 is equal to or higher than the WSEL of 1728.98. The ineffective flow elevation should be lower than the WSEL at Section 2.

[ST IF 03S2R](#)

SECNO: 290

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-DN). However, the right ineffective flow elevation of 1776.26 at the right ineffective flow station 1151 is equal to or higher than the WSEL of 1773.71. The ineffective flow elevation should be lower than the WSEL at Section 2.

[ST IF 03S2R](#)

SECNO: 120

This is Section 2. The selected profile is 1%-annual-chance. Weir flow occurs at (Bridge-DN). However, the right ineffective flow elevation of 1730.26 at the right ineffective flow station 1136.49 is equal to or higher than the WSEL of 1728.98. The ineffective flow elevation should be lower than the WSEL at Section 2.

[XS CD 01](#)

SECNO: 290

Critical Depth occurs at 1%-annual-chance flood. Flow Code will be "C". The Ineffective flow option is used. The Ineffective Flow elevation is equal to or higher than the Critical WSEL. Please investigate whether this selection is appropriate.

[XS CD 01](#)

SECNO: 120

Critical Depth occurs at 1%-annual-chance flood. Flow Code will be "C". The Ineffective flow option is used. The Ineffective Flow elevation is equal to or higher than the Critical WSEL. Please investigate whether this selection is appropriate.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[XS EC 01BDL](#) SECNO: 295

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1779.42 is higher than the starting combined GR and Road station elevation of 1777.86. The Left_Sta_Eff is equal to the starting GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BDL](#) SECNO: 125

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.67 is higher than the starting combined GR and Road station elevation of 1732.56. The Left_Sta_Eff is equal to the starting GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BDR](#) SECNO: 295

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1779.42 is higher than the ending combined GR and Road station elevation of 1777.03. The Right_Sta_Eff is equal to the ending GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BDR](#) SECNO: 125

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.67 is higher than the ending combined GR and Road station elevation of 1730.26. The Right_Sta_Eff is equal to the ending GR station. Section 2 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUL](#) SECNO: 295

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1779.42 is higher than the starting combined GR and Road station elevation of 1777.06. The Left_Sta_Eff is equal to the starting GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUL](#) SECNO: 125

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1734.72 is higher than the starting combined GR and Road station elevation of 1730.86. The Left_Sta_Eff is equal to the starting GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUR](#) SECNO: 295

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1779.42 is higher than the ending combined GR and Road station elevation of 1777.61. The Right_Sta_Eff is equal to the ending GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01BUR](#) SECNO: 125

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.72 is higher than the ending combined GR and Road station elevation of 1730.95. The Right_Sta_Eff is equal to the ending GR station. Section 3 and/or the Road section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or use the lid option at the upstream and downstream internal sections and a lateral weir to determine the amount of overflow down the roadway. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 360

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1786.07 is higher than the starting GR station elevation of 1779.74. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 338

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1784.21 is higher than the starting GR station elevation of 1775.17. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 310

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1779.56 is higher than the starting GR station elevation of 1779.06. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 300

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1779.42 is higher than the starting GR station elevation of 1777.06. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 150

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1734.75 is higher than the starting GR station elevation of 1734.26. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 140

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1734.94 is higher than the starting GR station elevation of 1731.76. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 130

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1734.72 is higher than the starting GR station elevation of 1730.86. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS Output – Corrected Effective Conditions Flamingo Wash

[XS EC 01R](#)

SECNO: 360

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1786.07 is higher than the ending GR station elevation of 1779.74. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 338

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1784.21 is higher than the ending GR station elevation of 1775.17. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 310

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1779.56 is higher than the ending GR station elevation of 1779.06. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 300

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1779.42 is higher than the ending GR station elevation of 1777.61. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 150

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.75 is higher than the ending GR station elevation of 1733.69. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 140

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.94 is higher than the ending GR station elevation of 1730.44. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 130

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1734.72 is higher than the ending GR station elevation of 1730.95. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.



Flamingo Wash HEC-RAS Output

Standard Table 1

Pre-Project Conditions

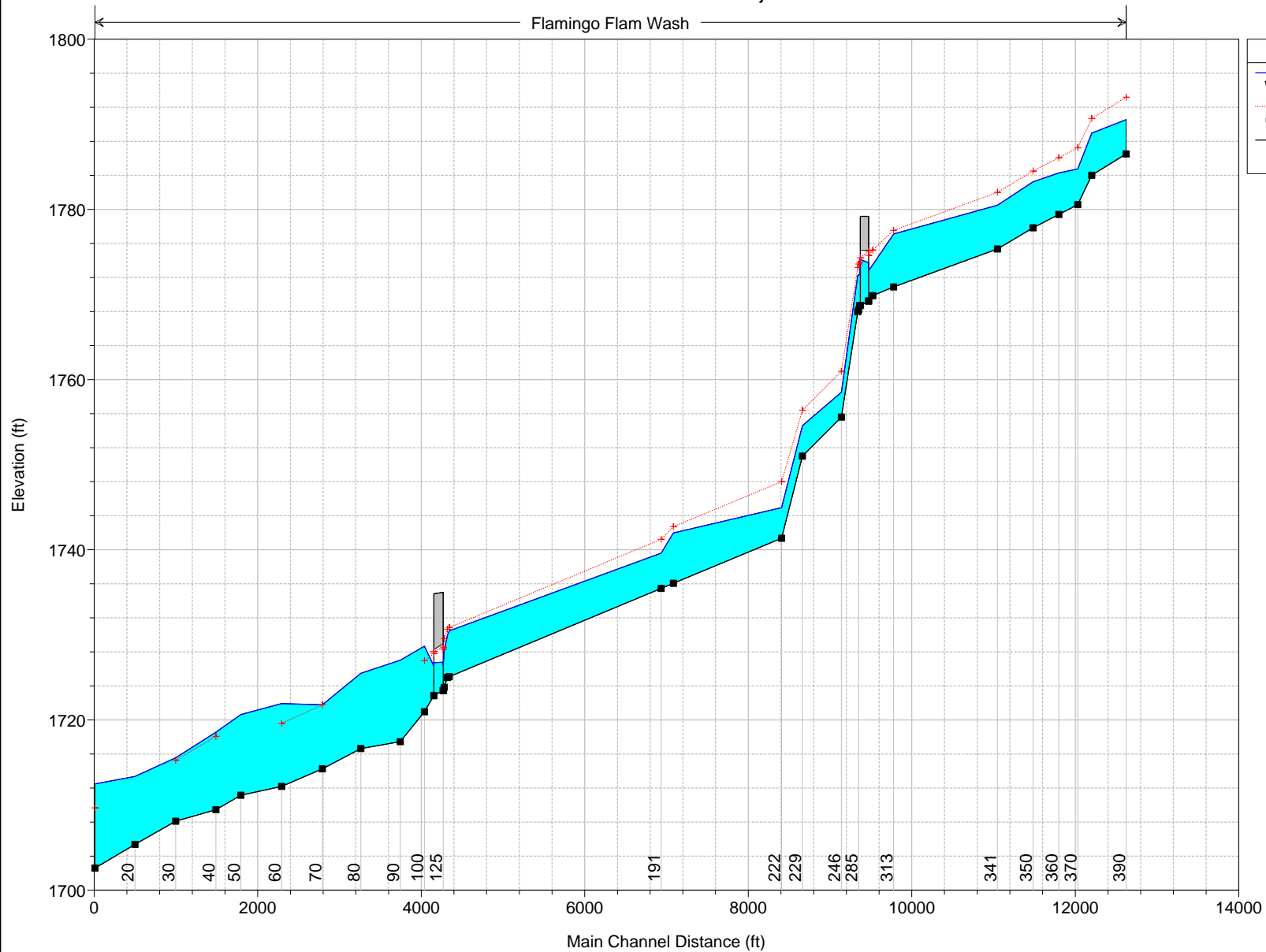
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Flam Wash	390	PF 1	6300	1786.51	1790.54	1793.18	1799.75	0.013014	24.35	258.71	67.00	2.18
Flam Wash	380	PF 1	6300	1784.01	1788.97	1790.68	1794.95	0.006727	19.63	321.01	67.00	1.58
Flam Wash	370	PF 1	6300	1780.56	1784.76	1787.23	1793.22	0.011420	23.34	269.93	67.00	2.05
Flam Wash	360	PF 1	6300	1779.41	1784.27	1786.07	1790.49	0.007130	20.01	314.92	67.00	1.63
Flam Wash	350	PF 1	6300	1777.83	1783.25	1784.50	1788.24	0.005118	17.93	351.38	67.00	1.38
Flam Wash	341	PF 1	6300	1775.34	1780.49	1782.00	1785.95	0.005181	18.74	336.21	70.00	1.51
Flam Wash	313	PF 1	6300	1770.88	1777.11	1777.54	1780.75	0.002741	15.32	411.34	70.00	1.11
Flam Wash	311	PF 1	6300	1769.86	1773.50	1775.23	1779.37	0.009038	19.44	324.00	104.00	1.94
Flam Wash	305	PF 1	6300	1769.22	1772.83	1774.59	1778.89	0.009511	19.75	318.92	104.00	1.99
Flam Wash	300		Lamb Boulevard Bridge									
Flam Wash	295	PF 1	6300	1768.70	1772.45	1773.78	1777.10	0.006238	17.32	363.84	104.00	1.63
Flam Wash	285	PF 1	6300	1768.19	1772.25	1773.58	1776.85	0.081892	17.23	365.74	104.00	1.62
Flam Wash	284	PF 1	6300	1767.96	1772.27	1773.18	1775.97	0.057796	15.45	407.67	104.00	1.38
Flam Wash	246	PF 1	6300	1755.59	1758.51	1760.98	1768.60	0.021870	25.49	247.17	104.00	2.91
Flam Wash	229	PF 1	6300	1751.00	1754.58	1756.39	1760.74	0.009746	19.90	316.54	104.00	2.01
Flam Wash	222	PF 1	6300	1741.35	1744.95	1748.01	1756.86	0.018052	27.69	227.51	70.00	2.71
Flam Wash	193	PF 1	6300	1736.06	1741.98	1742.72	1746.04	0.003247	16.16	389.79	70.00	1.21
Flam Wash	191	PF 1	6300	1735.46	1739.60	1741.23	1745.19	0.007062	18.97	332.05	90.00	1.74
Flam Wash	142	PF 1	6300	1725.09	1730.48	1730.86	1733.60	0.002767	14.18	444.30	90.00	1.12
Flam Wash	138	PF 1	6300	1725.00	1729.96	1730.67	1733.49	0.003477	15.06	418.39	93.00	1.25
Flam Wash	135	PF 1	6400	1723.84	1728.13	1729.56	1733.16	0.006064	18.00	355.52	93.00	1.62
Flam Wash	131	PF 1	6400	1723.47	1726.46	1728.32	1732.92	0.010595	20.39	313.86	105.00	2.08
Flam Wash	125		Nellis Boulevard Bridge									
Flam Wash	121	PF 1	6400	1722.86	1726.34	1727.82	1731.36	0.007083	17.97	356.07	106.21	1.73
Flam Wash	100	PF 1	6400	1720.96	1728.67	1726.95	1730.08	0.003222	9.51	673.24	104.31	0.66
Flam Wash	90	PF 1	6400	1717.45	1727.03		1728.89	0.004781	10.93	586.46	110.92	0.80
Flam Wash	80	PF 1	6400	1716.64	1725.48		1726.83	0.003327	9.32	686.83	115.54	0.67
Flam Wash	70	PF 1	6400	1714.26	1721.78	1721.78	1724.39	0.008008	12.95	494.02	97.06	1.01
Flam Wash	60	PF 1	6400	1712.20	1721.94	1719.58	1722.48	0.001219	6.53	1303.75	396.85	0.42
Flam Wash	50	PF 1	6400	1711.16	1720.64		1721.59	0.002496	7.83	816.92	143.13	0.58
Flam Wash	40	PF 1	6400	1709.46	1718.57	1718.08	1720.46	0.004863	11.21	611.51	157.92	0.81
Flam Wash	30	PF 1	6400	1708.11	1715.56	1715.26	1717.74	0.006250	11.86	547.67	123.17	0.90
Flam Wash	20	PF 1	6400	1705.38	1713.37		1714.95	0.004456	10.08	634.74	117.52	0.76
Flam Wash	10	PF 1	6400	1702.59	1712.50	1709.67	1713.38	0.001903	7.55	866.35	157.34	0.52

Flamingo Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	390	PF 1	1799.75	1790.54	9.21				6300.00		67.00
Flam Wash	380	PF 1	1794.95	1788.97	5.98	3.83	0.97		6300.00		67.00
Flam Wash	370	PF 1	1793.22	1784.76	8.46	1.47	0.25		6300.00		67.00
Flam Wash	360	PF 1	1790.49	1784.27	6.21	2.07	0.67		6300.00		67.00
Flam Wash	350	PF 1	1788.24	1783.25	4.99	1.89	0.37		6300.00		67.00
Flam Wash	341	PF 1	1785.95	1780.49	5.45	2.25	0.05		6300.00		70.00
Flam Wash	313	PF 1	1780.75	1777.11	3.64	4.66	0.54		6300.00		70.00
Flam Wash	311	PF 1	1779.37	1773.50	5.87	1.16	0.22		6300.00		104.00
Flam Wash	305	PF 1	1778.89	1772.83	6.06	0.47	0.02		6300.00		104.00
Flam Wash	300		Lamb Boulevard Bridge								
Flam Wash	295	PF 1	1777.10	1772.45	4.66				6300.00		104.00
Flam Wash	285	PF 1	1776.85	1772.25	4.61	0.23	0.01		6300.00		104.00
Flam Wash	284	PF 1	1775.97	1772.27	3.71	0.61	0.27		6300.00		104.00
Flam Wash	246	PF 1	1768.60	1758.51	10.09	6.74	0.64		6300.00		104.00
Flam Wash	229	PF 1	1760.74	1754.58	6.15	6.68	1.18		6300.00		104.00
Flam Wash	222	PF 1	1756.86	1744.95	11.91	3.30	0.58		6300.00		70.00
Flam Wash	193	PF 1	1746.04	1741.98	4.06	8.47	2.36		6300.00		70.00
Flam Wash	191	PF 1	1745.19	1739.60	5.59	0.69	0.15		6300.00		90.00
Flam Wash	142	PF 1	1733.60	1730.48	3.12	10.85	0.74		6300.00		90.00
Flam Wash	138	PF 1	1733.49	1729.96	3.52	0.07	0.04		6300.00		93.00
Flam Wash	135	PF 1	1733.16	1728.13	5.03	0.18	0.15		6400.00		93.00
Flam Wash	131	PF 1	1732.92	1726.46	6.46	0.10	0.14		6400.00		105.00
Flam Wash	125		Nellis Boulevard Bridge								
Flam Wash	121	PF 1	1731.36	1726.34	5.02				6400.00		106.21
Flam Wash	100	PF 1	1730.08	1728.67	1.40	1.15	0.04		6400.00		104.31
Flam Wash	90	PF 1	1728.89	1727.03	1.85	1.91	0.15	0.38	6399.62		110.92
Flam Wash	80	PF 1	1726.83	1725.48	1.35	2.32	0.13	0.00	6400.00		115.54
Flam Wash	70	PF 1	1724.39	1721.78	2.61	1.26	0.62		6400.00		97.06
Flam Wash	60	PF 1	1722.48	1721.94	0.54	0.84	0.04	489.40	5022.46	888.14	396.85
Flam Wash	50	PF 1	1721.59	1720.64	0.95	1.03	0.09		6400.00		143.13
Flam Wash	40	PF 1	1720.46	1718.57	1.89	2.70	0.03	1.91	6190.32	207.78	157.92
Flam Wash	30	PF 1	1717.74	1715.56	2.18	2.61	0.18	23.13	6376.87		123.17
Flam Wash	20	PF 1	1714.95	1713.37	1.58	1.36	0.21		6400.00		117.52
Flam Wash	10	PF 1	1713.38	1712.50	0.88				6352.73	47.27	157.34

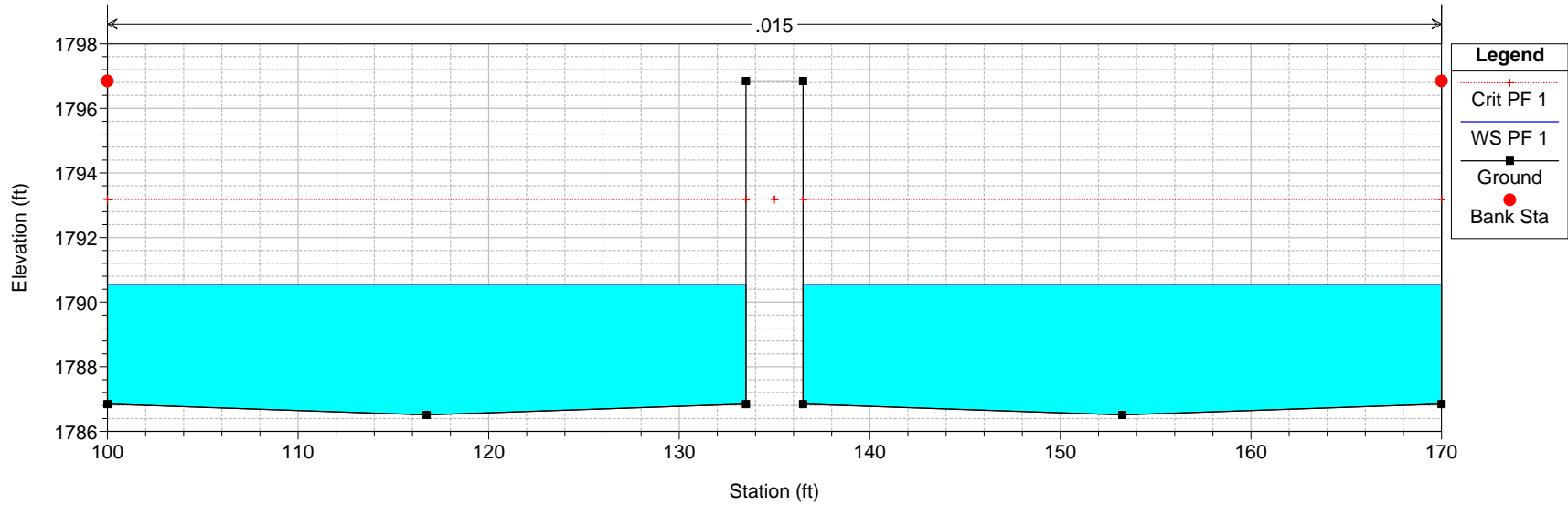
Flamingo Wash HEC-RAS Output
Standard Table 2
Pre-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	390	PF 1	1799.75	1790.54	9.21				6300.00		67.00
Flam Wash	380	PF 1	1794.95	1788.97	5.98	3.83	0.97		6300.00		67.00
Flam Wash	370	PF 1	1793.22	1784.76	8.46	1.47	0.25		6300.00		67.00
Flam Wash	360	PF 1	1790.49	1784.27	6.21	2.07	0.67		6300.00		67.00
Flam Wash	350	PF 1	1788.24	1783.25	4.99	1.89	0.37		6300.00		67.00
Flam Wash	341	PF 1	1785.95	1780.49	5.45	2.25	0.05		6300.00		70.00
Flam Wash	313	PF 1	1780.75	1777.11	3.64	4.66	0.54		6300.00		70.00
Flam Wash	311	PF 1	1779.37	1773.50	5.87	1.16	0.22		6300.00		104.00
Flam Wash	305	PF 1	1778.89	1772.83	6.06	0.47	0.02		6300.00		104.00
Flam Wash	300		Lamb Boulevard Bridge								
Flam Wash	295	PF 1	1777.10	1772.45	4.66				6300.00		104.00
Flam Wash	285	PF 1	1776.85	1772.25	4.61	0.23	0.01		6300.00		104.00
Flam Wash	284	PF 1	1775.97	1772.27	3.71	0.61	0.27		6300.00		104.00
Flam Wash	246	PF 1	1768.60	1758.51	10.09	6.74	0.64		6300.00		104.00
Flam Wash	229	PF 1	1760.74	1754.58	6.15	6.68	1.18		6300.00		104.00
Flam Wash	222	PF 1	1756.86	1744.95	11.91	3.30	0.58		6300.00		70.00
Flam Wash	193	PF 1	1746.04	1741.98	4.06	8.47	2.36		6300.00		70.00
Flam Wash	191	PF 1	1745.19	1739.60	5.59	0.69	0.15		6300.00		90.00
Flam Wash	142	PF 1	1733.60	1730.48	3.12	10.85	0.74		6300.00		90.00
Flam Wash	138	PF 1	1733.49	1729.96	3.52	0.07	0.04		6300.00		93.00
Flam Wash	135	PF 1	1733.16	1728.13	5.03	0.18	0.15		6400.00		93.00
Flam Wash	131	PF 1	1732.92	1726.46	6.46	0.10	0.14		6400.00		105.00
Flam Wash	125		Nellis Boulevard Bridge								
Flam Wash	121	PF 1	1731.36	1726.34	5.02				6400.00		106.21
Flam Wash	100	PF 1	1730.08	1728.67	1.40	1.15	0.04		6400.00		104.31
Flam Wash	90	PF 1	1728.89	1727.03	1.85	1.91	0.15	0.38	6399.62		110.92
Flam Wash	80	PF 1	1726.83	1725.48	1.35	2.32	0.13	0.00	6400.00		115.54
Flam Wash	70	PF 1	1724.39	1721.78	2.61	1.26	0.62		6400.00		97.06
Flam Wash	60	PF 1	1722.48	1721.94	0.54	0.84	0.04	489.40	5022.46	888.14	396.85
Flam Wash	50	PF 1	1721.59	1720.64	0.95	1.03	0.09		6400.00		143.13
Flam Wash	40	PF 1	1720.46	1718.57	1.89	2.70	0.03	1.91	6190.32	207.78	157.92
Flam Wash	30	PF 1	1717.74	1715.56	2.18	2.61	0.18	23.13	6376.87		123.17
Flam Wash	20	PF 1	1714.95	1713.37	1.58	1.36	0.21		6400.00		117.52
Flam Wash	10	PF 1	1713.38	1712.50	0.88				6352.73	47.27	157.34

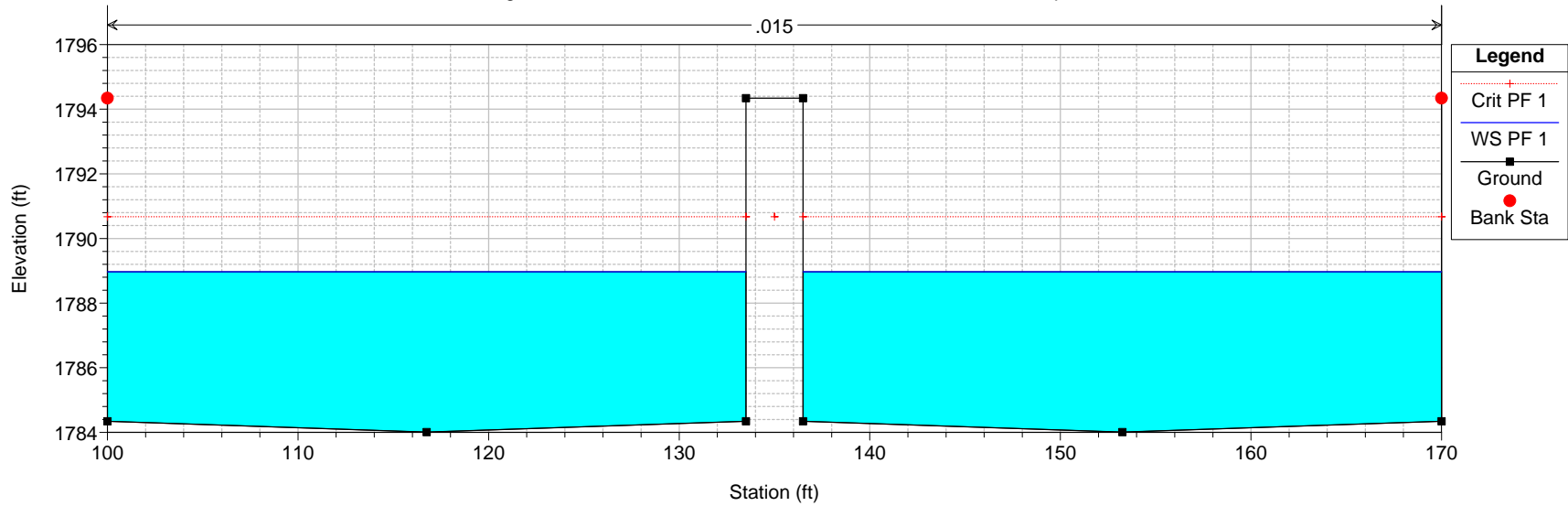


Legend	
WS PF 1	
Crit PF 1	
Ground	

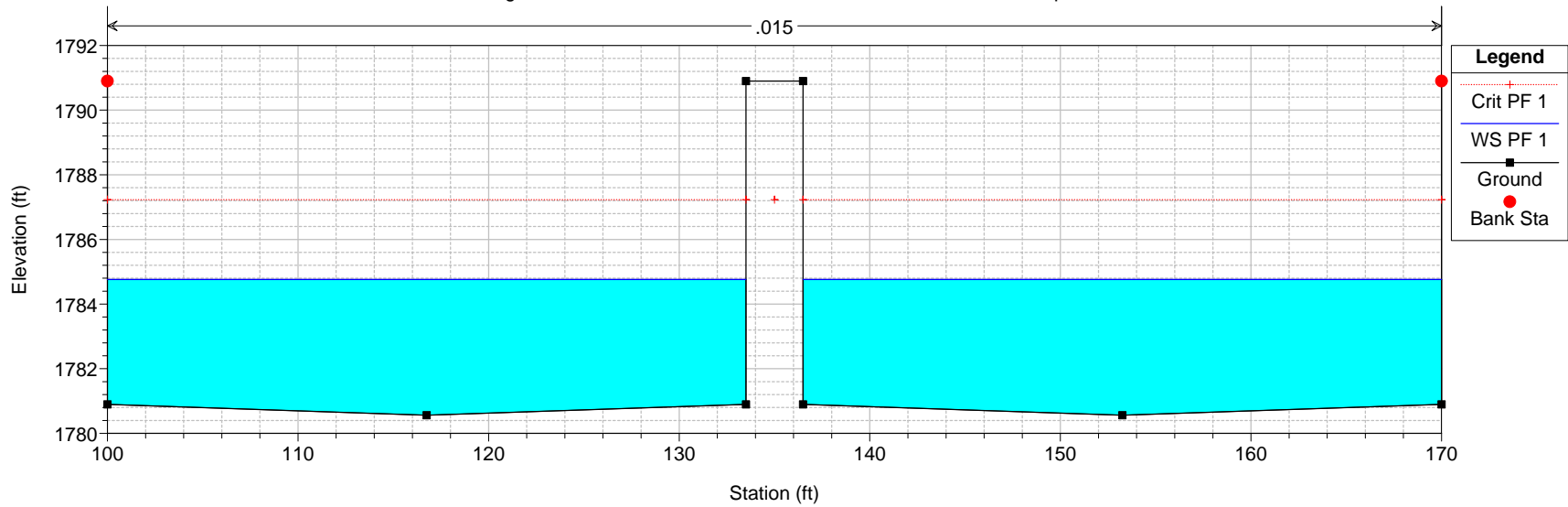
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 390 Ex. Concrete Channel Upstream of I-515



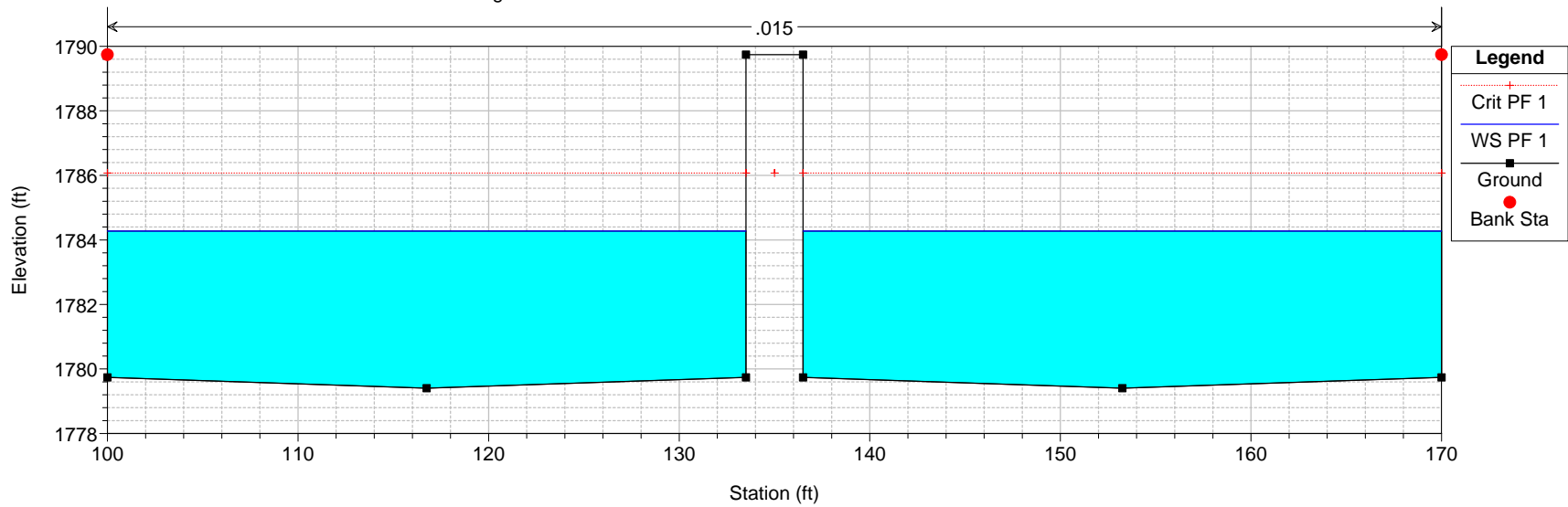
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 380 Ex. Concrete Channel Upstream of I-515



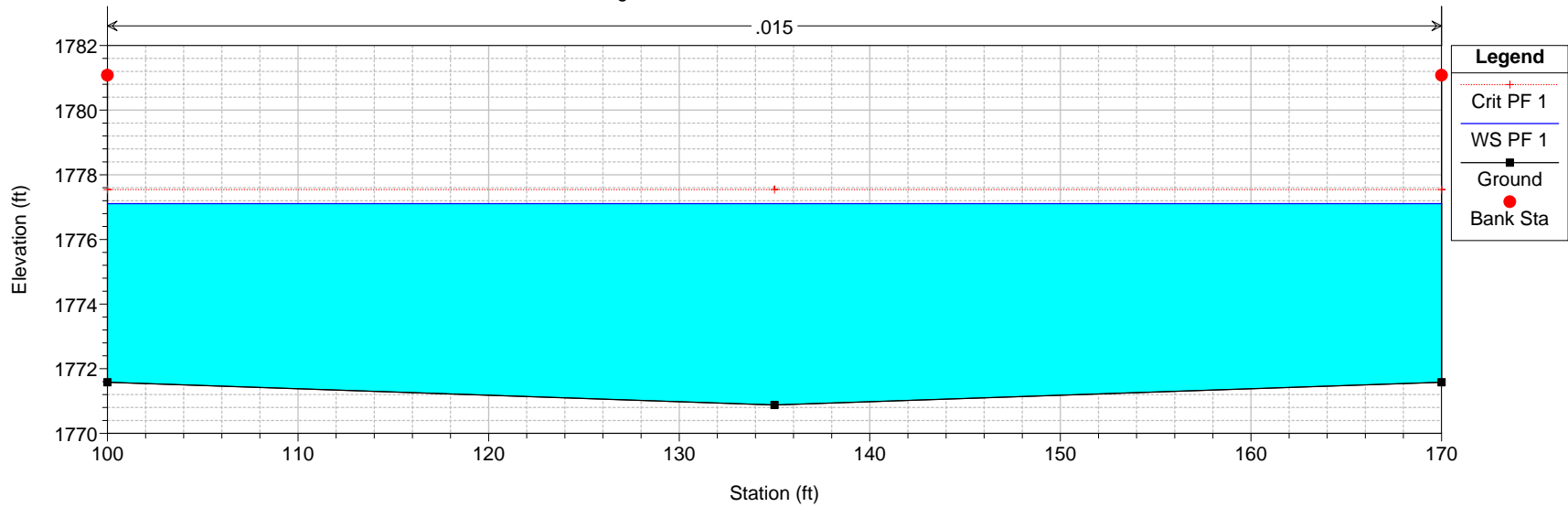
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 370 Ex. Concrete Channel Upstream of I-515



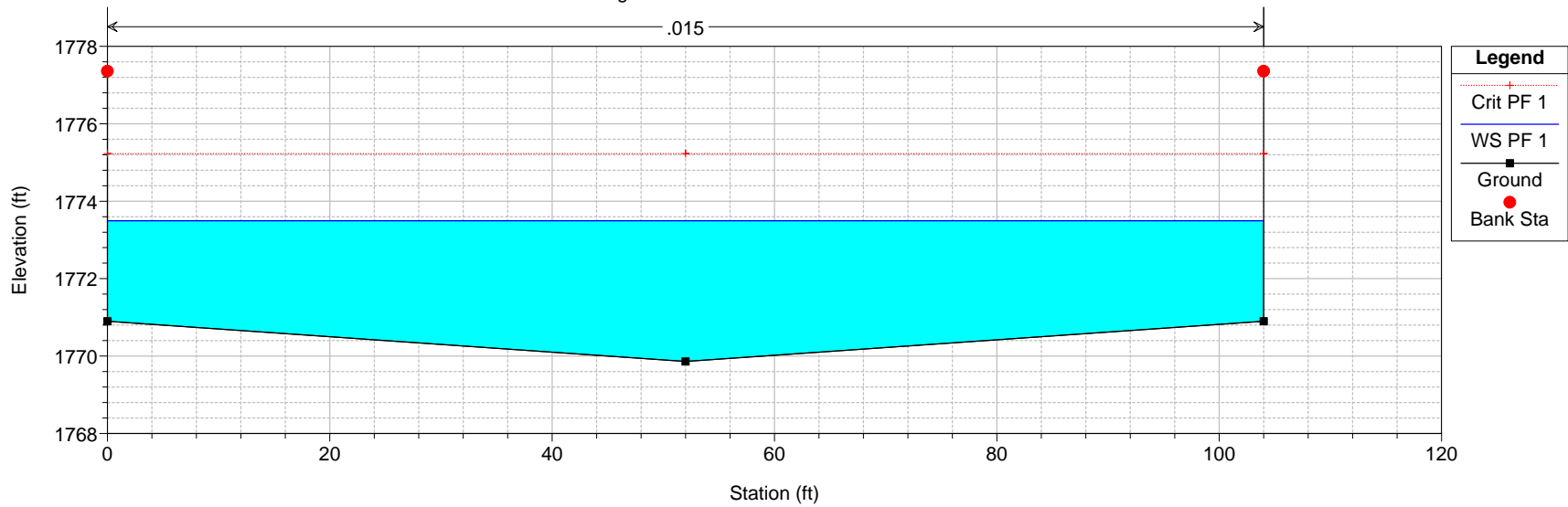
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 360 Ex. Concrete Channel Downstream of I-515



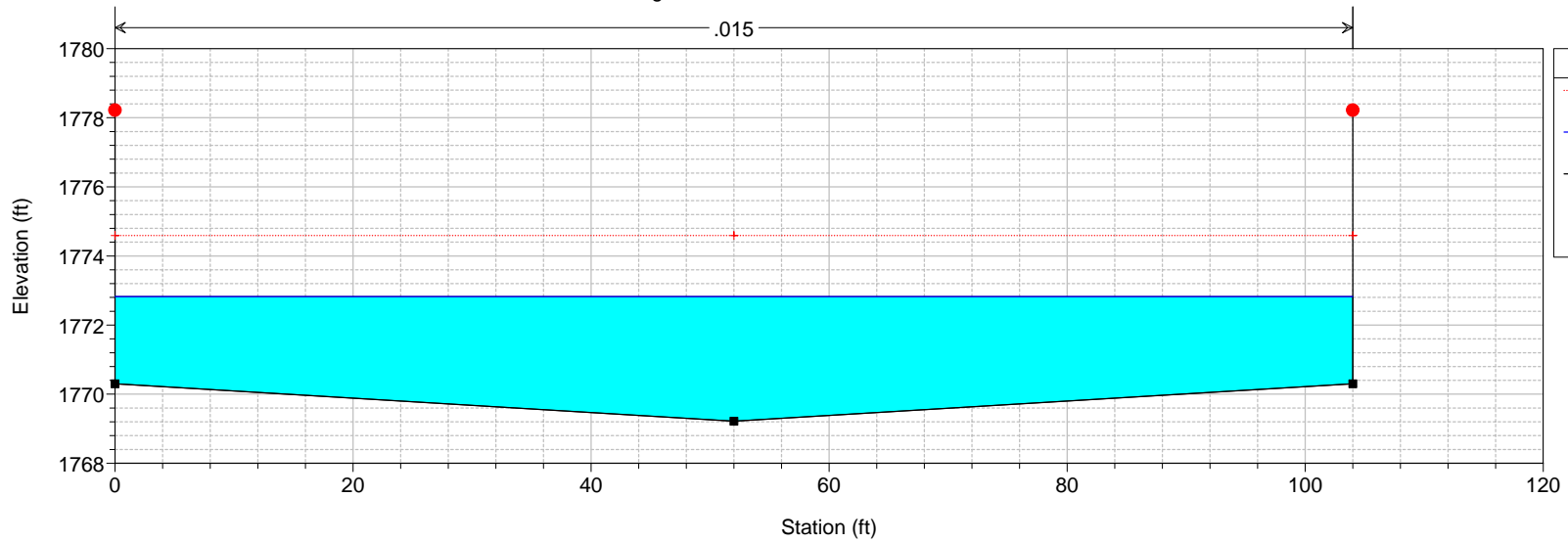
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 313 "AB" 34+06.10



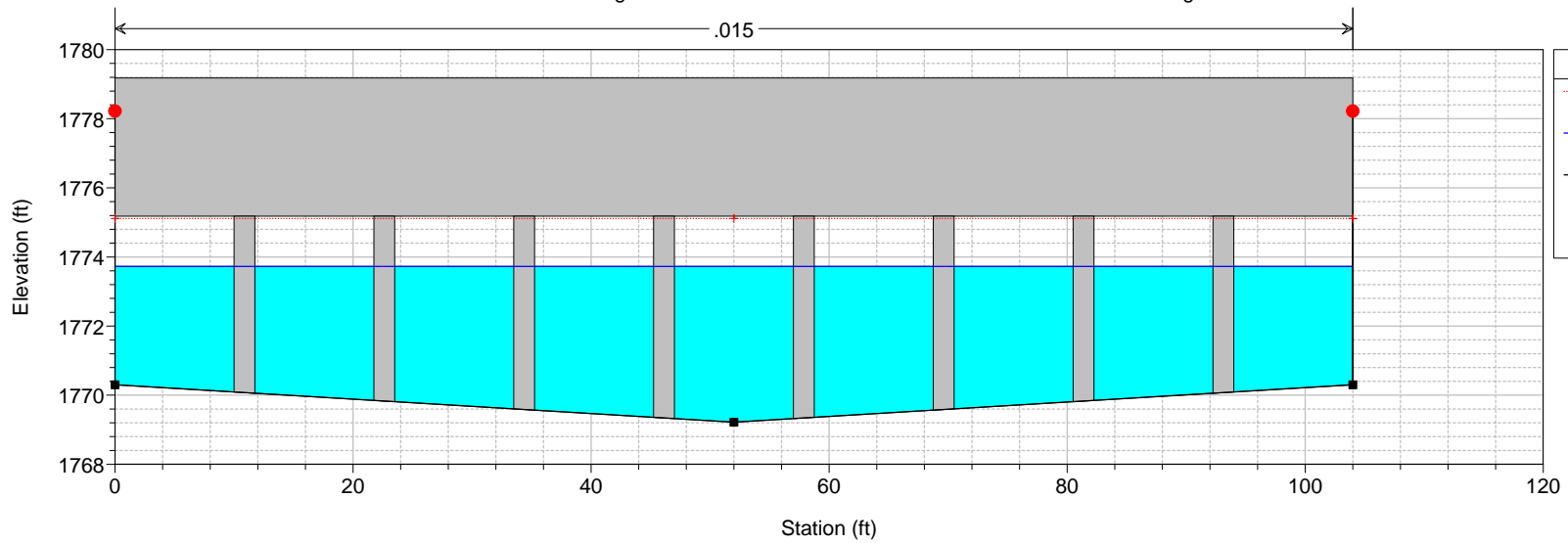
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 311 "AB" 36+61.10

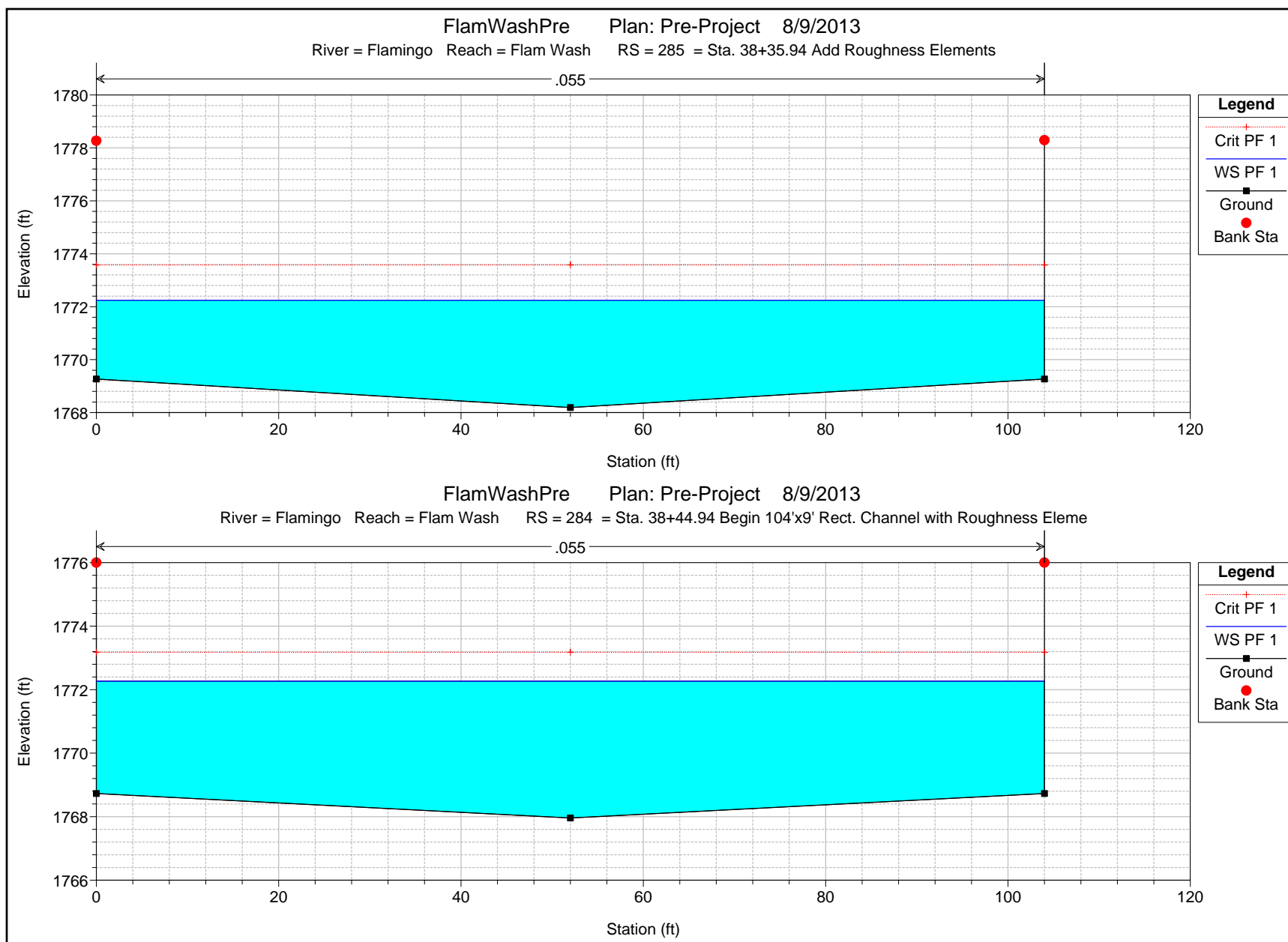


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 305 = "AB" 37+11.52

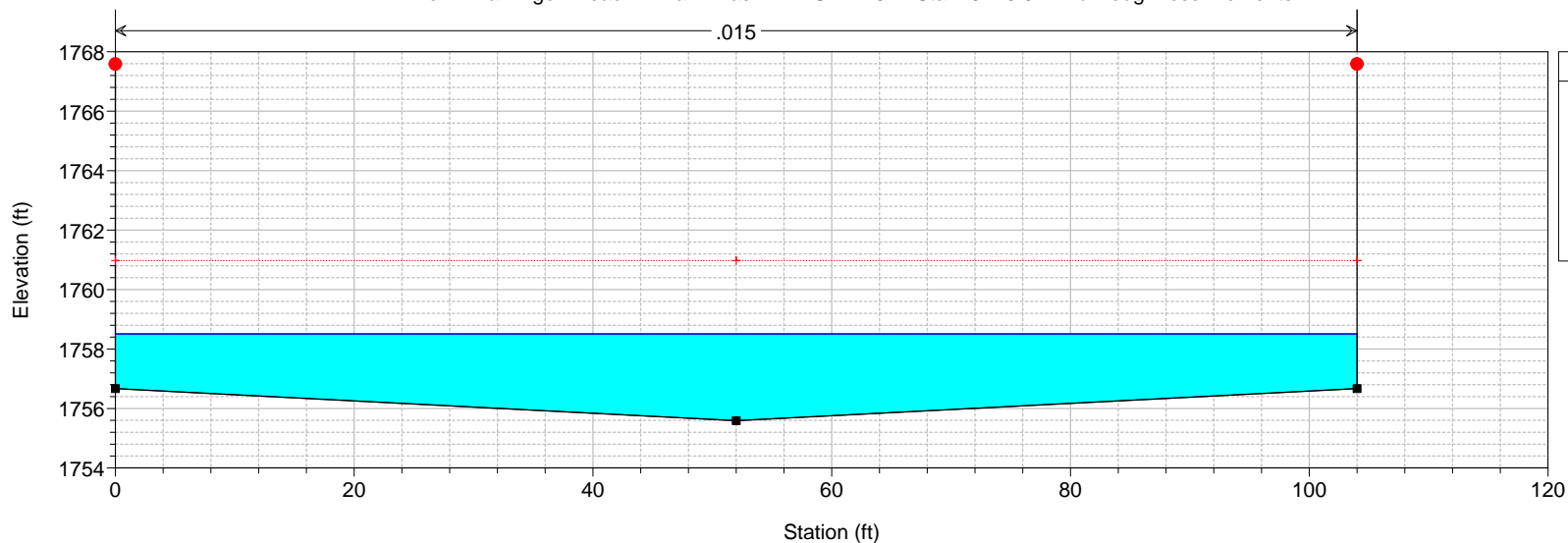


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

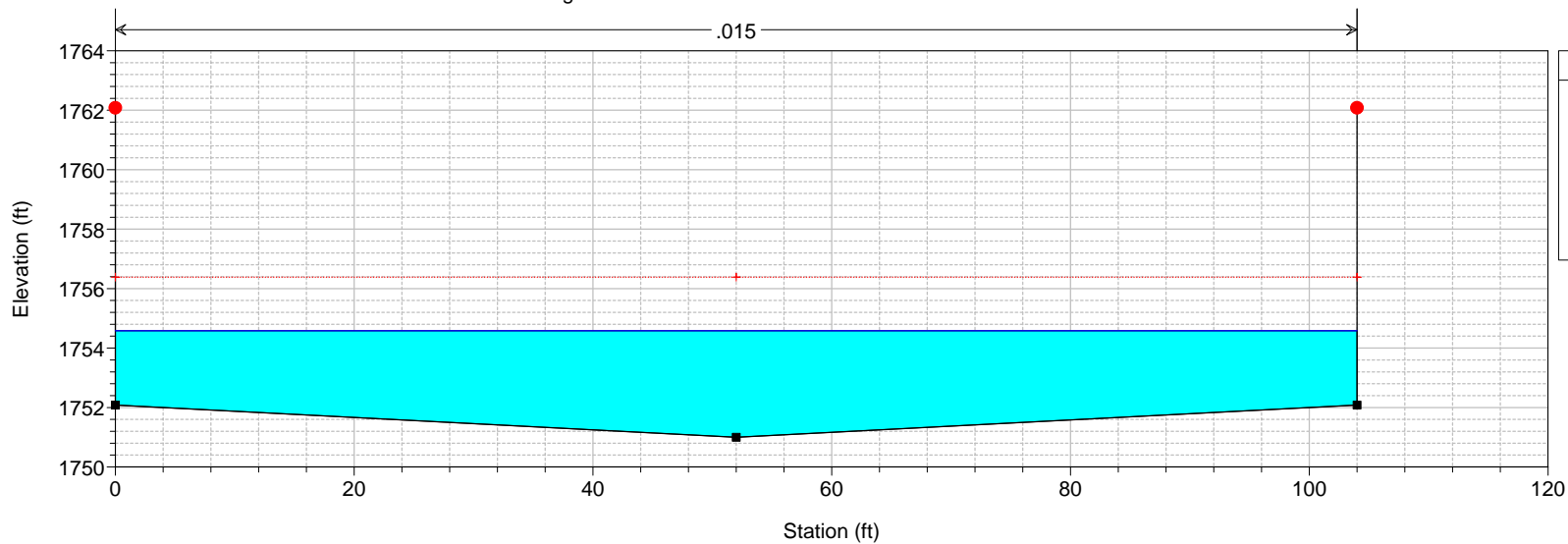




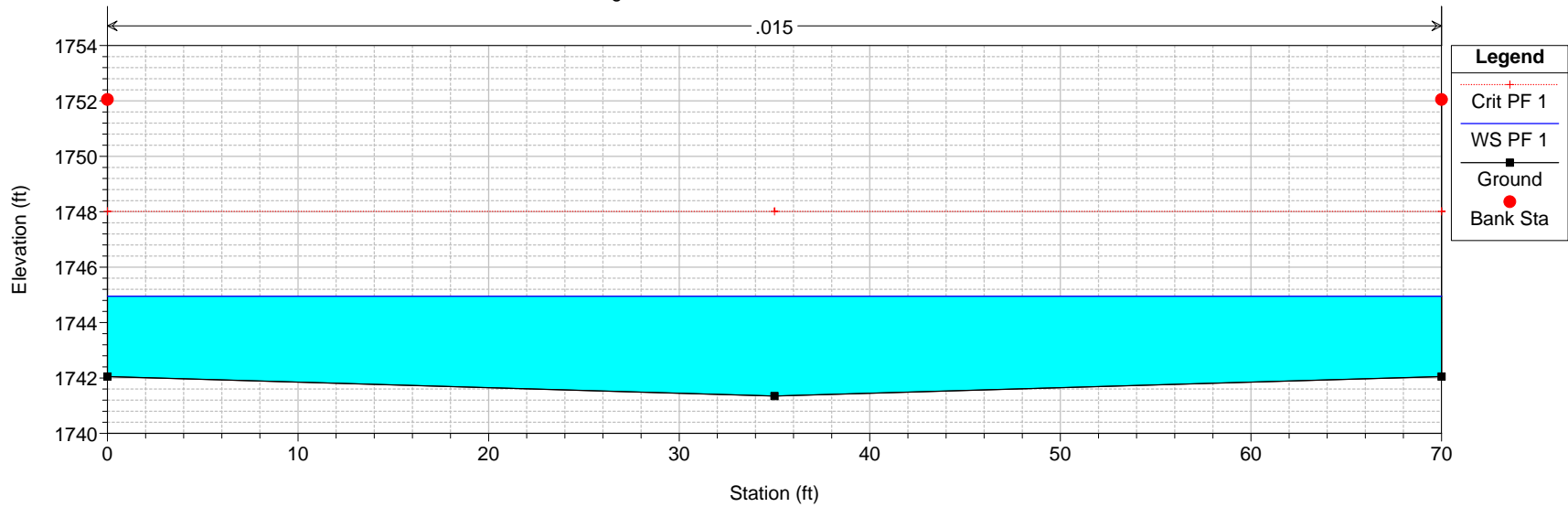
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 246 = Sta. 40+45.94 End Roughness Elements



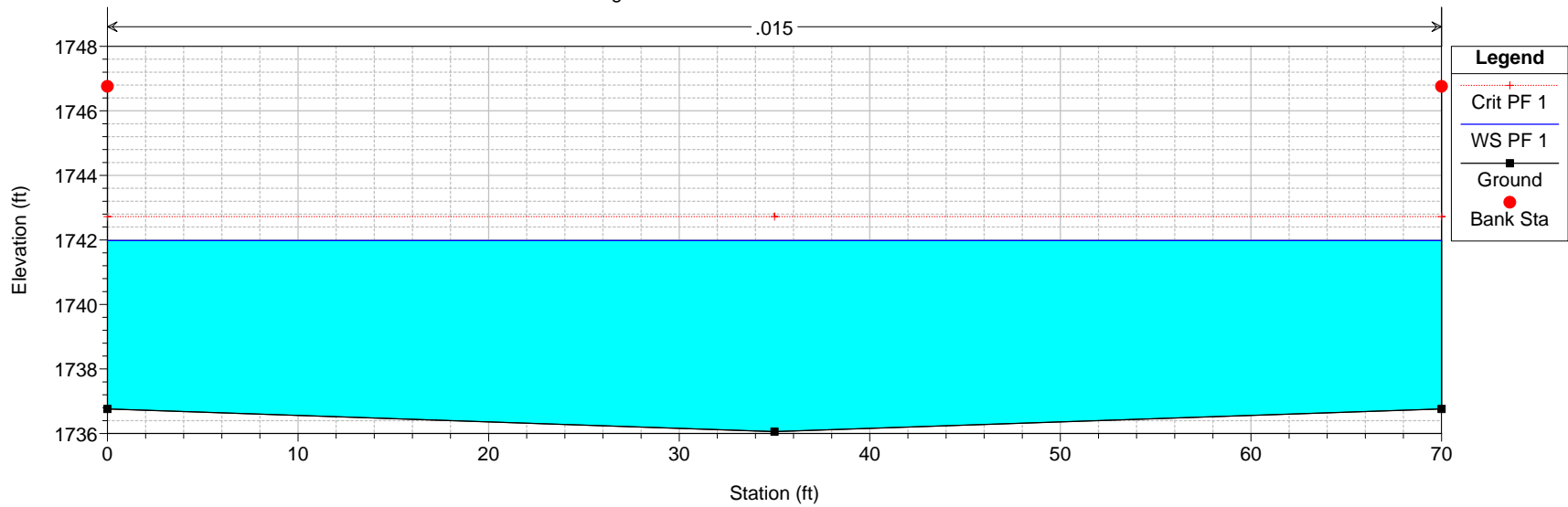
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 229 = Sta. 45+22.37 Transition Structure



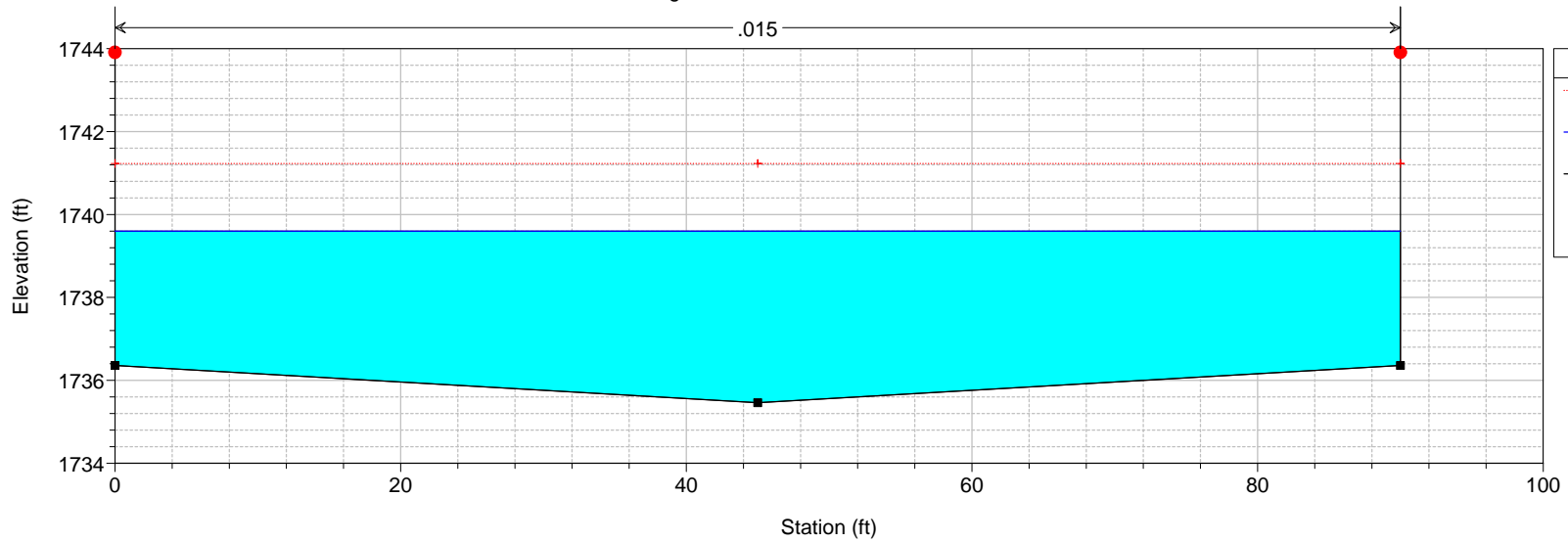
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 222 = Sta. 47+77.37



FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 193 = Sta. 60+98.98

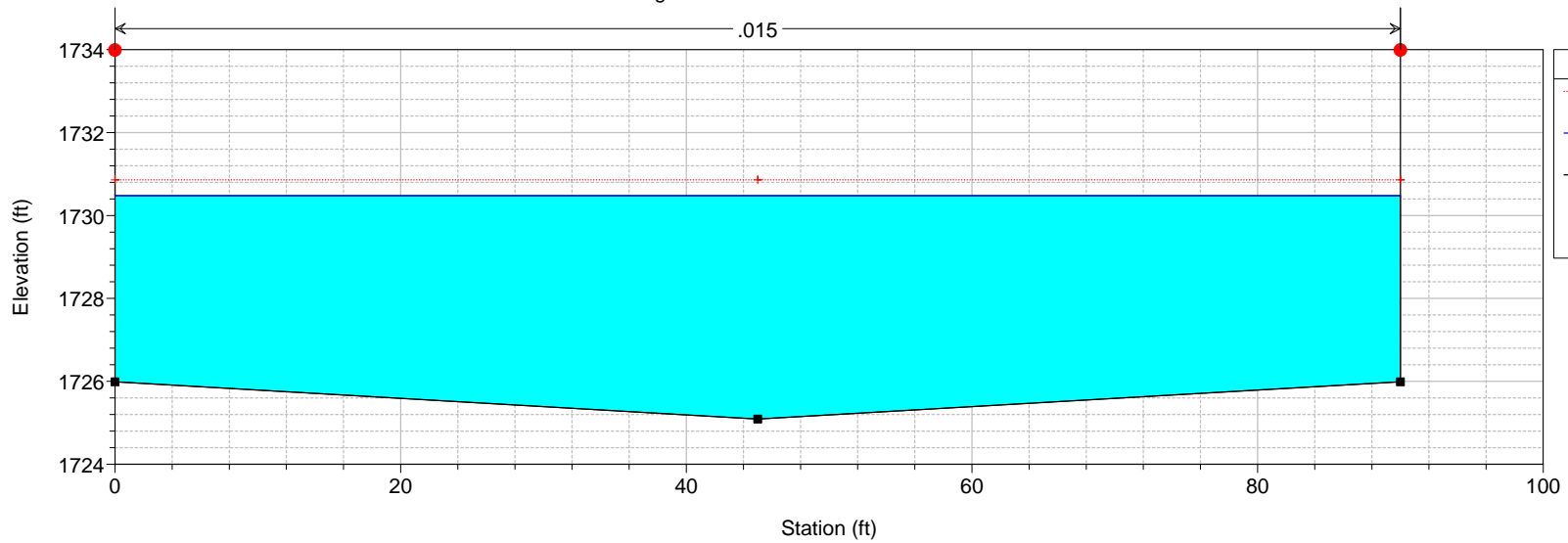


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 191 = Sta. 62+50



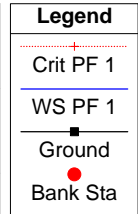
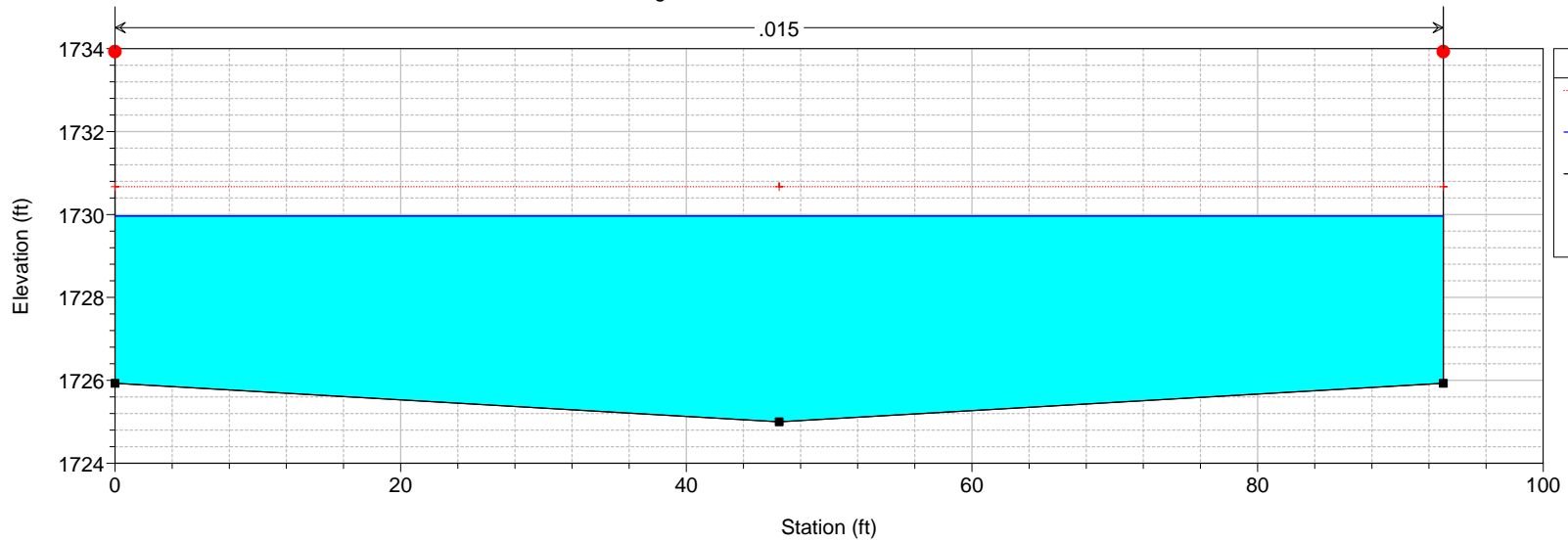
Legend	
Crit PF 1	
WS PF 1	
Ground	
Bank Sta	

FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 142 = Sta. 88+41.64

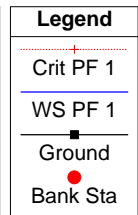
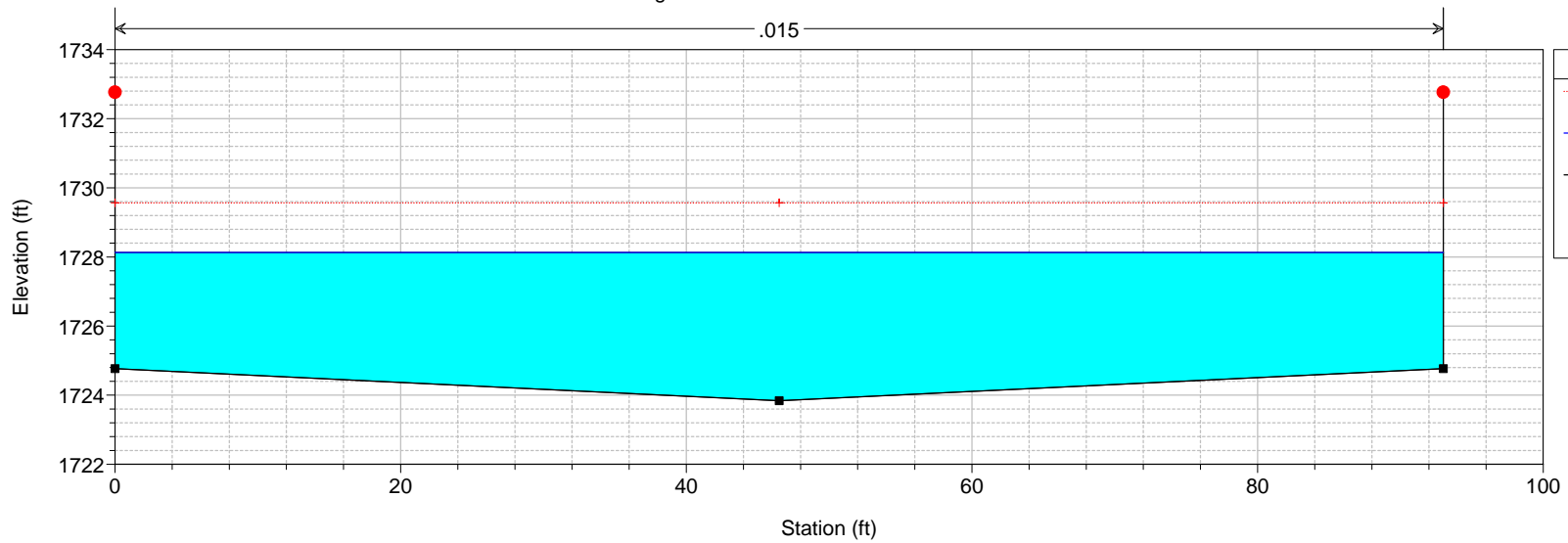


Legend	
Crit PF 1	
WS PF 1	
Ground	
Bank Sta	

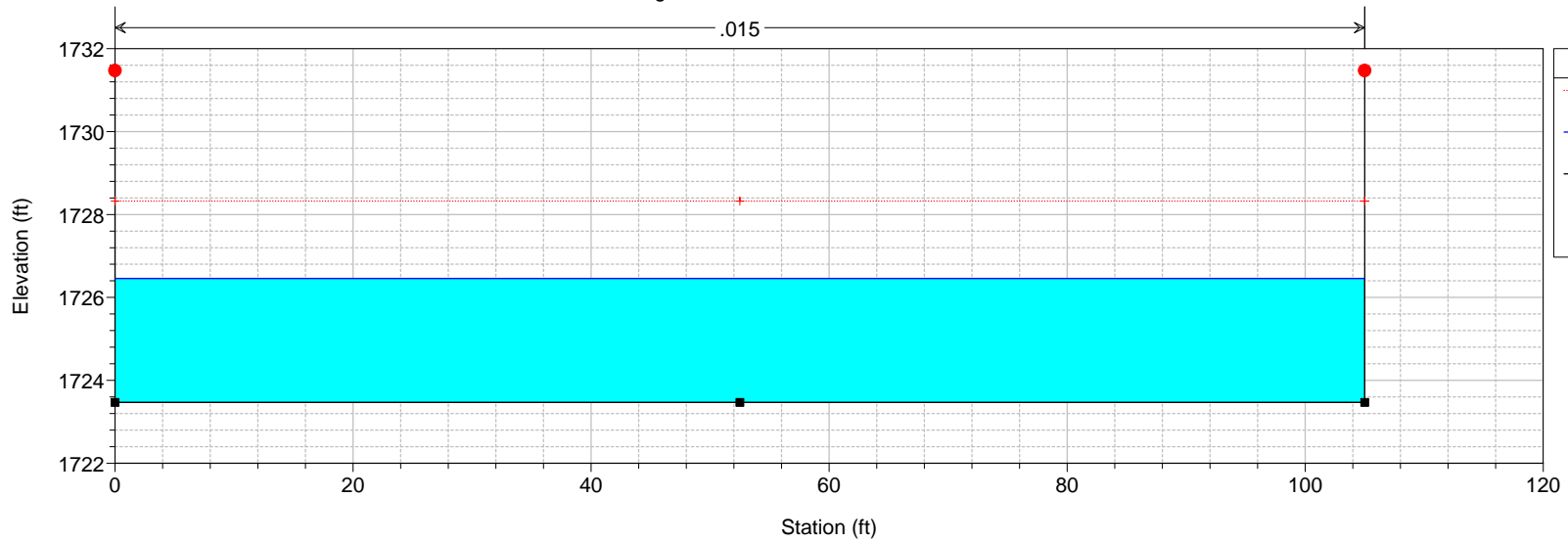
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 138 = Sta. 88+64.14



FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 135 = Sta. 89+02.27

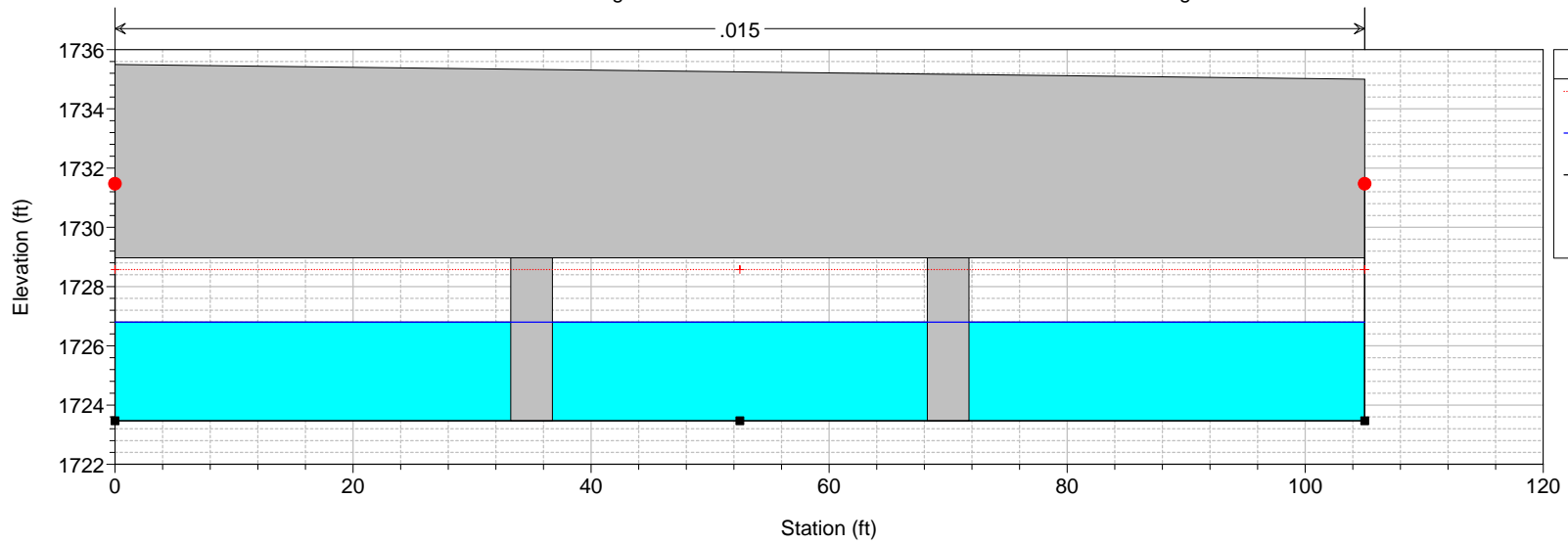


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 131 = Sta. 89+15.54

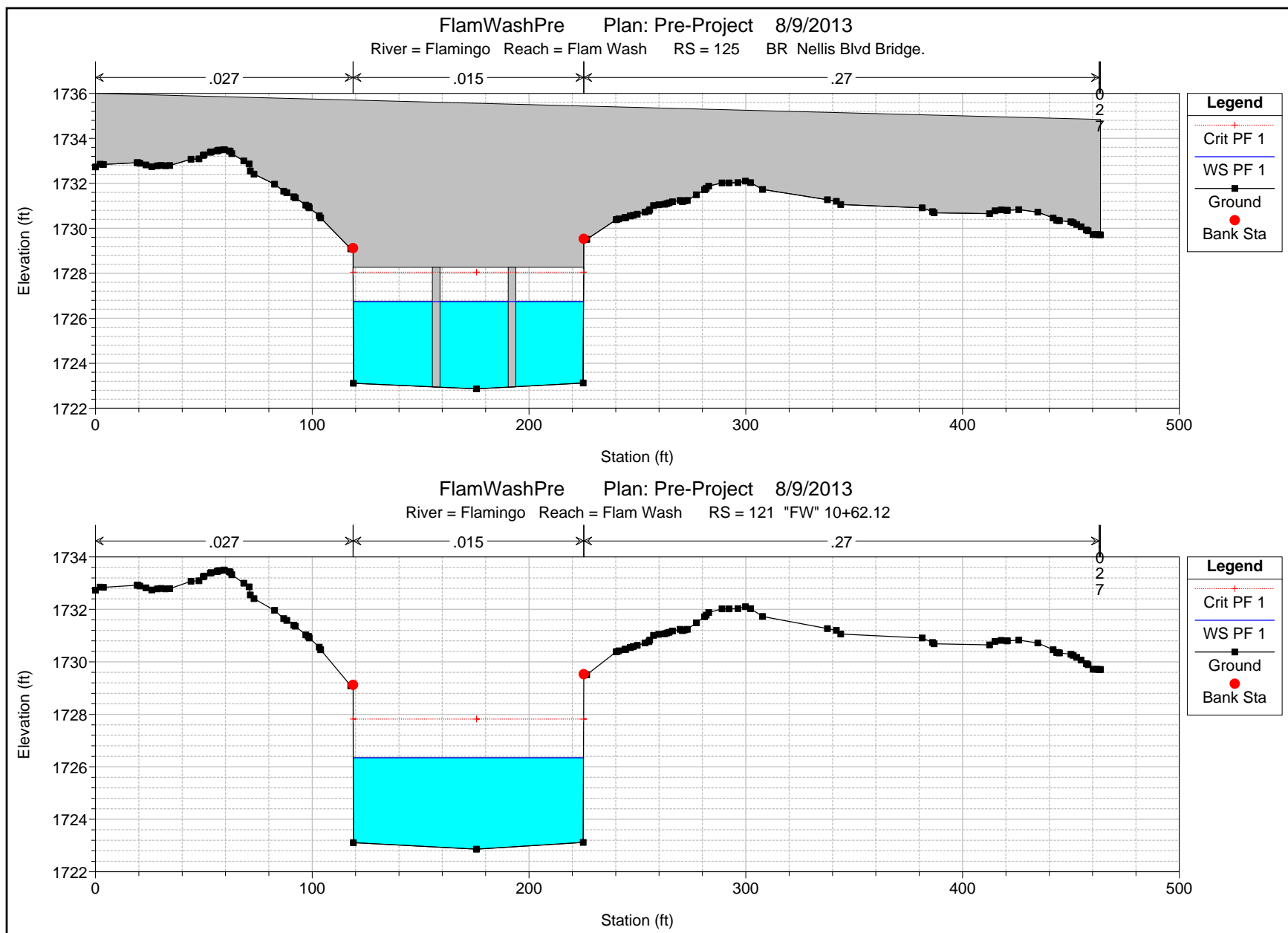


Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●

FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 125 BR Nellis Blvd Bridge.

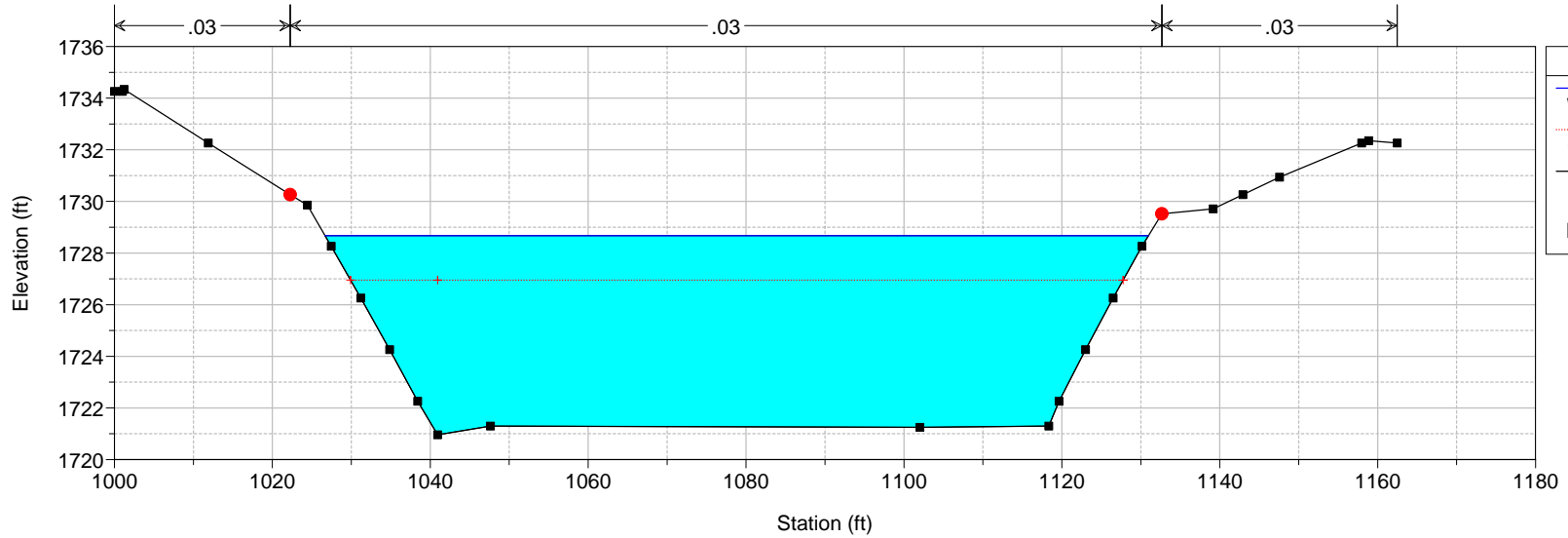


Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●



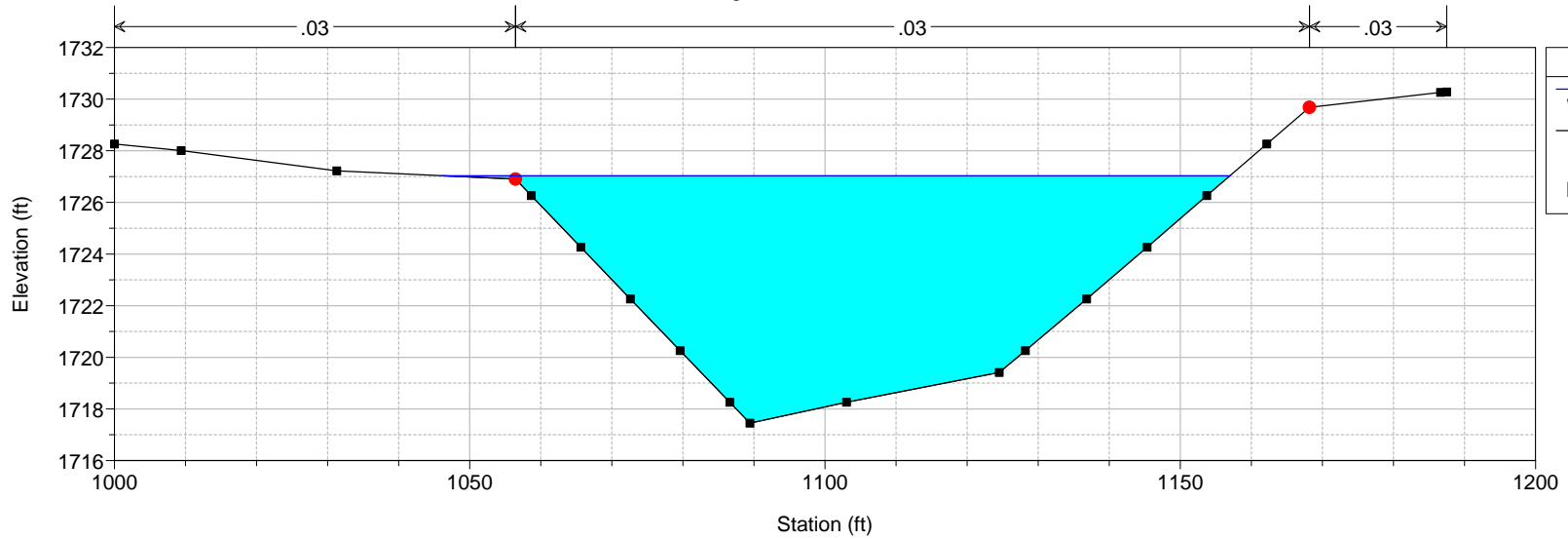
FlamWashPre Plan: Pre-Project 8/9/2013

River = Flamingo Reach = Flam Wash RS = 100

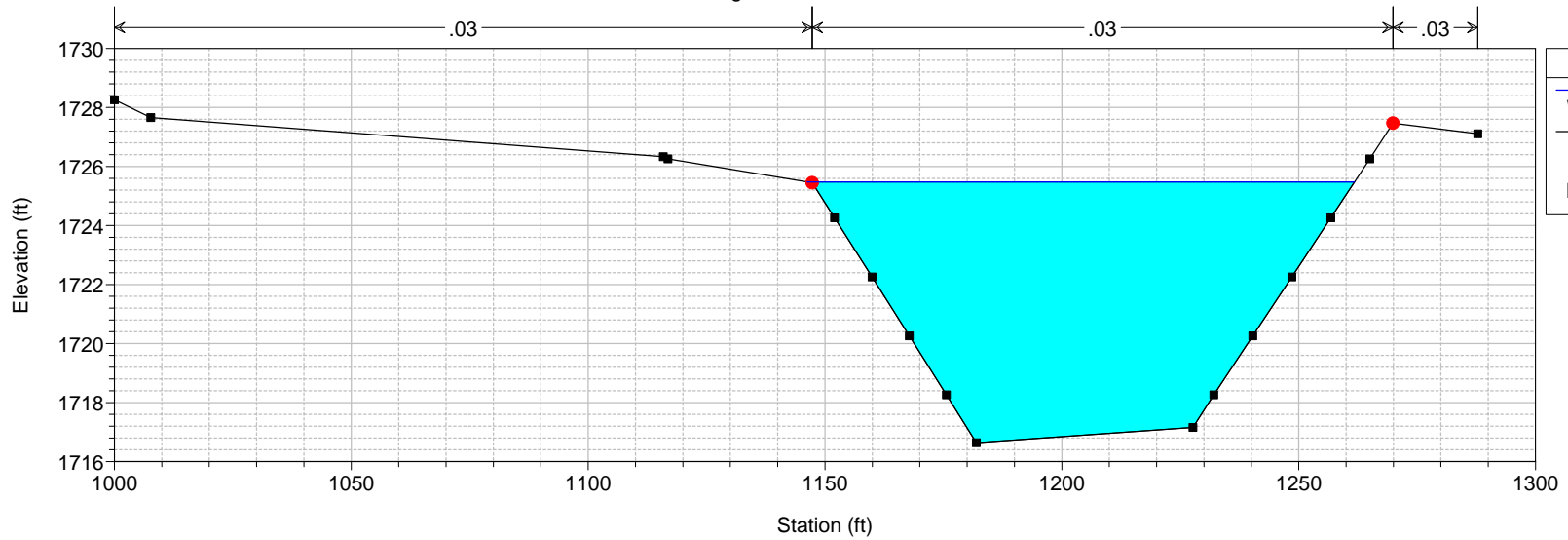


FlamWashPre Plan: Pre-Project 8/9/2013

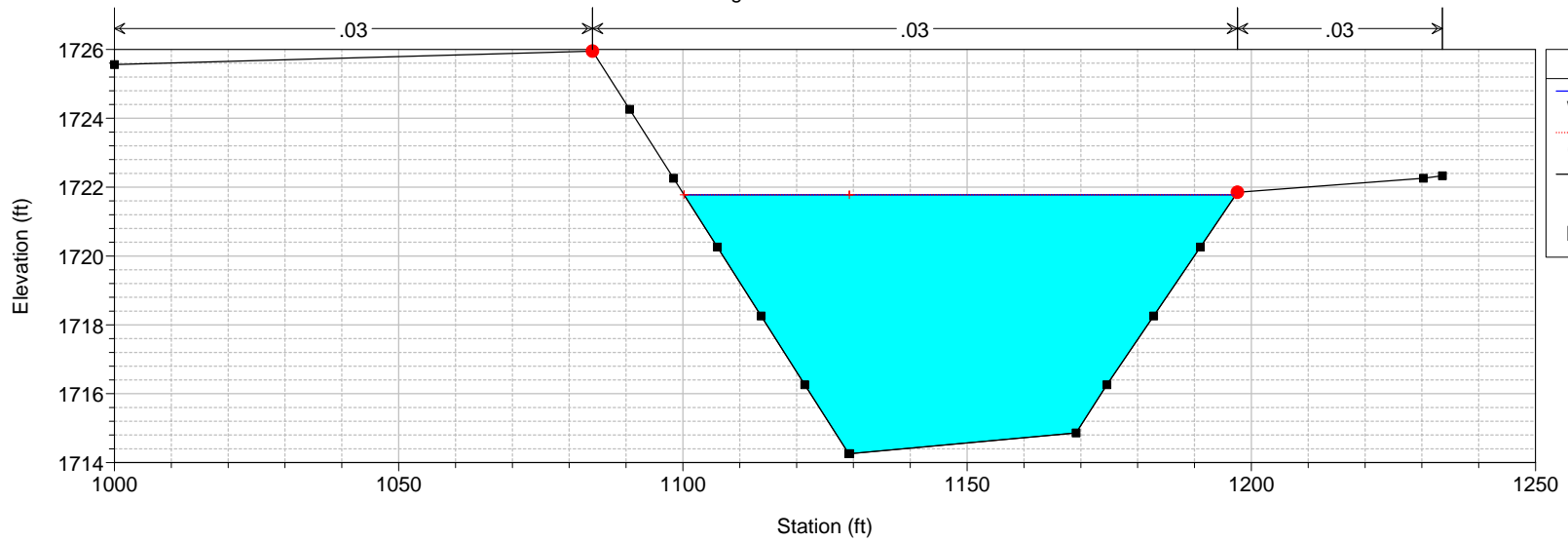
River = Flamingo Reach = Flam Wash RS = 90

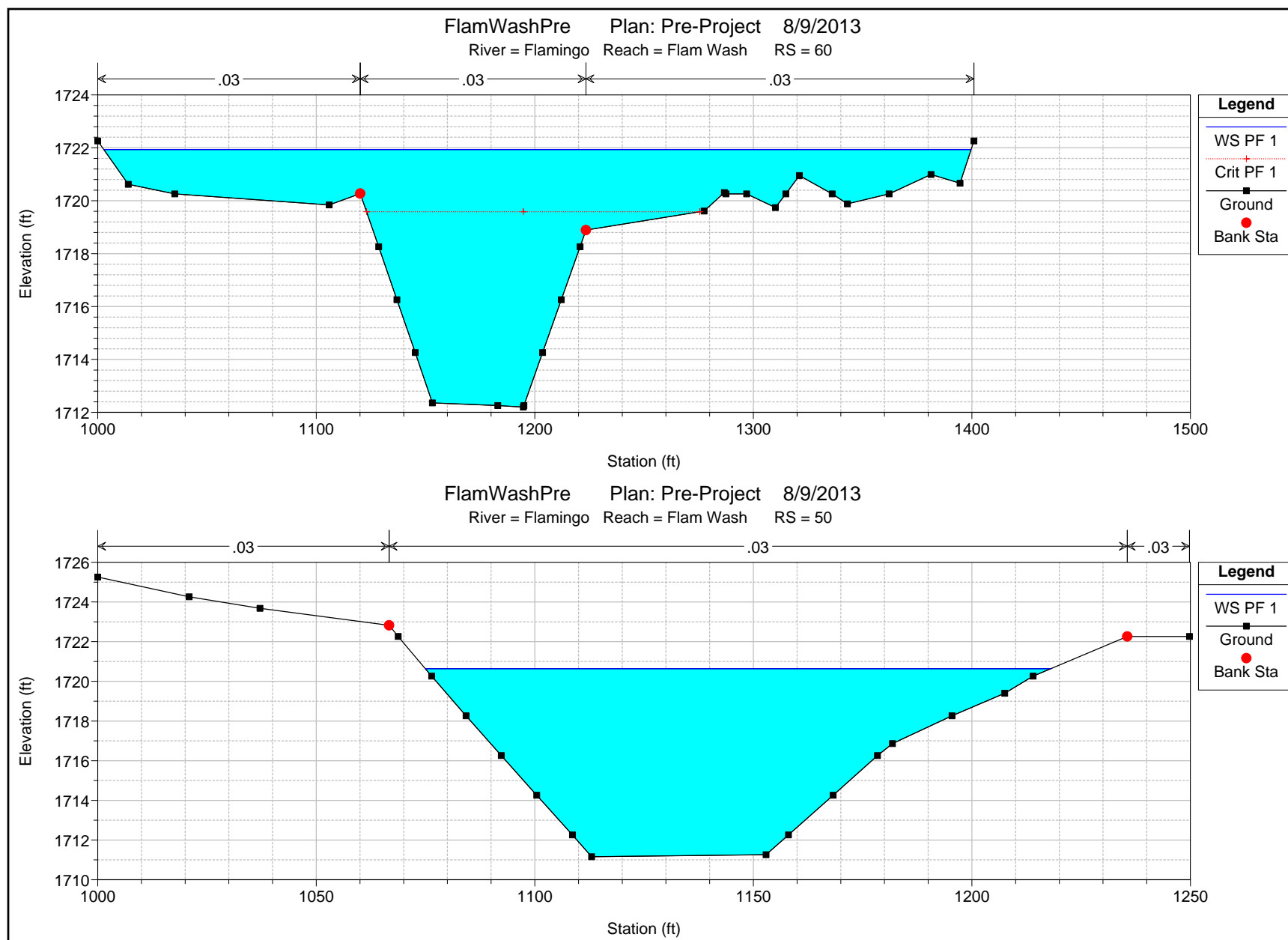


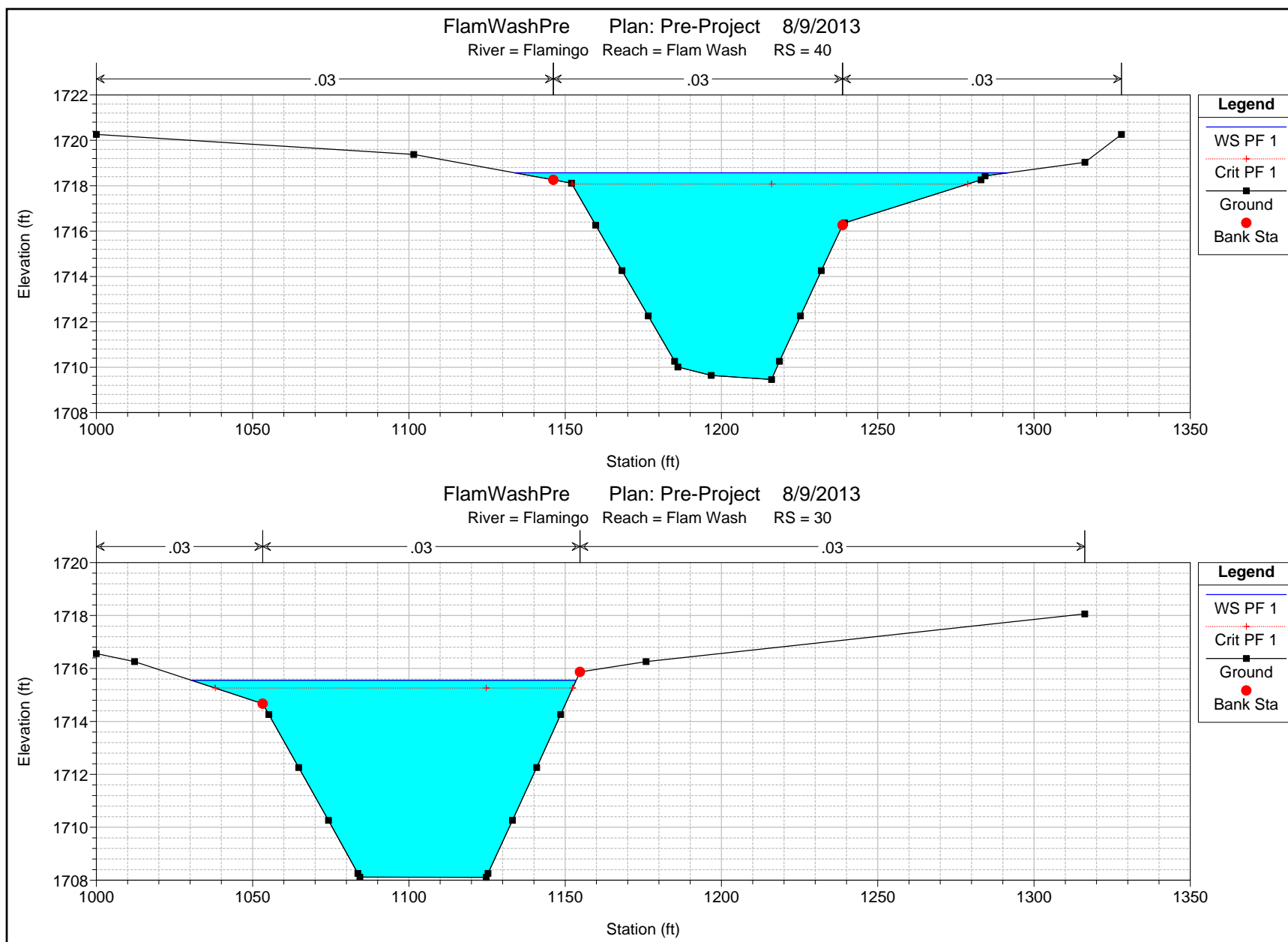
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 80

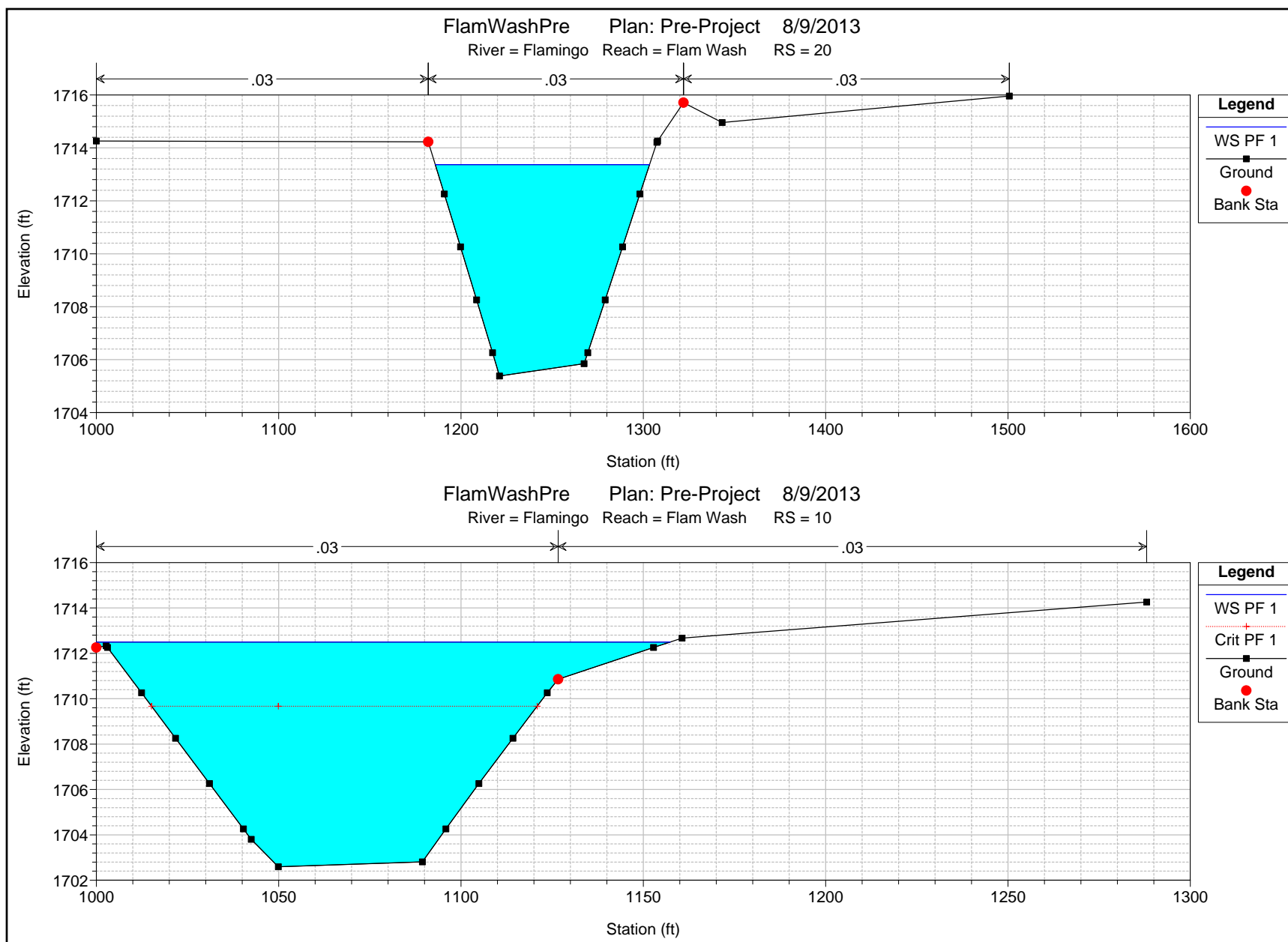


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70

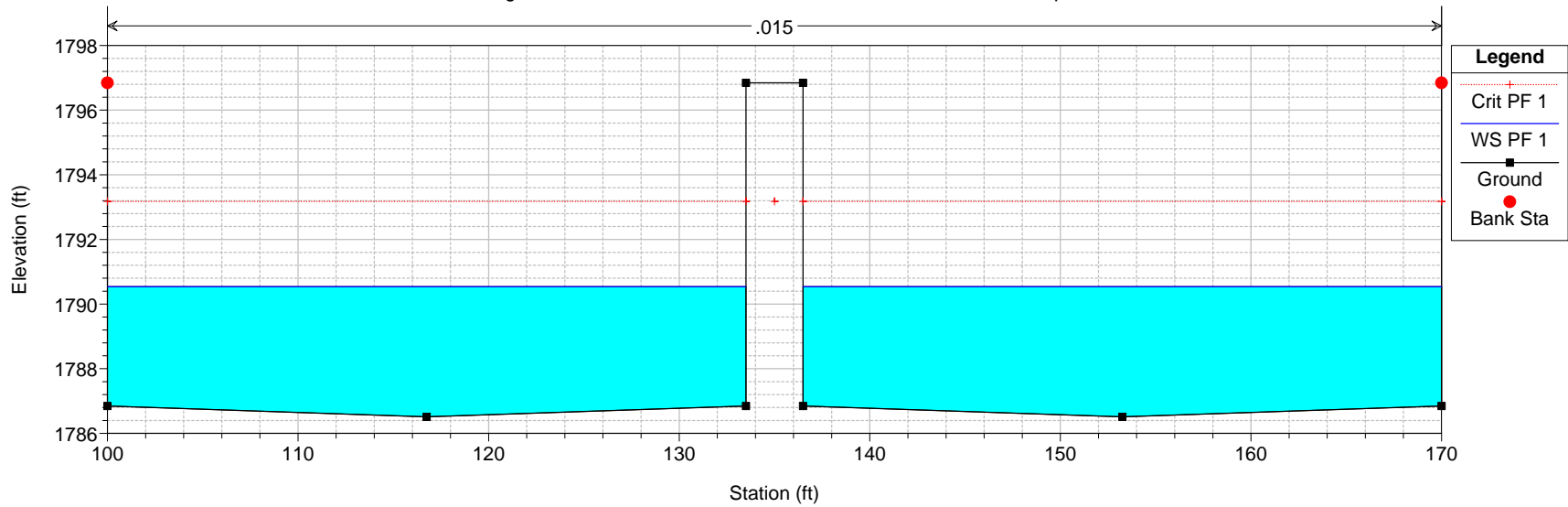




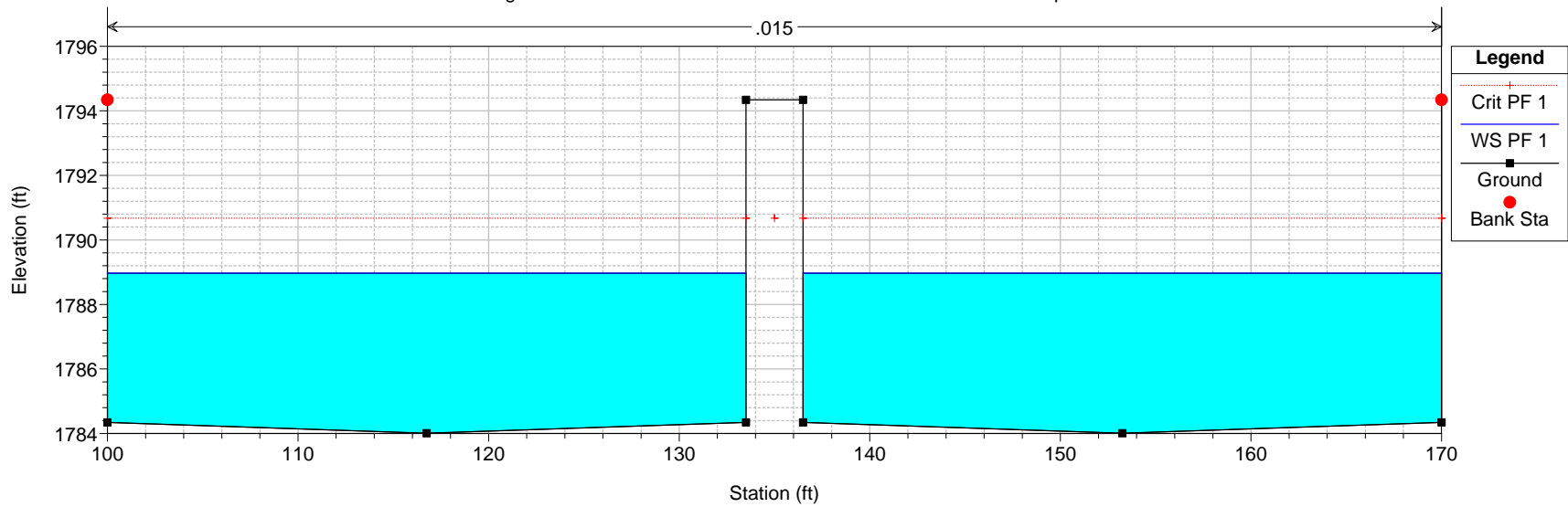




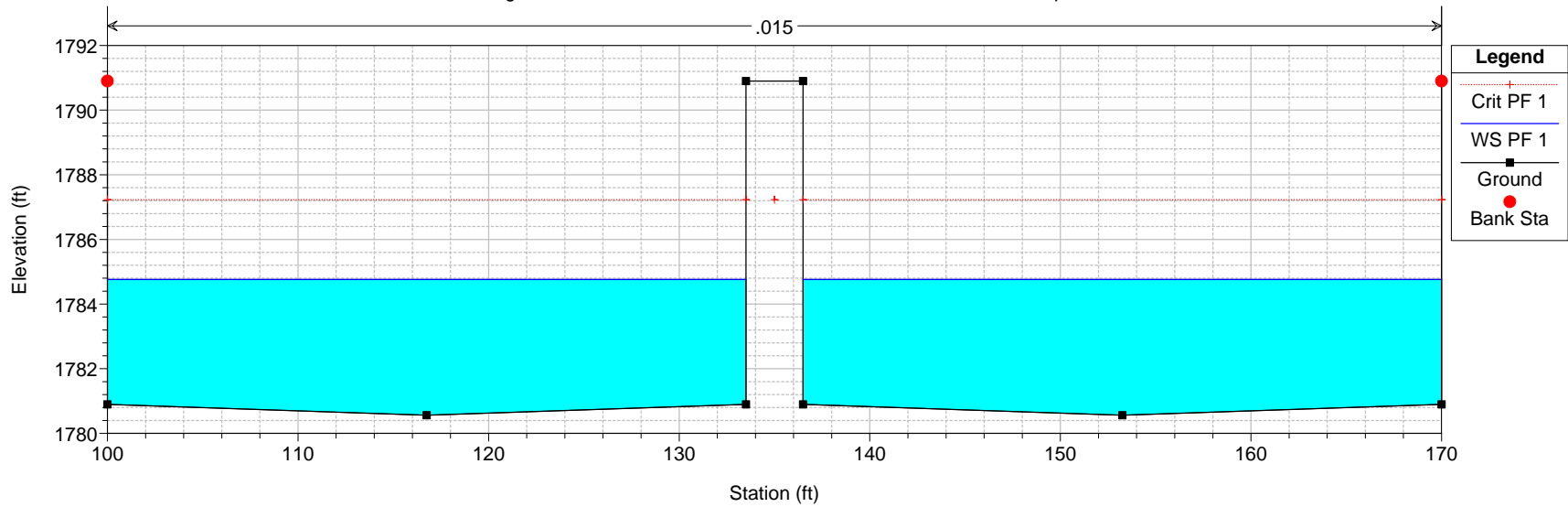
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 390 Ex. Concrete Channel Upstream of I-515



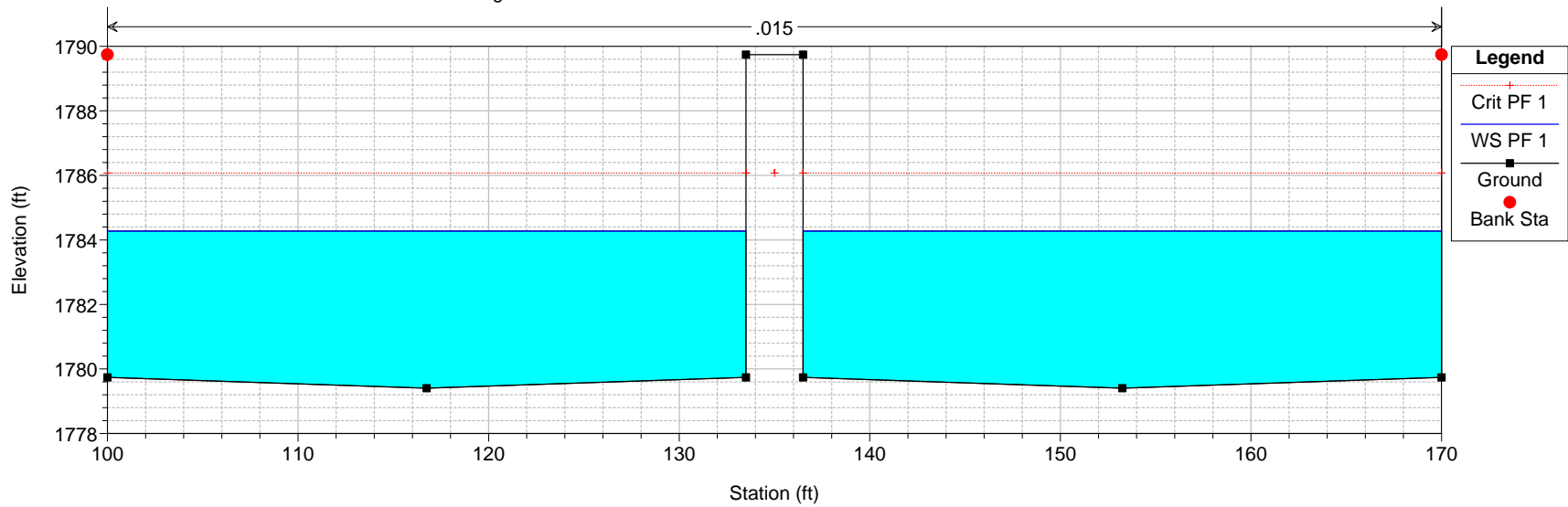
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 380 Ex. Concrete Channel Upstream of I-515



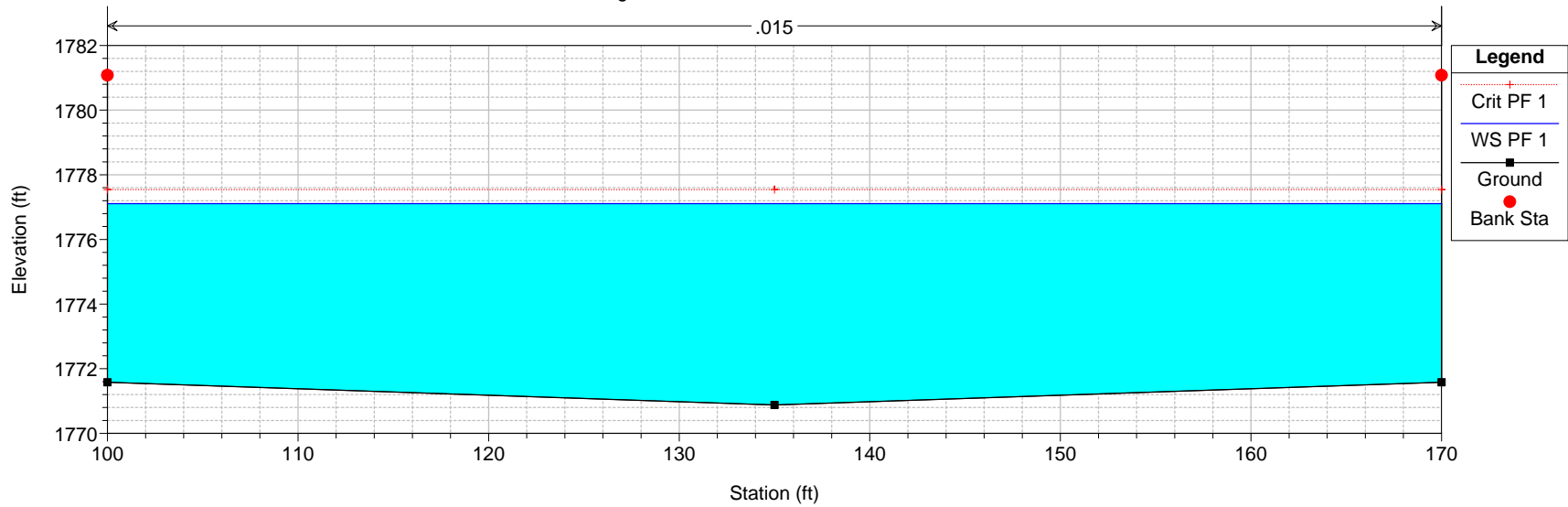
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 370 Ex. Concrete Channel Upstream of I-515



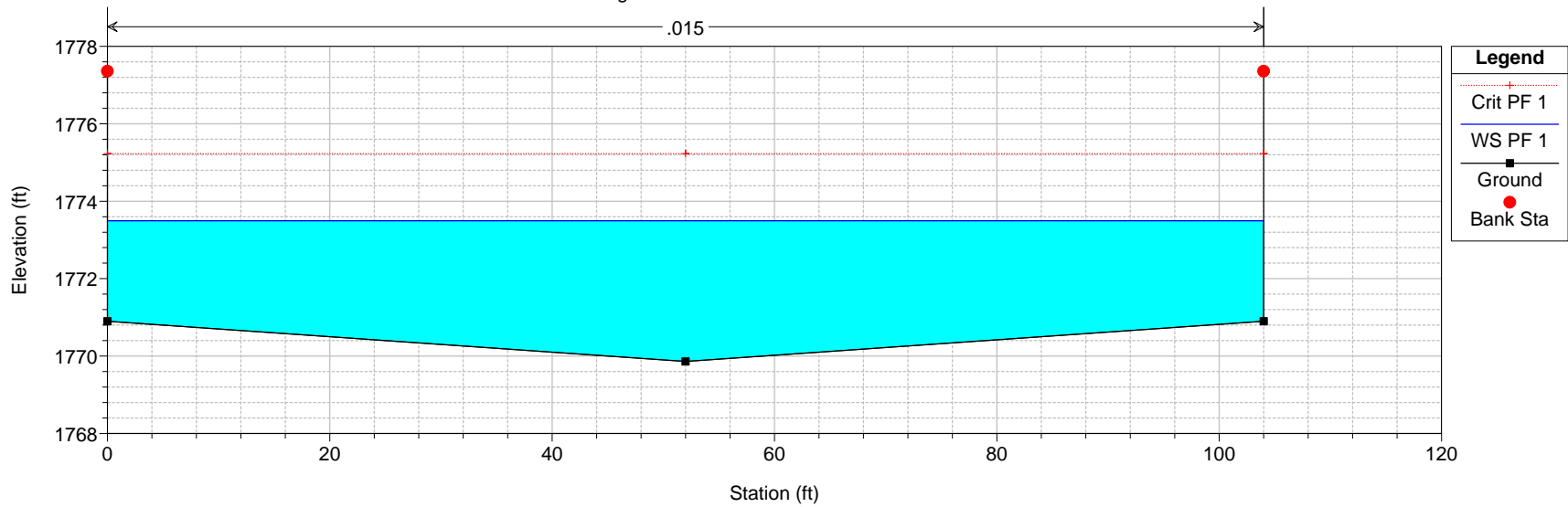
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 360 Ex. Concrete Channel Downstream of I-515



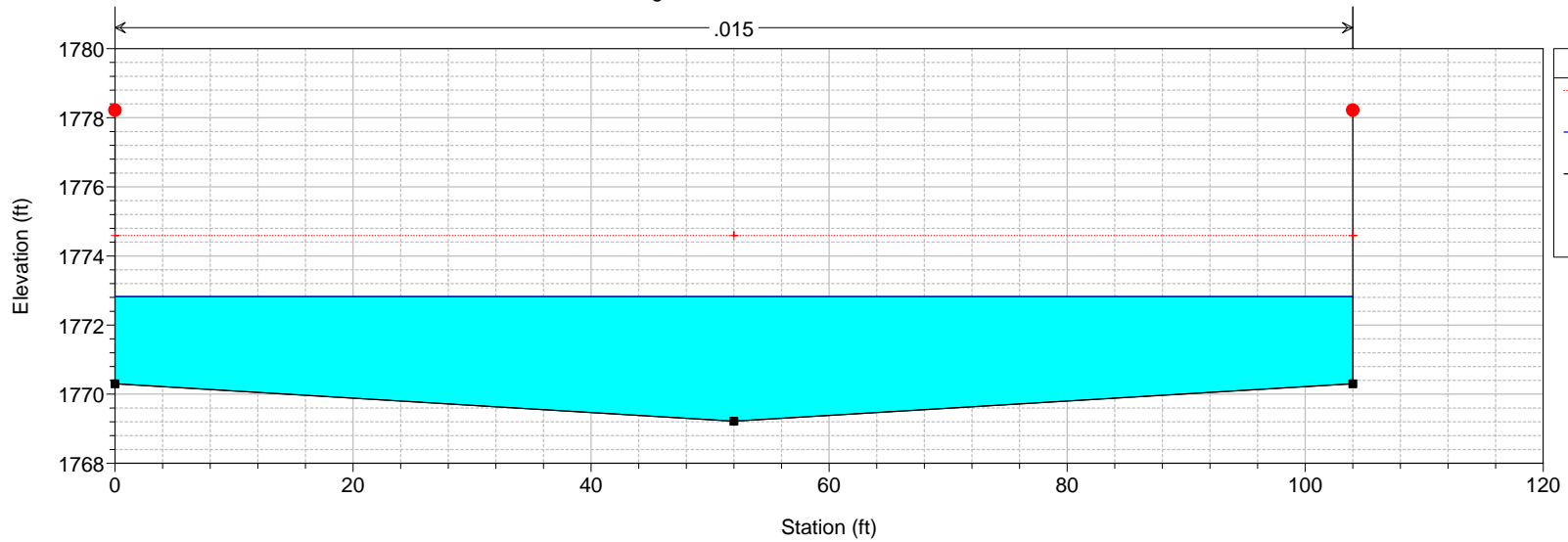
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 313 "AB" 34+06.10



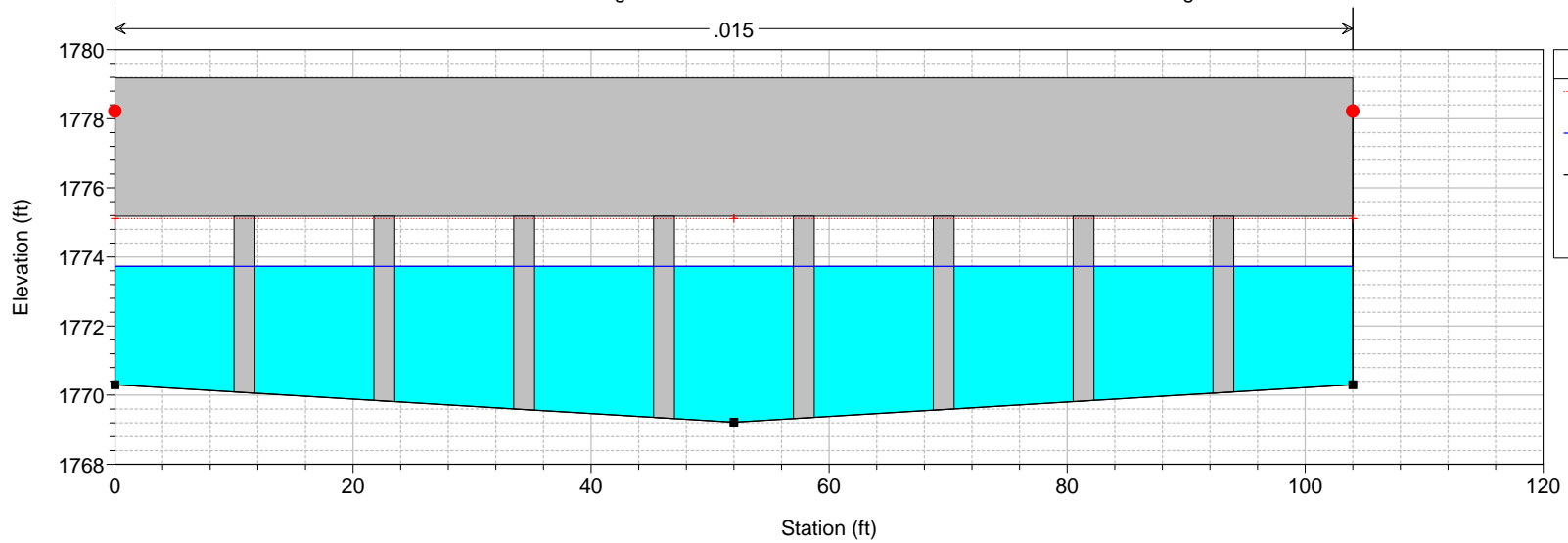
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 311 "AB" 36+61.10



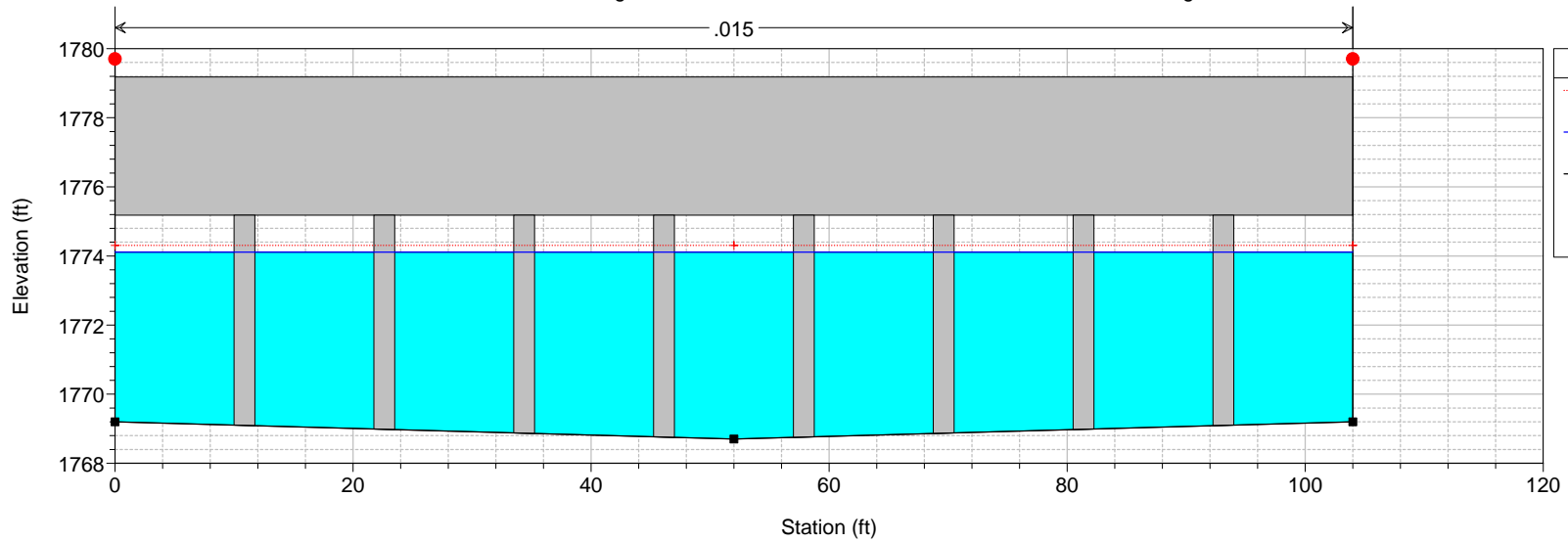
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 305 = "AB" 37+11.52



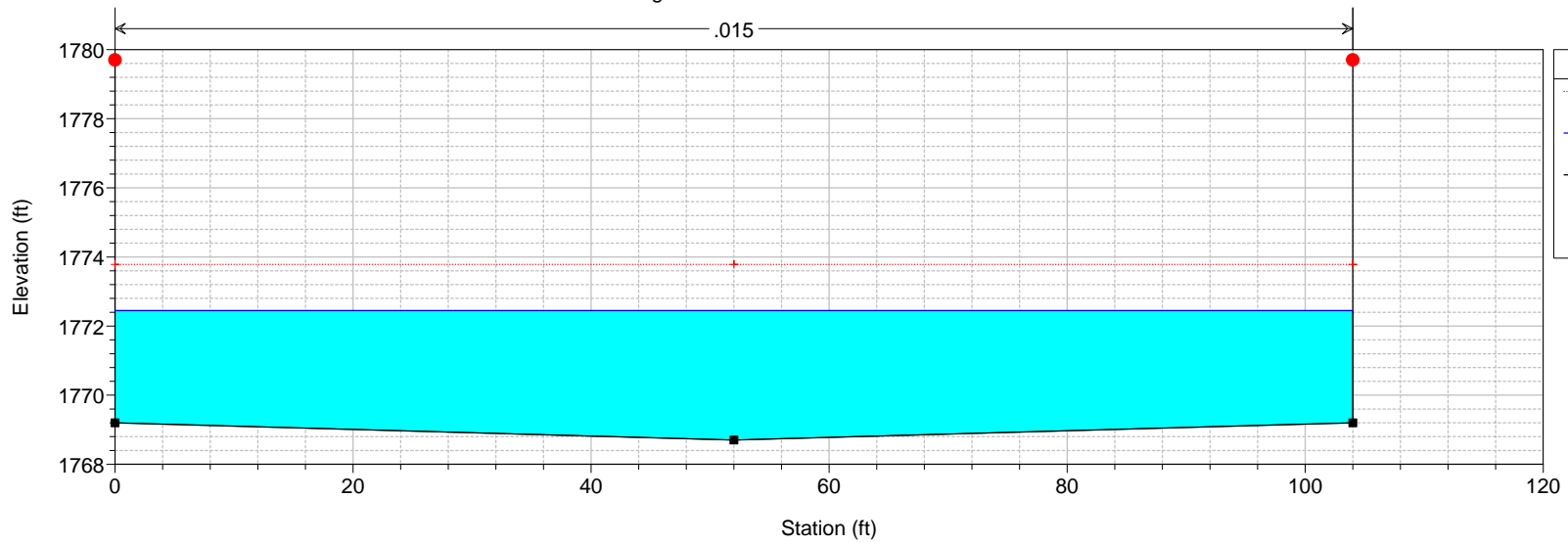
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

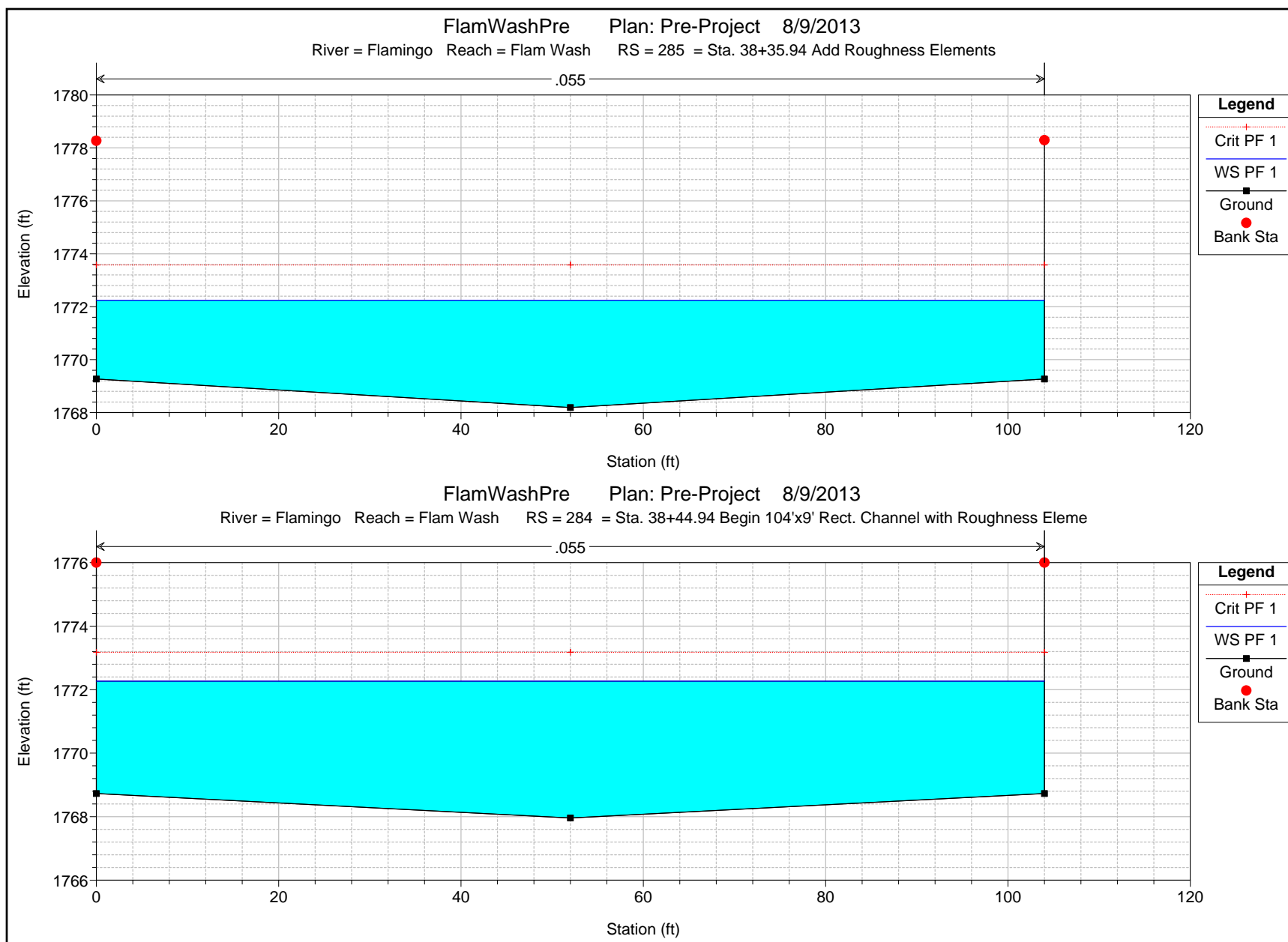


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

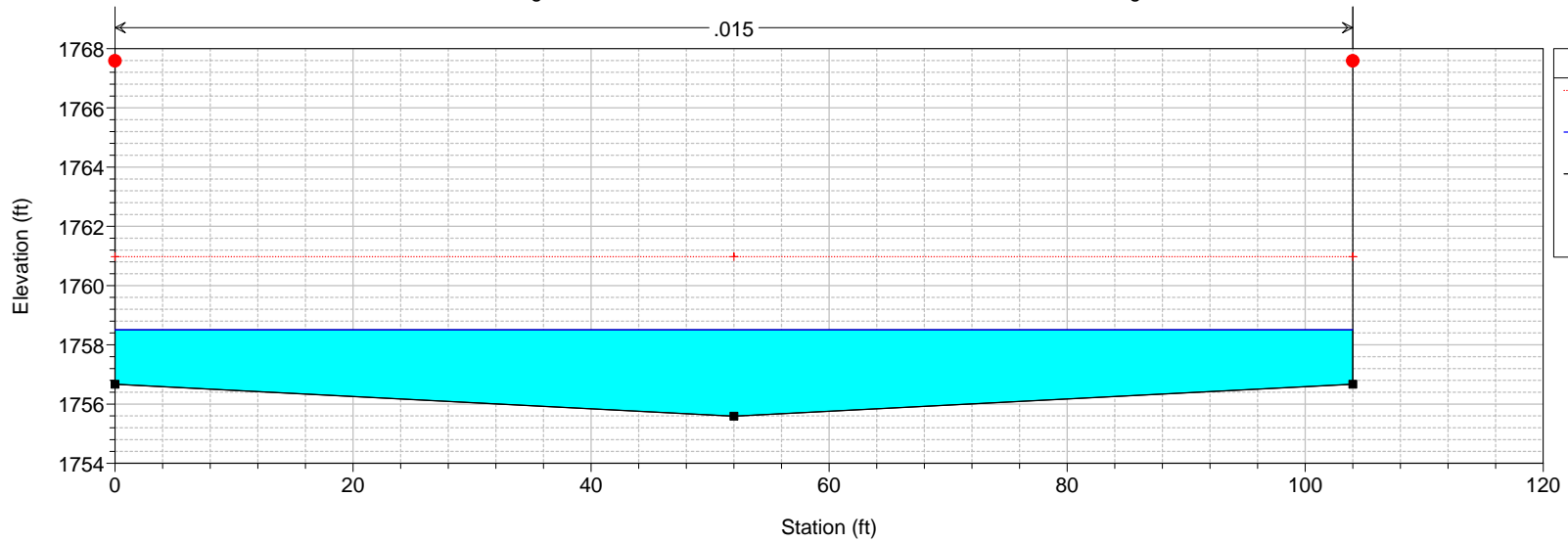


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 295 = "AB" 38+20.93

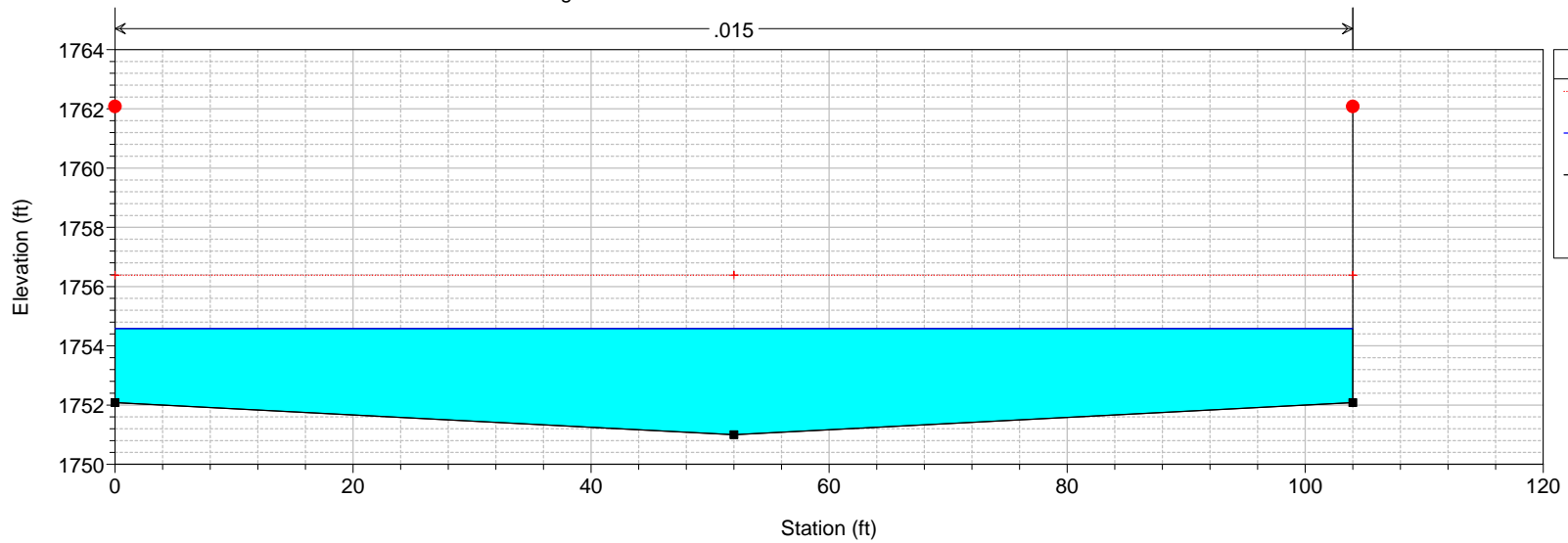




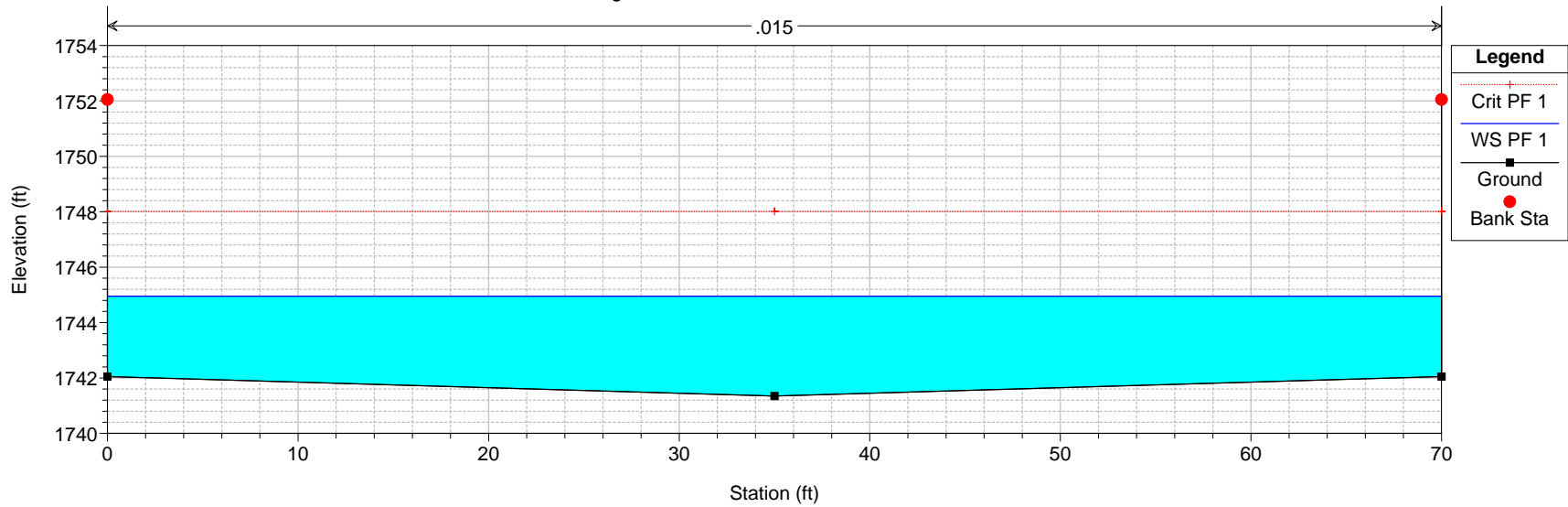
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 246 = Sta. 40+45.94 End Roughness Elements



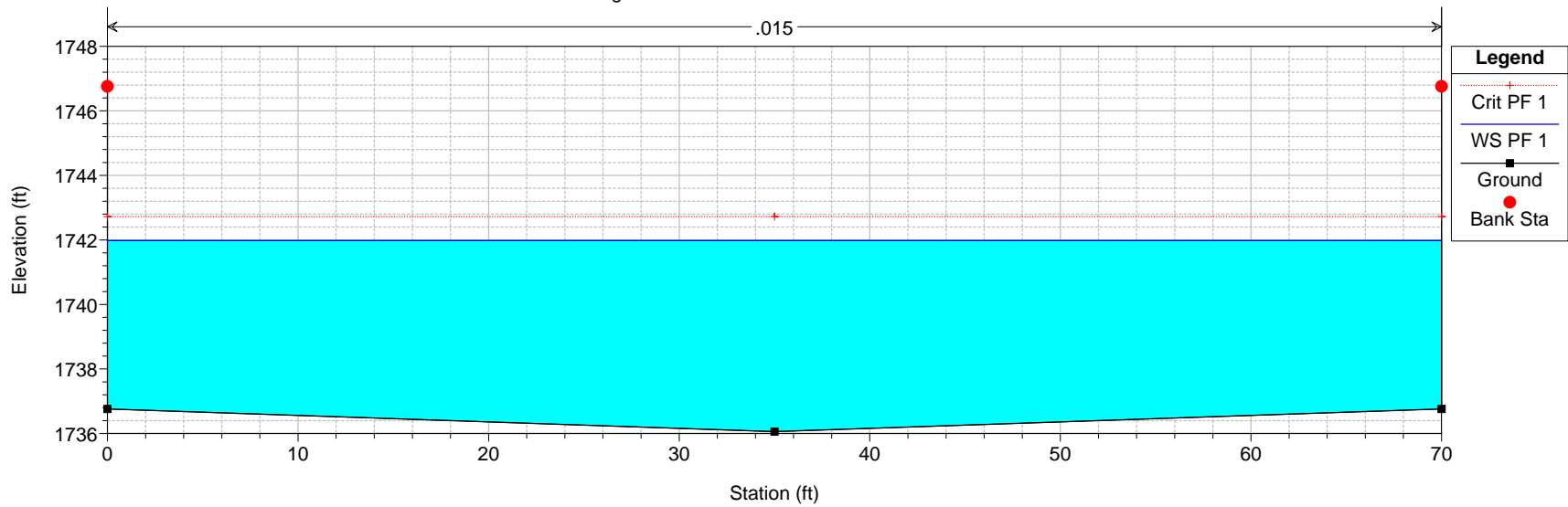
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 229 = Sta. 45+22.37 Transition Structure



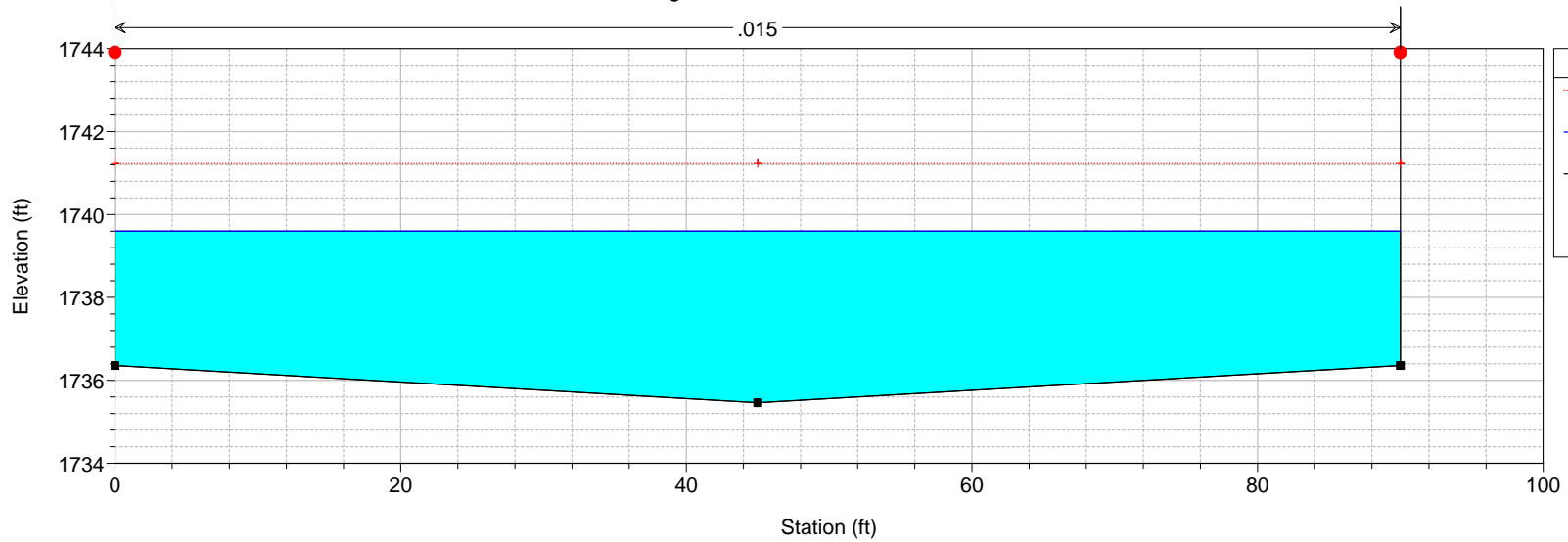
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 222 = Sta. 47+77.37



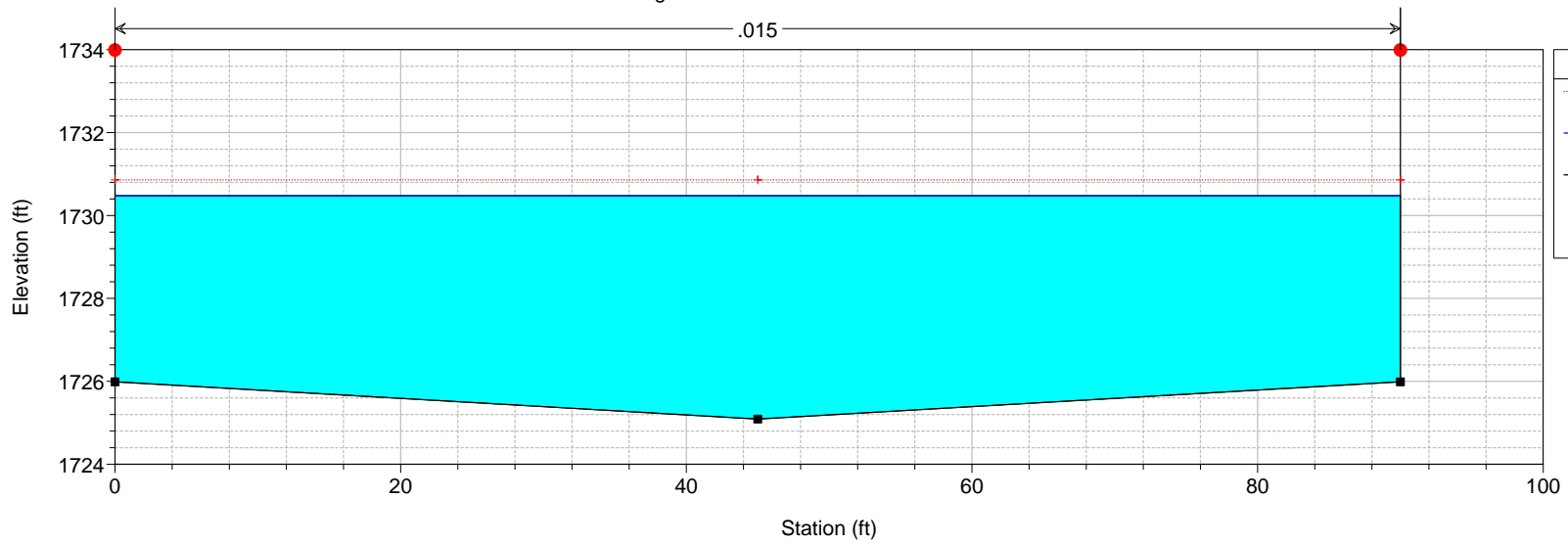
FlamWashPre Plan: Pre-Project 8/9/2013
River = Flamingo Reach = Flam Wash RS = 193 = Sta. 60+98.98



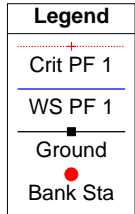
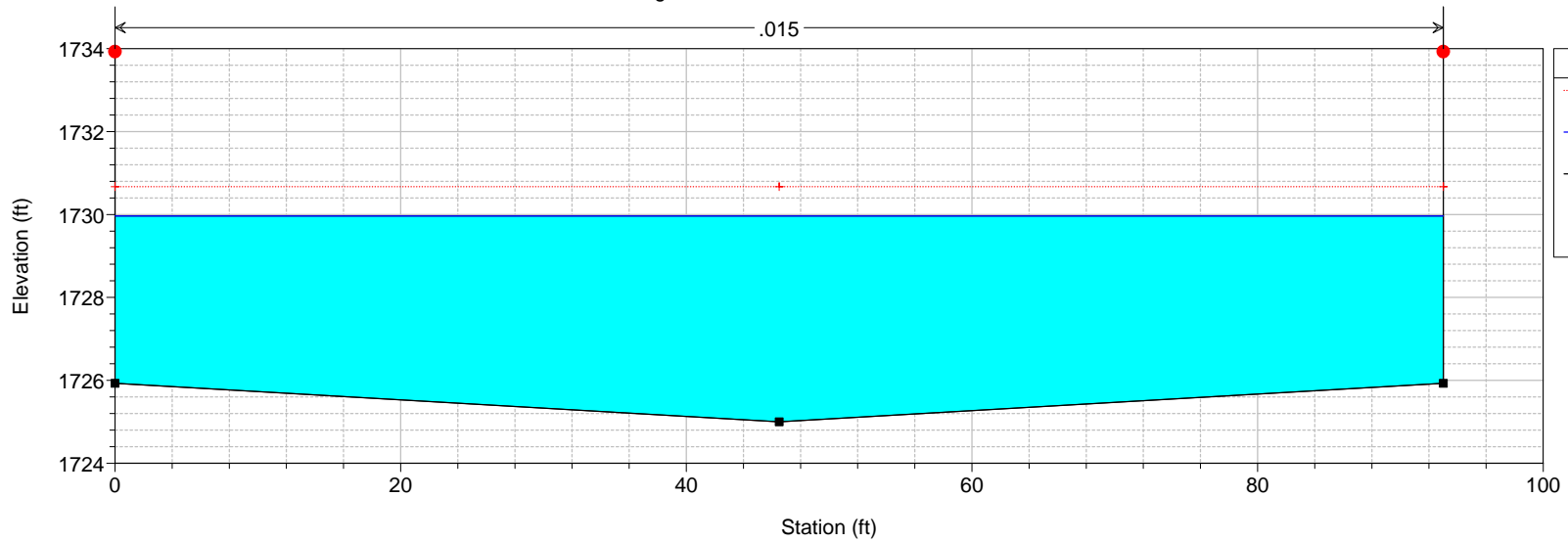
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 191 = Sta. 62+50



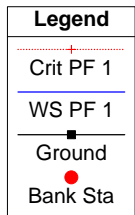
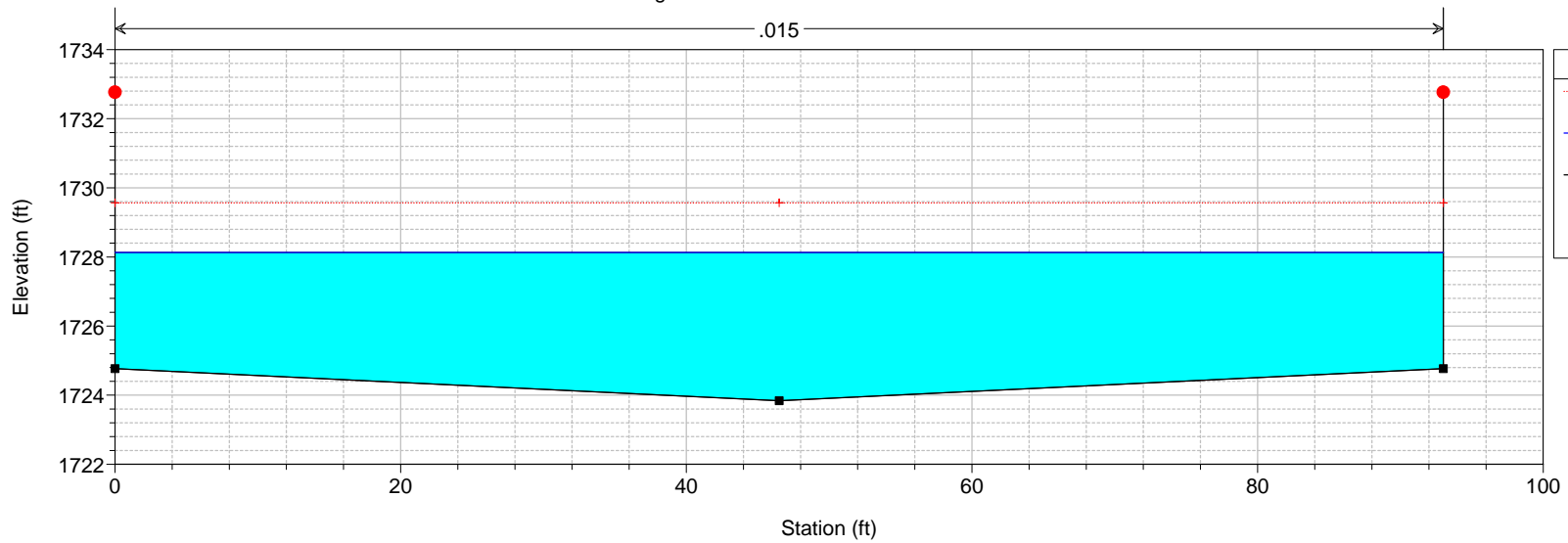
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 142 = Sta. 88+41.64



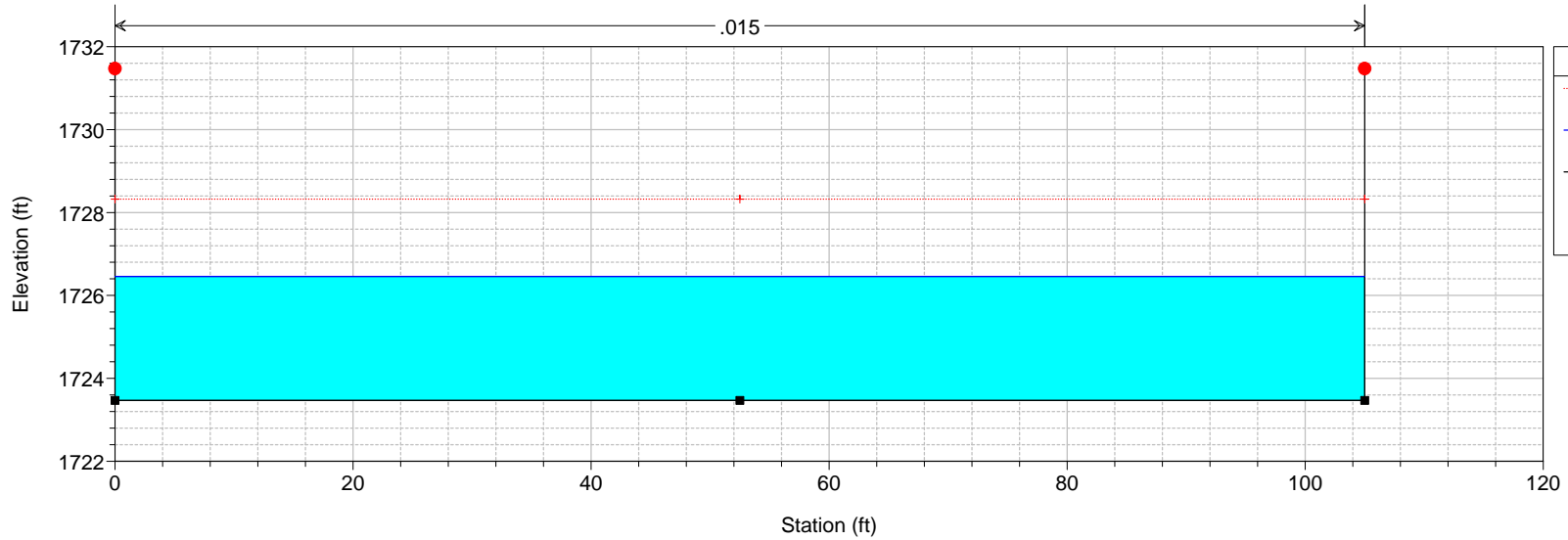
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 138 = Sta. 88+64.14



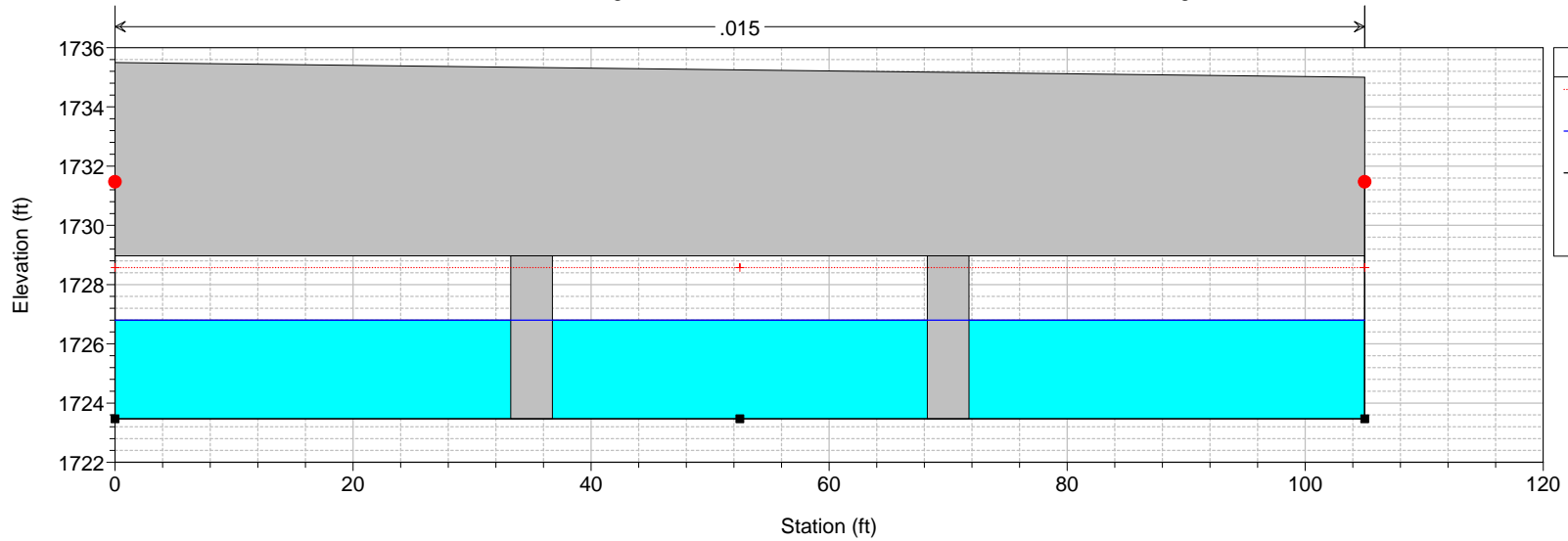
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 135 = Sta. 89+02.27

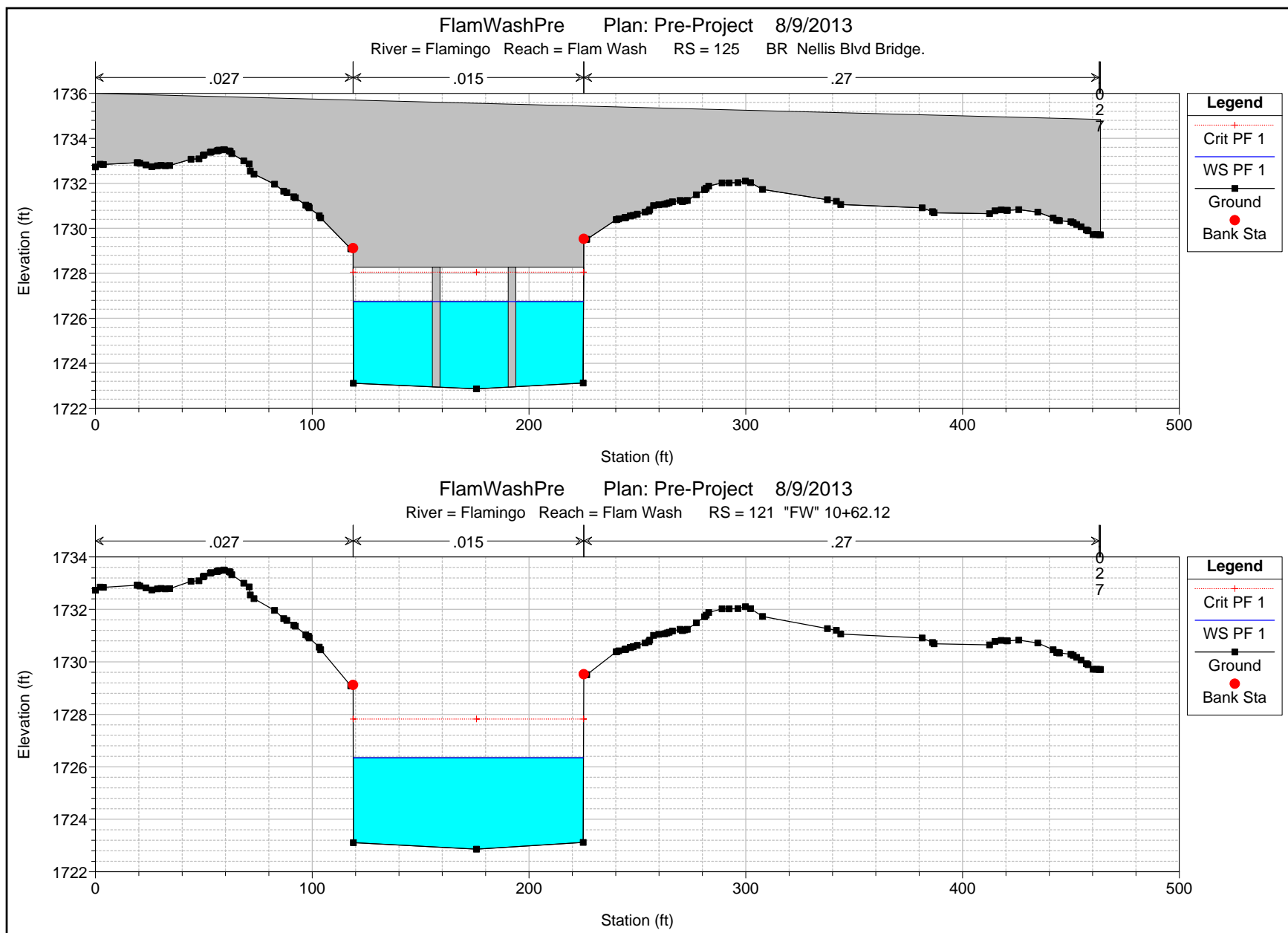


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 131 = Sta. 89+15.54



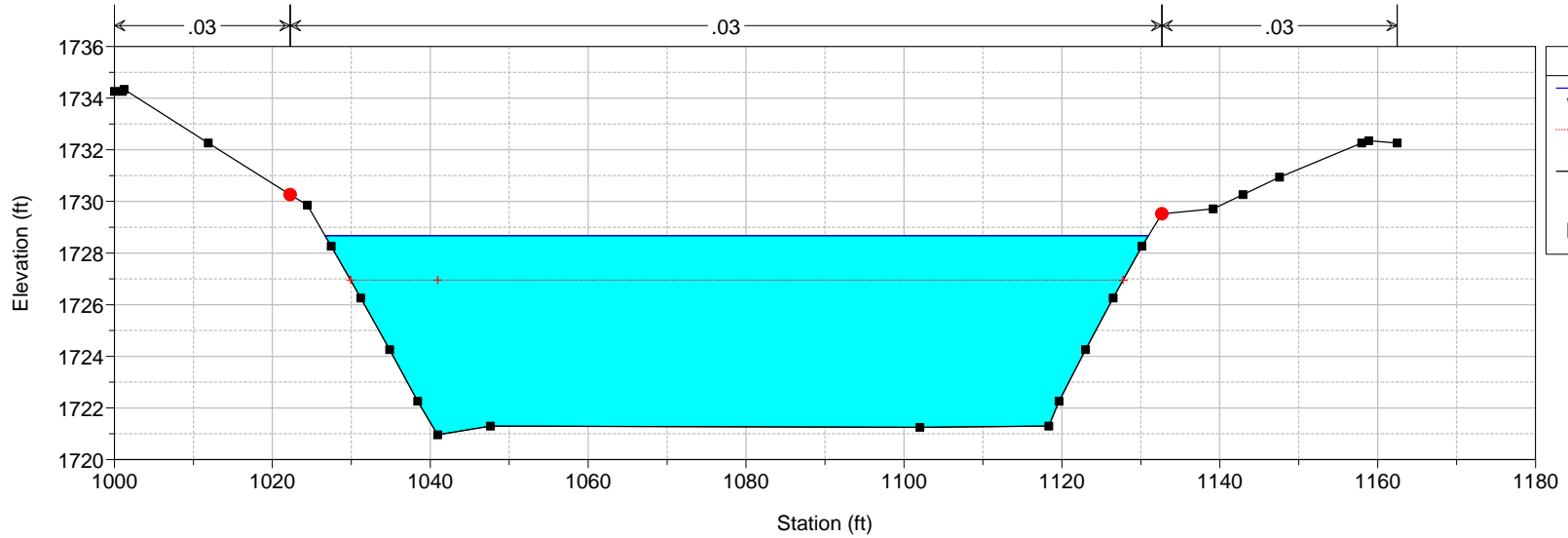
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 125 BR Nellis Blvd Bridge.





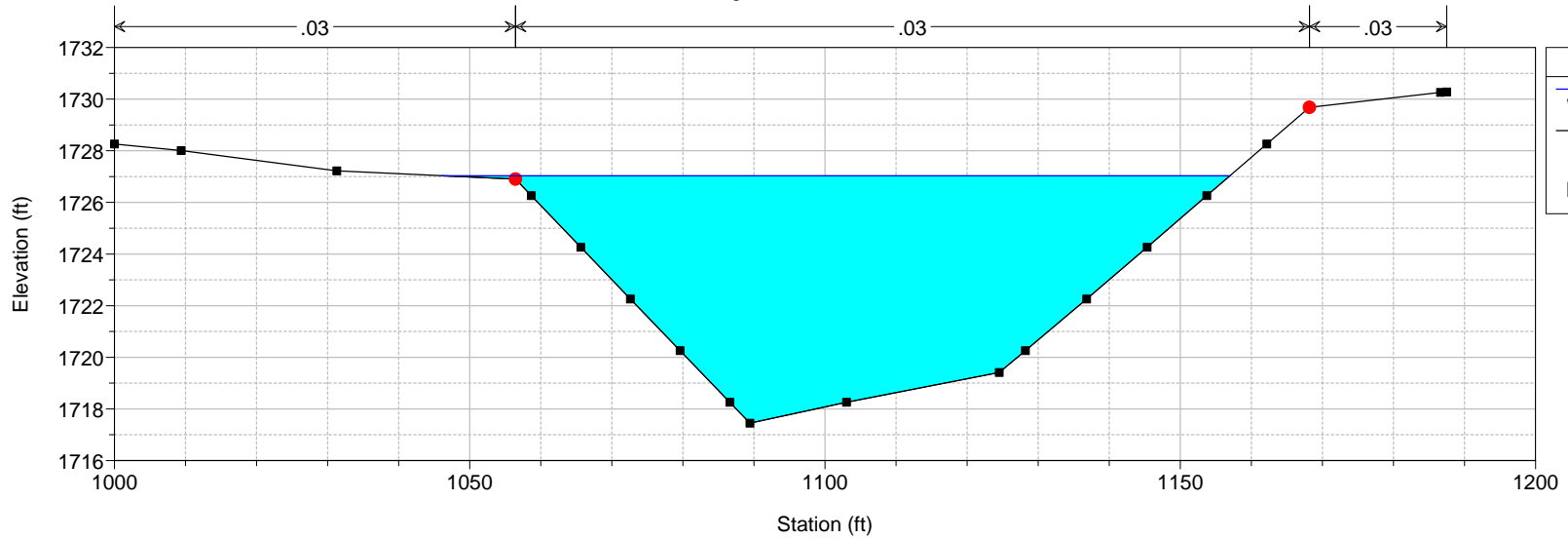
FlamWashPre Plan: Pre-Project 8/9/2013

River = Flamingo Reach = Flam Wash RS = 100

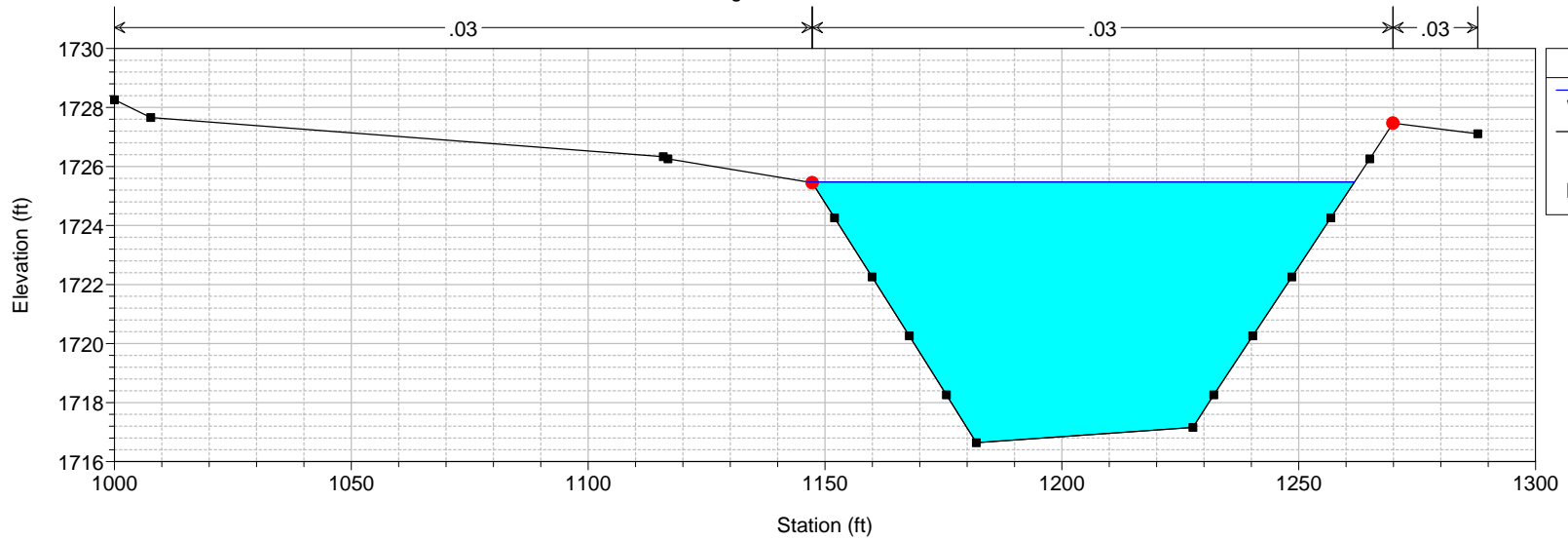


FlamWashPre Plan: Pre-Project 8/9/2013

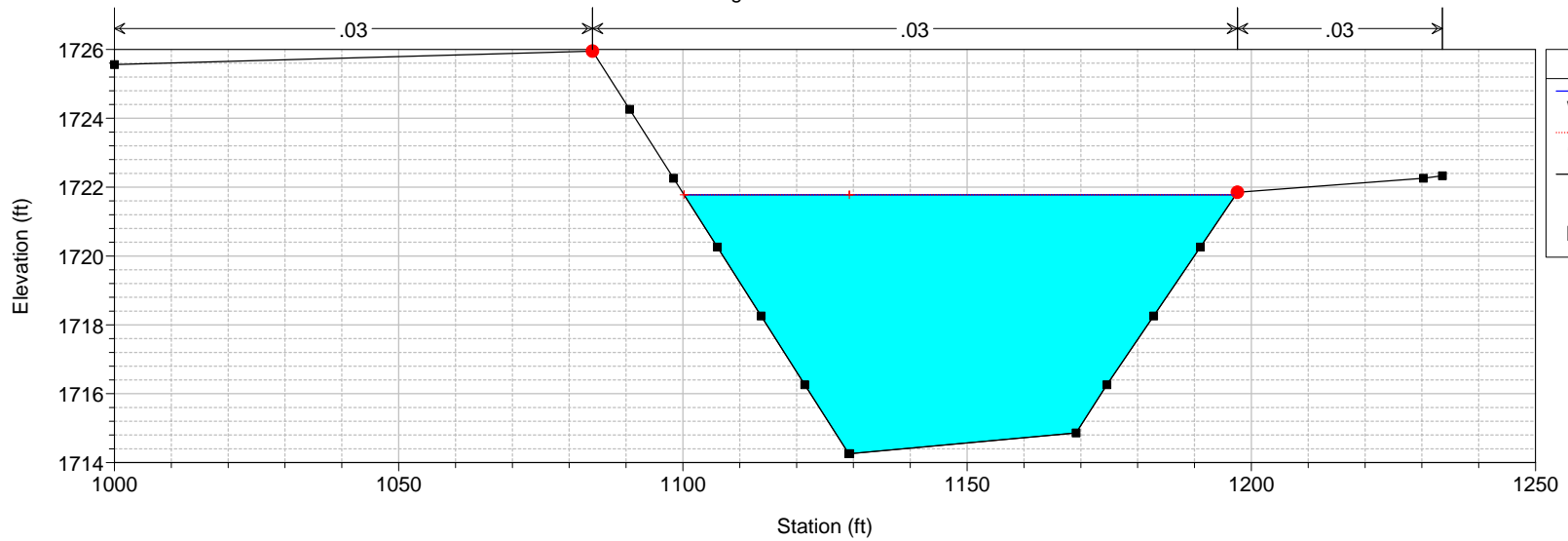
River = Flamingo Reach = Flam Wash RS = 90

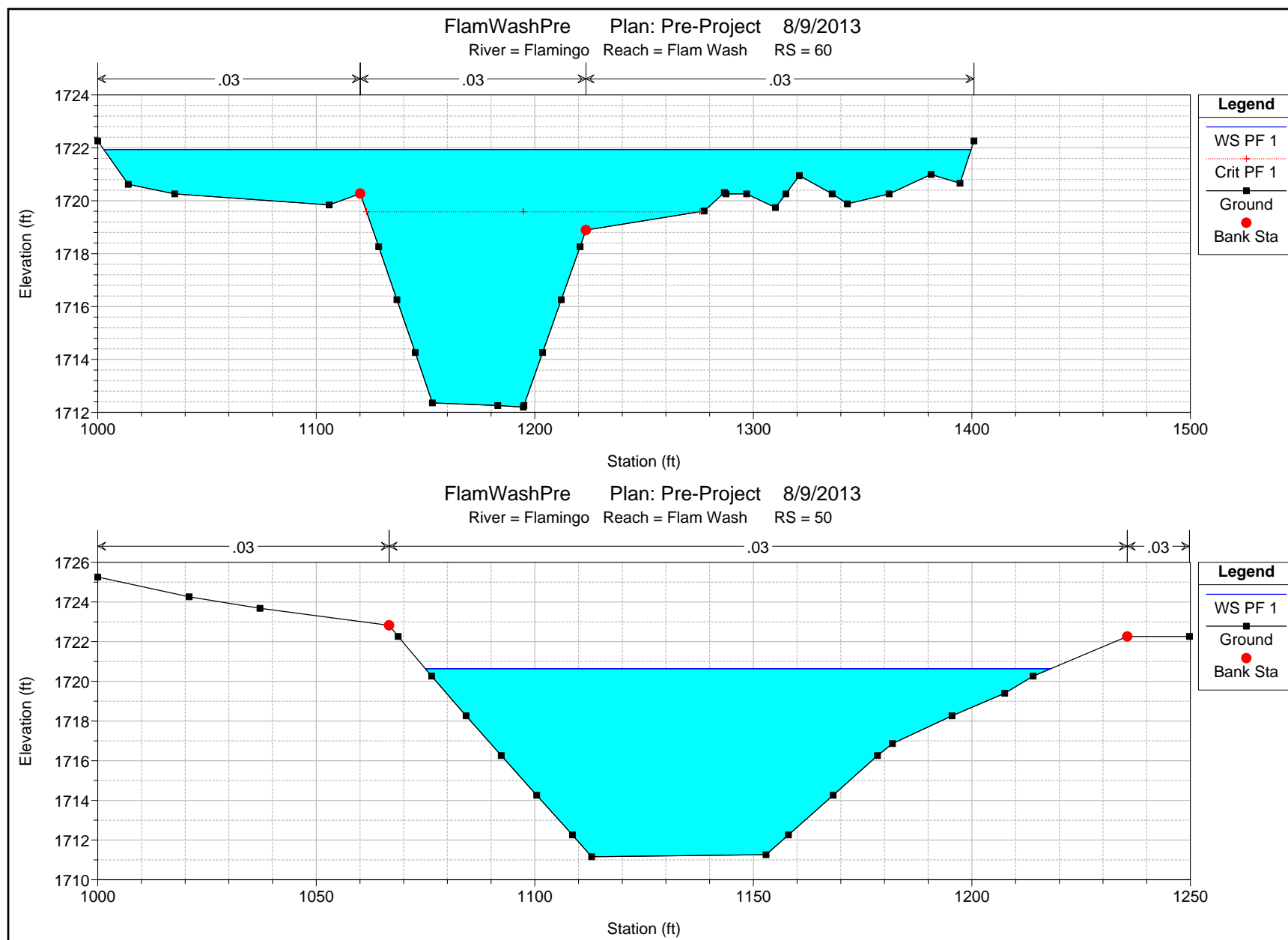


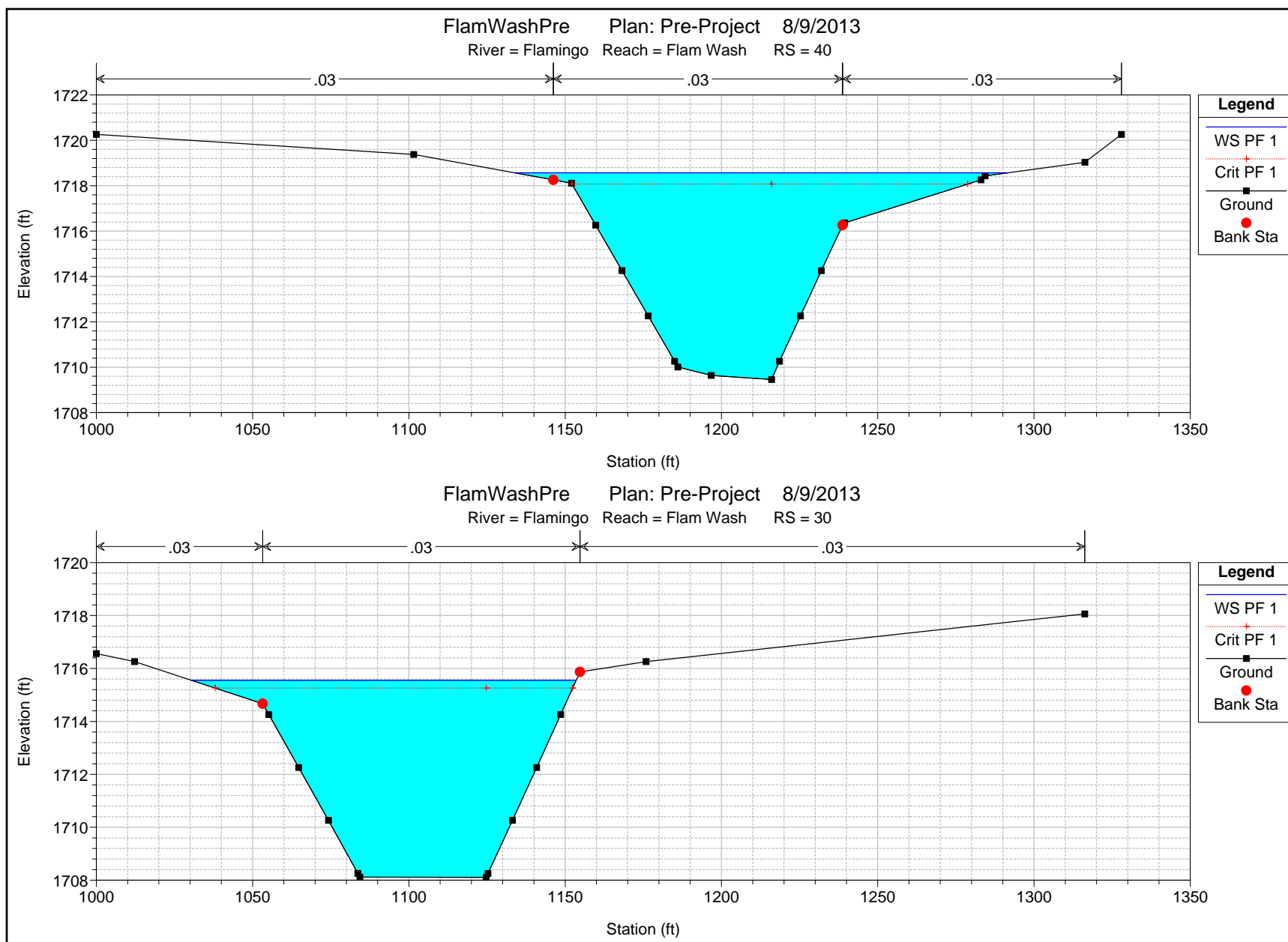
FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 80

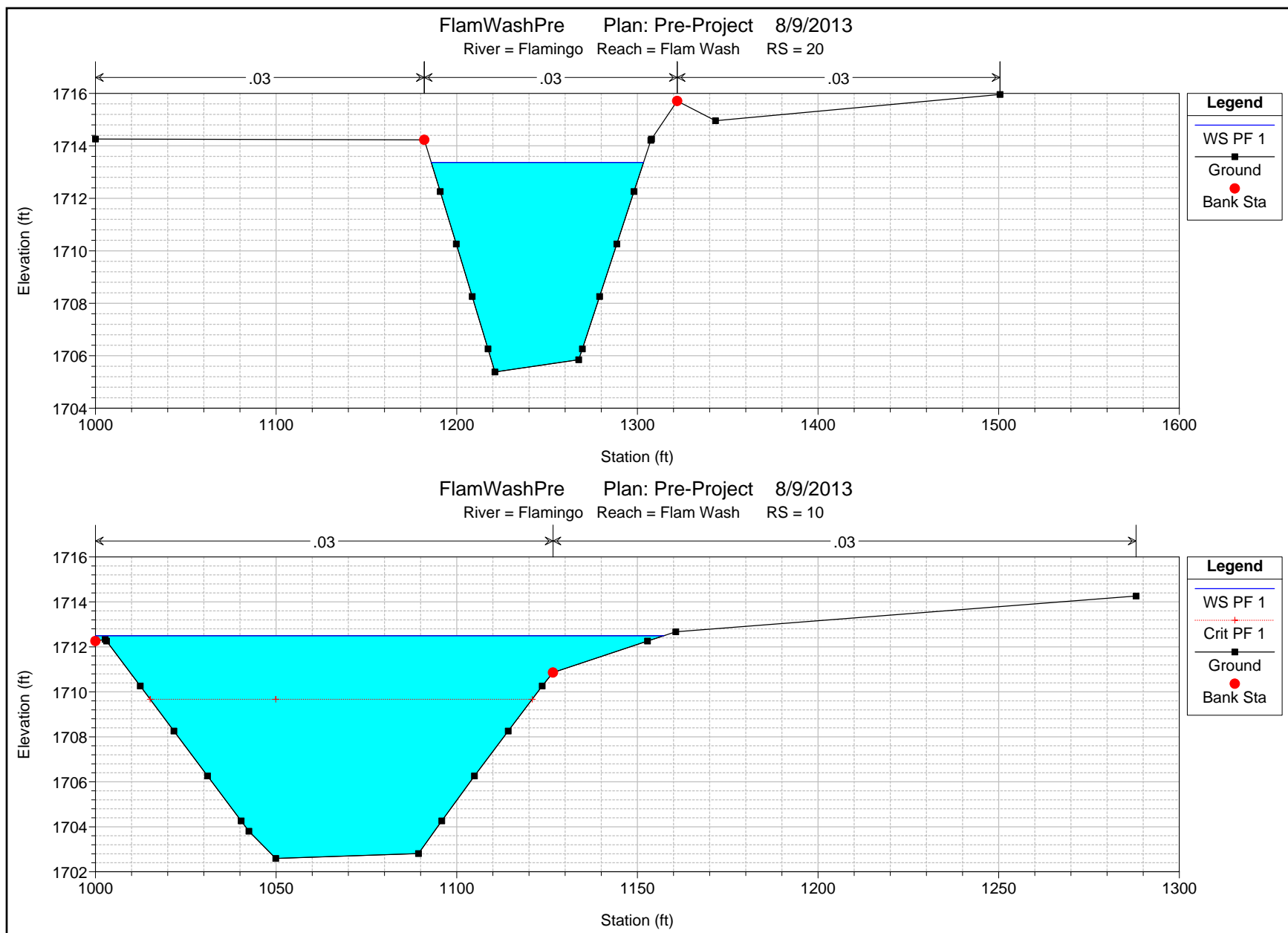


FlamWashPre Plan: Pre-Project 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70









HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```

X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X
X   X   X       X   X   X   X   X   X
XXXXXXX XXXX   X       XXX XXXX XXXXXX XXXX
X   X   X       X   X   X   X   X   X
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X   X   XXXXXX   XXXX   X   X   X   X   XXXXX

```

PROJECT DATA
Project Title: FlamWashPre
Project File : FlamWashPre.prj
Run Date and Time: 8/9/2013 5:32:08 AM

Project in English units

Project Description:
FLAMINGO WASH
PRE-PROJECT CONDITIONS MODEL
DATUM - NAVD88
FILE;
FlamWashPre.prj
STARTING WSE = NORMAL DEPTH
MIXED FLOW RUN (ENGINEERED
CHANNEL FROM I-515 TO NELLIS)
FLAMINGO WASH FIS RESTUDY
PHASE
1,2,3 OF FLAMINGO WASH INCLUDED
FLAMINGO I-515 TO NELLIS
NELLIS
BLVD BRIDGE INVERT
MODEL IS ALSO THE POST-PROJECT CONDITIONS FOR THE FLAMINGO
WASH LOMR BETWEEN I-515 AND NELLIS BOULEVARD FOR THE RECENTLY COMPLETE CONCRETE
LINED CHANNEL

PLAN DATA

Plan Title: Pre-Project
Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Pre-Project\FlamWashPre.p01

Geometry Title: Flamingo Pre
Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Pre-
Project\FlamWashPre.g01

Flow Title : FlamWashPRE
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Pre-
Project\FlamWashPre.f04

Plan Summary Information:
Number of: Cross Sections = 32 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FlamWashPRE
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Pre-Project\FlamWashPre.f04

Flow Data (cfs)

River	Reach	RS	PF 1
Flamingo	Flam Wash	390	6300
Flamingo	Flam Wash	135	6400

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Flamingo	Flam Wash	PF 1	Normal S = 0.013	Normal S = 0.0019

GEOMETRY DATA

Geometry Title: Flamingo Pre
 Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Pre-Project\FlamWashPre.g01

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 390

INPUT

Description: Ex. Concrete Channel Upstream of I-515

Station Elevation Data		num=	10				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001796.847		1001786.847		116.751786.512		133.51786.847	
136.51796.847		136.51786.847		153.251786.512		1701786.847	
						1701796.847	

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
100	.02	100	.015	170	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		420.9	420.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1799.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1790.54	Reach Len. (ft)	420.90	420.90	420.90
Crit W.S. (ft)	1793.18	Flow Area (sq ft)		258.71	
E.G. Slope (ft/ft)	0.013014	Area (sq ft)		258.71	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	24.35	Avg. Vel. (ft/s)		24.35	
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)		3.86	
Conv. Total (cfs)	55225.4	Conv. (cfs)		55225.4	
Length Wtd. (ft)	420.90	Wetted Per. (ft)		81.79	
Min Ch El (ft)	1786.51	Shear (lb/sq ft)		2.57	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.41	126.85	4.49
C & E Loss (ft)		Cum SA (acres)	1.82	25.60	2.66

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 380

INPUT

Description: Ex. Concrete Channel Upstream of I-515

Station Elevation Data		num=	10				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001794.344		1001784.344		116.751784.009		133.51784.344	
136.51794.344		136.51784.344		153.251784.009		1701784.344	
						1701794.344	

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
100	.02	100	.015	170	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		170 170.96	173	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1794.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1788.97	Reach Len. (ft)	170.00	170.96	173.00
Crit W.S. (ft)	1790.68	Flow Area (sq ft)		321.01	
E.G. Slope (ft/ft)	0.006727	Area (sq ft)		321.01	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	19.63	Avg. Vel. (ft/s)		19.63	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		4.79	
Conv. Total (cfs)	76810.7	Conv. (cfs)		76810.7	
Length Wtd. (ft)	170.96	Wetted Per. (ft)		85.51	
Min Ch El (ft)	1784.01	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	3.83	Cum Volume (acre-ft)	2.41	124.05	4.49
C & E Loss (ft)	0.97	Cum SA (acres)	1.82	24.95	2.66

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 370

INPUT

Description: Ex. Concrete Channel Upstream of I-515

Station Elevation Data		num=	10				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1001790.899		1001780.899		116.751780.564		133.51780.899	
136.51790.899		136.51780.899		153.251780.564		1701780.899	
						1701790.899	

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
100	.02	100	.015	170	.02		

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
100	170		222 232.15	238	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1793.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.76	Reach Len. (ft)	222.00	232.15	238.00
Crit W.S. (ft)	1787.23	Flow Area (sq ft)		269.93	
E.G. Slope (ft/ft)	0.011420	Area (sq ft)		269.93	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	23.34	Avg. Vel. (ft/s)		23.34	
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)		4.03	
Conv. Total (cfs)	58953.5	Conv. (cfs)		58953.5	
Length Wtd. (ft)	232.15	Wetted Per. (ft)		82.46	
Min Ch El (ft)	1780.56	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	1.47	Cum Volume (acre-ft)	2.41	122.89	4.49
C & E Loss (ft)	0.25	Cum SA (acres)	1.82	24.69	2.66

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 360

INPUT

Description: Ex. Concrete Channel Downstream of I-515

Station Elevation Data	num=	10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
100 1789.74 100 1779.74 116.751779.405 133.5 1779.74 133.5 1789.74		
136.5 1789.74 136.5 1779.74 153.251779.405 170 1779.74 170 1789.74		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
100 .02 100 .015 170 .02		

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
100	170		323 314.29	310	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1790.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.27	Reach Len. (ft)	323.00	314.29	310.00
Crit W.S. (ft)	1786.07	Flow Area (sq ft)		314.92	
E.G. Slope (ft/ft)	0.007130	Area (sq ft)		314.92	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	20.01	Avg. Vel. (ft/s)		20.01	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		4.70	
Conv. Total (cfs)	74610.9	Conv. (cfs)		74610.9	
Length Wtd. (ft)	314.29	Wetted Per. (ft)		85.14	
Min Ch El (ft)	1779.41	Shear (lb/sq ft)		1.65	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	2.07	Cum Volume (acre-ft)	2.41	121.33	4.49
C & E Loss (ft)	0.67	Cum SA (acres)	1.82	24.33	2.66

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 350

INPUT

Description: Ex. Concrete Channel Downstream of I-515

Station Elevation Data	num=	10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1001788.169 1001778.169 116.751777.834 133.51778.169 133.51788.169		
136.51788.169 136.51778.169 153.251777.834 1701778.169 1701788.169		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
100 .02 100 .015 170 .02		

Bank Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
100	170		439 436.71	435	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1788.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1783.25	Reach Len. (ft)	439.00	436.71	435.00
Crit W.S. (ft)	1784.50	Flow Area (sq ft)		351.38	
E.G. Slope (ft/ft)	0.005118	Area (sq ft)		351.38	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	17.93	Avg. Vel. (ft/s)		17.93	
Max Chl Dpth (ft)	5.41	Hydr. Depth (ft)		5.24	
Conv. Total (cfs)	88062.1	Conv. (cfs)		88062.1	
Length Wtd. (ft)	436.71	Wetted Per. (ft)		87.32	

Min Ch El (ft)	1777.83	Shear (lb/sq ft)		1.29	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	1.89	Cum Volume (acre-ft)	2.41	118.93	4.49
C & E Loss (ft)	0.37	Cum SA (acres)	1.82	23.85	2.66

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 341

INPUT

Description: Ex. Concrete Channel Downstream of I-515 - "AB" 21+37.2

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1784.3	100	1776.04	135	1775.34	170	1776.04
						170	1784.3

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		1268.87	1268.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.45	Wt. n-Val.		0.015	
W.S. Elev (ft)	1780.49	Reach Len. (ft)	1268.87	1268.87	1268.87
Crit W.S. (ft)	1782.00	Flow Area (sq ft)		336.21	
E.G. Slope (ft/ft)	0.005181	Area (sq ft)		336.21	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	18.74	Avg. Vel. (ft/s)		18.74	
Max Chl Dpth (ft)	5.15	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	87525.8	Conv. (cfs)		87525.8	
Length Wtd. (ft)	1268.87	Wetted Per. (ft)		78.92	
Min Ch El (ft)	1775.34	Shear (lb/sq ft)		1.38	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)	2.41	115.48	4.49
C & E Loss (ft)	0.05	Cum SA (acres)	1.82	23.16	2.66

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 313

INPUT

Description: "AB" 34+06.10

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1781.08	100	1771.58	135	1770.88	170	1771.58
						170	1781.08

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		255	255	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1780.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1777.11	Reach Len. (ft)	255.00	255.00	255.00
Crit W.S. (ft)	1777.54	Flow Area (sq ft)		411.34	
E.G. Slope (ft/ft)	0.002741	Area (sq ft)		411.34	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	15.32	Avg. Vel. (ft/s)		15.32	
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	120323.6	Conv. (cfs)		120323.6	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		81.07	
Min Ch El (ft)	1770.88	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	4.66	Cum Volume (acre-ft)	2.41	104.59	4.49
C & E Loss (ft)	0.54	Cum SA (acres)	1.82	21.12	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 311

INPUT

Description: "AB" 36+61.10

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1777.36	0	1770.9	52	1769.86	104	1770.9
						104	1777.36

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		50.42	50.42	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1779.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1773.50	Reach Len. (ft)	50.42	50.42	50.42
Crit W.S. (ft)	1775.23	Flow Area (sq ft)		324.00	
E.G. Slope (ft/ft)	0.009038	Area (sq ft)		324.00	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	19.44	Avg. Vel. (ft/s)		19.44	
Max Chl Dpth (ft)	3.64	Hydr. Depth (ft)		3.12	
Conv. Total (cfs)	66266.4	Conv. (cfs)		66266.4	
Length Wtd. (ft)	50.42	Wetted Per. (ft)		109.21	
Min Ch El (ft)	1769.86	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	1.16	Cum Volume (acre-ft)	2.41	102.44	4.49
C & E Loss (ft)	0.22	Cum SA (acres)	1.82	20.61	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 305

INPUT

Description: = "AB" 37+11.52

Station Elevation Data		num=		5	
Sta	Elev	Sta	Elev	Sta	Elev
0	1778.22	0	1770.3	52	1769.22
				104	1770.3
				104	1778.22

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		109.41	109.41	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1778.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1772.83	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1774.59	Flow Area (sq ft)		318.92	
E.G. Slope (ft/ft)	0.009511	Area (sq ft)		318.92	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	19.75	Avg. Vel. (ft/s)		19.75	
Max Chl Dpth (ft)	3.61	Hydr. Depth (ft)		3.07	
Conv. Total (cfs)	64598.1	Conv. (cfs)		64598.1	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		109.08	
Min Ch El (ft)	1769.22	Shear (lb/sq ft)		1.74	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	2.41	102.07	4.49
C & E Loss (ft)	0.02	Cum SA (acres)	1.82	20.49	2.66

BRIDGE

RIVER: Flamingo
 REACH: Flam Wash RS: 300

INPUT

Description: Lamb Blvd Bridge

Distance from Upstream XS = .1

Deck/Roadway Width = 102.55

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=		6	
Sta	Hi Cord	Lo Cord	Sta
0	1779.18	1775.18	25.54
			1779.18
			1775.18
128.56	1779.18	1775.18	128.56
			1779.18
			1775.18
			147.13
			1779.18
			1775.18

Upstream Bridge Cross Section Data		num=		5	
Sta	Elev	Sta	Elev	Sta	Elev
0	1778.22	0	1770.3	52	1769.22
				104	1770.3
				104	1778.22

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	0	104	.1	.3

Downstream Deck/Roadway Coordinates

num=		5	
Sta	Hi Cord	Lo Cord	Sta
0	1779.18	1775.18	47.98
			1779.18
			1775.18
147.13	1779.18	1775.18	151
			1779.18
			1775.18

Downstream Bridge Cross Section Data

Station Elevation Data		Sta		Elev		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1779.7	0	1769.2	52	1768.7	104	1769.2	104	1779.7				

Manning's n Values		Sta		Elev		Sta		Elev	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02				

Bank Sta: Left		Right		Coeff Contr.		Expan.	
0		104		.1		.3	

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 1779.18
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 8

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		10.88	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		22.63	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		34.38	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		46.13	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		57.88	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		69.63	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		81.38	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data

Pier Station		Upstream=		Downstream=	
Upstream	num=	2		93.13	
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy		Momentum		Cd		Yarnell		KVal	
					.29				.75

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
 Do not add Weight component to Momentum
 Class B flow critical depth computations use critical depth
 inside the bridge at the upstream end
 Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1778.89	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1772.83	E.G. Elev (ft)	1778.58	1776.97
Q Total (cfs)	6300.00	W.S. Elev (ft)	1773.73	1774.11
Q Bridge (cfs)	6300.00	Crit W.S. (ft)	1775.11	1774.31
Q Weir (cfs)		Max Chl Dpth (ft)	4.51	5.41
Weir Sta Lft (ft)		Vel Total (ft/s)	17.68	13.57
Weir Sta Rgt (ft)		Flow Area (sq ft)	356.38	464.31
Weir Submerg		Froude # Chl	1.57	1.05
Weir Max Depth (ft)		Specif Force (cu ft)	4126.75	3992.27
Min El Weir Flow (ft)	1779.19	Hydr Depth (ft)	3.96	5.16
Min El Prs (ft)	1775.18	W.P. Total (ft)	161.19	182.82
Delta EG (ft)	1.78	Conv. Total (cfs)	59914.3	85619.6
Delta WS (ft)	0.38	Top Width (ft)	90.00	90.00
BR Open Area (sq ft)	487.08	Frctn Loss (ft)		
BR Open Vel (ft/s)	17.68	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.53	0.86
Br Sel Method	Momentum	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 295

INPUT

Description: = "AB" 38+20.93

Station Elevation Data		num=	5
Sta	Elev	Sta	Elev
0	1779.7	0	1769.2
52	1768.7	104	1769.2
104	1779.7		

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.02	0	.015
104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104	15.01	15.01	15.01	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1777.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1772.45	Reach Len. (ft)	15.01	15.01	15.01
Crit W.S. (ft)	1773.78	Flow Area (sq ft)		363.84	
E.G. Slope (ft/ft)	0.006238	Area (sq ft)		363.84	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	17.32	Avg. Vel. (ft/s)		17.32	
Max Chl Dpth (ft)	3.75	Hydr. Depth (ft)		3.50	
Conv. Total (cfs)	79768.6	Conv. (cfs)		79768.6	
Length Wtd. (ft)	15.01	Wetted Per. (ft)		110.50	
Min Ch El (ft)	1768.70	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.41	102.07	4.49
C & E Loss (ft)		Cum SA (acres)	1.82	20.49	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 285

INPUT

Description: = Sta. 38+35.94 Add Roughness Elements

Station Elevation Data		num=	5
Sta	Elev	Sta	Elev
0	1778.27	0	1769.27
52	1768.19	104	1769.27
104	1778.29		

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.02	0	.055
104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104	9	9	9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1776.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.61	Wt. n-Val.		0.055	
W.S. Elev (ft)	1772.25	Reach Len. (ft)	9.00	9.00	9.00
Crit W.S. (ft)	1773.58	Flow Area (sq ft)		365.74	
E.G. Slope (ft/ft)	0.081892	Area (sq ft)		365.74	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	17.23	Avg. Vel. (ft/s)		17.23	
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)		3.52	
Conv. Total (cfs)	22015.1	Conv. (cfs)		22015.1	

Length Wtd. (ft)	9.00	Wetted Per. (ft)	109.98		
Min Ch El (ft)	1768.19	Shear (lb/sq ft)	17.00		
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	2.41	101.94	4.49
C & E Loss (ft)	0.01	Cum SA (acres)	1.82	20.46	2.66

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 284

INPUT

Description: = Sta. 38+44.94 Begin 104'x9' Rect. Channel with Roughness Elements

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1776	0	1768.73	52	1767.96	104	1768.73
						104	1776

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
0	.02	0	.055	104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		201	201	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1775.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.71	Wt. n-Val.		0.055	
W.S. Elev (ft)	1772.27	Reach Len. (ft)	201.00	201.00	201.00
Crit W.S. (ft)	1773.18	Flow Area (sq ft)		407.67	
E.G. Slope (ft/ft)	0.057796	Area (sq ft)		407.67	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	15.45	Avg. Vel. (ft/s)		15.45	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)		3.92	
Conv. Total (cfs)	26205.4	Conv. (cfs)		26205.4	
Length Wtd. (ft)	201.00	Wetted Per. (ft)		111.08	
Min Ch El (ft)	1767.96	Shear (lb/sq ft)		13.24	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	2.41	101.86	4.49
C & E Loss (ft)	0.27	Cum SA (acres)	1.82	20.43	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 246

INPUT

Description: = Sta. 40+45.94 End Roughness Elements

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1767.59	0	1756.67	52	1755.59	104	1756.67
						104	1767.59

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val		
0	.02	0	.015	104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		476.43	476.43	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1768.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1758.51	Reach Len. (ft)	476.43	476.43	476.43
Crit W.S. (ft)	1760.98	Flow Area (sq ft)		247.17	
E.G. Slope (ft/ft)	0.021870	Area (sq ft)		247.17	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	25.49	Avg. Vel. (ft/s)		25.49	
Max Chl Dpth (ft)	2.92	Hydr. Depth (ft)		2.38	
Conv. Total (cfs)	42600.7	Conv. (cfs)		42600.7	
Length Wtd. (ft)	476.43	Wetted Per. (ft)		107.70	
Min Ch El (ft)	1755.59	Shear (lb/sq ft)		3.13	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	6.74	Cum Volume (acre-ft)	2.41	100.35	4.49
C & E Loss (ft)	0.64	Cum SA (acres)	1.82	19.95	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 229

INPUT

Description: = Sta. 45+22.37 Transition Structure

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1762.08	0	1752.08	52	1751	104	1752.08
						104	1762.08

Manning's n Values		num=		3
Sta	n Val	Sta	n Val	Sta n Val
0	.02	0	.015	104 .02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	104		255 255	255		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.15	Wt. n-Val.		0.015	
W.S. Elev (ft)	1754.58	Reach Len. (ft)	255.00	255.00	255.00
Crit W.S. (ft)	1756.39	Flow Area (sq ft)		316.54	
E.G. Slope (ft/ft)	0.009746	Area (sq ft)		316.54	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	19.90	Avg. Vel. (ft/s)		19.90	
Max Chl Dpth (ft)	3.58	Hydr. Depth (ft)		3.04	
Conv. Total (cfs)	63814.4	Conv. (cfs)		63814.4	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		109.03	
Min Ch El (ft)	1751.00	Shear (lb/sq ft)		1.77	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	6.68	Cum Volume (acre-ft)	2.41	97.27	4.49
C & E Loss (ft)	1.18	Cum SA (acres)	1.82	18.82	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 222

INPUT

Description: = Sta. 47+77.37

Station Elevation Data		num=		5
Sta	Elev	Sta	Elev	Sta Elev
0	1752.05	0	1742.05	35 1741.35
				70 1742.05
				70 1752.05

Manning's n Values		num=		3
Sta	n Val	Sta	n Val	Sta n Val
0	.02	0	.015	70 .02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	70		1322.63 1322.63	1322.63		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1756.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1744.95	Reach Len. (ft)	1322.63	1322.63	1322.63
Crit W.S. (ft)	1748.01	Flow Area (sq ft)		227.51	
E.G. Slope (ft/ft)	0.018052	Area (sq ft)		227.51	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	27.69	Avg. Vel. (ft/s)		27.69	
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)		3.25	
Conv. Total (cfs)	46889.9	Conv. (cfs)		46889.9	
Length Wtd. (ft)	1322.63	Wetted Per. (ft)		75.81	
Min Ch El (ft)	1741.35	Shear (lb/sq ft)		3.38	
Alpha	1.00	Stream Power (lb/ft s)	70.00	0.00	0.00
Frctn Loss (ft)	3.30	Cum Volume (acre-ft)	2.41	95.68	4.49
C & E Loss (ft)	0.58	Cum SA (acres)	1.82	18.31	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 193

INPUT

Description: = Sta. 60+98.98

Station Elevation Data		num=		5
Sta	Elev	Sta	Elev	Sta Elev
0	1746.76	0	1736.76	35 1736.06
				70 1736.76
				70 1746.76

Manning's n Values		num=		3
Sta	n Val	Sta	n Val	Sta n Val
0	.02	0	.015	70 .02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	70		150 150	150		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1746.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1741.98	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	1742.72	Flow Area (sq ft)		389.79	
E.G. Slope (ft/ft)	0.003247	Area (sq ft)		389.79	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	16.16	Avg. Vel. (ft/s)		16.16	
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)		5.57	

Conv. Total (cfs)	110562.4	Conv. (cfs)	110562.4		
Length Wtd. (ft)	150.00	Wetted Per. (ft)	80.45		
Min Ch El (ft)	1736.06	Shear (lb/sq ft)	0.98		
Alpha	1.00	Stream Power (lb/ft s)	70.00	0.00	0.00
Frctn Loss (ft)	8.47	Cum Volume (acre-ft)	2.41	86.31	4.49
C & E Loss (ft)	2.36	Cum SA (acres)	1.82	16.18	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 191

INPUT
Description: = Sta. 62+50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1743.91	0	1736.36	45	1735.46	90	1736.36	90	1743.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	90	.02

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	90	2591.64	2591.64	2591.64	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1745.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1739.60	Reach Len. (ft)	2591.64	2591.64	2591.64
Crit W.S. (ft)	1741.23	Flow Area (sq ft)		332.05	
E.G. Slope (ft/ft)	0.007062	Area (sq ft)		332.05	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	18.97	Avg. Vel. (ft/s)		18.97	
Max Chl Dpth (ft)	4.14	Hydr. Depth (ft)		3.69	
Conv. Total (cfs)	74970.6	Conv. (cfs)		74970.6	
Length Wtd. (ft)	2591.64	Wetted Per. (ft)		96.50	
Min Ch El (ft)	1735.46	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)	90.00	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	2.41	85.06	4.49
C & E Loss (ft)	0.15	Cum SA (acres)	1.82	15.91	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 142

INPUT
Description: = Sta. 88+41.64
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.99	0	1725.99	45	1725.09	90	1733.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	90	.02

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	90	22.5	22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1730.48	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	1730.86	Flow Area (sq ft)		444.30	
E.G. Slope (ft/ft)	0.002767	Area (sq ft)		444.30	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	14.18	Avg. Vel. (ft/s)		14.18	
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)		4.94	
Conv. Total (cfs)	119758.2	Conv. (cfs)		119758.2	
Length Wtd. (ft)	22.50	Wetted Per. (ft)		98.99	
Min Ch El (ft)	1725.09	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)	90.00	0.00	0.00
Frctn Loss (ft)	10.85	Cum Volume (acre-ft)	2.41	61.97	4.49
C & E Loss (ft)	0.74	Cum SA (acres)	1.82	10.55	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 138

INPUT

Description: = Sta. 88+64.14

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.93	0	1725.93	46.5	1725	93	1725.93	93	1733.93

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	93	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	93		39.15	39.15		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1733.49	Element			
Vel Head (ft)	3.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1729.96	Reach Len. (ft)	39.15	39.15	39.15
Crit W.S. (ft)	1730.67	Flow Area (sq ft)		418.39	
E.G. Slope (ft/ft)	0.003477	Area (sq ft)		418.39	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	15.06	Avg. Vel. (ft/s)		15.06	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		4.50	
Conv. Total (cfs)	106843.6	Conv. (cfs)		106843.6	
Length Wtd. (ft)	39.15	Wetted Per. (ft)		101.09	
Min Ch El (ft)	1725.00	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	93.00	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	2.41	61.74	4.49
C & E Loss (ft)	0.04	Cum SA (acres)	1.82	10.50	2.66

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 135

INPUT

Description: = Sta. 89+02.27

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.77	0	1724.77	46.5	1723.84	93	1724.77	93	1732.77

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	93	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	93		12.25	12.25		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1733.16	Element			
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.13	Reach Len. (ft)	12.25	12.25	12.25
Crit W.S. (ft)	1729.56	Flow Area (sq ft)		355.52	
E.G. Slope (ft/ft)	0.006064	Area (sq ft)		355.52	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)		3.82	
Conv. Total (cfs)	82183.6	Conv. (cfs)		82183.6	
Length Wtd. (ft)	12.25	Wetted Per. (ft)		99.73	
Min Ch El (ft)	1723.84	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)	93.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	2.41	61.40	4.49
C & E Loss (ft)	0.15	Cum SA (acres)	1.82	10.42	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 131

INPUT

Description: = Sta. 89+15.54

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1731.47	0	1723.47	52.5	1723.47	105	1723.47	105	1731.47

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	105	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	105		114.06	114.06		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1732.92	Element			
Vel Head (ft)	6.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1726.46	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1728.32	Flow Area (sq ft)		313.86	
E.G. Slope (ft/ft)	0.010595	Area (sq ft)		313.86	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	105.00	Top Width (ft)		105.00	
Vel Total (ft/s)	20.39	Avg. Vel. (ft/s)		20.39	
Max Chl Dpth (ft)	2.99	Hydr. Depth (ft)		2.99	
Conv. Total (cfs)	62178.0	Conv. (cfs)		62178.0	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		110.98	

Min Ch El (ft)	1723.47	Shear (lb/sq ft)		1.87	
Alpha	1.00	Stream Power (lb/ft s)	105.00	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	2.41	61.30	4.49
C & E Loss (ft)	0.14	Cum SA (acres)	1.82	10.39	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE

RIVER: Flamingo
 REACH: Flam Wash RS: 125

INPUT

Description: Nellis Blvd Bridge.
 Distance from Upstream XS = .1
 Deck/Roadway Width = 113.9
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	1735.5	1728.97			105	1735	1728.97		

Upstream Bridge Cross Section Data
 Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1731.47	0	1723.47	52.5	1723.47	105	1723.47
						105	1731.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	105	.02

Bank Sta: Left Right Coeff Contr. Expan.
 0 105 .1 .3

Downstream Deck/Roadway Coordinates
 num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	1736	1728.27			600	1734.5	1728.27		

Downstream Bridge Cross Section Data
 Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.73	2.18	1732.85	3.68	1732.84	19.21	1732.92	19.59	1732.92
20.47	1732.89	23.29	1732.82	26	1732.74	28.61	1732.78	30.25	1732.8
32.22	1732.78	34.26	1732.79	44.06	1733.07	47.75	1733.09	49.7	1733.24
50.13	1733.27	53.02	1733.38	53.36	1733.4	56.07	1733.44	56.55	1733.46
56.94	1733.48	59.15	1733.5	59.53	1733.49	61.75	1733.44	62.18	1733.42
62.89	1733.32	68.41	1733	70.87	1732.86	71.42	1732.55	73.14	1732.41
82.64	1731.96	86.85	1731.65	88.25	1731.58	91.48	1731.4	92.2	1731.36
97.03	1731.03	98.11	1730.98	98.22	1730.97	98.62	1730.91	103.21	1730.56
103.87	1730.46	117.78	1729.09	117.89	1729.09	118.86	1729.12	118.97	1723.11
175.75	1722.86	224.99	1723.12	225.25	1729.53	226.22	1729.51	226.65	1729.51
240.16	1730.38	240.51	1730.39	241.38	1730.42	244.22	1730.47	244.44	1730.48
244.48	1730.48	244.54	1730.48	246.73	1730.55	246.89	1730.55	248.05	1730.58
249.94	1730.63	253.49	1730.72	255.34	1730.77	255.68	1730.83	257.47	1731.01
259.86	1731.05	262.53	1731.07	263.64	1731.1	264.63	1731.13	266.19	1731.18
269.69	1731.24	270.7	1731.19	270.94	1731.2	271.88	1731.22	273.03	1731.24
277.17	1731.49	280.98	1731.72	281.75	1731.78	282.88	1731.88	289.02	1732.02
292.33	1732.02	296.39	1732.03	299.85	1732.1	302.18	1732.03	307.73	1731.73
337.64	1731.27	341.77	1731.2	343.78	1731.06	381.35	1730.91	386.13	1730.74
386.92	1730.69	412.46	1730.65	414.96	1730.78	417.8	1730.82	420.32	1730.8
420.66	1730.8	425.91	1730.83	434.7	1730.72	441.78	1730.46	443.41	1730.36
443.77	1730.36	444.18	1730.35	444.7	1730.34	450	1730.29	451.05	1730.25
452.61	1730.17	454.64	1730.07	457.08	1729.93	457.9	1729.89	460.19	1729.72
461.86	1729.72	463.1	1729.71	463.57	1729.71				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.027	118.86	.015	225.25	.27	463.1	.027

Bank Sta: Left Right Coeff Contr. Expan.
 118.86 225.25 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data
 Pier Station Upstream= 35 Downstream= 157.17
 Upstream num= 2

Width	Elev	Width	Elev
3.5	1722	3.5	1732

 Downstream num= 2

Width	Elev	Width	Elev
3.5	1722	3.5	1732

Pier Data
 Pier Station Upstream= 70 Downstream= 192.17
 Upstream num= 2

Width	Elev	Width	Elev
3.5	1722	3.5	1732

 Downstream num= 2

Width	Elev	Width	Elev
3.5	1722	3.5	1732

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Momentum Cd = .29
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1732.92	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1726.46	E.G. Elev (ft)	1732.78	1731.34
Q Total (cfs)	6400.00	W.S. Elev (ft)	1726.80	1726.74
Q Bridge (cfs)	6400.00	Crit W.S. (ft)	1728.57	1728.05
Q Weir (cfs)		Max Chl Dpth (ft)	3.33	3.88
Weir Sta Lft (ft)		Vel Total (ft/s)	19.63	17.21
Weir Sta Rgt (ft)		Flow Area (sq ft)	325.99	371.80
Weir Submerg		Froude # Chl	1.90	1.57
Weir Max Depth (ft)		Specif Force (cu ft)	4442.25	4161.53
Min El Weir Flow (ft)	1735.01	Hydr Depth (ft)	3.33	3.75
Min El Prs (ft)	1728.97	W.P. Total (ft)	117.96	121.47
Delta EG (ft)	1.56	Conv. Total (cfs)	63594.9	77646.3
Delta WS (ft)	0.12	Top Width (ft)	98.00	99.23
BR Open Area (sq ft)	523.58	Frctn Loss (ft)		
BR Open Vel (ft/s)	19.63	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.75	1.30
Br Sel Method	Momentum	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 121

INPUT

Description: "FW" 10+62.12

Station Elevation Data	num=	113							
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 1732.73	2.18 1732.85	3.68 1732.84	19.21 1732.92	19.59 1732.92					
20.47 1732.89	23.29 1732.82	26 1732.74	28.61 1732.78	30.25 1732.8					
32.22 1732.78	34.26 1732.79	44.06 1733.07	47.75 1733.09	49.7 1733.24					
50.13 1733.27	53.02 1733.38	53.36 1733.4	56.07 1733.44	56.55 1733.46					
56.94 1733.48	59.15 1733.5	59.53 1733.49	61.75 1733.44	62.18 1733.42					
62.89 1733.32	68.41 1733	70.87 1732.86	71.42 1732.55	73.14 1732.41					
82.64 1731.96	86.85 1731.65	88.25 1731.58	91.48 1731.4	92.2 1731.36					
97.03 1731.03	98.11 1730.98	98.22 1730.97	98.62 1730.91	103.21 1730.56					
103.87 1730.46	117.78 1729.09	117.89 1729.09	118.86 1729.12	118.97 1723.11					
175.75 1722.86	224.99 1723.12	225.25 1729.53	226.22 1729.51	226.65 1729.51					
240.16 1730.38	240.51 1730.39	241.38 1730.42	244.22 1730.47	244.44 1730.48					
244.48 1730.48	244.54 1730.48	246.73 1730.55	246.89 1730.55	248.05 1730.58					
249.94 1730.63	253.49 1730.72	255.34 1730.77	255.68 1730.83	257.47 1731.01					
259.86 1731.05	262.53 1731.07	263.64 1731.1	264.63 1731.13	266.19 1731.18					
269.69 1731.24	270.7 1731.19	270.94 1731.2	271.88 1731.22	273.03 1731.24					
277.17 1731.49	280.98 1731.72	281.75 1731.78	282.88 1731.88	289.02 1732.02					
292.33 1732.02	296.39 1732.03	299.85 1732.1	302.18 1732.03	307.73 1731.73					
337.64 1731.27	341.77 1731.2	343.78 1731.06	381.35 1730.91	386.13 1730.74					
386.92 1730.69	412.46 1730.65	414.96 1730.78	417.8 1730.82	420.32 1730.8					
420.66 1730.8	425.91 1730.83	434.7 1730.72	441.78 1730.46	443.41 1730.36					
443.77 1730.36	444.18 1730.35	444.7 1730.34	450 1730.29	451.05 1730.25					
452.61 1730.17	454.64 1730.07	457.08 1729.93	457.9 1729.89	460.19 1729.72					
461.86 1729.72	463.1 1729.71	463.57 1729.71							

Manning's n Values	num=	4							
Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val	Sta n Val
0 .027	118.86 .015	225.25 .27	463.1 .027						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
118.86	225.25	114.76	115.8	119.31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.02	Wt. n-Val.		0.015	
W.S. Elev (ft)	1726.34	Reach Len. (ft)	114.76	115.80	119.31
Crit W.S. (ft)	1727.82	Flow Area (sq ft)		356.07	
E.G. Slope (ft/ft)	0.007083	Area (sq ft)		356.07	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	106.21	Top Width (ft)		106.21	
Vel Total (ft/s)	17.97	Avg. Vel. (ft/s)		17.97	
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)		3.35	
Conv. Total (cfs)	76044.8	Conv. (cfs)		76044.8	
Length Wtd. (ft)	115.80	Wetted Per. (ft)		112.48	
Min Ch El (ft)	1722.86	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)	463.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.41	61.30	4.49
C & E Loss (ft)		Cum SA (acres)	1.82	10.39	2.66

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 100

INPUT

Description:

Station Elevation Data		num= 25							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1734.26	1001	1734.26	1001.22	1734.34	1011.88	1732.26	1022.27	1730.26
1024.44	1729.86	1027.45	1728.26	1031.2	1726.26	1034.85	1724.26	1038.4	1722.26
1040.93	1720.96	1047.62	1721.3	1102.02	1721.25	1118.34	1721.3	1119.65	1722.26
1123	1724.26	1126.5	1726.26	1130.15	1728.26	1132.68	1729.52	1139.16	1729.71
1142.93	1730.26	1147.57	1730.94	1157.98	1732.26	1158.86	1732.35	1162.48	1732.26

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1022.27	.03	1132.68	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1022.27	1132.68		289.86	295.13	299.75	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.40	Wt. n-Val.		0.030	
W.S. Elev (ft)	1728.67	Reach Len. (ft)	289.86	295.13	299.75
Crit W.S. (ft)	1726.95	Flow Area (sq ft)		673.24	
E.G. Slope (ft/ft)	0.003222	Area (sq ft)		673.24	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	104.31	Top Width (ft)		104.31	
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)		9.51	
Max Chl Dpth (ft)	7.71	Hydr. Depth (ft)		6.45	
Conv. Total (cfs)	112750.5	Conv. (cfs)		112750.5	
Length Wtd. (ft)	295.13	Wetted Per. (ft)		108.28	
Min Ch El (ft)	1720.96	Shear (lb/sq ft)		1.25	
Alpha	1.00	Stream Power (lb/ft s)	1162.48	0.00	0.00
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	2.41	59.93	4.49
C & E Loss (ft)	0.04	Cum SA (acres)	1.82	10.11	2.66

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash

RS: 90

INPUT

Description:

Station Elevation Data		num= 20							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728.26	1009.38	1728.01	1031.29	1727.22	1056.45	1726.9	1058.67	1726.26
1065.64	1724.26	1072.62	1722.26	1079.6	1720.26	1086.6	1718.26	1089.42	1717.45
1103.03	1718.26	1124.51	1719.41	1128.2	1720.26	1136.83	1722.26	1145.32	1724.26
1153.73	1726.26	1162.18	1728.26	1168.18	1729.68	1186.62	1730.26	1187.5	1730.28

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1056.45	.03	1168.18	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1056.45	1168.18		495.14	482.19	465.14	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1728.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1727.03	Reach Len. (ft)	495.14	482.19	465.14
Crit W.S. (ft)		Flow Area (sq ft)	0.68	585.78	
E.G. Slope (ft/ft)	0.004781	Area (sq ft)	0.68	585.78	
Q Total (cfs)	6400.00	Flow (cfs)	0.38	6399.62	
Top Width (ft)	110.92	Top Width (ft)	10.38	100.54	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)	0.56	10.93	
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	0.07	5.83	
Conv. Total (cfs)	92563.7	Conv. (cfs)	5.5	92558.1	
Length Wtd. (ft)	482.19	Wetted Per. (ft)	10.38	102.81	
Min Ch El (ft)	1717.45	Shear (lb/sq ft)	0.02	1.70	
Alpha	1.00	Stream Power (lb/ft s)	1187.50	0.00	0.00
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	2.41	55.67	4.49
C & E Loss (ft)	0.15	Cum SA (acres)	1.79	9.42	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash

RS: 80

INPUT

Description:

Station Elevation Data		num= 18							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1728.26	1007.66	1727.66	1115.85	1726.33	1116.84	1726.26	1147.29	1725.45
1152.02	1724.26	1159.92	1722.26	1167.78	1720.26	1175.62	1718.26	1181.94	1716.64
1227.68	1717.16	1232.07	1718.26	1240.31	1720.26	1248.54	1722.26	1256.76	1724.26
1264.99	1726.26	1269.91	1727.47	1287.78	1727.11				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1147.29	.03	1269.91	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1147.29	1269.91	455.76	470.68	481.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1726.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1725.48	Reach Len. (ft)	455.76	470.68	481.96
Crit W.S. (ft)		Flow Area (sq ft)	0.01	686.82	
E.G. Slope (ft/ft)	0.003327	Area (sq ft)	0.01	686.82	
Q Total (cfs)	6400.00	Flow (cfs)	0.00	6400.00	
Top Width (ft)	115.54	Top Width (ft)	1.06	114.48	
Vel Total (ft/s)	9.32	Avg. Vel. (ft/s)	0.17	9.32	
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)	0.01	6.00	
Conv. Total (cfs)	110961.9	Conv. (cfs)	0.0	110961.8	
Length Wtd. (ft)	470.68	Wetted Per. (ft)	1.06	116.59	
Min Ch El (ft)	1716.64	Shear (lb/sq ft)	0.00	1.22	
Alpha	1.00	Stream Power (lb/ft s)	1287.78	0.00	0.00
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	2.40	48.63	4.49
C & E Loss (ft)	0.13	Cum SA (acres)	1.72	8.23	2.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 70

INPUT Description:

Station Elevation Data	num=	17
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1725.56 1084.1 1725.95 1090.63 1724.26 1098.35 1722.26 1106.05 1720.26		
1113.75 1718.26 1121.45 1716.26 1129.17 1714.26 1129.24 1714.26 1129.36 1714.26		
1169.17 1714.86 1174.59 1716.26 1182.8 1718.26 1191.03 1720.26 1197.56 1721.85		
1230.27 1722.26 1233.61 1722.33		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .03 1084.1 .03 1197.56 .03		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1084.1	1197.56	493.27	497.95	498.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1724.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.61	Wt. n-Val.		0.030	
