Request for Letter of Map Revision
Flamingo Wash
Desert Inn to Spencer Street
Clark County, Nevada

Prepared for:
CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT
500 S. Grand Central Parkway
Las Vegas, NV 89155



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March 2012

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Flamingo Wash at Spencer Street LOMR -

- Flamingo Wash at Spencer Street LOMR Post Project Conditions HECRAS Model
- Flamingo Wash at Spencer Street LOMR Workmaps

Flamingo Wash at Mojave Road to Boulder Highway LOMR

- Flamingo Wash at Mojave Road to Boulder Highway LOMR Post Project Conditions HECRAS Model
- Flamingo Wash at Mojave Road to Boulder Highway LOMR Workmap

Proposed Hydraulic Model

- Proposed Subcritical HECRAS Model
- Proposed Supercritical HECRAS Model
- CHECK-RAS Output Files
- Hydraulic Workmap

1.0 INTRODUCTION

1.1 Purpose of Study

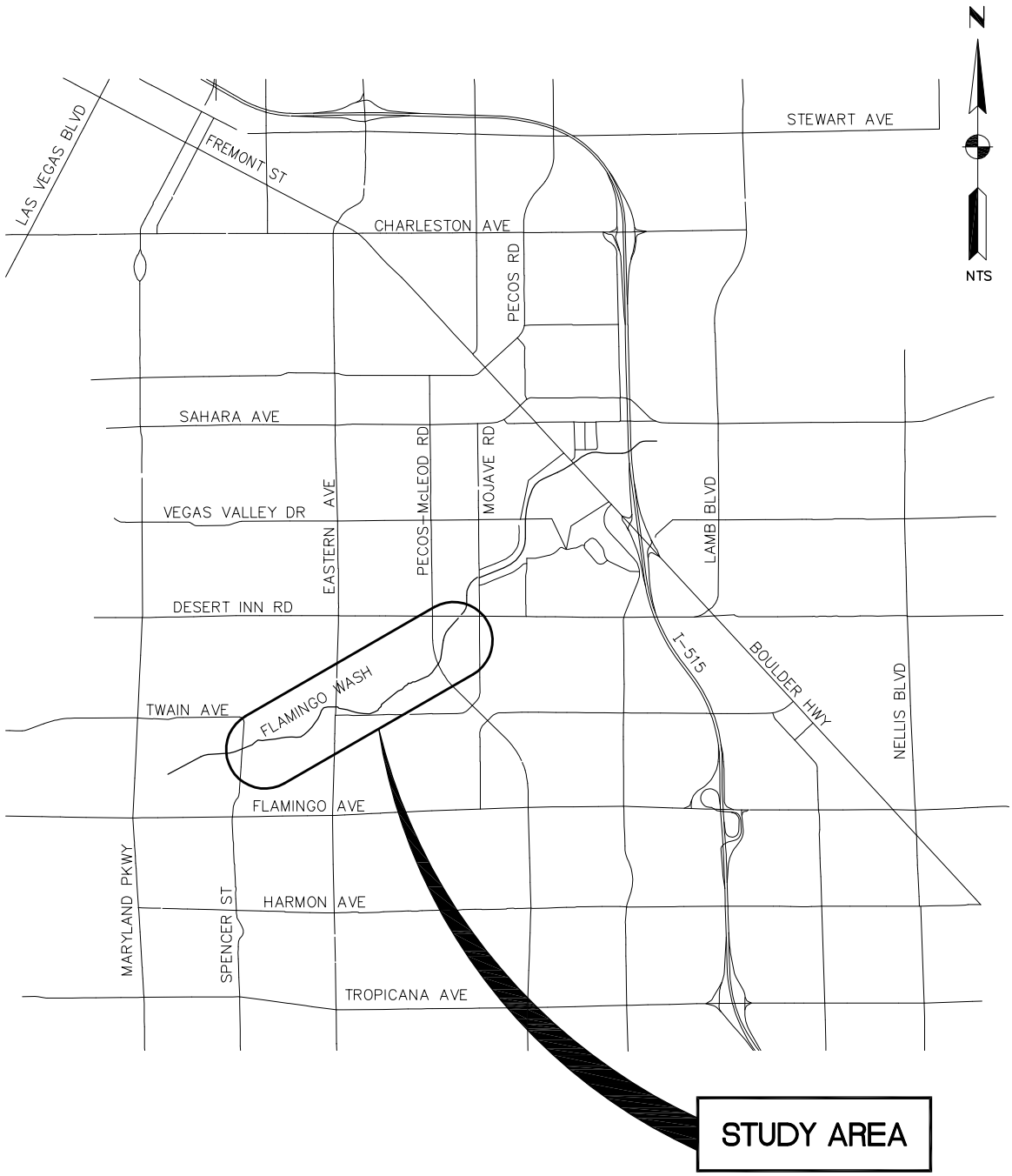
This submittal package provides hydraulic data in support of a Request for a Letter of Map Revision (LOMR) for the Flamingo Wash between Spencer Street and Desert Inn Road in Clark County, Nevada (see Figure 1). This LOMR request was prepared by The Louis Berger Group, Inc. (LBG) on behalf of Clark County Public Works (County) in cooperation with the Clark County Regional Flood Control District (CCRFCD).

This LOMR is a follow up to a Conditional Letter of Map Revision (CLOMR) for the project which was issued by FEMA on August 13, 2007 (Case No: 07-09-0935R) based on the Request for CLOMR for Flamingo Wash – Spencer Street to Desert Inn Road (LBG, 2007). A copy of the CLOMR issued by FEMA is provided in Appendix A.

Subsequent to receiving the CLOMR, the design was revised to eliminate all proposed channel improvements upstream of Eastern Avenue, including the new RCB under Eastern Avenue. The only differences between the 2007 CLOMR and this LOMR request are:

- FEMA MT-2 Form 3 has been updated (2/2011 version) and re-signed;
- The Proposed HECRAS Model has been revised to eliminate improvements upstream of Eastern Avenue; and,
- As-built plans and certification are included.

For completeness, all exhibits, information and data which were previously submitted in the CLOMR request (i.e., effective and corrected effective hydraulic models) are also included in this LOMR report.



FLAMINGO WASH
SPENCER ST TO DESERT INN RD
VICINITY MAP

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FIGURE 1

1.2 Project Description

The study area, extending from Spencer Street to Desert Inn Road, encompasses approximately 1.5 miles of the Flamingo Wash in unincorporated Clark County, Nevada, Sections 13 and 14, Township 21 South, Range 61 East. The wash between Spencer Street and Desert Inn Road is designated as Special Flood Hazard Area (SFHA) Zone A on Flood Insurance Rate Map (FIRM) Panels 2190, 2557 and 2580 for Clark County Nevada and Incorporated Areas (see Figures 2a through 2d). SFHA Zone A is defined as an area subject to flooding by the 1% - annual chance flood with no base flood elevations determined.

The basis of this LOMR request is the Flamingo Wash Spencer Street to Desert Inn Road improvement project which was designed by LBG for the County. Copies of the as-built plans and a certification letter are provided in Appendix D. Figure 3 is an annotated FIRM showing the proposed Zone A floodplain.