W.S. Elev (ft)	1721.78	Reach Len. (ft)	493.27	497.95	498.08
Crit W.S. (ft)	1721.78	Flow Area (sq ft)		494.02	
E.G. Slope (ft/ft)	0.008008	Area (sq ft)		494.02	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	97.06	Top Width (ft)		97.06	
Vel Total (ft/s)	12.95	Avg. Vel. (ft/s)		12.95	
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	71518.3	Conv. (cfs)		71518.3	
Length Wtd. (ft)	497.78	Wetted Per. (ft)		98.87	
Min Ch El (ft)	1714.26	Shear (lb/sq ft)		2.50	
Alpha	1.00	Stream Power (lb/ft s)	1233.61	0.00	0.00
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	2.40	42.25	4.49
C & E Loss (ft)	0.62	Cum SA (acres)	1.72	7.09	2.66

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 60

INPUT Description:

Station Elevation Data	num=	31
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
1000 1722.26 1013.98 1720.62 1035.26 1720.26 1105.92 1719.84 1119.77 1720.26		
1120.01 1720.26 1120.14 1720.27 1128.57 1718.26 1136.9 1716.26 1145.29 1714.26		
1153.14 1712.36 1183.08 1712.26 1194.72 1712.2 1194.99 1712.26 1203.55 1714.26		
1212.13 1716.26 1220.71 1718.26 1223.41 1718.89 1277.47 1719.61 1286.74 1720.31		
1287.48 1720.26 1296.95 1720.26 1310.09 1719.74 1314.87 1720.26 1321.04 1720.95		
1336.07 1720.26 1343.02 1719.88 1362.12 1720.26 1381.28 1720.99 1394.59 1720.66		
1400.91 1722.26		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
1000 .03 1120.14 .03 1223.41 .03		

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1120.14	1223.41	499.62	499.27	502.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1722.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	1721.94	Reach Len. (ft)	499.62	499.27	502.10
Crit W.S. (ft)	1719.58	Flow Area (sq ft)	199.08	769.61	335.05
E.G. Slope (ft/ft)	0.001219	Area (sq ft)	199.08	769.61	335.05
Q Total (cfs)	6400.00	Flow (cfs)	489.40	5022.46	888.14
Top Width (ft)	396.85	Top Width (ft)	117.37	103.27	176.22
Vel Total (ft/s)	4.91	Avg. Vel. (ft/s)	2.46	6.53	2.65
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)	1.70	7.45	1.90
Conv. Total (cfs)	183316.4	Conv. (cfs)	14017.9	143859.3	25439.2
Length Wtd. (ft)	499.48	Wetted Per. (ft)	117.46	104.97	176.53
Min Ch El (ft)	1712.20	Shear (lb/sq ft)	0.13	0.56	0.14
Alpha	1.45	Stream Power (lb/ft s)	1400.91	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	1.28	35.02	2.57
C & E Loss (ft)	0.04	Cum SA (acres)	1.05	5.94	1.65

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 50

INPUT

Description:

Station	Elev	Data	num=	21					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1725.26	1020.92	1724.26	1037.11	1723.68	1066.67	1722.82	1068.75	1722.26
1076.4	1720.26	1084.26	1718.26	1092.32	1716.26	1100.45	1714.26	1108.62	1712.26
1112.98	1711.16	1152.91	1711.26	1158.04	1712.26	1168.25	1714.26	1178.41	1716.26
1181.82	1716.86	1195.46	1718.26	1207.5	1719.4	1214.02	1720.26	1235.55	1722.26
1249.78	1722.26								

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1066.67	.03	1235.55	.03

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1066.67	1235.55		334.29	305.6	277.63		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1721.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.		0.030	
W.S. Elev (ft)	1720.64	Reach Len. (ft)	334.29	305.60	277.63
Crit W.S. (ft)		Flow Area (sq ft)		816.92	
E.G. Slope (ft/ft)	0.002496	Area (sq ft)		816.92	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	143.13	Top Width (ft)		143.13	
Vel Total (ft/s)	7.83	Avg. Vel. (ft/s)		7.83	
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	128092.0	Conv. (cfs)		128092.0	
Length Wtd. (ft)	305.15	Wetted Per. (ft)		145.04	
Min Ch El (ft)	1711.16	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)	1249.78	0.00	0.00
Frctn Loss (ft)	1.03	Cum Volume (acre-ft)	0.13	25.93	0.64
C & E Loss (ft)	0.09	Cum SA (acres)	0.38	4.53	0.64

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 40

INPUT

Description:

Station	Elev	Data	num=	20					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1720.26	1101.53	1719.38	1146.2	1718.26	1152.03	1718.11	1159.77	1716.26
1168.18	1714.26	1176.59	1712.26	1185.01	1710.26	1186.07	1710.01	1196.73	1709.64
1216.01	1709.46	1218.57	1710.26	1225.27	1712.26	1231.97	1714.26	1238.76	1716.26
1239.39	1716.36	1283.03	1718.26	1284.32	1718.43	1316.26	1719.03	1327.96	1720.26

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1146.2	.03	1238.76	.03

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	1146.2	1238.76		500.14	491.57	481.13		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.89	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	1718.57	Reach Len. (ft)	500.14	491.57	481.13
Crit W.S. (ft)	1718.08	Flow Area (sq ft)	1.91	552.39	57.21
E.G. Slope (ft/ft)	0.004863	Area (sq ft)	1.91	552.39	57.21
Q Total (cfs)	6400.00	Flow (cfs)	1.91	6190.32	207.78
Top Width (ft)	157.92	Top Width (ft)	12.36	92.56	53.00
Vel Total (ft/s)	10.47	Avg. Vel. (ft/s)	1.00	11.21	3.63
Max Chl Dpth (ft)	9.11	Hydr. Depth (ft)	0.15	5.97	1.08
Conv. Total (cfs)	91780.0	Conv. (cfs)	27.3	88773.0	2979.7
Length Wtd. (ft)	491.42	Wetted Per. (ft)	12.36	94.51	53.06

Min Ch El (ft)	1709.46	Shear (lb/sq ft)	0.05	1.77	0.33
Alpha	1.11	Stream Power (lb/ft s)	1327.96	0.00	0.00
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	0.13	21.13	0.46
C & E Loss (ft)	0.03	Cum SA (acres)	0.33	3.70	0.47

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 30

INPUT

Description:

Station Elevation Data		num= 16							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1716.56	1012.26	1716.26	1053.23	1714.67	1055.19	1714.26	1064.74	1712.26
1074.25	1710.26	1083.68	1708.26	1084.33	1708.12	1124.71	1708.11	1125.31	1708.26
1133.14	1710.26	1140.87	1712.26	1148.55	1714.26	1154.72	1715.87	1175.89	1716.26
1316.21	1718.06								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1053.23	.03	1154.72	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1053.23	1154.72		494.86	498.03	503.84	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.18	Wt. n-Val.	0.030	0.030	
W.S. Elev (ft)	1715.56	Reach Len. (ft)	494.86	498.03	503.84
Crit W.S. (ft)	1715.26	Flow Area (sq ft)	10.16	537.51	
E.G. Slope (ft/ft)	0.006250	Area (sq ft)	10.16	537.51	
Q Total (cfs)	6400.00	Flow (cfs)	23.13	6376.87	
Top Width (ft)	123.17	Top Width (ft)	22.88	100.29	
Vel Total (ft/s)	11.69	Avg. Vel. (ft/s)	2.28	11.86	
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)	0.44	5.36	
Conv. Total (cfs)	80955.6	Conv. (cfs)	292.6	80663.0	
Length Wtd. (ft)	498.02	Wetted Per. (ft)	22.89	101.92	
Min Ch El (ft)	1708.11	Shear (lb/sq ft)	0.17	2.06	
Alpha	1.03	Stream Power (lb/ft s)	1316.21	0.00	0.00
Frctn Loss (ft)	2.61	Cum Volume (acre-ft)	0.06	14.98	0.14
C & E Loss (ft)	0.18	Cum SA (acres)	0.13	2.61	0.18

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 20

INPUT

Description:

Station Elevation Data		num= 17							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1714.26	1182.02	1714.23	1190.86	1712.26	1199.75	1710.26	1208.56	1708.26
1217.31	1706.26	1221.12	1705.38	1267.53	1705.85	1269.51	1706.26	1279.06	1708.26
1288.6	1710.26	1298.12	1712.26	1307.42	1714.21	1307.8	1714.26	1322.04	1715.71
1343.21	1714.96	1500.75	1715.96						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1182.02	.03	1322.04	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	1182.02	1322.04		483.22	488.53	497.54	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.58	Wt. n-Val.		0.030	
W.S. Elev (ft)	1713.37	Reach Len. (ft)	483.22	488.53	497.54
Crit W.S. (ft)		Flow Area (sq ft)		634.74	
E.G. Slope (ft/ft)	0.004456	Area (sq ft)		634.74	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	117.52	Top Width (ft)		117.52	
Vel Total (ft/s)	10.08	Avg. Vel. (ft/s)		10.08	
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		5.40	
Conv. Total (cfs)	95871.7	Conv. (cfs)		95871.7	
Length Wtd. (ft)	488.56	Wetted Per. (ft)		119.20	
Min Ch El (ft)	1705.38	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)	1500.75	0.00	0.00
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)		8.28	0.14
C & E Loss (ft)	0.21	Cum SA (acres)		1.37	0.18

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 10

INPUT

Description:

Station Elevation Data		num= 18									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1712.26	1002.71	1712.33	1003.06	1712.26	1012.39	1710.26	1021.7	1708.26		
1031.01	1706.26	1040.32	1704.26	1042.48	1703.8	1049.9	1702.59	1089.4	1702.81		
1095.84	1704.26	1104.89	1706.26	1114.24	1708.26	1123.66	1710.26	1126.64	1710.86		
1152.79	1712.26	1160.64	1712.67	1288.04	1714.26						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1000	.03	1126.64	.03

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	1000	1126.64		0	0		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.030	0.030
W.S. Elev (ft)	1712.50	Reach Len. (ft)			
Crit W.S. (ft)	1709.67	Flow Area (sq ft)		841.28	25.07
E.G. Slope (ft/ft)	0.001903	Area (sq ft)		841.28	25.07
Q Total (cfs)	6400.00	Flow (cfs)		6352.73	47.27
Top Width (ft)	157.34	Top Width (ft)		126.64	30.70
Vel Total (ft/s)	7.39	Avg. Vel. (ft/s)		7.55	1.89
Max Chl Dpth (ft)	9.91	Hydr. Depth (ft)		6.64	0.82
Conv. Total (cfs)	146726.6	Conv. (cfs)		145643.0	1083.6
Length Wtd. (ft)		Wetted Per. (ft)		128.74	30.75
Min Ch El (ft)	1702.59	Shear (lb/sq ft)		0.78	0.10
Alpha	1.04	Stream Power (lb/ft s)	1288.04	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Flamingo

Reach	River Sta.	n1	n2	n3	n4
Flam Wash	390	.02	.015	.02	
Flam Wash	380	.02	.015	.02	
Flam Wash	370	.02	.015	.02	
Flam Wash	360	.02	.015	.02	
Flam Wash	350	.02	.015	.02	
Flam Wash	341	.02	.015	.02	
Flam Wash	313	.02	.015	.02	
Flam Wash	311	.02	.015	.02	
Flam Wash	305	.02	.015	.02	
Flam Wash	300	Bridge			
Flam Wash	295	.02	.015	.02	
Flam Wash	285	.02	.055	.02	
Flam Wash	284	.02	.055	.02	
Flam Wash	246	.02	.015	.02	
Flam Wash	229	.02	.015	.02	
Flam Wash	222	.02	.015	.02	
Flam Wash	193	.02	.015	.02	
Flam Wash	191	.02	.015	.02	
Flam Wash	142	.02	.015	.02	
Flam Wash	138	.02	.015	.02	
Flam Wash	135	.02	.015	.02	
Flam Wash	131	.02	.015	.02	
Flam Wash	125	Bridge			
Flam Wash	121	.027	.015	.27	.027
Flam Wash	100	.03	.03	.03	
Flam Wash	90	.03	.03	.03	
Flam Wash	80	.03	.03	.03	
Flam Wash	70	.03	.03	.03	
Flam Wash	60	.03	.03	.03	
Flam Wash	50	.03	.03	.03	
Flam Wash	40	.03	.03	.03	
Flam Wash	30	.03	.03	.03	
Flam Wash	20	.03	.03	.03	
Flam Wash	10	.03	.03	.03	

SUMMARY OF REACH LENGTHS

River: Flamingo

Reach	River Sta.	Left	Channel	Right
Flam Wash	390	420.9	420.9	420.9
Flam Wash	380	170	170.96	173
Flam Wash	370	222	232.15	238
Flam Wash	360	323	314.29	310
Flam Wash	350	439	436.71	435
Flam Wash	341	1268.87	1268.87	1268.87
Flam Wash	313	255	255	255
Flam Wash	311	50.42	50.42	50.42
Flam Wash	305	109.41	109.41	109.41
Flam Wash	300	Bridge		
Flam Wash	295	15.01	15.01	15.01
Flam Wash	285	9	9	9
Flam Wash	284	201	201	201
Flam Wash	246	476.43	476.43	476.43
Flam Wash	229	255	255	255
Flam Wash	222	1322.63	1322.63	1322.63

Flam Wash	193	150	150	150
Flam Wash	191	2591.64	2591.64	2591.64
Flam Wash	142	22.5	22.5	22.5
Flam Wash	138	39.15	39.15	39.15
Flam Wash	135	12.25	12.25	12.25
Flam Wash	131	114.06	114.06	114.06
Flam Wash	125	Bridge		
Flam Wash	121	114.76	115.8	119.31
Flam Wash	100	289.86	295.13	299.75
Flam Wash	90	495.14	482.19	465.14
Flam Wash	80	455.76	470.68	481.96
Flam Wash	70	493.27	497.95	498.08
Flam Wash	60	499.62	499.27	502.1
Flam Wash	50	334.29	305.6	277.63
Flam Wash	40	500.14	491.57	481.13
Flam Wash	30	494.86	498.03	503.84
Flam Wash	20	483.22	488.53	497.54
Flam Wash	10	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Flamingo

Reach	River Sta.	Contr.	Expan.
Flam Wash	390	.1	.3
Flam Wash	380	.1	.3
Flam Wash	370	.1	.3
Flam Wash	360	.1	.3
Flam Wash	350	.1	.3
Flam Wash	341	.1	.3
Flam Wash	313	.1	.3
Flam Wash	311	.1	.3
Flam Wash	305	.1	.3
Flam Wash	300	Bridge	
Flam Wash	295	.1	.3
Flam Wash	285	.1	.3
Flam Wash	284	.1	.3
Flam Wash	246	.1	.3
Flam Wash	229	.1	.3
Flam Wash	222	.1	.3
Flam Wash	193	.1	.3
Flam Wash	191	.1	.3
Flam Wash	142	.1	.3
Flam Wash	138	.1	.3
Flam Wash	135	.1	.3
Flam Wash	131	.1	.3
Flam Wash	125	Bridge	
Flam Wash	121	.1	.3
Flam Wash	100	.1	.3
Flam Wash	90	.1	.3
Flam Wash	80	.1	.3
Flam Wash	70	.1	.3
Flam Wash	60	.1	.3
Flam Wash	50	.1	.3
Flam Wash	40	.1	.3
Flam Wash	30	.1	.3
Flam Wash	20	.1	.3
Flam Wash	10	.1	.3



CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

Group By Message ID

[BR PF 01](#)

SECNO: 300

This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1778.89 is less than or equal to MinTopRd of 1779.18 . 2. EGEL 3 of 1778.89 is greater than or equal to MxLoCdU of 1775.18 . 3. WSEL 2 of 1772.45 is less than MxLoCdD of 1775.18 .

[BR PF 01](#)

SECNO: 125

This is a Bridge Section. The selected profile is 1%-annual-chance. Type of flow is sluice gate pressure flow because, 1. EGEL 3 of 1732.92 is less than or equal to MinTopRd of 1735 . 2. EGEL 3 of 1732.92 is greater than or equal to MxLoCdU of 1728.97 . 3. WSEL 2 of 1726.34 is less than MxLoCdD of 1728.27 .

[NT RC 01L](#)

SECNO: 125

All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.

[NT RC 01R](#)

SECNO: 390

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 380

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 370

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 360

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#)

SECNO: 350

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

- [NT RC 01R](#) SECNO: 341
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 313
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 311
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 305
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 300
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 300
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 295
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 285
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

- [NT RC 01R](#) SECNO: 284
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 246
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 229
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 222
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 193
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 191
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 142
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 138
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

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[NT RC 01R](#) SECNO: 135

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 131

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 125

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 05](#) SECNO: 100

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#) SECNO: 90

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#) SECNO: 80

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#) SECNO: 70

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#) SECNO: 60

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#) SECNO: 50

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 40

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 30

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 20

The left overbank n-value of 0.03 and the right overbank n-value of 0.03 are less than or equal to the channel n-value of 0.03. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RS 01S2C](#)

SECNO: 121

This is Section 2 of a hydraulic structure. Channel n value of 0.015 is less than the channel n value of 0.03 at Section 1. Normally the channel "n" value at Section 2 represents the reach between Section 2 and Section 1, and is higher than the "n" value within the hydraulic structure. Please change the "n" value or provide supporting information for the use of the lower "n" value.

[NT RS 02BDC](#)

SECNO: 300

This is the Downstream Bridge Section (BRD). The channel n value of 0.015 for the downstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 2. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 2. The "n" value for Section 2 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of the higher "n" value.

[NT RS 02BUC](#)

SECNO: 300

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT RS 02BUC](#)

SECNO: 125

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT TL 01S2](#)

SECNO: 295

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#) SECNO: 121

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#) SECNO: 305

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#) SECNO: 131

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S4](#) SECNO: 311

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#) SECNO: 135

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[ST DT 01B](#) SECNO: 300

This is (Bridge-UP). 'Upstream Dist' of 0.1 in "Bridge Width Table" is less than the height of the bridge opening of 5.96. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 01B](#) SECNO: 125

This is (Bridge-UP). 'Upstream Dist' of 0.1 in "Bridge Width Table" is less than the height of the bridge opening of 5.5. This indicates that Section 3 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 3 should be relocated or provide a statement that it represents the natural valley cross section. The HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 4, 3 and 2 and 'Upstream Dist' should be adjusted.

[ST DT 02B](#) SECNO: 125

This is (Bridge-DN). 'Downstream Dist' of 0.06 in 'Bridge Width Table' is less than the height of the bridge opening of 5.5. This indicates that Section 2 may not be placed at the foot of the road embankment or wing walls and may not represent the natural valley cross section. Section 2 should be relocated or provide a statement that it represents the natural valley cross section. A HEC-RAS geometry file may need to be recreated using a GIS program. Lengths at Sections 3 and 2 should be adjusted.

[ST DT 03](#) SECNO: 300

This is (Bridge-UP) section. The Contraction Length is longer than the Expansion Length. Section 4 channel distance of 50.42 is longer than Section 2 channel distance of 15.01. Section 4 and Section 1 should be relocated. The HEC-RAS geometry file may need to be recreated using a GIS program.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[ST IF 01S2L](#) SECNO: 300

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1772.45. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2L](#) SECNO: 125

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Left Ineffective Flow station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to wsel2 of 1726.34. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 300

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1772.45. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S2R](#) SECNO: 125

This is Section 2 of a hydraulic structure. The highest flood frequency that has low or pressure flow is . However, the Right Ineffective Flow Station was not considered at Section 2. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to wsel2 of 1726.34. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 300

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1779.18. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3L](#) SECNO: 125

This is Section 3. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Left Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The left ineffective flow elevation should be equal to lmntprdu of 1735. The placement of the left ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 300

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1779.18. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[ST IF 01S3R](#) SECNO: 125

This is Section 3 of a hydraulic structure. The highest flood frequency that has low or pressure flow is 1%-annual-chance. However, the Right Ineffective Flow station was not considered at Section 3. The ineffective flow station and elevation should be inserted. The right ineffective flow elevation should be equal to rmntprdu of 1735. The placement of the right ineffective flow station is explained on page 5-7 of Hydraulic Reference Manual (HEC, 2010).

[XS EC 01L](#) SECNO: 360

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1784.27 is higher than the starting GR station elevation of 1779.74. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[XS EC 01L](#)

SECNO: 341

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1780.49 is higher than the starting GR station elevation of 1776.04. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 313

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1777.11 is higher than the starting GR station elevation of 1771.58. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 311

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1773.5 is higher than the starting GR station elevation of 1770.9. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 305

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1772.83 is higher than the starting GR station elevation of 1770.3. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 295

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1772.45 is higher than the starting GR station elevation of 1769.2. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 285

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1772.25 is higher than the starting GR station elevation of 1769.27. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 284

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1772.26 is higher than the starting GR station elevation of 1768.73. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[XS EC 01L](#)

SECNO: 246

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1758.51 is higher than the starting GR station elevation of 1756.67. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 229

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1754.58 is higher than the starting GR station elevation of 1752.08. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 222

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1744.95 is higher than the starting GR station elevation of 1742.05. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 193

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1741.98 is higher than the starting GR station elevation of 1736.76. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 191

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1739.6 is higher than the starting GR station elevation of 1736.36. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 142

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1730.48 is higher than the starting GR station elevation of 1725.99. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 138

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1729.96 is higher than the starting GR station elevation of 1725.93. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[XS EC 01L](#)

SECNO: 135

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1728.13 is higher than the starting GR station elevation of 1724.77. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 131

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1726.46 is higher than the starting GR station elevation of 1723.47. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01L](#)

SECNO: 10

Cross section extended vertically. Flow Code will be EL. The 1%-annual-chance WSEL of 1712.5 is higher than the starting GR station elevation of 1712.26. The Left_Sta_Eff is equal to the starting GR station. If there is divided flow then cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 360

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1784.27 is higher than the ending GR station elevation of 1779.74. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 341

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1780.49 is higher than the ending GR station elevation of 1776.04. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 313

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1777.11 is higher than the ending GR station elevation of 1771.58. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 311

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1773.5 is higher than the ending GR station elevation of 1770.9. The Right_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[XS EC 01R](#)

SECNO: 305

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1772.83 is higher than the ending GR station elevation of 1770.3. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 295

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1772.45 is higher than the ending GR station elevation of 1769.2. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 285

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1772.25 is higher than the ending GR station elevation of 1769.27. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 284

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1772.26 is higher than the ending GR station elevation of 1768.73. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 246

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1758.51 is higher than the ending GR station elevation of 1756.67. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 229

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1754.58 is higher than the ending GR station elevation of 1752.08. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 222

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1744.95 is higher than the ending GR station elevation of 1742.05. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

CHECK-RAS SUMMARY – Flamingo Wash Pre-Project Conditions

[XS EC 01R](#)

SECNO: 193

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1741.98 is higher than the ending GR station elevation of 1736.76. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 191

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1739.6 is higher than the ending GR station elevation of 1736.36. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 142

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1730.48 is higher than the ending GR station elevation of 1725.99. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 138

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1729.96 is higher than the ending GR station elevation of 1725.93. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 135

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1728.13 is higher than the ending GR station elevation of 1724.77. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS EC 01R](#)

SECNO: 131

Cross section extended vertically. Flow Code will be ER. The 1%-annual-chance WSEL of 1726.46 is higher than the ending GR station elevation of 1723.47. The Rght_Sta_Eff is equal to the ending GR station. If there is divided flow then the cross section should be trimmed or the ineffective flow station should be used to block the divided flow. If there is no divided flow then the cross section should be expanded to cover the 1%-annual-chance floodplain. The HEC-RAS geometry file may need to be recreated using a GIS program. Or provide explanation why the cross section should not be expanded.

[XS FR 02](#)

The profile is computed as mixed flow regime. It is acceptable if part of the stream is an engineered channel. For Flood Insurance Studies a subcritical flow regime should be selected, for natural streams. Supercritical flow regime should be selected if the entire stream is an engineered channel. The flow regime should be changed appropriately or justify the selection of mixed flow regime.



Las Vegas Wash



Flamingo Wash HEC-RAS Output

Standard Table 1

Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Flam Wash	390	PF 1	6300	1786.51	1790.54	1793.18	1799.75	0.013014	24.35	258.71	67.00	2.18
Flam Wash	380	PF 1	6300	1784.01	1788.97	1790.68	1794.95	0.006727	19.63	321.01	67.00	1.58
Flam Wash	370	PF 1	6300	1780.56	1784.76	1787.23	1793.22	0.011420	23.34	269.93	67.00	2.05
Flam Wash	360	PF 1	6300	1779.41	1784.27	1786.07	1790.49	0.007130	20.01	314.92	67.00	1.63
Flam Wash	350	PF 1	6300	1777.83	1783.25	1784.50	1788.24	0.005118	17.93	351.38	67.00	1.38
Flam Wash	341	PF 1	6300	1775.34	1780.49	1782.00	1785.95	0.005181	18.74	336.21	70.00	1.51
Flam Wash	313	PF 1	6300	1770.88	1777.11	1777.54	1780.75	0.002741	15.32	411.34	70.00	1.11
Flam Wash	311	PF 1	6300	1769.86	1773.50	1775.23	1779.37	0.009038	19.44	324.00	104.00	1.94
Flam Wash	305	PF 1	6300	1769.22	1772.83	1774.59	1778.89	0.009511	19.75	318.92	104.00	1.99
Flam Wash	300		Lamb Boulevard Bridge									
Flam Wash	295	PF 1	6300	1768.70	1772.45	1773.78	1777.10	0.006238	17.32	363.84	104.00	1.63
Flam Wash	285	PF 1	6300	1768.19	1772.25	1773.58	1776.85	0.081892	17.23	365.74	104.00	1.62
Flam Wash	284	PF 1	6300	1767.96	1772.27	1773.18	1775.97	0.057796	15.45	407.67	104.00	1.38
Flam Wash	246	PF 1	6300	1755.59	1758.51	1760.98	1768.60	0.021870	25.49	247.17	104.00	2.91
Flam Wash	229	PF 1	6300	1751.00	1754.58	1756.39	1760.74	0.009746	19.90	316.54	104.00	2.01
Flam Wash	222	PF 1	6300	1741.35	1744.95	1748.01	1756.86	0.018052	27.69	227.51	70.00	2.71
Flam Wash	193	PF 1	6300	1736.06	1741.98	1742.72	1746.04	0.003247	16.16	389.79	70.00	1.21
Flam Wash	191	PF 1	6300	1735.46	1739.60	1741.23	1745.19	0.007062	18.97	332.05	90.00	1.74
Flam Wash	142	PF 1	6300	1725.09	1730.48	1730.86	1733.60	0.002767	14.18	444.30	90.00	1.12
Flam Wash	138	PF 1	6300	1725.00	1729.96	1730.67	1733.49	0.003477	15.06	418.39	93.00	1.25
Flam Wash	135	PF 1	6400	1723.84	1728.13	1729.56	1733.16	0.006064	18.00	355.52	93.00	1.62
Flam Wash	131	PF 1	6400	1723.47	1726.46	1728.32	1732.92	0.010595	20.39	313.86	105.00	2.08
Flam Wash	125		Nellis Boulevard Bridge									
Flam Wash	121	PF 1	6400	1722.86	1726.34	1727.82	1731.36	0.007083	17.97	356.07	106.21	1.73
Flam Wash	116	PF 1	6400	1722.64	1726.94	1727.99	1730.93	0.004837	16.03	399.26	106.01	1.46
Flam Wash	114	PF 1	6400	1717.64	1720.47	1722.78	1729.93	0.021806	24.68	259.36	115.00	2.90
Flam Wash	113.6	PF 1	6400	1717.16	1719.95	1722.30	1729.78	0.023253	25.16	254.34	115.00	2.98
Flam Wash	98	PF 1	6400	1710.12	1720.13	1715.26	1720.67	0.000215	5.90	1085.32	115.01	0.34
Flam Wash	97.7	PF 1	6400	1709.24	1720.20		1720.64	0.000160	5.36	1193.85	115.01	0.29
Flam Wash	94	PF 1	6400	1709.09	1720.18		1720.62	0.000153	5.29	1209.25	115.00	0.29
Flam Wash	92	PF 1	6400	1709.04	1719.57		1720.54	0.001708	7.90	809.71	122.65	0.54
Flam Wash	89	PF 1	6400	1708.90	1719.41		1720.39	0.001725	7.93	806.76	122.45	0.54
Flam Wash	88	PF 1	6400	1708.82	1719.31		1720.29	0.001740	7.96	804.27	122.29	0.55
Flam Wash	87.7	PF 1	6400	1708.78	1719.26		1720.24	0.001749	7.97	802.78	122.20	0.55
Flam Wash	87	PF 1	6400	1708.70	1719.16		1720.15	0.001757	7.98	801.51	122.11	0.55
Flam Wash	86	PF 1	6400	1708.63	1719.07		1720.07	0.001775	8.01	798.58	121.94	0.55
Flam Wash	85	PF 1	6400	1708.55	1718.98		1719.98	0.001785	8.03	796.82	121.79	0.55
Flam Wash	84	PF 1	6400	1708.49	1718.89		1719.90	0.001802	8.06	794.12	121.64	0.56
Flam Wash	83	PF 1	6400	1708.40	1718.79		1719.80	0.001789	8.03	796.97	122.05	0.55
Flam Wash	82.5	PF 1	6400	1708.33	1718.70		1719.71	0.001812	8.06	793.75	122.00	0.56
Flam Wash	82	PF 1	6400	1708.30	1718.67		1719.68	0.001820	8.07	792.63	121.99	0.56
Flam Wash	81	PF 1	6400	1708.25	1718.61		1719.62	0.001821	8.07	792.90	122.12	0.56
Flam Wash	79	PF 1	6400	1708.20	1718.59		1719.55	0.001662	7.85	815.15	122.01	0.54
Flam Wash	78.9	PF 1	6400	1708.18	1718.58		1719.51	0.001581	7.74	826.44	121.51	0.52
Flam Wash	78	PF 1	6400	1708.10	1718.42		1719.41	0.001933	8.01	798.83	129.90	0.57
Flam Wash	77	PF 1	6400	1708.03	1718.35		1719.30	0.001949	7.85	815.10	137.64	0.57
Flam Wash	76	PF 1	6400	1707.95	1718.12		1719.19	0.001912	8.32	768.83	116.77	0.57
Flam Wash	75	PF 1	6400	1707.88	1717.98		1719.10	0.001902	8.47	755.38	111.02	0.57
Flam Wash	74	PF 1	6400	1707.80	1717.88		1719.00	0.001925	8.51	752.23	110.84	0.58
Flam Wash	73	PF 1	6400	1707.73	1717.75		1718.90	0.001987	8.61	743.19	110.17	0.58
Flam Wash	72.3	PF 1	6400	1707.70	1717.70		1718.87	0.002021	8.67	737.96	109.58	0.59
Flam Wash	71	PF 1	6400	1707.65	1717.57		1718.79	0.002140	8.88	721.01	107.93	0.61
Flam Wash	70.5	PF 1	6400	1707.58	1717.31		1718.67	0.002446	9.36	684.04	104.57	0.64
Flam Wash	70	PF 1	6400	1707.55	1717.18		1718.61	0.002609	9.60	667.00	103.02	0.66
Flam Wash	69	PF 1	6400	1707.50	1716.90		1718.51	0.003035	10.17	629.55	99.84	0.71
Flam Wash	68.5	PF 1	6400	1707.43	1716.19		1718.28	0.004330	11.59	552.09	93.92	0.84
Flam Wash	68	PF 1	6400	1707.40	1716.36		1718.10	0.003469	10.60	603.82	99.59	0.76
Flam Wash	67	PF 1	6400	1707.35	1716.12		1717.98	0.003792	10.94	585.10	98.44	0.79

Flamingo Wash HEC-RAS Output

Standard Table 1

Post-Project Conditions

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Flam Wash	66	PF 1	6400	1707.28	1716.13		1717.73	0.003170	10.15	630.73	103.93	0.73
Flam Wash	65.5	PF 1	6400	1707.20	1715.82		1717.54	0.003530	10.54	607.36	102.56	0.76
Flam Wash	65	PF 1	6400	1707.18	1715.71		1717.49	0.003693	10.70	597.90	102.03	0.78
Flam Wash	64	PF 1	6400	1707.06	1715.58		1717.36	0.003687	10.69	598.42	102.15	0.78
Flam Wash	63	PF 1	6400	1706.81	1715.47		1717.15	0.003418	10.40	615.36	103.48	0.75
Flam Wash	62.9	PF 1	6400	1706.75	1715.75		1716.98	0.002339	8.91	717.97	114.67	0.63
Flam Wash	62	PF 1	6400	1706.57	1715.84		1716.83	0.001850	8.02	797.87	125.59	0.56
Flam Wash	61	PF 1	6400	1706.32	1714.75		1716.62	0.003953	10.95	584.24	101.39	0.80
Flam Wash	60.8	PF 1	6400	1706.28	1714.73		1716.58	0.003895	10.90	586.97	101.43	0.80
Flam Wash	60.5	PF 1	6400	1706.07	1714.68		1716.38	0.003512	10.47	611.01	103.81	0.76
Flam Wash	60.2	PF 1	6400	1705.83	1714.72		1716.14	0.002791	9.55	670.50	110.30	0.68
Flam Wash	59.6	PF 1	6400	1705.74	1714.17		1716.04	0.003989	10.95	584.26	102.13	0.81
Flam Wash	59.3	PF 1	6400	1705.58	1714.07		1715.90	0.003851	10.85	589.68	101.74	0.79
Flam Wash	59	PF 1	6400	1705.33	1714.34		1715.57	0.002340	8.91	718.45	114.89	0.63
Flam Wash	58.5	PF 1	6400	1705.21	1713.55		1715.43	0.004043	11.01	581.40	101.92	0.81
Flam Wash	58	PF 1	6400	1705.09	1713.48		1715.32	0.003917	10.88	588.14	102.43	0.80
Flam Wash	57	PF 1	6400	1704.84	1713.33		1715.11	0.003760	10.72	597.23	103.21	0.79
Flam Wash	56	PF 1	6400	1704.59	1712.85		1714.88	0.004451	11.42	560.60	99.97	0.85
Flam Wash	55	PF 1	6400	1704.35	1712.68		1714.64	0.004244	11.23	569.87	100.49	0.83
Flam Wash	54	PF 1	6400	1704.10	1712.53		1714.41	0.004019	11.02	580.55	101.02	0.81
Flam Wash	53	PF 1	6400	1703.86	1712.38		1714.20	0.003808	10.82	591.39	101.60	0.79
Flam Wash	52.5	PF 1	6400	1703.61	1712.26		1713.98	0.003523	10.52	608.14	102.76	0.76
Flam Wash	52	PF 1	6400	1703.55	1712.26		1713.92	0.003366	10.34	619.12	103.88	0.75
Flam Wash	51	PF 1	6400	1703.36	1712.15		1713.79	0.003274	10.26	623.61	103.55	0.74
Flam Wash	49	PF 1	6400	1703.12	1712.03		1713.62	0.003127	10.11	633.17	103.88	0.72
Flam Wash	48.7	PF 1	6400	1702.87	1711.93		1713.44	0.002916	9.86	648.91	104.78	0.70
Flam Wash	48.5	PF 1	6400	1702.84	1711.92		1713.42	0.002897	9.84	650.29	104.84	0.70
Flam Wash	48	PF 1	6400	1702.62	1711.84		1713.28	0.002716	9.62	665.26	105.71	0.68
Flam Wash	47	PF 1	6400	1702.38	1711.76		1713.13	0.002523	9.37	682.77	106.70	0.65
Flam Wash	42	PF 1	6400	1702.13	1711.69		1712.98	0.002333	9.12	701.84	107.77	0.63
Flam Wash	41	PF 1	6400	1702.13	1711.69		1712.98	0.002335	9.12	701.67	107.75	0.63
Flam Wash	40.5	PF 1	6400	1702.04	1711.67		1712.93	0.002268	9.03	709.00	108.20	0.62
Flam Wash	37	PF 1	6400	1701.88	1711.63		1712.85	0.002161	8.87	721.13	108.84	0.61
Flam Wash	36	PF 1	6400	1701.64	1711.23		1712.70	0.002713	9.74	656.95	102.12	0.68
Flam Wash	35	PF 1	6400	1701.39	1711.07		1712.56	0.003102	9.79	653.47	111.81	0.71
Flam Wash	34	PF 1	6400	1701.26	1711.15		1712.41	0.002853	9.02	709.73	129.64	0.68
Flam Wash	33.5	PF 1	6400	1701.14	1711.06		1712.34	0.002714	9.06	706.09	123.27	0.67
Flam Wash	33	PF 1	6400	1700.90	1710.94		1712.21	0.002462	9.03	708.88	115.50	0.64
Flam Wash	32.5	PF 1	6400	1700.71	1710.90		1712.05	0.002477	8.60	744.00	131.30	0.64
Flam Wash	32	PF 1	6400	1700.65	1710.84		1711.95	0.002515	8.46	756.10	138.39	0.64
Flam Wash	31.5	PF 1	6400	1700.62	1710.77		1711.91	0.002465	8.56	748.06	132.65	0.63
Flam Wash	31	PF 1	6400	1700.52	1710.56		1711.78	0.002403	8.86	721.98	118.80	0.63
Flam Wash	30.9	PF 1	6400	1700.48	1710.49		1711.73	0.002411	8.93	716.63	116.85	0.64
Flam Wash	30.5	PF 1	6400	1700.43	1710.40		1711.66	0.002407	9.01	710.04	113.98	0.64
Flam Wash	29	PF 1	6400	1700.31	1710.21		1711.51	0.002413	9.17	697.68	109.11	0.64
Flam Wash	28	PF 1	6400	1700.24	1710.10		1711.42	0.002456	9.23	693.34	108.84	0.64
Flam Wash	27	PF 1	6400	1700.14	1709.95		1711.30	0.002503	9.29	688.59	108.53	0.65
Flam Wash	26	PF 1	6400	1700.05	1709.81		1711.17	0.002565	9.38	682.60	108.16	0.66
Flam Wash	25	PF 1	6400	1699.95	1709.65		1711.04	0.002630	9.46	676.42	107.74	0.67
Flam Wash	24	PF 1	6400	1699.86	1709.48		1710.91	0.002720	9.58	668.38	107.23	0.68
Flam Wash	23	PF 1	6400	1699.76	1709.31		1710.77	0.002813	9.69	660.28	106.69	0.69
Flam Wash	22	PF 1	6400	1699.67	1709.12		1710.62	0.002946	9.85	649.49	105.99	0.70
Flam Wash	21	PF 1	6400	1699.57	1708.89		1710.47	0.003119	10.06	636.23	105.09	0.72
Flam Wash	19	PF 1	6400	1699.39	1709.74		1709.94	0.000595	3.58	1787.96	405.84	0.30
Flam Wash	15	PF 1	6400	1699.29	1709.69		1709.90	0.000759	3.70	1731.47	450.14	0.33
Flam Wash	11	PF 1	6400	1699.11	1709.63	1704.77	1709.83	0.000753	3.62	1767.26	471.52	0.33
Flam Wash	8		Inline Weir - Low Flow Crossing									
Flam Wash	1	PF 1	6400	1698.16	1705.93	1703.70	1706.51	0.001901	6.15	1040.73	250.35	0.53

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	390	PF 1	1799.75	1790.54	9.21				6300.00		67.00
Flam Wash	380	PF 1	1794.95	1788.97	5.98	3.83	0.97		6300.00		67.00
Flam Wash	370	PF 1	1793.22	1784.76	8.46	1.47	0.25		6300.00		67.00
Flam Wash	360	PF 1	1790.49	1784.27	6.21	2.07	0.67		6300.00		67.00
Flam Wash	350	PF 1	1788.24	1783.25	4.99	1.89	0.37		6300.00		67.00
Flam Wash	341	PF 1	1785.95	1780.49	5.45	2.25	0.05		6300.00		70.00
Flam Wash	313	PF 1	1780.75	1777.11	3.64	4.66	0.54		6300.00		70.00
Flam Wash	311	PF 1	1779.37	1773.50	5.87	1.16	0.22		6300.00		104.00
Flam Wash	305	PF 1	1778.89	1772.83	6.06	0.47	0.02		6300.00		104.00
Flam Wash	300		Lamb Boulevard Bridge								
Flam Wash	295	PF 1	1777.10	1772.45	4.66				6300.00		104.00
Flam Wash	285	PF 1	1776.85	1772.25	4.61	0.23	0.01		6300.00		104.00
Flam Wash	284	PF 1	1775.97	1772.27	3.71	0.61	0.27		6300.00		104.00
Flam Wash	246	PF 1	1768.60	1758.51	10.09	6.74	0.64		6300.00		104.00
Flam Wash	229	PF 1	1760.74	1754.58	6.15	6.68	1.18		6300.00		104.00
Flam Wash	222	PF 1	1756.86	1744.95	11.91	3.30	0.58		6300.00		70.00
Flam Wash	193	PF 1	1746.04	1741.98	4.06	8.47	2.36		6300.00		70.00
Flam Wash	191	PF 1	1745.19	1739.60	5.59	0.69	0.15		6300.00		90.00
Flam Wash	142	PF 1	1733.60	1730.48	3.12	10.85	0.74		6300.00		90.00
Flam Wash	138	PF 1	1733.49	1729.96	3.52	0.07	0.04		6300.00		93.00
Flam Wash	135	PF 1	1733.16	1728.13	5.03	0.18	0.15		6400.00		93.00
Flam Wash	131	PF 1	1732.92	1726.46	6.46	0.10	0.14		6400.00		105.00
Flam Wash	125		Nellis Boulevard Bridge								
Flam Wash	121	PF 1	1731.36	1726.34	5.02				6400.00		106.21
Flam Wash	116	PF 1	1730.93	1726.94	3.99	0.13	0.31		6400.00		106.01
Flam Wash	114	PF 1	1729.93	1720.47	9.45	0.45	0.55		6400.00		115.00
Flam Wash	113.6	PF 1	1729.78	1719.95	9.83	0.11	0.04		6400.00		115.00
Flam Wash	98	PF 1	1720.67	1720.13	0.54	0.00	0.03		6400.00		115.01
Flam Wash	97.7	PF 1	1720.64	1720.20	0.45	0.02	0.00		6400.00		115.01
Flam Wash	94	PF 1	1720.62	1720.18	0.43	0.02	0.05		6400.00		115.00
Flam Wash	92	PF 1	1720.54	1719.57	0.97	0.16	0.00		6400.00		122.65
Flam Wash	89	PF 1	1720.39	1719.41	0.98	0.10	0.00		6400.00		122.45
Flam Wash	88	PF 1	1720.29	1719.31	0.98	0.05	0.00		6400.00		122.29
Flam Wash	87.7	PF 1	1720.24	1719.26	0.99	0.09	0.00		6400.00		122.20
Flam Wash	87	PF 1	1720.15	1719.16	0.99	0.09	0.00		6400.00		122.11
Flam Wash	86	PF 1	1720.07	1719.07	1.00	0.09	0.00		6400.00		121.94
Flam Wash	85	PF 1	1719.98	1718.98	1.00	0.08	0.00		6400.00		121.79
Flam Wash	84	PF 1	1719.9	1718.89	1.01	0.10	0.00		6400.00		121.64
Flam Wash	83	PF 1	1719.80	1718.79	1.00	0.09	0.00		6400.00		122.05
Flam Wash	82.5	PF 1	1719.71	1718.70	1.01	0.03	0.00		6400.00		122.00
Flam Wash	82	PF 1	1719.68	1718.67	1.01	0.06	0.00		6400.00		121.99
Flam Wash	81	PF 1	1719.62	1718.61	1.01	0.06	0.02		6400.00		122.12
Flam Wash	79	PF 1	1719.55	1718.59	0.96	0.03	0.01		6400.00		122.01
Flam Wash	78.9	PF 1	1719.51	1718.58	0.93	0.09	0.01		6400.00		121.51
Flam Wash	78	PF 1	1719.41	1718.42	1.00	0.10	0.01		6400.00		129.90
Flam Wash	77	PF 1	1719.30	1718.35	0.96	0.10	0.01		6400.00		137.64
Flam Wash	76	PF 1	1719.19	1718.12	1.08	0.10	0.00		6400.00		116.77
Flam Wash	75	PF 1	1719.10	1717.98	1.11	0.10	0.00		6400.00		111.02
Flam Wash	74	PF 1	1719.00	1717.88	1.12	0.10	0.00		6400.00		110.84

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	73	PF 1	1718.90	1717.75	1.15	0.03	0.00		6400.00		110.17
Flam Wash	72.3	PF 1	1718.87	1717.70	1.17	0.07	0.01		6400.00		109.58
Flam Wash	71	PF 1	1718.79	1717.57	1.22	0.11	0.01		6400.00		107.93
Flam Wash	70.5	PF 1	1718.67	1717.31	1.36	0.05	0.01		6400.00		104.57
Flam Wash	70	PF 1	1718.61	1717.18	1.43	0.09	0.02		6400.00		103.02
Flam Wash	69	PF 1	1718.51	1716.90	1.60	0.18	0.05		6400.00		99.84
Flam Wash	68.5	PF 1	1718.28	1716.19	2.09	0.07	0.10		6400.00		93.92
Flam Wash	68	PF 1	1718.10	1716.36	1.74	0.11	0.01		6400.00		99.59
Flam Wash	67	PF 1	1717.98	1716.12	1.86	0.17	0.08		6400.00		98.44
Flam Wash	66	PF 1	1717.73	1716.13	1.60	0.17	0.01		6400.00		103.93
Flam Wash	65.5	PF 1	1717.54	1715.82	1.72	0.06	0.01		6400.00		102.56
Flam Wash	65	PF 1	1717.49	1715.71	1.78	0.13	0.00		6400.00		102.03
Flam Wash	64	PF 1	1717.36	1715.58	1.78	0.18	0.03		6400.00		102.15
Flam Wash	63	PF 1	1717.15	1715.47	1.68	0.03	0.13		6400.00		103.48
Flam Wash	62.9	PF 1	1716.98	1715.75	1.23	0.08	0.07		6400.00		114.67
Flam Wash	62	PF 1	1716.83	1715.84	1.00	0.13	0.09		6400.00		125.59
Flam Wash	61	PF 1	1716.62	1714.75	1.86	0.03	0.01		6400.00		101.39
Flam Wash	60.8	PF 1	1716.58	1714.73	1.85	0.15	0.04		6400.00		101.43
Flam Wash	60.5	PF 1	1716.38	1714.68	1.70	0.16	0.09		6400.00		103.81
Flam Wash	60.2	PF 1	1716.14	1714.72	1.41	0.06	0.04		6400.00		110.30
Flam Wash	59.6	PF 1	1716.04	1714.17	1.86	0.13	0.01		6400.00		102.13
Flam Wash	59.3	PF 1	1715.90	1714.07	1.83	0.15	0.18		6400.00		101.74
Flam Wash	59	PF 1	1715.57	1714.34	1.23	0.08	0.06		6400.00		114.89
Flam Wash	58.5	PF 1	1715.43	1713.55	1.88	0.10	0.01		6400.00		101.92
Flam Wash	58	PF 1	1715.32	1713.48	1.84	0.19	0.02		6400.00		102.43
Flam Wash	57	PF 1	1715.11	1713.33	1.78	0.20	0.02		6400.00		103.21
Flam Wash	56	PF 1	1714.88	1712.85	2.02	0.22	0.02		6400.00		99.97
Flam Wash	55	PF 1	1714.64	1712.68	1.96	0.21	0.02		6400.00		100.49
Flam Wash	54	PF 1	1714.41	1712.53	1.89	0.20	0.02		6400.00		101.02
Flam Wash	53	PF 1	1714.20	1712.38	1.82	0.18	0.03		6400.00		101.60
Flam Wash	52.5	PF 1	1713.98	1712.26	1.72	0.04	0.02		6400.00		102.76
Flam Wash	52	PF 1	1713.92	1712.26	1.66	0.12	0.01		6400.00		103.88
Flam Wash	51	PF 1	1713.79	1712.15	1.64	0.16	0.01		6400.00		103.55
Flam Wash	49	PF 1	1713.62	1712.03	1.59	0.15	0.02		6400.00		103.88
Flam Wash	48.7	PF 1	1713.44	1711.93	1.51	0.02	0.00		6400.00		104.78
Flam Wash	48.5	PF 1	1713.42	1711.92	1.50	0.12	0.02		6400.00		104.84
Flam Wash	48	PF 1	1713.28	1711.84	1.44	0.13	0.02		6400.00		105.71
Flam Wash	47	PF 1	1713.13	1711.76	1.36	0.12	0.02		6400.00		106.70
Flam Wash	42	PF 1	1712.98	1711.69	1.29	0.00	0.00		6400.00		107.77
Flam Wash	41	PF 1	1712.98	1711.69	1.29	0.04	0.01		6400.00		107.75
Flam Wash	40.5	PF 1	1712.93	1711.67	1.27	0.07	0.01		6400.00		108.20
Flam Wash	37	PF 1	1712.85	1711.63	1.22	0.12	0.03		6400.00		108.84
Flam Wash	36	PF 1	1712.70	1711.23	1.47	0.14	0.00		6400.00		102.12
Flam Wash	35	PF 1	1712.56	1711.07	1.49	0.08	0.07		6400.00		111.81
Flam Wash	34	PF 1	1712.41	1711.15	1.26	0.07	0.00		6400.00		129.64
Flam Wash	33.5	PF 1	1712.34	1711.06	1.28	0.13	0.00		6400.00		123.27
Flam Wash	33	PF 1	1712.21	1710.94	1.27	0.12	0.04		6400.00		115.50
Flam Wash	32.5	PF 1	1712.05	1710.90	1.15	0.09	0.01		6400.00		131.30
Flam Wash	32	PF 1	1711.95	1710.84	1.11	0.04	0.00		6400.00		138.39

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	31.5	PF 1	1711.91	1710.77	1.14	0.12	0.01		6400.00		132.65
Flam Wash	31	PF 1	1711.78	1710.56	1.22	0.05	0.00		6400.00		118.80
Flam Wash	30.9	PF 1	1711.73	1710.49	1.24	0.07	0.00		6400.00		116.85
Flam Wash	30.5	PF 1	1711.66	1710.40	1.26	0.15	0.00		6400.00		113.98
Flam Wash	29	PF 1	1711.51	1710.21	1.31	0.10	0.00		6400.00		109.11
Flam Wash	28	PF 1	1711.42	1710.10	1.32	0.12	0.00		6400.00		108.84
Flam Wash	27	PF 1	1711.3	1709.95	1.34	0.13	0.00		6400.00		108.53
Flam Wash	26	PF 1	1711.17	1709.81	1.37	0.13	0.00		6400.00		108.16
Flam Wash	25	PF 1	1711.04	1709.65	1.39	0.13	0.00		6400.00		107.74
Flam Wash	24	PF 1	1710.91	1709.48	1.42	0.14	0.00		6400.00		107.23
Flam Wash	23	PF 1	1710.77	1709.31	1.46	0.14	0.00		6400.00		106.69
Flam Wash	22	PF 1	1710.62	1709.12	1.51	0.15	0.01		6400.00		105.99
Flam Wash	21	PF 1	1710.47	1708.89	1.57	0.11	0.41		6400.00		105.09
Flam Wash	19	PF 1	1709.94	1709.74	0.20	0.03	0.00		6400.00		405.84
Flam Wash	15	PF 1	1709.90	1709.69	0.21	0.07	0.00		6400.00		450.14
Flam Wash	11	PF 1	1709.83	1709.63	0.20				6400.00		471.52
Flam Wash	8		Inline Weir - Low Flow Crossing								
Flam Wash	1	PF 1	1706.51	1705.93	0.59				6400.00		250.35

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	390	PF 1	1799.75	1790.54	9.21				6300.00		67.00
Flam Wash	380	PF 1	1794.95	1788.97	5.98	3.83	0.97		6300.00		67.00
Flam Wash	370	PF 1	1793.22	1784.76	8.46	1.47	0.25		6300.00		67.00
Flam Wash	360	PF 1	1790.49	1784.27	6.21	2.07	0.67		6300.00		67.00
Flam Wash	350	PF 1	1788.24	1783.25	4.99	1.89	0.37		6300.00		67.00
Flam Wash	341	PF 1	1785.95	1780.49	5.45	2.25	0.05		6300.00		70.00
Flam Wash	313	PF 1	1780.75	1777.11	3.64	4.66	0.54		6300.00		70.00
Flam Wash	311	PF 1	1779.37	1773.50	5.87	1.16	0.22		6300.00		104.00
Flam Wash	305	PF 1	1778.89	1772.83	6.06	0.47	0.02		6300.00		104.00
Flam Wash	300		Lamb Boulevard Bridge								
Flam Wash	295	PF 1	1777.10	1772.45	4.66				6300.00		104.00
Flam Wash	285	PF 1	1776.85	1772.25	4.61	0.23	0.01		6300.00		104.00
Flam Wash	284	PF 1	1775.97	1772.27	3.71	0.61	0.27		6300.00		104.00
Flam Wash	246	PF 1	1768.60	1758.51	10.09	6.74	0.64		6300.00		104.00
Flam Wash	229	PF 1	1760.74	1754.58	6.15	6.68	1.18		6300.00		104.00
Flam Wash	222	PF 1	1756.86	1744.95	11.91	3.30	0.58		6300.00		70.00
Flam Wash	193	PF 1	1746.04	1741.98	4.06	8.47	2.36		6300.00		70.00
Flam Wash	191	PF 1	1745.19	1739.60	5.59	0.69	0.15		6300.00		90.00
Flam Wash	142	PF 1	1733.60	1730.48	3.12	10.85	0.74		6300.00		90.00
Flam Wash	138	PF 1	1733.49	1729.96	3.52	0.07	0.04		6300.00		93.00
Flam Wash	135	PF 1	1733.16	1728.13	5.03	0.18	0.15		6400.00		93.00
Flam Wash	131	PF 1	1732.92	1726.46	6.46	0.10	0.14		6400.00		105.00
Flam Wash	125		Nellis Boulevard Bridge								
Flam Wash	121	PF 1	1731.36	1726.34	5.02				6400.00		106.21
Flam Wash	116	PF 1	1730.93	1726.94	3.99	0.13	0.31		6400.00		106.01
Flam Wash	114	PF 1	1729.93	1720.47	9.45	0.45	0.55		6400.00		115.00
Flam Wash	113.6	PF 1	1729.78	1719.95	9.83	0.11	0.04		6400.00		115.00
Flam Wash	98	PF 1	1720.67	1720.13	0.54	0.00	0.03		6400.00		115.01
Flam Wash	97.7	PF 1	1720.64	1720.20	0.45	0.02	0.00		6400.00		115.01
Flam Wash	94	PF 1	1720.62	1720.18	0.43	0.02	0.05		6400.00		115.00
Flam Wash	92	PF 1	1720.54	1719.57	0.97	0.16	0.00		6400.00		122.65
Flam Wash	89	PF 1	1720.39	1719.41	0.98	0.10	0.00		6400.00		122.45
Flam Wash	88	PF 1	1720.29	1719.31	0.98	0.05	0.00		6400.00		122.29
Flam Wash	87.7	PF 1	1720.24	1719.26	0.99	0.09	0.00		6400.00		122.20
Flam Wash	87	PF 1	1720.15	1719.16	0.99	0.09	0.00		6400.00		122.11
Flam Wash	86	PF 1	1720.07	1719.07	1.00	0.09	0.00		6400.00		121.94
Flam Wash	85	PF 1	1719.98	1718.98	1.00	0.08	0.00		6400.00		121.79
Flam Wash	84	PF 1	1719.9	1718.89	1.01	0.10	0.00		6400.00		121.64
Flam Wash	83	PF 1	1719.80	1718.79	1.00	0.09	0.00		6400.00		122.05
Flam Wash	82.5	PF 1	1719.71	1718.70	1.01	0.03	0.00		6400.00		122.00
Flam Wash	82	PF 1	1719.68	1718.67	1.01	0.06	0.00		6400.00		121.99
Flam Wash	81	PF 1	1719.62	1718.61	1.01	0.06	0.02		6400.00		122.12
Flam Wash	79	PF 1	1719.55	1718.59	0.96	0.03	0.01		6400.00		122.01
Flam Wash	78.9	PF 1	1719.51	1718.58	0.93	0.09	0.01		6400.00		121.51
Flam Wash	78	PF 1	1719.41	1718.42	1.00	0.10	0.01		6400.00		129.90
Flam Wash	77	PF 1	1719.30	1718.35	0.96	0.10	0.01		6400.00		137.64
Flam Wash	76	PF 1	1719.19	1718.12	1.08	0.10	0.00		6400.00		116.77
Flam Wash	75	PF 1	1719.10	1717.98	1.11	0.10	0.00		6400.00		111.02
Flam Wash	74	PF 1	1719.00	1717.88	1.12	0.10	0.00		6400.00		110.84

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

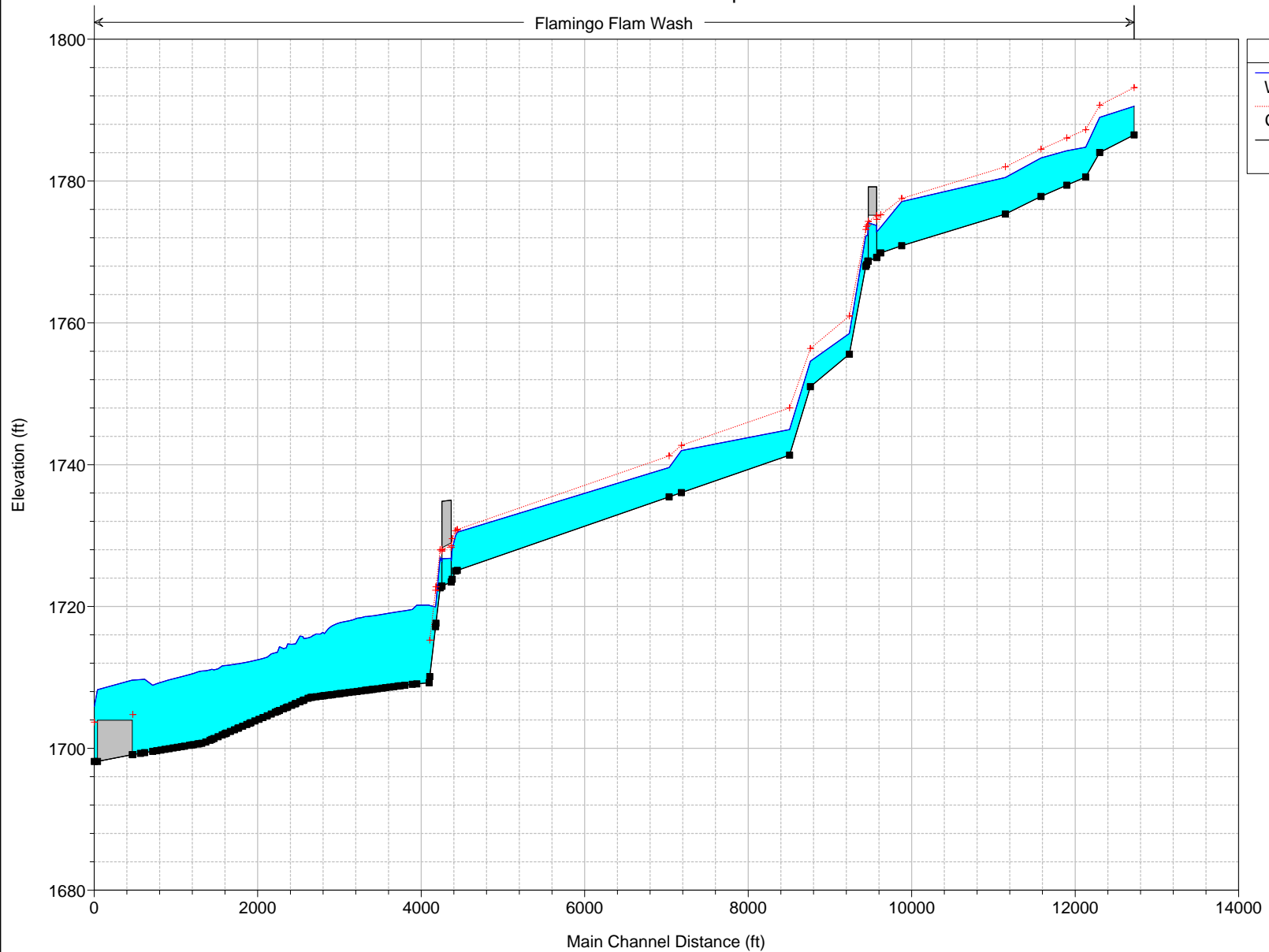
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	73	PF 1	1718.90	1717.75	1.15	0.03	0.00		6400.00		110.17
Flam Wash	72.3	PF 1	1718.87	1717.70	1.17	0.07	0.01		6400.00		109.58
Flam Wash	71	PF 1	1718.79	1717.57	1.22	0.11	0.01		6400.00		107.93
Flam Wash	70.5	PF 1	1718.67	1717.31	1.36	0.05	0.01		6400.00		104.57
Flam Wash	70	PF 1	1718.61	1717.18	1.43	0.09	0.02		6400.00		103.02
Flam Wash	69	PF 1	1718.51	1716.90	1.60	0.18	0.05		6400.00		99.84
Flam Wash	68.5	PF 1	1718.28	1716.19	2.09	0.07	0.10		6400.00		93.92
Flam Wash	68	PF 1	1718.10	1716.36	1.74	0.11	0.01		6400.00		99.59
Flam Wash	67	PF 1	1717.98	1716.12	1.86	0.17	0.08		6400.00		98.44
Flam Wash	66	PF 1	1717.73	1716.13	1.60	0.17	0.01		6400.00		103.93
Flam Wash	65.5	PF 1	1717.54	1715.82	1.72	0.06	0.01		6400.00		102.56
Flam Wash	65	PF 1	1717.49	1715.71	1.78	0.13	0.00		6400.00		102.03
Flam Wash	64	PF 1	1717.36	1715.58	1.78	0.18	0.03		6400.00		102.15
Flam Wash	63	PF 1	1717.15	1715.47	1.68	0.03	0.13		6400.00		103.48
Flam Wash	62.9	PF 1	1716.98	1715.75	1.23	0.08	0.07		6400.00		114.67
Flam Wash	62	PF 1	1716.83	1715.84	1.00	0.13	0.09		6400.00		125.59
Flam Wash	61	PF 1	1716.62	1714.75	1.86	0.03	0.01		6400.00		101.39
Flam Wash	60.8	PF 1	1716.58	1714.73	1.85	0.15	0.04		6400.00		101.43
Flam Wash	60.5	PF 1	1716.38	1714.68	1.70	0.16	0.09		6400.00		103.81
Flam Wash	60.2	PF 1	1716.14	1714.72	1.41	0.06	0.04		6400.00		110.30
Flam Wash	59.6	PF 1	1716.04	1714.17	1.86	0.13	0.01		6400.00		102.13
Flam Wash	59.3	PF 1	1715.90	1714.07	1.83	0.15	0.18		6400.00		101.74
Flam Wash	59	PF 1	1715.57	1714.34	1.23	0.08	0.06		6400.00		114.89
Flam Wash	58.5	PF 1	1715.43	1713.55	1.88	0.10	0.01		6400.00		101.92
Flam Wash	58	PF 1	1715.32	1713.48	1.84	0.19	0.02		6400.00		102.43
Flam Wash	57	PF 1	1715.11	1713.33	1.78	0.20	0.02		6400.00		103.21
Flam Wash	56	PF 1	1714.88	1712.85	2.02	0.22	0.02		6400.00		99.97
Flam Wash	55	PF 1	1714.64	1712.68	1.96	0.21	0.02		6400.00		100.49
Flam Wash	54	PF 1	1714.41	1712.53	1.89	0.20	0.02		6400.00		101.02
Flam Wash	53	PF 1	1714.20	1712.38	1.82	0.18	0.03		6400.00		101.60
Flam Wash	52.5	PF 1	1713.98	1712.26	1.72	0.04	0.02		6400.00		102.76
Flam Wash	52	PF 1	1713.92	1712.26	1.66	0.12	0.01		6400.00		103.88
Flam Wash	51	PF 1	1713.79	1712.15	1.64	0.16	0.01		6400.00		103.55
Flam Wash	49	PF 1	1713.62	1712.03	1.59	0.15	0.02		6400.00		103.88
Flam Wash	48.7	PF 1	1713.44	1711.93	1.51	0.02	0.00		6400.00		104.78
Flam Wash	48.5	PF 1	1713.42	1711.92	1.50	0.12	0.02		6400.00		104.84
Flam Wash	48	PF 1	1713.28	1711.84	1.44	0.13	0.02		6400.00		105.71
Flam Wash	47	PF 1	1713.13	1711.76	1.36	0.12	0.02		6400.00		106.70
Flam Wash	42	PF 1	1712.98	1711.69	1.29	0.00	0.00		6400.00		107.77
Flam Wash	41	PF 1	1712.98	1711.69	1.29	0.04	0.01		6400.00		107.75
Flam Wash	40.5	PF 1	1712.93	1711.67	1.27	0.07	0.01		6400.00		108.20
Flam Wash	37	PF 1	1712.85	1711.63	1.22	0.12	0.03		6400.00		108.84
Flam Wash	36	PF 1	1712.70	1711.23	1.47	0.14	0.00		6400.00		102.12
Flam Wash	35	PF 1	1712.56	1711.07	1.49	0.08	0.07		6400.00		111.81
Flam Wash	34	PF 1	1712.41	1711.15	1.26	0.07	0.00		6400.00		129.64
Flam Wash	33.5	PF 1	1712.34	1711.06	1.28	0.13	0.00		6400.00		123.27
Flam Wash	33	PF 1	1712.21	1710.94	1.27	0.12	0.04		6400.00		115.50
Flam Wash	32.5	PF 1	1712.05	1710.90	1.15	0.09	0.01		6400.00		131.30
Flam Wash	32	PF 1	1711.95	1710.84	1.11	0.04	0.00		6400.00		138.39

Flamingo Wash HEC-RAS Output
Standard Table 2
Post-Project Conditions

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Flam Wash	31.5	PF 1	1711.91	1710.77	1.14	0.12	0.01		6400.00		132.65
Flam Wash	31	PF 1	1711.78	1710.56	1.22	0.05	0.00		6400.00		118.80
Flam Wash	30.9	PF 1	1711.73	1710.49	1.24	0.07	0.00		6400.00		116.85
Flam Wash	30.5	PF 1	1711.66	1710.40	1.26	0.15	0.00		6400.00		113.98
Flam Wash	29	PF 1	1711.51	1710.21	1.31	0.10	0.00		6400.00		109.11
Flam Wash	28	PF 1	1711.42	1710.10	1.32	0.12	0.00		6400.00		108.84
Flam Wash	27	PF 1	1711.3	1709.95	1.34	0.13	0.00		6400.00		108.53
Flam Wash	26	PF 1	1711.17	1709.81	1.37	0.13	0.00		6400.00		108.16
Flam Wash	25	PF 1	1711.04	1709.65	1.39	0.13	0.00		6400.00		107.74
Flam Wash	24	PF 1	1710.91	1709.48	1.42	0.14	0.00		6400.00		107.23
Flam Wash	23	PF 1	1710.77	1709.31	1.46	0.14	0.00		6400.00		106.69
Flam Wash	22	PF 1	1710.62	1709.12	1.51	0.15	0.01		6400.00		105.99
Flam Wash	21	PF 1	1710.47	1708.89	1.57	0.11	0.41		6400.00		105.09
Flam Wash	19	PF 1	1709.94	1709.74	0.20	0.03	0.00		6400.00		405.84
Flam Wash	15	PF 1	1709.90	1709.69	0.21	0.07	0.00		6400.00		450.14
Flam Wash	11	PF 1	1709.83	1709.63	0.20				6400.00		471.52
Flam Wash	8		Inline Weir - Low Flow Crossing								
Flam Wash	1	PF 1	1706.51	1705.93	0.59				6400.00		250.35

FlamWashPost Plan: Proposed 8/9/2013

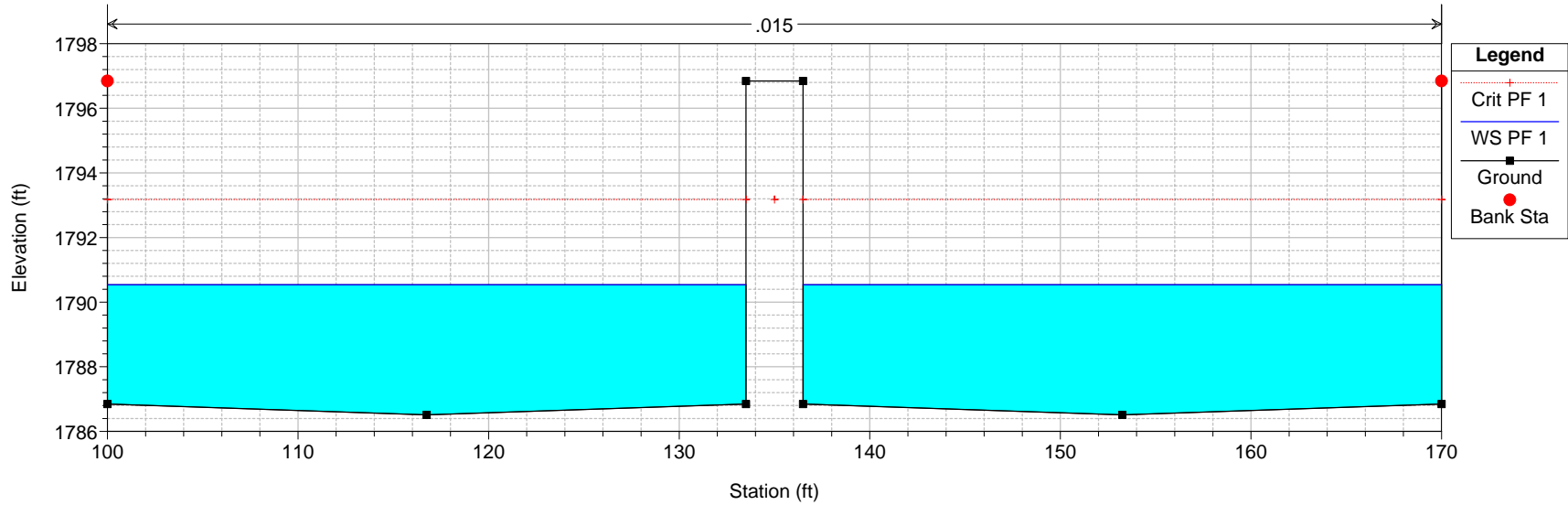
Flamingo Flam Wash



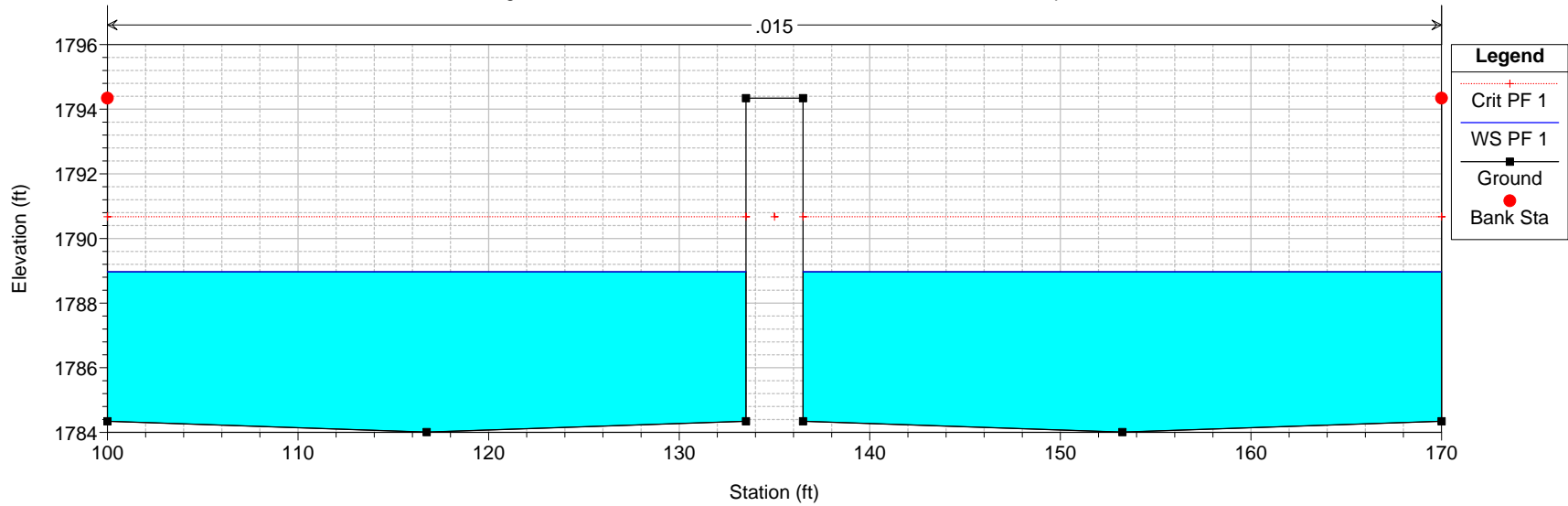
Legend

- WS PF 1
- Crit PF 1
- Ground

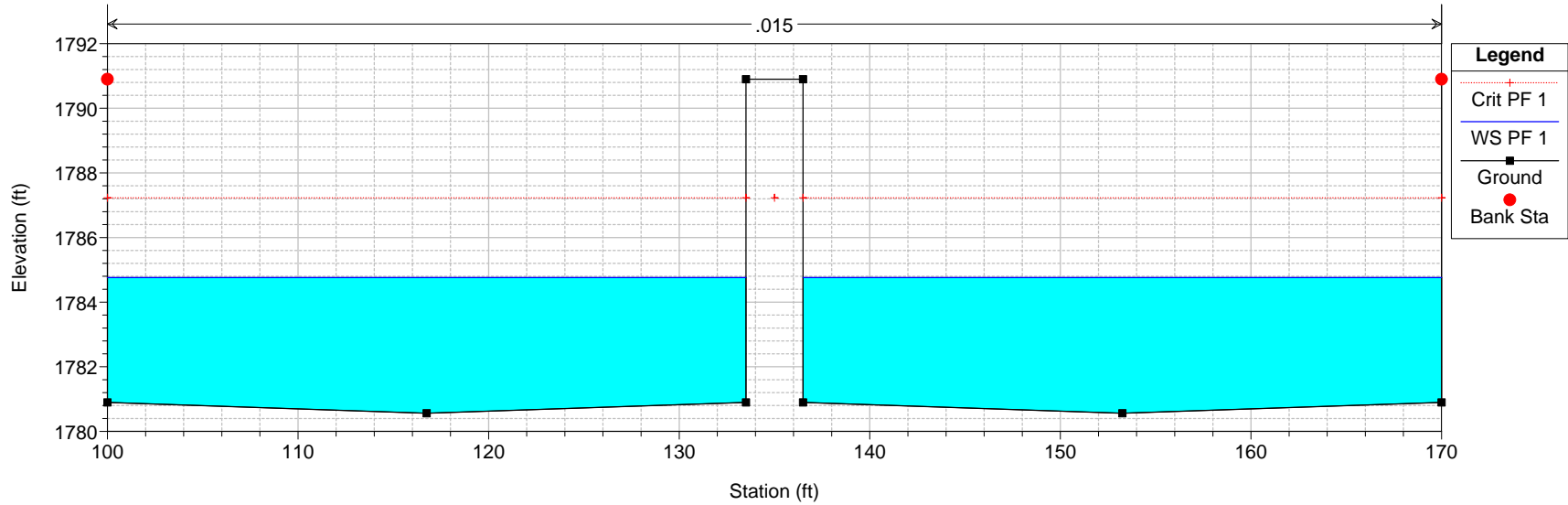
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 390 Ex. Concrete Channel Upstream of I-515



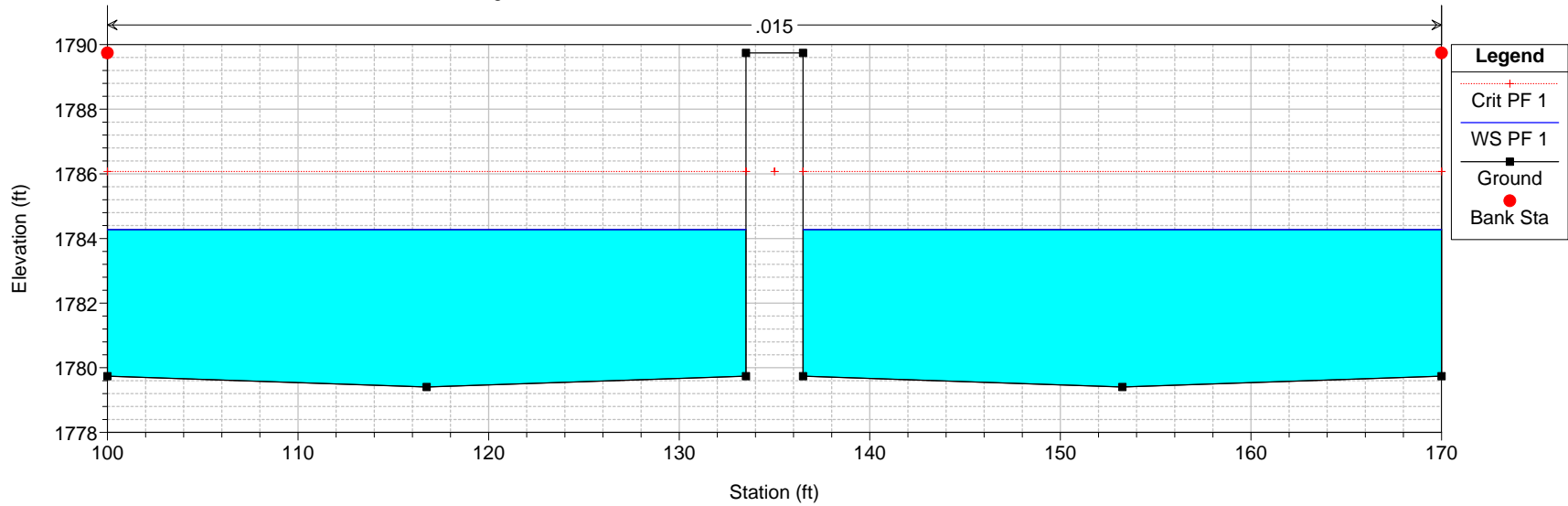
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 380 Ex. Concrete Channel Upstream of I-515



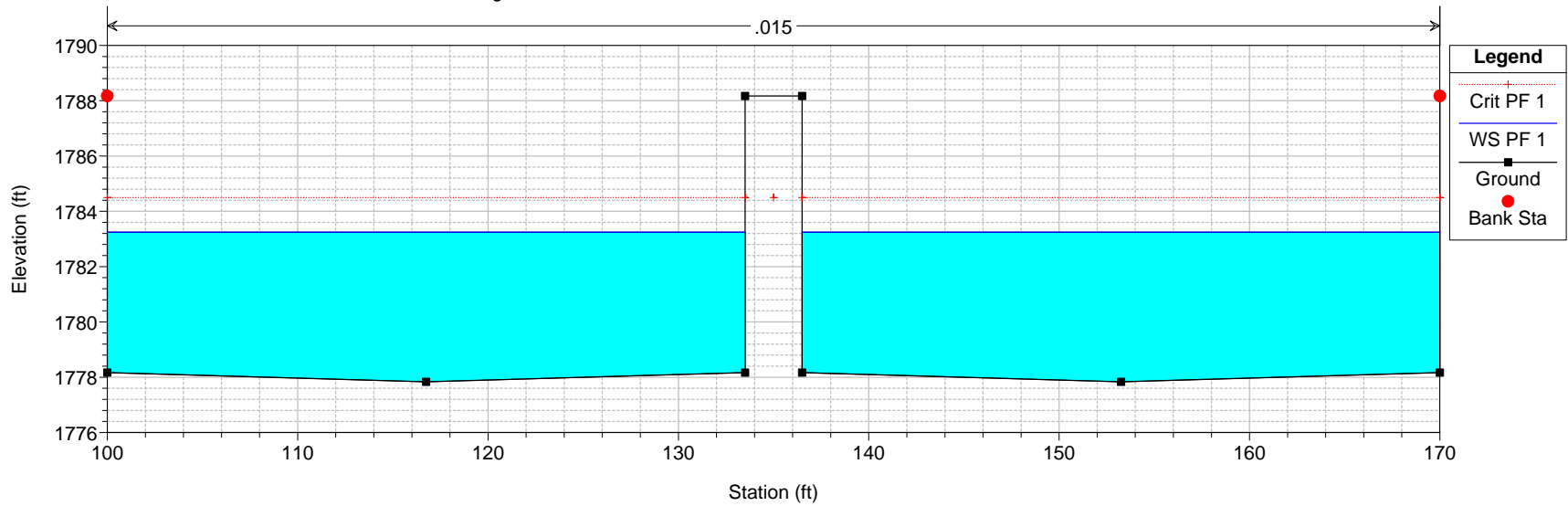
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 370 Ex. Concrete Channel Upstream of I-515



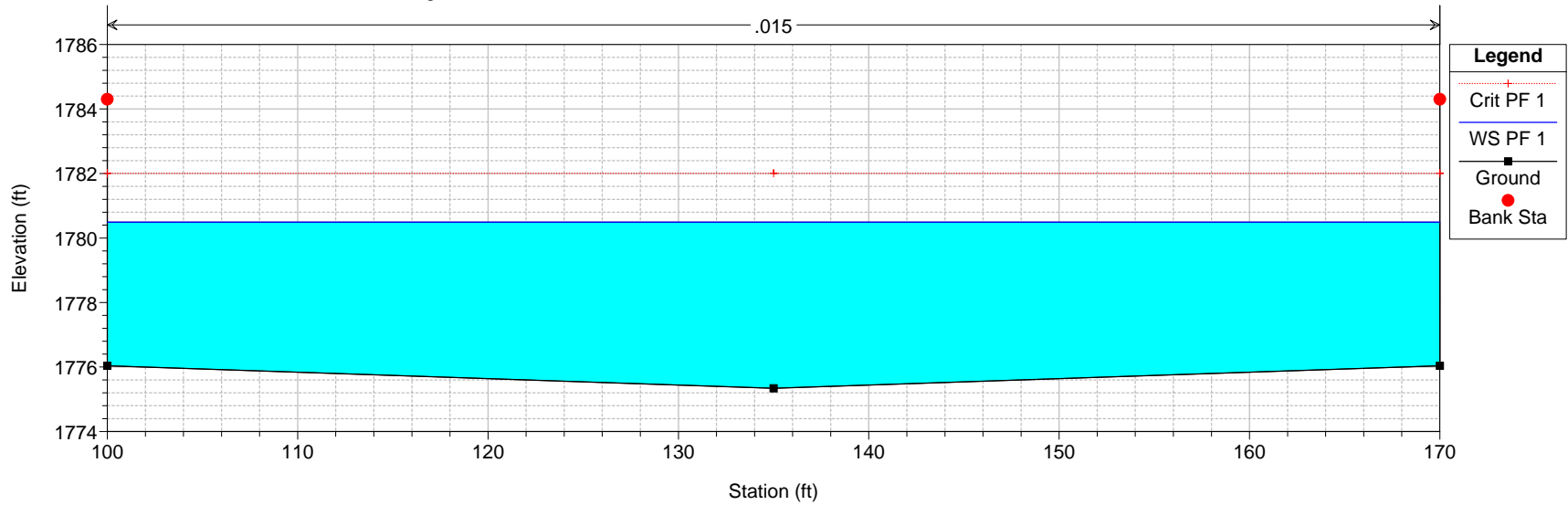
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 360 Ex. Concrete Channel Downstream of I-515



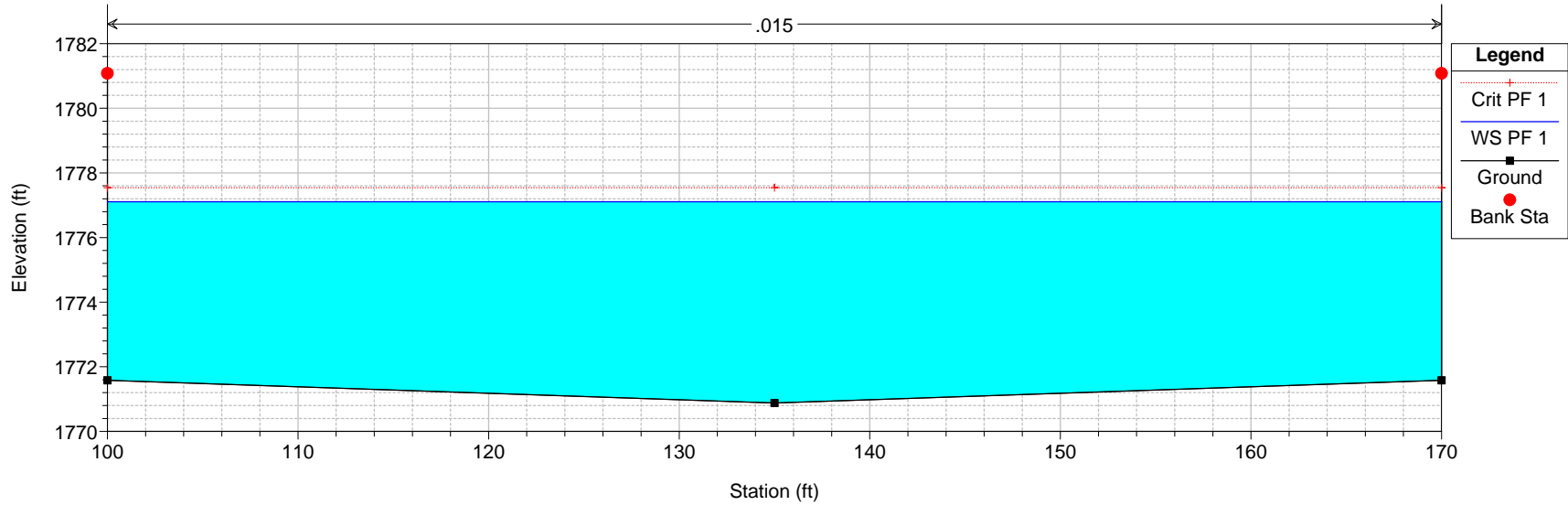
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 350 Ex. Concrete Channel Downstream of I-515



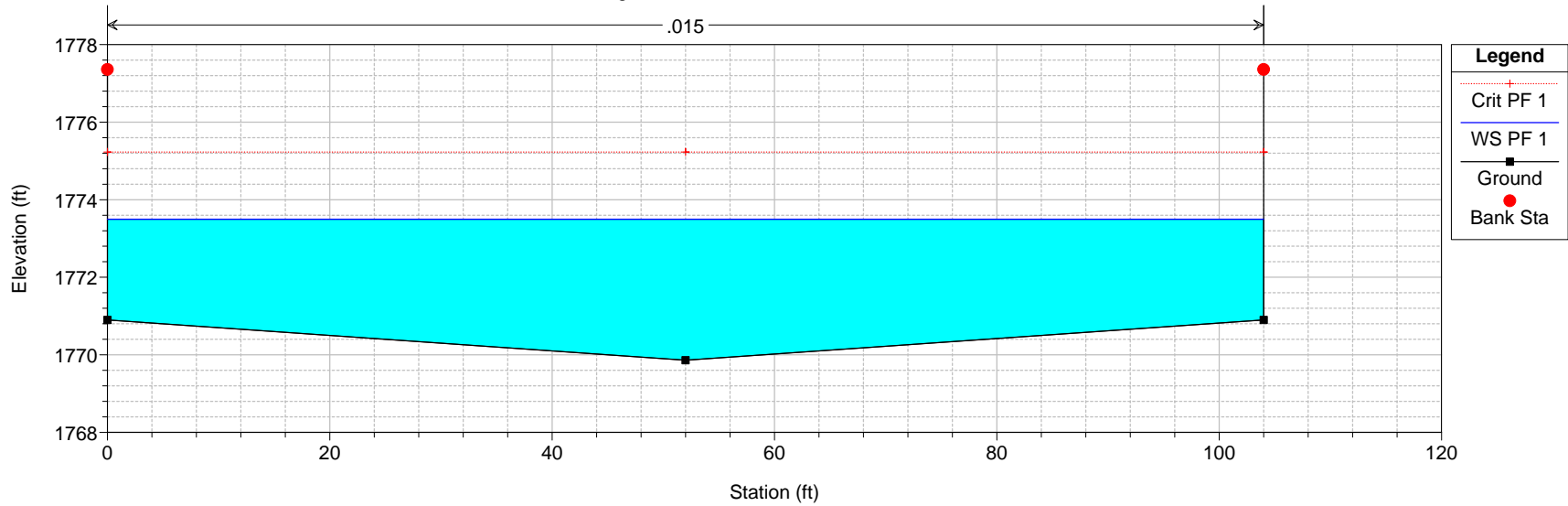
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 341 Ex. Concrete Channel Downstream of I-515 - "AB" 21+37.2



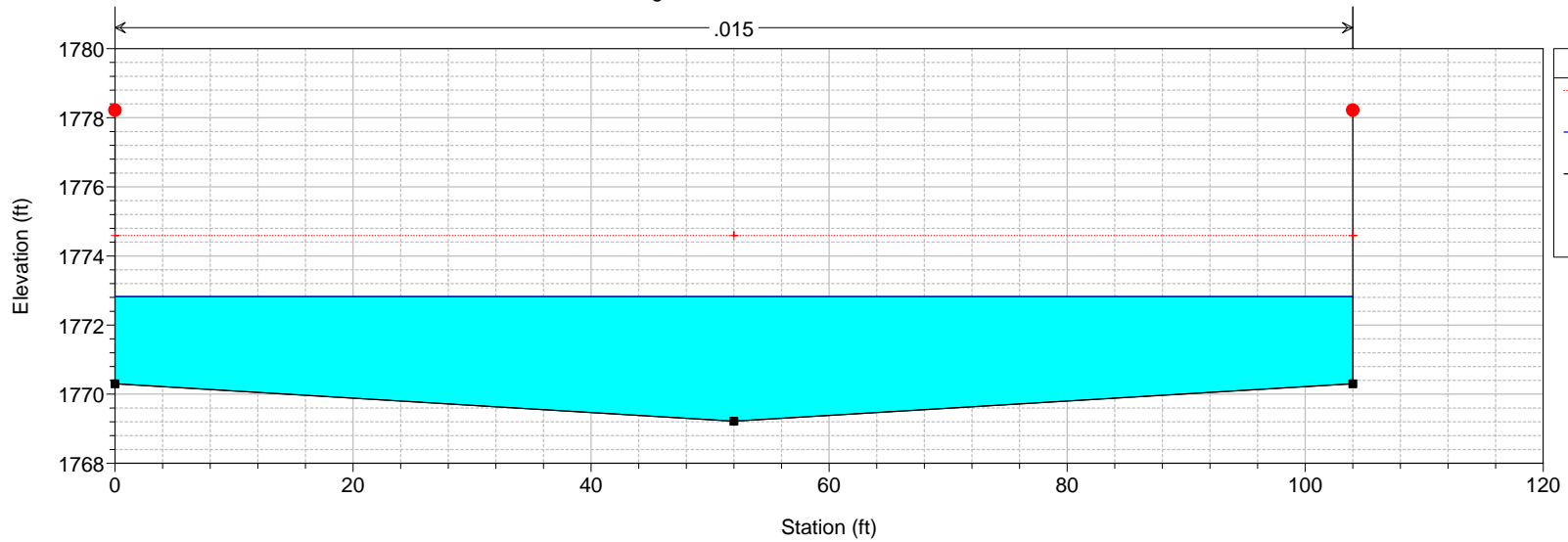
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 313 "AB" 34+06.10



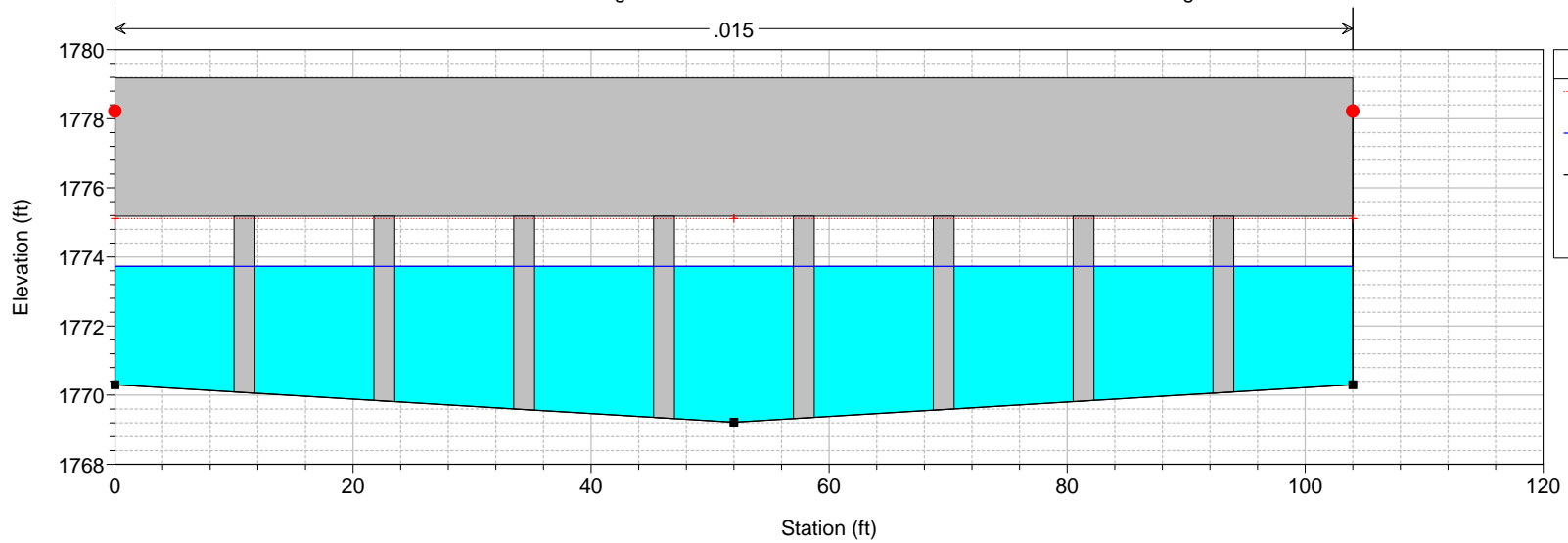
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 311 "AB" 36+61.10



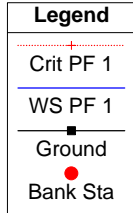
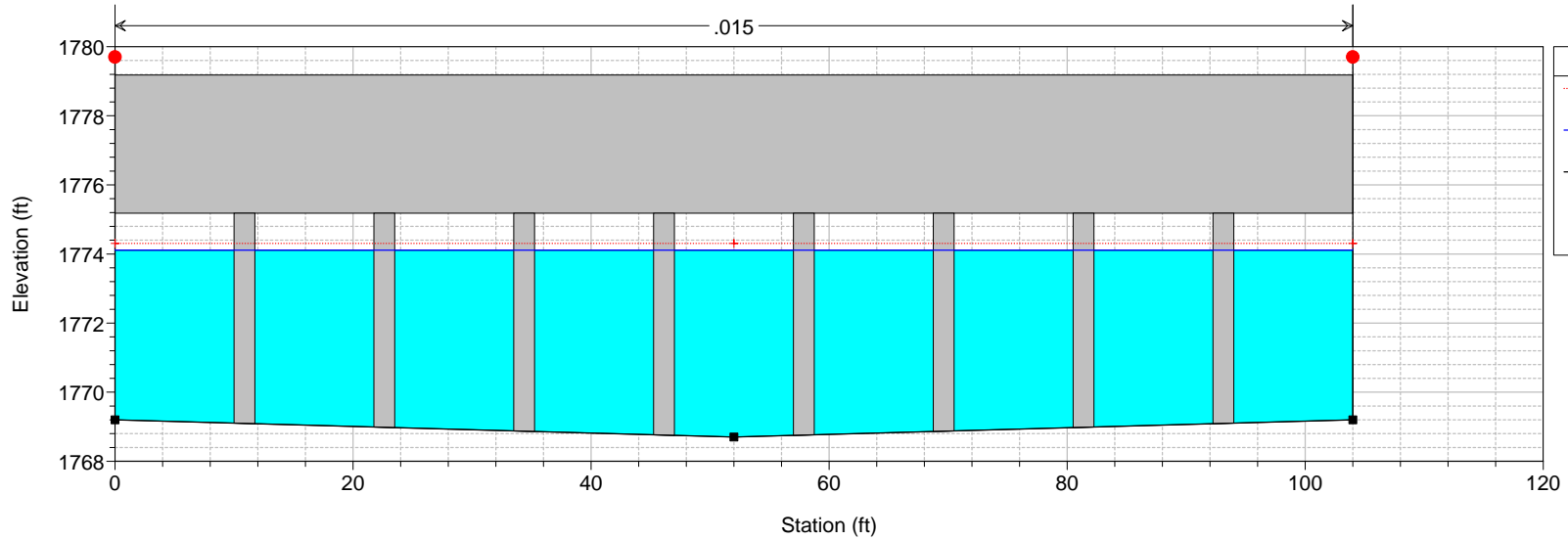
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 305 = "AB" 37+11.52



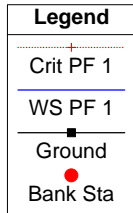
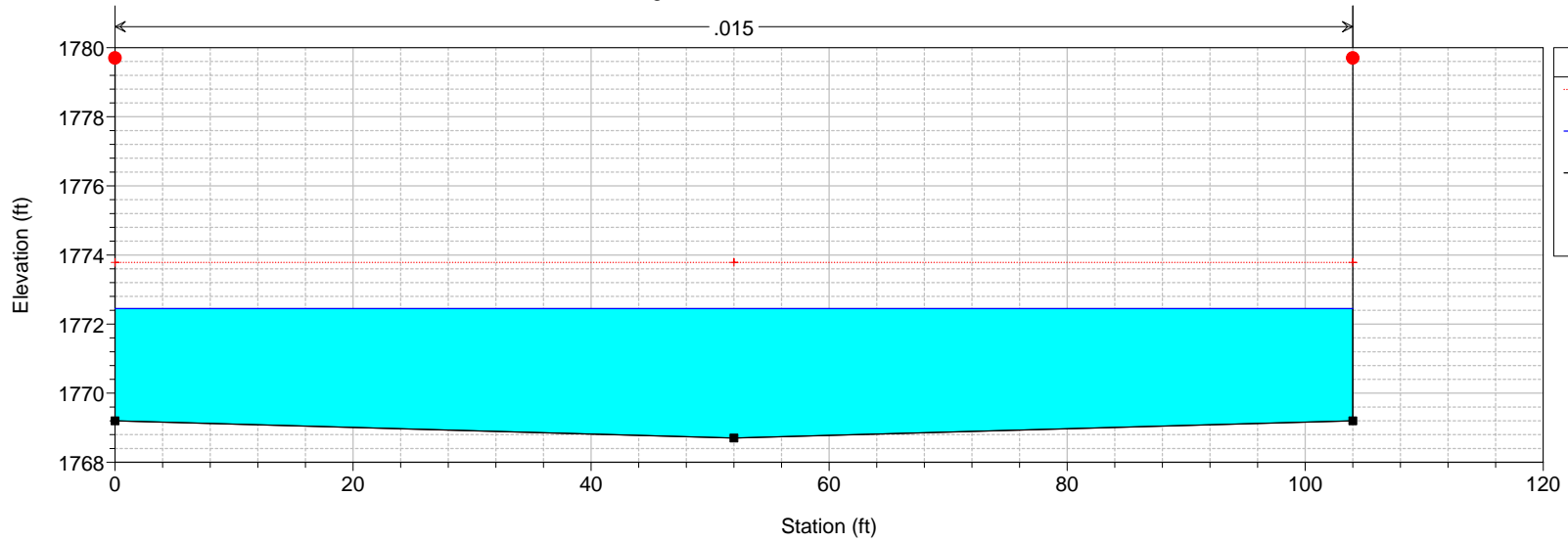
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

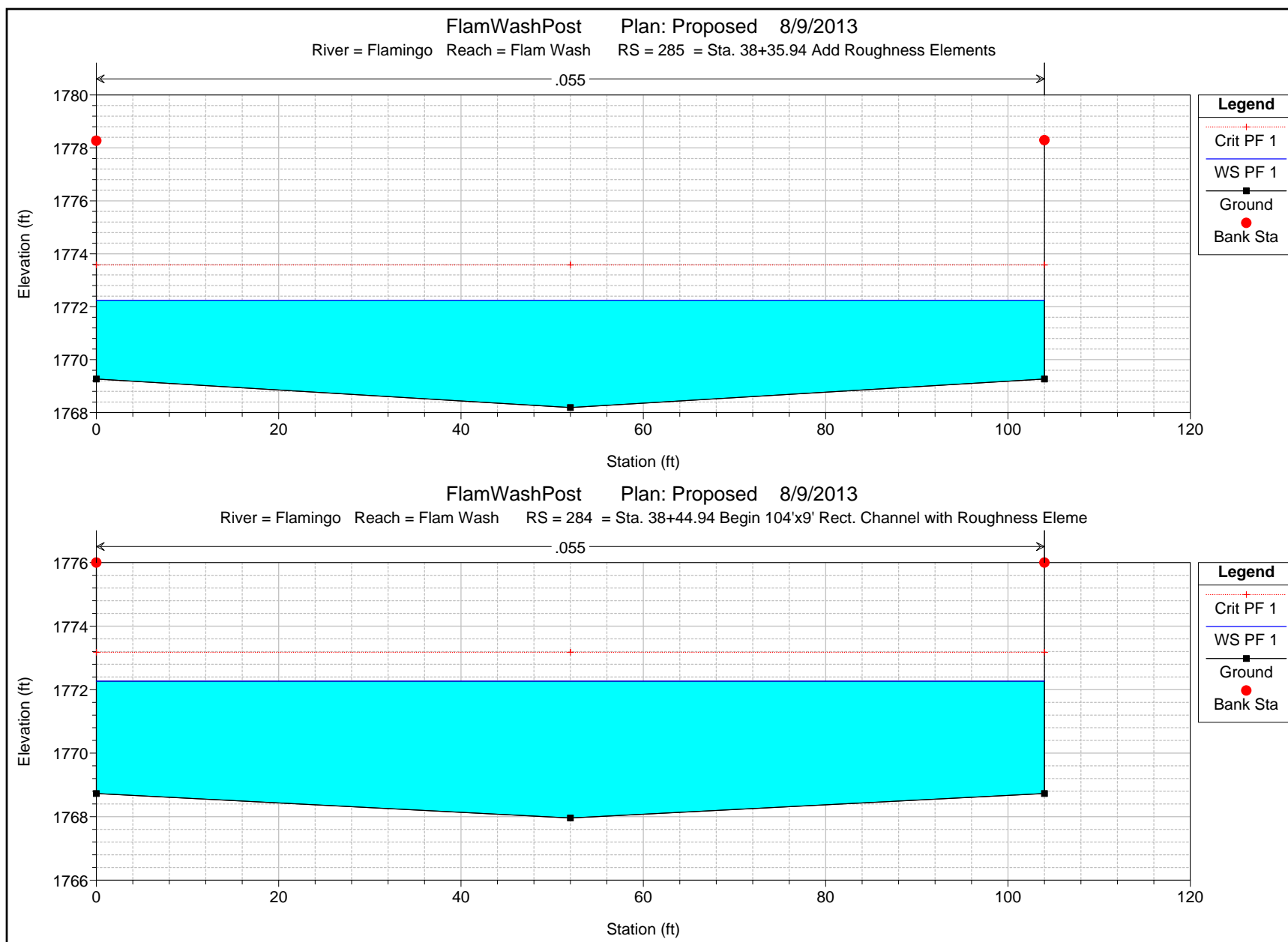


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

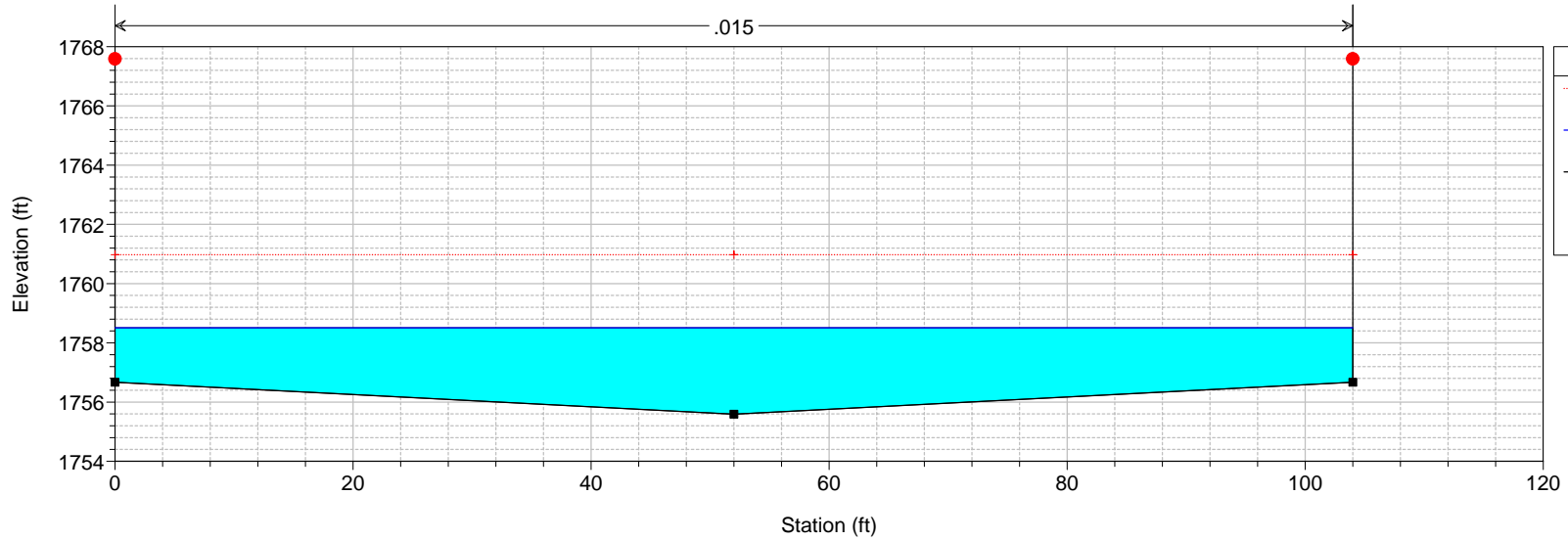


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 295 = "AB" 38+20.93



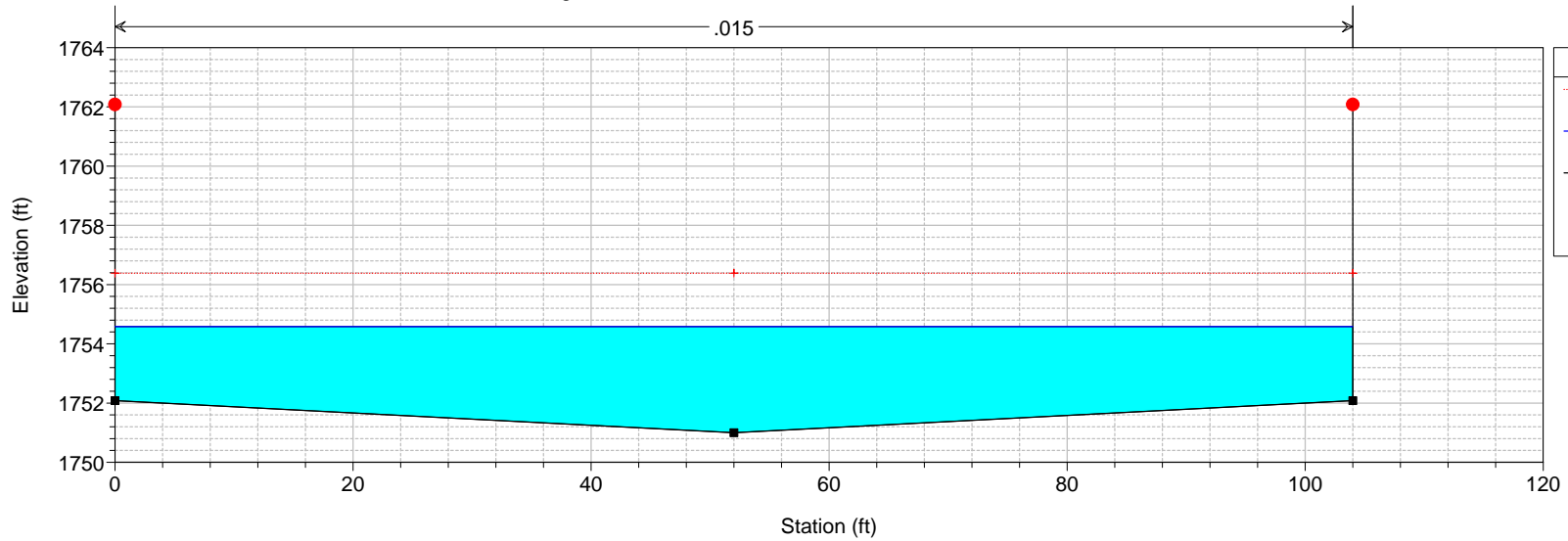


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 246 = Sta. 40+45.94 End Roughness Elements



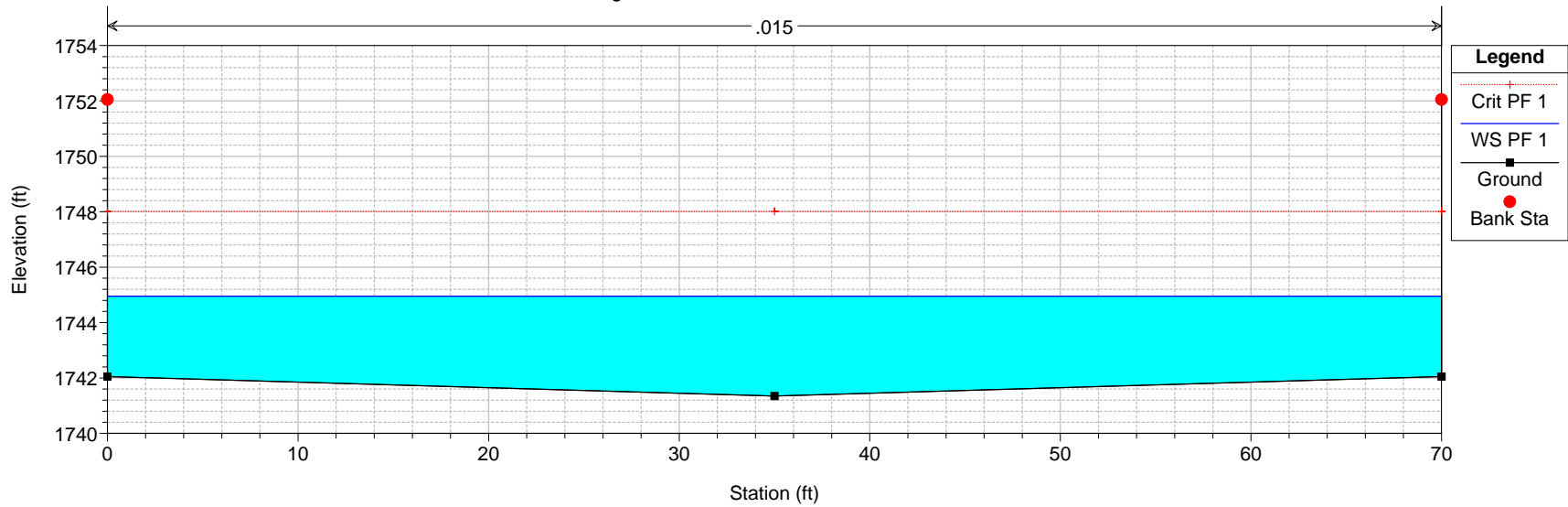
Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 229 = Sta. 45+22.37 Transition Structure

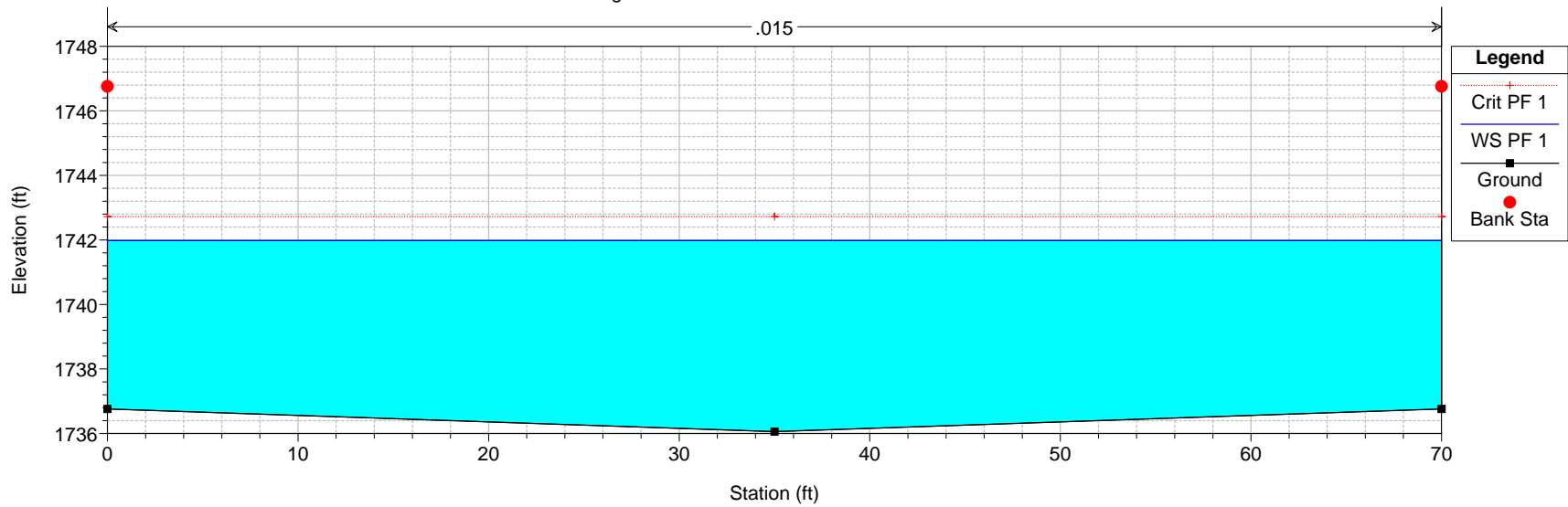


Legend
 Crit PF 1
 WS PF 1
 Ground
 Bank Sta

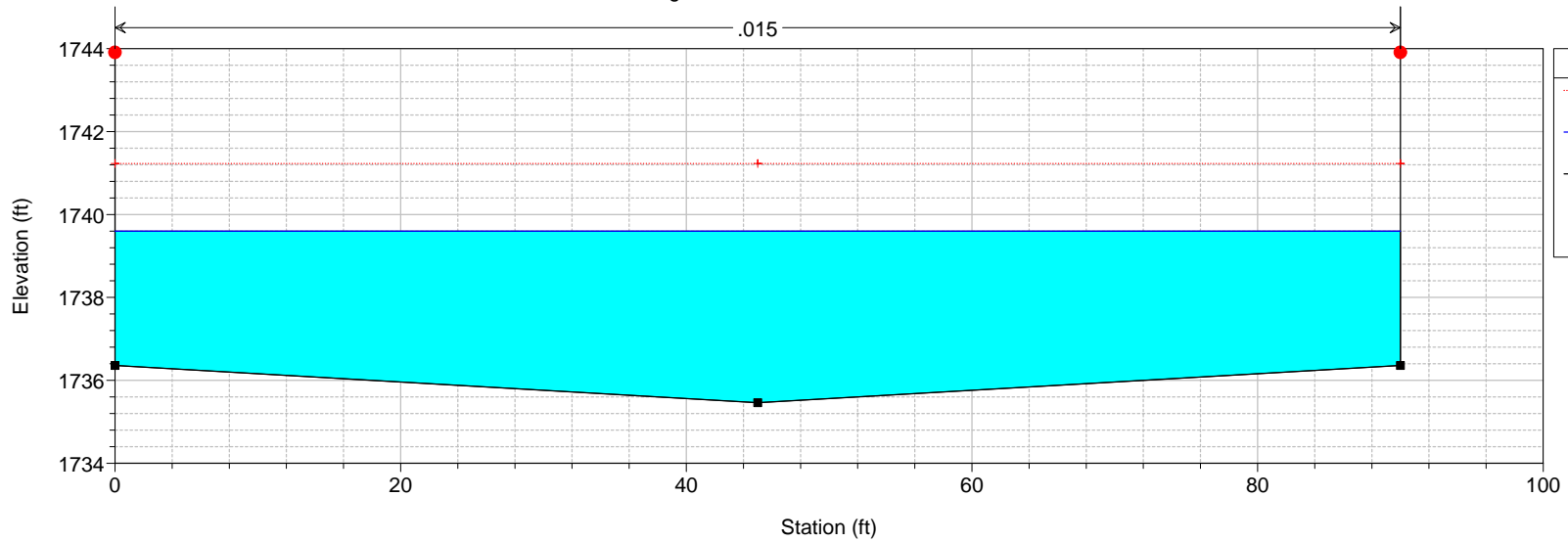
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 222 = Sta. 47+77.37



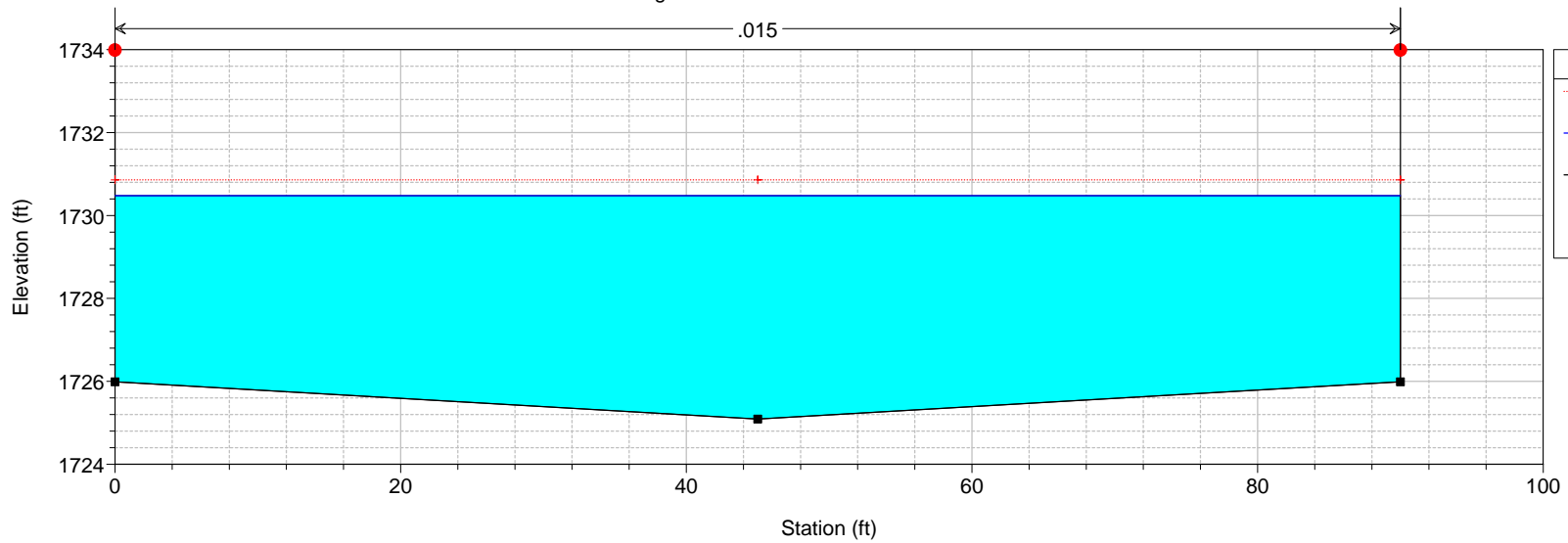
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 193 = Sta. 60+98.98



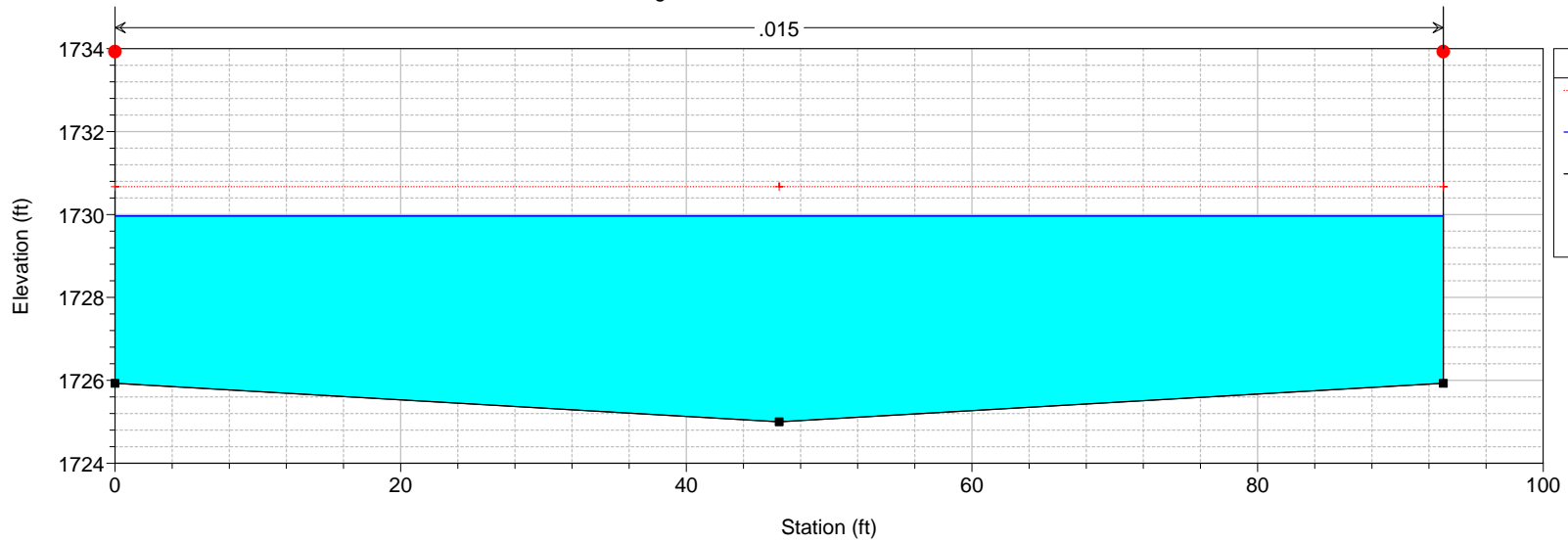
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 191 = Sta. 62+50



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 142 = Sta. 88+41.64

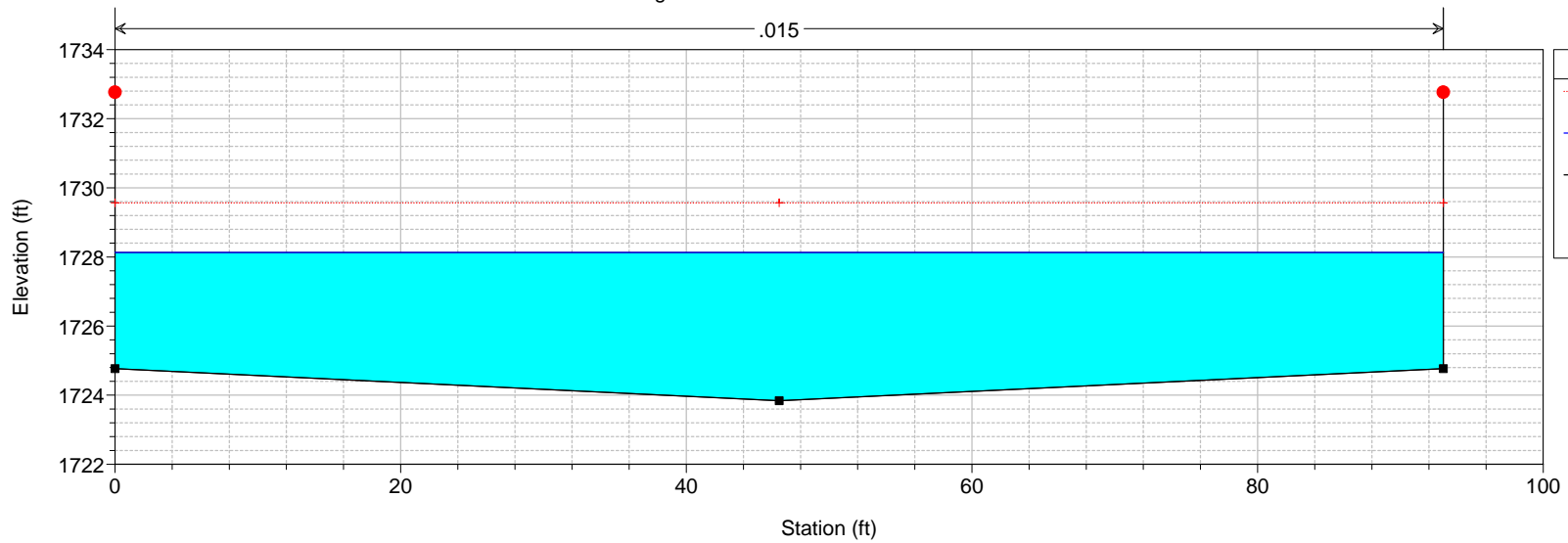


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 138 = Sta. 88+64.14



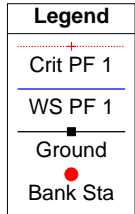
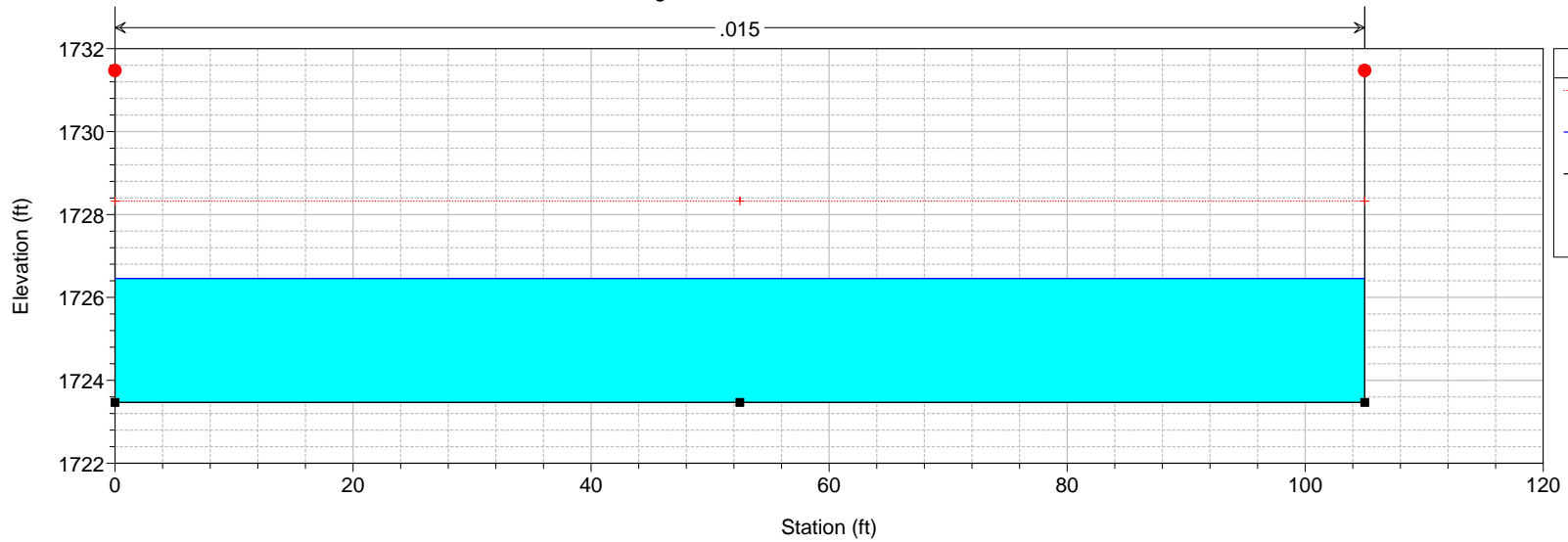
Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 135 = Sta. 89+02.27

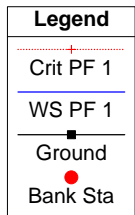
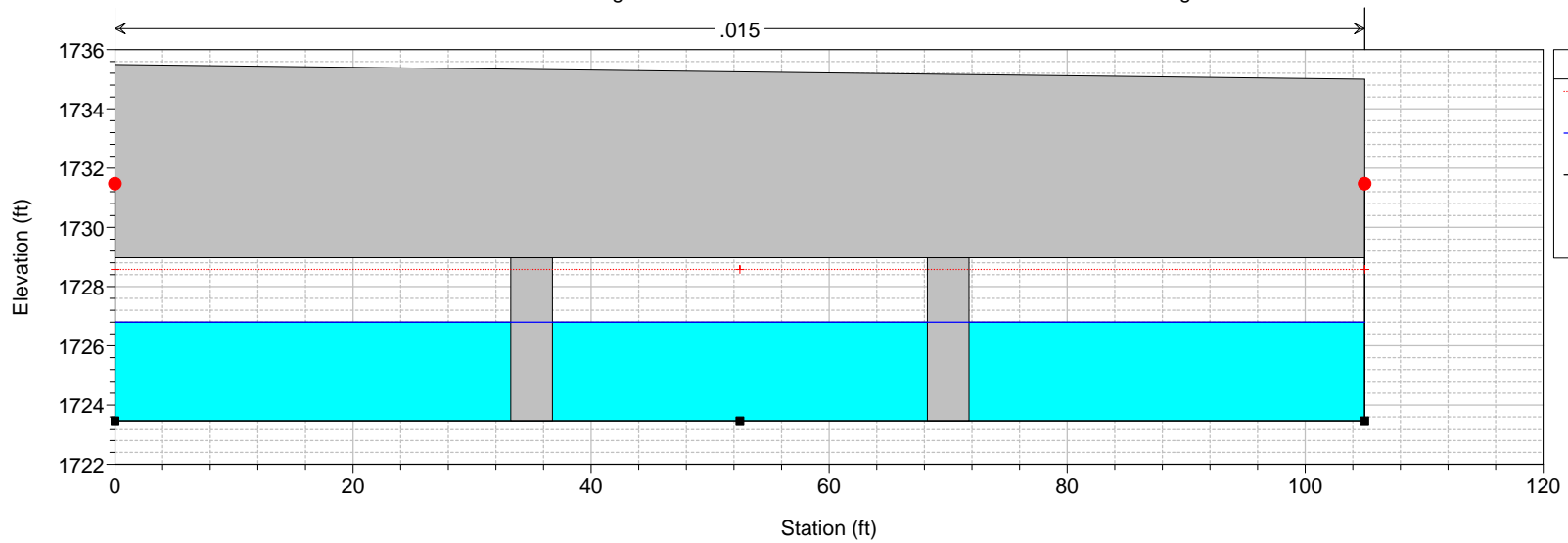


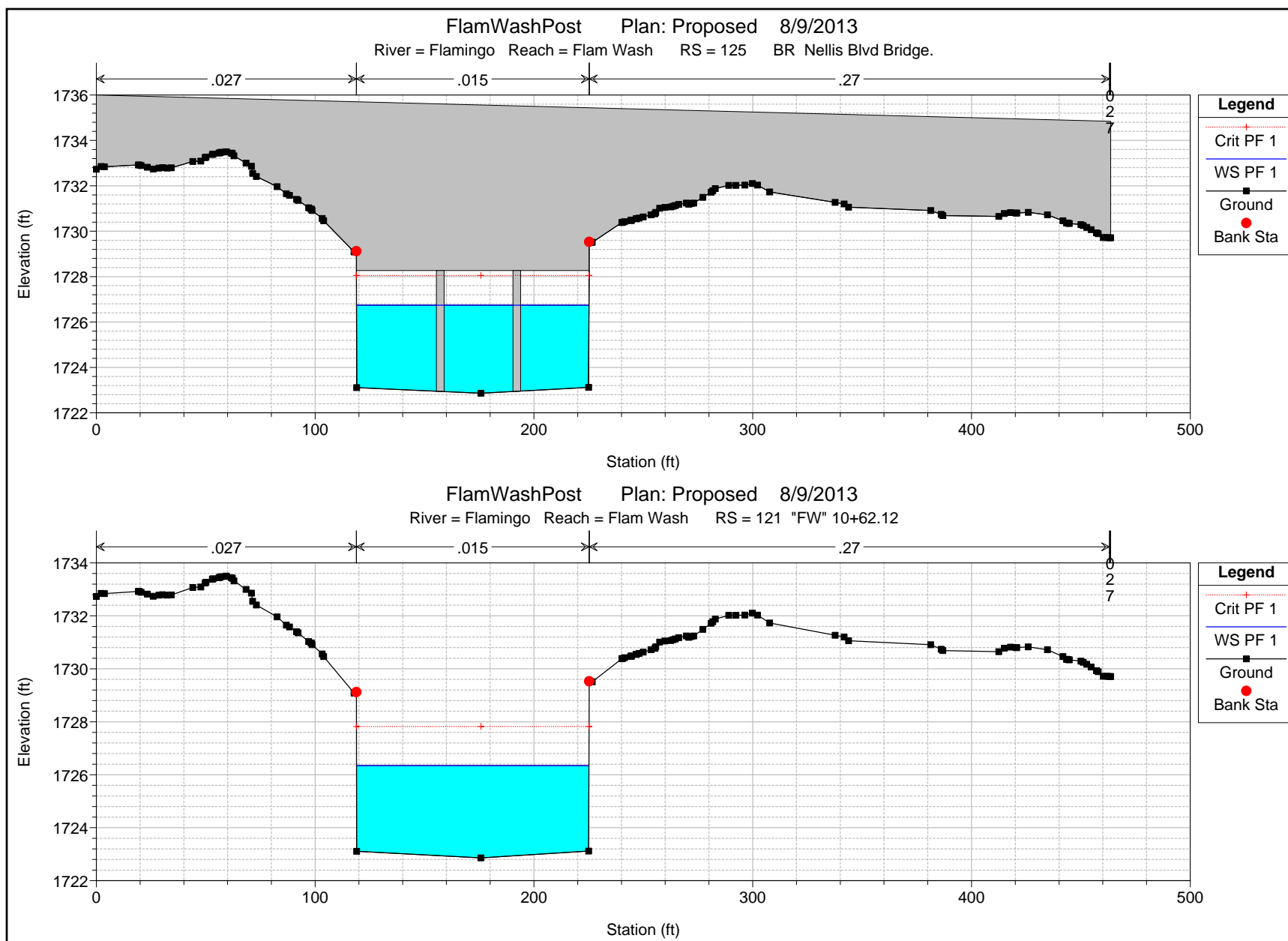
Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●

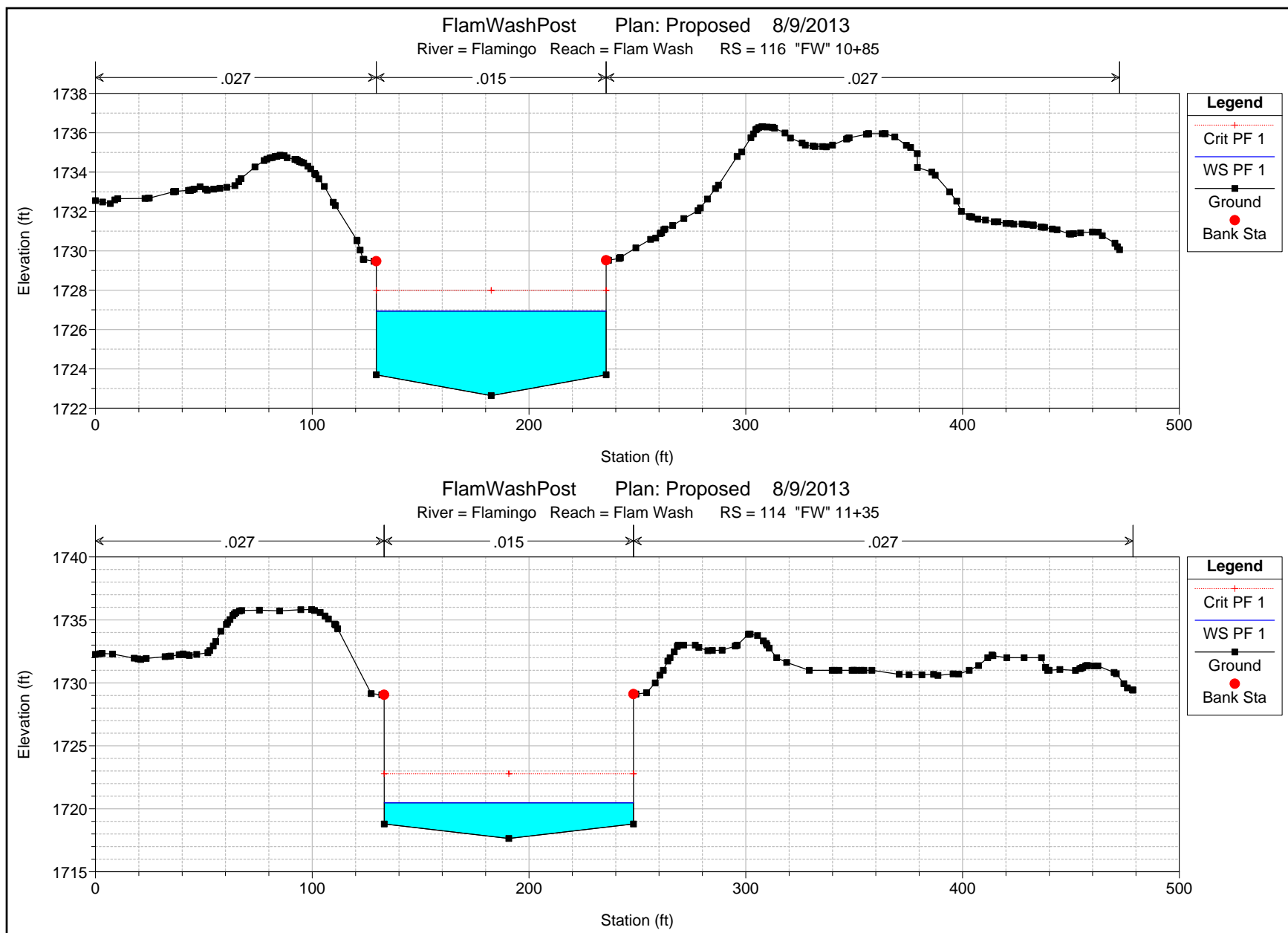
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 131 = Sta. 89+15.54

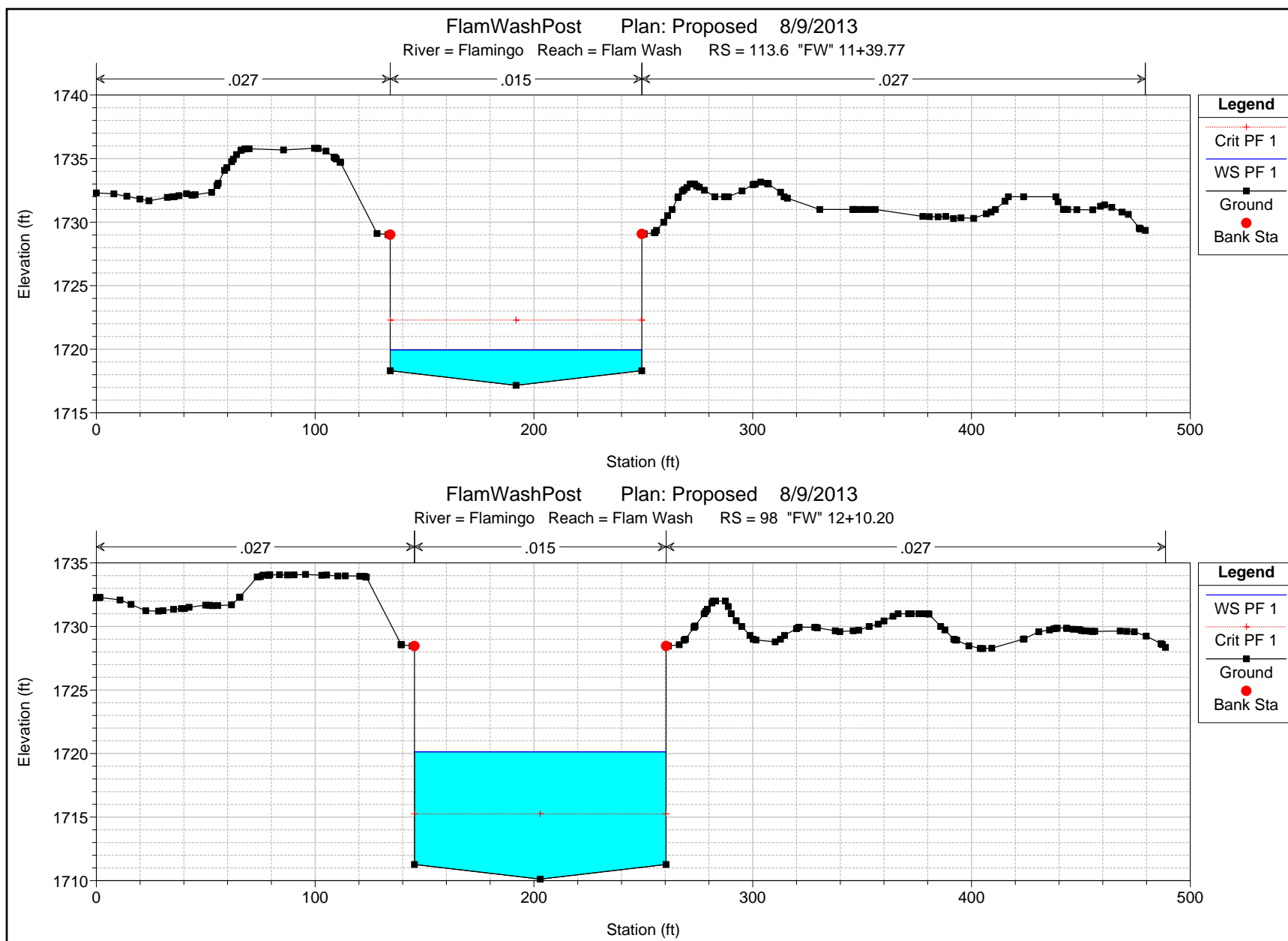


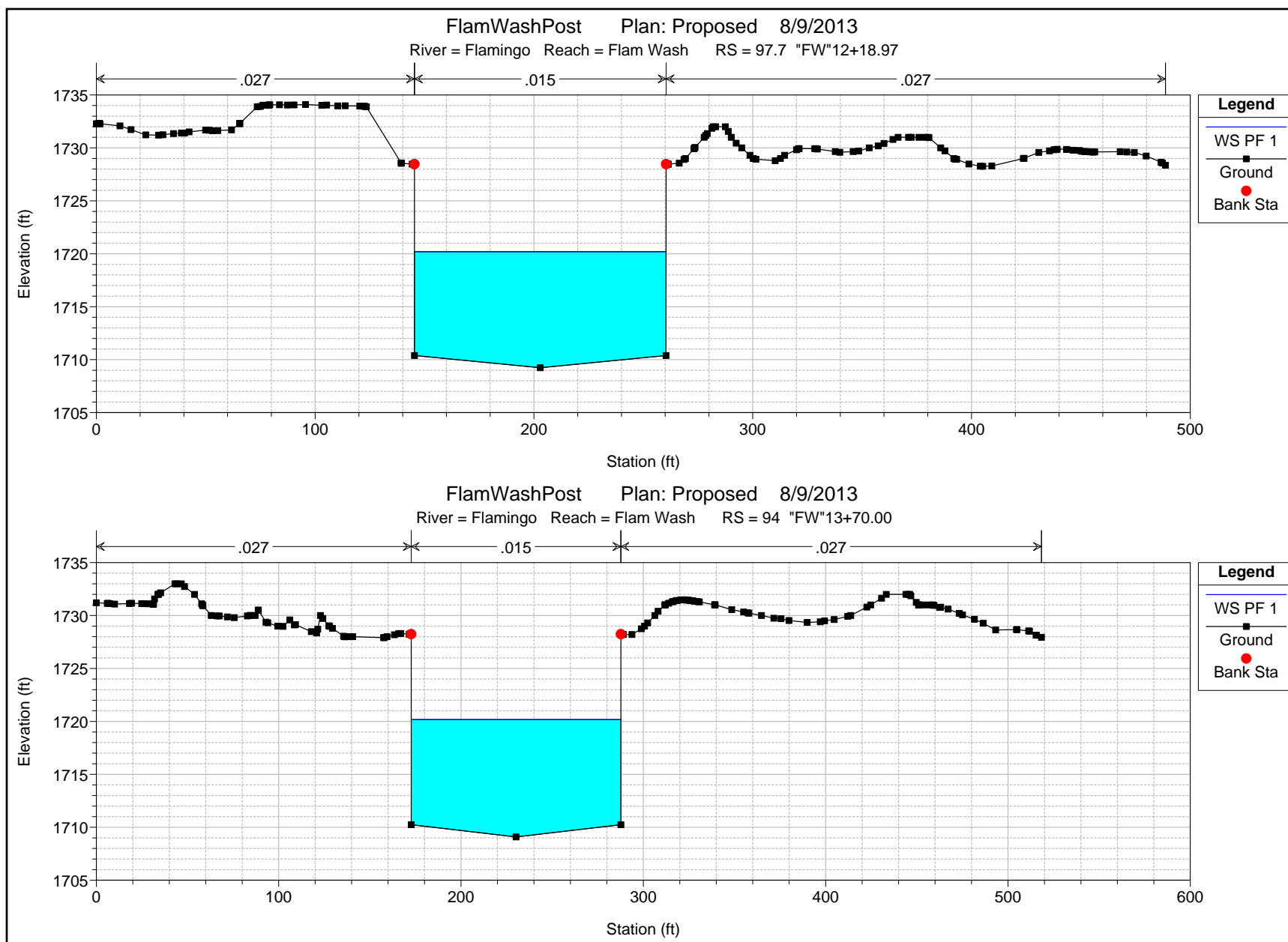
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 125 BR Nellis Blvd Bridge.



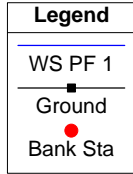
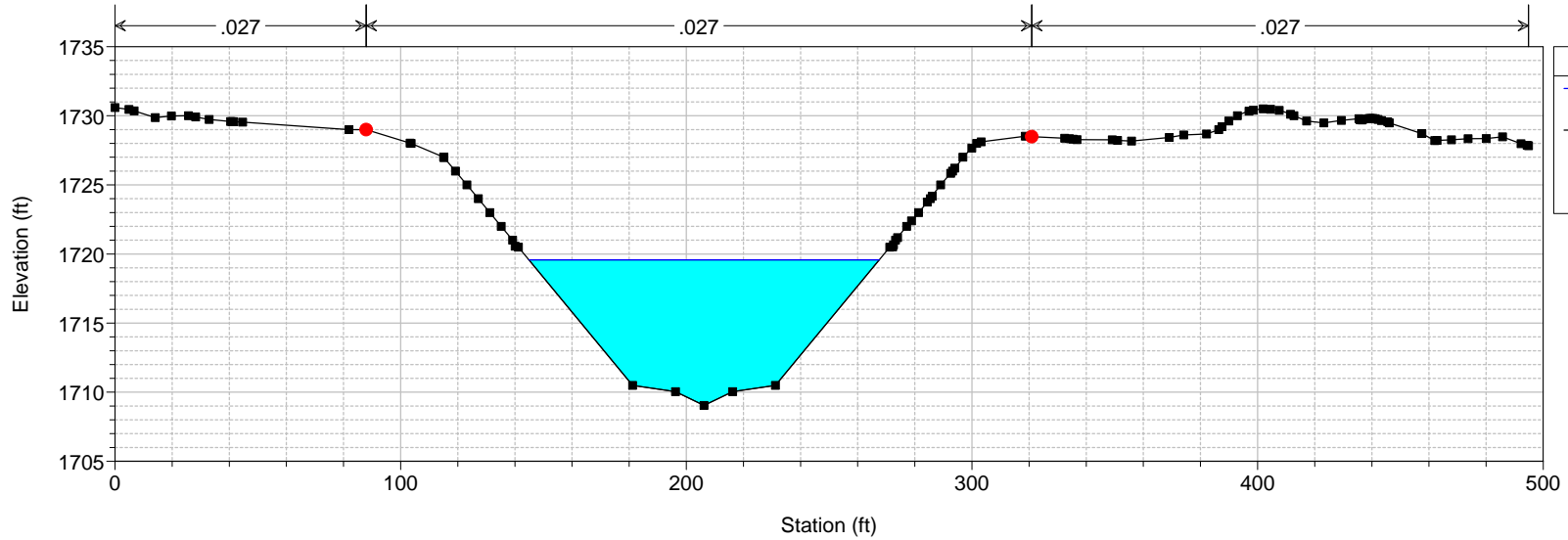




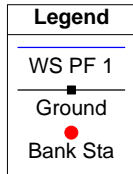
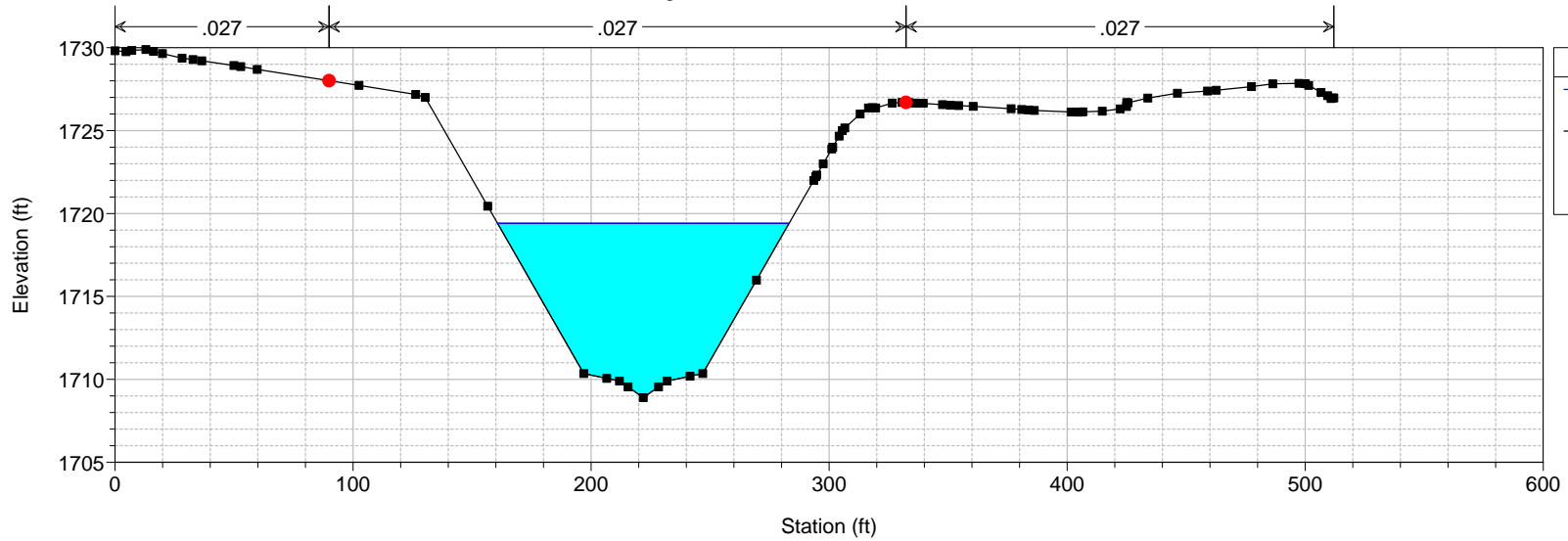




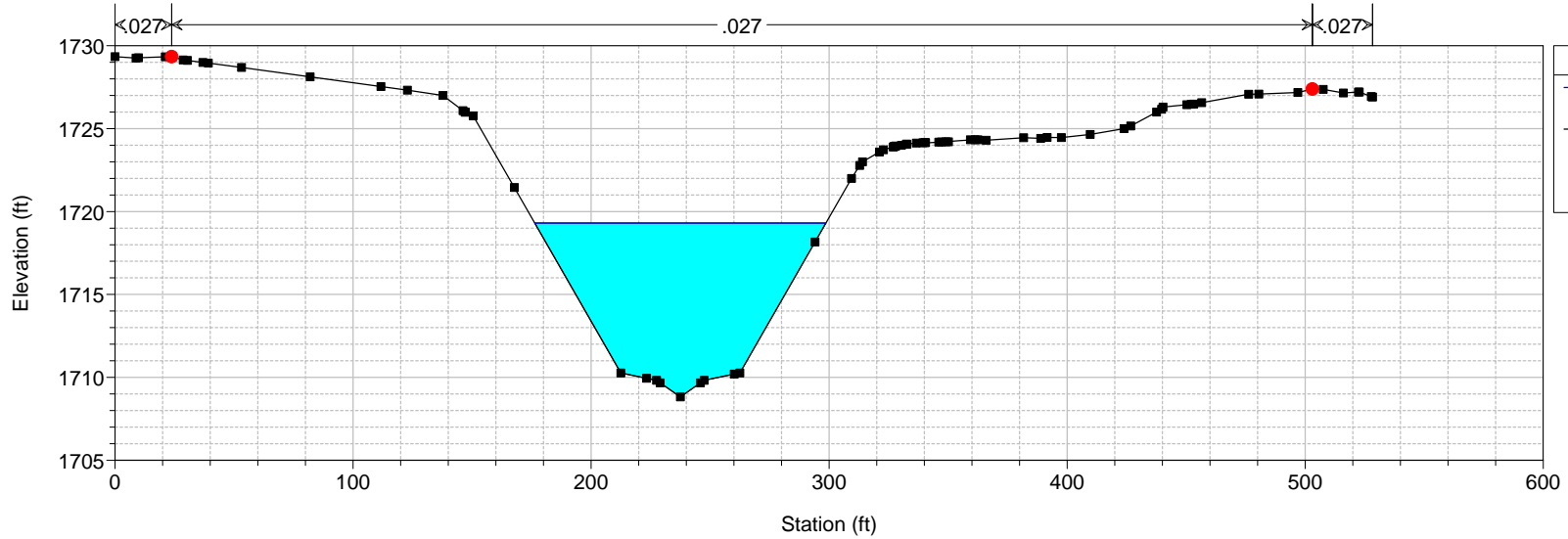
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 92 "FW"14+25



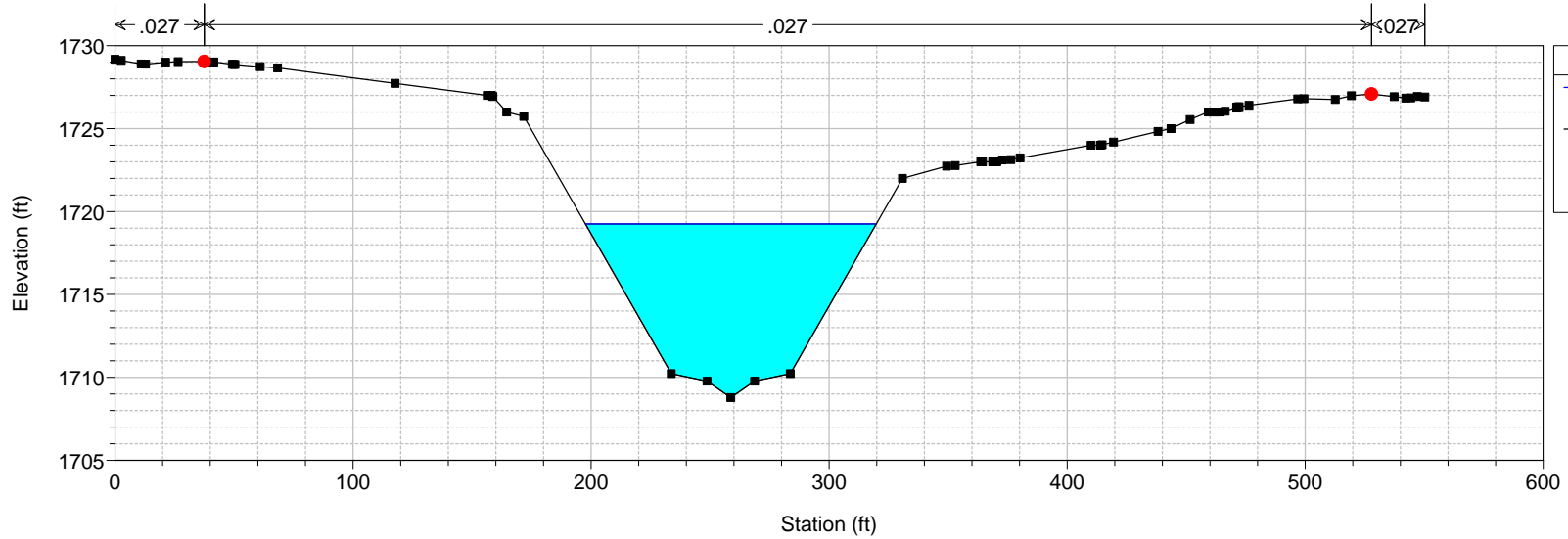
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 89 "FW" 15+16.10



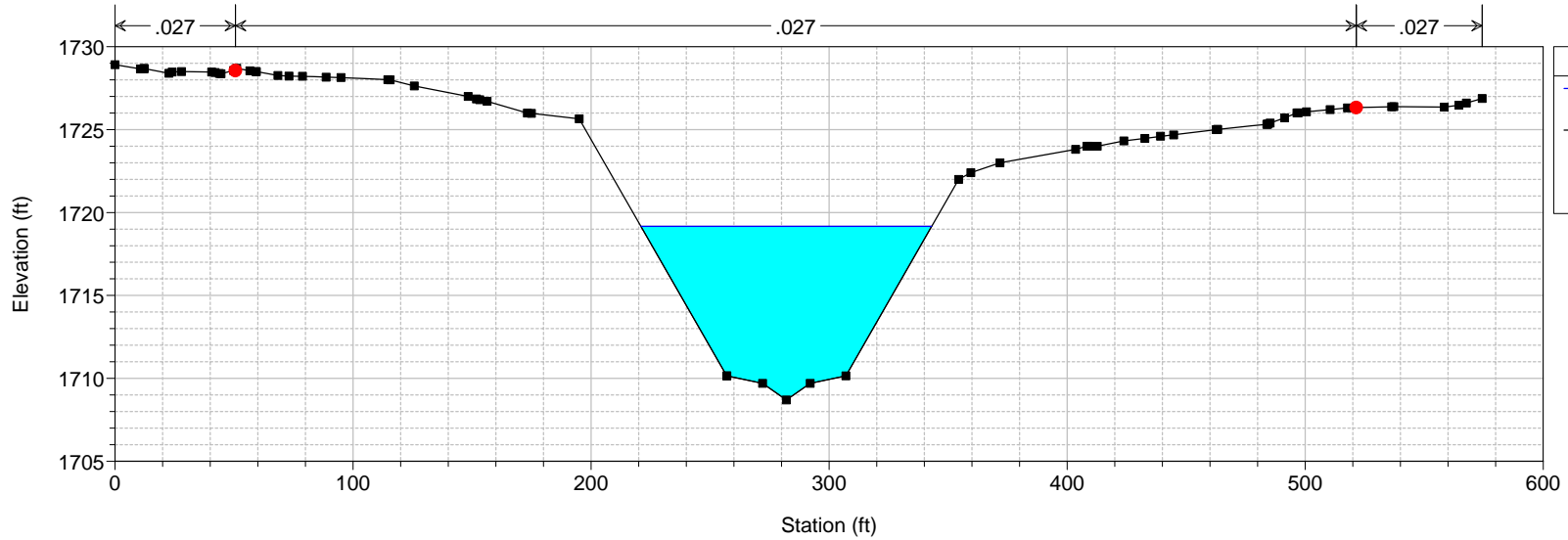
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 88 "FW" 15+71.10



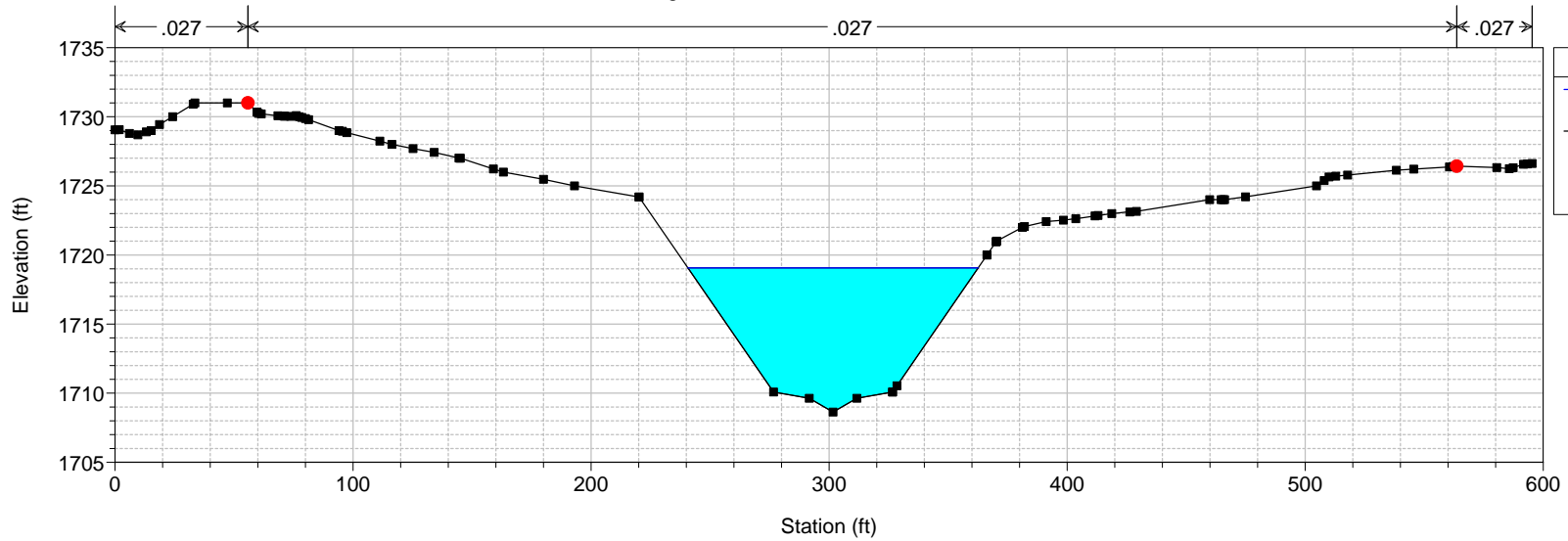
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 87.7 "FW" 16+00.00



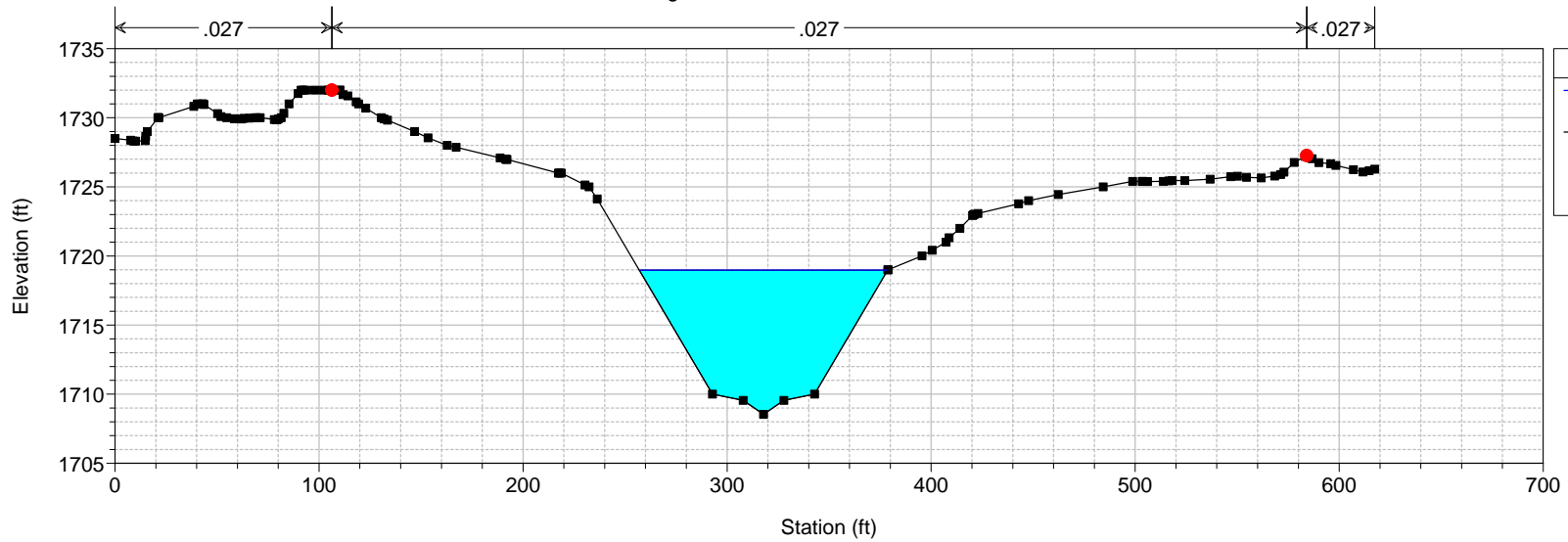
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 87 "FW" 16+50.00



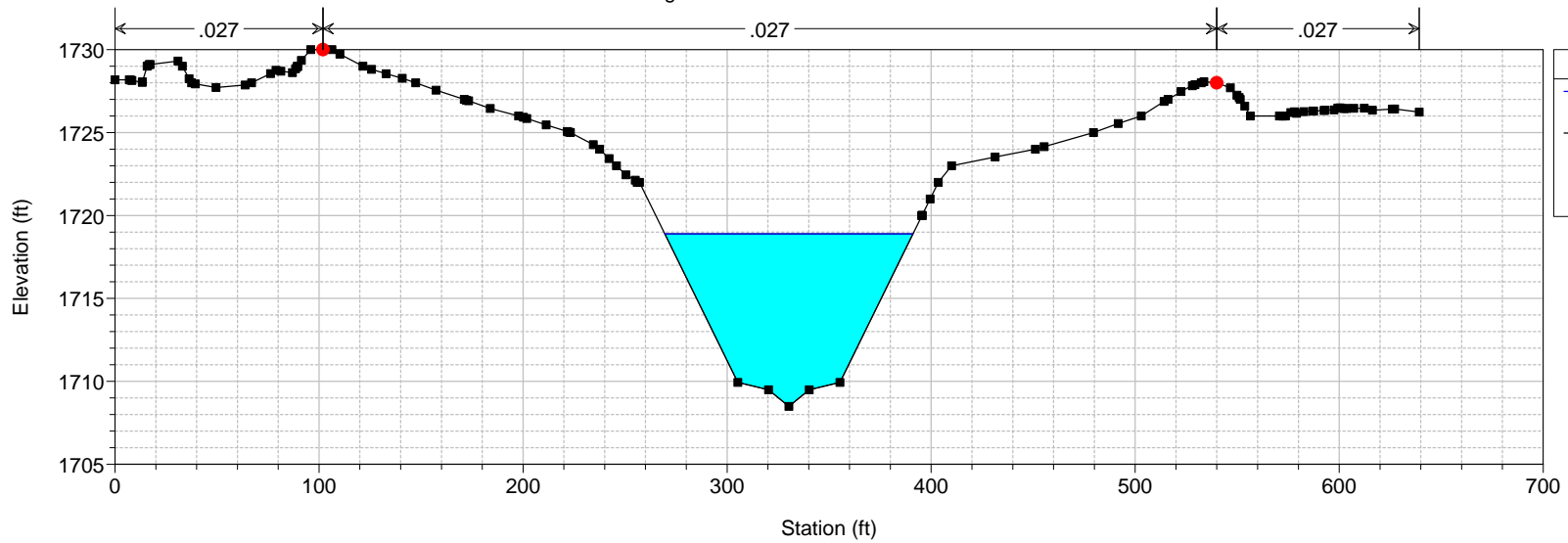
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 86 "FW" 17+00.00



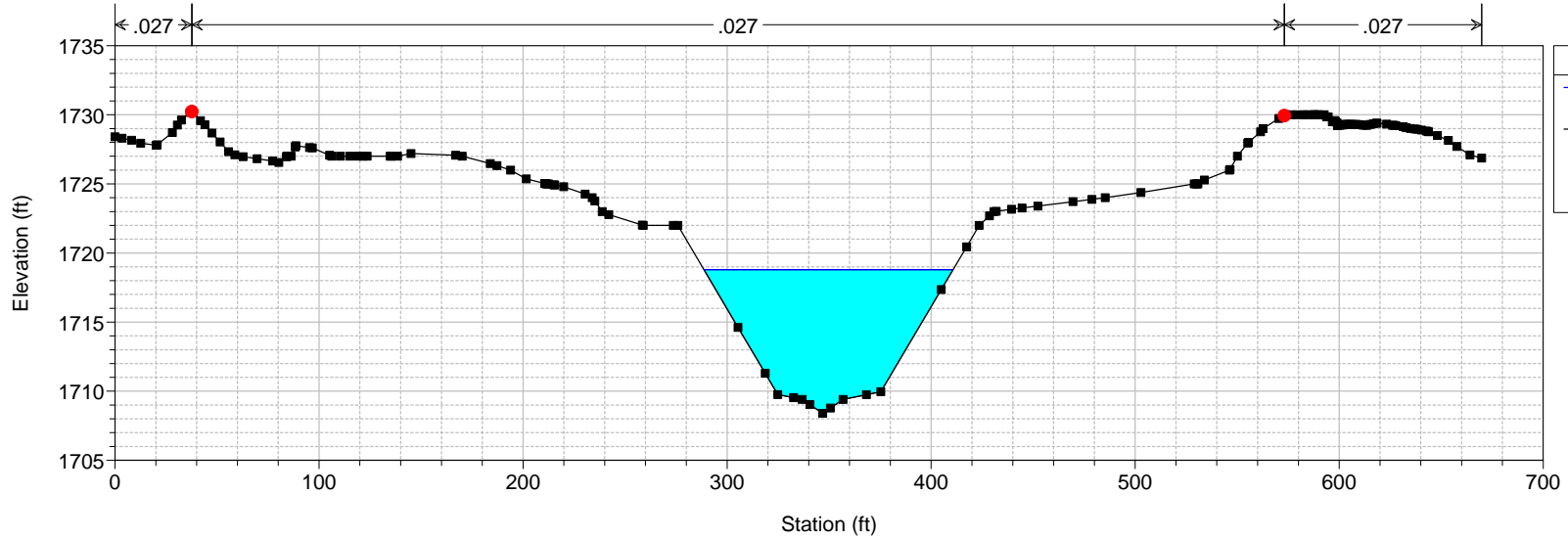
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 85 "FW"17+50.00



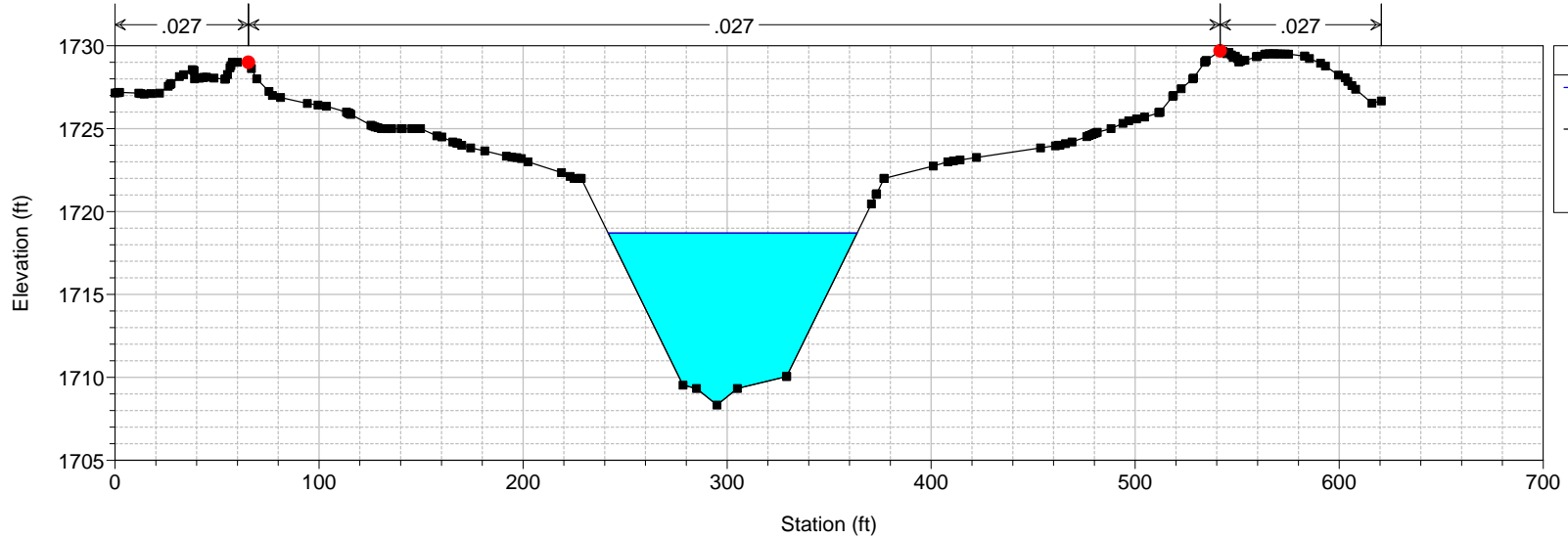
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 84 "FW" 17+93.42



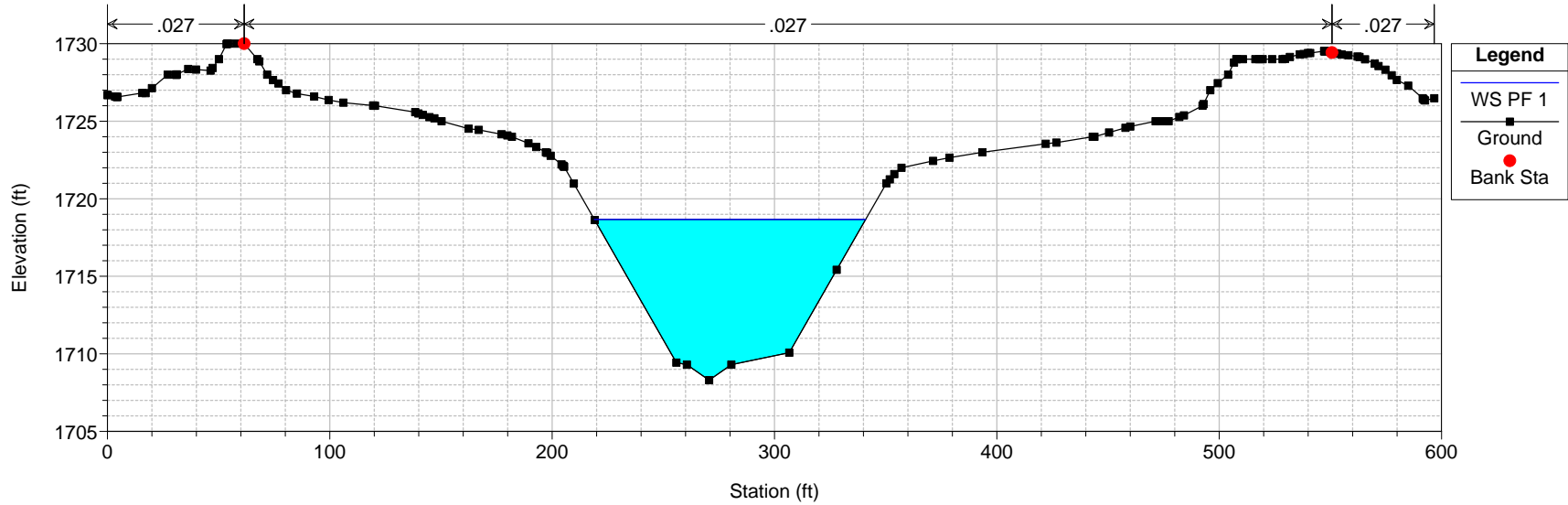
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 83 "FW" 18+51.22



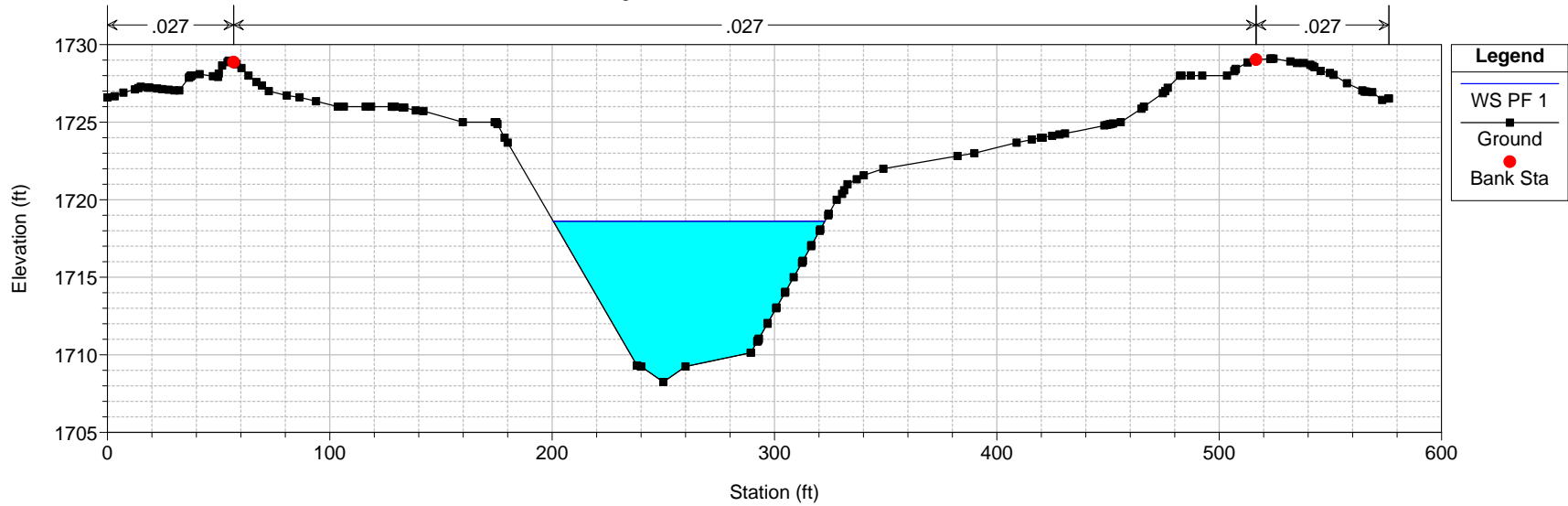
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 82.5 "FW" 19+00.00



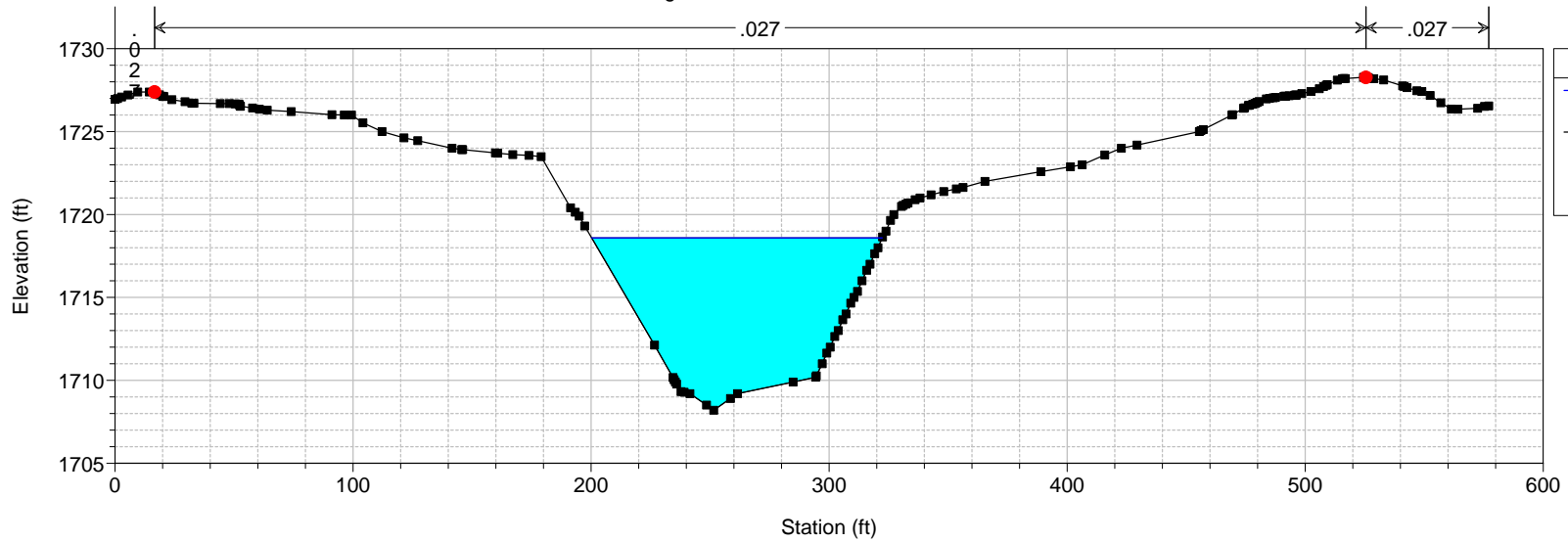
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 82 "FW" 19+16.86



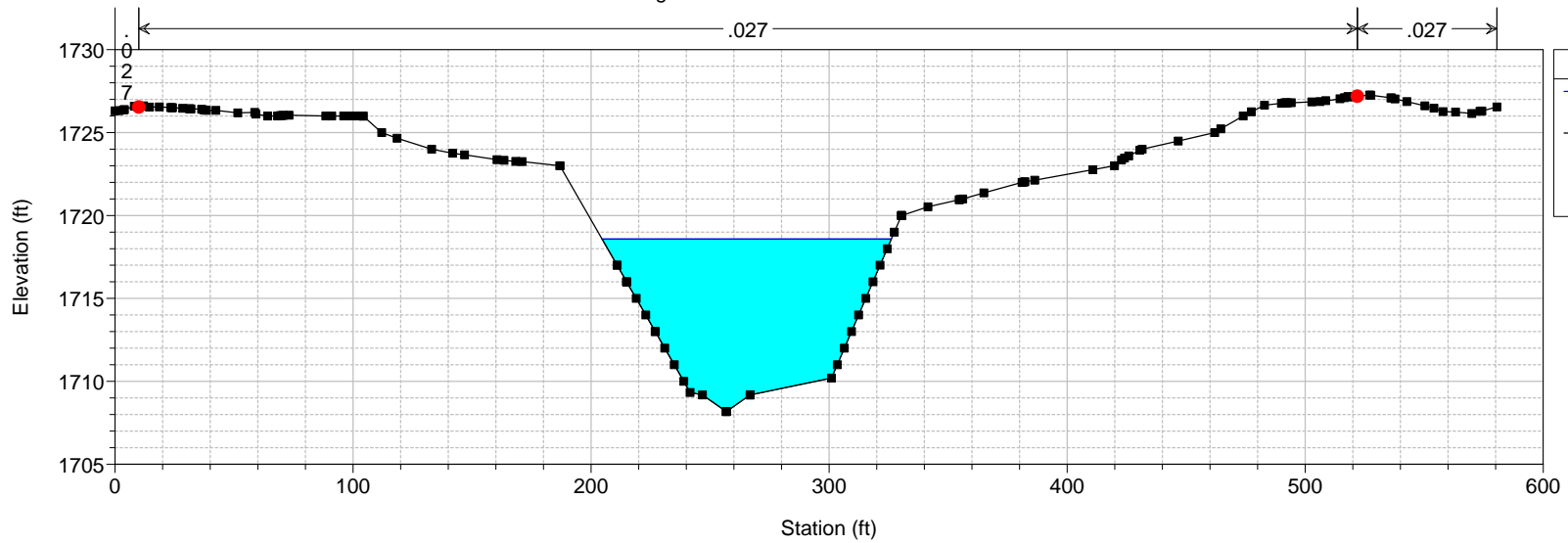
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 81 "FW" 19+50.00



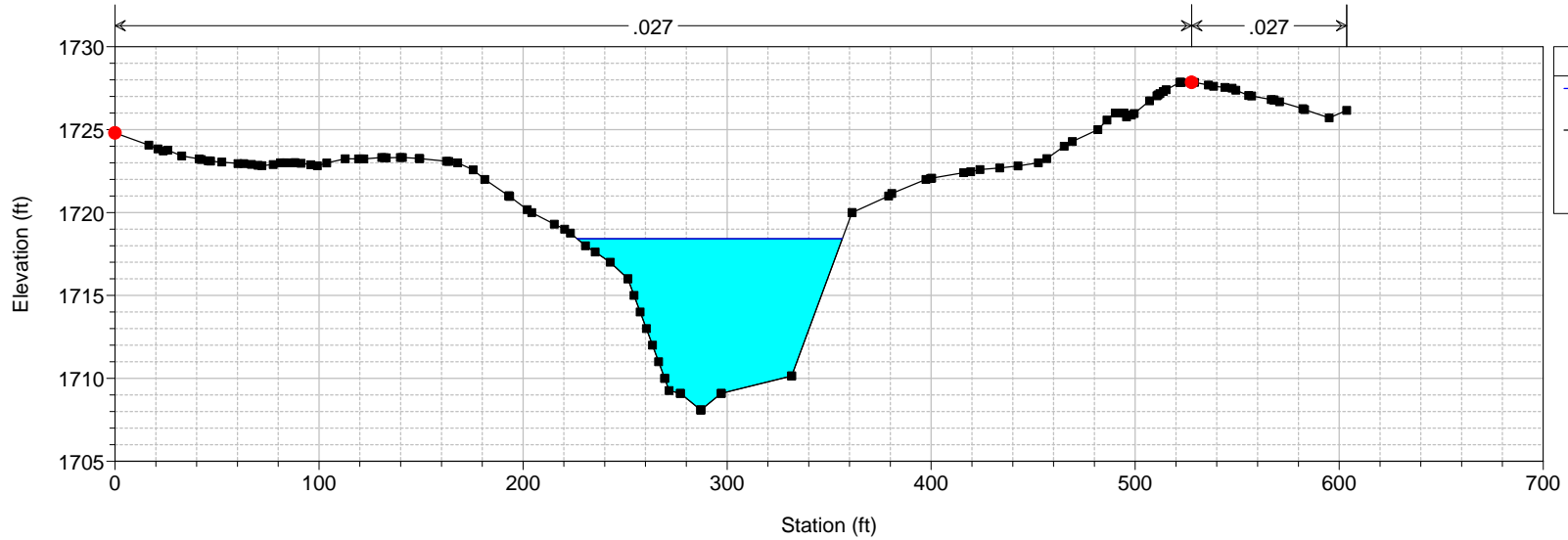
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 79 "FW" 19+82.49



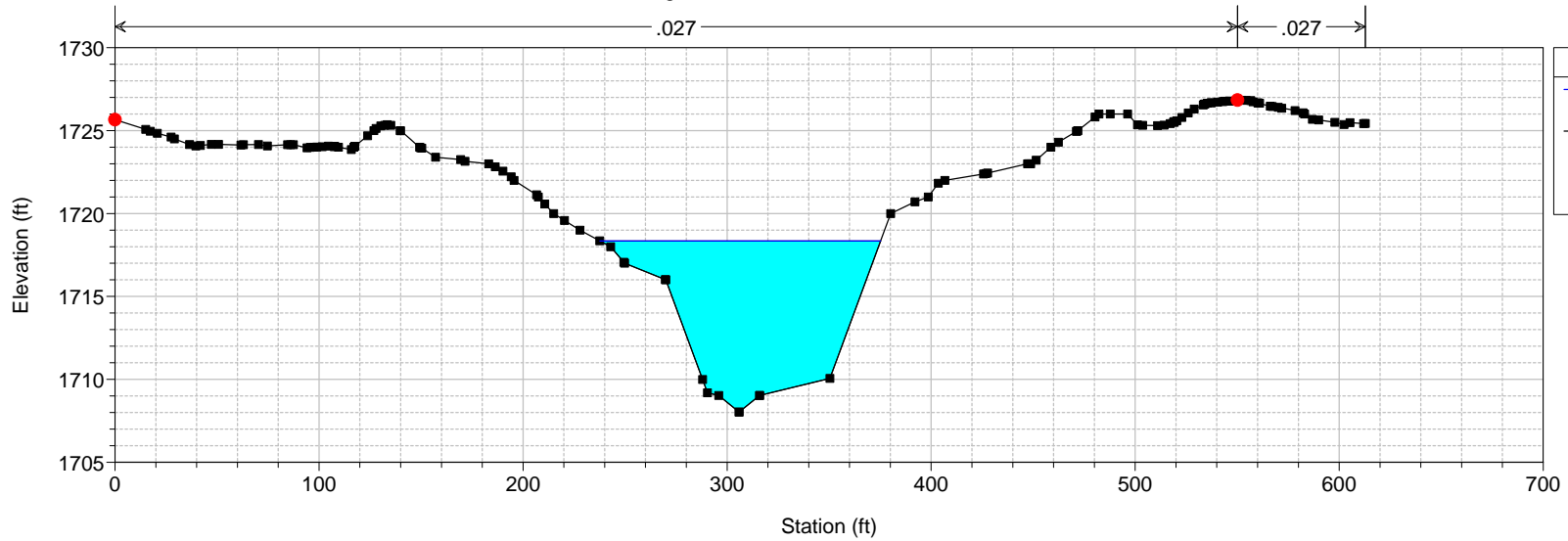
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 78.9 "FW" 20+00.00



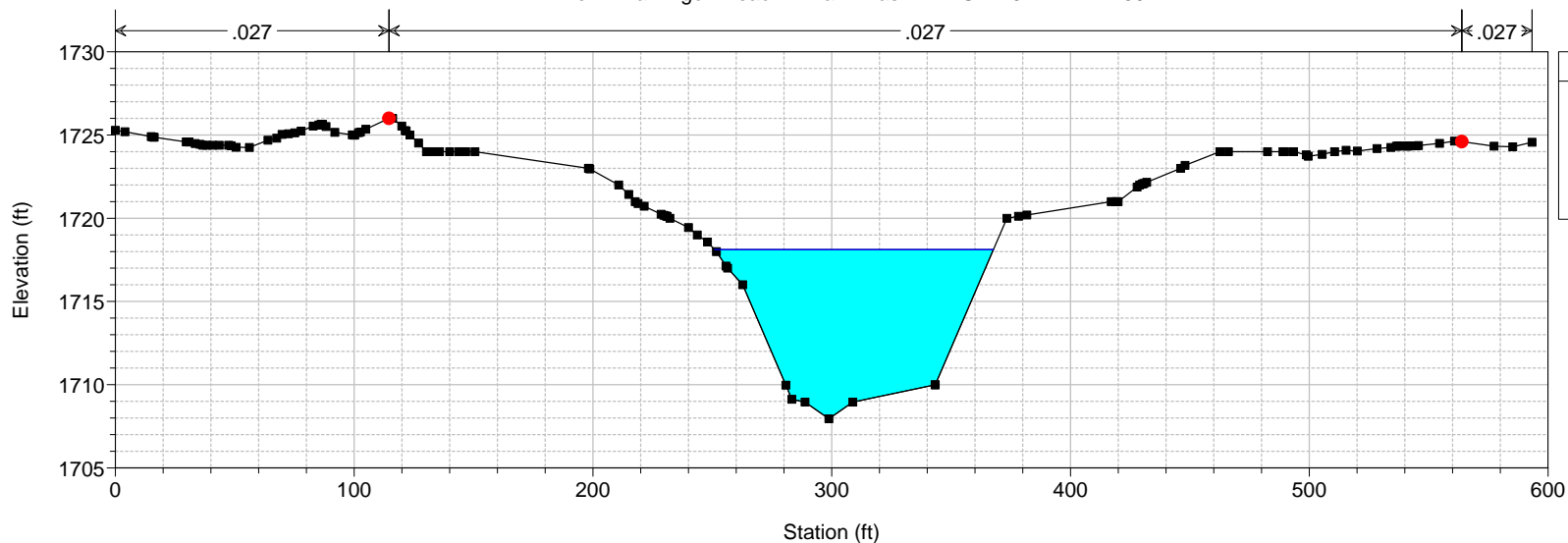
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 78 "FW" 20+50.00



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 77 "FW" 21+00.00



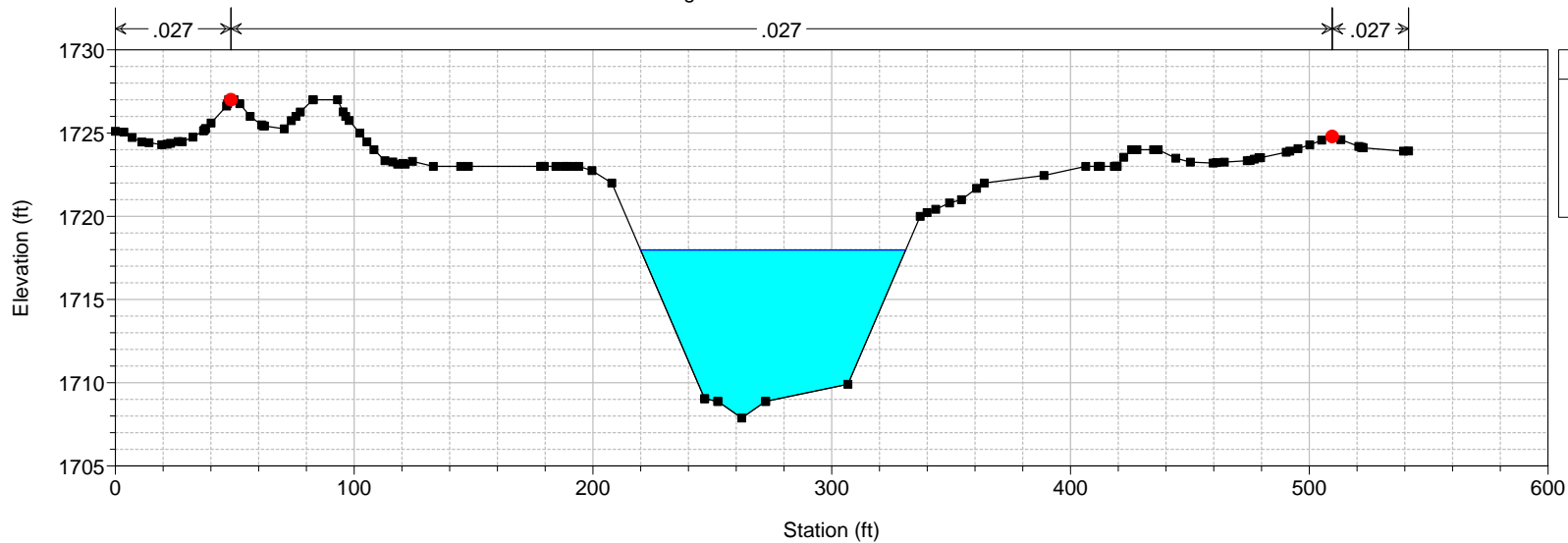
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 76 "FW" 21+50



Legend

- WS PF 1
- Ground
- Bank Sta

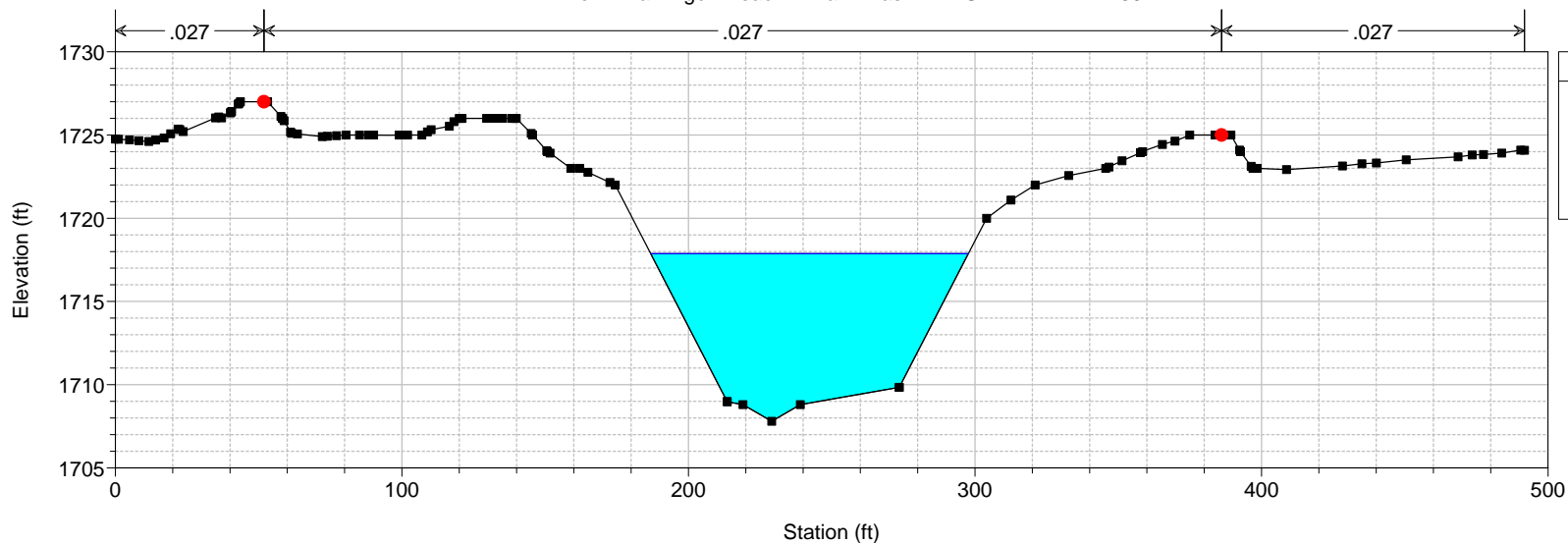
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 75 "FW" 22+00



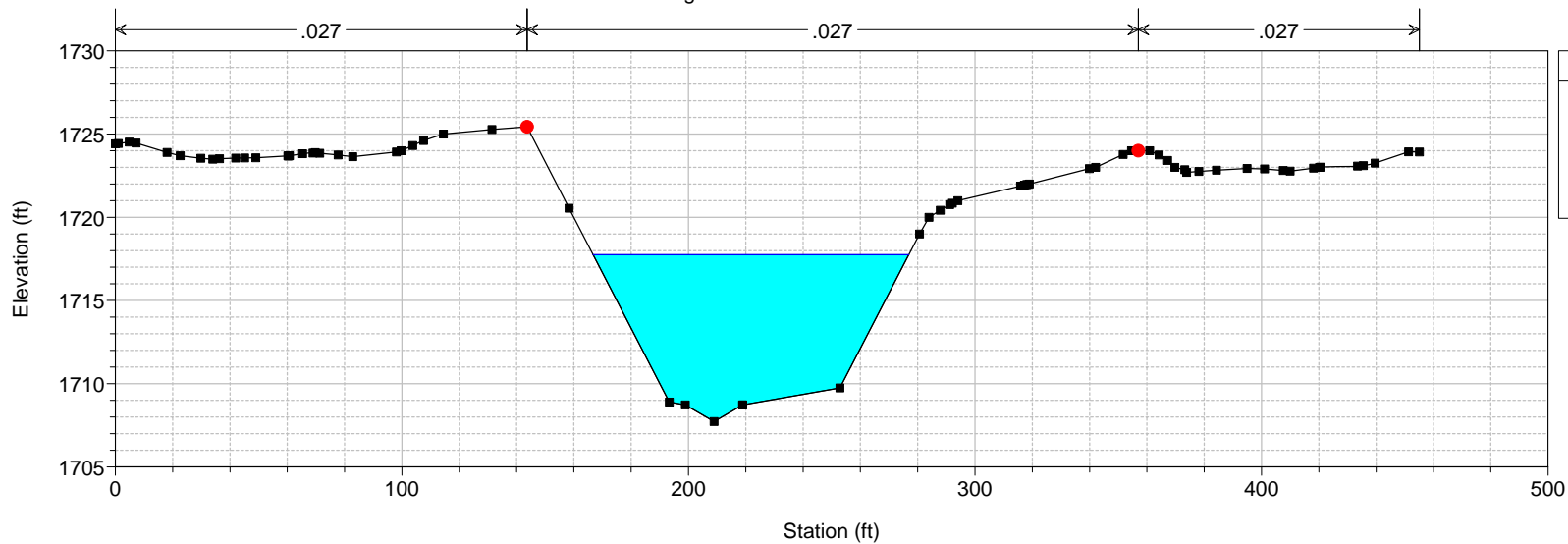
Legend

- WS PF 1
- Ground
- Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 74 "FW"22+50

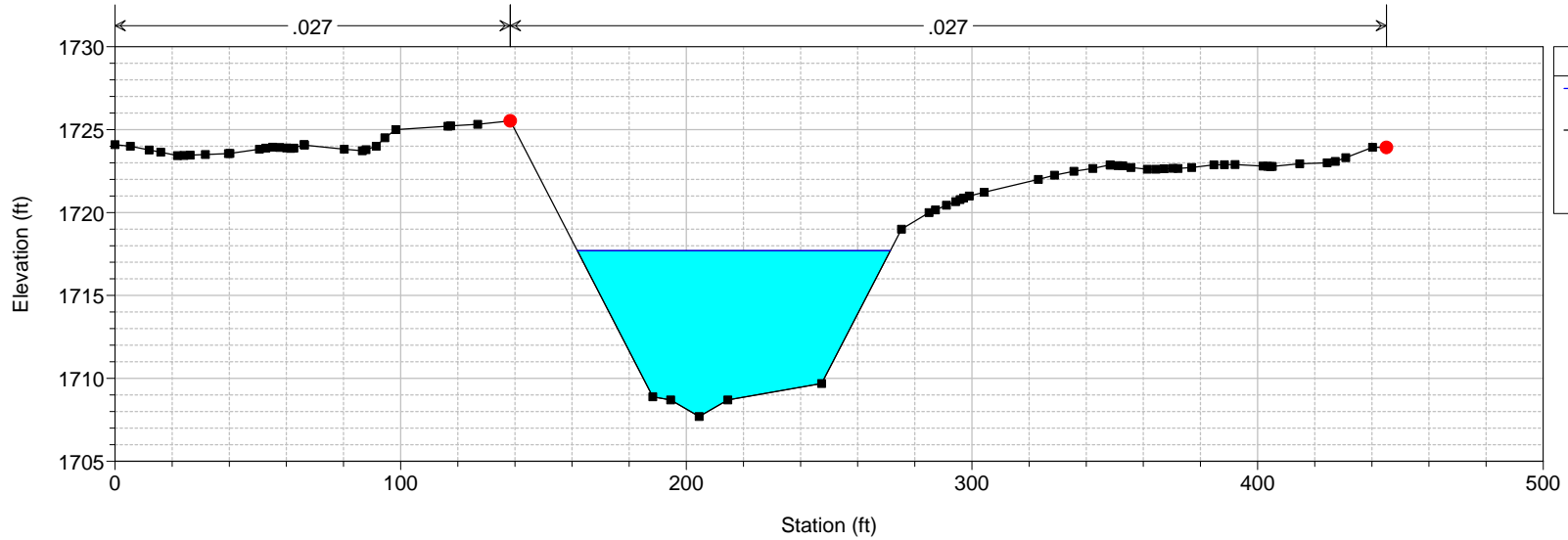


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 73 "FW"23+00



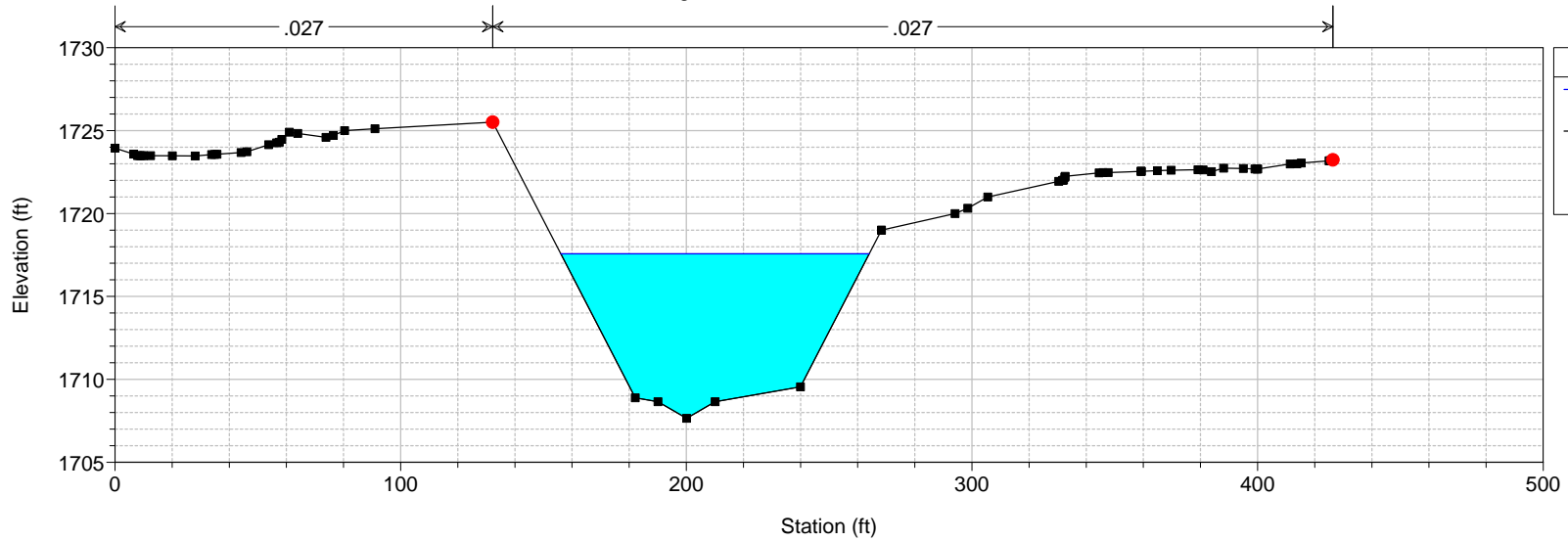
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 72.3 "FW"23+16.88

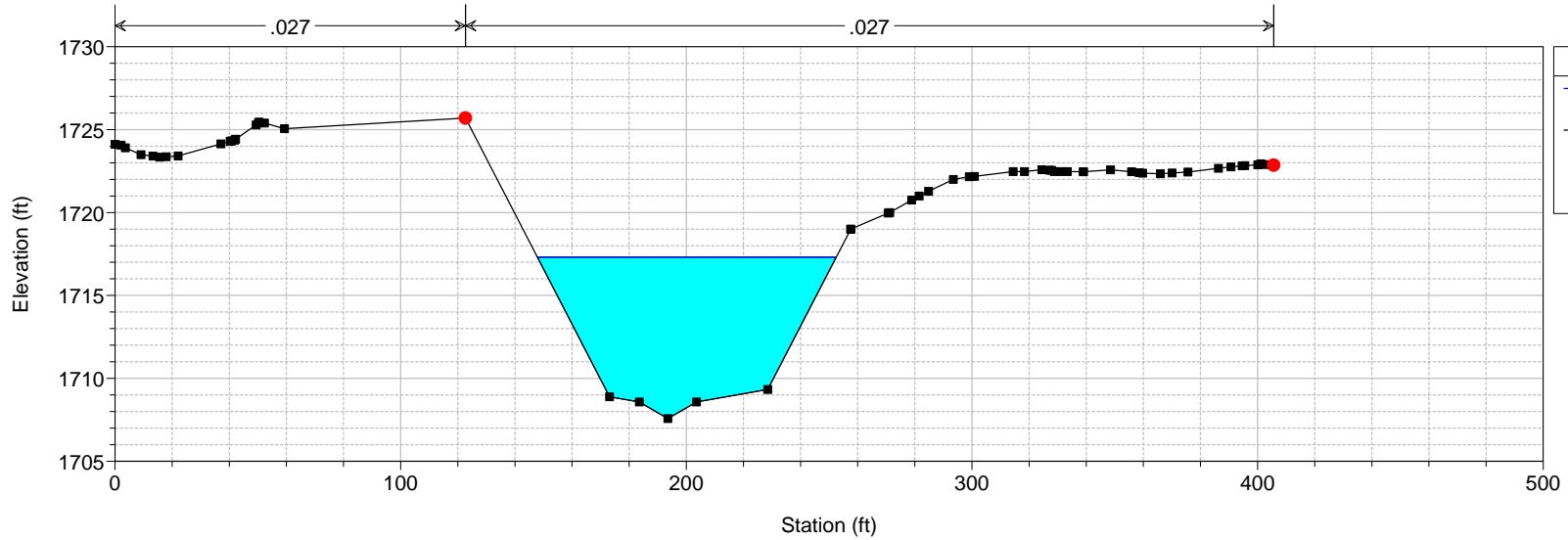


FlamWashPost Plan: Proposed 8/9/2013

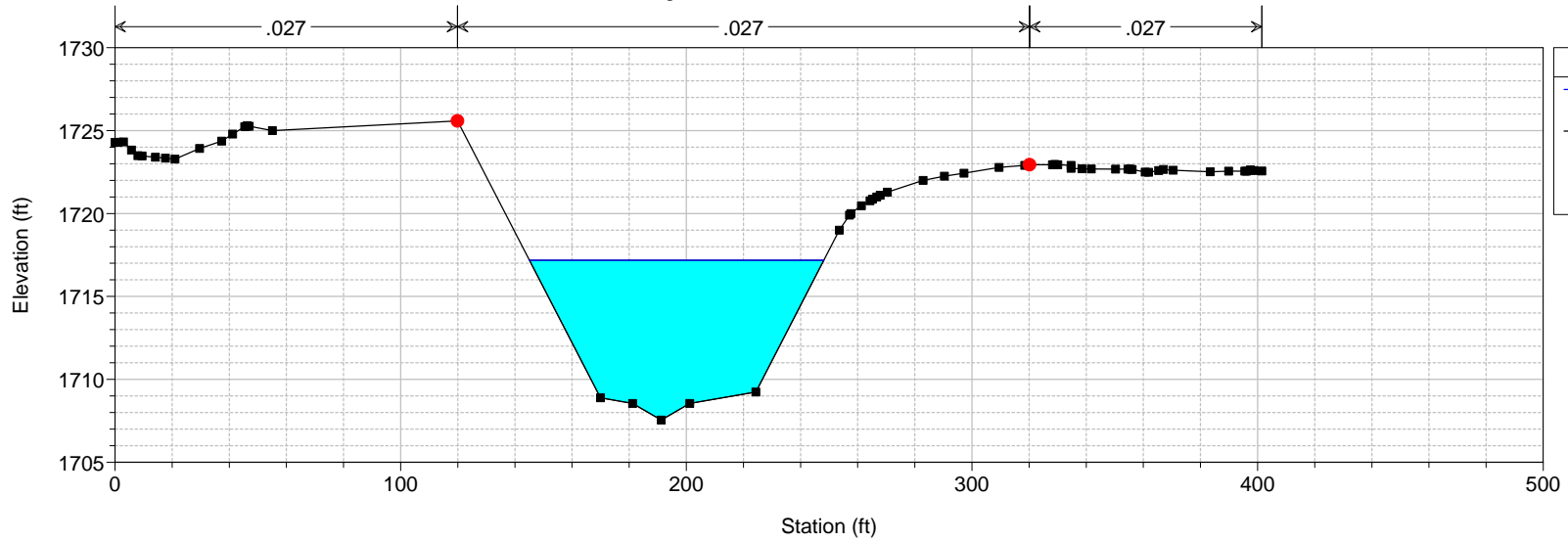
River = Flamingo Reach = Flam Wash RS = 71 "FW" 23+50

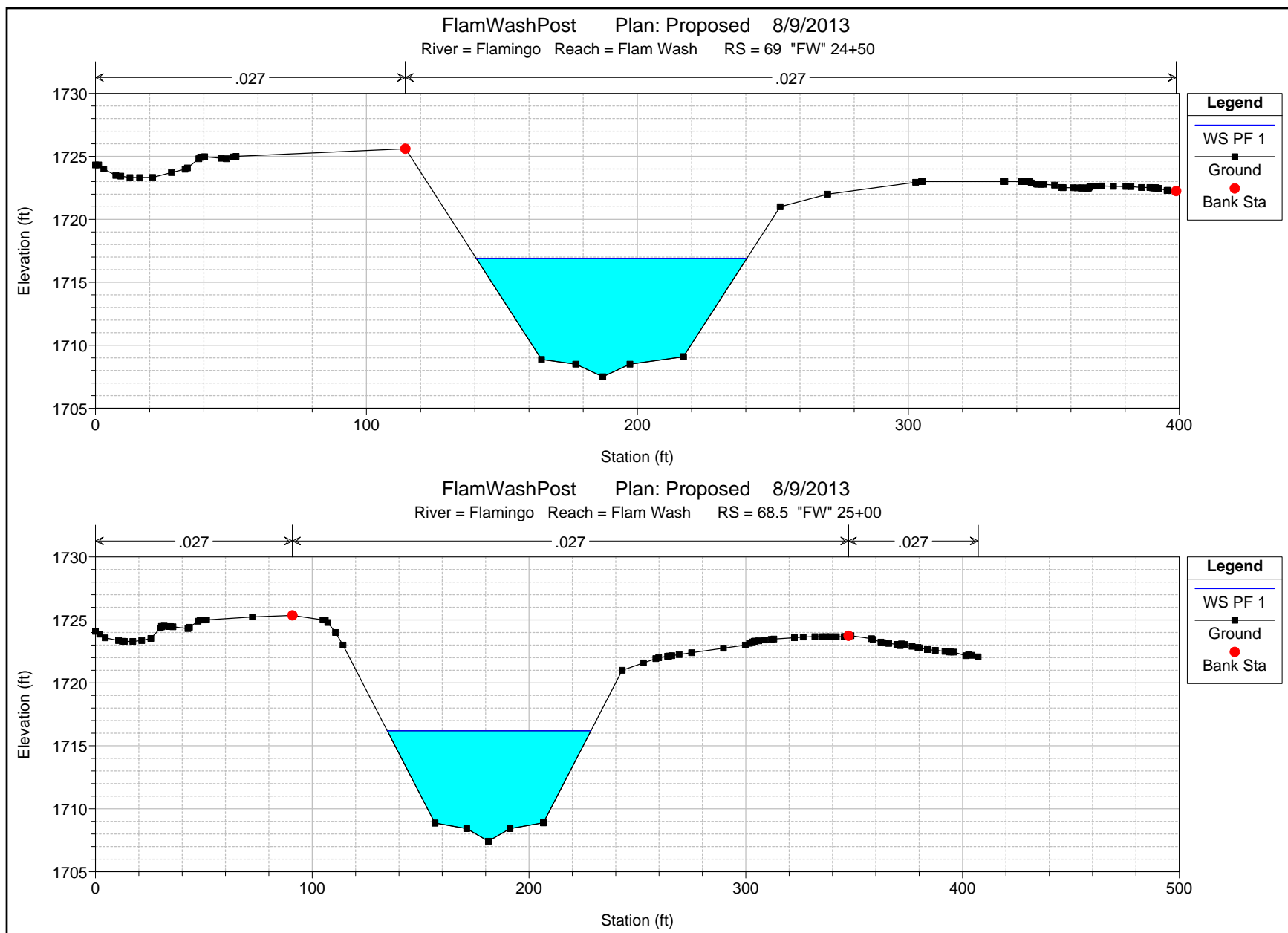


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70.5 "FW" 24+00

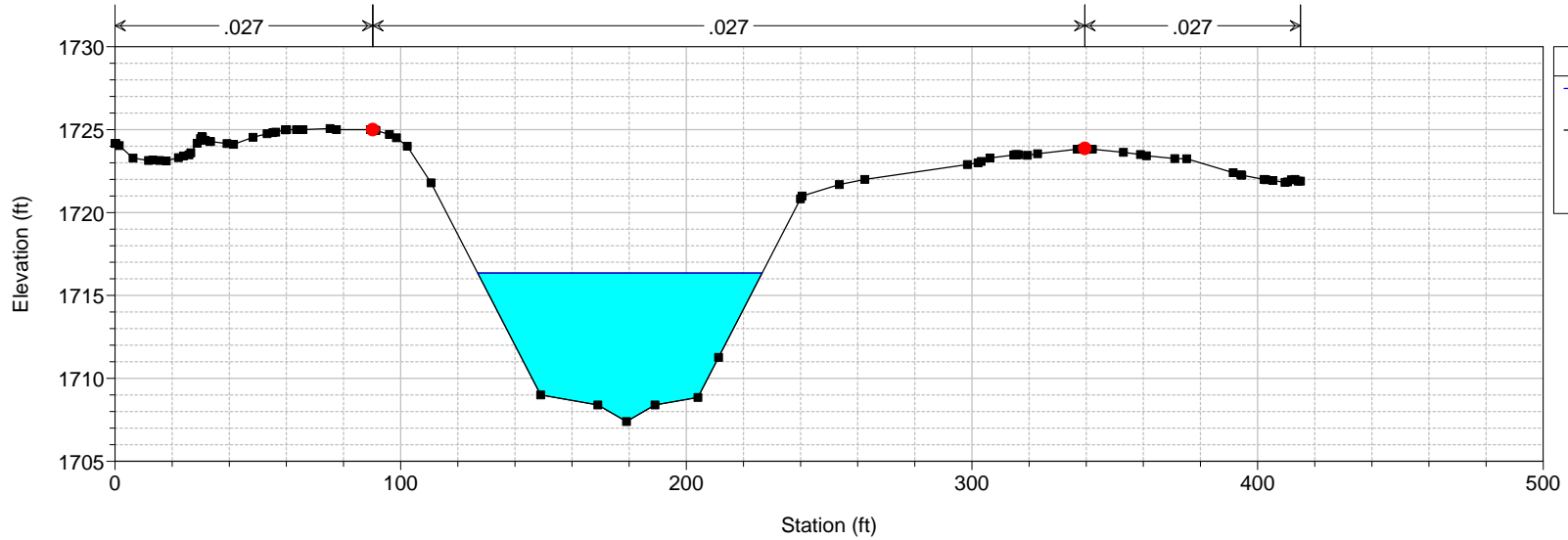


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70 "FW" 24+18.14

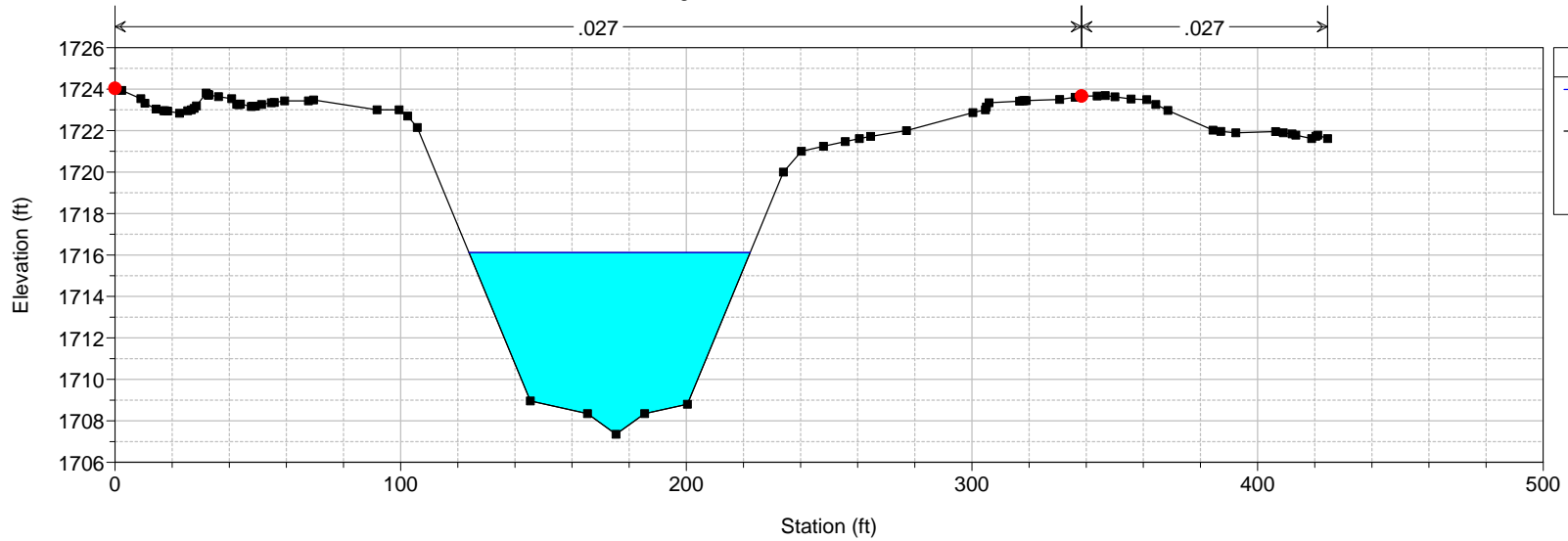




FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 68 "FW" 25+19.40

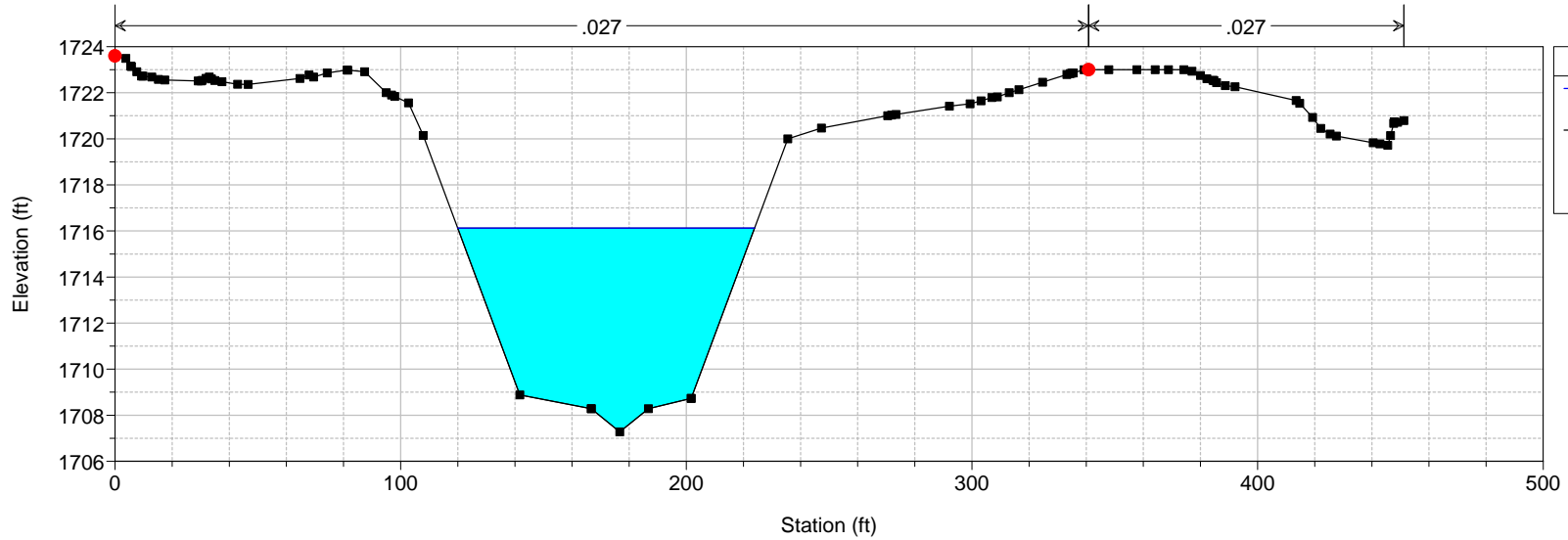


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 67 "FW" 25+50



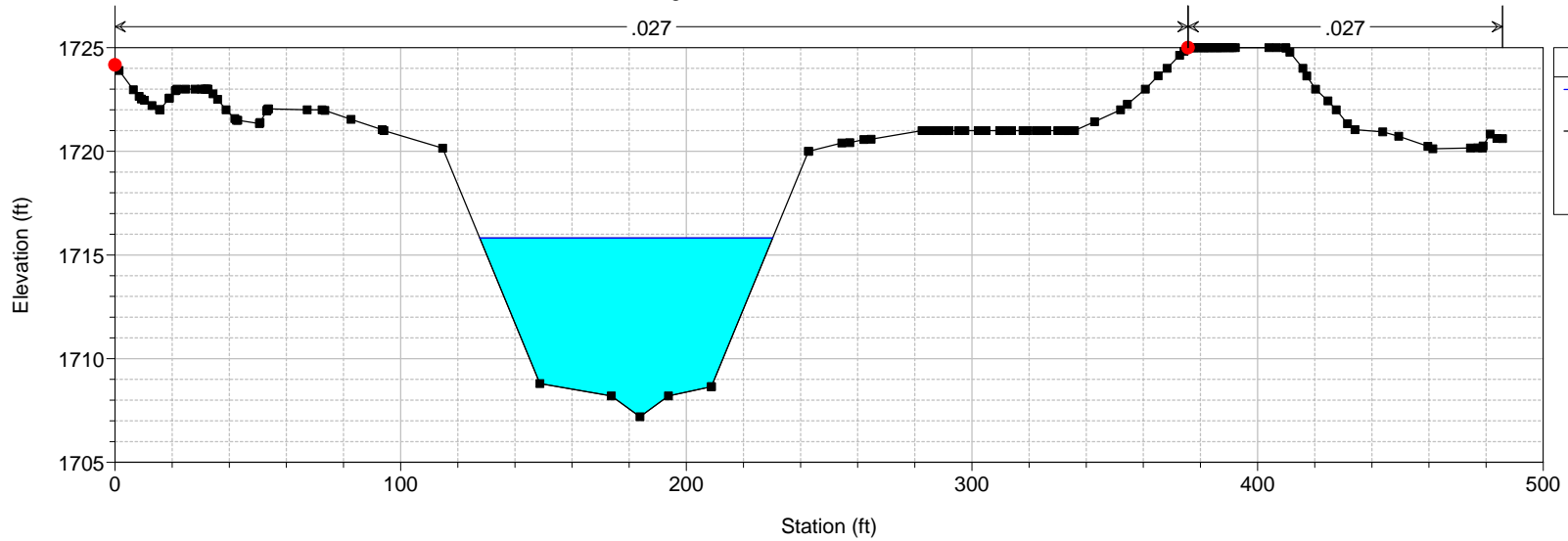
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 66 "FW" 26+00

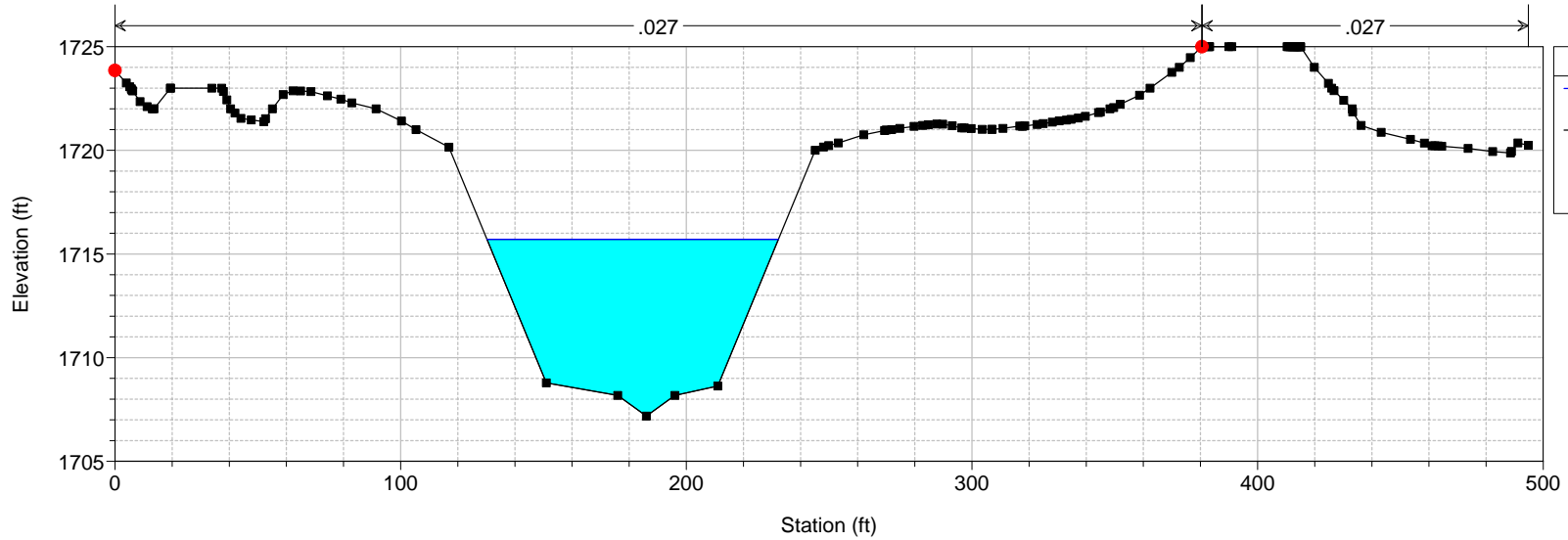


FlamWashPost Plan: Proposed 8/9/2013

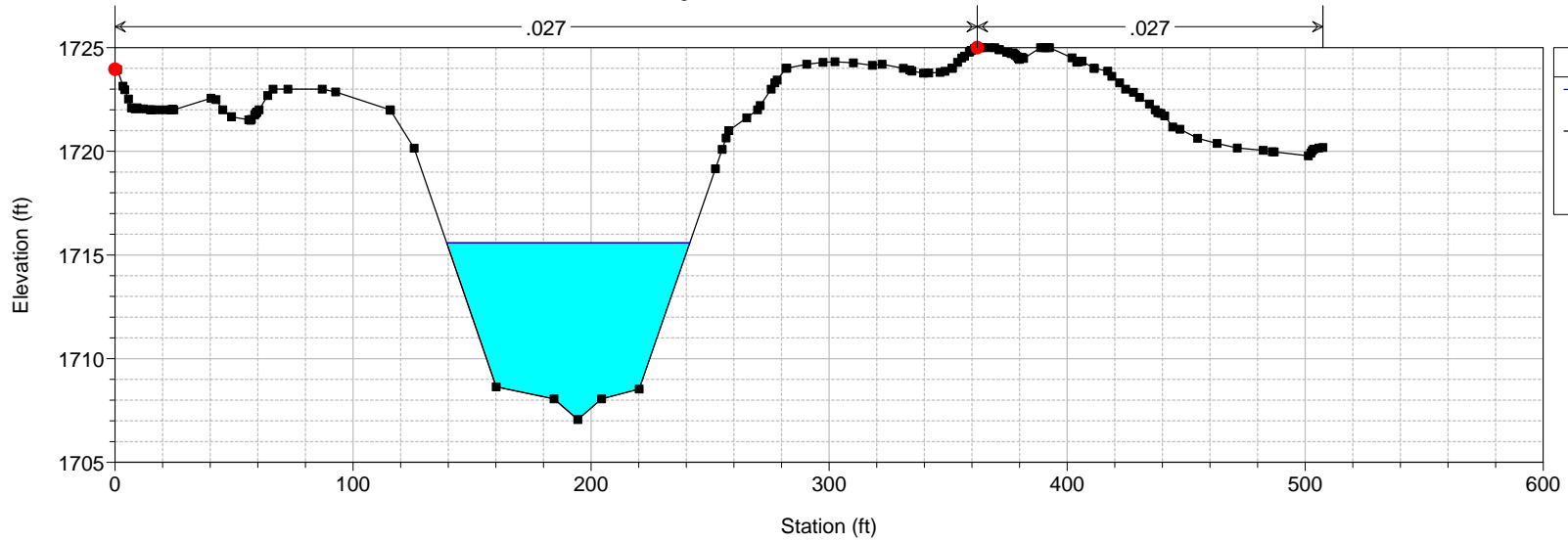
River = Flamingo Reach = Flam Wash RS = 65.5 "FW" 26+00

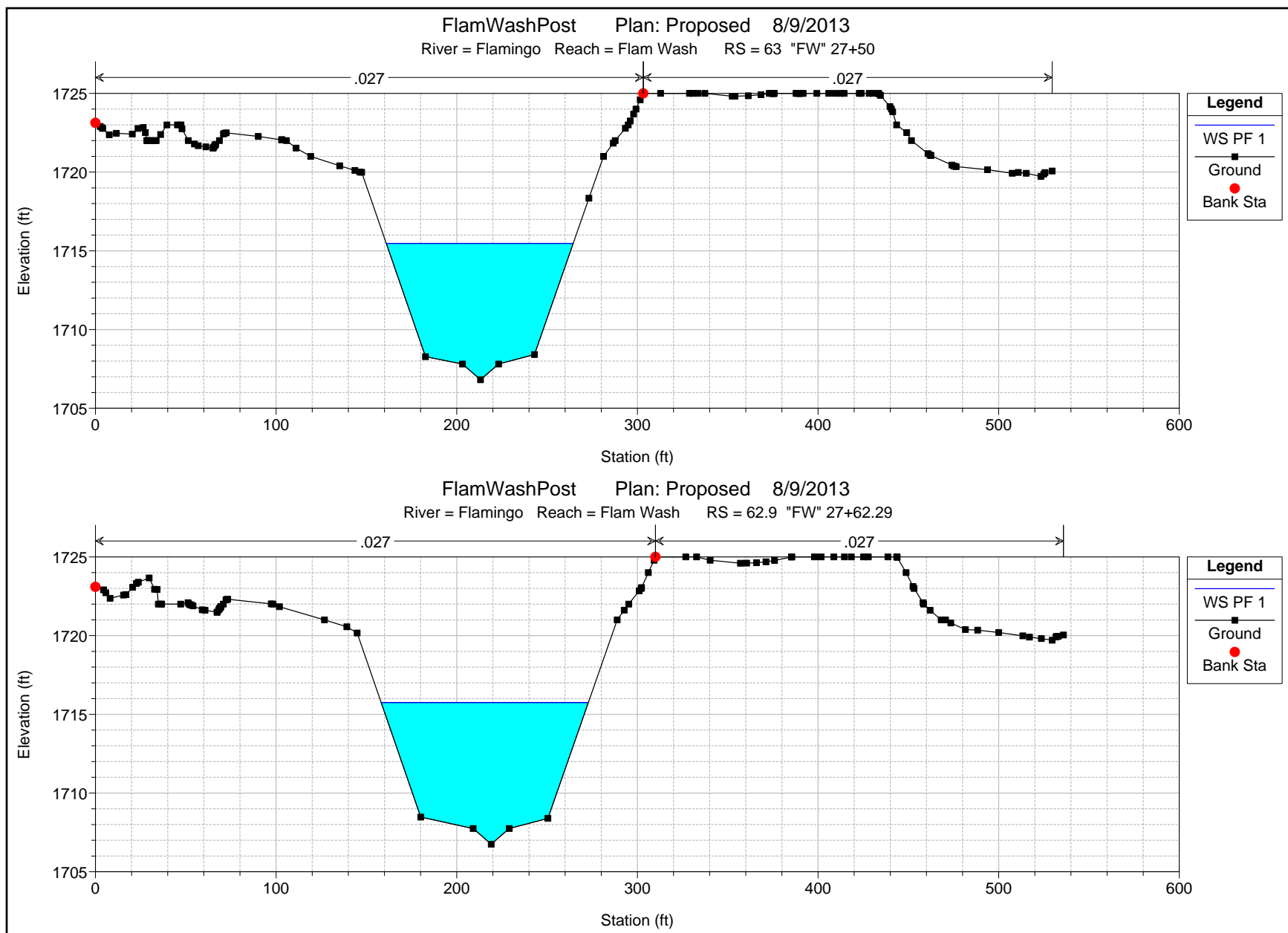


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 65 "FW"26+65.8



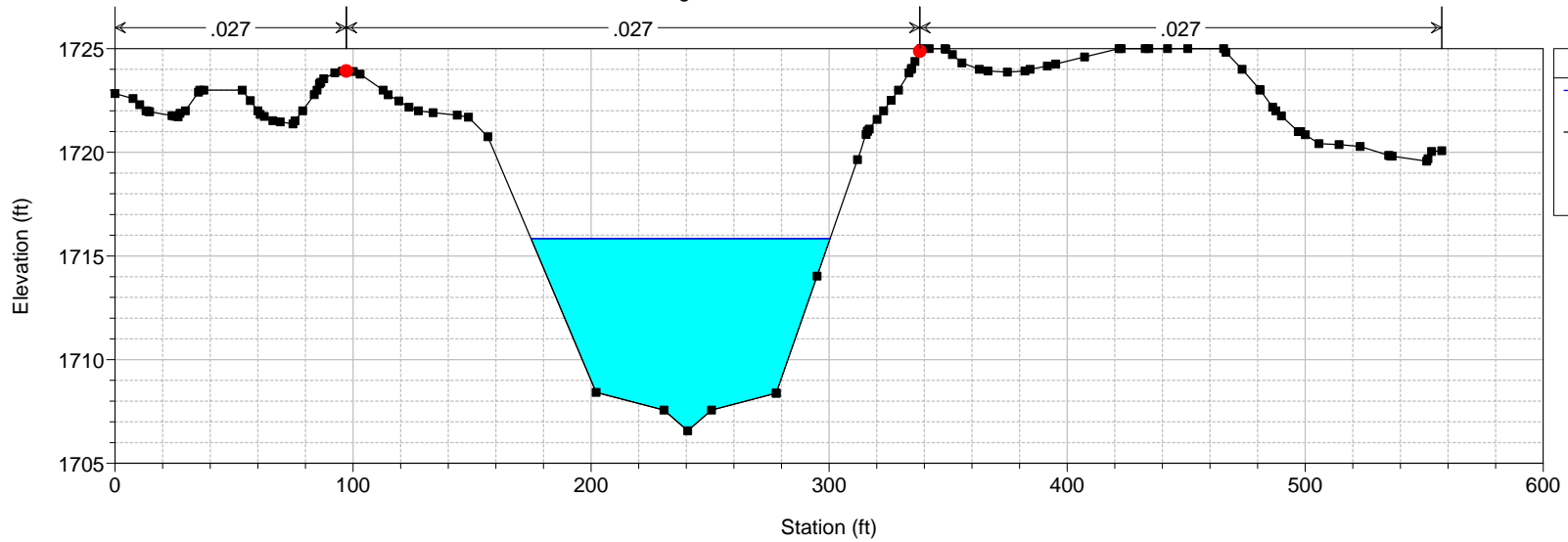
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 64 "FW" 27+00





FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 62 "FW" 28+00

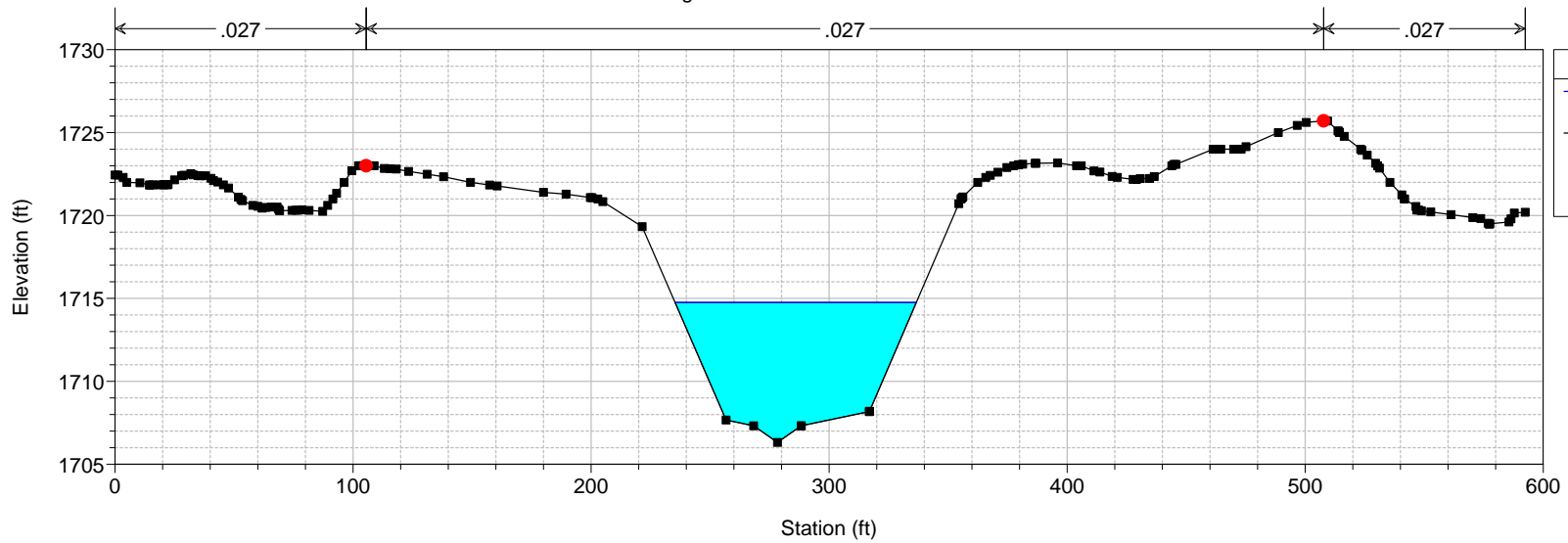


Legend

WS PF 1
Ground
Bank Sta

FlamWashPost Plan: Proposed 8/9/2013

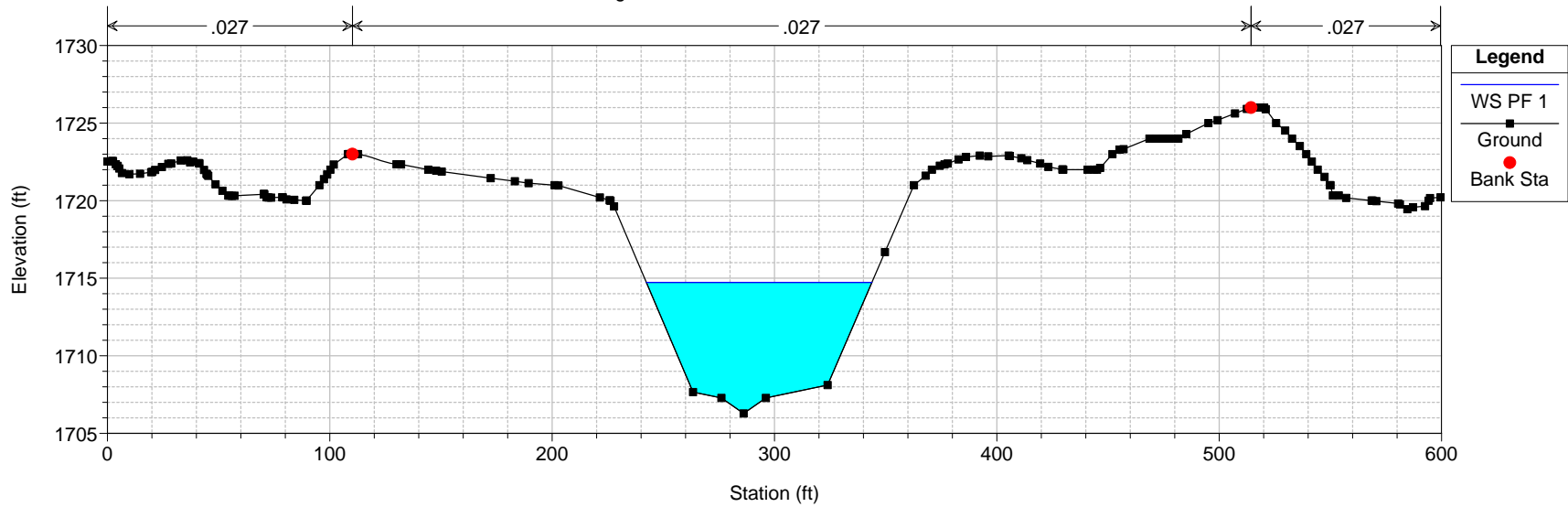
River = Flamingo Reach = Flam Wash RS = 61 "FW" 28+50



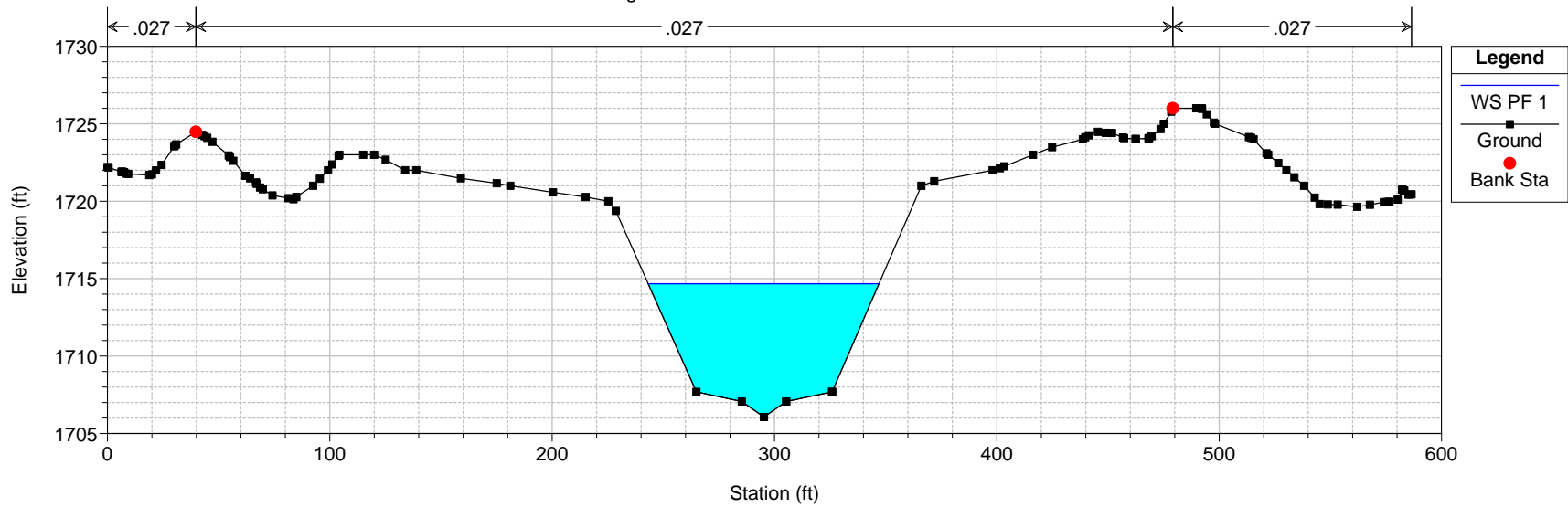
Legend

WS PF 1
Ground
Bank Sta

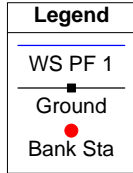
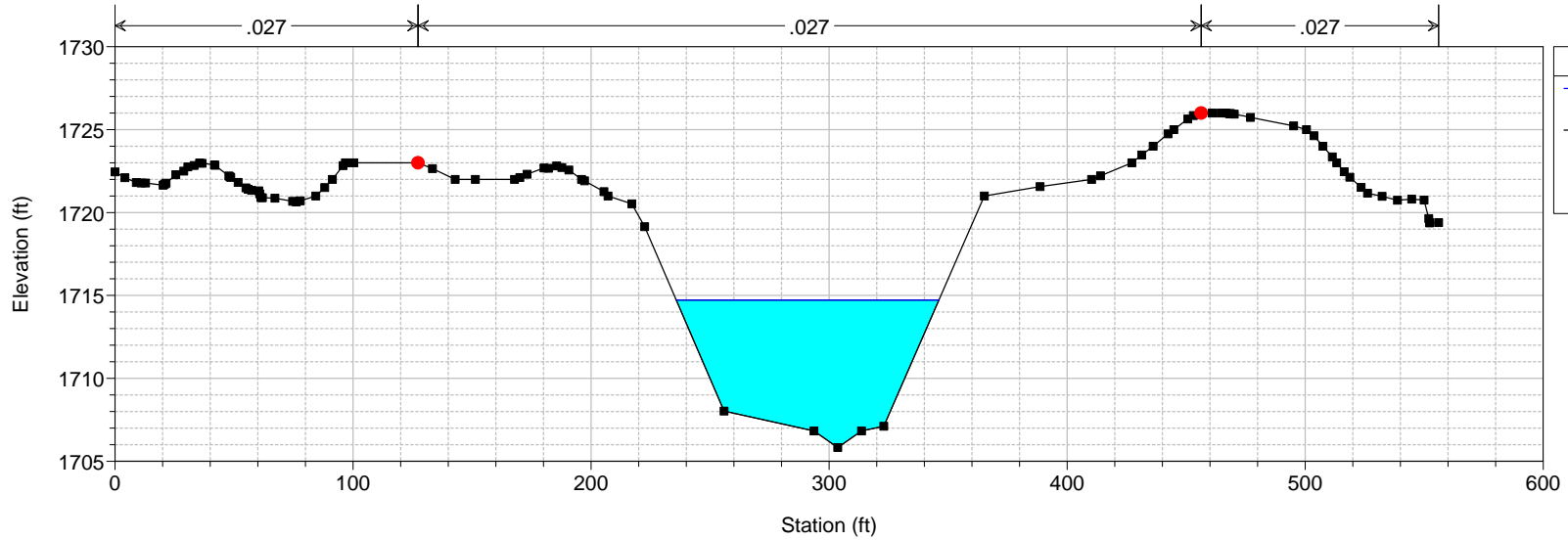
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.8 "FW"28+58.79



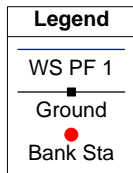
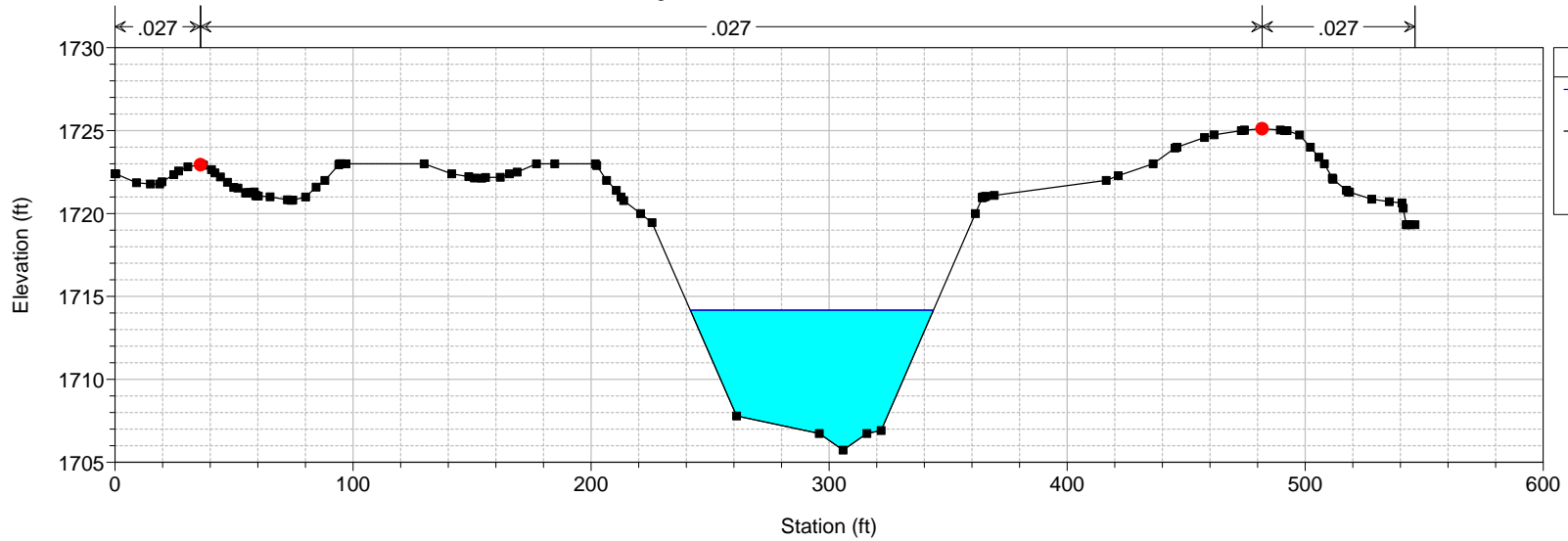
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.5 "FW" 29+00



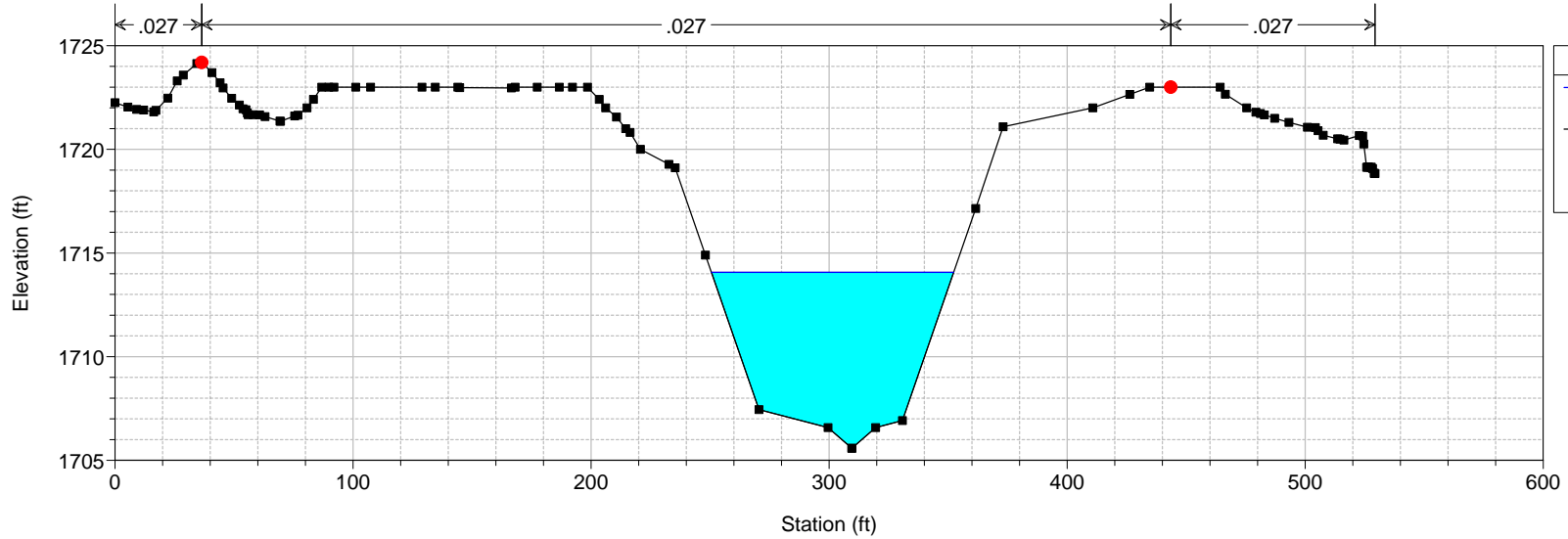
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.2 "FW" 29+50



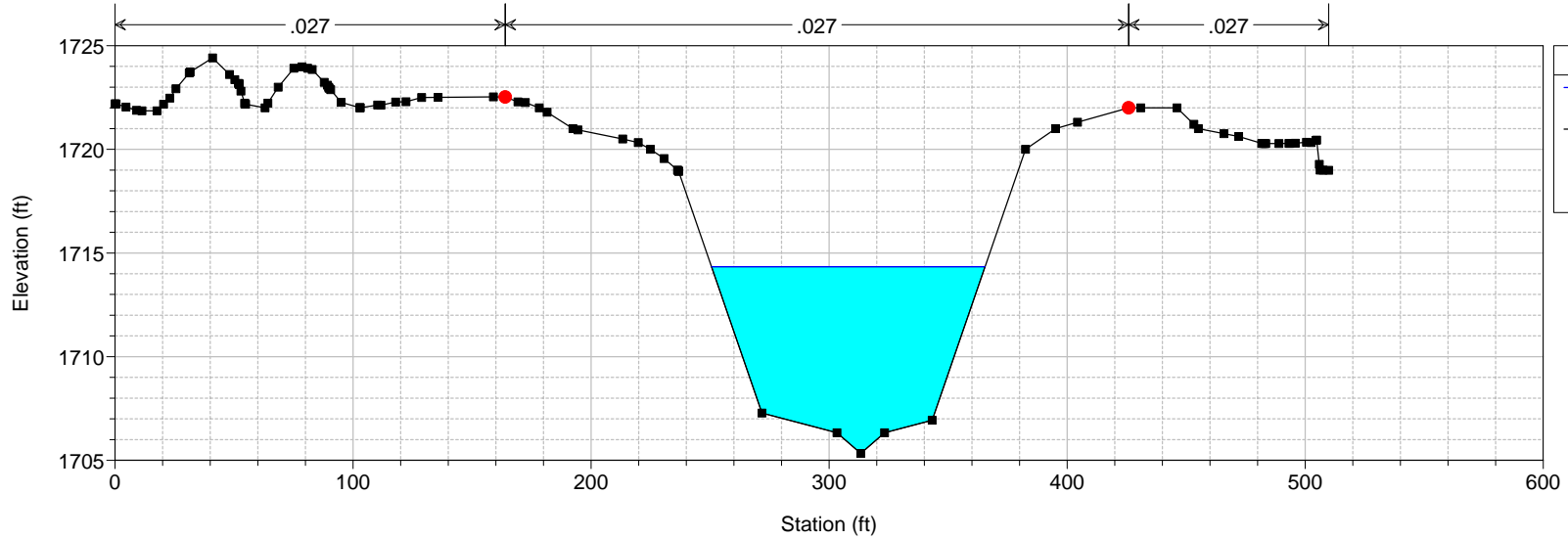
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59.6 "FW" 29+66.89

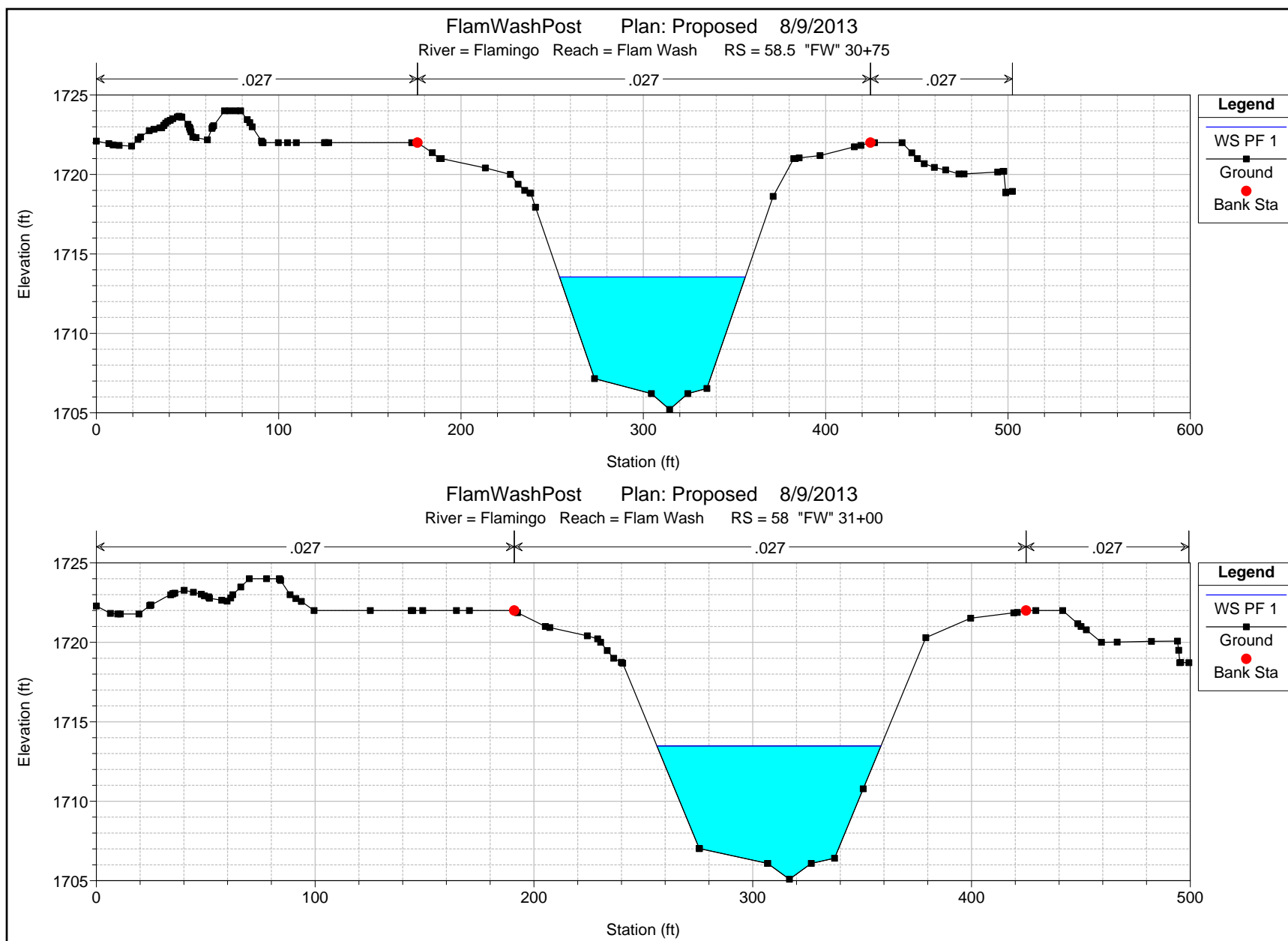


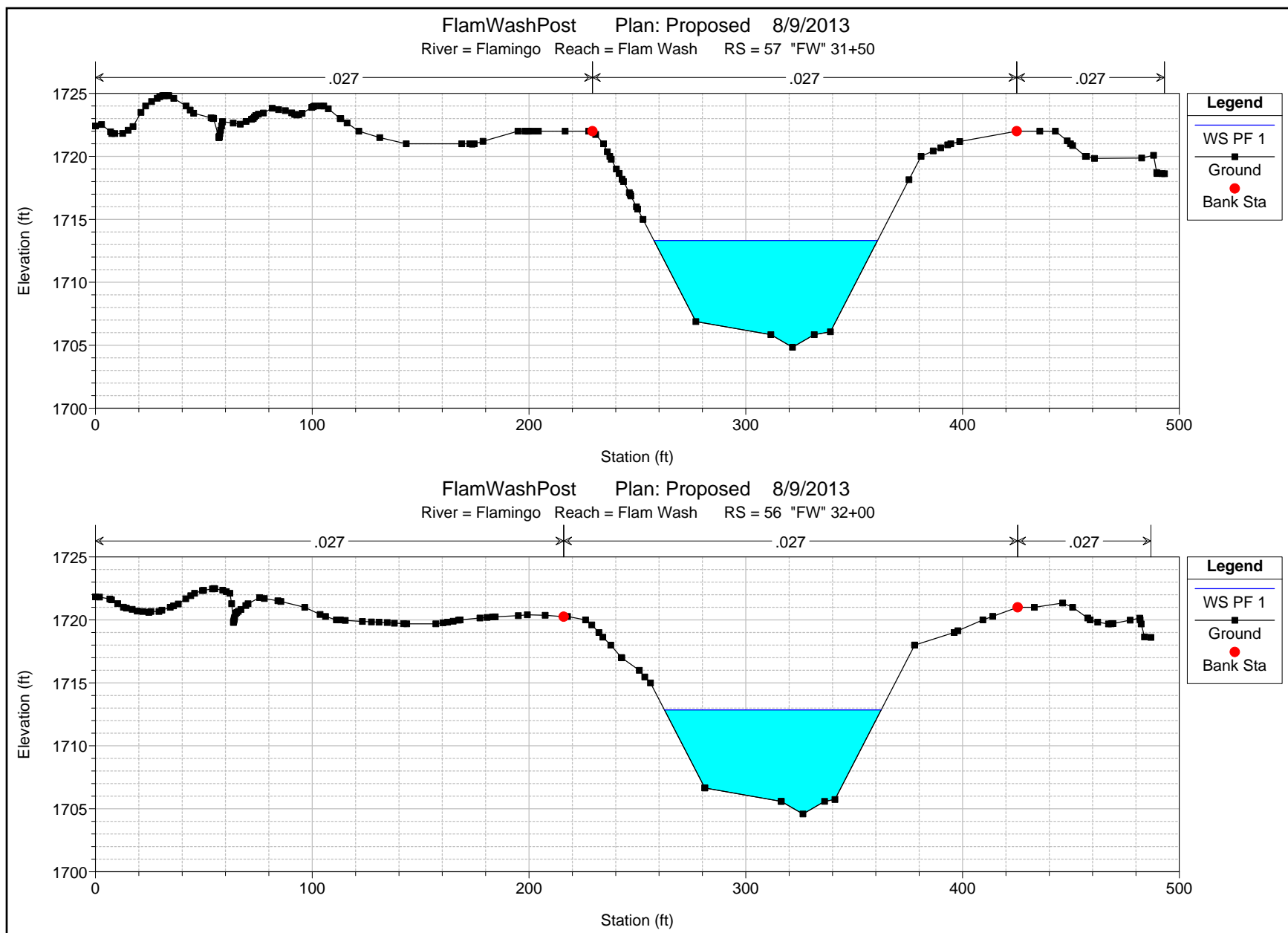
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59.3 "FW" 30+00



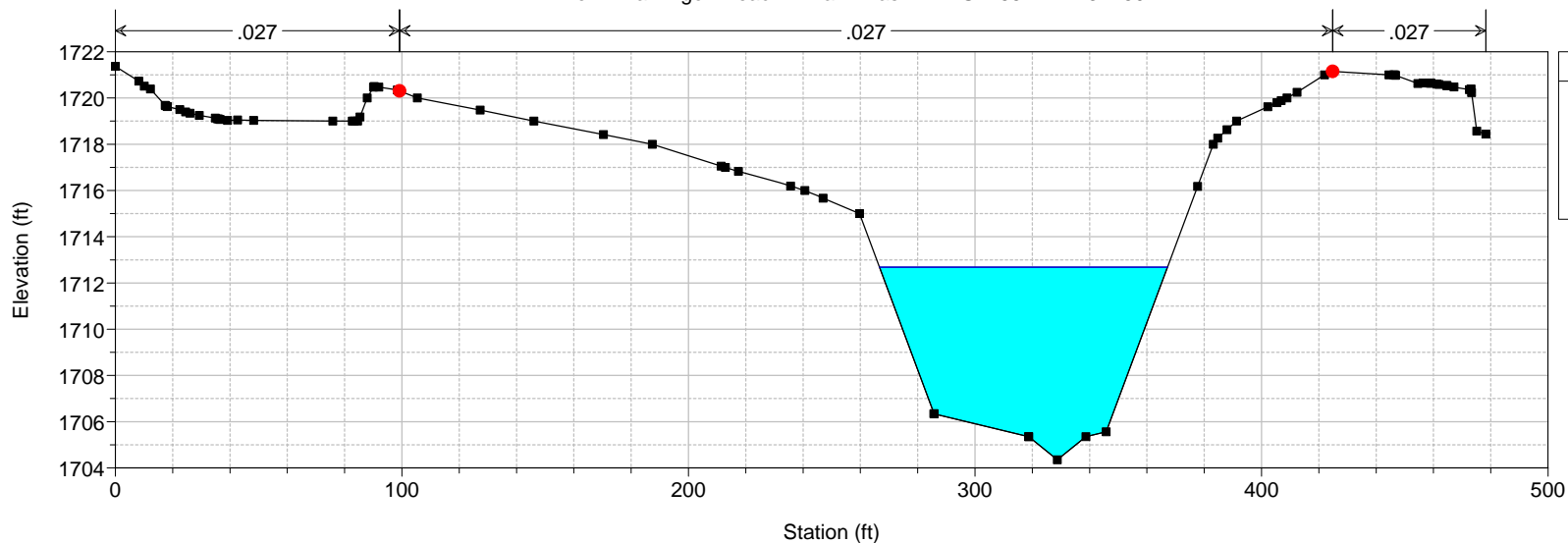
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59 "FW" 30+50







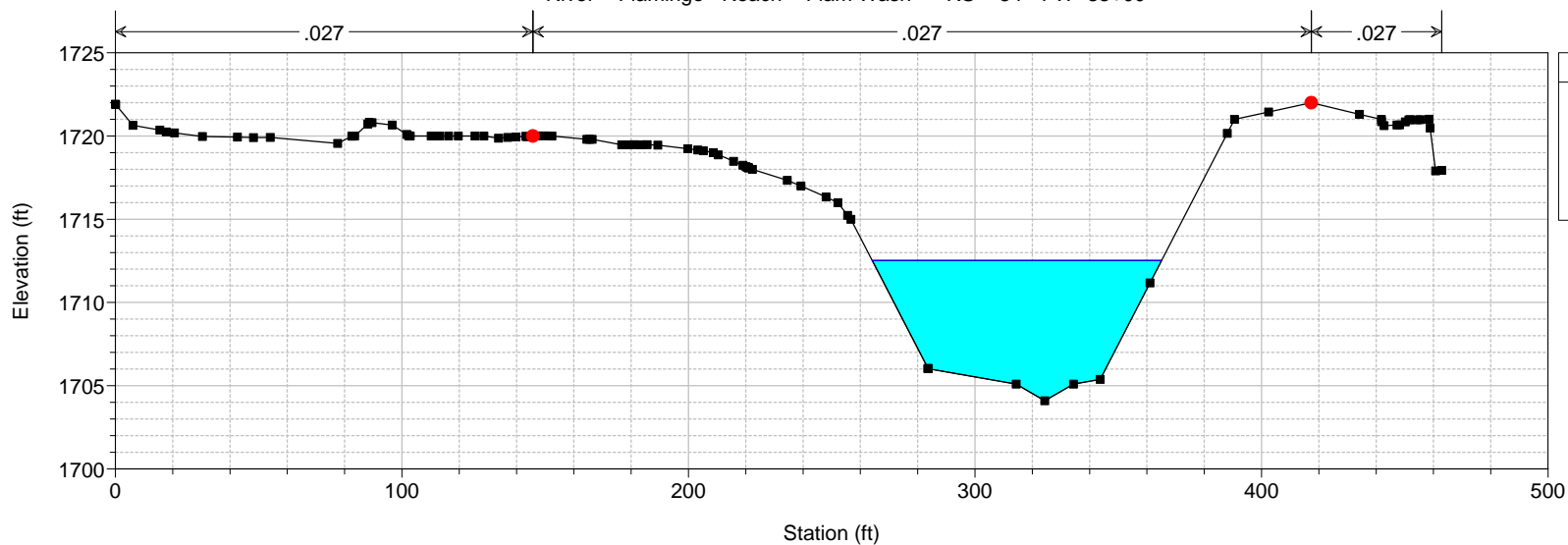
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 55 "FW" 32+50



Legend

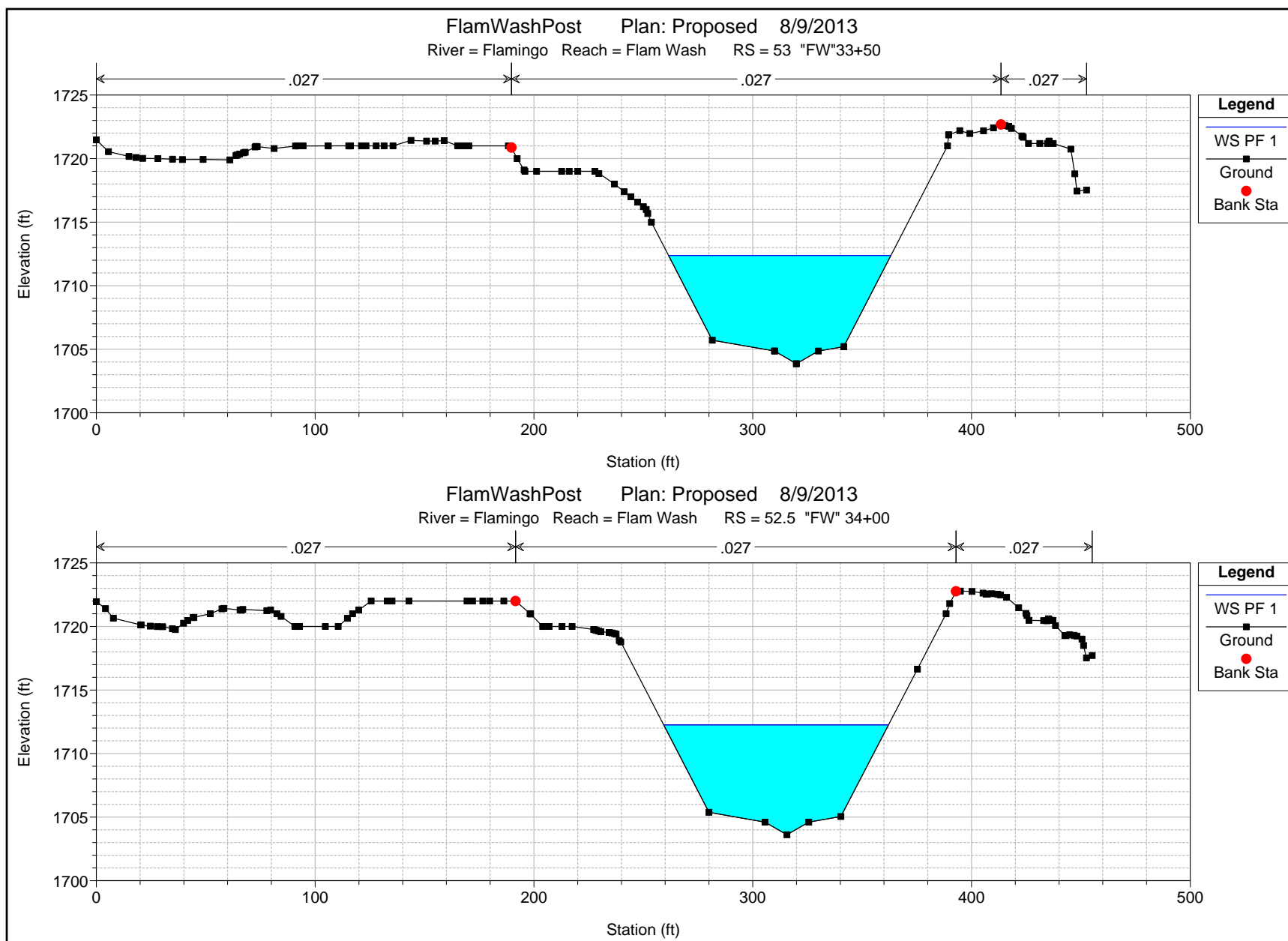
- WS PF 1
- Ground
- Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 54 "FW" 33+00

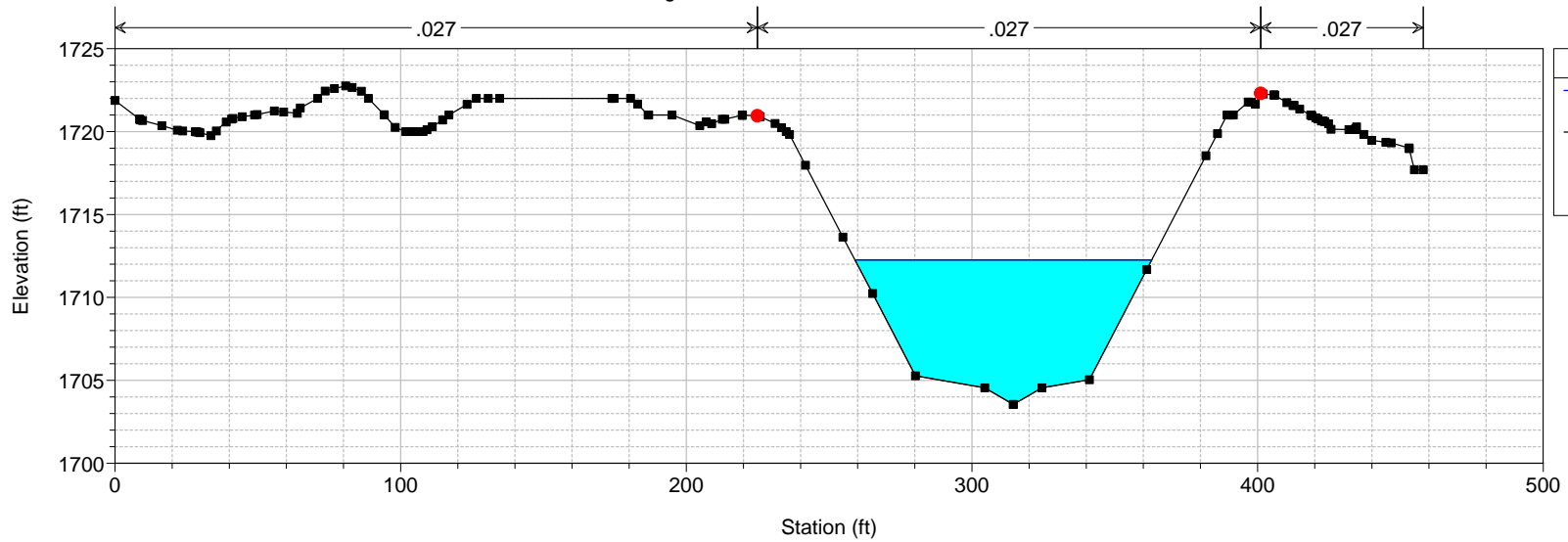


Legend

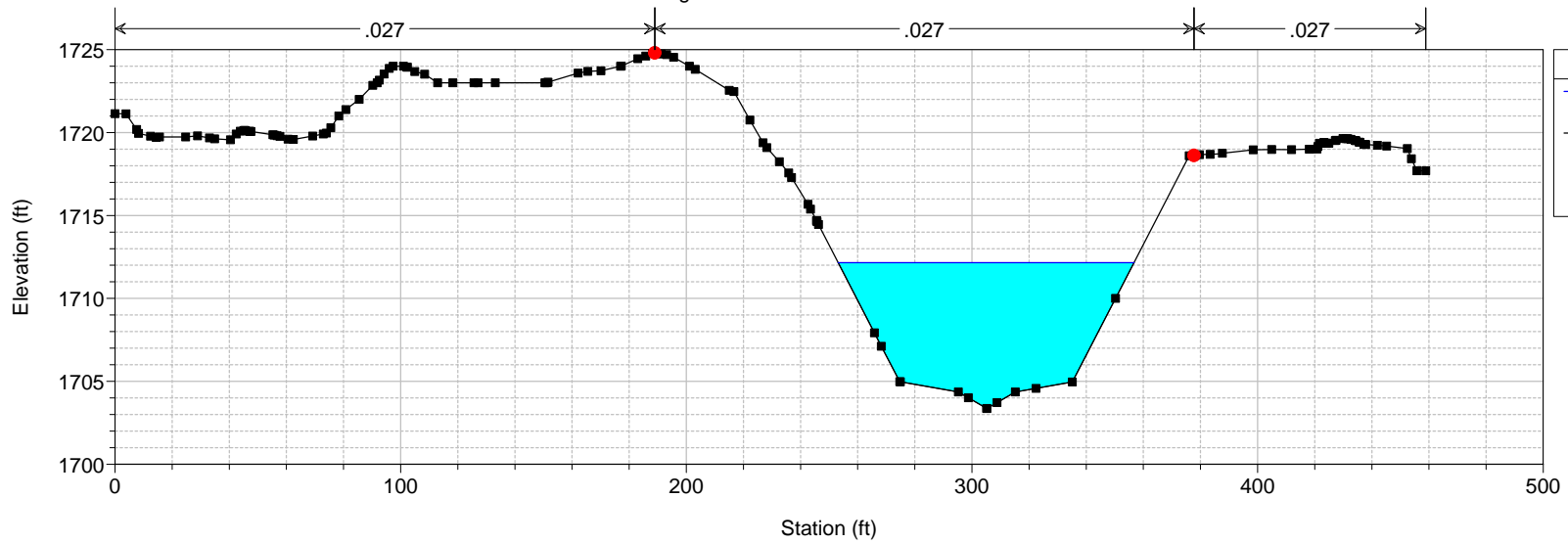
- WS PF 1
- Ground
- Bank Sta



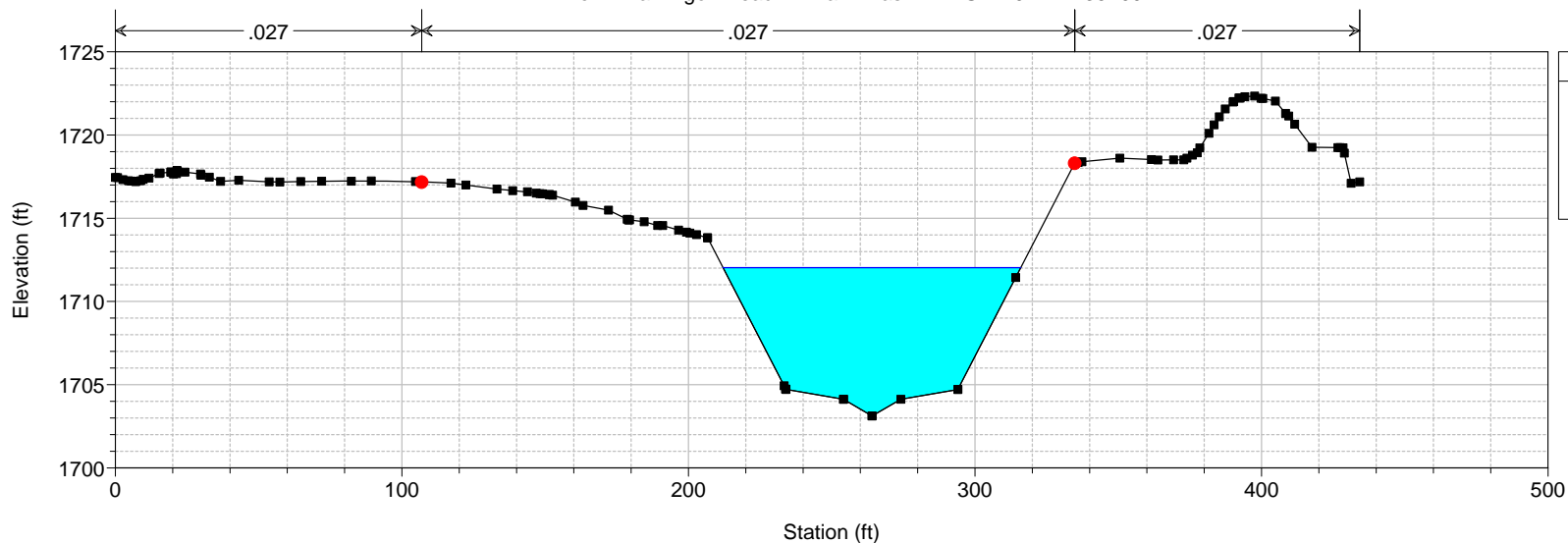
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 52 "FW" 34+12.68



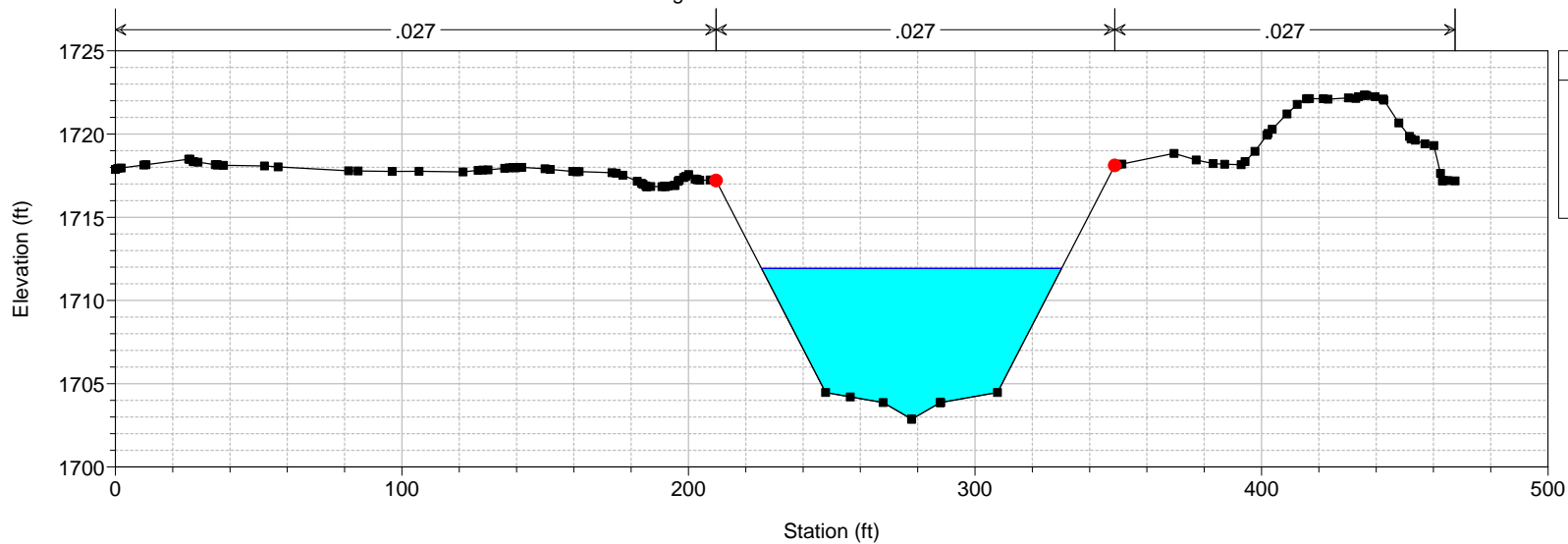
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 51 "FW" 34+50



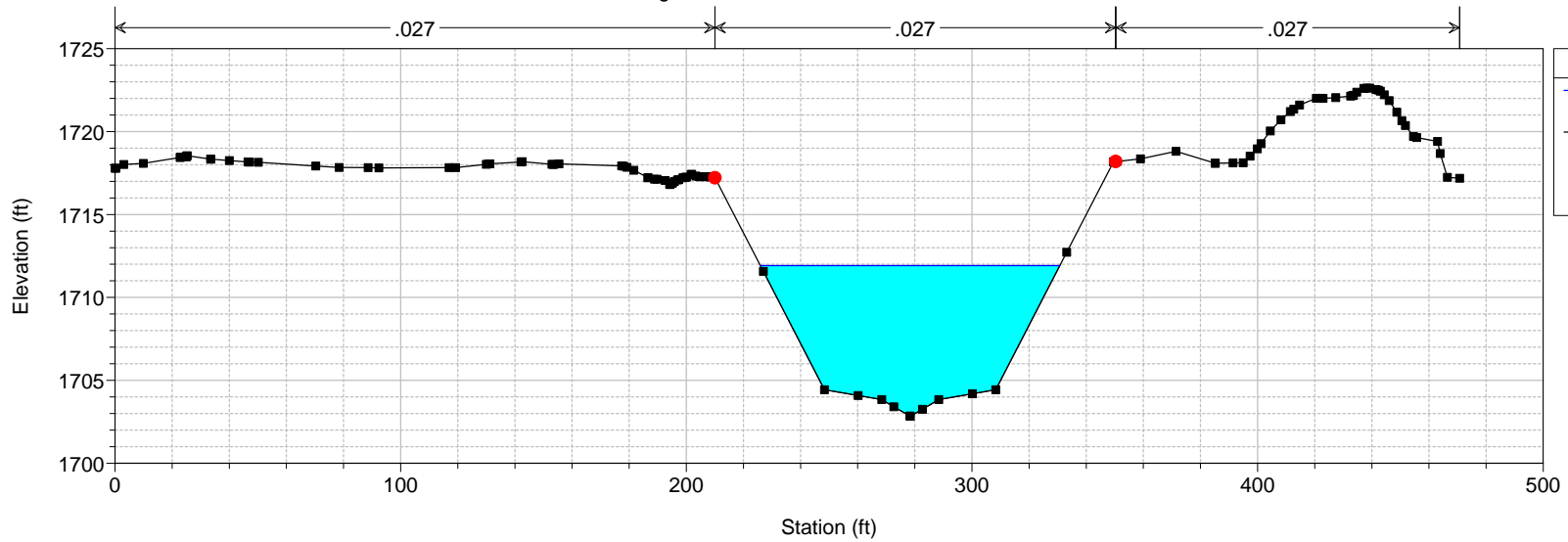
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 49 "FW"35+00



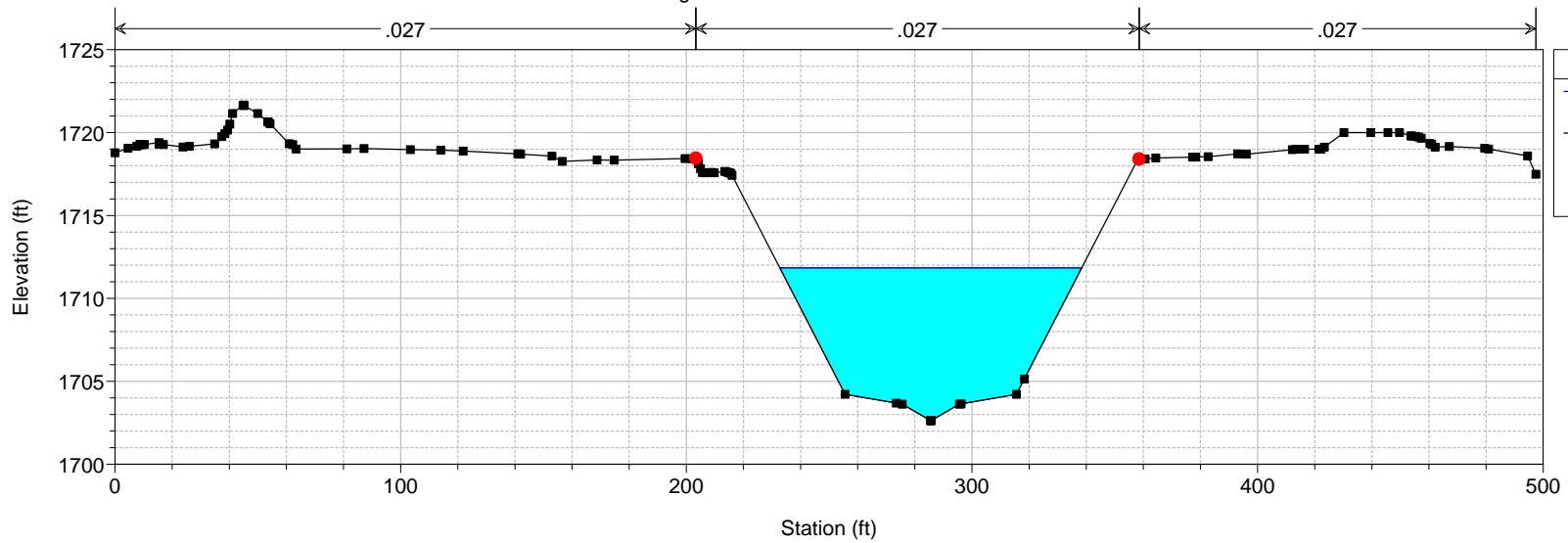
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48.7 "FW" 35+50



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48.5 "FW"35+56.52

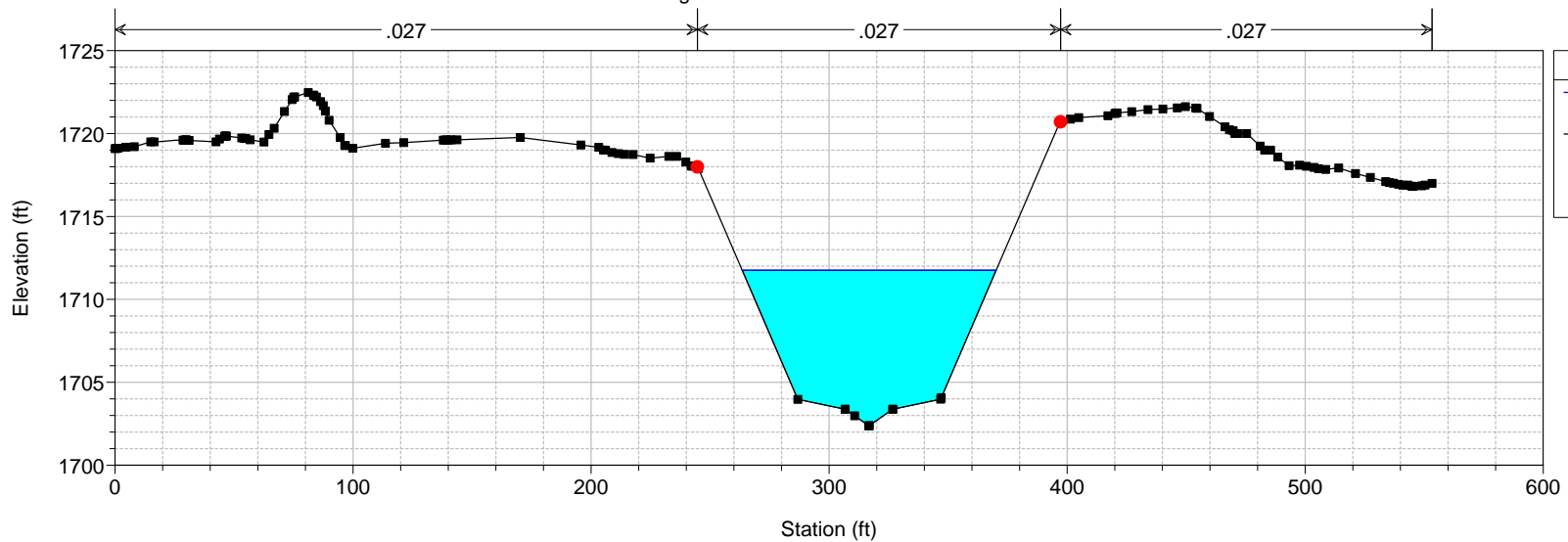


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48 "FW" 36+00



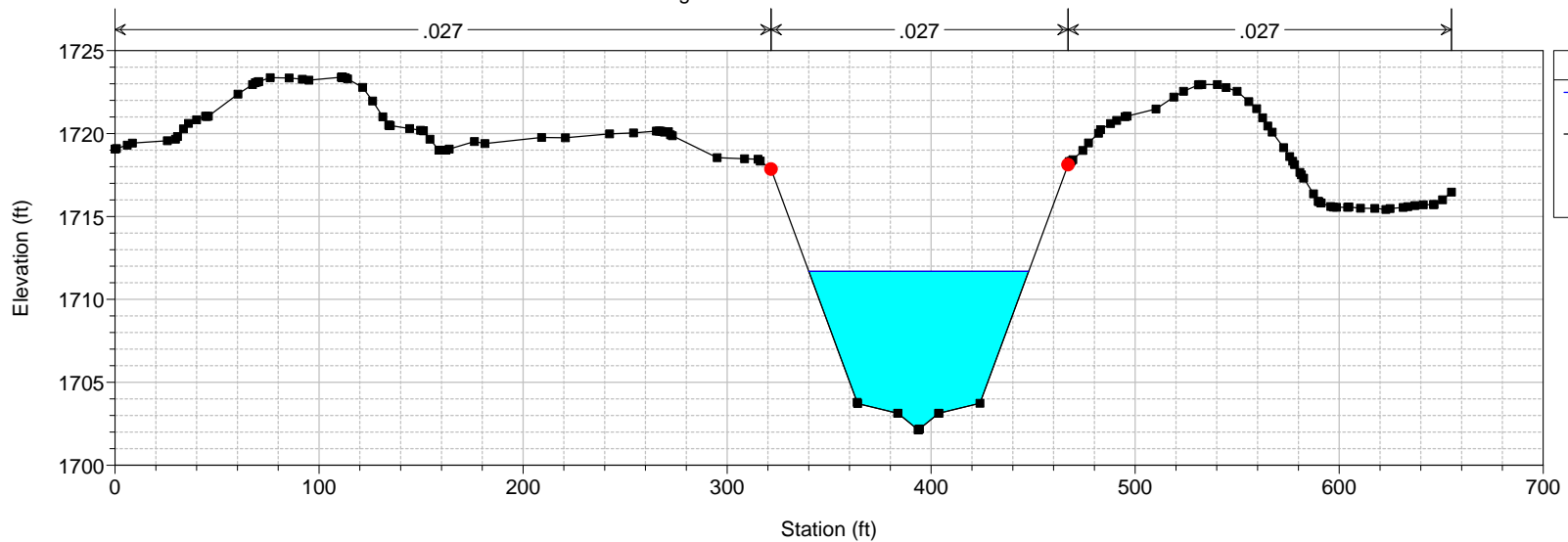
FlamWashPost Plan: Proposed 8/9/2013

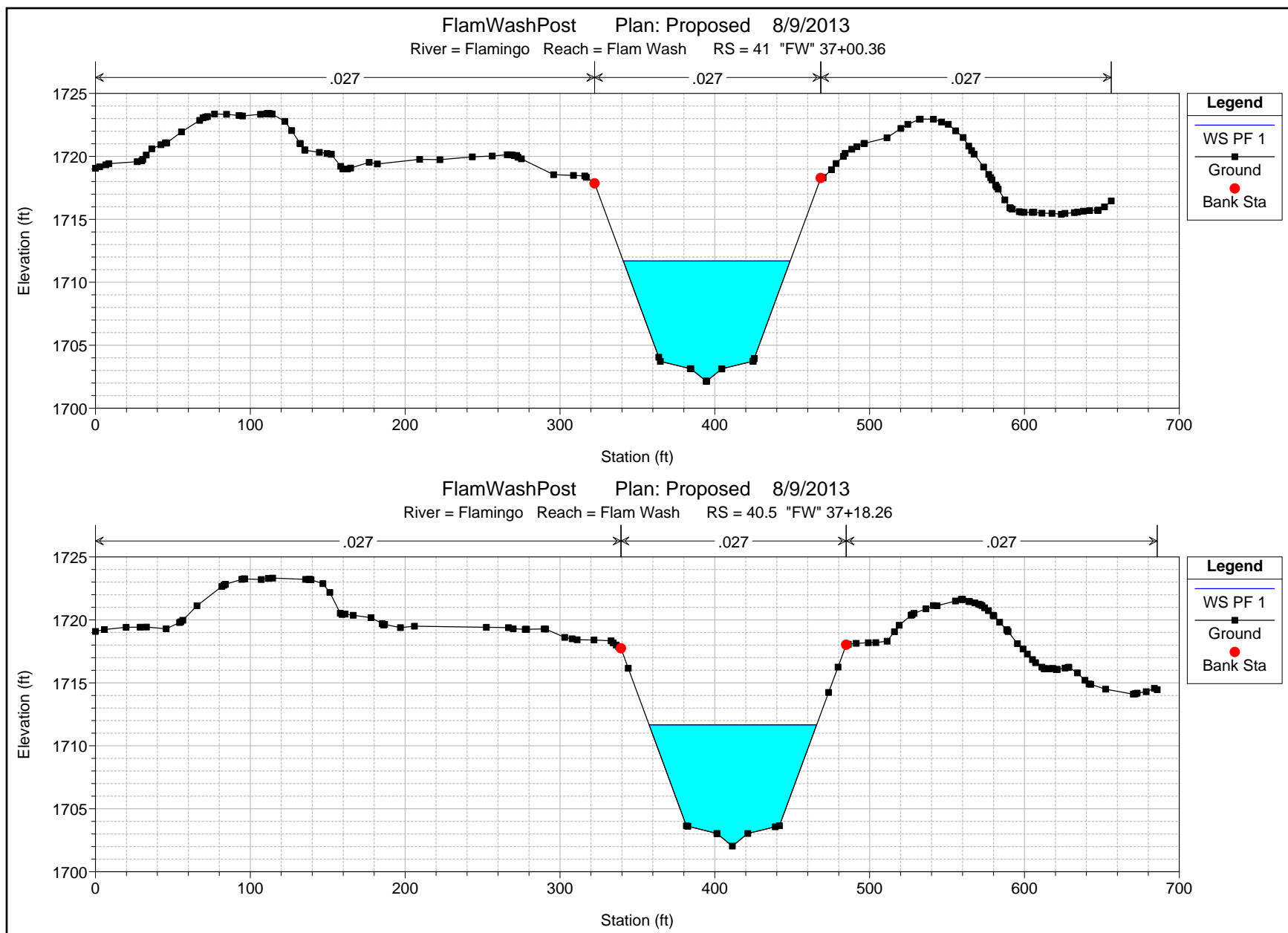
River = Flamingo Reach = Flam Wash RS = 47 "FW" 36+50

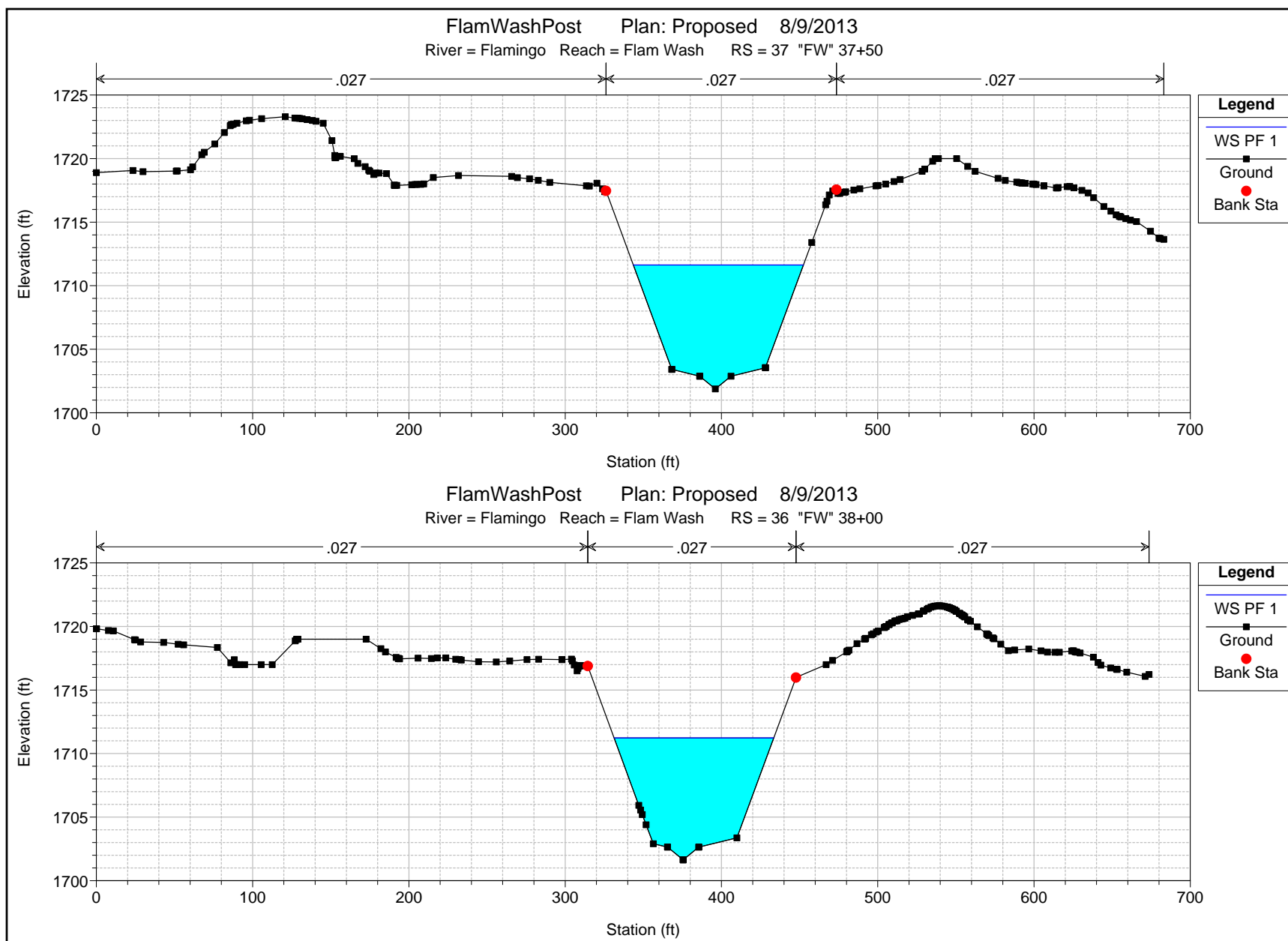


FlamWashPost Plan: Proposed 8/9/2013

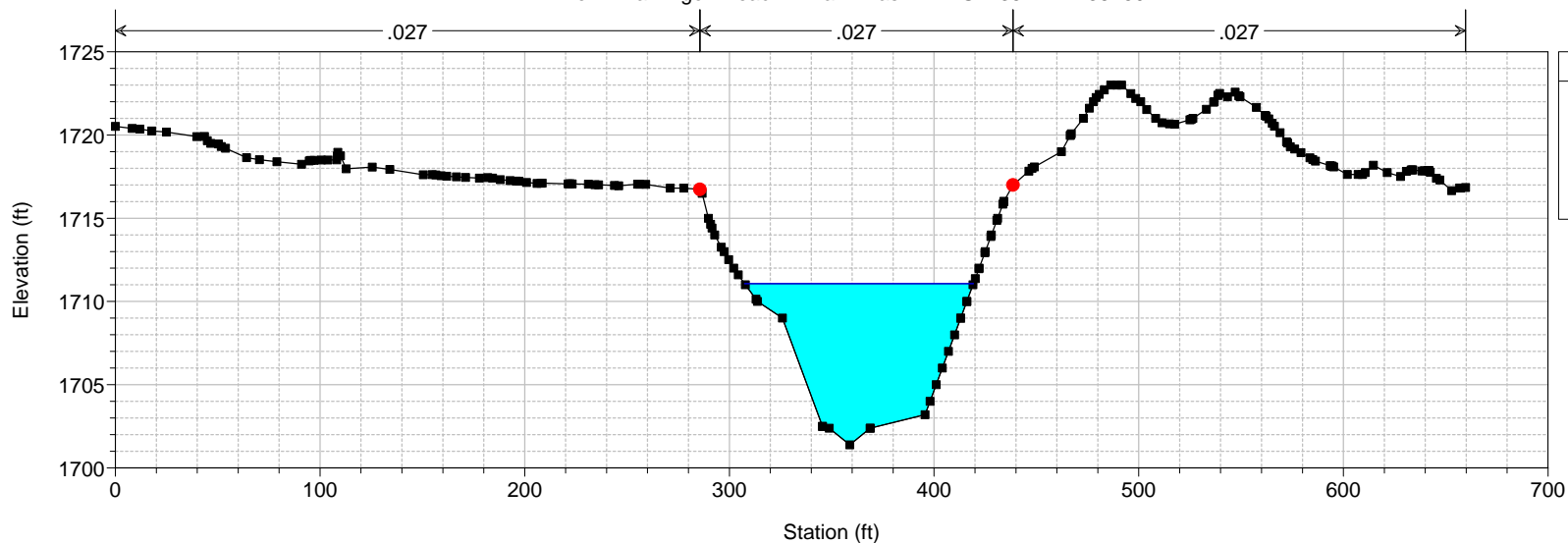
River = Flamingo Reach = Flam Wash RS = 42 "FW" 37+00



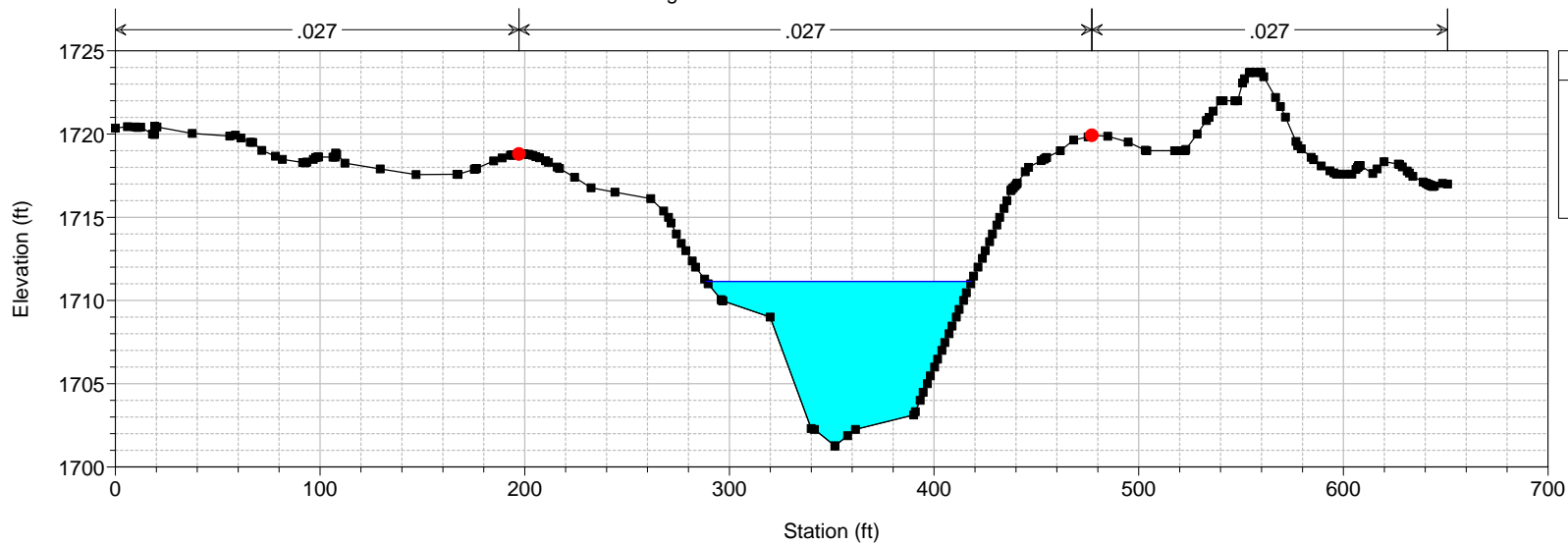


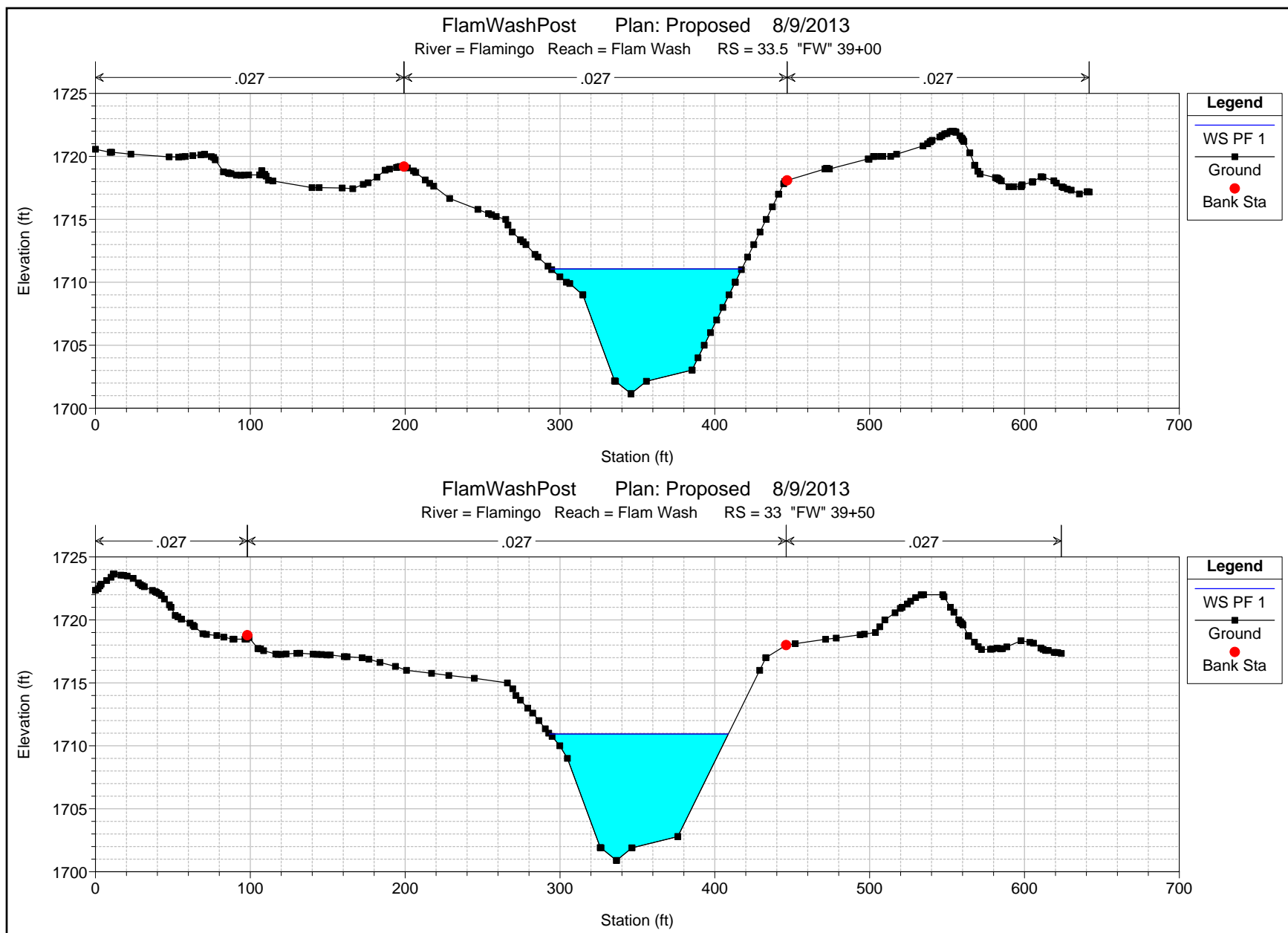


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 35 "FW" 38+50

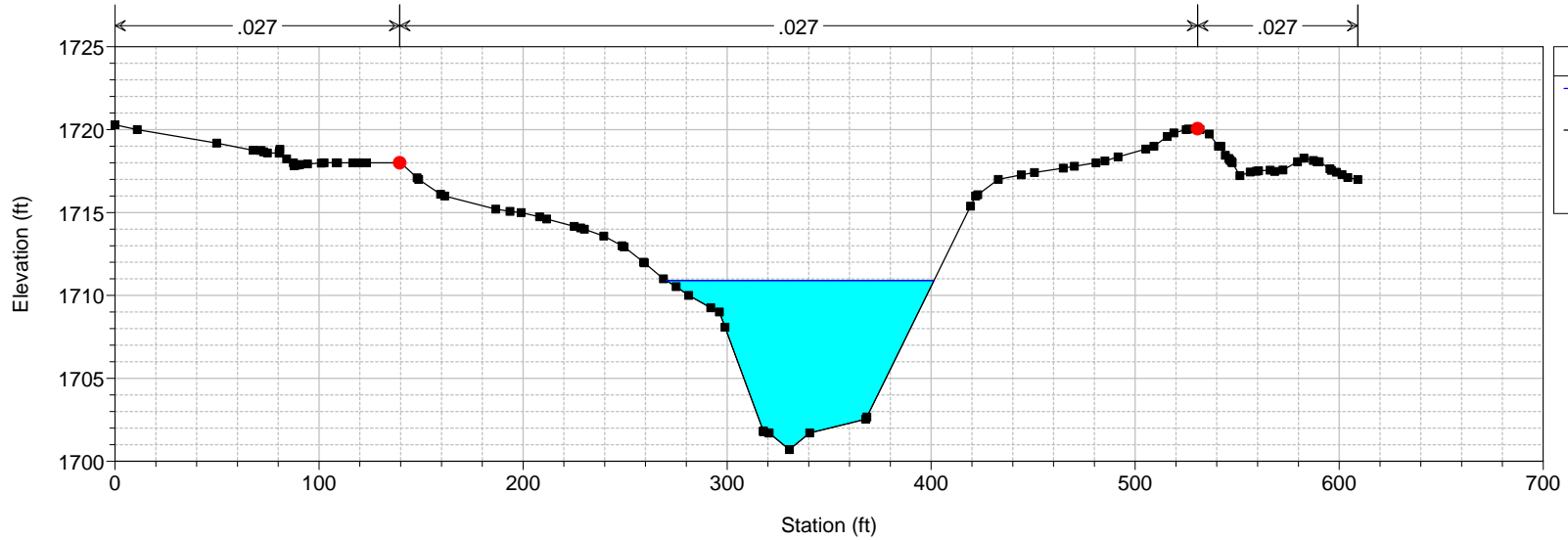


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 34 "FW" 38+76.18

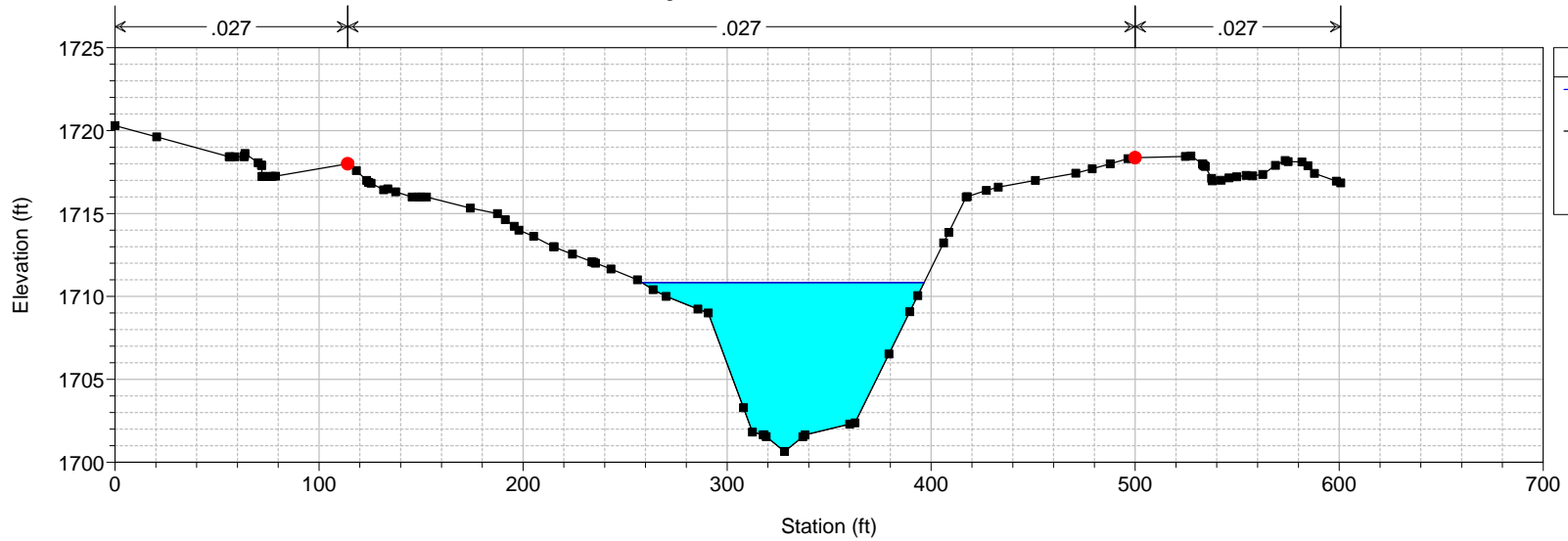




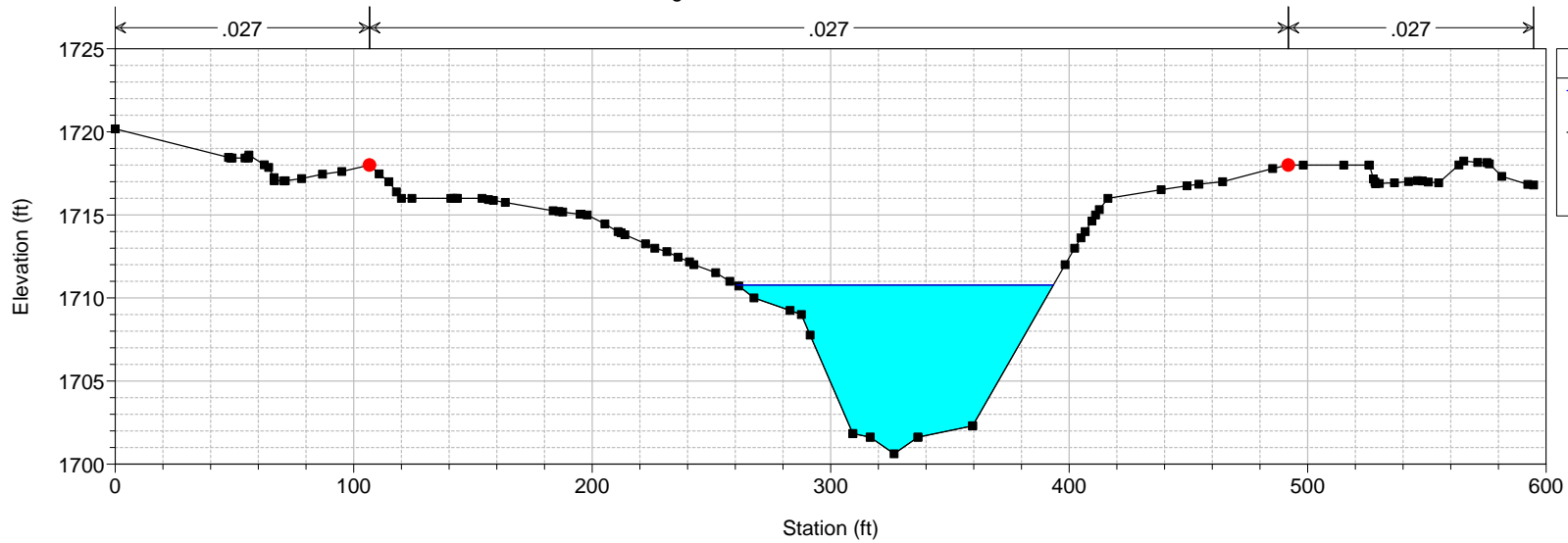
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 32.5 "FW" 40+00



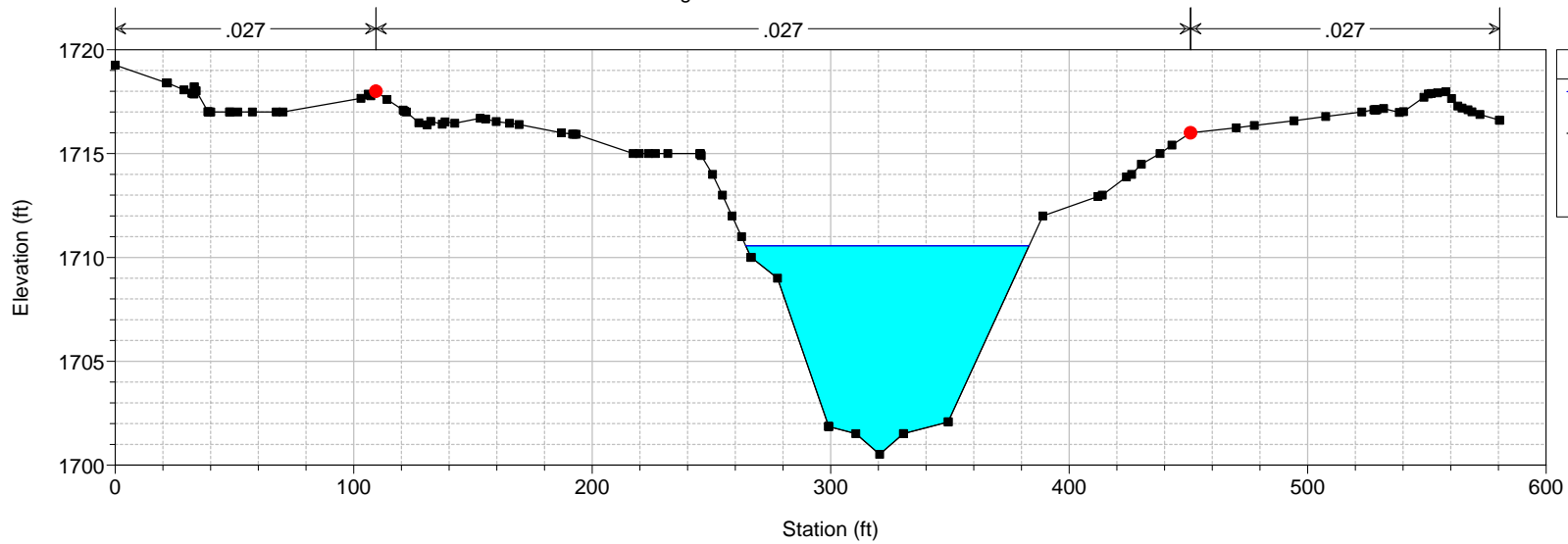
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 32 "FW" 40+34.11



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 31.5 "FW" 40+50

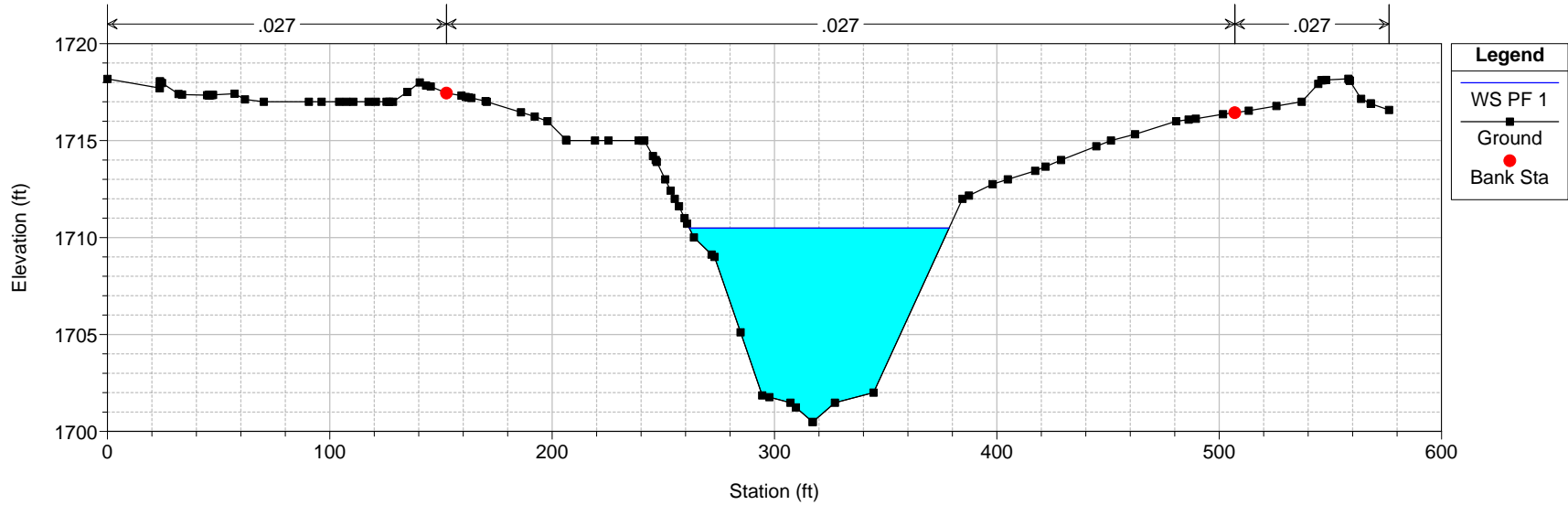


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 31 "FW" 41+00



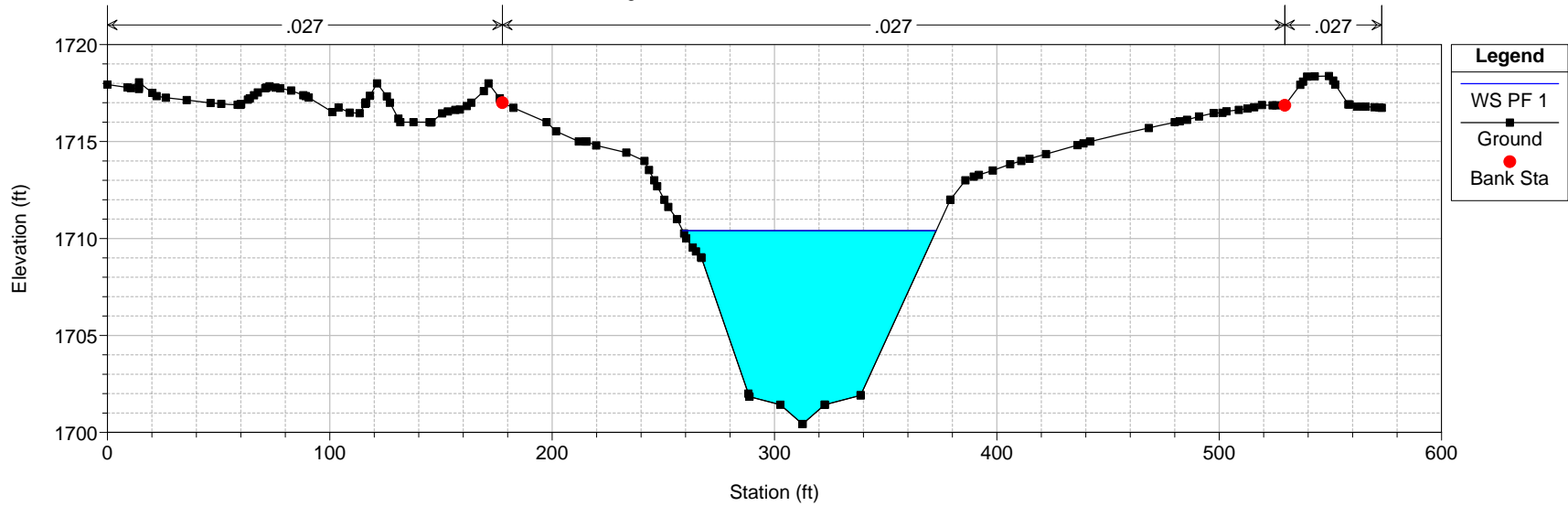
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 30.9 "FW" 41+22.44

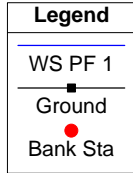
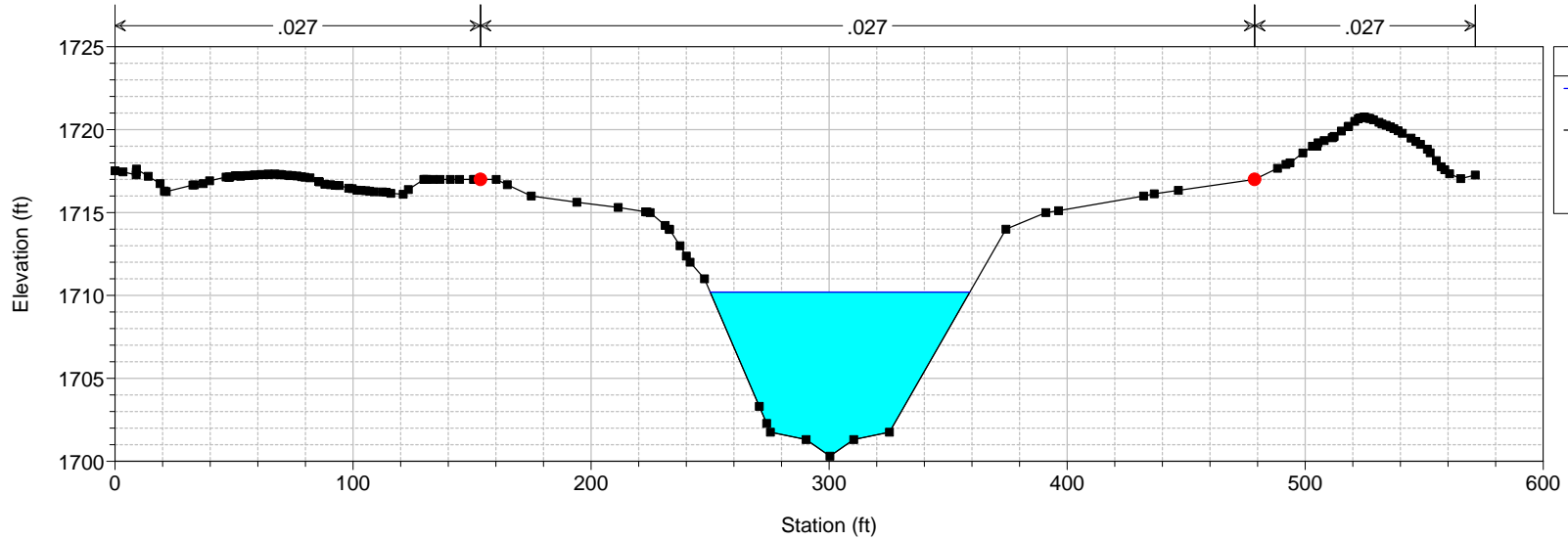


FlamWashPost Plan: Proposed 8/9/2013

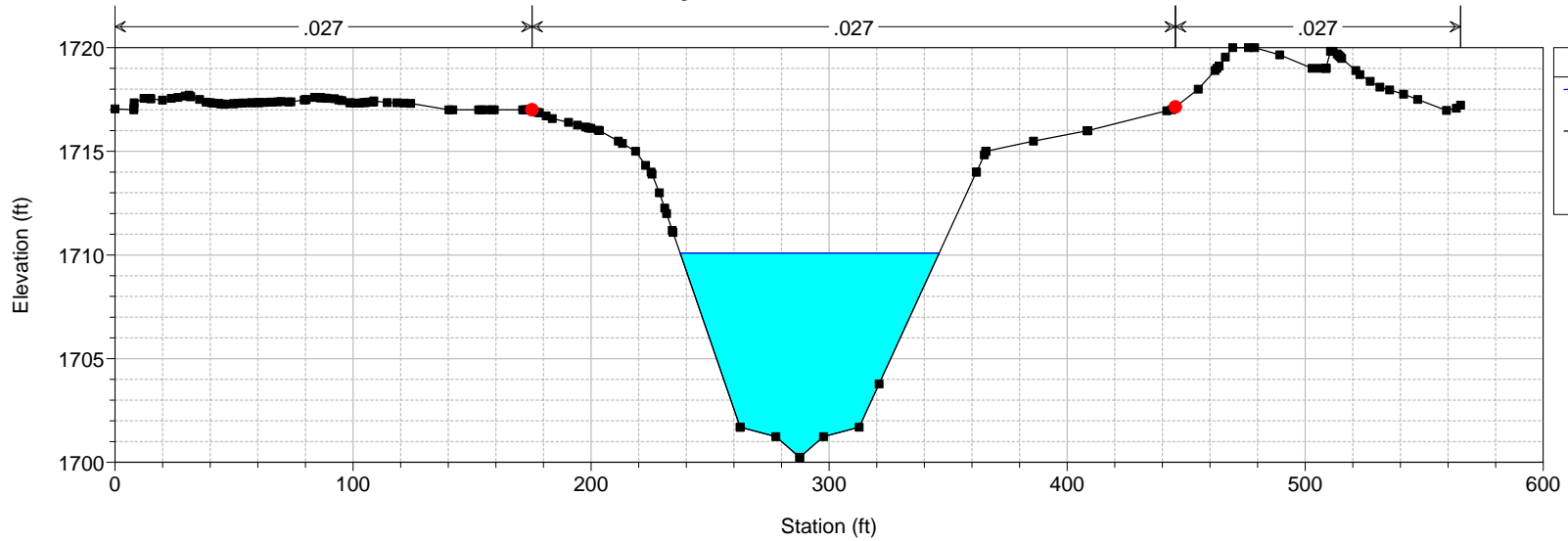
River = Flamingo Reach = Flam Wash RS = 30.5 "FW" 41+50



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 29 "FW" 42+10.78

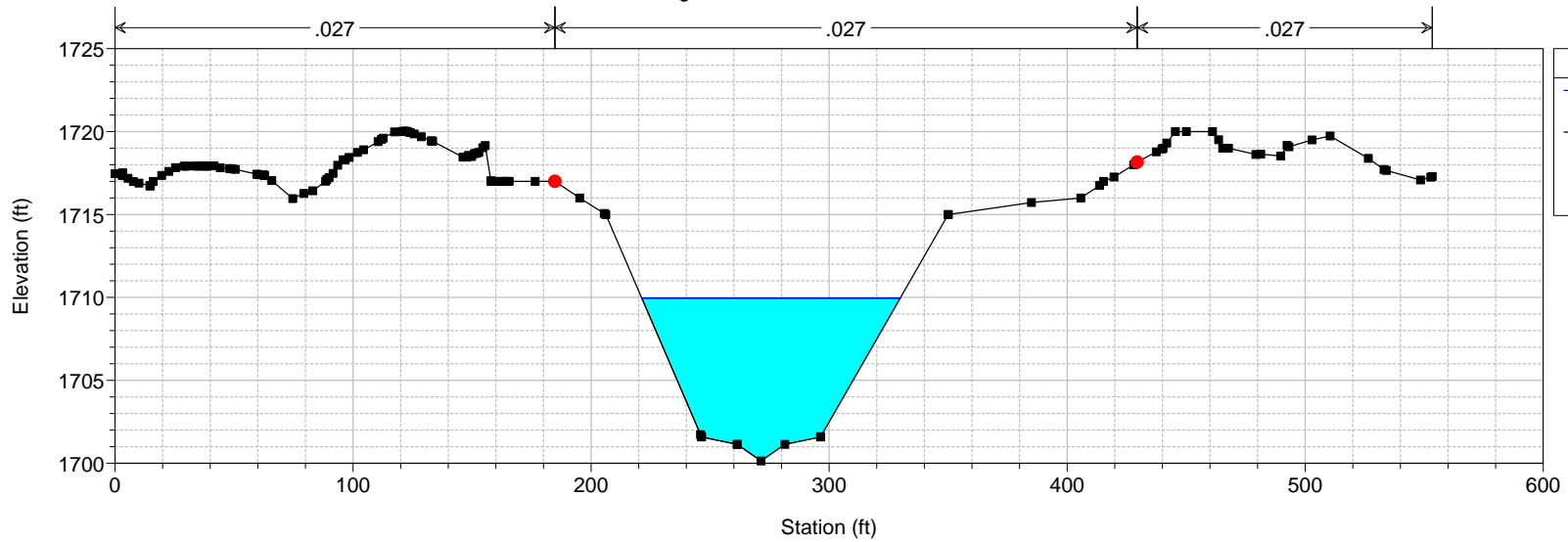


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 28 "FW" 42+50



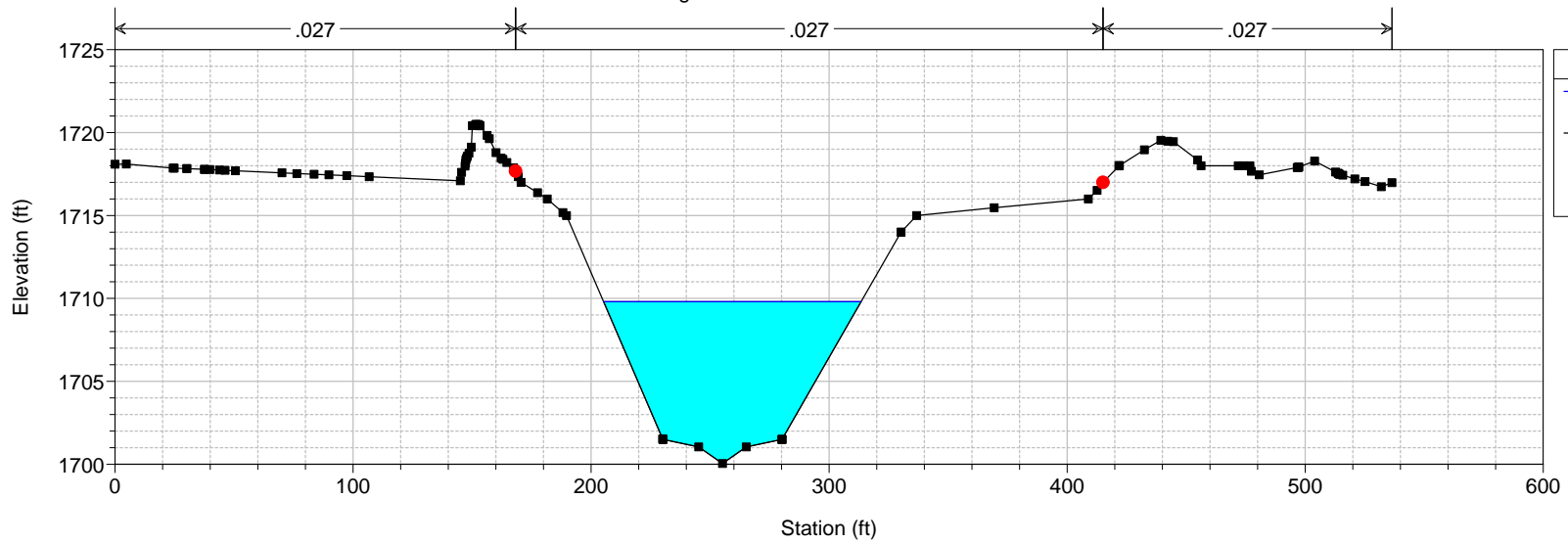
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 27 "FW" 43+00



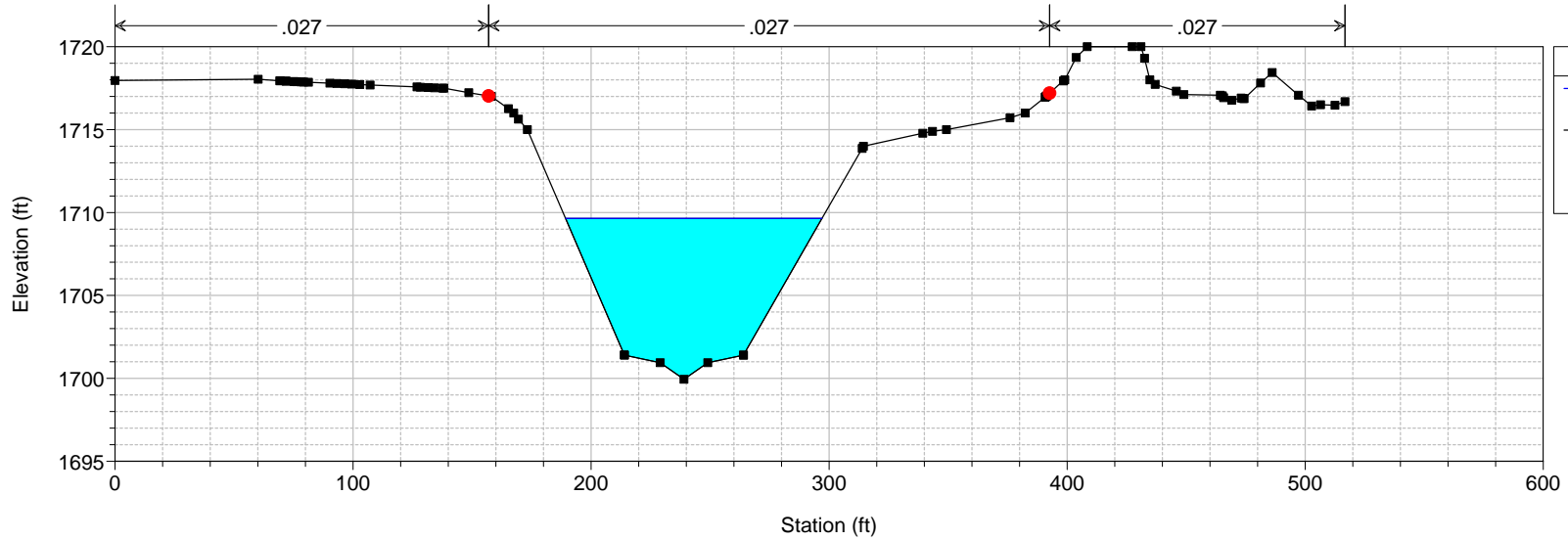
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 26 "FW" 43+50



FlamWashPost Plan: Proposed 8/9/2013

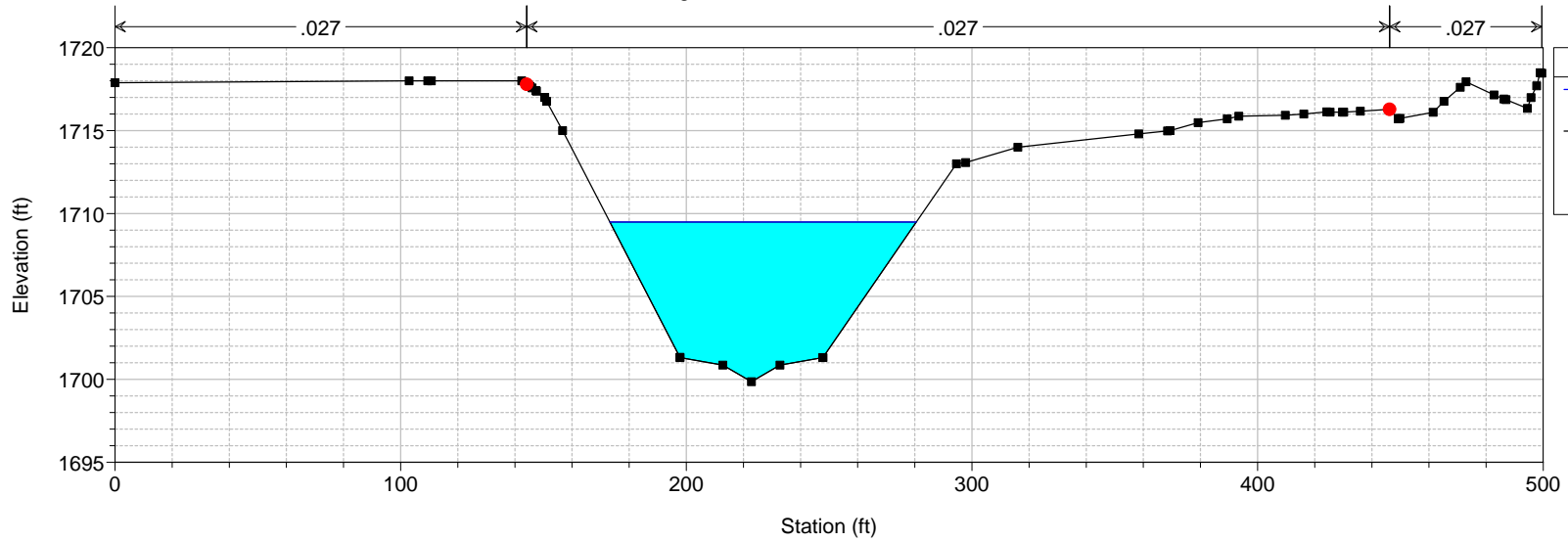
River = Flamingo Reach = Flam Wash RS = 25 "FW" 44+00



Legend	
WS PF 1	
Ground	■
Bank Sta	●

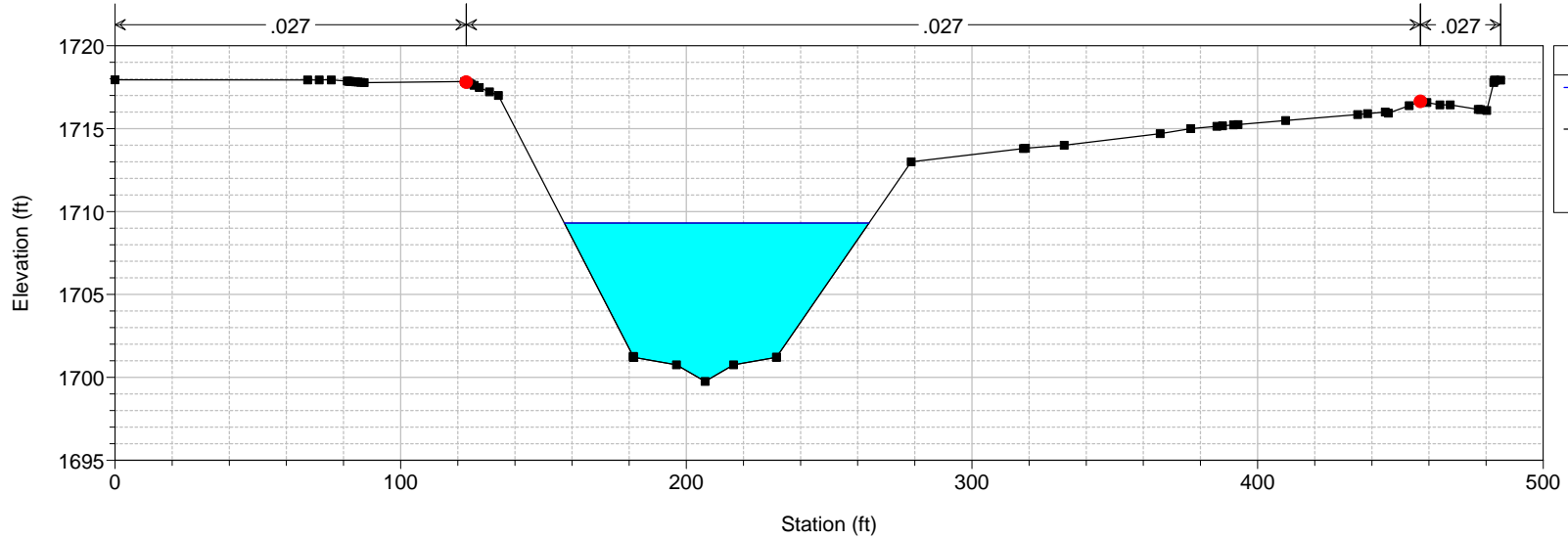
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 24 "FW" 44+50

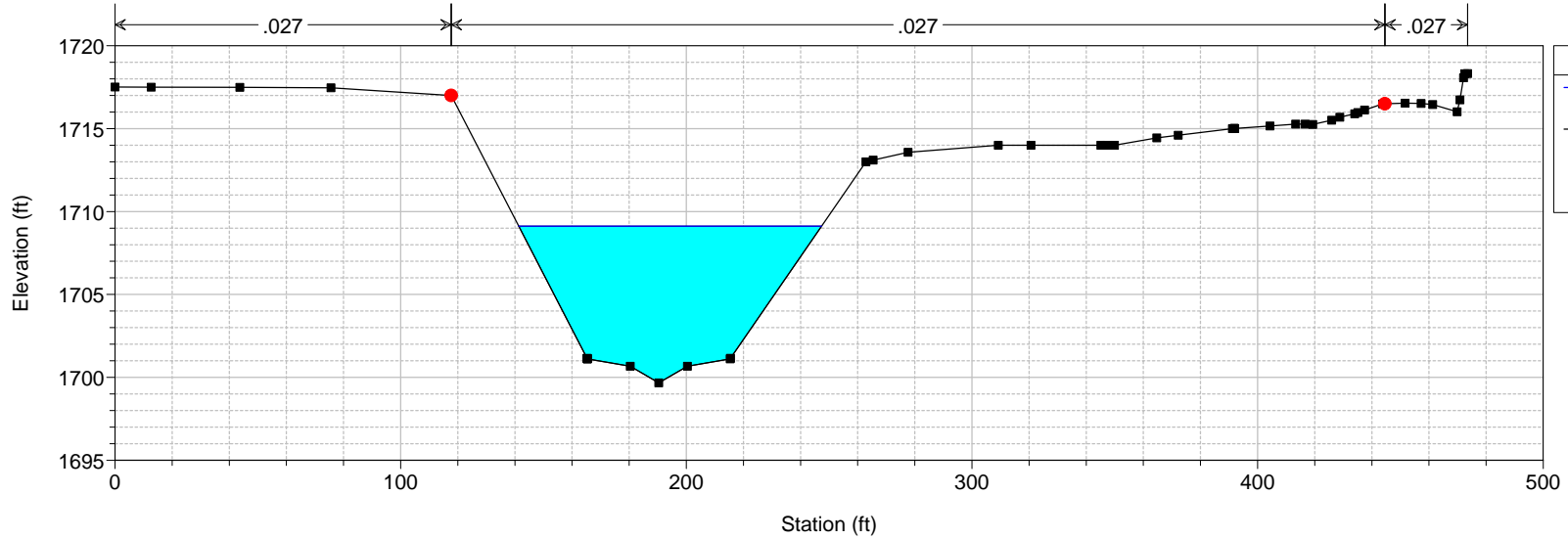


Legend	
WS PF 1	
Ground	■
Bank Sta	●

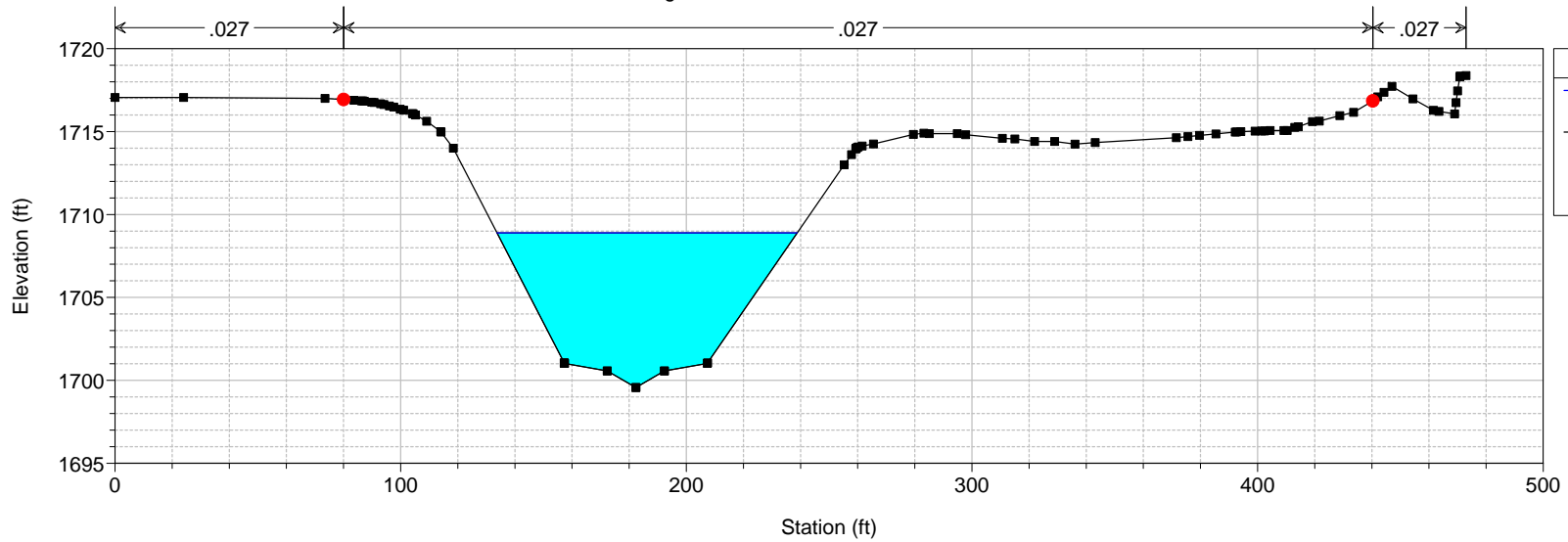
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 23 "FW" 45+00.00



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 22 "FW" 45+50.00

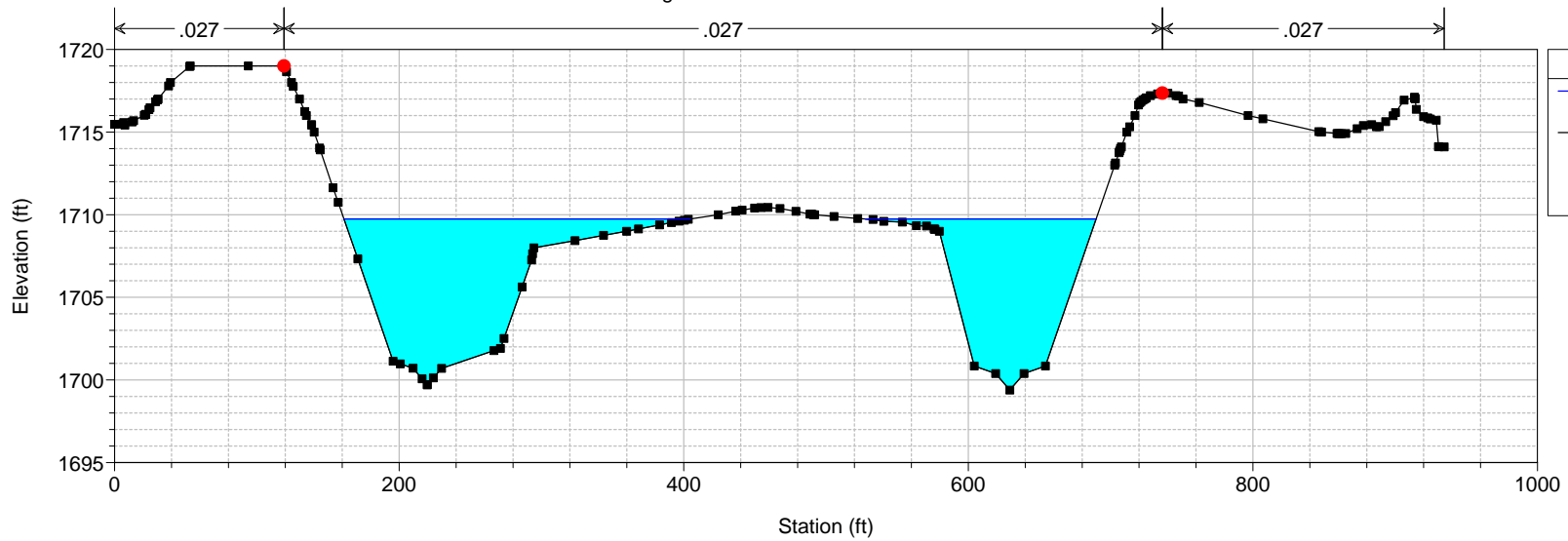


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 21 "FW" 46+00.00

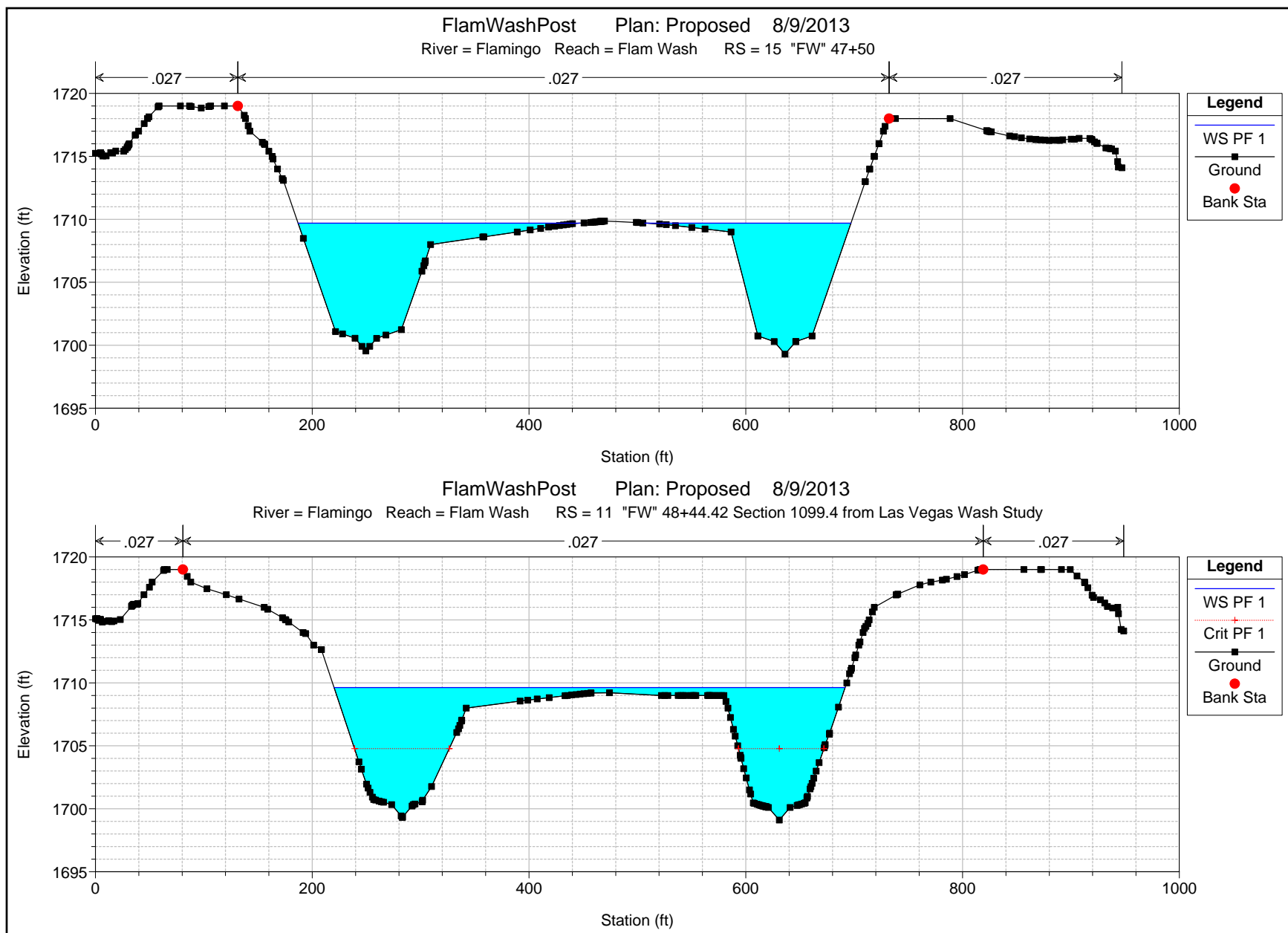


Legend	
WS PF 1	—
Ground	■
Bank Sta	●

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 19 "FW" 46+98.70

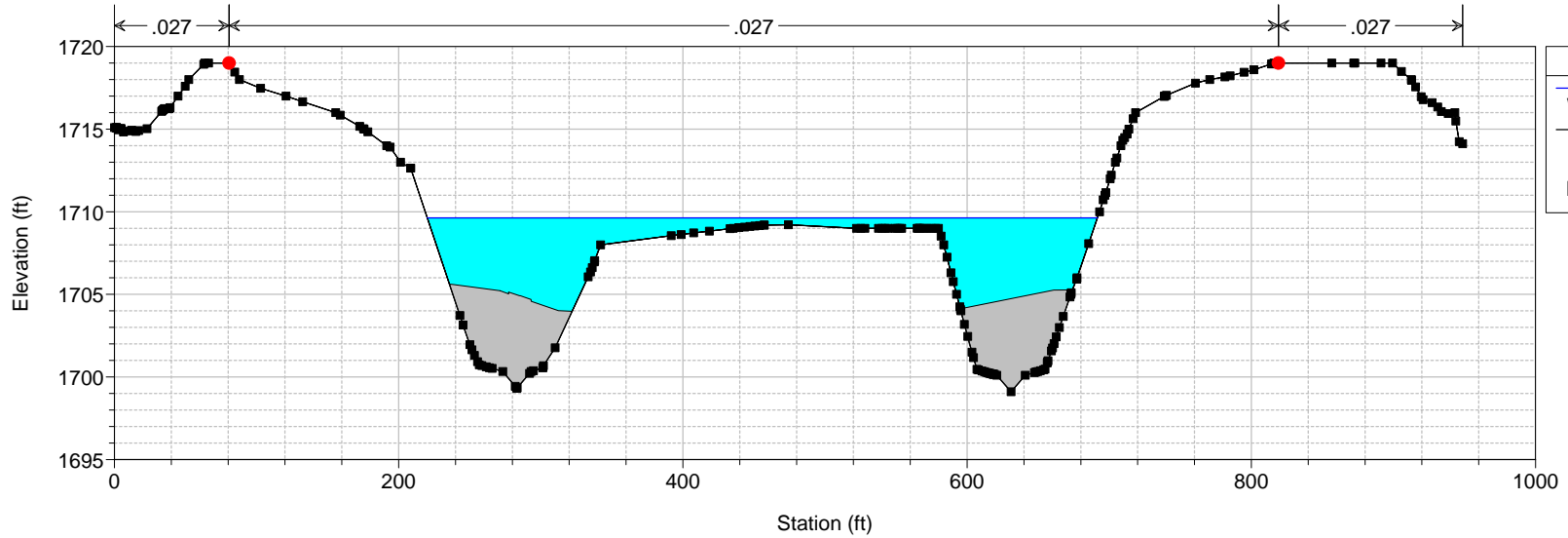


Legend	
WS PF 1	—
Ground	■
Bank Sta	●



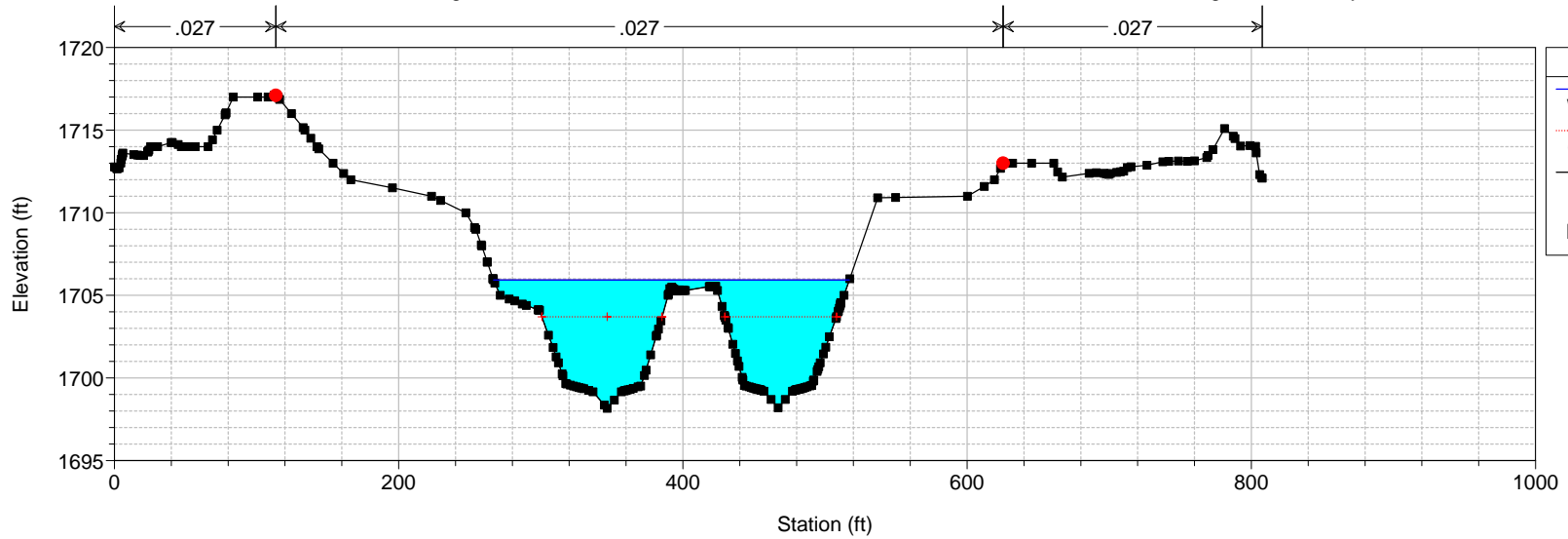
FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 8 IS

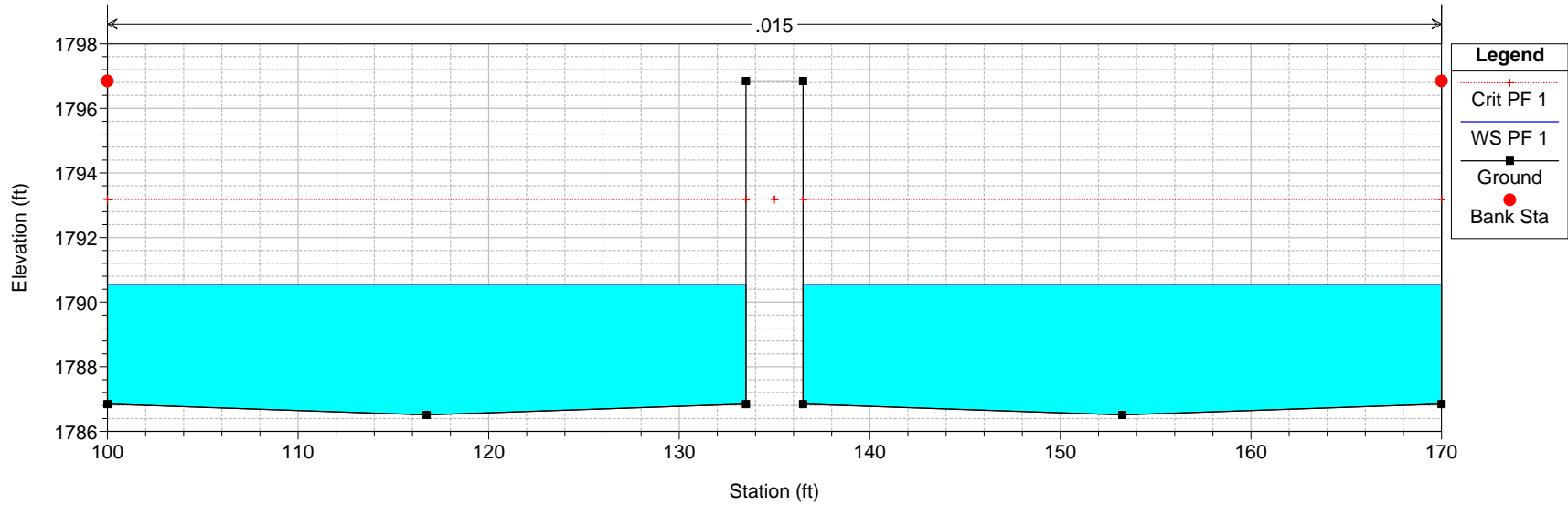


FlamWashPost Plan: Proposed 8/9/2013

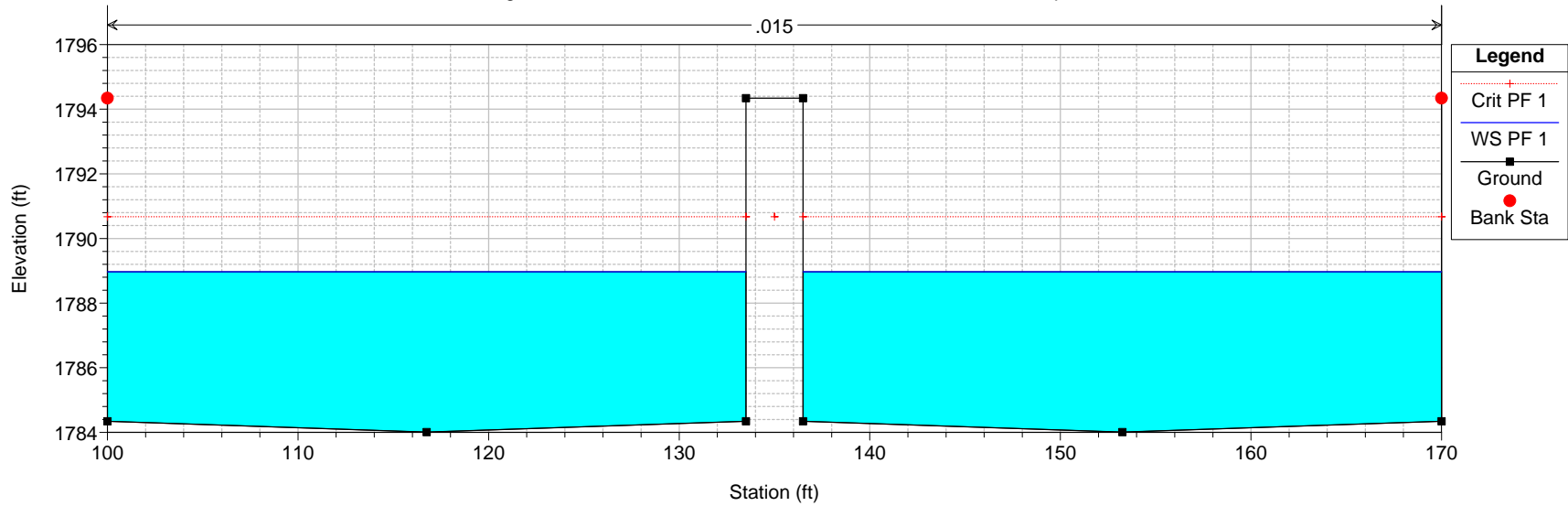
River = Flamingo Reach = Flam Wash RS = 1 "FW" 53+14.92 - Section 1097.5 From Las Vegas Wash Study



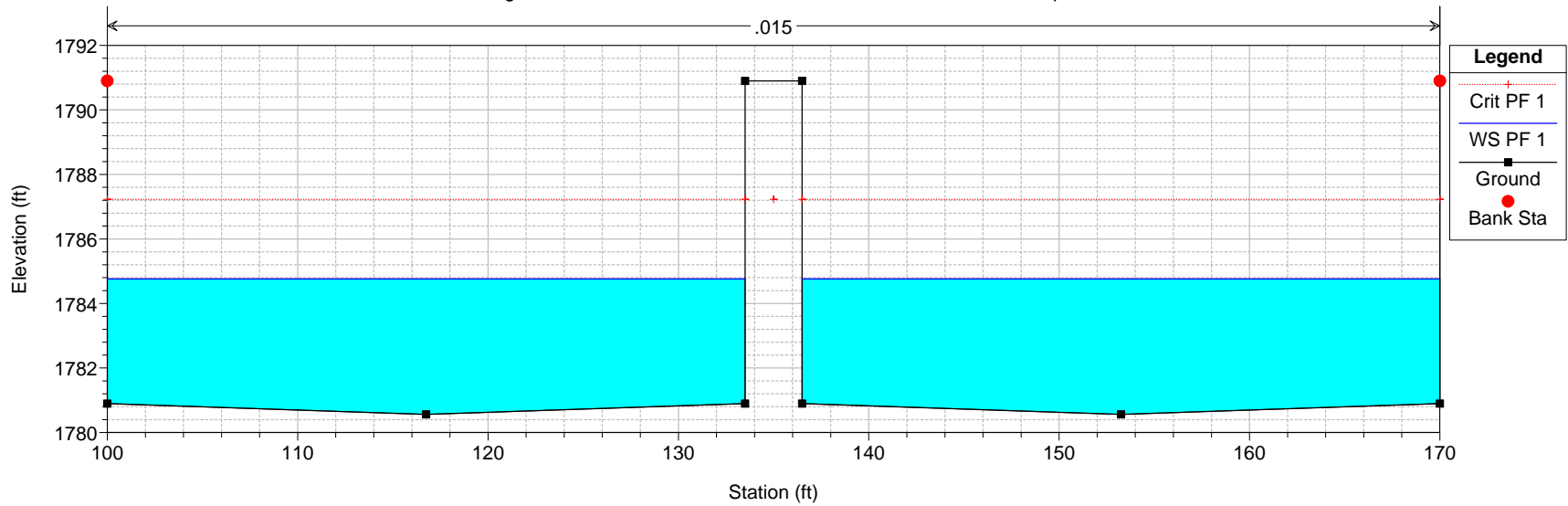
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 390 Ex. Concrete Channel Upstream of I-515



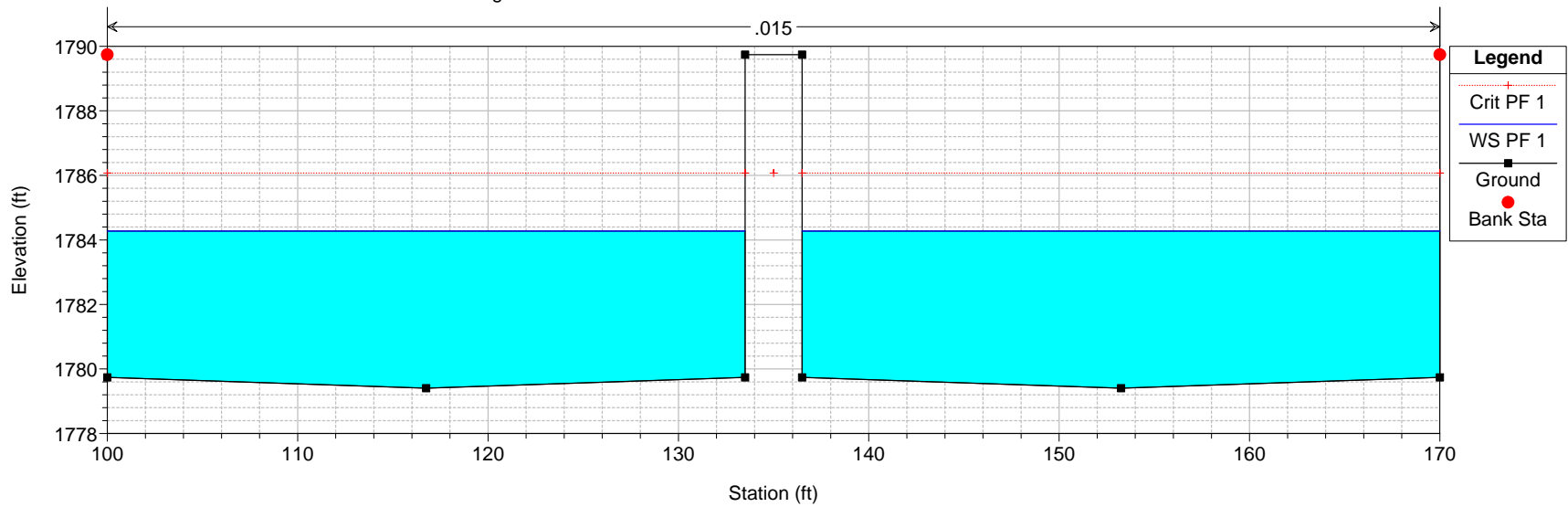
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 380 Ex. Concrete Channel Upstream of I-515



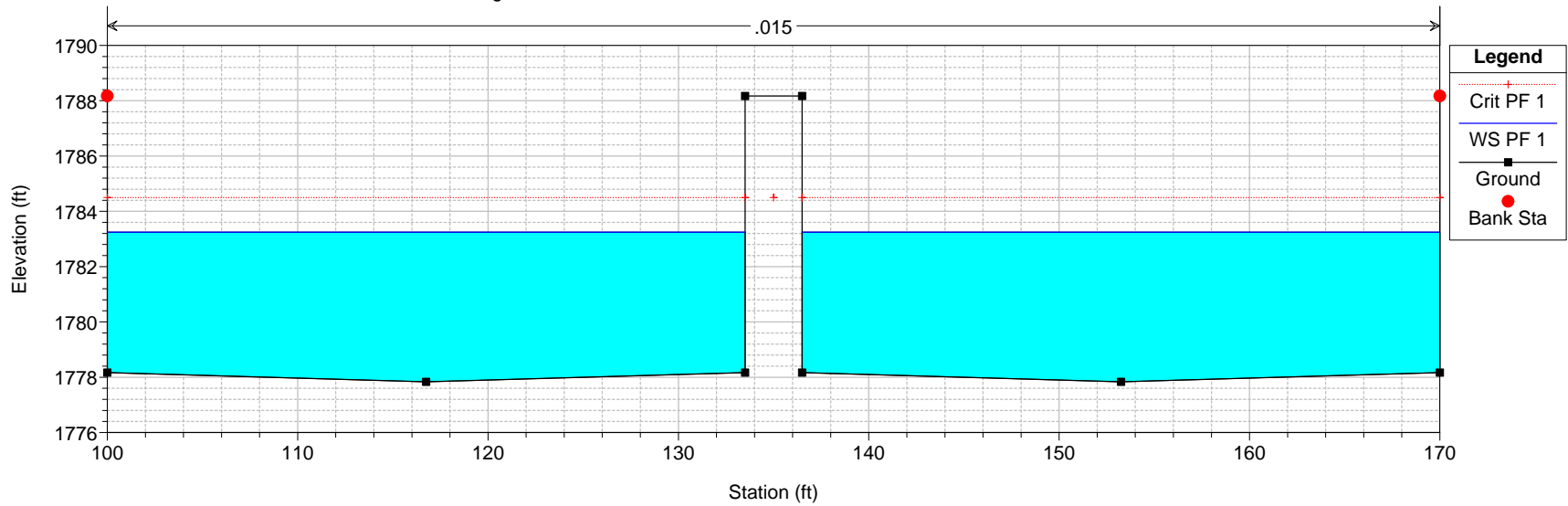
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 370 Ex. Concrete Channel Upstream of I-515



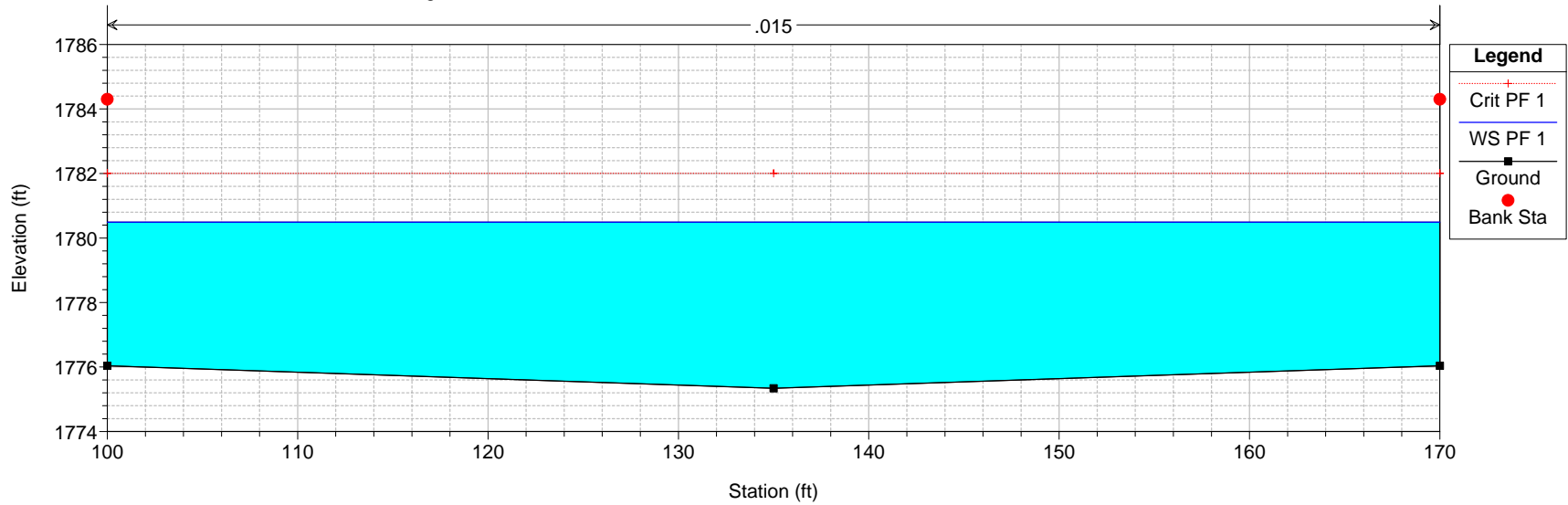
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 360 Ex. Concrete Channel Downstream of I-515



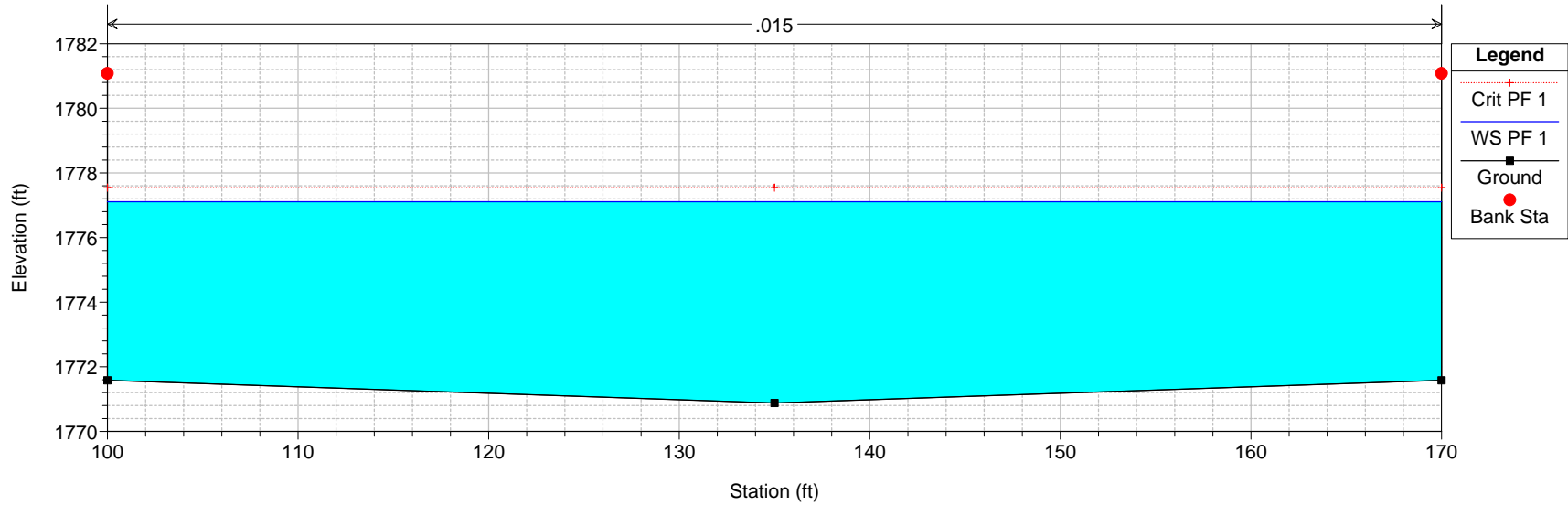
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 350 Ex. Concrete Channel Downstream of I-515



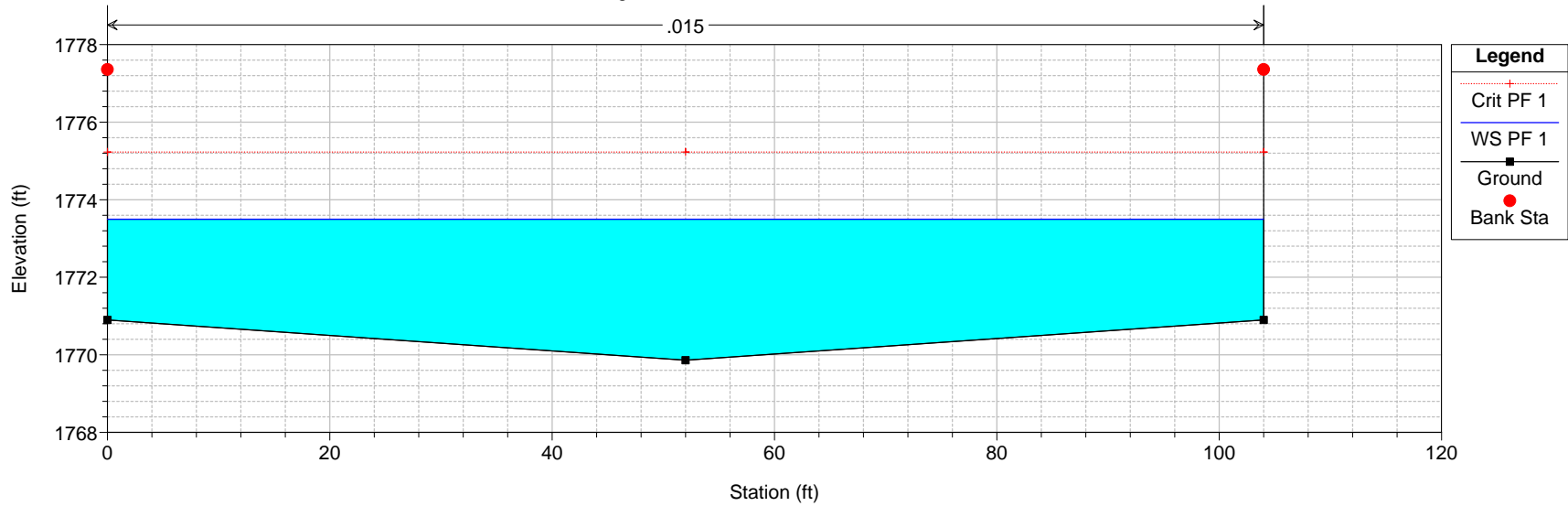
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 341 Ex. Concrete Channel Downstream of I-515 - "AB" 21+37.2



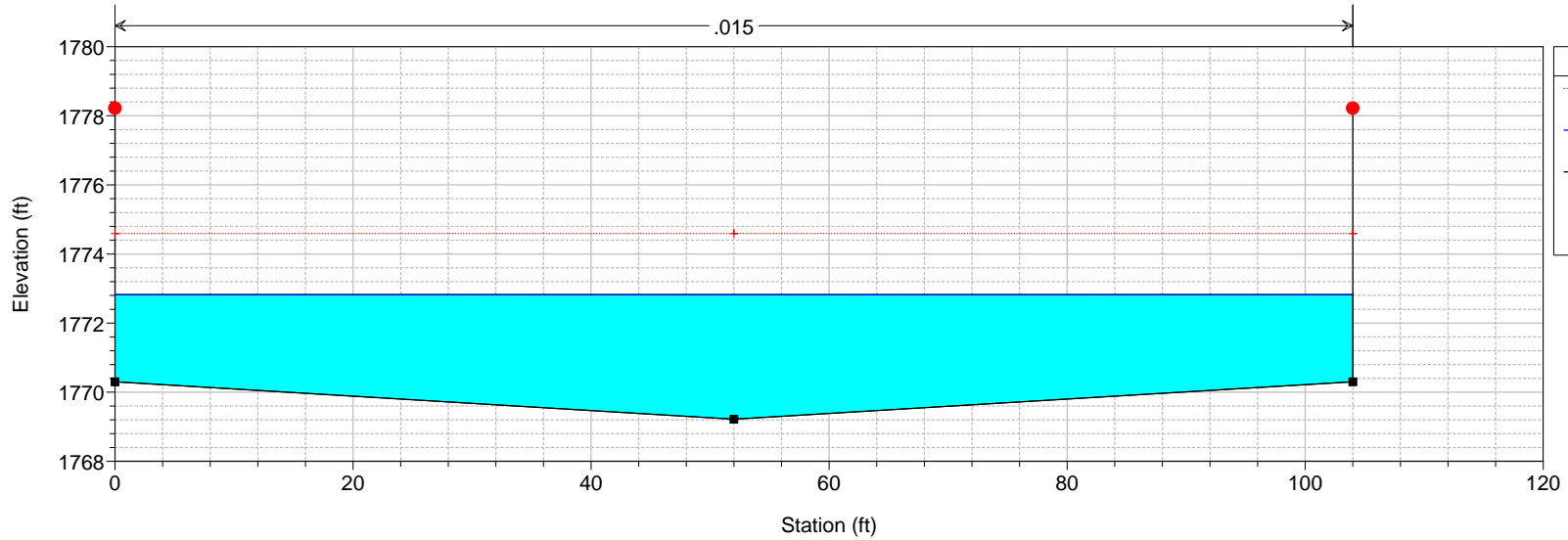
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 313 "AB" 34+06.10



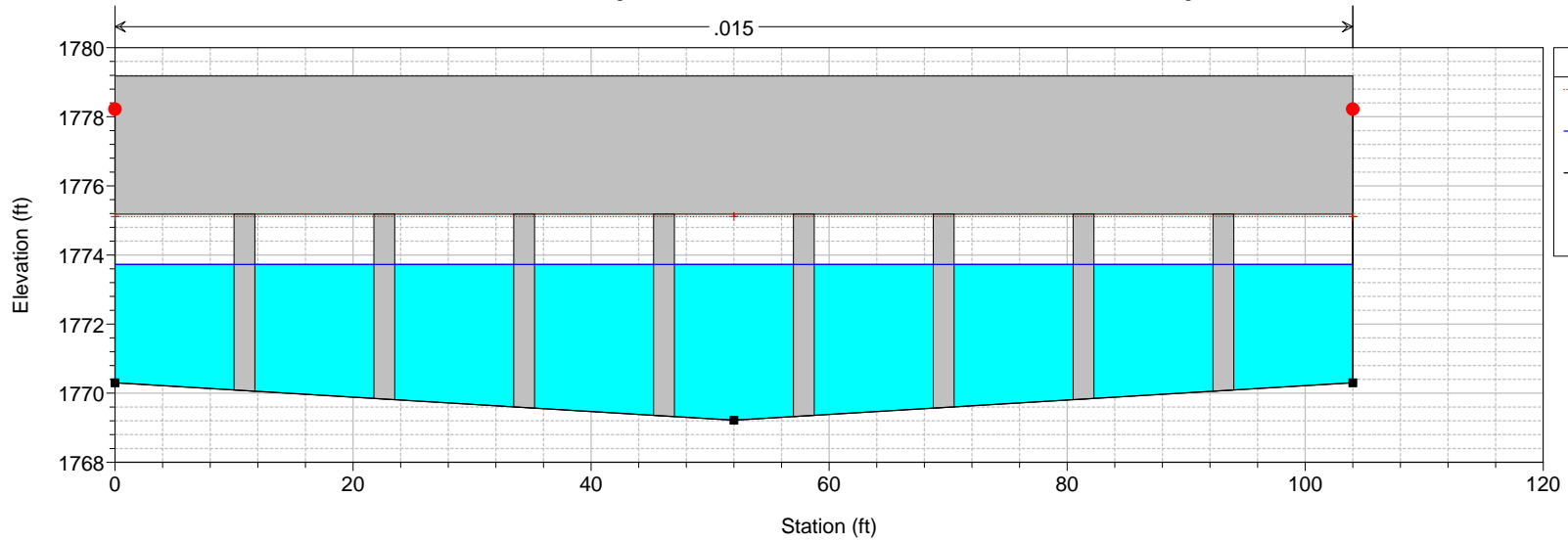
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 311 "AB" 36+61.10



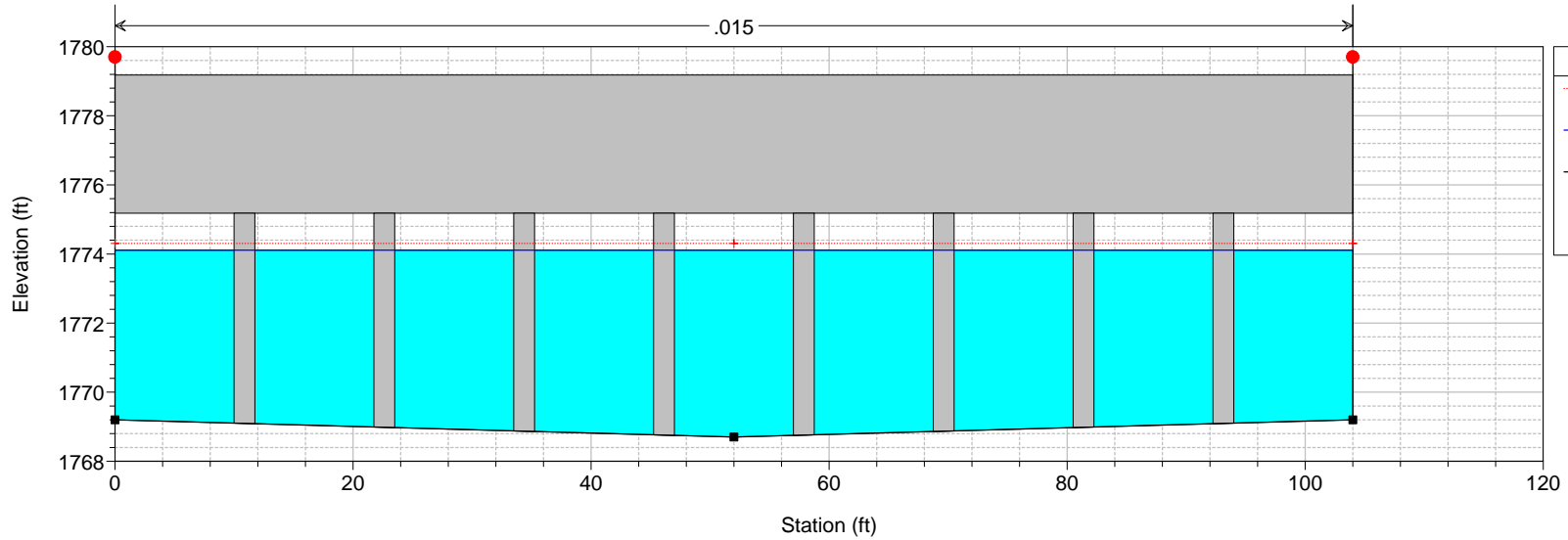
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 305 = "AB" 37+11.52



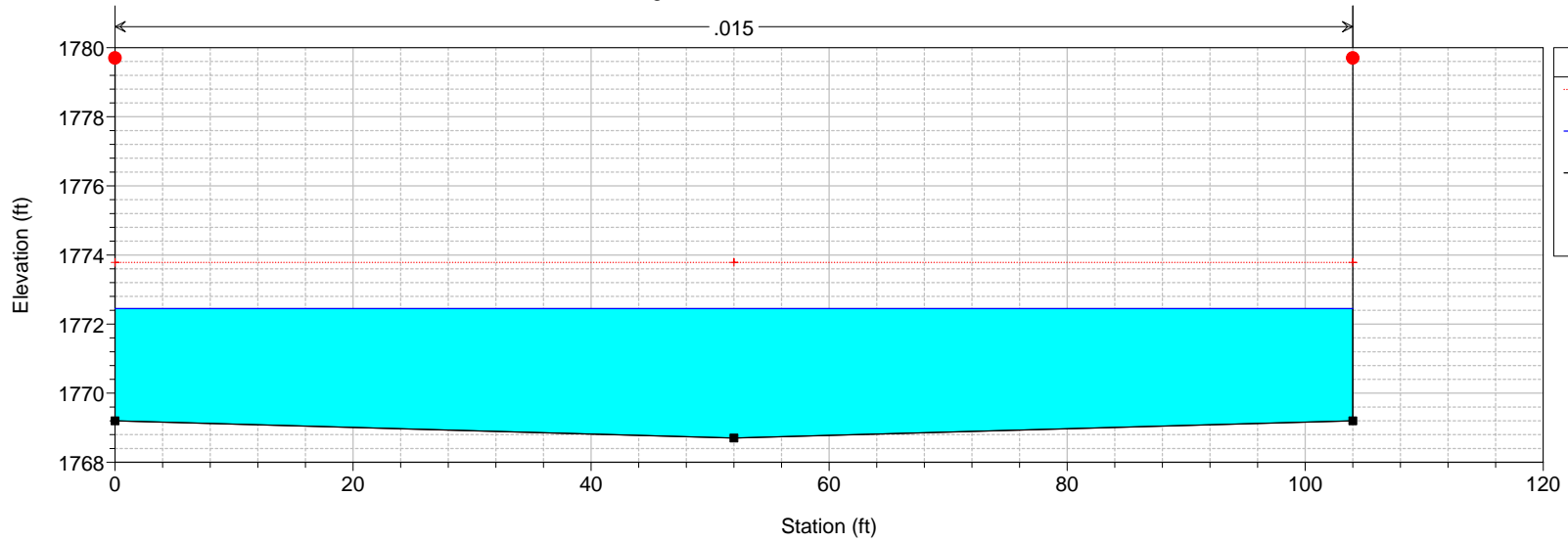
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

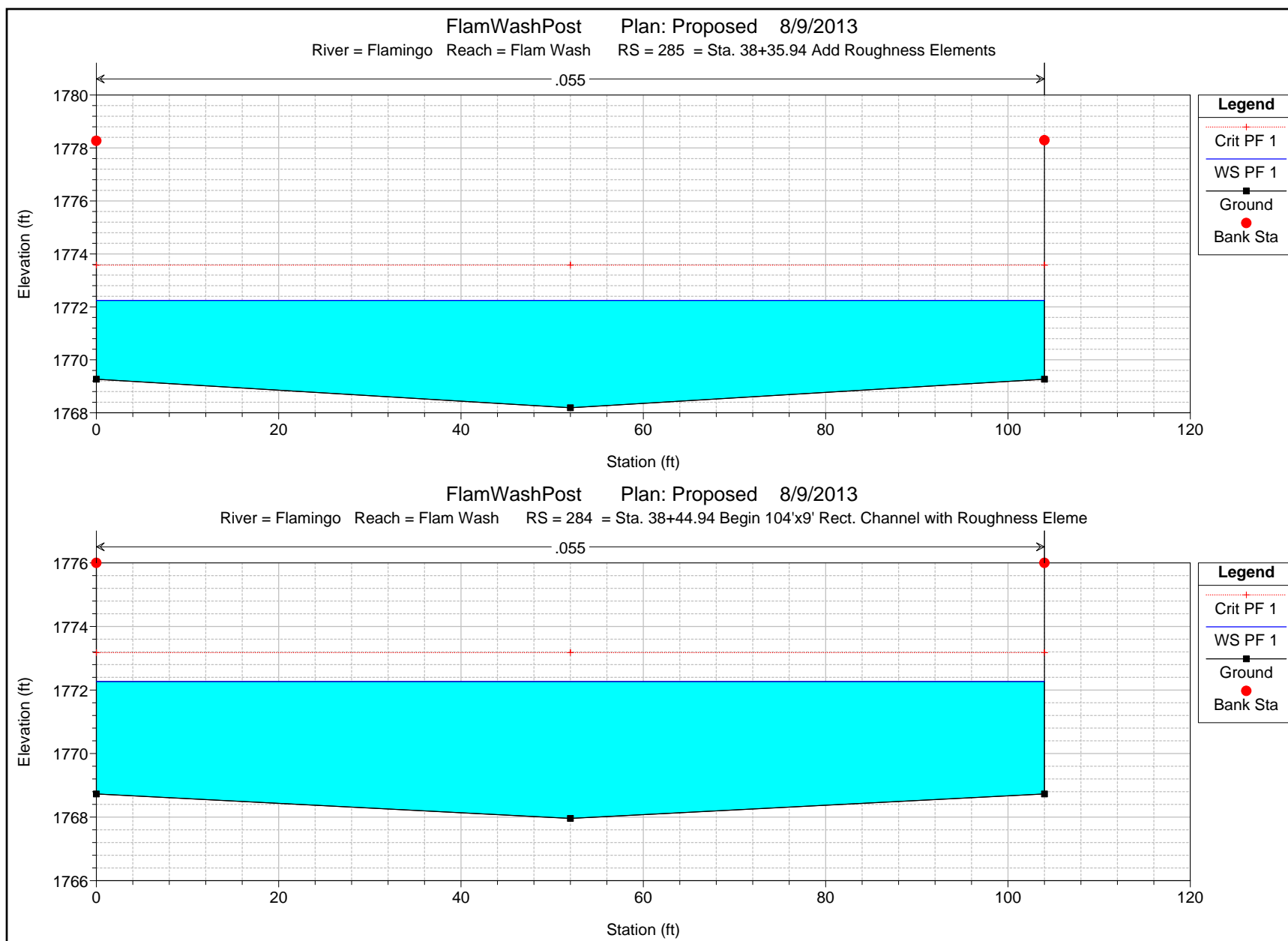


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 300 BR Lamb Blvd Bridge

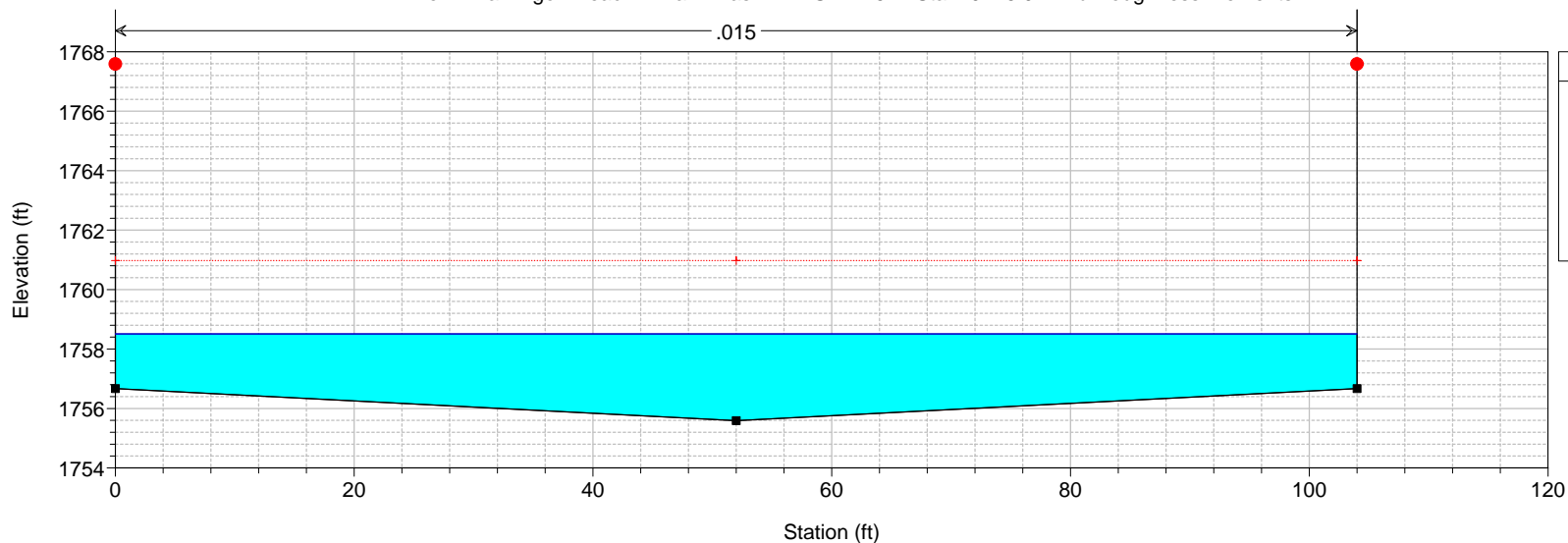


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 295 = "AB" 38+20.93





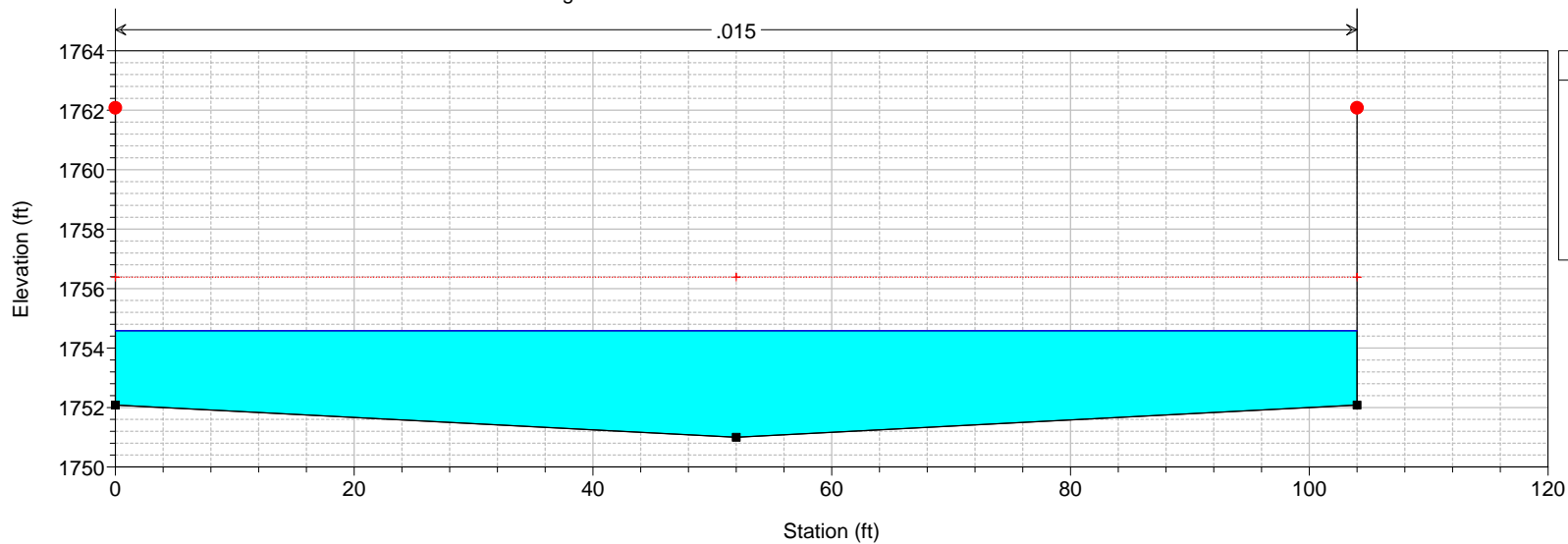
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 246 = Sta. 40+45.94 End Roughness Elements



Legend

- Crit PF 1
- WS PF 1
- Ground
- Bank Sta

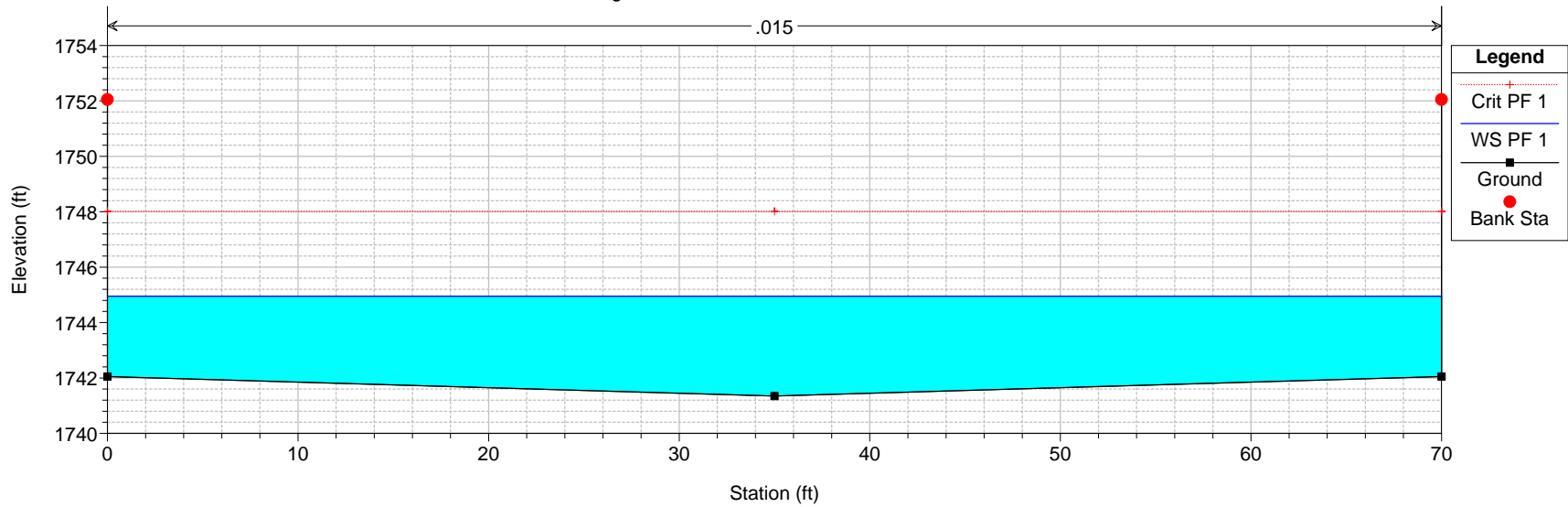
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 229 = Sta. 45+22.37 Transition Structure



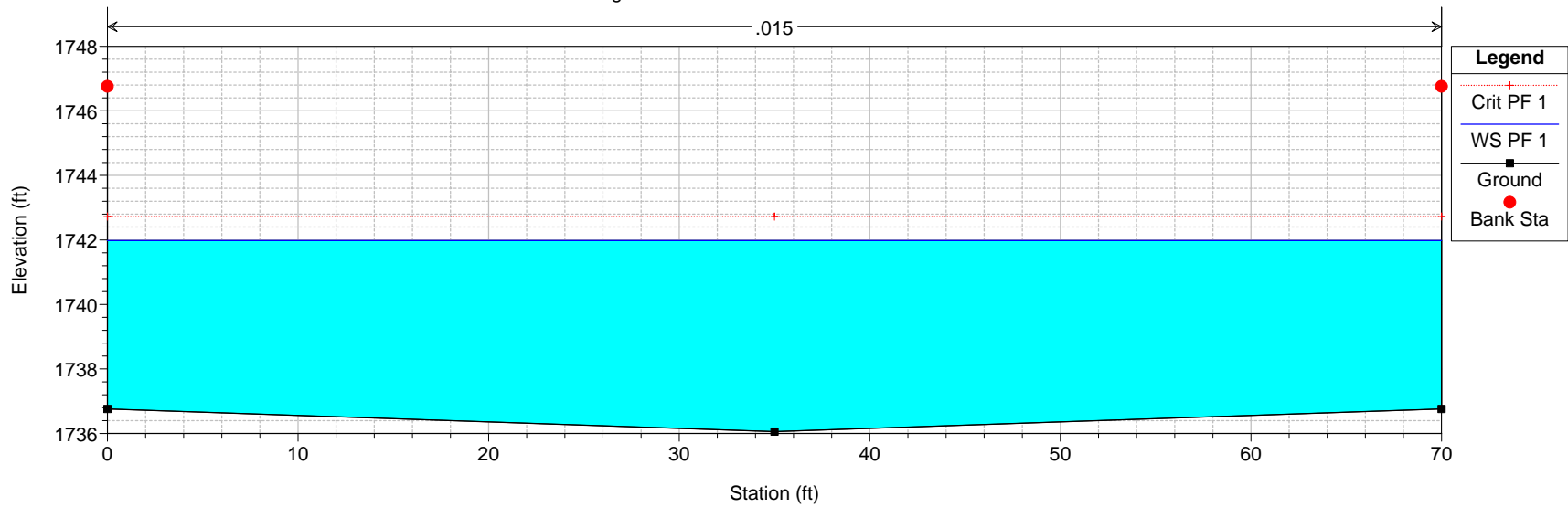
Legend

- Crit PF 1
- WS PF 1
- Ground
- Bank Sta

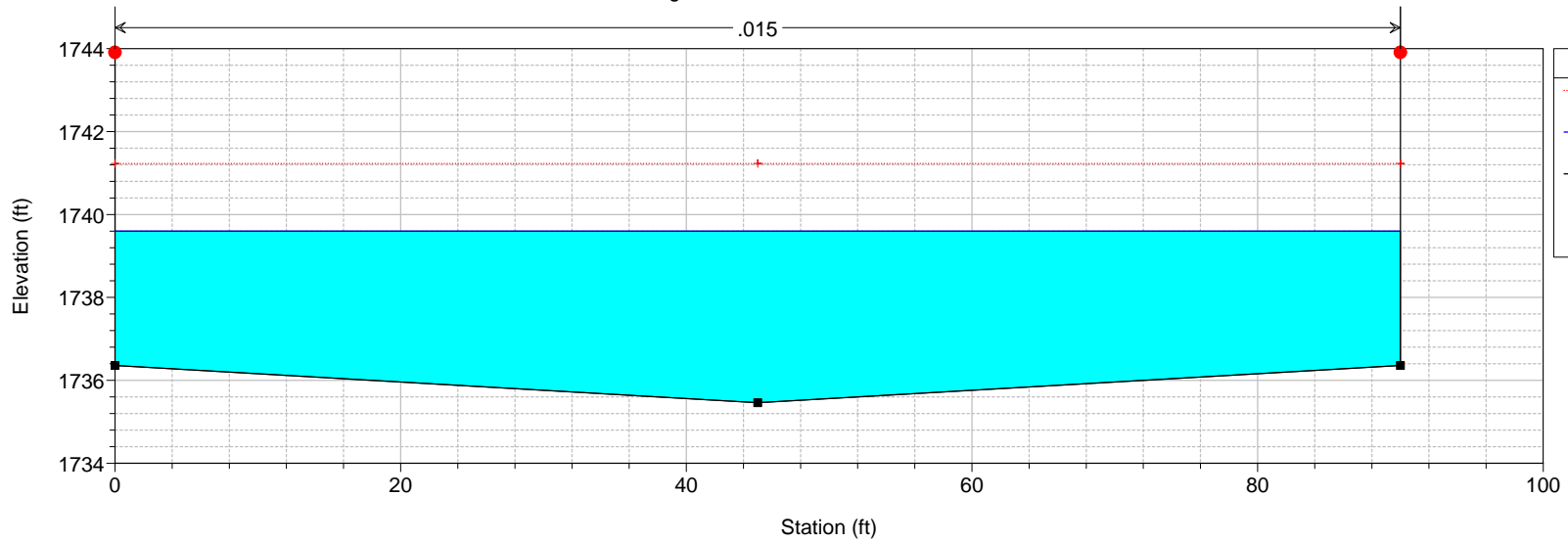
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 222 = Sta. 47+77.37



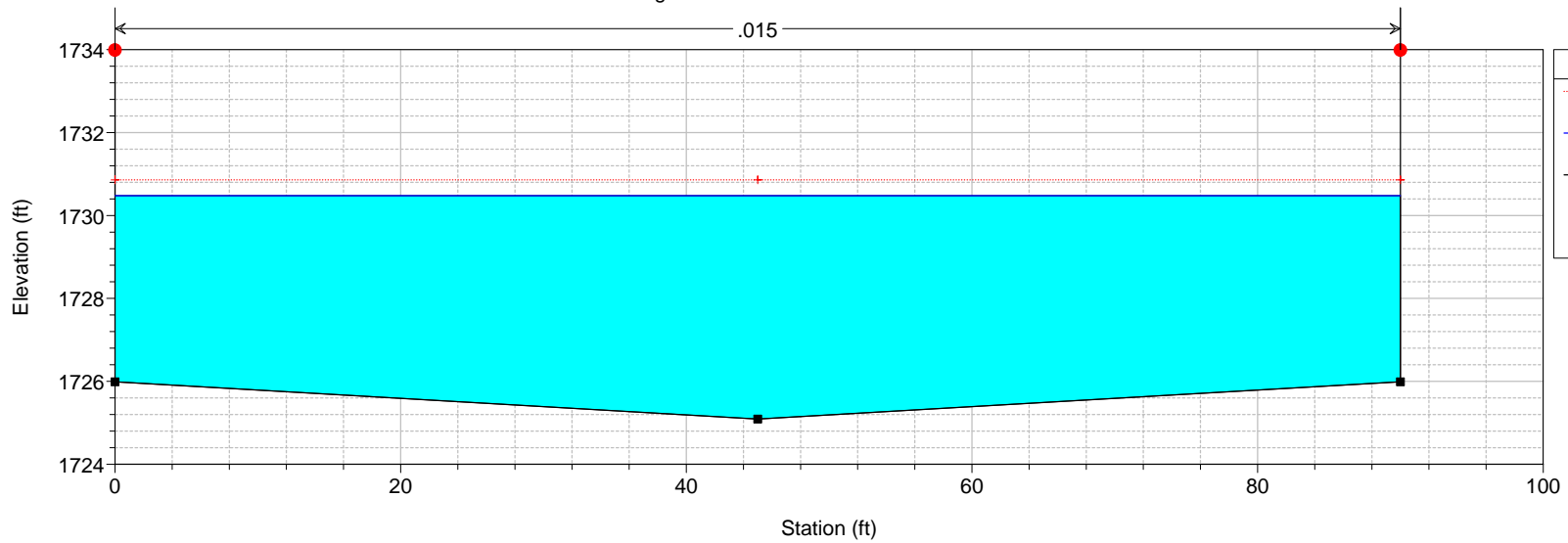
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 193 = Sta. 60+98.98



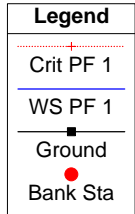
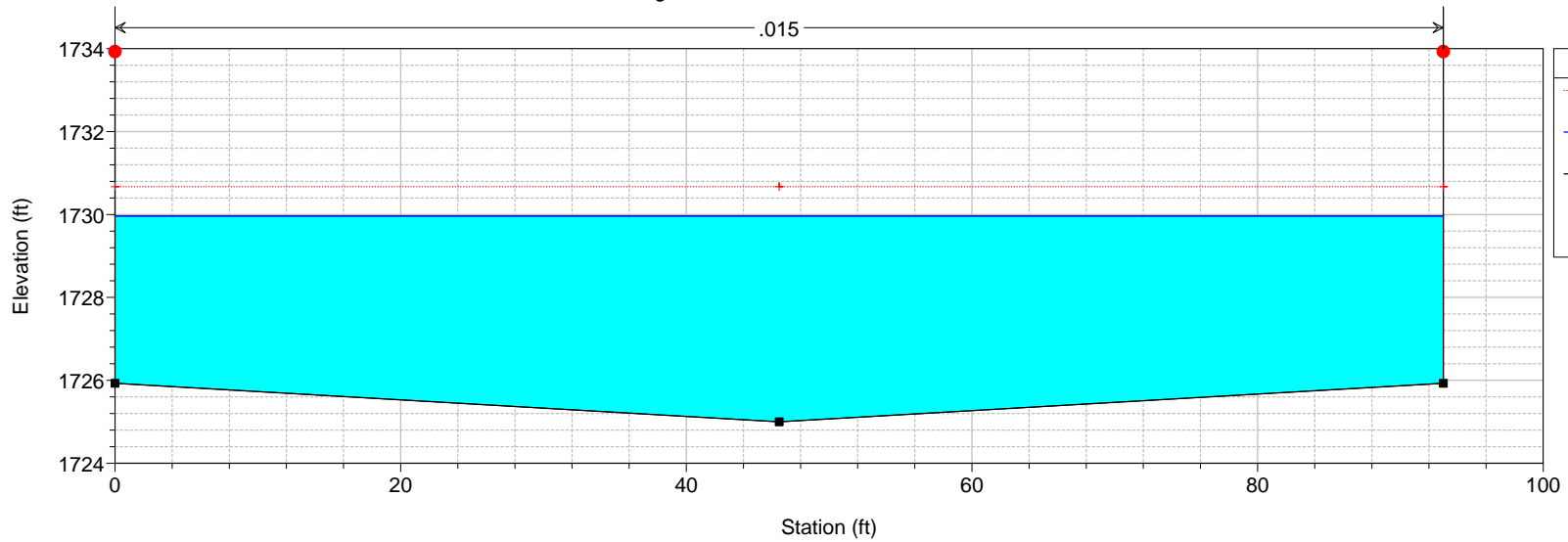
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 191 = Sta. 62+50



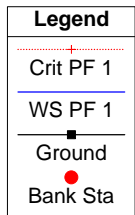
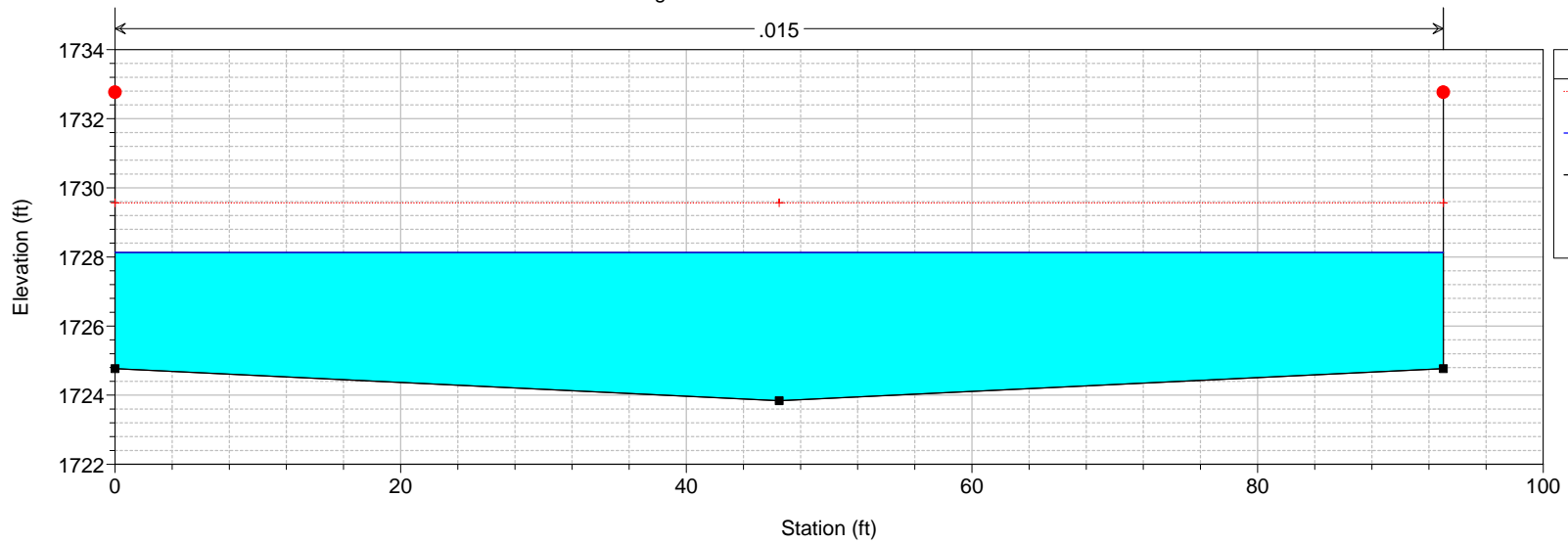
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 142 = Sta. 88+41.64



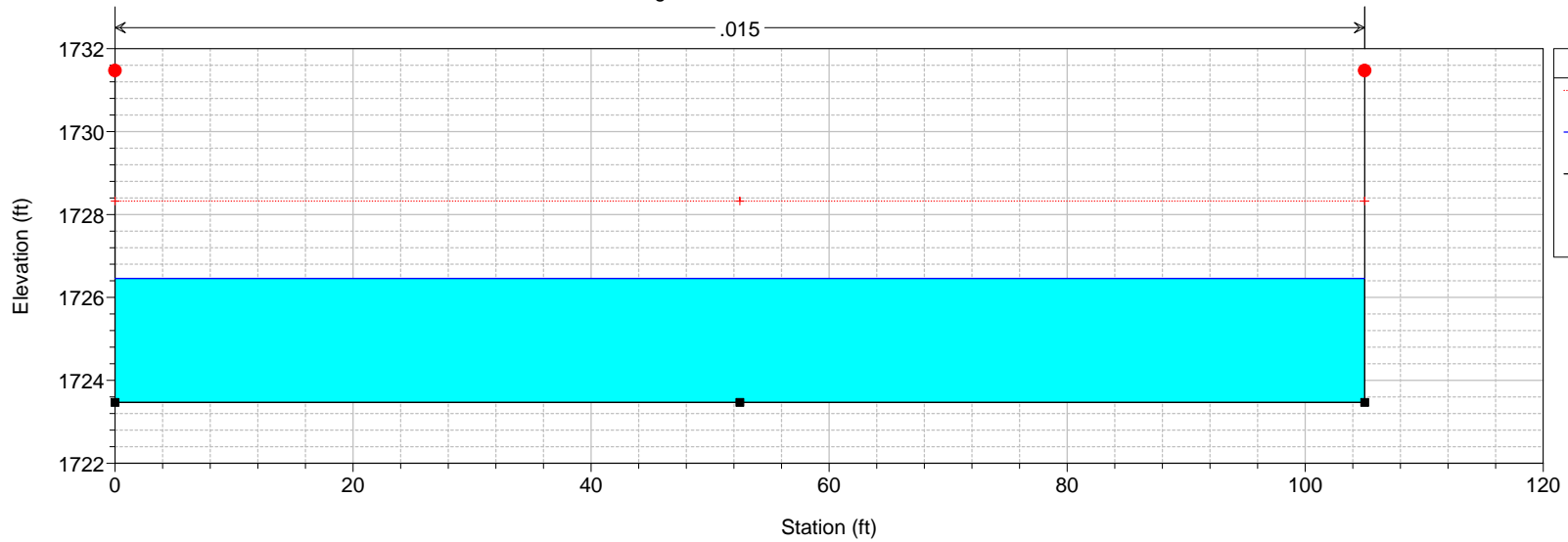
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 138 = Sta. 88+64.14



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 135 = Sta. 89+02.27

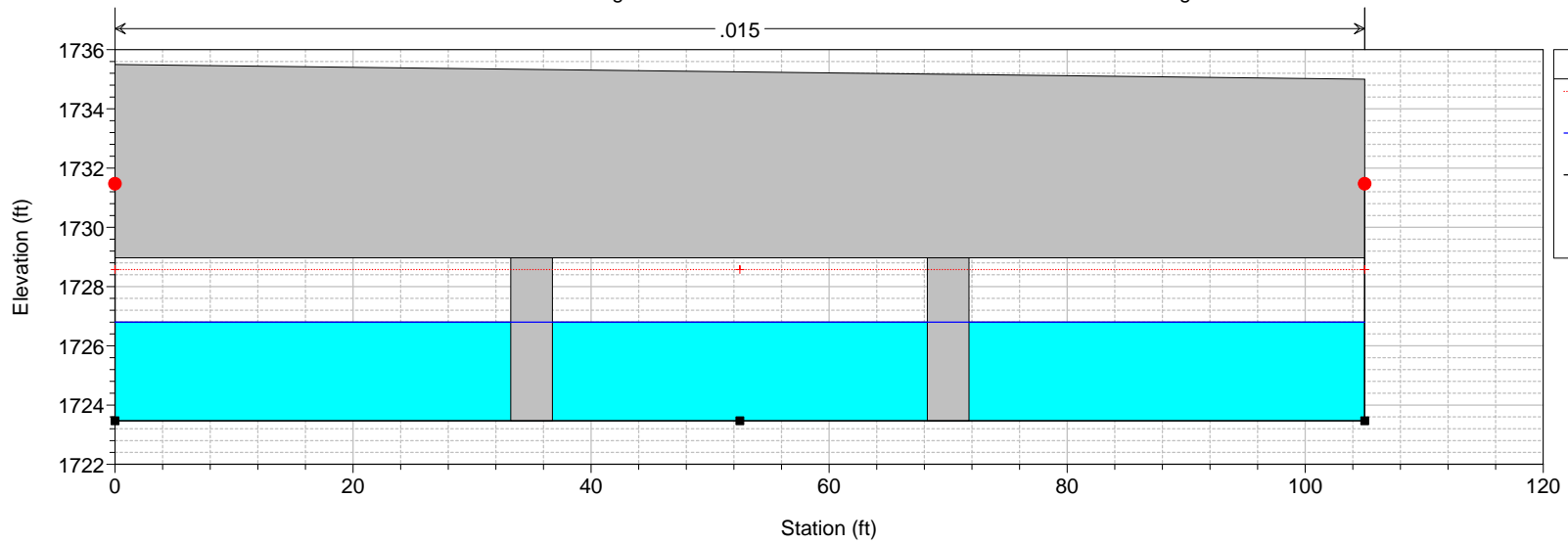


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 131 = Sta. 89+15.54

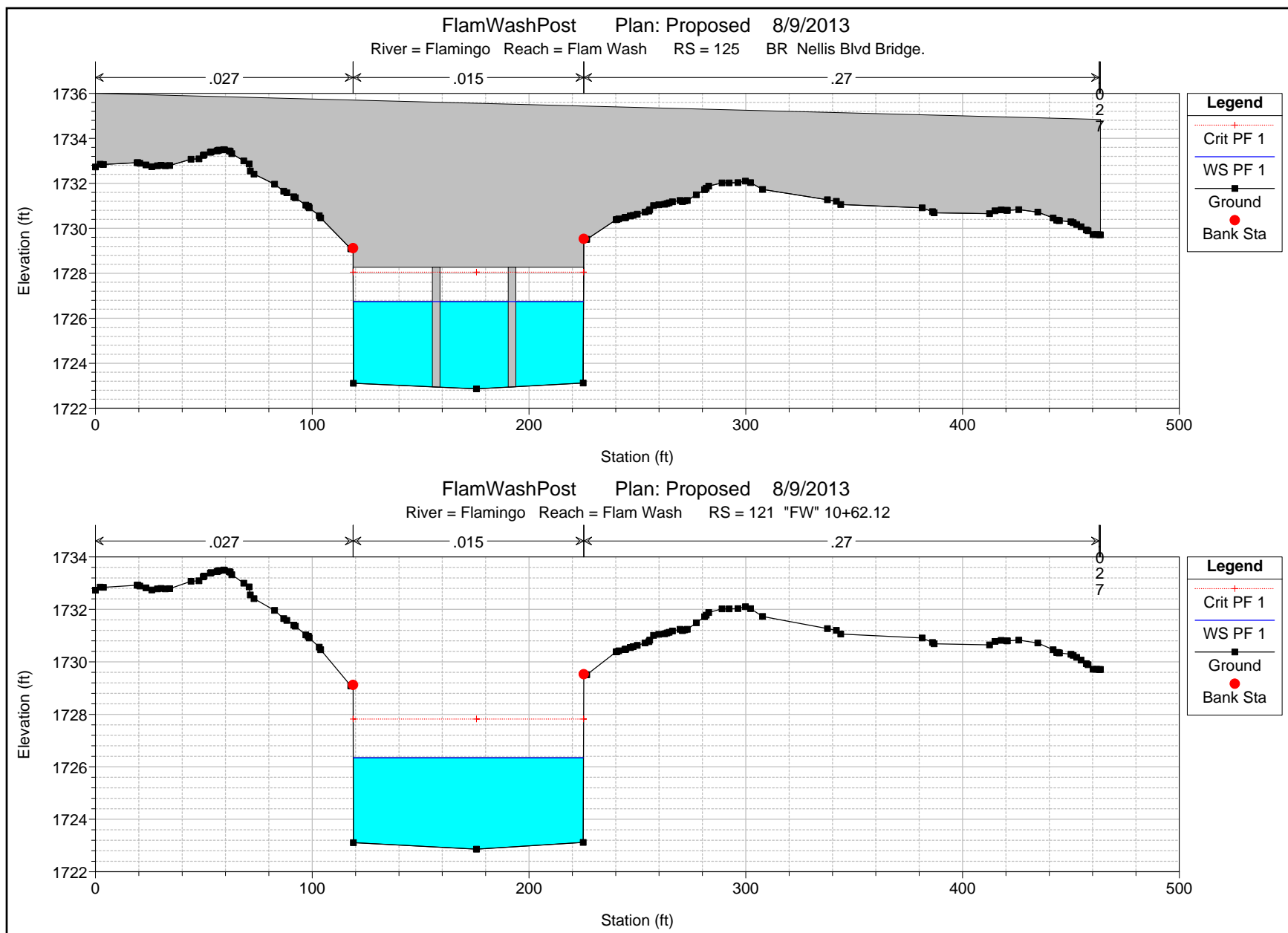


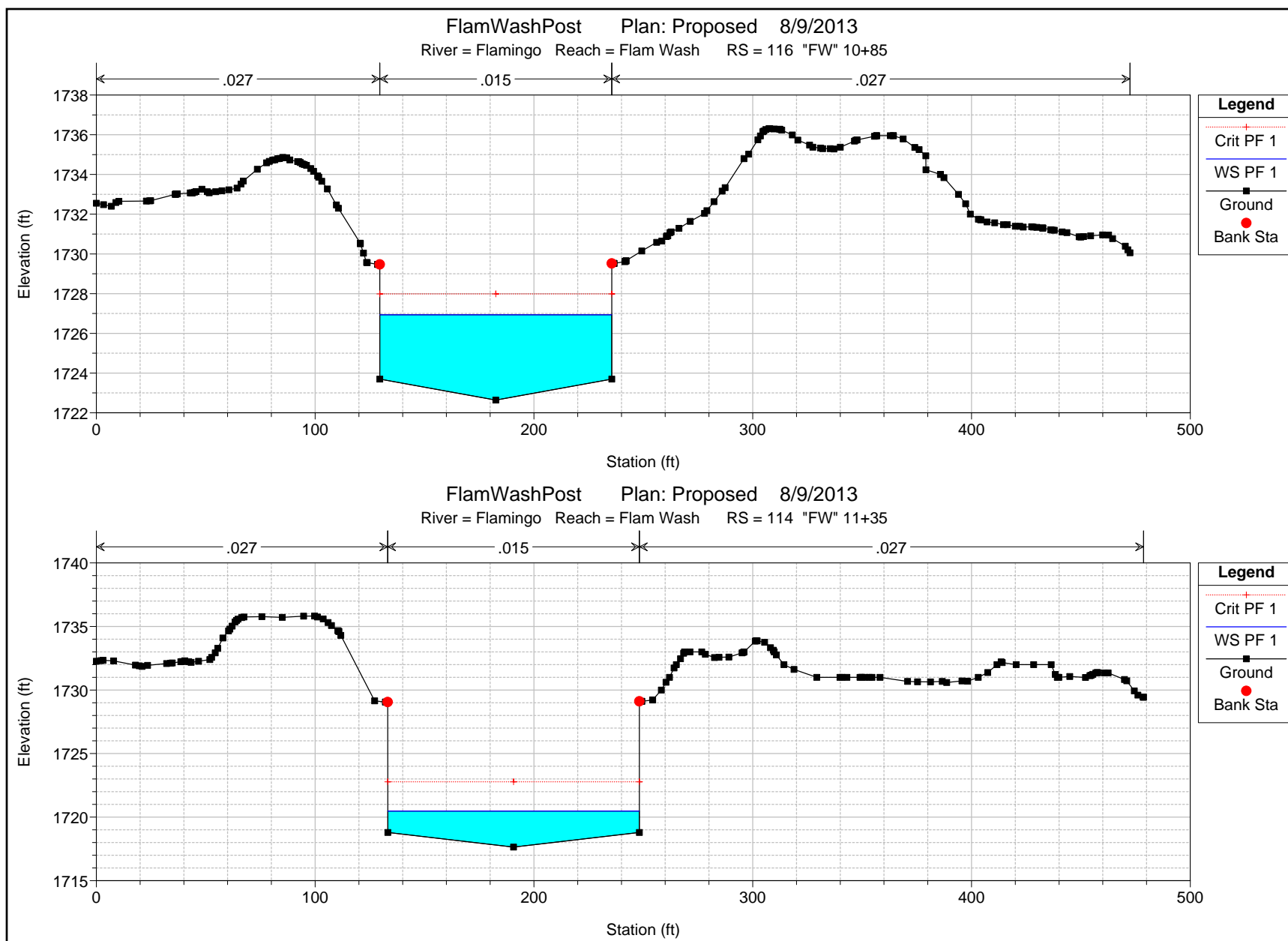
Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●

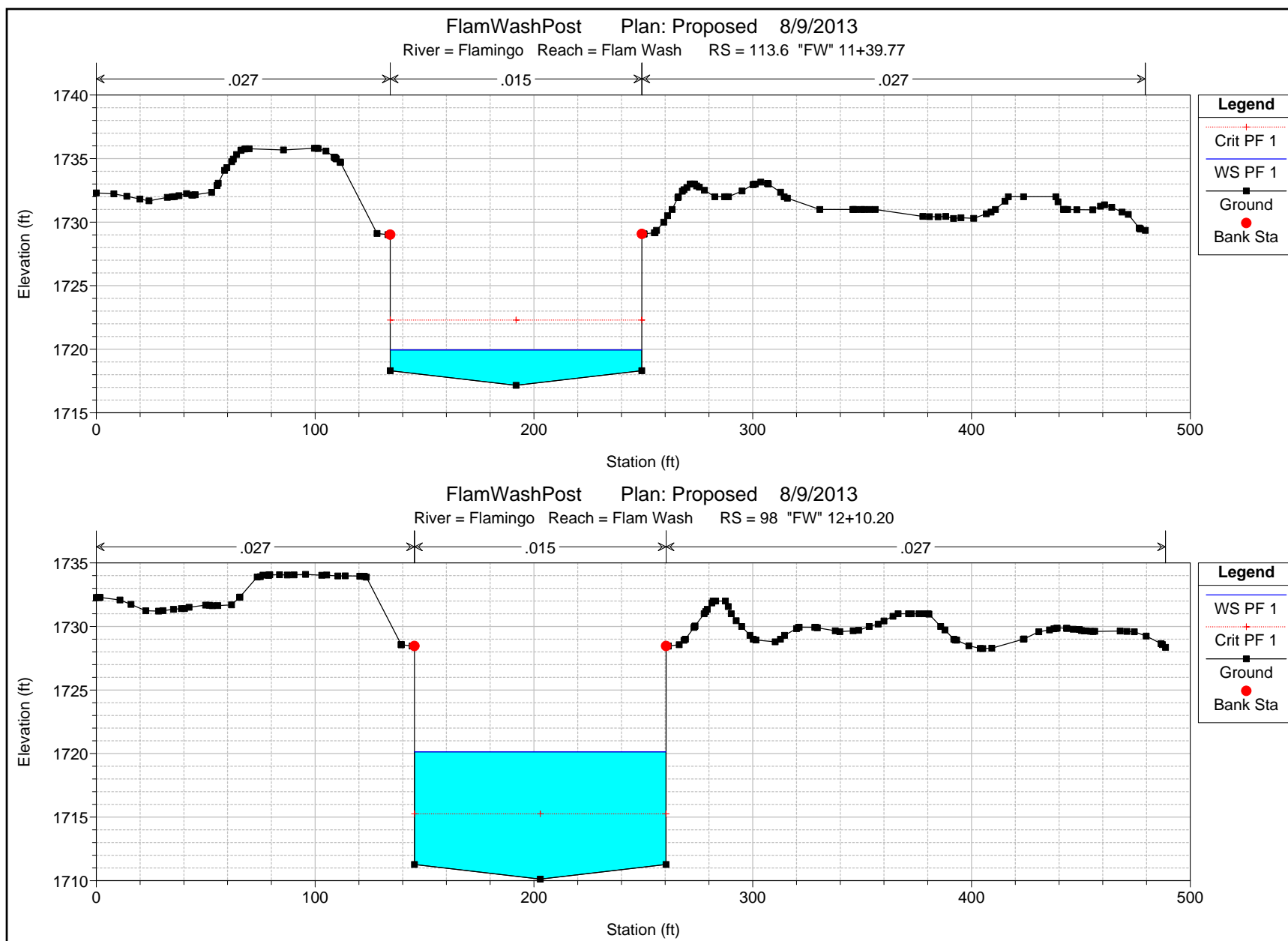
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 125 BR Nellis Blvd Bridge.

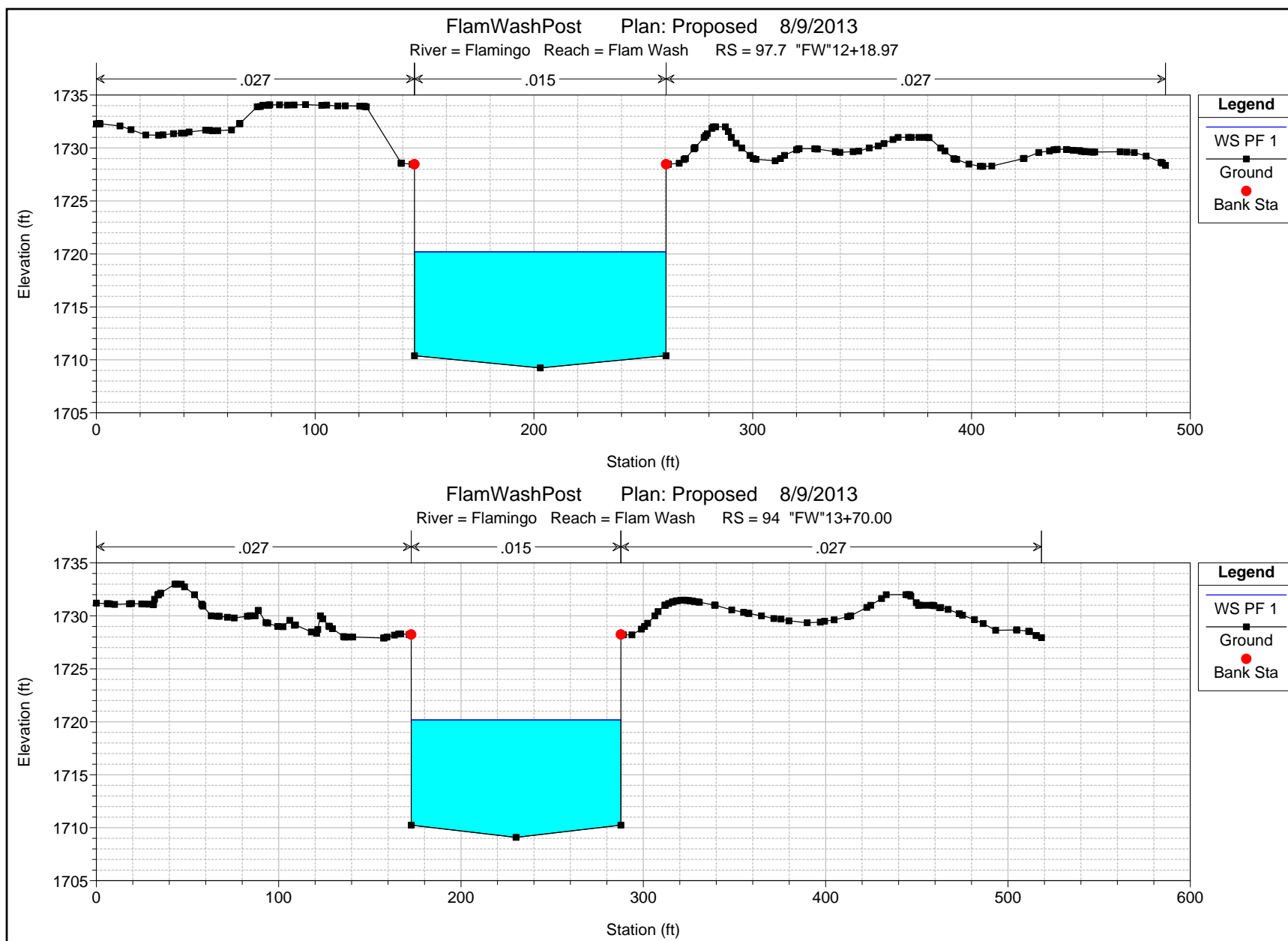


Legend	
Crit PF 1	+
WS PF 1	—
Ground	■
Bank Sta	●

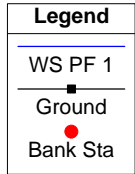
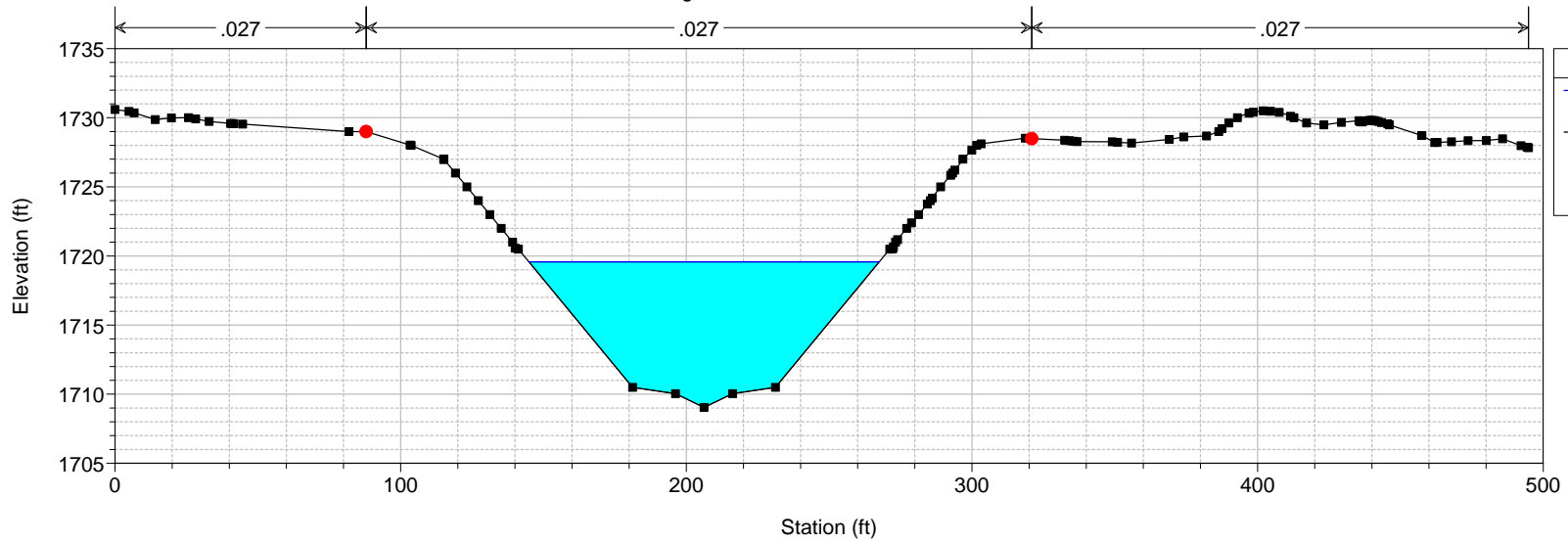




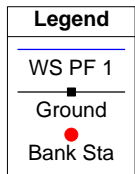
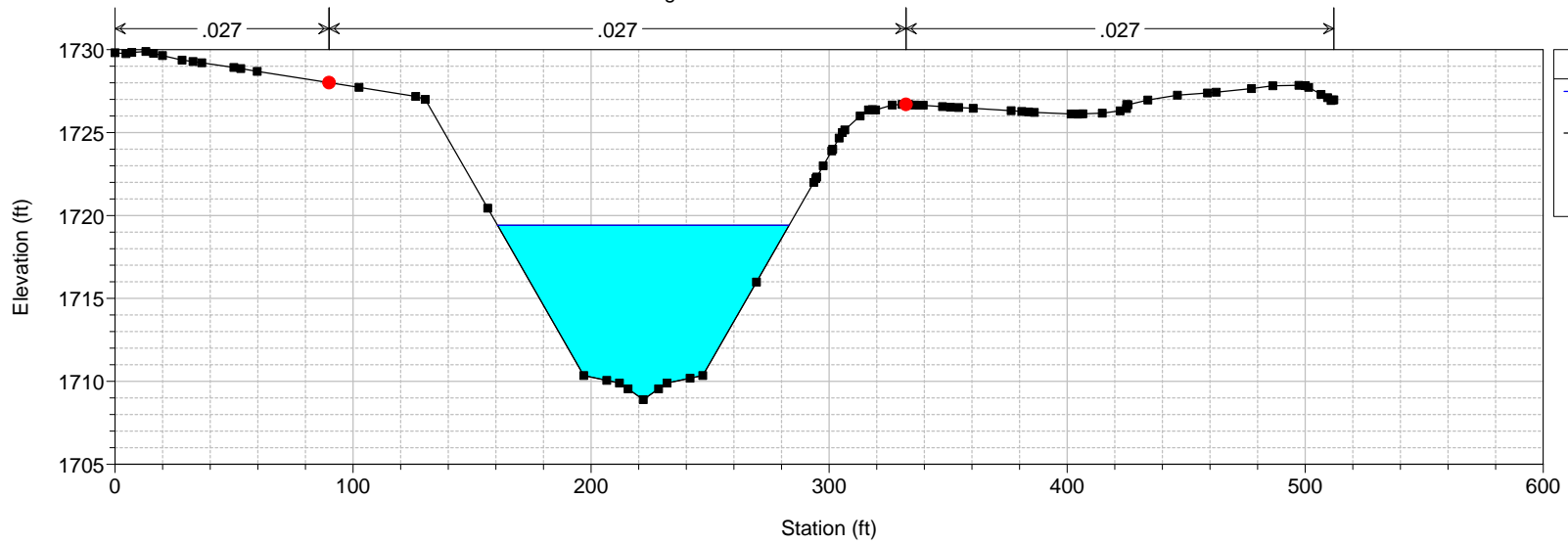




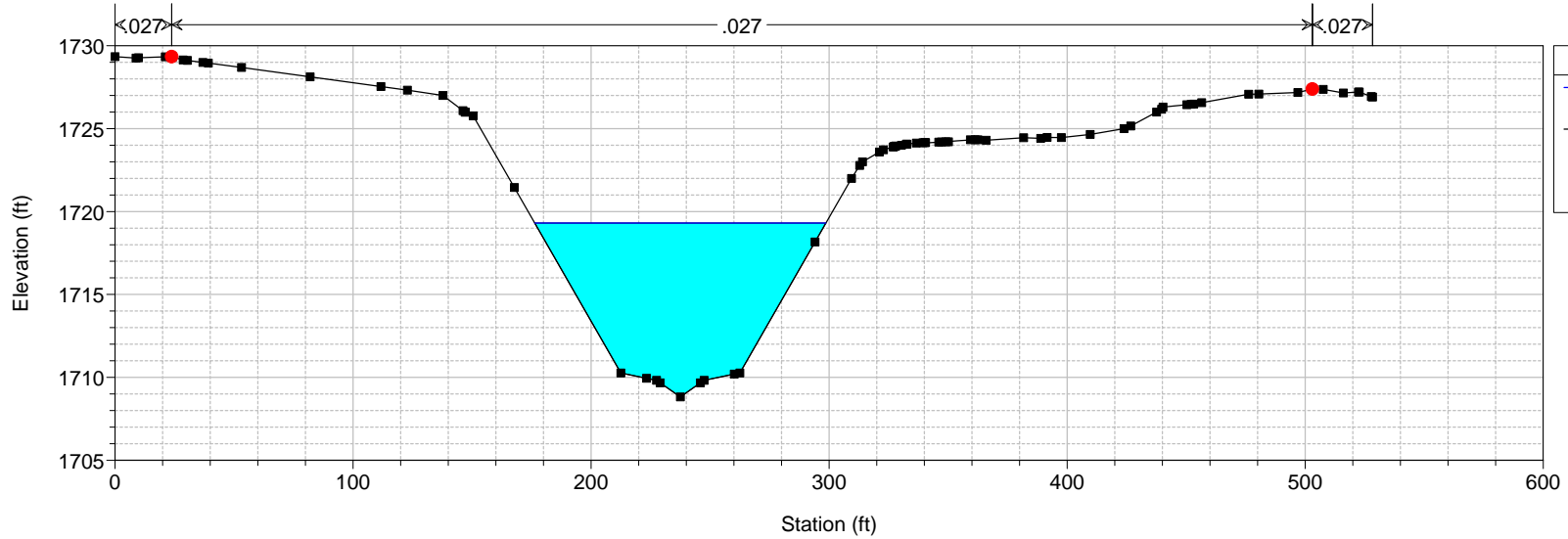
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 92 "FW"14+25



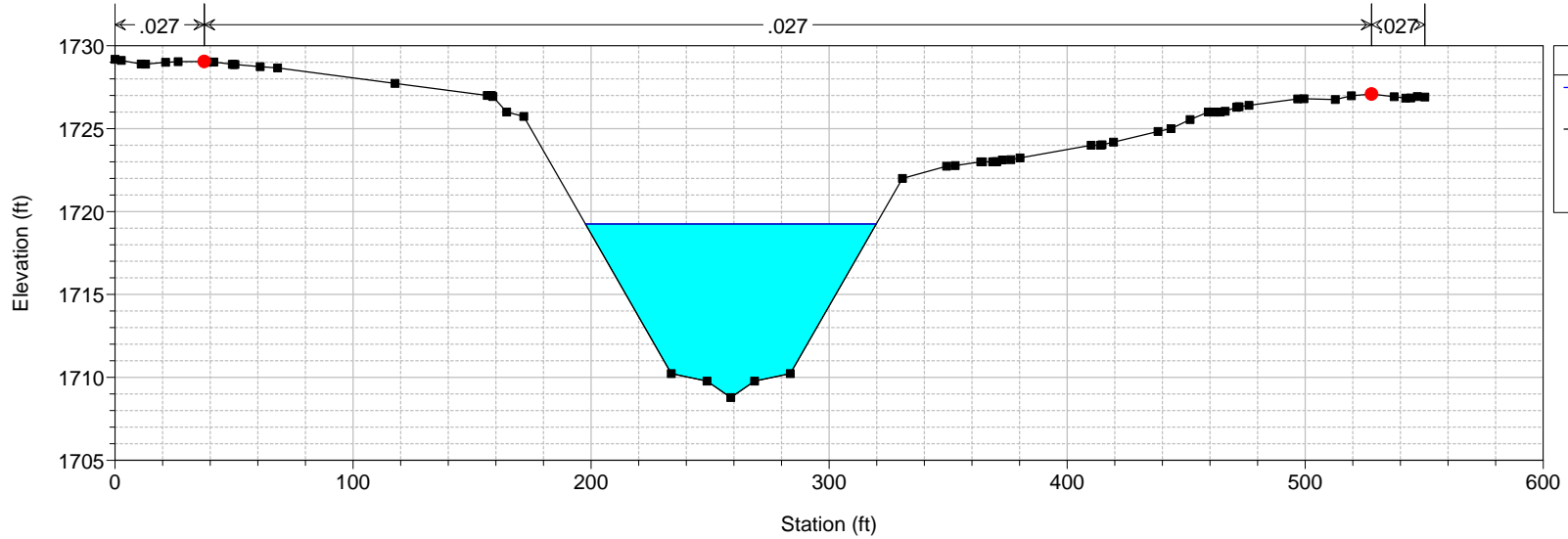
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 89 "FW" 15+16.10



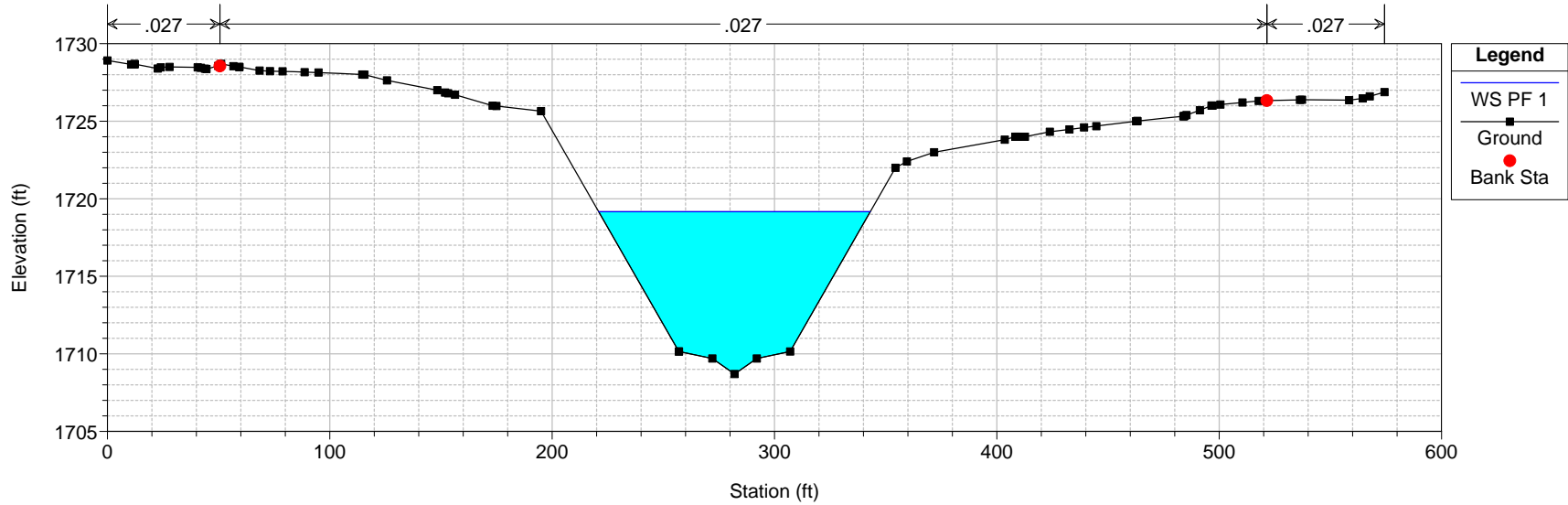
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 88 "FW" 15+71.10



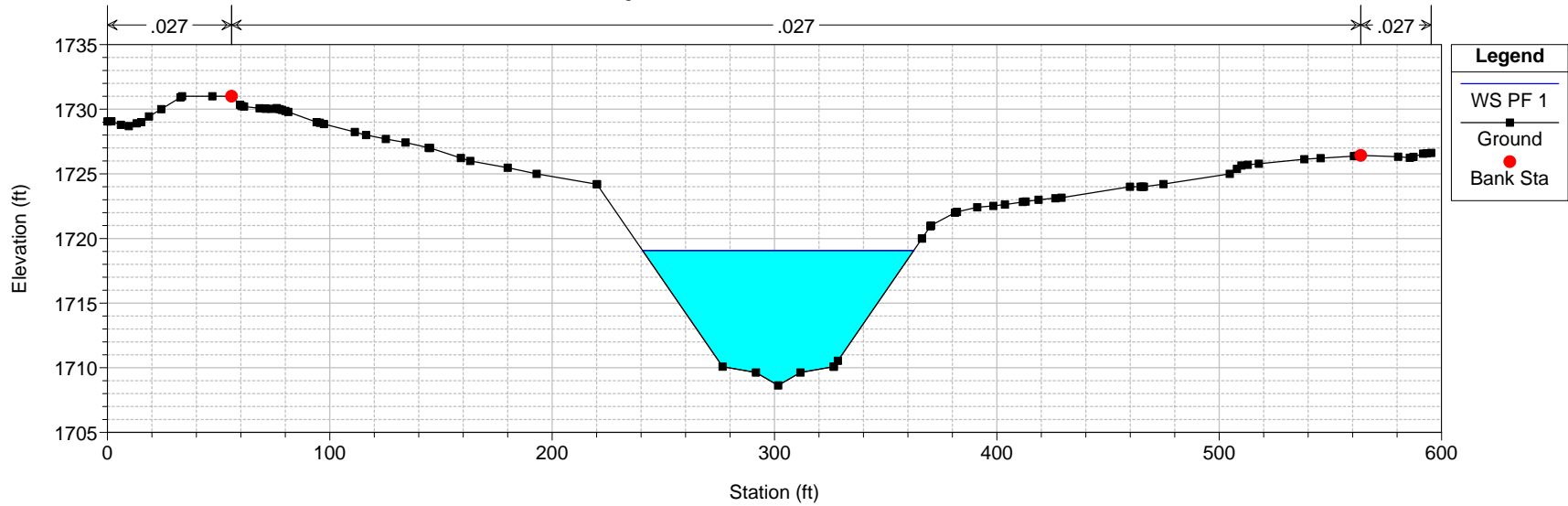
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 87.7 "FW" 16+00.00



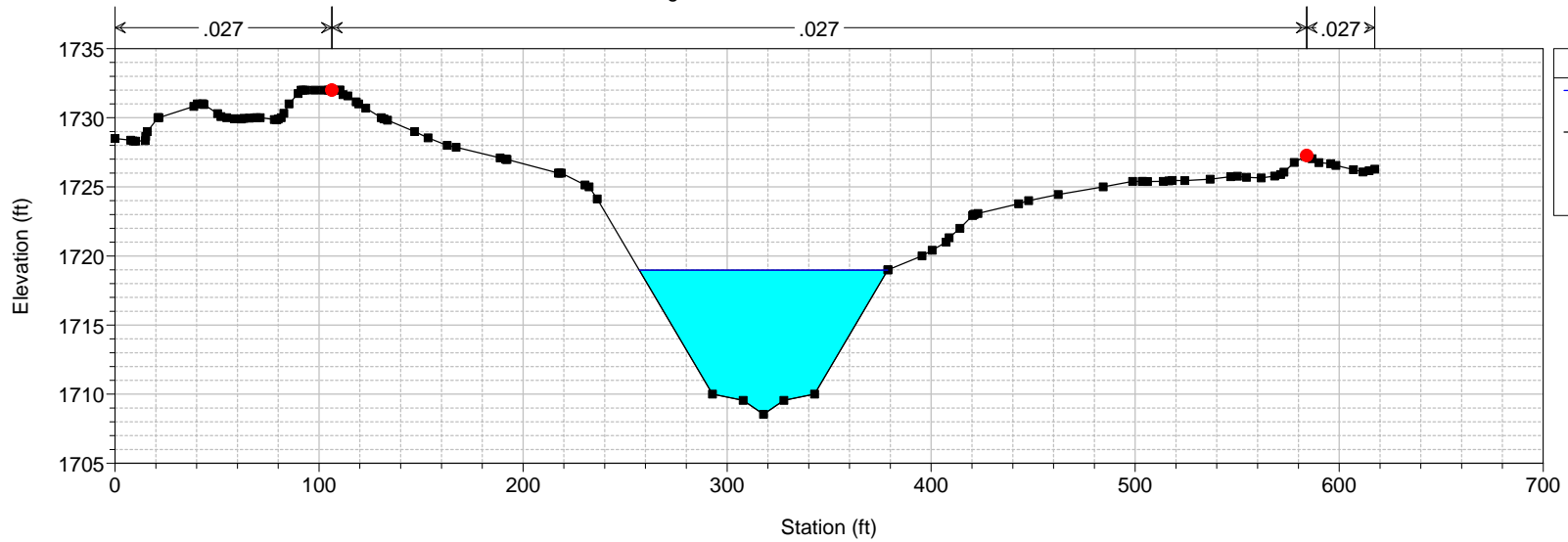
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 87 "FW" 16+50.00



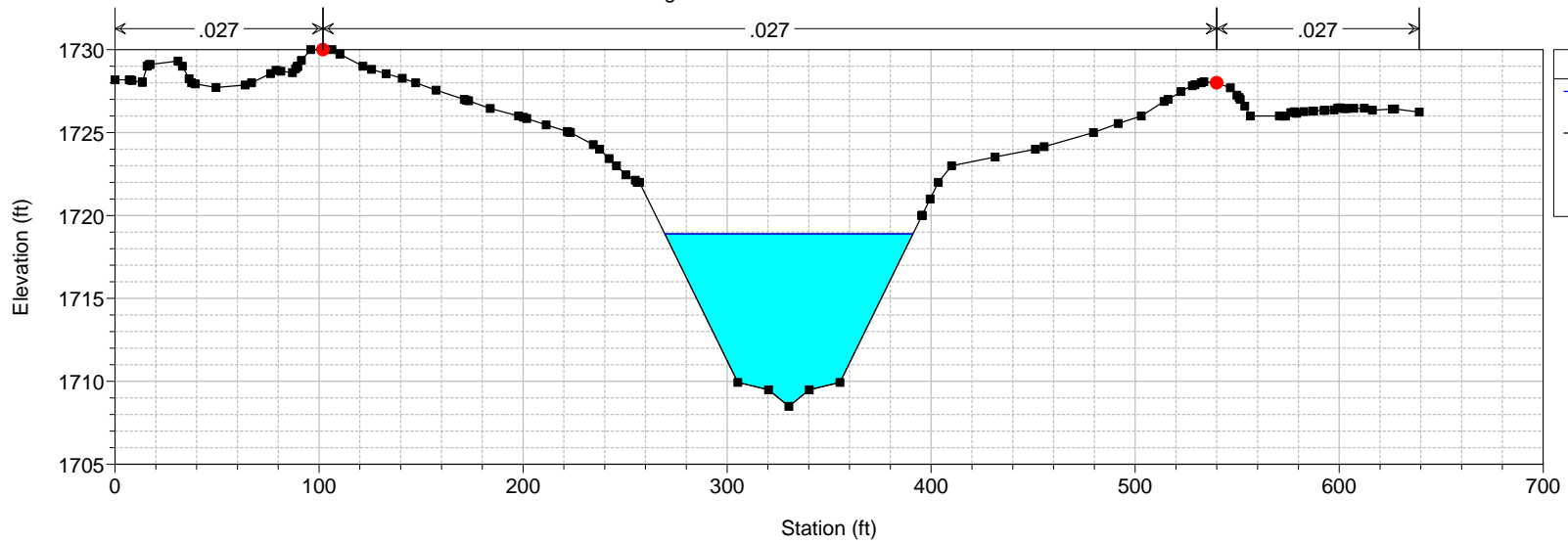
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 86 "FW" 17+00.00



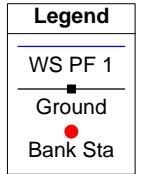
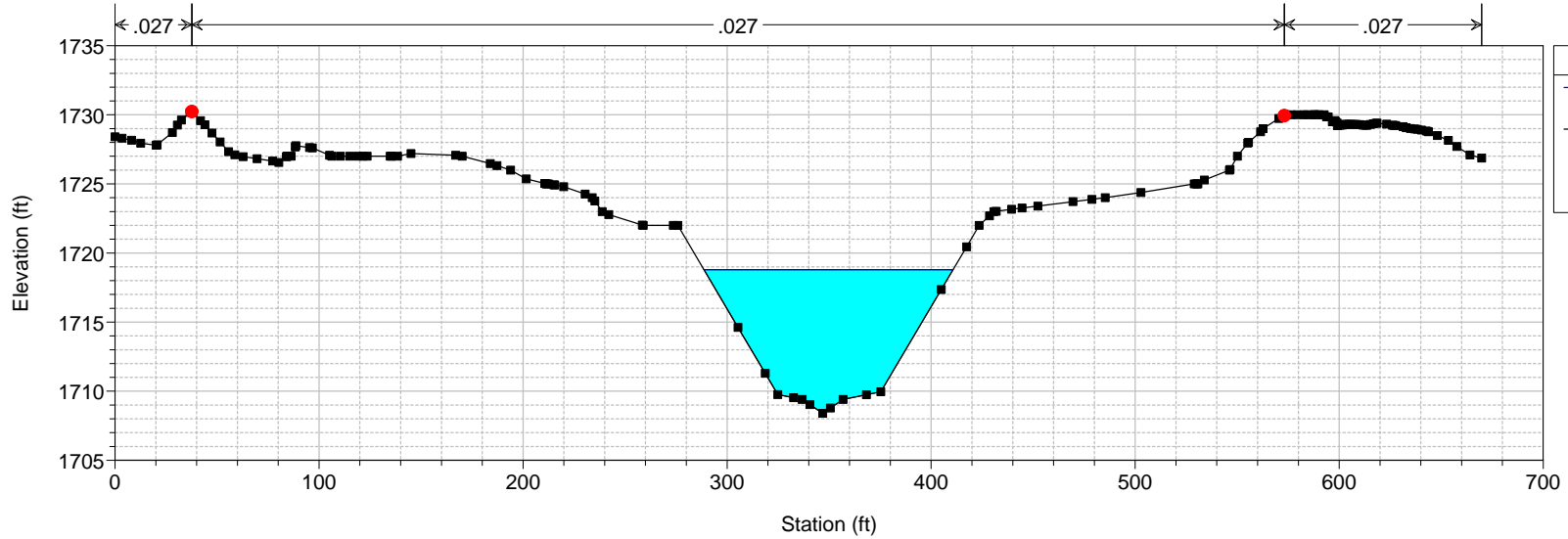
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 85 "FW"17+50.00



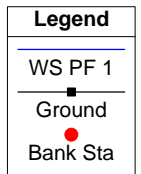
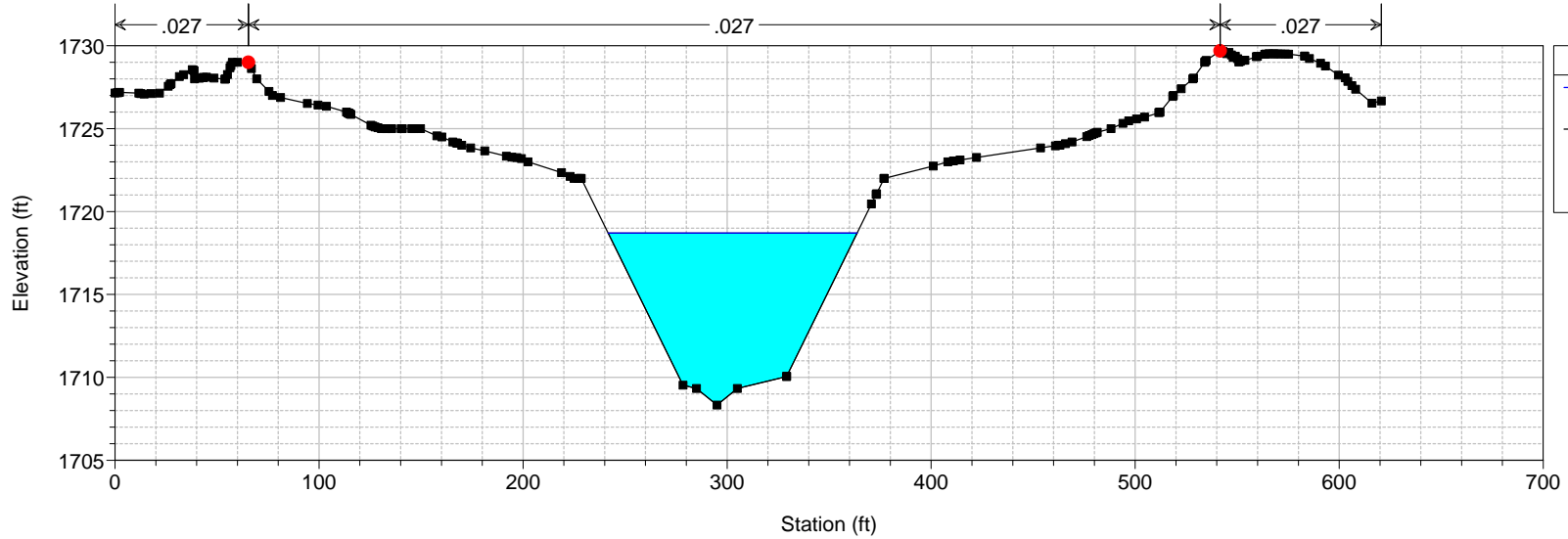
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 84 "FW" 17+93.42



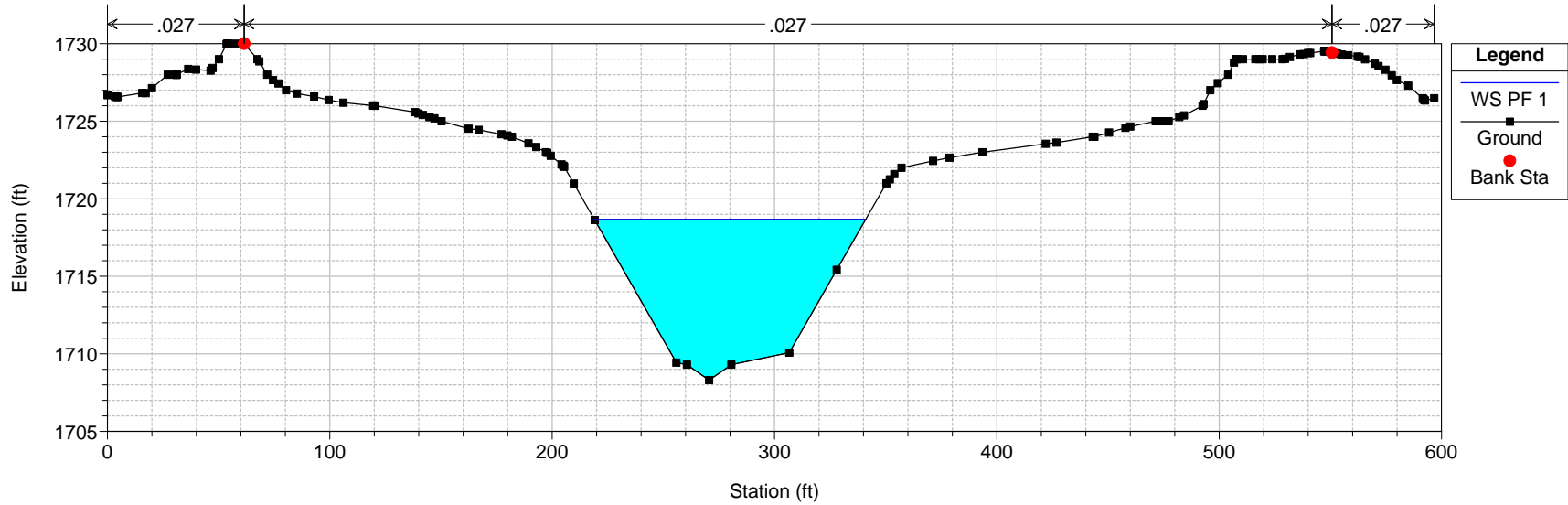
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 83 "FW" 18+51.22



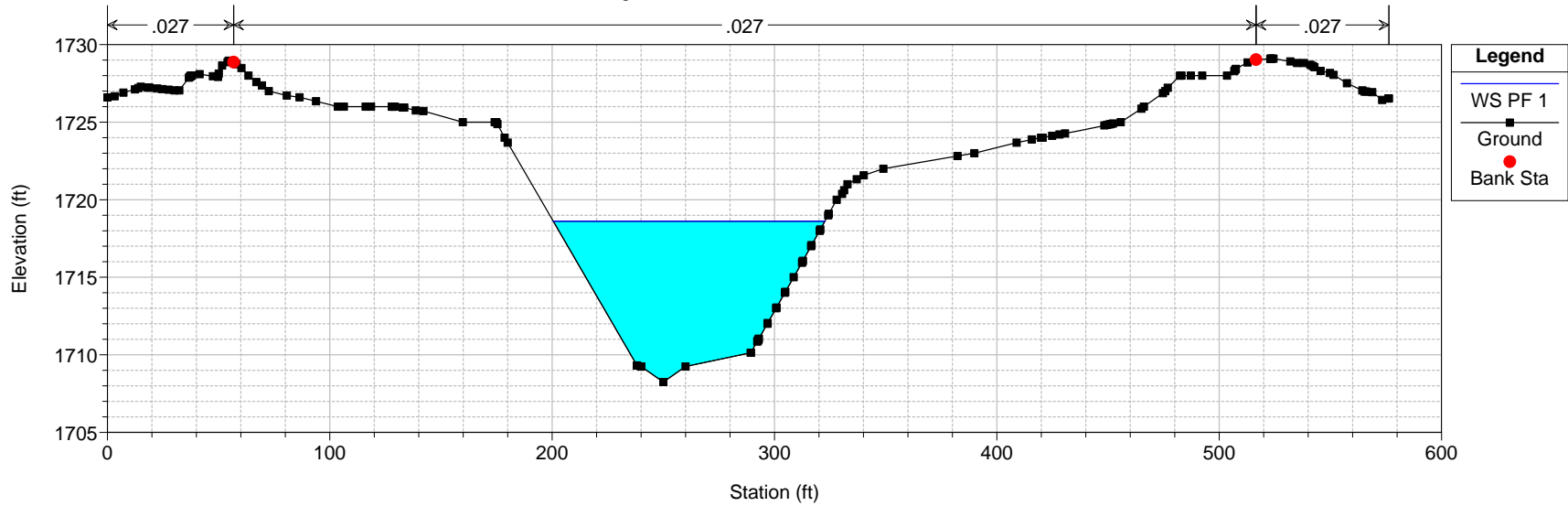
FlamWashPost Plan: Proposed 8/9/2013
River = Flamingo Reach = Flam Wash RS = 82.5 "FW" 19+00.00



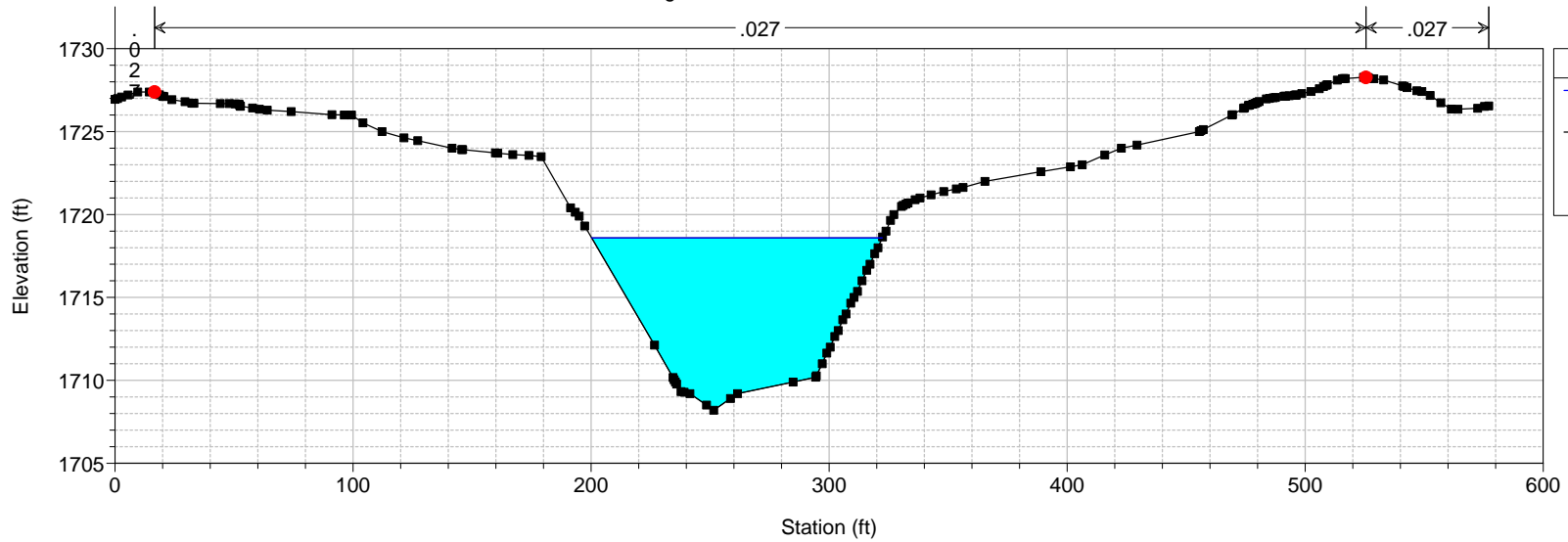
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 82 "FW" 19+16.86



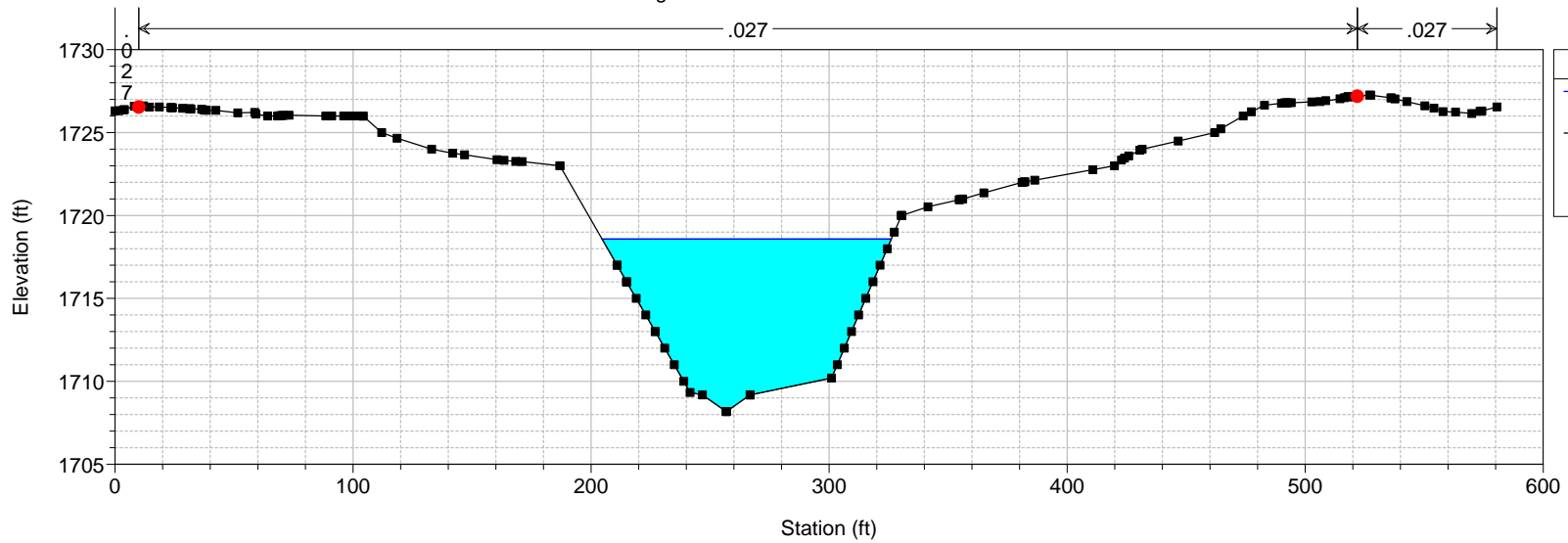
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 81 "FW" 19+50.00



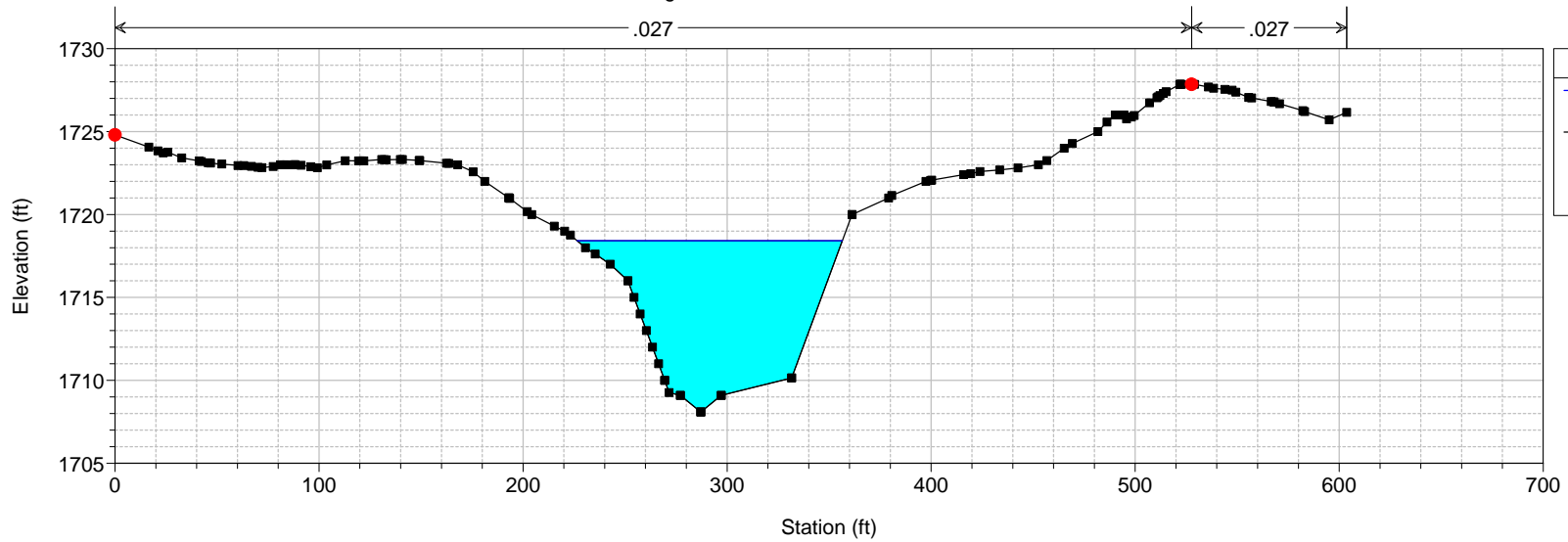
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 79 "FW" 19+82.49



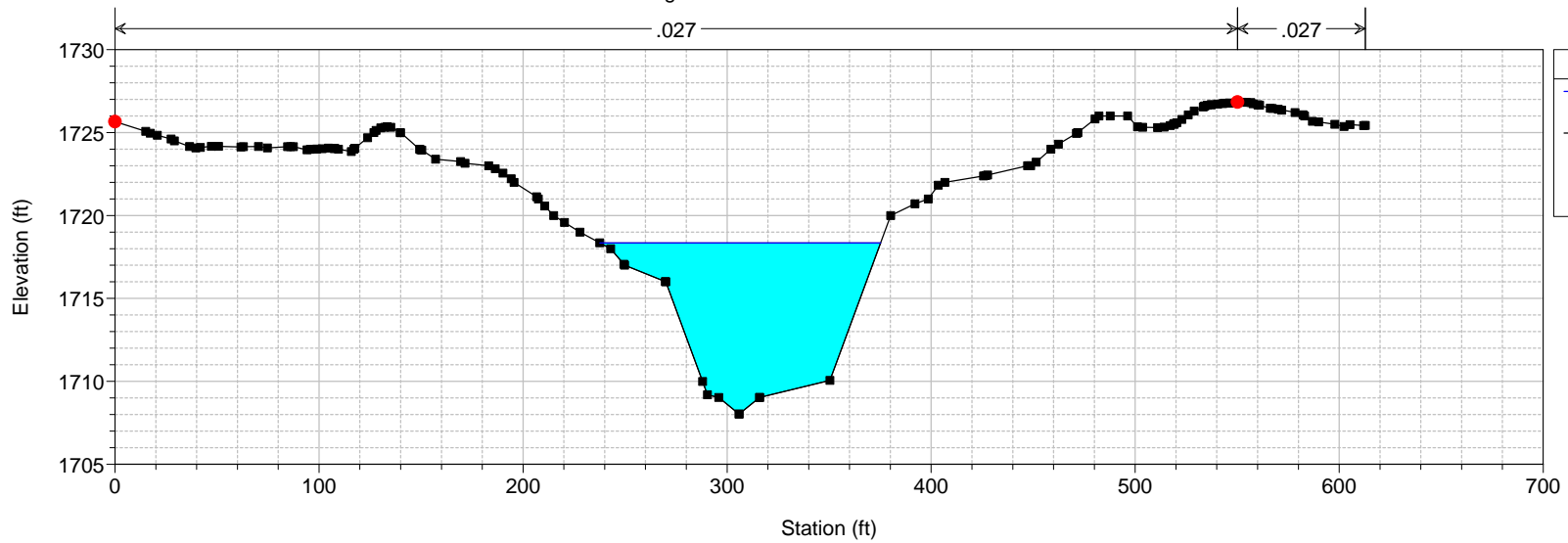
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 78.9 "FW" 20+00.00



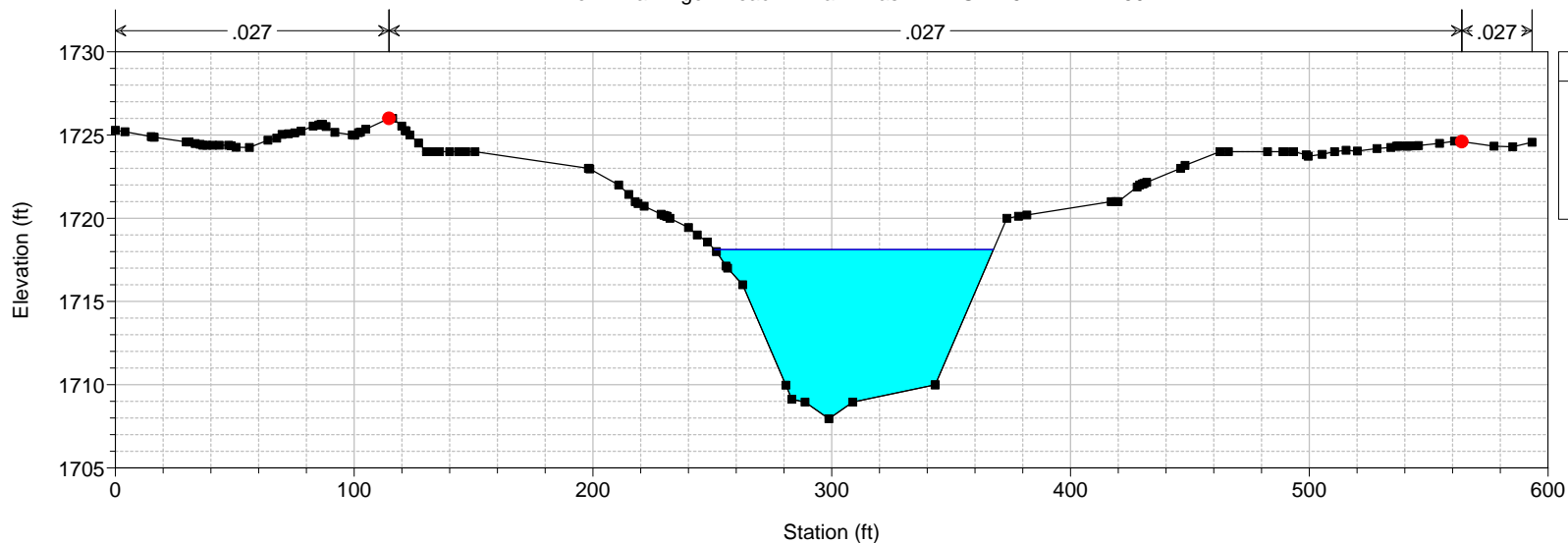
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 78 "FW" 20+50.00



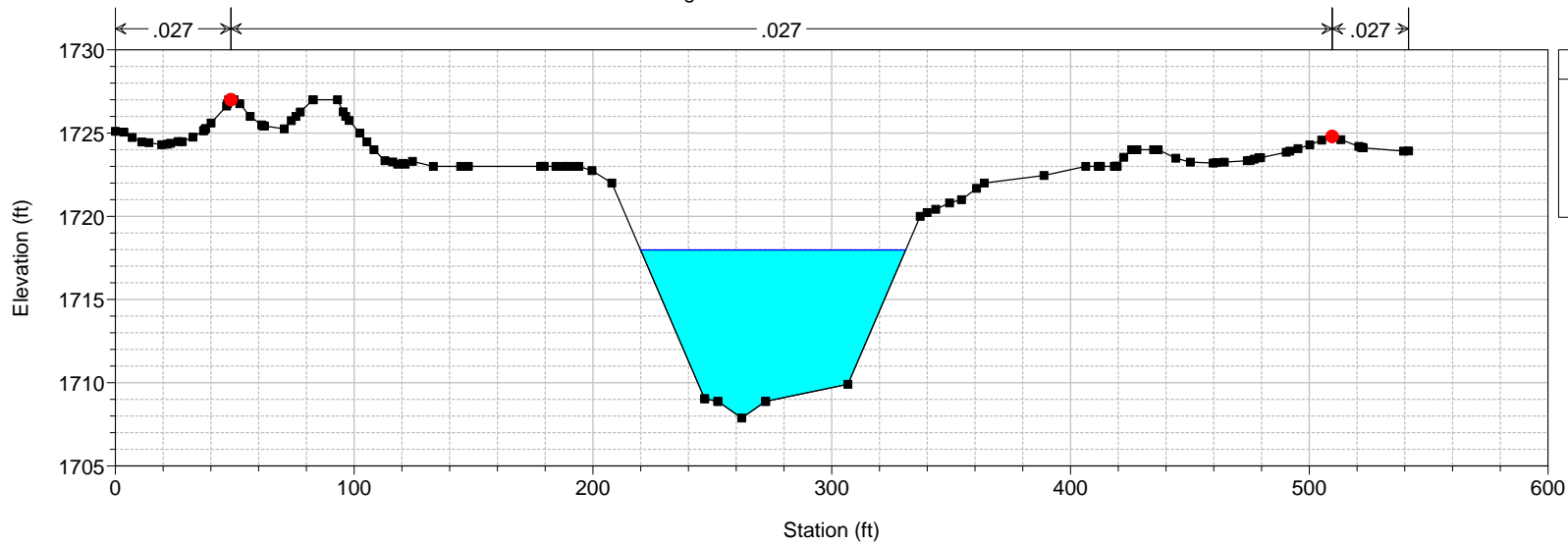
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 77 "FW" 21+00.00



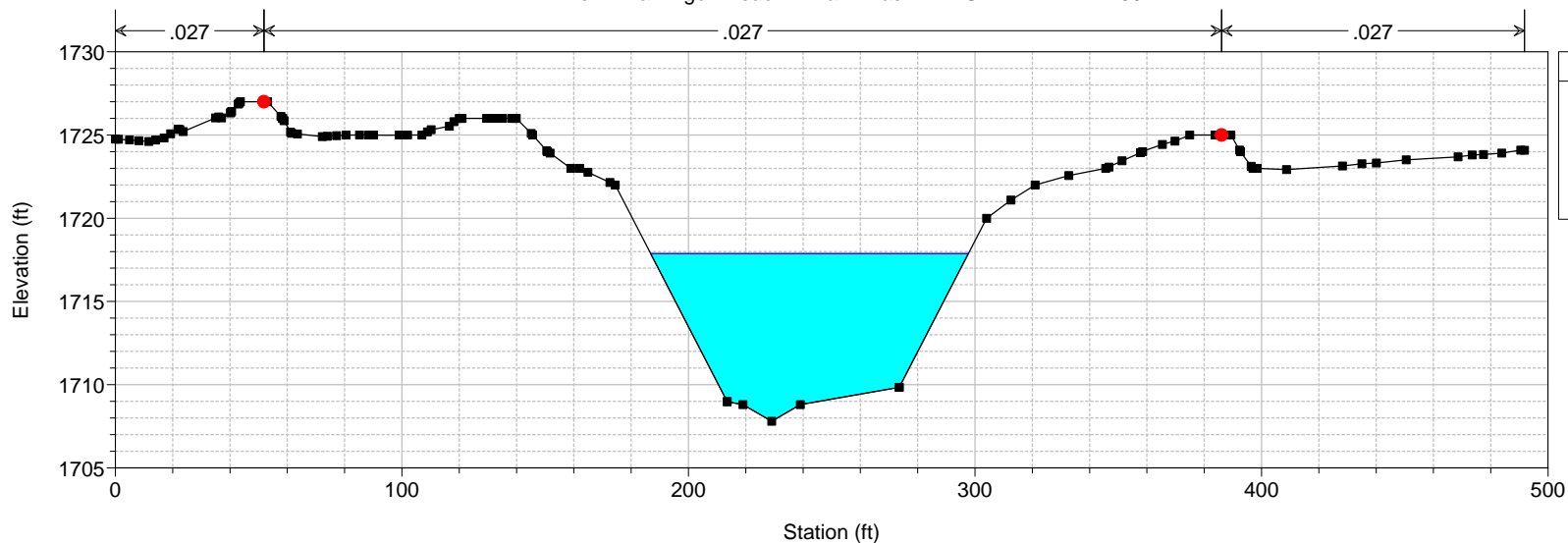
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 76 "FW" 21+50



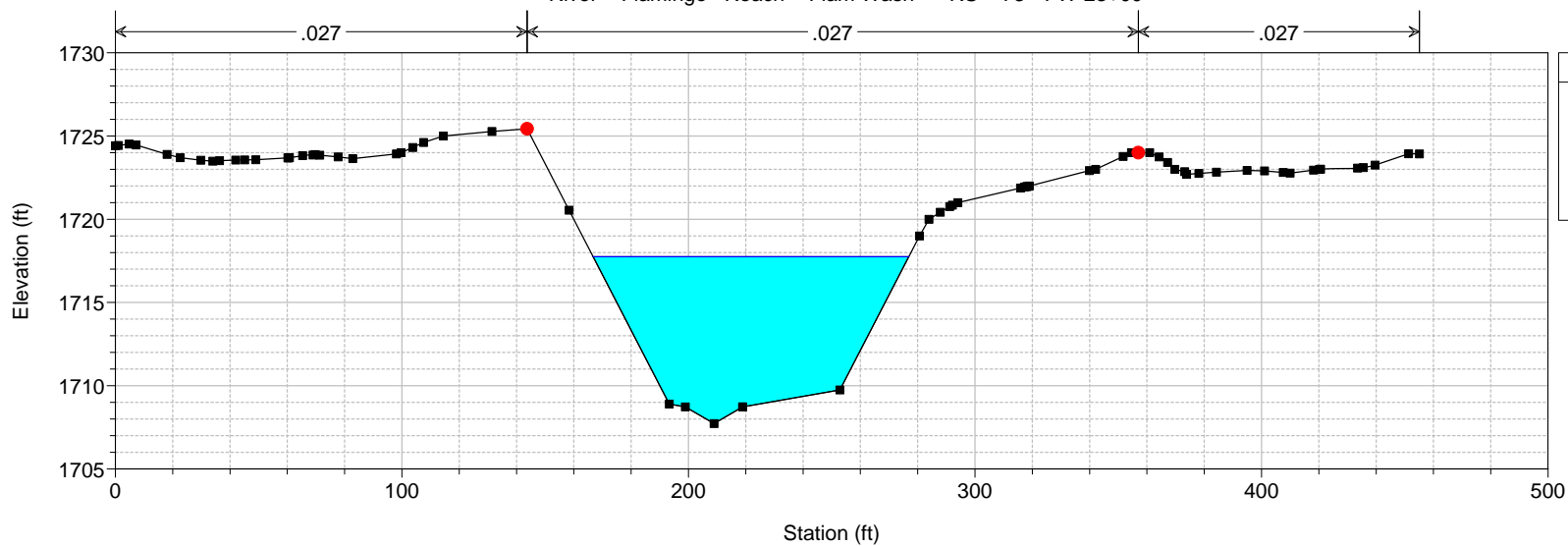
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 75 "FW" 22+00

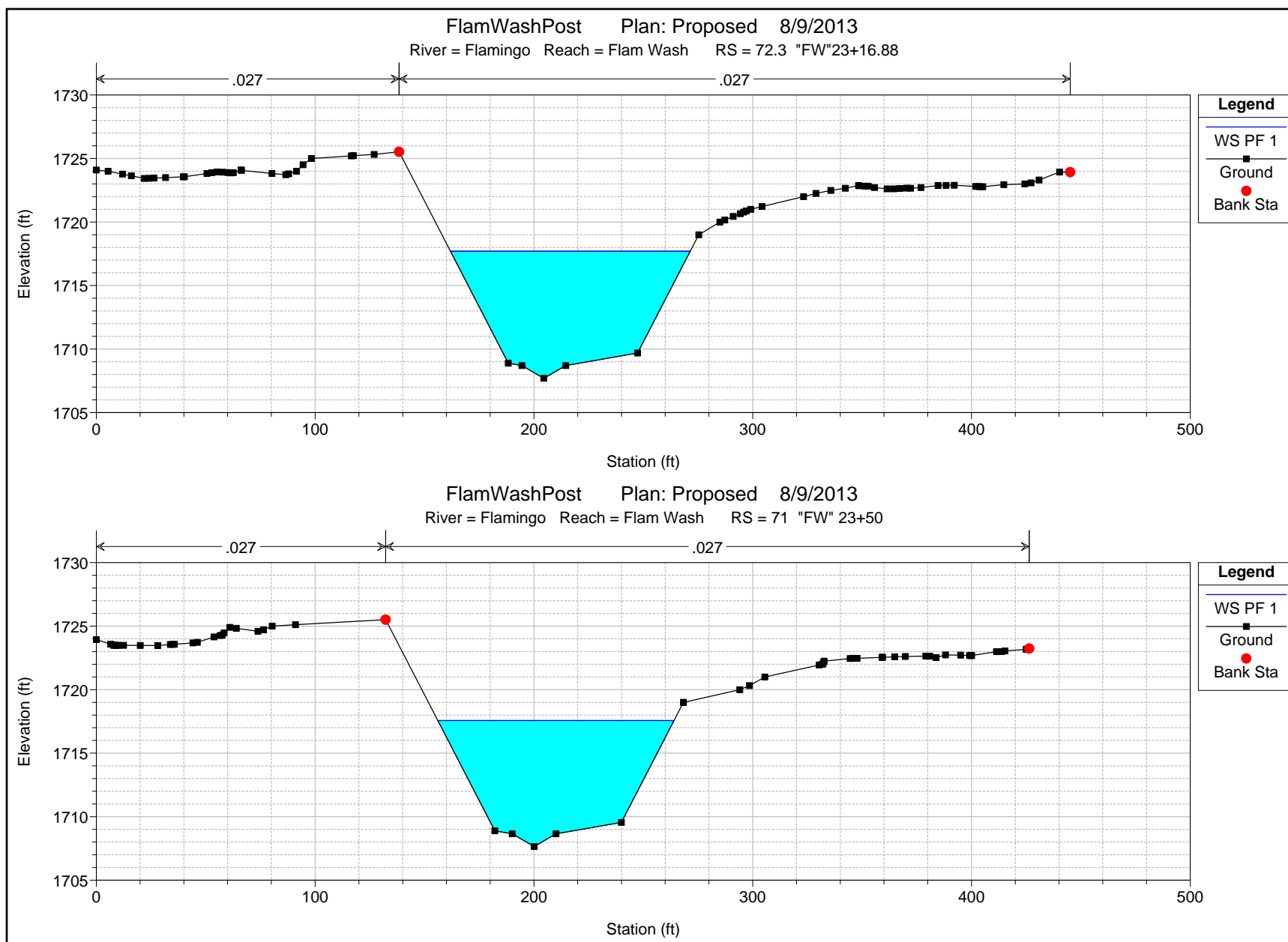


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 74 "FW"22+50

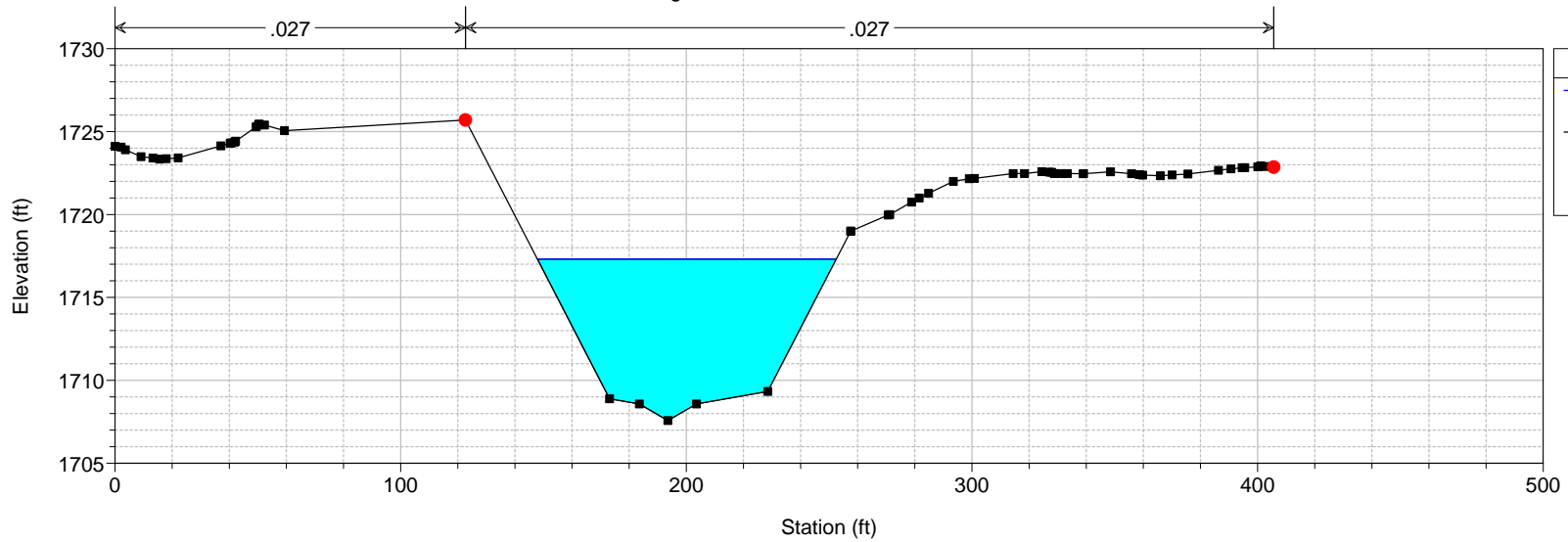


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 73 "FW"23+00

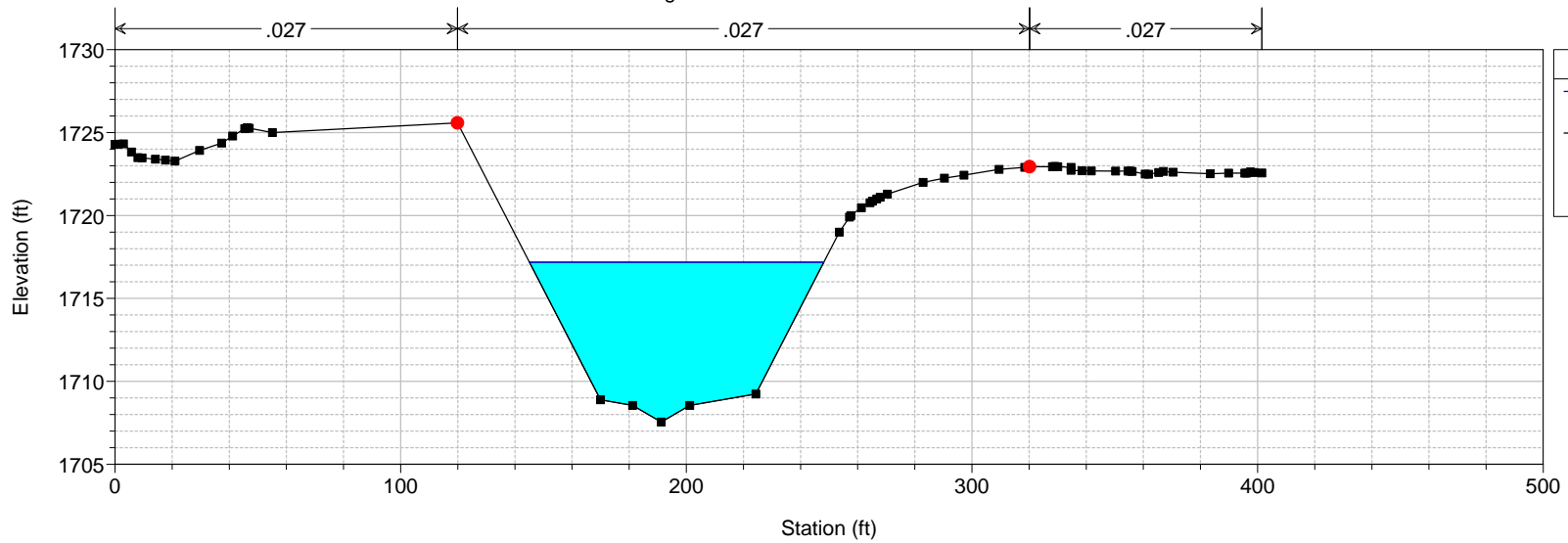


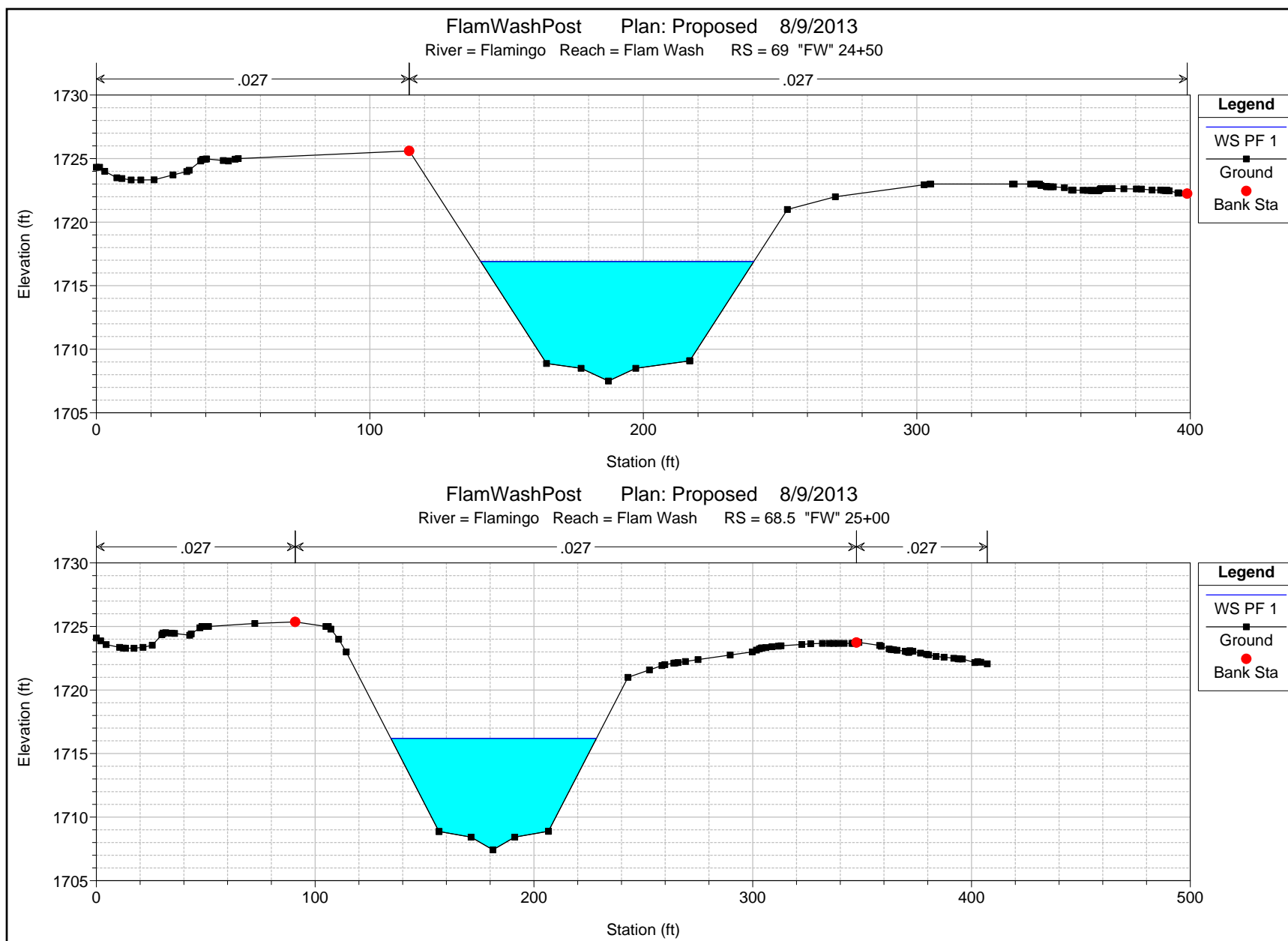


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70.5 "FW" 24+00

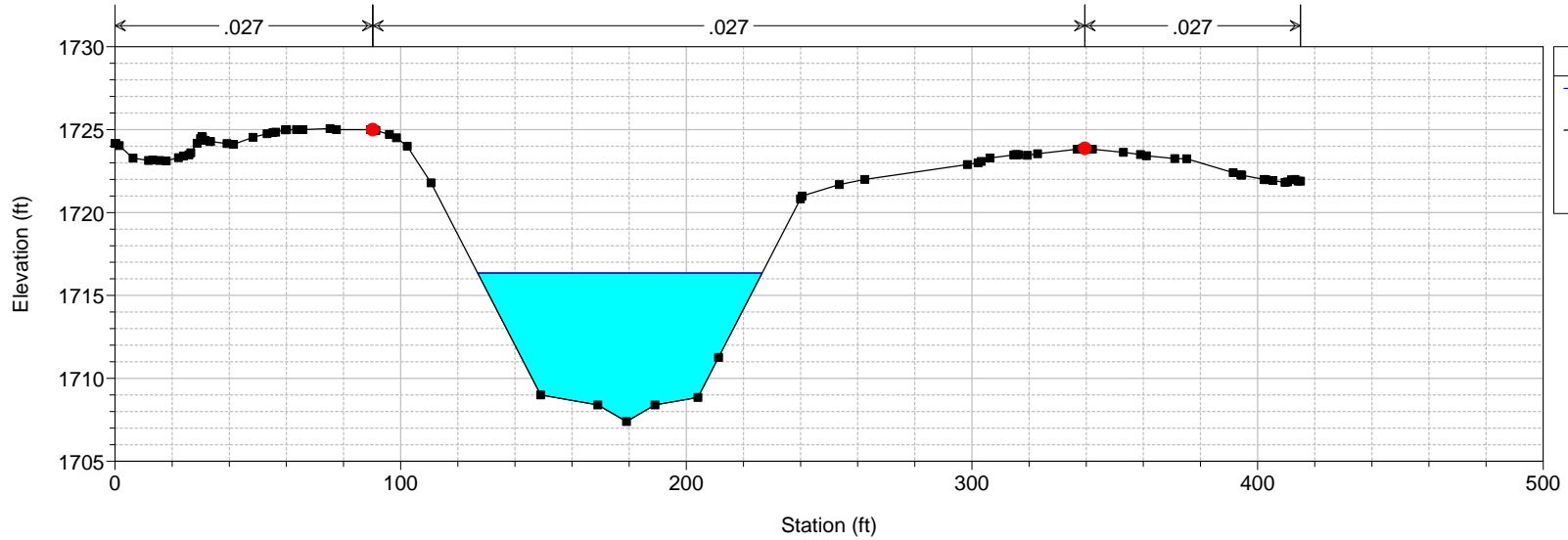


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 70 "FW" 24+18.14

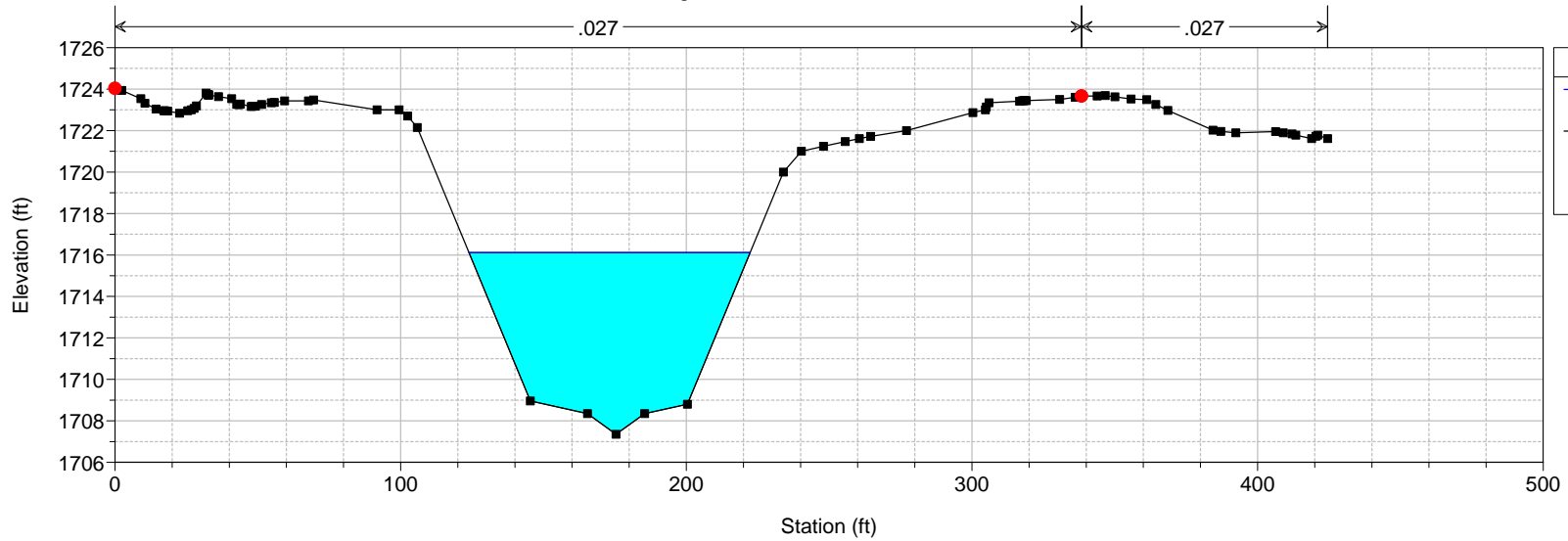




FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 68 "FW" 25+19.40

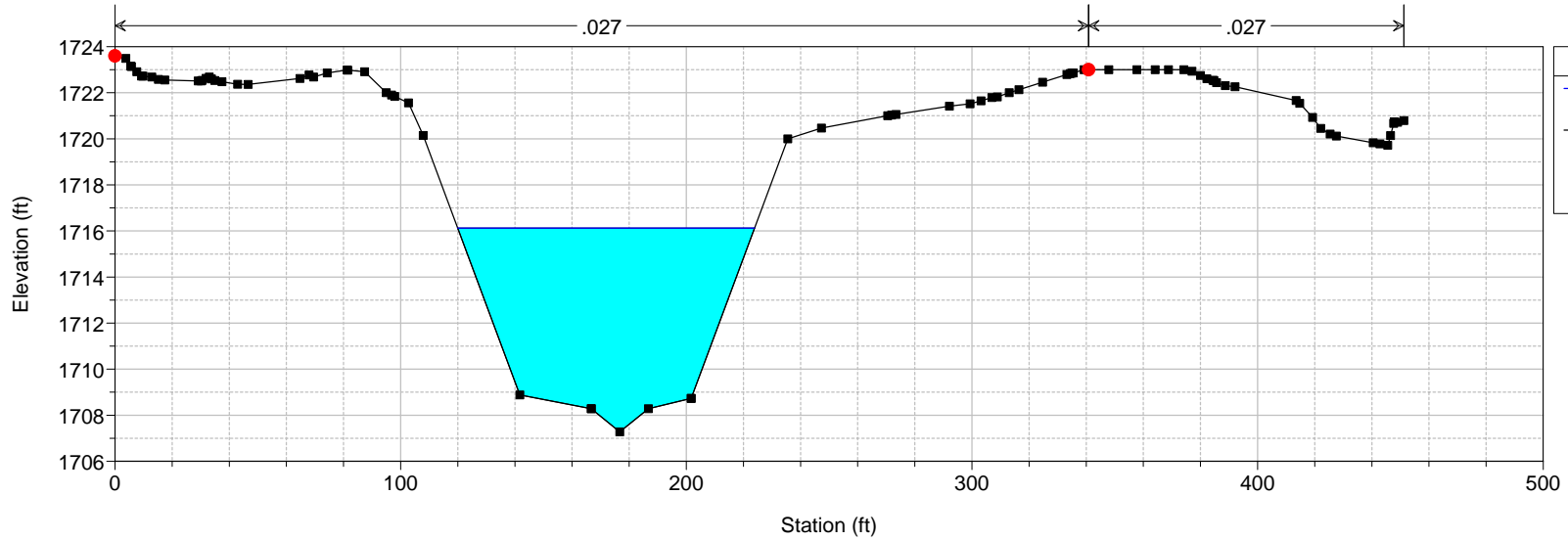


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 67 "FW" 25+50



FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 66 "FW" 26+00

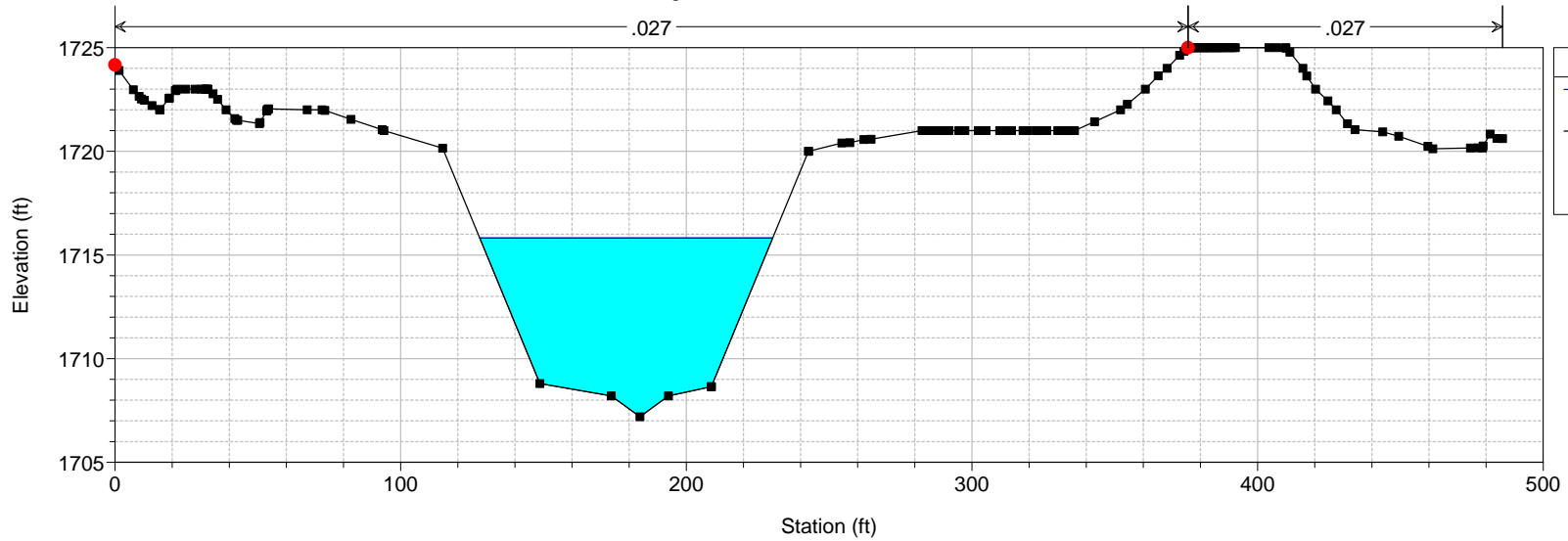


Legend

WS PF 1
Ground
Bank Sta

FlamWashPost Plan: Proposed 8/9/2013

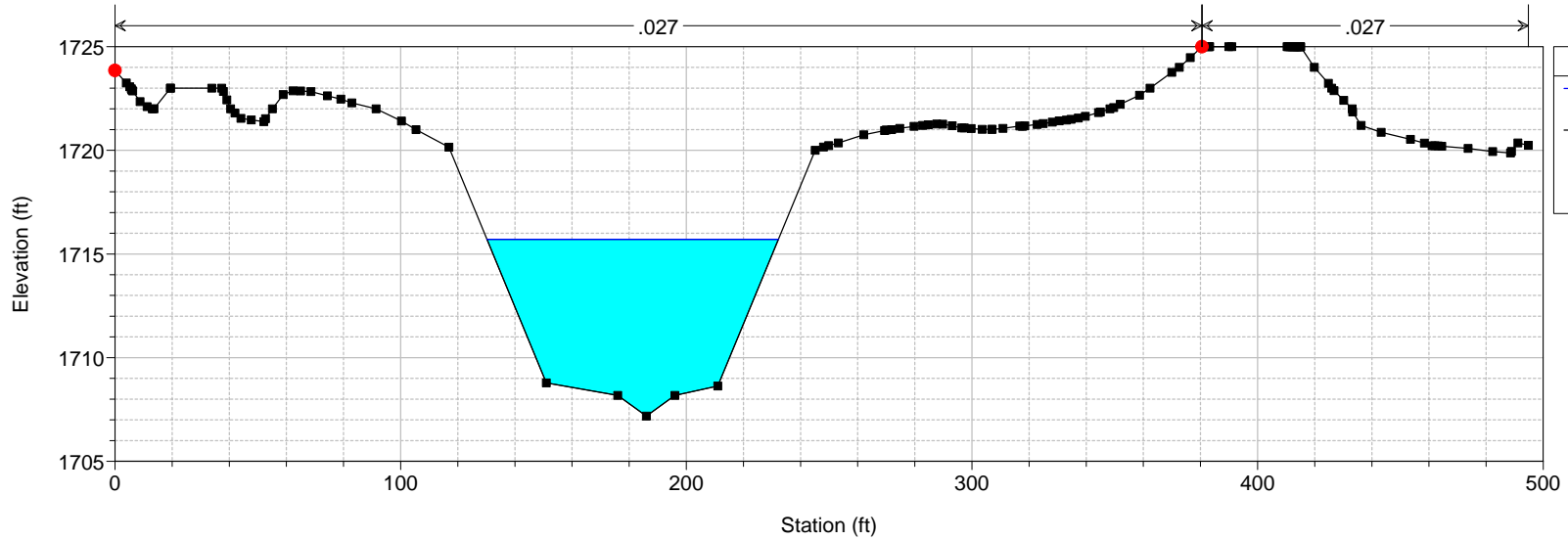
River = Flamingo Reach = Flam Wash RS = 65.5 "FW" 26+00



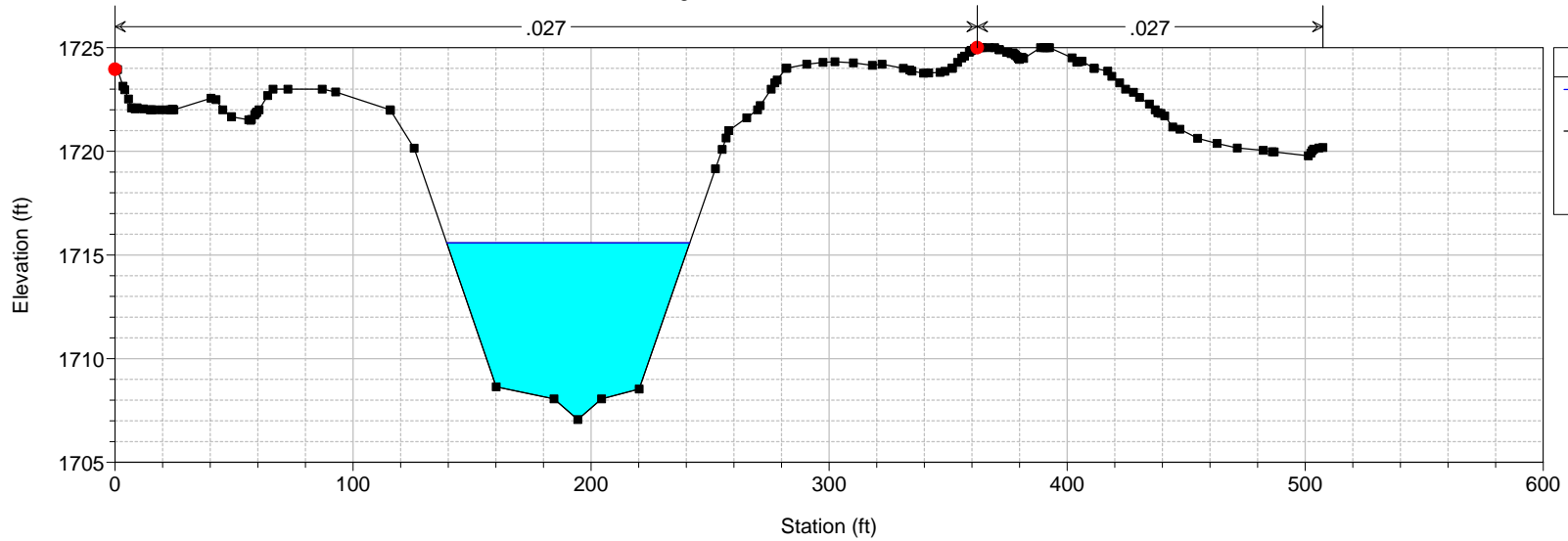
Legend

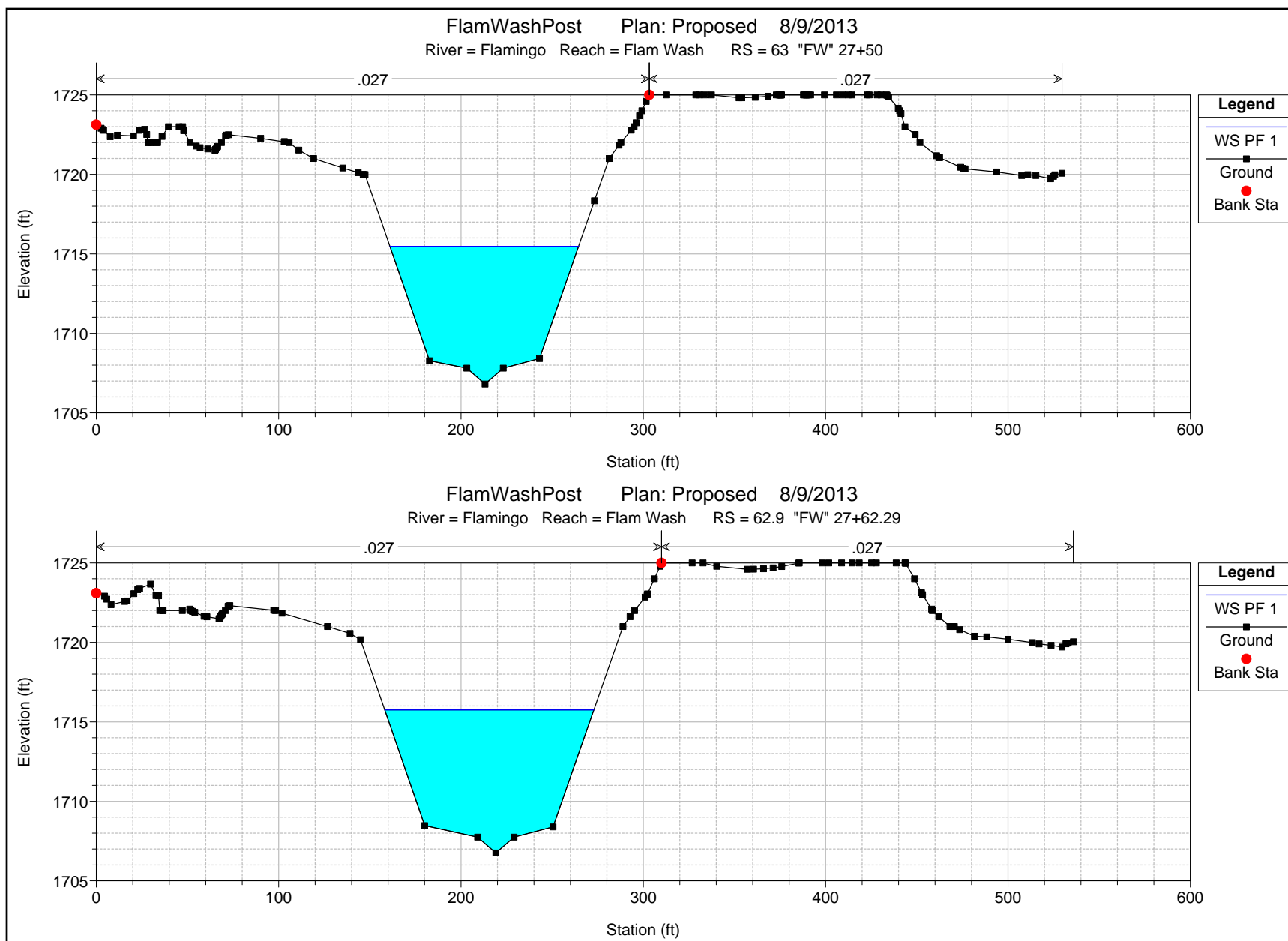
WS PF 1
Ground
Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 65 "FW"26+65.8



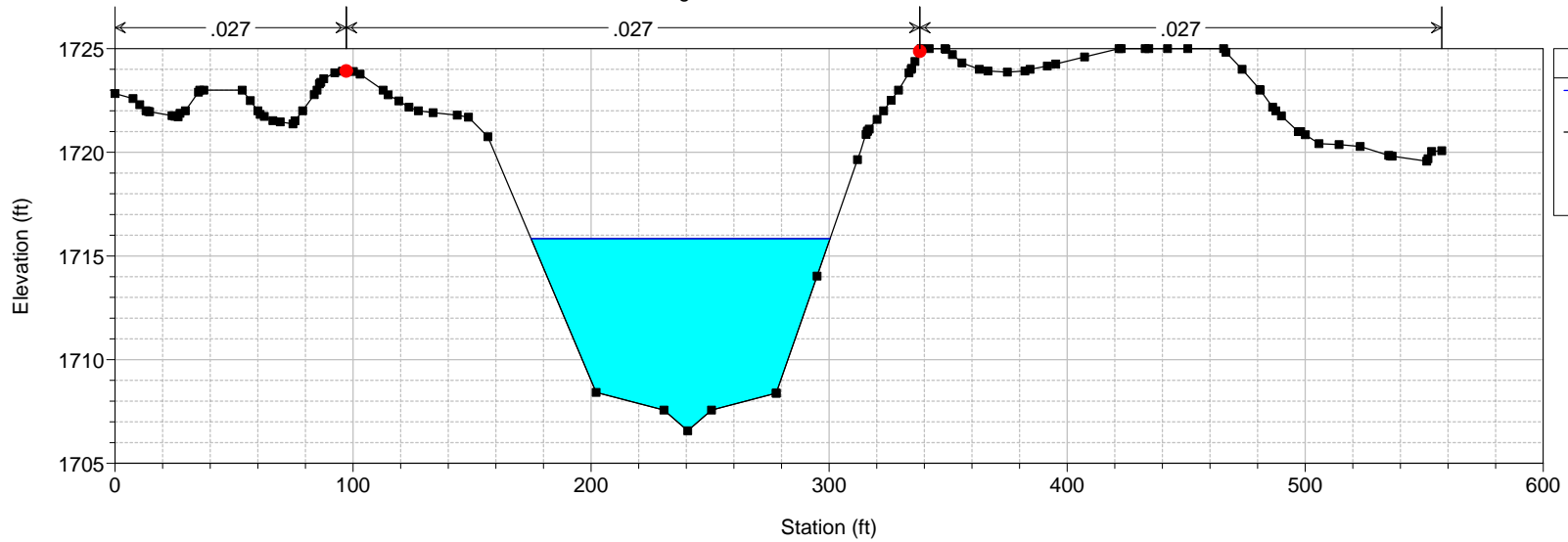
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 64 "FW" 27+00





FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 62 "FW" 28+00

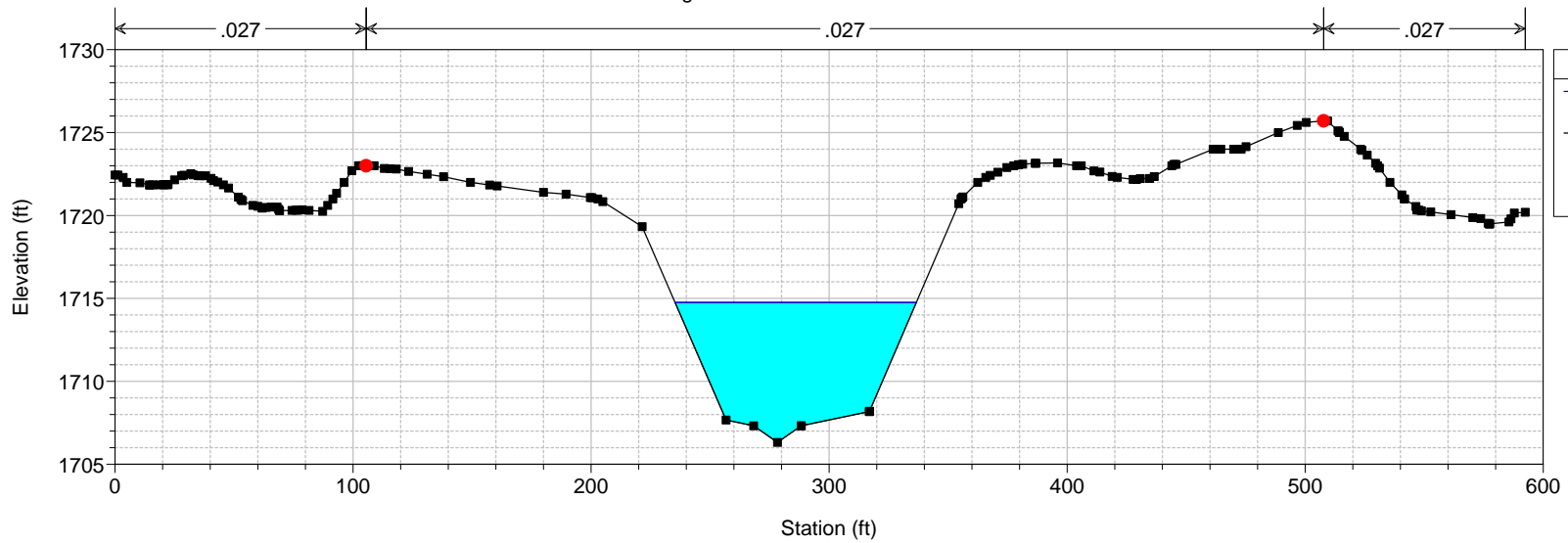


Legend

- WS PF 1
- Ground
- Bank Sta

FlamWashPost Plan: Proposed 8/9/2013

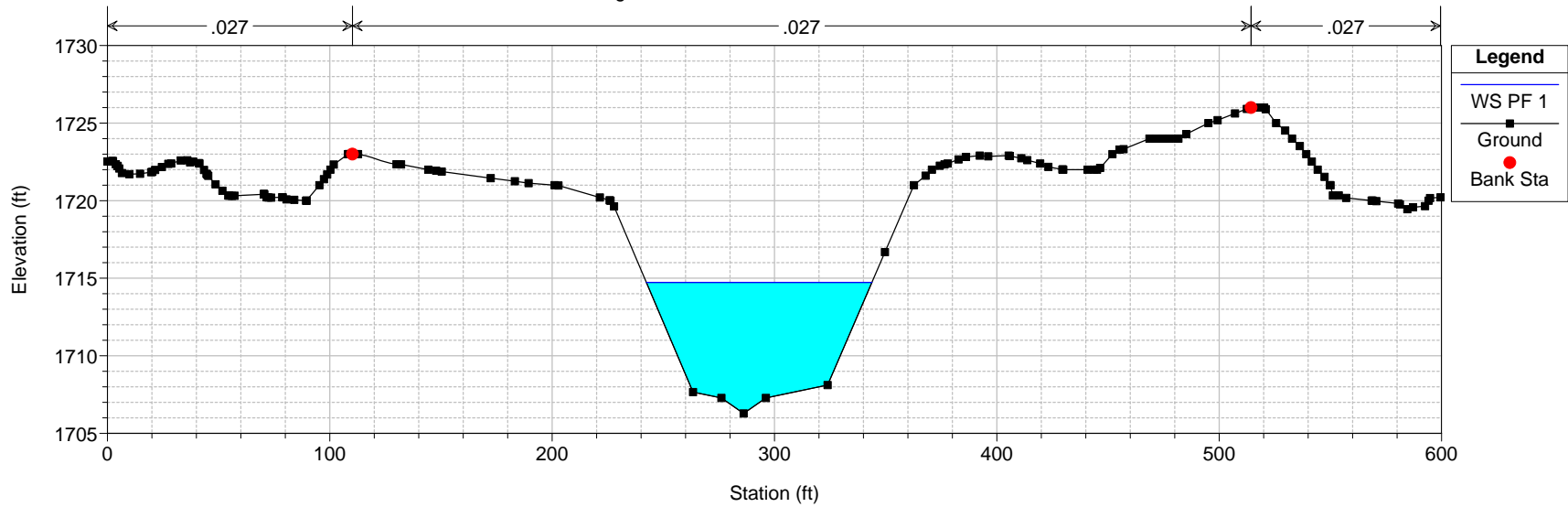
River = Flamingo Reach = Flam Wash RS = 61 "FW" 28+50



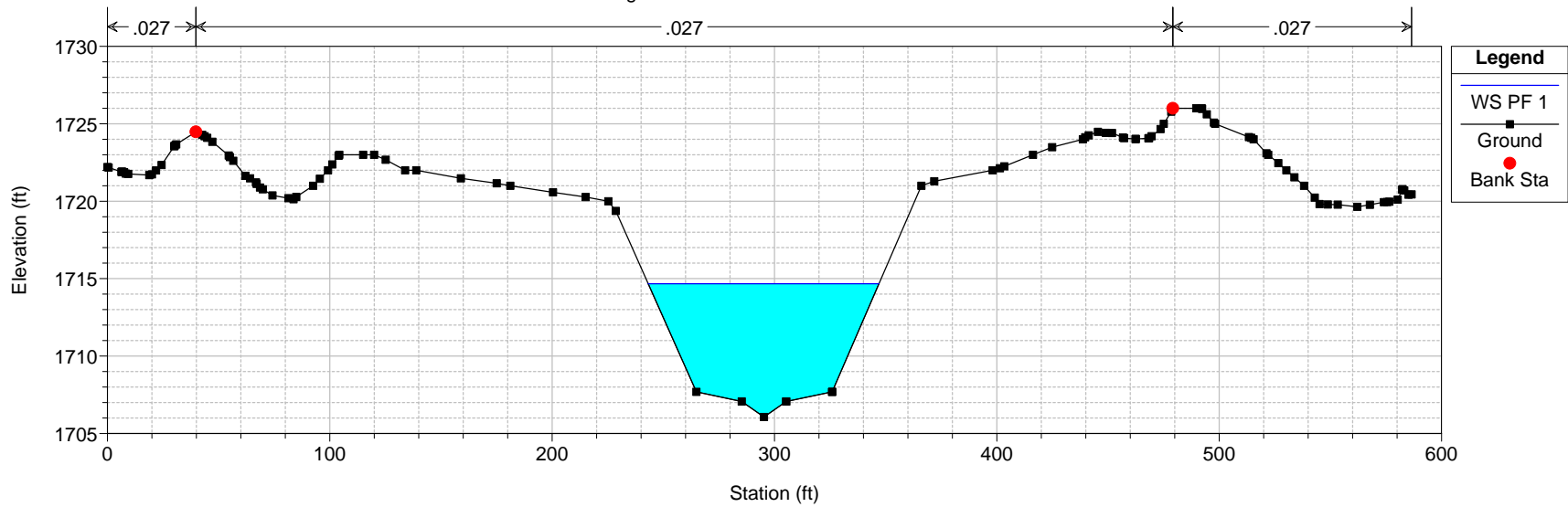
Legend

- WS PF 1
- Ground
- Bank Sta

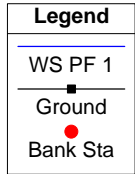
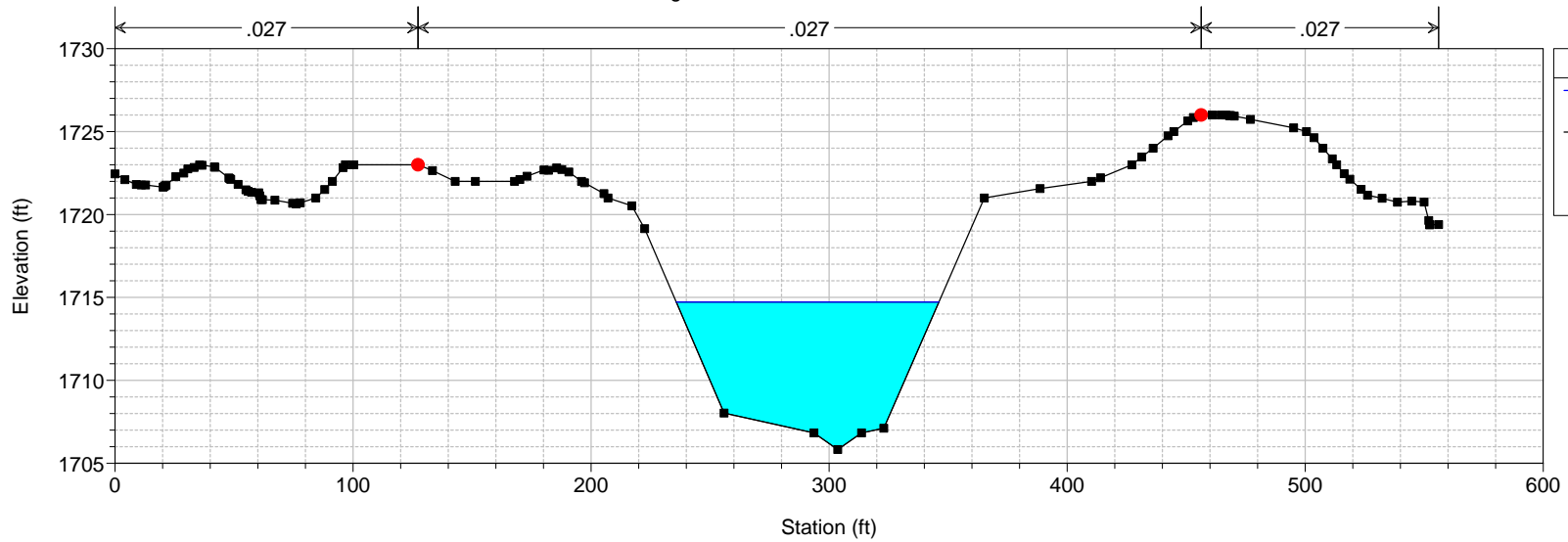
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.8 "FW"28+58.79



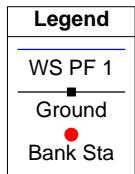
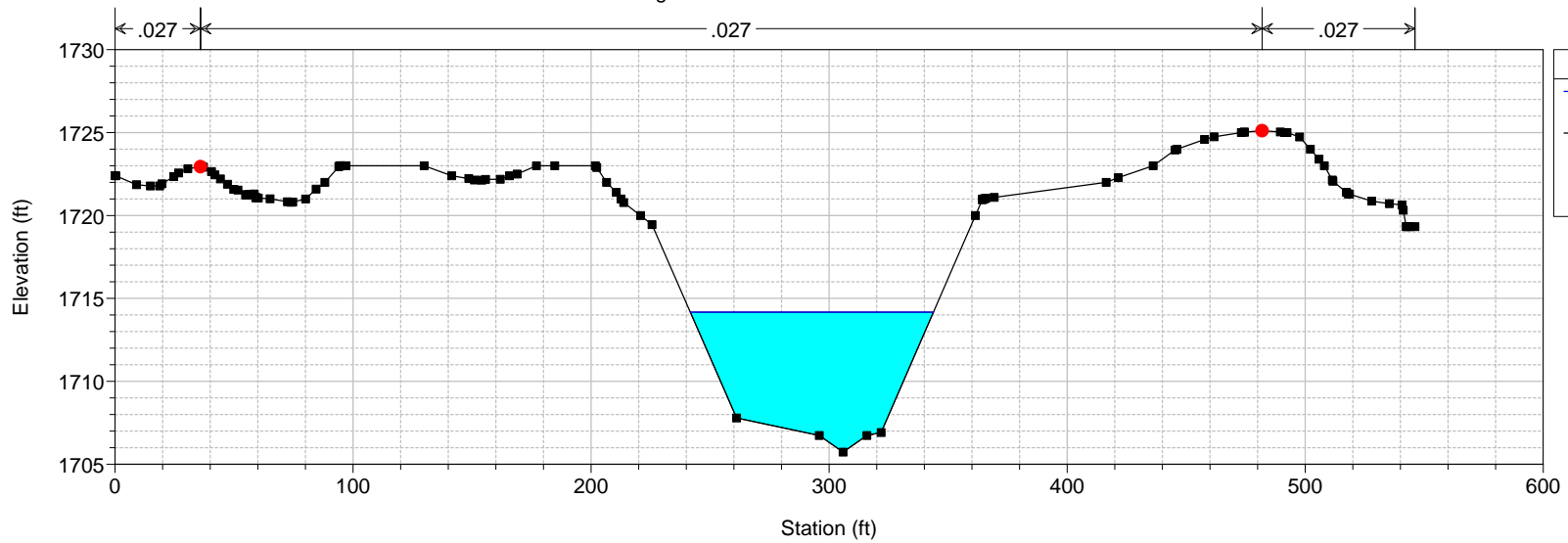
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.5 "FW" 29+00



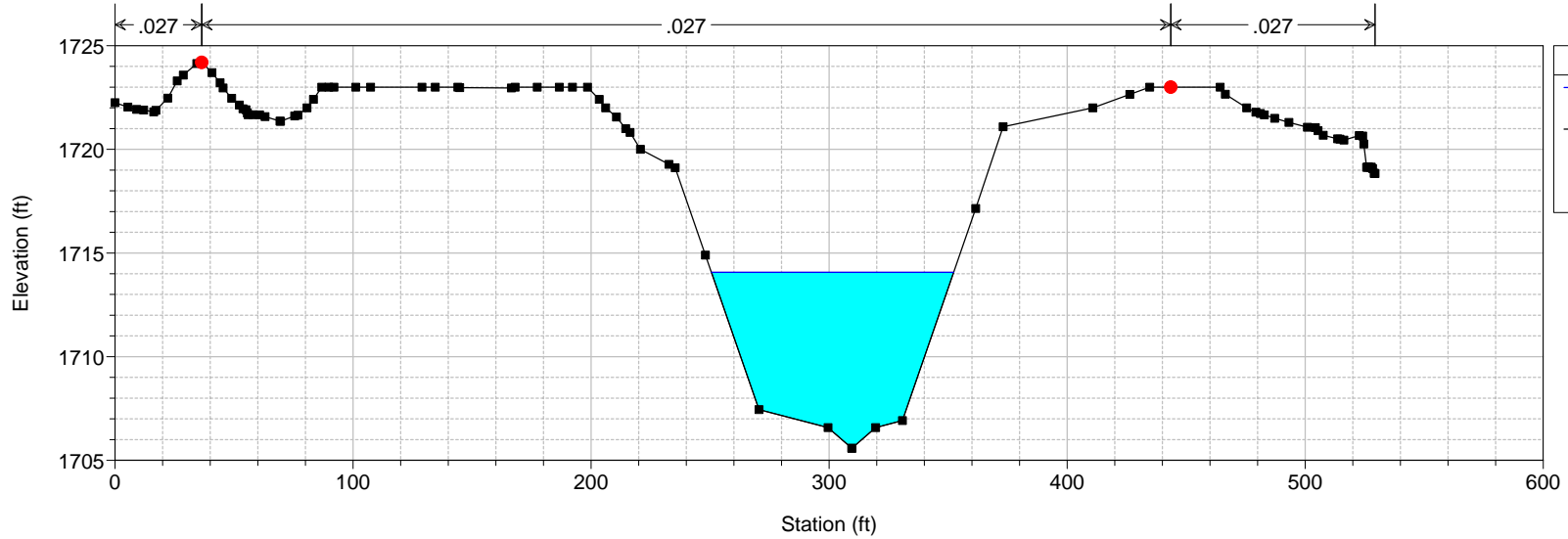
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 60.2 "FW" 29+50



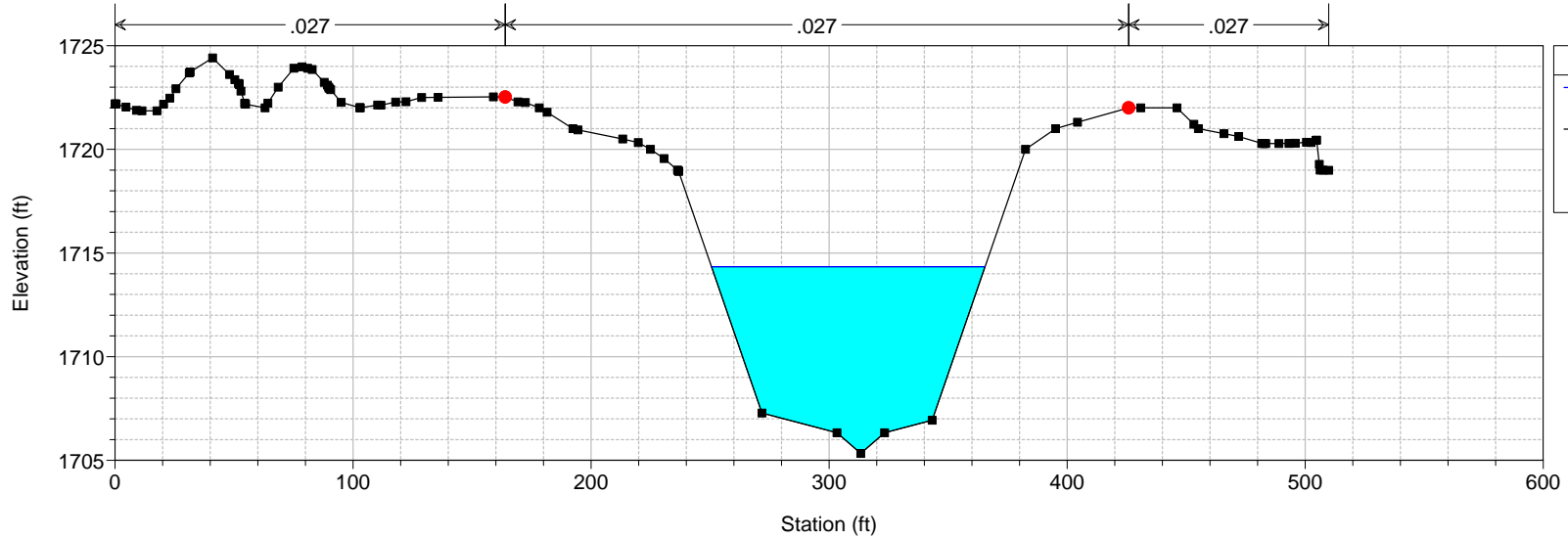
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59.6 "FW" 29+66.89

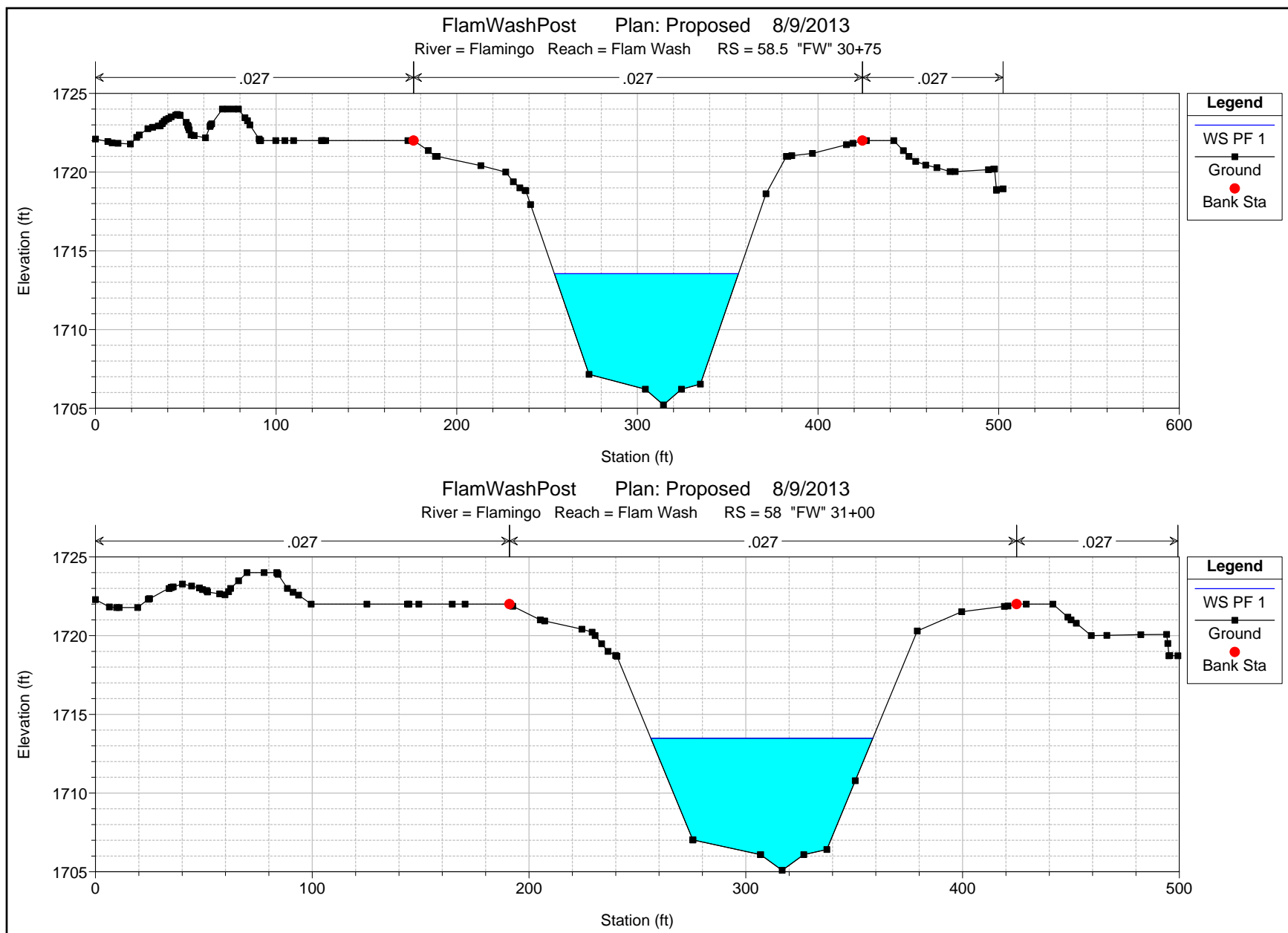


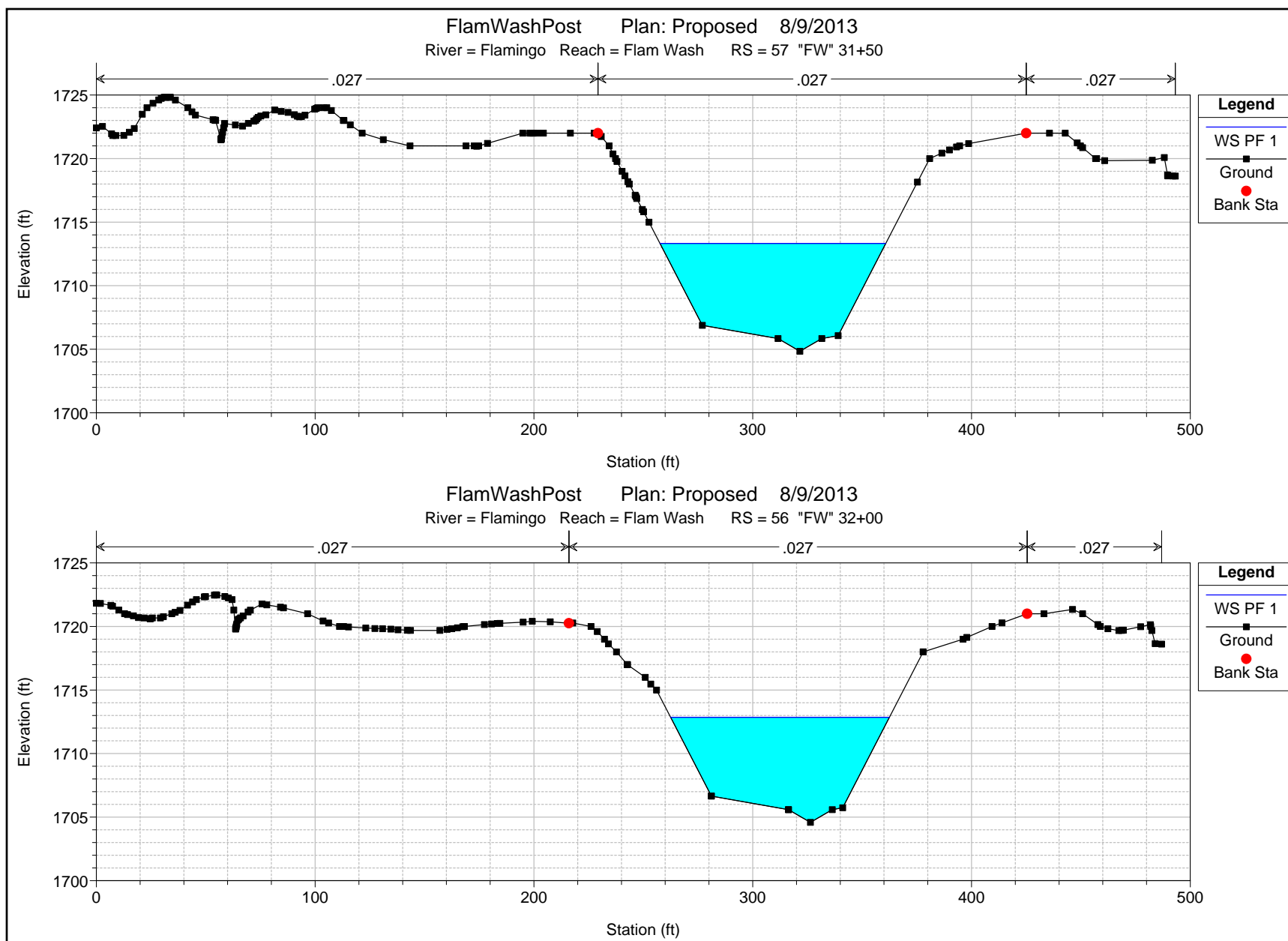
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59.3 "FW" 30+00



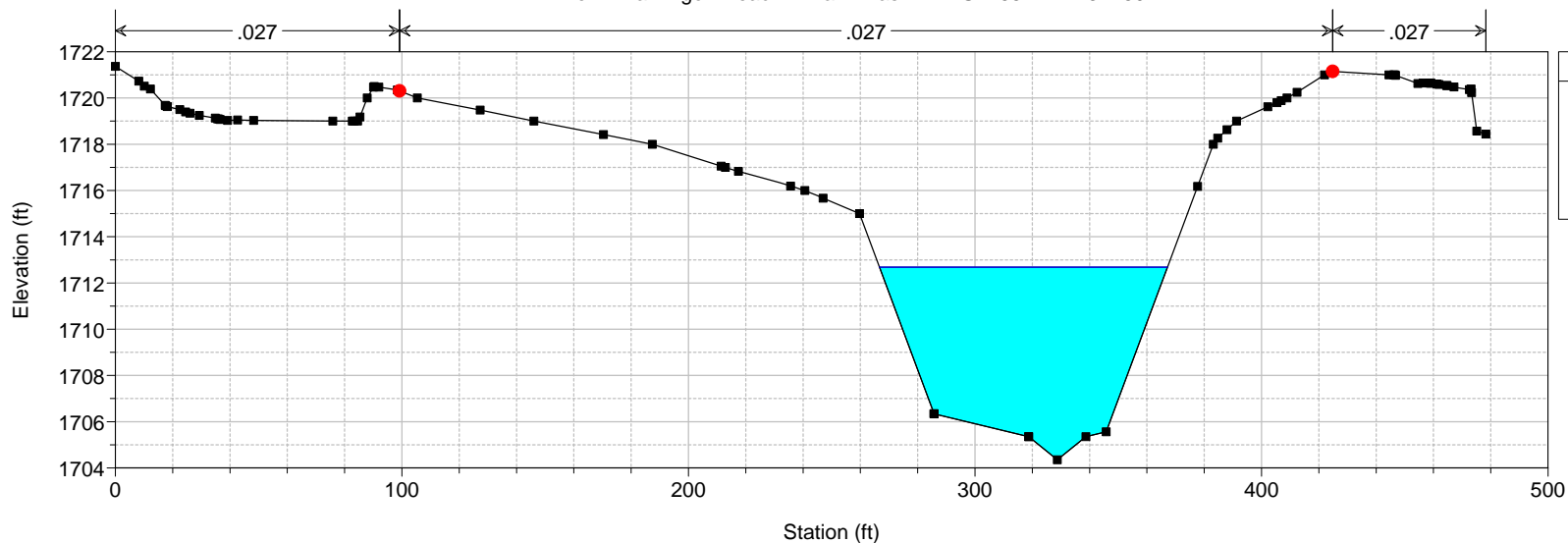
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 59 "FW" 30+50







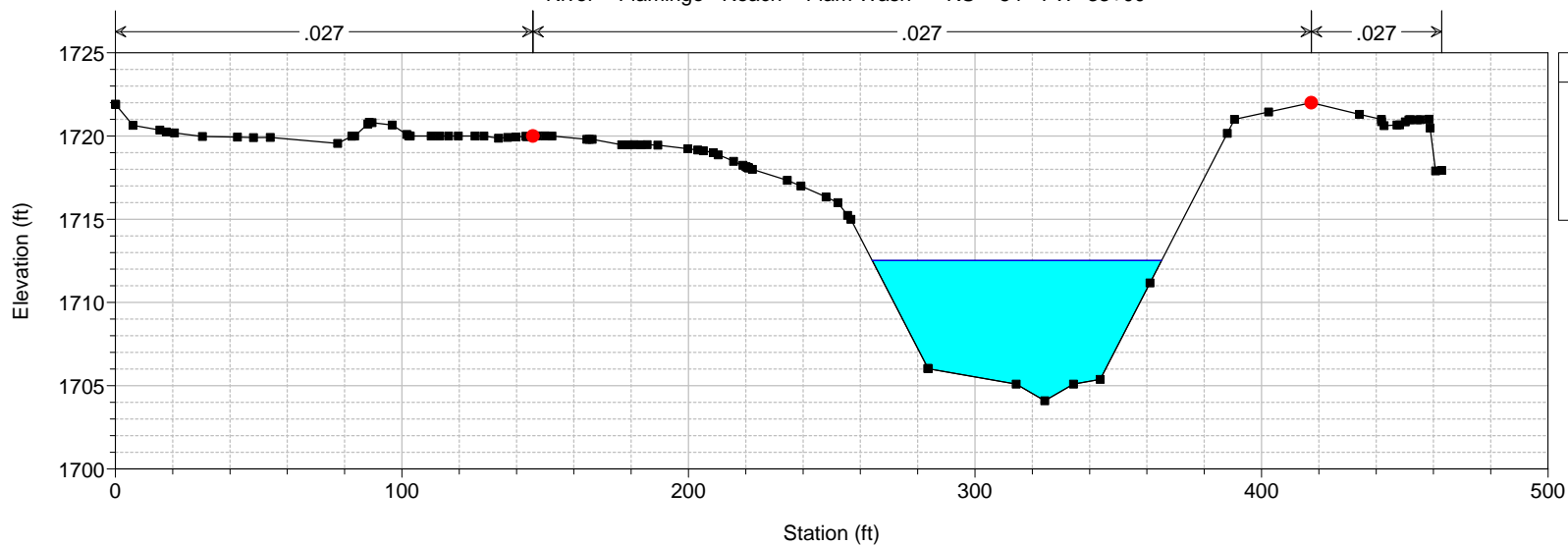
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 55 "FW" 32+50



Legend

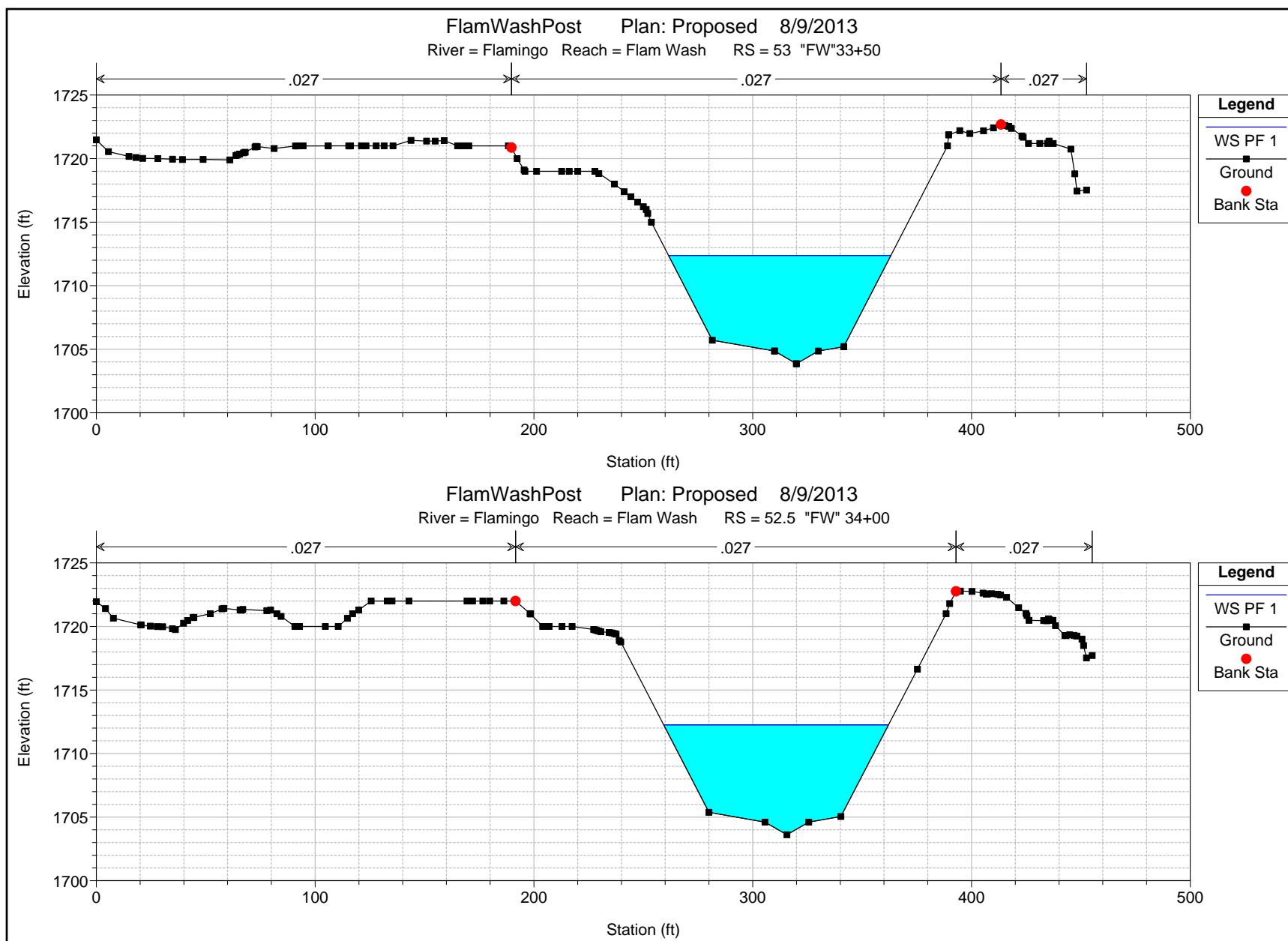
- WS PF 1
- Ground
- Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 54 "FW" 33+00

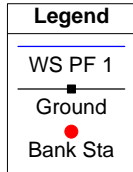
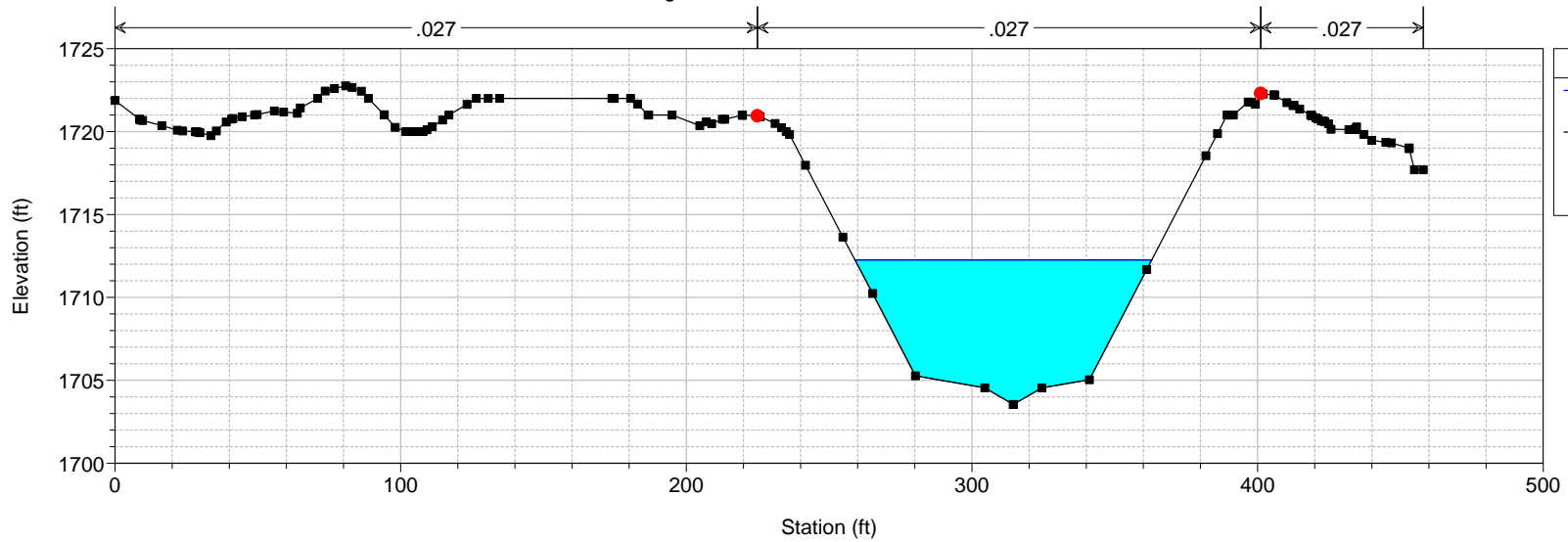


Legend

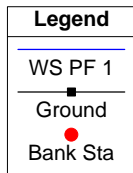
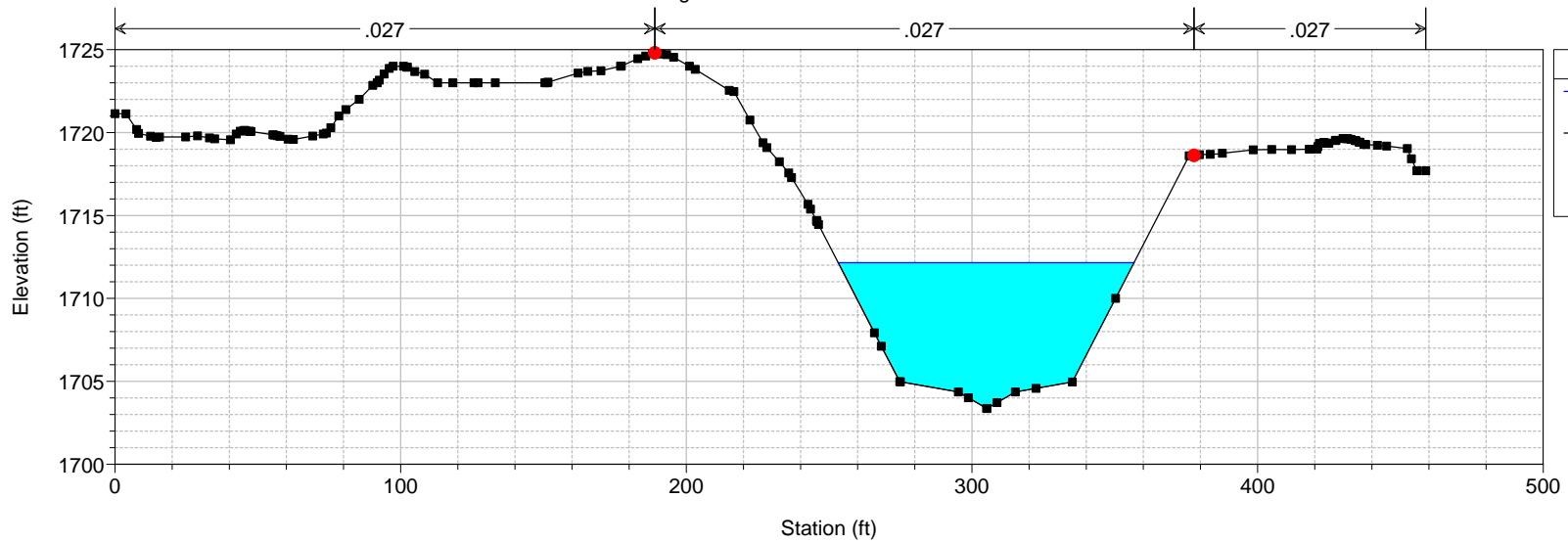
- WS PF 1
- Ground
- Bank Sta



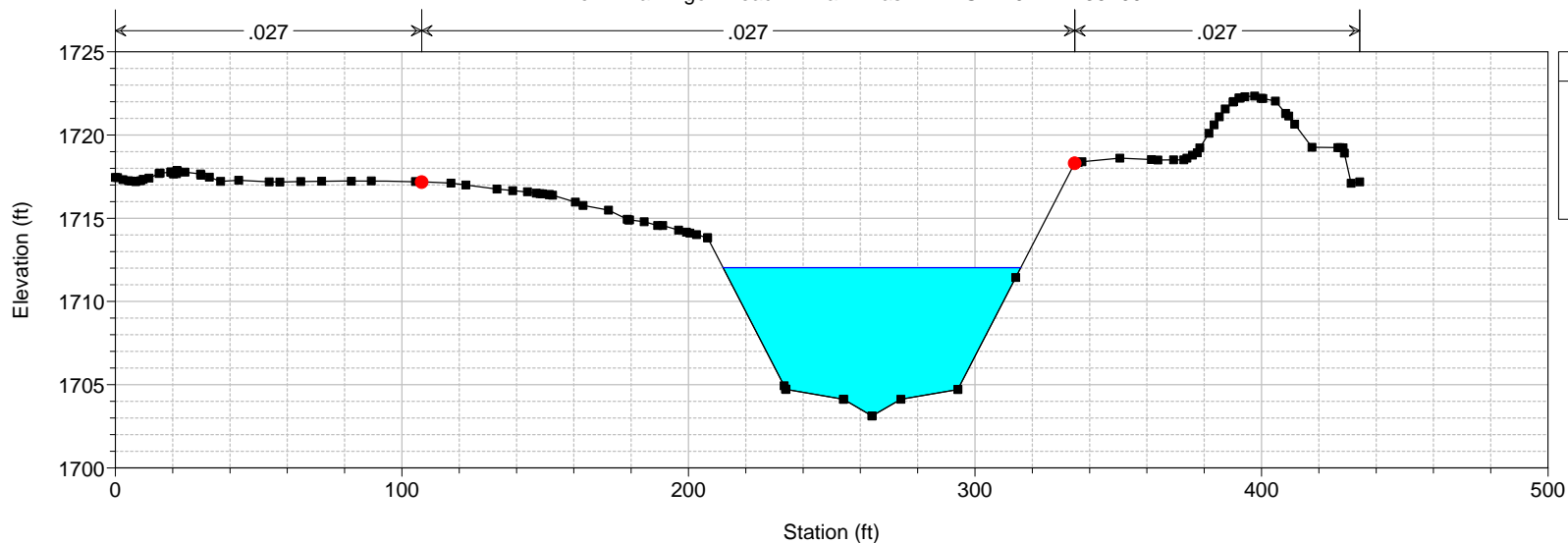
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 52 "FW" 34+12.68



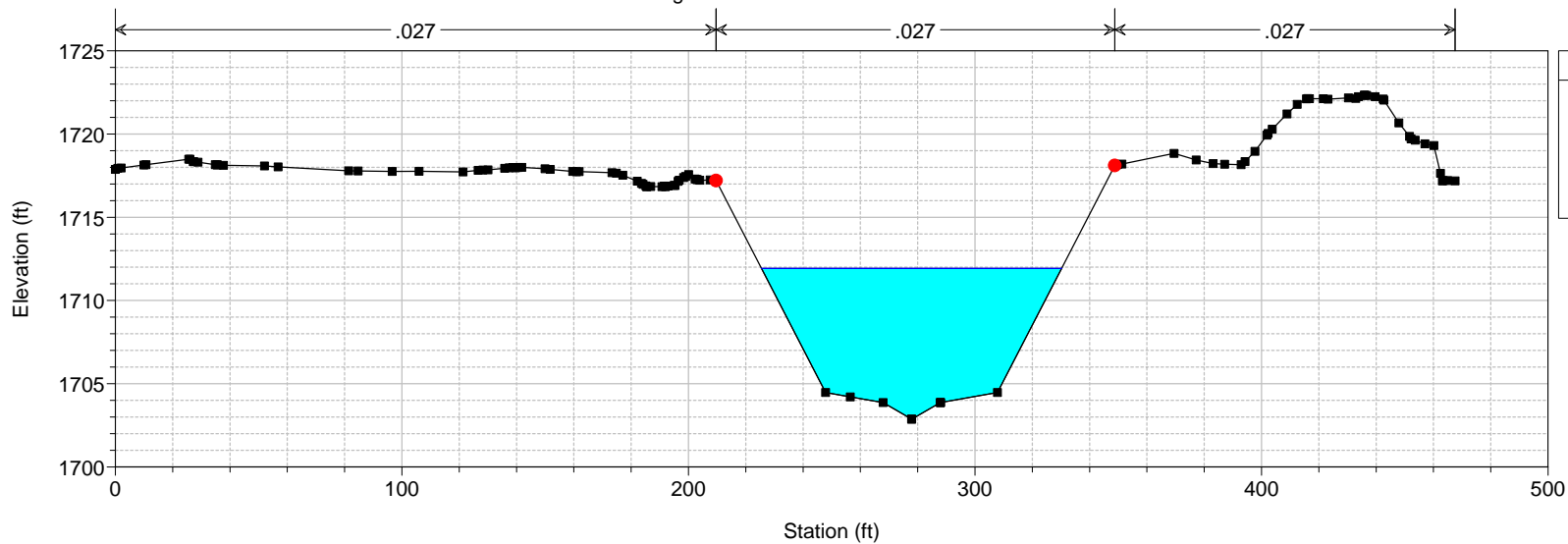
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 51 "FW" 34+50



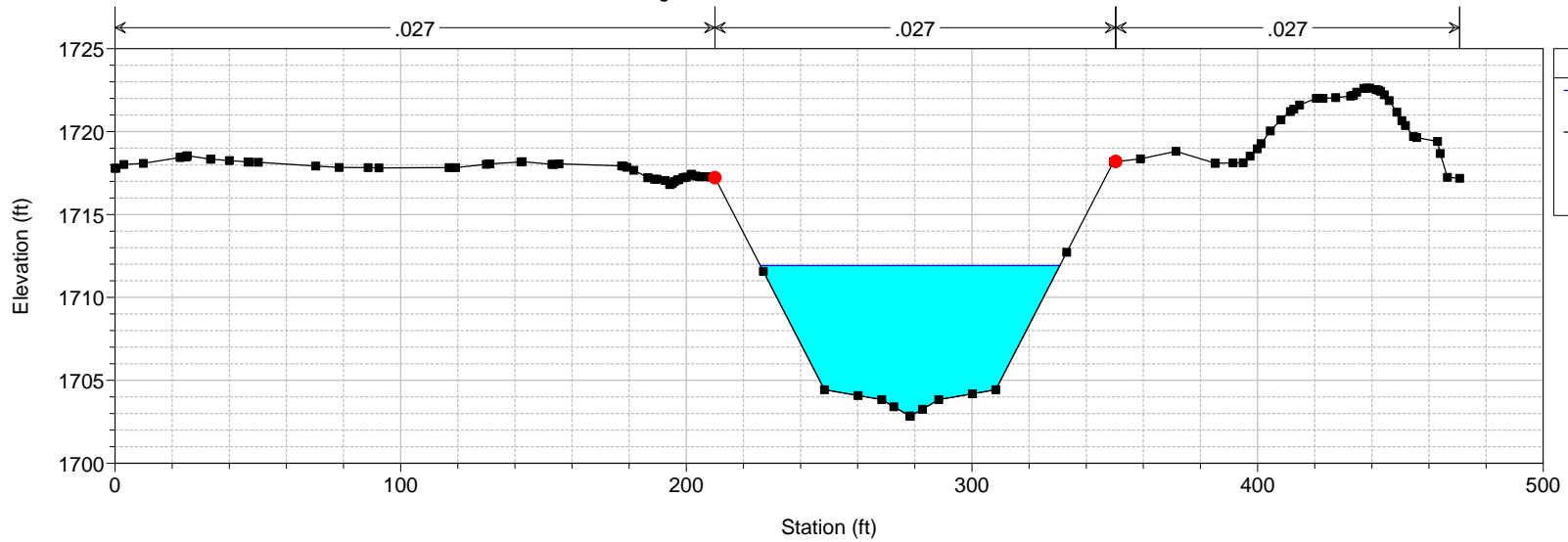
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 49 "FW"35+00



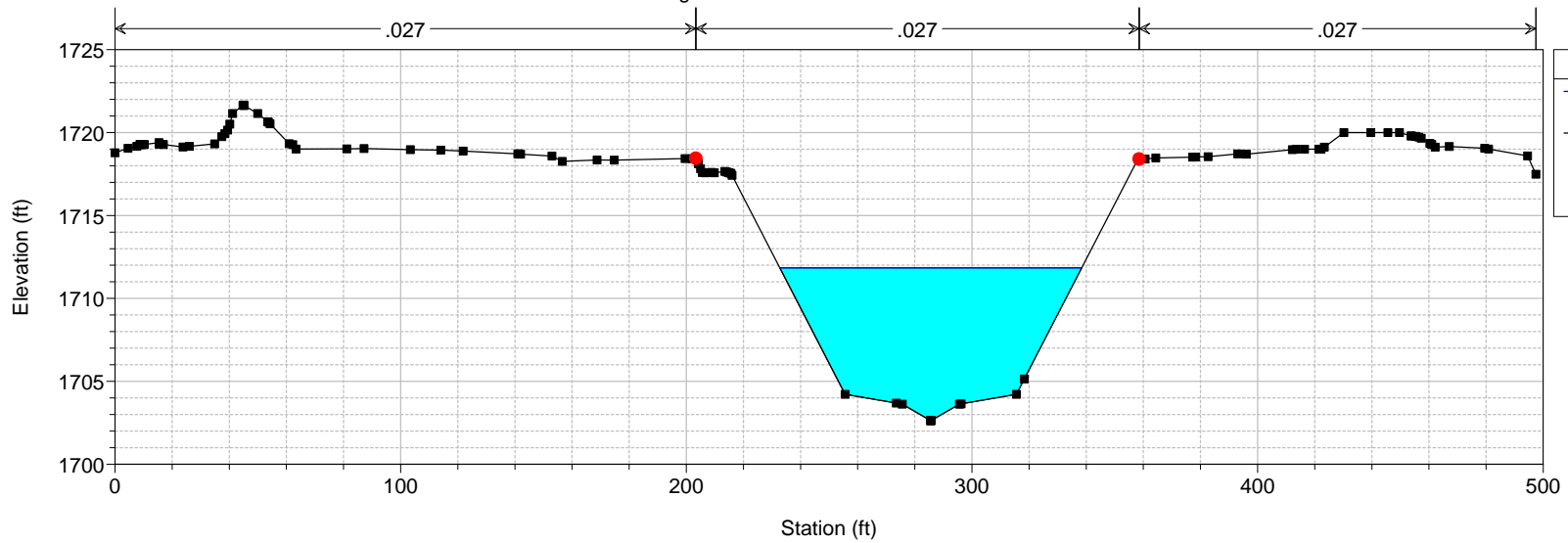
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48.7 "FW" 35+50



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48.5 "FW"35+56.52

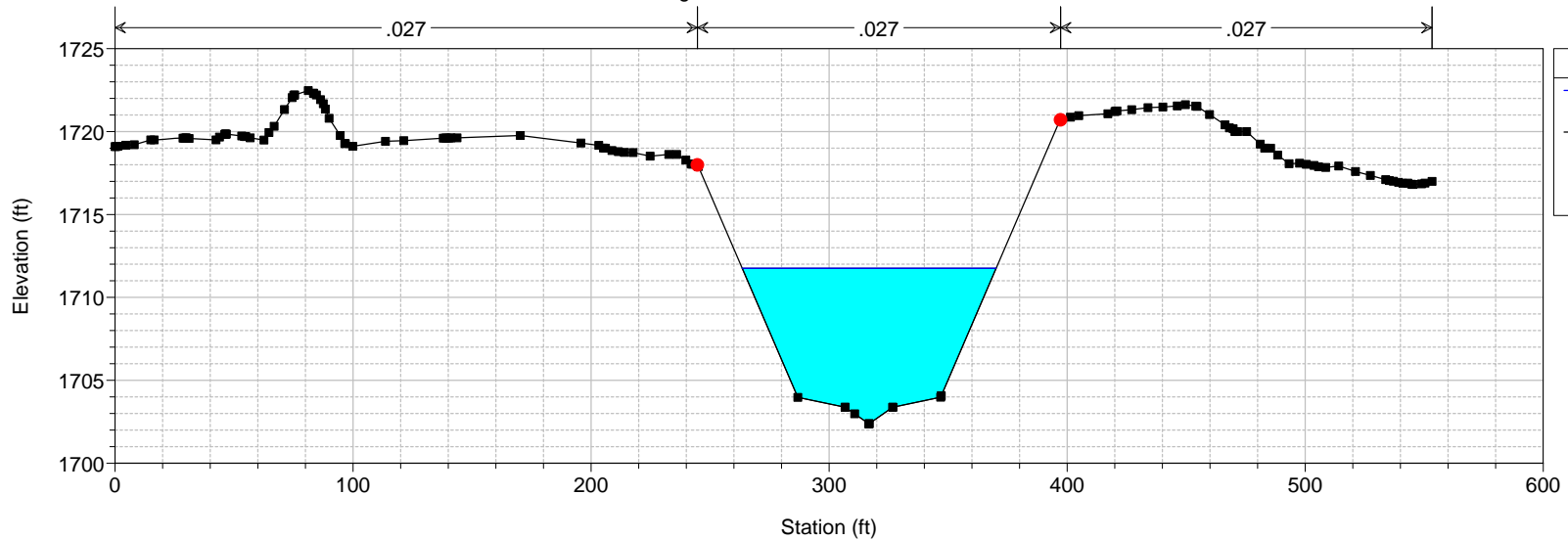


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 48 "FW" 36+00



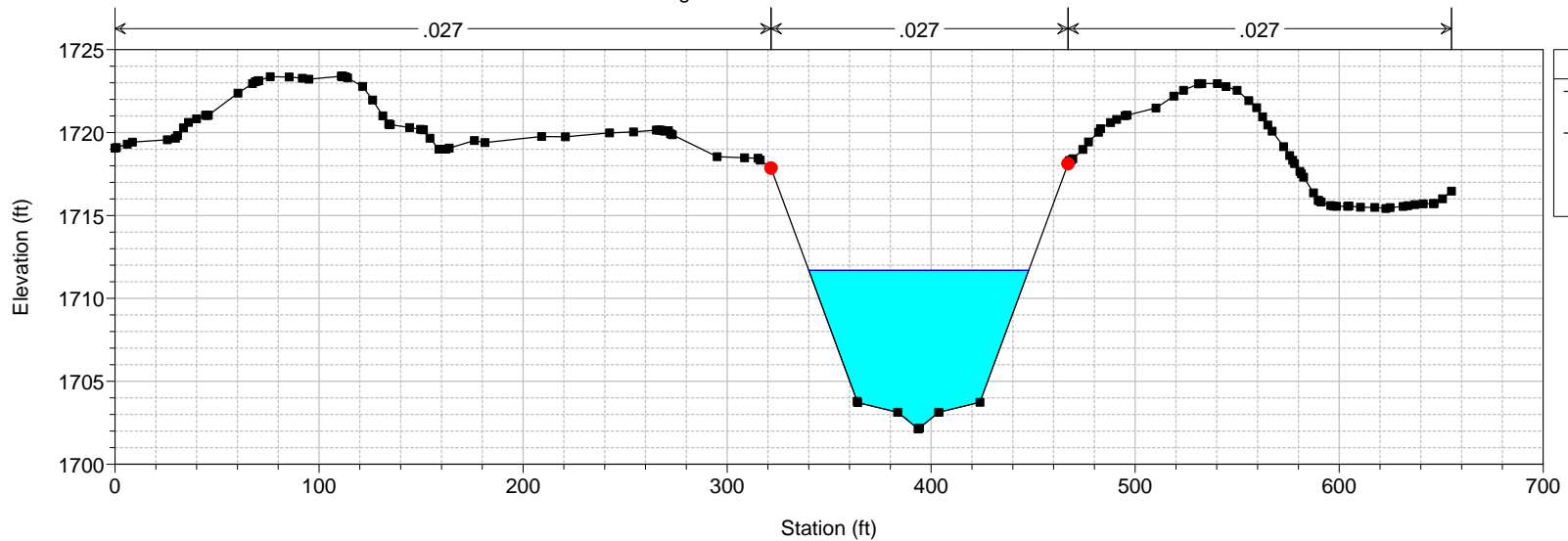
FlamWashPost Plan: Proposed 8/9/2013

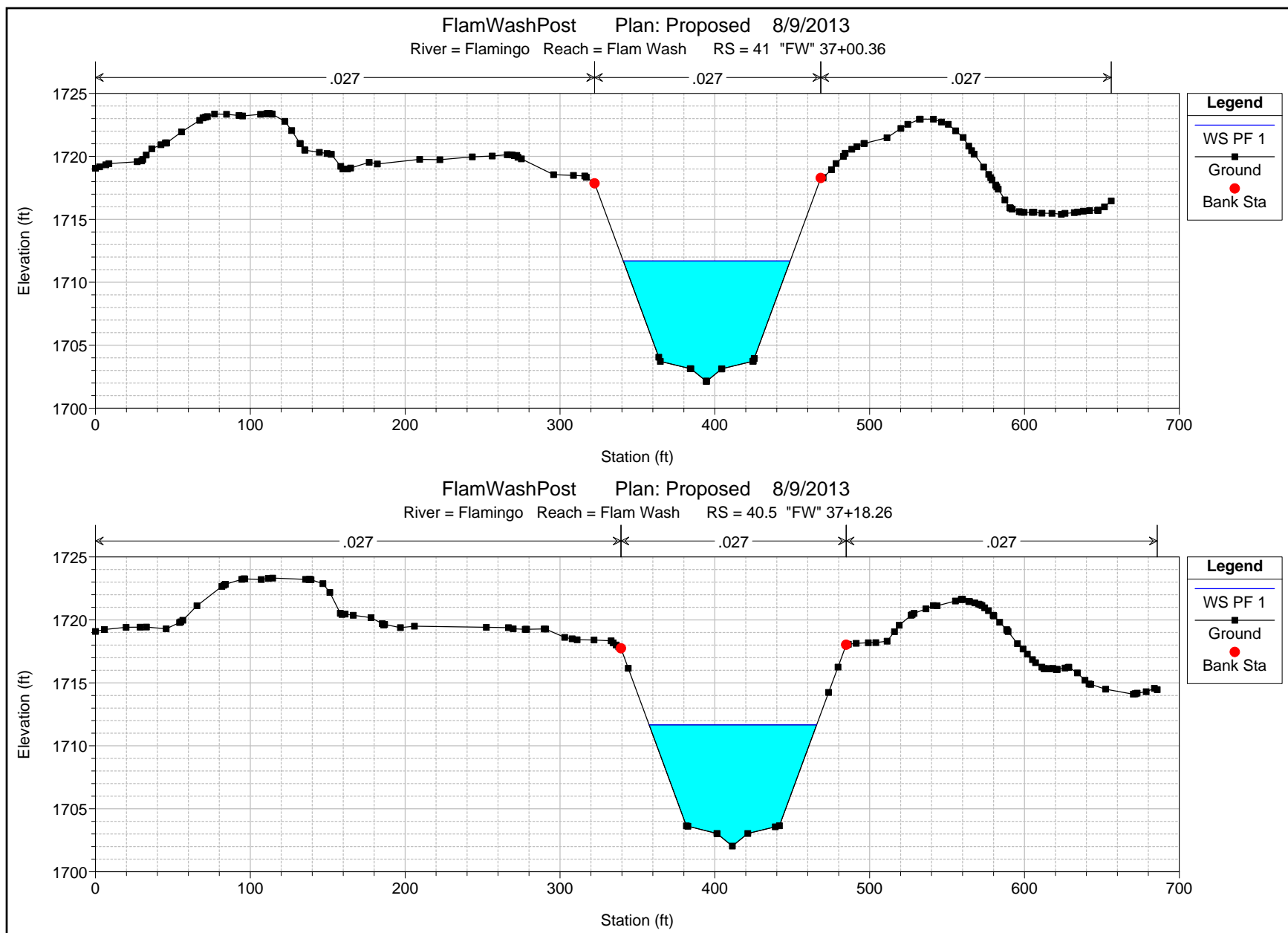
River = Flamingo Reach = Flam Wash RS = 47 "FW" 36+50

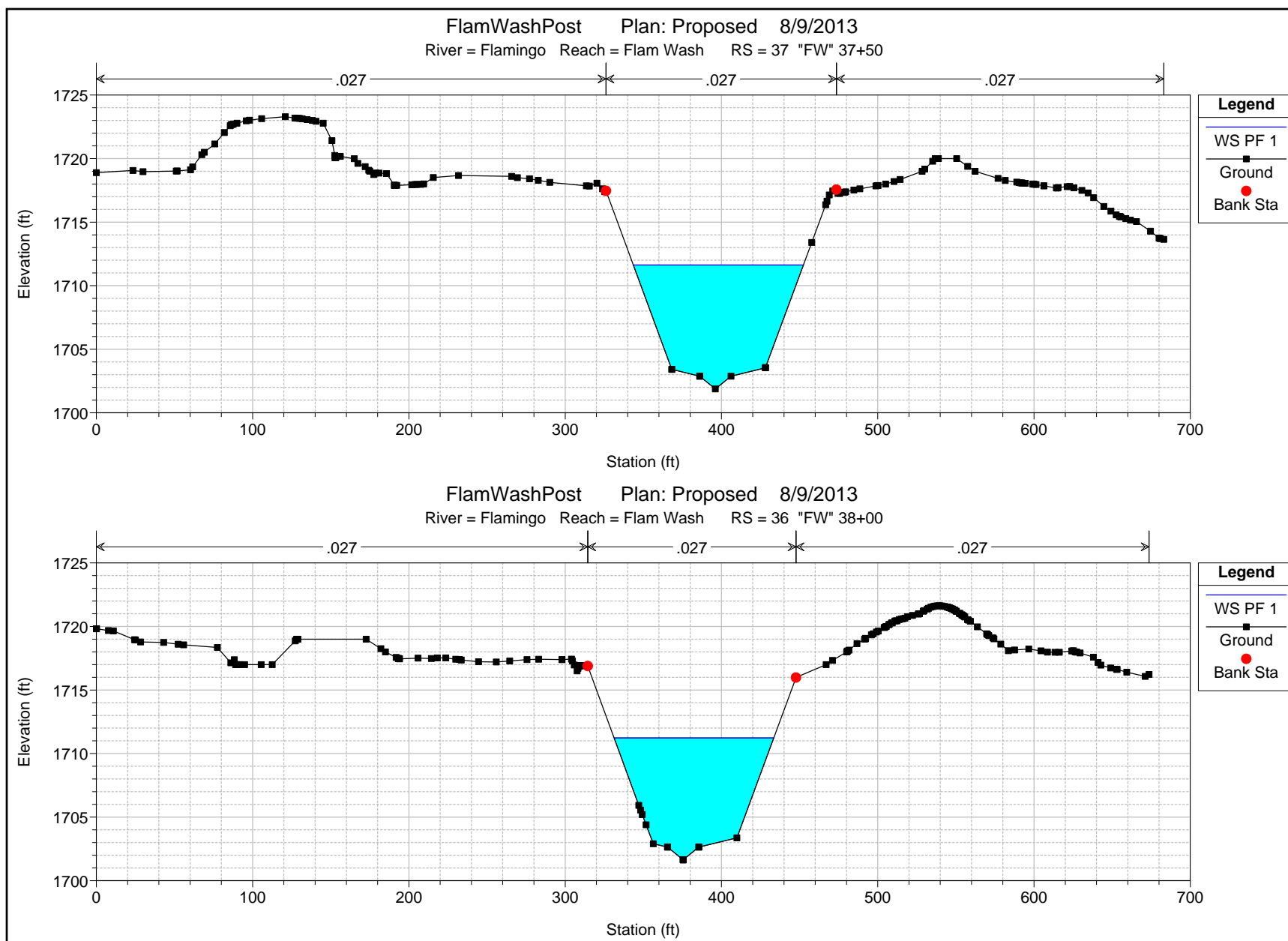


FlamWashPost Plan: Proposed 8/9/2013

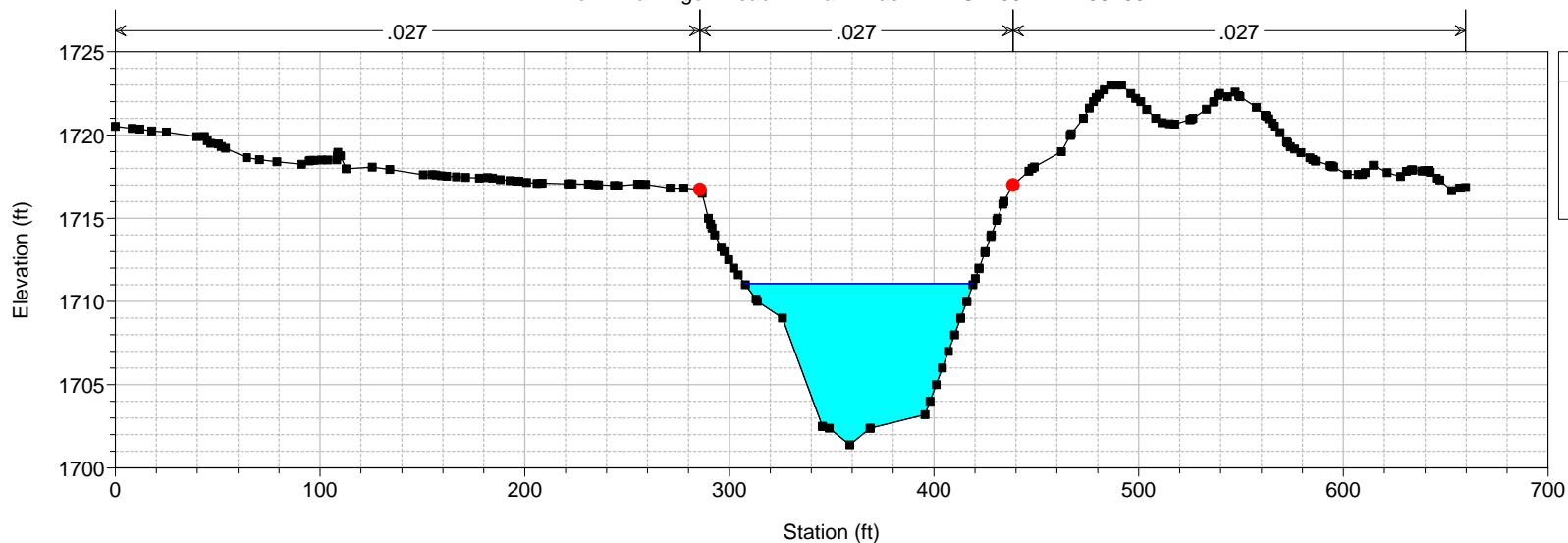
River = Flamingo Reach = Flam Wash RS = 42 "FW" 37+00







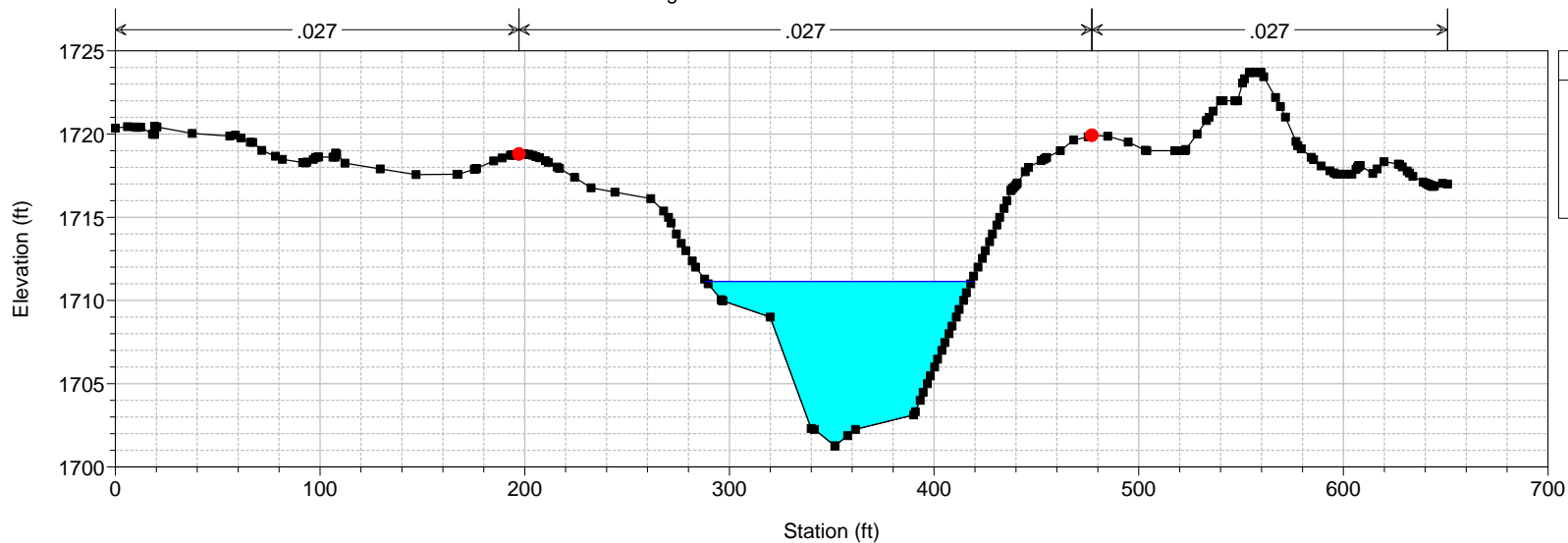
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 35 "FW" 38+50



Legend

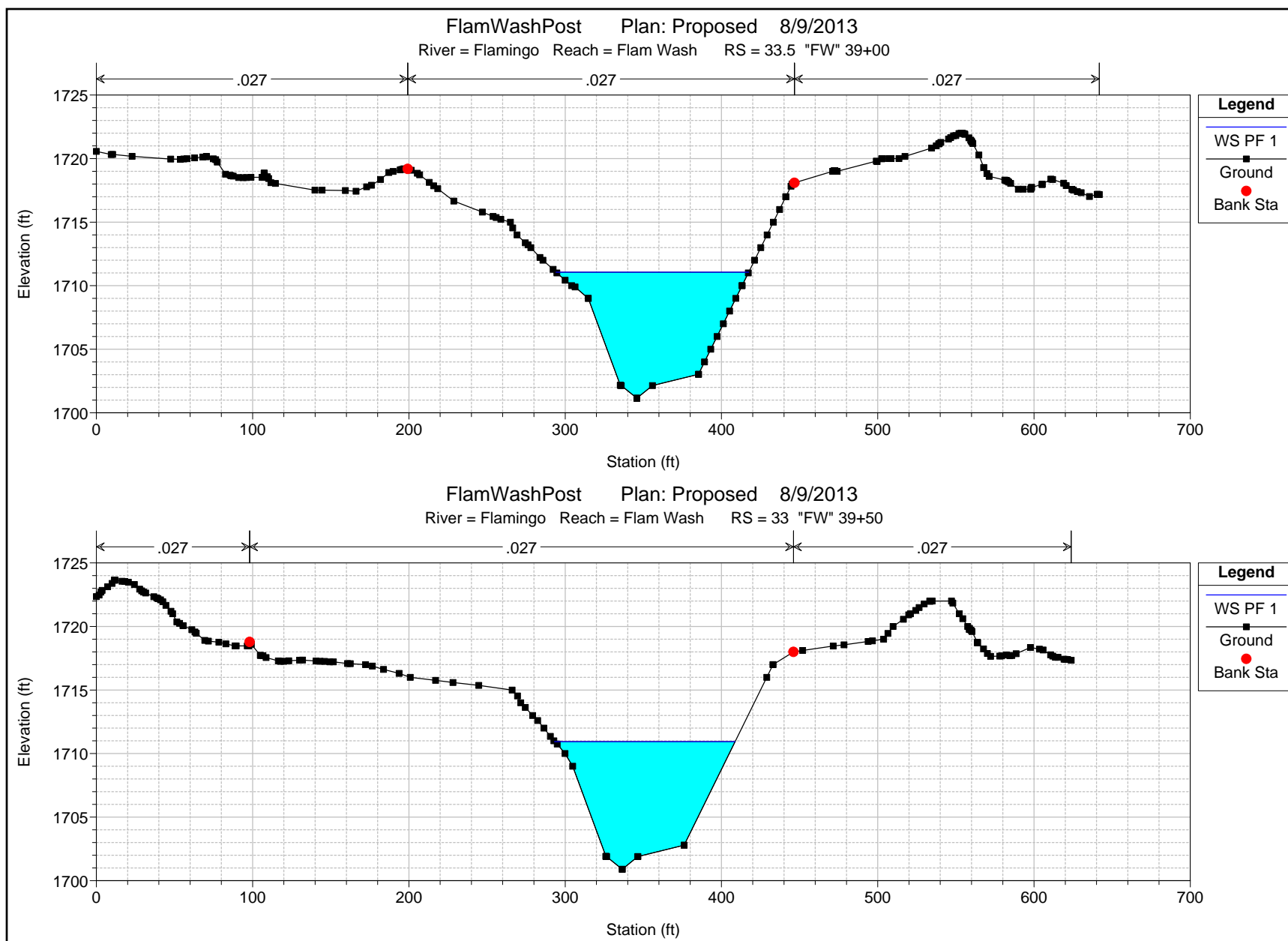
- WS PF 1
- Ground
- Bank Sta

FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 34 "FW" 38+76.18

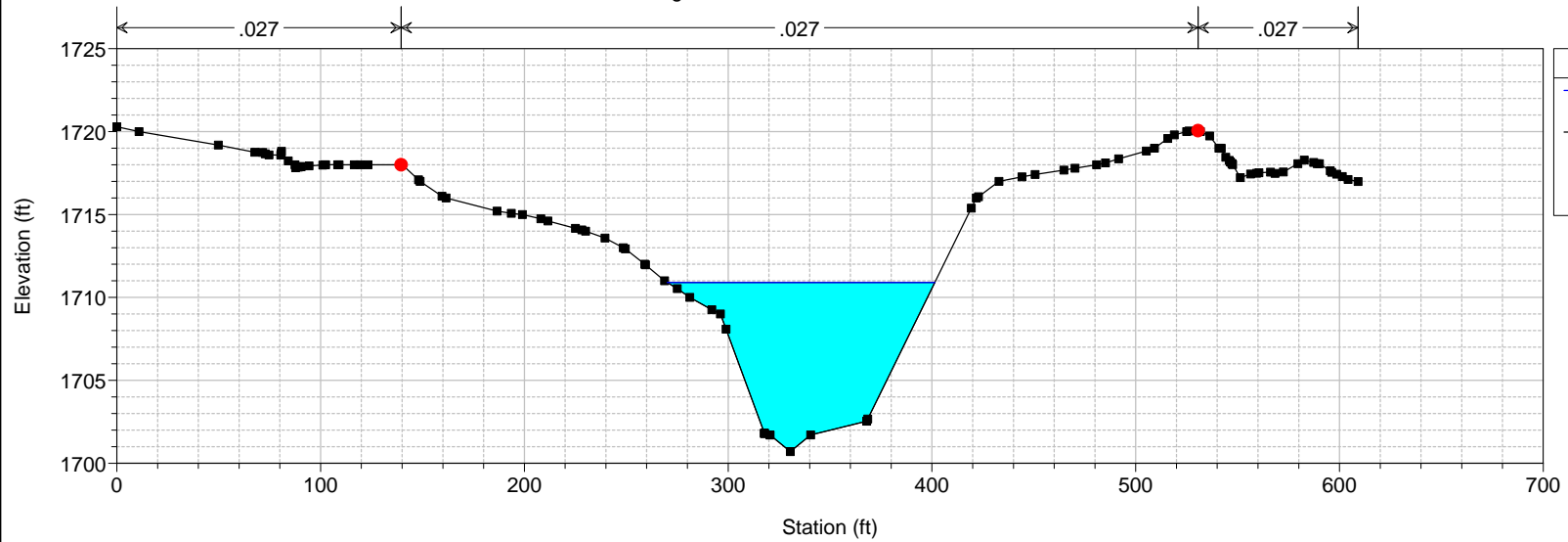


Legend

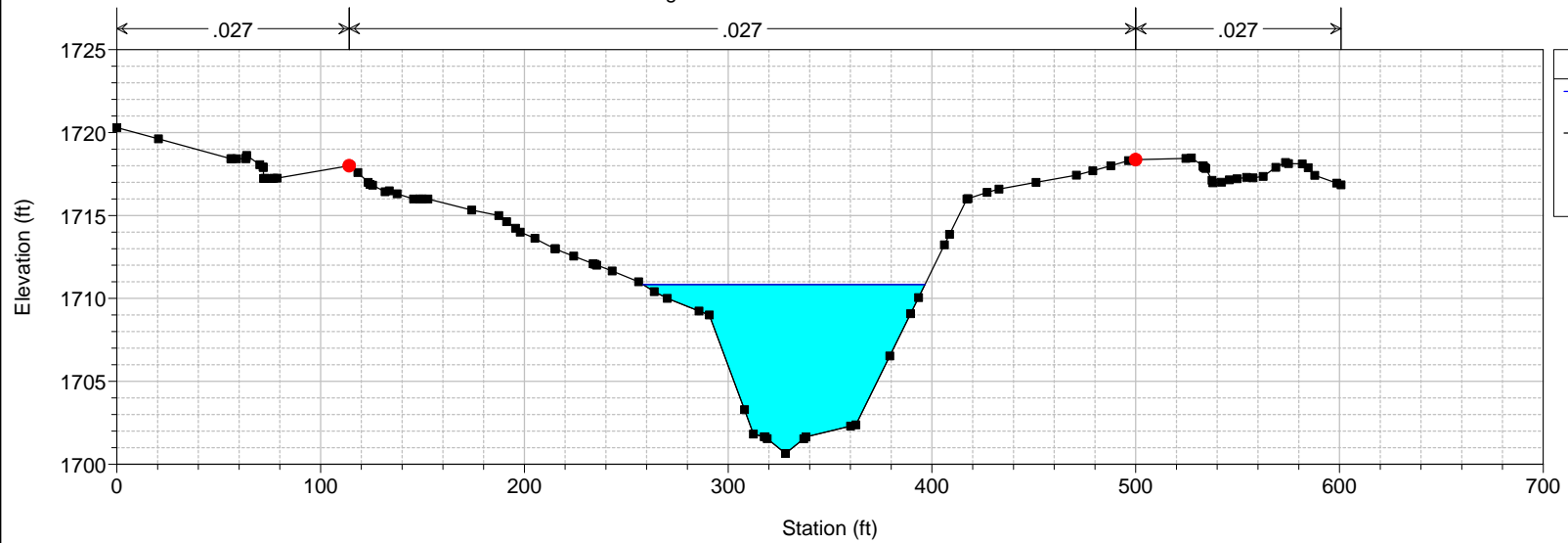
- WS PF 1
- Ground
- Bank Sta



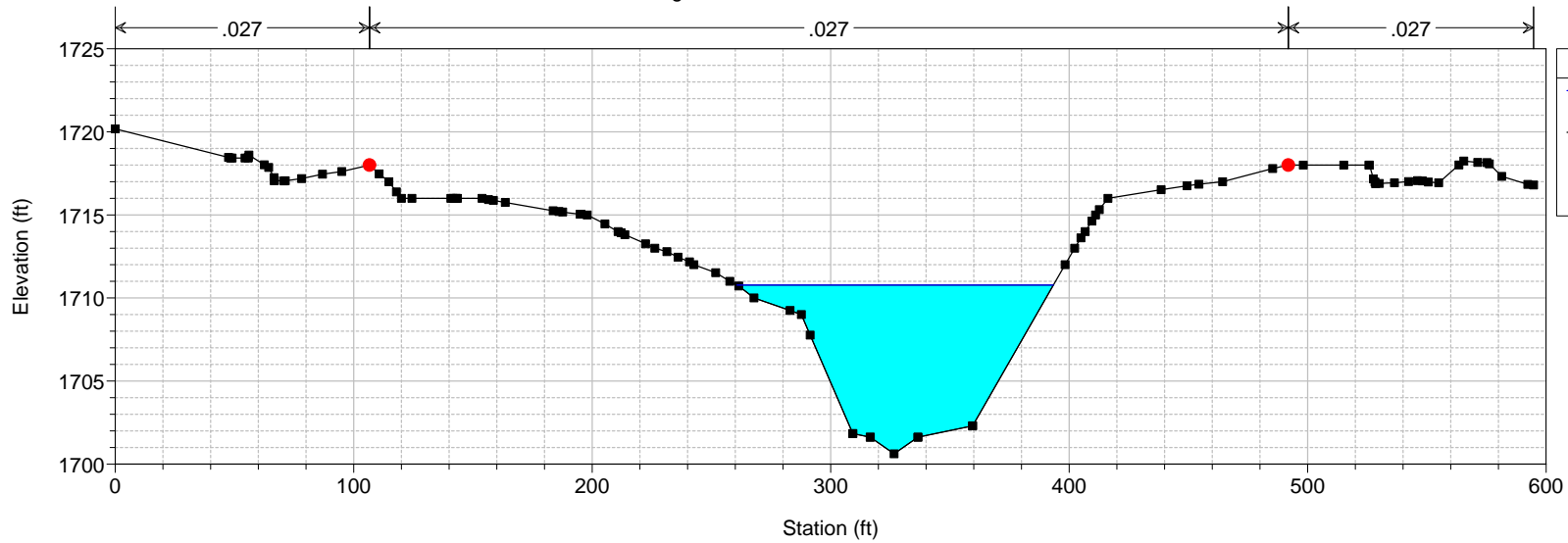
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 32.5 "FW" 40+00



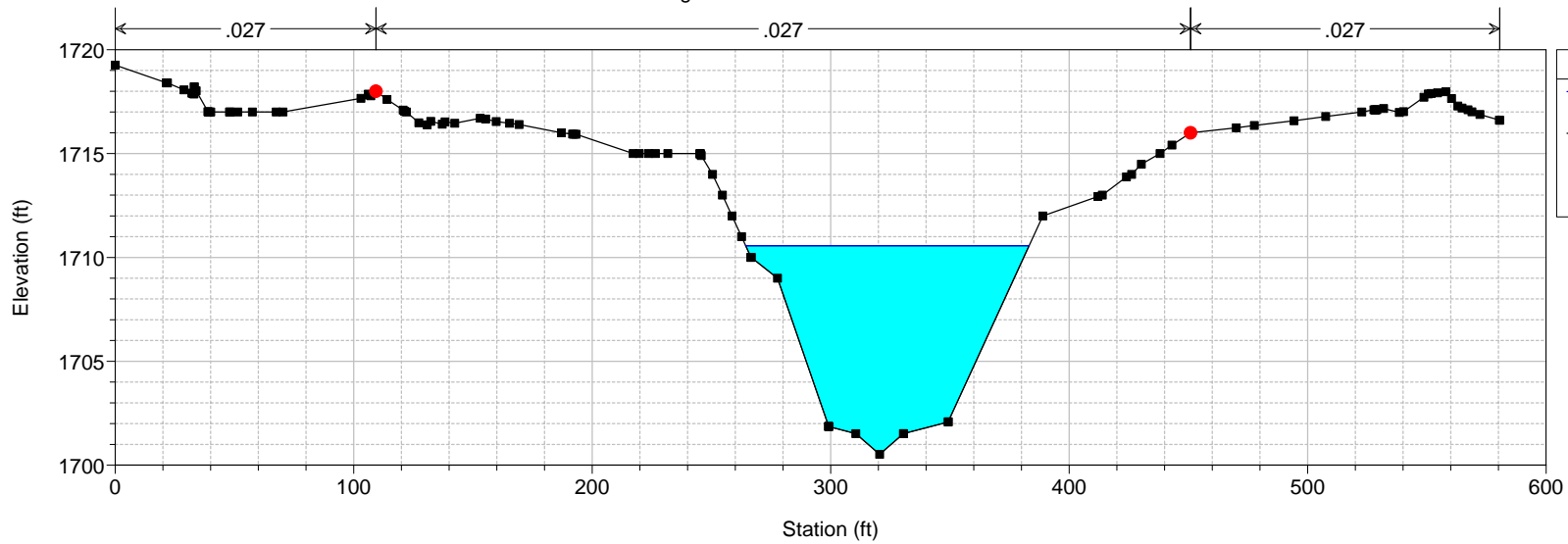
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 32 "FW" 40+34.11

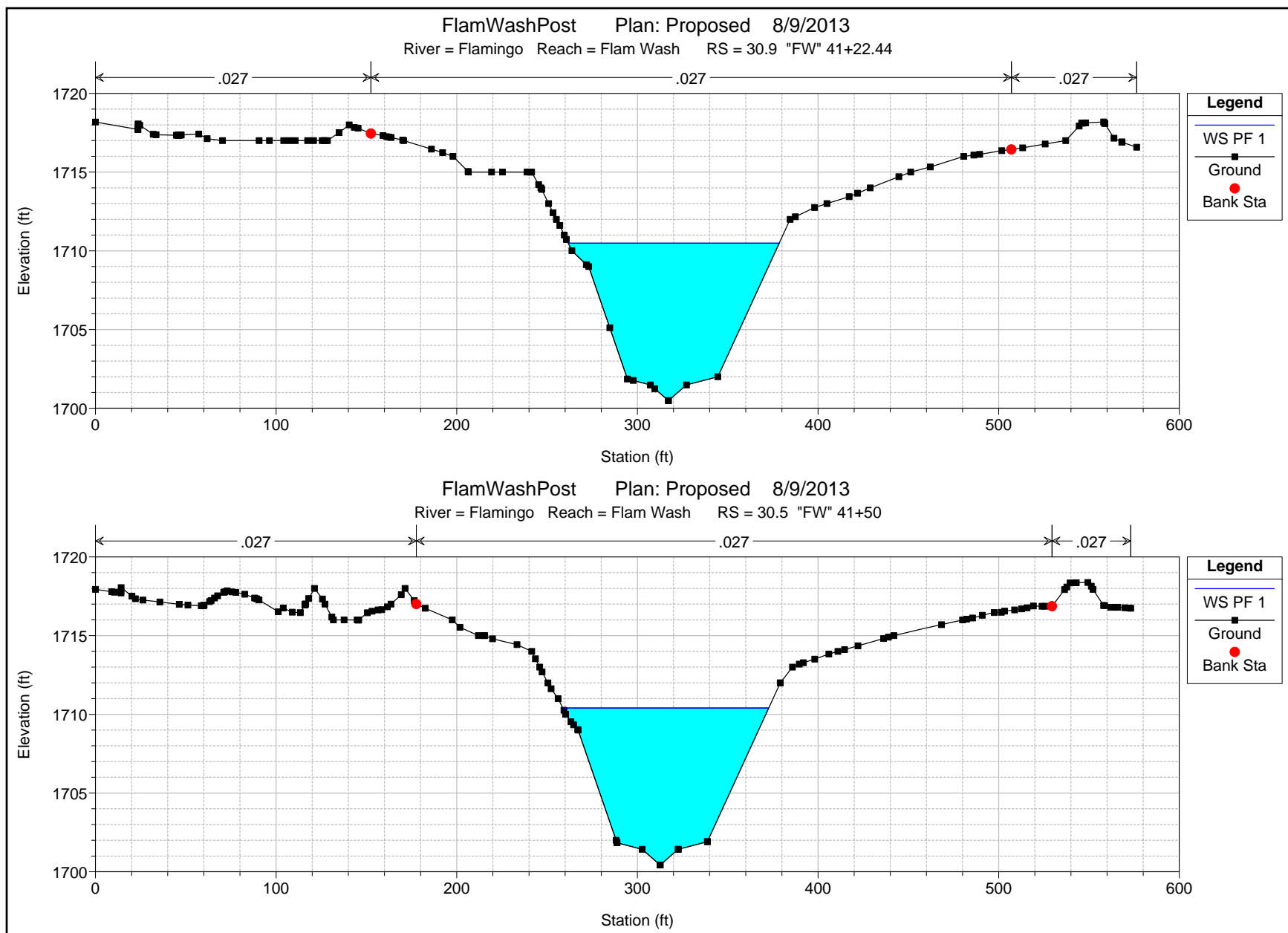


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 31.5 "FW" 40+50

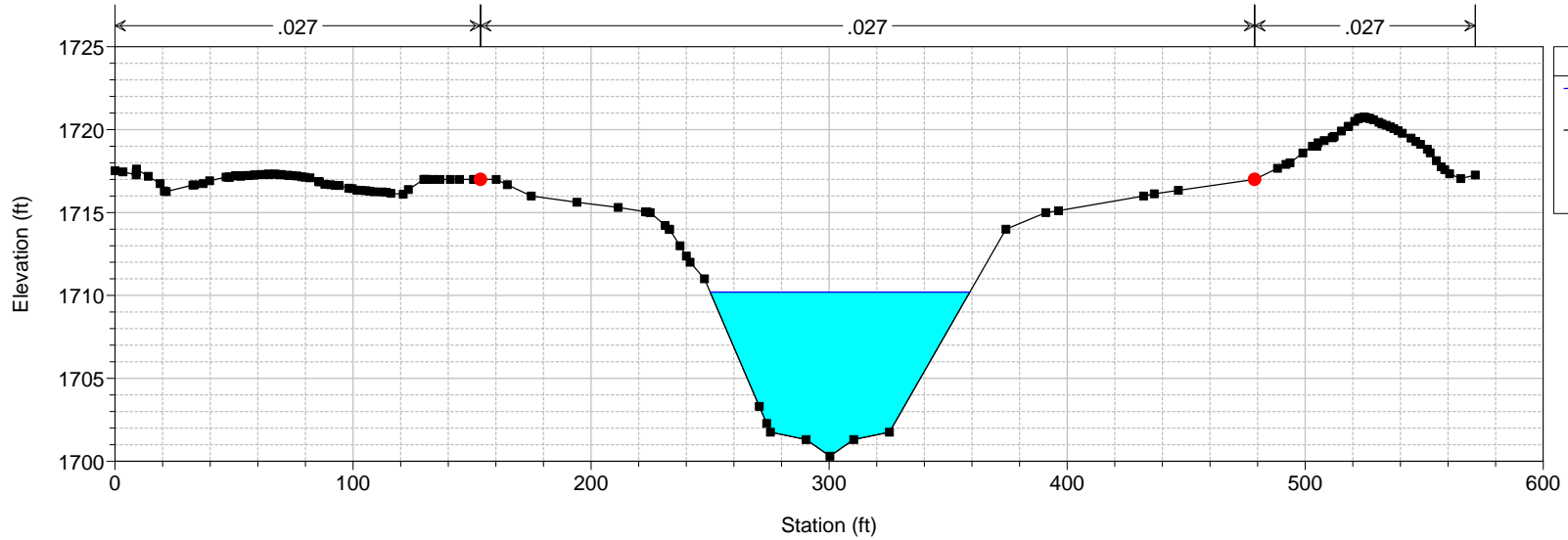


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 31 "FW" 41+00

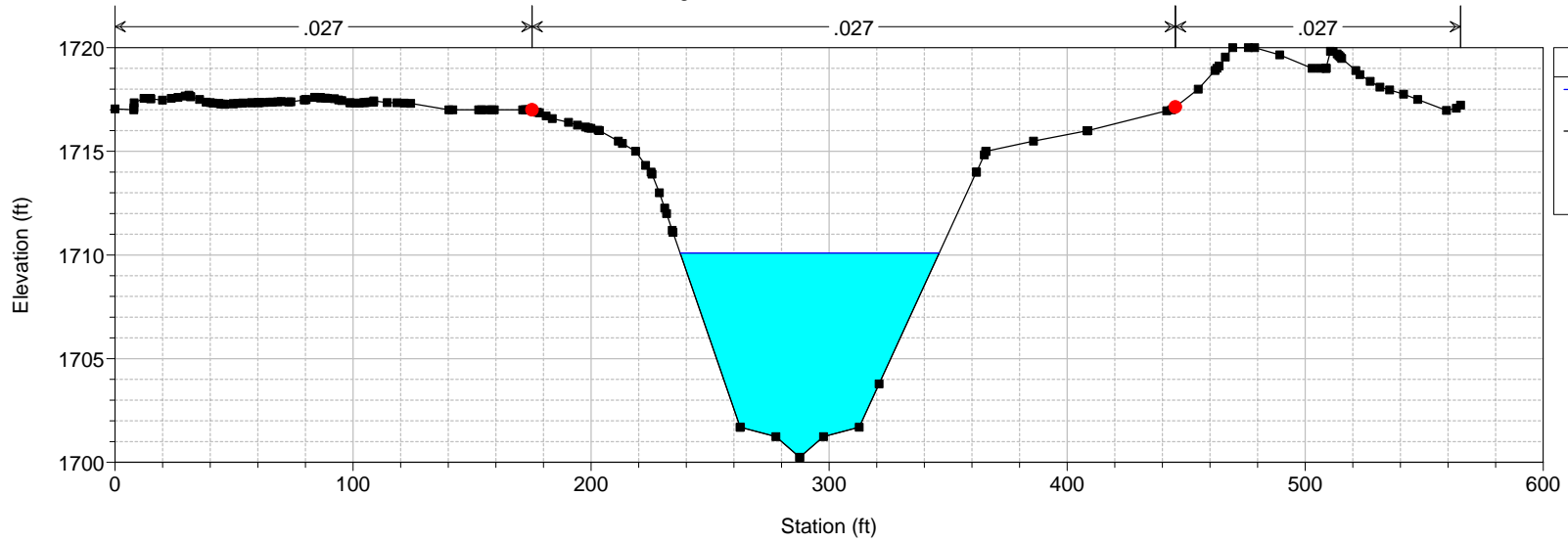


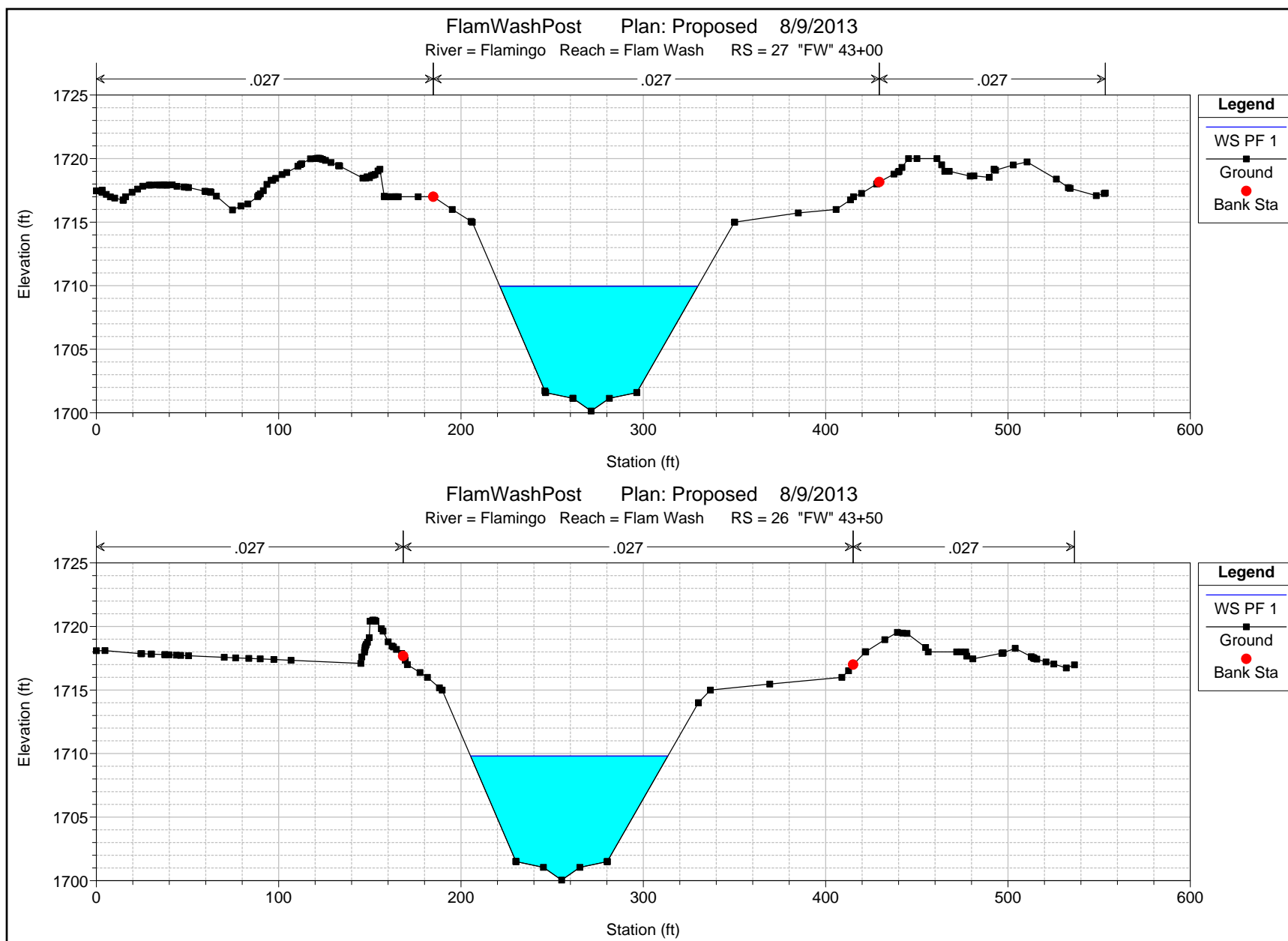


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 29 "FW" 42+10.78



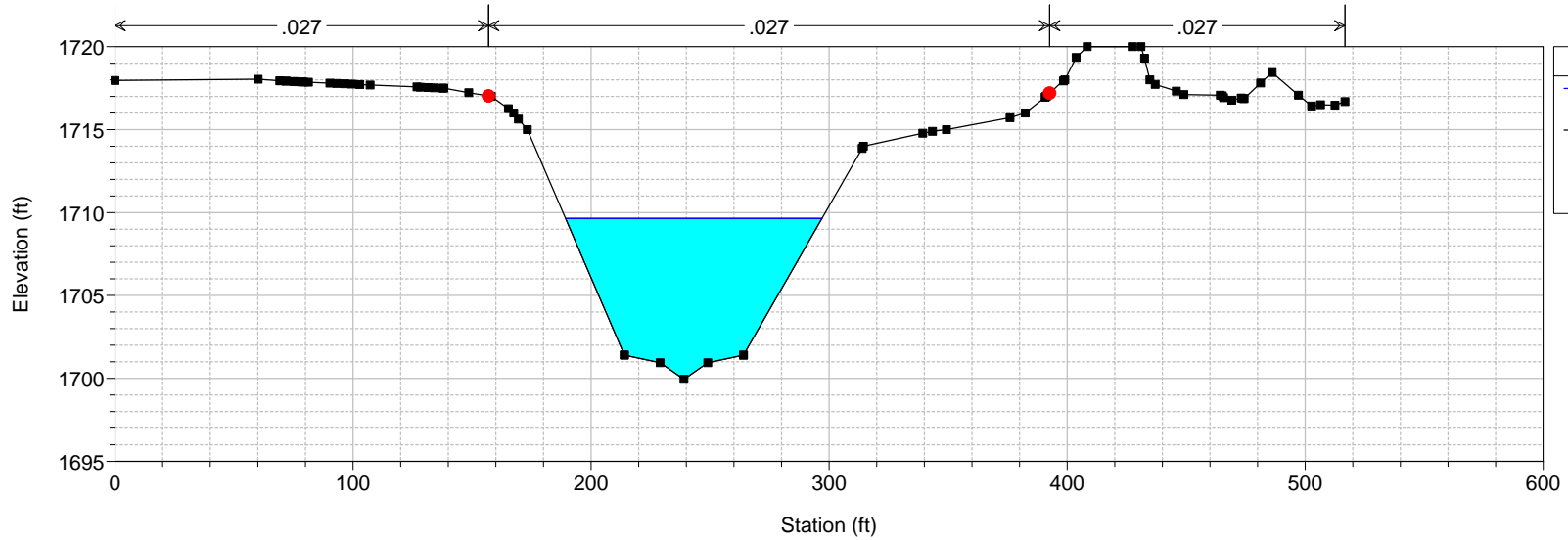
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 28 "FW" 42+50





FlamWashPost Plan: Proposed 8/9/2013

River = Flamingo Reach = Flam Wash RS = 25 "FW" 44+00

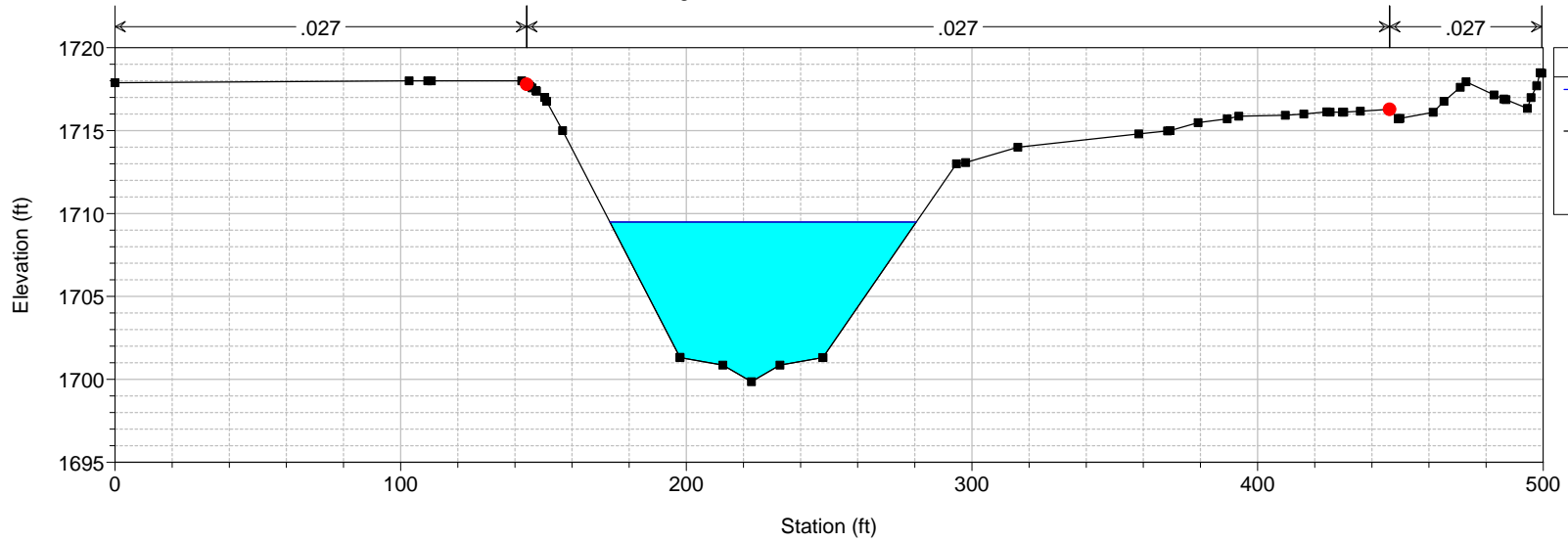


Legend

WS PF 1
Ground
Bank Sta

FlamWashPost Plan: Proposed 8/9/2013

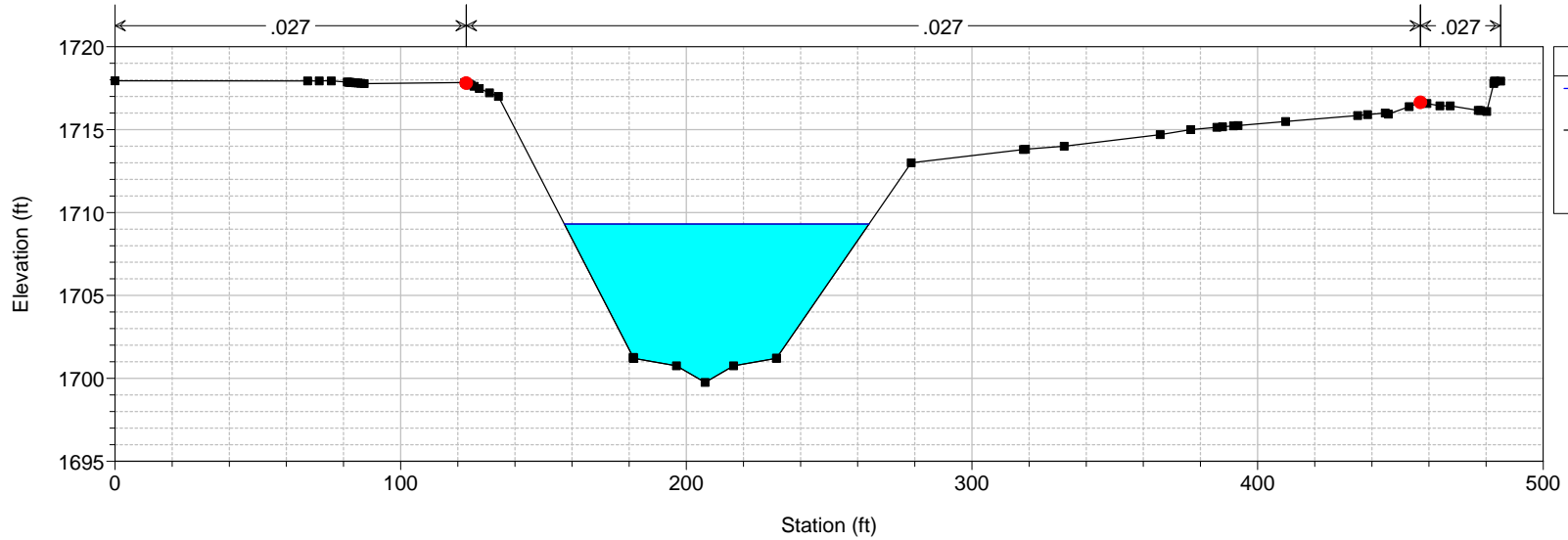
River = Flamingo Reach = Flam Wash RS = 24 "FW" 44+50



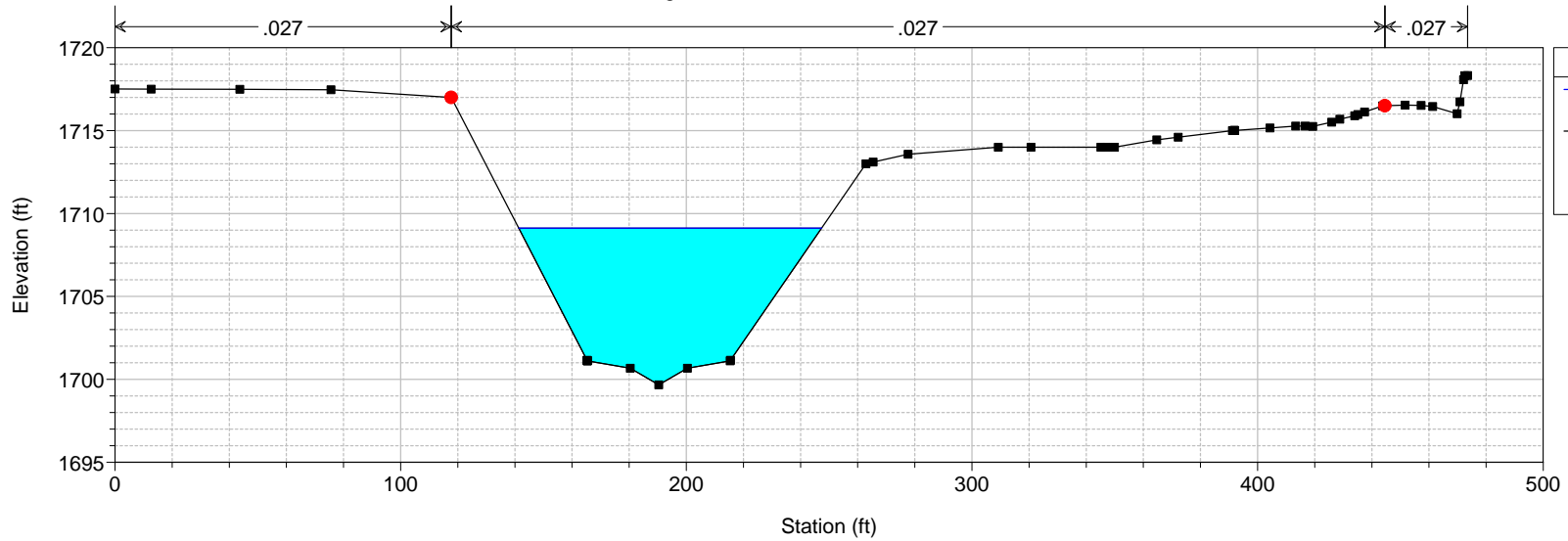
Legend

WS PF 1
Ground
Bank Sta

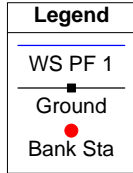
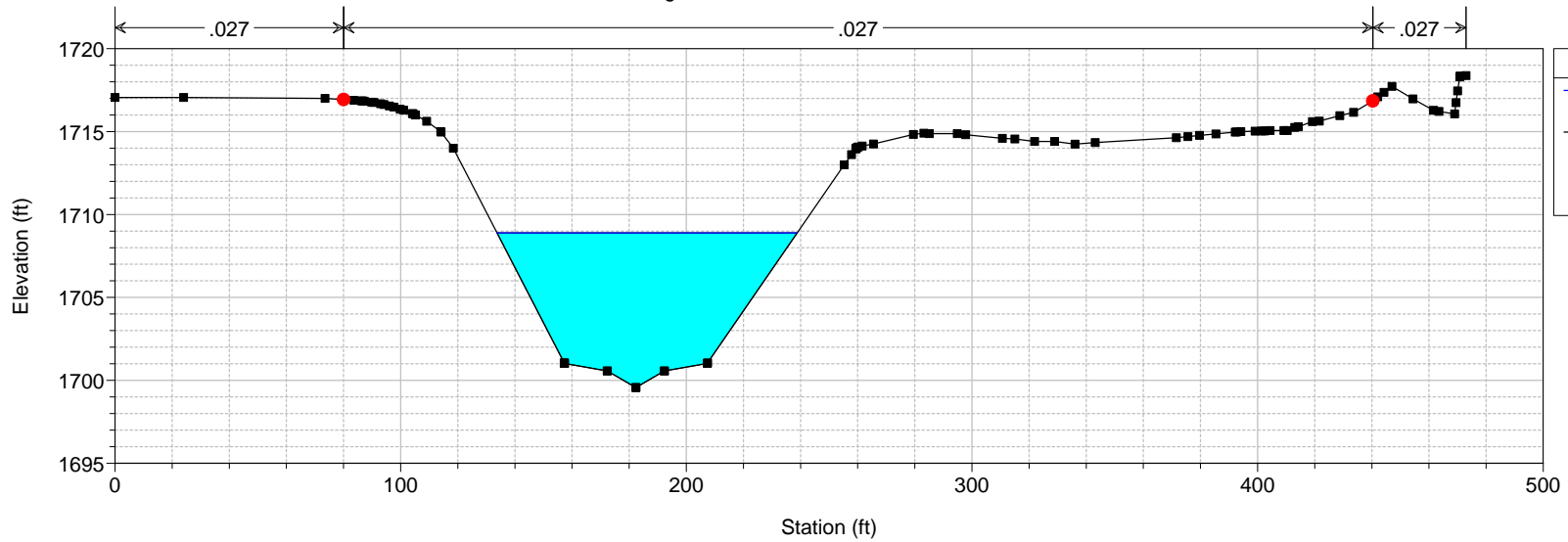
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 23 "FW" 45+00.00



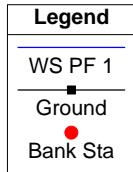
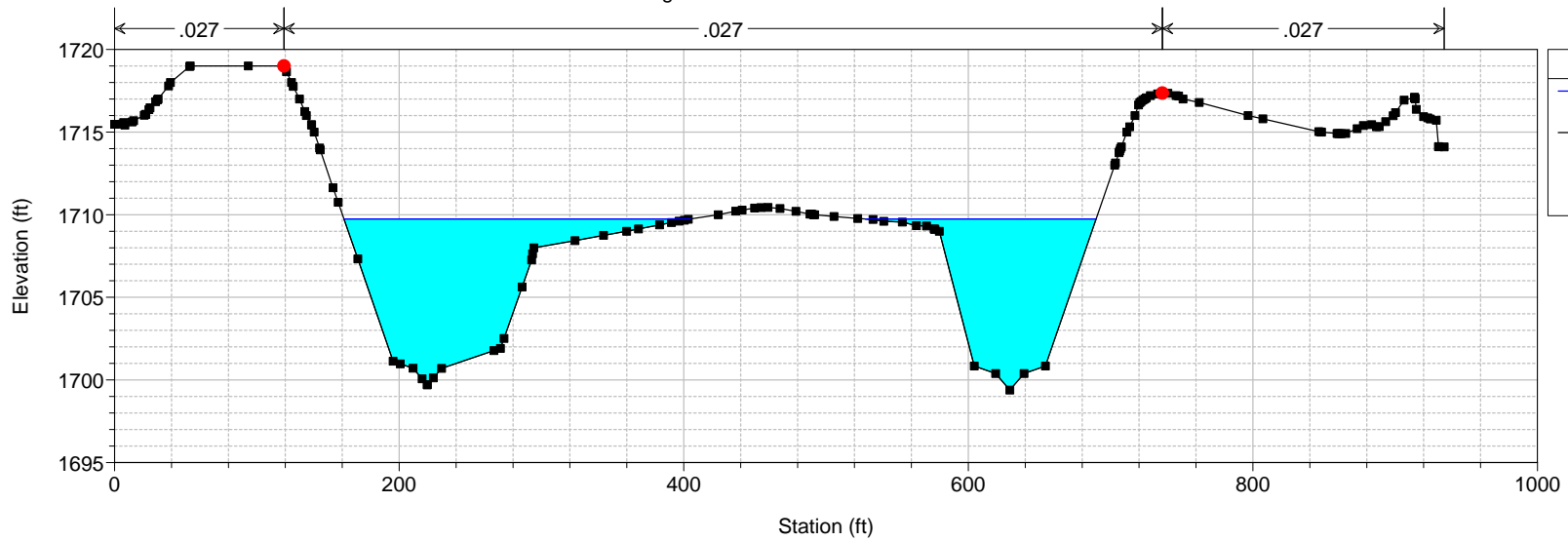
FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 22 "FW" 45+50.00

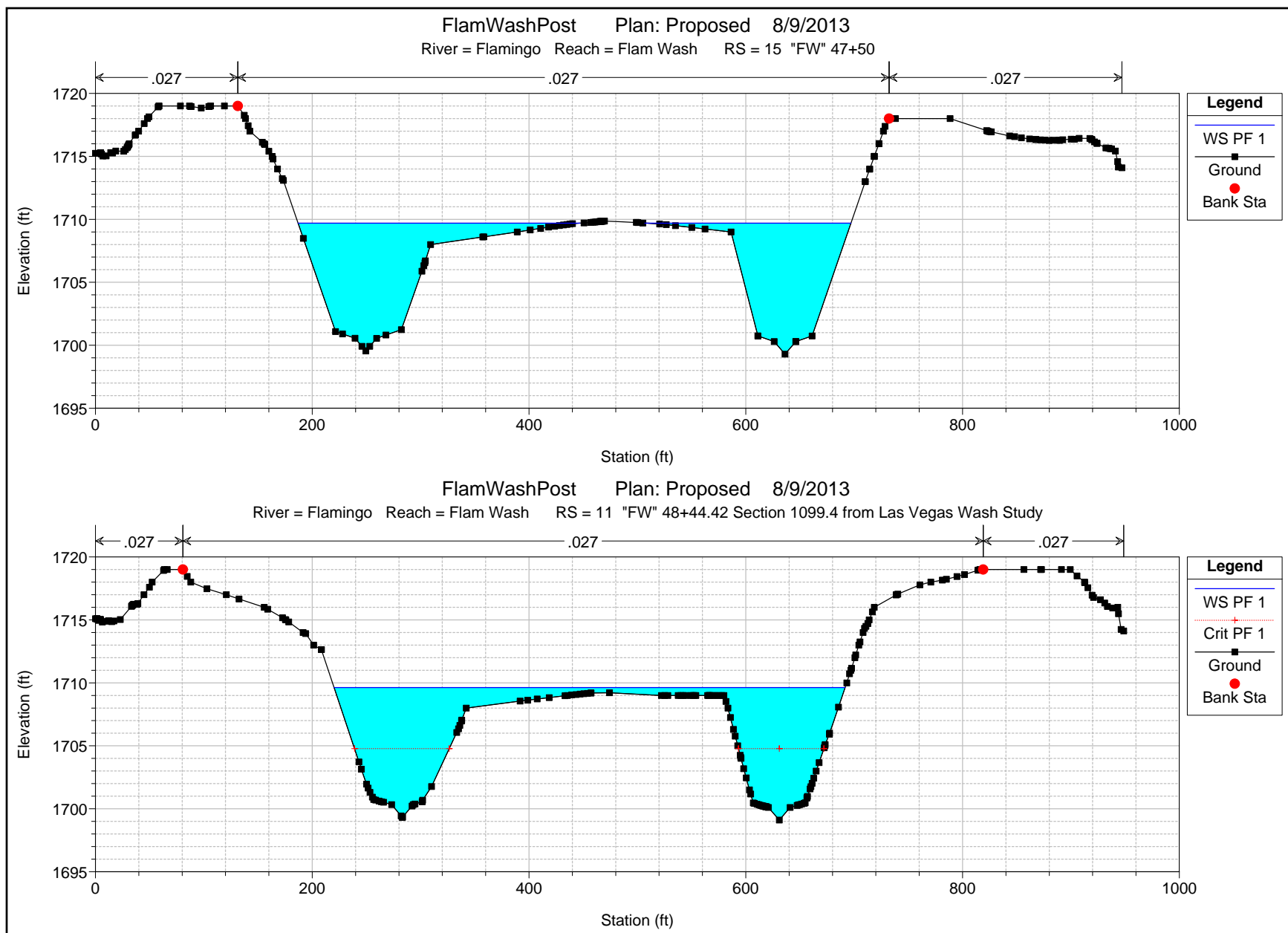


FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 21 "FW" 46+00.00



FlamWashPost Plan: Proposed 8/9/2013
 River = Flamingo Reach = Flam Wash RS = 19 "FW" 46+98.70





HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X       X   X   X   X   X   X   X
X   X   X       X   X   X   X   X   X   X
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X   X   X       X   X   X   X   X       X
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X   X   XXXXXX   XXXX   X   X   X   X   XXXXX