The Flamingo Wash channel project includes construction of a concrete-lined, rectangular channel between Eastern Avenue and Desert Inn Road. The purpose of this LOMR is to: 1) revise the FIRM to reflect the proposed channel improvements between Eastern Avenue to Desert Inn Road; and 2) revise the floodplain boundaries for the Flamingo Wash through the golf course between Spencer Street and Eastern Avenue based on new topographic information which was acquired at the time of the channel design.

2.0 PREVIOUS STUDIES AND LOMRS

The limits of this LOMR study are depicted on the effective FIRM (Figure 2a). With the exception of the Golf Course area between Spencer Street and Eastern Avenue, the floodplain boundaries on Figure 2a were originally modeled and delineated in the Flood Insurance Study Restudy for the Flamingo Wash in Clark County, Nevada (FIS, 1997), prepared by G.C. Wallace Inc., for the CCRFCD. The source of the floodplain mapping for the Golf Course area is not known.

Subsequent to the preparation of the FIS (1997), two LOMRs (Case No. 04-09-0166P and Case No. 04-09-0167P) were issued in 2004 that revised the floodplain boundaries upstream of Spencer Street and downstream of Desert Inn Road. The FIRM maps were updated in November 2011 to reflect the two LOMRs (see Figures 2b through 2d). Brief discussions of the FIS (1997) and 2004 LOMRs, as they relate to this LOMR, are provided in the following sections.

2.1 Flamingo Wash Flood Insurance Study Restudy

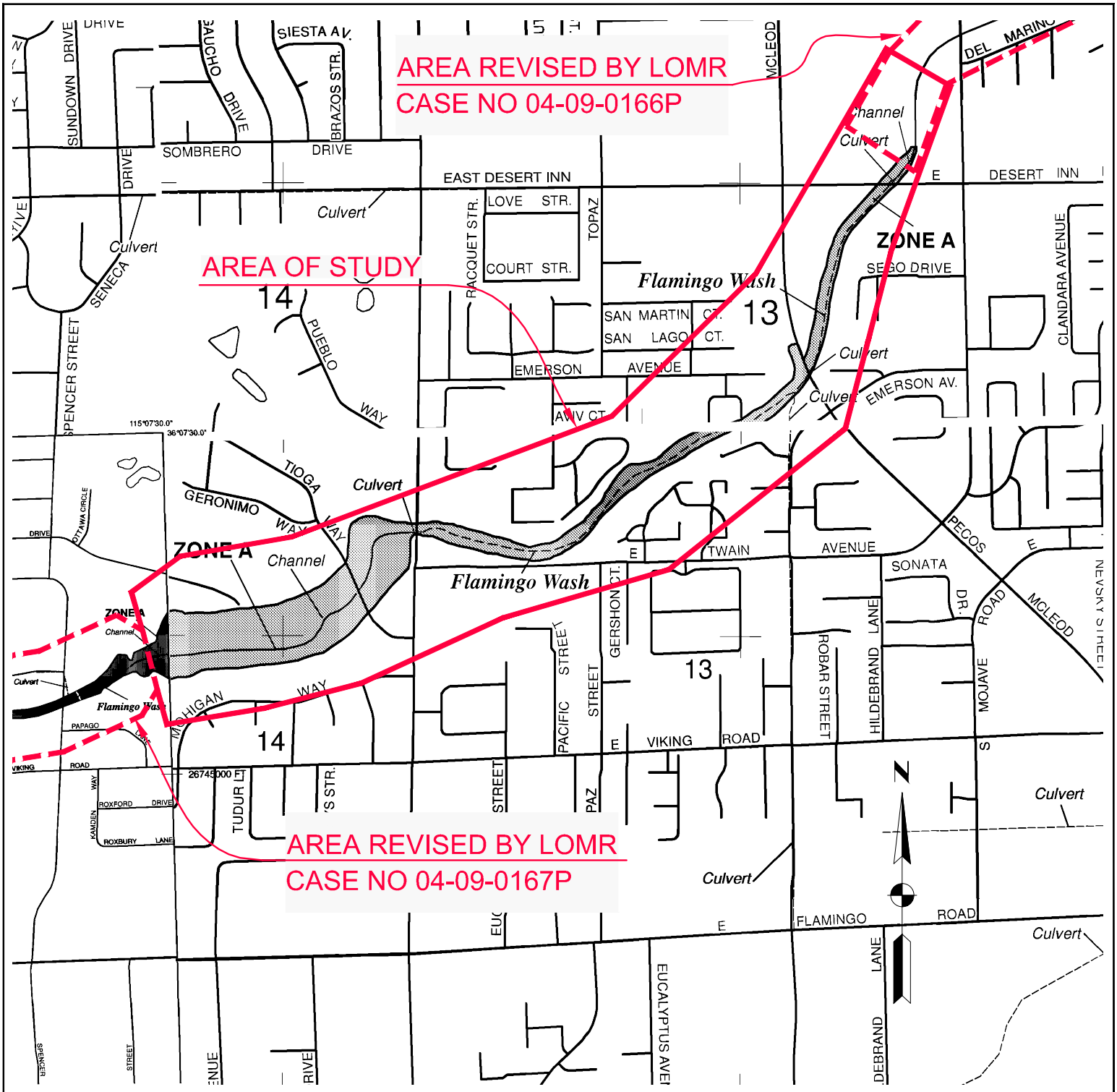
The FIS (1997) provides the "effective" 100-year flood hydrologic and hydraulic analyses for the Flamingo Wash watershed. Relevant excerpts from the FIS, including summary tables, a Workmap, and the HEC-2 hydraulic model, are provided Appendix B.1 and on the enclosed CD ROM in Appendix E for reference.

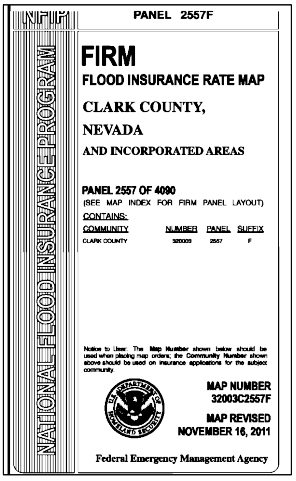
The 100-year flow rate developed by the FIS Restudy at Eastern Avenue is 5,500 cfs. The flow rate increases to 5,800 cfs approximately 450 ft upstream of Desert Inn Road. These flow rates were used in the Proposed HECRAS Model for this LOMR request.

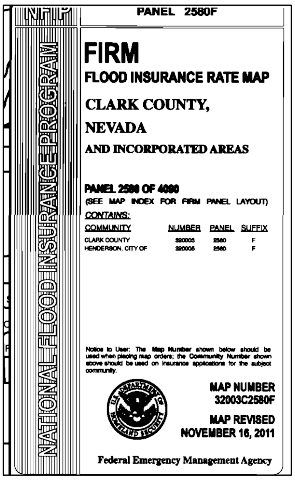
The FIS (1997) includes HEC-2 hydraulic analyses for several reaches of the Flamingo Wash. The reach that applies to this LOMR extends from Eastern Avenue to Las Vegas Wash. This is considered the "effective" model between Eastern Avenue and Desert Inn Road.