```

PROJECT DATA
Project Title: FlamWashPost
Project File : FlamWashPost.prj
Run Date and Time: 8/9/2013 4:32:07 AM

Project in English units

Project Description:
FLAMINGO WASH
POST-PROJECT CONDITIONS MODEL
DATUM - NAVD88
FILE;
FlamWashPost.prj
STARTING WSE = NORMAL DEPTH
MIXED FLOW RUN (ENGINEERED
CHANNEL FROM I-515 TO NELLIS)
FLAMINGO WASH FIS RESTUDY
PHASE
1,2,3 OF FLAMINGO WASH INCLUDED
FLAMINGO I-515 TO NELLIS
NELLIS
BLVD BRIDGE INVERT
GOLF COURSE LOW-FLOW CHANNEL

PLAN DATA

Plan Title: Proposed
Plan File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Post-Project\FlamWashPost.p05

Geometry Title: Flamingo Proposed
Geometry File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Post-Project\FlamWashPost.g05

Flow Title : FlamWashPost
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Post-Project\FlamWashPost.f03

Plan Summary Information:
Number of: Cross Sections = 113 Multiple Openings = 0
Culverts = 0 Inline Structures = 1
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FlamWashPost
Flow File : P:\ClarkCountyPubWorks\462579LVW\6_Permits\6_CLOMR-LOMR\4_CD\Hydraulic Models\Flamingo Wash\Post-Project\FlamWashPost.f03

Flow Data (cfs)

River	Reach	RS	PF 1
Flamingo	Flam Wash	390	6300
Flamingo	Flam Wash	135	6400

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Flamingo	Flam Wash	PF 1	Normal S = 0.013	Normal S = 0.0019

GEOMETRY DATA

Geometry Title: Flamingo Proposed

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
-----------	------	-------	----------	--------------	-------	--------------	--------

100 170 222 232.15 238 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1793.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.76	Reach Len. (ft)	222.00	232.15	238.00
Crit W.S. (ft)	1787.23	Flow Area (sq ft)		269.93	
E.G. Slope (ft/ft)	0.011420	Area (sq ft)		269.93	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	23.34	Avg. Vel. (ft/s)		23.34	
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)		4.03	
Conv. Total (cfs)	58953.5	Conv. (cfs)		58953.5	
Length Wtd. (ft)	232.15	Wetted Per. (ft)		82.46	
Min Ch El (ft)	1780.56	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	1.47	Cum Volume (acre-ft)		142.08	
C & E Loss (ft)	0.25	Cum SA (acres)		29.36	

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 360

INPUT

Description: Ex. Concrete Channel Downstream of I-515

Station	Elevation	Data	num=	10					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1789.74	100	1779.74	116.751	1779.405	133.5	1779.74	133.5	1789.74
136.5	1789.74	136.5	1779.74	153.251	1779.405	170	1779.74	170	1789.74

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	100	170		323	314.29	310		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1790.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1784.27	Reach Len. (ft)	323.00	314.29	310.00
Crit W.S. (ft)	1786.07	Flow Area (sq ft)		314.92	
E.G. Slope (ft/ft)	0.007130	Area (sq ft)		314.92	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	20.01	Avg. Vel. (ft/s)		20.01	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		4.70	
Conv. Total (cfs)	74610.9	Conv. (cfs)		74610.9	
Length Wtd. (ft)	314.29	Wetted Per. (ft)		85.14	
Min Ch El (ft)	1779.41	Shear (lb/sq ft)		1.65	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	2.07	Cum Volume (acre-ft)		140.52	
C & E Loss (ft)	0.67	Cum SA (acres)		29.00	

Warning: Divided flow computed for this cross-section.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 350

INPUT

Description: Ex. Concrete Channel Downstream of I-515

Station	Elevation	Data	num=	10					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1788.169	100	1778.169	116.751	1777.834	133.51	1778.169	133.51	1788.169
136.51	1788.169	136.51	1778.169	153.251	1777.834	170	1778.169	170	1788.169

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	100	170		439	436.71	435		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1788.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1783.25	Reach Len. (ft)	439.00	436.71	435.00
Crit W.S. (ft)	1784.50	Flow Area (sq ft)		351.38	
E.G. Slope (ft/ft)	0.005118	Area (sq ft)		351.38	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.00	Top Width (ft)		67.00	
Vel Total (ft/s)	17.93	Avg. Vel. (ft/s)		17.93	
Max Chl Dpth (ft)	5.41	Hydr. Depth (ft)		5.24	
Conv. Total (cfs)	88062.1	Conv. (cfs)		88062.1	
Length Wtd. (ft)	436.71	Wetted Per. (ft)		87.32	
Min Ch El (ft)	1777.83	Shear (lb/sq ft)		1.29	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00

Frctn Loss (ft)	1.89	Cum Volume (acre-ft)	138.12
C & E Loss (ft)	0.37	Cum SA (acres)	28.52

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 341

INPUT

Description: Ex. Concrete Channel Downstream of I-515 - "AB" 21+37.2

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1784.3	100	1776.04	135	1775.34	170	1776.04	170	1784.3

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		1268.87	1268.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1785.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.45	Wt. n-Val.		0.015	
W.S. Elev (ft)	1780.49	Reach Len. (ft)	1268.87	1268.87	1268.87
Crit W.S. (ft)	1782.00	Flow Area (sq ft)		336.21	
E.G. Slope (ft/ft)	0.005181	Area (sq ft)		336.21	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	18.74	Avg. Vel. (ft/s)		18.74	
Max Chl Dpth (ft)	5.15	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	87525.8	Conv. (cfs)		87525.8	
Length Wtd. (ft)	1268.87	Wetted Per. (ft)		78.92	
Min Ch El (ft)	1775.34	Shear (lb/sq ft)		1.38	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	2.25	Cum Volume (acre-ft)		134.67	
C & E Loss (ft)	0.05	Cum SA (acres)		27.83	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 313

INPUT

Description: "AB" 34+06.10

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1781.08	100	1771.58	135	1770.88	170	1771.58	170	1781.08

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
100	.02	100	.015	170	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	100	170		255	255	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1780.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.64	Wt. n-Val.		0.015	
W.S. Elev (ft)	1777.11	Reach Len. (ft)	255.00	255.00	255.00
Crit W.S. (ft)	1777.54	Flow Area (sq ft)		411.34	
E.G. Slope (ft/ft)	0.002741	Area (sq ft)		411.34	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	15.32	Avg. Vel. (ft/s)		15.32	
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	120323.6	Conv. (cfs)		120323.6	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		81.07	
Min Ch El (ft)	1770.88	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	170.00	0.00	0.00
Frctn Loss (ft)	4.66	Cum Volume (acre-ft)		123.78	
C & E Loss (ft)	0.54	Cum SA (acres)		25.79	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 311

INPUT

Description: "AB" 36+61.10

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1777.36	0	1770.9	52	1769.86	104	1770.9	104	1777.36

Manning's n Values		num=	3						
--------------------	--	------	---	--	--	--	--	--	--

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1779.7	0	1769.2	52	1768.7	104	1769.2	104	1779.7

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02

Bank	Sta: Left	Right	Coeff	Contr.	Expan.
	0	104	.1		.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 1779.18
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 8

Pier Data					
Pier Station	Upstream=	10.88	Downstream=	10.88	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	22.63	Downstream=	22.63	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	34.38	Downstream=	34.38	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	46.13	Downstream=	46.13	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	57.88	Downstream=	57.88	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	69.63	Downstream=	69.63	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	81.38	Downstream=	81.38	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Pier Data					
Pier Station	Upstream=	93.13	Downstream=	93.13	
Upstream	num=	2			
Width	Elev	Width	Elev		
1.75	1769.18	1.75	1775.18		
Downstream	num=	2			
Width	Elev	Width	Elev		
1.75	1768.81	1.75	1775.18		

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = .29
Yarnell KVal = .75
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1778.89	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1772.83	E.G. Elev (ft)	1778.58	1776.97
Q Total (cfs)	6300.00	W.S. Elev (ft)	1773.73	1774.11
Q Bridge (cfs)	6300.00	Crit W.S. (ft)	1775.11	1774.31
Q Weir (cfs)		Max Chl Dpth (ft)	4.51	5.41
Weir Sta Lft (ft)		Vel Total (ft/s)	17.68	13.57
Weir Sta Rgt (ft)		Flow Area (sq ft)	356.38	464.31
Weir Submerg		Froude # Chl	1.57	1.05
Weir Max Depth (ft)		Specif Force (cu ft)	4126.75	3992.27
Min El Weir Flow (ft)	1779.19	Hydr Depth (ft)	3.96	5.16
Min El Prs (ft)	1775.18	W.P. Total (ft)	161.19	182.82
Delta EG (ft)	1.78	Conv. Total (cfs)	59914.3	85619.6
Delta WS (ft)	0.38	Top Width (ft)	90.00	90.00
BR Open Area (sq ft)	487.08	Frctn Loss (ft)		
BR Open Vel (ft/s)	17.68	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.53	0.86
Br Sel Method	Momentum	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 295

INPUT

Description: = "AB" 38+20.93

Station Elevation Data		num=	Sta		Elev	Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1779.7	0	1769.2	52	1768.7	104	1769.2	104	1779.7

Manning's n Values		num=	Sta		n Val	Sta	n Val
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104	15.01	15.01	15.01	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1777.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1772.45	Reach Len. (ft)	15.01	15.01	15.01
Crit W.S. (ft)	1773.78	Flow Area (sq ft)		363.84	
E.G. Slope (ft/ft)	0.006238	Area (sq ft)		363.84	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	17.32	Avg. Vel. (ft/s)		17.32	
Max Chl Dpth (ft)	3.75	Hydr. Depth (ft)		3.50	
Conv. Total (cfs)	79768.6	Conv. (cfs)		79768.6	
Length Wtd. (ft)	15.01	Wetted Per. (ft)		110.50	
Min Ch El (ft)	1768.70	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		121.26	
C & E Loss (ft)		Cum SA (acres)		25.16	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 285

INPUT

Description: = Sta. 38+35.94 Add Roughness Elements

Station Elevation Data		num=	Sta		Elev	Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1778.27	0	1769.27	52	1768.19	104	1769.27	104	1778.29

Manning's n Values		num=	Sta		n Val	Sta	n Val
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.055	104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104	9	9	9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1776.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.61	Wt. n-Val.		0.055	
W.S. Elev (ft)	1772.25	Reach Len. (ft)	9.00	9.00	9.00
Crit W.S. (ft)	1773.58	Flow Area (sq ft)		365.74	
E.G. Slope (ft/ft)	0.081892	Area (sq ft)		365.74	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	17.23	Avg. Vel. (ft/s)		17.23	
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)		3.52	
Conv. Total (cfs)	22015.1	Conv. (cfs)		22015.1	
Length Wtd. (ft)	9.00	Wetted Per. (ft)		109.98	
Min Ch El (ft)	1768.19	Shear (lb/sq ft)		17.00	

Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		121.13	
C & E Loss (ft)	0.01	Cum SA (acres)		25.12	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 284

INPUT

Description: = Sta. 38+44.94 Begin 104'x9' Rect. Channel with Roughness Elements

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1776	0	1768.73	52	1767.96	104	1768.73
						104	1776

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.055	104	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		201	201	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1775.97	Element		Left OB	Channel	Right OB
Vel Head (ft)	3.71	Wt. n-Val.			0.055	
W.S. Elev (ft)	1772.27	Reach Len. (ft)	201.00		201.00	201.00
Crit W.S. (ft)	1773.18	Flow Area (sq ft)			407.67	
E.G. Slope (ft/ft)	0.057796	Area (sq ft)			407.67	
Q Total (cfs)	6300.00	Flow (cfs)			6300.00	
Top Width (ft)	104.00	Top Width (ft)			104.00	
Vel Total (ft/s)	15.45	Avg. Vel. (ft/s)			15.45	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)			3.92	
Conv. Total (cfs)	26205.4	Conv. (cfs)			26205.4	
Length Wtd. (ft)	201.00	Wetted Per. (ft)			111.08	
Min Ch El (ft)	1767.96	Shear (lb/sq ft)			13.24	
Alpha	1.00	Stream Power (lb/ft s)	104.00		0.00	0.00
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)			121.05	
C & E Loss (ft)	0.27	Cum SA (acres)			25.10	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 246

INPUT

Description: = Sta. 40+45.94 End Roughness Elements

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1767.59	0	1756.67	52	1755.59	104	1756.67
						104	1767.59

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	104	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		476.43	476.43	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1768.60	Element		Left OB	Channel	Right OB
Vel Head (ft)	10.09	Wt. n-Val.			0.015	
W.S. Elev (ft)	1758.51	Reach Len. (ft)	476.43		476.43	476.43
Crit W.S. (ft)	1760.98	Flow Area (sq ft)			247.17	
E.G. Slope (ft/ft)	0.021870	Area (sq ft)			247.17	
Q Total (cfs)	6300.00	Flow (cfs)			6300.00	
Top Width (ft)	104.00	Top Width (ft)			104.00	
Vel Total (ft/s)	25.49	Avg. Vel. (ft/s)			25.49	
Max Chl Dpth (ft)	2.92	Hydr. Depth (ft)			2.38	
Conv. Total (cfs)	42600.7	Conv. (cfs)			42600.7	
Length Wtd. (ft)	476.43	Wetted Per. (ft)			107.70	
Min Ch El (ft)	1755.59	Shear (lb/sq ft)			3.13	
Alpha	1.00	Stream Power (lb/ft s)	104.00		0.00	0.00
Frctn Loss (ft)	6.74	Cum Volume (acre-ft)			119.54	
C & E Loss (ft)	0.64	Cum SA (acres)			24.62	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 229

INPUT

Description: = Sta. 45+22.37 Transition Structure

Station Elevation Data		num=	5				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1762.08	0	1752.08	52	1751	104	1752.08
						104	1762.08

Manning's n Values		num=	3
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Sta	n Val	Sta	n Val	Sta	n Val		
0	.02	0	.015	104	.02		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	104		255	255	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1760.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.15	Wt. n-Val.		0.015	
W.S. Elev (ft)	1754.58	Reach Len. (ft)	255.00	255.00	255.00
Crit W.S. (ft)	1756.39	Flow Area (sq ft)		316.54	
E.G. Slope (ft/ft)	0.009746	Area (sq ft)		316.54	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	104.00	Top Width (ft)		104.00	
Vel Total (ft/s)	19.90	Avg. Vel. (ft/s)		19.90	
Max Chl Dpth (ft)	3.58	Hydr. Depth (ft)		3.04	
Conv. Total (cfs)	63814.4	Conv. (cfs)		63814.4	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		109.03	
Min Ch El (ft)	1751.00	Shear (lb/sq ft)		1.77	
Alpha	1.00	Stream Power (lb/ft s)	104.00	0.00	0.00
Frctn Loss (ft)	6.68	Cum Volume (acre-ft)		116.46	
C & E Loss (ft)	1.18	Cum SA (acres)		23.49	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 222

INPUT
Description: = Sta. 47+77.37
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1752.05	0	1742.05	35	1741.35	70	1742.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	70	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	70		1322.63	1322.63	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1756.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1744.95	Reach Len. (ft)	1322.63	1322.63	1322.63
Crit W.S. (ft)	1748.01	Flow Area (sq ft)		227.51	
E.G. Slope (ft/ft)	0.018052	Area (sq ft)		227.51	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	27.69	Avg. Vel. (ft/s)		27.69	
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)		3.25	
Conv. Total (cfs)	46889.9	Conv. (cfs)		46889.9	
Length Wtd. (ft)	1322.63	Wetted Per. (ft)		75.81	
Min Ch El (ft)	1741.35	Shear (lb/sq ft)		3.38	
Alpha	1.00	Stream Power (lb/ft s)	70.00	0.00	0.00
Frctn Loss (ft)	3.30	Cum Volume (acre-ft)		114.86	
C & E Loss (ft)	0.58	Cum SA (acres)		22.98	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 193

INPUT
Description: = Sta. 60+98.98
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1746.76	0	1736.76	35	1736.06	70	1736.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	70	.02

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	70		150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1746.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1741.98	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	1742.72	Flow Area (sq ft)		389.79	
E.G. Slope (ft/ft)	0.003247	Area (sq ft)		389.79	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	70.00	Top Width (ft)		70.00	
Vel Total (ft/s)	16.16	Avg. Vel. (ft/s)		16.16	
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)		5.57	
Conv. Total (cfs)	110562.4	Conv. (cfs)		110562.4	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		80.45	

Min Ch El (ft)	1736.06	Shear (lb/sq ft)	0.98		
Alpha	1.00	Stream Power (lb/ft s)	70.00	0.00	
Frctn Loss (ft)	8.47	Cum Volume (acre-ft)	105.49		
C & E Loss (ft)	2.36	Cum SA (acres)	20.85		

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 191

INPUT
Description: = Sta. 62+50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1743.91	0	1736.36	45	1735.46	90	1736.36	90	1743.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	90	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	90	2591.64 2591.64	2591.64	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1745.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1739.60	Reach Len. (ft)	2591.64	2591.64	2591.64
Crit W.S. (ft)	1741.23	Flow Area (sq ft)		332.05	
E.G. Slope (ft/ft)	0.007062	Area (sq ft)		332.05	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	18.97	Avg. Vel. (ft/s)		18.97	
Max Chl Dpth (ft)	4.14	Hydr. Depth (ft)		3.69	
Conv. Total (cfs)	74970.6	Conv. (cfs)		74970.6	
Length Wtd. (ft)	2591.64	Wetted Per. (ft)		96.50	
Min Ch El (ft)	1735.46	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)	90.00	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)		104.25	
C & E Loss (ft)	0.15	Cum SA (acres)		20.58	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 142

INPUT
Description: = Sta. 88+41.64
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.99	0	1725.99	45	1725.09	90	1725.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	90	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	90	22.5 22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1730.48	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	1730.86	Flow Area (sq ft)		444.30	
E.G. Slope (ft/ft)	0.002767	Area (sq ft)		444.30	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	90.00	Top Width (ft)		90.00	
Vel Total (ft/s)	14.18	Avg. Vel. (ft/s)		14.18	
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)		4.94	
Conv. Total (cfs)	119758.2	Conv. (cfs)		119758.2	
Length Wtd. (ft)	22.50	Wetted Per. (ft)		98.99	
Min Ch El (ft)	1725.09	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)	90.00	0.00	0.00
Frctn Loss (ft)	10.85	Cum Volume (acre-ft)		81.15	
C & E Loss (ft)	0.74	Cum SA (acres)		15.22	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 138

INPUT

Description: = Sta. 88+64.14

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1733.93	0	1725.93	46.5	1725	93	1725.93	93	1733.93

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	93	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	93	39.15	39.15	39.15	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1729.96	Reach Len. (ft)	39.15	39.15	39.15
Crit W.S. (ft)	1730.67	Flow Area (sq ft)		418.39	
E.G. Slope (ft/ft)	0.003477	Area (sq ft)		418.39	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	15.06	Avg. Vel. (ft/s)		15.06	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		4.50	
Conv. Total (cfs)	106843.6	Conv. (cfs)		106843.6	
Length Wtd. (ft)	39.15	Wetted Per. (ft)		101.09	
Min Ch El (ft)	1725.00	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	93.00	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		80.93	
C & E Loss (ft)	0.04	Cum SA (acres)		15.17	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 135

INPUT

Description: = Sta. 89+02.27

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.77	0	1724.77	46.5	1723.84	93	1724.77	93	1732.77

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	93	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	93	12.25	12.25	12.25	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1733.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1728.13	Reach Len. (ft)	12.25	12.25	12.25
Crit W.S. (ft)	1729.56	Flow Area (sq ft)		355.52	
E.G. Slope (ft/ft)	0.006064	Area (sq ft)		355.52	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	93.00	Top Width (ft)		93.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)		3.82	
Conv. Total (cfs)	82183.6	Conv. (cfs)		82183.6	
Length Wtd. (ft)	12.25	Wetted Per. (ft)		99.73	
Min Ch El (ft)	1723.84	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)	93.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		80.58	
C & E Loss (ft)	0.15	Cum SA (acres)		15.09	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 131

INPUT

Description: = Sta. 89+15.54

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1731.47	0	1723.47	52.5	1723.47	105	1723.47	105	1731.47

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	105	.02				

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	0	105	114.06	114.06	114.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1732.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1726.46	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1728.32	Flow Area (sq ft)		313.86	
E.G. Slope (ft/ft)	0.010595	Area (sq ft)		313.86	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	105.00	Top Width (ft)		105.00	
Vel Total (ft/s)	20.39	Avg. Vel. (ft/s)		20.39	
Max Chl Dpth (ft)	2.99	Hydr. Depth (ft)		2.99	
Conv. Total (cfs)	62178.0	Conv. (cfs)		62178.0	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		110.98	
Min Ch El (ft)	1723.47	Shear (lb/sq ft)		1.87	
Alpha	1.00	Stream Power (lb/ft s)	105.00	0.00	0.00

Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	80.49
C & E Loss (ft)	0.14	Cum SA (acres)	15.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE

RIVER: Flamingo
 REACH: Flam Wash RS: 125

INPUT

Description: Nellis Blvd Bridge.
 Distance from Upstream XS = .1
 Deck/Roadway Width = 113.9
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	1735.5	1728.97			105	1735	1728.97		

Upstream Bridge Cross Section Data

Station Elevation Data		num=	5						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1731.47	0	1723.47	52.5	1723.47	105	1723.47	105	1731.47

Manning's n Values		num=	3						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.015	105	.02				

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	0	105	.1		.3

Downstream Deck/Roadway Coordinates

num=		2							
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
0	1736	1728.27			600	1734.5	1728.27		

Downstream Bridge Cross Section Data

Station Elevation Data		num=	113						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.73	2.18	1732.85	3.68	1732.84	19.21	1732.92	19.59	1732.92
20.47	1732.89	23.29	1732.82	26	1732.74	28.61	1732.78	30.25	1732.8
32.22	1732.78	34.26	1732.79	44.06	1733.07	47.75	1733.09	49.7	1733.24
50.13	1733.27	53.02	1733.38	53.36	1733.4	56.07	1733.44	56.55	1733.46
56.94	1733.48	59.15	1733.5	59.53	1733.49	61.75	1733.44	62.18	1733.42
62.89	1733.32	68.41	1733	70.87	1732.86	71.42	1732.55	73.14	1732.41
82.64	1731.96	86.85	1731.65	88.25	1731.58	91.48	1731.4	92.2	1731.36
97.03	1731.03	98.11	1730.98	98.22	1730.97	98.62	1730.91	103.21	1730.56
103.87	1730.46	117.78	1729.09	117.89	1729.09	118.86	1729.12	118.97	1723.11
175.75	1722.86	224.99	1723.12	225.25	1729.53	226.22	1729.51	226.65	1729.51
240.16	1730.38	240.51	1730.39	241.38	1730.42	244.22	1730.47	244.44	1730.48
244.48	1730.48	244.54	1730.48	246.73	1730.55	246.89	1730.55	248.05	1730.58
249.94	1730.63	253.49	1730.72	255.34	1730.77	255.68	1730.83	257.47	1731.01
259.86	1731.05	262.53	1731.07	263.64	1731.1	264.63	1731.13	266.19	1731.18
269.69	1731.24	270.7	1731.19	270.94	1731.2	271.88	1731.22	273.03	1731.24
277.17	1731.49	280.98	1731.72	281.75	1731.78	282.88	1731.88	289.02	1732.02
292.33	1732.02	296.39	1732.03	299.85	1732.1	302.18	1732.03	307.73	1731.73
337.64	1731.27	341.77	1731.2	343.78	1731.06	381.35	1730.91	386.13	1730.74
386.92	1730.69	412.46	1730.65	414.96	1730.78	417.8	1730.82	420.32	1730.8
420.66	1730.8	425.91	1730.83	434.7	1730.72	441.78	1730.46	443.41	1730.36
443.77	1730.36	444.18	1730.35	444.7	1730.34	450	1730.29	451.05	1730.25
452.61	1730.17	454.64	1730.07	457.08	1729.93	457.9	1729.89	460.19	1729.72
461.86	1729.72	463.1	1729.71	463.57	1729.71				

Manning's n Values		num=	4						
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.027	118.86	.015	225.25	.27	463.1	.027		

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	118.86	225.25	.1		.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data

Pier Station	Upstream=	35	Downstream=	157.17
Upstream	num=	2		
Width	Elev	Width	Elev	
3.5	1722	3.5	1732	
Downstream	num=	2		
Width	Elev	Width	Elev	
3.5	1722	3.5	1732	

Pier Data

Pier Station	Upstream=	70	Downstream=	192.17
Upstream	num=	2		
Width	Elev	Width	Elev	
3.5	1722	3.5	1732	
Downstream	num=	2		
Width	Elev	Width	Elev	
3.5	1722	3.5	1732	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
 Energy

Momentum Cd = .29
Yarnell KVal = .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 1

E.G. US. (ft)	1732.92	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1726.46	E.G. Elev (ft)	1732.78	1731.34
Q Total (cfs)	6400.00	W.S. Elev (ft)	1726.80	1726.74
Q Bridge (cfs)	6400.00	Crit W.S. (ft)	1728.57	1728.05
Q Weir (cfs)		Max Chl Dpth (ft)	3.33	3.88
Weir Sta Lft (ft)		Vel Total (ft/s)	19.63	17.21
Weir Sta Rgt (ft)		Flow Area (sq ft)	325.99	371.80
Weir Submerg		Froude # Chl	1.90	1.57
Weir Max Depth (ft)		Specif Force (cu ft)	4442.25	4161.53
Min El Weir Flow (ft)	1735.01	Hydr Depth (ft)	3.33	3.75
Min El Prs (ft)	1728.97	W.P. Total (ft)	117.96	121.47
Delta EG (ft)	1.56	Conv. Total (cfs)	63594.9	77646.3
Delta WS (ft)	0.12	Top Width (ft)	98.00	99.23
BR Open Area (sq ft)	523.58	Frctn Loss (ft)		
BR Open Vel (ft/s)	19.63	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.75	1.30
Br Sel Method	Momentum	Power Total (lb/ft s)	0.00	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 121

INPUT

Description: "FW" 10+62.12

Station	Elevation	Data	num=	113					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.73	2.18	1732.85	3.68	1732.84	19.21	1732.92	19.59	1732.92
20.47	1732.89	23.29	1732.82	26	1732.74	28.61	1732.78	30.25	1732.8
32.22	1732.78	34.26	1732.79	44.06	1733.07	47.75	1733.09	49.7	1733.24
50.13	1733.27	53.02	1733.38	53.36	1733.4	56.07	1733.44	56.55	1733.46
56.94	1733.48	59.15	1733.5	59.53	1733.49	61.75	1733.44	62.18	1733.42
62.89	1733.32	68.41	1733	70.87	1732.86	71.42	1732.55	73.14	1732.41
82.64	1731.96	86.85	1731.65	88.25	1731.58	91.48	1731.4	92.2	1731.36
97.03	1731.03	98.11	1730.98	98.22	1730.97	98.62	1730.91	103.21	1730.56
103.87	1730.46	117.78	1729.09	117.89	1729.09	118.86	1729.12	118.97	1723.11
175.75	1722.86	224.99	1723.12	225.25	1729.53	226.22	1729.51	226.65	1729.51
240.16	1730.38	240.51	1730.39	241.38	1730.42	244.22	1730.47	244.44	1730.48
244.48	1730.48	244.54	1730.48	246.73	1730.55	246.89	1730.55	248.05	1730.58
249.94	1730.63	253.49	1730.72	255.34	1730.77	255.68	1730.83	257.47	1731.01
259.86	1731.05	262.53	1731.07	263.64	1731.1	264.63	1731.13	266.19	1731.18
269.69	1731.24	270.7	1731.19	270.94	1731.2	271.88	1731.22	273.03	1731.24
277.17	1731.49	280.98	1731.72	281.75	1731.78	282.88	1731.88	289.02	1732.02
292.33	1732.02	296.39	1732.03	299.85	1732.1	302.18	1732.03	307.73	1731.73
337.64	1731.27	341.77	1731.2	343.78	1731.06	381.35	1730.91	386.13	1730.74
386.92	1730.69	412.46	1730.65	414.96	1730.78	417.8	1730.82	420.32	1730.8
420.66	1730.8	425.91	1730.83	434.7	1730.72	441.78	1730.46	443.41	1730.36
443.77	1730.36	444.18	1730.35	444.7	1730.34	450	1730.29	451.05	1730.25
452.61	1730.17	454.64	1730.07	457.08	1729.93	457.9	1729.89	460.19	1729.72
461.86	1729.72	463.1	1729.71	463.57	1729.71				

Manning's n	Values	num=	4				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.027	118.86	.015	225.25	.27	463.1	.027

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	118.86	225.25		23.49	22.88	22.92		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1731.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.02	Wt. n-Val.		0.015	
W.S. Elev (ft)	1726.34	Reach Len. (ft)	23.49	22.88	22.92
Crit W.S. (ft)	1727.82	Flow Area (sq ft)		356.07	
E.G. Slope (ft/ft)	0.007083	Area (sq ft)		356.07	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	106.21	Top Width (ft)		106.21	
Vel Total (ft/s)	17.97	Avg. Vel. (ft/s)		17.97	
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)		3.35	
Conv. Total (cfs)	76044.8	Conv. (cfs)		76044.8	
Length Wtd. (ft)	22.88	Wetted Per. (ft)		112.48	
Min Ch El (ft)	1722.86	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)	463.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		80.49	
C & E Loss (ft)		Cum SA (acres)		15.06	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 116

INPUT

Description: "FW" 10+85

Station Elevation Data		num=		162							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.55	3.31	1732.48	6.84	1732.4	8.91	1732.59	10.33	1732.65		
22.85	1732.66	24.35	1732.67	24.85	1732.68	36.02	1733	36.22	1733.01		
36.34	1733.01	36.5	1733.01	36.98	1733.02	42.95	1733.07	43.75	1733.07		
43.8	1733.07	44.85	1733.11	45.57	1733.14	48.25	1733.26	50.71	1733.13		
51.58	1733.08	54.57	1733.13	57.38	1733.18	60.59	1733.23	64.33	1733.31		
66.13	1733.52	67.17	1733.67	73.55	1734.26	77.8	1734.59	79.03	1734.66		
80.61	1734.72	81.59	1734.74	82.89	1734.79	83.74	1734.8	85.16	1734.86		
85.99	1734.84	87.02	1734.84	88.43	1734.73	92.01	1734.65	92.59	1734.64		
93.27	1734.6	94.15	1734.53	94.99	1734.5	96.04	1734.46	97.96	1734.3		
99.3	1734.16	101.13	1733.93	101.64	1733.86	103.02	1733.66	105.61	1733.27		
109.71	1732.47	110.65	1732.3	120.6	1730.54	120.61	1730.53	120.68	1730.51		
122.11	1730.04	123.53	1729.57	123.79	1729.56	128.55	1729.47	128.56	1729.47		
129.56	1729.47	129.57	1723.7	182.57	1722.64	235.57	1723.7	235.58	1729.52		
236.56	1729.52	236.57	1729.52	236.58	1729.52	241.55	1729.61	241.6	1729.62		
242.11	1729.64	242.12	1729.66	249.27	1730.15	256.08	1730.58	258.47	1730.65		
260.51	1730.87	260.81	1730.91	261.18	1730.91	262.16	1731.07	262.73	1731.11		
266.29	1731.29	271.43	1731.64	277.97	1732.04	279.06	1732.18	282.27	1732.63		
286.02	1733.16	287.41	1733.34	295.99	1734.79	298.13	1735.02	302.37	1735.75		
303.52	1735.94	304.62	1736.15	305.12	1736.19	306	1736.26	307.39	1736.3		
307.61	1736.31	307.77	1736.31	309.74	1736.29	312.31	1736.28	312.41	1736.27		
313.28	1736.23	318.11	1735.99	320.64	1735.73	325.98	1735.48	327.49	1735.37		
330.98	1735.33	331.94	1735.3	335.43	1735.3	337.12	1735.28	340.03	1735.37		
346.48	1735.68	347.1	1735.72	347.68	1735.74	355.62	1735.92	356.53	1735.94		
356.58	1735.95	356.61	1735.95	362.91	1735.95	364.28	1735.95	364.32	1735.95		
368.74	1735.79	374.05	1735.36	376.03	1735.25	379.13	1734.94	379.14	1734.24		
385.8	1734	385.81	1734	387.4	1733.84	394	1733	397.32	1732.52		
399.45	1732	403.1	1731.75	404.11	1731.72	404.29	1731.72	407.06	1731.61		
410.56	1731.57	414.6	1731.47	416.36	1731.47	420.01	1731.39	422.06	1731.39		
423.64	1731.35	427.48	1731.37	428.19	1731.35	429.84	1731.34	432.43	1731.31		
432.55	1731.3	432.61	1731.3	436.17	1731.22	436.91	1731.2	437.85	1731.19		
441.4	1731.11	443.61	1731.07	449.16	1730.86	449.92	1730.85	451.18	1730.87		
454.42	1730.91	459.95	1730.96	462.64	1730.95	464.49	1730.77	470.29	1730.39		
471.46	1730.21	472.41	1730.06								

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	129.56	.015	235.58	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	129.56	235.58		51.33	50.08		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1730.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.99	Wt. n-Val.		0.015	
W.S. Elev (ft)	1726.94	Reach Len. (ft)	51.33	50.00	50.08
Crit W.S. (ft)	1727.99	Flow Area (sq ft)		399.26	
E.G. Slope (ft/ft)	0.004837	Area (sq ft)		399.26	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	106.01	Top Width (ft)		106.01	
Vel Total (ft/s)	16.03	Avg. Vel. (ft/s)		16.03	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)		3.77	
Conv. Total (cfs)	92026.5	Conv. (cfs)		92026.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		112.49	
Min Ch El (ft)	1722.64	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)	472.41	0.00	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		80.29	
C & E Loss (ft)	0.31	Cum SA (acres)		15.01	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 114

INPUT

Description: "FW" 11+35

Station Elevation Data		num=		129							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1732.26	1.97	1732.31	3.05	1732.34	7.88	1732.29	17.85	1731.96		
19.64	1731.9	20.88	1731.86	23.4	1731.94	32.11	1732.08	33.95	1732.11		
34.69	1732.13	38.57	1732.22	39.24	1732.24	40.4	1732.3	42.19	1732.22		
43.32	1732.18	46.7	1732.26	51.87	1732.39	52.69	1732.56	54.31	1732.92		
55.48	1733.28	57.83	1734.09	60.41	1734.65	61.01	1734.79	62.05	1735.03		
63.35	1735.35	64.06	1735.47	64.75	1735.57	66.4	1735.7	67.46	1735.74		
75.67	1735.77	84.98	1735.72	94.76	1735.81	99.73	1735.82	101.02	1735.74		
103.7	1735.59	105.92	1735.31	107.46	1735.07	110.34	1734.67	110.72	1734.62		
110.84	1734.6	111.74	1734.3	127.19	1729.15	132.15	1729.05	132.19	1729.05		
133.19	1729.05	133.2	1718.79	190.7	1717.64	248.2	1718.79	248.21	1729.11		
249.21	1729.11	249.26	1729.11	254.21	1729.21	254.25	1729.22	258.25	1730		
260.36	1730.61	261.97	1731	264.04	1731.73	265.06	1732	267.01	1732.46		
268.42	1732.89	268.82	1733	271.35	1733	276.68	1733	278.35	1732.81		
282.5	1732.55	284.62	1732.57	289.07	1732.59	295.12	1732.92	295.65	1732.96		
296.04	1733	301.17	1733.85	301.63	1733.88	302.05	1733.87	305.42	1733.75		
308.13	1733.33	309.43	1733.13	309.83	1733	310.8	1732.76	314.26	1732		
318.88	1731.62	329.27	1731	339.86	1731	340.86	1731	343.04	1731		
349.03	1731	349.7	1731	349.83	1731	351.31	1731	353.3	1731		
354.51	1731	358.15	1731	370.76	1730.68	375.34	1730.65	381.27	1730.64		
386.6	1730.68	388.66	1730.59	395.6	1730.71	398.17	1730.69	403.09	1731		
407.39	1731.37	411.65	1732	413.54	1732.21	414.01	1732.16	420.4	1732		
428.41	1732	436.38	1732	438.29	1731.22	439.22	1731	439.56	1731		
439.9	1731	444.9	1731.06	452.11	1730.99	454.11	1731.13	454.59	1731.16		
454.72	1731.17	455.41	1731.23	456.79	1731.34	457.3	1731.36	457.39	1731.36		
457.74	1731.36	460.79	1731.35	462.45	1731.35	469.92	1730.83	470.96	1730.72		
474.4	1729.93	476.04	1729.6	478.39	1729.44	478.6	1729.43				

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
-----	-------	-----	-------	-----	-------

0 .027 133.19 .015 248.21 .027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	133.19	248.21		4.9	4.77	4.78	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.45	Wt. n-Val.		0.015	
W.S. Elev (ft)	1720.47	Reach Len. (ft)	4.90	4.77	4.78
Crit W.S. (ft)	1722.78	Flow Area (sq ft)		259.36	
E.G. Slope (ft/ft)	0.021806	Area (sq ft)		259.36	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	115.00	Top Width (ft)		115.00	
Vel Total (ft/s)	24.68	Avg. Vel. (ft/s)		24.68	
Max Chl Dpth (ft)	2.83	Hydr. Depth (ft)		2.26	
Conv. Total (cfs)	43340.5	Conv. (cfs)		43340.5	
Length Wtd. (ft)	4.77	Wetted Per. (ft)		118.38	
Min Ch El (ft)	1717.64	Shear (lb/sq ft)		2.98	
Alpha	1.00	Stream Power (lb/ft s)	478.60	0.00	0.00
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)		79.91	
C & E Loss (ft)	0.55	Cum SA (acres)		14.88	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 113.6

INPUT

Description: "FW" 11+39.77

Station	Elevation	Data	num=	122	
Sta	Elev	Sta	Elev	Sta Elev Sta Elev	
0	1732.3	8.01	1732.22	13.94 1732.03 19.92 1731.82 24.05 1731.68	
32.46	1731.95	34.71	1731.99	35.69 1732.01 37.75 1732.08 41.25 1732.24	
43.65	1732.13	44.11	1732.13	45.19 1732.16 52.67 1732.35 55.13 1732.87	
55.16	1732.87	55.71	1733.06	58.6 1734.07 59.63 1734.29 61.83 1734.75	
62.62	1734.96	64.11	1735.32	66.07 1735.64 66.2 1735.67 67.82 1735.75	
68.32	1735.77	69.87	1735.77	85.54 1735.68 99.65 1735.81 100.65 1735.82	
101.36	1735.79	104.94	1735.59	108.71 1735.11 108.87 1735.09 109.16 1735.05	
109.2	1735.04	109.68	1734.97	111.45 1734.72 111.51 1734.71 111.55 1734.7	
128.3	1729.11	133.3	1729.01	134.3 1729.01 134.31 1718.31 191.81 1717.16	
249.31	1718.31	249.32	1729.07	250.27 1729.07 250.32 1729.07 255.05 1729.17	
255.32	1729.17	256.01	1729.35	259.33 1730 261.08 1730.51 263.14 1731	
265.77	1731.93	266.03	1732	267.83 1732.43 268.61 1732.55 269.91 1732.72	
271.39	1733	271.45	1733	272.19 1733 272.75 1733 273.31 1733	
273.35	1733	274.36	1732.85	275.62 1732.75 277.88 1732.51 282.66 1732	
287.09	1732	287.89	1732	288.91 1732 295.1 1732.45 300.11 1732.95	
300.48	1732.97	301.16	1733	303.67 1733.15 306.72 1733.04 306.89 1733.04	
307.14	1733	312.7	1732.36	314.36 1732 315.84 1731.88 330.64 1731	
345.72	1731	346.1	1731	346.92 1731 349.73 1731 350.8 1731	
353.44	1731	355.95	1731	377.74 1730.45 380.77 1730.43 384.7 1730.42	
388.23	1730.45	391.79	1730.29	395.18 1730.35 401.01 1730.3 406.77 1730.66	
408.93	1730.79	410.9	1731	415.27 1731.65 416.85 1732 423.8 1732	
438.53	1732	439.53	1731.6	442.07 1731 442.23 1731 442.98 1731	
443.92	1731	448.14	1730.98	455.41 1730.97 458.96 1731.25 460.82 1731.36	
464.11	1731.17	468.83	1730.79	471.63 1730.61 476.63 1729.53 476.92 1729.49	
477.2	1729.47	479.44	1729.35		

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .027	134.3	.015 249.32 .027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	134.3	249.32		57.59	70.43	90.61	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1729.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.83	Wt. n-Val.		0.015	
W.S. Elev (ft)	1719.95	Reach Len. (ft)	57.59	70.43	90.61
Crit W.S. (ft)	1722.30	Flow Area (sq ft)		254.34	
E.G. Slope (ft/ft)	0.023253	Area (sq ft)		254.34	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	115.00	Top Width (ft)		115.00	
Vel Total (ft/s)	25.16	Avg. Vel. (ft/s)		25.16	
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)		2.21	
Conv. Total (cfs)	41970.0	Conv. (cfs)		41970.0	
Length Wtd. (ft)	70.43	Wetted Per. (ft)		118.30	
Min Ch El (ft)	1717.16	Shear (lb/sq ft)		3.12	
Alpha	1.00	Stream Power (lb/ft s)	479.44	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		79.88	
C & E Loss (ft)	0.04	Cum SA (acres)		14.87	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 98

INPUT

Description: "FW" 12+10.20

Station	Elevation	Data	num=	132
Sta	Elev	Sta	Elev	Sta Elev Sta Elev
0	1732.28	.95	1732.29	1.1 1732.29 1.22 1732.29 1.3 1732.29
1.35	1732.29	1.71	1732.28	10.78 1732.08 15.85 1731.73 22.6 1731.23
28.47	1731.21	30.43	1731.24	35.24 1731.35 38.87 1731.4 40.31 1731.4

42.36	1731.51	49.93	1731.68	51.63	1731.67	53.03	1731.63	55.5	1731.64
61.8	1731.7	65.46	1732.29	65.5	1732.3	65.58	1732.31	73.53	1733.89
74.97	1733.91	76.15	1734.04	78.74	1734.02	78.88	1734.06	79.28	1734.07
83.71	1734.07	87.35	1734.05	90.36	1734.06	95.61	1734.09	103	1734.03
105.24	1734.05	110.35	1733.97	113.75	1733.98	120.39	1733.95	122.06	1733.95
122.37	1733.94	122.55	1733.93	123.42	1733.88	139.32	1728.58	139.37	1728.56
139.38	1728.56	144.37	1728.46	145.37	1728.46	145.38	1711.27	202.88	1710.12
260.38	1711.27	260.39	1728.46	261.38	1728.46	261.39	1728.46	266.39	1728.56
268.58	1728.91	269.24	1729	273.14	1729.92	273.48	1730	273.65	1730.04
277.81	1731	278.53	1731.17	279.22	1731.35	281.31	1731.85	281.91	1732
283.07	1732	287.49	1732	288.84	1731.56	290.19	1731	292.42	1730.45
294.97	1730	298.73	1729.3	300.23	1729	301.47	1728.93	310.26	1728.79
312.69	1729	314.55	1729.3	319.99	1729.83	320.88	1729.92	321.22	1729.94
328.33	1729.93	328.79	1729.93	329.53	1729.89	337.71	1729.66	339.83	1729.59
345.89	1729.66	348.42	1729.7	353.22	1730	357.32	1730.19	359.98	1730.43
364.09	1730.8	366.45	1731	371.19	1731	372.47	1731	375.98	1731
378.56	1731	380.15	1731	380.52	1730.97	385.92	1730	387.83	1729.72
391.91	1729	392.54	1728.93	393.2	1728.92	398.79	1728.48	404.01	1728.27
405.13	1728.26	409.25	1728.29	423.66	1729	423.79	1729	423.99	1729.02
430.78	1729.58	435.62	1729.72	437.67	1729.82	438.65	1729.85	439.16	1729.87
443.44	1729.86	443.6	1729.85	446.47	1729.78	449.3	1729.76	450.25	1729.68
451.64	1729.65	452.48	1729.65	454.39	1729.62	455.56	1729.6	456.32	1729.62
467.92	1729.64	471	1729.61	474.41	1729.58	479.84	1729.24	486.61	1728.65
487.24	1728.57	488.66	1728.36						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	145.37	.015	260.39	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	145.37	260.39		8.77	8.77		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1720.13	Reach Len. (ft)	8.77	8.77	8.77
Crit W.S. (ft)	1715.26	Flow Area (sq ft)		1085.32	
E.G. Slope (ft/ft)	0.000215	Area (sq ft)		1085.32	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	115.01	Top Width (ft)		115.01	
Vel Total (ft/s)	5.90	Avg. Vel. (ft/s)		5.90	
Max Chl Dpth (ft)	10.01	Hydr. Depth (ft)		9.44	
Conv. Total (cfs)	436355.8	Conv. (cfs)		436355.8	
Length Wtd. (ft)	8.77	Wetted Per. (ft)		132.74	
Min Ch El (ft)	1710.12	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)	488.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		78.80	
C & E Loss (ft)	0.03	Cum SA (acres)		14.68	

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 97.7

INPUT

Description: "FW"12+18.97

Station Elevation Data		num=		132	
Sta	Elev	Sta	Elev	Sta	Elev
0	1732.28	.95	1732.29	1.1	1732.29
1.35	1732.29	1.71	1732.28	10.78	1732.08
28.47	1731.21	30.43	1731.24	35.24	1731.35
42.36	1731.51	49.93	1731.68	51.63	1731.67
61.8	1731.7	65.46	1732.29	65.5	1732.3
74.97	1733.91	76.15	1734.04	78.74	1734.02
83.71	1734.07	87.35	1734.05	90.36	1734.06
105.24	1734.05	110.35	1733.97	113.75	1733.98
122.37	1733.94	122.55	1733.93	123.42	1733.88
139.38	1728.56	144.37	1728.46	145.37	1728.46
260.38	1710.39	260.39	1728.46	261.38	1728.46
268.58	1728.91	269.24	1729	273.14	1729.92
277.81	1731	278.53	1731.17	279.22	1731.35
283.07	1732	287.49	1732	288.84	1731.56
294.97	1730	298.73	1729.3	300.23	1729
312.69	1729	314.55	1729.3	319.99	1729.83
328.33	1729.93	328.79	1729.93	329.53	1729.89
345.89	1729.66	348.42	1729.7	353.22	1730
364.09	1730.8	366.45	1731	371.19	1731
378.56	1731	380.15	1731	380.52	1730.97
391.91	1729	392.54	1728.93	393.2	1728.92
405.13	1728.26	409.25	1728.29	423.66	1729
430.78	1729.58	435.62	1729.72	437.67	1729.82
443.44	1729.86	443.6	1729.85	446.47	1729.78
451.64	1729.65	452.48	1729.65	454.39	1729.62
467.92	1729.64	471	1729.61	474.41	1729.58
487.24	1728.57	488.66	1728.36		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	145.37	.015	260.39	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	145.37	260.39		151.03	151.03		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.015	
W.S. Elev (ft)	1720.20	Reach Len. (ft)	151.03	151.03	151.03
Crit W.S. (ft)		Flow Area (sq ft)		1193.85	
E.G. Slope (ft/ft)	0.000160	Area (sq ft)		1193.85	

Q Total (cfs)	6400.00	Flow (cfs)	6400.00	
Top Width (ft)	115.01	Top Width (ft)	115.01	
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	5.36	
Max Chl Dpth (ft)	10.96	Hydr. Depth (ft)	10.38	
Conv. Total (cfs)	506654.3	Conv. (cfs)	506654.3	
Length Wtd. (ft)	151.03	Wetted Per. (ft)	134.64	
Min Ch El (ft)	1709.24	Shear (lb/sq ft)	0.09	
Alpha	1.00	Stream Power (lb/ft s)	488.66	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	78.57	
C & E Loss (ft)	0.00	Cum SA (acres)	14.66	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 94

INPUT

Description: "FW"13+70.00

Station Elevation Data		num=	150						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1731.21	6	1731.15	6.44	1731.15	7.3	1731.13	9.97	1731.08
18.16	1731.14	19.36	1731.16	24.88	1731.13	26.2	1731.12	28.92	1731.1
31.27	1731.05	31.36	1731.11	31.88	1731.57	33.89	1731.99	33.89	1732
33.91	1731.99	33.94	1732	35.29	1732.15	43.08	1733	43.99	1733
46.58	1733	48.37	1732.74	53.83	1732	57.74	1731.1	58.19	1731
58.49	1730.92	63.04	1730	66.31	1729.96	67.45	1729.96	71.83	1729.87
75.6	1729.8	82.81	1729.96	84.29	1730	84.48	1730	87.11	1730
88.73	1730.51	88.91	1730.5	93.05	1729.37	94.03	1729.32	99.49	1729
102.36	1728.98	106.1	1729.59	108.6	1729.11	109.23	1729.14	117.9	1728.48
120.76	1728.35	121.44	1728.71	122.91	1730	124.2	1729.72	127.59	1729.03
127.73	1729	127.83	1728.99	129.49	1728.79	135.58	1728.05	136.15	1728
136.44	1728	136.69	1728	138.29	1728	140.58	1728	157.58	1727.91
157.78	1727.91	159.39	1728	163.48	1728.18	165.77	1728.28	166.3	1728.3
166.62	1728.3	166.95	1728.29	171.62	1728.24	171.71	1728.23	172.72	1728.24
172.72	1710.24	230.22	1709.09	287.72	1710.24	287.72	1728.24	288.72	1728.22
288.73	1728.22	288.77	1728.22	288.97	1728.22	293.74	1728.21	298.87	1728.75
300.64	1729	302.34	1729.3	306.32	1730	308.12	1730.4	311.89	1731
311.9	1731	311.91	1731	313.86	1731.16	315.85	1731.3	316.3	1731.32
317.97	1731.41	318.76	1731.42	320.54	1731.48	321.14	1731.48	322.45	1731.49
323.28	1731.46	324.69	1731.45	325.52	1731.42	326.92	1731.4	327.99	1731.35
329.81	1731.32	330.7	1731.28	339.1	1731.01	339.2	1731.01	339.39	1731
348.49	1730.56	354.97	1730.33	357.37	1730.25	357.87	1730.22	364.81	1730
371.56	1729.75	375.53	1729.7	379.87	1729.53	389.84	1729.35	397.06	1729.4
399.38	1729.5	404.67	1729.62	412.1	1729.93	413.78	1730	422.56	1730.8
424.75	1731	430.67	1731.64	433.23	1732	443.99	1732	445.2	1732
446.03	1732	446.68	1731.86	449.7	1731.24	450.94	1731	451.02	1731
451.06	1731	453.54	1731	457.22	1731	458.76	1731	459.39	1730.96
462.49	1730.76	463.06	1730.79	467.16	1730.61	473.21	1730.21	475.07	1730.06
481.59	1729.64	486.41	1729.27	493.25	1728.64	504.68	1728.67	504.89	1728.67
511.33	1728.55	511.76	1728.52	515.37	1728.15	515.5	1728.14	518.38	1727.94

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	172.72	.015
		287.72	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	172.72	287.72		55.11	55	55.01	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1720.18	Reach Len. (ft)	55.11	55.00	55.01
Crit W.S. (ft)		Flow Area (sq ft)		1209.25	
E.G. Slope (ft/ft)	0.000153	Area (sq ft)		1209.25	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	115.00	Top Width (ft)		115.00	
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)		5.29	
Max Chl Dpth (ft)	11.09	Hydr. Depth (ft)		10.52	
Conv. Total (cfs)	516909.2	Conv. (cfs)		516909.2	
Length Wtd. (ft)	55.00	Wetted Per. (ft)		134.90	
Min Ch El (ft)	1709.09	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)	518.38	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		74.41	
C & E Loss (ft)	0.05	Cum SA (acres)		14.26	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 92

INPUT

Description: "FW"14+25

Station Elevation Data		num=	104						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1730.59	4.9	1730.46	6.7	1730.36	14.11	1729.87	19.76	1729.98
25.72	1730	28.23	1729.92	32.94	1729.73	40.47	1729.59	41.09	1729.58
41.53	1729.57	44.7	1729.54	81.93	1729	87.93	1729	103.27	1728.02
103.66	1728	115.09	1727	115.1	1727	115.11	1727	115.12	1727
115.15	1726.99	119.18	1726	123.18	1725	127.18	1724	131.18	1723
135.18	1722	139.18	1721	140.09	1720.56	141.22	1720.49	181.22	1710.49
196.22	1710.04	206.22	1709.04	216.22	1710.04	231.22	1710.49	271.22	1720.49
272.27	1720.52	272.55	1720.66	273.24	1721	273.94	1721.18	277.13	1722
278.84	1722.4	281.3	1723	284.4	1723.75	285.4	1724	286.11	1724.18
289.05	1725	292.55	1725.84	293.2	1726	293.99	1726.21	296.82	1727
299.97	1727.66	301.63	1728	303.22	1728.12	318.72	1728.52	320.96	1728.49
332.44	1728.37	334.12	1728.34	335.42	1728.31	336.78	1728.27	349.1	1728.26

350.99	1728.22	355.85	1728.17	369.1	1728.43	374.12	1728.61	382.14	1728.68
386.42	1729	387.55	1729.21	389.91	1729.62	392.95	1730	396.97	1730.33
398.54	1730.4	401.95	1730.5	404.57	1730.47	407.59	1730.39	411.49	1730.11
412.7	1730	417.15	1729.62	423.18	1729.49	429.32	1729.67	435.45	1729.79
435.88	1729.72	436.02	1729.71	436.27	1729.7	436.68	1729.7	438.64	1729.79
439.31	1729.81	439.91	1729.8	440.42	1729.8	441.17	1729.79	442.16	1729.73
443.35	1729.65	445.56	1729.56	446.09	1729.49	457.41	1728.72	457.5	1728.71
462.01	1728.21	462.83	1728.22	467.85	1728.26	473.67	1728.34	480.04	1728.35
485.75	1728.48	492.23	1727.98	494.33	1727.86	494.83	1727.83		

Manning's n Values		num=		3					
Sta	n Val	Sta	n Val	Sta	n Val				
0	.027	87.93	.027	320.96	.027				
Bank Sta: Left		Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.		
87.93		320.96	92.99		91.1	.1	.3		

CROSS SECTION OUTPUT Profile #PF 1						
E.G. Elev (ft)	1720.54	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.97	Wt. n-Val.		0.027		
W.S. Elev (ft)	1719.57	Reach Len. (ft)	92.99	91.10	91.11	
Crit W.S. (ft)		Flow Area (sq ft)		809.71		
E.G. Slope (ft/ft)	0.001708	Area (sq ft)		809.71		
Q Total (cfs)	6400.00	Flow (cfs)		6400.00		
Top Width (ft)	122.65	Top Width (ft)		122.65		
Vel Total (ft/s)	7.90	Avg. Vel. (ft/s)		7.90		
Max Chl Dpth (ft)	10.53	Hydr. Depth (ft)		6.60		
Conv. Total (cfs)	154847.5	Conv. (cfs)		154847.5		
Length Wtd. (ft)	91.10	Wetted Per. (ft)		125.00		
Min Ch El (ft)	1709.04	Shear (lb/sq ft)		0.69		
Alpha	1.00	Stream Power (lb/ft s)	494.83	0.00	0.00	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)		73.13		
C & E Loss (ft)	0.00	Cum SA (acres)		14.11		

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 89

INPUT									
Description: "FW" 15+16.10									
Station Elevation Data		num=		79					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.81	4.62	1729.75	7.05	1729.83	12.97	1729.89	16.17	1729.77
19.95	1729.64	28.15	1729.37	32.78	1729.28	36.44	1729.21	49.96	1728.92
52.83	1728.86	59.75	1728.69	89.92	1728.01	102.51	1727.73	126.34	1727.18
130.36	1727	156.59	1720.44	196.94	1710.35	206.61	1710.06	211.94	1709.9
215.5	1709.55	221.94	1708.9	228.38	1709.55	231.94	1709.9	241.61	1710.19
246.94	1710.35	269.49	1715.99	293.53	1722	294.4	1722.22	294.82	1722.32
297.53	1723	301.09	1723.89	301.53	1724	304.2	1724.67	305.53	1725
306.55	1725.16	313.01	1726	316.5	1726.37	318.18	1726.39	319.57	1726.37
326.5	1726.66	330.68	1726.7	332.33	1726.7	333.34	1726.7	335.92	1726.66
337.76	1726.65	339.54	1726.65	347.6	1726.56	351.01	1726.53	354.38	1726.51
360.5	1726.46	376.48	1726.32	380.94	1726.27	383.79	1726.24	386.21	1726.22
401.66	1726.12	403.02	1726.12	404.46	1726.11	405.38	1726.12	406.55	1726.13
414.72	1726.17	422.23	1726.31	424.96	1726.45	425	1726.69	425.6	1726.68
433.91	1726.96	446.33	1727.25	458.97	1727.39	462.62	1727.43	477.46	1727.65
486.39	1727.82	497.34	1727.85	499.98	1727.83	501.45	1727.73	506.67	1727.3
509.38	1727.1	510.86	1726.93	511.42	1726.96	512.04	1726.97		

Manning's n Values		num=		3					
Sta	n Val	Sta	n Val	Sta	n Val				
0	.027	89.92	.027	332.33	.027				
Bank Sta: Left		Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.		
89.92		332.33	58.33		55	.1	.3		

CROSS SECTION OUTPUT Profile #PF 1						
E.G. Elev (ft)	1720.39	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.98	Wt. n-Val.		0.027		
W.S. Elev (ft)	1719.41	Reach Len. (ft)	58.33	55.00	55.01	
Crit W.S. (ft)		Flow Area (sq ft)		806.76		
E.G. Slope (ft/ft)	0.001725	Area (sq ft)		806.76		
Q Total (cfs)	6400.00	Flow (cfs)		6400.00		
Top Width (ft)	122.45	Top Width (ft)		122.45		
Vel Total (ft/s)	7.93	Avg. Vel. (ft/s)		7.93		
Max Chl Dpth (ft)	10.51	Hydr. Depth (ft)		6.59		
Conv. Total (cfs)	154078.7	Conv. (cfs)		154078.7		
Length Wtd. (ft)	55.00	Wetted Per. (ft)		124.80		
Min Ch El (ft)	1708.90	Shear (lb/sq ft)		0.70		
Alpha	1.00	Stream Power (lb/ft s)	512.04	0.00	0.00	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		71.44		
C & E Loss (ft)	0.00	Cum SA (acres)		13.85		

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 88

INPUT									
Description: "FW" 15+71.10									
Station Elevation Data		num=		79					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.34	8.82	1729.25	9.85	1729.27	21.14	1729.33	23.84	1729.34
24.23	1729.33	28.6	1729.14	30.4	1729.11	36.93	1728.99	39.2	1728.95
53.18	1728.69	81.98	1728.12	111.74	1727.54	122.82	1727.32	137.78	1727
146.2	1726.08	147.08	1726	147.13	1725.99	150.47	1725.77	167.75	1721.45
212.47	1710.27	223.28	1709.95	227.47	1709.82	229.02	1709.67	237.47	1708.82
245.91	1709.67	247.47	1709.82	260.13	1710.2	262.47	1710.27	294.06	1718.17

309.38	1722	312.85	1722.78	313.99	1723	321.14	1723.59	322.83	1723.72
326.89	1723.89	327.29	1723.92	327.6	1723.93	327.78	1723.94	327.96	1723.95
330.37	1724	332.46	1724.06	332.7	1724.06	336.65	1724.13	339.42	1724.15
340.1	1724.16	340.51	1724.16	346.05	1724.19	347.16	1724.2	349.08	1724.21
350.15	1724.21	359.37	1724.33	361.3	1724.33	362.52	1724.33	366	1724.3
381.69	1724.45	388.91	1724.41	391.56	1724.47	397.58	1724.46	409.7	1724.65
423.91	1725	426.69	1725.16	437.58	1726	439.65	1726.17	440.29	1726.3
450.24	1726.44	452.11	1726.47	453.17	1726.48	456.49	1726.56	476.27	1727.07
480.5	1727.08	496.91	1727.18	503.03	1727.39	507.54	1727.37	516.02	1727.15
522.36	1727.21	522.69	1727.21	527.78	1726.93	528.31	1726.9		

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	23.84	.027	503.03	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	23.84	503.03		31.7	28.9		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.98	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.31	Reach Len. (ft)	31.70	28.90	
Crit W.S. (ft)		Flow Area (sq ft)		804.27	
E.G. Slope (ft/ft)	0.001740	Area (sq ft)		804.27	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.29	Top Width (ft)		122.29	
Vel Total (ft/s)	7.96	Avg. Vel. (ft/s)		7.96	
Max Chl Dpth (ft)	10.49	Hydr. Depth (ft)		6.58	
Conv. Total (cfs)	153416.9	Conv. (cfs)		153416.9	
Length Wtd. (ft)	28.90	Wetted Per. (ft)		124.63	
Min Ch El (ft)	1708.82	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)	528.31	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		70.42	
C & E Loss (ft)	0.00	Cum SA (acres)		13.70	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 87.7

INPUT

Description: "FW" 16+00.00

Station Elevation Data										num=	66
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	1729.18	2.62	1729.11	11.01	1728.9	12.83	1728.89	21.24	1729		
26.54	1729.04	37.53	1729.05	41.09	1729.01	41.15	1729.01	41.53	1729.02		
49.28	1728.88	49.86	1728.87	50.42	1728.87	60.96	1728.74	68.32	1728.66		
117.64	1727.73	156.37	1727	158.11	1727	158.78	1726.93	164.52	1726		
171.71	1725.73	233.71	1710.23	248.71	1709.78	258.71	1708.78	268.71	1709.78		
283.71	1710.23	330.8	1722	349.32	1722.73	352.93	1722.77	363.7	1723		
364.4	1723	368.67	1723	368.87	1723	369.08	1723	369.38	1723		
369.94	1723	370.47	1723.01	372.78	1723.11	376.31	1723.13	380.18	1723.23		
410.06	1724	414	1724	414.67	1724.03	419.47	1724.19	438.13	1724.83		
443.64	1725	451.64	1725.55	459.28	1726	461.85	1726	462.65	1726		
464.31	1726	466.36	1726.05	471.16	1726.29	471.42	1726.31	472.24	1726.32		
476.36	1726.4	496.81	1726.79	499.47	1726.8	512.64	1726.75	519.38	1726.98		
527.91	1727.08	537.34	1726.92	542.22	1726.84	544.34	1726.85	547.09	1726.93		
550.29	1726.9										

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	37.53	.027	527.91	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	37.53	527.91		55.17	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.26	Reach Len. (ft)	55.17	50.00	50.01
Crit W.S. (ft)		Flow Area (sq ft)		802.78	
E.G. Slope (ft/ft)	0.001749	Area (sq ft)		802.78	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.20	Top Width (ft)		122.20	
Vel Total (ft/s)	7.97	Avg. Vel. (ft/s)		7.97	
Max Chl Dpth (ft)	10.47	Hydr. Depth (ft)		6.57	
Conv. Total (cfs)	153022.1	Conv. (cfs)		153022.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		124.54	
Min Ch El (ft)	1708.78	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)	550.29	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		69.89	
C & E Loss (ft)	0.00	Cum SA (acres)		13.62	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 87

INPUT

Description: "FW" 16+50.00

Station Elevation Data										num=	74
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	1728.91	10.65	1728.66	11.98	1728.67	12.2	1728.68	12.32	1728.68		
22.62	1728.4	24.02	1728.47	27.99	1728.5	40.59	1728.47	42.07	1728.44		
43.8	1728.39	44.51	1728.37	49.78	1728.57	50.61	1728.56	51.14	1728.7		
56.64	1728.55	59.3	1728.49	59.32	1728.5	68.45	1728.26	73.12	1728.23		
78.76	1728.22	88.67	1728.16	94.94	1728.14	114.58	1728.01	114.83	1728.01		
115.56	1728	125.72	1727.63	148.37	1727	151.86	1726.85	153.25	1726.8		
156.32	1726.71	173.24	1726	174.91	1725.98	195.01	1725.65	257	1710.15		

257.01	1710.15	272.01	1709.7	282.01	1708.7	292.01	1709.7	307.01	1710.15
354.4	1722	359.56	1722.4	371.78	1723	403.55	1723.81	408.32	1724
408.94	1724	409.41	1724	412.63	1724	423.82	1724.32	432.63	1724.47
439.22	1724.6	444.76	1724.68	462.62	1725	462.82	1725	463	1725.01
463.15	1725.01	463.19	1725.01	483.88	1725.32	484.04	1725.32	484.4	1725.34
485.27	1725.39	491.32	1725.71	496.51	1726.01	497.04	1726.01	500.5	1726.07
510.47	1726.21	517.78	1726.31	521.46	1726.33	536.33	1726.38	537.22	1726.39
558.42	1726.36	564.57	1726.47	567.73	1726.6	574.33	1726.88		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	50.61	.027	521.46	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	50.61	521.46		53.73	50	50.03	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.16	Reach Len. (ft)	53.73	50.00	50.03
Crit W.S. (ft)		Flow Area (sq ft)		801.51	
E.G. Slope (ft/ft)	0.001757	Area (sq ft)		801.51	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.11	Top Width (ft)		122.11	
Vel Total (ft/s)	7.98	Avg. Vel. (ft/s)		7.98	
Max Chl Dpth (ft)	10.46	Hydr. Depth (ft)		6.56	
Conv. Total (cfs)	152698.1	Conv. (cfs)		152698.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		124.44	
Min Ch El (ft)	1708.70	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	574.33	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		68.97	
C & E Loss (ft)	0.00	Cum SA (acres)		13.48	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 86

INPUT
Description: "FW"17+00.00

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1729.05	1.15	1729.07	1.75	1729.07	6.04	1728.79	9.62	1728.69
13.18	1728.91	15.19	1729	18.69	1729.44	24.2	1730	32.86	1730.91
33.55	1731	47.18	1731	55.84	1731	59.62	1730.35	60.27	1730.24
61.48	1730.21	68.42	1730.07	70.93	1730.05	71.28	1730.04	73.76	1730.03
76.11	1730.09	77.39	1730	78.41	1729.95	79.98	1729.87	81.33	1729.79
94.05	1729	95.53	1728.95	97.34	1728.85	111.22	1728.24	116.33	1728
125.17	1727.69	134.08	1727.42	144.46	1727.02	144.71	1727.01	145.04	1727
158.93	1726.22	163.13	1726	180.02	1725.48	193.04	1725	220.13	1724.2
220.14	1724.2	276.64	1710.08	291.64	1709.63	301.64	1708.63	311.64	1709.63
326.64	1710.08	326.65	1710.08	328.48	1710.54	366.29	1719.99	366.34	1720
370.15	1720.95	370.33	1721	370.35	1721	381.16	1722	382.06	1722.05
391.19	1722.42	398.41	1722.52	403.59	1722.62	411.72	1722.82	412.95	1722.86
418.74	1723	426.32	1723.11	429.11	1723.15	459.88	1724	464.65	1724
465.55	1724	466.1	1724	474.92	1724.21	504.73	1725	507.99	1725.38
509.97	1725.64	512.83	1725.7	517.8	1725.78	538.3	1726.13	545.6	1726.21
560.6	1726.37	562.13	1726.4	563.36	1726.43	563.66	1726.43	580.45	1726.32
585.74	1726.25	587.37	1726.31	591.72	1726.56	593.38	1726.59	595.36	1726.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	55.84	.027	563.66	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	55.84	563.66		52.56	50	50.36	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1720.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1719.07	Reach Len. (ft)	52.56	50.00	50.36
Crit W.S. (ft)		Flow Area (sq ft)		798.58	
E.G. Slope (ft/ft)	0.001775	Area (sq ft)		798.58	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	121.94	Top Width (ft)		121.94	
Vel Total (ft/s)	8.01	Avg. Vel. (ft/s)		8.01	
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)		6.55	
Conv. Total (cfs)	151913.2	Conv. (cfs)		151913.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		124.26	
Min Ch El (ft)	1708.63	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	595.36	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		68.05	
C & E Loss (ft)	0.00	Cum SA (acres)		13.34	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 85

INPUT
Description: "FW"17+50.00

Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1728.5	7.68	1728.37	8.82	1728.32	10.09	1728.31	14.85	1728.34
15.08	1728.65	15.78	1729	21.04	1729.99	21.1	1730	21.21	1730
21.49	1730	38.59	1730.82	40.33	1731	42.79	1731	43.25	1731
43.58	1730.96	50.31	1730.3	51.89	1730.09	54.75	1730	58.49	1729.93
58.66	1729.93	61.8	1729.91	62.03	1729.91	63.17	1729.96	65.87	1729.97
68.3	1729.99	69.39	1730	71.15	1730	78.05	1729.87	79.2	1729.85

80	1729.9	81.45	1730	82.75	1730.32	85.25	1731	89.69	1731.75
91.19	1732	92.19	1732	93.5	1732	97.83	1732	102.11	1732
104.63	1732	105.53	1732	106.29	1732	110.17	1732	110.33	1732
111.75	1731.67	114.17	1731.58	118.19	1731.15	119.43	1731	122.86	1730.7
130.45	1730	131.8	1729.91	133.56	1729.83	146.82	1729	153.42	1728.54
162.8	1728	167.15	1727.86	188.77	1727.1	191.46	1727	191.74	1726.99
192.08	1726.98	217.33	1726	217.81	1726	218.72	1726	230.31	1725.14
232.3	1725	236.33	1724.13	292.83	1710	307.83	1709.55	317.83	1708.55
327.83	1709.55	342.83	1710	378.82	1719	378.83	1719	395.52	1720
400.47	1720.41	407.32	1721	408.79	1721.32	414.12	1722	420.29	1722.93
420.79	1723	421.34	1723.02	422.89	1723.08	442.86	1723.78	447.79	1724
462.3	1724.45	484.33	1725	498.75	1725.4	503.45	1725.4	504.05	1725.4
506.05	1725.38	513.8	1725.4	516.55	1725.43	518.18	1725.46	524.34	1725.45
536.73	1725.55	546.8	1725.74	550.1	1725.77	554.56	1725.69	561.8	1725.64
568.35	1725.78	571.32	1725.9	572.88	1726.06	577.96	1726.77	583.24	1727.21
584.13	1727.26	586.72	1727.04	590	1726.75	595.8	1726.68	598.37	1726.55
606.95	1726.25	611.63	1726.08	614.64	1726.17	617.41	1726.28		

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	106.29	.027	584.13	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	106.29	584.13		45.17	43.42	44.44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.98	Reach Len. (ft)	45.17		44.44
Crit W.S. (ft)		Flow Area (sq ft)		796.82	
E.G. Slope (ft/ft)	0.001785	Area (sq ft)		796.82	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	121.79	Top Width (ft)		121.79	
Vel Total (ft/s)	8.03	Avg. Vel. (ft/s)		8.03	
Max Chl Dpth (ft)	10.43	Hydr. Depth (ft)		6.54	
Conv. Total (cfs)	151476.8	Conv. (cfs)		151476.8	
Length Wtd. (ft)	43.42	Wetted Per. (ft)		124.12	
Min Ch El (ft)	1708.55	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	617.41	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		67.14	
C & E Loss (ft)	0.00	Cum SA (acres)		13.20	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 84

INPUT										
Description: "FW" 17+93.42										
Station Elevation Data			num=	113						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.18	7.02	1728.18	7.63	1728.17	8.3	1728.14	13.37	1728.03	
13.41	1728.06	15.7	1729	16.68	1729.09	17.22	1729.1	30.83	1729.31	
32.97	1729	36.29	1728.24	37.52	1728	39.38	1727.93	49.52	1727.72	
63.75	1727.87	66.95	1728	76.23	1728.56	78.91	1728.75	81.32	1728.7	
86.97	1728.61	88.53	1728.85	89.36	1728.97	89.43	1728.99	89.5	1729	
91.33	1729.35	95.97	1730	101.93	1730	106.33	1730	110.2	1729.73	
121.54	1729	125.76	1728.81	132.85	1728.55	140.75	1728.27	147.35	1728	
157.34	1727.56	171.18	1727	172.14	1726.95	173.3	1726.91	183.92	1726.45	
197.76	1726	200.17	1725.92	201.81	1725.85	211.32	1725.46	221.7	1725.06	
222.48	1725.03	223.21	1725	234.38	1724.27	237.51	1724	242.16	1723.43	
245.75	1723	250.36	1722.45	254.95	1722.13	255.88	1722	257.02	1722	
305.27	1709.94	320.27	1709.49	330.27	1708.49	340.27	1709.49	355.27	1709.94	
395.52	1720	395.53	1720	395.54	1720	395.55	1720.01	399.53	1721	
403.53	1722	410.01	1723	431.39	1723.53	451.07	1724	455.42	1724.15	
479.59	1725	491.66	1725.55	502.94	1726	514.15	1726.88	516.12	1727	
522.45	1727.47	528.01	1727.82	529.27	1727.89	532.38	1728	533.71	1728.07	
539.65	1728	539.97	1728	540	1728	546.67	1727.7	549.9	1727.25	
550.96	1727.11	551.47	1727	553.69	1726.59	556.46	1726	570.69	1726	
572.01	1726	572.41	1726	572.57	1726	573.64	1726	576.28	1726.21	
578.05	1726.25	579.09	1726.16	582.62	1726.26	587	1726.29	587.44	1726.3	
592.51	1726.33	592.9	1726.35	597.43	1726.37	599.28	1726.48	600.49	1726.49	
602.42	1726.44	603.62	1726.45	607.15	1726.46	612.26	1726.47	616.24	1726.35	
625.99	1726.41	627.18	1726.42	639.23	1726.23					

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	101.93	.027	539.97	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	101.93	539.97		60.12	57.8	59.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.89	Reach Len. (ft)	60.12		59.49
Crit W.S. (ft)		Flow Area (sq ft)		794.12	
E.G. Slope (ft/ft)	0.001802	Area (sq ft)		794.12	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	121.64	Top Width (ft)		121.64	
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)		8.06	
Max Chl Dpth (ft)	10.40	Hydr. Depth (ft)		6.53	
Conv. Total (cfs)	150751.0	Conv. (cfs)		150751.0	
Length Wtd. (ft)	57.80	Wetted Per. (ft)		123.96	
Min Ch El (ft)	1708.49	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	639.23	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		66.34	
C & E Loss (ft)	0.00	Cum SA (acres)		13.08	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 83

INPUT

Description: "FW" 18+51.22

Station	Elevation	Data	num=	155						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1728.41	3.48	1728.31	8.1	1728.16	12.6	1727.94	20.19	1727.8	
20.41	1727.8	20.67	1727.83	28.08	1728.72	30.55	1729.26	32.57	1729.62	
36.74	1730.18	37.7	1730.23	38.24	1730.17	41.92	1729.58	44.08	1729.28	
47.51	1728.68	51.52	1728.03	55.63	1727.33	58.71	1727.11	62.75	1726.97	
69.61	1726.82	77.19	1726.65	80.25	1726.55	84	1726.97	84.36	1727	
84.5	1727	86.38	1727	88.37	1727.67	88.65	1727.76	95.31	1727.63	
96.71	1727.6	105.14	1727.07	106.23	1727	110.44	1727	115.08	1727	
119.1	1727	121.61	1727	123.61	1727	134.87	1727	135.46	1727	
138.43	1727	145.07	1727.2	166.95	1727.07	170.18	1727	183.93	1726.47	
187.23	1726.33	193.86	1726	201.52	1725.36	210.64	1725.03	211.32	1725	
211.5	1725	212.45	1725	215.06	1724.93	215.49	1724.92	219.91	1724.8	
230.4	1724.26	233.87	1724	235.15	1723.77	238.81	1723	241.99	1722.78	
258.46	1722.02	258.92	1722	273.65	1722	275.87	1722	305.35	1714.62	
318.65	1711.3	324.81	1709.76	332.57	1709.53	336.83	1709.4	340.54	1709.03	
346.83	1708.4	350.59	1708.78	356.83	1709.4	368.3	1709.74	375.36	1709.96	
404.98	1717.36	417.36	1720.45	423.54	1722	428.57	1722.69	430.73	1723	
431.9	1723.02	439.45	1723.17	444.56	1723.26	452.33	1723.39	469.51	1723.72	
478.82	1723.88	485.31	1724	502.82	1724.38	528.95	1725	530.01	1725	
530.26	1725	530.78	1725	533.93	1725.28	546.21	1726	546.47	1726.04	
550.09	1727	555.17	1727.96	555.53	1728	561.45	1728.77	562.69	1729	
570.4	1729.73	572.78	1729.93	573.1	1729.94	573.66	1730	576.39	1730	
579.49	1730	582.89	1730	584.28	1730	587.57	1730	587.94	1730	
588.6	1730	590.04	1730	592.61	1730	593.77	1729.86	594.65	1729.85	
596.63	1729.5	597.79	1729.59	598.29	1729.51	599	1729.41	599.18	1729.21	
600.29	1729.25	601.1	1729.28	601.51	1729.26	602.55	1729.3	603.54	1729.31	
604.82	1729.31	605.87	1729.31	607.33	1729.3	608.47	1729.3	609.97	1729.29	
611.74	1729.25	613.05	1729.25	613.75	1729.25	615.24	1729.3	616.69	1729.35	
618.12	1729.39	618.58	1729.39	623.25	1729.33	626.1	1729.25	626.73	1729.23	
627.69	1729.22	631.28	1729.14	632.83	1729.07	634.88	1729.01	636.88	1728.98	
638.27	1728.95	640.28	1728.9	642.64	1728.83	643.48	1728.79	643.71	1728.77	
648.11	1728.5	653.45	1728.15	657.62	1727.71	664.05	1727.09	669.86	1726.87	

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	37.7	.027	573.1	.027

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	37.7	573.1	127.69	48.78	17.33	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.79	Reach Len. (ft)	127.69	48.78	17.33
Crit W.S. (ft)		Flow Area (sq ft)		796.97	
E.G. Slope (ft/ft)	0.001789	Area (sq ft)		796.97	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.05	Top Width (ft)		122.05	
Vel Total (ft/s)	8.03	Avg. Vel. (ft/s)		8.03	
Max Chl Dpth (ft)	10.39	Hydr. Depth (ft)		6.53	
Conv. Total (cfs)	151327.8	Conv. (cfs)		151327.8	
Length Wtd. (ft)	48.78	Wetted Per. (ft)		124.36	
Min Ch Bl (ft)	1708.40	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	669.86	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		65.29	
C & E Loss (ft)	0.00	Cum SA (acres)		12.91	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 82.5

INPUT

Description: "FW" 19+00.00

Station	Elevation	Data	num=	164						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1727.15	1.23	1727.17	1.57	1727.17	2.19	1727.19	11.67	1727.14	
12.59	1727.11	14.29	1727.08	17.68	1727.11	21.82	1727.14	26.07	1727.56	
27.05	1727.66	27.46	1727.72	31.56	1728.14	33.64	1728.25	37.82	1728.56	
38.38	1728.53	38.77	1728.49	38.97	1728	41.32	1728.04	43.29	1728.08	
43.32	1728.08	44.84	1728.1	48.48	1728.05	53.82	1727.98	54.2	1728	
55.11	1728.26	56.33	1728.67	56.78	1728.8	57.48	1729	60	1729	
65.38	1729	66.89	1728.62	69.5	1728	75.44	1727.24	77.14	1727	
81.12	1726.88	94.29	1726.52	99.51	1726.42	103.6	1726.35	113.45	1726	
114.23	1725.95	114.33	1725.94	114.45	1725.93	114.64	1725.92	115.02	1725.89	
115.57	1725.86	125.4	1725.21	126.33	1725.16	127.43	1725.1	128.89	1725.05	
130.57	1725	132.85	1725	132.98	1725	135.44	1725	135.56	1725	
140.26	1725	140.51	1725	140.82	1725	145.44	1725	146.54	1725	
149.72	1725	157.71	1724.56	160.2	1724.5	165.57	1724.2	167.28	1724.14	
167.89	1724.12	169.93	1724	174.29	1723.84	181.22	1723.66	191.82	1723.34	
194.47	1723.28	196.97	1723.25	199.16	1723.2	202.4	1723	218.81	1722.35	
223.03	1722.12	224.98	1722	226.99	1722	228.02	1722	228.33	1722	
228.52	1722	278.4	1709.53	285.01	1709.33	295.01	1708.33	305.01	1709.33	
329.13	1710.05	329.23	1710.07	370.76	1720.46	373.06	1721.03	373.15	1721.05	
373.22	1721.07	376.92	1722	376.93	1722	376.94	1722	401.04	1722.74	
408.17	1723	410.96	1723.05	414.14	1723.11	422.25	1723.26	453.62	1723.84	
460.88	1723.96	462.48	1724	462.57	1724	463.1	1724	465.84	1724.09	
469.06	1724.2	476.23	1724.52	477.48	1724.58	478.77	1724.64	479.82	1724.7	
480.68	1724.74	481.44	1724.78	488.18	1725	493.99	1725.32	496.82	1725.47	
500.69	1725.58	504.58	1725.7	511.54	1725.97	511.84	1725.98	512.2	1726	
518.41	1726.94	518.67	1727	522.57	1727.4	528.23	1728	528.6	1728.05	
534.03	1729	534.31	1729.05	534.85	1729.11	541.64	1729.69	543	1729.65	
544.8	1729.52	545.93	1729.59	547.21	1729.44	548.05	1729.29	548.25	1729.3	
549.13	1729.37	550.25	1729.22	550.79	1729.02	551.57	1729.06	553.09	1729.12	

553.8	1729.12	559.41	1729.34	559.95	1729.36	563.44	1729.48	563.88	1729.5
565.57	1729.52	567.5	1729.51	568.1	1729.51	569.79	1729.51	571.45	1729.5
573.55	1729.5	575.2	1729.49	583.06	1729.38	583.13	1729.37	585.39	1729.23
590.85	1728.94	593.27	1728.77	599.62	1728.23	602.88	1728.07	604.24	1727.85
606.22	1727.59	608.04	1727.38	616.01	1726.54	620.67	1726.67		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	65.38	.027	541.64	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	65.38	541.64		36.03 16.86	5.89		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.70	Reach Len. (ft)	36.03	16.86	5.89
Crit W.S. (ft)		Flow Area (sq ft)		793.75	
E.G. Slope (ft/ft)	0.001812	Area (sq ft)		793.75	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.00	Top Width (ft)		122.00	
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)		8.06	
Max Chl Dpth (ft)	10.37	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	150353.0	Conv. (cfs)		150353.0	
Length Wtd. (ft)	16.86	Wetted Per. (ft)		124.30	
Min Ch El (ft)	1708.33	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	620.67	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		64.40	
C & E Loss (ft)	0.00	Cum SA (acres)		12.78	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 82

INPUT

Description: "FW" 19+16.86

Station Elevation Data		num=		135	
Sta	Elev	Sta	Elev	Sta	Elev
0	1726.69	.14	1726.69	3.43	1726.59
4.53	1726.56	15.69	1726.82	17.14	1726.81
30.84	1728	30.95	1728	30.98	1728
36.33	1728.37	39.86	1728.33	46.35	1728.26
53.57	1729.97	53.89	1730	54.02	1730
61.52	1730	61.65	1729.97	67.41	1729
74.49	1727.65	76.89	1727.43	80.35	1727
99.48	1726.37	106.13	1726.2	119.52	1726.01
119.79	1726	120.3	1726	138.42	1725.58
144.78	1725.26	147.01	1725.19	150.28	1725
177.23	1724.16	179.9	1724.08	181.93	1724
197.2	1723	197.76	1722.96	199.32	1722.77
205.19	1722.09	205.42	1722.06	209.72	1720.98
260.6	1709.3	270.6	1708.3	280.6	1709.3
350.3	1721	351.86	1721.25	353.91	1721.59
378.67	1722.65	393.49	1723	421.98	1723.54
443.87	1724	450.47	1724.27	457.81	1724.57
473.45	1725	476.54	1725	477.23	1725
492.53	1726	492.97	1726.1	495.98	1727
506.63	1728.78	507.69	1729	507.99	1729
517.94	1729	519.53	1729	523.79	1729
531.75	1729.14	536.22	1729.31	537.95	1729.33
547.2	1729.52	547.37	1729.52	547.39	1729.52
547.6	1729.52	550.74	1729.42	552.46	1729.38
558.09	1729.25	562.24	1729.17	563.12	1729.14
571.67	1728.56	574.71	1728.32	577.54	1727.96
591.49	1726.48	591.87	1726.42	592.06	1726.39

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	61.52	.027	550.74	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	61.52	550.74		54.74 33.14	11.52		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.67	Reach Len. (ft)	54.74	33.14	11.52
Crit W.S. (ft)		Flow Area (sq ft)		792.63	
E.G. Slope (ft/ft)	0.001820	Area (sq ft)		792.63	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	121.99	Top Width (ft)		121.99	
Vel Total (ft/s)	8.07	Avg. Vel. (ft/s)		8.07	
Max Chl Dpth (ft)	10.37	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	150008.8	Conv. (cfs)		150008.8	
Length Wtd. (ft)	33.14	Wetted Per. (ft)		124.29	
Min Ch El (ft)	1708.30	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	596.70	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		64.09	
C & E Loss (ft)	0.00	Cum SA (acres)		12.73	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 81

INPUT

Description: "FW" 19+50.00

Station Elevation Data	num=	147
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1726.59	3.25	1726.67	7.19	1726.9	12.4	1727.11	13.87	1727.2
14.97	1727.28	18.1	1727.23	18.88	1727.23	22.33	1727.17	24.6	1727.13
27.47	1727.09	30.14	1727.05	32.3	1727.05	36.65	1727.87	36.97	1727.92
37.35	1727.95	37.43	1727.97	37.44	1727.97	37.49	1727.98	37.65	1728
37.78	1728	37.97	1728.01	41.47	1728.09	47.43	1727.96	49.72	1727.91
50.06	1728.13	51.56	1728.65	54	1728.87	54.57	1728.96	56.79	1728.87
58.12	1728.74	60.26	1728.49	63.43	1728	66.99	1727.58	69.5	1727.37
72.55	1727	80.69	1726.72	86.37	1726.6	93.79	1726.35	103.62	1726
106.32	1726	116.11	1726	118.58	1726	127.89	1726	128.11	1726
128.37	1726	129.3	1726	132.86	1725.94	133.5	1725.94	138.67	1725.75
142.08	1725.72	159.83	1725	174.17	1725	174.59	1725	174.96	1725
175.4	1724.88	178.59	1724	179.97	1723.68	238.14	1709.31	238.15	1709.31
240.01	1709.25	240.02	1709.25	250.01	1708.25	260.01	1709.25	289.32	1710.13
289.33	1710.13	292.26	1710.86	292.38	1710.88	292.55	1710.92	292.66	1710.95
292.84	1711	292.96	1711.04	296.81	1712	296.94	1712.05	300.75	1713
300.92	1713.05	304.69	1714	304.87	1714.06	308.6	1715	312.37	1715.94
312.56	1716	312.75	1716.06	316.44	1717	316.67	1717.07	320.31	1718
320.57	1718.08	324.16	1719	324.44	1719.09	327.99	1720	330.38	1720.37
331.31	1720.61	332.81	1721	336.96	1721.32	340.16	1721.57	348.96	1722
382.29	1722.82	389.87	1723	408.9	1723.68	415.71	1723.88	419.85	1724
420.57	1724	424.89	1724.12	428.15	1724.21	430.63	1724.27	448.38	1724.79
449.63	1724.83	450.58	1724.86	451.34	1724.88	452.21	1724.91	455.72	1725
464.97	1725.87	466.11	1726	474.68	1726.87	475.73	1727	476.85	1727.22
482.38	1728	483.02	1728	487.26	1728	492.37	1728	503.47	1728
506.78	1728.29	507.26	1728.39	507.53	1728.43	512.77	1728.85	516.55	1729.03
522.99	1729.08	523.24	1729.08	523.35	1729.08	523.62	1729.09	524.42	1729.09
531.98	1728.91	534.99	1728.81	538	1728.81	541	1728.7	542.03	1728.62
542.8	1728.55	545.6	1728.3	549.81	1728.17	551.48	1728.05	557.41	1727.51
564.31	1727.05	565.34	1726.97	566.18	1726.97	568.82	1726.93	573.31	1726.43
576.12	1726.53	576.3	1726.53						

Manning's n Values num= 3
Sta n Val Sta n Val
0 .027 56.79 .027 516.55 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
56.79 516.55 49.03 32.49 11.33 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.01	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.61	Reach Len. (ft)	49.03	32.49	11.33
Crit W.S. (ft)		Flow Area (sq ft)		792.90	
E.G. Slope (ft/ft)	0.001821	Area (sq ft)		792.90	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.12	Top Width (ft)		122.12	
Vel Total (ft/s)	8.07	Avg. Vel. (ft/s)		8.07	
Max Chl Dpth (ft)	10.36	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	149986.4	Conv. (cfs)		149986.4	
Length Wtd. (ft)	32.49	Wetted Per. (ft)		124.43	
Min Ch Bl (ft)	1708.25	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	576.30	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		63.49	
C & E Loss (ft)	0.02	Cum SA (acres)		12.64	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 79

INPUT

Description: "FW" 19+82.49

Station	Elevation	Data	num=	150					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1726.94	1.03	1726.99	2.77	1727.08	5.48	1727.21	9.57	1727.39
14.42	1727.39	16.67	1727.39	18.68	1727.22	20	1727.13	20.5	1727.11
23.91	1726.92	29.41	1726.8	32.23	1726.72	32.81	1726.71	33.14	1726.71
44.19	1726.69	48.02	1726.69	50.5	1726.67	52.03	1726.66	52.24	1726.61
52.54	1726.53	52.67	1726.53	57.75	1726.42	60.69	1726.35	63.92	1726.29
74.01	1726.21	91.15	1726.02	96.29	1726	99.36	1726	104.15	1725.53
112.15	1725	121.4	1724.62	127.16	1724.45	141.6	1724	145.63	1723.91
146.03	1723.91	159.79	1723.71	160.82	1723.7	167.08	1723.61	173.9	1723.56
179.02	1723.49	191.37	1720.4	193.36	1720.14	194.98	1719.9	197.32	1719.31
226.62	1712.13	234.39	1710.17	234.9	1710.04	235.41	1709.91	235.92	1709.78
237.75	1709.32	239.09	1709.28	241.53	1709.2	248.5	1708.51	251.53	1708.2
258.55	1708.91	261.53	1709.2	284.87	1709.9	294.36	1710.19	294.61	1710.28
297.09	1711	299.02	1711.64	300.44	1712	302.37	1712.64	303.79	1713
305.72	1713.65	307.13	1714	309.07	1714.65	310.48	1715	311.91	1715.36
313.84	1716	315.77	1716.64	317.18	1717	319.12	1717.64	320.52	1718
322.46	1718.65	323.85	1719	325.8	1719.65	327.18	1720	330.41	1720.49
331.15	1720.55	332.32	1720.63	333.17	1720.69	336.11	1720.89	338.18	1721
342.83	1721.19	348.16	1721.38	353.45	1721.54	356.27	1721.63	365.44	1722
388.95	1722.58	401.4	1722.87	406.33	1723	415.79	1723.59	422.79	1724
429.35	1724.19	455.52	1725	456.21	1725.05	457.19	1725.12	469.2	1726
469.45	1726.02	474.07	1726.4	474.53	1726.43	476.13	1726.57	476.66	1726.59
477.96	1726.65	478.8	1726.69	479.21	1726.72	479.9	1726.76	480.64	1726.81
483.69	1726.97	485.02	1727	486.59	1727.04	487.47	1727.06	491.02	1727.12
491.22	1727.13	491.49	1727.13	491.76	1727.13	493.3	1727.16	495.57	1727.2
495.77	1727.19	496.03	1727.2	496.34	1727.21	498.56	1727.29	502.46	1727.41
505.94	1727.58	507.72	1727.72	508.79	1727.79	509.3	1727.83	513.48	1728.1
515.68	1728.19	516.21	1728.2	516.87	1728.2	524.48	1728.27	525.55	1728.26
526.54	1728.25	528.79	1728.19	532.96	1728.11	540.94	1727.75	541.55	1727.73
542.74	1727.65	546.89	1727.46	549	1727.41	552.53	1727.18	556.95	1726.73
561.39	1726.36	564.13	1726.35	572.44	1726.4	575.35	1726.52	577.13	1726.55

Manning's n Values num= 3
Sta n Val Sta n Val
0 .027 16.67 .027 525.55 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
16.67 525.55 18.29 17.51 17.61 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.59	Reach Len. (ft)	18.29	17.51	17.61
Crit W.S. (ft)		Flow Area (sq ft)		815.15	
E.G. Slope (ft/ft)	0.001662	Area (sq ft)		815.15	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	122.01	Top Width (ft)		122.01	
Vel Total (ft/s)	7.85	Avg. Vel. (ft/s)		7.85	
Max Chl Dpth (ft)	10.39	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	156998.7	Conv. (cfs)		156998.7	
Length Wtd. (ft)	17.51	Wetted Per. (ft)		124.51	
Min Ch El (ft)	1708.20	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)	577.13	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		62.89	
C & E Loss (ft)	0.01	Cum SA (acres)		12.55	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 78.9

INPUT

Description: "FW" 20+00.00

Station Elevation Data		num= 135		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1726.31	1.73	1726.32	3.55	1726.37	3.94	1726.39	8.11	1726.58
10.01	1726.54	11.99	1726.61	14.46	1726.54	18.65	1726.55	23.33	1726.51
23.88	1726.5	24.16	1726.5	28.41	1726.46	31.29	1726.43	31.57	1726.43
31.91	1726.42	36.35	1726.4	37.27	1726.37	37.83	1726.36	38.44	1726.34
42.35	1726.34	51.6	1726.19	58.7	1726.22	59.13	1726.11	64.05	1726
64.16	1726	68.32	1726	69.29	1726.02	69.96	1726.03	70.67	1726.04
73.11	1726.05	88.53	1726	91.06	1726	96.07	1726	99.07	1726
102.27	1726	104.2	1726	104.3	1725.99	112.02	1725	118.47	1724.66
133.02	1724	141.84	1723.75	146.83	1723.66	160.43	1723.37	163.41	1723.33
168.37	1723.26	171	1723.25	186.92	1723	186.93	1723	210.92	1717
210.93	1717	214.92	1716	214.94	1716	214.95	1715.99	218.95	1715
222.95	1714	226.94	1713	226.95	1713	230.94	1712	234.94	1711
238.93	1710	241.6	1709.33	246.8	1709.18	256.79	1708.18	256.8	1708.18
256.81	1708.18	266.8	1709.18	266.83	1709.18	301.01	1710.2	303.4	1711
306.4	1712	309.4	1713	312.4	1714	315.4	1715	318.4	1716
321.4	1717	324.4	1718	327.4	1719	330.4	1720	330.41	1720
330.42	1720	330.44	1720	341.49	1720.52	354.6	1720.95	355.05	1720.97
356.1	1721	365	1721.36	381.08	1722	381.85	1722.02	382.25	1722.03
386.41	1722.13	410.79	1722.76	419.88	1723	422.84	1723.35	424.1	1723.46
425.87	1723.59	430.55	1723.93	431.49	1724	446.65	1724.49	461.95	1725
464.56	1725.22	473.97	1726	477.4	1726.25	482.89	1726.65	490.02	1726.76
491.17	1726.78	491.36	1726.78	491.63	1726.78	491.95	1726.79	492.59	1726.79
494.14	1726.8	502.77	1726.85	506.19	1726.87	508.61	1726.92	514.61	1727.04
516.53	1727.1	517.88	1727.16	518.08	1727.16	520.52	1727.16	521.78	1727.19
521.9	1727.19	527.04	1727.26	527.59	1727.25	535.97	1727.09	536.26	1727.08
537.72	1727.03	542.69	1726.87	550.28	1726.61	554.06	1726.47	557.91	1726.26
563.16	1726.23	569.98	1726.15	573.41	1726.28	574.2	1726.3	580.51	1726.55

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.027	10.01	.027	521.9	.027		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	10.01	521.9		58.77	50	50.51	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.58	Reach Len. (ft)	58.77	50.00	50.51
Crit W.S. (ft)		Flow Area (sq ft)		826.44	
E.G. Slope (ft/ft)	0.001581	Area (sq ft)		826.44	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	121.51	Top Width (ft)		121.51	
Vel Total (ft/s)	7.74	Avg. Vel. (ft/s)		7.74	
Max Chl Dpth (ft)	10.40	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	160964.4	Conv. (cfs)		160964.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		124.13	
Min Ch El (ft)	1708.18	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)	580.51	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		62.56	
C & E Loss (ft)	0.01	Cum SA (acres)		12.50	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 78

INPUT

Description: "FW" 20+50.00

Station Elevation Data		num= 128		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.8	16.58	1724.06	21.05	1723.84	23.67	1723.71	25.85	1723.76
32.71	1723.41	41.25	1723.23	42.32	1723.2	45.64	1723.12	46.47	1723.11
46.84	1723.1	52.38	1723.04	60.28	1722.95	63.13	1722.95	66.83	1722.9
70.1	1722.85	72.03	1722.83	77.55	1722.89	81.09	1723	83	1723
83.99	1723	87.74	1723	87.85	1723	88.27	1723.01	91.17	1722.97
95.97	1722.88	99.17	1722.82	103.74	1722.99	112.81	1723.24	119.35	1723.23
120.27	1723.23	121.18	1723.23	121.99	1723.23	130.69	1723.32	131.92	1723.31
132.91	1723.3	139.85	1723.32	140.87	1723.32	149.03	1723.26	149.39	1723.25
162.49	1723.09	163.55	1723.08	167.97	1723	175.55	1722.57	181.22	1722
192.99	1721.01	193.14	1721	193.19	1721	193.43	1720.97	202.04	1720.18
204.23	1720	215.3	1719.3	220.35	1719	223.2	1718.76	230.58	1718

235.31	1717.62	242.69	1717	251.38	1716	251.39	1716	254.39	1715
257.39	1714	260.39	1713	263.39	1712	266.39	1711	269.39	1710
269.4	1710	271.59	1709.27	277.09	1709.1	277.1	1709.1	287.09	1708.1
287.1	1708.1	287.11	1708.1	297.1	1709.1	297.13	1709.1	331.59	1710.14
331.62	1710.15	361.18	1720	361.27	1720	379.2	1721	380.7	1721.15
397.43	1722	399.72	1722.05	400.26	1722.07	415.92	1722.4	419.36	1722.46
423.88	1722.59	433.58	1722.69	442.54	1722.81	452.58	1723	456.68	1723.25
465.17	1724	469.19	1724.28	481.68	1725	486.15	1725.57	490.24	1726
494.12	1726	494.53	1726	495.72	1725.76	498.13	1725.88	499.54	1725.97
507.06	1726.73	510.65	1727.04	511.16	1727.09	512.1	1727.17	513.76	1727.3
515.2	1727.4	521.84	1727.84	521.94	1727.84	522.06	1727.85	522.17	1727.85
522.72	1727.85	527.69	1727.85	529.05	1727.85	535.87	1727.69	538.41	1727.61
543.98	1727.55	547.47	1727.5	549.36	1727.38	555.65	1727.06	557.09	1727.03
566.64	1726.81	567.9	1726.79	568.15	1726.78	570.73	1726.68	582.19	1726.26
583.04	1726.21	595.06	1725.71	603.69	1726.16				

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	527.69	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	527.69		54.01	50	50.94	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.42	Reach Len. (ft)	54.01	50.00	50.94
Crit W.S. (ft)		Flow Area (sq ft)		798.83	
E.G. Slope (ft/ft)	0.001933	Area (sq ft)		798.83	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	129.90	Top Width (ft)		129.90	
Vel Total (ft/s)	8.01	Avg. Vel. (ft/s)		8.01	
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	145575.9	Conv. (cfs)		145575.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		132.57	
Min Ch El (ft)	1708.10	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)	603.69	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		61.62	
C & E Loss (ft)	0.01	Cum SA (acres)		12.35	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 77

INPUT										
Description: "FW" 21+00.00										
Station Elevation Data			num= 138							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1725.66	15.02	1725.07	17.27	1724.96	20.7	1724.84	27.46	1724.61	
29.12	1724.5	36.54	1724.16	39.63	1724.07	41.8	1724.1	47.17	1724.17	
50.73	1724.17	61.73	1724.13	62.96	1724.15	70.28	1724.16	74.7	1724.07	
84.61	1724.15	86.08	1724.15	87.43	1724.15	94.12	1723.96	95.71	1723.99	
97.49	1724	98.88	1724.01	101.57	1724.03	104.61	1724.06	107.46	1724.03	
107.67	1724.05	109.56	1724	115.79	1723.86	117.02	1724	117.48	1724.05	
123.79	1724.69	126.9	1725	127.95	1725.13	130.22	1725.28	132.2	1725.32	
133.37	1725.36	135.17	1725.32	139.75	1725	139.94	1724.99	149.29	1724	
149.75	1723.96	150.4	1723.94	157.14	1723.39	169.42	1723.25	171.55	1723.15	
183.1	1723	186.33	1722.82	190.13	1722.55	194.19	1722.21	195.54	1722	
206.66	1721.13	207.45	1721	210.6	1720.57	215.02	1720	220.32	1719.58	
227.9	1719	237.53	1718.35	242.96	1718	249.39	1717.06	249.75	1717	
269.69	1716.01	269.97	1716	287.99	1709.99	290.39	1709.19	295.9	1709.03	
305.89	1708.03	305.9	1708.03	315.89	1709.03	315.9	1709.03	350.39	1710.06	
380.2	1720	392.03	1720.7	398.6	1721	403.47	1721.83	406.72	1722	
425.7	1722.38	426.73	1722.41	427.67	1722.44	447.24	1723	447.53	1723	
447.76	1723	448.78	1723	451.44	1723.21	458.69	1724	462.35	1724.3	
471.22	1724.95	471.76	1724.98	471.92	1725	480.31	1725.82	482.26	1726	
487.74	1726	496.32	1726	501.16	1725.35	503.68	1725.32	510.96	1725.3	
514.2	1725.33	517.18	1725.42	518.78	1725.51	519.06	1725.55	519.15	1725.5	
520.42	1725.59	522.82	1725.79	526.02	1726.06	528.9	1726.3	533.34	1726.55	
533.76	1726.58	533.99	1726.59	534.15	1726.6	535.36	1726.65	537.18	1726.68	
537.37	1726.68	540.43	1726.72	542.93	1726.74	543.76	1726.77	545.85	1726.77	
546.22	1726.78	550.18	1726.84	552.41	1726.83	554.41	1726.82	556.66	1726.81	
557.78	1726.73	560.17	1726.67	560.24	1726.67	561.01	1726.65	566.18	1726.47	
567.24	1726.45	570.16	1726.4	571.8	1726.35	578.38	1726.21	582.29	1726.07	
583.06	1726	586.89	1725.68	589.91	1725.64	597.85	1725.5	602.36	1725.37	
605.31	1725.48	611.96	1725.42	612.77	1725.43					

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	550.18	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	550.18		51	50	51.52	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.35	Reach Len. (ft)	51.00	50.00	51.52
Crit W.S. (ft)		Flow Area (sq ft)		815.10	
E.G. Slope (ft/ft)	0.001949	Area (sq ft)		815.10	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	137.64	Top Width (ft)		137.64	
Vel Total (ft/s)	7.85	Avg. Vel. (ft/s)		7.85	
Max Chl Dpth (ft)	10.32	Hydr. Depth (ft)		5.92	
Conv. Total (cfs)	144958.5	Conv. (cfs)		144958.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		140.32	
Min Ch El (ft)	1708.03	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	612.77	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		60.70	
C & E Loss (ft)	0.01	Cum SA (acres)		12.20	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash

RS: 76

INPUT

Description: "FW" 21+50

Station Elevation Data		num=	120								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1725.28	4	1725.2	15.03	1724.9	15.63	1724.88	16.25	1724.87		
29.7	1724.58	30.76	1724.58	30.85	1724.58	33.39	1724.49	35.46	1724.44		
36.64	1724.38	38.28	1724.38	40.7	1724.38	43.48	1724.38	47.45	1724.38		
48.46	1724.36	50.56	1724.26	56.12	1724.25	63.9	1724.69	67.54	1724.81		
69.79	1725.04	72.5	1725.07	75.15	1725.13	77.77	1725.23	82.86	1725.54		
85.22	1725.6	85.87	1725.6	86.26	1725.65	86.75	1725.64	88.22	1725.51		
91.94	1725.16	99.22	1725.01	100.06	1724.99	100.22	1725	101.83	1725.14		
102.63	1725.18	104.88	1725.35	114.58	1726	116.15	1726	119.92	1725.54		
121.41	1725.26	121.77	1725.24	123.33	1725	126.97	1724.52	130.26	1724		
132.53	1724	135.7	1724	139.97	1724	143.81	1724	146.68	1724		
150.57	1724	198.06	1723	198.32	1723	198.68	1722.96	210.82	1722		
215	1721.43	217.68	1721	218.87	1720.88	221.45	1720.72	228.56	1720.24		
229.75	1720.18	230.58	1720.14	231.11	1720.11	232.26	1720	239.98	1719.44		
243.7	1719	247.95	1718.57	251.73	1718	255.7	1717.13	256.35	1717		
262.67	1716	280.76	1709.97	283.32	1709.12	288.83	1708.95	298.83	1707.95		
308.83	1708.95	343.32	1709.99	343.33	1709.99	373.36	1720	378.25	1720.12		
381.68	1720.19	417.05	1721	418.96	1721	419.94	1721	427.92	1721.87		
428.95	1722	430	1722.05	430.24	1722.06	430.78	1722.09	431.9	1722.16		
446.14	1723	447.94	1723.18	462.55	1724	466.14	1724	482.52	1724		
488.93	1724	489.66	1724	493.4	1724	498.76	1723.81	499.55	1723.72		
505.39	1723.84	510.6	1724	515.38	1724.08	520.16	1724.04	528.37	1724.19		
534.16	1724.25	536.51	1724.33	537.19	1724.34	538.03	1724.34	540.92	1724.33		
541.44	1724.34	541.93	1724.35	544.68	1724.35	545.72	1724.37	554.57	1724.5		
560.8	1724.63	563.88	1724.6	577.35	1724.33	585.19	1724.29	593.31	1724.56		

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	114.58	.027	563.88	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 114.58 563.88 62.37 50 52.26 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.027	
W.S. Elev (ft)	1718.12	Reach Len. (ft)	62.37	50.00	52.26
Crit W.S. (ft)		Flow Area (sq ft)		768.83	
E.G. Slope (ft/ft)	0.001912	Area (sq ft)		768.83	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	116.77	Top Width (ft)		116.77	
Vel Total (ft/s)	8.32	Avg. Vel. (ft/s)		8.32	
Max Chl Dpth (ft)	10.17	Hydr. Depth (ft)		6.58	
Conv. Total (cfs)	146352.2	Conv. (cfs)		146352.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		119.52	
Min Ch El (ft)	1707.95	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)	593.31	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		59.79	
C & E Loss (ft)	0.00	Cum SA (acres)		12.05	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash

RS: 75

INPUT

Description: "FW"22+00

Station Elevation Data		num=	113								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1725.1	3.57	1725.05	7.06	1724.73	11.06	1724.46	14.05	1724.42		
19.4	1724.3	21.64	1724.33	23.06	1724.38	26.23	1724.49	28.04	1724.48		
32.48	1724.75	36.88	1725.13	37.31	1725.19	37.75	1725.27	40.04	1725.6		
46.61	1726.62	46.96	1726.76	47.43	1727	48.4	1727	49.68	1727		
52.1	1726.76	56.45	1726	61.27	1725.49	61.9	1725.43	62.44	1725.42		
70.73	1725.25	73.66	1725.74	75.56	1726	77.41	1726.26	82.71	1727		
82.91	1727	93.04	1727	95.38	1726.27	96.45	1726	97.88	1725.75		
102.34	1725	105.3	1724.47	108.27	1724	112.87	1723.34	116.19	1723.26		
118.24	1723.13	120.44	1723.18	121.4	1723.13	124.4	1723.3	133.18	1723		
144.58	1723	147.86	1723	178.07	1723	178.73	1723	179.63	1723		
184.47	1723	187.99	1723	188.99	1723	191.88	1723	194.08	1723		
199.62	1722.74	207.9	1722	246.76	1709.04	246.77	1709.04	252.27	1708.88		
252.28	1708.88	262.27	1707.88	272.27	1708.88	272.28	1708.88	306.77	1709.91		
337.03	1720	339.95	1720.22	343.54	1720.42	349.34	1720.8	354.31	1721		
360.65	1721.68	363.9	1722	388.86	1722.45	406.38	1723	411.59	1723		
411.93	1723	412.57	1723	418.37	1723	418.52	1723	418.67	1723		
419.11	1723	419.21	1723	419.3	1723	419.39	1723	419.55	1723		
422.29	1723.54	425.58	1724	427.8	1724	434.82	1724	436.71	1724		
444.1	1723.49	450.21	1723.25	459.73	1723.2	461.14	1723.22	464.41	1723.25		
474	1723.34	475.24	1723.36	476.98	1723.43	478.89	1723.52	479.58	1723.52		
490.3	1723.85	491.83	1723.91	495.28	1724.06	500.17	1724.29	505.2	1724.57		
509.63	1724.79	513.25	1724.6	520.74	1724.2	521.74	1724.15	522.17	1724.13		
522.58	1724.11	539.48	1723.91	541.59	1723.92						

Manning's n Values

num=

3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	48.4	.027	509.63	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 48.4 509.63 60.15 50 52.67 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.98	Reach Len. (ft)	60.15	50.00	52.67
Crit W.S. (ft)		Flow Area (sq ft)		755.38	
E.G. Slope (ft/ft)	0.001902	Area (sq ft)		755.38	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	111.02	Top Width (ft)		111.02	
Vel Total (ft/s)	8.47	Avg. Vel. (ft/s)		8.47	
Max Chl Dpth (ft)	10.10	Hydr. Depth (ft)		6.80	
Conv. Total (cfs)	146745.7	Conv. (cfs)		146745.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		113.90	
Min Ch El (ft)	1707.88	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	541.59	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		58.91	
C & E Loss (ft)	0.00	Cum SA (acres)		11.92	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 74

INPUT

Description: "FW"22+50

Station Elevation Data		num=	105						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.75	1.09	1724.74	4.91	1724.71	8.21	1724.66	11.67	1724.61
14.03	1724.7	17.01	1724.82	19.31	1725.07	21.86	1725.36	22.48	1725.33
23.7	1725.21	34.93	1726.03	36.1	1726.08	37.05	1726.03	40.18	1726.33
40.25	1726.35	40.56	1726.41	42.86	1726.86	43.24	1726.91	43.66	1727
51.89	1727	52.4	1727	53.1	1727	57.8	1726.11	58.34	1726
58.41	1725.99	58.86	1725.86	61.15	1725.18	61.52	1725.1	63.56	1725.06
72.19	1724.9	73.95	1724.92	77.2	1724.96	80.56	1725	85.19	1725
88.44	1725	90.11	1725	99.04	1725	100.53	1725	101.98	1725
106.94	1725	108.87	1725.19	110.22	1725.32	116.58	1725.53	118.15	1725.8
120.03	1726	120.65	1726	120.74	1726	121.02	1726	129.54	1726
132.4	1726	135.16	1726	138.32	1726	138.92	1726	139.48	1726
139.89	1726	145.12	1725.09	145.62	1725	150.55	1724.05	150.79	1724
151.72	1723.91	158.91	1723	162.05	1723	164.89	1722.76	172.58	1722.15
174.45	1722	213.46	1708.99	213.54	1708.97	219.05	1708.8	229.05	1707.8
239.05	1708.8	273.54	1709.84	273.55	1709.84	304.03	1720	312.57	1721.09
321	1722	332.72	1722.56	345.63	1723	346.74	1723.07	351.32	1723.45
357.71	1723.94	358.5	1724	365.4	1724.43	369.77	1724.63	374.94	1725
383.75	1725	386.05	1725	388.37	1725	389.3	1725	392.35	1724.09
392.68	1724	396.37	1723.12	396.96	1723	398.49	1723	408.7	1722.92
428.26	1723.14	435.05	1723.27	440.07	1723.32	450.5	1723.51	468.57	1723.69
473.52	1723.8	477.48	1723.83	483.85	1723.91	490.44	1724.09	491.8	1724.08

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	51.89	.027	386.05	.027

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	51.89	386.05		53.98	50	52.67		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1719.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.88	Reach Len. (ft)	53.98	50.00	52.67
Crit W.S. (ft)		Flow Area (sq ft)		752.23	
E.G. Slope (ft/ft)	0.001925	Area (sq ft)		752.23	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	110.84	Top Width (ft)		110.84	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	10.08	Hydr. Depth (ft)		6.79	
Conv. Total (cfs)	145886.4	Conv. (cfs)		145886.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		113.71	
Min Ch El (ft)	1707.80	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)	491.80	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		58.05	
C & E Loss (ft)	0.00	Cum SA (acres)		11.80	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 73

INPUT

Description: "FW"23+00

Station Elevation Data		num=	72						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.41	1.06	1724.43	4.81	1724.52	7.24	1724.46	18.04	1723.89
22.65	1723.7	29.81	1723.54	33.97	1723.49	36.35	1723.52	41.99	1723.55
45.11	1723.56	49.04	1723.57	60.19	1723.69	60.37	1723.69	60.6	1723.7
60.72	1723.7	65.33	1723.82	68.99	1723.86	69.73	1723.88	71.35	1723.85
77.74	1723.74	82.84	1723.64	98.09	1723.92	99.74	1724	103.79	1724.31
107.58	1724.61	114.49	1725	131.44	1725.27	143.71	1725.43	158.33	1720.54
193.31	1708.9	198.92	1708.73	208.92	1707.73	218.92	1708.73	218.93	1708.73
252.87	1709.75	280.63	1719	283.91	1720	287.91	1720.42	291.17	1720.76
292.13	1720.85	294	1721	315.89	1721.87	317.24	1721.93	317.94	1721.96
318.29	1721.97	318.97	1722	339.89	1722.92	342.13	1723	351.68	1723.77
354.63	1724	357.02	1724	360.94	1724	364.24	1723.74	367.23	1723.41
369.76	1723	373.21	1722.86	373.83	1722.7	378.1	1722.75	384.25	1722.83
394.96	1722.93	401.03	1722.9	407.54	1722.81	409.97	1722.77	418.15	1722.95
420.23	1723	420.63	1723.01	433.52	1723.07	435.55	1723.1	439.63	1723.25
451.29	1723.93	455.12	1723.92						

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	143.71	.027	357.02	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
143.71 357.02 17.45 16.88 17.78 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.75	Reach Len. (ft)	17.45	16.88	17.78
Crit W.S. (ft)		Flow Area (sq ft)		743.19	
E.G. Slope (ft/ft)	0.001987	Area (sq ft)		743.19	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	110.17	Top Width (ft)		110.17	
Vel Total (ft/s)	8.61	Avg. Vel. (ft/s)		8.61	
Max Chl Dpth (ft)	10.02	Hydr. Depth (ft)		6.75	
Conv. Total (cfs)	143563.0	Conv. (cfs)		143563.0	
Length Wtd. (ft)	16.88	Wetted Per. (ft)		113.01	
Min Ch El (ft)	1707.73	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)	455.12	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		57.19	
C & E Loss (ft)	0.00	Cum SA (acres)		11.67	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 72.3

INPUT

Description: "FW"23+16.88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.09	5.4	1724	11.94	1723.77	16	1723.64	21.89	1723.43
24.13	1723.44	26.33	1723.46	31.66	1723.5	39.72	1723.55	40.25	1723.56
50.57	1723.82	52.8	1723.88	55.19	1723.94	57.6	1723.92	60.11	1723.89
61.55	1723.87	62.62	1723.88	66.18	1724.1	66.33	1724.06	80.29	1723.82
86.58	1723.72	87.87	1723.79	91.47	1724	94.45	1724.51	98.28	1725
116.57	1725.21	117.51	1725.22	126.97	1725.32	138.35	1725.53	188.27	1708.89
194.52	1708.7	204.52	1707.7	214.52	1708.7	247.39	1709.69	275.32	1719
284.99	1720	287.2	1720.16	291.07	1720.44	294.3	1720.66	295.86	1720.78
297.07	1720.87	299.09	1721	304.29	1721.22	323.22	1722	328.89	1722.25
335.69	1722.49	342.35	1722.66	348.33	1722.87	348.48	1722.86	351.23	1722.83
352.79	1722.82	355.66	1722.71	361.38	1722.61	364.43	1722.61	367.26	1722.64
370.38	1722.67	372.14	1722.66	376.91	1722.71	384.72	1722.87	388.37	1722.88
392.09	1722.89	401.91	1722.8	403.5	1722.79	404.49	1722.77	405.16	1722.78
414.75	1722.94	424.33	1723	427.19	1723.08	430.86	1723.31	440.22	1723.93
445.12	1723.92								

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	138.35	.027	445.12	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
138.35 445.12 20.21 33.12 50.64 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.70	Reach Len. (ft)	20.21	33.12	50.64
Crit W.S. (ft)		Flow Area (sq ft)		737.96	
E.G. Slope (ft/ft)	0.002021	Area (sq ft)		737.96	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	109.58	Top Width (ft)		109.58	
Vel Total (ft/s)	8.67	Avg. Vel. (ft/s)		8.67	
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)		6.73	
Conv. Total (cfs)	142372.4	Conv. (cfs)		142372.4	
Length Wtd. (ft)	33.12	Wetted Per. (ft)		112.43	
Min Ch El (ft)	1707.70	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	445.12	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		56.90	
C & E Loss (ft)	0.01	Cum SA (acres)		11.63	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 71

INPUT

Description: "FW" 23+50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.94	6.53	1723.58	7.9	1723.49	8.64	1723.49	9.19	1723.49
10.04	1723.49	12.44	1723.49	20.07	1723.48	28.07	1723.47	33.84	1723.55
34.86	1723.56	35.71	1723.57	44.13	1723.68	46.16	1723.72	53.81	1724.15
56.59	1724.26	57.51	1724.3	58.4	1724.47	61.02	1724.9	63.99	1724.83
73.83	1724.59	76.41	1724.71	80.35	1725	91.02	1725.11	132.26	1725.51
182.12	1708.89	190.09	1708.65	200.09	1707.65	210.09	1708.65	239.95	1709.55
268.3	1719	268.31	1719	294.08	1720	298.5	1720.32	305.51	1721
330.39	1721.94	331.69	1722	332.06	1722.02	332.53	1722.19	332.64	1722.24
344.51	1722.45	345.88	1722.47	347.72	1722.47	359.13	1722.54	359.27	1722.54
359.28	1722.54	364.9	1722.58	369.74	1722.61	379.1	1722.64	379.32	1722.64
380.92	1722.63	383.85	1722.53	388.08	1722.73	395.03	1722.71	399.05	1722.69
399.77	1722.68	400.05	1722.69	411.38	1722.99	413.74	1723	415.29	1723.04
424.99	1723.18	425.3	1723.19	426.36	1723.23				

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	132.26	.027	426.36	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
132.26 426.36 31.02 50 73.27 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.57	Reach Len. (ft)	31.02	50.00	73.27
Crit W.S. (ft)		Flow Area (sq ft)		721.01	
E.G. Slope (ft/ft)	0.002140	Area (sq ft)		721.01	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	107.93	Top Width (ft)		107.93	
Vel Total (ft/s)	8.88	Avg. Vel. (ft/s)		8.88	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	138339.6	Conv. (cfs)		138339.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		110.76	
Min Ch El (ft)	1707.65	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	426.36	0.00	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		56.35	
C & E Loss (ft)	0.01	Cum SA (acres)		11.54	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 70.5

INPUT

Description: "FW" 24+00

Station Elevation Data		num=	61						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.11	2.12	1724.06	3.64	1723.9	9.12	1723.49	13.28	1723.4
15.61	1723.34	17.94	1723.37	22.09	1723.41	37.05	1724.14	40.31	1724.3
40.79	1724.32	41.86	1724.37	42.21	1724.42	49.39	1725.28	50.2	1725.4
50.36	1725.42	50.45	1725.45	52.33	1725.39	59.31	1725.05	122.7	1725.7
122.71	1725.7	173.14	1708.89	183.54	1708.58	193.54	1707.58	203.54	1708.58
228.52	1709.33	257.54	1719	257.58	1719	270.69	1719.97	271.23	1720
278.87	1720.75	281.53	1721	284.83	1721.28	293.47	1722	299.07	1722.16
300.83	1722.18	314.43	1722.47	318.39	1722.47	324.43	1722.58	327.07	1722.55
327.92	1722.54	328.86	1722.47	330.95	1722.47	333.41	1722.47	339	1722.46
339.02	1722.46	348.54	1722.57	355.84	1722.46	358.54	1722.4	359.78	1722.37
365.96	1722.34	370.06	1722.38	375.59	1722.44	386.31	1722.67	390.7	1722.75
394.57	1722.82	395.53	1722.83	400.07	1722.87	401.09	1722.94	402.79	1722.89
405.67	1722.86								

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	122.7	.027	405.67	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	122.7	405.67		11.4	18.14	25.87	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.		0.027	
W.S. Elev (ft)	1717.31	Reach Len. (ft)	11.40	18.14	25.87
Crit W.S. (ft)		Flow Area (sq ft)		684.04	
E.G. Slope (ft/ft)	0.002446	Area (sq ft)		684.04	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	104.57	Top Width (ft)		104.57	
Vel Total (ft/s)	9.36	Avg. Vel. (ft/s)		9.36	
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)		6.54	
Conv. Total (cfs)	129393.9	Conv. (cfs)		129393.9	
Length Wtd. (ft)	18.14	Wetted Per. (ft)		107.34	
Min Ch El (ft)	1707.58	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)	405.67	0.00	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		55.54	
C & E Loss (ft)	0.01	Cum SA (acres)		11.42	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 70

INPUT

Description: "FW" 24+18.14

Station Elevation Data		num=	62						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.29	1.11	1724.3	2.97	1724.32	5.77	1723.83	8.02	1723.49
9.49	1723.47	14.12	1723.39	17.65	1723.34	21.02	1723.28	29.58	1723.92
37.33	1724.37	41.15	1724.79	45.39	1725.23	46.2	1725.27	46.25	1725.28
46.98	1725.26	55.12	1725	119.89	1725.58	169.98	1708.89	181.22	1708.55
191.22	1707.55	201.22	1708.55	224.33	1709.24	253.55	1719	257.14	1719.9
257.62	1720	261.31	1720.47	264.33	1720.77	265.16	1720.86	266.65	1721
267.9	1721.1	270.42	1721.29	282.88	1722	290.34	1722.25	297.18	1722.43
309.46	1722.78	318.49	1722.9	320.18	1722.94	328.18	1722.94	328.85	1722.95
329.14	1722.95	330.04	1722.94	334.69	1722.9	334.7	1722.72	338.46	1722.7
341.8	1722.69	350.25	1722.68	354.6	1722.68	355.37	1722.68	356.09	1722.66
360.61	1722.5	361.85	1722.49	365.36	1722.59	367.04	1722.66	370.43	1722.61
383.44	1722.52	389.88	1722.55	395.49	1722.55	396.14	1722.55	397.46	1722.63
398.76	1722.59	401.5	1722.56						

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	119.89	.027	320.18	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	119.89	320.18		20.2	31.86	45.32	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.		0.027	

W.S. Elev (ft)	1717.18	Reach Len. (ft)	20.20	31.86	45.32
Crit W.S. (ft)		Flow Area (sq ft)		667.00	
E.G. Slope (ft/ft)	0.002609	Area (sq ft)		667.00	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.02	Top Width (ft)		103.02	
Vel Total (ft/s)	9.60	Avg. Vel. (ft/s)		9.60	
Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	125291.8	Conv. (cfs)		125291.8	
Length Wtd. (ft)	31.86	Wetted Per. (ft)		105.77	
Min Ch El (ft)	1707.55	Shear (lb/sq ft)		1.03	
Alpha	1.00	Stream Power (lb/ft s)	401.50	0.00	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		55.26	
C & E Loss (ft)	0.02	Cum SA (acres)		11.38	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 69

INPUT

Description: "FW" 24+50

Station Elevation Data		num=	83						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.32	1.19	1724.32	3.09	1724	7.5	1723.49	9.33	1723.43
12.74	1723.32	16.26	1723.32	21.08	1723.33	28.04	1723.71	33.08	1723.98
33.93	1724.08	38.17	1724.81	38.77	1724.92	39.15	1724.94	39.88	1724.95
40.31	1724.97	46.4	1724.85	48.31	1724.81	50.76	1724.95	51.89	1725
114.39	1725.6	114.45	1725.6	164.6	1708.88	177.23	1708.5	187.23	1707.5
197.23	1708.5	216.97	1709.09	216.98	1709.1	252.69	1721	270.23	1722
302.68	1722.94	304.86	1723	305.07	1723	335	1723	335.6	1723
341.63	1723	342.78	1723	342.96	1723	343.65	1723	344.07	1723
344.83	1723	345.34	1722.88	347.34	1722.81	347.41	1722.8	347.72	1722.79
348.99	1722.78	349.92	1722.78	353.94	1722.71	356.54	1722.53	357.04	1722.52
357.07	1722.52	360.77	1722.51	362.37	1722.5	363.7	1722.49	364.13	1722.49
364.56	1722.49	365.73	1722.48	366.32	1722.48	366.56	1722.49	366.97	1722.57
367.3	1722.64	368.11	1722.64	369.22	1722.64	371.42	1722.65	375.68	1722.62
380.28	1722.61	382.13	1722.6	386	1722.53	389.13	1722.53	390.09	1722.5
390.77	1722.49	391.2	1722.5	391.4	1722.5	391.53	1722.5	392.26	1722.46
395.48	1722.29	395.51	1722.29	395.57	1722.29	395.6	1722.29	395.66	1722.29
395.71	1722.29	395.86	1722.29	398.84	1722.24				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	114.39	.027	398.84	.027

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
114.39	398.84	32.14	50	73.29	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.90	Reach Len. (ft)	32.14	50.00	73.29
Crit W.S. (ft)		Flow Area (sq ft)		629.55	
E.G. Slope (ft/ft)	0.003035	Area (sq ft)		629.55	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	99.84	Top Width (ft)		99.84	
Vel Total (ft/s)	10.17	Avg. Vel. (ft/s)		10.17	
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	116175.5	Conv. (cfs)		116175.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		102.53	
Min Ch El (ft)	1707.50	Shear (lb/sq ft)		1.16	
Alpha	1.00	Stream Power (lb/ft s)	398.84	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		54.79	
C & E Loss (ft)	0.05	Cum SA (acres)		11.30	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 68.5

INPUT

Description: "FW" 25+00

Station Elevation Data		num=	95						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.09	1.96	1723.87	4.51	1723.57	10.65	1723.36	12.39	1723.3
13.31	1723.29	17.23	1723.29	21.3	1723.36	25.54	1723.53	29.95	1724.35
30.44	1724.48	30.64	1724.45	31.67	1724.51	34.06	1724.47	34.62	1724.47
35.75	1724.45	42.63	1724.31	43.36	1724.41	47.31	1724.89	48.26	1725
48.74	1725	49.55	1725	50.18	1725	51.27	1725	72.43	1725.23
90.88	1725.36	104.91	1725	105.63	1725	106.03	1725	107.18	1724.79
110.75	1724	114.21	1723	156.6	1708.87	156.61	1708.87	171.25	1708.43
181.25	1707.43	191.25	1708.43	206.64	1708.89	206.65	1708.89	242.97	1721
252.78	1721.58	258.5	1721.92	259.84	1722	263.95	1722.11	264.52	1722.13
265.85	1722.16	269.24	1722.24	274.99	1722.39	289.67	1722.75	299.77	1723
301.7	1723.14	303.06	1723.24	303.9	1723.3	304.24	1723.31	305.97	1723.34
308.75	1723.4	311.73	1723.45	312.95	1723.48	322.45	1723.58	326.47	1723.64
331.83	1723.67	334.96	1723.67	336.96	1723.67	339.07	1723.67	341.8	1723.67
345.36	1723.67	346.06	1723.68	347.41	1723.73	348.51	1723.74	358.03	1723.51
358.75	1723.44	362.35	1723.23	363.23	1723.19	364.35	1723.17	365.93	1723.13
369.69	1723.05	370.36	1723.02	371.26	1722.98	371.26	1722.97	371.27	1722.98
371.84	1723.09	373.19	1723.04	376.72	1722.9	379.42	1722.81	380.38	1722.77
383.75	1722.64	387.44	1722.58	391.88	1722.5	393.84	1722.45	394.57	1722.45
395.81	1722.44	401.49	1722.16	402.81	1722.23	404.22	1722.19	407.19	1722.06

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	90.88	.027	347.41	.027

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.88	347.41	12.61	19.4	30.09	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.19	Reach Len. (ft)	12.61	19.40	30.09
Crit W.S. (ft)		Flow Area (sq ft)		552.09	
E.G. Slope (ft/ft)	0.004330	Area (sq ft)		552.09	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	93.92	Top Width (ft)		93.92	
Vel Total (ft/s)	11.59	Avg. Vel. (ft/s)		11.59	
Max Chl Dpth (ft)	8.76	Hydr. Depth (ft)		5.88	
Conv. Total (cfs)	97257.8	Conv. (cfs)		97257.8	
Length Wtd. (ft)	19.40	Wetted Per. (ft)		96.40	
Min Ch El (ft)	1707.43	Shear (lb/sq ft)		1.55	
Alpha	1.00	Stream Power (lb/ft s)	407.19	0.00	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		54.11	
C & E Loss (ft)	0.10	Cum SA (acres)		11.19	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 68

INPUT

Description: "FW" 25+19.40

Station Elevation Data		num= 85		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.17	.3	1724.17	1.46	1724.04	6.32	1723.28	11.72	1723.14
13.24	1723.17	15.64	1723.14	17.92	1723.11	22.19	1723.31	23.98	1723.41
25.87	1723.48	26.53	1723.6	28.71	1724.18	29.94	1724.46	30.43	1724.58
30.57	1724.55	31.58	1724.36	33.2	1724.29	33.47	1724.28	39.22	1724.16
41.51	1724.11	48.28	1724.54	53.22	1724.75	55.25	1724.82	56.24	1724.85
59.64	1724.99	59.83	1725	59.87	1725	60.06	1725	63.54	1725
65.79	1725	75.27	1725.06	77.52	1725	89.41	1725	90.24	1725
90.93	1724.97	91.33	1724.95	96.05	1724.71	98.54	1724.51	102.33	1724
110.65	1721.79	149.04	1709	169.04	1708.4	179.04	1707.4	189.04	1708.4
204.04	1708.85	211.3	1711.27	239.98	1720.83	240.49	1721	253.59	1721.69
262.48	1722	298.4	1722.89	302.15	1723	303.23	1723.08	306.29	1723.29
314.65	1723.47	315.23	1723.49	315.65	1723.49	316.28	1723.49	319.43	1723.45
322.95	1723.54	336.84	1723.82	338.59	1723.85	339.01	1723.86	339.12	1723.87
339.22	1723.87	339.54	1723.87	342.18	1723.82	353.01	1723.63	358.97	1723.5
361.05	1723.42	371.02	1723.25	375.14	1723.24	391.47	1722.4	394.12	1722.27
394.47	1722.25	402.24	1722	402.89	1721.98	405.36	1721.93	409.59	1721.82
410.48	1721.85	411.86	1721.98	413.08	1722	414.2	1721.89	415.03	1721.89

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	90.24	.027	339.54	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	90.24	339.54		30.83	30.6	33.3	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1718.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.74	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.36	Reach Len. (ft)	30.83	30.60	33.30
Crit W.S. (ft)		Flow Area (sq ft)		603.82	
E.G. Slope (ft/ft)	0.003469	Area (sq ft)		603.82	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	99.59	Top Width (ft)		99.59	
Vel Total (ft/s)	10.60	Avg. Vel. (ft/s)		10.60	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	108662.0	Conv. (cfs)		108662.0	
Length Wtd. (ft)	30.60	Wetted Per. (ft)		102.12	
Min Ch El (ft)	1707.40	Shear (lb/sq ft)		1.28	
Alpha	1.00	Stream Power (lb/ft s)	415.03	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		53.85	
C & E Loss (ft)	0.01	Cum SA (acres)		11.15	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 67

INPUT

Description: "FW" 25+50

Station Elevation Data		num= 81		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.04	2.34	1723.94	9.06	1723.54	10.49	1723.32	14.38	1723.04
17.06	1722.96	17.55	1722.96	18.4	1722.94	22.57	1722.84	25.44	1722.96
26.68	1723	27.67	1723.07	28.52	1723.19	31.92	1723.81	32.48	1723.74
32.57	1723.72	32.71	1723.72	32.78	1723.72	32.81	1723.72	36.26	1723.64
40.85	1723.54	42.62	1723.27	43.02	1723.26	43.4	1723.26	43.64	1723.27
43.92	1723.28	47.69	1723.16	48.26	1723.18	49.18	1723.18	51.32	1723.26
54.72	1723.34	55.74	1723.36	59.4	1723.43	67.72	1723.43	69.54	1723.48
91.72	1723	99.43	1723	102.49	1722.7	105.81	1722.15	145.38	1708.96
165.4	1708.35	175.4	1707.35	185.4	1708.35	200.4	1708.8	233.99	1720
240.31	1721	248	1721.24	255.66	1721.47	260.59	1721.61	264.53	1721.72
277.06	1722	300.34	1722.87	304.7	1723	305.02	1723.14	306	1723.34
316.65	1723.42	317.6	1723.44	318.12	1723.44	318.37	1723.45	319.02	1723.45
330.7	1723.5	336.14	1723.61	338.36	1723.67	343.79	1723.67	346.66	1723.69
350.03	1723.63	355.69	1723.52	361.18	1723.49	364.37	1723.26	368.58	1722.97
384.4	1722.02	387.09	1721.96	392.39	1721.89	406.28	1721.95	408.99	1721.89
412.07	1721.84	413.4	1721.78	418.92	1721.61	420.4	1721.73	421.06	1721.78
424.52	1721.61								

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	338.36	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 338.36 50.08 50 56.09 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.12	Reach Len. (ft)	50.08	50.00	56.09
Crit W.S. (ft)		Flow Area (sq ft)		585.10	
E.G. Slope (ft/ft)	0.003792	Area (sq ft)		585.10	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	98.44	Top Width (ft)		98.44	
Vel Total (ft/s)	10.94	Avg. Vel. (ft/s)		10.94	
Max Chl Dpth (ft)	8.77	Hydr. Depth (ft)		5.94	
Conv. Total (cfs)	103928.6	Conv. (cfs)		103928.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		100.91	
Min Ch El (ft)	1707.35	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)	424.52	0.00	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		53.43	
C & E Loss (ft)	0.08	Cum SA (acres)		11.08	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 66

INPUT

Description: "FW" 26+00

Station	Elevation	Data	num=	85					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.6	3.78	1723.49	5.47	1723.16	5.74	1723.14	7.61	1722.91
9.26	1722.72	9.81	1722.72	12.9	1722.68	15.21	1722.58	17.42	1722.55
29.09	1722.51	30.16	1722.51	30.53	1722.54	31.88	1722.63	33.03	1722.68
33.79	1722.6	34.95	1722.53	37.42	1722.48	42.95	1722.37	46.6	1722.36
64.76	1722.62	67.91	1722.77	69.54	1722.68	74.3	1722.86	81.27	1722.99
81.49	1722.98	87.37	1722.91	94.97	1722	96.84	1721.9	97.9	1721.84
102.72	1721.56	107.89	1720.15	141.71	1708.88	166.7	1708.28	166.71	1708.28
176.71	1707.28	186.71	1708.28	201.7	1708.73	201.71	1708.73	235.52	1720
247.3	1720.47	270.48	1721	271.86	1721.03	273.4	1721.06	292.08	1721.42
299.33	1721.52	303.18	1721.65	306.99	1721.79	308.9	1721.82	313.05	1722
316.43	1722.13	324.72	1722.46	333.21	1722.79	334.33	1722.83	334.91	1722.85
335.45	1722.86	339.26	1723	340.87	1723	347.91	1723	357.75	1723
364.17	1723	368.82	1723	374.18	1723	377.04	1722.93	380.01	1722.75
382.22	1722.61	384.38	1722.54	384.71	1722.53	385.64	1722.44	388.72	1722.31
392.08	1722.26	413.49	1721.66	414.76	1721.54	419.22	1720.93	422.07	1720.45
425.4	1720.21	427.59	1720.12	440.45	1719.83	442.84	1719.78	445.58	1719.72
446.53	1720.14	447.63	1720.67	447.82	1720.74	449.02	1720.72	451.21	1720.79

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	340.87	.027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 340.87 50.49 50 57.1 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.		0.027	
W.S. Elev (ft)	1716.13	Reach Len. (ft)	50.49	50.00	57.10
Crit W.S. (ft)		Flow Area (sq ft)		630.73	
E.G. Slope (ft/ft)	0.003170	Area (sq ft)		630.73	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.93	Top Width (ft)		103.93	
Vel Total (ft/s)	10.15	Avg. Vel. (ft/s)		10.15	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		6.07	
Conv. Total (cfs)	113678.2	Conv. (cfs)		113678.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		106.42	
Min Ch El (ft)	1707.28	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)	451.21	0.00	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		52.74	
C & E Loss (ft)	0.01	Cum SA (acres)		10.96	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 65.5

INPUT

Description: "FW" 26+50

Station	Elevation	Data	num=	132					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1724.17	.22	1724.14	1.4	1723.9	6.42	1722.97	8.47	1722.65
9.22	1722.52	10.33	1722.46	12.96	1722.21	15.62	1722.01	15.7	1722
15.71	1722	18.91	1722.55	19.03	1722.57	21.12	1722.92	21.4	1722.95
21.69	1723	24.66	1723	27.97	1723	30.22	1723	31.36	1723
31.92	1723	32.25	1723	32.56	1723	34.31	1722.77	35.91	1722.51
38.88	1722	41.96	1721.58	42.57	1721.5	42.98	1721.5	50.57	1721.34
50.78	1721.39	53.09	1721.95	53.2	1721.97	53.33	1722	53.55	1722.04
53.75	1722.05	67.29	1722	72.46	1722	73.47	1721.97	82.62	1721.54
93.54	1721.04	94.15	1721	114.71	1720.15	148.75	1708.8	173.75	1708.2
183.75	1707.2	193.75	1708.2	208.75	1708.65	208.76	1708.65	242.79	1720
242.8	1720	254.42	1720.4	257.24	1720.42	262.17	1720.57	264.72	1720.58
282.51	1721	285.18	1721	287.74	1721	289.98	1721	292.01	1721
295.4	1721	297.52	1721	302.17	1721	304.94	1721	309.71	1721
310.98	1721	313.87	1721	317.9	1721	319.41	1721	322.5	1721
323.78	1721	326.18	1721	330.06	1721	332.69	1721	333.54	1721
335.89	1721	342.91	1721.43	352.02	1722	354.38	1722.27	360.71	1723
365.21	1723.64	368.29	1724	372.69	1724.63	374.23	1724.83	375.65	1725
376.08	1725	376.13	1725	376.91	1725	377.64	1725	377.84	1725

378.58	1725	379.3	1725	380.03	1725	380.78	1725	381.23	1725
381.69	1725	382.56	1725	383.11	1725	383.68	1725	384.66	1725
385.31	1725	385.99	1725	386.7	1725	387.45	1725	388.24	1725
389.44	1725	390.31	1725	391.23	1725	392.19	1725	403.94	1725
406.67	1725	409.81	1725	409.94	1724.98	411.27	1724.78	415.84	1724
417.23	1723.63	420.3	1723	424.64	1722.43	427.53	1722	431.47	1721.33
434.12	1721.04	443.78	1720.94	449.39	1720.73	459.61	1720.24	461.34	1720.12
474.53	1720.16	477.08	1720.17	478.75	1720.16	478.95	1720.26	481.4	1720.83
483.75	1720.62	485.77	1720.61						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	375.65	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	375.65		15.96	15.8	17.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.72	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.82	Reach Len. (ft)	15.96	15.80	17.18
Crit W.S. (ft)		Flow Area (sq ft)		607.36	
E.G. Slope (ft/ft)	0.003530	Area (sq ft)		607.36	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.56	Top Width (ft)		102.56	
Vel Total (ft/s)	10.54	Avg. Vel. (ft/s)		10.54	
Max Chl Dpth (ft)	8.62	Hydr. Depth (ft)		5.92	
Conv. Total (cfs)	107722.6	Conv. (cfs)		107722.6	
Length Wtd. (ft)	15.80	Wetted Per. (ft)		104.98	
Min Ch El (ft)	1707.20	Shear (lb/sq ft)		1.27	
Alpha	1.00	Stream Power (lb/ft s)	485.77	0.00	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)		52.03	
C & E Loss (ft)	0.01	Cum SA (acres)		10.85	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 65

INPUT

Description: "FW"26+65.8

Station Elevation Data		num=		124	
Sta	Elev	Sta	Elev	Sta	Elev
0	1723.85	3.94	1723.25	5.13	1723.07
6.19	1722.86	8.76	1722.35	11.24	1722.11
19.39	1723	19.42	1723	33.87	1723
39.13	1722.43	40.47	1722	41.97	1721.8
52.11	1721.38	52.71	1721.53	55.11	1722
64.95	1722.86	68.58	1722.83	74.32	1722.63
91.38	1722	100.27	1721.41	105.36	1721
176.01	1708.18	186.01	1707.18	196.01	1708.18
248.04	1720.16	249.83	1720.23	253.22	1720.36
269.99	1720.98	271.87	1721	274.74	1721.06
284.72	1721.23	287.67	1721.27	289.75	1721.26
297.31	1721.08	299.75	1721.05	303.58	1721.01
310.88	1721.06	316.71	1721.17	317.66	1721.16
324.95	1721.29	328.12	1721.36	330.52	1721.42
337.23	1721.56	339.69	1721.64	344.32	1721.82
349.64	1722.06	351.94	1722.22	358.66	1722.66
372.61	1724	376.41	1724.47	380.53	1725
383.24	1725	389.92	1725	390.93	1725
411.21	1725	411.54	1725	412.07	1725
413.08	1725	413.55	1725	413.73	1725
414.65	1725	415.03	1725	415.08	1724.99
425.91	1723	426.75	1722.88	430.16	1722.41
436.26	1721.2	443.27	1720.87	453.52	1720.53
462.04	1720.22	463.19	1720.21	464.47	1720.2
488.53	1719.87	488.87	1719.95	491.11	1720.36

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	380.53	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	380.53		47.94	34.2	13.62	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.71	Reach Len. (ft)	47.94	34.20	13.62
Crit W.S. (ft)		Flow Area (sq ft)		597.90	
E.G. Slope (ft/ft)	0.003693	Area (sq ft)		597.90	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.03	Top Width (ft)		102.03	
Vel Total (ft/s)	10.70	Avg. Vel. (ft/s)		10.70	
Max Chl Dpth (ft)	8.53	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	105321.7	Conv. (cfs)		105321.7	
Length Wtd. (ft)	34.20	Wetted Per. (ft)		104.41	
Min Ch El (ft)	1707.18	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)	494.77	0.00	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		51.81	
C & E Loss (ft)	0.00	Cum SA (acres)		10.81	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 64

INPUT

Description: "FW" 27+00

Station Elevation Data		Data		num=	141										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.96	.45	1723.95	1.05	1723.94	3.34	1723.14	4.06	1722.97						
5.63	1722.52	6.89	1722.09	8.43	1722.05	9.25	1722.1	11.97	1722.05						
14.83	1722	15.39	1722	15.76	1722	19.34	1722	22.86	1722						
23.43	1722	23.93	1722	24.24	1722.03	24.73	1722	40.33	1722.56						
42.46	1722.49	45.27	1722	48.92	1721.67	48.94	1721.66	56.18	1721.52						
57	1721.5	57.3	1721.54	58.69	1721.76	59.24	1721.84	59.53	1721.88						
59.59	1721.89	60.5	1722	64.15	1722.69	66.41	1723	72.65	1723						
87.07	1723	92.69	1722.86	115.51	1722	115.75	1721.98	125.63	1720.15						
160.16	1708.64	184.41	1708.06	194.41	1707.06	204.41	1708.06	220.22	1708.53						
252.25	1719.16	255.06	1720.09	256.72	1720.64	257.8	1721	265.42	1721.62						
269.91	1722	271.02	1722.21	275.63	1723	277.18	1723.3	278.14	1723.44						
281.85	1724	282.21	1724.01	290.57	1724.2	297.45	1724.29	302.43	1724.32						
310.21	1724.27	318.19	1724.15	322.21	1724.2	331.2	1724	333.86	1723.92						
334.8	1723.87	339.68	1723.77	341.82	1723.78	346.6	1723.81	348.65	1723.86						
351.57	1724	351.71	1724.01	351.79	1724.02	353.94	1724.29	355.7	1724.5						
356.89	1724.59	358.87	1724.78	359.49	1724.85	359.82	1724.87	361.05	1724.95						
361.14	1724.95	362.23	1725	363.05	1725	363.74	1725	364.19	1725						
367.32	1725	369.54	1725	371.3	1724.9	371.55	1724.9	374.63	1724.77						
375.13	1724.77	376.43	1724.71	377.24	1724.75	377.74	1724.7	378.29	1724.64						
378.95	1724.57	379.46	1724.49	379.94	1724.43	380.99	1724.54	381.7	1724.48						
388.83	1725	390.22	1725	390.95	1725	391.78	1725	392.54	1725						
402.01	1724.51	404.02	1724.3	404.24	1724.31	404.5	1724.32	404.8	1724.33						
405.13	1724.34	405.48	1724.34	405.86	1724.35	406.24	1724.34	411.32	1724						
411.36	1724	417.07	1723.87	418.74	1723.62	422.06	1723.3	424.55	1723						
427.85	1722.85	430.37	1722.6	434.51	1722.28	436.99	1722	438.1	1721.86						
439.4	1721.83	440.96	1721.71	444.36	1721.17	447.38	1721.07	454.77	1720.63						
462.93	1720.38	471.46	1720.16	482.36	1720.05	486.2	1719.98	486.97	1719.97						
501.32	1719.78	502.39	1719.91	502.97	1720.03	503.57	1720.11	505.72	1720.16						
507.44	1720.18														

Manning's n Values		Data		num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	362.23	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	362.23		72.8	50	18.83	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.58	Reach Len. (ft)	72.80	50.00	18.83
Crit W.S. (ft)		Flow Area (sq ft)		598.42	
E.G. Slope (ft/ft)	0.003687	Area (sq ft)		598.42	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.15	Top Width (ft)		102.15	
Vel Total (ft/s)	10.69	Avg. Vel. (ft/s)		10.69	
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	105396.2	Conv. (cfs)		105396.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		104.53	
Min Ch El (ft)	1707.06	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)	507.44	0.00	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		51.34	
C & E Loss (ft)	0.03	Cum SA (acres)		10.73	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 63

INPUT

Description: "FW" 27+50

Station Elevation Data		Data		num=	117										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1723.13	.61	1723.08	2.61	1722.9	3.61	1722.82	4.03	1722.77						
7.61	1722.37	11.6	1722.46	20.4	1722.42	23.57	1722.77	26.47	1722.83						
27.64	1722.51	28.41	1722	28.58	1722	30.02	1722	30.14	1722						
32.87	1722	33.61	1722	36.04	1722.39	39.54	1723	45.39	1723						
47.34	1723	47.89	1722.75	51.37	1722	54.78	1721.78	56.9	1721.68						
61.1	1721.6	65.08	1721.52	65.38	1721.57	65.92	1721.66	66.31	1721.73						
66.53	1721.76	68.59	1722	70.86	1722.42	71.41	1722.47	72.44	1722.49						
90.14	1722.27	103.03	1722.05	103.18	1722.06	105.71	1722	111.02	1721.53						
119.16	1721	135.2	1720.4	143.64	1720.11	146.3	1720	147.35	1719.99						
182.72	1708.28	203.17	1707.81	213.17	1706.81	223.17	1707.81	243.05	1708.41						
273.16	1718.34	281.24	1721	286.65	1721.84	287.69	1722	293.38	1722.78						
294.94	1723	296.02	1723.25	297.89	1723.69	299.22	1724	301.59	1724.59						
303.27	1725	312.86	1725	328.83	1725	330.83	1725	333.54	1725						
337.34	1725	352.5	1724.82	354.04	1724.82	361.38	1724.85	368.4	1724.92						
372.99	1725	374.3	1725	374.69	1725	375.21	1725	375.34	1725						
375.43	1725	375.61	1725	375.79	1725	387.8	1725	388.55	1725						
389.18	1725	389.49	1725	390.01	1725	390.79	1725	391.75	1725						
399.33	1725	405.94	1725	409.48	1725	412.46	1725	414.46	1725						
422.82	1725	423.86	1725	428.3	1725	430.34	1725	433.35	1725						
433.7	1724.98	434.54	1724.87	439.8	1724.16	440.59	1724	441.34	1723.83						
443.49	1723	449.06	1722.51	451.72	1722	460.88	1721.17	462.05	1721.08						
462.5	1721.05	474.05	1720.45	475.31	1720.38	476.42	1720.35	493.8	1720.15						
507.47	1719.93	510.85	1719.98	515.26	1719.93	523.37	1719.72	524.96	1719.87						
525.66	1719.97	529.59	1720.07												

Manning's n Values		Data		num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	0	.027	303.27	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	303.27		18.57	12.29	4.52	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1717.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.		0.027	

W.S. Elev (ft)	1715.47	Reach Len. (ft)	18.57	12.29	4.52
Crit W.S. (ft)		Flow Area (sq ft)		615.36	
E.G. Slope (ft/ft)	0.003418	Area (sq ft)		615.36	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.48	Top Width (ft)		103.48	
Vel Total (ft/s)	10.40	Avg. Vel. (ft/s)		10.40	
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	109469.0	Conv. (cfs)		109469.0	
Length Wtd. (ft)	12.29	Wetted Per. (ft)		105.88	
Min Ch El (ft)	1706.81	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)	529.59	0.00	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		50.64	
C & E Loss (ft)	0.13	Cum SA (acres)		10.61	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 62.9

INPUT

Description: "FW" 27+62.29

Station		Elevation		Data	num=	97									
Sta	Elev	Sta	Elev				Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1723.1	49	1723.09				4.49	1722.91	5.71	1722.72	8.12	1722.37			
15.5	1722.58	16.89	1722.61				20.59	1723.07	22.68	1723.32	23.78	1723.39			
29.72	1723.66	32.72	1722.95				34.13	1722.93	34.79	1722	36.39	1722			
36.62	1722	47.18	1722				51.22	1722.09	51.86	1722	52.65	1721.96			
53.01	1721.94	54.02	1721.89				59.06	1721.64	60.69	1721.61	67.29	1721.49			
67.34	1721.49	68.25	1721.64				68.78	1721.73	69.12	1721.79	69.36	1721.83			
69.5	1721.85	70.79	1722				72.22	1722.27	72.56	1722.3	73.22	1722.31			
97.29	1722.02	98.28	1722				101.82	1721.84	126.75	1721	139.15	1720.56			
144.87	1720.17	180.04	1708.47				209.06	1707.75	219.06	1706.75	229.06	1707.75			
250.46	1708.39	288.79	1721				292.72	1721.62	295.22	1722	301.01	1722.85			
302.09	1723	302.29	1723.05				306.02	1724	309.18	1724.79	310.03	1725			
326.79	1725	332.78	1725				340.26	1724.79	357.04	1724.6	360.45	1724.61			
365.91	1724.63	371.18	1724.69				375.95	1724.77	385.26	1724.99	385.53	1725			
398.04	1725	401.68	1725				408.75	1725	414.58	1725	418.44	1725			
425.2	1725	427.83	1725				438.69	1725	443.52	1725	443.61	1725			
443.79	1724.98	448.72	1724				452.59	1723.12	453.13	1723	458.07	1722.09			
458.48	1722	462.02	1721.61				468.14	1721	469.38	1721	470.6	1721			
473.46	1720.8	481.57	1720.39				488.36	1720.35	500.03	1720.2	513.37	1719.99			
517.02	1719.9	523.6	1719.81				529.63	1719.71	531.78	1719.91	531.96	1719.95			
533.03	1719.96	535.84	1720.04												

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	0	.027
		310.03	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	0	310.03		59.08	37.71	13.81	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.75	Reach Len. (ft)	59.08	37.71	13.81
Crit W.S. (ft)		Flow Area (sq ft)		717.97	
E.G. Slope (ft/ft)	0.002339	Area (sq ft)		717.97	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	114.67	Top Width (ft)		114.67	
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)		8.91	
Max Chl Dpth (ft)	9.00	Hydr. Depth (ft)		6.26	
Conv. Total (cfs)	132327.0	Conv. (cfs)		132327.0	
Length Wtd. (ft)	37.71	Wetted Per. (ft)		117.15	
Min Ch El (ft)	1706.75	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	535.84	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		50.45	
C & E Loss (ft)	0.07	Cum SA (acres)		10.58	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 62

INPUT

Description: "FW" 28+00

Station		Elevation		Data	num=	105									
Sta	Elev	Sta	Elev				Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1722.83	7.54	1722.59				10.37	1722.3	13.02	1722	13.97	1721.97			
14.57	1721.96	23.94	1721.77				25.1	1721.74	26.53	1721.71	27.28	1721.88			
29.55	1722	35.05	1722.9				35.6	1723	37.32	1723	53.42	1723			
56.86	1722.49	59.99	1722				61.01	1721.83	62.71	1721.73	66.31	1721.53			
69.41	1721.47	74.72	1721.37				75.6	1721.52	78.84	1722	83.7	1722.78			
84.9	1723	85.86	1723.3				86.44	1723.38	87.73	1723.55	92.33	1723.84			
95.53	1723.91	97.18	1723.92				100.16	1723.9	102.93	1723.77	112.6	1723			
114.74	1722.77	119.23	1722.48				123.47	1722.18	127.45	1722	133.62	1721.91			
143.74	1721.79	148.5	1721.69				156.66	1720.75	202.1	1708.42	230.58	1707.57			
240.58	1706.57	250.58	1707.57				277.76	1708.38	277.77	1708.38	294.91	1714.03			
311.9	1719.65	315.55	1720.86				315.98	1721	316.21	1721.03	316.84	1721.12			
320.13	1721.59	322.9	1722				326.03	1722.51	329.12	1723	333.57	1723.83			
334.49	1724	334.69	1724.05				336.08	1724.38	338.09	1724.87	338.62	1725			
342.06	1725	348.7	1725				349	1724.97	351.76	1724.71	355.81	1724.31			
363.07	1724	366.73	1723.92				374.84	1723.87	382.25	1723.92	384.41	1724			
391.64	1724.16	395.18	1724.26				407.29	1724.6	421.76	1725	422.7	1725			
432.79	1725	434.26	1725				442.18	1725	450.67	1725	465.74	1725			
466.71	1724.83	473.51	1724				480.9	1723.03	481.12	1723	486.3	1722.18			
487.62	1722	489.99	1721.75				497.12	1721	498.06	1721	500.09	1720.85			
505.78	1720.42	514.18	1720.37				523.11	1720.28	535.08	1719.85	535.81	1719.83			
536.49	1719.81	551.04	1719.57				551.57	1719.69	553.08	1720.04	557.37	1720.08			

Manning's n Values	num=	3
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Sta	n Val	Sta	n Val	Sta	n Val
0	.027	97.18	.027	338.09	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	97.18	338.09		84.73	50	18.63	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.00	Wt. n-Val.		0.027	
W.S. Elev (ft)	1715.84	Reach Len. (ft)	84.73	50.00	18.63
Crit W.S. (ft)		Flow Area (sq ft)		797.87	
E.G. Slope (ft/ft)	0.001850	Area (sq ft)		797.87	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	125.59	Top Width (ft)		125.59	
Vel Total (ft/s)	8.02	Avg. Vel. (ft/s)		8.02	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)		6.35	
Conv. Total (cfs)	148798.2	Conv. (cfs)		148798.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		127.90	
Min Ch El (ft)	1706.57	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)	557.37	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		49.80	
C & E Loss (ft)	0.09	Cum SA (acres)		10.48	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 61

INPUT
Description: "FW"28+50
Station Elevation Data num= 153

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.44	1.16	1722.44	3.39	1722.3	4.94	1722	10.48	1721.97
14.48	1721.84	14.68	1721.84	15.85	1721.85	18.69	1721.85	20.32	1721.86
20.81	1721.86	22.07	1721.85	22.31	1721.87	25.03	1722.15	27.96	1722.39
28.86	1722.43	31.86	1722.53	32.82	1722.45	34.89	1722.4	35.2	1722.4
35.82	1722.39	38	1722.39	40.3	1722.24	41.35	1722.1	43.14	1722.02
45.51	1721.85	47.67	1721.66	51.87	1721.11	52.89	1720.97	53.56	1720.89
57.89	1720.61	59.98	1720.55	61.75	1720.45	61.89	1720.45	63.47	1720.49
65.59	1720.51	68.07	1720.51	68.77	1720.37	69.12	1720.29	74.36	1720.31
75.91	1720.32	76.98	1720.32	78.55	1720.35	81.51	1720.31	87.24	1720.25
89.32	1720.61	91.54	1721	93.08	1721.34	96.22	1722	99.45	1722.7
102.29	1723	102.47	1723	103.11	1723	104.18	1723	105.55	1723
106.83	1723	108.7	1723	108.84	1723	113.19	1722.84	115.69	1722.82
118.18	1722.8	123.33	1722.66	131.1	1722.49	138	1722.34	149.32	1722
157.37	1721.84	160.55	1721.78	180.02	1721.39	189.46	1721.29	199.67	1721.08
200.38	1721.07	202.84	1721	204.95	1720.84	221.42	1719.33	256.68	1707.67
268.27	1707.32	278.27	1706.32	288.26	1707.32	288.27	1707.32	316.92	1708.18
316.93	1708.18	316.99	1708.2	354.5	1720.71	355.38	1721	355.76	1721.06
356.19	1721.12	362.42	1722	365.8	1722.3	367.73	1722.42	370.86	1722.61
374.7	1722.89	377.56	1723	379.55	1723.06	379.63	1723.05	381.29	1723.09
386.54	1723.15	386.89	1723.15	395.96	1723.17	403.97	1723	405.93	1723
411.27	1722.69	413.72	1722.62	418.91	1722.36	421.04	1722.3	427.69	1722.18
429.11	1722.17	430.75	1722.22	434.61	1722.23	436.61	1722.35	443.94	1723
444.79	1723.08	445.71	1723.08	461.3	1724	462.87	1724	464.55	1724
469.91	1724	471.96	1724	473.07	1724	475.13	1724.15	488.66	1725
496.63	1725.43	500.46	1725.61	507.78	1725.71	509.4	1725.7	513.76	1725.1
514.05	1725.07	514.41	1725	516.37	1724.77	523.29	1724	523.85	1723.92
526.05	1723.64	529.54	1723.15	530.4	1723	531.16	1722.86	535.56	1722
540.57	1721.24	541.66	1721	541.73	1721	546.52	1720.54	546.86	1720.33
547.72	1720.33	548.83	1720.28	552.75	1720.21	561.25	1720.05	570.38	1719.87
573.76	1719.82	576.81	1719.53	577.29	1719.48	577.55	1719.5	585.61	1719.61
586.45	1719.8	587.81	1720.15	592.44	1720.19				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	105.55	.027	507.78	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	105.55	507.78		15.83	8.79	3.37	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.75	Reach Len. (ft)	15.83	8.79	3.37
Crit W.S. (ft)		Flow Area (sq ft)		584.24	
E.G. Slope (ft/ft)	0.003953	Area (sq ft)		584.24	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.39	Top Width (ft)		101.39	
Vel Total (ft/s)	10.95	Avg. Vel. (ft/s)		10.95	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	101794.9	Conv. (cfs)		101794.9	
Length Wtd. (ft)	8.79	Wetted Per. (ft)		103.71	
Min Ch El (ft)	1706.32	Shear (lb/sq ft)		1.39	
Alpha	1.00	Stream Power (lb/ft s)	592.44	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		49.00	
C & E Loss (ft)	0.01	Cum SA (acres)		10.34	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 60.8

INPUT
Description: "FW"28+58.79

Station Elevation Data num= 154									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.53	1.86	1722.54	2.38	1722.55	2.47	1722.54	3.76	1722.35
4.51	1722.24	4.6	1722.22	5.3	1722.07	6.51	1721.78	9.9	1721.7
14.7	1721.73	19.64	1721.84	20.18	1721.86	21.43	1721.98	24.45	1722.17
27.39	1722.37	28.67	1722.39	32.98	1722.59	35.92	1722.6	37.18	1722.47
38.56	1722.52	41.11	1722.42	41.39	1722.39	43.39	1721.98	44.54	1721.73
44.84	1721.68	45.33	1721.6	48.65	1721.05	51.69	1720.64	54.31	1720.33
54.82	1720.33	56	1720.31	57.18	1720.32	70.33	1720.41	70.34	1720.41
70.35	1720.41	70.36	1720.41	70.37	1720.41	70.38	1720.41	70.39	1720.41
70.42	1720.4	71.61	1720.21	72.45	1720.2	73.6	1720.19	78.63	1720.22
78.79	1720.21	80.51	1720.08	84.01	1720.05	89.44	1720	89.45	1720
89.46	1720	95.36	1721	97.35	1721.38	98.8	1721.69	100.27	1722
101.78	1722.33	108.2	1723	108.31	1723	108.71	1723	109.36	1723
110.2	1723	110.99	1723	112.15	1723	112.71	1723	130	1722.35
131.03	1722.35	132.07	1722.34	144.26	1722	147.81	1721.93	150.3	1721.87
172.38	1721.45	183.21	1721.25	189.39	1721.13	201.12	1721	202.81	1720.98
221.44	1720.2	225.88	1720.02	226.24	1720	227.82	1719.63	263.35	1707.66
276.12	1707.28	286.12	1706.28	296.12	1707.28	323.87	1708.11	349.67	1716.68
362.71	1721	367.93	1721.61	370.79	1722	374.32	1722.25	376.45	1722.34
377.87	1722.39	382.78	1722.66	386.09	1722.82	392.33	1722.9	396.1	1722.86
405.34	1722.9	405.84	1722.87	411.01	1722.73	413.7	1722.61	419.48	1722.39
423.14	1722.18	429.52	1722.01	429.59	1722.01	429.62	1722	429.87	1722
440.77	1722	443.69	1722	445.05	1722	446.46	1722.11	452	1723
455.1	1723.29	456.96	1723.32	468.6	1724	471.53	1724	474.66	1724
477.69	1724	481.14	1724	481.64	1724	485.18	1724.29	495.14	1725
499.25	1725.19	507.11	1725.62	512.45	1725.91	514.36	1726	515.15	1726
518.19	1726	520.22	1726	520.91	1725.89	525.62	1725	529.67	1724.52
532.75	1724	536.22	1723.52	539.12	1723	541.63	1722.52	544.28	1722
547.34	1721.53	549.78	1721	549.95	1721	550.03	1720.99	551.09	1720.34
553.75	1720.34	557.12	1720.18	568.54	1720.01	568.82	1720	569.14	1720
570.67	1719.97	580.44	1719.82	581.23	1719.76	584.61	1719.45	587.19	1719.57
592.59	1719.65	594.17	1720	594.83	1720.17	599.51	1720.21		

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	110.2	.027	514.36	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	110.2	514.36		19.51	41.21	69.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.73	Reach Len. (ft)	19.51	41.21	69.87
Crit W.S. (ft)		Flow Area (sq ft)		586.97	
E.G. Slope (ft/ft)	0.003895	Area (sq ft)		586.97	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.43	Top Width (ft)		101.43	
Vel Total (ft/s)	10.90	Avg. Vel. (ft/s)		10.90	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	102547.3	Conv. (cfs)		102547.3	
Length Wtd. (ft)	41.21	Wetted Per. (ft)		103.78	
Min Ch El (ft)	1706.28	Shear (lb/sq ft)		1.38	
Alpha	1.00	Stream Power (lb/ft s)	599.51	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		48.89	
C & E Loss (ft)	0.04	Cum SA (acres)		10.32	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 60.5

INPUT

Description: "FW" 29+00

Station Elevation Data num= 116									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.2	.53	1722.18	6.33	1721.89	6.42	1721.89	6.53	1721.89
6.64	1721.88	6.76	1721.88	6.87	1721.88	7.34	1721.87	7.52	1721.87
8.3	1721.78	9.37	1721.76	18.82	1721.69	19.97	1721.73	21.85	1721.99
24.32	1722.34	29.97	1723.54	30.25	1723.59	30.93	1723.67	39.77	1724.48
42.65	1724.28	43.68	1724.2	44.84	1724.09	47.17	1723.84	54.54	1722.95
55.05	1722.85	56.55	1722.61	62.01	1721.64	64.12	1721.48	66.75	1721.21
67.12	1721.12	68.63	1720.88	69.85	1720.77	74.21	1720.37	81.38	1720.19
83.69	1720.13	84.95	1720.28	92.53	1721	95.52	1721.45	99.24	1722
101.09	1722.37	103.93	1722.93	104.29	1723	114.97	1723	119.91	1723
125.14	1722.68	133.85	1722	138.87	1722	158.92	1721.48	175.05	1721.16
181.17	1721	200.38	1720.57	215.08	1720.27	225.27	1720	228.6	1719.37
264.85	1707.69	285.26	1707.07	295.26	1706.07	305.25	1707.07	305.26	1707.07
325.9	1707.69	325.91	1707.69	366.06	1721	371.83	1721.29	398.1	1722
401.39	1722.13	403.36	1722.25	416.28	1723	424.87	1723.49	438.71	1724
439.72	1724.13	441.33	1724.25	445.45	1724.48	449.04	1724.41	451.79	1724.4
456.71	1724.11	457.25	1724.07	462.38	1724.02	462.51	1724.02	468.13	1724.06
468.51	1724.07	469.63	1724.2	473.59	1724.66	475.05	1725	478.4	1725.78
479.17	1726	489.67	1726	492.08	1726	492.27	1725.96	494.38	1725.61
497.65	1725.07	498.15	1725	513.36	1724.14	514.42	1724.09	515.43	1724
521.28	1723.09	522.02	1723	526.55	1722.46	530.2	1722	533.81	1721.54
538.13	1721	542.97	1720.23	545.16	1719.82	548.79	1719.79	553.32	1719.78
562.11	1719.64	567.74	1719.77	574.07	1719.94	575.52	1719.95	576.53	1719.97
580.25	1720.1	582.28	1720.74	582.45	1720.78	583.2	1720.69	585.1	1720.42
586.49	1720.44								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	39.77	.027	479.17	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	39.77	479.17		21.72	50	86.48	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.38	Element	Left OB	Channel	Right OB
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Station	Elevation	Data	num=	101					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.4	.31	1722.39	8.99	1721.86	14.87	1721.78	18.74	1721.78
19.71	1721.91	24.7	1722.35	26.73	1722.56	30.6	1722.82	35.95	1722.94
36.43	1722.96	37.16	1722.91	40.5	1722.65	42	1722.45	44.29	1722.2
47.24	1721.88	49.87	1721.57	51.64	1721.53	54.9	1721.25	55.07	1721.21
55.14	1721.23	56.05	1721.25	56.86	1721.26	58.47	1721.3	59.09	1721.44
59.19	1721.06	60.21	1721.05	65.15	1721.01	72.43	1720.83	73.96	1720.8
74.66	1720.81	80.07	1721	84.48	1721.59	88.18	1722	93.99	1722.94
94.34	1723	94.92	1723	95.16	1723	97.04	1723	129.84	1723
141.43	1722.39	148.6	1722.22	150.98	1722.14	154.07	1722.13	155.65	1722.18
161.81	1722.19	165.75	1722.39	168.95	1722.5	177.02	1723	184.73	1723
201.75	1723	202.34	1722.89	206.5	1722	210.59	1721.39	212.58	1721
213.68	1720.78	220.82	1720	225.61	1719.45	261.13	1707.79	295.88	1706.74
305.88	1705.74	315.88	1706.74	321.86	1706.92	361.46	1720	364.33	1720.95
364.43	1720.98	364.51	1721	365.2	1721.01	365.78	1721.03	369.34	1721.09
416.35	1722	421.43	1722.28	436.1	1723	445.36	1723.95	446.14	1724
457.73	1724.58	461.68	1724.74	473.17	1725	474.31	1725.03	474.49	1725.03
481.91	1725.11	489.55	1725.04	491.41	1725	492.38	1725	497.6	1724.73
502.18	1724	505.82	1723.39	508.01	1723	511.39	1722.14	511.65	1722.06
517.3	1721.4	518	1721.31	518.63	1721.29	527.96	1720.86	535.35	1720.71
540.63	1720.64	541.19	1720.32	542.44	1719.33	542.67	1719.33	544.1	1719.33
546.14	1719.33								

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 35.95 .027 481.91 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
35.95 481.91 13.24 33.11 52.47 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1716.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.86	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.17	Reach Len. (ft)	13.24	33.11	52.47
Crit W.S. (ft)		Flow Area (sq ft)		584.26	
E.G. Slope (ft/ft)	0.003989	Area (sq ft)		584.26	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.13	Top Width (ft)		102.13	
Vel Total (ft/s)	10.95	Avg. Vel. (ft/s)		10.95	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		5.72	
Conv. Total (cfs)	101331.0	Conv. (cfs)		101331.0	
Length Wtd. (ft)	33.11	Wetted Per. (ft)		104.44	
Min Ch El (ft)	1705.74	Shear (lb/sq ft)		1.39	
Alpha	1.00	Stream Power (lb/ft s)	546.14	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		47.34	
C & E Loss (ft)	0.01	Cum SA (acres)		10.06	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 59.3

INPUT

Description: "FW" 30+00

Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.25	5.42	1722.04	9.08	1721.93	12.07	1721.9	16.26	1721.81
17.18	1721.88	22.19	1722.47	26.12	1723.3	28.7	1723.58	34.32	1724.14
36.44	1724.19	40.75	1723.7	44.15	1723.21	45.37	1722.96	49.03	1722.46
52.21	1722.14	53.78	1721.96	54.99	1721.91	55.62	1721.75	55.94	1721.67
58.03	1721.67	60.72	1721.66	63.02	1721.58	69.27	1721.36	69.53	1721.35
75.49	1721.61	76.87	1721.65	80.66	1722	83.33	1722.41	86.83	1723
89.83	1723	91.96	1723	101.15	1723	107.35	1723	128.92	1723
134.57	1723	144.03	1723	144.77	1722.98	166.53	1722.96	168.06	1723
177.39	1723	186.65	1723	192.15	1723	198.46	1723	203.42	1722.41
206.15	1722	210.67	1721.56	214.57	1721	216.39	1720.82	220.74	1720
232.67	1719.28	235.34	1719.11	248.05	1714.9	270.53	1707.45	299.53	1706.58
309.52	1705.58	309.53	1705.58	319.53	1706.58	330.82	1706.92	361.58	1717.15
373.12	1721.09	410.82	1722	426.34	1722.65	434.66	1723	443.53	1723
464.27	1723	466.45	1722.66	475.41	1722	479.26	1721.79	481.18	1721.73
482.85	1721.66	487.17	1721.5	493.13	1721.3	500.92	1721.07	504.25	1721.05
505.38	1720.9	507.56	1720.68	513.59	1720.51	514.58	1720.49	516.26	1720.45
522.72	1720.67	524.14	1720.64	524.58	1720.26	525.82	1719.13	526.1	1719.14
526.42	1719.15	526.58	1719.15	527.6	1719.12	527.77	1719.14	528.27	1719.07
529.06	1718.84	529.07	1718.84	529.1	1718.84	529.35	1718.83		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 36.44 .027 443.53 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.44 443.53 19.22 50 74.5 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.83	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.07	Reach Len. (ft)	19.22	50.00	74.50
Crit W.S. (ft)		Flow Area (sq ft)		589.68	
E.G. Slope (ft/ft)	0.003851	Area (sq ft)		589.68	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.74	Top Width (ft)		101.74	
Vel Total (ft/s)	10.85	Avg. Vel. (ft/s)		10.85	
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)		5.80	
Conv. Total (cfs)	103132.5	Conv. (cfs)		103132.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		104.09	
Min Ch El (ft)	1705.58	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)	529.35	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		46.89	
C & E Loss (ft)	0.18	Cum SA (acres)		9.99	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 59

INPUT

Description: "FW" 30+50

Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.19	.07	1722.19	.43	1722.19	4.6	1722.04	9	1721.88
11.32	1721.86	17.6	1721.86	20.38	1722.18	23.03	1722.47	25.6	1722.92
31.18	1723.69	31.59	1723.73	41	1724.41	48.1	1723.61	50.3	1723.36
51.85	1723.18	52.08	1723.17	52.16	1723.13	52.87	1722.81	54.49	1722.23
54.58	1722.19	54.67	1722.19	54.86	1722.18	63.04	1722	64.23	1722.23
68.57	1723	75.13	1723.91	78.54	1723.98	80.89	1723.91	82.83	1723.85
87.87	1723.23	89.18	1723.1	89.76	1723	89.93	1722.95	90.61	1722.88
95	1722.27	102.84	1722.01	102.93	1722.01	102.98	1722	110.32	1722.14
111.74	1722.13	117.91	1722.28	122.23	1722.3	128.82	1722.5	135.72	1722.51
158.96	1722.53	163.97	1722.52	169.27	1722.29	172.38	1722.26	178.23	1722
181.5	1721.79	192.36	1721	194.48	1720.94	213.27	1720.5	219.82	1720.33

224.95	1720	230.64	1719.56	236.33	1719	236.5	1718.98	236.75	1718.95
236.77	1718.94	271.77	1707.28	303.26	1706.33	313.26	1705.33	323.26	1706.33
343.26	1706.93	382.47	1720	395.12	1721	404.35	1721.31	425.84	1722
430.95	1722	446.15	1722	453.25	1721.21	455.11	1721	465.88	1720.76
472.07	1720.62	481.74	1720.29	482.23	1720.28	482.84	1720.28	483.44	1720.28
488.95	1720.28	493.15	1720.29	493.53	1720.29	495.86	1720.3	500.53	1720.34
502.43	1720.33	504.49	1720.43	504.82	1720.45	505.93	1719.28	506.22	1719
507.48	1719	509.86	1718.99						

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	163.97	.027	425.84	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	163.97	425.84		9.37	25	35.64	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.027	
W.S. Elev (ft)	1714.34	Reach Len. (ft)	9.37	25.00	35.64
Crit W.S. (ft)		Flow Area (sq ft)		718.45	
E.G. Slope (ft/ft)	0.002340	Area (sq ft)		718.45	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	114.89	Top Width (ft)		114.89	
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)		8.91	
Max Chl Dpth (ft)	9.01	Hydr. Depth (ft)		6.25	
Conv. Total (cfs)	132315.6	Conv. (cfs)		132315.6	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		117.36	
Min Ch El (ft)	1705.33	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	509.86	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		46.14	
C & E Loss (ft)	0.06	Cum SA (acres)		9.86	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 58.5

INPUT

Description: "FW" 30+75

Station Elevation Data		num= 89							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.1	6.81	1721.94	9.21	1721.86	12.48	1721.83	19.32	1721.78
22.84	1722.21	24.3	1722.36	29.02	1722.76	31.67	1722.85	34.77	1722.93
35.87	1722.94	36.93	1723.08	37.1	1723.1	38.03	1723.23	39.13	1723.34
40.52	1723.41	41.92	1723.51	44.39	1723.62	45.31	1723.66	46.74	1723.62
46.92	1723.6	50.29	1723.16	51.04	1722.97	51.41	1722.9	51.53	1722.83
51.91	1722.68	52.87	1722.36	54.64	1722.32	60.95	1722.18	63.4	1722.9
63.77	1723	64.31	1723.07	70.26	1724	73.16	1724	76.51	1724
79.13	1724	82.78	1723.45	84.12	1723.26	85.46	1723	90.58	1722.1
90.99	1722	91.08	1722	91.47	1722	99.78	1722	104.84	1722
109.64	1722	125.15	1722	125.75	1722	127.45	1722	172.99	1722
176.09	1722	184.27	1721.37	188.23	1721	189.24	1721	213.37	1720.41
227.12	1720	231.3	1719.38	234.92	1719	237.81	1718.84	238.22	1718.82
240.84	1717.94	273.24	1707.15	304.39	1706.21	314.39	1705.21	324.39	1706.21
334.89	1706.53	371.16	1718.62	382.5	1721	383.28	1721	385.49	1721.04
396.92	1721.19	415.72	1721.74	419.36	1721.83	424.63	1722	426.8	1722
441.88	1722	447.21	1721.36	450.33	1721	454.06	1720.68	459.6	1720.45
465.82	1720.28	473.12	1720.03	475.95	1720.03	494.36	1720.15	497.25	1720.19
497.69	1720.2	498.74	1718.89	498.77	1718.85	502.46	1718.94		

Manning's n Values			num= 3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	176.09	.027	424.63	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	176.09	424.63		25.12	25	25.6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.		0.027	
W.S. Elev (ft)	1713.55	Reach Len. (ft)	25.12	25.00	25.60
Crit W.S. (ft)		Flow Area (sq ft)		581.40	
E.G. Slope (ft/ft)	0.004043	Area (sq ft)		581.40	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.92	Top Width (ft)		101.92	
Vel Total (ft/s)	11.01	Avg. Vel. (ft/s)		11.01	
Max Chl Dpth (ft)	8.34	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	100650.9	Conv. (cfs)		100650.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		104.21	
Min Ch El (ft)	1705.21	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)	502.46	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		45.77	
C & E Loss (ft)	0.01	Cum SA (acres)		9.80	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 58

INPUT

Description: "FW" 31+00

Station Elevation Data		num= 77							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.29	6.41	1721.82	9.75	1721.78	10.98	1721.78	19.46	1721.78
24.37	1722.31	24.64	1722.33	24.96	1722.35	34.01	1722.99	34.91	1723.06
35	1723.06	35.85	1723.1	40.11	1723.28	44.35	1723.15	47.99	1723.03

49.42	1722.92	51.34	1722.86	51.4	1722.84	51.69	1722.77	57.27	1722.65
59.77	1722.59	61.41	1722.79	62.33	1723	66	1723.48	69.91	1724
77.79	1724	83.67	1724	83.83	1723.96	84.19	1723.9	88.52	1723
91.16	1722.76	93.67	1722.58	99.53	1722	125.21	1722	143.9	1722
144.63	1722	149.2	1722	164.61	1722	170.48	1722	190.99	1722
192.5	1721.87	205.22	1721	207.22	1720.93	224.41	1720.41	229.12	1720.22
230.48	1720	233.51	1719.48	236.45	1719	239.95	1718.74	240.55	1718.69
275.55	1707.03	275.57	1707.02	275.58	1707.02	306.78	1706.09	306.79	1706.09
316.78	1705.09	326.78	1706.09	337.4	1706.41	350.52	1710.78	379.11	1720.3
399.61	1721.52	419.31	1721.86	420.95	1721.88	424.93	1722	429.39	1722
441.65	1722	448.6	1721.17	450.07	1721	452.45	1720.79	459.35	1720
466.57	1720.02	482.23	1720.06	494.16	1720.08	494.69	1719.5	495.17	1718.72
495.59	1718.73	499.35	1718.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	190.99	.027	424.93	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	190.99	424.93		50.23	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.84	Wt. n-Val.		0.027	
W.S. Elev (ft)	1713.48	Reach Len. (ft)	50.23	50.00	51.20
Crit W.S. (ft)		Flow Area (sq ft)		588.14	
E.G. Slope (ft/ft)	0.003917	Area (sq ft)		588.14	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.43	Top Width (ft)		102.43	
Vel Total (ft/s)	10.88	Avg. Vel. (ft/s)		10.88	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	102255.9	Conv. (cfs)		102255.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		104.74	
Min Ch El (ft)	1705.09	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)	499.35	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		45.43	
C & E Loss (ft)	0.02	Cum SA (acres)		9.74	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 57

INPUT

Description: "FW" 31+50

Station	Elevation	Data	num=	128					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.41	.01	1722.41	2.8	1722.53	6.98	1721.95	7.5	1721.81
8.92	1721.81	12.58	1721.82	15.1	1722.07	17.35	1722.37	21.01	1723.49
23.11	1724	25.88	1724.35	28.49	1724.61	29.68	1724.74	30.97	1724.82
31.56	1724.82	32.04	1724.82	33.64	1724.82	33.82	1724.82	36.14	1724.6
41.83	1724	43.69	1723.68	45.31	1723.42	53.36	1723.06	54.16	1723.02
54.31	1723.02	54.37	1723.02	54.48	1723.01	54.51	1723	56.99	1721.48
57.04	1721.52	57.07	1721.54	57.08	1721.55	57.09	1721.56	57.1	1721.57
57.11	1721.57	57.39	1721.8	57.74	1722.07	58.17	1722.41	58.59	1722.74
58.62	1722.75	63.52	1722.64	66.83	1722.56	69.48	1722.77	71.96	1722.94
72.83	1723	73.34	1723.13	73.96	1723.24	75.17	1723.35	77.45	1723.44
81.5	1723.82	84.49	1723.71	87.61	1723.63	90.53	1723.45	91.89	1723.33
92.94	1723.28	93.77	1723.31	95.33	1723.41	99.79	1723.89	100.49	1723.94
101.15	1724	104	1724	105.34	1724	107.4	1723.78	112.88	1723
113.17	1723	116.05	1722.65	121.48	1722	131.14	1721.49	143.39	1721
168.99	1721	172.72	1721	173.78	1720.98	173.84	1720.98	174.74	1721
178.78	1721.2	194.9	1722	198.14	1722	198.83	1722	199.68	1722
201.49	1722	204.32	1722	216.67	1722	227.52	1722	229.28	1722
230.77	1721.73	234.37	1721	236.12	1720.37	237.28	1720	237.96	1719.77
240.3	1719	241.6	1718.64	242.95	1718.19	243.6	1718	246.25	1717.12
246.63	1717	246.99	1716.86	249.57	1716	250.11	1715.82	252.58	1715
276.98	1706.88	311.57	1705.84	321.57	1704.84	331.57	1705.84	339.04	1706.07
375.29	1718.15	380.85	1720	386.44	1720.43	389.91	1720.68	393.16	1720.91
394.56	1721	398.66	1721.18	424.99	1722	435.62	1722	442.8	1722
448.32	1721.23	449.79	1721	450.76	1720.86	456.71	1720	457.18	1720
460.86	1719.84	482.61	1719.87	488.11	1720.08	489.61	1718.71	489.7	1718.64
489.8	1718.64	492.07	1718.63	493.13	1718.62				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	229.28	.027	424.99	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	229.28	424.99		50.23	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1715.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.		0.027	
W.S. Elev (ft)	1713.33	Reach Len. (ft)	50.23	50.00	51.20
Crit W.S. (ft)		Flow Area (sq ft)		597.23	
E.G. Slope (ft/ft)	0.003760	Area (sq ft)		597.23	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.21	Top Width (ft)		103.21	
Vel Total (ft/s)	10.72	Avg. Vel. (ft/s)		10.72	
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	104367.8	Conv. (cfs)		104367.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		105.55	
Min Ch El (ft)	1704.84	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)	493.13	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		44.75	
C & E Loss (ft)	0.02	Cum SA (acres)		9.62	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 56

INPUT
Description: "FW" 32+00

Station Elevation Data		num= 124									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.83	1.87	1721.81	6.61	1721.66	7.41	1721.59	10.27	1721.29		
12.87	1721.01	14.26	1720.93	16.95	1720.84	19.23	1720.7	21.82	1720.67		
24.57	1720.6	24.73	1720.61	25.61	1720.67	29.26	1720.67	30.63	1720.77		
34.46	1721	36.04	1721.11	38.2	1721.26	41.67	1721.68	43.96	1721.92		
45.75	1722.11	49.35	1722.33	49.89	1722.35	53.94	1722.46	54.64	1722.49		
54.72	1722.48	55.05	1722.47	58.7	1722.36	60.34	1722.24	61.99	1722.11		
62.81	1721.29	63.67	1719.8	63.68	1719.81	63.7	1719.82	63.71	1719.83		
63.8	1719.9	63.91	1719.99	64.05	1720.1	64.19	1720.21	64.65	1720.51		
64.74	1720.52	65.21	1720.58	65.92	1720.68	67.09	1720.83	69.37	1721.14		
70.39	1721.28	75.71	1721.77	77.9	1721.7	84.18	1721.52	85.55	1721.46		
96.54	1721	103.64	1720.43	106.16	1720.27	111.12	1720	111.65	1720		
111.99	1720	113	1720	115.24	1719.96	123.11	1719.88	127.33	1719.84		
130.8	1719.82	134.6	1719.79	137.9	1719.73	142.1	1719.7	143.58	1719.69		
157.02	1719.69	160.33	1719.77	162.43	1719.82	165.01	1719.89	167.47	1719.98		
168.15	1720	168.21	1720	177.34	1720.15	180.64	1720.2	183.24	1720.23		
184.45	1720.24	195.09	1720.34	199.23	1720.4	207.45	1720.37	216.02	1720.25		
217.74	1720.27	226.12	1720	228.96	1719.6	232.26	1719	234.05	1718.63		
237.73	1718	242.65	1717.01	242.67	1717	242.74	1716.99	250.87	1716		
253.42	1715.47	256.05	1715	281.06	1706.66	281.08	1706.65	316.35	1705.59		
316.36	1705.59	326.36	1704.59	336.36	1705.59	341.12	1705.74	377.9	1718		
377.91	1718	377.92	1718	396.09	1719	397.87	1719.14	409.38	1720		
413.92	1720.28	425.45	1721	433.14	1721	446.14	1721.34	450.78	1721		
457.74	1720.15	458.89	1720	462.36	1719.82	467.33	1719.68	468.6	1719.69		
469	1719.71	469.33	1719.71	469.36	1719.71	477.33	1719.98	481.76	1720.14		
481.91	1720	482.39	1719.68	483.92	1718.65	486.91	1718.61				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	216.02	.027	425.45	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	216.02	425.45		50.22	50	51.2	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.85	Reach Len. (ft)	50.22	50.00	51.20
Crit W.S. (ft)		Flow Area (sq ft)		560.60	
E.G. Slope (ft/ft)	0.004451	Area (sq ft)		560.60	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	99.97	Top Width (ft)		99.97	
Vel Total (ft/s)	11.42	Avg. Vel. (ft/s)		11.42	
Max Chl Dpth (ft)	8.26	Hydr. Depth (ft)		5.61	
Conv. Total (cfs)	95924.1	Conv. (cfs)		95924.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		102.25	
Min Ch El (ft)	1704.59	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)	486.91	0.00	0.00
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		44.09	
C & E Loss (ft)	0.02	Cum SA (acres)		9.51	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 55

INPUT
Description: "FW" 32+50

Station Elevation Data		num= 80									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.37	8.18	1720.73	10.07	1720.51	12.21	1720.39	17.4	1719.68		
17.62	1719.66	18.15	1719.63	22.47	1719.5	24.51	1719.4	26.06	1719.34		
29.27	1719.25	34.87	1719.13	35.61	1719.1	36.08	1719.09	36.55	1719.07		
39.17	1719.03	42.66	1719.05	48.25	1719.03	75.88	1719	82.65	1719		
83.33	1719	84.56	1719	85.36	1719.18	87.89	1720	90.07	1720.47		
90.36	1720.5	91.92	1720.47	98.4	1720.35	99.19	1720.31	105.36	1720		
127.31	1719.48	146.04	1719	170.32	1718.42	187.38	1718	211.4	1717.05		
212.88	1717	217.42	1716.83	235.64	1716.19	240.62	1716	246.97	1715.67		
259.73	1715	285.68	1706.35	285.71	1706.34	285.72	1706.34	318.72	1705.35		
318.73	1705.35	328.73	1704.35	338.73	1705.35	345.78	1705.56	377.69	1716.18		
383.16	1718	384.7	1718.26	387.93	1718.63	391.26	1719	402.2	1719.62		
405.35	1719.8	406.87	1719.89	408.86	1720	412.38	1720.25	421.98	1721		
424.83	1721.15	444.45	1721	446.13	1721	446.5	1721	446.78	1720.98		
454.55	1720.63	456.34	1720.65	458.48	1720.65	458.9	1720.64	459.15	1720.64		
461.2	1720.61	461.89	1720.59	464.59	1720.54	464.75	1720.54	467.18	1720.48		
472.53	1720.36	473.14	1720.39	473.32	1720.23	475.09	1718.57	478.27	1718.44		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	99.19	.027	424.83	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	99.19	424.83		50.19	50	51.2	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.96	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.68	Reach Len. (ft)	50.19	50.00	51.20
Crit W.S. (ft)		Flow Area (sq ft)		569.87	
E.G. Slope (ft/ft)	0.004244	Area (sq ft)		569.87	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	100.49	Top Width (ft)		100.49	
Vel Total (ft/s)	11.23	Avg. Vel. (ft/s)		11.23	
Max Chl Dpth (ft)	8.33	Hydr. Depth (ft)		5.67	

Conv. Total (cfs)	98237.6	Conv. (cfs)	98237.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)	102.80	
Min Ch El (ft)	1704.35	Shear (lb/sq ft)	1.47	
Alpha	1.00	Stream Power (lb/ft s)	478.27	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	43.44	
C & E Loss (ft)	0.02	Cum SA (acres)	9.39	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 54

INPUT

Description: "FW" 33+00

Station Elevation Data		num=	93						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.91	.11	1721.89	6.12	1720.64	15.49	1720.36	17.75	1720.24
20.62	1720.19	30.39	1719.97	42.61	1719.93	48.2	1719.9	54.05	1719.91
77.6	1719.55	82.5	1719.99	82.65	1720	83.48	1720	88.09	1720.72
88.58	1720.82	89.59	1720.8	96.58	1720.66	101.7	1720.09	102.36	1720.02
102.6	1720	102.77	1720	102.89	1720	110.17	1720	113.04	1720
116.3	1720	119.68	1720	125.48	1720	128.63	1720	133.7	1719.87
136.89	1719.91	139.78	1719.94	143.2	1719.98	143.59	1719.96	145.74	1720
147	1720.01	149.95	1720.01	152.35	1720	164.53	1719.8	165.41	1719.8
166.38	1719.8	176.68	1719.47	178.92	1719.47	181.04	1719.48	183.45	1719.47
185.6	1719.48	189.31	1719.45	199.8	1719.23	203.21	1719.16	205.23	1719.11
208.67	1719	210.37	1718.87	215.76	1718.48	219.03	1718.24	220.05	1718.16
220.48	1718.12	220.74	1718.1	220.88	1718.09	221.01	1718.08	222.31	1718
234.48	1717.34	239.28	1717	248.05	1716.34	252.12	1716	255.55	1715.23
256.7	1715	283.59	1706.04	283.62	1706.03	283.63	1706.02	314.35	1705.1
324.35	1704.1	334.35	1705.1	343.69	1705.38	361.08	1711.17	388.06	1720.16
390.58	1721	402.49	1721.44	417.38	1722	434.14	1721.3	441.82	1721
441.86	1720.86	442.75	1720.62	447.27	1720.66	448.2	1720.67	450.16	1720.85
451.44	1720.97	451.86	1720.98	454.31	1720.97	455.42	1720.98	458.44	1721.01
458.84	1720.48	460.72	1717.9	462.89	1717.93				

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	145.74	.027	417.38	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	145.74	417.38		50.19	50	50.48	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.89	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.53	Reach Len. (ft)	50.19	50.00	50.48
Crit W.S. (ft)		Flow Area (sq ft)		580.55	
E.G. Slope (ft/ft)	0.004019	Area (sq ft)		580.55	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.02	Top Width (ft)		101.02	
Vel Total (ft/s)	11.02	Avg. Vel. (ft/s)		11.02	
Max Chl Dpth (ft)	8.43	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	100959.5	Conv. (cfs)		100959.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		103.35	
Min Ch El (ft)	1704.10	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)	462.89	0.00	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		42.78	
C & E Loss (ft)	0.02	Cum SA (acres)		9.28	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 53

INPUT

Description: "FW"33+50

Station Elevation Data		num=	92						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.47	5.51	1720.55	14.9	1720.17	18.08	1720.08	21.14	1720.02
28.11	1720	34.84	1719.95	39.37	1719.92	48.82	1719.93	61.02	1719.89
63.79	1720.24	64.43	1720.28	65.46	1720.36	67.26	1720.45	68.06	1720.5
72.51	1720.91	72.99	1720.95	73	1720.95	73.53	1720.94	81.23	1720.79
90.99	1720.99	92.09	1721	94.52	1721	105.86	1721	106.04	1721
115.36	1721	115.6	1721	115.95	1721	116.17	1721	121.14	1721
123.24	1721	127.89	1721	131.51	1721	135.56	1721	143.81	1721.43
150.91	1721.38	154.88	1721.38	159	1721.41	165.14	1721	167.46	1721
170.24	1721	188.33	1721	189.26	1721	189.77	1720.87	192.33	1720
195.52	1719.1	195.88	1719	201.19	1719	212.64	1719	216.13	1719
220.02	1719	227.87	1719	229.67	1718.82	236.8	1718	241.22	1717.39
244.29	1717	247.39	1716.57	249.99	1716.21	251.34	1716	252.05	1715.68
253.67	1715	281.54	1705.71	309.97	1704.86	309.98	1704.86	319.97	1703.86
319.98	1703.86	329.98	1704.86	341.61	1705.2	341.62	1705.21	389.03	1721
389.54	1721.87	389.58	1721.87	394.62	1722.2	399.23	1721.97	405.49	1722.19
410.02	1722.41	413.48	1722.68	415.26	1722.6	417.02	1722.54	418.2	1722.38
423.02	1721.78	423.63	1721.68	426.02	1721.19	431.21	1721.19	434.68	1721.19
435.35	1721.34	435.45	1721.38	437.33	1721.19	445.38	1720.74	447.18	1718.8
448.21	1717.44	452.56	1717.53						

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	189.77	.027	413.48	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	189.77	413.48		50.19	50	50.63	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1714.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.82	Wt. n-Val.		0.027	

W.S. Elev (ft)	1712.38	Reach Len. (ft)	50.19	50.00	50.63
Crit W.S. (ft)		Flow Area (sq ft)		591.39	
E.G. Slope (ft/ft)	0.003808	Area (sq ft)		591.39	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	101.60	Top Width (ft)		101.60	
Vel Total (ft/s)	10.82	Avg. Vel. (ft/s)		10.82	
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)		5.82	
Conv. Total (cfs)	103708.9	Conv. (cfs)		103708.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		103.97	
Min Ch El (ft)	1703.86	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)	452.56	0.00	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		42.11	
C & E Loss (ft)	0.03	Cum SA (acres)		9.16	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 52.5

INPUT

Description: "FW" 34+00

Station		Elevation		Data	num=	101	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev				Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.95	4.19	1721.4				7.81	1720.65	20.34	1720.12	20.38	1720.12		
20.41	1720.12	24.65	1720.03				27.86	1719.99	30.34	1719.98	34.74	1719.82		
36.14	1719.75	39.85	1720.25				41.71	1720.47	44.26	1720.7	44.42	1720.71		
44.59	1720.72	52.06	1721				57.4	1721.39	58.29	1721.42	65.66	1721.29		
66.34	1721.28	66.92	1721.34				77.89	1721.24	79.67	1721.29	82.49	1721		
84.43	1720.79	90.75	1720				91.55	1720	92.87	1720	104.68	1720		
110.51	1720	114.74	1720.64				117.11	1721	119.88	1721.29	125.62	1722		
132.94	1722	135.13	1722				142.89	1722	169.41	1722	171.92	1722		
176.66	1722	179.75	1722				186.23	1722	191.6	1722	198.24	1721.01		
198.3	1721	198.44	1720.98				204.01	1720	206.96	1720	212.81	1720		
217.43	1720	227.33	1719.76				227.91	1719.73	228.61	1719.69	229.58	1719.64		
230.57	1719.58	234.36	1719.53				235.66	1719.49	236.72	1719.44	237.55	1719.39		
238.97	1718.89	239.72	1718.78				279.98	1705.38	305.6	1704.61	315.6	1703.61		
325.6	1704.61	340.29	1705.05				375.27	1716.64	388.39	1721	390.01	1721.8		
392.94	1722.76	394.91	1722.78				400.21	1722.75	405.25	1722.62	406.68	1722.55		
406.83	1722.55	407.25	1722.55				409.19	1722.57	411.93	1722.54	413.28	1722.47		
416.02	1722.29	421.56	1721.47				424.91	1721.03	425.33	1720.86	426.24	1720.48		
432.94	1720.46	434.48	1720.45				434.56	1720.46	435.15	1720.6	435.8	1720.51		
437.23	1720.48	438.4	1720.06				442.64	1719.28	443.25	1719.29	444.83	1719.35		
446.8	1719.3	448.16	1719.24				450.52	1719.01	451.21	1718.5	452.52	1717.53		
455.17	1717.71													

Manning's n Values		num=		3
Sta	n Val	Sta	n Val	
0	.027	191.6	.027	392.94
				.027

Bank	Sta: Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	191.6	392.94		12.73	12.68	13.29	
						.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.98	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.72	Wt. n-Val.			0.027	
W.S. Elev (ft)	1712.26	Reach Len. (ft)	12.73	12.68	13.29	
Crit W.S. (ft)		Flow Area (sq ft)		608.14		
E.G. Slope (ft/ft)	0.003523	Area (sq ft)		608.14		
Q Total (cfs)	6400.00	Flow (cfs)		6400.00		
Top Width (ft)	102.76	Top Width (ft)		102.76		
Vel Total (ft/s)	10.52	Avg. Vel. (ft/s)		10.52		
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)		5.92		
Conv. Total (cfs)	107832.7	Conv. (cfs)		107832.7		
Length Wtd. (ft)	12.68	Wetted Per. (ft)		105.16		
Min Ch El (ft)	1703.61	Shear (lb/sq ft)		1.27		
Alpha	1.00	Stream Power (lb/ft s)	455.17	0.00		
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		41.42		
C & E Loss (ft)	0.02	Cum SA (acres)		9.04		

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 52

INPUT

Description: "FW" 34+12.68

Station		Elevation		Data	num=	120	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
Sta	Elev	Sta	Elev				Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.88	8.57	1720.75				8.8	1720.7	9.63	1720.67	16.41	1720.36		
21.82	1720.08	23.68	1720.04				28.12	1719.99	28.48	1719.99	29.13	1719.97		
29.74	1719.93	33.57	1719.75				35.48	1720.04	38.93	1720.57	40.87	1720.75		
41.31	1720.79	44.52	1720.89				48.84	1721	49.72	1721.03	55.77	1721.24		
59.03	1721.18	63.82	1721.1				64.85	1721.42	70.95	1722	73.57	1722.44		
76.81	1722.59	80.74	1722.75				83.02	1722.66	86.26	1722.43	88.71	1722		
94.19	1721.02	94.29	1721				98.1	1720.25	101.8	1720	104.33	1720		
106.04	1720	107.85	1720				109.21	1720.11	111.07	1720.29	114.71	1720.7		
116.86	1721	123.24	1721.64				126.46	1722	130.65	1722	134.64	1722		
173.94	1722	174.76	1722				180.5	1722	182.94	1721.66	186.64	1721		
186.84	1721	194.99	1721				204.72	1720.36	206.99	1720.58	208.86	1720.48		
212.63	1720.74	213.5	1720.74				219.58	1720.99	219.64	1720.99	219.68	1720.99		
224.9	1720.95	225.25	1720.94				225.46	1720.93	225.87	1720.89	231.07	1720.49		
233.32	1720.23	234.99	1720				236.11	1719.83	241.7	1717.97	254.83	1713.64		
265.24	1710.24	280.2	1705.28				304.49	1704.55	314.49	1703.55	314.5	1703.55		
324.49	1704.55	341.1	1705.04				361.17	1711.68	381.91	1718.54	385.95	1719.88		
389.31	1721	390.48	1721				390.96	1721	391.48	1721	396.73	1721.78		
397.85	1721.76	399.22	1721.65				401.07	1722.3	401.96	1722.26	405.68	1722.21		
405.77	1722.21	406.05	1722.2				410.23	1721.74	412.39	1721.56	412.76	1721.58		
414.75	1721.36	418.6	1721				418.71	1721	418.88	1721	418.96	1720.94		
420.4	1720.83	421.1	1720.76				422.32	1720.64	422.96	1720.64	423.5	1720.6		
424.82	1720.47	425.74	1720.14				431.95	1720.12	434.24	1720.12	434.32	1720.18		

434.65 1720.28 437.16 1719.83 439.96 1719.47 444.91 1719.36 446.74 1719.32
452.99 1719.01 453.02 1719.01 453.08 1718.97 454.87 1717.7 458.02 1717.7

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 224.9 .027 401.07 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
224.9 401.07 61.3 37.32 28.16 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.26	Reach Len. (ft)	61.30	37.32	28.16
Crit W.S. (ft)		Flow Area (sq ft)		619.12	
E.G. Slope (ft/ft)	0.003366	Area (sq ft)		619.12	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.88	Top Width (ft)		103.88	
Vel Total (ft/s)	10.34	Avg. Vel. (ft/s)		10.34	
Max Chl Dpth (ft)	8.71	Hydr. Depth (ft)		5.96	
Conv. Total (cfs)	110310.0	Conv. (cfs)		110310.0	
Length Wtd. (ft)	37.32	Wetted Per. (ft)		106.28	
Min Ch El (ft)	1703.55	Shear (lb/sq ft)		1.22	
Alpha	1.00	Stream Power (lb/ft s)	458.02	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		41.24	
C & E Loss (ft)	0.01	Cum SA (acres)		9.01	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 51

INPUT

Description: "FW" 34+50

Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1721.14	3.82	1721.13	7.55	1720.19	8.2	1719.95	12.45	1719.78
14.42	1719.71	15.59	1719.73	24.71	1719.73	28.88	1719.8	33.05	1719.68
34.87	1719.62	40.4	1719.56	42.44	1719.91	43.86	1720.08	45.07	1720.12
45.35	1720.13	45.66	1720.12	46.99	1720.07	47.24	1720.07	47.59	1720.06
55.26	1719.87	55.74	1719.85	56.73	1719.81	57.72	1719.77	60.59	1719.6
62.44	1719.58	69.2	1719.79	72.91	1719.91	74.04	1719.97	75.55	1720.29
78.32	1721	80.81	1721.39	85.46	1722	90.24	1722.85	91.79	1723
92.56	1723.16	94.2	1723.53	96	1723.87	97.38	1724	101.01	1724
102.12	1723.94	102.37	1723.94	104.92	1723.68	108.37	1723.52	112.93	1723
118.24	1723	125.64	1723	127.06	1723	133.13	1723	150.47	1723
151.12	1723	151.39	1723.02	151.61	1723.04	162.1	1723.58	165.53	1723.69
170.12	1723.73	176.99	1724	177.16	1724.01	177.24	1724.01	182.98	1724.45
185.79	1724.61	188.16	1724.77	189	1724.8	191.22	1724.74	193.08	1724.7
195.58	1724.54	201.1	1724	203.14	1723.81	215.02	1722.55	216.67	1722.47
222.28	1720.75	226.85	1719.38	228.19	1719.09	232.59	1718.24	235.87	1717.56
236.82	1717.29	242.59	1715.68	243.5	1715.38	245.59	1714.69	245.63	1714.68
245.78	1714.63	246.28	1714.46	265.84	1707.93	268.28	1707.12	274.73	1704.98
274.96	1704.97	295.21	1704.36	298.74	1704.01	305.14	1703.37	305.21	1703.36
308.76	1703.72	315.21	1704.36	322.42	1704.58	335.15	1704.96	350.28	1710
376.06	1718.6	377.72	1718.62	378.14	1718.63	378.24	1718.63	379.68	1718.67
383.38	1718.69	387.69	1718.75	398.49	1718.96	404.91	1718.98	411.88	1718.97
418.09	1719	420.77	1719.01	421.13	1719.16	421.63	1719.36	423.18	1719.4
423.8	1719.37	424.1	1719.36	424.94	1719.36	427.22	1719.52	427.49	1719.54
429.9	1719.64	431.01	1719.63	431.56	1719.63	432.66	1719.59	434.13	1719.53
434.41	1719.51	435.53	1719.42	435.83	1719.41	437.2	1719.29	437.44	1719.29
437.85	1719.28	441.93	1719.23	445.15	1719.19	452.43	1719.04	453.82	1718.42
455.76	1717.7	458.9	1717.7						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 189 .027 377.72 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
189 377.72 114.41 50 37.64 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.15	Reach Len. (ft)	114.41	50.00	37.64
Crit W.S. (ft)		Flow Area (sq ft)		623.61	
E.G. Slope (ft/ft)	0.003274	Area (sq ft)		623.61	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.55	Top Width (ft)		103.55	
Vel Total (ft/s)	10.26	Avg. Vel. (ft/s)		10.26	
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)		6.02	
Conv. Total (cfs)	111846.2	Conv. (cfs)		111846.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		106.00	
Min Ch El (ft)	1703.36	Shear (lb/sq ft)		1.20	
Alpha	1.00	Stream Power (lb/ft s)	458.90	0.00	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)		40.71	
C & E Loss (ft)	0.01	Cum SA (acres)		8.92	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 49

INPUT

Description: "FW"35+00

Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.45	.76	1717.44	2.61	1717.32	4.54	1717.25
7.06	1717.21	7.07	1717.21	7.19	1717.21	8.8	1717.25
						9.7	1717.34

11.73	1717.41	15.22	1717.69	15.64	1717.71	19.38	1717.76	19.41	1717.78
19.45	1717.77	19.78	1717.74	20.3	1717.66	21.33	1717.68	21.51	1717.87
21.68	1717.83	24.3	1717.77	29.71	1717.66	29.89	1717.58	32.79	1717.47
36.75	1717.21	43.03	1717.28	53.7	1717.19	57.38	1717.18	64.7	1717.2
72	1717.22	82.36	1717.22	89.3	1717.24	104.69	1717.2	106.93	1717.17
117.12	1717.11	122.33	1717	133.17	1716.75	138.66	1716.66	143.83	1716.59
146.85	1716.51	148.19	1716.48	149.09	1716.47	151.35	1716.42	151.53	1716.42
152.55	1716.38	160.5	1715.97	163.24	1715.77	172.11	1715.49	178.61	1714.94
179.08	1714.89	179.43	1714.9	184.53	1714.79	189.23	1714.56	191.01	1714.56
196.52	1714.29	199.26	1714.17	200.48	1714.11	202.79	1714.01	206.65	1713.83
206.68	1713.83	233.37	1704.94	233.95	1704.74	233.98	1704.73	234	1704.72
234.01	1704.72	234.02	1704.72	254.09	1704.12	254.1	1704.12	264.02	1703.12
264.1	1703.12	274.1	1704.12	294.02	1704.71	294.02	1704.72	314.19	1711.44
334.78	1718.3	334.79	1718.3	336.01	1718.36	337.36	1718.39	350.57	1718.61
361.55	1718.53	363.81	1718.5	369.29	1718.51	372.87	1718.51	373.97	1718.61
375.86	1718.79	377.55	1718.93	378.47	1719.22	381.64	1720.1	383.43	1720.61
385.26	1721.09	387.31	1721.56	390.08	1721.98	390.23	1722.01	390.25	1722.01
392.09	1722.23	392.52	1722.22	394.17	1722.3	397.58	1722.34	399.82	1722.21
400.45	1722.2	404.85	1722.04	408.38	1721.3	409.5	1721.14	411.58	1720.65
417.62	1719.26	426.65	1719.24	427.44	1719.24	428.46	1719.23	428.87	1718.91
431.23	1717.1	434.25	1717.19						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 106.93 .027 334.79 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
106.93 334.79 83.84 50 37.48 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.59	Wt. n-Val.		0.027	
W.S. Elev (ft)	1712.03	Reach Len. (ft)	83.84	50.00	37.48
Crit W.S. (ft)		Flow Area (sq ft)		633.17	
E.G. Slope (ft/ft)	0.003127	Area (sq ft)		633.17	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	103.88	Top Width (ft)		103.88	
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)		10.11	
Max Chl Dpth (ft)	8.91	Hydr. Depth (ft)		6.10	
Conv. Total (cfs)	114441.6	Conv. (cfs)		114441.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		106.38	
Min Ch El (ft)	1703.12	Shear (lb/sq ft)		1.16	
Alpha	1.00	Stream Power (lb/ft s)	434.25	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		39.99	
C & E Loss (ft)	0.02	Cum SA (acres)		8.80	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 48.7

INPUT

Description: "FW" 35+50

Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.87	.83	1717.94	2.03	1717.96	9.94	1718.14	10.71	1718.16
25.61	1718.49	26.02	1718.49	27.21	1718.34	27.33	1718.35	28.85	1718.31
34.89	1718.16	35.47	1718.15	35.59	1718.15	37.74	1718.12	52.03	1718.08
56.82	1718.03	81.41	1717.79	84.71	1717.78	96.59	1717.75	105.97	1717.76
121.33	1717.72	126.59	1717.82	128.21	1717.84	130.03	1717.85	135.83	1717.94
137.45	1717.97	138.68	1717.99	139.62	1717.97	140.58	1717.99	141.82	1718
149.97	1717.91	151.74	1717.87	159.6	1717.75	160.9	1717.73	161.86	1717.74
173.3	1717.68	174.83	1717.65	177.06	1717.53	182.15	1717.17	183.6	1717.03
184.18	1716.98	185.15	1716.88	185.39	1716.83	186.84	1716.85	190.72	1716.84
191.54	1716.87	191.92	1716.85	192.01	1716.85	192.9	1716.87	194.94	1716.91
195.35	1716.91	196.36	1717.16	196.79	1717.22	198.32	1717.38	199.01	1717.45
200.06	1717.56	202.29	1717.3	202.77	1717.27	203.13	1717.26	203.96	1717.22
207.58	1717.24	209.67	1717.2	209.68	1717.2	209.77	1717.17	247.86	1704.47
256.45	1704.21	267.93	1703.87	277.86	1702.88	277.93	1702.87	287.92	1703.87
287.93	1703.87	287.95	1703.87	307.86	1704.47	348.8	1718.11	348.92	1718.15
348.95	1718.15	349.61	1718.17	349.62	1718.17	349.7	1718.17	351.28	1718.2
369.45	1718.84	377.18	1718.44	383.11	1718.22	387.09	1718.19	392.87	1718.16
394.22	1718.35	397.68	1718.96	401.86	1719.93	402.31	1720.04	403.73	1720.29
408.86	1721.21	412.45	1721.78	415.68	1722.11	416.14	1722.13	416.72	1722.12
421.53	1722.12	423.18	1722.09	430.32	1722.17	432.92	1722.14	433.8	1722.24
435.85	1722.34	436.1	1722.33	436.69	1722.32	439.63	1722.24	442.41	1722.1
442.7	1722.04	447.94	1720.67	451.65	1719.86	452.2	1719.71	453.61	1719.63
457.03	1719.41	460.15	1719.31	462.42	1717.64	463.1	1717.19	463.41	1717.2
464.92	1717.2	467.54	1717.19						

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 209.67 .027 348.8 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
209.67 348.8 10.15 6.52 4.87 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.93	Reach Len. (ft)	10.15	6.52	4.87
Crit W.S. (ft)		Flow Area (sq ft)		648.91	
E.G. Slope (ft/ft)	0.002916	Area (sq ft)		648.91	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	104.78	Top Width (ft)		104.78	
Vel Total (ft/s)	9.86	Avg. Vel. (ft/s)		9.86	
Max Chl Dpth (ft)	9.06	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	118524.0	Conv. (cfs)		118524.0	
Length Wtd. (ft)	6.52	Wetted Per. (ft)		107.32	
Min Ch El (ft)	1702.87	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)	467.54	0.00	0.00

Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	39.25
C & E Loss (ft)	0.00	Cum SA (acres)	8.68

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 48.5

INPUT

Description: "FW"35+56.52

Station Elevation Data		num=	117						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.79	.35	1717.79	3.08	1718.02	9.94	1718.08	22.81	1718.44
22.88	1718.45	24.87	1718.48	25.04	1718.51	25.05	1718.51	25.07	1718.52
25.28	1718.54	33.49	1718.34	33.52	1718.34	40.03	1718.25	46.52	1718.17
47.03	1718.16	50.15	1718.15	70.28	1717.92	78.47	1717.84	88.57	1717.83
92.37	1717.81	116.94	1717.83	119.27	1717.83	129.99	1718.03	130.91	1718.05
131.25	1718.05	142.1	1718.17	142.57	1718.19	152.98	1718.03	153.56	1718.02
155.44	1718.05	177.34	1717.93	178.08	1717.91	179.16	1717.85	181.64	1717.67
186.56	1717.22	186.59	1717.21	188.86	1717.13	189.77	1717.13	192.6	1717.05
194.18	1716.82	194.24	1716.81	194.34	1716.81	195.08	1716.89	195.14	1716.89
195.86	1716.99	196.85	1717.08	197.39	1717.1	198.8	1717.21	199.6	1717.24
200.08	1717.25	201.69	1717.4	201.77	1717.41	201.85	1717.42	201.87	1717.41
203.32	1717.32	204.41	1717.29	204.88	1717.27	206.95	1717.28	208.16	1717.26
210.05	1717.21	226.96	1711.57	248.34	1704.44	260.14	1704.09	268.4	1703.84
272.65	1703.41	278.28	1702.85	278.4	1702.84	282.65	1703.26	288.4	1703.84
300.18	1704.19	308.34	1704.44	333.17	1712.72	349.56	1718.18	349.74	1718.18
350.33	1718.2	350.37	1718.2	350.79	1718.2	358.98	1718.36	371.43	1718.81
385.16	1718.09	385.17	1718.09	391.39	1718.11	394.97	1718.12	397.36	1718.52
399.87	1718.96	401.22	1719.27	404.45	1720.04	408.19	1720.71	411.46	1721.21
412.65	1721.35	414.68	1721.6	420.54	1722.01	422.37	1722.01	422.9	1722
427.35	1722.05	432.56	1722.14	433.31	1722.17	433.56	1722.19	434.73	1722.38
437.17	1722.6	438.15	1722.62	439.27	1722.62	441.47	1722.54	442.27	1722.5
442.97	1722.43	444.33	1722.22	446.04	1721.87	448.72	1721.17	450.52	1720.66
451.74	1720.37	454.57	1719.71	455.69	1719.64	462.97	1719.4	463.95	1718.68
466.46	1717.24	470.7	1717.19						

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	210.05	.027
		350.33	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	210.05	350.33		68.39	43.48	32.4	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.92	Reach Len. (ft)	68.39	43.48	32.40
Crit W.S. (ft)		Flow Area (sq ft)		650.29	
E.G. Slope (ft/ft)	0.002897	Area (sq ft)		650.29	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	104.84	Top Width (ft)		104.84	
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)		9.84	
Max Chl Dpth (ft)	9.08	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	118898.6	Conv. (cfs)		118898.6	
Length Wtd. (ft)	43.48	Wetted Per. (ft)		107.39	
Min Ch El (ft)	1702.84	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)	470.70	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		39.15	
C & E Loss (ft)	0.02	Cum SA (acres)		8.67	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 48

INPUT

Description: "FW" 36+00

Station Elevation Data		num=	105						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.78	4.54	1719.05	7.63	1719.17	8.69	1719.28	8.91	1719.27
9.32	1719.27	10.23	1719.28	15.38	1719.39	15.46	1719.34	15.52	1719.31
15.53	1719.31	16.94	1719.28	23.79	1719.13	26.06	1719.17	34.86	1719.32
37.38	1719.75	38.44	1719.93	39.41	1720.15	40.17	1720.51	41.18	1721.15
44.78	1721.64	44.89	1721.65	44.96	1721.66	45.06	1721.65	45.2	1721.63
49.97	1721.15	53.48	1720.65	53.67	1720.63	54.3	1720.53	60.99	1719.33
62.21	1719.27	63.39	1719.01	81.12	1719.02	87.17	1719.04	103.38	1718.97
114.02	1718.94	121.88	1718.88	141.02	1718.71	141.31	1718.71	141.99	1718.7
152.98	1718.58	156.59	1718.26	168.77	1718.35	174.77	1718.34	199.55	1718.43
202.02	1718.42	203.35	1718.45	204.21	1718.12	205.01	1717.82	205.57	1717.59
206.66	1717.57	208.78	1717.6	209.81	1717.57	213.47	1717.66	214.14	1717.62
214.79	1717.59	215	1717.57	215.64	1717.54	215.99	1717.42	255.59	1704.22
273.51	1703.69	275.59	1703.62	285.45	1702.64	285.59	1702.62	285.6	1702.62
285.75	1702.64	295.6	1703.62	296.19	1703.64	315.59	1704.22	318.33	1705.14
358.11	1718.4	358.35	1718.47	358.58	1718.4	360.65	1718.4	364.37	1718.47
377.24	1718.52	378.35	1718.53	382.7	1718.54	393.02	1718.71	396.08	1718.7
412.18	1718.97	413.49	1719	416.46	1719	421.46	1719	421.54	1719
421.86	1719	422.23	1719	423.36	1719.12	430.21	1720	439.64	1720
445.6	1720	449.65	1720	453.78	1719.8	453.8	1719.79	455.32	1719.77
456.4	1719.72	457.3	1719.66	460.3	1719.35	460.94	1719.28	462.19	1719.12
467.12	1719.16	479.5	1719.05	480.84	1719.01	494.54	1718.59	497.44	1717.49

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	203.35	.027
		358.58	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	203.35	358.58		86.13	50	36.98	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.84	Reach Len. (ft)	86.13	50.00	36.98
Crit W.S. (ft)		Flow Area (sq ft)		665.26	
E.G. Slope (ft/ft)	0.002716	Area (sq ft)		665.26	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	105.71	Top Width (ft)		105.71	
Vel Total (ft/s)	9.62	Avg. Vel. (ft/s)		9.62	
Max Chl Dpth (ft)	9.22	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	122799.4	Conv. (cfs)		122799.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		108.30	
Min Ch El (ft)	1702.62	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)	497.44	0.00	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		38.50	
C & E Loss (ft)	0.02	Cum SA (acres)		8.56	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 47

INPUT

Description: "FW" 36+50

Station Elevation Data		num=	136						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.09	.52	1719.1	1.17	1719.11	4.54	1719.18	8.09	1719.21
15.03	1719.5	16.48	1719.5	28.53	1719.6	29.12	1719.6	29.74	1719.61
29.75	1719.61	30.09	1719.61	31.09	1719.58	42.45	1719.5	43.87	1719.67
46.17	1719.84	46.19	1719.84	46.39	1719.84	46.53	1719.85	46.77	1719.85
53.25	1719.73	54.31	1719.71	54.92	1719.7	56.78	1719.62	62.54	1719.49
64.69	1719.94	66.87	1720.32	71.19	1721.33	74.4	1722.05	75.05	1722.19
75.25	1722.2	75.48	1722.21	81.21	1722.47	83.34	1722.31	83.49	1722.31
84.6	1722.21	86.31	1721.92	87.48	1721.68	88.37	1721.36	89.94	1720.8
94.62	1719.76	96.53	1719.29	96.78	1719.27	99.85	1719.11	113.6	1719.41
121.34	1719.45	137.92	1719.6	138.75	1719.61	139.26	1719.61	140.21	1719.6
141.18	1719.62	143.67	1719.62	170.28	1719.76	195.72	1719.31	203.24	1719.17
205.18	1719.01	206.04	1719	208.76	1718.86	211.48	1718.79	213.94	1718.74
217.6	1718.73	224.83	1718.52	232.65	1718.62	235.92	1718.62	239.82	1718.28
242	1718.04	242.33	1718.04	242.56	1718.05	242.59	1718.04	242.67	1718.04
244.64	1717.99	244.81	1717.98	245.08	1717.89	286.82	1703.97	306.71	1703.38
306.72	1703.38	310.7	1702.98	316.72	1702.38	316.73	1702.38	316.82	1702.39
326.72	1703.38	326.75	1703.38	346.82	1703.98	347.03	1704.05	347.08	1704.07
396.98	1720.7	397.23	1720.71	397.31	1720.72	401.38	1720.87	404.9	1720.96
417.1	1721.07	420.04	1721.21	420.48	1721.23	420.94	1721.24	427.13	1721.32
433.94	1721.44	440.22	1721.48	446.22	1721.55	449.65	1721.62	454.03	1721.54
454.56	1721.52	459.82	1721.03	466.32	1720.4	468.17	1720.22	469.74	1720.17
470.45	1720	471.59	1720	475.39	1720	481.14	1719.24	482.95	1719
483.31	1719	483.34	1719	483.42	1719	483.84	1719	485.48	1719
488.41	1718.58	493.23	1718.06	497.66	1718.09	500.45	1718.03	503.68	1717.96
505.58	1717.87	508.64	1717.84	514.09	1717.92	521.11	1717.59	527.35	1717.36
533.8	1717.1	535.35	1717.04	537.06	1717.01	539.18	1716.94	540.98	1716.88
543.09	1716.89	544.66	1716.83	545.31	1716.81	548.9	1716.85	550.33	1716.89
553.27	1717								

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	244.64	.027
		397.23	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	244.64	397.23		115.51	50	35.18	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1713.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.76	Reach Len. (ft)	115.51	50.00	35.18
Crit W.S. (ft)		Flow Area (sq ft)		682.77	
E.G. Slope (ft/ft)	0.002523	Area (sq ft)		682.77	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	106.70	Top Width (ft)		106.70	
Vel Total (ft/s)	9.37	Avg. Vel. (ft/s)		9.37	
Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)		6.40	
Conv. Total (cfs)	127414.7	Conv. (cfs)		127414.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		109.35	
Min Ch El (ft)	1702.38	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)	553.27	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		37.72	
C & E Loss (ft)	0.02	Cum SA (acres)		8.44	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 42

INPUT

Description: "FW" 37+00

Station Elevation Data		num=	135						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.06	.67	1719.09	5.98	1719.3	8.52	1719.42	25.67	1719.56
29.66	1719.66	30.63	1719.82	33.58	1720.28	36.01	1720.61	39.97	1720.83
44.37	1721.05	44.95	1721.03	45.71	1721.05	60.22	1722.38	67.42	1722.95
68.75	1723.07	69.75	1723.1	70.48	1723.13	76.06	1723.37	85.36	1723.35
91.76	1723.27	95.01	1723.22	110.93	1723.4	111.25	1723.4	111.28	1723.4
111.31	1723.4	111.33	1723.4	111.34	1723.4	111.41	1723.4	111.51	1723.4
112.87	1723.37	113.98	1723.29	121.33	1722.78	126.26	1721.96	131.22	1721.01
134.18	1720.51	134.3	1720.49	134.54	1720.49	134.94	1720.48	144.35	1720.3
149.74	1720.2	151.11	1720.17	151.14	1720.17	154.39	1719.66	158.71	1719
160.24	1719	162.21	1719	163.76	1719.06	176.12	1719.52	181.28	1719.39
209.07	1719.76	220.77	1719.74	242.36	1719.98	254.13	1720.04	265.34	1720.15
266.48	1720.15	267.18	1720.15	268.02	1720.13	269.29	1720.08	271.28	1720.11

272.23	1719.92	273.16	1719.87	295.14	1718.54	308.59	1718.48	315.12	1718.45
316.2	1718.34	321.37	1717.87	321.53	1717.86	363.73	1703.79	363.94	1703.72
383.65	1703.13	383.69	1703.13	393.68	1702.13	393.69	1702.13	393.94	1702.16
394.32	1702.19	403.69	1703.13	403.71	1703.13	423.94	1703.74	467.1	1718.12
467.64	1718.31	468.6	1718.33	469.45	1718.42	474.37	1718.98	477.08	1719.43
482.01	1720.02	483.01	1720.23	487.9	1720.6	490.9	1720.79	495.04	1721.02
496.07	1721.05	510.19	1721.48	518.96	1722.2	523.68	1722.55	530.99	1722.93
531.43	1722.95	532.7	1722.95	540.31	1722.95	544.6	1722.77	549.94	1722.55
555.7	1721.92	559.57	1721.5	562.43	1720.95	564.97	1720.45	567.15	1720.08
572.76	1719.15	575.73	1718.61	577.2	1718.33	578.15	1718.13	580.7	1717.66
581.52	1717.51	582.57	1717.31	587.41	1716.36	589.71	1715.91	589.99	1715.89
590.99	1715.82	591.16	1715.81	595.81	1715.6	597.17	1715.56	598.66	1715.55
604.1	1715.55	604.64	1715.57	604.67	1715.57	610.4	1715.5	617.45	1715.49
622.83	1715.42	624.97	1715.48	631.3	1715.54	633.58	1715.59	637.05	1715.66
641.23	1715.7	646.2	1715.71	646.52	1715.72	650.68	1716.01	655.03	1716.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	321.53	.027	467.1	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	321.53	467.1		1.07	.36	.22	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.69	Reach Len. (ft)	1.07	0.36	0.22
Crit W.S. (ft)		Flow Area (sq ft)		701.84	
E.G. Slope (ft/ft)	0.002333	Area (sq ft)		701.84	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	107.77	Top Width (ft)		107.77	
Vel Total (ft/s)	9.12	Avg. Vel. (ft/s)		9.12	
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	132492.6	Conv. (cfs)		132492.6	
Length Wtd. (ft)	0.36	Wetted Per. (ft)		110.47	
Min Ch El (ft)	1702.13	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	655.03	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		36.93	
C & E Loss (ft)	0.00	Cum SA (acres)		8.32	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 41

INPUT

Description: "FW" 37+00.36

Station	Elevation	Data	num=	137						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	1719.05	2.69	1719.17	6.71	1719.33	8.64	1719.42	26.92	1719.57	
29.86	1719.64	30.57	1719.76	32.75	1720.1	36.38	1720.6	42.29	1720.92	
45.17	1721.07	45.54	1721.05	46.04	1721.07	55.59	1721.94	67.34	1722.86	
69.5	1723.06	71.11	1723.11	72.29	1723.16	76.92	1723.36	84.66	1723.34	
92.7	1723.24	95.05	1723.21	106.64	1723.34	110.58	1723.39	111	1723.39	
111.37	1723.4	111.6	1723.4	111.73	1723.4	112.58	1723.4	113.79	1723.37	
113.99	1723.36	114.15	1723.35	122.37	1722.78	126.72	1722.05	132.1	1721.03	
132.23	1721	135.13	1720.52	135.35	1720.49	144.63	1720.32	149.59	1720.22	
152.2	1720.17	152.25	1720.17	158.43	1719.21	159.77	1719	160.25	1719	
162.78	1719	164.77	1719.07	176.79	1719.53	182.09	1719.39	209.39	1719.76	
222.45	1719.73	243.39	1719.96	256.25	1720.03	265.98	1720.13	267.31	1720.12	
268.11	1720.12	269.09	1720.11	270.57	1720.05	272.12	1720.07	272.86	1719.92	
275.09	1719.8	295.9	1718.54	308.67	1718.49	315.98	1718.44	317.02	1718.34	
321.97	1717.9	322.4	1717.86	363.82	1704.05	364.81	1703.72	384.14	1703.14	
384.55	1703.13	394.36	1702.15	394.55	1702.13	394.8	1702.15	404.38	1703.11	
404.55	1703.13	424.54	1703.73	424.81	1703.74	425.44	1703.95	468.42	1718.28	
469.12	1718.29	469.78	1718.3	469.9	1718.32	475.33	1718.94	478.31	1719.43	
483.03	1720	484.17	1720.24	488.48	1720.56	491.76	1720.77	496.28	1721.02	
496.61	1721.03	511.17	1721.48	520.2	1722.22	524.65	1722.55	532.2	1722.94	
532.28	1722.95	532.39	1722.95	532.71	1722.95	541.2	1722.95	546.38	1722.73	
550.78	1722.55	555.54	1722.03	560.42	1721.5	563.99	1720.81	565.83	1720.45	
567.41	1720.18	573.62	1719.15	576.89	1718.56	578.2	1718.31	579.05	1718.13	
581.34	1717.71	582.07	1717.57	583.01	1717.39	587.36	1716.54	590.55	1715.92	
590.94	1715.89	591.91	1715.82	592.08	1715.81	596.58	1715.61	598.1	1715.56	
599.77	1715.55	605.04	1715.55	605.55	1715.57	606.06	1715.56	611.27	1715.49	
617.72	1715.48	623.79	1715.4	626.19	1715.48	632.13	1715.53	634.28	1715.58	
638.01	1715.65	642.07	1715.69	647.29	1715.71	647.41	1715.71	647.59	1715.71	
651.65	1715.99	656.04	1716.46							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	322.4	.027	468.42	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	322.4	468.42		27.88	17.9	22.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.69	Reach Len. (ft)	27.88	17.90	22.24
Crit W.S. (ft)		Flow Area (sq ft)		701.67	
E.G. Slope (ft/ft)	0.002335	Area (sq ft)		701.67	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	107.75	Top Width (ft)		107.75	
Vel Total (ft/s)	9.12	Avg. Vel. (ft/s)		9.12	
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	132458.7	Conv. (cfs)		132458.7	
Length Wtd. (ft)	17.90	Wetted Per. (ft)		110.45	
Min Ch El (ft)	1702.13	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)	656.04	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		36.92	
C & E Loss (ft)	0.01	Cum SA (acres)		8.32	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash

RS: 40.5

INPUT

Description: "FW" 37+18.26

Station Elevation Data		num=	139										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.08	5.75	1719.23	19.79	1719.41	28.86	1719.42	32.95	1719.43				
45.66	1719.29	54.37	1719.79	55.14	1719.85	56.39	1719.97	65.57	1721.12				
81.64	1722.66	83.08	1722.75	83.87	1722.83	94.52	1723.22	95.69	1723.25				
96.06	1723.25	96.36	1723.25	107.05	1723.21	111.61	1723.29	114.41	1723.32				
135.67	1723.22	137.82	1723.21	138.21	1723.21	138.4	1723.21	138.54	1723.2				
138.96	1723.2	139.27	1723.19	146.89	1722.88	151.38	1722.18	158.08	1720.53				
159.16	1720.43	161.29	1720.46	166.45	1720.37	178	1720.18	185.21	1719.7				
186.09	1719.62	186.12	1719.62	186.16	1719.62	186.2	1719.62	186.29	1719.62				
186.78	1719.64	196.93	1719.38	206.02	1719.5	252.43	1719.41	266.75	1719.38				
269.82	1719.29	277.54	1719.25	278.1	1719.25	278.46	1719.25	289.82	1719.28				
290.74	1719.27	303.03	1718.61	307.84	1718.5	311.1	1718.42	321.96	1718.4				
333.04	1718.34	334.35	1718.18	336.34	1718.01	337.93	1717.86	339.38	1717.74				
344.1	1716.16	381.66	1703.64	382.64	1703.61	401.34	1703.04	401.52	1703.02				
411.34	1702.04	421.34	1703.04	439.07	1703.57	441.69	1703.65	473.51	1714.24				
479.53	1716.25	484.87	1718.03	485.51	1718.04	486.24	1718.06	491.29	1718.14				
499.1	1718.19	503.96	1718.2	511.29	1718.31	516.02	1719.06	519.06	1719.57				
526.76	1720.37	527.43	1720.42	528.7	1720.52	536.39	1720.88	541.12	1721.14				
543.58	1721.12	555.43	1721.5	559.12	1721.62	559.36	1721.63	559.75	1721.63				
560.01	1721.63	564.05	1721.47	564.09	1721.47	564.53	1721.45	567.87	1721.35				
570.43	1721.25	571.42	1721.21	572.51	1721.14	574.28	1720.96	576.75	1720.73				
579.72	1720.37	579.93	1720.35	580.16	1720.32	583.98	1719.81	588.44	1719.22				
588.78	1719.17	589.43	1719.07	595.49	1718.11	599.04	1717.69	601.84	1717.29				
605.13	1716.85	607.16	1716.6	611.21	1716.25	612.67	1716.13	612.79	1716.12				
613.63	1716.11	614.02	1716.12	615.66	1716.12	615.88	1716.12	618.28	1716.15				
620.47	1716.05	621.03	1716.07	621.1	1716.06	626.13	1716.18	628.16	1716.22				
628.45	1716.24	628.64	1716.23	634.13	1715.79	639.07	1715.2	641.7	1714.91				
642.82	1714.88	652.39	1714.5	670.3	1714.1	671.27	1714.13	671.63	1714.14				
672.76	1714.18	678.58	1714.3	683.85	1714.56	685.76	1714.46						

Manning's n Values		num=	3				
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.027	339.38	.027	484.87	.027		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	339.38	484.87		47.1	31.74	26.05	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.67	Reach Len. (ft)	47.10	31.74	26.05
Crit W.S. (ft)		Flow Area (sq ft)		709.00	
E.G. Slope (ft/ft)	0.002268	Area (sq ft)		709.00	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	108.20	Top Width (ft)		108.20	
Vel Total (ft/s)	9.03	Avg. Vel. (ft/s)		9.03	
Max Chl Dpth (ft)	9.63	Hydr. Depth (ft)		6.55	
Conv. Total (cfs)	134391.3	Conv. (cfs)		134391.3	
Length Wtd. (ft)	31.74	Wetted Per. (ft)		110.92	
Min Ch Bl (ft)	1702.04	Shear (lb/sq ft)		0.91	
Alpha	1.00	Stream Power (lb/ft s)	685.76	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		36.63	
C & E Loss (ft)	0.01	Cum SA (acres)		8.27	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash

RS: 37

INPUT

Description: "FW" 37+50

Station Elevation Data		num=	144										
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.89	23.39	1719.06	29.86	1718.97	51.12	1719.02	51.77	1719.03				
60.29	1719.12	61.63	1719.35	67.46	1720.31	69.07	1720.5	75.73	1721.15				
81.89	1722.05	85.64	1722.58	86.28	1722.67	86.94	1722.69	87.6	1722.7				
89.99	1722.78	95.96	1722.97	98.02	1723.02	105.8	1723.14	120.85	1723.29				
127.03	1723.19	127.91	1723.18	128.9	1723.18	130	1723.16	131.68	1723.13				
134.89	1723.07	138.25	1723	140.55	1722.93	145.13	1722.78	150.75	1721.41				
152.62	1720.24	152.68	1720.06	153.13	1720.07	153.19	1720.07	155.78	1720.18				
155.84	1720.18	156.11	1720.18	165.01	1719.99	167.35	1719.62	172.01	1719.37				
174.29	1719.08	174.94	1719.01	177.51	1718.74	178.86	1718.87	180.93	1718.86				
185.68	1718.82	190.64	1717.91	190.77	1717.88	190.99	1717.88	191.2	1717.88				
192.17	1717.89	201.76	1717.94	203.85	1717.96	205.03	1717.97	207.64	1717.97				
209.47	1718.01	215.58	1718.51	231.73	1718.67	265.76	1718.6	269.43	1718.5				
277.14	1718.41	282.78	1718.29	290.12	1718.13	313.57	1717.86	315.46	1717.84				
320.27	1718.06	323.93	1717.62	325.25	1717.39	325.43	1717.46	325.79	1717.46				
326.12	1717.46	368.21	1703.42	368.23	1703.42	386.07	1702.88	386.08	1702.88				
396.08	1701.88	406.08	1702.88	428.11	1703.54	428.11	1703.55	428.16	1703.56				
457.79	1713.4	466.66	1716.36	467.52	1716.65	468.98	1717.14	471.23	1717.45				
473.57	1717.55	474.57	1717.26	475.75	1717.26	478.7	1717.35	479.46	1717.38				
484.73	1717.53	488.55	1717.62	498.79	1717.85	499.63	1717.87	500.2	1717.88				
505.04	1718	510.42	1718.2	514.36	1718.36	528.39	1719	530.06	1719.18				
535.1	1719.79	536.78	1720	538.8	1720	550.49	1720	557.55	1719.38				
562.34	1719	576.94	1718.44	581.57	1718.28	588.91	1718.15	590.45	1718.11				
591.34	1718.09	592.16	1718.08	592.48	1718.07	594.45	1718.05	599.24	1718				
599.25	1718	599.89	1718	599.93	1717.98	601.27	1717.96	606.29	1717.86				
606.35	1717.86	614.27	1717.69	615.01	1717.69	615.38	1717.72	621.21	1717.79				
622.9	1717.81	625.52	1717.7	630.6	1717.5	634.64	1717.3	638.12	1716.92				
644.65	1716.23	649.16	1715.86	652.58	1715.57	654.56	1715.46	654.93	1715.44				
655.55	1715.41	658.69	1715.28	661.72	1715.16	665.5	1715.04	674.48	1714.29				

679.99 1713.75 680.5 1713.72 680.71 1713.71 683.01 1713.65

Manning's n Values num= 3
Sta n Val Sta n Val
0 .027 326.12 .027 473.57 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
326.12 473.57 72.28 50 37.15 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.63	Reach Len. (ft)	72.28	50.00	37.15
Crit W.S. (ft)		Flow Area (sq ft)		721.13	
E.G. Slope (ft/ft)	0.002161	Area (sq ft)		721.13	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	108.84	Top Width (ft)		108.84	
Vel Total (ft/s)	8.87	Avg. Vel. (ft/s)		8.87	
Max Chl Dpth (ft)	9.75	Hydr. Depth (ft)		6.63	
Conv. Total (cfs)	137676.2	Conv. (cfs)		137676.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		111.61	
Min Ch El (ft)	1701.88	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)	683.01	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		36.11	
C & E Loss (ft)	0.03	Cum SA (acres)		8.19	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 36

INPUT

Description: "FW" 38+00

Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.82	.16	1719.82	7.74	1719.68	10.87	1719.65	24.44	1718.96
25.01	1718.93	28.33	1718.78	43.04	1718.74	52.37	1718.6	55.87	1718.55
77.44	1718.35	86.07	1717.14	88.23	1717.38	89.1	1717	89.55	1717
89.92	1717	91.71	1717	94.88	1717	105.48	1717	112.52	1717
127.27	1718.87	128.06	1718.97	128.29	1719	129.04	1719	172.62	1719
182.09	1718.25	185.01	1718	191.83	1717.56	193.17	1717.48	193.25	1717.48
193.52	1717.47	193.53	1717.47	193.7	1717.47	194.05	1717.45	205.87	1717.51
214.34	1717.48	218.24	1717.53	223.56	1717.53	229.97	1717.42	232.36	1717.4
233.52	1717.36	244.51	1717.22	255.92	1717.2	264.52	1717.28	275.58	1717.39
283.03	1717.42	297.92	1717.39	297.93	1717.39	304.05	1717.43	304.61	1717.29
305.82	1716.97	307.63	1716.51	308.15	1716.7	308.74	1716.85	308.89	1716.91
308.98	1716.91	309.05	1716.91	309.12	1716.91	309.38	1716.91	310.14	1716.91
311.01	1716.91	314.48	1716.88	314.49	1716.88	314.5	1716.88	314.5	1716.87
347.11	1705.93	348.2	1705.56	349.28	1705.2	351.8	1704.4	356.39	1702.91
365.45	1702.64	365.47	1702.64	375.45	1701.64	375.47	1701.64	375.48	1701.64
385.47	1702.64	385.51	1702.64	409.86	1703.37	447.68	1715.98	447.75	1716
447.76	1716	447.8	1716	467	1717	471.03	1717.33	480.11	1718
480.52	1718.05	480.75	1718.07	481.52	1718.14	486.69	1718.65	491.55	1719
491.97	1719.04	492.06	1719.04	492.23	1719.06	495.93	1719.34	497.15	1719.42
499.13	1719.56	500.37	1719.64	504.13	1719.91	504.47	1719.93	505.32	1720
505.36	1720	507.03	1720.14	507.35	1720.16	508.72	1720.27	509.32	1720.29
510.85	1720.42	511.56	1720.44	512.34	1720.44	513.73	1720.55	515.13	1720.58
516.23	1720.61	517.38	1720.65	518.99	1720.77	522.24	1720.87	526	1720.98
526.1	1720.99	526.72	1721	529.05	1721.2	529.64	1721.24	531.66	1721.37
532.55	1721.43	534.07	1721.52	535.45	1721.56	536.49	1721.6	537.98	1721.62
539.12	1721.63	539.9	1721.62	541.15	1721.61	542.76	1721.57	544.51	1721.53
544.79	1721.52	545.7	1721.48	545.93	1721.47	546.9	1721.42	547.76	1721.38
548.8	1721.31	549.31	1721.28	550.09	1721.21	550.32	1721.19	552.23	1721.04
552.3	1721.03	552.68	1721	553.79	1720.91	554.05	1720.89	554.76	1720.83
555.18	1720.8	555.69	1720.74	557.47	1720.54	557.98	1720.5	559.31	1720.4
563.73	1719.97	569.67	1719.42	570.28	1719.36	571.05	1719.28	573.65	1719.1
574.35	1719.03	578.7	1718.61	583.53	1718.09	587.58	1718.15	596.61	1718.22
604.46	1718.08	608.55	1717.98	613.39	1717.97	616.18	1717.97	624.09	1718.07
625.19	1718.09	626.23	1718.01	626.79	1717.99	627.42	1717.98	629.5	1717.91
638.01	1717.58	640.96	1717.17	642.73	1716.96	649.06	1716.73	652.8	1716.63
653.15	1716.62	659.35	1716.4	671.16	1716.07	673.58	1716.22		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 314.48 .027 447.68 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
314.48 447.68 70.35 50 35.18 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.47	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.23	Reach Len. (ft)	70.35	50.00	35.18
Crit W.S. (ft)		Flow Area (sq ft)		656.95	
E.G. Slope (ft/ft)	0.002713	Area (sq ft)		656.95	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	102.12	Top Width (ft)		102.12	
Vel Total (ft/s)	9.74	Avg. Vel. (ft/s)		9.74	
Max Chl Dpth (ft)	9.59	Hydr. Depth (ft)		6.43	
Conv. Total (cfs)	122874.1	Conv. (cfs)		122874.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		104.85	
Min Ch El (ft)	1701.64	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)	673.58	0.00	0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		35.32	
C & E Loss (ft)	0.00	Cum SA (acres)		8.07	

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 35

INPUT

Description: "FW" 38+50

Station Elevation Data		num= 188									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.52	8.24	1720.39	12.01	1720.36	17.74	1720.24	24.98	1720.18		
39.79	1719.9	43.51	1719.91	44.92	1719.66	46.61	1719.5	50.38	1719.46		
51.73	1719.31	53.81	1719.21	64.08	1718.64	70.35	1718.52	78.94	1718.39		
90.92	1718.24	94.74	1718.44	95.23	1718.47	95.38	1718.47	95.56	1718.47		
97.07	1718.48	100.59	1718.5	103.74	1718.5	108.13	1718.51	108.43	1718.74		
108.66	1718.96	110	1718.75	112.77	1717.97	125.51	1718.07	134.1	1717.93		
150.42	1717.61	154.8	1717.62	156.59	1717.6	159.15	1717.55	161.9	1717.53		
166.6	1717.49	171.1	1717.45	177.83	1717.41	181.88	1717.44	184.32	1717.41		
188.05	1717.32	192.79	1717.26	195.84	1717.23	197.22	1717.22	200.89	1717.15		
206.03	1717.09	207.96	1717.1	208.58	1717.11	221.17	1717.06	222.14	1717.07		
223.2	1717.06	231.1	1717.04	234.35	1717.02	236.09	1717.01	243.84	1716.97		
245.93	1716.95	255.14	1717.04	256.02	1717.04	259.11	1717.03	271.13	1716.81		
277.69	1716.81	285.62	1716.73	286.66	1716.5	289.76	1715	290.86	1714.64		
291.55	1714.41	292.81	1714	296.07	1713.26	297.4	1713	299.66	1712.51		
302.08	1712	304.35	1711.6	307.79	1711	312.97	1710.14	313.68	1710		
325.93	1709	345.45	1702.5	345.46	1702.49	348.8	1702.39	358.8	1701.39		
368.8	1702.39	368.81	1702.39	395.61	1703.2	398.02	1704	401.02	1705		
404.02	1706	407.02	1707	410.01	1707.99	413.01	1708.99	413.01	1709		
416.01	1709.99	416.01	1710	419.01	1711	420.14	1711.37	421.93	1711.97		
422.02	1712	424.81	1712.93	425.02	1713	427.72	1713.9	428.02	1714		
430.64	1714.87	431.02	1715	433.58	1715.85	434.02	1716	434.13	1716.02		
438.56	1717	446.34	1717.83	447.88	1718	449.05	1718.08	462.25	1719		
466.49	1719.97	466.63	1720	467.06	1720.07	472.99	1721	475.84	1721.61		
477.85	1722	479.18	1722.25	480.7	1722.44	483.15	1722.71	486.28	1723		
489.29	1723	491.58	1723	496.15	1722.49	498.54	1722.2	500.98	1722		
503.91	1721.53	508.23	1721	511.33	1720.73	515.04	1720.67	517.55	1720.65		
524.99	1720.91	525.6	1720.93	526.44	1721	533.06	1721.55	536.62	1721.97		
536.87	1722	538.7	1722.39	538.73	1722.39	539.51	1722.5	543.37	1722.29		
547.11	1722.57	548.87	1722.36	549.45	1722.3	557.47	1721.66	561.79	1721.18		
562.33	1721.13	563.55	1720.97	565.24	1720.71	566.3	1720.53	569.06	1720.14		
572.19	1719.59	572.72	1719.52	574.05	1719.3	576.17	1719.16	579.28	1718.94		
583.63	1718.63	585.01	1718.53	586.33	1718.43	593.57	1718.16	594.23	1718.13		
594.51	1718.13	595.26	1718.08	601.89	1717.63	607.2	1717.63	609.18	1717.63		
609.35	1717.64	610.65	1717.74	614.64	1718.19	621.44	1717.74	627.91	1717.51		
630.8	1717.82	633.04	1717.9	633.62	1717.9	633.95	1717.9	638.39	1717.84		
639.48	1717.86	641.25	1717.87	641.5	1717.86	641.68	1717.86	641.79	1717.86		
641.92	1717.84	642.41	1717.76	645.44	1717.4	647.08	1717.3	652.87	1716.66		
656.81	1716.82	657.28	1716.81	659.71	1716.85						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	285.62	.027	438.56	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	285.62	438.56		36.21	26.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.07	Reach Len. (ft)	36.21	26.18	18.40
Crit W.S. (ft)		Flow Area (sq ft)		653.47	
E.G. Slope (ft/ft)	0.003102	Area (sq ft)		653.47	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	111.81	Top Width (ft)		111.81	
Vel Total (ft/s)	9.79	Avg. Vel. (ft/s)		9.79	
Max Chl Dpth (ft)	9.68	Hydr. Depth (ft)		5.84	
Conv. Total (cfs)	114915.7	Conv. (cfs)		114915.7	
Length Wtd. (ft)	26.18	Wetted Per. (ft)		114.40	
Min Ch El (ft)	1701.39	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)	659.71	0.00	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		34.57	
C & E Loss (ft)	0.07	Cum SA (acres)		7.95	

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 34

INPUT

Description: "FW" 38+76.18

Station Elevation Data		num= 203									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.36	5.94	1720.44	9.78	1720.42	11	1720.39	12.38	1720.41		
18.09	1720	19.07	1719.97	19.09	1720.03	19.2	1720.47	20.33	1720.42		
37.51	1720.04	55.9	1719.88	58.66	1719.93	61.33	1719.76	65.96	1719.51		
67.1	1719.5	71.5	1719.02	78.2	1718.67	81.59	1718.48	91.49	1718.29		
92.02	1718.28	92.76	1718.27	93	1718.29	93.58	1718.32	96.71	1718.48		
97.87	1718.59	98.87	1718.62	99.33	1718.62	106.3	1718.61	107.29	1718.61		
107.34	1718.66	107.63	1718.86	108.11	1718.79	112.12	1718.25	129.37	1717.9		
146.91	1717.56	166.9	1717.58	167.37	1717.57	175.37	1717.88	175.68	1717.89		
175.89	1717.9	176.45	1717.93	184.83	1718.38	188.96	1718.56	193.07	1718.73		
193.55	1718.73	194	1718.74	194.74	1718.74	196.57	1718.81	197.18	1718.8		
199.28	1718.82	199.83	1718.81	201.65	1718.78	202.15	1718.77	203.91	1718.72		
205.49	1718.64	207.23	1718.57	210.19	1718.39	211.64	1718.3	215.82	1718.02		
216.97	1717.93	224.33	1717.4	232.38	1716.77	244.09	1716.51	261.55	1716.12		
267.91	1715.37	270.27	1715	271.46	1714.66	274.1	1714	276.5	1713.43		
278.73	1713	281.88	1712.37	283.48	1712	287.9	1711.29	289.58	1711		
295.96	1710.05	296.33	1710	296.78	1709.98	319.91	1709	339.98	1702.31		
341.57	1702.26	351.57	1701.26	351.58	1701.26	357.79	1701.88	361.58	1702.26		
390.06	1703.12	390.86	1703.32	393.24	1704	394.66	1704.48	396.76	1705		
398.19	1705.47	400.29	1706	401.71	1706.47	403.81	1707	405.23	1707.47		
407.34	1708	408.76	1708.47	410.87	1709	412.28	1709.47	414.39	1710		
415.81	1710.47	417.92	1711	419.34	1711.47	421.45	1712	423.58	1712.53		
424.98	1713	427.11	1713.53	428.51	1714	430.64	1714.53	432.04	1715		
434.18	1715.53	435.58	1716	437.51	1716.6	437.68	1716.64	438.26	1716.73		
438.69	1716.78	439.63	1716.89	440.33	1717	440.62	1717.05	444.55	1717.73		

446.18	1718	452.31	1718.4	453.72	1718.49	454.46	1718.55	455.01	1718.59
461.67	1719	468.22	1719.64	475.3	1719.83	477.14	1719.92	484.82	1719.87
494.86	1719.52	503.18	1719.03	503.68	1719	503.79	1719	503.92	1719
517.59	1719	520.72	1719	522.53	1719	522.58	1719	522.99	1719.07
528.5	1720	533.09	1720.81	534.35	1721	536.39	1721.38	539.95	1722
541.28	1722	547.03	1722	547.07	1722	548.36	1722	550.72	1723.07
551.65	1723.32	554	1723.7	554.43	1723.7	555.67	1723.7	557.35	1723.7
559.51	1723.7	559.74	1723.7	561.1	1723.44	566.84	1722.2	569.21	1721.65
571.65	1721.02	576.78	1719.55	577.62	1719.3	579.39	1719.11	584.23	1718.6
585.43	1718.46	589.17	1718.08	593.4	1717.79	595.35	1717.67	596.64	1717.59
600.44	1717.59	604.1	1717.59	606.11	1717.87	606.92	1717.99	607.21	1718.03
607.35	1718.06	607.42	1718.07	607.47	1718.08	607.49	1718.09	607.5	1718.09
608.18	1718.11	614.31	1717.63	616.48	1717.9	619.9	1718.34	626.87	1718.2
627.45	1718.17	628.79	1718.03	631.12	1717.78	632.23	1717.66	633.89	1717.46
638.96	1717.12	640.43	1717.04	641.21	1716.99	641.58	1716.97	641.9	1716.95
642.21	1716.93	642.51	1716.91	642.8	1716.9	643.1	1716.89	643.74	1716.85
644.4	1716.87	648.44	1717.03	650.84	1717				

Manning's n Values num= 3
Sta n Val Sta n Val
0 .027 197.18 .027 477.14 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
197.18 477.14 32.63 23.82 17.07 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.15	Reach Len. (ft)	32.63		17.07
Crit W.S. (ft)		Flow Area (sq ft)		709.73	
E.G. Slope (ft/ft)	0.002853	Area (sq ft)		709.73	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	129.64	Top Width (ft)		129.64	
Vel Total (ft/s)	9.02	Avg. Vel. (ft/s)		9.02	
Max Chl Dpth (ft)	9.89	Hydr. Depth (ft)		5.47	
Conv. Total (cfs)	119827.8	Conv. (cfs)		119827.8	
Length Wtd. (ft)	23.82	Wetted Per. (ft)		132.08	
Min Ch El (ft)	1701.26	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)	650.84	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		34.16	
C & E Loss (ft)	0.00	Cum SA (acres)		7.88	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 33.5

INPUT

Description: "FW" 39+00

Station Elevation Data	num=	168							
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 1720.56	9.5 1720.32	10.41 1720.33	22.9 1720.18	47.58 1719.96					
53.74 1719.94	55.96 1719.97	58 1719.99	62.89 1720.05	68.11 1720.12					
70.38 1720.16	70.43 1720.16	70.49 1720.16	74.87 1719.98	76.38 1719.91					
77.39 1719.72	82.64 1718.77	85.64 1718.69	86.34 1718.65	87.59 1718.62					
91.01 1718.51	93.97 1718.5	96.09 1718.51	98.94 1718.53	105.98 1718.53					
107.04 1718.52	107.35 1718.85	107.35 1718.86	107.51 1718.84	109.38 1718.57					
110.21 1718.43	111.67 1718.1	114.58 1718.04	139.85 1717.52	144.44 1717.52					
159.36 1717.49	166.15 1717.43	172.95 1717.78	176.06 1717.9	181.83 1718.36					
187.13 1718.9	189.9 1718.99	194.44 1719.11	195.42 1719.15	196.71 1719.2					
199.25 1719.19	201.49 1719.08	205.38 1718.85	206.83 1718.72	213.03 1718.13					
215.81 1717.86	218.43 1717.63	228.72 1716.66	246.98 1715.79	253.84 1715.45					
255.84 1715.36	258.82 1715.22	264.94 1715	266.45 1714.54	269.15 1714					
274.45 1713.37	276.26 1713.21	278.01 1713	283.86 1712.22	285.78 1712					
292.25 1711.29	294.68 1711	299.95 1710.43	304.1 1710	306.31 1709.9					
314.72 1709	314.75 1709	335.24 1702.17	335.26 1702.16	335.85 1702.14					
345.85 1701.15	345.85 1701.14	345.86 1701.15	355.85 1702.14	385.27 1703.03					
385.29 1703.03	389.17 1704	393.17 1705	397.17 1706	401.17 1707					
405.17 1708	409.17 1709	413.17 1710	413.18 1710	417.18 1711					
421.18 1712	425.18 1713	429.18 1714	433.18 1715	437.17 1716					
441.17 1717	441.19 1717	444.49 1717.83	445.16 1718	446.7 1718.09					
471.11 1719	472.14 1719.05	472.57 1719.05	474.03 1719	499.07 1719.8					
499.59 1719.76	502.55 1719.99	502.59 1719.99	502.88 1720	507.15 1720					
508.46 1720	513.58 1720	517.43 1720.17	534.47 1720.83	537.47 1721					
538.98 1721.15	539.35 1721.18	540.38 1721.27	545.27 1721.54	546.65 1721.65					
548.46 1721.79	549.95 1721.81	551.97 1721.97	553.28 1722	554.08 1722					
555.15 1721.96	555.6 1721.92	555.69 1721.91	558.32 1721.63	559.46 1721.45					
559.88 1721.38	560.22 1721.31	560.83 1721.19	564.66 1720.28	567.8 1719.3					
567.83 1719.29	569.8 1718.82	571.29 1718.6	581.26 1718.31	581.96 1718.29					
582.2 1718.28	582.42 1718.26	582.88 1718.23	583.05 1718.21	583.77 1718.15					
585 1718.04	589.94 1717.59	593.09 1717.59	597.82 1717.59	598.09 1717.65					
598.35 1717.72	598.37 1717.73	605.16 1717.97	605.2 1717.97	605.24 1717.98					
610.71 1718.38	611.92 1718.36	618.92 1718.06	620.56 1717.87	624.24 1717.58					
625.23 1717.52	627.72 1717.4	630.17 1717.32	635.47 1717.02	640.43 1717.19					
640.59 1717.19	641.62 1717.18	641.75 1717.17							

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 199.25 .027 446.7 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
199.25 446.7 67.71 50 36.45 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.027	
W.S. Elev (ft)	1711.06	Reach Len. (ft)	67.71	50.00	36.45
Crit W.S. (ft)		Flow Area (sq ft)		706.09	
E.G. Slope (ft/ft)	0.002714	Area (sq ft)		706.09	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	123.27	Top Width (ft)		123.27	

Vel Total (ft/s)	9.06	Avg. Vel. (ft/s)	9.06	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)	5.73	
Conv. Total (cfs)	122855.0	Conv. (cfs)	122855.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)	125.61	
Min Ch El (ft)	1701.14	Shear (lb/sq ft)	0.95	
Alpha	1.00	Stream Power (lb/ft s)	641.75	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	33.77	
C & E Loss (ft)	0.00	Cum SA (acres)	7.81	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 33

INPUT
 Description: "FW" 39+50
 Station Elevation Data num= 151

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1722.35	1.74	1722.47	2.88	1722.7	3.72	1722.84	7.23	1723.12
10.07	1723.39	11.71	1723.64	11.75	1723.65	11.76	1723.65	11.78	1723.65
11.82	1723.65	16.46	1723.56	18.22	1723.54	20.5	1723.48	24.32	1723.3
27.71	1722.93	29.01	1722.8	30.14	1722.71	31.51	1722.63	36.77	1722.34
38.6	1722.24	39.43	1722.19	41.03	1722.09	42.52	1721.94	44.5	1721.66
47.72	1721.2	48.84	1721	51.48	1720.36	53.29	1720.24	55.39	1720.06
55.59	1720.05	61.08	1719.74	63.06	1719.56	63.91	1719.46	69.41	1718.9
71.69	1718.85	78.36	1718.76	82.9	1718.63	88.76	1718.47	89.5	1718.47
96.59	1718.47	97.55	1718.47	97.7	1718.59	98.08	1718.78	99.15	1718.6
104.93	1717.72	105.09	1717.72	106.64	1717.7	108.64	1717.55	116.43	1717.29
117.92	1717.25	120.1	1717.26	123.08	1717.3	129.99	1717.35	131.97	1717.36
140.57	1717.28	143.18	1717.26	145.98	1717.25	149.38	1717.21	151.66	1717.21
160.71	1717.08	162.51	1717.07	172.24	1717	176.61	1716.88	183.74	1716.62
193.75	1716.31	200.84	1716	217.03	1715.76	228.19	1715.59	244.7	1715.36
266.05	1715	269.47	1714.53	271.56	1714	274.49	1713.63	279.14	1713
282.39	1712.6	286.38	1712	290.51	1711.35	292.72	1711	294.88	1710.75
299.87	1710	304.82	1709	326.06	1701.92	326.09	1701.91	326.46	1701.9
326.47	1701.9	336.46	1700.9	336.47	1700.9	346.46	1701.9	346.48	1701.9
376.1	1702.79	376.13	1702.79	428.95	1716	432.95	1717	432.98	1717
446.06	1718	451.91	1718.11	471.5	1718.46	478.4	1718.55	493.8	1718.82
496.58	1718.87	503.75	1719	506.47	1719.45	509.8	1720	516.38	1720.56
519.81	1720.91	520.9	1721	524.33	1721.26	526.47	1721.49	529.69	1721.77
533.27	1722	533.34	1722	533.44	1722	533.47	1722	533.53	1722
533.61	1722	533.81	1722	534.82	1722	547.17	1722	547.99	1721.84
552.18	1721	554.43	1720.61	557.51	1720	558.55	1719.76	558.67	1719.85
559.71	1719.7	560.3	1719.6	563.73	1718.74	563.77	1718.73	563.78	1718.72
563.79	1718.72	567.64	1718.23	570.11	1717.87	572.17	1717.65	578.07	1717.67
579.28	1717.69	582.33	1717.76	584.45	1717.7	585.77	1717.71	588.56	1717.86
597.66	1718.35	603.42	1718.21	605.8	1718.15	610.55	1717.77	611.98	1717.67
613.65	1717.57	615.34	1717.57	619.17	1717.42	620.22	1717.41	621.47	1717.4
623.77	1717.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.027	98.08	.027	446.06	.027

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
98.08	446.06	66.93	50	36.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.94	Reach Len. (ft)	66.93	50.00	36.90
Crit W.S. (ft)		Flow Area (sq ft)		708.88	
E.G. Slope (ft/ft)	0.002462	Area (sq ft)		708.88	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	115.50	Top Width (ft)		115.50	
Vel Total (ft/s)	9.03	Avg. Vel. (ft/s)		9.03	
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)		6.14	
Conv. Total (cfs)	128971.7	Conv. (cfs)		128971.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		117.93	
Min Ch El (ft)	1700.90	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)	623.77	0.00	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		32.96	
C & E Loss (ft)	0.04	Cum SA (acres)		7.67	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 32.5

INPUT
 Description: "FW" 40+00
 Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720.29	10.9	1720	49.85	1719.19	67.73	1718.75	71.53	1718.74
72.84	1718.66	74.65	1718.59	80.43	1718.58	80.59	1718.69	80.79	1718.81
84.12	1718.23	87.42	1718	87.75	1717.82	89.08	1717.86	89.87	1717.88
89.98	1717.88	90.5	1717.88	94.36	1717.93	101.08	1717.98	102.14	1718
102.46	1718	108.34	1718	109.1	1718	116.55	1718	119.42	1718
123.23	1718	139.57	1718	140.04	1718	148.04	1717.09	148.82	1717
159.57	1716.1	161.59	1716	186.59	1715.2	193.61	1715.07	199.06	1715
208.1	1714.74	211.52	1714.61	225.06	1714.17	228.19	1714.07	230.04	1714
239.57	1713.58	248.55	1713	249.51	1712.93	259.03	1712	259.43	1711.97
268.77	1711	274.99	1710.53	281.18	1710	292.01	1709.26	296.19	1709
298.92	1708.09	317.75	1701.82	317.8	1701.8	317.82	1701.79	320.5	1701.71
320.51	1701.71	330.5	1700.71	330.51	1700.71	340.5	1701.71	367.93	1702.54
367.94	1702.54	368.48	1702.67	419.33	1715.38	421.8	1716	422.82	1716.07
432.88	1717	444.14	1717.27	450.64	1717.41	464.73	1717.68	470.16	1717.79
480.77	1718	485.19	1718.11	491.63	1718.36	505.18	1718.83	509.22	1719
515.73	1719.58	518.96	1719.8	525.02	1720	526.16	1720.04	530.61	1720.05
530.71	1720.05	531.72	1720	536.28	1719.73	540.78	1719	541.55	1719

541.9	1719	541.92	1718.99	544.2	1718.45	545.86	1718.26	546.4	1718.17
547.14	1718.08	547.36	1718.05	547.57	1718.01	551.29	1717.22	556.39	1717.44
559.3	1717.49	560.45	1717.52	566.14	1717.55	568.36	1717.48	572.45	1717.56
579.57	1718.06	582.73	1718.28	587.33	1718.14	589.06	1718.06	590.19	1718.06
595.43	1717.64	596.15	1717.54	598.58	1717.43	601.37	1717.29	604.22	1717.11
609.09	1716.99								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	139.57	.027	530.61	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	139.57	530.61		45.41 34.11	25.43	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1712.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.90	Reach Len. (ft)	45.41	34.11	25.43
Crit W.S. (ft)		Flow Area (sq ft)		744.00	
E.G. Slope (ft/ft)	0.002477	Area (sq ft)		744.00	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	131.30	Top Width (ft)		131.30	
Vel Total (ft/s)	8.60	Avg. Vel. (ft/s)		8.60	
Max Chl Dpth (ft)	10.19	Hydr. Depth (ft)		5.67	
Conv. Total (cfs)	128586.8	Conv. (cfs)		128586.8	
Length Wtd. (ft)	34.11	Wetted Per. (ft)		133.69	
Min Ch El (ft)	1700.71	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)	609.09	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		32.13	
C & E Loss (ft)	0.01	Cum SA (acres)		7.53	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 32

INPUT

Description: "FW" 40+34.11

Station Elevation Data		num=		95	
Sta	Elev	Sta	Elev	Sta	Elev
0	1720.3	20.41	1719.62	55.92	1718.42
63.35	1718.42	63.46	1718.49	63.71	1718.62
71.89	1717.89	72	1717.23	72.63	1717.24
78.66	1717.25	114.02	1718	114.78	1718
124.3	1716.87	125.48	1716.83	131.62	1716.43
145.61	1716	148.63	1716	149.97	1716
187.43	1715	191.31	1714.63	195.67	1714.23
215	1713	215.24	1713	224.17	1712.55
235.49	1712	243.09	1711.66	256.05	1711
285.69	1709.24	290.76	1709	307.99	1703.29
318.15	1701.65	319.17	1701.55	328.15	1700.65
360.02	1702.3	362.7	1702.38	379.29	1706.53
406.14	1713.23	408.63	1713.86	417.17	1716
432.89	1716.59	451.11	1717	470.9	1717.43
496.42	1718.31	499.97	1718.37	524.64	1718.44
533.16	1718	533.3	1717.91	533.84	1717.88
537.81	1716.97	542.09	1717.01	545.98	1717.15
557.53	1717.27	562.55	1717.36	568.75	1717.9
581.73	1718.11	584.62	1717.88	587.85	1717.42
				598.64	1716.95
				600.73	1716.85

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	114.02	.027	499.97	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	114.02	499.97		10.8 15.89	20.68	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.84	Reach Len. (ft)	10.80	15.89	20.68
Crit W.S. (ft)		Flow Area (sq ft)		756.10	
E.G. Slope (ft/ft)	0.002515	Area (sq ft)		756.10	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	138.39	Top Width (ft)		138.39	
Vel Total (ft/s)	8.46	Avg. Vel. (ft/s)		8.46	
Max Chl Dpth (ft)	10.19	Hydr. Depth (ft)		5.46	
Conv. Total (cfs)	127627.9	Conv. (cfs)		127627.9	
Length Wtd. (ft)	15.89	Wetted Per. (ft)		140.76	
Min Ch El (ft)	1700.65	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	600.73	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)		31.54	
C & E Loss (ft)	0.00	Cum SA (acres)		7.42	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 31.5

INPUT

Description: "FW" 40+50

Station Elevation Data		num=		101	
Sta	Elev	Sta	Elev	Sta	Elev
0	1720.18	47.5	1718.46	48.34	1718.42
55.74	1718.42	55.82	1718.46	56.04	1718.6
66.59	1717.24	66.62	1717.06	66.79	1717.07
71.33	1717.05	78.16	1717.19	86.9	1717.45
110.66	1717.47	114.71	1717	117.91	1716.38
140.72	1716	141.7	1716	142.87	1716
				143.5	1716
				153.83	1716

156.49	1715.92	158.58	1715.87	163.55	1715.75	183.62	1715.25	186.08	1715.2
187.66	1715.18	194.94	1715.04	195.36	1715.04	197.92	1715	205.34	1714.46
210.85	1714	212.08	1713.93	213.7	1713.81	222.38	1713.26	226.25	1713
231.33	1712.79	235.98	1712.46	240.78	1712.17	242.66	1712	251.79	1711.52
257.72	1711	261.45	1710.72	267.8	1710	282.95	1709.25	287.67	1709
291.4	1707.77	309.26	1701.84	309.27	1701.84	316.59	1701.62	316.6	1701.62
326.59	1700.62	336.59	1701.62	336.6	1701.62	359.49	1702.3	359.51	1702.31
398.28	1712	402.27	1713	404.96	1713.62	406.74	1714	409.51	1714.63
411.07	1715	412.65	1715.32	416.28	1716	438.57	1716.52	449.38	1716.75
454.38	1716.85	464.34	1717	485.33	1717.79	491.91	1718	498.18	1718
515.16	1718	525.64	1718	525.89	1718	527.54	1717.17	528.23	1716.98
528.48	1716.87	530.05	1716.89	536.4	1716.93	542.3	1717.01	546.02	1717.06
548.08	1717.04	550.58	1716.98	554.96	1716.93	563.44	1718.01	565.47	1718.24
571.29	1718.16	575.19	1718.15	576.18	1718.07	581.38	1717.32	592.33	1716.84
594.72	1716.8								

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 106.62 .027 491.91 .027

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
106.62	491.91	34.36	50	63.73		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.77	Reach Len. (ft)	34.36	50.00	63.73
Crit W.S. (ft)		Flow Area (sq ft)		748.06	
E.G. Slope (ft/ft)	0.002465	Area (sq ft)		748.06	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	132.65	Top Width (ft)		132.65	
Vel Total (ft/s)	8.56	Avg. Vel. (ft/s)		8.56	
Max Chl Dpth (ft)	10.15	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	128897.0	Conv. (cfs)		128897.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		135.03	
Min Ch El (ft)	1700.62	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)	594.72	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		31.27	
C & E Loss (ft)	0.01	Cum SA (acres)		7.37	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 31

INPUT

Description: "FW" 41+00

Station	Elevation	Data	num=	110					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1719.26	21.46	1718.41	21.49	1718.41	21.9	1718.4	28.79	1718.07
32.09	1717.91	32.59	1717.89	32.74	1717.88	33	1717.87	33.11	1718.21
33.18	1718.21	33.96	1718.02	38.86	1717.02	38.94	1717	39.54	1717
40.04	1717	47.92	1717	48.18	1717	51.4	1717	57.47	1717
67.52	1717	70.32	1717	103.05	1717.66	106.15	1717.86	106.42	1717.82
107.18	1717.78	109.37	1718	113.93	1717.61	120.72	1717.09	121.29	1717.04
122.08	1717	127.27	1716.48	130.82	1716.38	132.32	1716.55	137.13	1716.41
138.3	1716.53	142.37	1716.46	153.03	1716.7	155.32	1716.66	159.74	1716.54
165.36	1716.46	169.35	1716.4	187.08	1716	191.79	1715.94	192.4	1715.93
193.2	1715.93	217.19	1715	219.76	1715	223.62	1715	226.51	1715
231.69	1715	245.17	1715	245.24	1714.99	245.25	1714.99	245.27	1714.99
245.28	1714.98	245.31	1714.98	245.75	1714.9	250.44	1714	254.6	1713
258.6	1712	262.6	1711	266.6	1710	266.61	1710	266.62	1710
277.69	1709	299.13	1701.87	299.15	1701.86	299.16	1701.86	310.52	1701.52
320.52	1700.52	330.52	1701.52	330.53	1701.52	349.26	1702.08	349.29	1702.09
388.92	1712	412.05	1712.93	413.88	1713	424.04	1713.88	426.2	1714
430.29	1714.49	438.06	1715	443.1	1715.41	450.9	1716	470.04	1716.24
477.61	1716.35	494.27	1716.58	507.56	1716.78	522.67	1717	527.77	1717.11
528.29	1717.1	528.32	1717.1	528.44	1717.1	529.02	1717.11	531.81	1717.17
538.43	1716.98	540.21	1717.02	548.77	1717.71	550.6	1717.87	551.82	1717.89
554.49	1717.92	557.99	1717.98	560.36	1717.65	562.95	1717.29	564.71	1717.19
567.24	1717.11	568.89	1717.01	572.23	1716.88	580.41	1716.61	580.55	1716.6

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 109.37 .027 450.9 .027

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
109.37	450.9	15.64	22.44	28.28		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.56	Reach Len. (ft)	15.64	22.44	28.28
Crit W.S. (ft)		Flow Area (sq ft)		721.98	
E.G. Slope (ft/ft)	0.002403	Area (sq ft)		721.98	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	118.80	Top Width (ft)		118.80	
Vel Total (ft/s)	8.86	Avg. Vel. (ft/s)		8.86	
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)		6.08	
Conv. Total (cfs)	130544.5	Conv. (cfs)		130544.5	
Length Wtd. (ft)	22.44	Wetted Per. (ft)		121.23	
Min Ch El (ft)	1700.52	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	580.55	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		30.42	
C & E Loss (ft)	0.00	Cum SA (acres)		7.23	

CROSS SECTION

RIVER: Flamingo

REACH: Flam Wash RS: 30.9

INPUT

Description: "FW" 41+22.44

Station Elevation Data		num=		105					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.18	23.39	1717.71	23.52	1717.7	23.62	1718.05	23.63	1718.05
24.57	1717.97	32	1717.4	33.58	1717.37	44.83	1717.34	45.5	1717.34
45.63	1717.34	45.73	1717.34	45.9	1717.34	46.07	1717.34	46.68	1717.35
47.02	1717.36	47.52	1717.36	57.14	1717.42	61.81	1717.12	70.34	1717
90.6	1717	96.31	1717	104.24	1717	107.49	1717	110.6	1717
117.46	1717	120.74	1717	125.5	1717	126.68	1717	128.45	1717
134.85	1717.51	140.46	1718	143.31	1717.84	145.39	1717.79	152.51	1717.45
159.2	1717.32	161.1	1717.25	162.52	1717.22	163.68	1717.2	170.06	1717.03
170.61	1717	185.98	1716.46	192.14	1716.24	197.92	1716	206.26	1715.04
206.47	1715	219.25	1715	225.34	1715	238.91	1715	240.51	1715
241.04	1715	241.46	1715	245.36	1714.2	246.6	1714	247.04	1713.9
250.87	1713	253.31	1712.42	255.13	1712	257.01	1711.61	259.57	1711
260.69	1710.72	263.78	1710	271.72	1709.12	273.05	1709	284.73	1705.11
294.5	1701.86	297.67	1701.77	307.19	1701.48	309.62	1701.24	317.19	1700.48
317.2	1700.48	327.2	1701.48	344.57	1702	384.57	1712	387.43	1712.16
398.09	1712.75	404.94	1713	417.24	1713.44	421.91	1713.66	428.85	1714
444.71	1714.71	451.34	1715	462.17	1715.33	480.64	1716	486.23	1716.08
489.45	1716.13	501.7	1716.36	507.03	1716.44	513.27	1716.54	525.72	1716.78
537.1	1717	544.52	1717.92	545.94	1718.11	546.49	1718.11	547.19	1718.12
548.06	1718.13	558.08	1718.19	558.51	1718.13	558.72	1718.08	563.81	1717.15
568.18	1716.91	568.21	1716.91	568.25	1716.9	568.26	1716.9	576.39	1716.58

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	152.51	.027	507.03	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	152.51	507.03		19.43	27.56	34.75	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.24	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.49	Reach Len. (ft)	19.43	27.56	34.75
Crit W.S. (ft)		Flow Area (sq ft)		716.63	
E.G. Slope (ft/ft)	0.002411	Area (sq ft)		716.63	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	116.85	Top Width (ft)		116.85	
Vel Total (ft/s)	8.93	Avg. Vel. (ft/s)		8.93	
Max Chl Dpth (ft)	10.01	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	130344.3	Conv. (cfs)		130344.3	
Length Wtd. (ft)	27.56	Wetted Per. (ft)		119.27	
Min Ch El (ft)	1700.48	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)	576.39	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		30.05	
C & E Loss (ft)	0.00	Cum SA (acres)		7.17	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 30.5

INPUT

Description: "FW" 41+50

Station Elevation Data		num=		137					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.94	9	1717.79	10.53	1717.76	14.12	1717.71	14.15	1717.81
14.22	1718.05	20.18	1717.51	22.09	1717.34	26.25	1717.26	35.66	1717.14
46.41	1716.99	51.2	1716.94	58.52	1716.9	59	1716.9	59.68	1716.89
59.82	1716.91	59.93	1716.92	60.11	1716.93	63.17	1717.16	63.99	1717.23
65.94	1717.39	67.63	1717.53	70.96	1717.75	71.61	1717.78	72.87	1717.85
75.59	1717.78	77.7	1717.74	82.66	1717.63	88.11	1717.39	89.24	1717.34
90.5	1717.27	101.21	1716.52	103.93	1716.75	108.98	1716.49	113.41	1716.46
115.93	1716.94	116.12	1716.98	116.14	1716.99	116.16	1717	116.23	1717
116.25	1717	118.01	1717.36	121.25	1718	125.63	1717.33	127.01	1717
130.86	1716.18	131.68	1716	137.64	1716	144.9	1716	145.27	1716
145.47	1715.98	145.73	1716	150.54	1716.45	153.12	1716.55	156.45	1716.63
158.5	1716.65	161.59	1716.83	163.62	1717	169.26	1717.6	171.38	1718
176.46	1717.23	177.62	1717	182.59	1716.74	197.49	1716	201.78	1715.53
211.98	1715	215.05	1715	215.49	1715	219.8	1714.8	233.38	1714.43
241.5	1714	243.58	1713.53	245.92	1713	247.25	1712.69	250.44	1712
252.24	1711.63	256.1	1711	259.32	1710.26	260.29	1710	263.22	1709.53
264.68	1709.33	267	1709.03	267.2	1709	288.22	1702	288.66	1701.85
288.69	1701.84	288.7	1701.84	302.6	1701.43	312.59	1700.43	312.6	1700.43
322.59	1701.43	322.6	1701.43	338.72	1701.91	338.75	1701.92	379.08	1712
379.09	1712	385.88	1713	389.62	1713.19	391.91	1713.28	398.19	1713.51
405.97	1713.83	410.97	1714	414.68	1714.11	422.09	1714.35	436.24	1714.81
438.95	1714.9	441.95	1715	468.35	1715.7	480.02	1716	482.22	1716.04
485.54	1716.12	490.91	1716.29	497.5	1716.47	501.42	1716.48	503.32	1716.56
508.8	1716.63	512.68	1716.7	515.7	1716.77	519.18	1716.88	524.01	1716.87
525.61	1716.87	529.52	1716.87	536.47	1717.92	537.71	1718.09	539.51	1718.35
542.94	1718.36	549.34	1718.38	551.23	1718.14	552.16	1717.94	558.08	1716.91
558.63	1716.91	561.98	1716.8	564.8	1716.8	565.83	1716.8	569.81	1716.77
572.07	1716.75	573.11	1716.74						

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	177.62	.027	529.52	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	177.62	529.52		43.89	60.78	77.66	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.40	Reach Len. (ft)	43.89	60.78	77.66

Crit W.S. (ft)		Flow Area (sq ft)	710.04	
E.G. Slope (ft/ft)	0.002407	Area (sq ft)	710.04	
Q Total (cfs)	6400.00	Flow (cfs)	6400.00	
Top Width (ft)	113.98	Top Width (ft)	113.98	
Vel Total (ft/s)	9.01	Avg. Vel. (ft/s)	9.01	
Max Chl Dpth (ft)	9.97	Hydr. Depth (ft)	6.23	
Conv. Total (cfs)	130437.2	Conv. (cfs)	130437.2	
Length Wtd. (ft)	60.78	Wetted Per. (ft)	116.43	
Min Ch El (ft)	1700.43	Shear (lb/sq ft)	0.92	
Alpha	1.00	Stream Power (lb/ft s)	573.11	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	29.60	
C & E Loss (ft)	0.00	Cum SA (acres)	7.10	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 29

INPUT

Description: "FW" 42+10.78

Station Elevation Data		num=	143						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.52	3.33	1717.45	8.89	1717.27	8.94	1717.45	8.99	1717.62
13.92	1717.19	18.97	1716.74	20.73	1716.3	21.53	1716.26	32.72	1716.66
33.34	1716.67	37.02	1716.74	39.76	1716.91	46.65	1717.14	47.76	1717.13
47.9	1717.13	48.2	1717.14	50.44	1717.21	51.15	1717.22	52.77	1717.19
54.68	1717.22	55.43	1717.23	56.27	1717.23	58.49	1717.26	58.75	1717.26
61.25	1717.29	61.46	1717.29	61.62	1717.29	64.12	1717.3	64.31	1717.31
64.5	1717.31	67.01	1717.32	67.28	1717.31	69.25	1717.3	69.67	1717.28
70.04	1717.28	72.57	1717.25	73.35	1717.22	74.31	1717.23	76.47	1717.2
78.35	1717.16	79.8	1717.13	81.94	1717.09	85.51	1716.87	85.86	1716.85
88.18	1716.7	90.54	1716.68	92.47	1716.64	94.12	1716.63	98.15	1716.47
99.7	1716.44	101.62	1716.35	103.43	1716.34	105.3	1716.32	106.96	1716.29
108.84	1716.25	112.37	1716.24	113.94	1716.22	115.85	1716.16	121.05	1716.1
123.21	1716.38	129.73	1717	129.9	1717	130.53	1717	130.97	1717
133.66	1717	136.52	1717	140.84	1717	144.72	1717	150.61	1717
150.92	1717	153.53	1717	160.15	1717	164.82	1716.68	174.84	1716
194	1715.62	211.37	1715.31	222.92	1715.04	223.47	1715.03	224.79	1715
231.12	1714.22	232.86	1714	232.94	1713.98	237.34	1713	239.97	1712.37
241.59	1712	247.62	1711	270.67	1703.31	273.77	1702.28	275.33	1701.76
290.33	1701.31	300.33	1700.31	310.33	1701.31	325.33	1701.76	374.28	1714
391.03	1715	396.4	1715.11	432.13	1716	436.56	1716.13	446.73	1716.34
478.77	1717	488.33	1717.67	491.92	1717.9	493.62	1718	499	1718.59
503.02	1719	504.93	1719	505.39	1719.21	507.98	1719.34	511.3	1719.51
511.7	1719.54	512.19	1719.59	515.23	1719.91	518.01	1720.18	518.11	1720.19
518.25	1720.2	520.81	1720.5	522.31	1720.65	522.88	1720.71	524.67	1720.74
524.81	1720.75	524.94	1720.75	526.64	1720.69	527.22	1720.67	528.67	1720.59
531.01	1720.44	532.26	1720.34	533.99	1720.26	535.8	1720.17	537.24	1720.06
538.99	1719.93	540.78	1719.78	544.49	1719.49	546.48	1719.29	548.44	1719.11
551.29	1718.82	552.5	1718.6	555.07	1718.13	557.08	1717.76	558.65	1717.58
560.65	1717.34	565.3	1717.04	571.48	1717.26				

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	153.53	.027
478.77	.027		

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
	153.53	478.77	41.23	39.22	39.76		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.31	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.21	Reach Len. (ft)	41.23	39.22	39.76
Crit W.S. (ft)		Flow Area (sq ft)		697.68	
E.G. Slope (ft/ft)	0.002413	Area (sq ft)		697.68	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	109.11	Top Width (ft)		109.11	
Vel Total (ft/s)	9.17	Avg. Vel. (ft/s)		9.17	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		6.39	
Conv. Total (cfs)	130278.5	Conv. (cfs)		130278.5	
Length Wtd. (ft)	39.22	Wetted Per. (ft)		111.63	
Min Ch El (ft)	1700.31	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)	571.48	0.00	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		28.62	
C & E Loss (ft)	0.00	Cum SA (acres)		6.94	

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 28

INPUT

Description: "FW" 42+50

Station Elevation Data		num=	164						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.05	7.91	1717	7.94	1717.1	8.02	1717.34	12.2	1717.55
14.48	1717.55	14.65	1717.55	14.72	1717.55	15.08	1717.53	19.96	1717.47
23.64	1717.55	26.46	1717.6	29.47	1717.67	31.02	1717.71	31.59	1717.64
31.84	1717.64	35.5	1717.5	38.29	1717.37	40.05	1717.35	41.18	1717.33
43.63	1717.31	44.48	1717.28	45.61	1717.28	46.17	1717.27	49.65	1717.3
49.74	1717.3	51.54	1717.31	53.55	1717.33	53.59	1717.33	57.26	1717.34
57.32	1717.34	60.16	1717.35	60.18	1717.35	60.8	1717.35	62.71	1717.36
65.06	1717.37	66.14	1717.37	68.35	1717.39	69.81	1717.4	72.97	1717.38
73.86	1717.39	79.47	1717.48	79.99	1717.49	80.29	1717.49	83.79	1717.6
84.03	1717.61	86.05	1717.59	86.32	1717.59	86.46	1717.58	88.4	1717.57
89.19	1717.55	92.14	1717.54	93.93	1717.48	95.27	1717.45	98.6	1717.34
98.96	1717.34	100.83	1717.33	102.63	1717.33	104.38	1717.35	104.95	1717.35
105.65	1717.36	106.35	1717.37	107.2	1717.37	107.9	1717.37	108.64	1717.37
108.67	1717.43	114.37	1717.35	118.45	1717.34	121.61	1717.33	124.18	1717.31
140.28	1717	141.91	1717	152.78	1717	153.86	1717	156.02	1717

158.3	1717	159.35	1717	171.28	1717	172.2	1717	172.69	1717
173.53	1717	174.42	1717	174.89	1717	175.23	1717	175.56	1717
177.49	1716.88	178.31	1716.86	181.14	1716.71	183.67	1716.58	190.53	1716.4
194.29	1716.26	197.67	1716.17	198.85	1716.13	199.92	1716.11	202.97	1716.02
203.5	1716	211.44	1715.49	213.18	1715.38	218.69	1715	222.89	1714.32
225.18	1714	225.6	1713.9	228.68	1713	230.91	1712.26	231.68	1712
234.11	1711.19	234.42	1711.09	262.6	1701.69	262.62	1701.69	277.62	1701.24
287.61	1700.24	287.62	1700.24	297.62	1701.24	312.62	1701.69	320.98	1703.78
361.86	1714	361.88	1714	365.19	1714.83	365.86	1715	365.88	1715
365.9	1715	385.86	1715.49	408.38	1715.99	408.47	1716	408.52	1716
408.56	1716	408.59	1716	408.6	1716	408.62	1716	408.64	1716
408.69	1716	441.83	1716.96	443.89	1717	445.44	1717.14	455.09	1718
462.11	1718.9	462.9	1719	463.79	1719.12	466.48	1719.55	469.51	1720
476.15	1720	478.78	1720	489.29	1719.65	502.89	1719	506.36	1719
508.74	1719	508.75	1719	508.76	1719.01	510.6	1719.83	511.74	1719.82
513.42	1719.7	514.12	1719.62	514.64	1719.56	515.34	1719.48	521.24	1718.9
522.98	1718.7	527.31	1718.38	531.37	1718.1	535.43	1717.96	541.31	1717.76
547.25	1717.5	559.36	1716.97	563.48	1717.08	565.29	1717.23		

Manning's n Values num= 3
Sta n Val Sta n Val
0 .027 175.23 .027 445.44 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
175.23 445.44 52.56 50 50.2 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.		0.027	
W.S. Elev (ft)	1710.10	Reach Len. (ft)	52.56	50.00	50.20
Crit W.S. (ft)		Flow Area (sq ft)		693.34	
E.G. Slope (ft/ft)	0.002456	Area (sq ft)		693.34	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	108.84	Top Width (ft)		108.84	
Vel Total (ft/s)	9.23	Avg. Vel. (ft/s)		9.23	
Max Chl Dpth (ft)	9.85	Hydr. Depth (ft)		6.37	
Conv. Total (cfs)	129146.3	Conv. (cfs)		129146.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		111.35	
Min Ch El (ft)	1700.24	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)	565.29	0.00	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)		27.99	
C & E Loss (ft)	0.00	Cum SA (acres)		6.84	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 27

INPUT

Description: "FW" 43+00

Station	Elevation	Data	num=	129					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.46	3.1	1717.36	3.16	1717.36	3.2	1717.52	5.44	1717.19
7.72	1716.99	10.06	1716.89	14.65	1716.73	14.75	1716.72	14.85	1716.74
16.08	1717	19.59	1717.36	22.61	1717.6	25.49	1717.83	28.99	1717.91
29.93	1717.91	33.23	1717.92	34.65	1717.91	36.19	1717.92	37.17	1717.94
38.04	1717.91	38.74	1717.91	41.57	1717.93	44.23	1717.82	48.15	1717.77
49.03	1717.75	50.54	1717.72	59.51	1717.43	59.94	1717.41	60.23	1717.4
62.29	1717.38	62.6	1717.37	62.77	1717.36	62.86	1717.35	65.88	1717.04
74.7	1715.96	79.28	1716.27	83.1	1716.43	88.49	1717.01	89.01	1717.12
89.94	1717.22	91.56	1717.48	93.57	1717.97	95.76	1718.3	96.73	1718.3
98.38	1718.44	101.86	1718.74	104.44	1718.9	110.54	1719.39	111.93	1719.53
112.66	1719.6	117.46	1719.98	120.37	1720	121.21	1720.03	122.06	1720.02
122.39	1720.02	122.99	1719.99	123.99	1719.94	125.69	1719.86	128.69	1719.69
132.81	1719.44	133.21	1719.42	133.25	1719.42	133.4	1719.41	146.2	1718.46
147.75	1718.46	148.48	1718.56	149.81	1718.5	150.91	1718.67	152	1718.7
152.83	1718.75	154.45	1719.03	155.54	1719.16	157.91	1717.03	157.93	1717
159.93	1717	161.5	1717	163.53	1717	164.05	1717	164.74	1717
165.62	1717	176.53	1717	184.78	1717	184.8	1717	195.2	1716
205.52	1715.06	206.18	1715	245.98	1701.73	246.39	1701.6	246.41	1701.59
261.4	1701.14	261.41	1701.14	271.41	1700.14	281.41	1701.14	296.41	1701.59
296.42	1701.6	350.03	1715	350.04	1715	384.97	1715.72	405.72	1716
413.64	1716.75	415.26	1717	419.7	1717.26	427.93	1718	429.44	1718.16
437.46	1718.78	439.77	1718.95	440.24	1719	441.84	1719.31	445.49	1720
450.06	1720	461.08	1720	463.63	1719.51	465.32	1719	466.33	1719
467.75	1719	479.25	1718.62	481.31	1718.64	489.76	1718.53	492.35	1719.17
493.15	1719.08	502.88	1719.5	510.47	1719.73	526.54	1718.38	533.07	1717.71
534.05	1717.66	548.44	1717.08	552.79	1717.25	553.36	1717.29		

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
0 .027 184.78 .027 429.44 .027

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
184.78 429.44 52.56 50 50.03 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.95	Reach Len. (ft)	52.56	50.00	50.03
Crit W.S. (ft)		Flow Area (sq ft)		688.59	
E.G. Slope (ft/ft)	0.002503	Area (sq ft)		688.59	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	108.53	Top Width (ft)		108.53	
Vel Total (ft/s)	9.29	Avg. Vel. (ft/s)		9.29	
Max Chl Dpth (ft)	9.81	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	127921.8	Conv. (cfs)		127921.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		111.03	
Min Ch El (ft)	1700.14	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)	553.36	0.00	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		27.20	

C & E Loss (ft) 0.00 Cum SA (acres) 6.72

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 26

INPUT

Description: "FW" 43+50

Station Elevation Data		num= 92									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1718.09	4.74	1718.1	24.41	1717.86	24.84	1717.86	30.12	1717.83		
30.17	1717.83	37.58	1717.78	37.63	1717.78	39.81	1717.77	43.86	1717.74		
46.28	1717.72	50.61	1717.7	70.11	1717.57	76.37	1717.53	83.62	1717.49		
89.85	1717.45	97.37	1717.4	106.78	1717.34	145.08	1717.09	145.58	1717.6		
147.07	1717.98	147.22	1718.15	147.39	1718.34	147.67	1718.46	148.02	1718.57		
148.67	1718.75	149.64	1719.12	150.14	1720.41	151.49	1720.48	151.73	1720.5		
152.71	1720.49	153.21	1720.42	153.33	1720.4	156.34	1719.83	157.24	1719.63		
160.04	1718.79	162.19	1718.46	162.97	1718.38	164.63	1718.2	167.41	1717.87		
168.26	1717.68	169.44	1717.34	170.56	1717	177.51	1716.37	181.6	1716		
188.14	1715.18	189.69	1715	230.09	1701.53	230.19	1701.5	230.2	1701.5		
245.2	1701.05	255.2	1700.05	265.2	1701.05	280.19	1701.5	280.2	1701.5		
280.21	1701.5	330.21	1714	330.22	1714	336.75	1715	369.37	1715.47		
408.86	1716	412.55	1716.52	415.04	1717	421.77	1717.99	421.8	1718		
421.88	1718.01	421.94	1718.01	432.43	1718.96	439.32	1719.54	442.21	1719.48		
444.62	1719.45	454.81	1718.35	456.22	1718	471.84	1718	474.07	1718		
476.77	1718	477.4	1717.67	480.7	1717.45	496.62	1717.89	496.86	1717.89		
497.11	1717.9	497.35	1717.92	503.96	1718.28	512.76	1717.62	513.78	1717.55		
514.11	1717.52	514.49	1717.48	515.81	1717.43	520.86	1717.2	525.12	1717.04		
531.99	1716.73	536.46	1716.98								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	168.26	.027	415.04	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	168.26	415.04		52.56	50	50.13	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.37	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.81	Reach Len. (ft)	52.56	50.00	50.13
Crit W.S. (ft)		Flow Area (sq ft)		682.60	
E.G. Slope (ft/ft)	0.002565	Area (sq ft)		682.60	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	108.16	Top Width (ft)		108.16	
Vel Total (ft/s)	9.38	Avg. Vel. (ft/s)		9.38	
Max Chl Dpth (ft)	9.75	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	126367.8	Conv. (cfs)		126367.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		110.64	
Min Ch El (ft)	1700.05	Shear (lb/sq ft)		0.99	
Alpha	1.00	Stream Power (lb/ft s)	536.46	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		26.41	
C & E Loss (ft)	0.00	Cum SA (acres)		6.59	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 25

INPUT

Description: "FW" 44+00

Station Elevation Data		num= 74									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.96	60.1	1718.04	69.18	1717.94	69.38	1717.94	71.81	1717.92		
71.83	1717.92	75.25	1717.9	75.28	1717.9	76.28	1717.89	78.15	1717.88		
79.27	1717.87	81.27	1717.86	90.26	1717.8	93.15	1717.78	96.5	1717.76		
99.38	1717.74	102.85	1717.72	107.19	1717.69	126.81	1717.57	128.31	1717.56		
131.55	1717.54	134.15	1717.52	137.64	1717.5	138.19	1717.5	148.62	1717.23		
156.95	1717.03	158.08	1717	165.27	1716.26	167.51	1716	169.49	1715.63		
173.2	1715	213.94	1701.42	213.99	1701.4	228.99	1700.95	238.99	1699.95		
248.99	1700.95	263.99	1701.4	264.01	1701.41	313.86	1713.87	314.38	1714		
339.37	1714.78	343.43	1714.89	349.28	1715	375.97	1715.72	382.37	1716		
390.75	1716.95	391.16	1717	391.28	1717.02	392.61	1717.2	398.43	1717.93		
399.02	1718	403.76	1719.35	408.43	1720	427.27	1720	430.98	1720		
432.5	1719.3	434.73	1718	437	1717.73	445.87	1717.32	449.04	1717.11		
464.33	1717.07	465.19	1717.04	465.75	1716.92	469.17	1716.77	473.09	1716.9		
473.84	1716.88	474.36	1716.87	481.25	1717.81	486.14	1718.44	497.18	1717.07		
502.72	1716.42	506.44	1716.5	512.52	1716.47	516.72	1716.69				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	156.95	.027	392.61	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	156.95	392.61		52.56	50	50.02	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1711.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.39	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.65	Reach Len. (ft)	52.56	50.00	50.02
Crit W.S. (ft)		Flow Area (sq ft)		676.42	
E.G. Slope (ft/ft)	0.002630	Area (sq ft)		676.42	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	107.74	Top Width (ft)		107.74	
Vel Total (ft/s)	9.46	Avg. Vel. (ft/s)		9.46	
Max Chl Dpth (ft)	9.70	Hydr. Depth (ft)		6.28	
Conv. Total (cfs)	124792.1	Conv. (cfs)		124792.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		110.21	

Min Ch El (ft)	1699.95	Shear (lb/sq ft)		1.01	
Alpha	1.00	Stream Power (lb/ft s)	516.72	0.00	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		25.63	
C & E Loss (ft)	0.00	Cum SA (acres)		6.47	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 24

INPUT

Description: "FW" 44+50

Station Elevation Data		num=	57						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.89	102.94	1718	109.48	1718	110.72	1718	142.37	1718
144.16	1717.79	144.42	1717.76	144.77	1717.72	145.26	1717.66	146.02	1717.57
147.32	1717.41	147.52	1717.38	150.41	1717	150.42	1717	151.12	1716.76
156.7	1715	197.73	1701.33	197.78	1701.31	212.78	1700.86	222.78	1699.86
232.78	1700.86	247.78	1701.31	247.79	1701.31	294.55	1713	297.79	1713.07
316.04	1714	358.4	1714.8	368.47	1714.98	369.37	1715	379.15	1715.48
389.38	1715.71	393.4	1715.87	409.71	1715.92	416.19	1716	424.17	1716.13
425.37	1716.11	429.71	1716.11	430.14	1716.11	435.95	1716.17	446.23	1716.28
449.23	1715.72	449.3	1715.71	449.33	1715.71	449.39	1715.72	449.81	1715.73
461.48	1716.1	465.25	1716.76	470.94	1717.61	472.97	1717.94	482.76	1717.15
486.26	1716.9	486.96	1716.87	494.48	1716.34	495.7	1716.99	497.7	1717.7
498.89	1718.49	499.51	1718.46						

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	144.16	.027	446.23	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	144.16	446.23		52.56	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.91	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.			0.027	
W.S. Elev (ft)	1709.48	Reach Len. (ft)	52.56	50.00		50.04
Crit W.S. (ft)		Flow Area (sq ft)		668.38		
E.G. Slope (ft/ft)	0.002720	Area (sq ft)		668.38		
Q Total (cfs)	6400.00	Flow (cfs)		6400.00		
Top Width (ft)	107.23	Top Width (ft)		107.23		
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)		9.58		
Max Chl Dpth (ft)	9.62	Hydr. Depth (ft)		6.23		
Conv. Total (cfs)	122721.2	Conv. (cfs)		122721.2		
Length Wtd. (ft)	50.00	Wetted Per. (ft)		109.68		
Min Ch El (ft)	1699.86	Shear (lb/sq ft)		1.03		
Alpha	1.00	Stream Power (lb/ft s)	499.51	0.00		0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		24.86		
C & E Loss (ft)	0.00	Cum SA (acres)		6.35		

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 23

INPUT

Description: "FW" 45+00.00

Station Elevation Data		num=	60						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1717.94	67.42	1717.93	71.5	1717.93	75.71	1717.93	81.33	1717.87
81.78	1717.86	82.29	1717.85	82.86	1717.84	83.5	1717.83	84.23	1717.82
85.08	1717.81	86.07	1717.79	87.24	1717.77	122.43	1717.84	122.68	1717.82
122.98	1717.8	123.37	1717.77	123.9	1717.74	124.62	1717.69	125.71	1717.61
127.51	1717.48	131.08	1717.22	134.21	1717	181.39	1701.27	181.51	1701.23
181.54	1701.22	181.55	1701.22	181.57	1701.21	196.57	1700.76	206.57	1699.76
216.57	1700.76	231.57	1701.21	231.58	1701.22	278.72	1713	318.06	1713.8
318.75	1713.82	332.29	1714	365.88	1714.7	376.6	1715	385.75	1715.14
387.71	1715.17	391.53	1715.22	393.15	1715.24	409.84	1715.49	435.02	1715.85
438.46	1715.9	444.67	1716	445.79	1715.93	453.07	1716.39	457.03	1716.64
459.28	1716.57	463.82	1716.43	467.46	1716.43	477.26	1716.16	478	1716.15
480.23	1716.09	482.69	1717.78	482.91	1717.92	483.27	1717.91	485.11	1717.92

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	122.98	.027	457.03	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	122.98	457.03		52.56	50		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.77	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.46	Wt. n-Val.			0.027	
W.S. Elev (ft)	1709.31	Reach Len. (ft)	52.56	50.00		50.22
Crit W.S. (ft)		Flow Area (sq ft)		660.28		
E.G. Slope (ft/ft)	0.002813	Area (sq ft)		660.28		
Q Total (cfs)	6400.00	Flow (cfs)		6400.00		
Top Width (ft)	106.69	Top Width (ft)		106.69		
Vel Total (ft/s)	9.69	Avg. Vel. (ft/s)		9.69		
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)		6.19		
Conv. Total (cfs)	120666.5	Conv. (cfs)		120666.5		
Length Wtd. (ft)	50.00	Wetted Per. (ft)		109.11		
Min Ch El (ft)	1699.76	Shear (lb/sq ft)		1.06		
Alpha	1.00	Stream Power (lb/ft s)	485.11	0.00		0.00
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		24.10		
C & E Loss (ft)	0.00	Cum SA (acres)		6.22		

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 22

INPUT

Description: "FW" 45+50.00

Station		Elevation Data		num=	50
Sta	Elev	Sta	Elev	Sta	Elev
0	1717.51	12.64	1717.5	43.67	1717.49
117.71	1717	165.26	1701.15	165.31	1701.13
165.36	1701.12	180.36	1700.67	190.36	1699.67
215.48	1701.15	262.89	1713	265.4	1713.1
320.67	1714	345.11	1714	347.12	1714
372.19	1714.6	391.18	1715	391.81	1715.01
392	1715.01	404.32	1715.16	413.34	1715.27
425.94	1715.51	428.81	1715.69	434	1715.89
443.77	1716.49	444.55	1716.5	451.63	1716.54
469.87	1716.02	470.83	1716.73	472.07	1718.07

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	117.71	.027
		444.55	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	117.71	444.55		50.97	50	50.56	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.12	Reach Len. (ft)	50.97	50.00	50.56
Crit W.S. (ft)		Flow Area (sq ft)		649.49	
E.G. Slope (ft/ft)	0.002946	Area (sq ft)		649.49	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	105.99	Top Width (ft)		105.99	
Vel Total (ft/s)	9.85	Avg. Vel. (ft/s)		9.85	
Max Chl Dpth (ft)	9.45	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	117921.3	Conv. (cfs)		117921.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		108.39	
Min Ch El (ft)	1699.67	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)	473.52	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		23.35	
C & E Loss (ft)	0.01	Cum SA (acres)		6.10	

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 21

INPUT

Description: "FW" 46+00.00

Station		Elevation Data		num=	89
Sta	Elev	Sta	Elev	Sta	Elev
0	1717.06	24.03	1717.06	73.52	1717
86.31	1716.85	86.77	1716.85	87.29	1716.83
92.98	1716.68	94.11	1716.63	96.03	1716.55
101.03	1716.29	104.11	1716.08	104.39	1716.07
114.04	1715	114.17	1714.97	118.4	1714
157.31	1701.03	157.33	1701.03	157.33	1701.02
182.33	1699.57	182.34	1699.57	192.33	1700.57
207.47	1701.06	255.24	1713	257.86	1713.61
259.41	1713.98	259.5	1714	259.76	1714.04
265.5	1714.25	279.51	1714.83	283.18	1714.9
297.79	1714.81	310.62	1714.59	315.01	1714.55
336.07	1714.24	343.17	1714.34	371.52	1714.63
385.41	1714.86	392.15	1714.97	392.72	1714.98
401.4	1715.04	402.45	1715.04	404.4	1715.06
413.02	1715.25	414.25	1715.29	419.19	1715.6
433.63	1716.16	440.37	1716.85	442.04	1717.09
454.37	1716.97	461.59	1716.28	463.5	1716.22
469.99	1717.45	470.77	1718.29	470.88	1718.35

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
0	.027	80.04	.027
		440.37	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	80.04	440.37		98.98	98.7	99.83	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1710.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.57	Wt. n-Val.		0.027	
W.S. Elev (ft)	1708.89	Reach Len. (ft)	98.98	98.70	99.83
Crit W.S. (ft)		Flow Area (sq ft)		636.23	
E.G. Slope (ft/ft)	0.003119	Area (sq ft)		636.23	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	105.09	Top Width (ft)		105.09	
Vel Total (ft/s)	10.06	Avg. Vel. (ft/s)		10.06	
Max Chl Dpth (ft)	9.32	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	114590.2	Conv. (cfs)		114590.2	
Length Wtd. (ft)	98.70	Wetted Per. (ft)		107.46	
Min Ch El (ft)	1699.57	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)	472.96	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		22.61	
C & E Loss (ft)	0.41	Cum SA (acres)		5.98	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 19

INPUT

Description: "FW" 46+98.70

Station Elevation Data		Data		num=		144									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1715.47	5.03	1715.48	6.31	1715.57	7.25	1715.42	12.24	1715.61						
13.33	1715.69	20.8	1716.02	21.72	1716.06	21.91	1716.07	24.07	1716.36						
24.84	1716.47	28.88	1716.84	30.12	1716.95	30.61	1717	37.91	1717.79						
39.29	1718	52.69	1718.97	53.16	1719	94	1719	119.1	1719						
120.88	1718.65	124.32	1718	125.57	1717.76	129.95	1717	133.69	1716.24						
134.78	1716	138.36	1715.45	138.5	1715.42	140.24	1715	144.09	1714.04						
144.54	1713.92	153.54	1711.63	157.13	1710.75	170.89	1707.33	195.76	1701.13						
200.8	1700.97	209.76	1700.71	216.13	1700.07	219.75	1699.71	219.77	1699.71						
223.96	1700.12	229.86	1700.7	266.55	1701.78	271.2	1701.91	273.66	1702.51						
286.44	1705.63	293.1	1707.26	293.78	1707.64	294.58	1708	323.56	1708.43						
343.65	1708.75	359.89	1709	368.22	1709.14	382.96	1709.38	391.35	1709.52						
396.74	1709.61	400.47	1709.67	403.2	1709.72	424.18	1710	436.47	1710.21						
441.06	1710.28	449.73	1710.4	454.27	1710.43	459.18	1710.44	467.69	1710.37						
478.79	1710.2	488.74	1710.03	489.85	1710.04	491.11	1710	491.99	1710						
505.64	1709.89	522.26	1709.77	533.02	1709.71	540.55	1709.6	553.63	1709.55						
563.52	1709.34	570.6	1709.32	576.05	1709.13	576.11	1709.13	576.56	1709.12						
579.64	1709	604.14	1700.84	619.14	1700.39	629.14	1699.39	639.14	1700.39						
654.14	1700.84	702.8	1713	703.35	1713.13	705.89	1713.75	706.33	1713.86						
706.94	1714	707.54	1714.1	711.35	1715	713.39	1715.32	717.06	1716						
719.64	1716.64	720.53	1716.78	721.35	1716.85	722.75	1716.93	723.96	1717						
725.1	1717.07	727.92	1717.21	732.97	1717.31	736.35	1717.36	740.28	1717.35						
745.92	1717.21	747.77	1717.18	750.92	1717	762.24	1716.79	796.57	1716						
807	1715.8	846.3	1715.03	847.8	1715.01	848.08	1715	848.14	1715						
859.15	1714.91	859.61	1714.91	860.61	1714.9	862.12	1714.9	865.25	1714.91						
873.3	1715.21	877.58	1715.39	883.42	1715.45	886.79	1715.32	888.81	1715.33						
893.33	1715.63	898.55	1715.99	900.25	1716.18	906.22	1716.93	913.53	1717.08						
913.55	1717.08	913.6	1717.08	913.61	1717.08	913.63	1717.07	913.99	1717.01						
914.82	1716.38	919.95	1715.93	922.95	1715.86	924.67	1715.79	928.8	1715.72						
930.5	1714.12	930.51	1714.11	930.72	1714.11	934.46	1714.1								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	119.1	.027	736.35	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	119.1	736.35		42.65	51.3		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.74	Reach Len. (ft)	42.65	51.30	67.35
Crit W.S. (ft)		Flow Area (sq ft)		1787.96	
E.G. Slope (ft/ft)	0.000595	Area (sq ft)		1787.96	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	405.84	Top Width (ft)		405.84	
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)		3.58	
Max Chl Dpth (ft)	10.35	Hydr. Depth (ft)		4.41	
Conv. Total (cfs)	262477.6	Conv. (cfs)		262477.6	
Length Wtd. (ft)	51.30	Wetted Per. (ft)		410.40	
Min Ch El (ft)	1699.39	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)	934.46	0.00	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		19.86	
C & E Loss (ft)	0.00	Cum SA (acres)		5.40	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 15

INPUT

Description: "FW" 47+50

Station Elevation Data		Data		num=		161									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1715.24	3.89	1715.24	4.14	1715.24	4.55	1715.26	4.86	1715.29						
5.63	1715.18	6.75	1715.03	9.83	1715.04	14.07	1715.3	15.78	1715.26						
18.74	1715.42	26.05	1715.4	27.59	1715.55	29.13	1715.69	29.67	1715.77						
30.23	1715.86	30.77	1715.94	31.18	1716	36.65	1716.68	36.96	1716.72						
39.77	1717	44.93	1717.6	47.92	1718	49.36	1718.14	57.77	1718.92						
58.49	1718.99	58.67	1719	78.41	1719	86.73	1719	87.74	1718.96						
88.24	1718.95	97.57	1718.84	104.58	1718.95	105.2	1718.96	106.23	1719						
119.01	1719	131.35	1719	131.36	1719	137.32	1718.26	138.36	1718						
140.88	1717.43	142.43	1717	153.9	1716.12	155.71	1716	156.23	1715.94						
159.98	1715.4	163.05	1715	163.78	1714.79	167.96	1714	172.42	1713.23						
173.35	1713.09	191.8	1708.49	221.51	1701.09	228	1700.9	239.42	1700.56						
245.79	1699.92	249.42	1699.56	249.43	1699.56	253.07	1699.92	259.42	1700.55						
267.94	1700.81	282.29	1701.24	301.18	1705.88	303.01	1706.32	303.93	1706.55						
304.44	1706.7	309.2	1708	357.3	1708.6	358.33	1708.61	389.13	1709						
401.07	1709.16	410.75	1709.28	417.96	1709.38	423.58	1709.45	428.1	1709.51						
431.84	1709.55	435.01	1709.59	437.73	1709.63	440.09	1709.66	450.8	1709.71						
457.06	1709.75	459.05	1709.77	460.75	1709.78	462.21	1709.8	463.47	1709.81						
464.56	1709.82	465.51	1709.83	465.6	1709.83	466.16	1709.84	466.73	1709.84						
467.27	1709.85	467.78	1709.85	468.26	1709.85	468.72	1709.86	469.17	1709.86						
469.61	1709.86	499.05	1709.76	500.48	1709.74	505.08	1709.7	520.47	1709.63						
526.6	1709.58	535.04	1709.5	550.25	1709.35	562.42	1709.23	586.38	1709						
611.15	1700.74	611.17	1700.74	626.17	1700.29	636.17	1699.29	646.16	1700.29						
646.17	1700.29	661.17	1700.74	710.19	1712.99	710.22	1713	714.3	1713.98						
714.36	1714	718.51	1714.99	718.54	1715	718.57	1715.01	722.87	1716						
722.94	1716.02	727.02	1717	728.54	1717.39	732.23	1718	738.06	1718						
788.54	1718	822.24	1717.05	823.22	1717	824.51	1716.97	826.15	1716.94						
826.52	1716.94	843.4	1716.62	848.07	1716.56	854.25	1716.47	861.82	1716.39						

867.51	1716.34	867.62	1716.34	871.91	1716.31	875.76	1716.29	879.91	1716.26
883.57	1716.28	889.08	1716.28	889.5	1716.27	892.48	1716.32	900.23	1716.37
903.23	1716.36	907.62	1716.43	917.39	1716.42	918.9	1716.36	919.43	1716.32
921.73	1716.15	923.85	1716.05	924.14	1716.03	932.28	1715.67	934.66	1715.65
935.94	1715.61	937.51	1715.59	940.97	1715.42	943.12	1714.58	943.76	1714.15
947.05	1714.09								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	131.35	.027	732.23	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	131.35	732.23		80.15	94.42	124.31	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.69	Reach Len. (ft)	80.15	94.42	124.31
Crit W.S. (ft)		Flow Area (sq ft)		1731.47	
E.G. Slope (ft/ft)	0.000759	Area (sq ft)		1731.47	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	450.14	Top Width (ft)		450.14	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	10.40	Hydr. Depth (ft)		3.85	
Conv. Total (cfs)	232360.0	Conv. (cfs)		232360.0	
Length Wtd. (ft)	94.42	Wetted Per. (ft)		454.72	
Min Ch El (ft)	1699.29	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)	947.05	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		17.79	
C & E Loss (ft)	0.00	Cum SA (acres)		4.90	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Flamingo
REACH: Flam Wash RS: 11

INPUT

Description: "FW" 48+44.42 Section 1099.4 from Las Vegas Wash Study

Station	Elevation	Data	num=	214					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1715.09	1.38	1715.08	1.41	1715.08	1.44	1715.08	1.54	1715.08
1.58	1715.07	2.68	1714.96	3.71	1715	4.05	1715.01	4.38	1715.02
4.44	1715.02	4.49	1715.02	4.58	1715.03	4.68	1715.02	6.32	1714.83
11.02	1714.89	12.22	1714.93	15.03	1714.86	17.03	1714.91	22.91	1715.03
33.21	1716.07	33.65	1716.12	34.23	1716.17	34.72	1716.21	35.21	1716.24
38.38	1716.24	38.47	1716.23	39.12	1716.3	44.7	1717	49.81	1717.59
52.35	1718	62.83	1718.92	63.56	1719	66.22	1719	80.69	1719
84.62	1718.45	87.93	1718	102.8	1717.47	120.71	1717	132.49	1716.66
155.66	1716	158.91	1715.85	172.55	1715.17	175.19	1715.03	175.69	1715
178.34	1714.84	191.54	1714	193.99	1713.91	201.3	1713	208.45	1712.64
208.46	1712.64	243.1	1703.72	245.33	1703.14	250.06	1701.96	251.49	1701.64
253.28	1701.3	255.44	1700.93	256.74	1700.74	258.56	1700.69	261.57	1700.62
263.87	1700.56	265.74	1700.52	273.2	1700.33	282.07	1699.44	283.16	1699.33
283.2	1699.33	283.21	1699.33	292.09	1700.22	293.2	1700.33	294.85	1700.38
301.47	1700.56	301.54	1700.58	301.89	1700.68	310.1	1701.77	333.34	1706.06
334.99	1706.35	336.2	1706.62	337.68	1706.97	337.94	1707.04	342.06	1708
391.8	1708.55	398.78	1708.62	407.52	1708.72	418.64	1708.83	433.22	1708.98
435.44	1709	439.33	1709.04	443.43	1709.07	447.19	1709.11	450.7	1709.14
454	1709.17	457.13	1709.19	457.24	1709.19	474.2	1709.21	522.16	1709
525.22	1709	528.09	1709	537.66	1709	540.02	1709	542.22	1709
544.26	1709	549.3	1709	550.98	1709	552.52	1709	553.94	1709
564.85	1709	565.67	1709	566.41	1709	566.72	1709	569.28	1709
571.96	1709	574.78	1709	577.74	1709	579.83	1709	581.72	1708.52
583.56	1708	585.81	1707.25	588.63	1706.31	590.25	1705.77	592.56	1705
594.81	1704.25	595.27	1704.1	595.56	1704	598.08	1703.18	600.42	1702.46
603.42	1701.5	604.48	1701.17	606.96	1700.46	607.97	1700.43	610.38	1700.36
612.13	1700.32	613.46	1700.28	614.53	1700.26	615.4	1700.23	616.14	1700.22
616.78	1700.2	617.36	1700.19	617.87	1700.18	618.35	1700.16	618.67	1700.16
619.24	1700.16	620.87	1700.11	630.88	1699.11	640.88	1700.11	647.41	1700.27
648.48	1700.3	649.8	1700.33	651.51	1700.38	653.82	1700.44	654.79	1700.47
656.38	1700.85	656.6	1700.91	656.89	1700.98	659.3	1701.58	660.06	1701.76
661.13	1702.02	662.77	1702.43	664.96	1702.99	667.64	1703.66	672.34	1704.84
672.96	1705	672.98	1705.01	673.21	1705.1	677.06	1705.92	677.35	1706
685.56	1708.07	693.15	1710	695.75	1710.72	696.97	1711	697.59	1711.16
700.71	1712	701.43	1712.21	704.31	1713	705.37	1713.25	708.17	1714
709.53	1714.33	710.87	1714.49	712.59	1714.71	713.79	1715	716.8	1715.63
718.5	1716	738.66	1716.98	738.88	1717	739.14	1717.01	740.23	1717.05
760.67	1717.78	770.73	1718	781.38	1718.16	785.07	1718.23	794.88	1718.44
801.71	1718.59	814.16	1718.94	814.89	1718.96	816.04	1719	819.07	1719
856.62	1719	872.06	1719	872.79	1719	891.21	1719	899.31	1719
905.54	1718.49	912.6	1718	912.68	1717.95	915.55	1717.56	919.49	1716.96
920.78	1716.78	927.18	1716.6	931.09	1716.34	933.61	1716.06	938.49	1715.94
943.2	1716	943.85	1715.49	946.28	1714.24	948.63	1714.12		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	80.69	.027	819.07	.027

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	80.69	819.07		1070.68	470.5	476.45	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1709.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.027	
W.S. Elev (ft)	1709.63	Reach Len. (ft)	1070.68	470.50	476.45
Crit W.S. (ft)	1704.77	Flow Area (sq ft)		1767.26	
E.G. Slope (ft/ft)	0.000753	Area (sq ft)		1767.26	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	471.52	Top Width (ft)		471.52	

Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)	3.62	
Max Chl Dpth (ft)	10.52	Hydr. Depth (ft)	3.75	
Conv. Total (cfs)	233210.3	Conv. (cfs)	233210.3	
Length Wtd. (ft)	470.50	Wetted Per. (ft)	475.97	
Min Ch El (ft)	1699.11	Shear (lb/sq ft)	0.17	
Alpha	1.00	Stream Power (lb/ft s)	948.63	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	14.00	
C & E Loss (ft)		Cum SA (acres)	3.90	

INLINE STRUCTURE

RIVER: Flamingo
 REACH: Flam Wash RS: 8

INPUT

Description:

Distance from Upstream XS = 5.5
 Deck/Roadway Width = 425.61
 Weir Coefficient = 2.6
 Weir Embankment Coordinates num = 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1707	238.18	1705.6	271.32	1705.22	271.36	1705.22	271.41	1705.21
271.46	1705.21	271.56	1705.21	277.27	1705.03	277.45	1705.14	285.02	1704.92
285.26	1704.92	285.5	1704.92	293.08	1704.69	293.26	1704.58	299	1704.41
312.34	1704.01	400	1703.7	468.64	1703.89	582.93	1703.92	661.01	1705.26
939.19	1705.5								

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

E.G. Elev (ft)	1709.83	Q Gates (cfs)	
W.S. Elev (ft)	1709.63	Q Gate Group (cfs)	0.00
Q Total (cfs)	6400.00	Gate Open Ht (ft)	1705.93
Q Weir (cfs)	6400.00	Gate #Open	
Weir Flow Area (sq ft)	1261.00	Gate Area (sq ft)	1.00
Weir Sta Lft (ft)	219.37	Gate Submerg	0.00
Weir Sta Rgt (ft)	692.48	Gate Invert (ft)	0.00
Weir Max Depth (ft)	5.85	Gate Weir Coef	0.000
Weir Avg Depth (ft)	2.67		
Weir Coef (ft ^{1/2})	2.600	Q Breach (cfs)	
Weir Submerg	0.18	Breach Avg Velocity (ft/s)	
Min El Weir Flow (ft)	1703.99	Breach Flow Area (sq ft)	
Wr Top Wdth (ft)	473.11		

CROSS SECTION

RIVER: Flamingo
 REACH: Flam Wash RS: 1

INPUT

Description: "FW" 53+14.92 - Section 1097.5 From Las Vegas Wash Study

Station	Elevation	Data	num=	254
0	1712.77	.76	1712.75	1.67 1712.67
4.45	1713.01	4.68	1713.22	5.32 1713.42
13.65	1713.52	16.29	1713.49	17.96 1713.47
23.54	1713.69	23.62	1713.7	24.18 1713.79
30.41	1714	39.86	1714.24	40.69 1714.25
51.94	1714	56.92	1714	65.86 1714
77.85	1715.92	78.3	1716	78.55 1716.05
108.12	1717	112.3	1717.1	113.62 1717.1
124.53	1716	132.75	1715.15	133.94 1715
143.8	1713.87	153.87	1713	161.28 1712.37
223.17	1711	229.5	1710.74	247.29 1710
258.11	1708.05	258.39	1708	262.28 1707.03
266.4	1706	266.46	1705.99	266.49 1705.98
267.69	1705.74	271.47	1705	277.74 1704.78
289.75	1704.39	298.17	1704.13	298.4 1704.12
305.4	1702.59	308.63	1701.84	310.73 1701.28
315.55	1700.13	317.55	1699.66	318.34 1699.63
325.07	1699.46	326.93	1699.42	328.66 1699.39
336.71	1699.16	344.72	1698.36	346.71 1698.16
358.56	1699.22	359.22	1699.24	360.12 1699.25
365.06	1699.37	368.46	1699.46	370.32 1699.51
377.25	1701.4	381.24	1702.53	381.52 1702.59
389.56	1705	389.81	1705.07	390.82 1705.41
392.96	1705.41	393.45	1705.37	393.93 1705.35
395.34	1705.29	395.82	1705.28	397.64 1705.33
399.61	1705.31	400.29	1705.31	400.99 1705.3
418.92	1705.53	419.34	1705.53	419.74 1705.53
420.83	1705.53	421.17	1705.54	421.5 1705.54
422.48	1705.54	422.82	1705.55	423.17 1705.55
429.22	1703.79	429.39	1703.74	429.68 1703.65
432.02	1703	435.12	1702.04	436.95 1701.48
441.67	1700.04	442.03	1699.93	442.26 1699.87
446.67	1699.46	448.25	1699.42	449.51 1699.39
452.16	1699.33	452.83	1699.31	453.43 1699.3
455.16	1699.26	455.17	1699.26	457.03 1699.2
471.99	1698.7	477.03	1699.2	478.89 1699.26
480.62	1699.3	481.22	1699.31	481.89 1699.33
484.55	1699.39	485.8	1699.42	487.38 1699.46
491.83	1699.81	491.97	1699.84	492.14 1699.88
495.61	1700.68	496.59	1700.92	498.86 1701.46
507.66	1703.6	508.11	1703.71	509.26 1704
510.51	1704.35	510.78	1704.44	510.97 1704.51
				511.1 1704.56
				513.4 1705

517.4	1706	537.03	1710.9	549.72	1710.92	600.2	1711	612.08	1711.59
619.23	1712	623.43	1712.69	625.33	1713	626.43	1713	632.04	1713
645.41	1713	660.99	1713	663.74	1712.47	667.02	1712.16	685.88	1712.38
690.93	1712.42	696.43	1712.38	697.88	1712.36	699.57	1712.32	700.82	1712.37
705.3	1712.44	707.87	1712.48	710.21	1712.52	712.74	1712.73	715.35	1712.78
726.51	1712.87	737.75	1713.08	741.93	1713.11	748.68	1713.13	754.97	1713.11
760.01	1713.14	768.59	1713.34	769.53	1713.47	772.9	1713.82	781.12	1715.09
787.31	1714.63	788.46	1714.49	792.4	1714.04	799.1	1714.06	802.93	1714.02
803.44	1713.62	805.78	1712.31	807.19	1712.12	807.67	1712.09		

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.027	113.62	.027	625.33	.027

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	113.62	625.33	.1		.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1706.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.027	
W.S. Elev (ft)	1705.93	Reach Len. (ft)			
Crit W.S. (ft)	1703.70	Flow Area (sq ft)		1040.73	
E.G. Slope (ft/ft)	0.001901	Area (sq ft)		1040.73	
Q Total (cfs)	6400.00	Flow (cfs)		6400.00	
Top Width (ft)	250.35	Top Width (ft)		250.35	
Vel Total (ft/s)	6.15	Avg. Vel. (ft/s)		6.15	
Max Chl Dpth (ft)	7.77	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	146774.9	Conv. (cfs)		146774.9	
Length Wtd. (ft)		Wetted Per. (ft)		253.70	
Min Ch El (ft)	1698.16	Shear (lb/sq ft)		0.49	
Alpha	1.00	Stream Power (lb/ft s)	807.67	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Flamingo

Reach	River Sta.	n1	n2	n3	n4
Flam Wash	390	.02	.015	.02	
Flam Wash	380	.02	.015	.02	
Flam Wash	370	.02	.015	.02	
Flam Wash	360	.02	.015	.02	
Flam Wash	350	.02	.015	.02	
Flam Wash	341	.02	.015	.02	
Flam Wash	313	.02	.015	.02	
Flam Wash	311	.02	.015	.02	
Flam Wash	305	.02	.015	.02	
Flam Wash	300	Bridge			
Flam Wash	295	.02	.015	.02	
Flam Wash	285	.02	.055	.02	
Flam Wash	284	.02	.055	.02	
Flam Wash	246	.02	.015	.02	
Flam Wash	229	.02	.015	.02	
Flam Wash	222	.02	.015	.02	
Flam Wash	193	.02	.015	.02	
Flam Wash	191	.02	.015	.02	
Flam Wash	142	.02	.015	.02	
Flam Wash	138	.02	.015	.02	
Flam Wash	135	.02	.015	.02	
Flam Wash	131	.02	.015	.02	
Flam Wash	125	Bridge			
Flam Wash	121	.027	.015	.27	.027
Flam Wash	116	.027	.015	.027	
Flam Wash	114	.027	.015	.027	
Flam Wash	113.6	.027	.015	.027	
Flam Wash	98	.027	.015	.027	
Flam Wash	97.7	.027	.015	.027	
Flam Wash	94	.027	.015	.027	
Flam Wash	92	.027	.027	.027	
Flam Wash	89	.027	.027	.027	
Flam Wash	88	.027	.027	.027	
Flam Wash	87.7	.027	.027	.027	
Flam Wash	87	.027	.027	.027	
Flam Wash	86	.027	.027	.027	
Flam Wash	85	.027	.027	.027	
Flam Wash	84	.027	.027	.027	
Flam Wash	83	.027	.027	.027	
Flam Wash	82.5	.027	.027	.027	
Flam Wash	82	.027	.027	.027	
Flam Wash	81	.027	.027	.027	
Flam Wash	79	.027	.027	.027	
Flam Wash	78.9	.027	.027	.027	
Flam Wash	78	.027	.027	.027	
Flam Wash	77	.027	.027	.027	
Flam Wash	76	.027	.027	.027	
Flam Wash	75	.027	.027	.027	
Flam Wash	74	.027	.027	.027	
Flam Wash	73	.027	.027	.027	
Flam Wash	72.3	.027	.027	.027	
Flam Wash	71	.027	.027	.027	
Flam Wash	70.5	.027	.027	.027	
Flam Wash	70	.027	.027	.027	
Flam Wash	69	.027	.027	.027	
Flam Wash	68.5	.027	.027	.027	
Flam Wash	68	.027	.027	.027	
Flam Wash	67	.027	.027	.027	
Flam Wash	66	.027	.027	.027	
Flam Wash	65.5	.027	.027	.027	
Flam Wash	65	.027	.027	.027	

Flam Wash	64	.027	.027	.027
Flam Wash	63	.027	.027	.027
Flam Wash	62.9	.027	.027	.027
Flam Wash	62	.027	.027	.027
Flam Wash	61	.027	.027	.027
Flam Wash	60.8	.027	.027	.027
Flam Wash	60.5	.027	.027	.027
Flam Wash	60.2	.027	.027	.027
Flam Wash	59.6	.027	.027	.027
Flam Wash	59.3	.027	.027	.027
Flam Wash	59	.027	.027	.027
Flam Wash	58.5	.027	.027	.027
Flam Wash	58	.027	.027	.027
Flam Wash	57	.027	.027	.027
Flam Wash	56	.027	.027	.027
Flam Wash	55	.027	.027	.027
Flam Wash	54	.027	.027	.027
Flam Wash	53	.027	.027	.027
Flam Wash	52.5	.027	.027	.027
Flam Wash	52	.027	.027	.027
Flam Wash	51	.027	.027	.027
Flam Wash	49	.027	.027	.027
Flam Wash	48.7	.027	.027	.027
Flam Wash	48.5	.027	.027	.027
Flam Wash	48	.027	.027	.027
Flam Wash	47	.027	.027	.027
Flam Wash	42	.027	.027	.027
Flam Wash	41	.027	.027	.027
Flam Wash	40.5	.027	.027	.027
Flam Wash	37	.027	.027	.027
Flam Wash	36	.027	.027	.027
Flam Wash	35	.027	.027	.027
Flam Wash	34	.027	.027	.027
Flam Wash	33.5	.027	.027	.027
Flam Wash	33	.027	.027	.027
Flam Wash	32.5	.027	.027	.027
Flam Wash	32	.027	.027	.027
Flam Wash	31.5	.027	.027	.027
Flam Wash	31	.027	.027	.027
Flam Wash	30.9	.027	.027	.027
Flam Wash	30.5	.027	.027	.027
Flam Wash	29	.027	.027	.027
Flam Wash	28	.027	.027	.027
Flam Wash	27	.027	.027	.027
Flam Wash	26	.027	.027	.027
Flam Wash	25	.027	.027	.027
Flam Wash	24	.027	.027	.027
Flam Wash	23	.027	.027	.027
Flam Wash	22	.027	.027	.027
Flam Wash	21	.027	.027	.027
Flam Wash	19	.027	.027	.027
Flam Wash	15	.027	.027	.027
Flam Wash	11	.027	.027	.027
Flam Wash	8	Inl Struct		
Flam Wash	1	.027	.027	.027

SUMMARY OF REACH LENGTHS

River: Flamingo

Reach	River Sta.	Left	Channel	Right
Flam Wash	390	420.9	420.9	420.9
Flam Wash	380	170	170.96	173
Flam Wash	370	222	232.15	238
Flam Wash	360	323	314.29	310
Flam Wash	350	439	436.71	435
Flam Wash	341	1268.87	1268.87	1268.87
Flam Wash	313	255	255	255
Flam Wash	311	50.42	50.42	50.42
Flam Wash	305	109.41	109.41	109.41
Flam Wash	300	Bridge		
Flam Wash	295	15.01	15.01	15.01
Flam Wash	285	9	9	9
Flam Wash	284	201	201	201
Flam Wash	246	476.43	476.43	476.43
Flam Wash	229	255	255	255
Flam Wash	222	1322.63	1322.63	1322.63
Flam Wash	193	150	150	150
Flam Wash	191	2591.64	2591.64	2591.64
Flam Wash	142	22.5	22.5	22.5
Flam Wash	138	39.15	39.15	39.15
Flam Wash	135	12.25	12.25	12.25
Flam Wash	131	114.06	114.06	114.06
Flam Wash	125	Bridge		
Flam Wash	121	23.49	22.88	22.92
Flam Wash	116	51.33	50	50.08
Flam Wash	114	4.9	4.77	4.78
Flam Wash	113.6	57.59	70.43	90.61
Flam Wash	98	8.77	8.77	8.77
Flam Wash	97.7	151.03	151.03	151.03
Flam Wash	94	55.11	55	55.01
Flam Wash	92	92.99	91.1	91.11
Flam Wash	89	58.33	55	55.01
Flam Wash	88	31.7	28.9	28.9
Flam Wash	87.7	55.17	50	50.01
Flam Wash	87	53.73	50	50.03
Flam Wash	86	52.56	50	50.36
Flam Wash	85	45.17	43.42	44.44
Flam Wash	84	60.12	57.8	59.49
Flam Wash	83	127.69	48.78	17.33
Flam Wash	82.5	36.03	16.86	5.89

Flam Wash	82	54.74	33.14	11.52
Flam Wash	81	49.03	32.49	11.33
Flam Wash	79	18.29	17.51	17.61
Flam Wash	78.9	58.77	50	50.51
Flam Wash	78	54.01	50	50.94
Flam Wash	77	51	50	51.52
Flam Wash	76	62.37	50	52.26
Flam Wash	75	60.15	50	52.67
Flam Wash	74	53.98	50	52.67
Flam Wash	73	17.45	16.88	17.78
Flam Wash	72.3	20.21	33.12	50.64
Flam Wash	71	31.02	50	73.27
Flam Wash	70.5	11.4	18.14	25.87
Flam Wash	70	20.2	31.86	45.32
Flam Wash	69	32.14	50	73.29
Flam Wash	68.5	12.61	19.4	30.09
Flam Wash	68	30.83	30.6	33.3
Flam Wash	67	50.08	50	56.09
Flam Wash	66	50.49	50	57.1
Flam Wash	65.5	15.96	15.8	17.18
Flam Wash	65	47.94	34.2	13.62
Flam Wash	64	72.8	50	18.83
Flam Wash	63	18.57	12.29	4.52
Flam Wash	62.9	59.08	37.71	13.81
Flam Wash	62	84.73	50	18.63
Flam Wash	61	15.83	8.79	3.37
Flam Wash	60.8	19.51	41.21	69.87
Flam Wash	60.5	21.72	50	86.48
Flam Wash	60.2	6.97	16.89	28
Flam Wash	59.6	13.24	33.11	52.47
Flam Wash	59.3	19.22	50	74.5
Flam Wash	59	9.37	25	35.64
Flam Wash	58.5	25.12	25	25.6
Flam Wash	58	50.23	50	51.2
Flam Wash	57	50.23	50	51.2
Flam Wash	56	50.22	50	51.2
Flam Wash	55	50.19	50	51.2
Flam Wash	54	50.19	50	50.48
Flam Wash	53	50.19	50	50.63
Flam Wash	52.5	12.73	12.68	13.29
Flam Wash	52	61.3	37.32	28.16
Flam Wash	51	114.41	50	37.64
Flam Wash	49	83.84	50	37.48
Flam Wash	48.7	10.15	6.52	4.87
Flam Wash	48.5	68.39	43.48	32.4
Flam Wash	48	86.13	50	36.98
Flam Wash	47	115.51	50	35.18
Flam Wash	42	1.07	.36	.22
Flam Wash	41	27.88	17.9	22.24
Flam Wash	40.5	47.1	31.74	26.05
Flam Wash	37	72.28	50	37.15
Flam Wash	36	70.35	50	35.18
Flam Wash	35	36.21	26.18	18.4
Flam Wash	34	32.63	23.82	17.07
Flam Wash	33.5	67.71	50	36.45
Flam Wash	33	66.93	50	36.9
Flam Wash	32.5	45.41	34.11	25.43
Flam Wash	32	10.8	15.89	20.68
Flam Wash	31.5	34.36	50	63.73
Flam Wash	31	15.64	22.44	28.28
Flam Wash	30.9	19.43	27.56	34.75
Flam Wash	30.5	43.89	60.78	77.66
Flam Wash	29	41.23	39.22	39.76
Flam Wash	28	52.56	50	50.2
Flam Wash	27	52.56	50	50.03
Flam Wash	26	52.56	50	50.13
Flam Wash	25	52.56	50	50.02
Flam Wash	24	52.56	50	50.04
Flam Wash	23	52.56	50	50.22
Flam Wash	22	50.97	50	50.56
Flam Wash	21	98.98	98.7	99.83
Flam Wash	19	42.65	51.3	67.35
Flam Wash	15	80.15	94.42	124.31
Flam Wash	11	1070.68	470.5	476.45
Flam Wash	8	Inl Struct		
Flam Wash	1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Flamingo

Reach	River Sta.	Contr.	Expan.
Flam Wash	390	.1	.3
Flam Wash	380	.1	.3
Flam Wash	370	.1	.3
Flam Wash	360	.1	.3
Flam Wash	350	.1	.3
Flam Wash	341	.1	.3
Flam Wash	313	.1	.3
Flam Wash	311	.1	.3
Flam Wash	305	.1	.3
Flam Wash	300	Bridge	
Flam Wash	295	.1	.3
Flam Wash	285	.1	.3
Flam Wash	284	.1	.3
Flam Wash	246	.1	.3
Flam Wash	229	.1	.3
Flam Wash	222	.1	.3
Flam Wash	193	.1	.3
Flam Wash	191	.1	.3
Flam Wash	142	.1	.3

Flam Wash	138	.1	.3
Flam Wash	135	.1	.3
Flam Wash	131	.1	.3
Flam Wash	125	Bridge	
Flam Wash	121	.1	.3
Flam Wash	116	.1	.3
Flam Wash	114	.1	.3
Flam Wash	113.6	.1	.3
Flam Wash	98	.1	.3
Flam Wash	97.7	.1	.3
Flam Wash	94	.1	.3
Flam Wash	92	.1	.3
Flam Wash	89	.1	.3
Flam Wash	88	.1	.3
Flam Wash	87.7	.1	.3
Flam Wash	87	.1	.3
Flam Wash	86	.1	.3
Flam Wash	85	.1	.3
Flam Wash	84	.1	.3
Flam Wash	83	.1	.3
Flam Wash	82.5	.1	.3
Flam Wash	82	.1	.3
Flam Wash	81	.1	.3
Flam Wash	79	.1	.3
Flam Wash	78.9	.1	.3
Flam Wash	78	.1	.3
Flam Wash	77	.1	.3
Flam Wash	76	.1	.3
Flam Wash	75	.1	.3
Flam Wash	74	.1	.3
Flam Wash	73	.1	.3
Flam Wash	72.3	.1	.3
Flam Wash	71	.1	.3
Flam Wash	70.5	.1	.3
Flam Wash	70	.1	.3
Flam Wash	69	.1	.3
Flam Wash	68.5	.1	.3
Flam Wash	68	.1	.3
Flam Wash	67	.1	.3
Flam Wash	66	.1	.3
Flam Wash	65.5	.1	.3
Flam Wash	65	.1	.3
Flam Wash	64	.1	.3
Flam Wash	63	.1	.3
Flam Wash	62.9	.1	.3
Flam Wash	62	.1	.3
Flam Wash	61	.1	.3
Flam Wash	60.8	.1	.3
Flam Wash	60.5	.1	.3
Flam Wash	60.2	.1	.3
Flam Wash	59.6	.1	.3
Flam Wash	59.3	.1	.3
Flam Wash	59	.1	.3
Flam Wash	58.5	.1	.3
Flam Wash	58	.1	.3
Flam Wash	57	.1	.3
Flam Wash	56	.1	.3
Flam Wash	55	.1	.3
Flam Wash	54	.1	.3
Flam Wash	53	.1	.3
Flam Wash	52.5	.1	.3
Flam Wash	52	.1	.3
Flam Wash	51	.1	.3
Flam Wash	49	.1	.3
Flam Wash	48.7	.1	.3
Flam Wash	48.5	.1	.3
Flam Wash	48	.1	.3
Flam Wash	47	.1	.3
Flam Wash	42	.1	.3
Flam Wash	41	.1	.3
Flam Wash	40.5	.1	.3
Flam Wash	37	.1	.3
Flam Wash	36	.1	.3
Flam Wash	35	.1	.3
Flam Wash	34	.1	.3
Flam Wash	33.5	.1	.3
Flam Wash	33	.1	.3
Flam Wash	32.5	.1	.3
Flam Wash	32	.1	.3
Flam Wash	31.5	.1	.3
Flam Wash	31	.1	.3
Flam Wash	30.9	.1	.3
Flam Wash	30.5	.1	.3
Flam Wash	29	.1	.3
Flam Wash	28	.1	.3
Flam Wash	27	.1	.3
Flam Wash	26	.1	.3
Flam Wash	25	.1	.3
Flam Wash	24	.1	.3
Flam Wash	23	.1	.3
Flam Wash	22	.1	.3
Flam Wash	21	.1	.3
Flam Wash	19	.1	.3
Flam Wash	15	.1	.3
Flam Wash	11	.1	.3
Flam Wash	8	Inl Struct	
Flam Wash	1	.1	.3



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Group By Message ID

- [NT RC 01L](#) SECNO: 125
All of the left overbank Manning's "n" values are less than 0.030. The "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure outlined to compute the overbank "n" value(s) for a natural floodplain (FHWA, 1984). Or follow the procedure outlined to compute the "n" values for urban development (USGS, 1977). Please submit supporting information on the evaluation of the "n" values.
- [NT RC 01R](#) SECNO: 390
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 380
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 370
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 360
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 350
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 341
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 313

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All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 311

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 305

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 300

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 300

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 295

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 285

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

[NT RC 01R](#) SECNO: 284

All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

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- [NT RC 01R](#) SECNO: 246
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 229
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 222
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 193
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 191
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 142
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 138
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 135
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.

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- [NT RC 01R](#) SECNO: 131
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 01R](#) SECNO: 125
All of the right overbank "n" values are less than 0.030. Manning's "n" values for the overbank areas are usually larger than 0.030 (Chow, 1959, page 113). The "n" value(s) should be re-evaluated. Follow the procedure on pages 17 and 54 of (FHWA, 1984) to compute the overbank "n" value for the natural floodplain. Or follow the procedure in (USGS, 1977) to compute the "n" value for urban development. Please submit supporting information on the evaluation of "n" value.
- [NT RC 05](#) SECNO: 94
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 92
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 89
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 88
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 87.7
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 87
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.
- [NT RC 05](#) SECNO: 86
The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the

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natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 85

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 84

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 83

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 82.5

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 82

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 81

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 79

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 78.9

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 76

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The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 75

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 74

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 73

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 72.3

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 71

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 70.5

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 70

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 69

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RC 05](#)

SECNO: 68.5

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

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[NT RC 05](#)

SECNO: 62

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[NT RC 05](#)

SECNO: 61

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[NT RC 05](#)

SECNO: 60.8

The left overbank n-value of 0.027 and the right overbank n-value of 0.027 are less than or equal to the channel n-value of 0.027. Follow the procedure in (FHWA, 1984) to compute the n-value for the natural floodplain and the channel. Or follow the procedure in (USGS, 1977) to compute the n-value for urban development. Please submit supporting information on the evaluation of n-values.

[NT RC 05](#)

SECNO: 60.5

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[NT RC 05](#)

SECNO: 60.2

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[NT RC 05](#)

SECNO: 59.6

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[NT RC 05](#)

SECNO: 59.3

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CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

SECNO: 48.7

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RC 05](#)

SECNO: 40.5

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RC 05](#)

SECNO: 31.5

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[NT RC 05](#)

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[NT RC 05](#)

SECNO: 30.9

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

SECNO: 28

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[NT RC 05](#)

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[NT RC 05](#)

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CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

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[NT RC 05](#)

SECNO: 1

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CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

[NT RS](#)
[02BUC](#)

SECNO: 125

This is the Upstream Bridge Section (BRU). The channel n value of 0.015 for the upstream internal bridge opening section is equal to or larger than the channel n value of 0.015 at Section 3. Usually, the channel "n" value of the bridge opening section represents the area below the bridge deck and is less than the channel "n" value of Section 3. The "n" value for Section 3 represents the natural valley channel section roughness for the reach between Section 3 and Section 4. Please change the "n" value of the internal bridge opening section or provide supporting information for the use of a higher "n" value.

[NT TL 01S2](#)

SECNO: 295

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#)

SECNO: 121

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S2](#)

SECNO: 1

This is Section2 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 305

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 131

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S3](#)

SECNO: 11

This is Section3 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively, for typical structure sections according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010).

[NT TL 01S4](#)

SECNO: 311

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#)

SECNO: 135

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..

[NT TL 01S4](#)

SECNO: 15

CHECK-RAS – FLAMINGO WASH POST-PROJECT CONDITIONS

This is Section 4 of a hydraulic structure. The contraction and expansion loss coefficients are 0.1 and 0.3. They should be equal to 0.3 and 0.5, respectively according to page 5-8 of the HEC-RAS Hydraulic Reference Manual (HEC, 2010)..





**SUMMARY OF EXISTING FLOWS
FOR
LAS VEGAS WASH -
FLOOD HAZARD MAPPING RESTUDY**

550-044

November 2008

Prepared for:

**Clark County Regional Flood Control District
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Fax: (702) 455-3870**

Prepared by:

**G. C. Wallace, Inc.
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2297**

I. INTRODUCTION

G. C. Wallace, Inc. (GCW) was authorized by the Clark County Regional Flood Control District (CCRFCD) to complete the Las Vegas Wash Letter of Map Revision (LOMR) under contract, *Agreement for Professional Services for the Las Vegas Wash LOMR I-15 to Clark County Wastewater Treatment Plant*, dated March 8, 2007. The purpose of this hydrologic analysis is to determine existing condition 100-year peak flows for the Las Vegas Wash from I-15 to Lake Las Vegas to support proposed revisions to the Effective floodplain mapping. The study area is shown on Figure FS-1.

II. INCORPORATED STUDIES

The Effective 100-year flows for the Las Vegas Wash were determined in the *Las Vegas Valley Flood Insurance Study Hydrology Report* (Reference 1, hereafter referred to as the 1991 Hydrology Report). The regulatory floodplain mapping shown on the FEMA FIRM panels used these flow rates from the 1991 Hydrology Report. Since 1991, the watersheds tributary to the Las Vegas Wash have undergone significant development. There have also been significant changes in methodology and storm centering analyses. Therefore, the 100-year flows specified in the 1991 Hydrology Report no longer reflect existing conditions.

The 2002 *Las Vegas Valley Flood Control Master Plan Update* (Reference 2, hereafter referred to as the 2002 MPU) prepared ultimate condition hydrologic modeling for the entire Las Vegas Valley, including areas tributary to the Las Vegas Wash. The 2002 MPU differed from previous updates in the way of breaking up the large watersheds into smaller subbasins and routings, with an increased level of detail.

The 2004 Upper Duck Creek Master Plan Amendment (MPA), (Reference 3) incorporated revisions to the 2002 MPU that included the revised land use west of I-15, Mountain's Edge Master Plan, Duck Creek Railroad Detention Basin, Pyle Avenue Storm Drain, revised tributary area to the Central Duck Creek Detention Basin, Green Park development, and Silverado Ranch developments, Rainbow Boulevard Improvements, and Lower Blue Diamond Detention Basin.

The 2005 Pittman Watershed – West Henderson Area Master Plan Amendment (Reference 4) incorporated revisions to the 2002 MPU that included the Pittman

West Detention Basin with diversion levee and outfall channel, Pittman North Detention Basin with diversion levee and outfall channel.

The 1998 Technical Memorandum on Hydrology for the "A" Channel Lining Project (Reference 5, hereafter referred to as the Black & Veatch Study) provided a storm centering model for the northern part of the study limit. The Black & Veatch Study established a 100-year peak flow rate for the "A" Channel (Las Vegas Wash) from Alexander Road to the Pecos Road/Lake Mead Boulevard Intersection by developing a worst-case storm centering based on an optimum relationship between Depth-Area-Reduction-Factors and drainage area. Note that this report was used to size the Cheyenne Peaking Basin.

III. METHODOLOGY

The watersheds tributary to the Las Vegas Wash have undergone significant development since the 100-year effective flow rates were determined in the 1991 Hydrology Report. The current condition of the watershed more closely resembles the ultimate condition model of the 2002 MPU than of the 1991 Hydrology Report, which reflected existing conditions in 1991. Therefore, the HEC-1 modeling for this project was based from the 2002 MPU, then reduced down to an existing condition by decreasing curve numbers and adjusting lag times and routings to reflect current development. In general, the modeling guidelines followed those used in the 2002 MPU.

Storm Centerings

The selected approach from the 1991 Hydrology Report was to begin at the upstream end of the study reach and move downstream, adopting the largest peak tributary flows as Las Vegas Wash peak flows. The "storm centering" approach was chosen for this report to more accurately portray the existing condition 100-year storm flows in the Las Vegas Wash. A study titled, *Storm Sizes and Shapes in the Arid Southwest* (Reference 7), suggests that the likelihood of a storm greater than 255 square miles is less than 0.2 percent; 50 percent of the storms analyzed were less than 32 square miles, with a mean storm size of 103 square miles. This study was the basis for the storm centering criteria used in the 2002 and 2008 Las Vegas Valley MPUs, which limited storm centerings to a maximum of 200 square miles. A total of nine (9) storm centerings were evaluated to determine controlling flow rates along the study reach of the Las Vegas Wash. Numerous detention basins impact

IV. CONCLUSIONS

Of the nine (9) storm centerings in the hydrologic analysis, only three (3) controlled with respect to the 100-year flow rates in the Las Vegas Wash, as shown on Figure FS-3. The storm centering “B-V” from the Black & Veatch study controlled the northern reach from I-15 to Las Vegas Boulevard. Storm centering “MPU6” controlled only at the Flamingo Wash confluence. The remaining study reaches were controlled by storm centering “MPU1”. Note that the computed area of 58.0 square miles to concentration point 2CLV1B-2 at Owens Avenue in HEC-1 model MPU1 does not match the reported area of 43.6 square miles. This is because GCW manually subtracted the area of 14.4 square miles associated with diversion DLVWH from 2CLV1B-2, as HEC-1 conserves area throughout the model and runoff from diversion DLVWH is not returned to the Las Vegas Wash until downstream of Owens Avenue, at Sandhill Road. A qualitative description of flow increases compared to the Effective flows from the 1991 Hydrology Report is outlined below:

- ♦ Cheyenne Avenue to Owens Avenue reach shows only a minor increase from the 1991 Hydrology Report due to peak reduction from the Cheyenne Peaking Basin.
- ♦ Sandhill Road to Sahara Avenue reach shows an increase of two (2) times the Effective 100-year flow from the 1991 Hydrology Report.
- ♦ Flamingo Wash confluence to Tropicana Avenue reach shows an increase of two and half (2.5) times the effective 100-year flow from the 1991 Hydrology Report.
- ♦ Duck Creek confluence shows an increase of two (2) times the Effective 100-year flow from the 1991 Hydrology Report.

The flow increases compared to the 1991 Hydrology Report are primarily due to watershed development (increased curve numbers) and the methodology of the 2002 MPU that divided the watersheds into smaller subbasins. Note that the results from the 2002 MPU methodology have been confirmed in recent storm events in highly gauged watersheds throughout the Las Vegas Valley. The results of the HEC-1 modeling for the Las Vegas Wash are summarized in Figure FS-4 and Table 2 below:

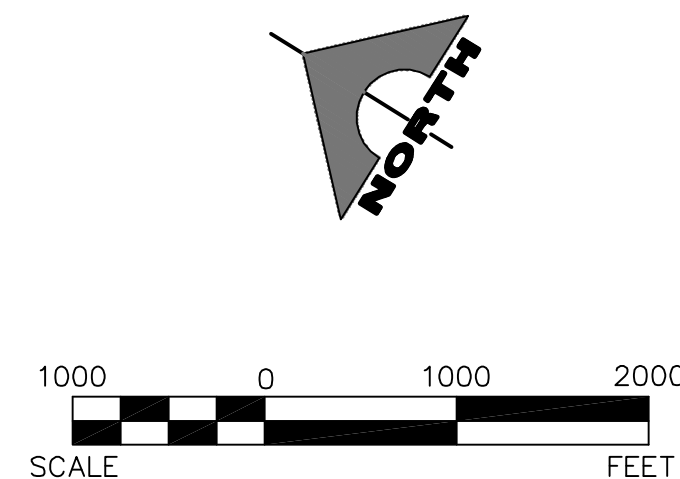
TABLE FS-2
Summary of HEC-1 Modeling

PT*	Location/ Description	Storm Centering	HEC-1 Node	Area (Sq Mi.)	DARF	2008 Q100 (cfs)	1991 Q100 (cfs)	% Change
1	Gowan Road	B-V	3C99B-7	72.0	0.64	9112	6730	35
2	Cheyenne Peaking Basin	B-V	CHYPKIN	72.0	0.64	9136	6730	36
3	Cheyenne Avenue	B-V	CHYPEAK	72.3	0.64	6977	6730	4
4	Las Vegas Boulevard	B-V	2CLW1A-4	72.3	0.64	7573	6730	13
5	Lake Mead Boulevard	MPU1	2CLV1B-2	43.0	0.70	7800	6730	16
6	Owens Avenue	MPU1	CCK-C	43.6	0.70	8155	6730	21
7	Sandhill Road	MPU1	CLVW01	59.7	0.66	11314	6730	68
8	Lamb Boulevard	MPU1	CCLVW03	63.5	0.66	11948	6730	78
9	Marion Drive	MPU1	CLVW04-C	63.8	0.66	11948	6730	78
10	Bonanza Road	MPU1	CCBN15-C	65.7	0.65	11948	6730	78
11	Cedar Avenue Channel	MPU1	CCCA10-C	67.5	0.65	12706	6730	89
12	Stewart Avenue	MPU1	CCST03-C	68.0	0.65	12754	6730	90
13	Charleston Boulevard	MPU1	CNEL04-2	73.0	0.64	13326	6730	98
14	Nellis Boulevard	MPU1	CCNEL06	74.3	0.64	13515	6730	101
15	Christy Lane	MPU1	CLVCH	76.9	0.64	13861	6730	106
16	Sahara Avenue	MPU1	CFW37	77.3	0.64	13861	6730	106
17	Flamingo Wash	MPU6	FLAMWASH	124.4	0.58	18601	7100	162
18	Sloan Lane	MPU1	CSLOAN	125.4	0.57	18672	7100	163
19	Vegas Valley Drive	MPU1	CLLV020	126.3	0.57	18718	7100	164
20	Desert Inn Road	MPU1	CLLV060	127.7	0.57	18718	7100	164
21	Monson Channel	MPU1	CLLV140	136.1	0.56	18718	7100	164
22	Tropicana Avenue	MPU1	CLLV170	139.7	0.56	18798	7100	165
23	Duck Creek	MPU1	CLLV200	178.1	0.53	20690	11500	80
24	Lake Las Vegas	MPU1	CLLV410	228.8	0.51	22530	NA	NA

*Refer to Figure FS-4.



PT	LOCATION DESCRIPTION	STORM CENTERING	HEC-1 NODE	AREA (SQ MI.)	DARF	2008 FHMR Q ₁₀₀ (CFS)	1991 Q ₁₀₀ (CFS)	% CHANGE
1	GOWAN ROAD	B-V	CS39B-7	72.0	0.64	9112	6730	35
2	CHEYENNE PEAKING BASIN	B-V	CHYCNLN	72.0	0.64	9136	6730	36
3	CHEYENNE AVENUE	B-V	CHYPEAK	67.3	0.64	6937	6730	3
4	LAS VEGAS BOULEVARD	B-V	2CLV1A-4	72.3	0.64	7573	6730	13
5	LAKE MEAD BOULEVARD	MPU1	2CLV1B-2	43.0	0.70	7800	6730	16
6	OWENS AVENUE	MPU1	CKC-K	43.6	0.70	8155	6730	21
7	SANDHILL ROAD	MPU1	CLVW01	60.1	0.66	11314	6730	68
8	JAMIS BOULEVARD	MPU1	CLVW03	63.5	0.66	11948	6730	78
9	MARION DRIVE	MPU1	CLVW4-2	63.8	0.66	11948	6730	78
10	BONANZA ROAD	MPU1	CCBN1S-C	67.7	0.65	11948	6730	78
11	CEDAR AVENUE CHANNEL	MPU1	CCA0A-1C	67.5	0.65	12706	6730	89
12	STEWART AVENUE	MPU1	CCS03-C	68.0	0.65	12754	6730	90
13	CHARLESTON BOULEVARD	MPU1	CNEL04-2	73.0	0.64	13326	6730	98
14	NELLIS BOULEVARD	MPU1	CNEL06	74.3	0.64	13515	6730	101
15	CHRISTY LANE	MPU1	GLUH	76.0	0.64	13861	6730	106
16	SAHARA AVENUE	MPU1	CFW37	77.3	0.64	13861	6730	106
17	FLAMINGO WASH	MPU6	FLAMWASH	124.4	0.58	18601	7100	162
18	SLOAN LANE	MPU1	CSLOAN	125.4	0.57	18672	7100	163
19	VEGAS VALLEY DRIVE	MPU1	CLLV020	126.3	0.57	18718	7100	164
20	DESERT INN ROAD	MPU1	CLLV060	127.7	0.57	18718	7100	164
21	MONSON CHANNEL	MPU1	CLLV140	136.1	0.56	18718	7100	164
22	TROPICANA AVENUE	MPU1	CLLV130	136.1	0.56	18718	7100	165
23	DUCK CREEK	MPU1	CLLV200	178.1	0.53	20690	11500	80
24	LAKE LAS VEGAS	MPU1	CLLV410	228.8	0.51	22530	NA	NA



LEGEND

HEC-1 COMBINATION POINT

JURISDICTION BOUNDARY

EFFECTIVE FLOODPLAIN

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD • LAS VEGAS, NV 89146
TEL: 702.804.2000 • E: 202.804.2389 • GCWALL@AICE.COM

PROJECT NO.
550-044

[illegible]CLARK COUNTY REGIONAL
FLOOD CONTROL DISTRICT

**LAS VEGAS WASH
FLOOD HAZARD MAPPING RESTUDY**

SUMMARY OF HEC-1 MODELING

DRAWING
FS-4
SHT OF SHT

HTE: 00-00000

% COMPLETE



TECHNICAL SUPPORT DATA NOTE FOR

For

Clark County, Nevada

(COMMUNITY NAME AND STATE)

FLOOD INSURANCE STUDY

SUBMITTED BY: G. C. Wallace, Inc.
Study Contractor

DATE SUBMITTED OCTOBER 1997

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

2.4.4 Eastern Avenue to Las Vegas Wash Reach

Clark County Regional Flood Control District Master Plan facilities which have been constructed include the Eastern Avenue Culvert, Pecos-McLeod Interconnect Bridge, Desert Inn Road Culvert, Mojave Road Culvert, Trailer Park Bridge, Boulder Highway Culvert, US 95 Bridge, Lamb Boulevard Culvert, Nellis Boulevard Bridge.

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

3.0 ENGINEERING METHODS

3.1 Hydrologic Analysis

3.1.1 Introduction

This section summarizes the existing conditions/existing facilities of the Flamingo Wash drainage basin conducted for the Flamingo Wash FIS Restudy. The study area covered by this analysis includes the Flamingo Wash, Tropicana Wash, and Red Rock Wash drainage areas. The purpose of this analysis was to develop acceptable discharges for use in the Flamingo Wash FIS Restudy.

The basis of the hydrologic analysis was the HEC-1 model developed by James M. Montgomery Consulting Engineers, Inc. for the Las Vegas Valley Flood Insurance Study Hydrology Report dated September 1991.

Peak discharges have been computed for proposed FIS concentration points for the 100-year return period only using the September 1990 version of the HEC-1 Flood Hydrograph Package.

Subbasins are shown on Figure S-4 of the 1991 Master Plan Update for the Las Vegas Valley included here as Figure 2.

3.1.2 Modifications to the 1991 Effective Model

The following paragraphs discuss the changes made to the Flamingo/Tropicana Wash HEC-1 model from the 1991 Las Vegas Valley FIS Hydrology Report.

3.1.2.1 Previous HEC-1 analyses in the study area were performed using the August 1988 version of the program (File: F100.DAT). This study was performed using the September 1990 version of the HEC-1 Flood Hydrograph Package.