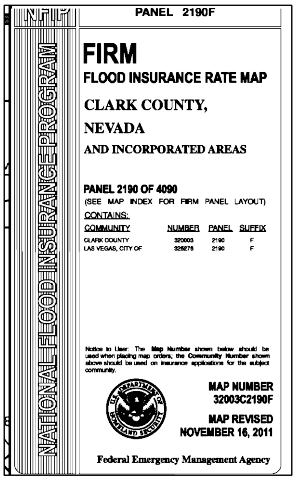
It should be noted that the elevations in the FIS HEC-2 hydraulic model are based on the National Geodetic Vertical Datum of 1929 (NGVD29). All hydraulic modeling in this LOMR is based on the North American Vertical Datum of 1988 (NAVD88). To correct for the differences in datum, the FIS NGVD29 elevations must be adjusted upward by a factor of 2.26 ft. A "corrected" FIS HEC-2 model was prepared previously as part of LOMR Case No. 04-09-0166P which is included in Appendix B.1.3.

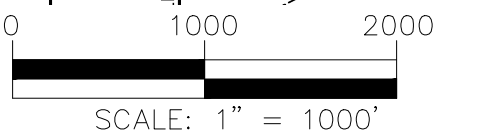
The "corrected" FIS HEC-2 model was not used in this study. It is provided for information purposes only because it is effective model for the wash between Eastern Avenue and Desert Inn Road. The Proposed HECRAS Model in this LOMR request ties into HECRAS models prepared for LOMRs upstream of Eastern Avenue and downstream of Desert Inn Road.











CLARK COUNTY, NEVADA
DEPARTMENT OF PUBLIC WORKS

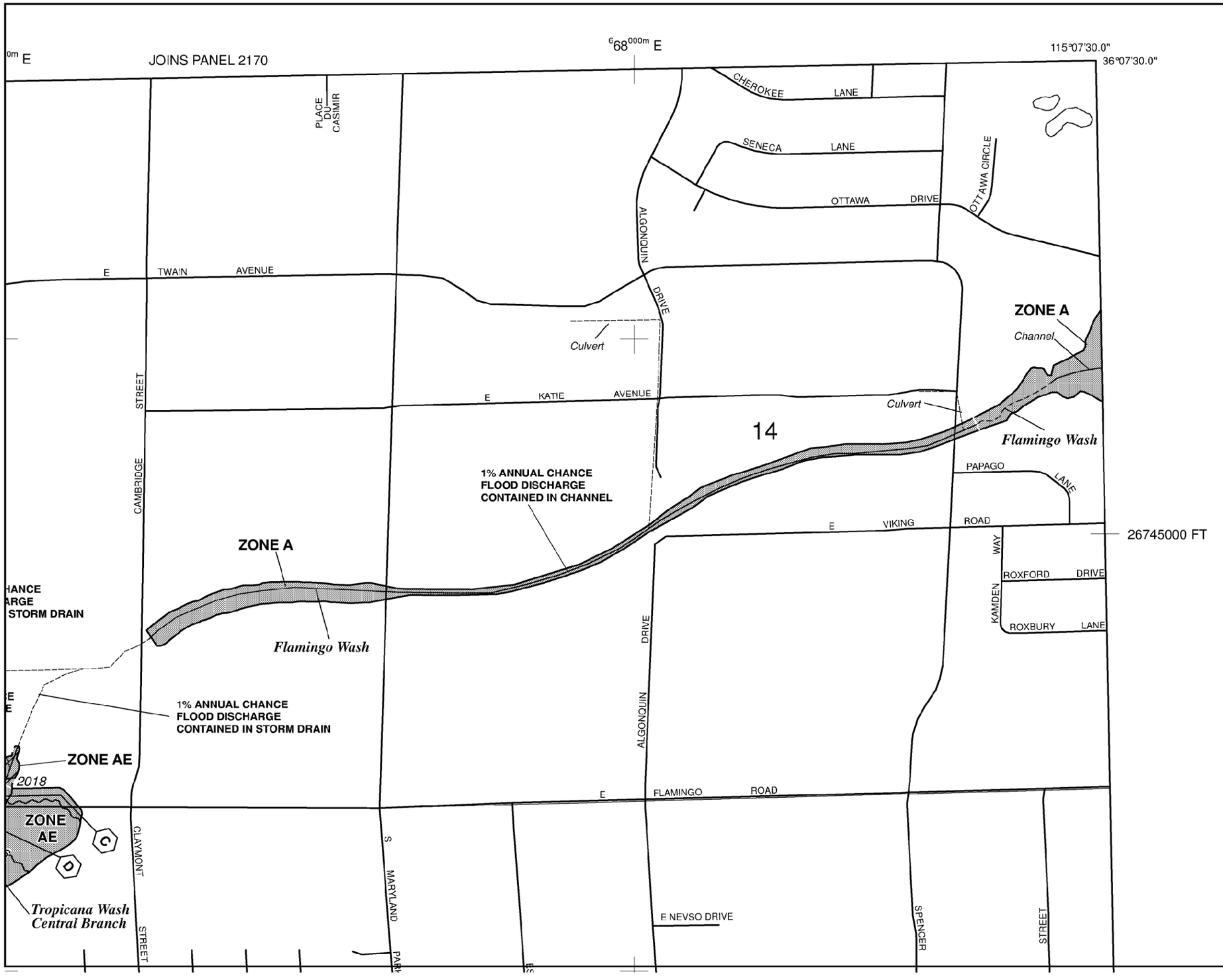
FLAMINGO WASH

SPENCER STREET TO DESERT INN ROAD

FIRM

THE Louis Berger Group, INC.
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Las Vegas, Nevada 89119 Fax: 702-736-0704

FIGURE 2a



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

PANEL 2557F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2557 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	2557	F

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
32003C2557F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

FIGURE 2b

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

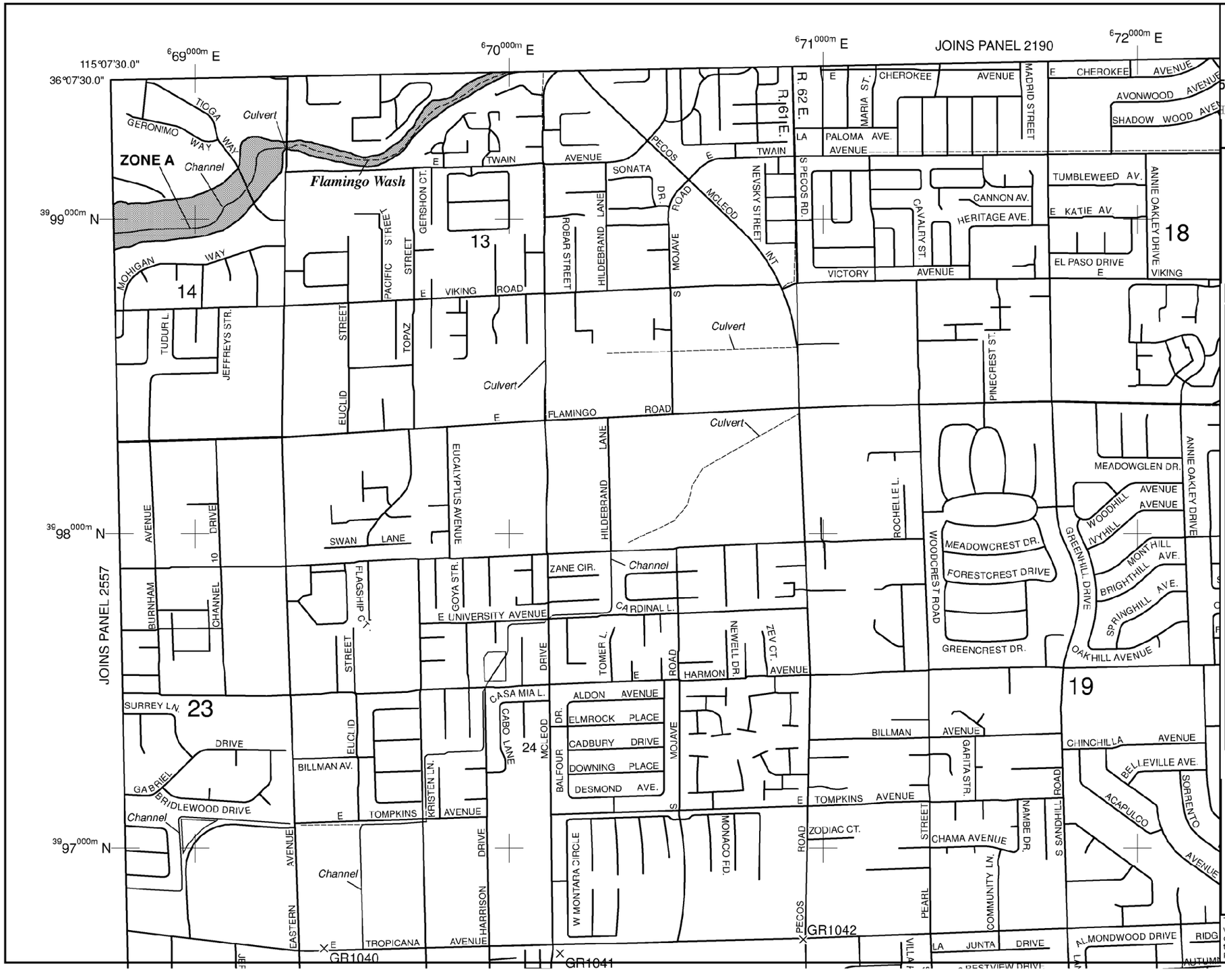


FIGURE 2c

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

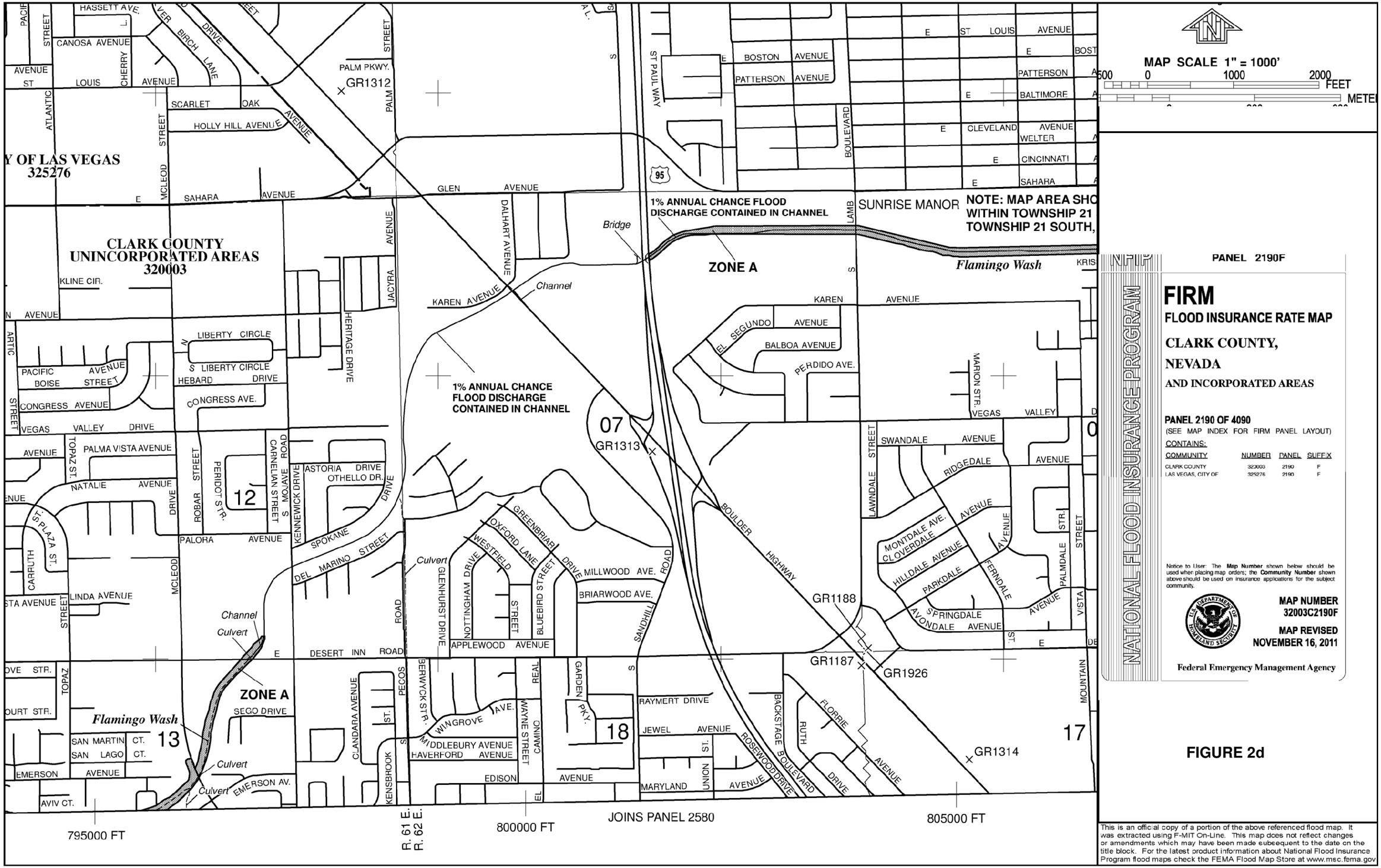
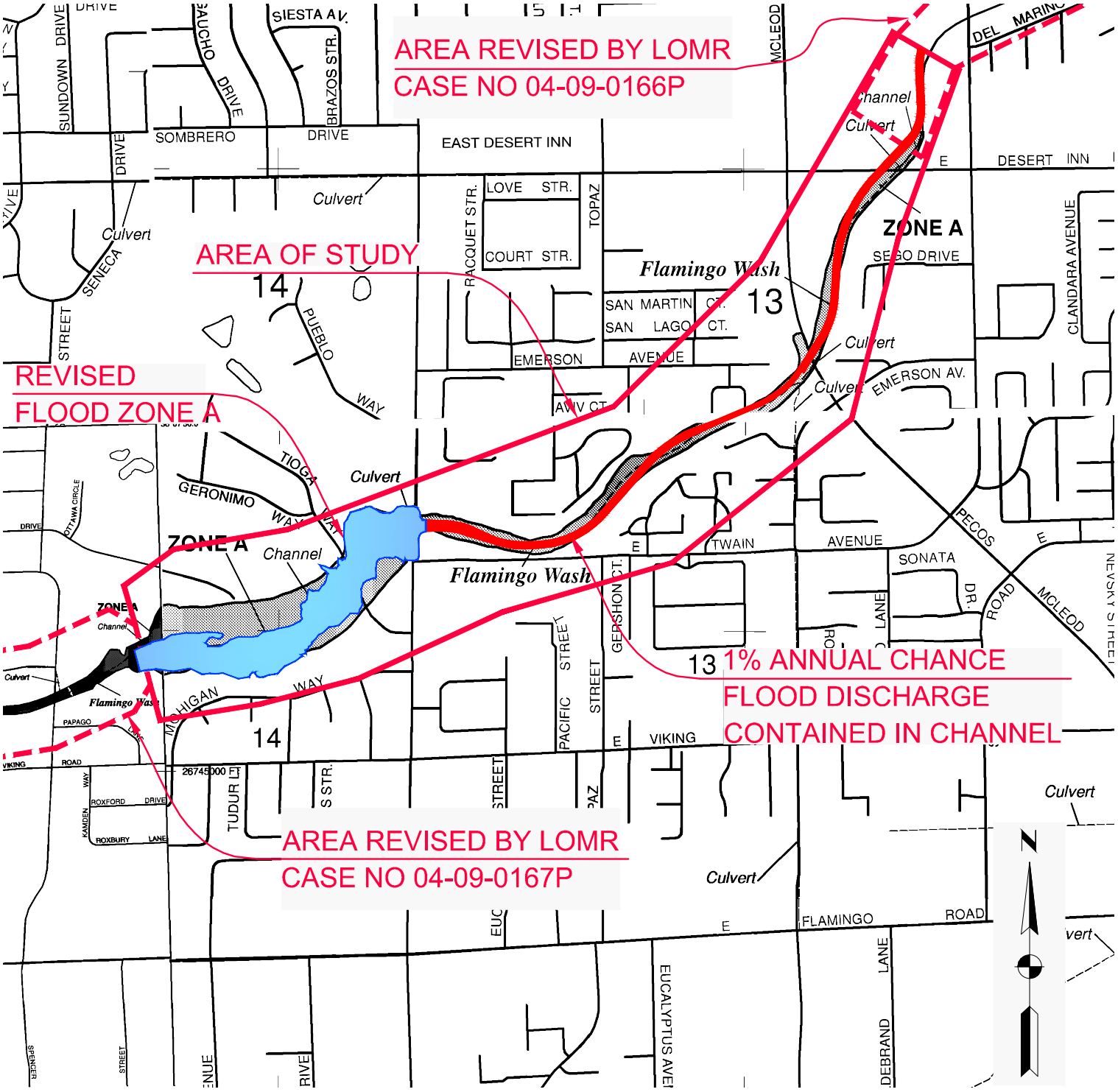
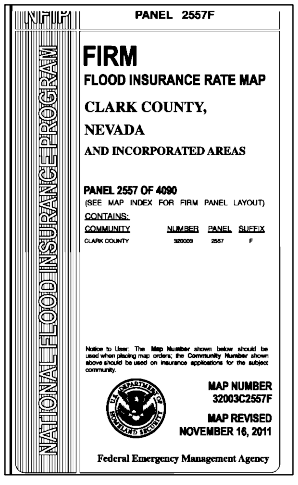
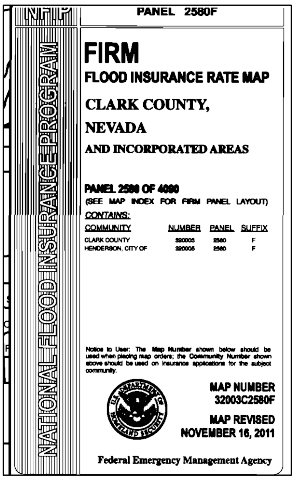