3.1.2.2 Minor changes were made to some Kinematic Wave routings due to the inability of the September 1990 version of HEC-1 to run these routings (File: F100R.DAT).

3.1.2.3 The Red Rock Detention Basin drainage area is no longer included as a part of the Flamingo Wash watershed for the 100-year return period storm event. This is due to the negligible contribution of runoff from the detention basin during the 100-year storm event since the Red Rock Detention Basin Expansion project (LOMR Case No. 97-09-177P). The Depth Area Reduction Factors (DARF) were increased with the decrease in drainage area for this study (File: F-FL.DAT).

3.1.2.4 The Upper Flamingo Wash Detention Basin and drainage area were modified to reflect the Upper Flamingo Wash Detention Basin LOMR (LOMR Case No. 97-09-138P) except for the Red Rock Detention Basin drainage area as discussed above (File: F-FL.DAT).

3.1.2.5 Peak discharges for FIS hydrology were required at numerous concentration points in the Flamingo Wash drainage area. Appropriate peak discharges at each concentration point were determined using two (2) design storm centerings:

3.1.2.5.1 For each concentration point, a storm covering the Flamingo and Tropicana watersheds was investigated. No runoff from the Red Rock Detention Basin watershed was assumed. DARF's for this scenario were based on the total

tributary area, excluding the Red Rock Detention Basin area. This is referred to as the "Overall Storm" (File: F-FL.DAT).

3.1.2.5.2 For each concentration point, a storm covering the Flamingo and Tropicana watersheds, excluding the Red Rock and Upper Flamingo Wash Detention Basin areas, was investigated. No runoff from the Red Rock or Upper Flamingo Wash Detention Basins were assumed. DARF's for this scenario were based on the storm area upstream of each concentration point. This is referred to as the "Central Storm" (File: F-FLC.DAT). The Central Storm produces discharges which differ from the Overall Storm. The Overall Storm produces higher discharges upstream of the Flamingo/Tropicana confluence while the Central Storm produces higher discharges downstream.

3.1.3 Summary of Results

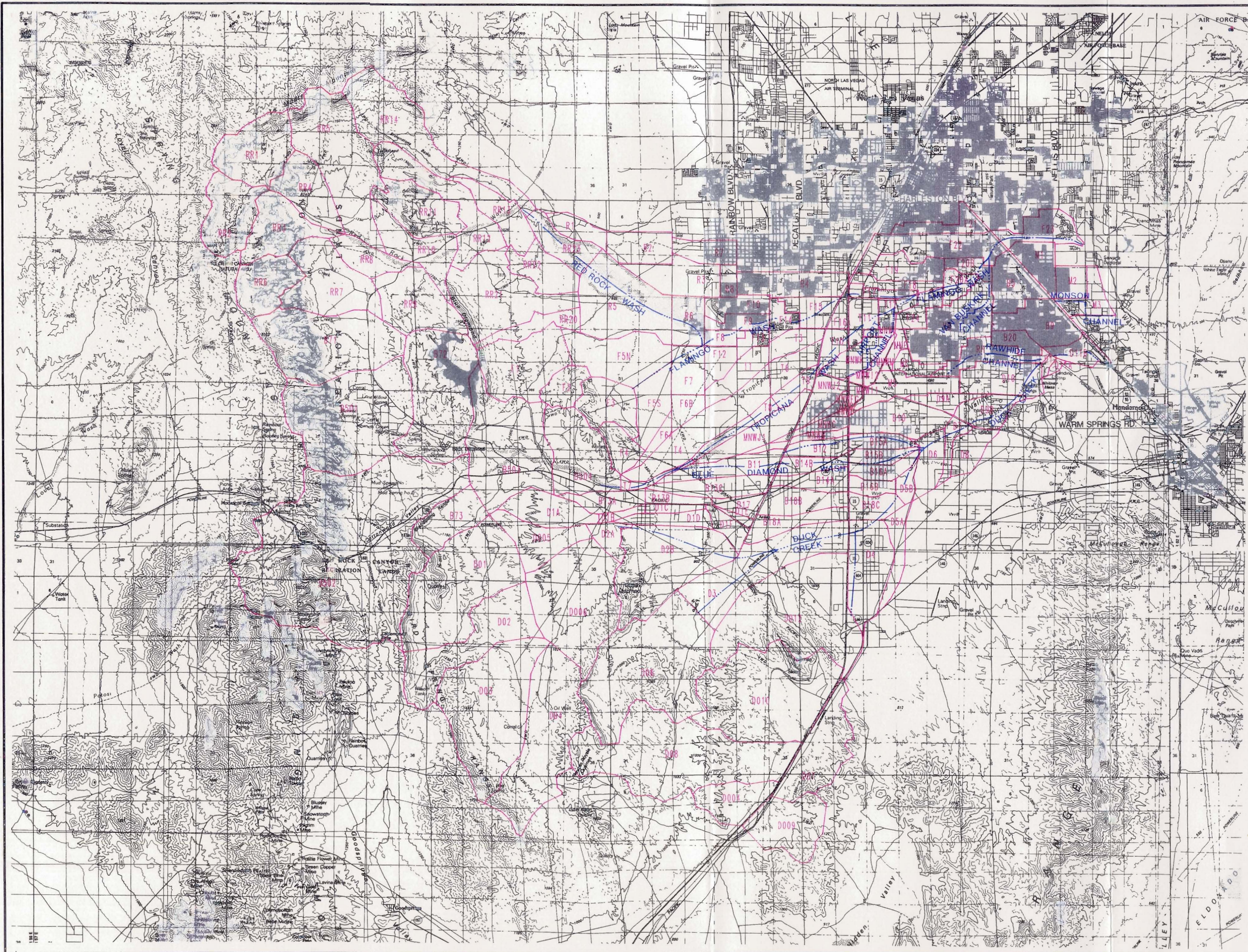
The existing conditions, 100-year HEC-1 model was executed for the two storm scenarios discharged above. Results are shown in Table 1. This table lists the tributary area, appropriate DARF, and peak discharge for each proposed FIS concentration point assuming occurrence of the Overall Storm and Central Storm.

The conclusion was made from the data presented in Table 1 that the controlling storm (i.e., the storm producing the largest peak discharge) is the Overall Storm for all Flamingo Wash locations between the Upper Flamingo Wash Detention Basin and the Tropicana Wash confluence. Downstream of the Flamingo/Tropicana Wash confluence, the Central Storm controls.

Note that for the Overall Storm, the peak discharge drops significantly with the increase in tributary area upstream of the Flamingo/Tropicana Wash confluence. This is due to differences in peak time and DARF. However, it is felt that instead of having the peak discharge go down in this reach, the highest peak discharge held through this reach would be more appropriate.

TABLE 1
COMPARISON OF ALTERNATIVE 100-YEAR STORM SIMULATIONS FOR FLAMINGO WASH WATERSHED

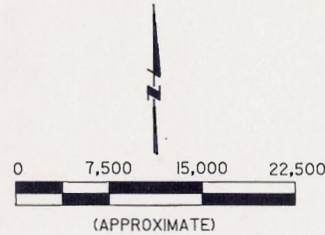
Concentration Point	Description	Overall Storm			Central Storm			Adopted Discharge (cfs)
		Area (sq mi)	DARF	Peak Q (cfs)	Area (sq mi)	DARF	Peak Q (cfs)	
F8	Flamingo Wash at Rainbow Blvd.	37.94	0.72	3,874	3.38	0.92	1,310	3,900
F9	Flamingo Wash at Jones Blvd.	40.35	0.71	3,646	5.79	0.90	1,517	3,900
F14	Flamingo Wash at Decatur Blvd.	50.27	0.68	2,902	15.71	0.82	2,268	3,900
F15	Flamingo Wash at UPRR	51.59	0.68	2,921	17.03	0.80	2,366	3,900
F16	Flamingo Wash at I-15/Caesars Palace	52.11	0.68	2,931	17.55	0.80	2,445	3,900
F17	Flamingo Wash at Winnick Ave./Hughes Center	52.76	0.68	2,934	18.20	0.80	2,581	3,900
F17	Flamingo Wash at Flamingo/Tropicana Confluence	73.61	0.64	4,556	39.05	0.71	4,627	4,600
F18	Flamingo Wash at Spencer St.	77.79	0.64	5,151	43.23	0.71	5,496	5,500
F20B	Flamingo Wash at D/S Desert Inn Rd.	85.45	0.62	5,650	50.89	0.68	5,832	5,800
F22	Flamingo Wash at Boulder Hwy.	90.15	0.61	5,974	55.59	0.67	6,257	6,300
F23	Flamingo Wash at Nellis Blvd./Las Vegas Wash	92.07	0.61	6,098	57.51	0.67	6,411	6,400



1991 FLOOD
CONTROL MASTER
PLAN UPDATE
LAS VEGAS VALLEY

LEGEND

- 45 SUBAREA DESIGNATION
- SUBAREA DELINEATION



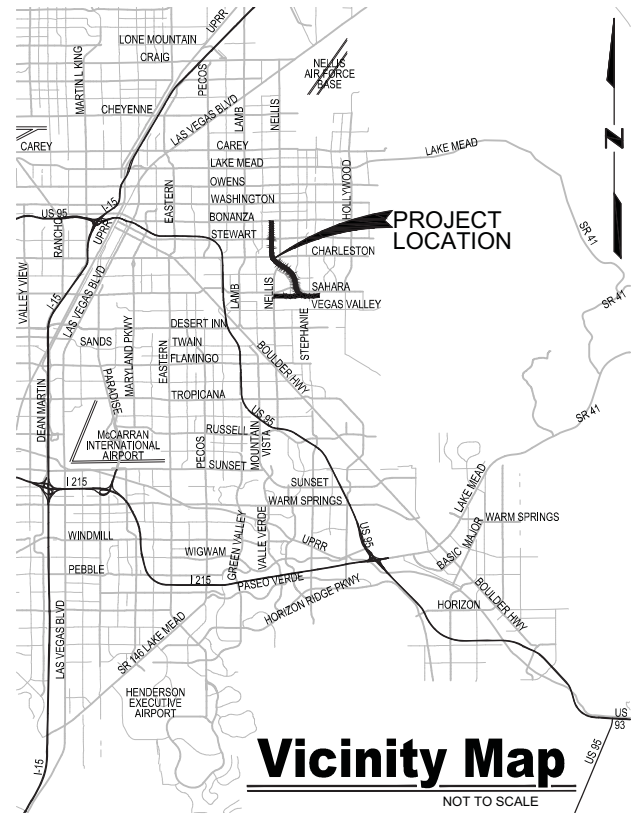
SOUTHWEST BASIN
HYDROLOGIC SUBAREAS

FIGURE S-4



Appendix E.3

DEPARTMENT OF PUBLIC WORKS



County Commissioners

Steve Sisolak, Chairman
Larry Brown, Vice Chairman
Susan Brager
Tom Collins
Chris Giunchigliani
Mary Beth Scow
Lawrence Weekly

2013 **LAS VEGAS WASH SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS**

FUNDED BY
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

County Manager

Donald G Burnette

Clark County Regional Flood Control District

Approved:

Gale Wm Fraser II

Director of Public Works

Approved:

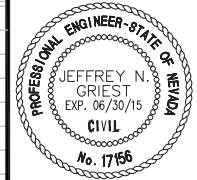
Denis Cederburg

Director of Public Works (City of Las Vegas)

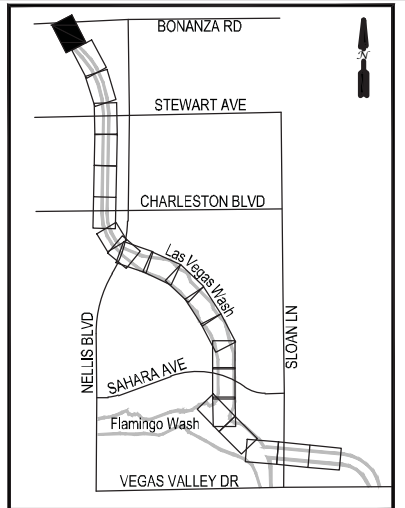
Approved:

Jorge Cervantes, P.E., P.T.O.E.

AGENCY			DEPARTMENT OF PUBLIC WORKS			REVISIONS			DESIGN ENGINEERING DIVISION
PLANS REVIEWED BY			BY			NUMBER	DESCRIPTION	DATE	
CENTRAL TELEPHONE COMPANY DBA CENTURYLINK			DESIGN ENGINEERING DIVISION						COVER SHEET
LAS VEGAS VALLEY WATER DISTRICT			CONSTRUCTION MANAGEMENT DIVISION						
SOUTHWEST GAS CORPORATION			MAINTENANCE MANAGEMENT DIVISION						L-2031
NV ENERGY COMPANY (TRANSMISSION)			TRAFFIC MANAGEMENT DIVISION						
NV ENERGY COMPANY (DISTRIBUTION)			COUNTY SURVEYOR'S OFFICE						
CLARK COUNTY WATER RECLAMATION DISTRICT									
COX COMMUNICATIONS, LAS VEGAS, INC									
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION									



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
PRELIMINARY - NOT FOR CONSTRUCTION
BID No.:



KEYMAP

CONSTRUCTION NOTES

- 1 ADJUST EXISTING SS MANHOLE TO CHANNEL FINISHED GRADE PER DET ____
- 3 INSTALL 6" CHAIN LINK FENCE PER USDOCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET ____
- 5 CONSTRUCT 80" CONCRETE RECTANGULAR CHANNEL
- 6 CONSTRUCT CONCRETE CUT OFF WALL
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 9 CONSTRUCT CONCRETE TRANSITION FROM 90" TRAPEZOIDAL CHANNEL TO 80" RECTANGULAR CHANNEL
- 29 CONSTRUCT 96" RCP BUBBLER STRUCTURE PER DET ____
- 41 INSTALL 24" RCP STORMDRAIN
- 42 CONSTRUCT 48" TYPE 1 MANHOLE PER USD 403
- 43 CONSTRUCT 60" TYPE 1 MANHOLE PER USD 403
- 47 CONCRETE TRAIL STA. 15+00 TO 17+60
- 50 CONSTRUCT 4' WIDE CONCRETE SWALE PER DET ____

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CHANNEL PROFILE
SEE SHEET PR-1

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FREEMAN AND ARTERIAL
SYSTEM OF TRANSPORTATION

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IT'S COSTLY.
**Call before you
Overhead**
1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.
**Call
811**

REV No.	DATE	DESCRIPTION	APPROVED
8			
7			
6			
5			
4			
3			
2			
1			



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 9+45 TO "LV" 15+50
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

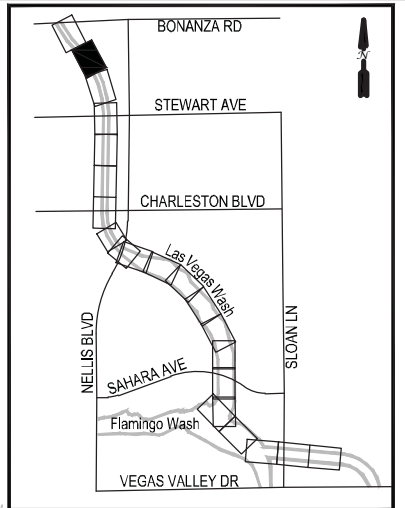
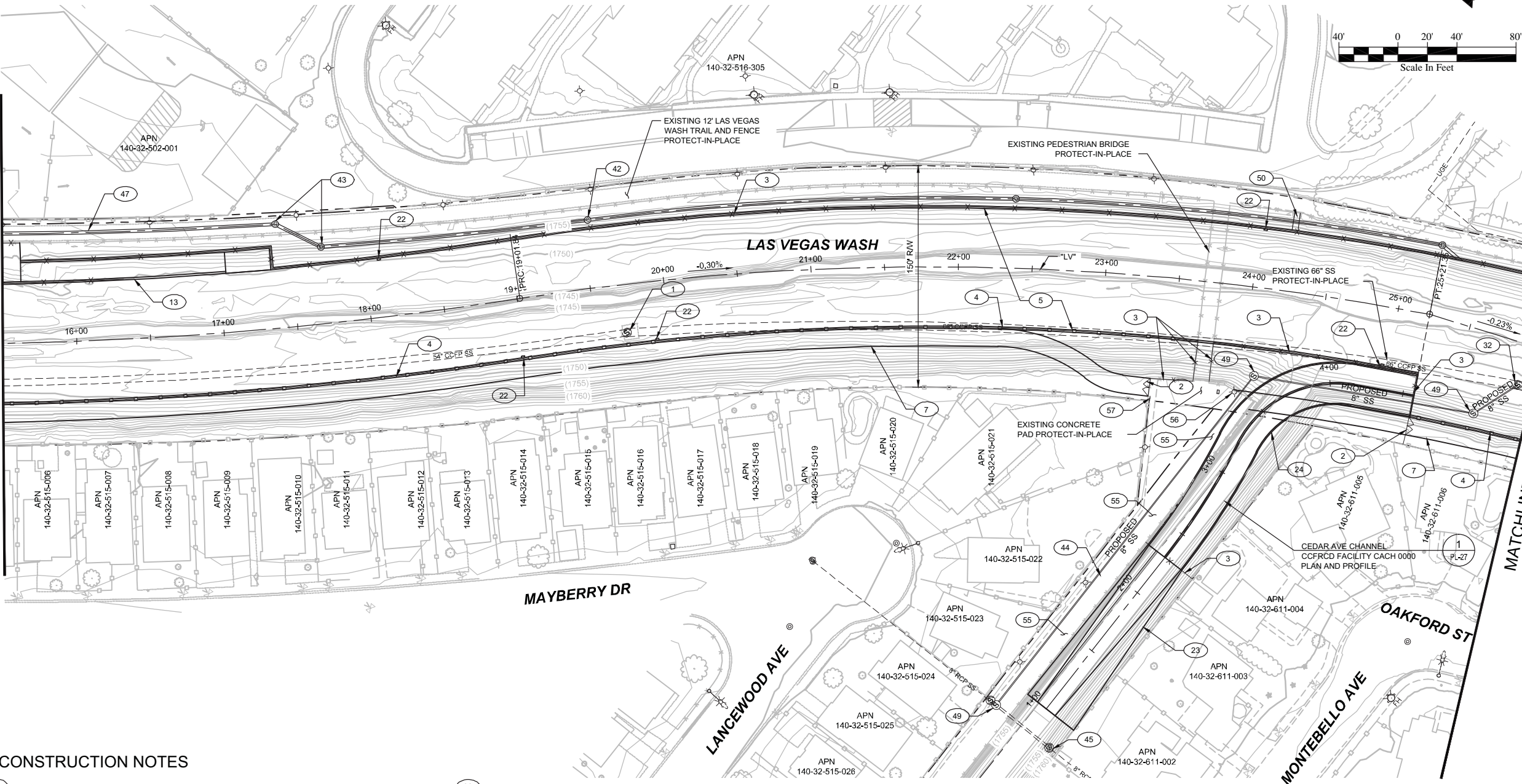


DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 25423

L-2031
DRAWING NO.
PL-1
SHT: OF

MATCHLINE "LV" 15+50 ~ SEE SHEET PL-2



KEYMAP

MATCHLINE "LV" 26+00 ~ SEE SHEET PL-3

CONSTRUCTION NOTES

- 1 ADJUST EXISTING SS MANHOLE TO CHANNEL FINISHED GRADE PER DET
- 2 INSTALL 14' WIDE DOUBLE SWING GATE PER USDCCA 253
- 3 INSTALL 6' CHAIN LINK FENCE PER USDCCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET
- 5 CONSTRUCT 80' CONCRETE RECTANGULAR CHANNEL
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 13 CONSTRUCT ACCESS RAMP PER DET
- 22 INSTALL GATE. SEE FENCE SCHEDULE
- 23 CONSTRUCT CONCRETE TRANSITION FROM 14' TRAPEZOIDAL CHANNEL TO DUAL 13'X10' RCB
- 24 CONSTRUCT DUAL 13'X10' RCB

- 32 CONSTRUCT SANITARY SEWER MANHOLE PER DET
- 42 CONSTRUCT 48" TYPE 1 MANHOLE PER USD 403
- 43 CONSTRUCT 60" TYPE 1 MANHOLE PER USD 403
- 44 CONSTRUCT 8" SANITARY SEWER
- 45 CAP EXISTING SANITARY SEWER
- 47 CONCRETE TRAIL STA. 15+00 TO 17+60
- 49 CONSTRUCT 48" SANITARY SEWER
- 50 CONSTRUCT 4' WIDE CONCRETE SWALE PER DET
- 55 CONSTRUCT ASPHALT TRAIL
- 56 RESET TRAIL LIGHT
- 57 INSTALL "NO OUTLET" SIGN

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-2

FAST
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UnderGround
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FREEWAY AND ARTERIAL
SYSTEM OF TRANSPORTATION

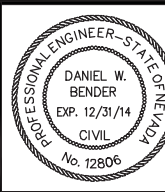
AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.
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Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

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811
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

REV No.	DATE	DESCRIPTION	APPROVED
8			
7			
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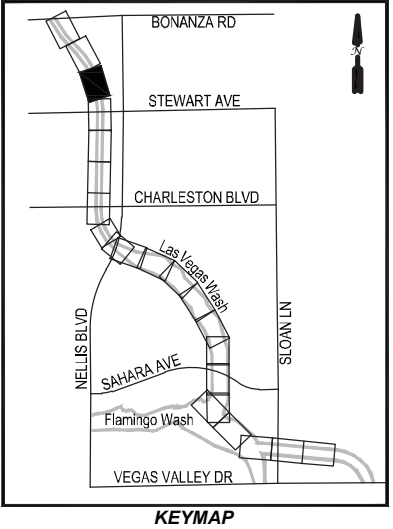
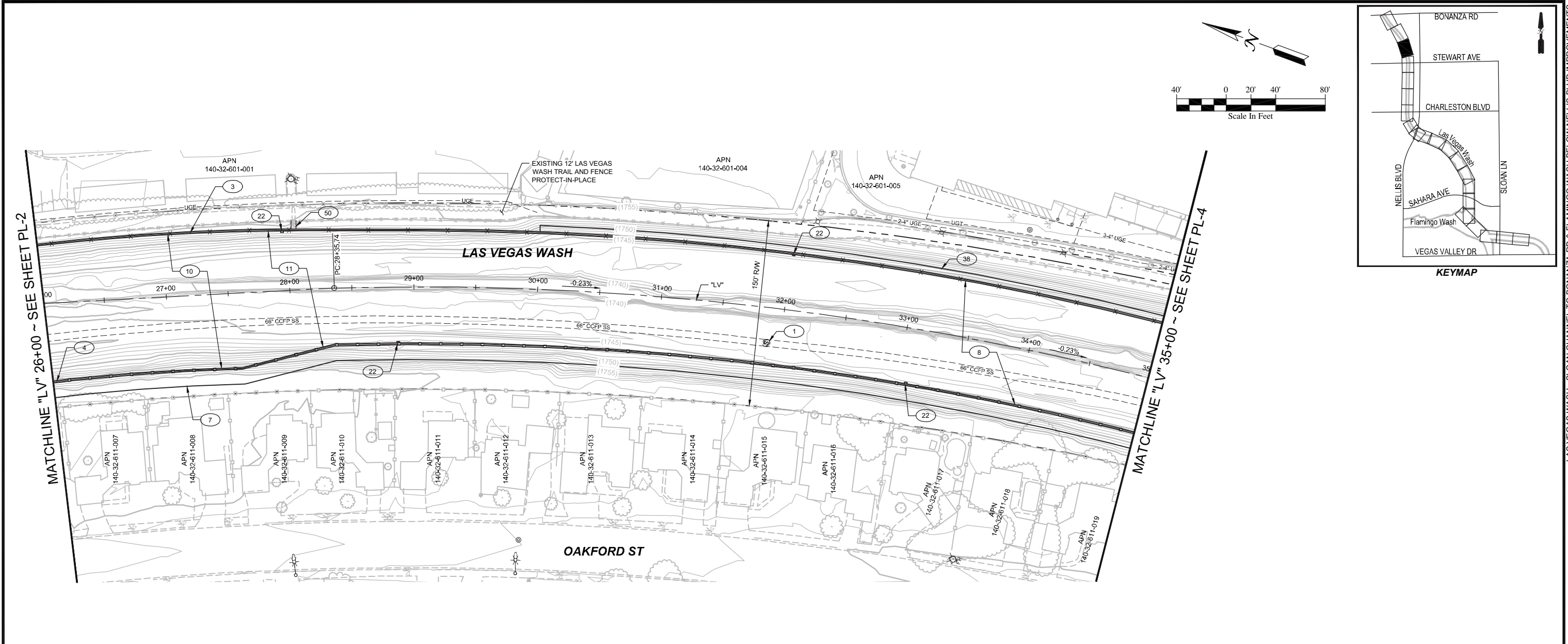
LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 15+50 TO "LV" 26+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 25423

L-2031
DRAWING NO.
PL-2
SHT: OF



- CONSTRUCTION NOTES**
- 1 ADJUST EXISTING SS MANHOLE TO CHANNEL FINISHED GRADE PER DET ____
 - 3 INSTALL 6" CHAIN LINK FENCE PER USDOCA 252
 - 4 INSTALL POST AND CABLE FENCE PER DET ____
 - 7 CONSTRUCT 12' MAINTENANCE ROAD
 - 8 CONSTRUCT 90' CONCRETE RECTANGULAR CHANNEL
 - 10 CONSTRUCT 109.5' RECTANGULAR CONCRETE CHANNEL
 - 11 CONSTRUCT TRANSITION FROM 108' TO 90' RECTANGULAR CONCRETE CHANNEL
 - 22 INSTALL GATE. SEE FENCE SCHEDULE
 - 38 CONSTRUCT 5' MANWAY PER DET ____
 - 50 CONSTRUCT 4' WIDE CONCRETE SWALE PER DET ____

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CHANNEL PROFILE
SEE SHEET PR-3**

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FREEMAN AND ARTERIAL
SYSTEM OF TRANSPORTATION

AVOID OVERHEAD POWER LINE CONTACT.
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UTILITY LINES. IT'S COSTLY.
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 26+00 TO "LV" 35+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



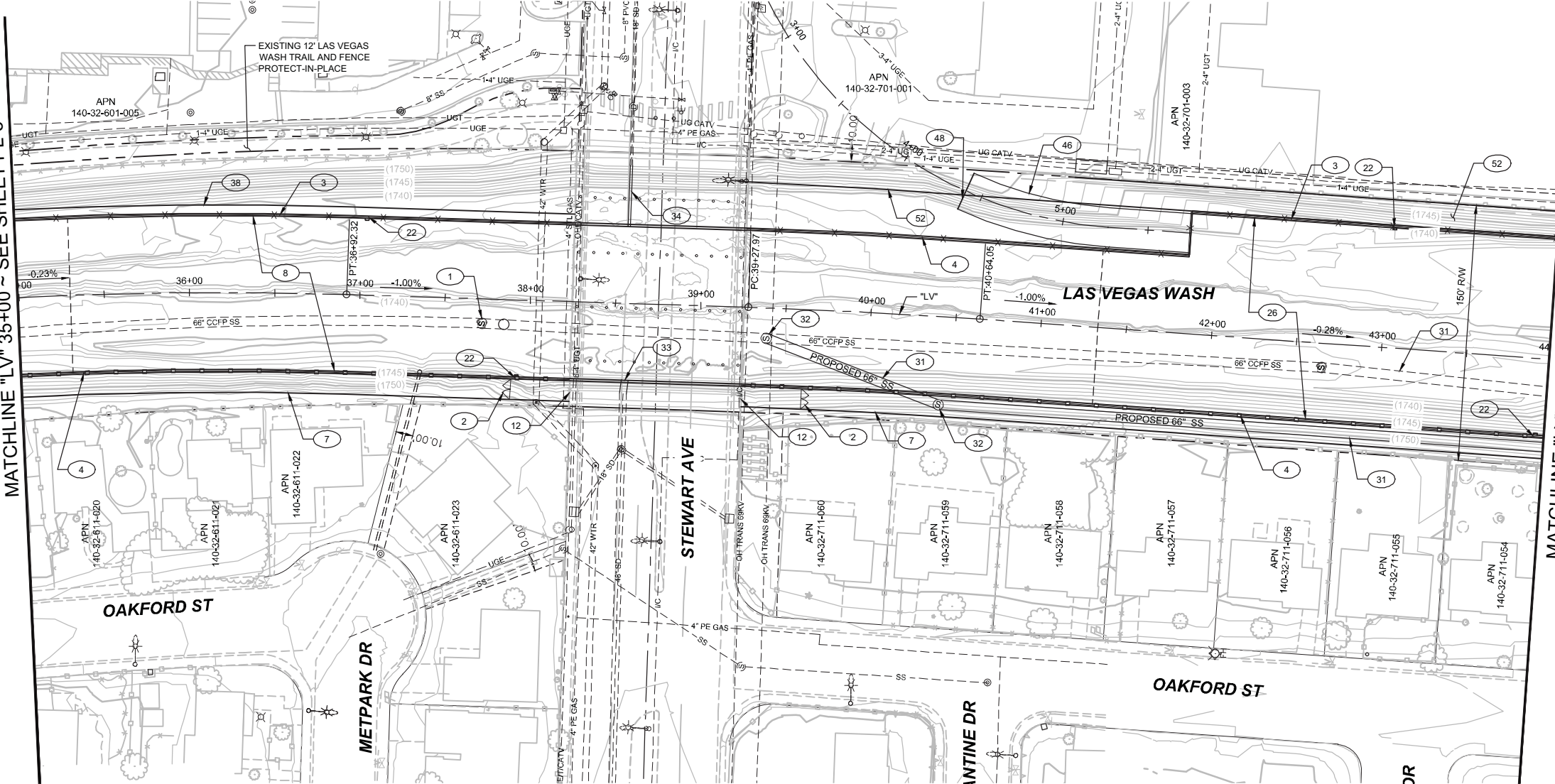
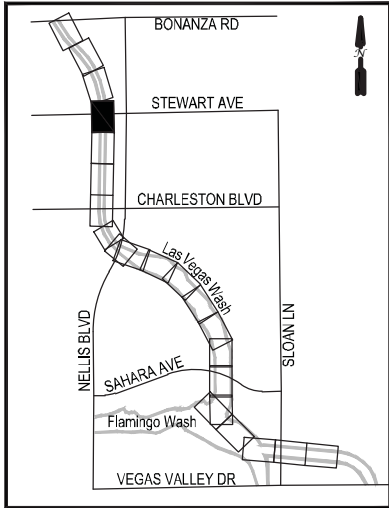
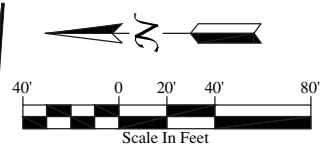
DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 25423

L-2031
DRAWING NO.
PL-3
SHT: OF

MATCHLINE "LV" 35+00 ~ SEE SHEET PL-3

MATCHLINE "LV" 44+00 ~ SEE SHEET PL-5



CONSTRUCTION NOTES

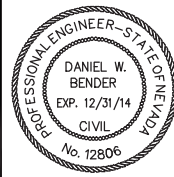
- 1 ADJUST EXISTING SS MANHOLE TO CHANNEL FINISHED GRADE PER DET
- 2 INSTALL 14' WIDE DOUBLE SWING GATE PER USDCCA 253
- 3 INSTALL 6' CHAIN LINK FENCE PER USDCCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 8 CONSTRUCT 90' CONCRETE RECTANGULAR CHANNEL
- 12 MAINTENANCE ROAD ACCEDD PER STRUCTURAL DET
- 22 INSTALL GATE. SEE FENCE SCHEDULE
- 26 CONSTRUCT 124' RECTANGULAR CONCRETE CHANNEL
- 30 CONSTRUCT RESIDENTIAL CMU SCREEN WALL
- 31 INSTALL 66" SANITARY SEWER (CCFP) PER DET
- 32 CONSTRUCT SANITARY SEWER MANHOLE PER DET
- 33 EXTEND EXISTING 48" RCP STORMDRAIN PER DET
- 34 EXTEND EXISTING 18" RCP STORMDRAIN PER DET
- 38 CONSTRUCT 5' MANWAY PER DET
- 46 CONSTRUCT DUAL 11'X10' RCB
- 48 INSTALL CAP ON (2) 11'X10' RCB WITH BRICK AND MORTAR OR PRECAST CONCRETE PLUG
- 52 CONSTRUCT 15' MAINTENANCE ROAD & TRAIL

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-4

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 35+00 TO "LV" 44+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



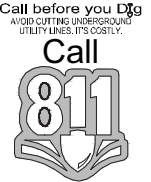
DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 25423

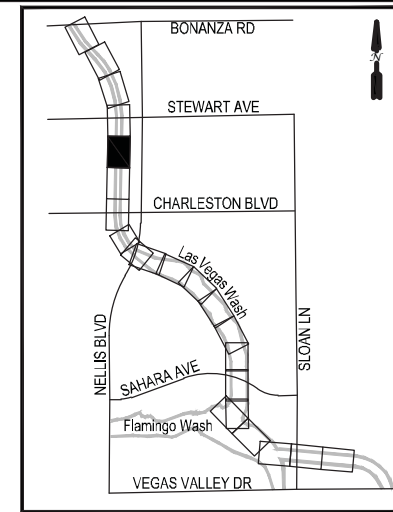
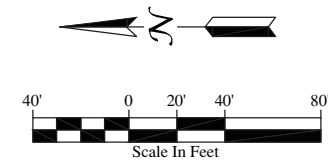
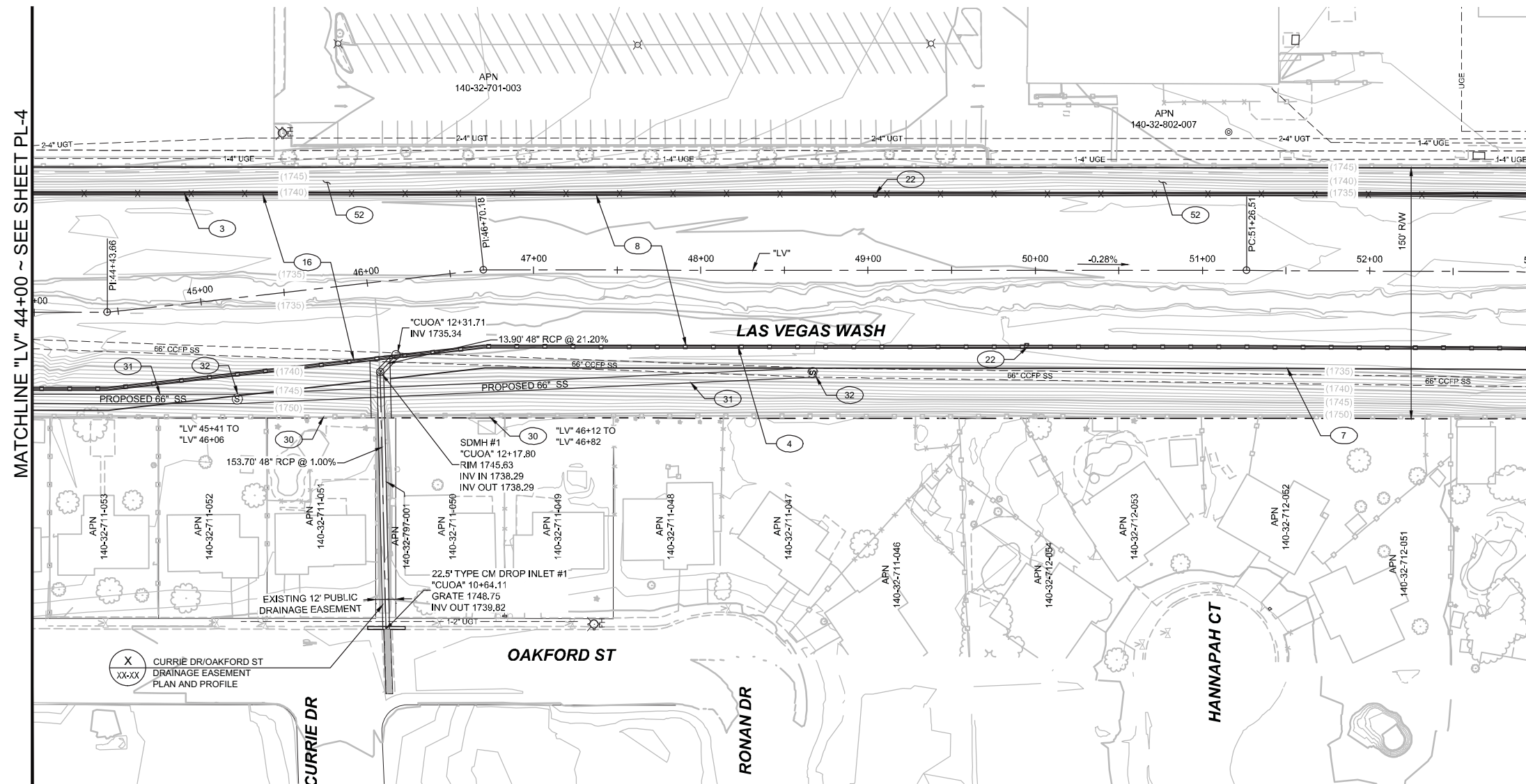
L-2031
DRAWING NO.
PL-4
SHT: OF



Call before you
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NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CONSTRUCTION NOTES

- 3 INSTALL 6" CHAIN LINK FENCE PER USDCCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET ____
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 8 CONSTRUCT 90' CONCRETE RECTANGULAR CHANNEL
- 16 CONSTRUCT TRANSITION FROM 124' TO 100' RECTANGULAR CONCRETE CHANNEL
- 22 INSTALL GATE. SEE FENCE SCHEDULE
- 30 CONSTRUCT RESIDENTIAL CMU SCREEN WALL
- 31 INSTALL 66" SANITARY SEWER (CCFP) PER DET ____
- 32 CONSTRUCT SANITARY SEWER MANHOLE PER DET ____
- 52 CONSTRUCT 15' MAINTENANCE ROAD & TRAIL

**FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-5**



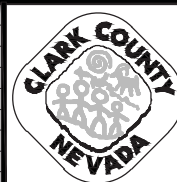
AVOID OVERHEAD POWER LINE CONTACT.
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Call
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NV ENERGY ENVIRONMENT AND
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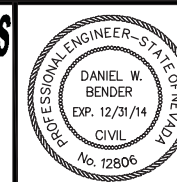
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN

"LV" 44+00 TO "LV" 53+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY:	<u>H. MURVOSH</u>
DRAWN BY:	<u>S. ELIZONDO</u>
CHECKED BY:	<u>D. BENDER</u>
DATE:	<u>August 6, 2013</u>



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 LAS VEGAS, NEVADA 89119 (702) 369-9396

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	SCALE
	HORIZ: 1"=40'
	VERT: NONE
	FIELD BOOK
	WORK ORDER
PROJECT No.	25423

L-2031

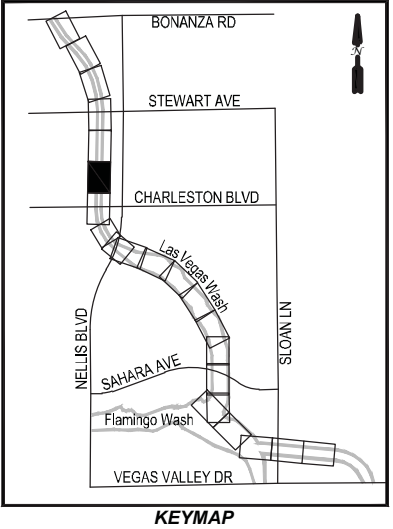
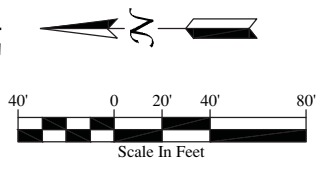
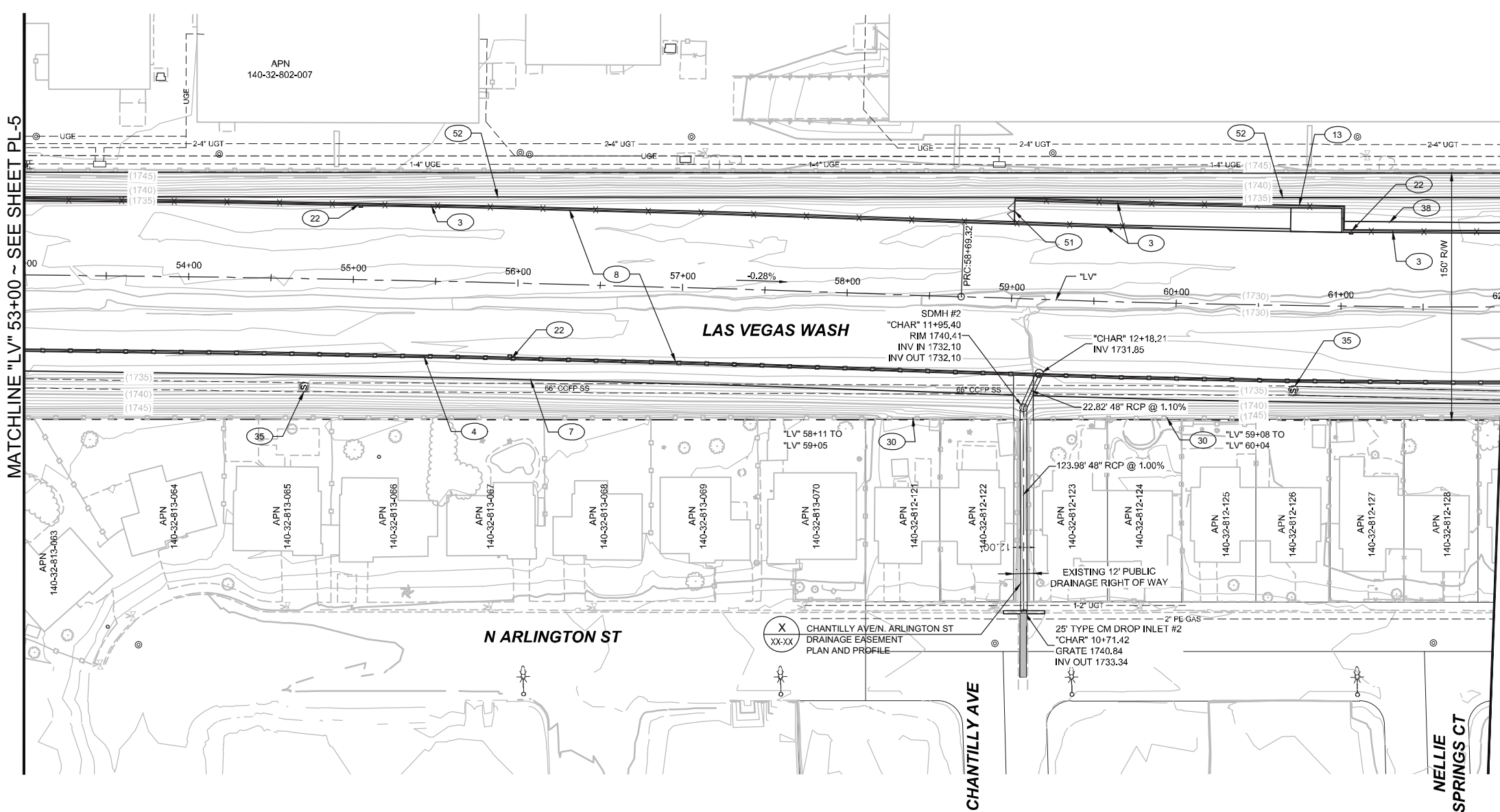
DRAWING NO.

PL-5

SHT: OF

MATCHLINE "LV" 53+00 ~ SEE SHEET PL-5

MATCHLINE "LV" 62+00 ~ SEE SHEET PL-7

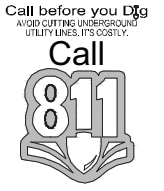


- CONSTRUCTION NOTES**
- 3 INSTALL 6" CHAIN LINK FENCE PER USDOCA 252
 - 4 INSTALL POST AND CABLE FENCE PER DET ____
 - 7 CONSTRUCT 12' MAINTENANCE ROAD
 - 8 CONSTRUCT 90' CONCRETE RECTANGULAR CHANNEL
 - 13 CONSTRUCT ACCESS RAMP PER DET ____
 - 22 INSTALL GATE. SEE FENCE SCHEDULE
 - 30 CONSTRUCT RESIDENTIAL CMU SCREEN WALL
 - 35 ADJUST EXISTING SS MANHOLE TO FINISHED GRADE PER DET ____
 - 38 CONSTRUCT 5' MANWAY PER DET ____
 - 51 INSTALL 13' WIDE DOUBLE SWING GATE PER USDOCA 253
 - 52 CONSTRUCT 15' MAINTENANCE ROAD & TRAIL

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-6



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SAFETY SERVICES DEPARTMENT



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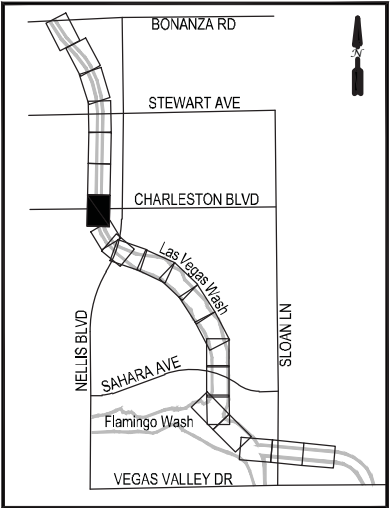
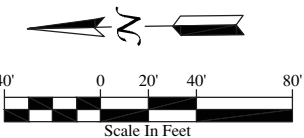
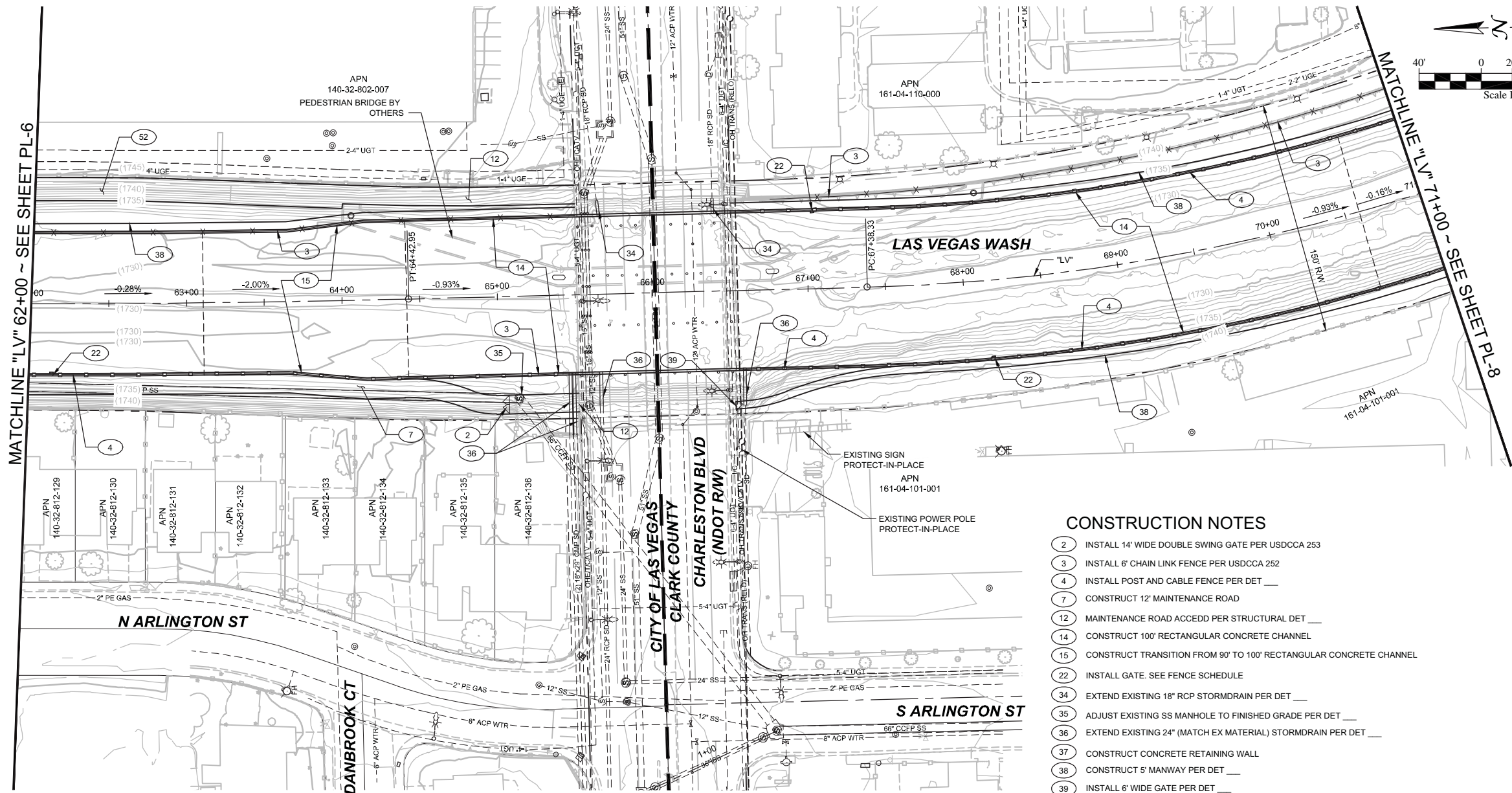
LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 53+00 TO "LV" 62+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 25423

L-2031
DRAWING NO.
PL-6
SHT: OF



CONSTRUCTION NOTES

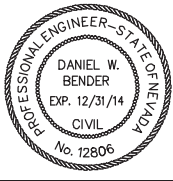
- 2 INSTALL 14' WIDE DOUBLE SWING GATE PER USDCCA 253
- 3 INSTALL 6' CHAIN LINK FENCE PER USDCCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 12 MAINTENANCE ROAD ACCEDD PER STRUCTURAL DET
- 14 CONSTRUCT 100' RECTANGULAR CONCRETE CHANNEL
- 15 CONSTRUCT TRANSITION FROM 90' TO 100' RECTANGULAR CONCRETE CHANNEL
- 22 INSTALL GATE. SEE FENCE SCHEDULE
- 34 EXTEND EXISTING 18" RCP STORMDRAIN PER DET
- 35 ADJUST EXISTING SS MANHOLE TO FINISHED GRADE PER DET
- 36 EXTEND EXISTING 24" (MATCH EX MATERIAL) STORMDRAIN PER DET
- 37 CONSTRUCT CONCRETE RETAINING WALL
- 38 CONSTRUCT 5' MANWAY PER DET
- 39 INSTALL 6' WIDE GATE PER DET
- 52 CONSTRUCT 15' MAINTENANCE ROAD & TRAIL

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-7

REV No.	DATE	DESCRIPTION	APPROVED
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 62+00 TO "LV" 71+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396

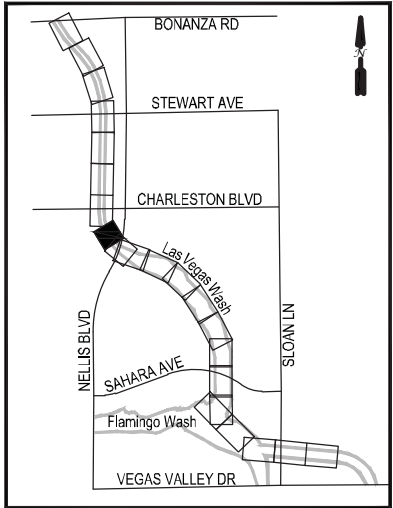
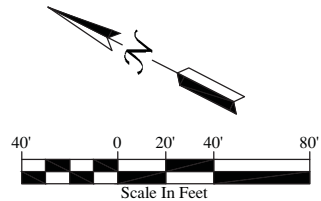
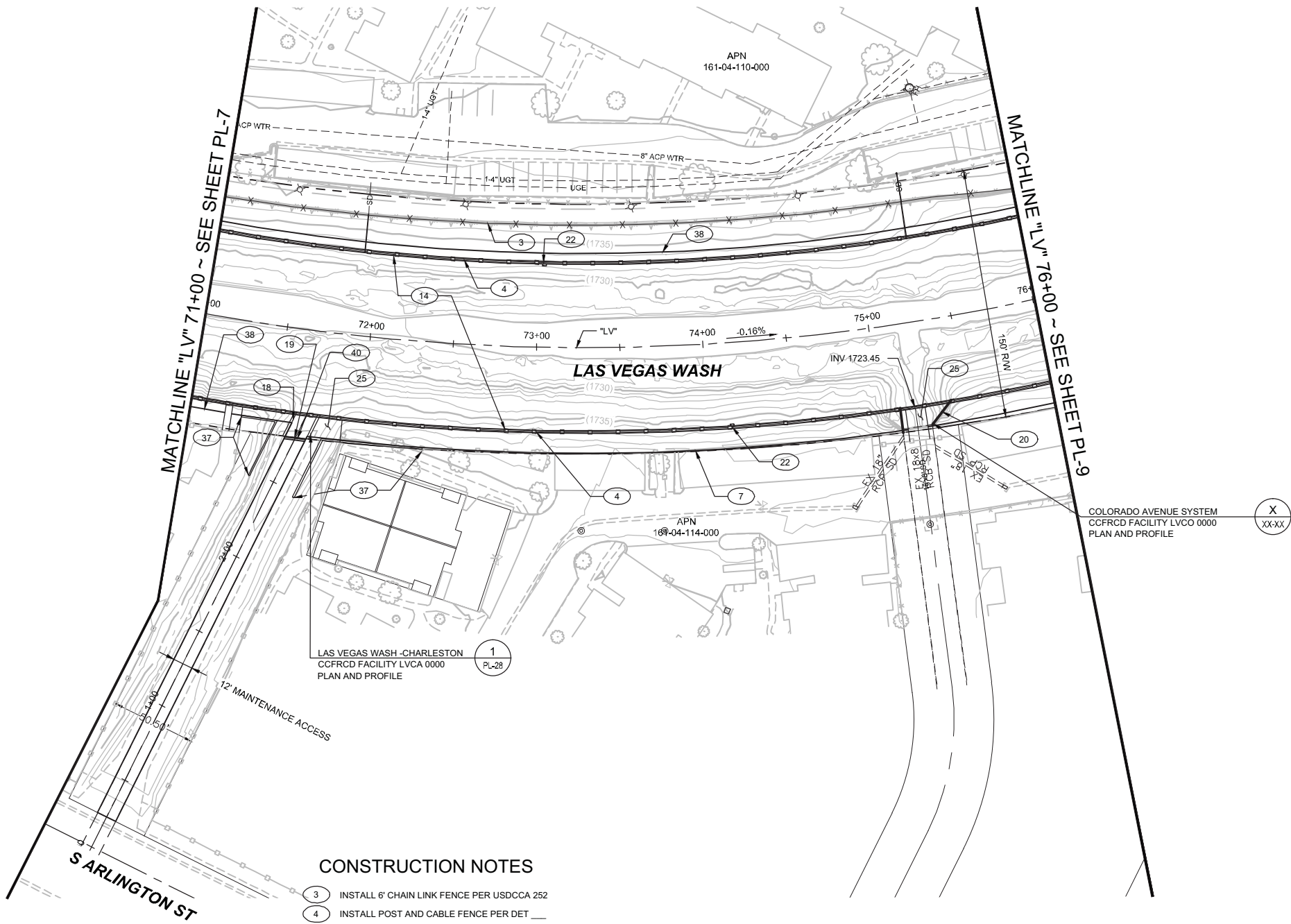
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HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PL-7
SHT: OF



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CONSTRUCTION NOTES

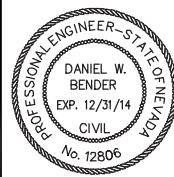
- 3 INSTALL 6' CHAIN LINK FENCE PER USDOCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET ____
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 14 CONSTRUCT 100' RECTANGULAR CONCRETE CHANNEL
- 18 CONSTRUCT 12'X9' RCB
- 19 INSTALL CAP ON 12'X9' RCB WITH BRICK AND MORTAR OR PRECAST CONCRETE PLUG
- 20 CONSTRUCT 18'X8' RCB EXTENSION WITH FLARED END PER DET ____
- 22 INSTALL GATE. SEE FENCE SCHEDULE
- 25 CONSTRUCT 12' CONCRETE MAINTENANCE ACCESS ROAD
- 37 CONSTRUCT CONCRETE RETAINING WALL
- 38 CONSTRUCT 5' MANWAY PER DET ____
- 40 CONSTRUCT 3' DEEP CONCRETE CUT OFF WALL PER DET ____

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-8

REV No.	DATE	DESCRIPTION	APPROVED
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 71+00 TO "LV" 76+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013

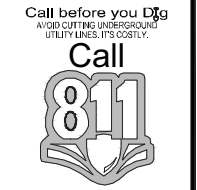
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 24523
SHT: OF

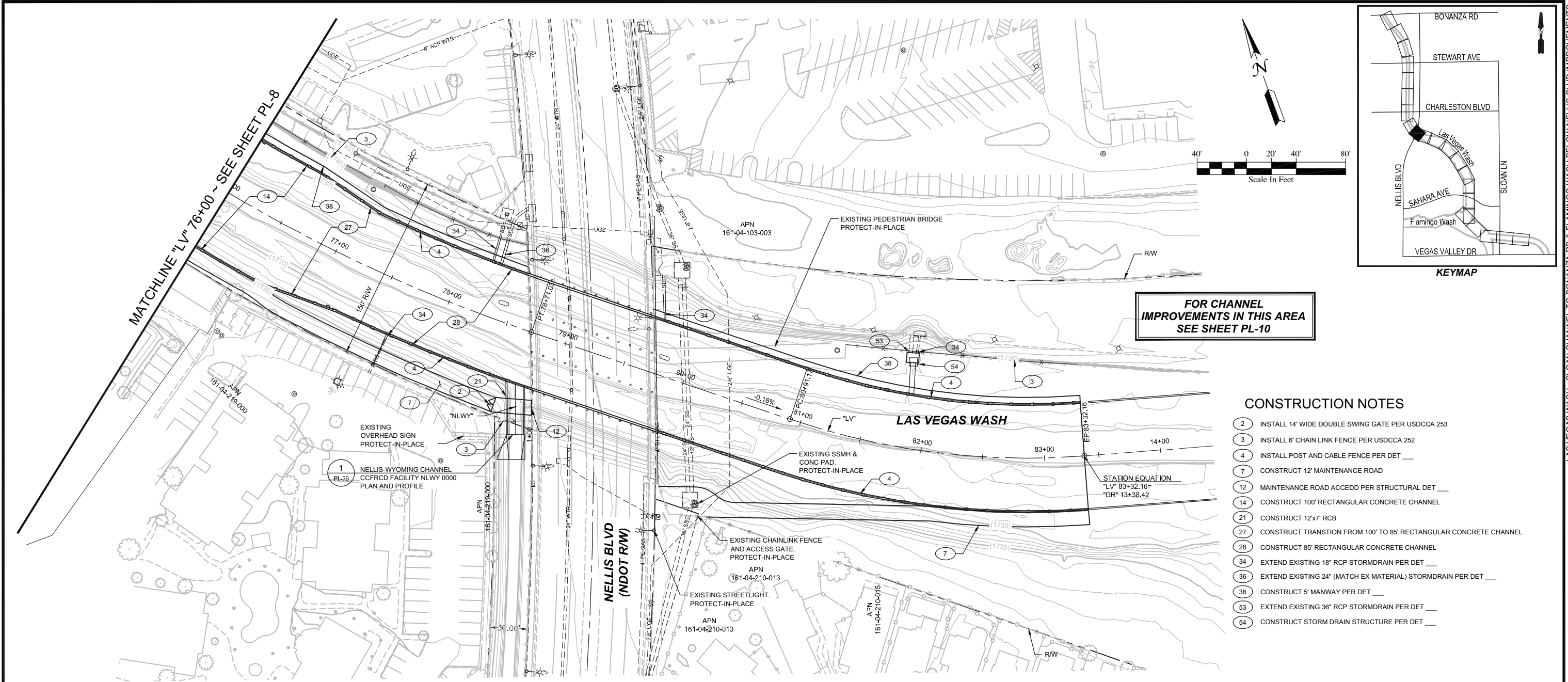
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



FOR CHANNEL IMPROVEMENTS IN THIS AREA SEE SHEET PL-10

CONSTRUCTION NOTES

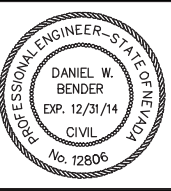
- 2 INSTALL 14' WIDE DOUBLE SWING GATE PER USDOCA 253
- 3 INSTALL 6' CHAIN LINK FENCE PER USDOCA 252
- 4 INSTALL POST AND CABLE FENCE PER DET
- 7 CONSTRUCT 12' MAINTENANCE ROAD
- 12 MAINTENANCE ROAD ACCORD PER STRUCTURAL DET
- 14 CONSTRUCT 100' RECTANGULAR CONCRETE CHANNEL
- 21 CONSTRUCT 12x7' RCB
- 27 CONSTRUCT TRANSITION FROM 100' TO 85' RECTANGULAR CONCRETE CHANNEL
- 28 CONSTRUCT 85' RECTANGULAR CONCRETE CHANNEL
- 34 EXTEND EXISTING 18" RCP STORMDRAIN PER DET
- 36 EXTEND EXISTING 24" (MATCH EX MATERIAL) STORMDRAIN PER DET
- 38 CONSTRUCT 5' MANWAY PER DET
- 53 EXTEND EXISTING 36" RCP STORMDRAIN PER DET
- 54 CONSTRUCT STORM DRAIN STRUCTURE PER DET

FOR DRAINAGE CHANNEL PROFILE SEE SHEET PR-9

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"LV" 76+00 TO "LV" 83+32.16
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



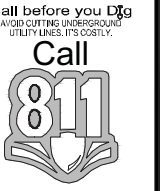
DESIGNED BY: H. MURVOSH
DRAWN BY: S. ELIZONDO
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396

SCALE
HORIZ: 1"=40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 24523
SHT: OF

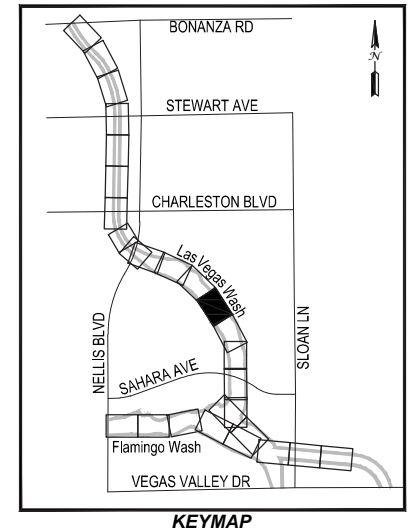
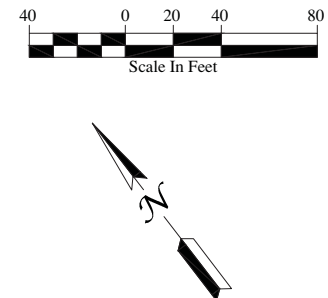
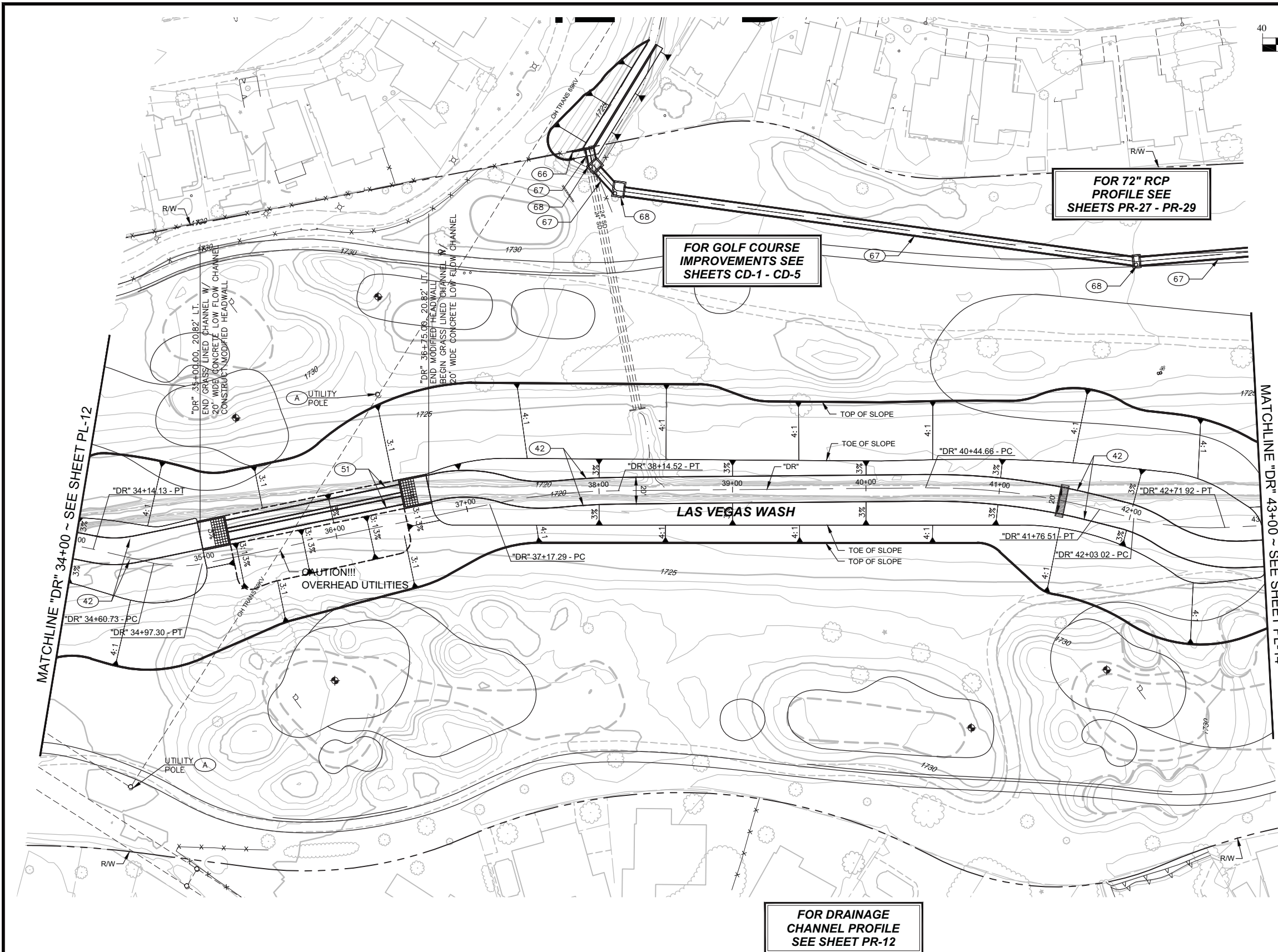
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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



- LEGEND**
- GOLF COURSE FOOT BRIDGE
 - GOLF COURSE CONTROL POINT
- CONSTRUCTION NOTES**
- 42 CONSTRUCT 20' WIDE x 1' DEEP CONCRETE LOW FLOW CHANNEL (SEE DETAILS ON SHEET TY-10)
 - 51 CONSTRUCT 2-43"x68" HERCP CULVERT WITH HEADWALLS (SEE PROFILE ON SHEET PR-13)
 - 66 CONSTRUCT RCP HEADWALL (SEE PROFILE ON SHEET PR-27, PR-28 & PR-29)
 - 67 INSTALL 72" RCP STORM DRAIN (SEE PROFILE ON SHEET PR-27, PR-28 & PR-29)
 - 68 CONSTRUCT TYPE 4 STORM DRAIN MANHOLE PER NDOT STD. DWG. NO. R-4.3.2 (SEE PROFILE ON SHEET PR-27, PR-28 & PR-29)
 - A PROTECT IN PLACE

FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-12

FOR 72" RCP
PROFILE SEE
SHEETS PR-27 - PR-29

FOR GOLF COURSE
IMPROVEMENTS SEE
SHEETS CD-1 - CD-5

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IT'S COSTLY.

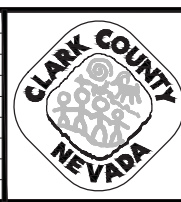
Call before you Dig
before you
Overhead
1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call 811

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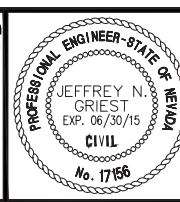


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"DR" 34+00 TO "DR" 43+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE	
HORIZ: 1" = 40'	
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FIELD BOOK	
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PROJECT No. 462579	SHT: OF

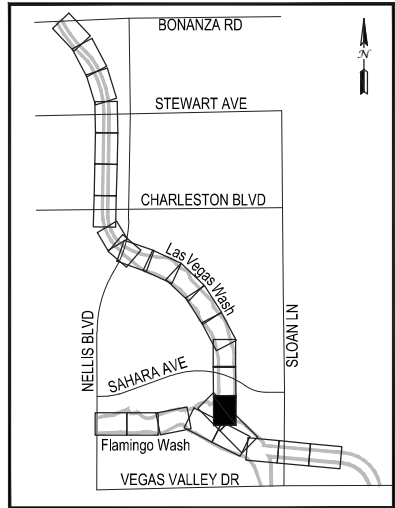
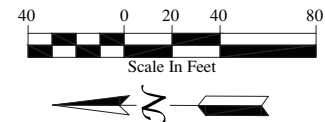
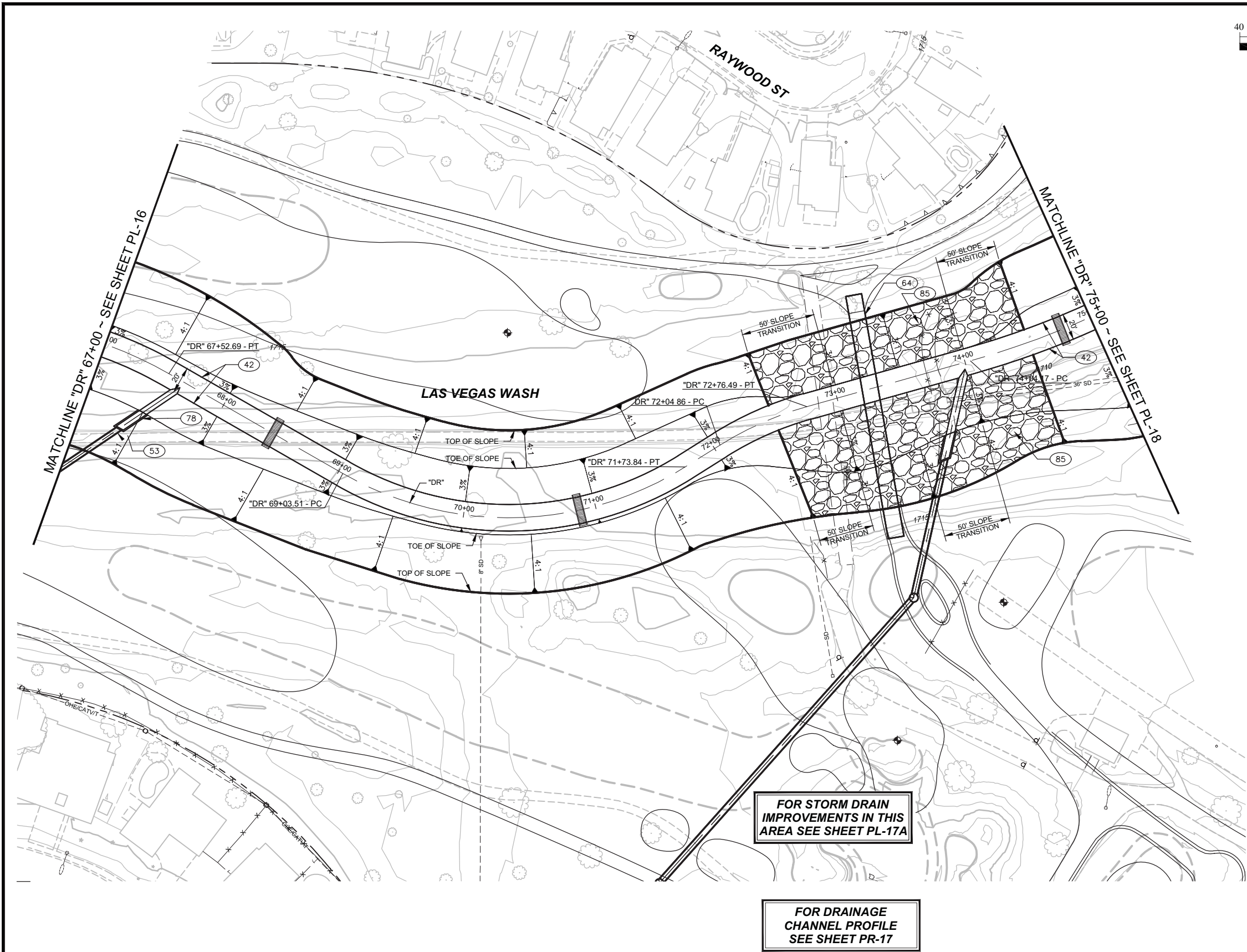
L-2031

DRAWING NO.

PL-13

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



LEGEND

- GOLF COURSE FOOT BRIDGE
- GOLF COURSE CONTROL POINT

CONSTRUCTION NOTES

- 42 CONSTRUCT 20' WIDE x 1' DEEP CONCRETE LOW FLOW CHANNEL (SEE DETAILS ON SHEET TY-10)
- 53 INSTALL 42" RCP STORM DRAIN PIPE
- 64 CONSTRUCT 12' WIDE STEEL PEDESTRIAN BRIDGE CROSSING
- 78 CONSTRUCT MODIFIED HEADWALL
- 85 CONSTRUCT RIPRAP CHANNEL LINING $D_{50} = 18"$, $T = 36"$

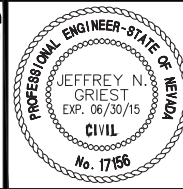
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NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you Dig
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NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"DR" 67+00 TO "DR" 75+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

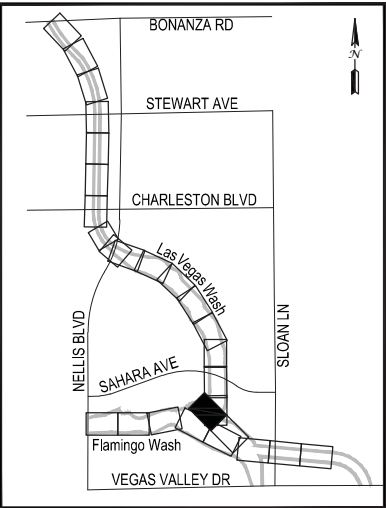
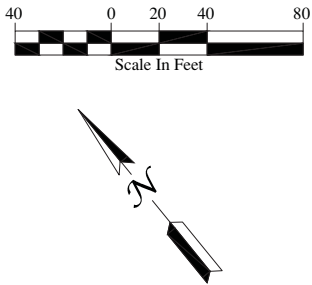
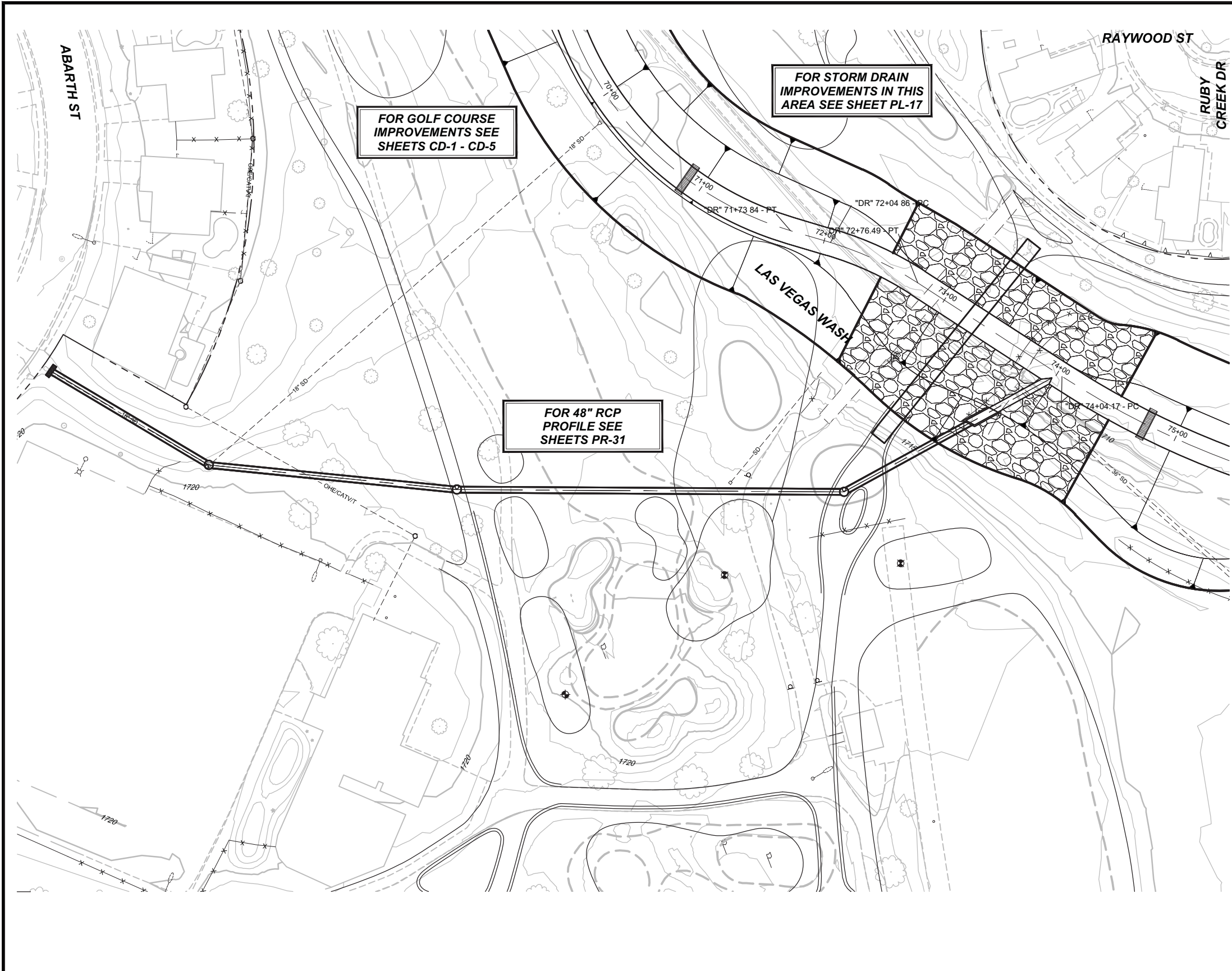


DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PL-17
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS NOT FOR CONSTRUCTION



LEGEND

- GOLF COURSE FOOT BRIDGE
- GOLF COURSE CONTROL POINT

CONSTRUCTION NOTES

- 59 CONSTRUCT TYPE 8 DROP INLET PER NDOT STD. DWG. NO R-4.2.4.1
- 60 INSTALL 48" RCP STORM DRAIN PIPE
- 61 CONSTRUCT 72" TYPE 1 STORM DRAIN MANHOLE PER USDCCA STD. DWG. NO. 403.
- 7B CONSTRUCT MODIFIED HEADWALL
- A PROTECT IN PLACE

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.

Call before you Dig

Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"DR" 67+00 TO "DR" 75+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE

HORIZ: 1" = 40'

VERT: NONE

FIELD BOOK

WORK ORDER

PROJECT No. 462579

L-2031

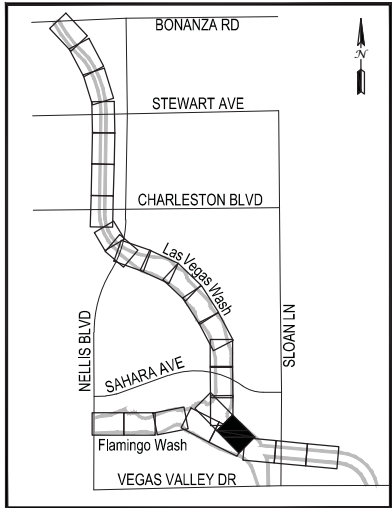
DRAWING NO.

PL-17A

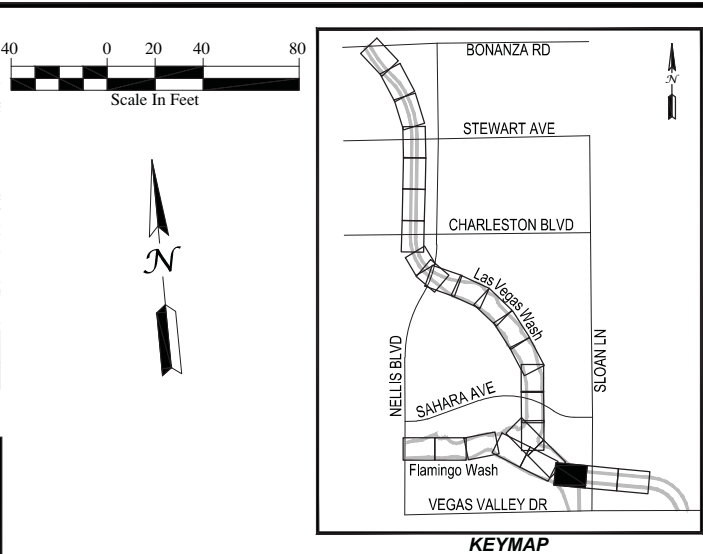
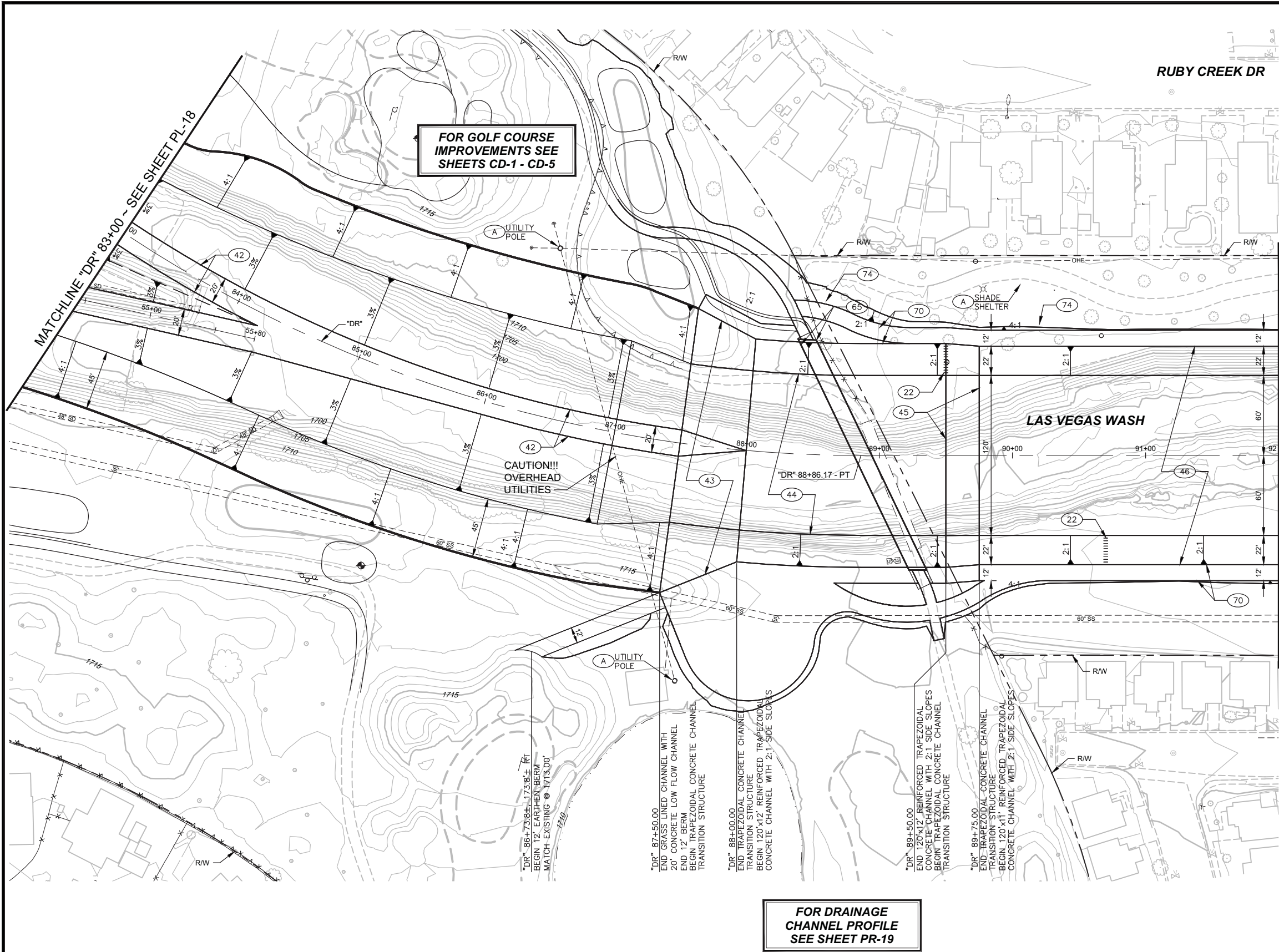
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



NOT FOR CONSTRUCTION



LEGEND

- GOLF COURSE FOOT BRIDGE
- GOLF COURSE CONTROL POINT

CONSTRUCTION NOTES

- 22 INSTALL CHANNEL ACCESS LADDER
- 42 CONSTRUCT 20' WIDE x 1' DEEP CONCRETE LOW FLOW CHANNEL (SEE DETAILS ON SHEET TY-10)
- 43 CONSTRUCT CONCRETE TRANSITION STRUCTURE
- 44 CONSTRUCT 120' WIDE x 12' DEEP CONCRETE TRAPEZOIDAL CHANNEL WITH 2:1 SIDE SLOPES (SEE DETAILS ON SHEET TY-12)
- 45 CONSTRUCT CONCRETE TRANSITION STRUCTURE
- 46 CONSTRUCT 120' WIDE x 11' DEEP CONCRETE TRAPEZOIDAL CHANNEL WITH 2:1 SIDE SLOPES (SEE DETAILS ON SHEET TY-13)
- 65 CONSTRUCT 12' WIDE STEEL PEDESTRIAN BRIDGE CROSSING
- 70 CONSTRUCT 12' TYPE II AGGREGATE BASE MAINTENANCE ROAD
- 71 CONNECT TO EXISTING CONCRETE CHANNEL SLOPE PER STRUCTURAL DETAILS
- 74 LANDSCAPE SLOPE TO MATCH EXISTING
- A PROTECT IN PLACE

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.

Call before you Dig

Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call before you Dig

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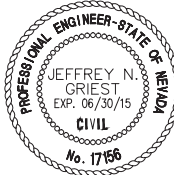


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"DR" 83+00 TO "DR" 92+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK

DRAWN BY: B. MAHAN

CHECKED BY: J. GR EST

DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350

HENDERSON, NEVADA 89074

PHONE 702-369-6175, FAX 702-369-1107

SCALE

HORIZ: 1" = 40'

VERT: NONE

FIELD BOOK

WORK ORDER

PROJECT No. 462579

SHT: OF

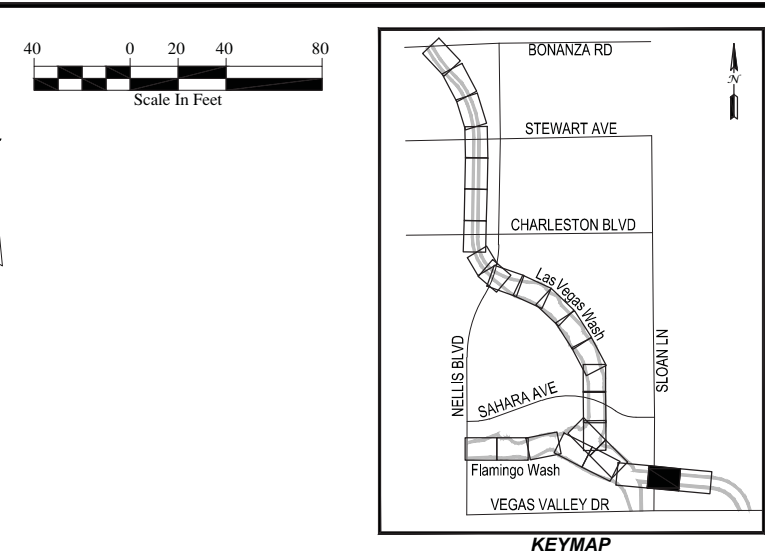
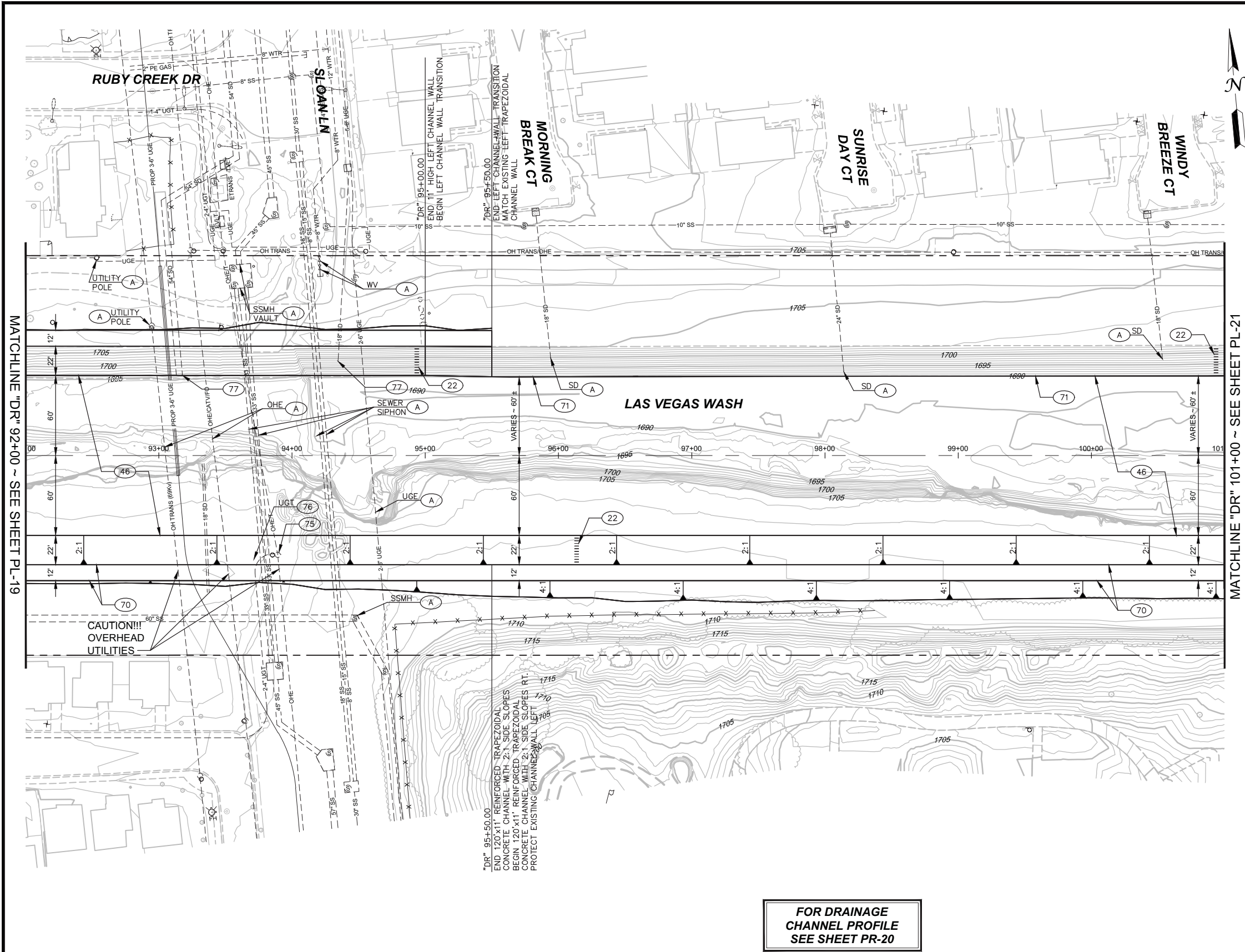
L-2031

DRAWING NO.

PL-19

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



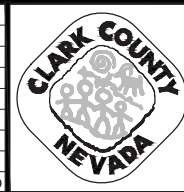
- LEGEND**
- GOLF COURSE FOOT BRIDGE
 - GOLF COURSE CONTROL POINT
- CONSTRUCTION NOTES**
- 22 INSTALL CHANNEL ACCESS LADDER
 - 46 CONSTRUCT 120' WIDE x 11' DEEP CONCRETE TRAPEZOIDAL CHANNEL WITH 2:1 SIDE SLOPES (SEE DETAILS ON SHEETS TY-13 & TY-14)
 - 70 CONSTRUCT 12' TYPE II AGGREGATE BASE MAINTENANCE ROAD
 - 71 CONNECT TO EXISTING CONCRETE CHANNEL SLOPE PER STRUCTURAL DETAILS
 - 75 EXISTING POWER POLE TO BE RELOCATED BY OTHERS
 - 76 EXISTING UNDERGROUND TELEPHONE TO BE RELOCATED BY OTHERS
 - A PROTECT IN PLACE

APPROVED FOR CONSTRUCTION
Las Vegas Valley Water District Engineering Services Manager
Date _____ Project No. _____

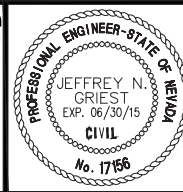
Call before you Dig
811
Call before you Dig
Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

FOR DRAINAGE CHANNEL PROFILE SEE SHEET PR-20

REV No.	DATE	DESCRIPTION	APPROVED
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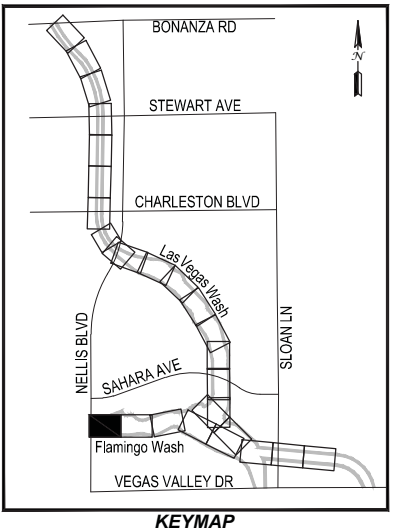
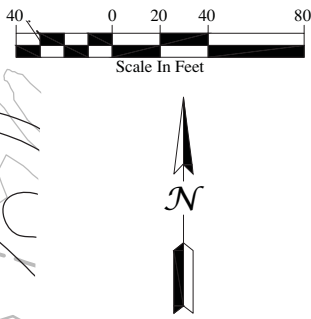
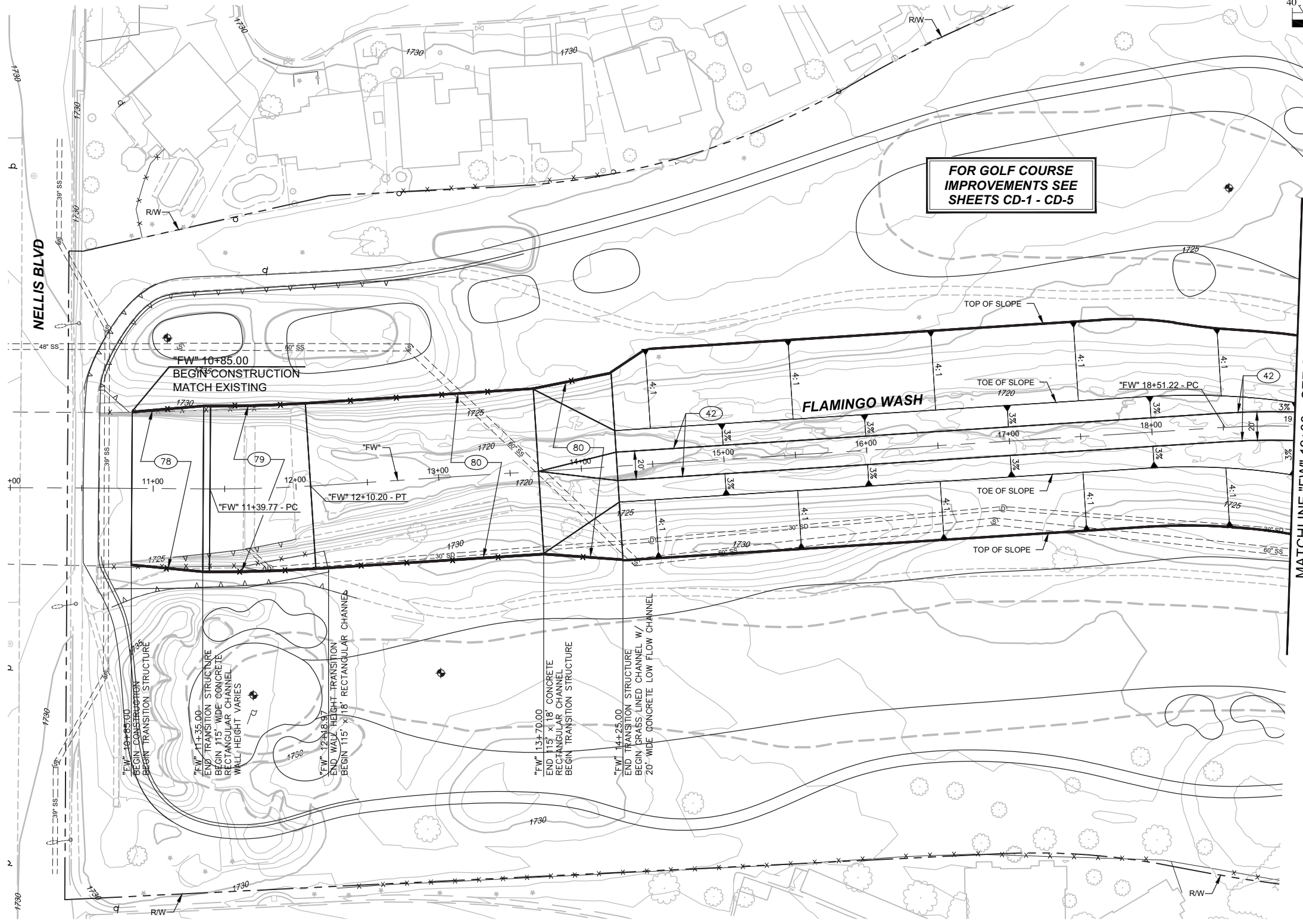
LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PLAN
"DR" 92+00 TO "DR" 101+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE	L-2031
HORIZ: 1" = 40'	DRAWING NO.
VERT: NONE	PL-20
FIELD BOOK	
WORK ORDER	
PROJECT No. 462579	SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



- LEGEND**
- GOLF COURSE FOOT BRIDGE
 - GOLF COURSE CONTROL POINT

- CONSTRUCTION NOTES**
- 42) CONSTRUCT 20' WIDE x 1' DEEP CONCRETE LOW FLOW CHANNEL (SEE DETAILS ON SHEET TY-10)

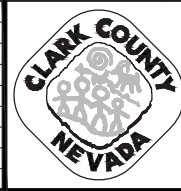
FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-23

FOR GOLF COURSE
IMPROVEMENTS SEE
SHEETS CD-1 - CD-5

Call before you Dig
Overhead
1-702-227-2929
NVE ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you Dig
811
NVE ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

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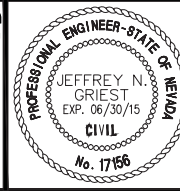


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"FW" 10+00 TO "FW" 19+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

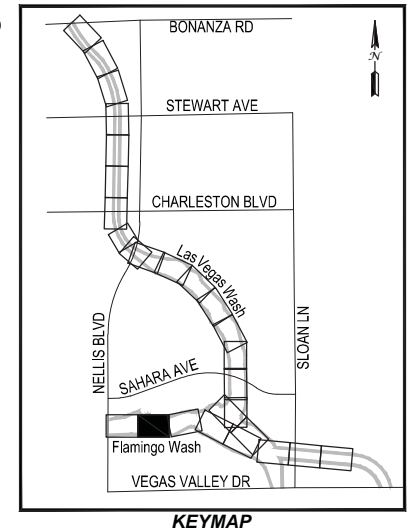
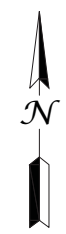
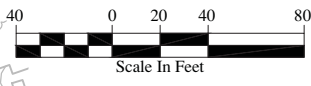
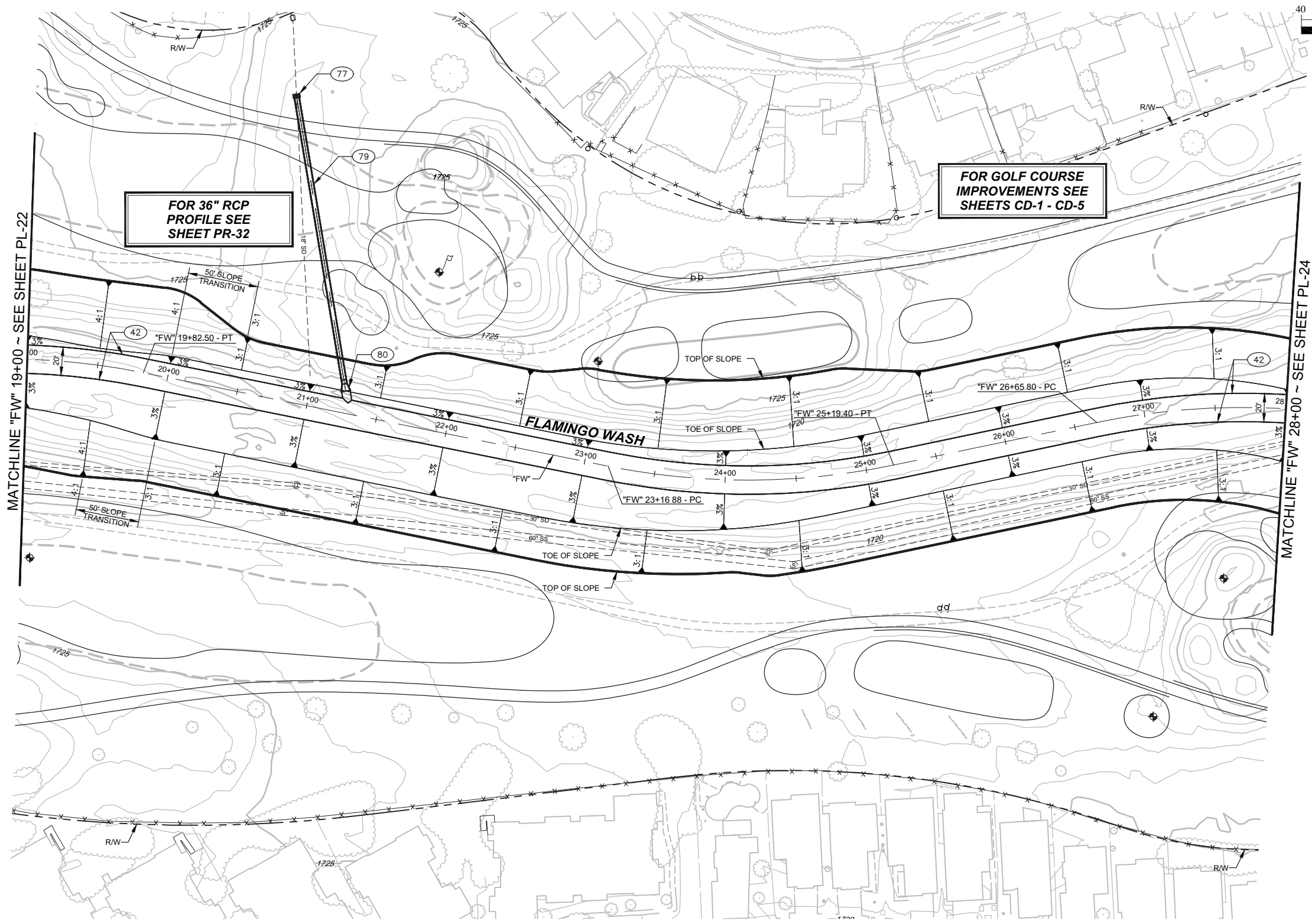
PL-22

SHT: OF

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



- LEGEND**
- GOLF COURSE FOOT BRIDGE
 - GOLF COURSE CONTROL POINT

- CONSTRUCTION NOTES**
- 42 CONSTRUCT 20' WIDE x 1' DEEP CONCRETE LOW FLOW CHANNEL (SEE DETAILS ON SHEET TY-10)
 - 77 CONSTRUCT TYPE 2A DROP INLET PER NDOT STD. DWG. R-4.2.1.1.
 - 79 INSTALL 36" RCP STORM DRAIN PIPE
 - 80 INSTALL 36" PRECAST RCP END SECTION

**FOR DRAINAGE
CHANNEL PROFILE
SEE SHEET PR-23**

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

**Call
before you
Overhead**

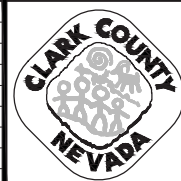
1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

**Call
before you
811**

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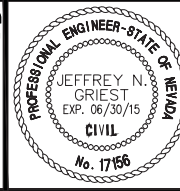


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"FW" 19+00 TO "FW" 28+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK

DRAWN BY: B. MAHAN

CHECKED BY: J. GR EST

DATE: August 5, 2013

CH2MHILL.

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

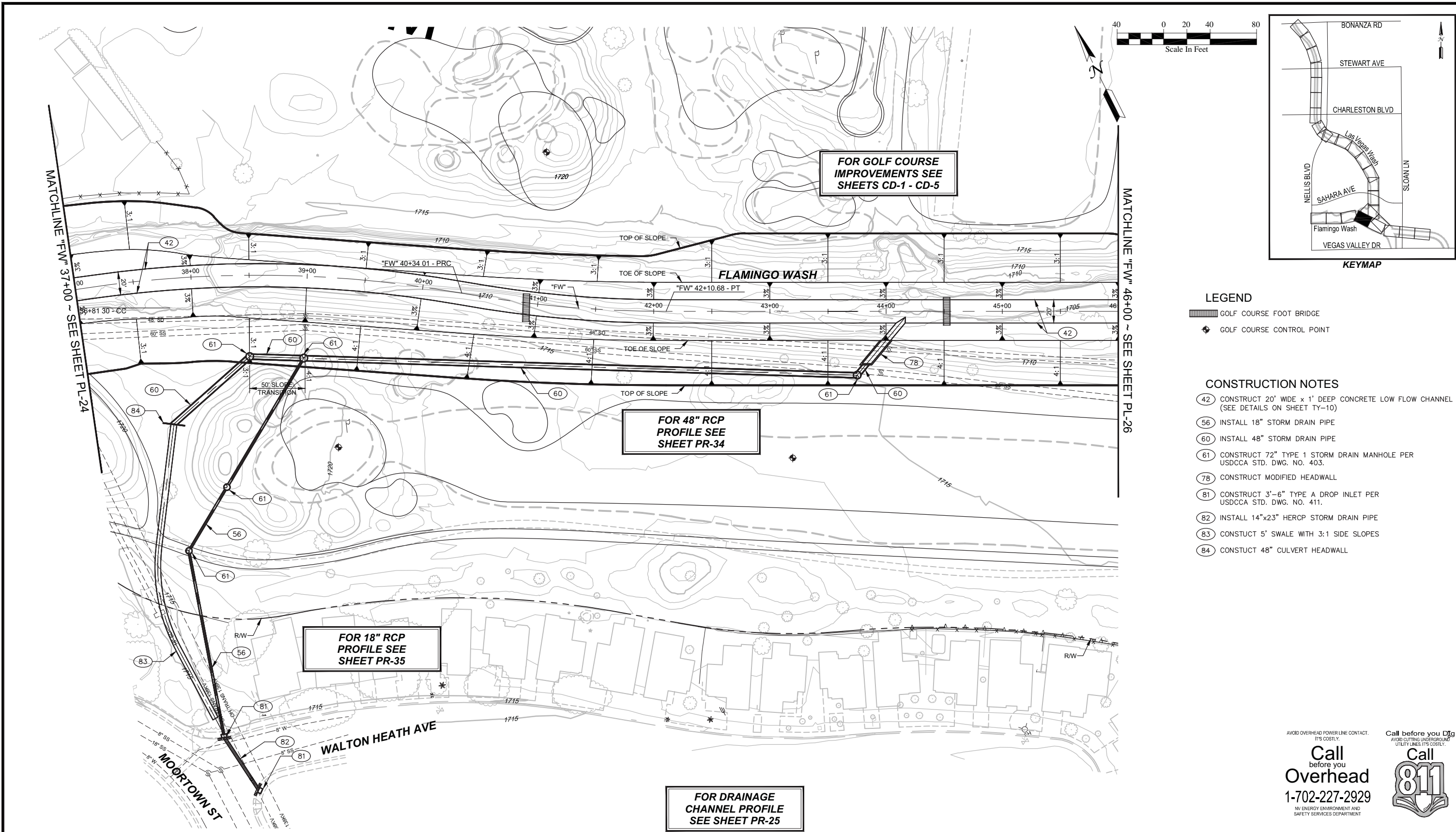
PL-23

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



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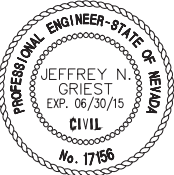


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PLAN

"FW" 37+00 TO "FW" 46+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL.
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: NONE
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

PL-25

SHT: OF

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.

Call before you Dig

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call before you Dig

811

Call before you Dig

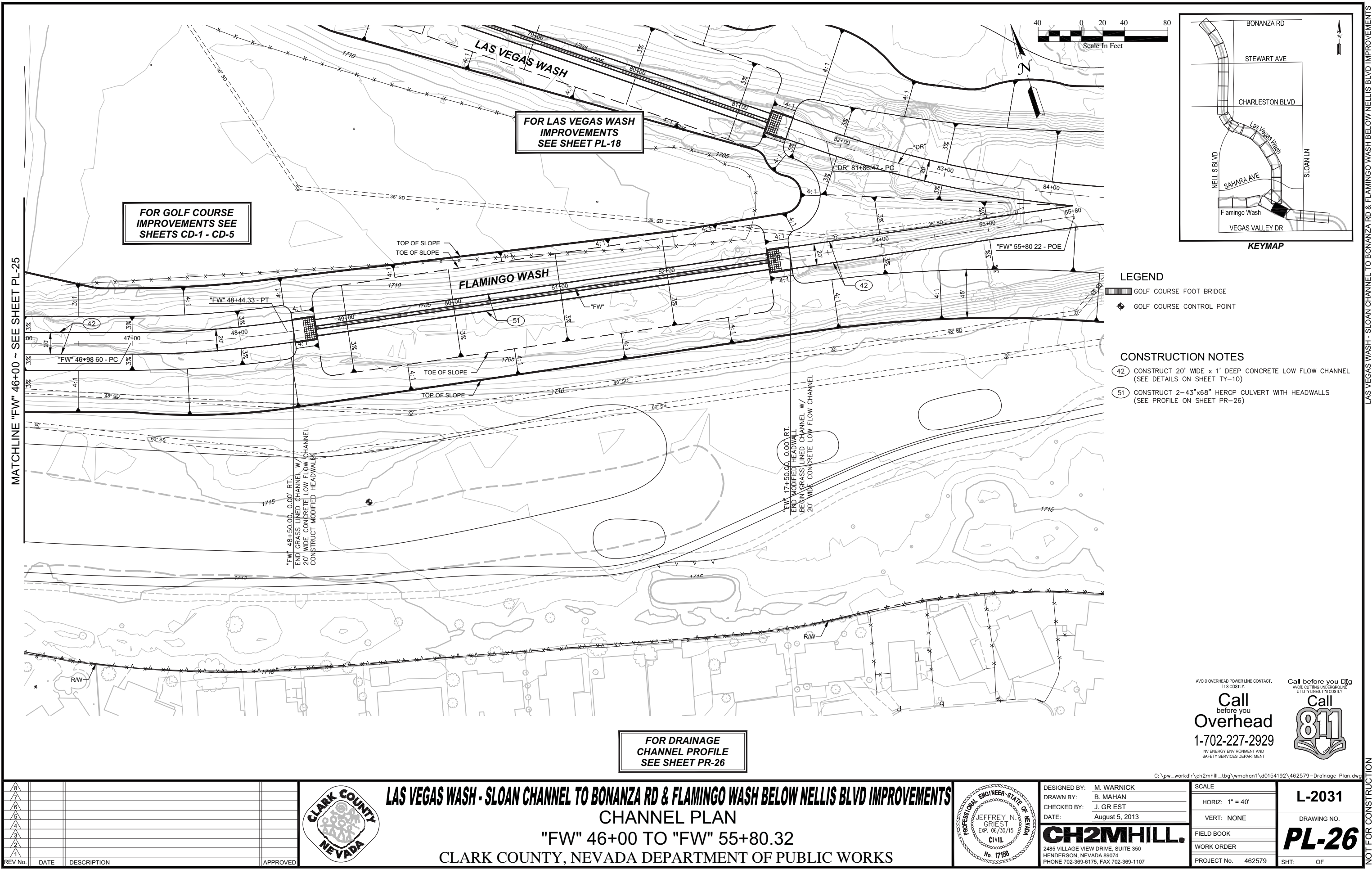
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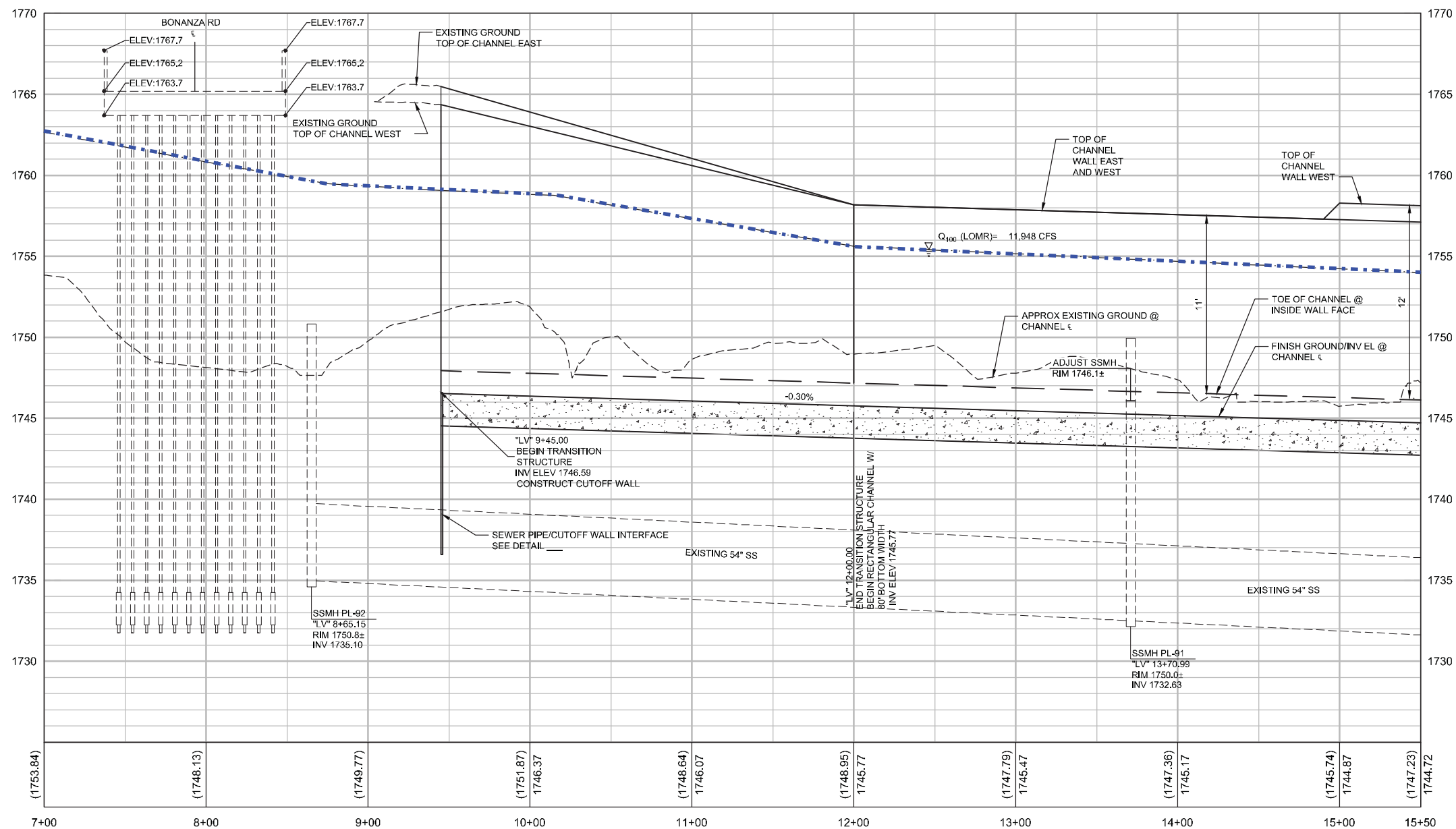
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION





EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-1

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEMAN AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you dig
Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 5+50 TO "LV" 15+50
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

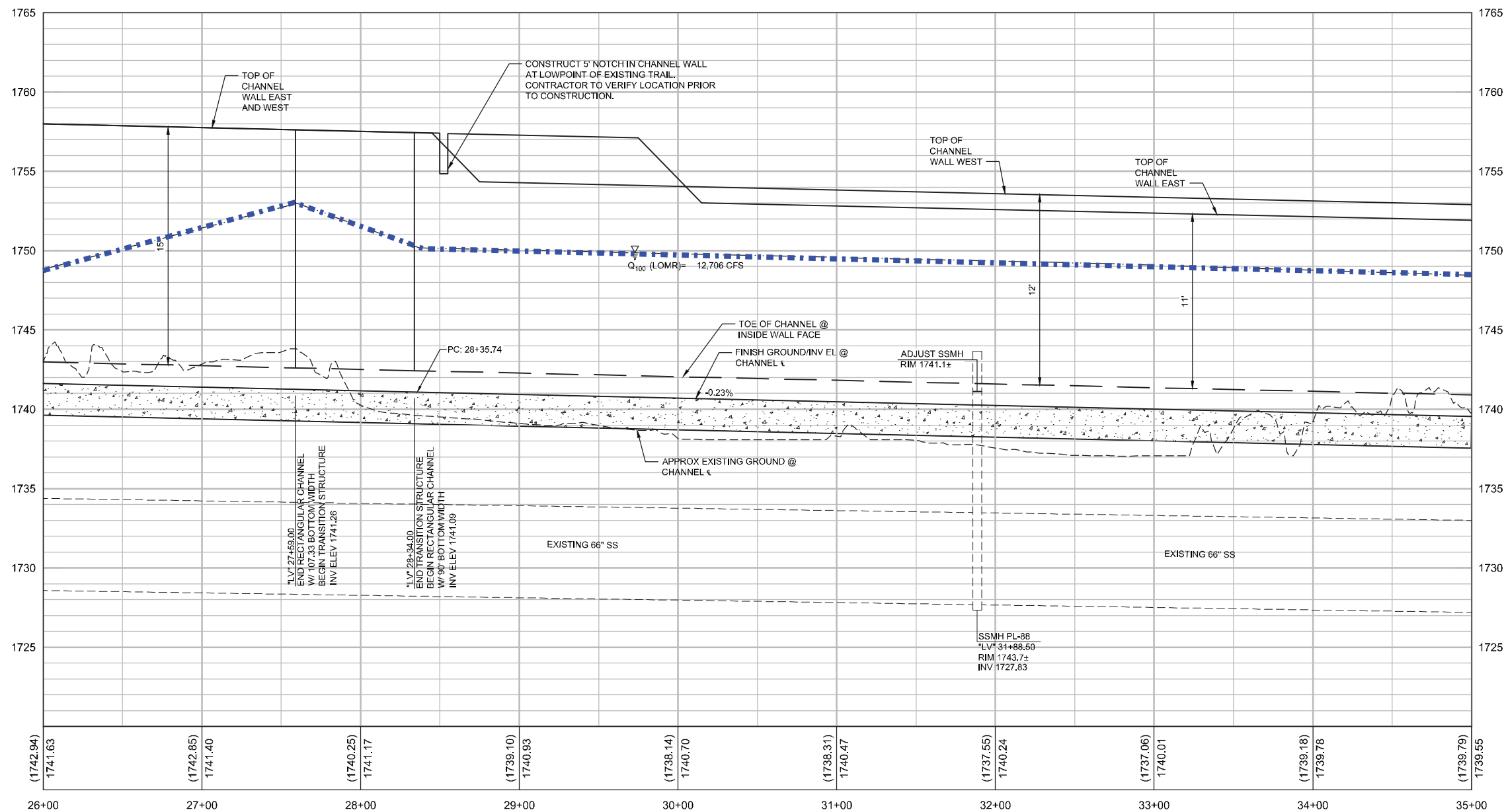


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-1
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

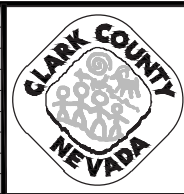
FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-3



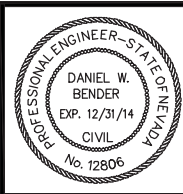
AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT



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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 26+00 TO "LV" 35+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

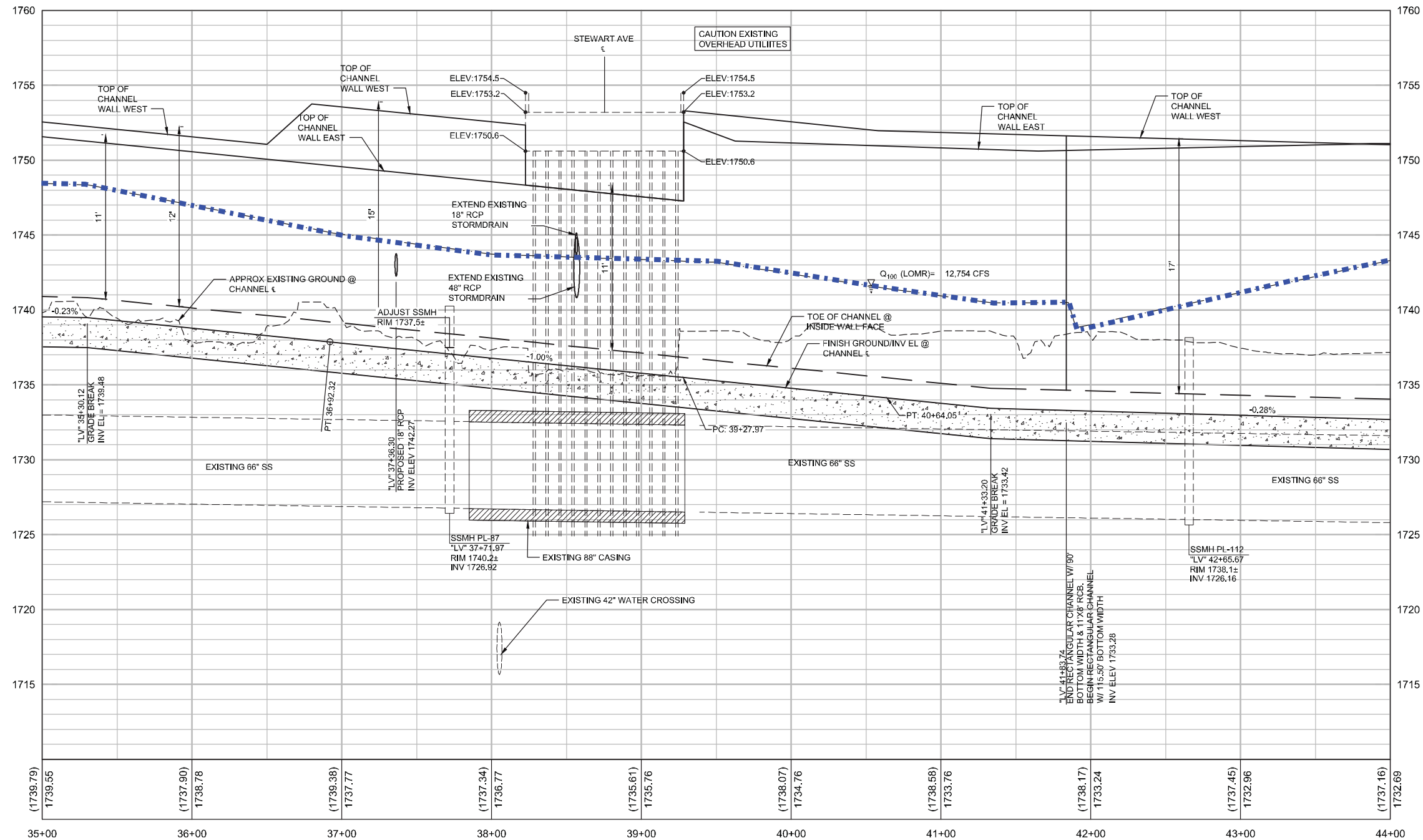


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-3
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-4

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

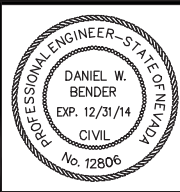
AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you dig
Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you dig
Call **811**
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

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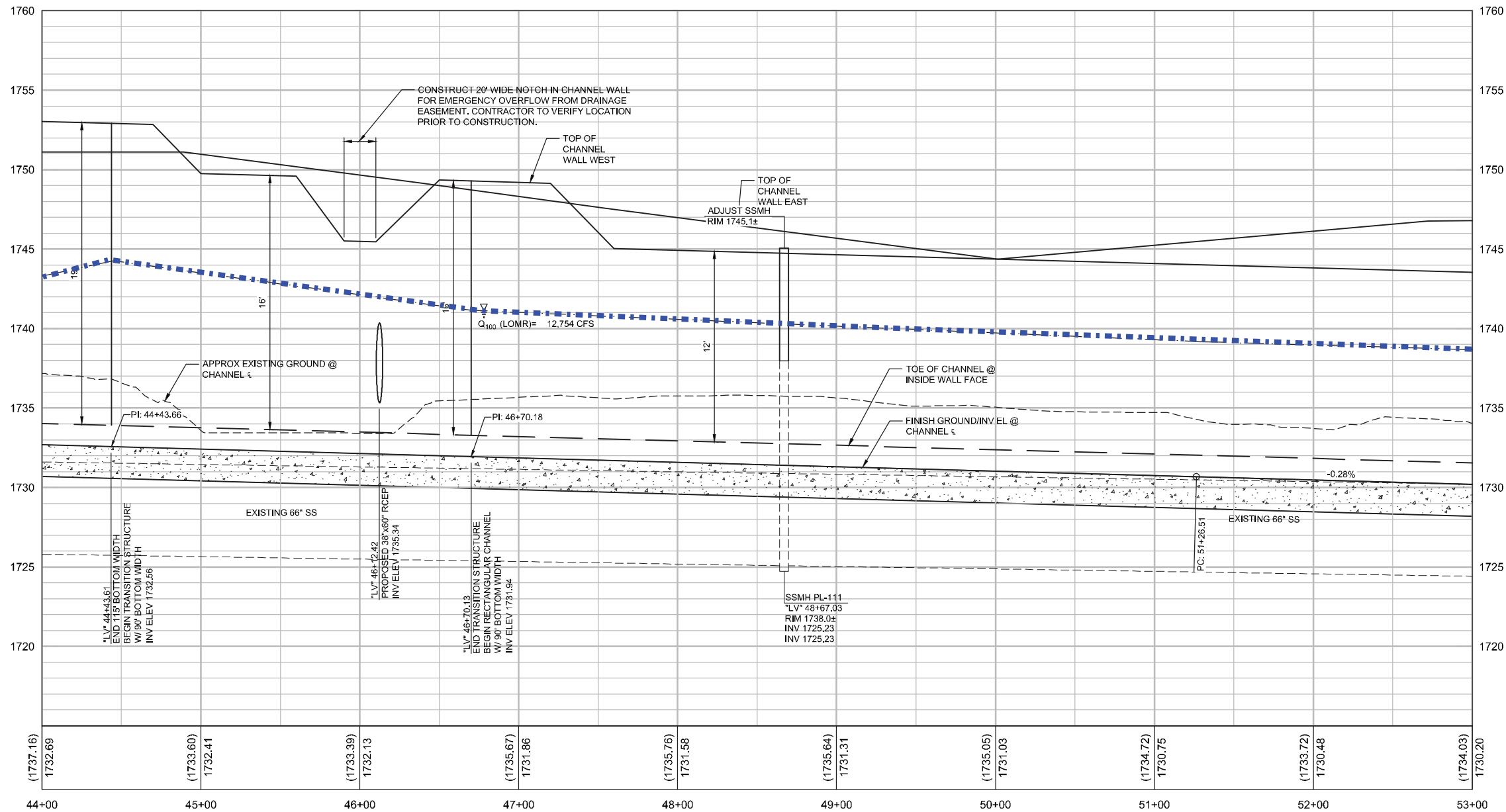
LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 35+00 TO "LV" 44+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-4
SHT: OF



EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-5

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

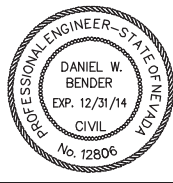
AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 44+00 TO "LV" 53+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

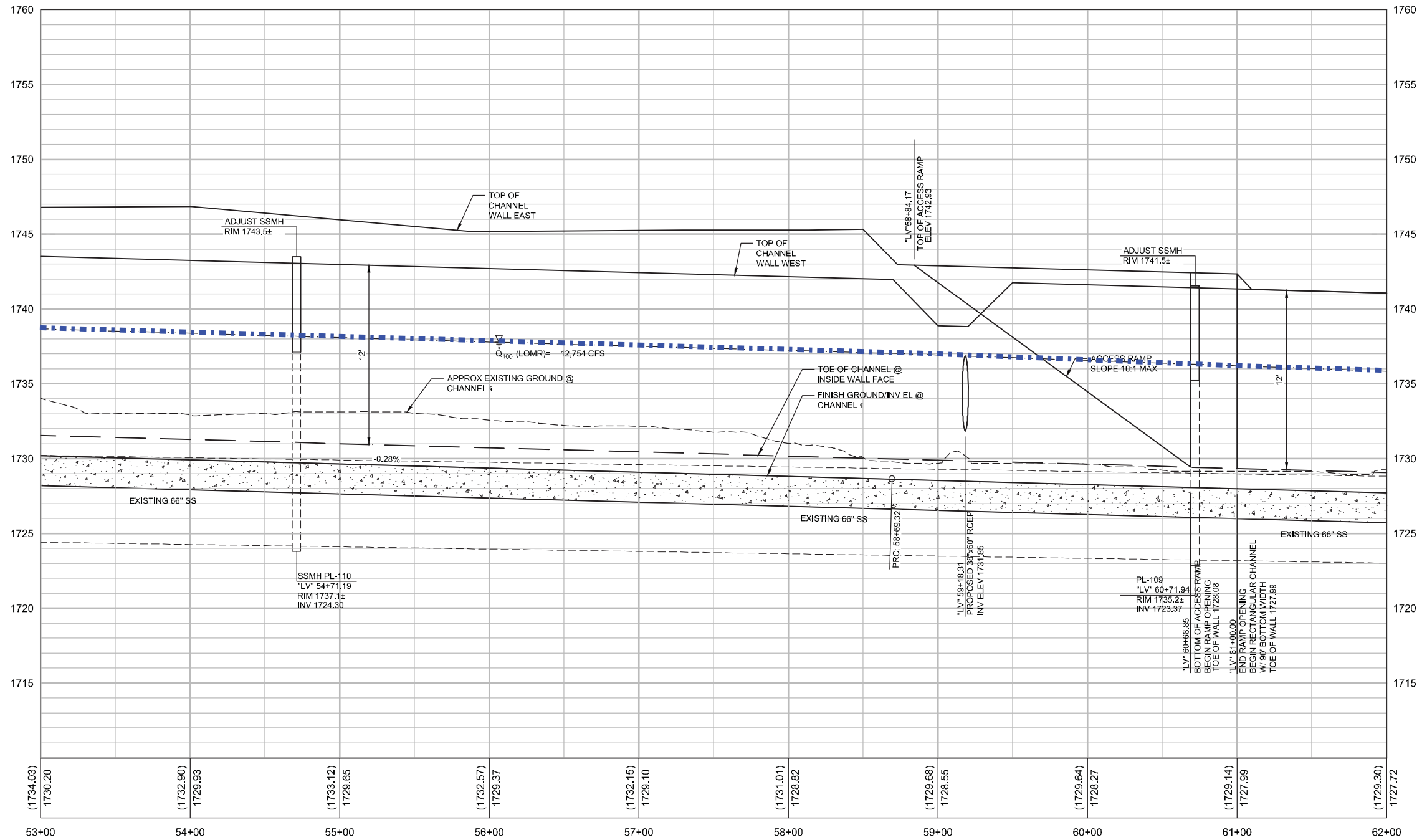


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-5
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-6

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEMAN AND ARTERIAL SYSTEM OF TRANSPORTATION

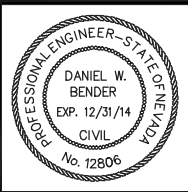
AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
Call before you dig
Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 53+00 TO "LV" 62+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

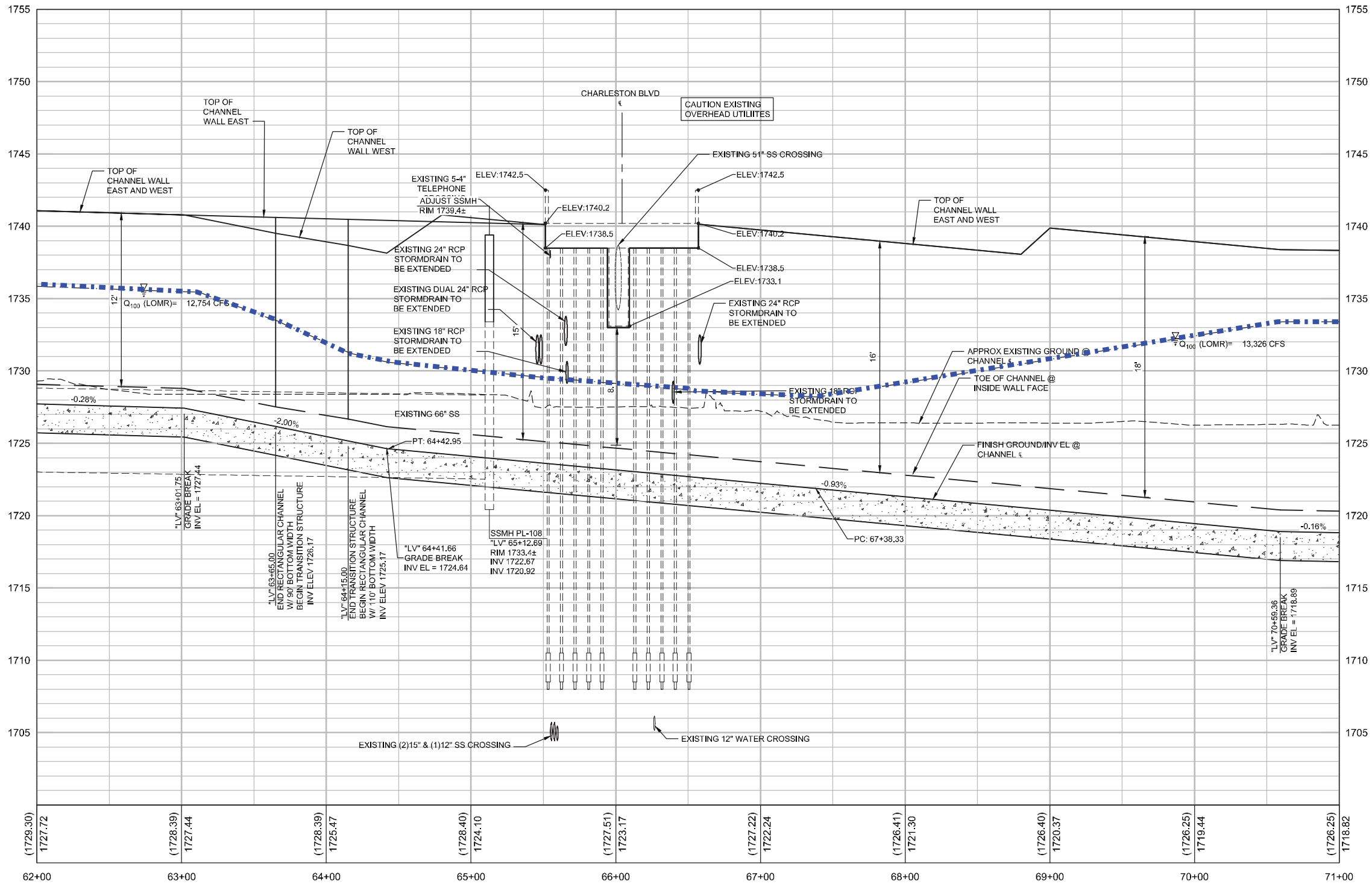


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-6
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



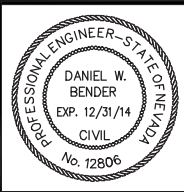
EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE CHANNEL PLAN SEE SHEET PL-7

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 62+00 TO "LV" 71+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013

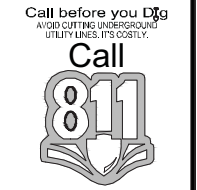
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

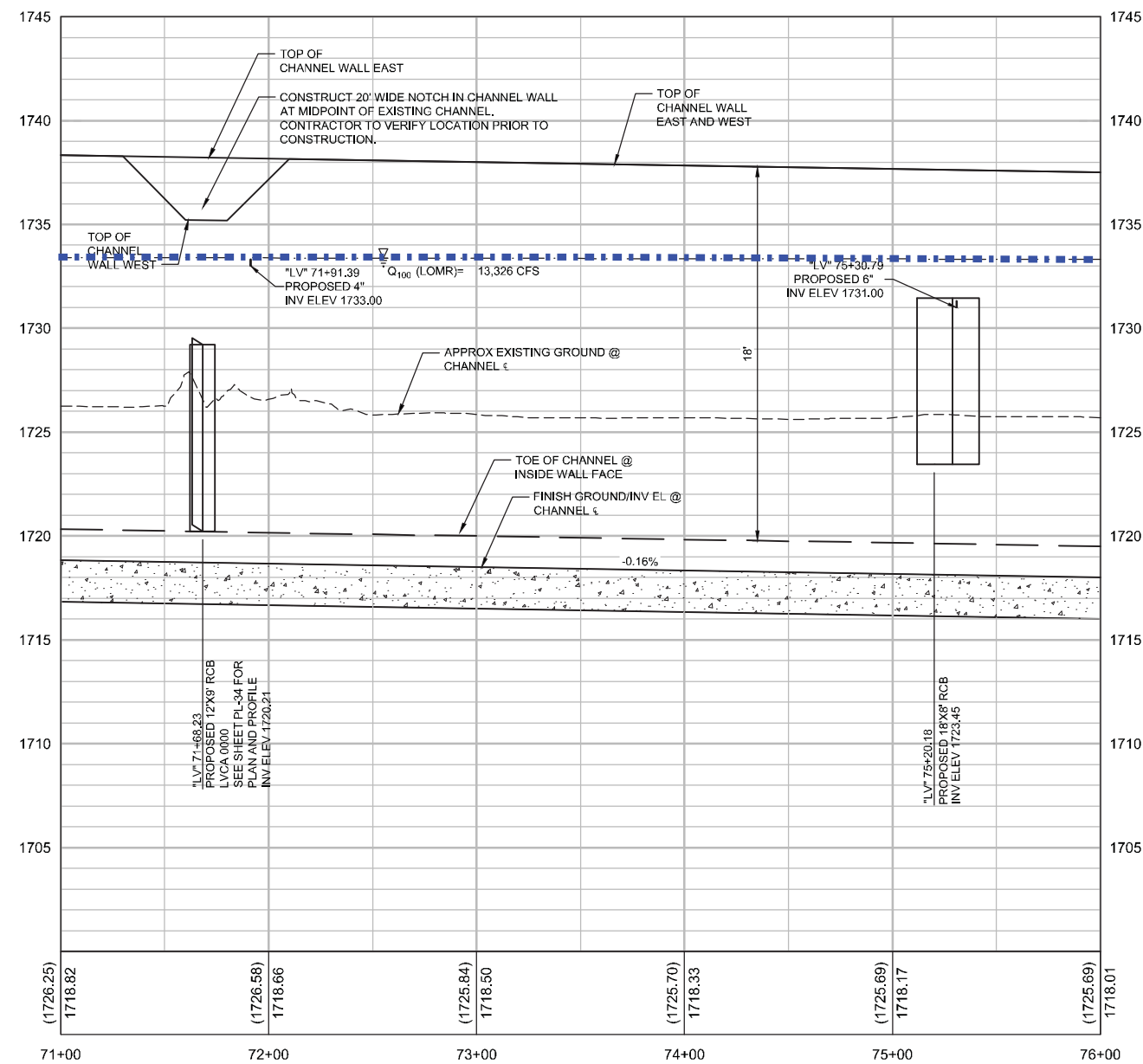
L-2031
DRAWING NO.
PR-7
SHT: OF



AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
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Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



EXISTING UTILITIES ARE TO BE PROTECTED-IN-PLACE UNLESS OTHERWISE NOTED

FOR DRAINAGE
CHANNEL PLAN
SEE SHEET PL-8



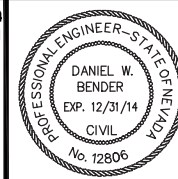
AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.
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Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT



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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 71+00 TO "LV" 76+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

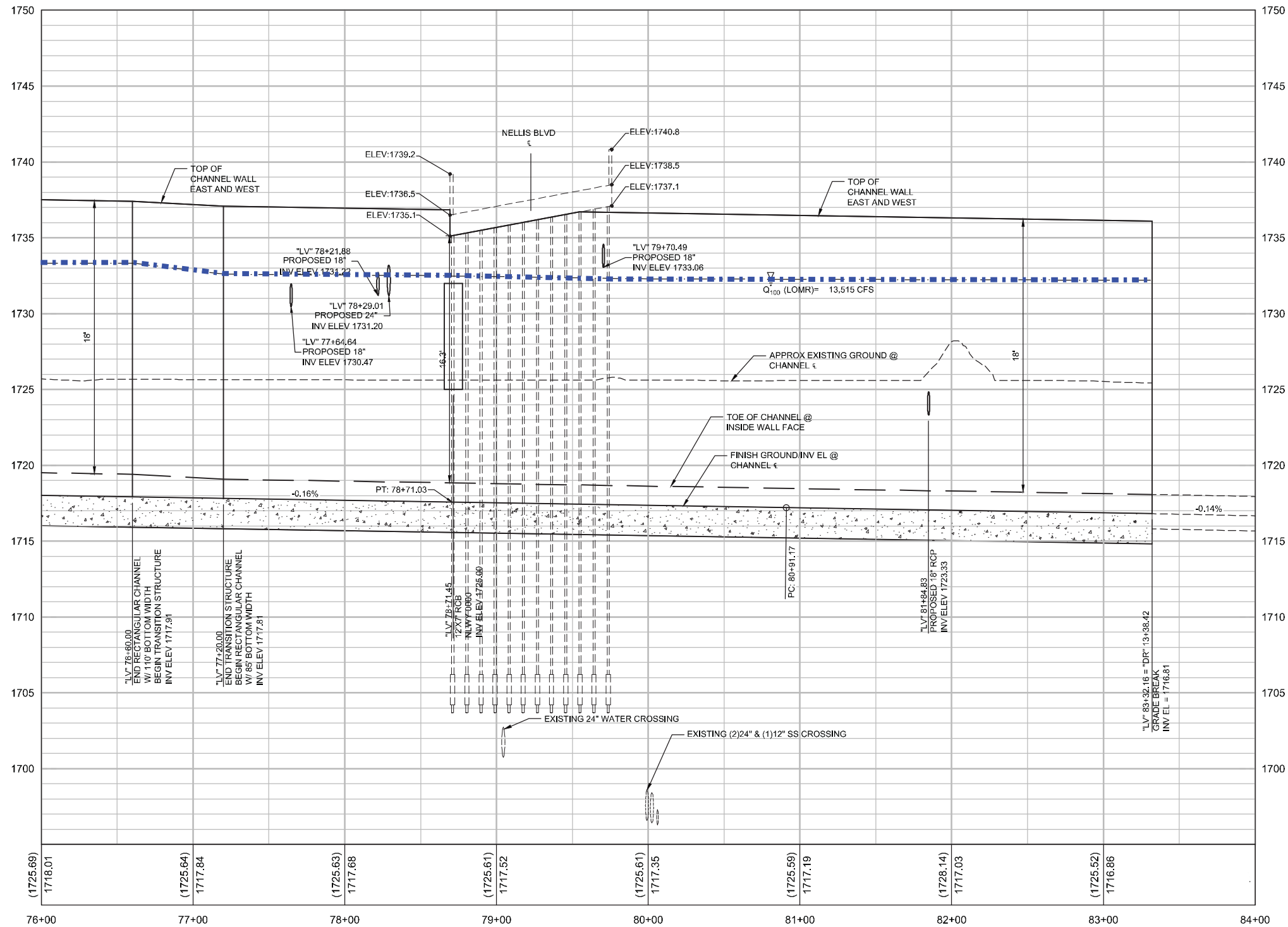


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013

Stanley Consultants
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
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SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-8
SHT: OF



SEE SHEET PR-10 FOR
CONTINUATION OF
CHANNEL PROFILE

EXISTING UTILITIES ARE TO BE
PROTECTED-IN-PLACE UNLESS
OTHERWISE NOTED

FOR DRAINAGE
CHANNEL PLAN
SEE SHEET PL-9

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEMAN AND ARTERIAL
SYSTEM OF TRANSPORTATION

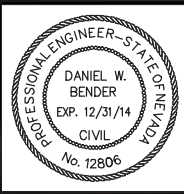
AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.
Call before you dig
Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.
Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"LV" 76+00 TO "LV" 83+32.16
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

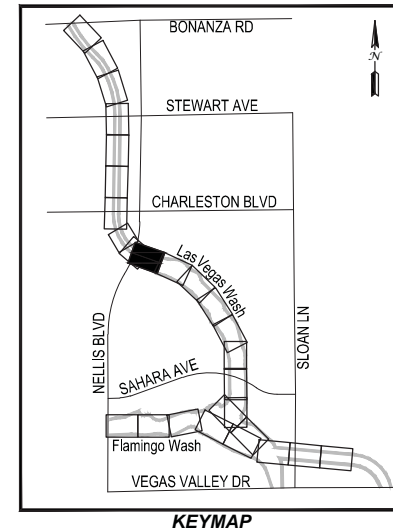
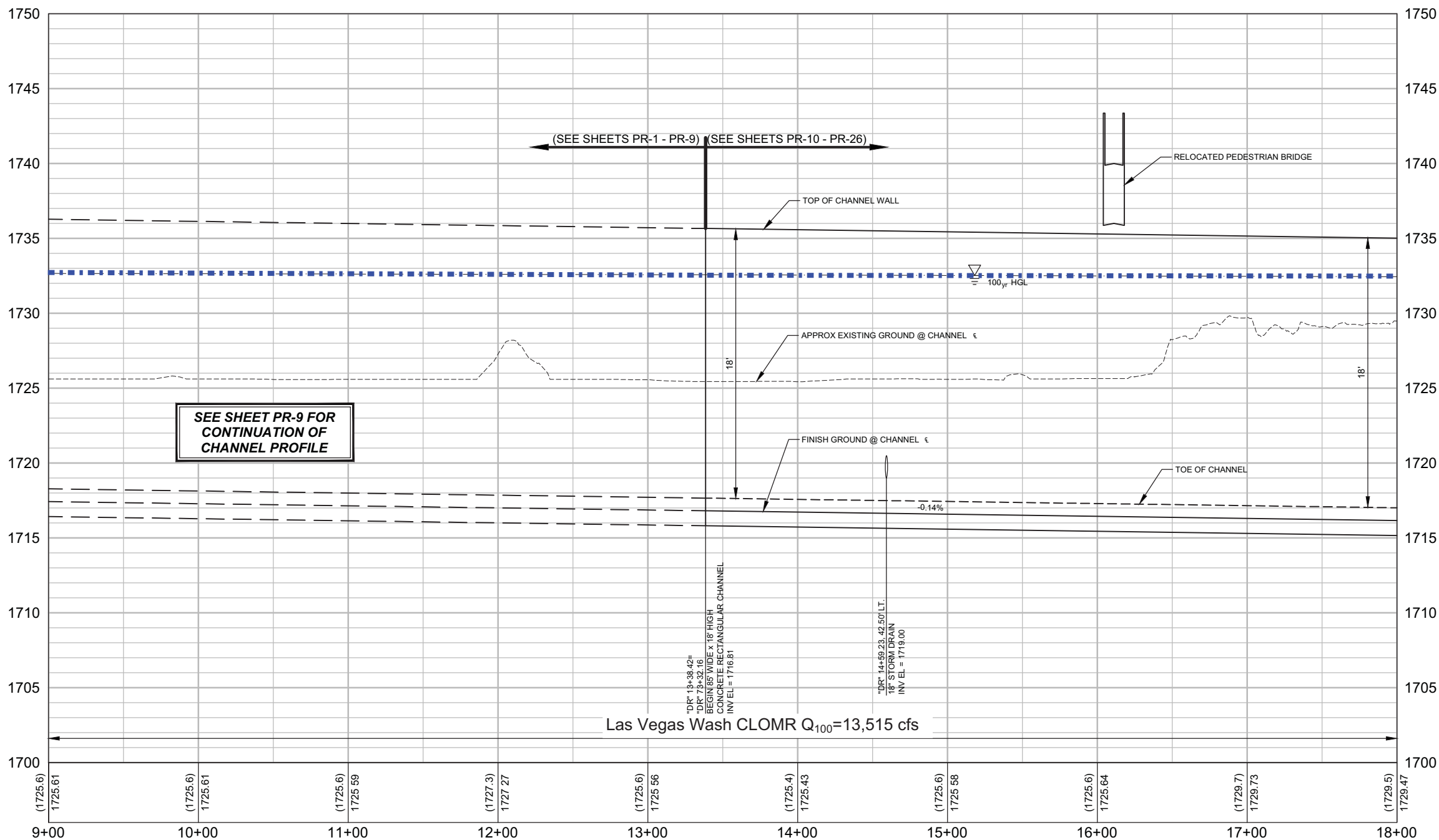


DESIGNED BY: H. MURVOSH
DRAWN BY: D. DADE
CHECKED BY: D. BENDER
DATE: August 6, 2013
Stanley Consultants Inc.
5820 SOUTH EASTERN AVENUE, SUITE 200
LAS VEGAS, NEVADA 89119 (702) 369-9396
A Stanley Group Company: Engineering, Environmental Sciences, and Construction Services Worldwide

SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK
WORK ORDER
PROJECT No. 24523

L-2031
DRAWING NO.
PR-9
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



SEE SHEET PR-9 FOR
CONTINUATION OF
CHANNEL PROFILE

FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-10

AVOID OVERHEAD POWER LINE CONTACT.
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UTILITY LINES. IT'S COSTLY.

Call 811

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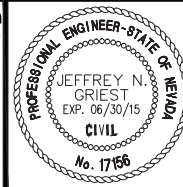


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"DR" 15+00 TO "DR" 18+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK

DRAWN BY: B. MAHAN

CHECKED BY: J. GR EST

DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

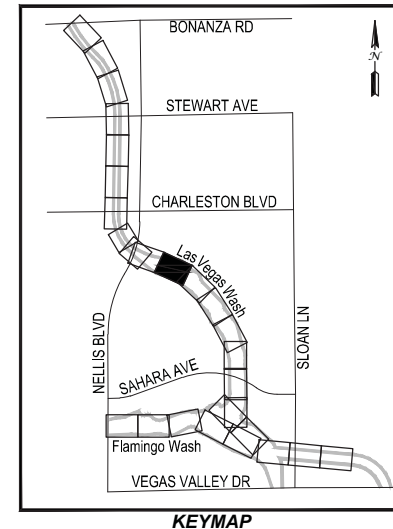
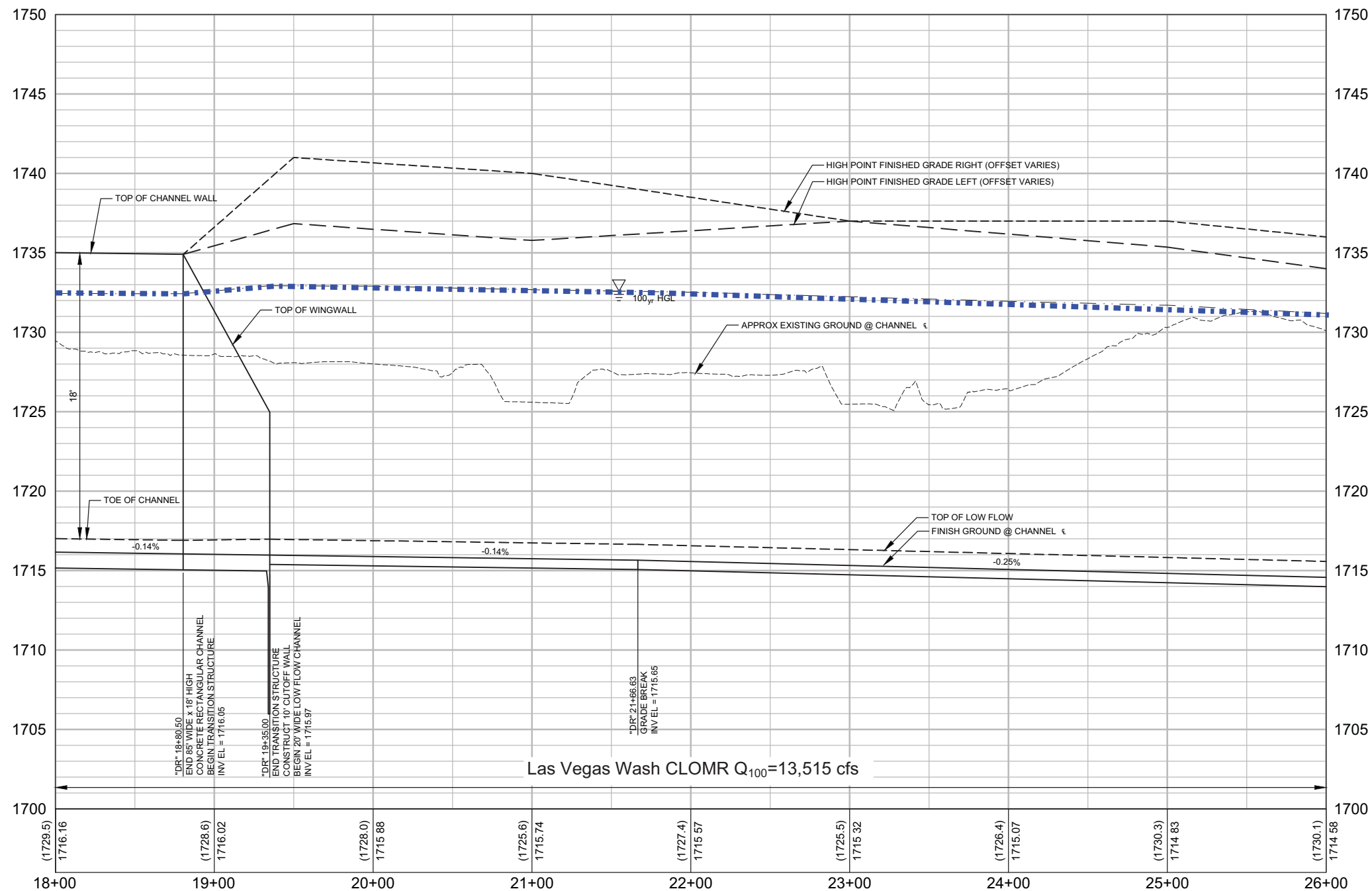
PR-10

SHT: OF

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-11

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
Overhead
1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

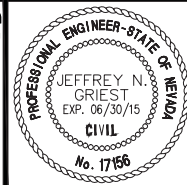
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 18+00 TO "DR" 26+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

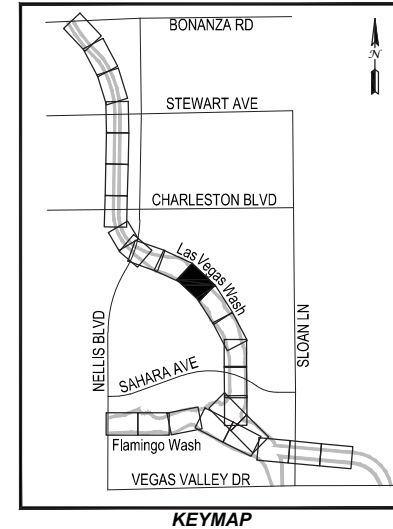
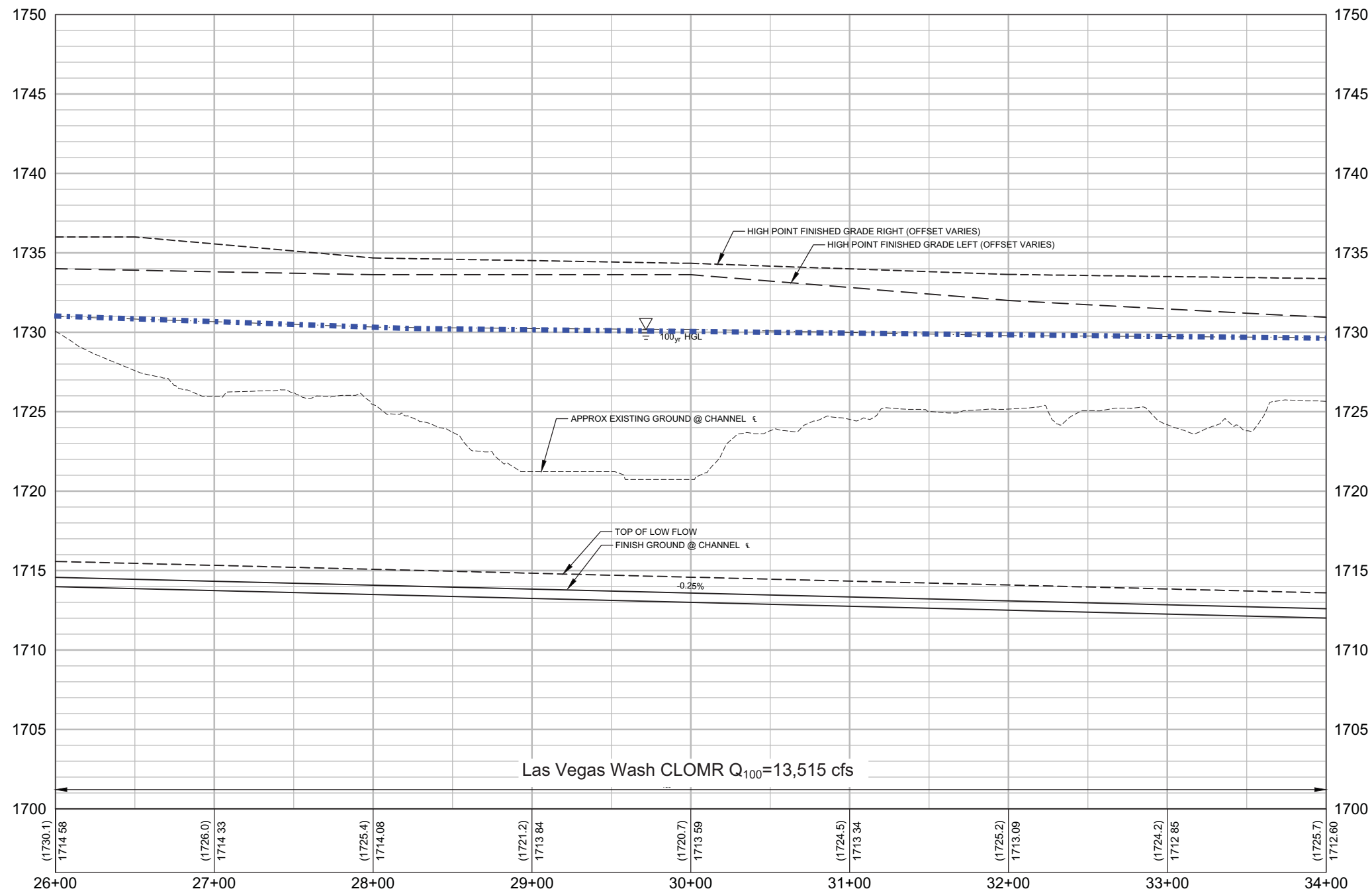
SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'

FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-11

SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-12

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

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Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

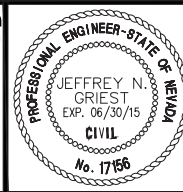
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 26+00 TO "DR" 34+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

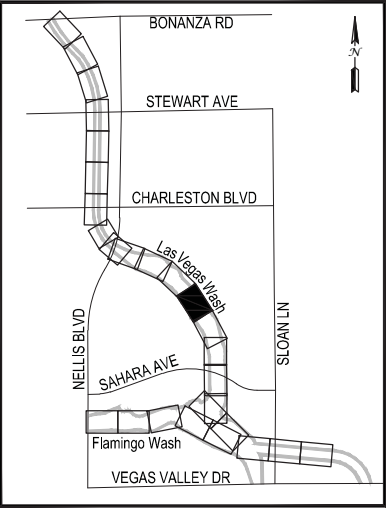
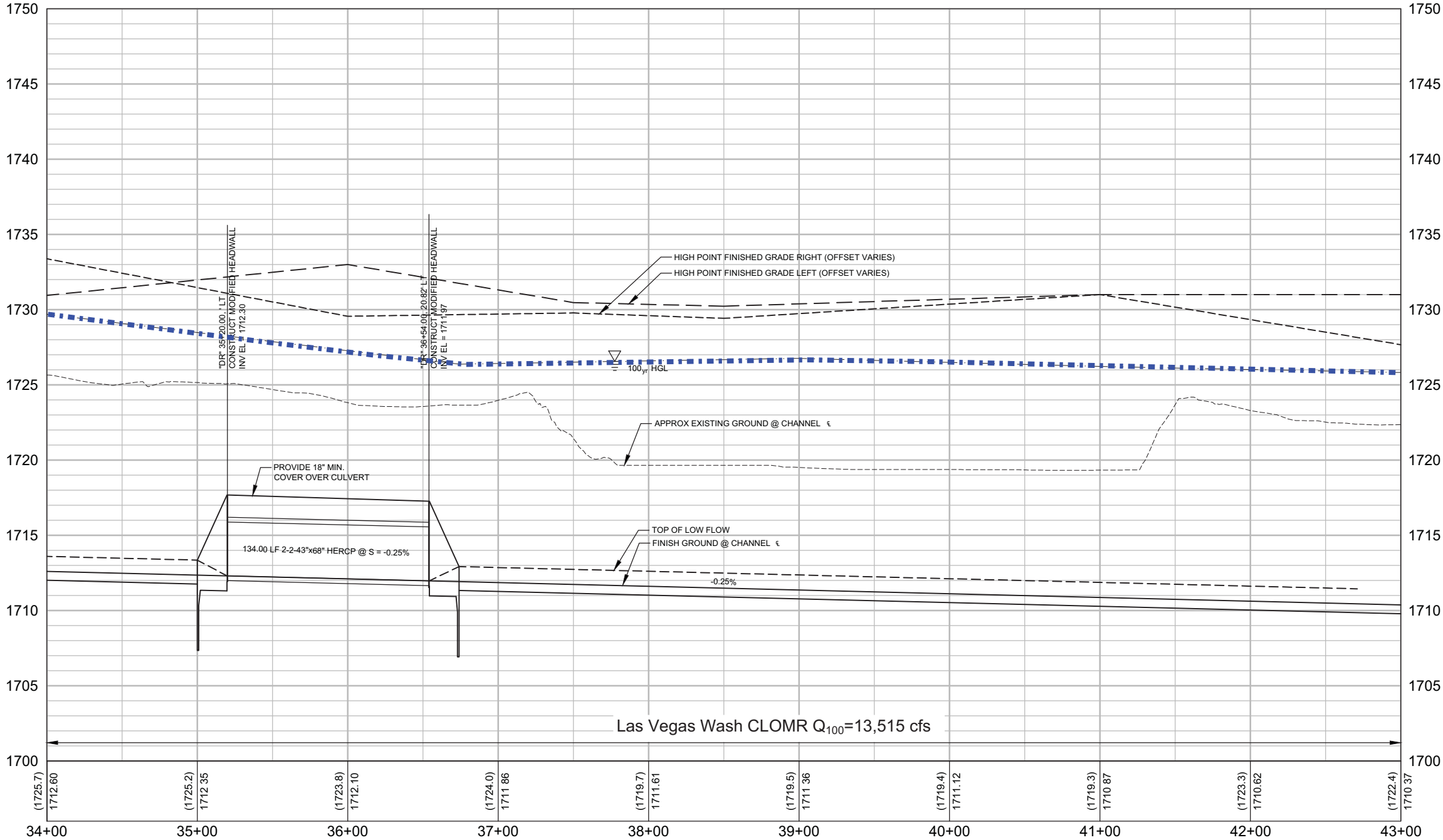
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-12
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



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1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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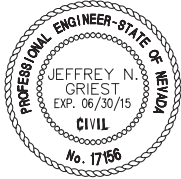


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"DR" 34+00 TO "DR" 43+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL

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HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

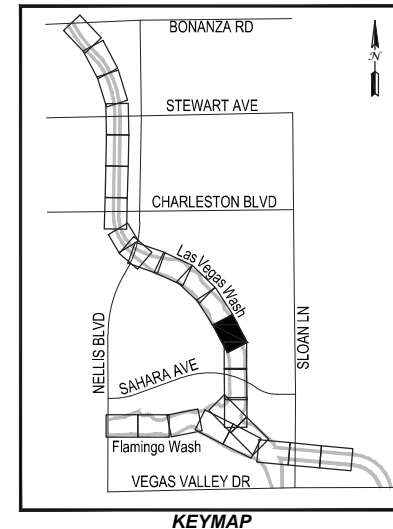
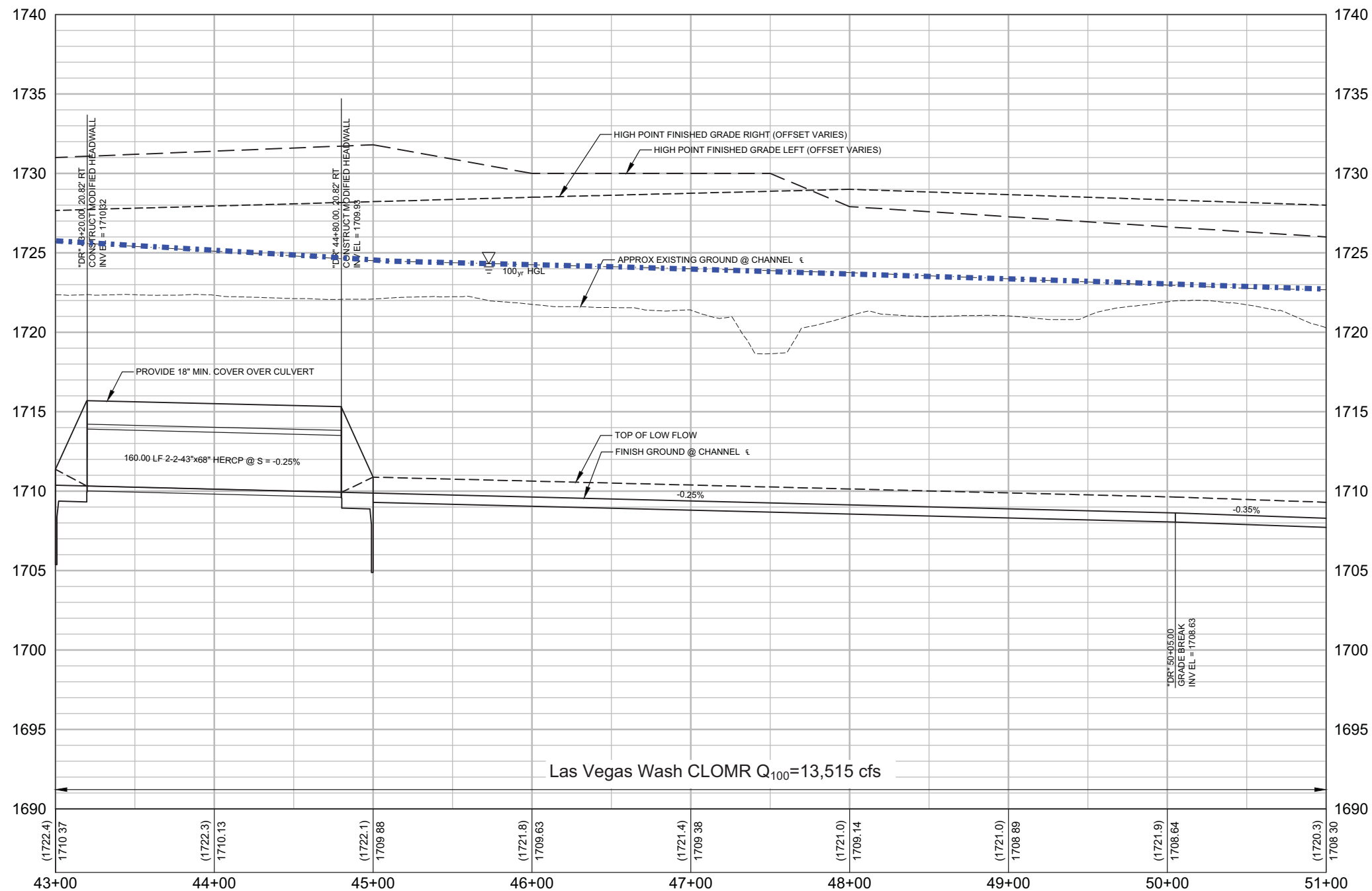
DRAWING NO.

PR-13

SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-14

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

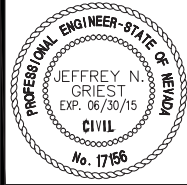
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 43+00 TO "DR" 51+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

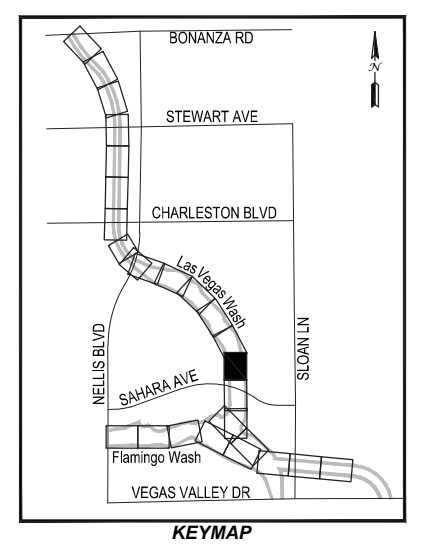
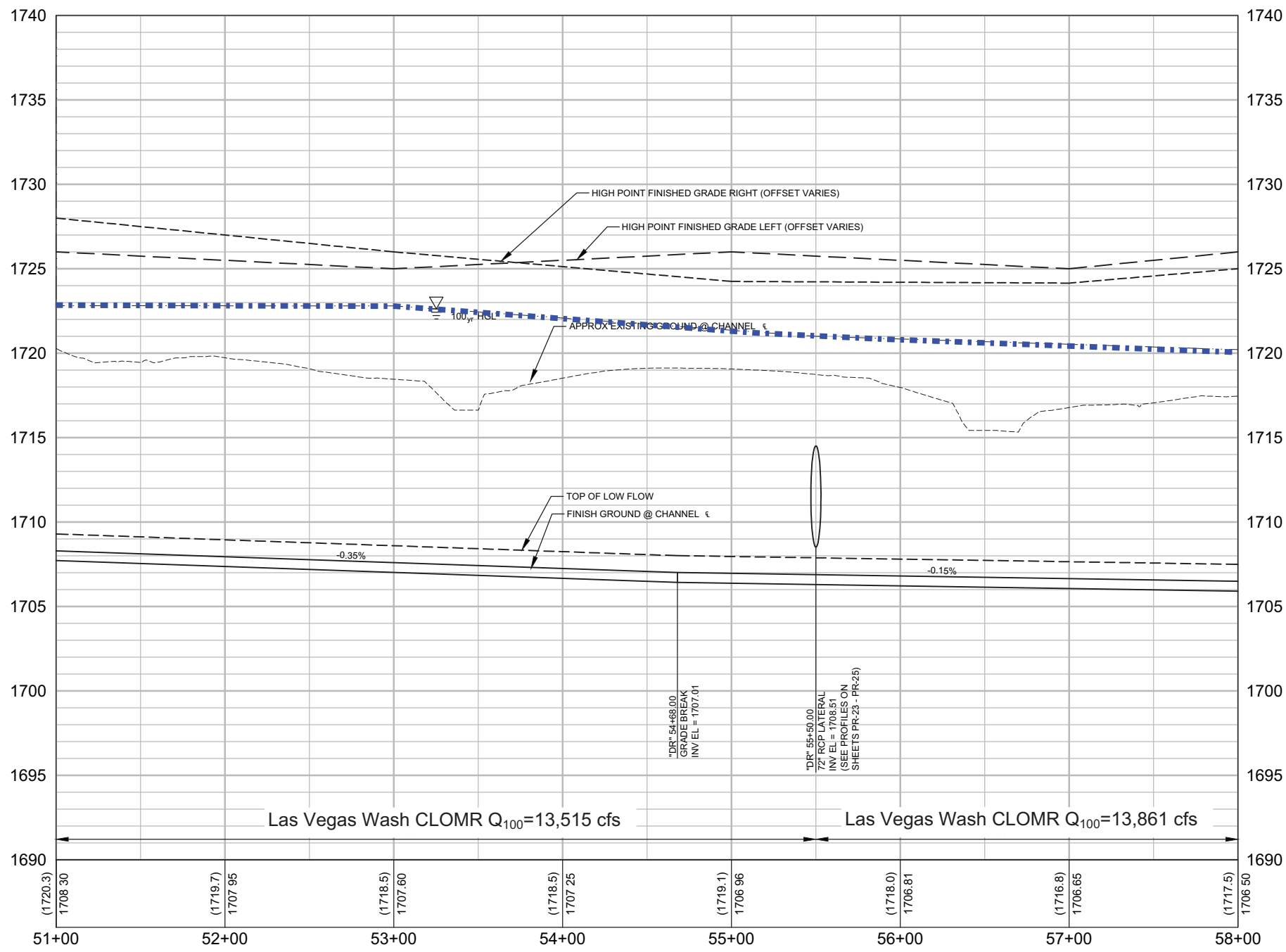
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-14
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-15

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
Call before you Overhead
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NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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REV No.	DATE	DESCRIPTION	APPROVED

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"DR" 51+00 TO "DR" 58+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS

DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

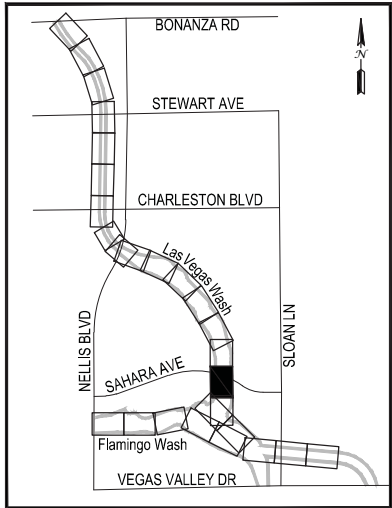
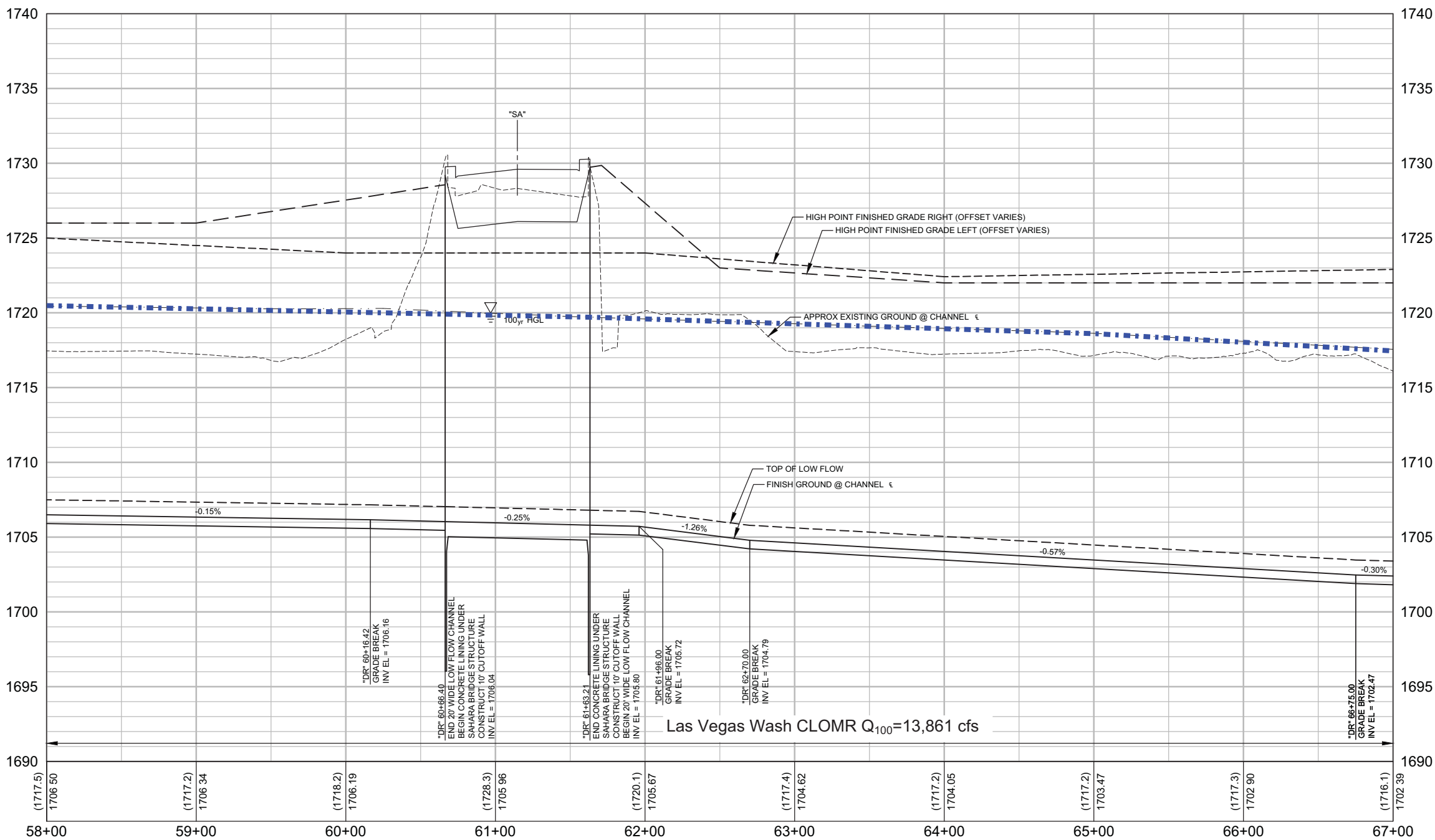
SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'

FIELD BOOK
WORK ORDER
PROJECT No. 462579 SHT: OF

L-2031
DRAWING NO.
PR-15

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION

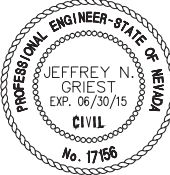


FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-16

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 58+00 TO "DR" 67+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

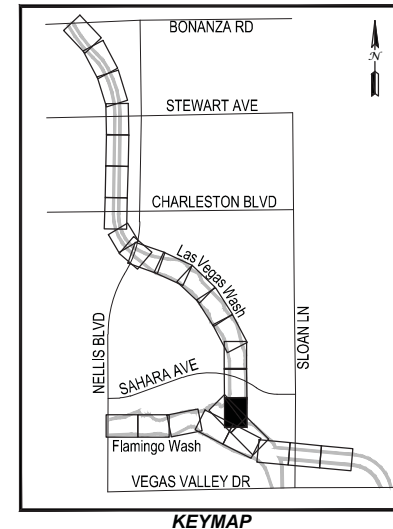
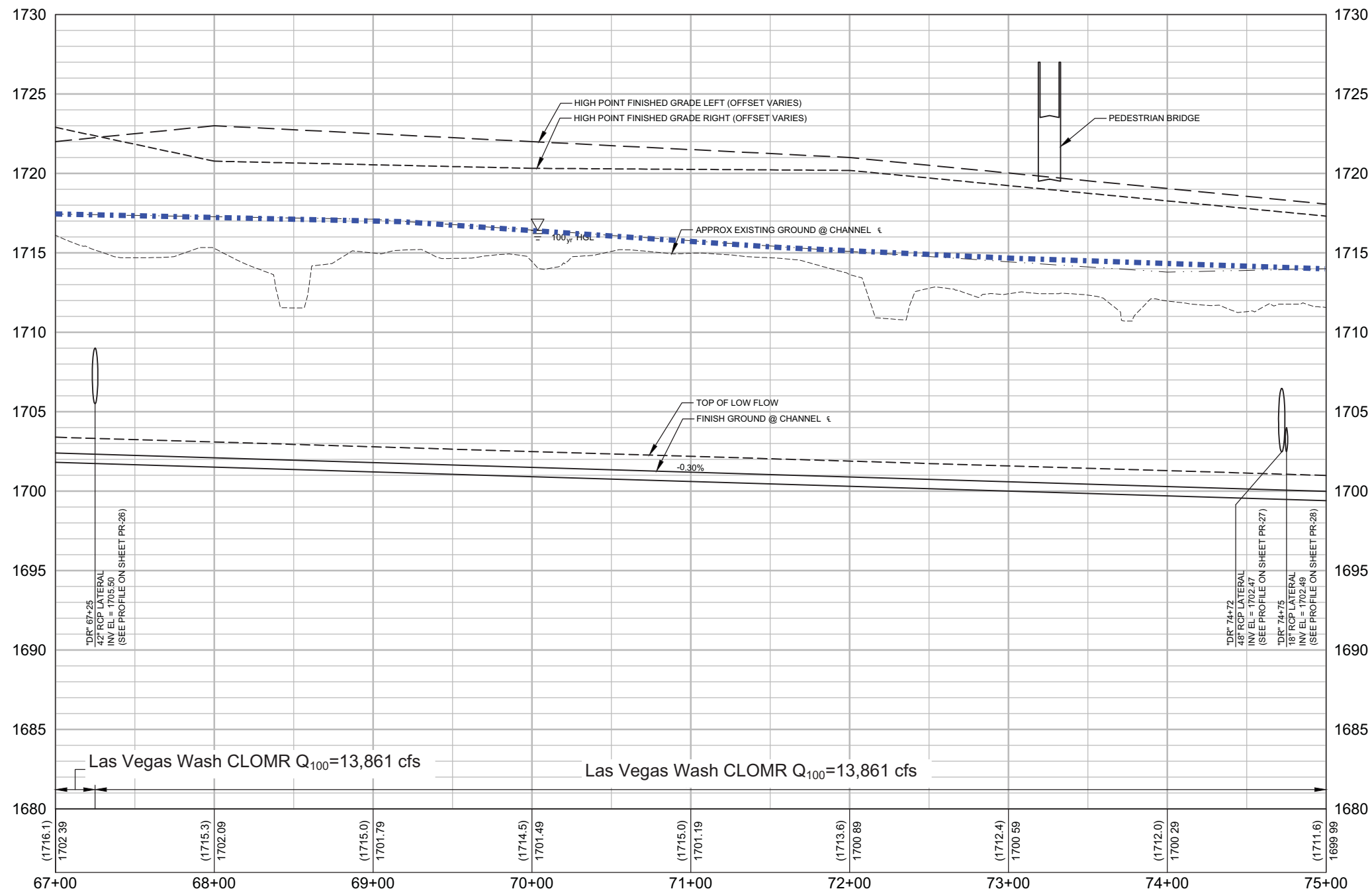
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call 811

SCALE	L-2031
HORIZ: 1" = 40'	DRAWING NO.
VERT: 1" = 4'	PR-16
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WORK ORDER	
PROJECT No. 462579	SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-17

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

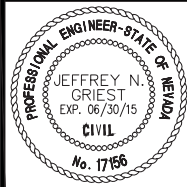
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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REV No.	DATE	DESCRIPTION	APPROVED



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 67+00 TO "DR" 75+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

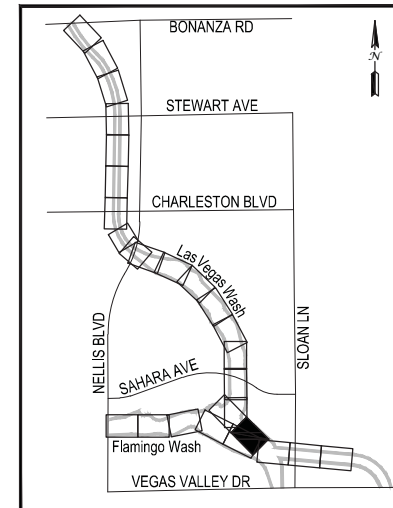
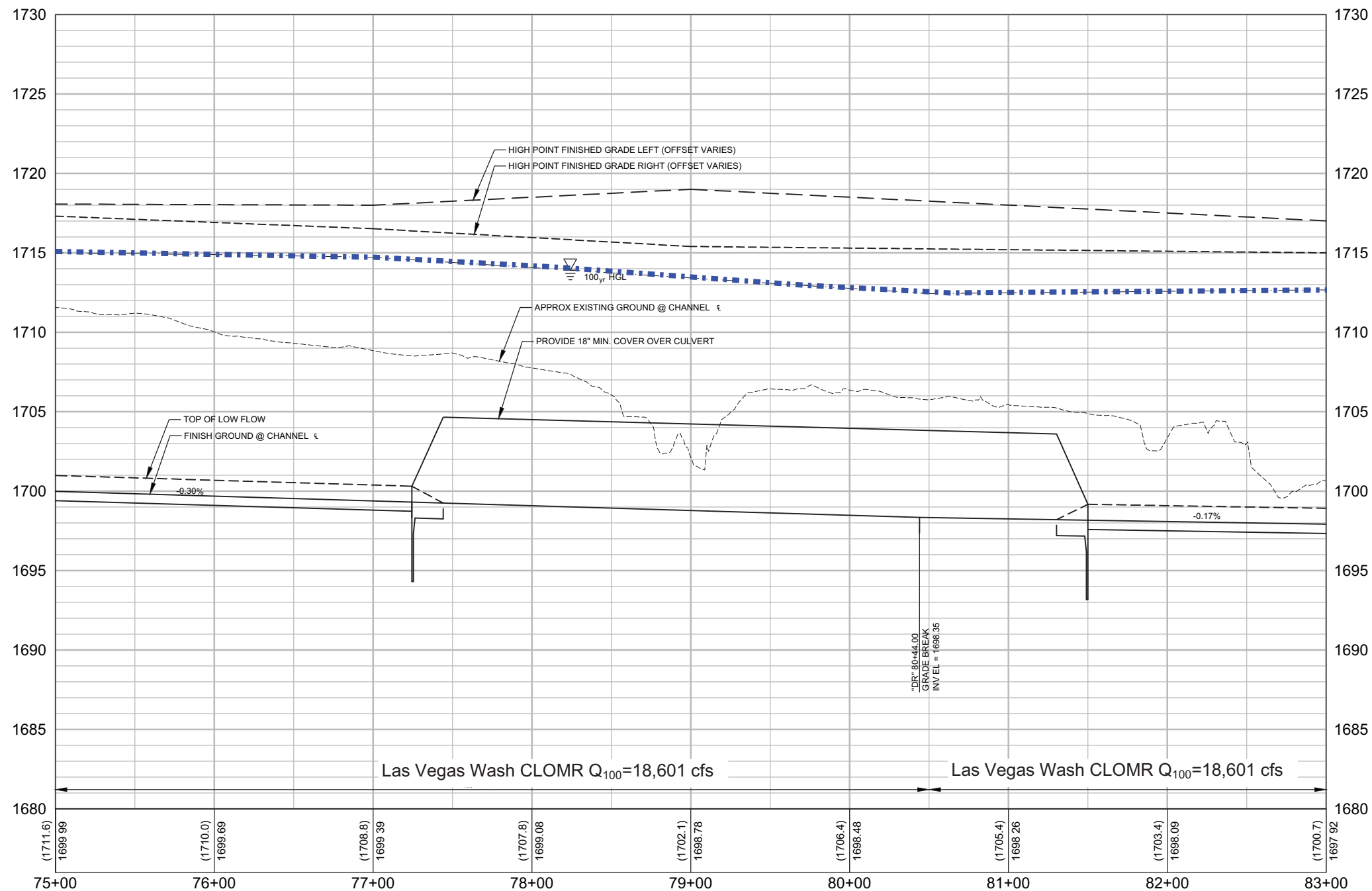
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-17
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-18

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

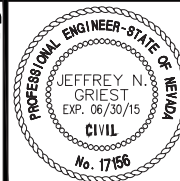
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

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REV No.	DATE	DESCRIPTION	APPROVED



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 75+00 TO "DR" 83+00
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

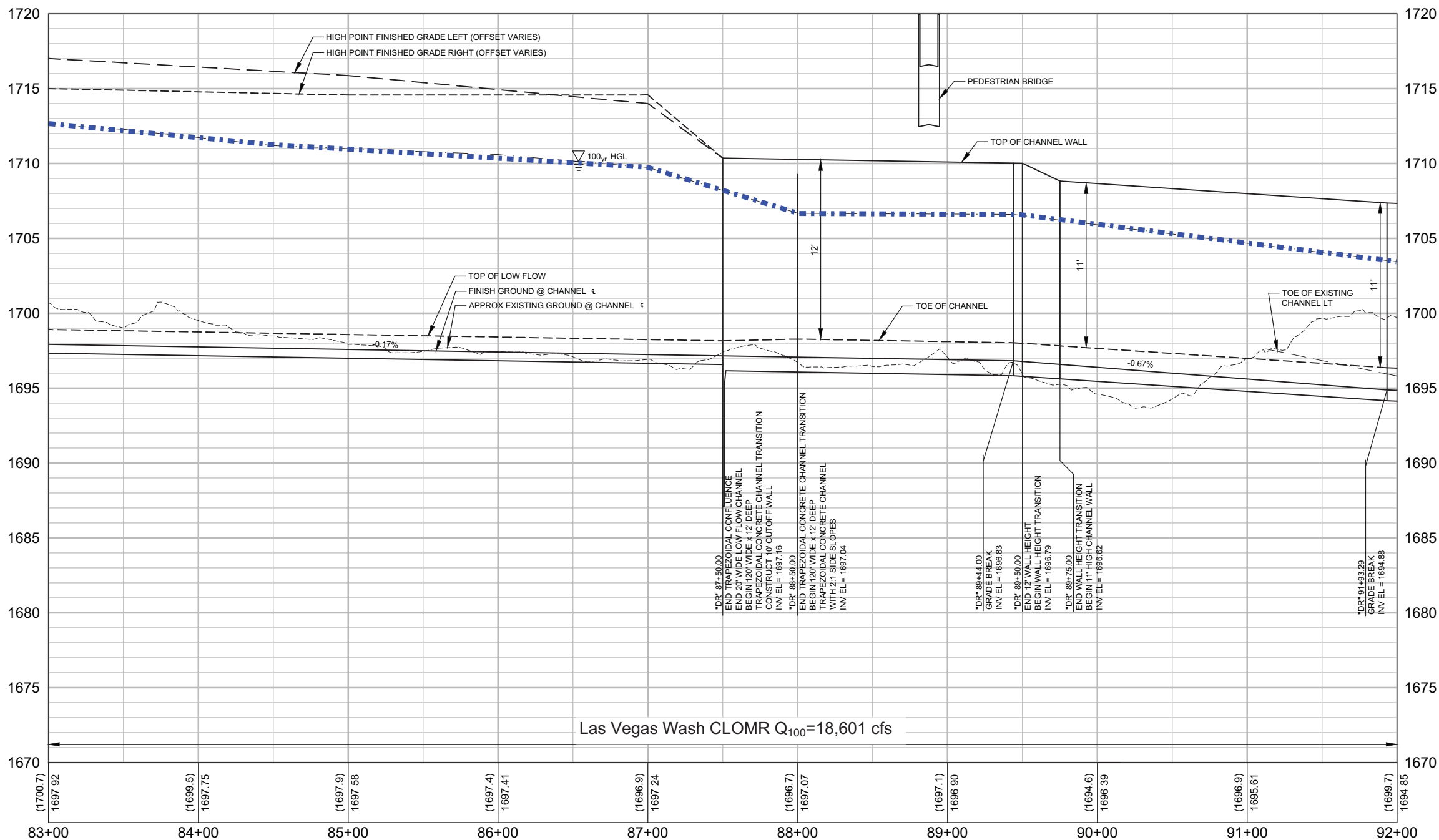
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

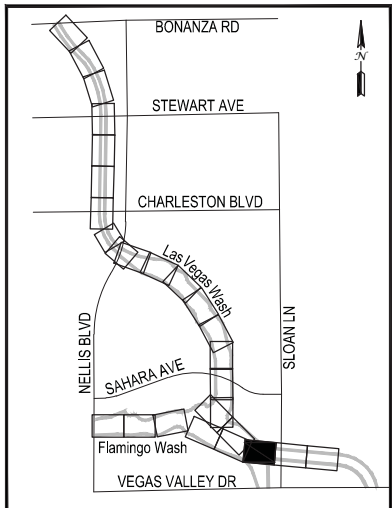
L-2031
DRAWING NO.
PR-18
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



Las Vegas Wash CLOMR $Q_{100}=18,601$ cfs



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Call before you Dig

Call before you Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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Call 811

FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-19

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REV No.	DATE	DESCRIPTION	APPROVED	

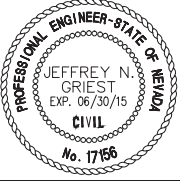


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"DR" 83+00 TO "DR" 92+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

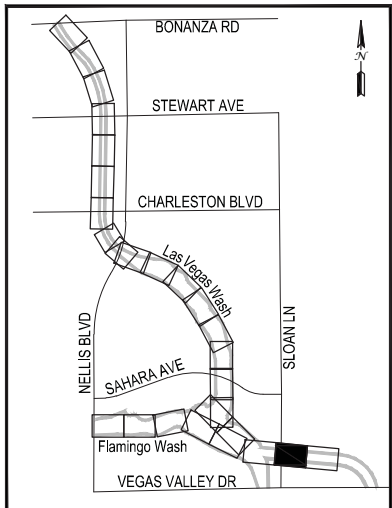
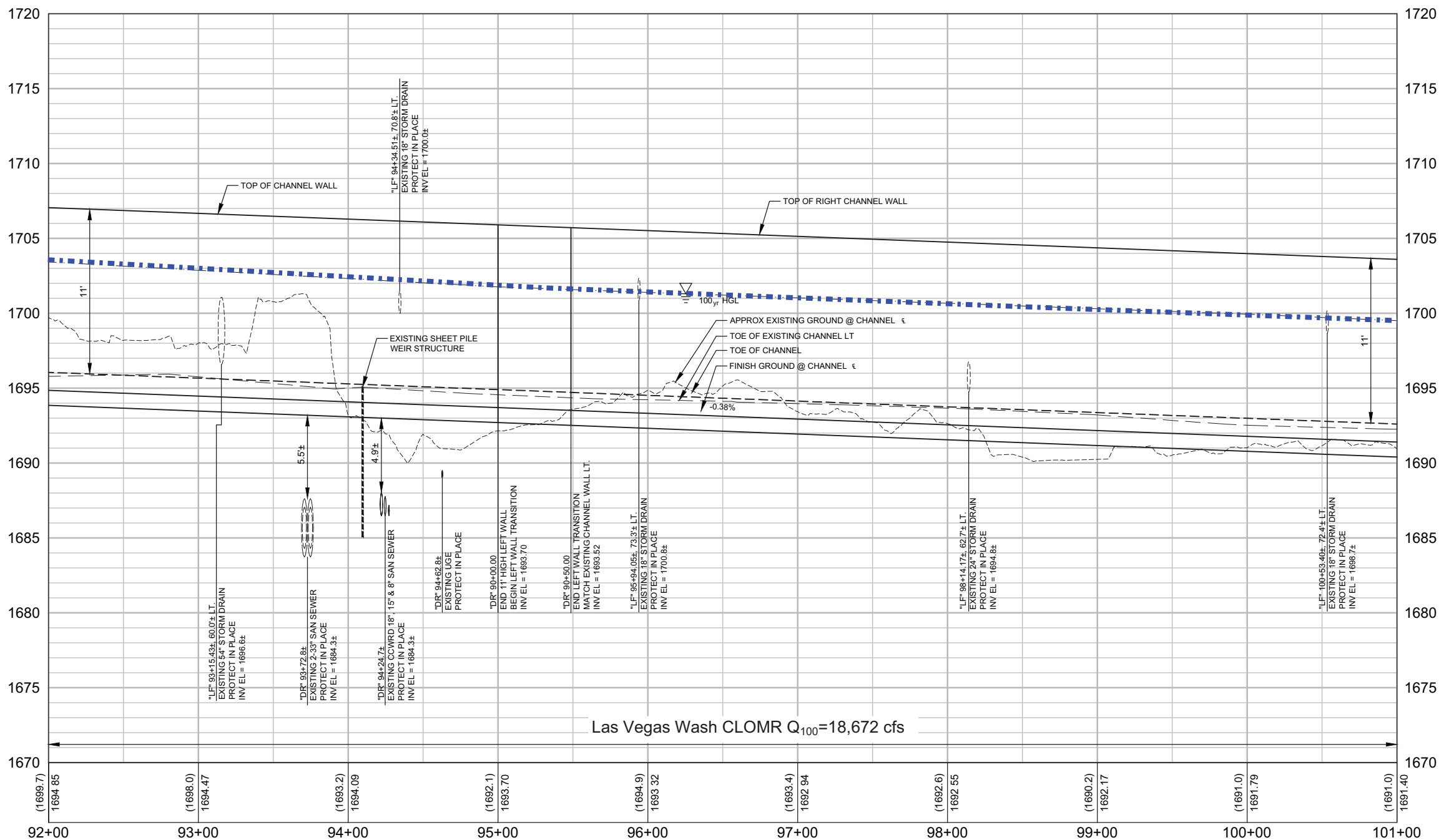
PR-19

SHT: OF

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



AVOID OVERHEAD POWER LINE CONTACT. IT'S COSTLY.

Call before you Dig

Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

REV No.	DATE	DESCRIPTION	APPROVED
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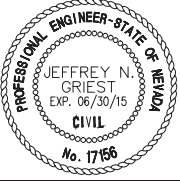


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"DR" 92+00 TO "DR" 101+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

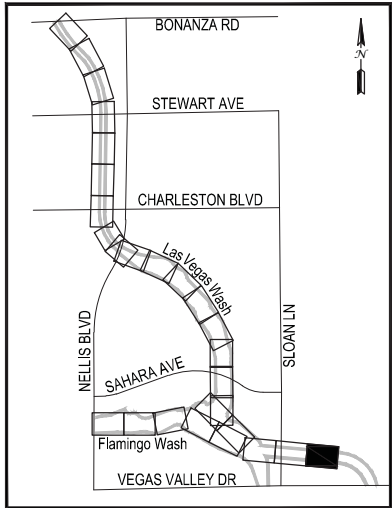
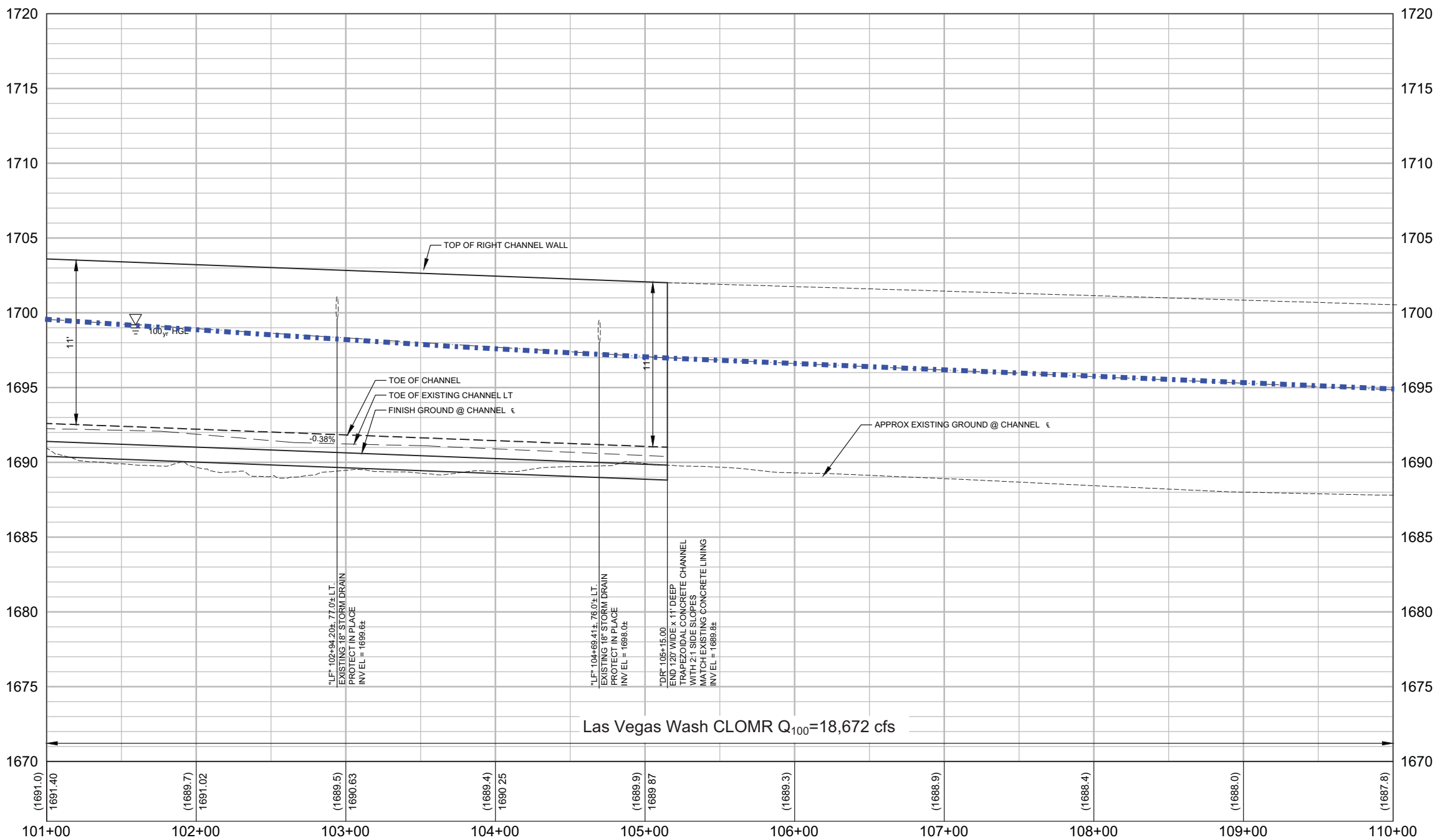
PR-20

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



AVOID OVERHEAD POWER LINE CONTACT.
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Call before you Overhead
1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

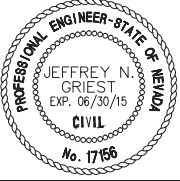
Call 811

FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-21

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REV No.	DATE	DESCRIPTION	APPROVED



LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS
CHANNEL PROFILE
"DR" 101+00 TO "DR" 105+15
CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

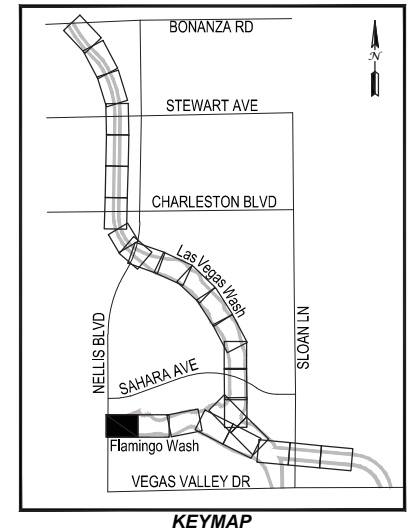
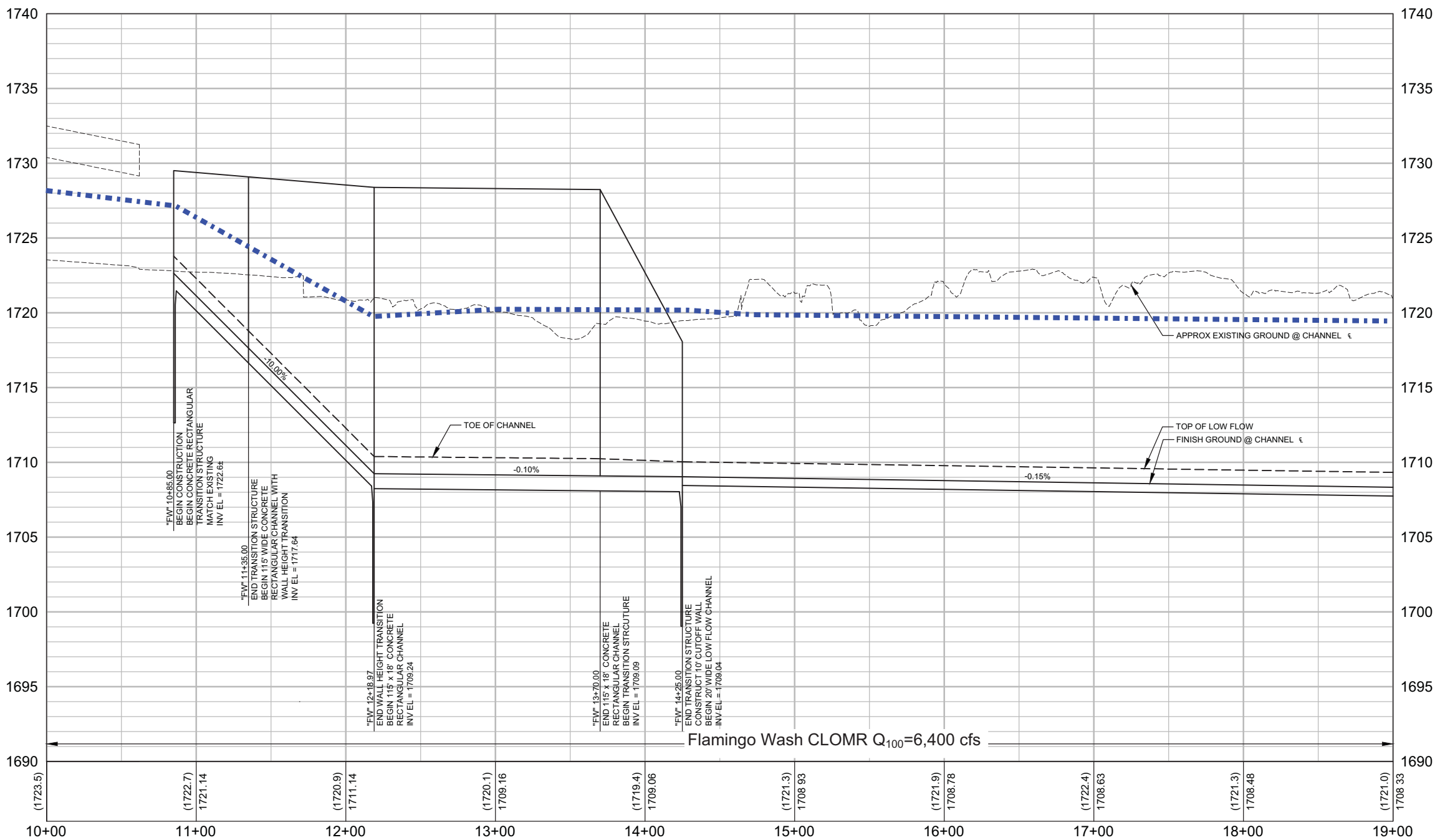
CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-21
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig

Overhead

1-702-227-2929

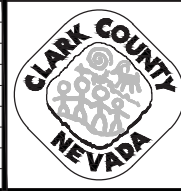
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-22

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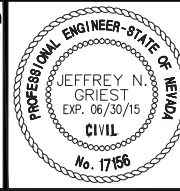


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"FW" 10+00 TO "FW" 19+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

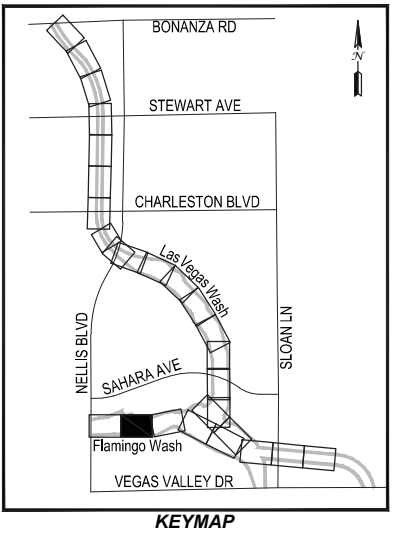
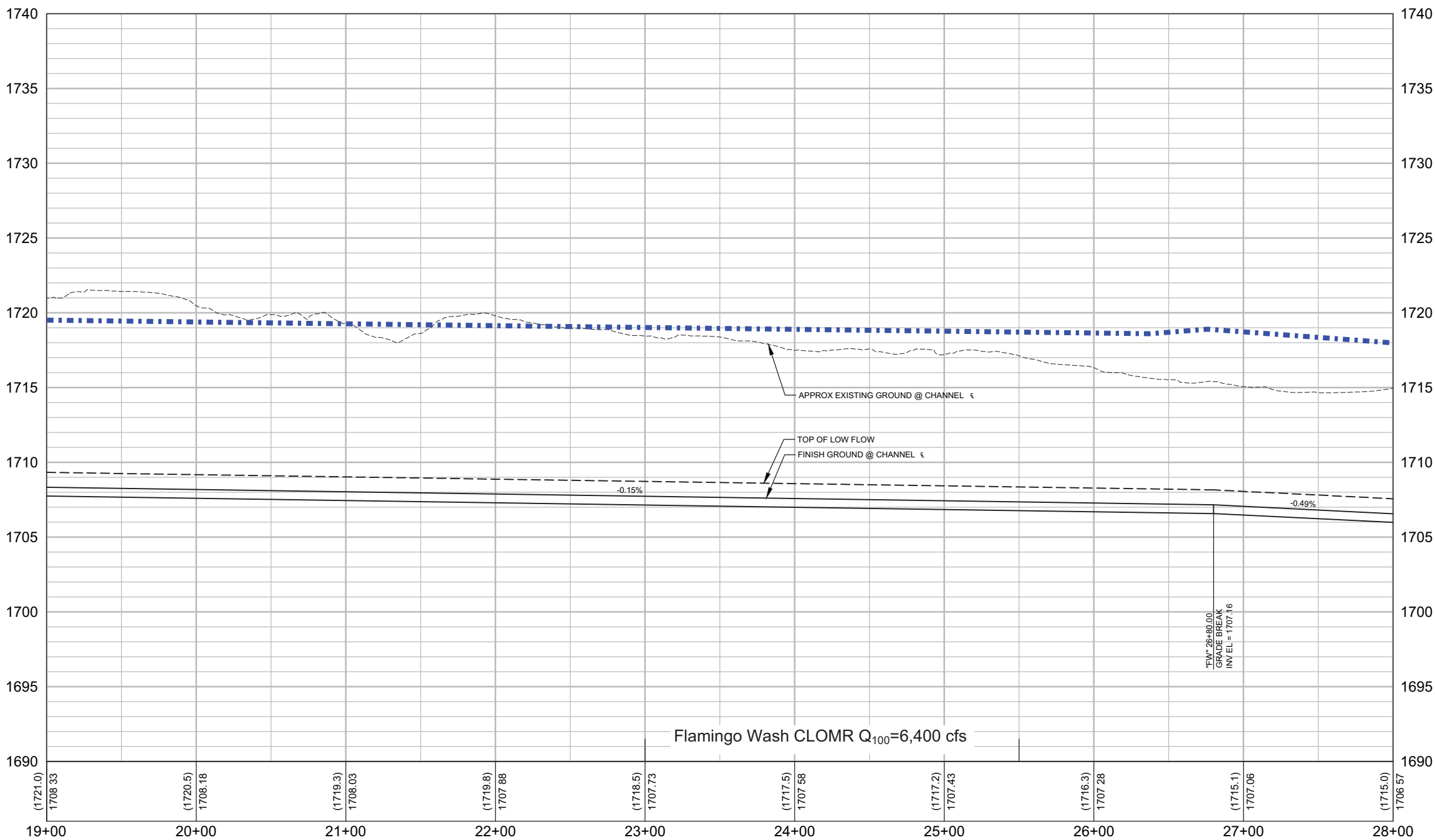
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PR-22

SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-23

AVOID OVERHEAD POWER LINE CONTACT.
IT'S COSTLY.

Call before you Dig
1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call 811

REV No.	DATE	DESCRIPTION	APPROVED
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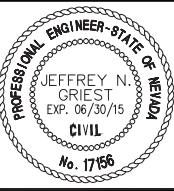


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"FW" 19+00 TO "FW" 28+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

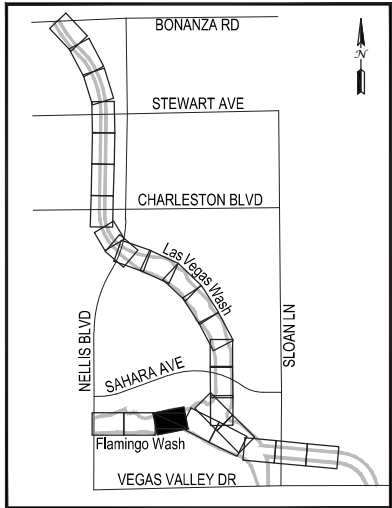
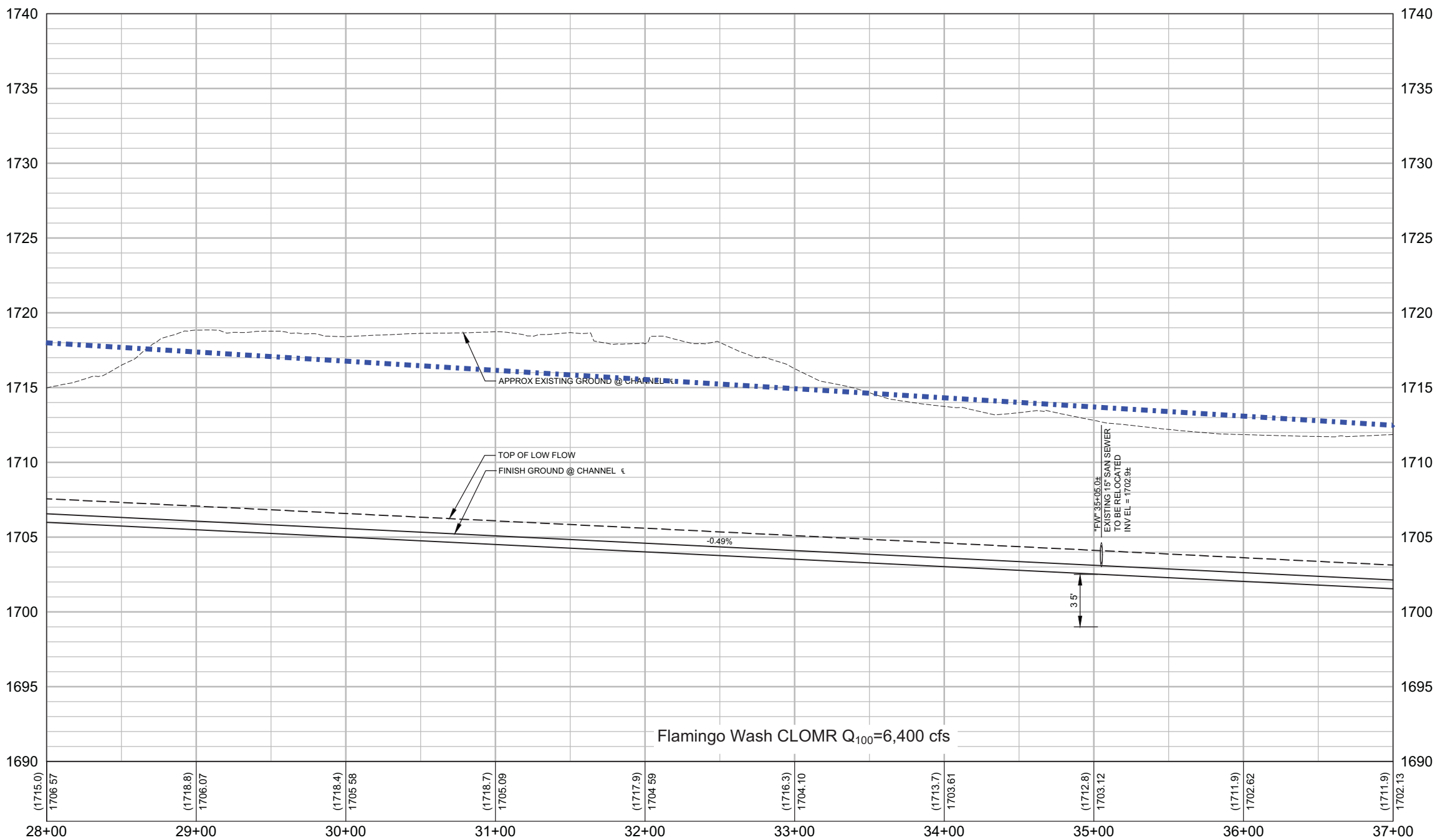
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PR-23

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



AVOID OVERHEAD POWER LINE CONTACT.
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1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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Call 811

FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-24

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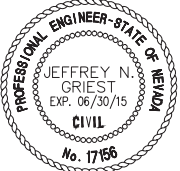


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"FW" 28+00 TO "FW" 37+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

DRAWING NO.

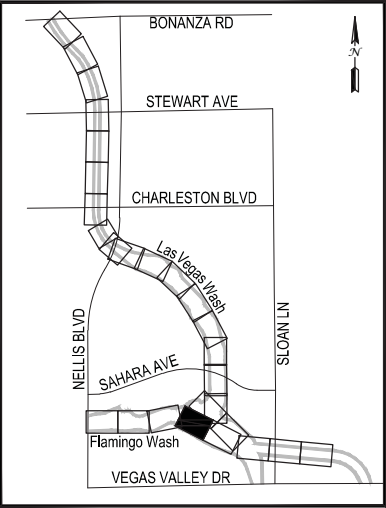
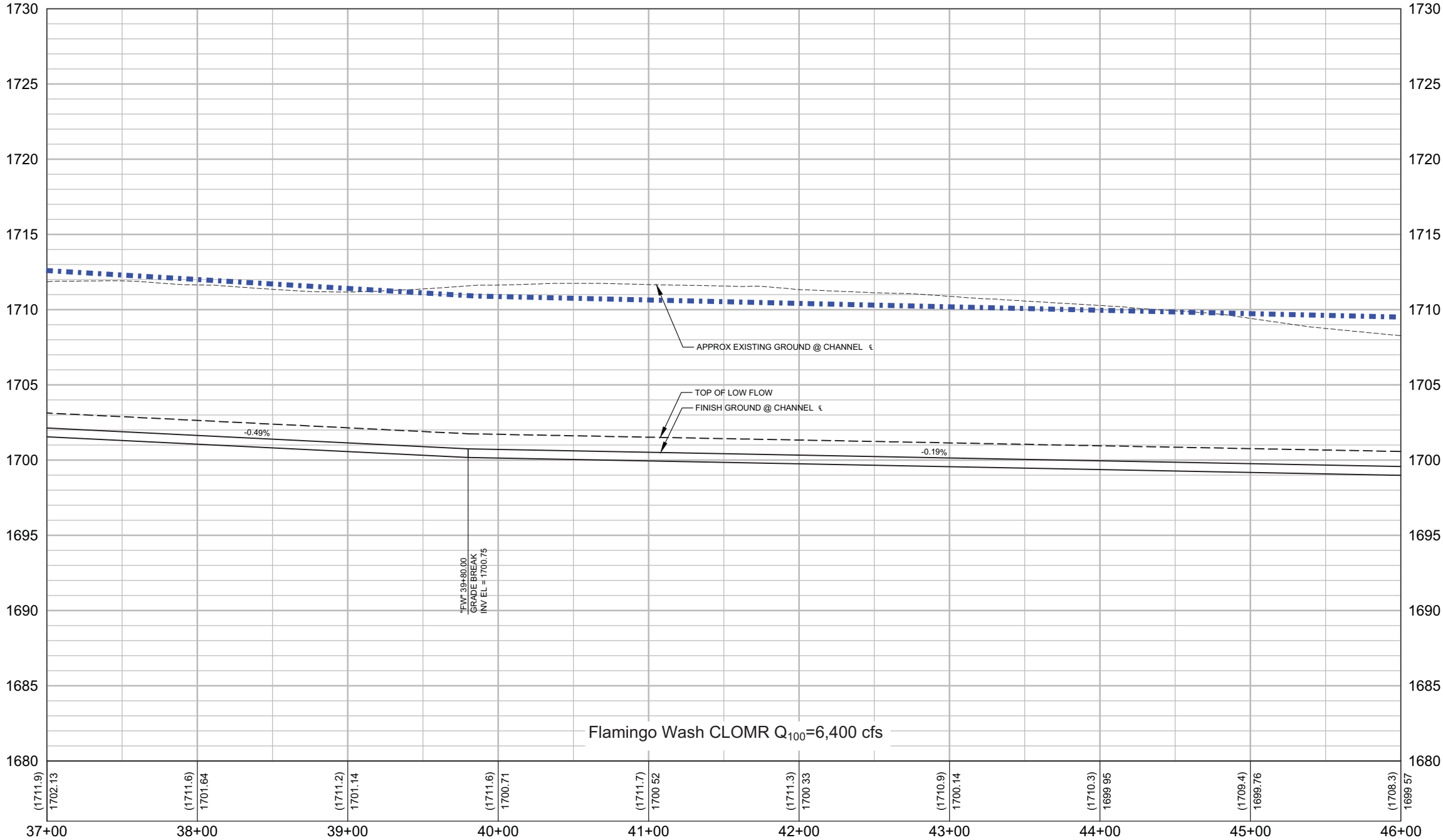
PR-24

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LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-25

AVOID OVERHEAD POWER LINE CONTACT.
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Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call 811

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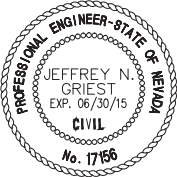


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"FW" 37+00 TO "FW" 46+00

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031

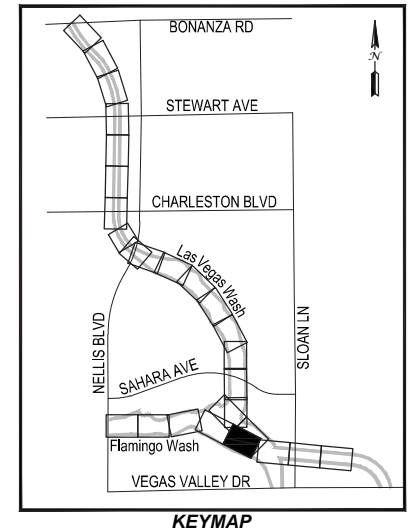
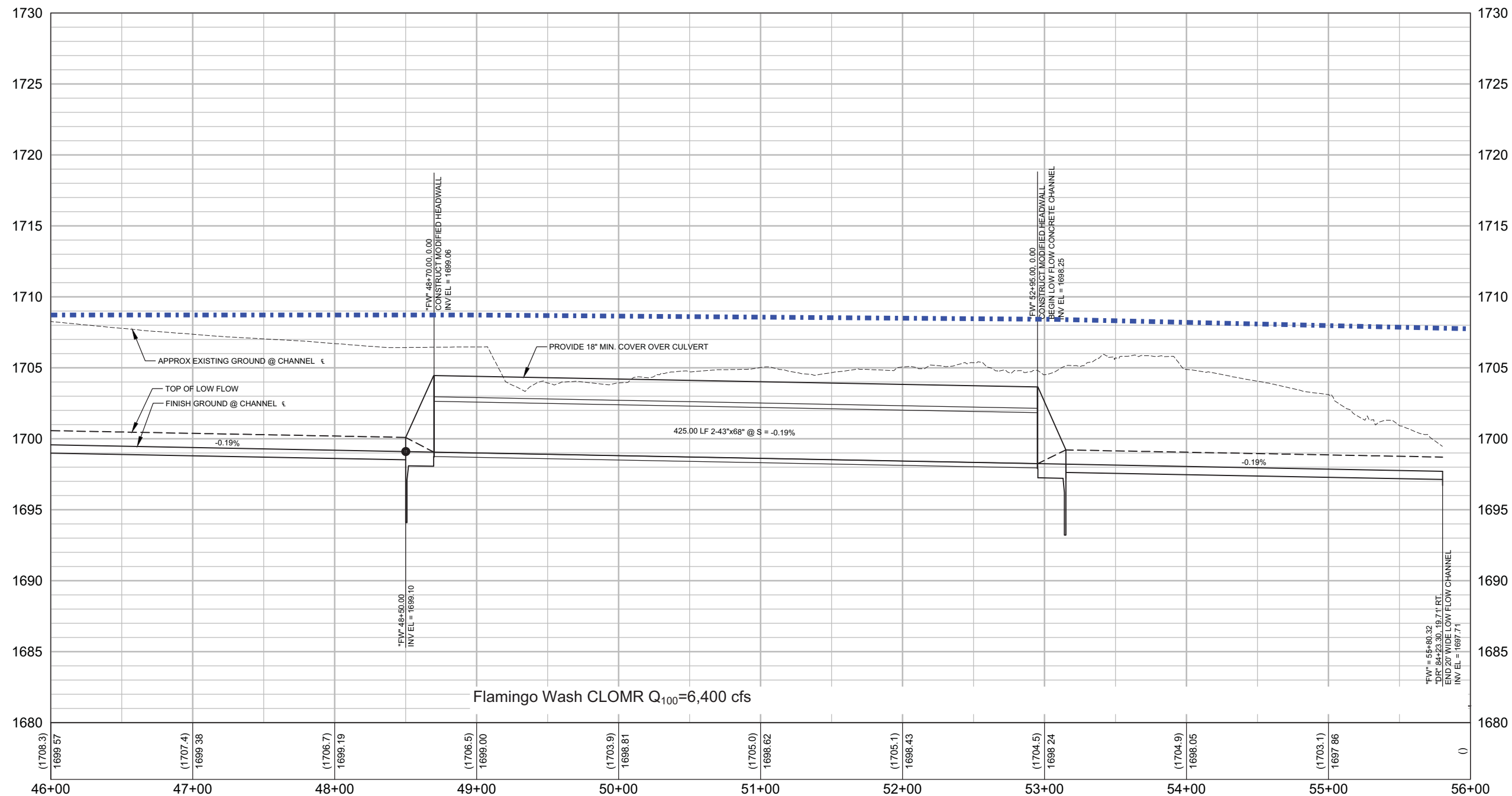
DRAWING NO.

PR-25

SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



FOR DRAINAGE
CHANNEL PLAN
SEE SHEETS PL-26

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1-702-227-2929
NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

Call 811

REV No.	DATE	DESCRIPTION	APPROVED
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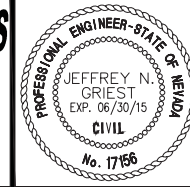


LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

CHANNEL PROFILE

"FW" 46+00 TO "FW" 55+80.32

CLARK COUNTY, NEVADA DEPARTMENT OF PUBLIC WORKS



DESIGNED BY: M. WARNICK
DRAWN BY: B. MAHAN
CHECKED BY: J. GR EST
DATE: August 5, 2013

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE 702-369-6175, FAX 702-369-1107

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'

FIELD BOOK
WORK ORDER
PROJECT No. 462579

L-2031
DRAWING NO.
PR-26

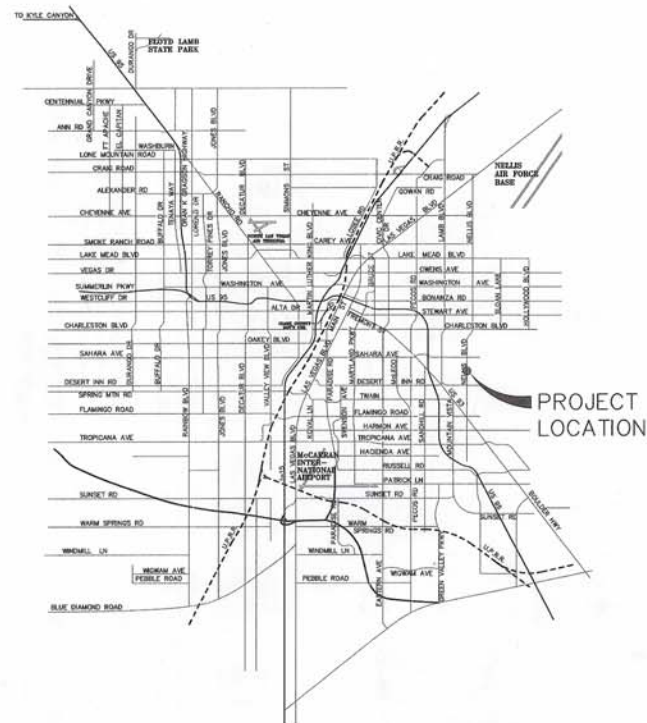
SHT: OF

LAS VEGAS WASH - SLOAN CHANNEL TO BONANZA RD & FLAMINGO WASH BELOW NELLIS BLVD IMPROVEMENTS

NOT FOR CONSTRUCTION



DEPARTMENT OF PUBLIC WORKS



Vicinity Map
NOT TO SCALE



"Progress as Promised"

2005 IMPROVEMENT PLANS FOR FLAMINGO WASH CHANNEL AT NELLIS BOULEVARD FUNDED BY

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
"MAINTENANCE WORK PROJECT"

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89146

County Manager
Thom Reilly


Director of Public Works
Approved:
[Signature] (Acting)

Clark County Regional
Flood Control District
Approved:
[Signature]
Gale Wm. Fraser II, P.E.
General Manager/Chief Engineer

County Commissioners
Rory Reid, Chairman
Myrna Williams, Vice-Chair
Yvonne Atkinson Gates
Lynette Boggs McDonald
Tom Collins
Chip Maxfield
Bruce L. Woodbury

SIGNATURE ON THESE PLANS WILL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS. THE APPROVAL OF THESE DRAWINGS DOES NOT GUARANTEE CAPACITY IN THE DISTRICT'S COLLECTION OR TREATMENT SYSTEM.

"THE APPLICANT SPRINT NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS."

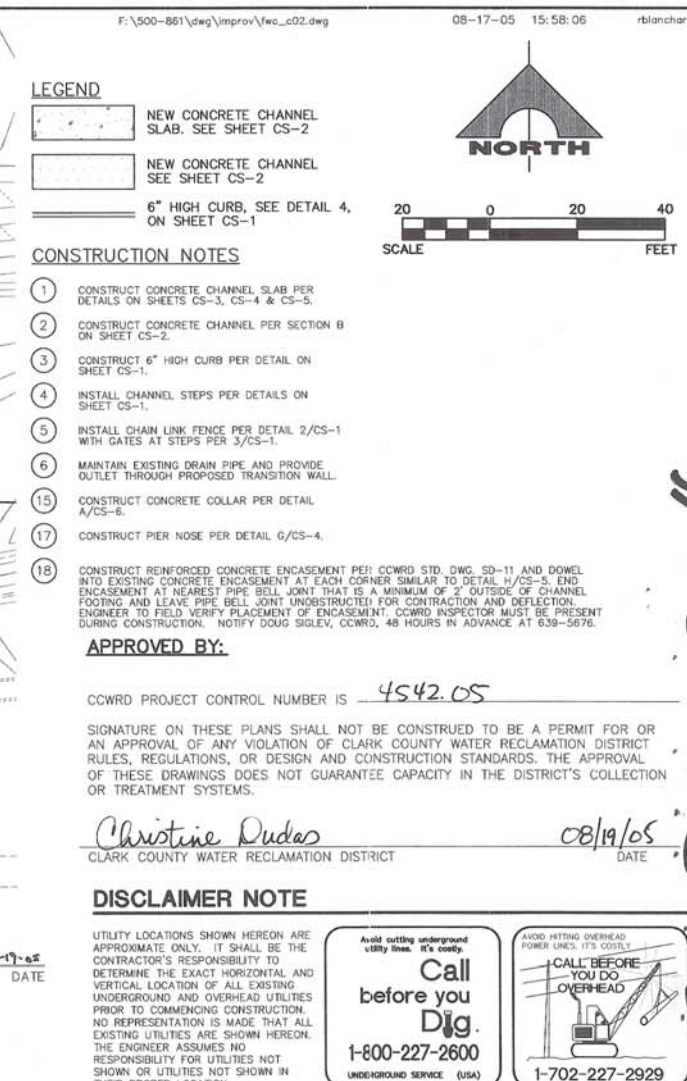
AGENCY		PLANS REVIEWED BY	DATE	DEPARTMENT OF PUBLIC WORKS		BY	DATE	REVISIONS			DESIGN ENGINEERING DIVISION
								NUMBER	DESCRIPTION	DATE	
SPRINT		Dean Whitham	7-1-05								 L-1754
LAS VEGAS VALLEY WATER DISTRICT		Dean Whitham	7-28-05								
SOUTHWEST GAS COMPANY		Dean Whitham	6/30/05	CONSTRUCTION MANAGEMENT DIVISION		Dean Whitham	9/1/05				
NEVADA POWER COMPANY (TRANSMISSION)		Paul Taylor	7/22/05	DESIGN ENGINEERING DIVISION		Paul Taylor	8-24-05				
NEVADA POWER COMPANY (DISTRIBUTION)		Paul Taylor	7/16/05	MAINTENANCE MANAGEMENT DIVISION		Paul Taylor	8-27-05				
CLARK COUNTY WATER RECLAMATION DISTRICT		Christine Dudas	08/19/05	TRAFFIC MANAGEMENT DIVISION		Christine Dudas	8-21-05				
COX COMMUNICATIONS LAS VEGAS, INC.		Christine Dudas	7/20/05	COUNTY SURVEYOR'S OFFICE		Christine Dudas	9-2-05				
CLARK COUNTY FIRE DEPARTMENT		Christine Dudas	7/6/05								




L-1754

"As Builds"

FLAMINGO WASH CHANNEL



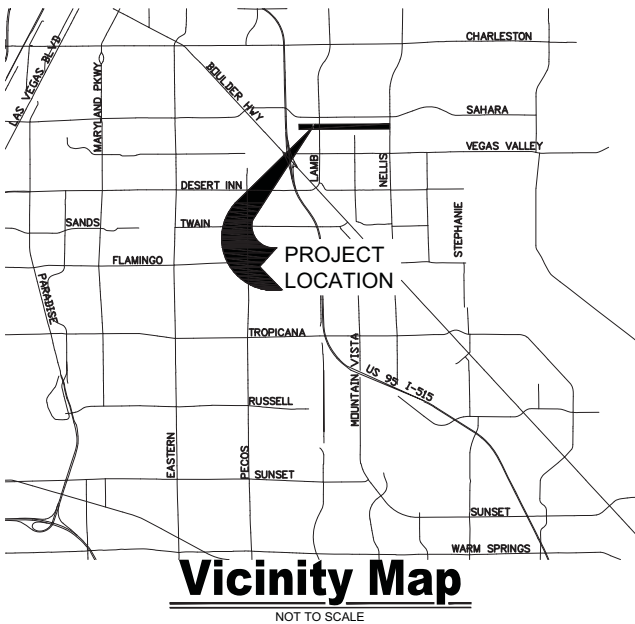
PROJECT No: 500.861 DRAWN BY: D\PEO\RKB
DESIGNED BY: WH\EGG CHECKED BY: WH\EGG
APPROVED BY: JEP

 **G.C. WALLACE, INC.**
Engineers/Planners/Surveyors
1505 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

SCALE	L-1754
HORIZ: 1" = 20'	DRAWING NO.
VERT: 1" = 2'	C-2
FELD BOOK	
	SHT. 6 OF



DEPARTMENT OF PUBLIC WORKS



County Commissioners

Rory Reid, Chair
Susan Brager, Vice Chair
Larry Brown
Tom Collins
Chris Giunchigliani
Steve Sisolak
Lawrence Weekly



"Progress as Promised"

2010
IMPROVEMENT PLANS FOR
FLAMINGO WASH -
NELLIS BLVD TO I-515

FUNDED BY
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

County Manager

Virginia Valentine

Director of Public Works

Approved:

Denis Cederburg

Clark County Regional
Flood Control District

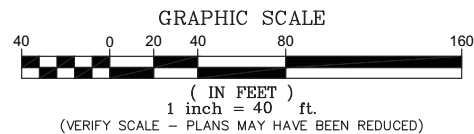
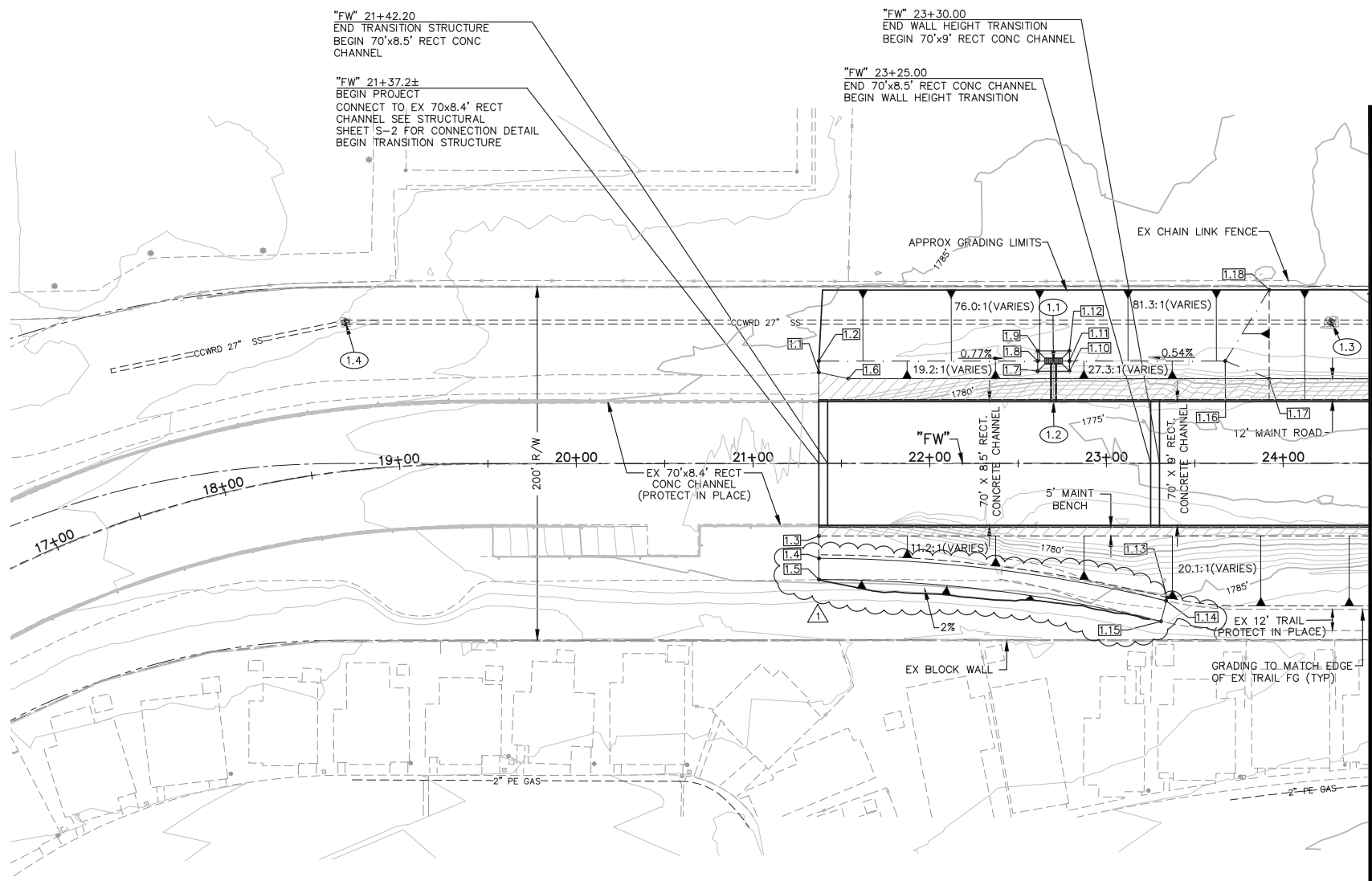
Approved:

Gale Wm. Fraser II, P.E.



2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTNNV.COM

AGENCY			DEPARTMENT OF PUBLIC WORKS			REVISIONS			ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CCDFW. THE DOCUMENTS WERE SEALED ON 8/16/10 BY JEFFREY M. GRIEST UNDER LICENSE NO. 17156	DESIGN ENGINEERING DIVISION COVER SHEET L-1955
	REVIEWED BY	DATE		BY	DATE	NUMBER	DESCRIPTION	DATE		
CENTURY LINK TELEPHONE			DESIGN ENGINEERING DIVISION							
LAS VEGAS VALLEY WATER DISTRICT			CONSTRUCTION MANAGEMENT DIVISION							
SOUTHWEST GAS CORPORATION			MAINTENANCE MANAGEMENT DIVISION							
NV ENERGY COMPANY [TRANSMISSION]			TRAFFIC MANAGEMENT DIVISION							
NV ENERGY COMPANY [DISTRIBUTION]			COUNTY SURVEYOR'S OFFICE							
CLARK COUNTY WATER RECLAMATION DISTRICT										
COX COMMUNICATIONS, LAS VEGAS, INC										
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)										



- LEGEND:**
- [Hatched Box] TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
 - [Dotted Box] NEW 12" WIDE ASPHALT TRAIL (SEE SHEET XS-1)
 - [Circle with 1.1] DESIGN POINT DATA NUMBER (SEE TABLE ON THIS SHEET)
- NOTES:**
- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 - SEE SHEET PR-1 FOR PROFILE.
 - PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
 - FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
 - SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

- STORM DRAIN CONSTRUCTION ITEMS:**
- 1.1 "FW" 22+70.01, 57.99' LT
CONSTRUCT MODIFIED NDOT TYPE 8 D.I. W/CONC APRON PER STRUCTURAL DETAIL ON SHEET S-12
INSTALL 21.74 LF 30" RCP
SEE STORM DRAIN PROFILE 1.2 ON SHEET SD-1
 - 1.2 "FW" 22+70.01, 35.00' LT
CONNECT 30" RCP TO 70' X 8.5' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- SANITARY SEWER CONSTRUCTION ITEMS:**
- 1.3 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.
 - 1.4 EXISTING SSMH - PROTECT IN PLACE

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
1.1	"FW" 21+37.23	51.56' LT	1784.58	BEGIN MAINT RD (MATCH EX)
1.2	"FW" 21+37.23	58.00' LT	1784.57	BEGIN FL (MATCH EX GROUND)
1.3	"FW" 21+37.27	41.00' RT	1784.54	BEGIN 5' MAINT. BENCH
1.4	"FW" 21+37.29	53.67' RT	1784.58	*BEGIN-PC-12'-TRAIL-(831.09'-R)
1.5	"FW" 21+37.26	65.78' RT	1784.60	*BEGIN-PC-12'-TRAIL-(819.09'-R)
1.6	"FW" 21+53.87	48.00' LT	1784.72	ANG PT MAINTENANCE RD
1.7	"FW" 22+61.01	52.24' LT	1783.96	CONC APRON
1.8	"FW" 22+61.01	57.99' LT	1783.62	FLOW LINE
1.9	"FW" 22+61.01	63.74' LT	1783.69	CONC APRON
1.10	"FW" 22+79.01	52.24' LT	1784.01	CONC APRON
1.11	"FW" 22+79.01	57.99' LT	1783.60	FLOW LINE
1.12	"FW" 22+79.01	63.74' LT	1783.68	CONC APRON

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
1.13	"FW" 23+34.21	75.74' RT	1785.63	HINGE LINE
1.14	"FW" 23+33.76	77.68' RT	1785.67	*END-NEW-12'-TRAIL
1.15	"FW" 23+30.89	89.34' RT	1785.99	*END-NEW-12'-TRAIL
1.16	"FW" 23+67.14	58.00' LT	1784.08	FLOW LINE
1.17	"FW" 23+92.04	48.00' LT	1784.36	HINGE LINE
1.18	"FW" 23+92.04	98.24' RT	1784.61	HINGE LINE

NOTE:
*MATCH EXISTING ASPHALT TRAIL/SEE SHEET D-5 FOR NEW TRAIL DETAIL

REV	NO	DATE	DESCRIPTION	APPROVED
1	8/12		RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 21+37.2± TO "FW" 24+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

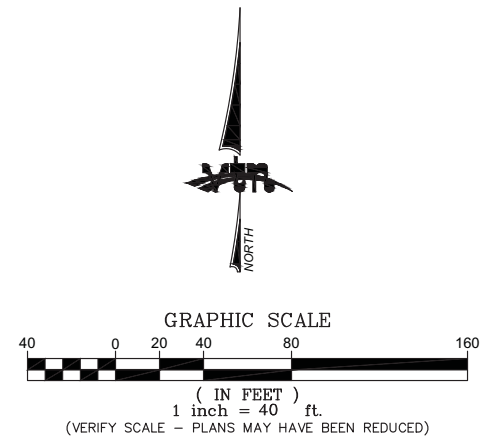
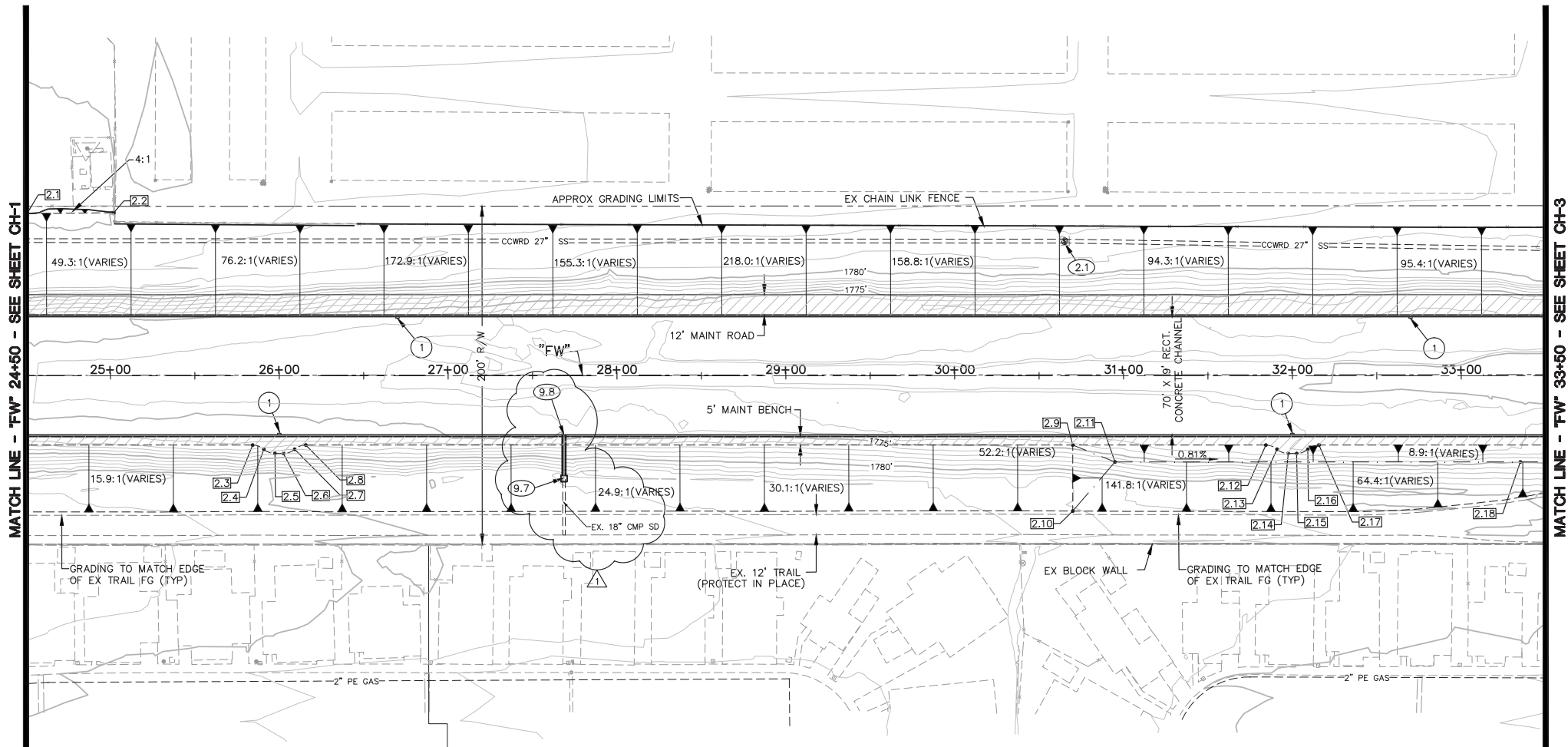
DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

vtm
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTMV.COM

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NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you Dig
Avoid cutting underground
utility lines. It's costly.
Call 811

SCALE		SHEET No	
HORIZ:	1" = 40'	CH-1	
VERT:	NA	FCLA04V	
FIELD BOOK	NONE	L-1955	



LEGEND:

- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
- DESIGN POINT DATA NUMBER (SEE TABLE ON THIS SHEET)
- SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS

NOTES:

- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
- SEE SHEET PR-2 FOR PROFILE.
- PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
- FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
- SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

SANITARY SEWER CONSTRUCTION ITEMS:

- EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
	"FW" 24+50.00	98.25' LT	1785.11	BEGIN HINGE LINE
	"FW" 25+02.04	98.00' LT	1784.94	END HINGE LINE
	"FW" 25+84.27	41.00' RT	1783.53	PC HINGE LINE (10' R)
	"FW" 25+90.89	43.50' RT	1783.56	PCR HINGE LINE (10' R)
	"FW" 25+97.50	46.00' RT	1783.59	PT HINGE LINE
	"FW" 26+02.50	46.00' RT	1783.57	PC HINGE LINE (10' R)
	"FW" 26+09.11	43.50' RT	1783.49	PCR HINGE LINE (10' R)
	"FW" 26+15.73	41.00' RT	1783.42	PT HINGE LINE
	"FW" 30+69.94	41.00' RT	1781.79	HINGE LINE
	"FW" 30+69.94	80.09' RT	1782.18	HINGE LINE
	"FW" 30+94.95	51.00' RT	1781.45	FLOW LINE

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
	"FW" 31+84.29	41.00' RT	1781.38	PC HINGE LINE (10' R)
	"FW" 31+90.91	43.50' RT	1781.40	PCR HINGE LINE (10' R)
	"FW" 31+97.52	46.00' RT	1781.43	PT HINGE LINE
	"FW" 32+02.52	46.00' RT	1781.41	PC HINGE LINE (10' R)
	"FW" 32+09.13	43.50' RT	1781.34	PCR HINGE LINE (10' R)
	"FW" 32+15.75	41.00' RT	1781.26	PT HINGE LINE
	"FW" 33+35.00	51.00' RT	1779.50	FLOW LINE

STORM DRAIN CONSTRUCTION ITEMS:

- "FW" 27+68.6±, 60.8±' RT CONNECT TO EX. 18" CMP CONSTRUCT RCP ANGLED COLLAR PER COLLAR DETAIL ON SHEET D-5 A NDOT CONNECTION PER DETAILS ON SHEET R-2.2.3 MAY BE USED IN LIEU OF CONCRETE COLLAR INSTALL 25.81 LF 18" RCP SEE STORM DRAIN PROFILE 9.8 ON SHEET SD-11
- "FW" 27+68.6±, 35.0±' RT CONNECT 18" RCP AT INSIDE WALL OF 70' X 9' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL SHEET S-1

AVOID OVERHEAD POWER LINE CONTACT IT'S COSTLY

Call before you Dig

Call before you Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you Dig

AVOID cutting underground utility lines. It's costly.

Call 811

E:\7136\ENGINEERING DRAWINGS\CONSTRUCTION\REVIEWS\7136-CHAN_PLAN_REV1-3-11.dwg

REV No	DATE	DESCRIPTION	APPROVED
1	7/11	CONSTRUCTION REVISION	



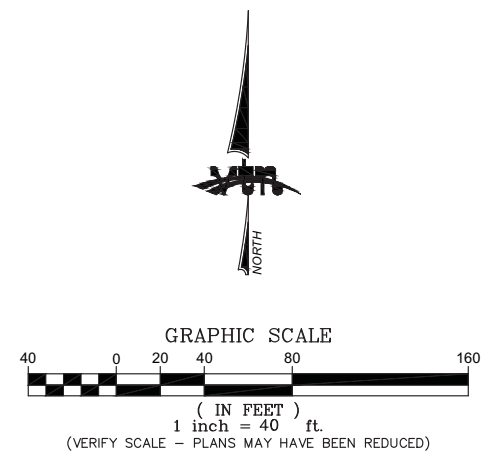
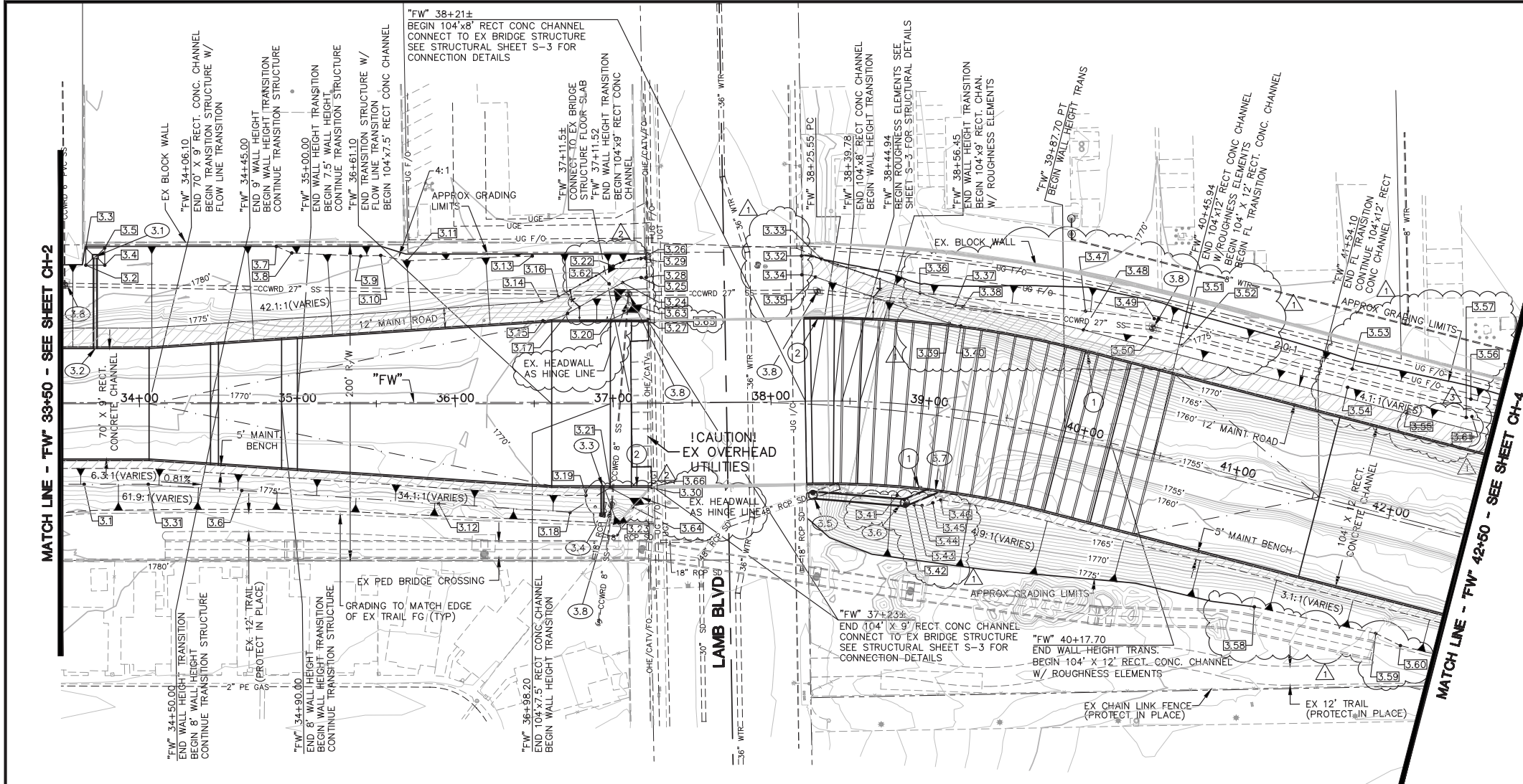
FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 24+50 TO "FW" 33+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CDDPW. THE DOCUMENTS WERE SEALED ON 7/27/11 BY DAVID A. BERGH UNDER LICENSE NO. 20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

vtm
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTMV.COM

SCALE		SHEET No	
HORIZ:	1" = 40'	CH-2	
VERT:	NA	FCLA04V	
FIELD BOOK	NONE	L-1955	



- LEGEND:**
- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
 - DESIGN POINT DATA NUMBER (SEE TABLE ON SHEET CH-3A)
 - SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS
 - PAINTED STAFF GAUGE SEE D-6 FOR DETAILS AND LOCATIONS
- NOTES:**
- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 - SEE SHEET PR-3 FOR PROFILE.
 - PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
 - FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
 - SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

- STORM DRAIN CONSTRUCTION ITEMS:**
- 3.1 "FW" 33+72.05, 93.26' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 57.26 LF 24" RCP SEE STORM DRAIN PROFILE 3.2 ON SHEET SD-1
 - 3.2 "FW" 33+72.05, 35.00' LT CONNECT 24" RCP TO 70' X 9' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
 - 3.3 "FW" 36+93.25, 52.00' RT CONNECT 18" RCP TO 104' X 7.5' RECT CONC CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
 - 3.4 "FW" 36+93.3±, 70.4± RT CONNECT TO EX 18" RCP CONSTRUCT RCP ANGLED COLLAR PER COLLAR DETAIL ON SHEET D-5 INSTALL 18.44 LF 18" RCP SEE STORM DRAIN PROFILE 3.3 ON SHEET SD-2
 - 3.5 "FW" 38+25.46, 59.59' RT CONSTRUCT 60" TYPE IIIA SDMH PER USDOCA STD. DWG. NO. 406A W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A INSTALL 58.43 LF 48" RCP SEE STORM DRAIN PROFILE 3.7 ON SHEET SD-2
 - 3.6 "FW" 38+90.46, 62.28' RT CONSTRUCT 60" TYPE III SDMH PER USDOCA STD. DWG. NO. 406A W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A INSTALL 21.19 LF 48" RCP SEE STORM DRAIN PROFILE 3.7 ON SHEET SD-2
 - 3.7 "FW" 39+10.94, 52.00' RT CONNECT 48" RCP TO 104' X 9' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
 - 3.8 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

FAST

Call before you UnderGround

1-702-432-5300

FREEWAY AND AIRPORT SYSTEMS OF TRANSPORTATION

FOR DESIGN POINT DATA SEE SHEET CH-3A

Call before you Overhead

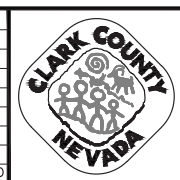
1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you Dig

Call 811

REV NO	DATE	DESCRIPTION	APPROVED
1	11/11	CONSTRUCTION/RAMP REVISION	VTN
2	6/11	CONSTRUCTION REVISION	VTN
3	3/11	REVISION PER ADDENDUM 3	VTN



FLAMINGO WASH - NELLIS BLVD TO I-515

CHANNEL PLAN

"FW" 33+50 TO "FW" 42+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CDDPW. THE DOCUMENTS WERE SEALED ON 11/21/11 BY DAVID A. BERGH UNDER LICENSE NO. 20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

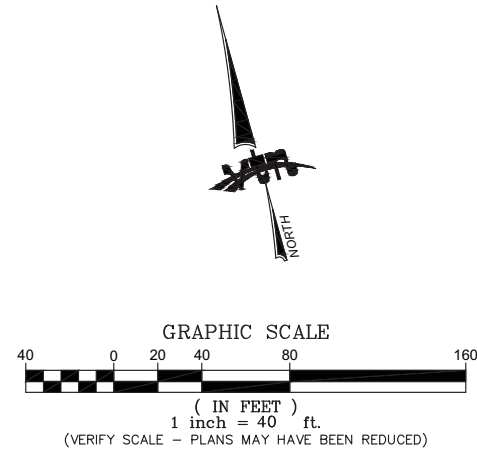
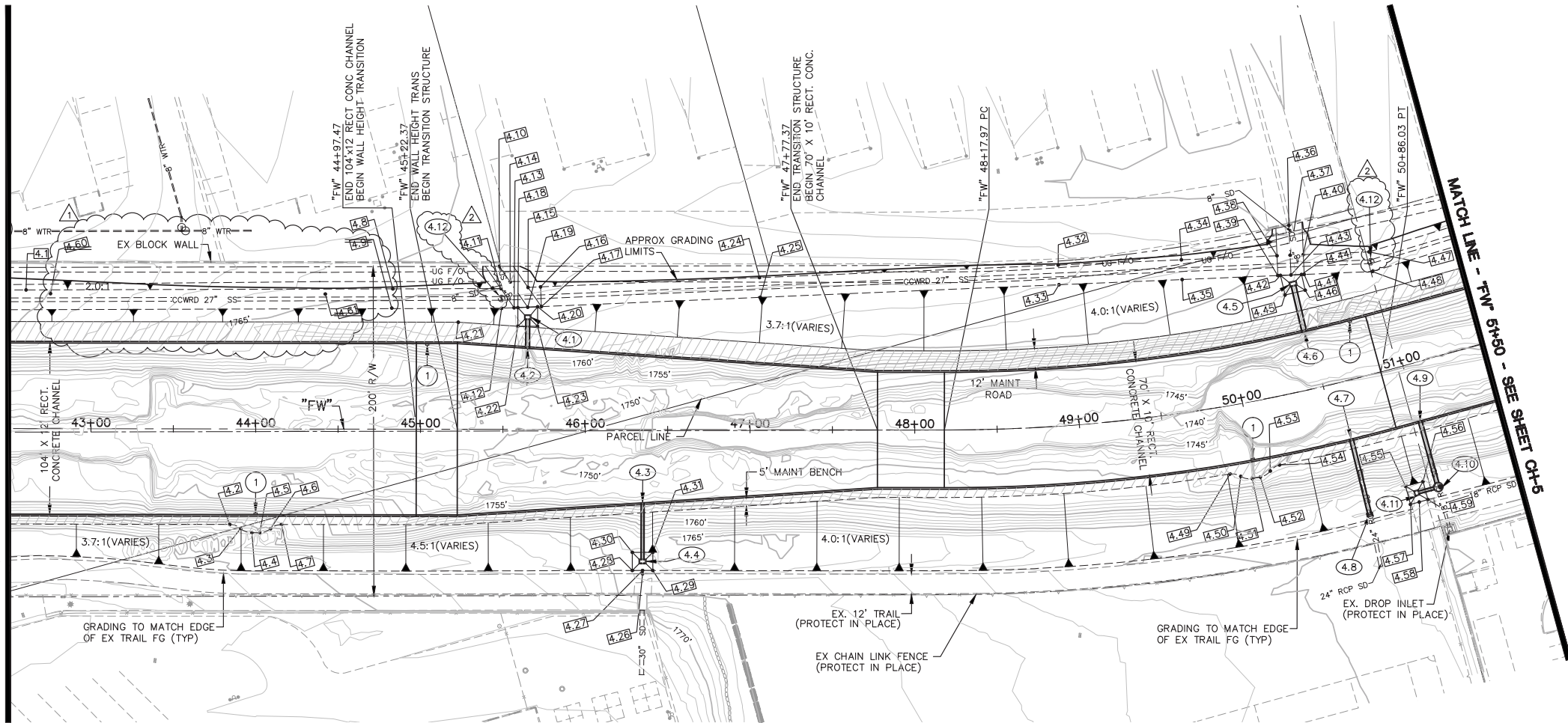
SCALE	SHEET No
HORIZ: 1" = 40'	CH-3
VERT: NA	FCLA04V
FIELD BOOK NONE	L-1955

RECORD DRAWINGS

FLAMINGO WASH - NELLIS BLVD TO I-515

INFORMATION SUPPLIED BY CONTRACTOR - AUGUST 2012

MATCH LINE - "FW" 42+50 - SEE SHEET CH-3



LEGEND:

- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
- DESIGN POINT DATA NUMBER (SEE TABLE ON SHEET CH-4A)
- SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS

NOTES:

- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
- SEE SHEET PR-4 FOR PROFILE.
- PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
- FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
- SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

STORM DRAIN CONSTRUCTION ITEMS:

- 4.1 "FW" 45+64.98, 68.10' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 17.94 LF 18" RCP SEE STORM DRAIN PROFILE 4.2 ON SHEET SD-3
- 4.2 "FW" 45+64.98, 49.16' LT CONNECT 18" RCP TO RECT CONC TRANSITION STRUCTURE PER STRUCTURAL DETAIL ON SHEET S-1
- 4.3 "FW" 46+34.90, 44.50' RT CONNECT 18" RCP TO RECT. CONC. TRANSITION STRUCTURE PER STRUCTURAL DETAIL ON SHEET S-1
- 4.4 "FW" 46+34.91, 80.07' RT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 34.57 LF 18" RCP SEE STORM DRAIN PROFILE 4.3 ON SHEET SD-3
- 4.5 "FW" 50+46.13, 64.88' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 28.88 LF 18" RCP SEE STORM DRAIN PROFILE 4.6 ON SHEET SD-3
- 4.6 "FW" 50+46.25, 35.00' LT CONNECT 18" RCP TO 70' X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 4.7 "FW" 50+58.97, 35.00' RT CONNECT 24" RCP TO 70' X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1

- 4.8 "FW" 50+59.0±, 82.2'± RT CONNECT TO EX 24" RCP CONSTRUCT RCP ANGLED COLLAR PER COLLAR DETAIL ON SHEET D-5 INSTALL 47.23 LF 24" RCP SEE STORM DRAIN PROFILE 4.7 IN SHEET SD-4
- 4.9 "FW" 51+01.15, 35.00' RT CONNECT 24" RCP TO 70'x10' RECT CONC CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 4.10 "FW" 51+01.15, 76.67' RT CONSTRUCT 60" TYPE IA SDMH PER USDOCA STD. DWG. NO. 404A W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A CONNECT TO EX. 18" RCP INSTALL 41.67 LF 24" RCP SEE STORM DRAIN PROFILE 4.9 ON SHEET SD-4
- 4.11 "FW" 50+87.70, 76.67' RT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 12.45 LF 18" RCP SEE STORM DRAIN PROFILE 4.9 ON SHEET SD-4

SANITARY SEWER CONSTRUCTION ITEMS:

- 4.12 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE USING SPECIAL MANHOLE TYPE A SHORTY CONE PER DETAILS ON SHEET D5 AND DCSWCS STD. DWG. 13

FOR DESIGN POINT DATA
SEE SHEET CH-4A

AVOID OVERHEAD POWER LINE CONTACT
IT'S COSTLY

Call before you Dig
Avoid cutting underground
utility lines. It's costly.

Call before you Overhead

1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call 811

REV	No	DATE	DESCRIPTION	APPROVED
1	4/12	11/11	MANHOLE ADJUSTMENT REVISION	CCWRD
2	11/11		CONSTRUCTION/RAMP REVISION	VTN



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 42+50 TO "FW" 51+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

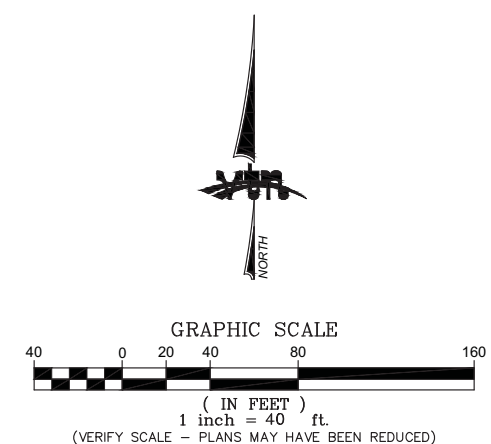
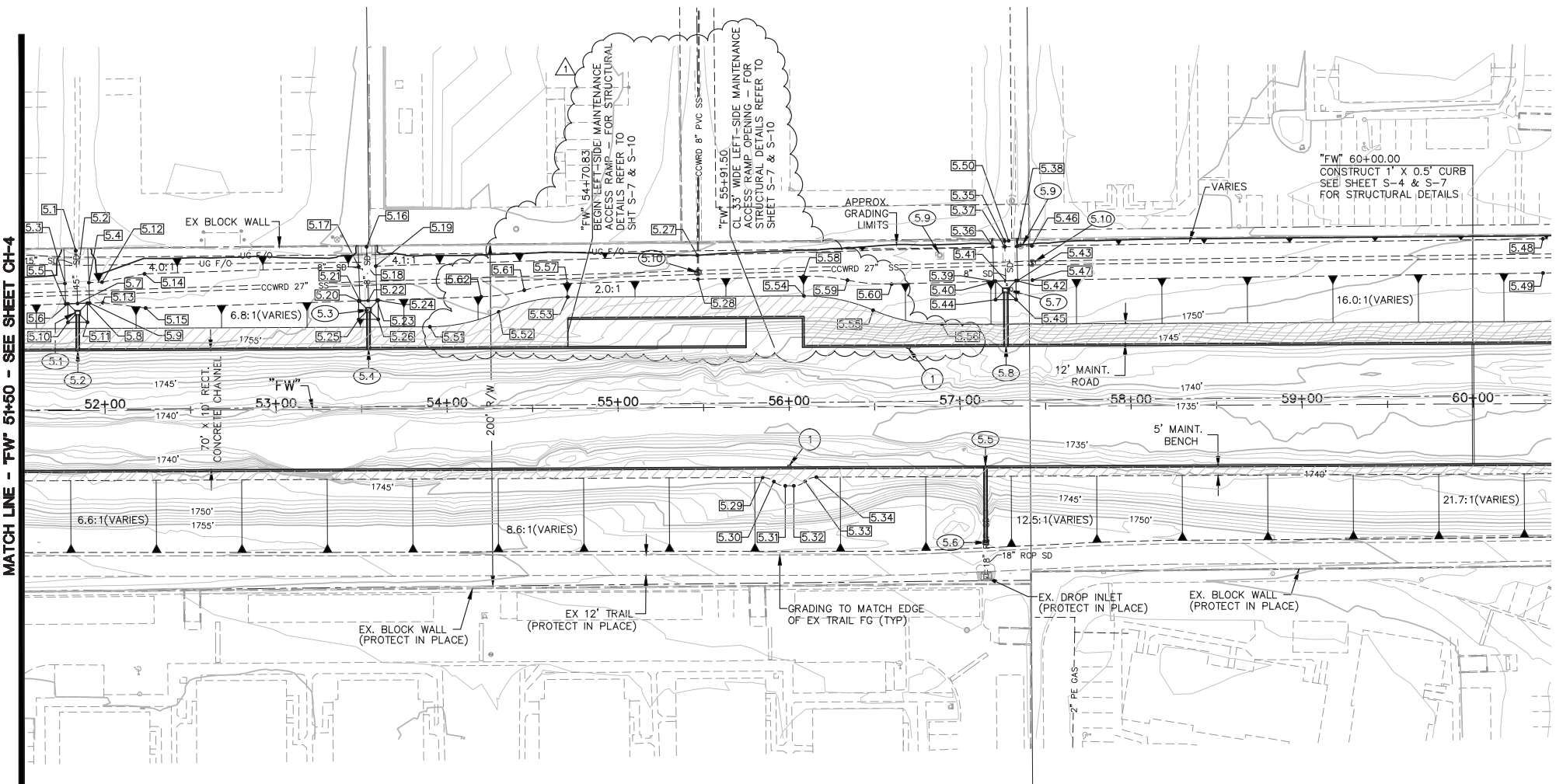
ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CCOPW.
THE
DOCUMENTS WERE SEALED
ON 11/21/11
BY
DAVID A. BERGH
UNDER LICENSE NO.
20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

VTN

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

SCALE	SHEET No
HORIZ: 1" = 40'	CH-4
VERT: NA	FCLA04V
FIELD BOOK NONE	L-1955



- LEGEND:**
- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
 - DESIGN POINT DATA NUMBER (SEE TABLE ON SHEET CH-5A)
 - SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS

- NOTES:**
- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 - SEE SHEET PR-5 FOR PROFILE.
 - PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
 - FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
 - SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

STORM DRAIN CONSTRUCTION ITEMS:

- 5.1 "FW" 51+84.20, 57.12' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 21.11 LF 18" RCP SEE STORM DRAIN PROFILE 5.2 ON SHEET SD-4
- 5.2 "FW" 51+84.20, 35.00' LT CONNECT 18" RCP TO 70" X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 5.3 "FW" 53+54.26, 58.02' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 22.00 LF 18" RCP SEE STORM DRAIN PROFILE 5.4 ON SHEET SD-5
- 5.4 "FW" 53+54.26, 35.00' LT CONNECT 18" RCP TO 70" X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 5.5 "FW" 57+14.64, 35.00' RT CONNECT 18" RCP TO 70" X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 5.6 "FW" 57+14.64, 79.7' RT CONNECT TO EX 18" SD CONSTRUCT RCP ANGLED COLLAR PER COLLAR DETAIL ON SHEET D-5 INSTALL 44.74 LF 18" RCP SEE STORM DRAIN PROFILE 5.5 ON SHEET SD-5
- 5.7 "FW" 57+27.03, 67.78' LT CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON PER DETAIL ON SHEET D-5 INSTALL 31.78 LF 18" RCP SEE STORM DRAIN PROFILE 5.8 ON SHEET SD-5
- 5.8 "FW" 57+27.03, 35.00' LT CONNECT 18" RCP TO 70" X 10' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- 5.9 EXISTING F.O. MANHOLE (ADJUST TO FINISH GRADE)
- 5.10 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

SANITARY SEWER CONSTRUCTION ITEMS:

FOR DESIGN POINT DATA
SEE SHEET CH-5A

AVOID OVERHEAD POWER LINE CONTACT
IT'S COSTLY

Call before you Overhead

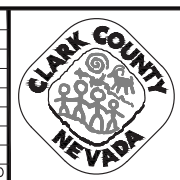
1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you Dig
Avoid cutting underground utility lines. It's costly.

Call 811

REV No	DATE	DESCRIPTION	APPROVED



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 51+50 TO "FW" 60+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 11/21/11
BY
DAVID A. BERGH
UNDER LICENSE NO.
20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

VTN

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

SCALE	SHEET No
HORIZ: 1" = 40'	CH-5
VERT: NA	FCLA04V
FIELD BOOK NONE	L-1955

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
5.1	"FW" 51+83.28	94.75' LT	1754.99	*END 14' WIDE VALLEY GUTTER
5.2	"FW" 51+83.86	74.62' LT	1754.21	*CL 14' WIDE VALLEY GUTTER
5.3	"FW" 51+76.86	74.41' LT	1754.56	HINGE LINE @ VALLEY GUTTER
5.4	"FW" 51+90.85	74.82' LT	1754.56	HINGE LINE @ VALLEY GUTTER
5.5	"FW" 51+77.21	62.42' LT	1754.56	HINGE LINE @ VALLEY GUTTER
5.6	"FW" 51+78.49	62.46' LT	1754.26	CONC APRON
5.7	"FW" 51+84.20	62.62' LT	1753.97	BEGIN 14' WIDE VALLEY GUTTER
5.8	"FW" 51+89.91	62.79' LT	1754.26	CONC APRON
5.9	"FW" 51+91.20	62.82' LT	1754.56	HINGE LINE @ VALLEY GUTTER
5.10	"FW" 51+78.49	51.62' LT	1752.47	CONC APRON
5.11	"FW" 51+89.91	51.62' LT	1752.47	CONC APRON
5.12	"FW" 51+98.53	75.04' LT	1754.52	ANG PT HINGE LINE
5.13	"FW" 51+98.88	63.04' LT	1754.28	ANG PT HINGE LINE
5.14	"FW" 52+23.41	79.76' LT	1754.55	ANG PT HINGE LINE
5.15	"FW" 52+23.98	59.76' LT	1754.15	ANG PT HINGE LINE
5.16	"FW" 53+53.33	95.77' LT	1753.90	*END 10' WIDE VALLEY GUTTER
5.17	"FW" 53+48.69	83.36' LT	1753.92	HINGE LINE @ VALLEY GUTTER
5.18	"FW" 53+53.69	83.51' LT	1753.67	*CL 10' WIDE VALLEY GUTTER
5.19	"FW" 53+58.68	83.65' LT	1753.92	HINGE LINE @ VALLEY GUTTER
5.20	"FW" 53+48.55	65.35' LT	1753.52	CONC APRON
5.21	"FW" 53+49.26	63.37' LT	1753.52	HINGE LINE @ VALLEY GUTTER
5.22	"FW" 53+54.26	63.52' LT	1753.27	*BEGIN 10' WIDE VALLEY GUTTER
5.23	"FW" 53+59.26	63.66' LT	1753.52	HINGE LINE @ VALLEY GUTTER
5.24	"FW" 53+59.97	63.68' LT	1753.52	CONC APRON
5.25	"FW" 53+58.55	52.52' LT	1751.77	CONC APRON
5.26	"FW" 53+59.97	52.52' LT	1751.77	CONC APRON
5.27	"FW" 55+46.80	89.07' LT	1754.88	GRADE BREAK HINGE LINE
5.28	"FW" 55+47.27	69.07' LT	1754.48	GRADE BREAK HINGE LINE
5.29	"FW" 55+84.28	41.00' RT	1748.92	PC HINGE LINE (10' R)
5.30	"FW" 55+90.89	43.50' RT	1748.95	PCR HINGE LINE (10' R)
5.31	"FW" 55+97.51	46.00' RT	1748.97	PT HINGE LINE
5.32	"FW" 56+02.51	46.00' RT	1748.95	PC HINGE LINE (10' R)
5.33	"FW" 56+09.12	43.50' RT	1748.87	PCR HINGE LINE (10' R)
5.34	"FW" 56+15.74	41.00' RT	1748.80	PT HINGE LINE
5.35	"FW" 56+26.45	98.00' RT	1751.08	*END 14' WIDE VALLEY GUTTER

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
5.36	"FW" 57+19.56	93.11' LT	1751.41	HINGE LINE @ VALLEY GUTTER
5.37	"FW" 57+26.56	93.27' LT	1751.06	*CL 14' WIDE VALLEY GUTTER
5.38	"FW" 57+33.56	93.44' LT	1751.41	HINGE LINE @ VALLEY GUTTER
5.39	"FW" 57+20.03	73.12' LT	1751.01	HINGE LINE @ VALLEY GUTTER
5.40	"FW" 57+21.03	73.14' LT	1750.96	CONC APRON
5.41	"FW" 57+27.03	73.28' LT	1750.66	BEGIN 14' WIDE VALLEY GUTTER
5.42	"FW" 57+34.02	73.44' LT	1750.96	HINGE LINE @ VALLEY GUTTER
5.43	"FW" 57+33.03	73.42' LT	1751.01	CONC APRON
5.44	"FW" 57+21.03	62.28' LT	1750.54	CONC APRON
5.45	"FW" 57+33.03	62.28' LT	1750.54	CONC APRON
5.46	"FW" 57+42.38	93.64' LT	1751.36	ANG PT HINGE LINE
5.47	"FW" 57+42.63	73.65' LT	1750.96	ANG PT HINGE LINE
5.48	"FW" 60+41.26	96.37' LT	1749.72	GRADE BREAK HINGE LINE
5.49	"FW" 60+41.26	76.37' LT	1749.32	GRADE BREAK HINGE LINE
5.50	"FW" 57+28.81	96.96' LT	1751.13	HINGE LINE
5.51	"FW" 53+90.14	48.00' LT	1749.84	PC MAINTENANCE RD
5.52	"FW" 54+30.48	56.50' LT	1751.70	PCR MAINTENANCE RD (100' R)
5.53	"FW" 54+70.83	65.00' LT	1753.64	PT MAINTENANCE RD (100' R)
5.54	"FW" 56+09.00	65.00' LT	1752.20	PC MAINTENANCE RD
5.55	"FW" 56+49.35	56.50' LT	1750.12	PCR MAINTENANCE RD (100' R)
5.56	"FW" 56+89.69	48.00' LT	1748.64	PT MAINTENANCE RD (100' R)
5.57	"FW" 54+70.61	72.87' LT	1754.00	PT HINGE LINE (108' R)
5.58	"FW" 56+08.73	76.51' LT	1754.07	PC HINGE LINE
5.59	"FW" 56+34.49	74.11' LT	1753.00	PCR HINGE LINE (111.5' R)
5.60	"FW" 56+60.24	71.72' LT	1751.93	PT HINGE LINE (111.5' R)
5.61	"FW" 54+45.43	69.14' LT	1754.00	PCR HINGE LINE (108' R)
5.62	"FW" 54+20.25	65.41' LT	1753.92	PC HINGE LINE

NOTE:

*SEE SHEET D-5 FOR CONC VALLEY GUTTER DETAIL

[illegible]

FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 51+50 TO "FW" 60+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

**ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 11/21/11
BY
DAVID A. BERGH
UNDER LICENSE NO.
20846**

DESIGNED BY:	DAB
DRAWN BY:	DKP
CHECKED BY:	JNG, TMM
DATE:	SEPTEMBER 2010



2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5144
PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTNNV.COM

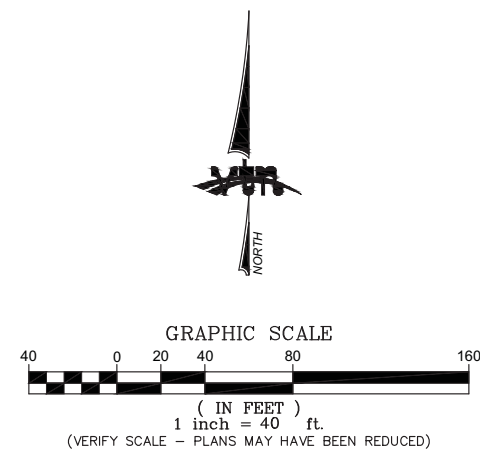
SCALE	
HORIZ:	NA
VERT:	NA
FIELD BOOK	NONE

SHEET No	CH-5A
FCLA04V	
L-1955	

RECORD DRAWINGS

INFORMATION SUPPLIED BY CONTRACTOR – AUGUST 2012

FLAMINGO WASH - NELLIS BLVD TO I-515

**LEGEND:**TYPE II MAINTENANCE ROAD
AND/OR MAINTENANCE BENCH
(SEE SHEET XS-1)

6.1

DESIGN POINT DATA NUMBER
(SEE TABLE ON SHEET CH-6A)

1


SEE SHEET D-1 FOR CHANNEL LADDER
& ACCESS OPENING LOCATIONS**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET PR-6 FOR PROFILE.
3. PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
4. FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

FOR DESIGN POINT DATA
SEE SHEET CH-6A

S:\1316\ENGINEERING\DRAWINGS\PRODUCTION PLANS\1316-CHAN_PLAN.dwg

SCALE		SHEET No	
HORIZ:	1" = 40'	CH-6	
VERT:	NA	FCLA04V	
FIELD BOOK	FCLA04V	L-1955	

DESIGNED BY:	DAB
DRAWN BY:	DKP
CHECKED BY:	JNG, TMM
DATE:	SEPTEMBER 2010
	
2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5148 PHONE (702) 875-7550 FAX (702) 362-2587 WEB SITE WWW.VTNV.COM	

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CDDPW. THE DOCUMENTS WERE SEALED ON 9/30/10 BY JEFFREY M. GRIEST UNDER LICENSE NO. 17156

FLAMINGO WASH - NELLIS BLVD TO I-515

CHANNEL PLAN

"FW" 60+50 TO "FW" 69+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS



REV No	DATE	DESCRIPTION	APPROVED

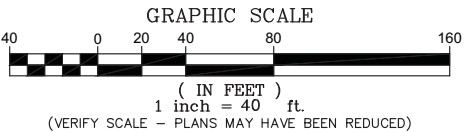
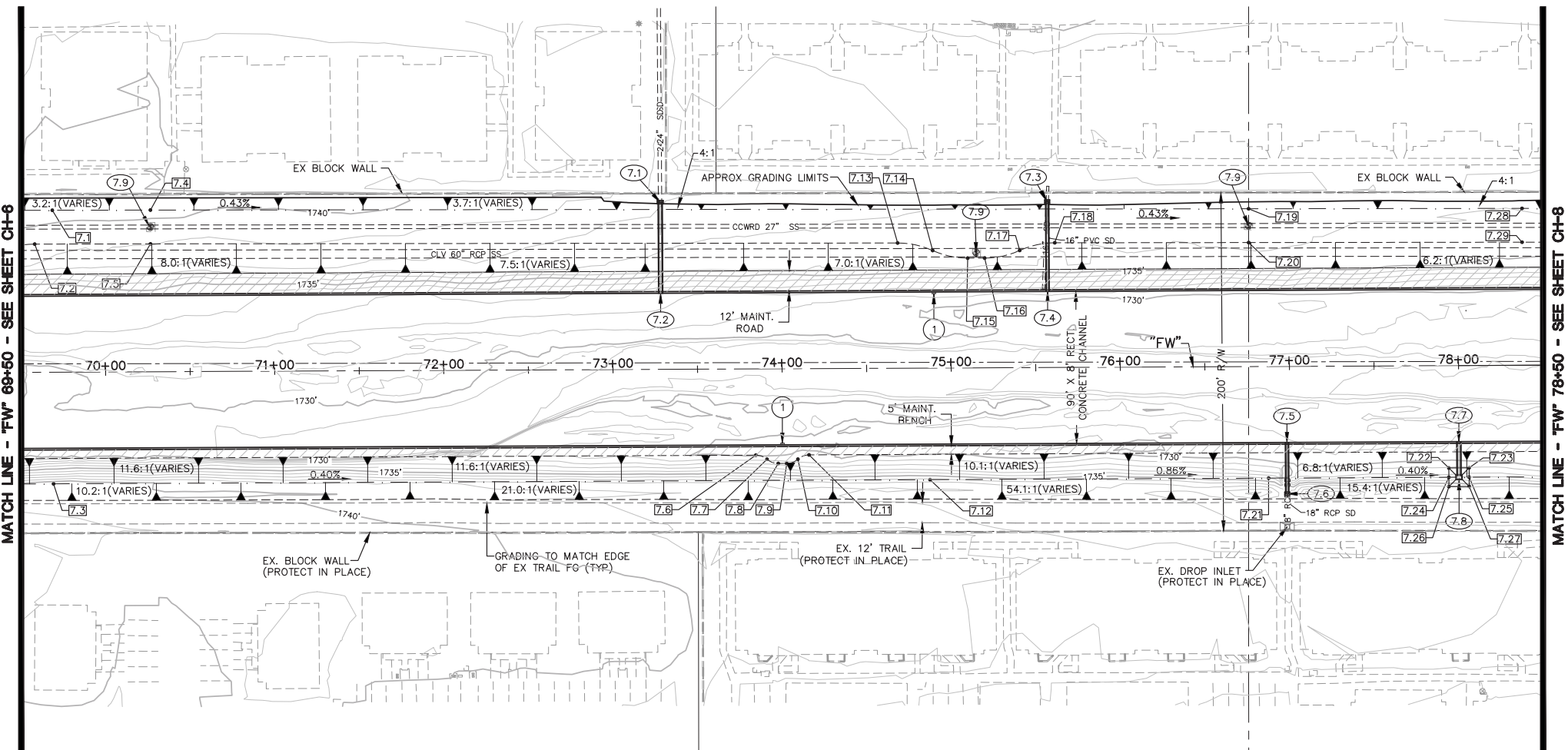
STORM DRAIN CONSTRUCTION ITEMS:

- 6.1 "FW" 63+78.91, 45.00' RT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 6.2 "FW" 63+78.9±, 67.7± RT
CONNECT TO EX 18" RCP
CONSTRUCT RCP ANGLED COLLAR
PER COLLAR DETAIL ON SHEET D-5
INSTALL 22.65 LF 18" RCP
SEE STORM DRAIN PROFILE 6.1 ON SHEET SD-6
- 6.3 "FW" 63+86.78, 61.90' LT
CONSTRUCT MODIFIED NDOT TYPE 4 SDMH
PER STRUCTURAL DETAIL ON SHEET S-11
INSTALL 30.20 LF 54" RCP
SEE STORM DRAIN PROFILE 6.4 ON SHEET SD-6
- 6.4 "FW" 64+13.83, 45.00' LT
CONNECT 54" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 6.5 "FW" 69+01.5±, 54.0'± LT
CONSTRUCT RCP ANGLED COLLAR
PER COLLAR DETAIL ON SHEET D-5
CONNECT TO EX. 18" PVC SD
INSTALL 9.00 LF 18" RCP
SEE STORM DRAIN PROFILE 6.6 ON SHEET SD-6

- 6.6 "FW" 69+01.53, 45.00' LT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 6.7 EX SDMH (ADJUST TO FINISH GRADE)
- 6.8 "FW" 63+95.00, 102.02' LT
CONSTRUCT MODIFIED NDOT TYPE 8 D.I. W/ CONC APRON
FOR STRUCTURAL DETAILS REFER TO SHEET S-12
INSTALL 78.87 LF 30" RCP
SEE STORM DRAIN PROFILE 6.9 ON SHEET SD-11
- 6.9 "FW" 64+50.75, 45.00' LT
CONNECT 30" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1

SANITARY SEWER CONSTRUCTION ITEMS:

- 6.10 EX SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSCWS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.



- LEGEND:**
- [Hatched Box] TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
 - [Box with 7.1] DESIGN POINT DATA NUMBER (SEE TABLE ON THIS SHEET)
 - [Circle with 1] SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS

- NOTES:**
- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 - SEE SHEET PR-7 FOR PROFILE.
 - PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
 - FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
 - SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
7.1	"FW" 69+68.90	95.80' LT	1738.72	FLOW LINE
7.2	"FW" 69+58.38	75.83' LT	1739.16	PT HINGE LINE
7.3	"FW" 69+68.90	66.00' RT	1739.84	FLOW LINE
7.4	"FW" 70+26.95	95.59' LT	1738.47	FLOW LINE
7.5	"FW" 70+26.88	75.63' LT	1738.87	HINGE LINE
7.6	"FW" 73+84.26	51.00' RT	1739.47	PC HINGE LINE (10' R)
7.7	"FW" 73+90.88	53.50' RT	1739.47	PCR HINGE LINE (10' R)
7.8	"FW" 73+97.49	56.00' RT	1739.49	PT HINGE LINE
7.9	"FW" 74+02.49	56.00' RT	1739.47	PC HINGE LINE (10' R)
7.10	"FW" 74+09.10	53.50' RT	1739.40	PCR HINGE LINE (10' R)
7.11	"FW" 74+15.72	51.00' RT	1739.34	PT HINGE LINE
7.12	"FW" 74+87.19	66.00' RT	1737.76	FLOW LINE
7.13	"FW" 74+68.67	74.08' LT	1736.96	PC HINGE LINE (50' R)
7.14	"FW" 74+89.39	69.51' LT	1736.96	PCR HINGE LINE (50' R)
7.15	"FW" 75+10.10	64.93' LT	1736.96	PT HINGE LINE

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
7.16	"FW" 75+20.10	64.90' LT	1736.92	PC HINGE LINE (50' R)
7.17	"FW" 75+40.85	69.32' LT	1736.74	PCR HINGE LINE (50' R)
7.18	"FW" 75+61.59	73.75' LT	1736.56	PT HINGE LINE
7.19	"FW" 76+76.33	93.35' LT	1735.66	GRADE BREAK FLOW LINE
7.20	"FW" 76+76.33	73.35' LT	1736.06	GRADE BREAK HINGE LINE
7.21	"FW" 76+87.41	66.00' RT	1736.05	GRADE BREAK FLOW LINE
7.22	"FW" 77+94.00	60.52' RT	1736.43	CONC APRON
7.23	"FW" 78+06.00	60.52' RT	1736.38	CONC APRON
7.24	"FW" 77+94.00	66.02' RT	1735.62	FLOW LINE CONC APRON
7.25	"FW" 78+06.00	66.02' RT	1735.57	FLOW LINE CONC APRON
7.26	"FW" 77+94.00	71.52' RT	1736.03	CONC APRON
7.27	"FW" 78+06.00	71.52' RT	1735.99	CONC APRON
7.28	"FW" 78+38.01	92.80' RT	1734.97	GRADE BREAK FLOW LINE
7.29	"FW" 78+37.95	72.80' RT	1735.37	GRADE BREAK HINGE LINE

STORM DRAIN CONSTRUCTION ITEMS:

- 7.1 "FW" 73+28.4±, 98.9'± LT
CONSTRUCT RCP ANGLE COLLAR
PER DETAIL ON SHEET D-5
INSTALL 53.87 LF 24" RCP
SEE STORM DRAIN PROFILE 7.2 ON SHEET SD-7
- 7.2 "FW" 73+28.40, 45.00' LT
CONNECT 24" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 7.3 "FW" 75+57.2±, 98.2'± LT
CONSTRUCT RCP ANGLE COLLAR
PER DETAIL ON SHEET D-5
INSTALL 53.17 LF 18" RCP
SEE STORM DRAIN PROFILE 7.4 ON SHEET SD-7
- 7.4 "FW" 75+57.24, 45.00' LT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 7.5 "FW" 76+98.38, 45.00' RT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER COLLAR DETAIL ON SHEET D-5
INSTALL 30.29 LF 18" RCP
SEE STORM DRAIN PROFILE 7.5 ON SHEET SD-7
- 7.6 "FW" 76+98.4±, 75.3'± RT
CONNECT TO EX 18" RCP
CONSTRUCT RCP ANGLED COLLAR
PER COLLAR DETAIL ON SHEET D-5
INSTALL 30.29 LF 18" RCP
SEE STORM DRAIN PROFILE 7.5 ON SHEET SD-7

SANITARY SEWER CONSTRUCTION ITEMS:

- 7.7 "FW" 78+00.00, 45.00' RT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 7.8 "FW" 78+00.00, 60.02' RT
CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON
PER DETAIL ON SHEET D-5
INSTALL 20.02 LF 18" RCP
SEE STORM DRAIN PROFILE 7.7 ON SHEET SD-8
- 7.9 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

AVOID OVERHEAD POWER LINE CONTACT
IT'S COSTLY

Call before you Overhead

1-702-227-2929
NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you Dig
Avoid cutting underground
utility lines. It's costly.

Call 811

\\V136\ENGINEERING\DRAWINGS\PRODUCTION PLANS\7136-CHAN_PLAN.dwg

REV	NO	DATE	DESCRIPTION	APPROVED



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 69+50 TO "FW" 78+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

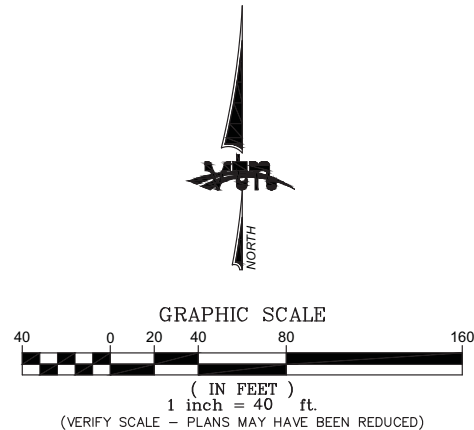
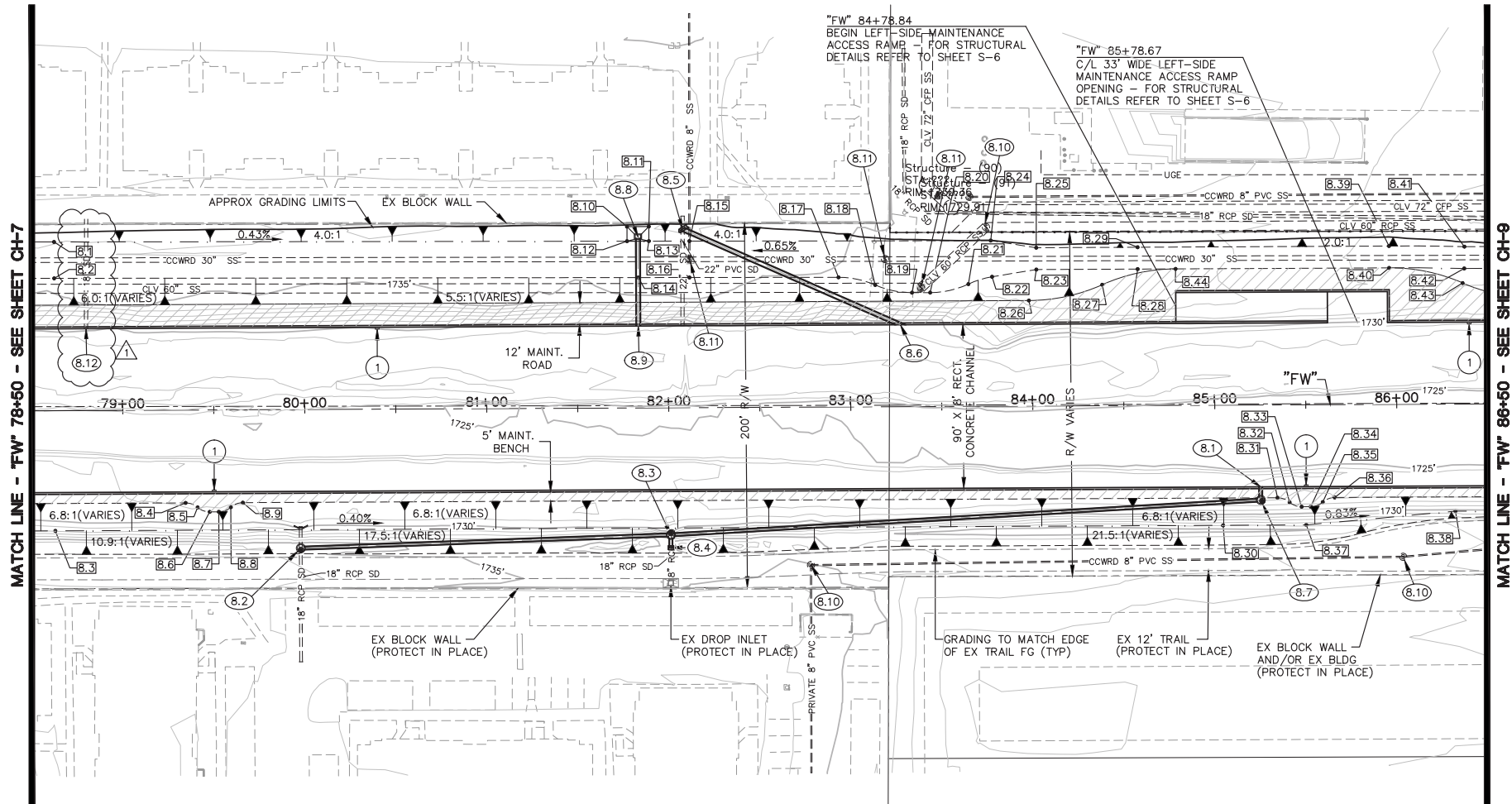
ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

SCALE
HORIZ: 1" = 40'
VERT: NA
FIELD BOOK NONE

SHEET No
CH-7
FCLA04V
L-1955



- LEGEND:**
- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
 - DESIGN POINT DATA NUMBER (SEE TABLE ON SHEET CH-8A)
 - SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS

- NOTES:**
- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 - SEE SHEET PR-8 FOR PROFILE.
 - PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
 - FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
 - SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

STORM DRAIN CONSTRUCTION ITEMS:

- (8.1)** "FW" 85+25.01, 45.00' RT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- (8.2)** "FW" 79+97.37, 76.20' RT
CONNECT EX 18" RCP
CONSTRUCT 48" TYPE I SDMH
PER USDCCA STD. DWG. NO. 403A
W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A
INSTALL 204.54 LF 18" RCP
SEE STORM DRAIN PROFILE 8.1 ON SHEET SD-10
- (8.3)** "FW" 82+00.80, 62.36' RT
CONSTRUCT 48" TYPE IA SDMH PER USDCCA STD. DWG. NO. 404A
W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A
INSTALL 324.68 LF 18" RCP
SEE STORM DRAIN PROFILE 8.1 ON SHEET SD-10
- (8.4)** "FW" 82+00.8±, 76.8±' RT
CONNECT TO EX 18" RCP
CONSTRUCT RCP ANGLED COLLAR PER COLLAR DETAIL ON SHEET D-5
INSTALL 6.72 LF 18" RCP
SEE STORM DRAIN PROFILE 8.3 ON SHEET SD-8
- (8.5)** "FW" 82+08.1±, 98.2±' LT
CONNECT TO EX 22" PVC SD
CONSTRUCT RCP ANGLED COLLAR PER DETAIL ON SHEET D-5
INSTALL 130.77 LF 24" RCP
SEE STORM DRAIN PROFILE 8.6 ON SHEET SD-9
- (8.6)** "FW" 83+27.52, 45.00' LT
CONNECT 24" RCP TO 90' X 8' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- (8.7)** "FW" 85+25.01, 52.20' RT,
CONSTRUCT 48" TYPE I SDMH PER USDCCA STD. DWG. NO. 403A
W/ LOCKING MANHOLE COVER PER DCSWCS STD. DWG. SD-3 & SD-3A
INSTALL 17.20 LF 18" RCP
SEE STORM DRAIN PROFILE 8.1 ON SHEET SD-10
- (8.8)** "FW" 81+83.49, 94.13' LT
CONSTRUCT NDOT TYPE 2B D.I.
W/ CONC APRON PER DETAIL ON SHEET D-5
INSTALL 48.14 LF 18" RCP
SEE STORM DRAIN PROFILE 8.9 ON SHEET SD-11
- (8.9)** "FW" 81+83.49, 45.00' LT
CONNECT 18" RCP 90' X 8' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1
- (8.12)** "FW" 78+80.00, 45.00' LT
CONNECT EX 18" RCP 90' X 8' RECT. CONC. CHANNEL PER STRUCTURAL DETAIL ON SHEET S-1

SANITARY SEWER CONSTRUCTION ITEMS:

- (8.10)** EXISTING SSMH (PROTECT IN PLACE)
- (8.11)** EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

FOR DESIGN POINT DATA
SEE SHEET CH-8A

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REV	No	DATE	DESCRIPTION	APPROVED
1	8/12		RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 78+50 TO "FW" 86+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

VEN

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LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VENNV.COM

SCALE	SHEET No
HORIZ: 1" = 40'	CH-8
VERT: NA	FCLA04V
FIELD BOOK NONE	L-1955

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
8.1	"FW" 78+62.62	92.72' LT	1734.86	GRADE BREAK FLOW LINE
8.2	"FW" 78+62.62	72.72' LT	1735.26	GRADE BREAK HINGE LINE
8.3	"FW" 78+62.62	66.03' RT	1735.35	GRADE BREAK FLOW LINE
8.4	"FW" 79+34.26	51.00' RT	1737.27	PC HINGE LINE (10' R)
8.5	"FW" 79+40.88	53.50' RT	1737.26	PCR HINGE LINE (10' R)
8.6	"FW" 79+47.49	56.00' RT	1737.28	PT HINGE LINE
8.7	"FW" 79+52.49	56.00' RT	1737.26	PC HINGE LINE (10' R)
8.8	"FW" 79+59.10	53.50' RT	1737.19	PCR HINGE LINE (10' R)
8.9	"FW" 79+65.72	51.00' RT	1737.14	PT HINGE LINE
8.10	"FW" 81+77.49	99.63' LT	1735.36	CONC APRON
8.11	"FW" 81+89.49	99.63' LT	1735.52	CONC APRON
8.12	"FW" 81+77.49	91.65' LT	1733.50	CONC APRON
8.13	"FW" 81+89.49	91.65' LT	1733.52	CONC APRON
8.14	"FW" 81+83.61	71.63' LT	1733.87	GRADE BREAK HINGE LINE
8.15	"FW" 82+11.75	91.54' LT	1733.66	GRADE BREAK FLOW LINE
8.16	"FW" 82+11.68	71.54' LT	1734.06	GRADE BREAK HINGE LINE
8.17	"FW" 82+93.59	71.25' LT	1734.59	PC HINGE LINE (50' R)
8.18	"FW" 83+13.73	66.94' LT	1735.13	PCR HINGE LINE (50' R)
8.19	"FW" 83+33.93	62.63' LT	1735.40	PT HINGE LINE
8.20	"FW" 83+43.93	62.61' LT	1735.49	PC HINGE LINE (50' R)
8.21	"FW" 83+64.94	67.19' LT	1735.59	PCR HINGE LINE (50' R)
8.22	"FW" 83+78.02	71.15' LT	1735.14	PT HINGE LINE
8.23	"FW" 84+02.31	75.00' LT	1735.30	ANG PT HINGE LINE
8.24	"FW" 83+77.35	91.04' LT	1734.73	ANG PT HINGE LINE
8.25	"FW" 84+02.31	87.00' LT	1735.51	ANG PT HINGE LINE
8.26	"FW" 83+98.15	58.00' LT	1735.55	PC MAINTENANCE RD (100' R)
8.27	"FW" 83+38.49	66.50' LT	1735.56	PCR MAINTENANCE RD (100' R)
8.28	"FW" 84+58.00	75.00' LT	1735.66	GRADE BREAK HINGE LINE
8.29	"FW" 84+58.00	87.00' LT	1735.90	GRADE BREAK HINGE LINE
8.30	"FW" 85+04.33	66.00' RT	1732.78	FLOW LINE
8.31	"FW" 85+34.26	51.00' RT	1734.87	PC HINGE LINE (10' R)
8.32	"FW" 85+40.88	53.50' RT	1734.86	PCR HINGE LINE (10' R)
8.33	"FW" 85+47.49	56.00' RT	1734.88	PT HINGE LINE
8.34	"FW" 85+52.49	56.00' RT	1734.85	PC HINGE LINE (10' R)
8.35	"FW" 85+59.10	53.50' RT	1734.78	PCR HINGE LINE (10' R)

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
8.36	"FW" 85+65.72	51.00' RT	1734.74	PT HINGE LINE
8.37	"FW" 85+49.99	66.00' RT	1732.40	ANG PT FLOW LINE
8.38	"FW" 86+31.98	58.83' RT	1731.76	ANG PT FLOW LINE
8.39	"FW" 85+96.17	87.00' LT	1735.34	GRADE BREAK HINGE LINE
8.40	"FW" 85+96.17	75.00' LT	1735.10	PC MAINTENANCE RD (100' R)
8.41	"FW" 86+37.57	86.48' LT	1733.67	ANG PT HINGE LINE
8.42	"FW" 86+37.44	74.49' LT	1733.42	ANG PT FLOW LINE
8.43	"FW" 86+36.52	66.50' LT	1734.77	PCR MAINTENANCE RD (100' R)
8.44	"FW" 84+78.84	75.00' LT	1735.58	PT MAINTENANCE RD

REV No	DATE	DESCRIPTION	APPROVED	



FLAMINGO WASH - NELLIS BLVD TO I-515

CHANNEL PLAN

"FW" 78+50 TO "FW" 86+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CCDPW.
THE
DOCUMENTS WERE SEALED
ON 6/27/11
BY
DAVID A. BERGH
UNDER LICENSE NO.
20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2597
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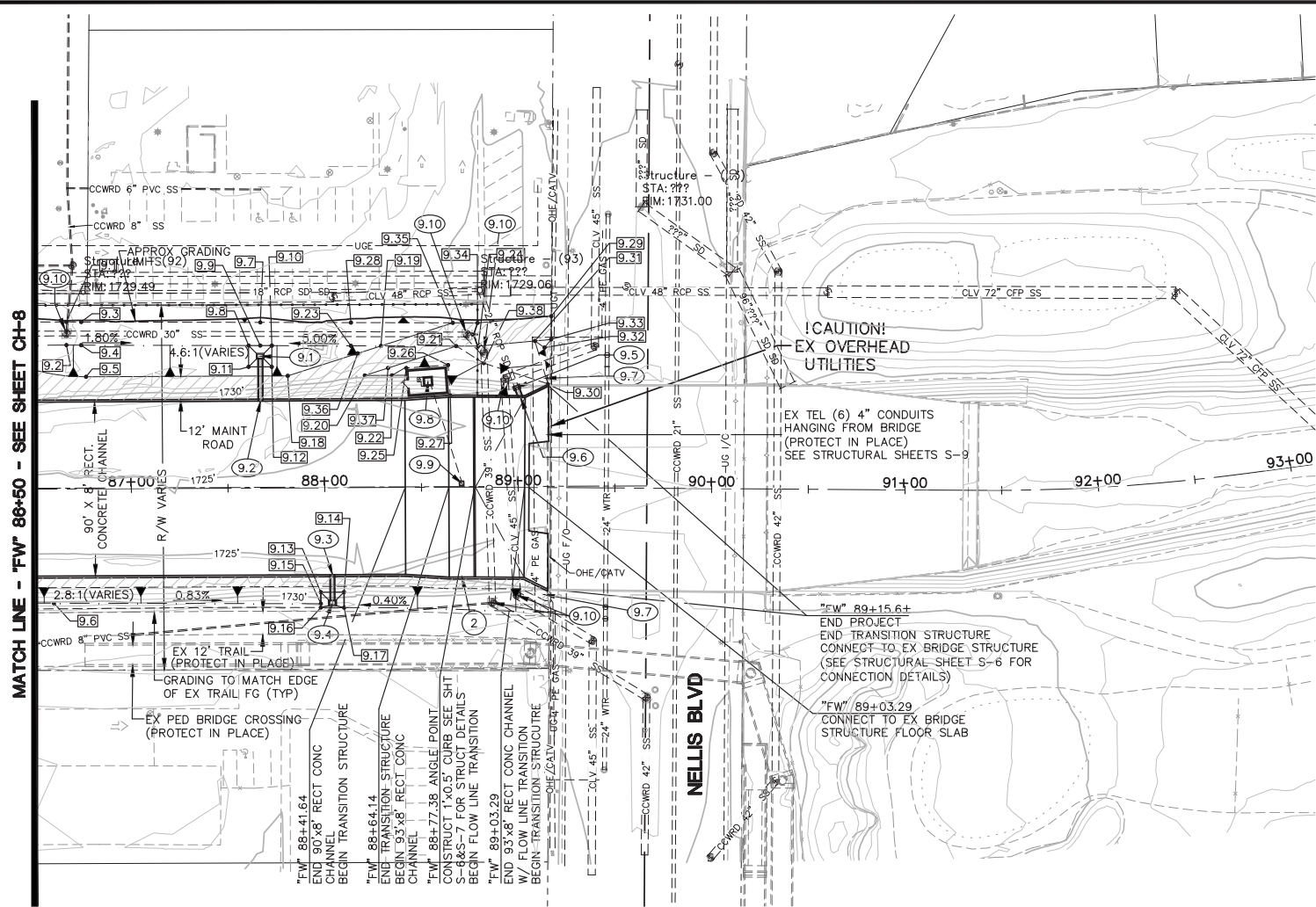
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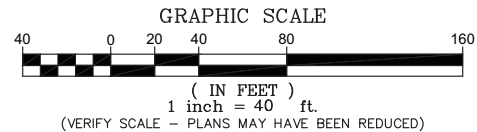
SCALE		SHEET No	
HORIZ: NA		CH-8A	
VERT: NA		FCLA04V	
FIELD BOOK NONE		L-1955	



STORM DRAIN CONSTRUCTION ITEMS:

- 9.1 "FW" 87+66.99, 68.21' LT
CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON
PER DETAIL ON SHEET D-5
INSTALL 22.21 LF 18" RCP
SEE STORM DRAIN PROFILE 9.2 ON SHEET SD-9
- 9.2 "FW" 87+66.99, 45.00' LT
CONNECT 18" RCP TO 90' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 9.3 "FW" 88+03.71, 45.00' RT
CONNECT 18" RCP TO TRANSITION STRUCTURE
PER STRUCTURAL DETAIL ON SHEET S-1
- 9.4 "FW" 88+03.71, 59.49' RT
CONSTRUCT NDOT TYPE 2B D.I. W/CONC APRON
PER DETAIL ON SHEET D-5
INSTALL 13.49 LF 18" RCP
SEE STORM DRAIN PROFILE 9.3 ON SHEET SD-9
- 9.5 "FW" 88+98.9±, 51.6'± LT
CONNECT TO EX 24" RCP
CONSTRUCT RCP COLLAR
PER COLLAR DETAIL ON SHEET D-5
INSTALL 5.48 LF 24" RCP
SEE STORM DRAIN PROFILE 9.6 ON SHEET SD-8
- 9.6 "FW" 89+00.90, 46.50' LT
CONNECT 24" RCP TO 93' X 8' RECT. CONC. CHANNEL
PER STRUCTURAL DETAIL ON SHEET S-1
- 9.7 EX. GAS VENT - TO BE RELOCATED BY SWG
- 9.8 "FW" 88+53.61, 54.81' LT
CONSTRUCT FLOOD CONTROL MONITORING STATION
PER DETAILS ON SHEET D-6
- 9.9 "FW" 88+70.76, 2.00' LT
CONSTRUCT 2' SUMP FLOOD CONTROL MONITORING STATION
PER DETAILS ON SHEET D-6
- 9.10 EXISTING SSMH - ADJUST MANHOLE LID TO NEW FINISHED GRADE. MAXIMUM MEASUREMENT FROM TOP OF ECCENTRIC CONE TO TOP OF LID SHALL BE 18-INCHES PER DCSWCS SD-5. IF THIS DIMENSION CANNOT BE ACHIEVED BY ADJUSTING GRADE RINGS ALONE, THE BARREL SECTION WILL NEED TO BE REWORKED.

SANITARY SEWER CONSTRUCTION ITEMS:



LEGEND:

- TYPE II MAINTENANCE ROAD AND/OR MAINTENANCE BENCH (SEE SHEET XS-1)
- DESIGN POINT DATA NUMBER (SEE TABLE ON THIS SHEET)
- SEE SHEET D-1 FOR CHANNEL LADDER & ACCESS OPENING LOCATIONS
- PAINTED STAFF GAUGE SEE D-6 FOR DETAILS AND LOCATIONS

NOTES:

- CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
- SEE SHEET PR-9 FOR PROFILE.
- PROTECT IN-PLACE ALL EXISTING TRAIL FEATURES, FENCES, GATES AND WALLS UNLESS NOTED OTHERWISE. SEE SHEETS RP-1 THRU RP-9 FOR REMOVAL PLANS.
- FOR FENCING NOT SPECIFIED ON PLANS, REFER TO TYPICAL CHANNEL SECTIONS ON SHEET XS-1 AND FENCING PLANS SHEETS F-1 THRU F-3.
- SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS & DETAILS

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
9.1	"FW" 86+66.88	86.42' LT	1732.47	GRADE BREAK HINGE LINE
9.2	"FW" 86+66.79	74.42' LT	1732.23	GRADE BREAK FLOW LINE
9.3	"FW" 86+74.50	86.37' LT	1732.16	GRADE BREAK HINGE LINE
9.4	"FW" 86+74.41	74.37' LT	1731.92	GRADE BREAK FLOW LINE
9.5	"FW" 86+76.86	58.00' LT	1734.44	PT MAINTENANCE RD
9.6	"FW" 86+59.68	59.00' RT	1731.49	GRADE BREAK FLOW LINE
9.7	"FW" 87+67.07	85.71' LT	1730.49	GRADE BREAK HINGE LINE
9.8	"FW" 87+60.99	73.75' LT	1730.36	CONC APRON
9.9	"FW" 87+66.99	73.71' LT	1730.25	FLOW LINE CONC APRON
9.10	"FW" 87+72.99	73.66' LT	1730.55	CONC APRON
9.11	"FW" 87+60.91	62.75' LT	1731.75	CONC APRON
9.12	"FW" 87+72.91	62.66' LT	1731.75	CONC APRON
9.13	"FW" 87+97.71	53.99' RT	1732.66	CONC APRON
9.14	"FW" 88+09.71	53.99' RT	1732.92	CONC APRON
9.15	"FW" 87+97.71	59.94' RT	1730.35	FLOW LINE CONC APRON

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
9.16	"FW" 87+97.71	61.92' RT	1730.70	CONC APRON
9.17	"FW" 88+09.71	62.00' RT	1730.63	CONC APRON
9.18	"FW" 87+81.14	58.00' LT	1734.02	ANG PT MAINTENANCE RD
9.19	"FW" 88+29.40	73.25' LT	1732.40	GRADE BREAK MAINTENANCE RD
9.20	"FW" 88+20.98	58.00' LT	1733.86	ANG PT MAINTENANCE RD
9.21	"FW" 88+68.41	72.98' LT	1731.90	ANG PT/GRADE BREAK MAINT RD
9.22	"FW" 88+35.00	58.00' LT	1733.81	ANG PT MAINTENANCE RD
9.23	"FW" 88+13.85	73.36' LT	1732.60	GRADE BREAK FLOW LINE
9.24	"FW" 88+79.04	72.92' LT	1731.75	MAINT ROAD (SEE NOTE A)
9.25	"FW" 88+42.45	61.75' LT	1733.84	END MAINT RD/BEGIN HINGE LINE
9.26	"FW" 88+64.06	63.19' LT	1733.77	ANG PT HINGE LINE
9.27	"FW" 88+65.11	47.50' LT	1733.43	END HINGE LINE @ CHANNEL WALL
9.28	"FW" 88+13.94	85.37' LT	1732.84	GRADE BREAK HINGE LINE
9.29	"FW" 89+16.54	88.65' LT	1730.83	END MAINT ROAD (SEE NOTE B)
9.30	"FW" 89+14.98	53.69' LT	1730.91	END FLOW LINE AND BERM

DESIGN POINT DATA				
POINT NO.	STATION	OFFSET	ELEVATION	DESCRIPTION
9.31	"FW" 89+08.12	75.77' LT	1731.03	BEGIN FLOW LINE AND BERM
9.32	"FW" 89+13.17	72.36' LT	1731.25	TOP OF BERM
9.33	"FW" 89+16.54	76.65' LT	1730.96	END MAINT RD (SEE NOTE B)
9.34	"FW" 88+78.43	84.92' LT	1732.00	MAINT ROAD (SEE NOTE A)
9.35	"FW" 88+66.60	85.00' LT	1732.16	ANG PT/GRADE BREAK MAINT RD
9.36	"FW" 88+17.36	69.44' LT	1733.62	GRADE BREAK MAINTENANCE RD
9.37	"FW" 88+33.01	61.80' LT	1732.64	GRADE BREAK MAINTENANCE RD
9.38	"FW" 88+81.77	64.16' LT	1731.50	ANG PT/GRADE BREAK HINGE LINE

NOTES:

- A. ANG PT/GRADE BREAK MAINTENANCE RD & 12' WIDE DOUBLE SWING GATE (SEE SHEET D-3 FOR GATE DETAILS)
- B. MATCH EX DRIVEWAY



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REV NO	DATE	DESCRIPTION	APPROVED



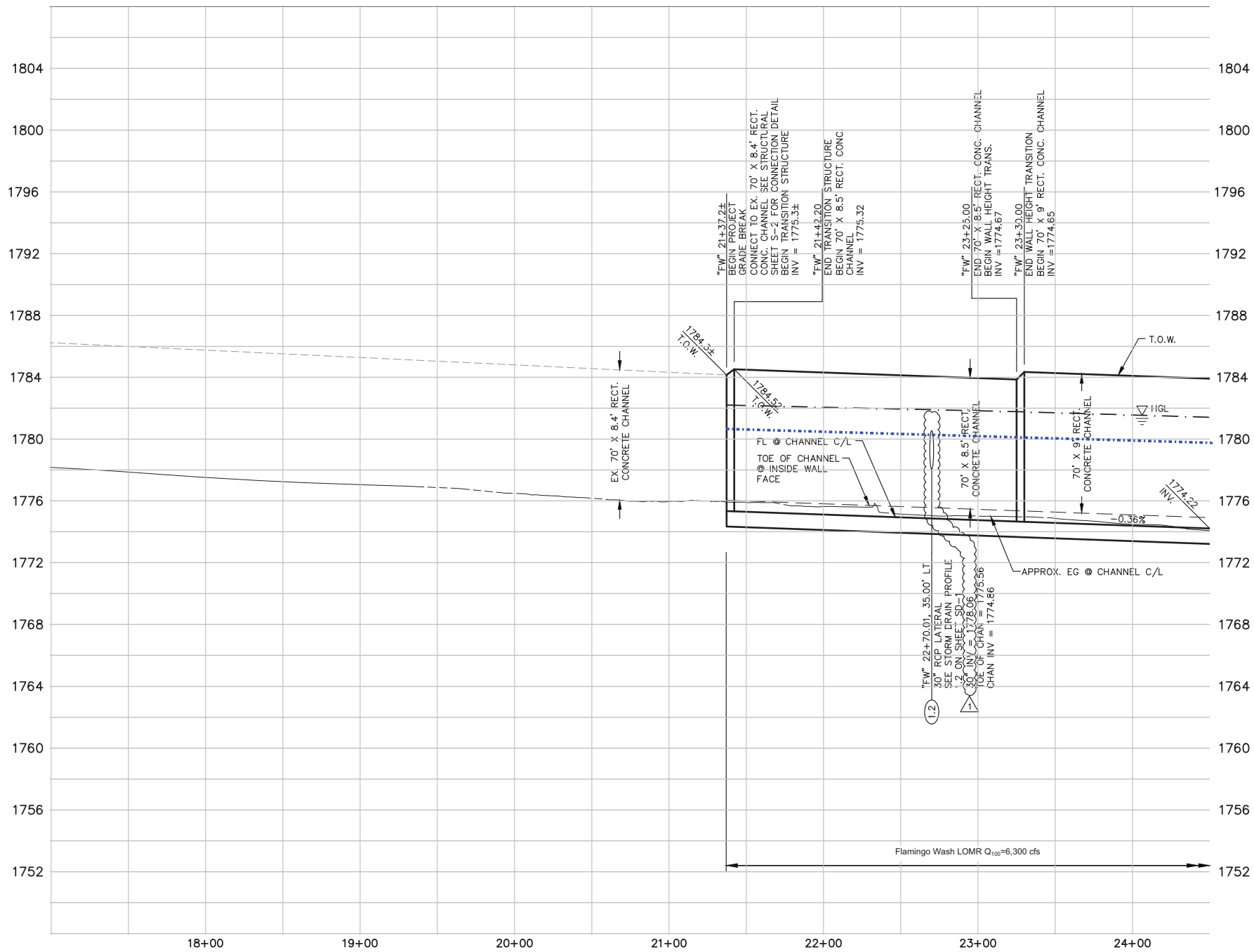
FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PLAN
"FW" 86+50 TO "FW" 89+15.6±
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CDDPW. THE DOCUMENTS WERE SEALED ON 9/30/10 BY JEFFREY M. GRIEST UNDER LICENSE NO. 17156

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

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LAS VEGAS, NEVADA 89146-5148
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FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

SCALE		SHEET No	
HORIZ:	1" = 40'	CH-9	
VERT:	NA	FCLA04V	
FIELD BOOK	NONE	L-1955	



- NOTES:**
1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 2. SEE SHEET CH-1 FOR PLAN VIEW.
 3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
 4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
 5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.

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REV No	DATE	DESCRIPTION	APPROVED
1	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 21+37.2± TO "FW" 24+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CDDPW. THE DOCUMENTS WERE SEALED ON 9/30/10 BY JEFFREY M. GRIEST UNDER LICENSE NO. 17156

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DATE: SEPTEMBER 2010

vtm

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PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTMNV.COM

SCALE

HORIZ: 1" = 40'
VERT: 1" = 4'

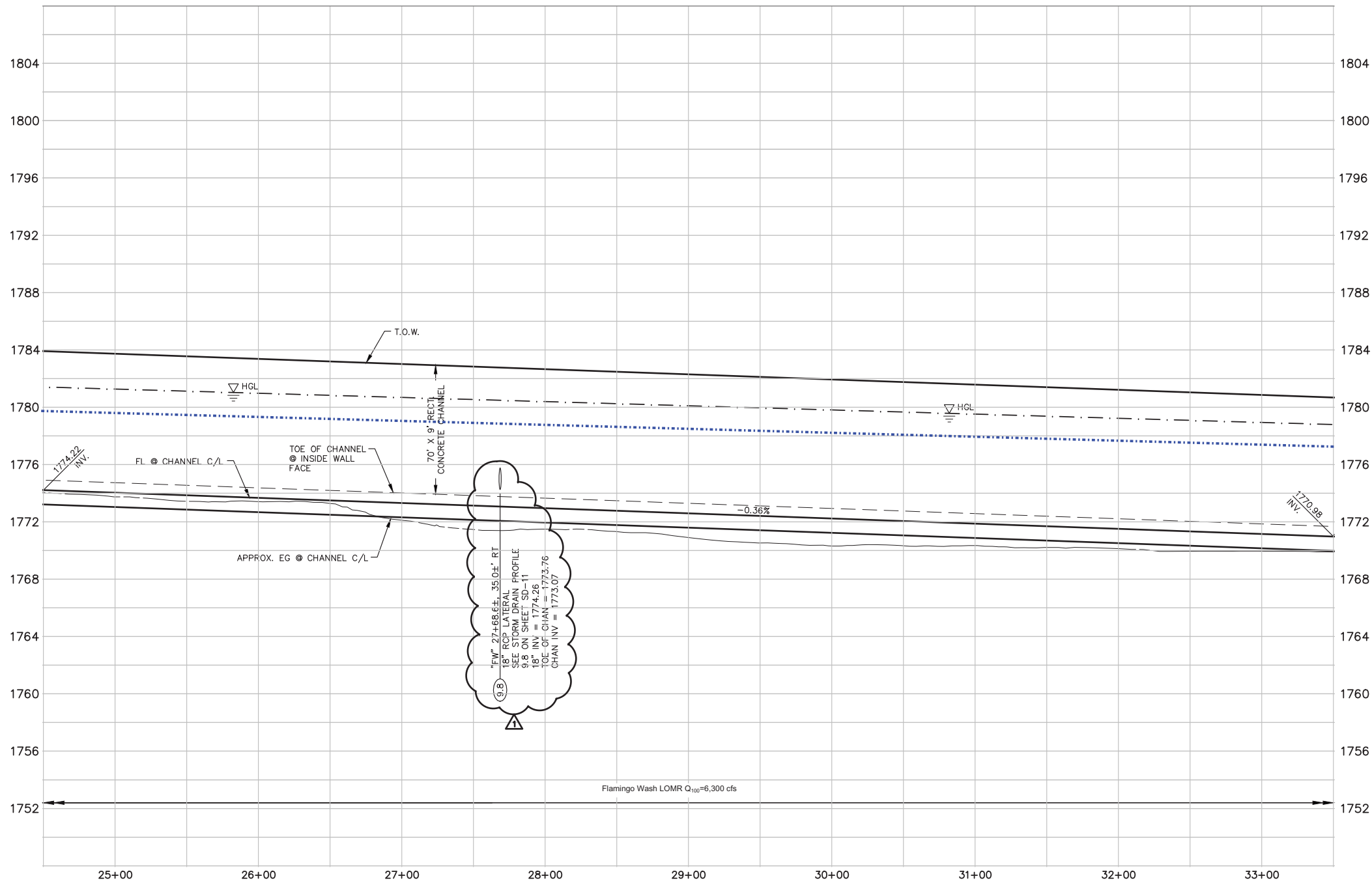
FIELD BOOK NONE

SHEET No

PR-1

FCLA04V

L-1955



NOTES:

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET CH-2 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.

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REV No	DATE	DESCRIPTION	APPROVED
1	7/11	CONSTRUCTION REVISION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 24+50 TO "FW" 33+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

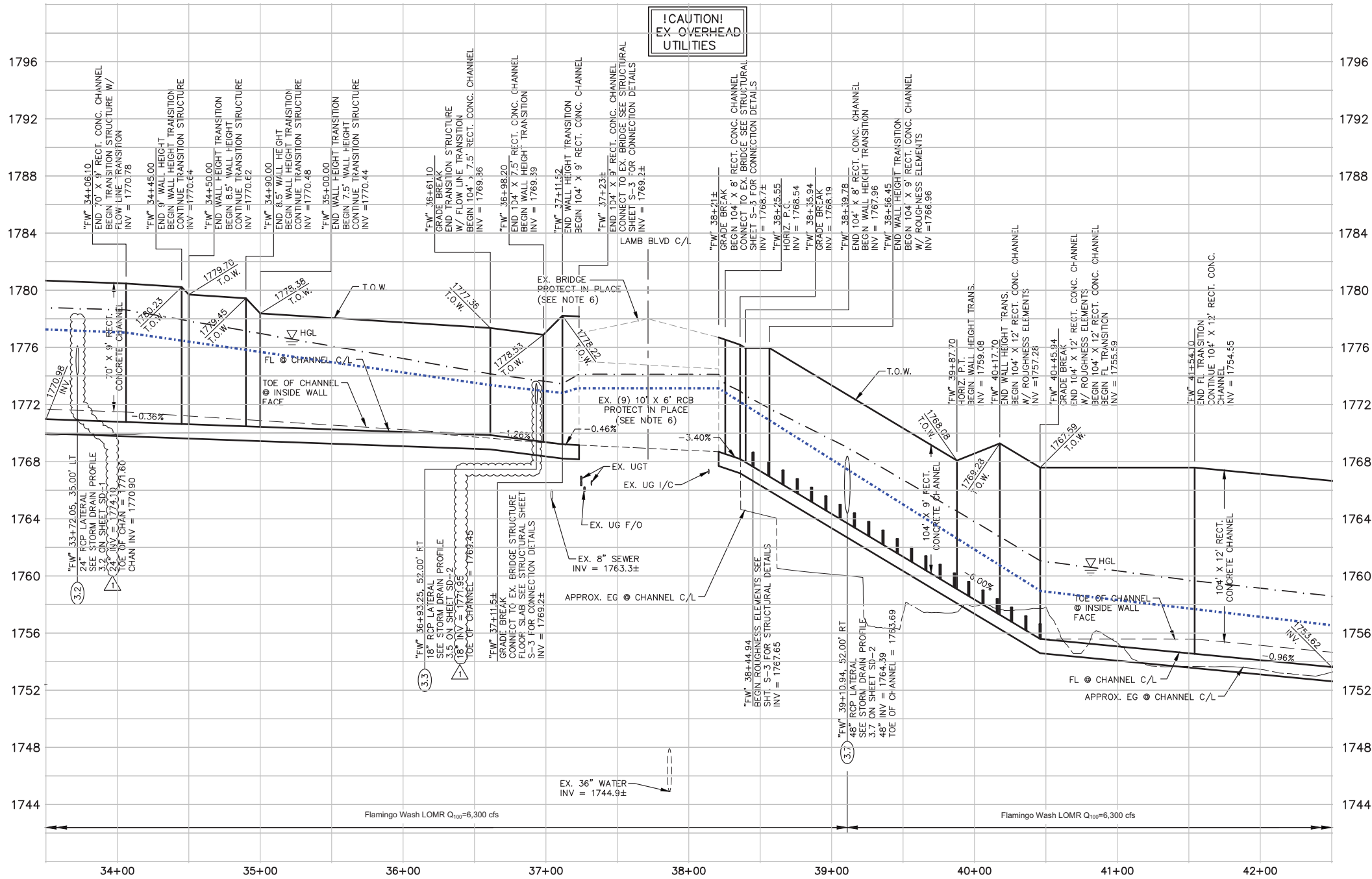
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CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

vtm

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WEB SITE WWW.VTMNV.COM

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK NONE

SHEET No
PR-2
FCLA04V
L-1955



NOTES:

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET CH-3 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.
6. EXISTING (9) 10'x 6' RCB BRIDGE STRUCTURE TO REMAIN. ANY DAMAGES INCURRED DURING CONSTRUCTION PERIOD SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.



REV No	DATE	DESCRIPTION	APPROVED
1	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 33+50 TO "FW" 42+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CCOPW. THE DOCUMENTS WERE SEALED ON 9/30/10 BY JEFFREY M. GRIEST UNDER LICENSE NO. 17156

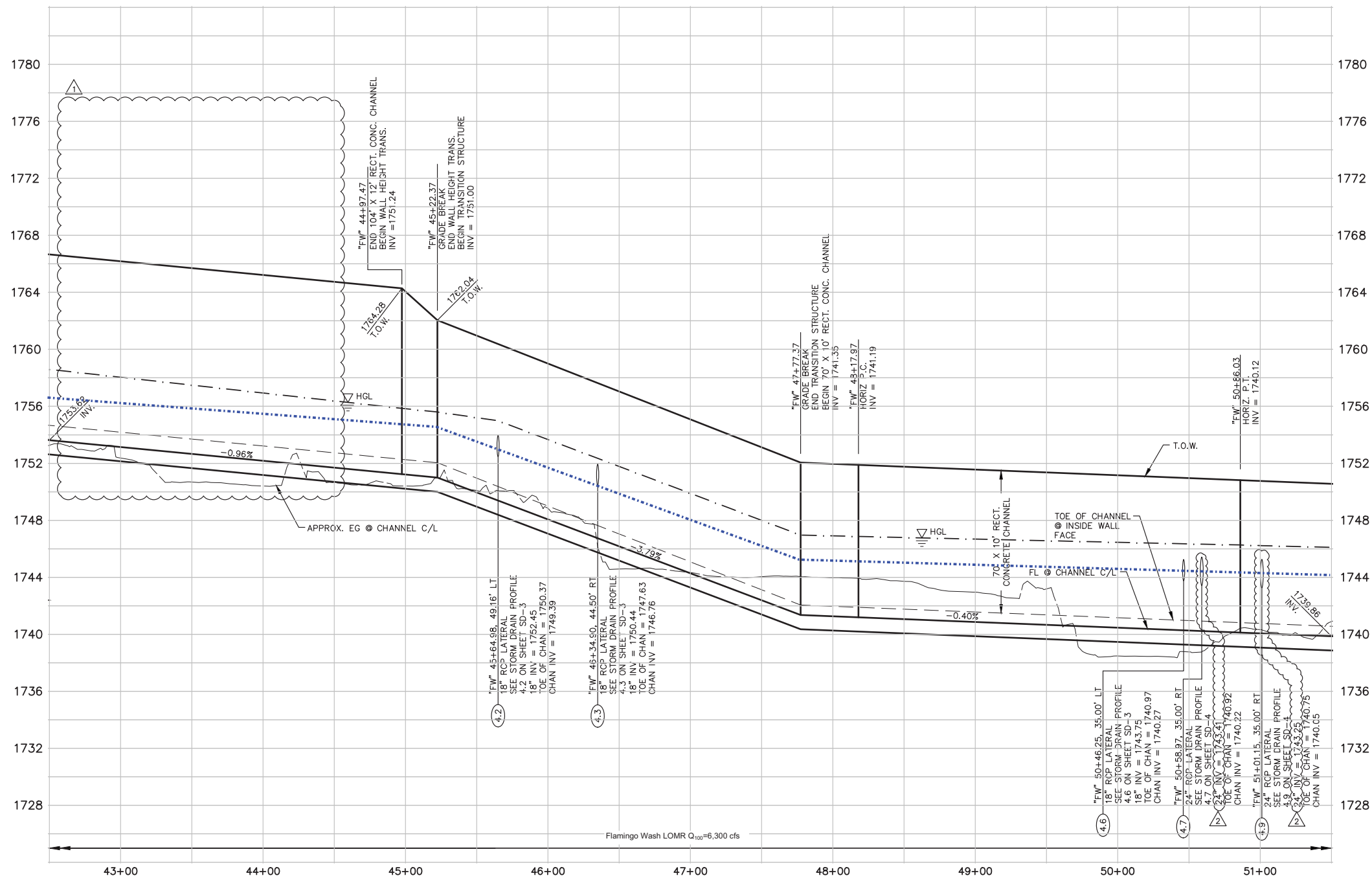
DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

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LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTHNV.COM

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'

FIELD BOOK NONE

SHEET No
PR-3
FCLA04V
L-1955



NOTES:

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2. SEE SHEET CH-4 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.

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SAFETY SERVICES DEPARTMENT

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Avoid cutting underground
utility lines. It's costly.

Call 811

REV No	DATE	DESCRIPTION	APPROVED
2	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	
1	11/11	CONSTRUCTION/RAMP REVISION	



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 42+50 TO "FW" 51+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

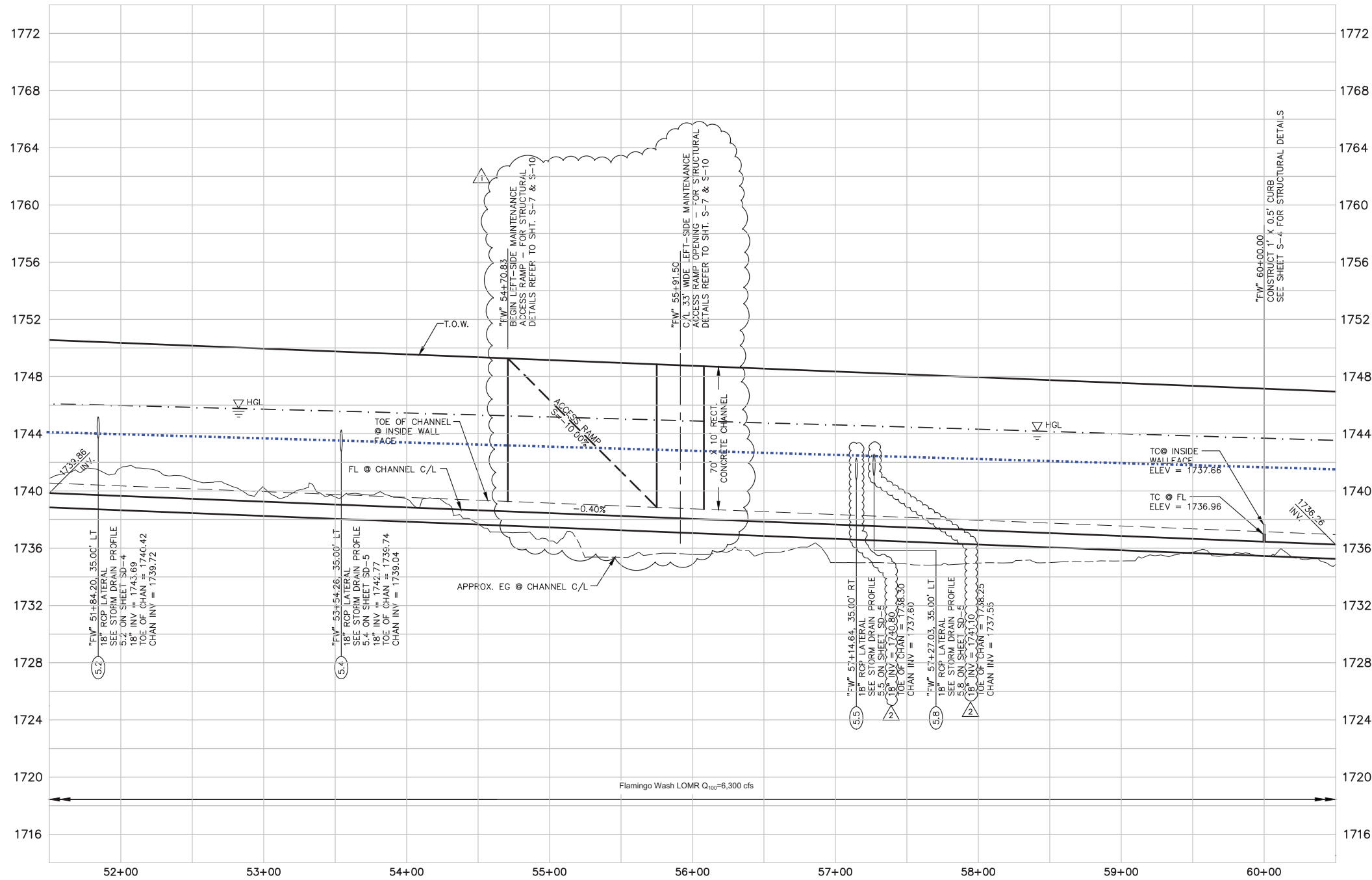
ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 11/21/11
BY
DAVID A. BERGH
UNDER LICENSE NO.
20646

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

VEN

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VENNV.COM

SCALE	SHEET No
HORIZ: 1" = 40'	PR-4
VERT: 1" = 4'	FCLA04V
FIELD BOOK NONE	L-1955



- NOTES:**
1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
 2. SEE SHEET CH-5 FOR PLAN VIEW.
 3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
 4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
 5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.

AVOID OVERHEAD POWER LINE CONTACT
IT'S COSTLY

Call before you Overhead

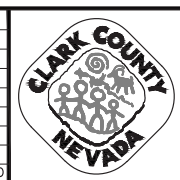
1-702-227-2929

NV ENERGY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

Call before you Dig
Avoid cutting underground utility lines. It's costly.

Call 811

REV No	DATE	DESCRIPTION	APPROVED
2	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	
1	11/11	CONSTRUCTION/RAMP REVISION	



FLAMINGO WASH - NELLIS BLVD TO I-515

CHANNEL PROFILE

"FW" 51+50 TO "FW" 60+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH THE CCOPW. THE DOCUMENTS WERE SEALED ON 11/21/11 BY DAVID A. BERGH UNDER LICENSE NO. 20646

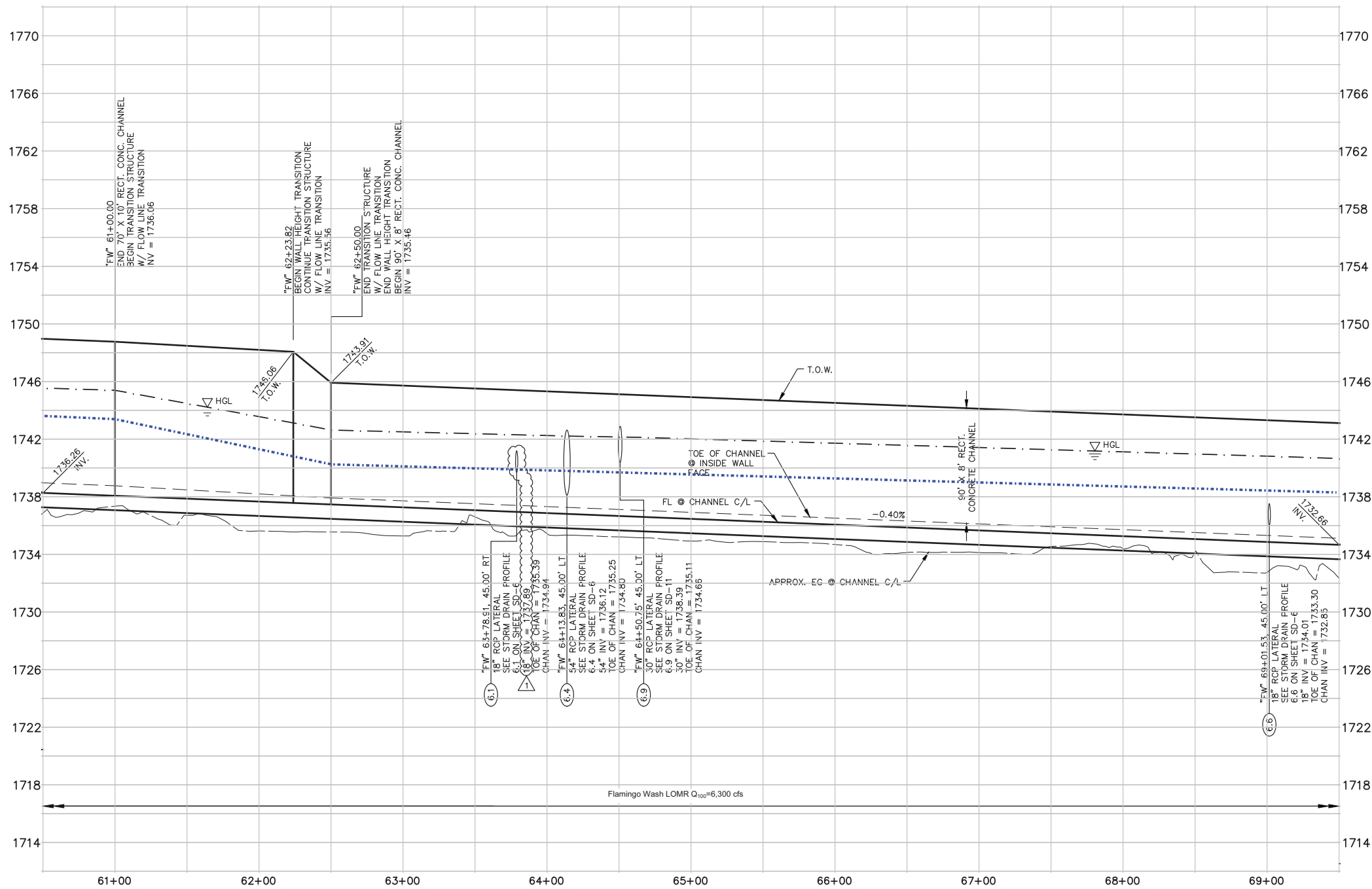
DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

VTN

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTNV.COM

SCALE	
HORIZ:	1" = 40'
VERT:	1" = 4'
FIELD BOOK	NONE

SHEET No
PR-5
FCLA04V
L-1955

**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET CH-6 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.



REV No	DATE	DESCRIPTION	APPROVED
1	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	

**FLAMINGO WASH - NELLIS BLVD TO I-515****CHANNEL PROFILE****"FW" 60+50 TO "FW" 69+50**

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

DESIGNED BY: DAB
DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010



SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'

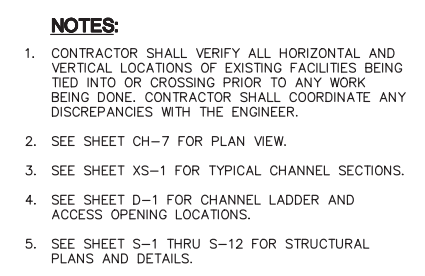
FIELD BOOK NONE

SHEET No

PR-6

FCLA04V

L-1955



AVOID OVERHEAD POWER LINE CONTACT
IT'S COSTLY

**Call
before you
Overhead**

1-702-227-2929

NV ENERGY ENVIRONMENT AND
SAFETY SERVICES DEPARTMENT

Call before you Dig
*Avoid digging underground
utility lines. It's costly.*

**Call
811**



1	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	
REV No	DATE	DESCRIPTION	APPROVED



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 69+50 TO "FW" 78+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

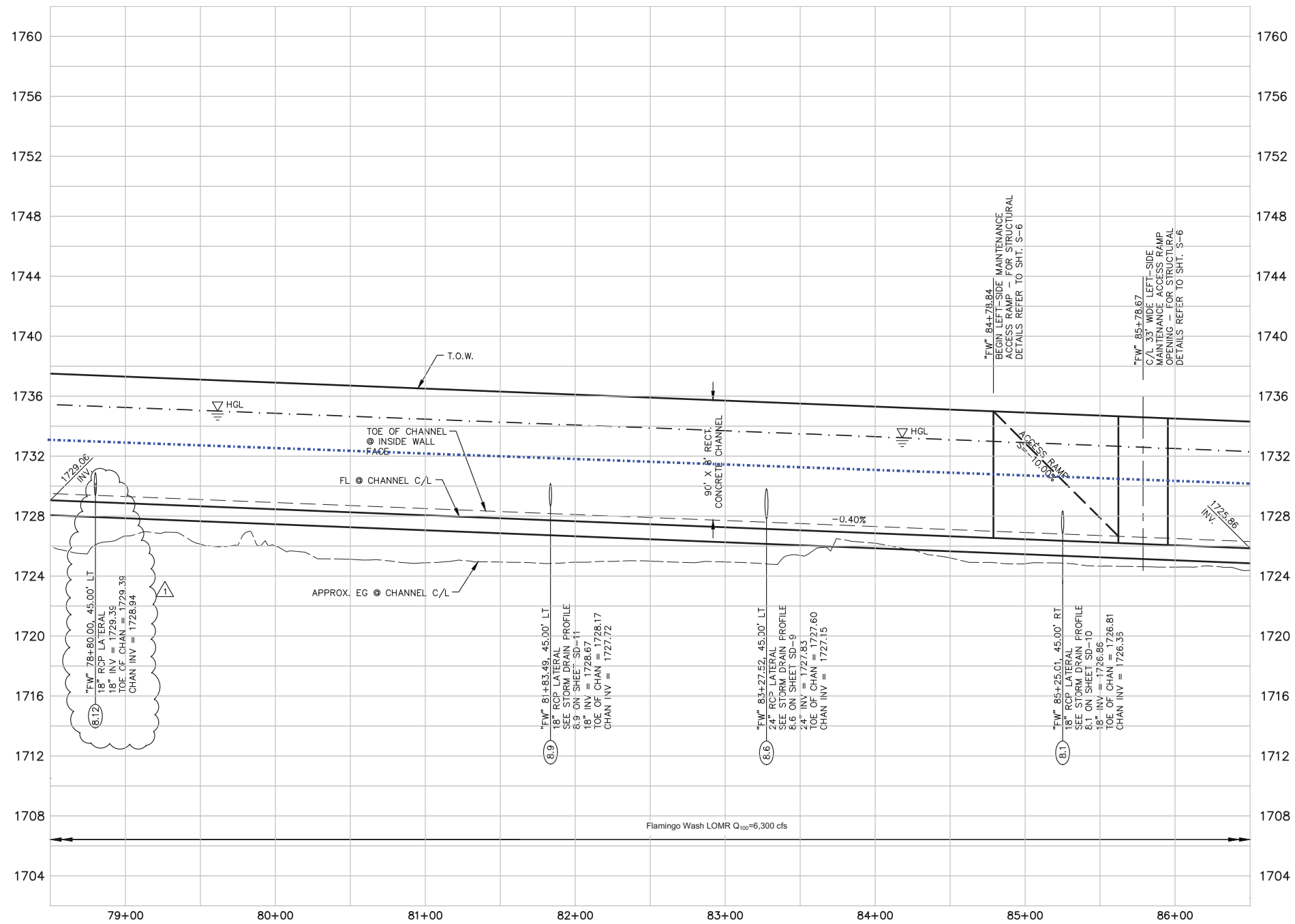
**ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
ON 9/30/10
BY
JEFFREY N. GRIEST
UNDER LICENSE NO.
17156**

DESIGNED BY:	DAB
DRAWN BY:	DKP
CHECKED BY:	JNG, TMM
DATE:	SEPTEMBER 2010

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-0100
PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTVNM.COM

SCALE	
HORIZ:	1" = 40'
VERT:	1" = 4'
FIELD BOOK	NONE

SHEET No
PR-7
FCLA04V
L-1955



NOTES:

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET CH-8 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.




REV No	DATE	DESCRIPTION	APPROVED
1	8/12	RECORD DRAWING INFORMATION PROVIDED BY CAPRIATI CONSTRUCTION	



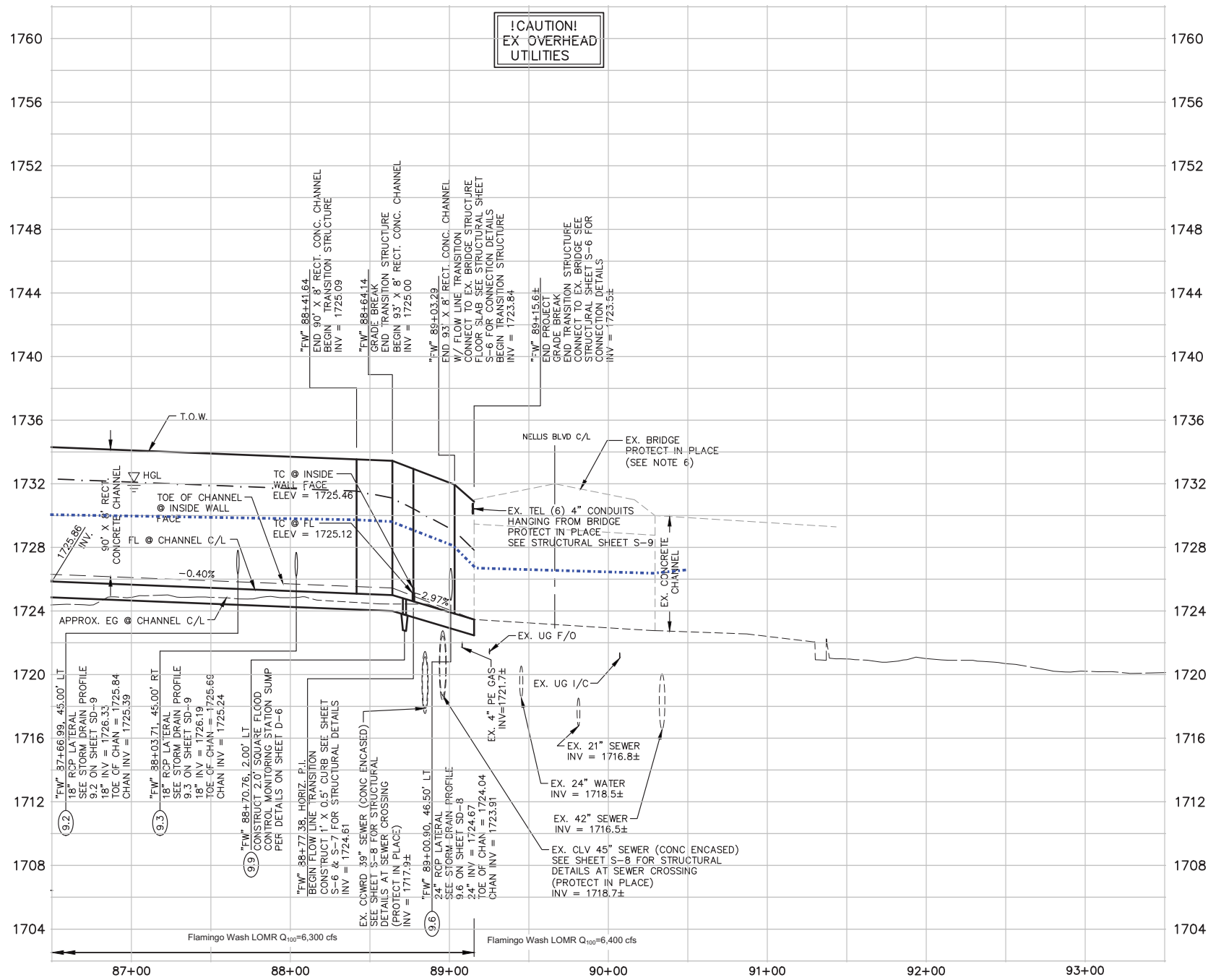
FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 78+50 TO "FW" 86+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
DRAWINGS ARE ON FILE
WITH THE CCOPW.
THE
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ON 9/30/10
BY
JEFFREY M. GRIEST
UNDER LICENSE NO.
17156

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DRAWN BY: DKP
CHECKED BY: JNG, TMM
DATE: SEPTEMBER 2010

2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2597
WEB SITE WWW.VTNV.COM

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK NONE

SHEET No
PR-8
FCLA04V
L-1955



NOTES:

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES BEING TIED INTO OR CROSSING PRIOR TO ANY WORK BEING DONE. CONTRACTOR SHALL COORDINATE ANY DISCREPANCIES WITH THE ENGINEER.
2. SEE SHEET CH-9 FOR PLAN VIEW.
3. SEE SHEET XS-1 FOR TYPICAL CHANNEL SECTIONS.
4. SEE SHEET D-1 FOR CHANNEL LADDER AND ACCESS OPENING LOCATIONS.
5. SEE SHEET S-1 THRU S-12 FOR STRUCTURAL PLANS AND DETAILS.
6. EXISTING 105' x 5.5' MULTI-SPAN BRIDGE STRUCTURE TO REMAIN. ANY DAMAGES INCURRED DURING CONSTRUCTION PERIOD SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.




REV No	DATE	DESCRIPTION	APPROVED



FLAMINGO WASH - NELLIS BLVD TO I-515
CHANNEL PROFILE
"FW" 86+50 TO "FW" 89+15.6±
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION
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WITH THE CDDPW.
THE
DOCUMENTS WERE SEALED
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DATE: SEPTEMBER 2010

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LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7550
FAX (702) 362-2587
WEB SITE WWW.VTNV.COM

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4"
FIELD BOOK NONE

SHEET No
PR-9
FCLA04V
L-1955



T1 FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;
 T2 Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN
 T3 File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

SO	-9182.57	1720.70	30	.025				
R	-9162.57	1720.80	30	.035				
R	-9137.57	1720.93	30	.015				
R	-9137.56	1722.14	30	.015				
R	-9129.80	1722.09	30	.015				
TS	-9029.60	1722.77	27	.015				
BX	-9029.60	1722.77	28					
REM	*** NELLIS BRIDGE ***							
R	-8915.58	1723.47	28	.015				
BE	-8915.58	1723.47	28	.500				
TS	-8903.29	1723.84	29	.015				
TS	-8878.40	1724.59	26	.015				
R	-8878.39	1725.11	26	.015				
R	-8877.39	1725.11	26	.015				
R	-8877.38	1724.61	26	.015				
R	-8864.14	1725.00	26	.015				
TS	-8841.64	1725.09	33	.015				
R	-8803.71	1725.24	33	.015				
R	-8766.99	1725.39	33	.015				
R	-8525.01	1726.36	33	.015				
R	-8327.52	1727.15	33	.015				
R	-8183.49	1727.72	33	.015				
R	-7800.00	1729.26	33	.015				
R	-7698.38	1729.66	33	.015				
R	-7557.24	1730.23	33	.015				
R	-7328.40	1731.14	33	.015				
R	-6901.53	1732.85	33	.015				
R	-6450.75	1734.66	33	.015				
R	-6413.83	1734.80	33	.015				
R	-6378.91	1734.94	33	.015				
R	-6250.00	1735.46	33	.015				
TS	-6100.00	1736.06	25	.015				
R	-6001.02	1736.45	25	.015				
R	-6001.01	1736.96	25	.015				
R	-6000.01	1736.96	25	.015				
R	-6000.00	1736.46	25	.015				
R	-5727.03	1737.55	25	.015				
R	-5714.64	1737.60	25	.015				
R	-5354.26	1739.04	25	.015				
R	-5184.20	1739.72	25	.015				
R	-5101.15	1740.05	25	.015				
R	-5086.03	1740.12	25	.015				
R	-5058.97	1740.22	25	.015			-1.550	
R	-5046.25	1740.27	25	.015			-0.729	
R	-4817.97	1741.18	25	.015			-13.079	
R	-4797.97	1741.26	25	.015				
R	-4777.37	1741.35	25	.015				
TS	-4522.37	1751.00	19	.015				
TS	-4497.47	1751.24	31	.015				
R	-4154.10	1754.55	31	.015				
R	-4057.05	1755.48	31	.015				
R	-4045.94	1755.59	31	.015				
R	-4017.70	1757.28	31	.055				
TS	-3987.70	1759.08	21	.055				
R	-3910.94	1763.69	21	.055			7.330	
R	-3856.45	1766.96	21	.055			5.116	
R	-3844.94	1767.65	21	.055			1.099	
TS	-3839.78	1767.96	19	.015			0.492	
R	-3835.94	1768.19	19	.015			0.367	
R	-3825.55	1768.54	19	.015			0.992	
R	-3820.93	1768.70	19	.015				
JX	-3820.93	1768.70	19	.015	130.000	1768.700	-30.00	
BX	-3820.93	1768.70	20					
REM	*** LAMB BRIDGE ***							
R	-3711.52	1769.22	20	.015				
BE	-3711.52	1769.22	20	.350				
TS	-3698.20	1769.39	32	.015				
R	-3693.25	1769.45	32	.015				
R	-3661.10	1769.86	32	.015				
TS	-3406.10	1770.78	34	.015				
R	-3372.05	1770.90	34	.015				
R	-2330.00	1774.65	34	.015				
TS	-2325.00	1774.67	35	.015				
R	-2270.01	1774.86	35	.015				
R	-2142.23	1775.32	35	.015				
TS	-2137.23	1775.34	17	.015				
REM	*** STATION EQUATION VTN	-18+86.86 = LBA 4+82.00 DELTA 2368.86	***					
R	-1886.86	1777.016	17	.015				
WX	-1886.86	1777.016	17	.015				
R	-1413.83	1779.381	3	.015			45.171	
REM	*** INTERSTATE 515 BRIDGE ***							
R	-1028.72	1781.307	3	.015			-36.879	
R	-978.72	1783.50	3	.015			-4.674	
R	-947.78	1783.682	3	.015			-2.951	
R	-943.72	1783.706	3	.015				
TS	-918.72	1783.853	4	.015				
R	-568.72	1785.94	4	.015				
R	-522.78	1786.211	4	.015				
R	-415.74	1786.842	4	.015			-15.331	
R	-393.72	1786.973	4	.015			7.090	
TS	-343.72	1787.268	5	.015			7.169	
R	-294.27	1787.559	5	.015			3.140	
R	-238.72	1787.90	5	.015			5.302	
R	-188.28	1788.672	5	.015			4.821	
R	-176.28	1788.855	5	.015				
BE	-176.28	1788.855	6	.500				
R	-88.28	1790.202	6	.015			6.729	
TS	11.43	1791.732	7	.015			8.550	
R	31.70	1792.042	7	.015			1.549	
R	98.48	1793.064	7	.015				
R	130.98	1793.56	7	.015			2.190	
R	171.24	1794.44	7	.015			2.714	

R	185.84	1794.566	7	.015			
R	221.24	1794.87	7	.015			
JX	264.60	1795.243	7	.015	2676.000	1795.243	30.00
WX	264.60	1795.243	9	.015			
R	436.54	1796.165	9	.015			
R	451.54	1796.294	9	.015			
BX	451.54	1796.294	10				
REM	***	BOULDER HIGHWAY BRIDGE	***				
R	620.84	1797.75	10	.015			
BE	620.84	1797.75	10	.500			
R	635.84	1797.879	11	.015			
R	731.24	1798.70	11	.015			-2.733
TS	781.24	1798.885	12	.015			-1.427
R	1017.22	1799.758	12	.015			-6.765
R	1080.98	1799.994	12	.015			
TS	1270.98	1800.697	13	.015			
R	1379.53	1801.07	13	.015			
R	1444.14	1801.723	13	.015			
R	1876.72	1805.987	13	.015			41.308
R	1936.04	1806.586	13	.015			
R	2719.51	1814.499	13	.015			24.940
JX	2719.51	1814.499	13	.015	477.000	1814.701	30.00
R	2729.51	1814.60	13	.015			.317
R	2930.98	1816.72	13	.015			
TS	3030.98	1818.57	15	.015			
R	3263.22	1820.08	15	.015			
R	3480.98	1821.50	15	.015			-15.868
R	3579.03	1822.422	15	.015			-7.161
JX	3579.03	1822.422	15	.015	474.000	1823.85	30.00
R	3743.80	1823.971	15	.015			-12.048
R	4328.00	1829.462	15	.015			-33.472
R	4985.68	1835.644	15	.015			
SH	4985.68	1835.644	15	.015			
CD	1	1	0	.000	9.100	70.000	2.000 2.000
CD	2	2	0	.000	9.100	70.000	
CD	3	2	1	.833	9.100	70.000	
CD	4	2	1	.833	9.600	70.000	
CD	5	2	1	.833	11.300	70.000	
CD	6	2	0	.000	11.300	70.000	
CD	7	2	0	.000	11.300	83.500	
CD	8	3	2	1.000	6.000	32.000	
CD	9	2	0	.000	11.300	75.000	
CD	10	2	1	2.500	11.300	75.000	
CD	11	2	0	.000	7.350	75.000	
CD	12	2	0	.000	7.600	60.000	
CD	13	2	0	.000	8.700	60.000	
CD	14	3	0	.000	6.000	8.000	
CD	15	1	0	.000	8.100	60.000	2.000 2.000
CD	16	3	0	.000	3.000	12.000	
CD	17	2	0	.000	9.100	70.000	-8.40
CD	18	2	0	.000	10.000	70.000	
CD	19	2	0	.000	10.000	104.000	
CD	20	3	8	1.000	6.000	104.000	
CD	21	2	0	.000	9.000	104.000	
CD	22	2	0	.000	8.000	104.000	
CD	23	2	0	.000	18.000	70.000	
CD	24	2	0	.000	8.500	90.000	-5.40
CD	25	2	0	.000	10.000	70.000	-8.40
CD	26	2	0	.000	8.000	93.000	-5.58
CD	27	2	0	.000	8.000	105.000	
CD	28	2	2	3.500	5.500	105.000	
CD	29	2	0	.000	8.000	93.000	
CD	30	1	0	.000	8.000	85.000	2.000 2.000
CD	31	2	0	.000	12.000	104.000	
CD	32	2	0	.000	7.500	104.000	
CD	33	2	0	.000	8.000	90.000	-5.40
CD	34	2	0	.000	9.000	70.000	-8.40
CD	35	2	0	.000	8.500	70.000	-8.40
Q		7195.000	.0				

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-9182.570	1720.700	5.239	1725.939	10952.00	21.89	7.44	1733.38	.00	7.53	105.96	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.884	.0050					.0352	.14	5.24	1.78	9.18	.035	.00	2.00	TRAP
-9178.687	1720.719	5.186	1725.905	10952.00	22.14	7.61	1733.52	.00	7.53	105.74	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.116	.0050					.0387	.62	5.19	1.80	9.18	.035	.00	2.00	TRAP
-9162.570	1720.800	4.967	1725.767	10952.00	23.22	8.38	1734.14	.00	7.53	104.87	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.000	.0052					.0077	.19	4.97	1.93	5.56	.015	.00	2.00	TRAP
-9137.570	1720.930	4.945	1725.875	10952.00	23.34	8.46	1734.34	.00	7.53	104.78	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.002	*****					.0075	.00	4.94	1.94	.28	.015	.00	2.00	TRAP
-9137.568	1721.184	5.040	1726.224	10952.00	22.86	8.11	1734.34	.00	7.53	105.16	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.005	*****					.0068	.00	5.04	1.89	.28	.015	.00	2.00	TRAP
-9137.563	1721.700	5.261	1726.961	10952.00	21.79	7.37	1734.34	.00	7.53	106.05	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.004	*****					.0058	.00	5.26	1.76	.28	.015	.00	2.00	TRAP
-9137.560	1722.140	5.492	1727.632	10952.00	20.78	6.70	1734.34	.00	7.53	106.97	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.760	-.0064					.0055	.04	5.49	1.65	.00	.015	.00	2.00	TRAP
-9129.800	1722.090	5.439	1727.529	10952.00	21.00	6.85	1734.38	.00	7.53	106.76	8.000	85.000	2.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0068					.0065	.65	5.44	1.67		.015	.00	2.00	TRAP
-9029.600	1722.770	4.658	1727.428	10952.00	22.39	7.79	1735.22	.00	6.97	105.00	8.000	105.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIDGE EXIT														

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-9029.600	1722.770	5.150	1727.920	10952.00	21.70	7.31	1735.23	.00	7.29	105.00	5.500	105.000	.00	2 3.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114.020	.0061					.0080	.92	5.15	1.74	5.57	.015	.00	.00	RECTANG
-8915.580	1723.470	5.038	1728.508	10952.00	22.18	7.64	1736.15	.00	7.29	105.00	5.500	105.000	.00	2 3.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIDGE ENTRANCE														
-8915.580	1723.470	4.367	1727.837	10952.00	23.89	8.86	1736.70	.00	6.97	105.00	5.500	105.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0301					.0079	.10	4.37	2.01		.015	.00	.00	RECTANG
-8903.290	1723.840	5.195	1729.035	10952.00	22.67	7.98	1737.01	.00	7.55	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0301					.0060	.15	5.19	1.75		.015	-5.58	.00	RECTANG
-8878.400	1724.590	5.841	1730.431	10952.00	21.00	6.85	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.005	48.4091					.0050	.00	5.84	1.56	.58	.015	-5.58	.00	RECTANG
-8878.396	1724.803	6.000	1730.802	10952.00	20.42	6.47	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.006	48.4091					.0044	.00	6.00	1.50	.58	.015	-5.58	.00	RECTANG
-8878.390	1725.110	6.281	1731.391	10952.00	19.47	5.89	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.000	.0000					.0041	.00	6.28	1.40	.00	.015	-5.58	.00	RECTANG
-8877.390	1725.110	6.277	1731.387	10952.00	19.48	5.89	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.003	*****					.0043	.00	6.28	1.40	.00	.015	-5.58	.00	RECTANG
-8877.387	1724.956	6.126	1731.082	10952.00	19.98	6.20	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.007	*****					.0048	.00	6.13	1.45	.00	.015	-5.58	.00	RECTANG

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-8877.380	1724.610	5.852	1730.462	10952.00	20.96	6.82	1737.28	.00	7.79	93.00	8.000	93.000	.00	0 .0
13.240	.0295					.0048	.06	5.85	1.56	3.51	.015	-5.58	.00	RECTANG
-8864.140	1725.000	6.108	1731.108	10952.00	20.04	6.24	1737.35	.00	7.79	93.00	8.000	93.000	.00	0 .0
TRANS STR	.0040					.0043	.10	6.11	1.46		.015	-5.40	.00	RECTANG
-8841.640	1725.090	6.451	1731.541	10952.00	19.55	5.93	1737.47	.00	7.94	90.00	8.000	90.000	.00	0 .0
37.930	.0040					.0040	.15	6.45	1.38	6.48	.015	-5.40	.00	RECTANG
-8803.710	1725.240	6.448	1731.688	10952.00	19.55	5.94	1737.63	.00	7.94	90.00	8.000	90.000	.00	0 .0
36.720	.0041					.0040	.15	6.45	1.38	6.42	.015	-5.40	.00	RECTANG
-8766.990	1725.390	6.451	1731.841	10952.00	19.55	5.93	1737.77	.00	7.94	90.00	8.000	90.000	.00	0 .0
241.980	.0040					.0040	.97	6.45	1.38	6.45	.015	-5.40	.00	RECTANG
-8525.010	1726.360	6.447	1732.807	10952.00	19.56	5.94	1738.75	.00	7.94	90.00	8.000	90.000	.00	0 .0
197.490	.0040					.0040	.80	6.45	1.38	6.46	.015	-5.40	.00	RECTANG
-8327.520	1727.150	6.440	1733.590	10952.00	19.58	5.95	1739.54	.00	7.94	90.00	8.000	90.000	.00	0 .0
144.029	.0040					.0041	.58	6.44	1.38	6.48	.015	-5.40	.00	RECTANG
-8183.490	1727.720	6.424	1734.144	10952.00	19.63	5.98	1740.13	.00	7.94	90.00	8.000	90.000	.00	0 .0
383.490	.0040					.0041	1.58	6.42	1.39	6.45	.015	-5.40	.00	RECTANG
-7800.000	1729.260	6.383	1735.643	10952.00	19.76	6.06	1741.71	.00	7.94	90.00	8.000	90.000	.00	0 .0
101.620	.0039					.0042	.43	6.38	1.40	6.49	.015	-5.40	.00	RECTANG

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-7698.380	1729.660	6.357	1736.017	10952.00	19.84	6.12	1742.13	.00	7.94	90.00	8.000	90.000	.00	0 .0
141.140	.0040					.0042	.60	6.36	1.41	6.44	.015	-5.40	.00	RECTANG
-7557.240	1730.230	6.328	1736.558	10952.00	19.94	6.17	1742.73	.00	7.94	90.00	8.000	90.000	.00	0 .0
228.840	.0040					.0044	1.00	6.33	1.42	6.47	.015	-5.40	.00	RECTANG
-7328.400	1731.140	6.242	1737.381	10952.00	20.23	6.35	1743.73	.00	7.94	90.00	8.000	90.000	.00	0 .0
4.603	.0040					.0045	.02	6.24	1.45	6.46	.015	-5.40	.00	RECTANG
-7323.797	1731.158	6.239	1737.398	10952.00	20.23	6.36	1743.75	.00	7.94	90.00	8.000	90.000	.00	0 .0
422.267	.0040					.0048	2.05	6.24	1.45	6.46	.015	-5.40	.00	RECTANG
-6901.530	1732.850	5.959	1738.809	10952.00	21.22	6.99	1745.80	.00	7.94	90.00	8.000	90.000	.00	0 .0
244.738	.0040					.0056	1.37	5.96	1.56	6.45	.015	-5.40	.00	RECTANG
-6656.792	1733.833	5.717	1739.550	10952.00	22.16	7.62	1747.17	.00	7.94	90.00	8.000	90.000	.00	0 .0
206.042	.0040					.0065	1.33	5.72	1.67	6.45	.015	-5.40	.00	RECTANG
-6450.750	1734.660	5.462	1740.122	10952.00	23.24	8.39	1748.51	.00	7.94	90.00	8.000	90.000	.00	0 .0
36.920	.0038					.0071	.26	5.46	1.79	6.56	.015	-5.40	.00	RECTANG
-6413.830	1734.800	5.408	1740.208	10952.00	23.48	8.56	1748.77	.00	7.94	90.00	8.000	90.000	.00	0 .0
34.920	.0040					.0073	.26	5.41	1.82	6.46	.015	-5.40	.00	RECTANG
-6378.910	1734.940	5.358	1740.298	10952.00	23.71	8.73	1749.02	.00	7.94	90.00	8.000	90.000	.00	0 .0
128.910	.0040					.0079	1.02	5.36	1.84	6.44	.015	-5.40	.00	RECTANG

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-6250.000	1735.460	5.166	1740.626	10952.00	24.63	9.42	1750.04	.00	7.94	90.00	8.000	90.000	.00	0 .0
TRANS STR	.0040					.0066	.99	5.17	1.95		.015	-8.40	.00	RECTANG
-6100.000	1736.060	7.324	1743.385	10952.00	22.43	7.81	1751.20	.00	9.47	70.00	10.000	70.000	.00	0 .0
98.980	.0039					.0049	.49	7.32	1.50	7.81	.015	-8.40	.00	RECTANG
-6001.020	1736.450	7.247	1743.697	10952.00	22.68	7.99	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
.003	49.7381					.0049	.00	7.25	1.52	.76	.015	-8.40	.00	RECTANG
-6001.017	1736.601	7.367	1743.967	10952.00	22.30	7.72	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
.007	49.7381					.0044	.00	7.37	1.48	.76	.015	-8.40	.00	RECTANG
-6001.010	1736.960	7.709	1744.669	10952.00	21.26	7.02	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
1.000	.0000					.0041	.00	7.71	1.38	.00	.015	-8.40	.00	RECTANG
-6000.010	1736.960	7.705	1744.665	10952.00	21.27	7.03	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
.002	*****					.0042	.00	7.70	1.38	.00	.015	-8.40	.00	RECTANG
-6000.008	1736.849	7.588	1744.437	10952.00	21.62	7.26	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
.008	*****					.0047	.00	7.59	1.42	.00	.015	-8.40	.00	RECTANG
-6000.000	1736.460	7.251	1743.711	10952.00	22.67	7.98	1751.69	.00	9.47	70.00	10.000	70.000	.00	0 .0
272.970	.0040					.0053	1.45	7.25	1.52	7.77	.015	-8.40	.00	RECTANG
-5727.030	1737.550	7.000	1744.551	10952.00	23.53	8.59	1753.14	.00	9.47	70.00	10.000	70.000	.00	0 .0
12.390	.0040					.0056	.07	7.00	1.61	7.75	.015	-8.40	.00	RECTANG

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-5714.640	1737.600	6.987	1744.587	10952.00	23.57	8.63	1753.22	.00	9.47	70.00	10.000	70.000	.00	0 .0
124.345	.0040					.0058	.73	6.99	1.61	7.77	.015	-8.40	.00	RECTANG
-5590.295	1738.097	6.850	1744.947	10952.00	24.07	9.00	1753.94	.00	9.47	70.00	10.000	70.000	.00	0 .0
236.036	.0040					.0065	1.54	6.85	1.66	7.77	.015	-8.40	.00	RECTANG
-5354.260	1739.040	6.547	1745.587	10952.00	25.25	9.90	1755.48	.00	9.47	70.00	10.000	70.000	.00	0 .0
170.060	.0040					.0075	1.27	6.55	1.79	7.77	.015	-8.40	.00	RECTANG
-5184.200	1739.720	6.300	1746.020	10952.00	26.30	10.74	1756.76	.00	9.47	70.00	10.000	70.000	.00	0 .0
83.050	.0040					.0083	.69	6.30	1.90	7.79	.015	-8.40	.00	RECTANG
-5101.150	1740.050	6.169	1746.219	10952.00	26.89	11.22	1757.44	.00	9.47	70.00	10.000	70.000	.00	0 .0
15.120	.0046					.0086	.13	6.17	1.96	7.43	.015	-8.40	.00	RECTANG
-5086.030	1740.120	6.148	1746.268	10952.00	26.98	11.31	1757.57	1.58	9.47	70.00	10.000	70.000	.00	0 .0
27.060	.0037					.0087	.24	7.73	1.97	7.96	.015	-8.40	.00	RECTANG
-5058.970	1740.220	6.102	1746.322	10952.00	27.20	11.49	1757.81	1.61	9.47	70.00	10.000	70.000	.00	0 .0
12.720	.0039					.0089	.11	7.71	2.00	7.81	.015	-8.40	.00	RECTANG
-5046.250	1740.270	6.081	1746.351	10952.00	27.30	11.57	1757.92	1.62	9.47	70.00	10.000	70.000	.00	0 .0
80.622	.0040					.0093	.75	7.70	2.01	7.78	.015	-8.40	.00	RECTANG
-4965.628	1740.591	5.946	1746.537	10952.00	27.96	12.14	1758.68	1.70	9.47	70.00	10.000	70.000	.00	0 .0
147.658	.0040					.0104	1.54	7.65	2.08	7.78	.015	-8.40	.00	RECTANG

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-4817.970	1741.180	5.685	1746.865	10952.00	29.32	13.35	1760.22	.00	9.47	70.00	10.000	70.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.000	.0040					.0113	.23	5.69	2.24	7.77	.015	-8.40	.00	RECTANG
-4797.970	1741.260	5.649	1746.909	10952.00	29.52	13.54	1760.45	.00	9.47	70.00	10.000	70.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.600	.0044					.0116	.24	5.65	2.26	7.56	.015	-8.40	.00	RECTANG
-4777.370	1741.350	5.613	1746.963	10952.00	29.73	13.72	1760.68	.00	9.47	70.00	10.000	70.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0378					.0098	2.49	5.61	2.28		.015	.00	.00	RECTANG
-4522.370	1751.000	4.601	1755.601	10952.00	22.89	8.14	1763.74	.00	7.01	104.00	10.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0096					.0078	.19	4.60	1.88		.015	.00	.00	RECTANG
-4497.470	1751.240	4.616	1755.857	10952.00	22.81	8.08	1763.94	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.462	.0096					.0077	.26	4.62	1.87	4.31	.015	.00	.00	RECTANG
-4464.008	1751.563	4.643	1756.206	10952.00	22.68	7.99	1764.19	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
192.470	.0096					.0070	1.36	4.64	1.85	4.31	.015	.00	.00	RECTANG
-4271.538	1753.418	4.870	1758.288	10952.00	21.63	7.26	1765.55	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117.438	.0096					.0060	.71	4.87	1.73	4.31	.015	.00	.00	RECTANG
-4154.100	1754.550	5.107	1759.657	10952.00	20.62	6.60	1766.26	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.875	.0096					.0055	.14	5.11	1.61	4.32	.015	.00	.00	RECTANG
-4129.225	1754.788	5.173	1759.962	10952.00	20.36	6.43	1766.40	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72.175	.0096					.0050	.36	5.17	1.58	4.32	.015	.00	.00	RECTANG

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-4057.050	1755.480	5.426	1760.906	10952.00	19.41	5.85	1766.76	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.110	.0099					.0045	.05	5.43	1.47	4.28	.015	.00	.00	RECTANG
-4045.940	1755.590	5.479	1761.069	10952.00	19.22	5.74	1766.81	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.240	.0598					.0599	1.69	5.48	1.45	5.48	.055	.00	.00	RECTANG
-4017.700	1757.280	5.476	1762.756	10952.00	19.23	5.74	1768.50	.00	7.01	104.00	12.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0600					.0600	1.80	5.48	1.45		.055	.00	.00	RECTANG
-3987.700	1759.080	5.474	1764.554	10952.00	19.24	5.75	1770.30	1.99	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.943	.0601					.0601	.78	7.47	1.45	5.47	.055	.00	.00	RECTANG
-3974.757	1759.857	5.474	1765.331	10952.00	19.24	5.75	1771.08	1.99	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.817	.0601					.0631	4.03	7.47	1.45	5.47	.055	.00	.00	RECTANG
-3910.940	1763.690	5.311	1769.001	10952.00	19.83	6.11	1775.11	2.08	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.852	.0600					.0674	.73	7.39	1.52	5.48	.055	.00	.00	RECTANG
-3900.088	1764.341	5.251	1769.592	10952.00	20.06	6.25	1775.84	2.13	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.579	.0600					.0743	1.98	7.38	1.54	5.48	.055	.00	.00	RECTANG
-3873.509	1765.936	5.006	1770.943	10952.00	21.03	6.87	1777.81	2.34	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.059	.0600					.0866	1.48	7.35	1.66	5.48	.055	.00	.00	RECTANG
-3856.450	1766.960	4.773	1771.733	10952.00	22.06	7.56	1779.29	2.62	7.01	104.00	9.000	104.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.510	.0600					.1000	1.15	7.39	1.78	5.48	.055	.00	.00	RECTANG

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-3844.940	1767.650	4.579	1772.229	10952.00	23.00	8.21	1780.44	2.84	7.01	104.00	9.000	104.000	.00	0 .0
TRANS STR	.0601					.0077	.04	7.42	1.89		.015	.00	.00	RECTANG
-3839.780	1767.960	4.674	1772.634	10952.00	22.53	7.88	1780.52	2.74	7.01	104.00	10.000	104.000	.00	0 .0
	3.840	.0599				.0072	.03	7.41	1.84	2.46	.015	.00	.00	RECTANG
-3835.940	1768.190	4.762	1772.952	10952.00	22.11	7.59	1780.55	2.63	7.01	104.00	10.000	104.000	.00	0 .0
	10.390	.0337				.0067	.07	7.39	1.79	2.93	.015	.00	.00	RECTANG
-3825.550	1768.540	4.899	1773.439	10952.00	21.50	7.18	1780.61	.00	7.01	104.00	10.000	104.000	.00	0 .0
	4.620	.0346				.0062	.03	4.90	1.71	2.91	.015	.00	.00	RECTANG
-3820.930	1768.700	4.969	1773.669	10952.00	21.19	6.98	1780.64	.00	7.01	104.00	10.000	104.000	.00	0 .0
JUNCT STR	.0000					.0064	.00	4.97	1.68		.015	.00	.00	RECTANG
-3820.930	1768.700	4.792	1773.492	10822.00	21.71	7.32	1780.81	.00	6.95	104.00	10.000	104.000	.00	0 .0
BRIDGE EXIT														
-3820.930	1768.700	5.419	1774.119	10822.00	20.80	6.72	1780.84	.00	6.00	104.00	6.000	104.000	.00	8 1.0
	3.940	.0048				.0119	.05	5.42	1.64	6.00	.015	.00	.00	BOX
----- WARNING - Flow depth near top of box conduit -----														
-3816.990	1768.719	5.400	1774.119	10822.00	20.88	6.77	1780.89	.00	6.00	104.00	6.000	104.000	.00	8 1.0
	53.412	.0048				.0127	.68	5.40	1.65	6.00	.015	.00	.00	BOX

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FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
-3763.578	1768.973	5.149	1774.121	10822.00	21.90	7.44	1781.57	.00	6.00	104.00	6.000	104.000	.00	8 1.0
	52.058	.0048				.0144	.75	5.15	1.77	6.00	.015	.00	.00	BOX
-3711.520	1769.220	4.909	1774.129	10822.00	22.96	8.19	1782.32	.00	6.00	104.00	6.000	104.000	.00	8 1.0
BRIDGE ENTRANCE														
-3711.520	1769.220	4.250	1773.470	10822.00	24.48	9.31	1782.78	.00	6.00	104.00	6.000	104.000	.00	0 .0
TRANS STR	.0128					.0098	.13	4.25	2.09		.015	.00	.00	BOX
-3698.200	1769.390	4.260	1773.650	10822.00	24.43	9.27	1782.92	.00	6.95	104.00	7.500	104.000	.00	0 .0
	4.950	.0121				.0098	.05	4.26	2.09	3.99	.015	.00	.00	RECTANG
-3693.250	1769.450	4.263	1773.713	10822.00	24.41	9.25	1782.96	.00	6.95	104.00	7.500	104.000	.00	0 .0
	32.150	.0128				.0096	.31	4.26	2.08	3.92	.015	.00	.00	RECTANG
-3661.100	1769.860	4.293	1774.153	10822.00	24.24	9.12	1783.28	.00	6.95	104.00	7.500	104.000	.00	0 .0
TRANS STR	.0036					.0067	1.70	4.29	2.06		.015	-8.40	.00	RECTANG
-3406.100	1770.780	7.852	1778.632	10822.00	20.61	6.59	1785.23	.00	9.40	70.00	9.000	70.000	.00	0 .0
	34.050	.0035				.0038	.13	7.85	1.33	8.02	.015	-8.40	.00	RECTANG
-3372.050	1770.900	7.840	1778.740	10822.00	20.64	6.62	1785.36	.00	9.40	70.00	9.000	70.000	.00	0 .0
	157.910	.0036				.0038	.61	7.84	1.33	7.97	.015	-8.40	.00	RECTANG
-3214.140	1771.468	7.793	1779.261	10822.00	20.77	6.70	1785.96	.00	9.40	70.00	9.000	70.000	.00	0 .0
	557.932	.0036				.0042	2.33	7.79	1.34	7.97	.015	-8.40	.00	RECTANG

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2656.208	1773.476	7.446	1780.922	10822.00	21.79	7.37	1788.29	.00	9.40	70.00	9.000	70.000	.00	0 .0
326.208	.0036					.0048	1.58	7.45	1.44	7.97	.015	-8.40	.00	RECTANG
-2330.000	1774.650	7.116	1781.766	10822.00	22.85	8.11	1789.87	.00	9.40	70.00	9.000	70.000	.00	0 .0
TRANS STR	.0040					.0052	.03	7.12	1.55		.015	-8.40	.00	RECTANG
-2325.000	1774.670	7.109	1781.779	10822.00	22.87	8.12	1789.90	.00	9.40	70.00	8.500	70.000	.00	0 .0
54.990	.0035					.0053	.29	7.11	1.55	8.07	.015	-8.40	.00	RECTANG
-2270.010	1774.860	7.038	1781.898	10822.00	23.12	8.30	1790.20	.00	9.40	70.00	8.500	70.000	.00	0 .0
127.780	.0036					.0056	.72	7.04	1.58	7.97	.015	-8.40	.00	RECTANG
-2142.230	1775.320	6.875	1782.195	10822.00	23.69	8.72	1790.91	.00	9.40	70.00	8.500	70.000	.00	0 .0
TRANS STR	.0040					.0058	.03	6.88	1.63		.015	-8.40	.00	RECTANG
-2137.230	1775.340	6.867	1782.207	10822.00	23.72	8.74	1790.95	.00	9.40	70.00	9.100	70.000	.00	0 .0
250.370	.0067					.0056	1.41	6.87	1.64	6.59	.015	-8.40	.00	RECTANG
-1886.860	1777.016	7.035	1784.051	10822.00	23.13	8.30	1792.36	1.94	9.40	70.00	9.100	70.000	.00	0 .0
WALL EXIT														
-1886.860	1777.016	7.034	1784.050	10822.00	22.25	7.68	1791.73	1.77	9.13	70.00	9.100	70.000	.00	1 .8
210.209	.0050					.0061	1.29	8.81	1.49	7.44	.015	.00	.00	RECTANG
-1676.651	1778.067	6.845	1784.912	10822.00	22.86	8.11	1793.03	1.87	9.13	70.00	9.100	70.000	.00	1 .8
262.821	.0050					.0069	1.81	8.72	1.55	7.44	.015	.00	.00	RECTANG

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FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-1413.830	1779.381	6.526	1785.907	10822.00	23.97	8.92	1794.83	2.06	9.13	70.00	9.100	70.000	.00	1 .8
22.519	.0050					.0074	.17	8.59	1.66	7.44	.015	.00	.00	RECTANG
-1391.311	1779.494	6.495	1785.989	10822.00	24.09	9.01	1795.00	2.08	9.13	70.00	9.100	70.000	.00	1 .8
197.512	.0050					.0080	1.59	8.58	1.68	7.44	.015	.00	.00	RECTANG
-1193.799	1780.481	6.193	1786.674	10822.00	25.26	9.91	1796.59	2.29	9.13	70.00	9.100	70.000	.00	1 .8
165.079	.0050					.0093	1.53	8.48	1.80	7.44	.015	.00	.00	RECTANG
-1028.720	1781.307	5.905	1787.212	10822.00	26.50	10.90	1798.11	2.46	9.13	70.00	9.100	70.000	.00	1 .8
19.339	.0439					.0093	.18	8.37	1.93	3.63	.015	.00	.00	RECTANG
-1009.381	1782.155	6.177	1788.332	10822.00	25.33	9.96	1798.29	2.25	9.13	70.00	9.100	70.000	.00	1 .8
16.893	.0439					.0081	.14	8.43	1.81	3.63	.015	.00	.00	RECTANG
-992.488	1782.896	6.479	1789.375	10822.00	24.15	9.06	1798.43	2.04	9.13	70.00	9.100	70.000	.00	1 .8
13.768	.0439					.0070	.10	8.52	1.68	3.63	.015	.00	.00	RECTANG
-978.720	1783.500	6.795	1790.295	10822.00	23.03	8.23	1798.53	1.90	9.13	70.00	9.100	70.000	.00	1 .8
30.940	.0059					.0066	.20	8.69	1.57	7.04	.015	.00	.00	RECTANG
-947.780	1783.682	6.780	1790.462	10822.00	23.08	8.27	1798.73	.00	9.13	70.00	9.100	70.000	.00	1 .8
4.060	.0059					.0066	.03	6.78	1.57	7.02	.015	.00	.00	RECTANG
-943.720	1783.706	6.778	1790.484	10822.00	23.08	8.27	1798.76	.00	9.13	70.00	9.100	70.000	.00	1 .8
TRANS STR	.0059					.0066	.17	6.78	1.57		.015	.00	.00	RECTANG

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-918.720	1783.853	6.759	1790.612	10822.00	23.15	8.32	1798.93	.00	9.13	70.00	9.600	70.000	.00	1 .8
350.000	.0060					.0070	2.44	6.76	1.58	7.01	.015	.00	.00	RECTANG
-568.720	1785.940	6.535	1792.474	10822.00	23.94	8.90	1801.38	.00	9.13	70.00	9.600	70.000	.00	1 .8
45.940	.0059					.0074	.34	6.53	1.66	7.03	.015	.00	.00	RECTANG
-522.780	1786.211	6.495	1792.706	10822.00	24.09	9.01	1801.72	3.12	9.13	70.00	9.600	70.000	.00	1 .8
107.040	.0059					.0076	.82	9.61	1.68	7.03	.015	.00	.00	RECTANG
-415.740	1786.842	6.393	1793.235	10822.00	24.47	9.30	1802.54	7.23	9.13	70.00	9.600	70.000	.00	1 .8
22.020	.0059					.0079	.17	13.62	1.72	7.01	.015	.00	.00	RECTANG
-393.720	1786.973	6.370	1793.343	10822.00	24.56	9.37	1802.71	3.24	9.13	70.00	9.600	70.000	.00	1 .8
TRANS STR	.0059					.0081	.40	9.61	1.73		.015	.00	.00	RECTANG
-343.720	1787.268	6.293	1793.561	10822.00	24.86	9.60	1803.16	1.47	9.13	70.00	11.300	70.000	.00	1 .8
49.450	.0059					.0083	.41	7.76	1.76	7.04	.015	.00	.00	RECTANG
-294.270	1787.559	6.235	1793.794	10822.00	25.10	9.78	1803.57	2.25	9.13	70.00	11.300	70.000	.00	1 .8
55.550	.0061					.0086	.48	8.49	1.78	6.94	.015	.00	.00	RECTANG
-238.720	1787.900	6.173	1794.073	10822.00	25.35	9.98	1804.05	2.30	9.13	70.00	11.300	70.000	.00	1 .8
50.440	.0153					.0084	.42	8.47	1.81	5.11	.015	.00	.00	RECTANG
-188.280	1788.672	6.339	1795.011	10822.00	24.68	9.46	1804.47	.00	9.13	70.00	11.300	70.000	.00	1 .8
12.000	.0152					.0079	.10	6.34	1.74	5.12	.015	.00	.00	RECTANG

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-176.280	1788.855	6.384	1795.239	10822.00	24.51	9.33	1804.57	1.72	9.13	70.00	11.300	70.000	.00	1 .8
BRIDGE ENTRANCE														
-176.280	1788.855	6.216	1795.071	10822.00	24.87	9.61	1804.68	1.79	9.06	70.00	11.300	70.000	.00	0 .0
31.771	.0153					.0066	.21	8.01	1.76	4.82	.015	.00	.00	RECTANG
-144.509	1789.341	6.354	1795.695	10822.00	24.33	9.19	1804.89	1.72	9.06	70.00	11.300	70.000	.00	0 .0
56.229	.0153					.0060	.34	8.07	1.70	4.82	.015	.00	.00	RECTANG
-88.280	1790.202	6.664	1796.866	10822.00	23.20	8.36	1805.22	1.75	9.06	70.00	11.300	70.000	.00	0 .0
TRANS STR	.0153					.0063	.62	8.42	1.58		.015	.00	.00	RECTANG
11.430	1791.732	5.470	1797.202	10822.00	23.69	8.72	1805.92	1.94	8.05	83.50	11.300	83.500	.00	0 .0
20.270	.0153					.0068	.14	7.41	1.79	4.28	.015	.00	.00	RECTANG
31.700	1792.042	5.551	1797.593	10822.00	23.35	8.47	1806.06	.00	8.05	83.50	11.300	83.500	.00	0 .0
15.726	.0153					.0065	.10	5.55	1.75	4.28	.015	.00	.00	RECTANG
47.426	1792.283	5.620	1797.902	10822.00	23.06	8.26	1806.16	.00	8.05	83.50	11.300	83.500	.00	0 .0
51.054	.0153					.0060	.30	5.62	1.71	4.28	.015	.00	.00	RECTANG
98.480	1793.064	5.894	1798.958	10822.00	21.99	7.51	1806.47	1.47	8.05	83.50	11.300	83.500	.00	0 .0
32.500	.0153					.0052	.17	7.37	1.60	4.28	.015	.00	.00	RECTANG
130.980	1793.560	6.127	1799.687	10822.00	21.15	6.95	1806.64	1.37	8.05	83.50	11.300	83.500	.00	0 .0
11.762	.0219					.0047	.06	7.49	1.51	3.83	.015	.00	.00	RECTANG

Program Package Serial Number: 1513

WATER SURFACE PROFILE LISTING

Date: 8-23-2010 Time: 4:52:15

FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

Q = 2008 MPU Flow; Freeboard Check; W/ROUGHNESS ELEMENTS - 100% DESIGN

File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
142.742	1793.817	6.298	1800.116	10822.00	20.58	6.57	1806.69	1.29	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.407	.0219					.0042	.07	7.59	1.44	3.83	.015	.00	.00	RECTANG
159.149	1794.176	6.606	1800.781	10822.00	19.62	5.98	1806.76	1.17	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.091	.0219					.0036	.04	7.78	1.35	3.83	.015	.00	.00	RECTANG
171.240	1794.440	6.928	1801.368	10822.00	18.71	5.43	1806.80	.00	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.600	.0086					.0032	.05	6.93	1.25	5.12	.015	.00	.00	RECTANG
185.840	1794.566	7.081	1801.647	10822.00	18.30	5.20	1806.85	.00	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.675	.0086					.0029	.05	7.08	1.21	5.13	.015	.00	.00	RECTANG
202.515	1794.709	7.317	1802.026	10822.00	17.71	4.87	1806.90	.00	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.312	.0086					.0026	.04	7.32	1.15	5.13	.015	.00	.00	RECTANG
216.827	1794.832	7.674	1802.507	10822.00	16.89	4.43	1806.94	.00	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.413	.0086					.0022	.01	7.67	1.07	5.13	.015	.00	.00	RECTANG
221.240	1794.870	8.050	1802.920	10822.00	16.10	4.02	1806.94	.00	8.05	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNCT STR	.0086					.0013	.06	8.05	1.00	-	.015	.00	.00	RECTANG
264.600	1795.243	10.390	1805.633	8146.00	9.39	1.37	1807.00	.00	6.66	83.50	11.300	83.500	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WALL EXIT														
264.600	1795.243	10.390	1805.633	8146.00	10.45	1.70	1807.33	.00	7.16	75.00	11.300	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41.316	.0054					.0007	.03	10.39	.57	5.35	.015	.00	.00	RECTANG

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WATER SURFACE PROFILE LISTING

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FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
305.916	1795.465	10.101	1805.565	8146.00	10.75	1.80	1807.36	.00	7.16	75.00	11.300	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HYDRAULIC JUMP														
305.916	1795.465	4.849	1800.313	8146.00	22.40	7.79	1808.10	.00	7.16	75.00	11.300	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130.624	.0054					.0076	1.00	4.85	1.79	5.35	.015	.00	.00	RECTANG
436.540	1796.165	4.728	1800.893	8146.00	22.97	8.19	1809.09	.00	7.16	75.00	11.300	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.000	.0086					.0079	.12	4.73	1.86	4.61	.015	.00	.00	RECTANG
451.540	1796.294	4.732	1801.026	8146.00	22.95	8.18	1809.21	.00	7.16	75.00	11.300	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIDGE EXIT														
451.540	1796.294	4.965	1801.259	8146.00	22.63	7.95	1809.21	.00	7.32	75.00	11.300	75.000	.00	1 2.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
169.300	.0086					.0085	1.44	4.97	1.82	4.95	.015	.00	.00	RECTANG
620.840	1797.750	4.974	1802.724	8146.00	22.59	7.92	1810.65	.00	7.32	75.00	11.300	75.000	.00	1 2.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIDGE ENTRANCE														
620.840	1797.750	4.632	1802.381	8146.00	23.45	8.54	1810.92	.00	7.16	75.00	7.350	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.000	.0086					.0085	.13	4.63	1.92	4.61	.015	.00	.00	RECTANG
635.840	1797.879	4.632	1802.511	8146.00	23.45	8.54	1811.05	.64	7.16	75.00	7.350	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95.400	.0086					.0085	.81	5.27	1.92	4.61	.015	.00	.00	RECTANG
731.240	1798.700	4.637	1803.337	8146.00	23.42	8.52	1811.86	.64	7.16	75.00	7.350	75.000	.00	0 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS STR	.0037					.0069	.34	5.27	1.92	-	.015	.00	.00	RECTANG

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WATER SURFACE PROFILE LISTING

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FLAMINGO WASH; NELLIS BOULEVARD TO MOHAVE ROAD - Mainline Peaking;

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File: 015-FLAMINGO-4-R.WSW - N=0.015 - by: VTN (D.Bergh) Updated: 8/10

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
781.240	1798.885	6.282	1805.167	8146.00	21.61	7.25	1812.42	.44	8.30	60.00	7.600	60.000	.00	0 .0
26.206	.0037					.0053	.14	6.72	1.52	7.05	.015	.00	.00	RECTANG
807.446	1798.982	6.249	1805.231	8146.00	21.73	7.33	1812.56	.44	8.30	60.00	7.600	60.000	.00	0 .0
209.774	.0037					.0058	1.22	6.69	1.53	7.05	.015	.00	.00	RECTANG
1017.220	1799.758	5.958	1805.716	8146.00	22.79	8.06	1813.78	.00	8.30	60.00	7.600	60.000	.00	0 .0
63.760	.0037					.0064	.41	5.96	1.65	7.05	.015	.00	.00	RECTANG
1080.980	1799.994	5.861	1805.855	8146.00	23.17	8.33	1814.19	.00	8.30	60.00	7.600	60.000	.00	0 .0
TRANS STR	.0037					.0075	1.43	5.86	1.69		.015	.00	.00	RECTANG
1270.980	1800.697	5.399	1806.096	8146.00	25.15	9.82	1815.92	.00	8.30	60.00	8.700	60.000	.00	0 .0
108.550	.0034					.0091	.98	5.40	1.91	7.22	.015	.00	.00	RECTANG
1379.530	1801.070	5.186	1806.256	8146.00	26.18	10.64	1816.90	.00	8.30	60.00	8.700	60.000	.00	0 .0
64.610	.0101					.0096	.62	5.19	2.03	5.11	.015	.00	.00	RECTANG
1444.140	1801.723	5.196	1806.919	8146.00	26.13	10.60	1817.52	2.12	8.30	60.00	8.700	60.000	.00	0 .0
432.580	.0099					.0094	4.05	7.32	2.02	5.15	.015	.00	.00	RECTANG
1876.720	1805.987	5.266	1811.253	8146.00	25.78	10.32	1821.57	.00	8.30	60.00	8.700	60.000	.00	0 .0
59.320	.0101					.0091	.54	5.27	1.98	5.11	.015	.00	.00	RECTANG
1936.040	1806.586	5.286	1811.872	8146.00	25.68	10.24	1822.12	.68	8.30	60.00	8.700	60.000	.00	0 .0
213.923	.0101					.0088	1.88	5.97	1.97	5.11	.015	.00	.00	RECTANG

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2149.963	1808.747	5.386	1814.133	8146.00	25.21	9.87	1824.00	.66	8.30	60.00	8.700	60.000	.00	0 .0
295.426	.0101					.0080	2.35	6.04	1.91	5.11	.015	.00	.00	RECTANG
2445.389	1811.730	5.649	1817.380	8146.00	24.03	8.97	1826.35	.60	8.30	60.00	8.700	60.000	.00	0 .0
166.259	.0101					.0069	1.14	6.25	1.78	5.11	.015	.00	.00	RECTANG
2611.647	1813.410	5.925	1819.335	8146.00	22.91	8.15	1827.49	.54	8.30	60.00	8.700	60.000	.00	0 .0
107.863	.0101					.0059	.64	6.47	1.66	5.11	.015	.00	.00	RECTANG
2719.510	1814.499	6.214	1820.713	8146.00	21.85	7.41	1828.13	.00	8.30	60.00	8.700	60.000	.00	0 .0
JUNCT STR	.0000					.0066	.00	6.71	1.54		.015	.00	.00	RECTANG
2719.510	1814.499	5.350	1819.849	7669.00	23.89	8.86	1828.71	.59	7.98	60.00	8.700	60.000	.00	0 .0
10.000	.0101					.0077	.08	5.94	1.82	4.91	.015	.00	.00	RECTANG
2729.510	1814.600	5.361	1819.961	7669.00	23.84	8.83	1828.79	.00	7.98	60.00	8.700	60.000	.00	0 .0
63.885	.0105					.0075	.48	5.36	1.81	4.85	.015	.00	.00	RECTANG
2793.395	1815.272	5.447	1820.719	7669.00	23.46	8.55	1829.27	.00	7.98	60.00	8.700	60.000	.00	0 .0
137.585	.0105					.0068	.94	5.45	1.77	4.85	.015	.00	.00	RECTANG
2930.980	1816.720	5.713	1822.433	7669.00	22.37	7.77	1830.21	.00	7.98	60.00	8.700	60.000	.00	0 .0
TRANS STR	.0185					.0066	.66	5.71	1.65		.015	.00	.00	RECTANG
3030.980	1818.570	5.047	1823.617	7669.00	21.68	7.30	1830.91	.00	7.32	80.19	8.100	60.000	2.00	0 .0
232.240	.0065					.0070	1.62	5.05	1.82	5.13	.015	.00	2.00	TRAP

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3263.220	1820.080	4.999	1825.079	7669.00	21.92	7.46	1832.54	1.97	7.32	79.99	8.100	60.000	2.00	0 .0
217.760	.0065					.0073	1.59	6.97	1.85	5.13	.015	.00	2.00	TRAP
3480.980	1821.500	4.932	1826.432	7669.00	22.26	7.69	1834.12	2.03	7.32	79.73	8.100	60.000	2.00	0 .0
98.050	.0094					.0072	.71	6.96	1.89	4.61	.015	.00	2.00	TRAP
3579.030	1822.422	5.018	1827.440	7669.00	21.82	7.39	1834.83	.00	7.32	80.07	8.100	60.000	2.00	0 .0
JUNCT STR	.0000					.0081	.00	6.98	1.84		.015	.00	2.00	TRAP
3579.030	1822.422	4.477	1826.899	7195.00	23.31	8.44	1835.33	2.18	7.04	77.91	8.100	60.000	2.00	0 .0
164.770	.0094					.0091	1.50	6.66	2.06	4.44	.015	.00	2.00	TRAP
3743.800	1823.971	4.492	1828.463	7195.00	23.22	8.37	1836.83	1.70	7.04	77.97	8.100	60.000	2.00	0 .0
584.200	.0094					.0084	4.93	6.19	2.05	4.44	.015	.00	2.00	TRAP
4328.000	1829.462	4.681	1834.143	7195.00	22.16	7.63	1841.77	.00	7.04	78.72	8.100	60.000	2.00	0 .0
228.324	.0094					.0074	1.68	4.68	1.92	4.44	.015	.00	2.00	TRAP
4556.325	1831.608	4.869	1836.477	7195.00	21.19	6.97	1843.45	.00	7.04	79.48	8.100	60.000	2.00	0 .0
141.906	.0094					.0064	.91	4.87	1.81	4.44	.015	.00	2.00	TRAP
4698.231	1832.942	5.077	1838.019	7195.00	20.20	6.34	1844.36	.00	7.04	80.31	8.100	60.000	2.00	0 .0
93.491	.0094					.0055	.52	5.08	1.69	4.44	.015	.00	2.00	TRAP
4791.722	1833.821	5.292	1839.113	7195.00	19.26	5.76	1844.87	.00	7.04	81.17	8.100	60.000	2.00	0 .0
65.317	.0094					.0048	.31	5.29	1.58	4.44	.015	.00	2.00	TRAP

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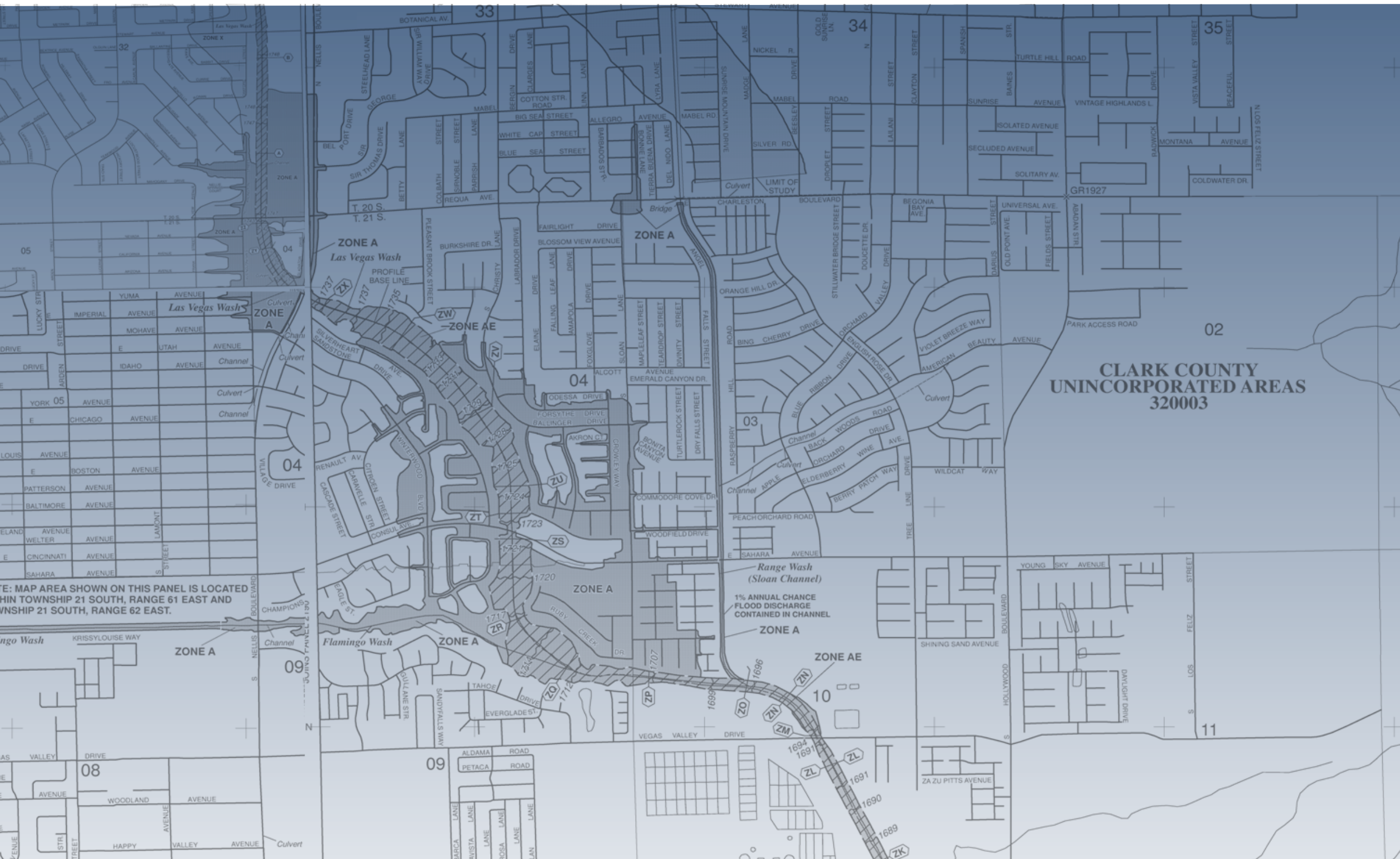
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
4857.039	1834.435	5.515	1839.950	7195.00	18.37	5.24	1845.19	.00	7.04	82.06	8.100	60.000	2.00	0 .0
46.671	.0094					.0042	.19	5.52	1.48	4.44	.015	.00	2.00	TRAP
4903.710	1834.874	5.747	1840.620	7195.00	17.51	4.76	1845.38	.00	7.04	82.99	8.100	60.000	2.00	0 .0
33.264	.0094					.0036	.12	5.75	1.39	4.44	.015	.00	2.00	TRAP
4936.975	1835.186	5.987	1841.173	7195.00	16.70	4.33	1845.50	.00	7.04	83.95	8.100	60.000	2.00	0 .0
23.046	.0094					.0031	.07	5.99	1.30	4.44	.015	.00	2.00	TRAP
4960.021	1835.403	6.236	1841.639	7195.00	15.92	3.94	1845.57	.00	7.04	84.95	8.100	60.000	2.00	0 .0
14.910	.0094					.0027	.04	6.24	1.22	4.44	.015	.00	2.00	TRAP
4974.931	1835.543	6.494	1842.037	7195.00	15.18	3.58	1845.61	.00	7.04	85.98	8.100	60.000	2.00	0 .0
8.210	.0094					.0024	.02	6.49	1.14	4.44	.015	.00	2.00	TRAP
4983.141	1835.620	6.762	1842.382	7195.00	14.47	3.25	1845.63	.00	7.04	87.05	8.100	60.000	2.00	0 .0
2.540	.0094					.0020	.01	6.76	1.07	4.44	.015	.00	2.00	TRAP
4985.680	1835.644	7.040	1842.684	7195.00	13.80	2.96	1845.64	.00	7.04	88.16	8.100	60.000	2.00	0 .0







Las Vegas Wash



August 2013

CLOMR
and
LOMR

Las Vegas Wash -
Sloan Channel
to Bonanza
Road and
Flamingo Wash -
Below I-515



Prepared by

CH2MHILL®
Stanley Consultants INC.