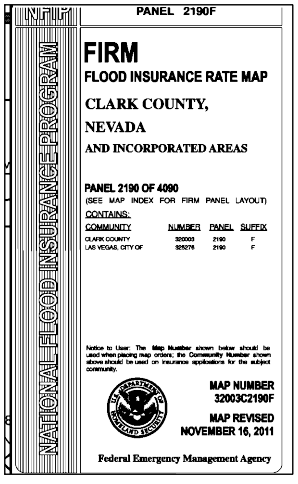
FIGURE 2d

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov









CLARK COUNTY, NEVADA
DEPARTMENT OF PUBLIC WORKS

FLAMINGO WASH

SPENCER STREET TO DESERT INN ROAD

ANNOTATED FIRM

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FIGURE 3

2.2 Flamingo Wash at Spencer LOMR

The Flamingo Wash at Spencer Street LOMR was issued by FEMA on March 12, 2004 (Case No. 04-09-0167P) in response to the Request for LOMR Flamingo Wash at Spencer Street prepared by the Louis Berger Group, Inc. for the CCRFCD (LBG, 2003a). A copy of the LOMR is provided in Appendix B.2.1.

The LOMR revised the floodplain boundary for the Flamingo Wash from Maryland Parkway to Spencer Street. A HECRAS model was prepared in support of the LOMR request. This is considered the "effective" hydraulic model for the Flamingo Wash between Maryland Parkway and Spencer Street. The Proposed HECRAS Model prepared for this LOMR request ties into the Flamingo Wash at Spencer LOMR model downstream of Spencer Street (cross-section 10 on Figure 4). Relevant excerpts from the Flamingo Wash at Spencer Street LOMR are provided in Appendix B.2 and Appendix E (CD ROM) including the workmap and HECRAS output.

2.3 Flamingo Wash Mojave Road to Boulder Highway LOMR

This LOMR was issued by FEMA on March 12, 2004 (Case No. 04-09-0166P) in response to the Request for LOMR Flamingo Wash Mojave Road to Boulder Highway prepared by the Louis Berger Group, Inc. for the CCRFCD (LBG, 2003b). A copy of the LOMR is provided in Appendix B.3.1.

The Flamingo Wash Mojave Road to Boulder Highway LOMR revised the floodplain downstream of Desert Inn Road. A HECRAS model was prepared in support of the LOMR request. This is considered the "effective" hydraulic model for the Flamingo Wash between Desert Inn Road and Boulder Highway. The HECRAS model prepared for this LOMR ties into the effective model downstream of Desert Inn Road (cross-section 620 on Figure 4). Relevant excerpts from the

Flamingo Wash Mojave Road to Boulder Highway LOMR are provided in Appendix B.3 and Appendix E (CD ROM) including the workmap and HECRAS output.

3.0 HYDRAULIC MODELS

3.1 Effective Hydraulic Models

There are three hydraulic models that represent the "effective" hydraulic data for the study reach:

1) The Flamingo Wash FIS Restudy HEC-2 model from Eastern Avenue to Las Vegas Wash (FIS, 1997);
2) The Flamingo Wash at Spencer Street LOMR Post-Project Conditions HECRAS model (LBG, 2003a); and,
3) The Flamingo Wash Mojave Road to Boulder Highway LOMR Post-Project Conditions HECRAS model (LBG, 2003b).

Model 1 was a subcritical HEC-2 run that addressed the Flamingo Wash between Eastern Avenue and Las Vegas Wash. The portions of Model 1 between Eastern Avenue and Desert Inn Road will be superseded by the Proposed HECRAS supercritical model in this study. Portions of Model 1 upstream of Eastern Avenue and downstream of Desert Inn Road have been previously revised by Models 2 and 3.

Models 2 and 3 were prepared for concrete channels which convey flow in the supercritical regime. The Proposed HECRAS model prepared for this LOMR ties into Model 2 at the upstream end and Model 3 at the downstream end as discussed in the following section.

3.2 Proposed HECRAS Models

Figure 4 is a hydraulic workmap showing the effective and proposed Flood Zone A, and HECRAS cross-sections used in the Proposed HECRAS modeling. Topographic data on the workmap was developed from aerial photogrammetry flown in August 2003. The contour interval of the original mapping is 1 foot and 40:1 scale. Cross-section information in the golf course was developed from the 1 foot contour data. Cross-section information for the improved channel sections are representative of the Flamingo Wash improvement plans in Appendix D.

Two HECRAS models for the 100-year flood were prepared for the Proposed conditions analysis: 1) subcritical; and, 2) supercritical. The models are provided in Appendix C.1 and C.2, respectively, and on the enclosed CD ROM in Appendix D.

The subcritical model was prepared for the purpose of delineating the floodplain through the earthen channel within golf course from Spencer Street to Eastern Avenue. Through the golf course, the Flamingo Wash consists of a gravel bed channel with sparse cattails and trees (see Figure 5). Flood flows exceed the banks of the gravel bed channel and inundate the grass fairways of the golf course. Manning's n values of 0.03 and 0.04 were used for the grass fairways and channel, respectively.

LEGEND

- PROPOSED FLOOD ZONE A
- EFFECTIVE FLOOD ZONE A
- EXISTING CULVERT
- 1+23 / 1921.00 — HECRAS CROSS SECTION MARKER, STATION, AND 100 YEAR BFE
- LIMITS OF FLAMINGO WASH STUDY DI TO SPENCER LOMR STUDY
- X SECTION NUMBER IMPORTED FROM LOMR CASE No. 04-09-0166P
- X SECTION NUMBER IMPORTED FROM LOMR CASE No. 04-09-0167P

N W E S

0 200 400 800
Feet

NOTE

TOPOGRAPHY SHOWN WAS FLOWN BY TRI-STATE SURVEYING ON AUGUST 5, 2003. FOR THE PURPOSES OF THE FLAMINGO WASH LOMR REQUEST, THE TOPOGRAPHY SHOWN CAN BE CONSIDERED AS REPRESENTATIVE OF THE CONDITIONS AT THE TIME IT WAS FLOWN.

BENCHMARK

CLARK COUNTY BENCH MARK STATION 6C11 12SSE6.
2" DOME HEAD BRASS CAP REFERENCE MONUMENT IN TOP OF CURB, NORTHEAST CORNER OF DESERT INN RD. AND MOJAVE RD. NEAR THE PC OF DESERT INN RD.
ELEVATION = 569.314 METERS (1867.82 FEET) NAVD 88.

CLARK COUNTY BENCH MARK STATION 8C11 13W4 1998.
RIVET AND ROUND ALUMINUM PLATE IN TOP OF CURB, NORTHEAST CORNER OF EASTERN AVE. AND TWAIN AVE. NEAR THE PC OF EASTERN AVE. ELEVATION = 584.619 METERS (1918.04 FEET) NAVD 88.

CLARK COUNTY BENCH MARK STATION 7C11 14SSW6.
RIVET AND SQUARE ALUMINUM PLATE IN TOP OF CURB, NORTHEAST CORNER OF FLAMINGO RD. AND TAMARUS ST - ALGONQUIN DR. NEAR PC OF FLAMINGO RD.
ELEVATION = 604.305 METERS (1982.62 FEET) NAVD 88.

DESERT INN ROAD
SEGO DRIVE
MOJAVE ROAD
SAN MARTIN CT
TOPAZ STREET
EASTERN AVENUE
EMERSON AVENUE
PEUBLO WAY
SPENCER STREET
COCHISE LN
OTTAWA DRIVE
TWAIN AVENUE
MOHIGAN WAY
TIOGA WAY
PACIFIC ST
MCLEOD DR

TIE IN X-SECTION (620) 2+23.47 1853.97
(630) 4+44.5 1856.74
(640) 7+02.71 1861.40
UPSTREAM LIMIT OF LOMR CASE No. 04-09-0166P
10+88.94 1863.55
12+14.54 1865.13
13+03.53 1865.83
13+92.52 1866.52
9+26 1859.19
14+81.51 1867.21
11+73.6 1864.81
12+59.03 1865.47
15+58.62 1867.60
13+48.02 1866.18
16+44.83 1868.12
14+37.01 1866.86
17+31.04 1868.74
15+00 1867.02
18+17.25 1869.36
19+03.46 1869.95
20+20.16 1872.44
21+37.68 1875.05
24+32.3 1877.16
5000 cfs
26+48.55 1877.83
29+21.88 1882.80
27+22.44 1880.59
29+64.21 1883.27
31+00.84 1884.80
25+96.14 1877.66
33+93.55 1888.38
27+03.87 1880.51
35+93.55 1890.05
27+53.87 1880.99
38+00 1892.42
39+77.08 1893.14
42+00 1893.97
43+50 1895.59
44+25.69 1896.18
47+00 1898.33
49+45.04 1900.23
50+12.88 1900.76
52+55.16 1902.34
52+79.92 1902.89
54+49.23 1904.52
56+48.42 1907.65
57+37.74 1908.54
57+76 1908.98
57+96 1911.11
59+17 1918.67
61+00 1919.31
64+69 1920.42
65+77 1924.10
67+36 1924.30
70+00 1924.22
72+00 1925.32
74+00 1927.14
76+00 1927.45
78+00 1929.88
80+00 1931.73
82+00 1931.73
220 cfs
TWAIN HYDRAULIC SECTION
WEIR SECTION
DOWNSTREAM LIMIT OF LOMR CASE No. 04-09-0167P
5500 cfs
(20) 86+67.78 1933.54
(22) 88+07.78 1935.21
(24) 88+37.78 1937.64
TIE IN X-SECTION (10) 83+50 1932.43

CLARK COUNTY, NEVADA
DEPARTMENT OF PUBLIC WORKS

FLAMINGO WASH
SPENCER STREET TO DESERT INN ROAD
HYDRAULIC WORKMAP

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FIGURE 4



Figure 5. Flamingo Wash through the Golf Course

Flood flows through the golf course are conveyed in the subcritical flow regime. The subcritical Proposed HECRAS Model ties in at cross-section 10 of the Flamingo Wash at Spencer Street LOMR (Post Project) model (see Figure 4). Cross-section 10 in the Flamingo Wash at Spenser Street LOMR corresponds to cross-section 83+20 in the Proposed HECRAS Model for this LOMR request.

Tioga Way crosses the Flamingo Wash within the Golf Course. At Tioga Way, there are three existing 90-inch corrugated metal arch pipes (CMAP) under Tioga Way (see Figure 6). The Proposed HECRAS Model results indicate that the CMAPs have capacity to convey approximately 2,975 cfs. Flow in excess of 2,975 cfs overtops the road.



Figure 6. Three 90-inch CMAP under Tioga Way

At Eastern Avenue, there are five 10' x 8' reinforced concrete box (RCB) culverts at the Flamingo Wash. The Proposed HECRAS Model results indicate that the Eastern Avenue RCB culverts have capacity to convey approximately 4,730 cfs. Flow in excess of the RCB capacity, 770 cfs, would overtop the roadway in a 100-year flood at a depth of approximately 1.3 feet (maximum depth at the low point in the road). The flow would be spread out approximately 375 wide across the existing dip in the roadway profile (see Weir Section on Figure 4).

It is possible that a portion of the flow in Eastern Avenue could break out and travel east within Twain Avenue. The flow that could potentially break out at Twain Avenue was estimated to be 220 cfs based on the area of conveyance across the weir section (see Appendix C.3). The 220 cfs would be conveyed at a hydraulic depth of less than 1 foot (see calculations in Appendix C.3) and, therefore, was not delineated on the Hydraulic Workmap as a flood hazard area. If flow travels east in Twain Avenue, it would re-enter the wash downstream as depicted on the Hydraulic Workmap (Figure 4).

The 220 cfs was subtracted at HECRAS Section 57+96 and added back in at Section 51+09.79 to reflect the potential for the break out at Twain Avenue



Figure 7. Five 10' x 8' RCB at Eastern Avenue (looking downstream)

A supercritical Proposed HECRAS Model was prepared for the proposed Flamingo Wash concrete channel improvements between Eastern Avenue and Desert Inn Road (see Figures 8 and 9). The results of the model demonstrate that the 100-year flood will be contained within the channel downstream of Eastern Avenue. The supercritical Proposed HECRAS Model ties into cross-section 620 of the Flamingo Wash Mojave Road to Boulder Highway LOMR (Post-Project) model (see Figure 4). Cross-section 620 in the Flamingo Wash at Spenser Street LOMR corresponds to cross-section 2+23.47 in the Proposed HECRAS Model for this LOMR request.



Figure 8. Flamingo Wash Channel downstream of Eastern Avenue

It should be noted that the effective HEC-2 model (FIS, 1997) indicates that the the entire 100-year flood of 5,500 cfs is conveyed through five 10' x 8' RCBs at Eastern Avenue (i.e., flow does not overtop the road). This model utilized the special bridge option in HEC-2. The subcritical Proposed HECRAS Model in this LOMR request used the culvert routine to model the five RCBs at Eastern Avenue. The Proposed HECRAS Model indicates that the RCBs operate under inlet control, which creates an upstream backwater, and the water would overtop the road during a 100-year event. The results of the Proposed HECRAS Model were substantiated on July 8, 1999 when a flood approximating the 100-year event occurred and flow overtopped both Tioga Way and Eastern Avenue.



Figure 9. Flamingo Wash Channel downstream of Pecos- McLeod Bridge

It should also be noted that the Flamingo Wash channel improvements were designed to convey a "future" flow of 6,300 cfs from Spencer Street to the Van Buskirk confluence and 6,640 cfs from the Van Buskirk confluence to Desert Inn Road. The future flow is anticipated to be greater than the existing "effective" flow rate (5,500 cfs and 5,800 cfs). The hydraulic grade line (HGL) on the enclosed as-built improvement plans is based on the future conditions flow rates. The concrete channel wall height was established by adding approximately 4 feet to the future HGL to account for freeboard and super-elevation of the water surface.

4.0 CONCLUSION

This report presents the technical data in support of a LOMR for the Flamingo Wash between Spencer Street to Desert Inn Road. These data included new hydraulic models to account for better topography through the golf course and proposed channel improvements and workmaps showing the revised floodplain boundaries. The results of the 100-year flood hydraulic models indicate the following:

- The 100-year flow of 5,500 cfs will be contained within the golf course without affecting any buildings or structures.

- The existing 90" CMAP culverts at Tioga Way have capacity to convey approximately 2,975 cfs. Flow in excess of 2,425 cfs (5,500 cfs minus 2,975 cfs) will overtops the road and re-enter the wash on the downstream side.

- The existing five 10' x 8' RCBs at Eastern Avenue have capacity to convey approximately 4,730 cfs. The remaining 770 cfs (5,500 cfs minus 4,730 cfs) will overtop Eastern Avenue. While the majority of the overtopping flow will be contained within the dip in Eastern Avenue profile at the wash, it is possible for up to 220 cfs to breakout and travel east within Twain Avenue. The 220 cfs would be contained in the Twain Avenue street section and re-enter the wash approximately 600 feet downstream of Eastern Avenue.

- Downstream of Eastern Avenue, the 100-year flood (5,500 cfs to 5,800 cfs) will be contained within the proposed Flamingo Wash channel improvements.

5.0 REFERENCES

1. LBG, 2003a. Request for Letter of Map Revision – Flamingo Wash at Spencer Street. Prepared by The Louis Berger Group, Inc. for Clark County Regional Flood Control District, October 15, 2003.

2. LBG, 2003b. Request for Letter of Map Revision Flamingo Wash Mojave Road to Boulder Highway. Prepared by The Louis Berger Group, Inc. for Clark County Regional Flood Control District, October 15, 2003.

3. LBG, 2007. Request for Conditional Letter of Map Revision – Flamingo Wash at Spencer Street to Desert Inn Road. Prepared by The Louis Berger Group, Inc. for Clark County Regional Flood Control District, January 11, 2007.

4. Design Manual, 1990. Hydrologic Criteria and Drainage Design Manual, prepared by: WRC Engineering, Inc. and updated by Montgomery Watson, for: Clark County Regional Flood Control District, Updated August 1999.

5. FIRM, 2002. Flood Insurance Rate Map, Clark County, Nevada and Unincorporated Areas, Community Number 320003C, Panel No. 2190, 2557, and 2580 of 4090, Maps Revised November 16, 2011.

6. FIS, 1997. Flamingo Wash Flood Insurance Study Restudy, prepared by G.C. Wallace, Inc. for Clark County Regional Flood Control District, October 1997.

7. HEC, 2003. HECRAS. River Analysis System, Computer Program and Manuals, Version 4.1.0. U.S. Department of the Army Corps of Engineers, Hydrologic Engineering Center, Davis, CA.

FORMS

- **Overview and Concurrence Form (MT-2 Form 1)**
- **Riverine Hydrology and Hydraulics Form (MT-2 Form 2)**
- **Riverine Structure Form (MT-2 Form 3)**
- **Statement of Explanations**
- **CLOMR Case No. 07-09-0935R**

Appendix A

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
Ex: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
320003	Clark County Nevada and Incorporated Areas	NV	32003C	2190F	11/16/11
320003	Clark County Nevada and Incorporated Areas	NV	32003C	2557F 2580F	11/16/11 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: Flamingo Wash Improvements Spencer Street to Desert Inn

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)

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: $5,000

☐ No, Attach Explanation

Please see the DHS-FEMA website at http://fema.gov/plan/prevent/fhm/frm_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: Syndi J. Flippin-Dudley. Ph. D., P.E.	Company: The Louis Berger Group, Inc.	
Mailing Address: 500 E. Amigo Court Suite 100 Las Vegas, NV 89119	Daytime Telephone No.: (702) 736-6632	FAX No.: (702) 736-0704
	EMAIL ADDRESS: sdudley@louisberger.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 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 requirement 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 request, the applicant has documented Endangered Species Act (ESA) compliance to DHS/FEMA prior to DHS/FEMA's review of the Conditional LOMR application. For LOMR request, I acknowledge that compliance with sections 9 and 10 of the ESA has been achieved independently of DHS/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 44 CFR 65.2(c), and that we have available upon request by DHS/FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Layne Weber, P.E., C.F.M., Principal Engineer	Community Name: Clark County Unincorporated Areas	
Mailing Address: 500 South Grand Central Parkway 2nd Floor Las Vegas, NV 89155	Daytime Telephone No.: (702) 455-6000	FAX No.: (702) 455-4808
	EMAIL ADDRESS: lweber@ccpw.gov	
Community Official's signature (required)		Date

CERTIFICATION BY REGISTRATION 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 instruction. 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
Syndi J. Flippin-Dudley, Ph. D., P.E.	11070	06/30/2013
Company Name	**Telephone No.**	**Fax No.**
The Louis Berger Group, Inc.	(702) 736-6632	(702) 736-0704
Signature	**E-mail Address**	**Date**
	sdudley@louisberger.com	

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

Form name and (Number)	Required if.....
☒ Riverine Hydrology & Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (optional)

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).

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).

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)

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ 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)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model → Specify Model: _____
☐ Regional Regression Equations ☐ 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*	DS of Desert Inn Road	2+23.47	1854.04	1853.97
Upstream Limit*	DS of Spencer Street	83+20	1932.43	1932.43

*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.

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name: See Attached CD	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: See Attached CD	Plan Name:	File Name:	Plan Name:	
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.

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 Channel from Desert Inn to Spencer

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

   Location of Structure: Flamingo Wash from Desert Inn to Spencer Street

   Downstream Limit/Cross Section: 10+88.94

   Upstream Limit/Cross Section: 57+96

2. Name of Structure: _____

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

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

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 Channel from Desert Inn to Spencer Street

1. Hydraulic Considerations

The channel was designed to carry 6,300+ (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)
☐ Shape (culverts only)
☐ Material
☐ Beveling or Rounding
☐ Wing Wall Angle
☐ Skew Angle
☐ Distances Between Cross Sections
☐ Erosion Protection
☐ Low Chord Elevations – Upstream and Downstream
☐ Top of Road Elevations – Upstream and Downstream
☐ Structure Invert Elevations – Upstream and Downstream
☐ 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	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ 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).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ 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 fomal 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 DOCUMENTION

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.

STATEMENTS OF EXPLANATION

1. **MT-2 Form 3, Page 2 of 11**
   Item B.4 Channelization – Sediment Transport Considerations

   The concrete channel 100-year peak flow velocity is greater than 20 ft/s. It is anticipated that the channel will be self-cleaning due to high flow velocities.

Federal Emergency Management Agency

Washington, D.C. 20472

AUG 0 8 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 07-09-0935R

Community: Clark County, NV
Community No.: 320003

104

RECEIVED
AUG 1 3 2007
The Louis Berger Group, Inc.
Las Vegas, Nevada

The Honorable Rory Reid
Chair, Board of Commissioners
Clark County
500 South Grand Central Parkway
Las Vegas, NV 89106

Dear Mr. Reid:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 8, 2007, Mr. Kevin Eubanks, P.E., CFM, Assistant General Manager, Clark County Regional Flood Control District, requested that FEMA evaluate the effects along Flamingo Wash from just downstream of Desert Inn Road to just downstream of Spencer Street, that updated topographic information, a proposed culvert under Tioga Way, a proposed culvert under Eastern Avenue, and proposed channelization would have on the flood hazard information shown on the effective FIRM.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Eubanks.

We reviewed the submitted data and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. We believe that, if the proposed project is constructed as shown on the undated plans entitled "Improvements Plans for Flamingo Wash Spencer Street to Desert Inn Road" and as described in the report entitled "Request for Conditional Letter of Map Revision Flamingo Wash – Spencer Street to Desert Inn Road," dated January 11, 2007, both prepared by The Louis Berger Group, Inc., and the data listed below are received, a revision to the FIRM would be warranted.

As a result of updated topographic information, proposed channelization, and proposed culverts, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base (1-percent-annual-chance) flood, will increase in some areas and decrease in other areas throughout the proposed area of revision, compared to the effective SFHA width from just downstream of Desert Inn Road to just downstream of Spencer Street along Flamingo Wash. The maximum increase in SFHA width, approximately 100 feet, will occur approximately 700 feet upstream of Tioga Way. The maximum decrease in SFHA width, approximately 200 feet, will occur just upstream of McLeod Drive. The entire base flood will be contained in the proposed channel and culverts from just downstream of Desert Inn Road to just downstream of Eastern Avenue.

Upon completion of the project, your community may submit the data listed below and request that we make a final determination on revising the effective FIRM.

- Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview & Concurrence Form," must be included. (A copy of this form is enclosed.)

- The detailed application and certification forms listed below may be required if as-built conditions differ from the preliminary plans. If required, please submit new forms (copies of which are enclosed) or annotated copies of the previously submitted forms showing the revised information.

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

  Hydraulic analyses for as-built conditions of the base flood and regulatory floodway, together with a topographic work map showing the revised floodplain and floodway boundaries, must be submitted with Form 2.

- Effective October 30, 2005, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $4,000 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). The payment, along with the revision application, must be forwarded to the following address:

  FEMA National Service Provider
  3601 Eisenhower Avenue
  Alexandria, VA 22304-6425

- As-built plans, certified by a registered professional engineer, of all proposed project elements

- Community acknowledgment of the map revision request

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM.

The basis of this CLOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culvert rests with your community.

This CLOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the

SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by calling the Director, Federal Insurance and Mitigation Division of FEMA in Oakland, California, at (510) 627-7175. If you have any questions regarding this CLOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Engineering Management Section
Mitigation

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation

Enclosures

cc: Mr. W. Layne Weber, P.E., CFM
Principal Engineer
Civil Engineering Division
Clark County Development Services

Mr. Kevin Eubanks, P.E., CFM
Assistant General Manager
Clark County
Regional Flood Control District

Syndi J. Flippin-Dudley, Ph.D., P.E.
The Louis Berger Group, Inc.

Effective Hydrologic and Hydraulic Data

Appendix B

Flamingo Wash FIS Study

Appendix B.1

B.1.1 Excerpts from FIS Reports

Flamingo Wash FIS Volume 1 of III

TECHNICAL SUPPORT DATA NOTEBOOK

For

Clark County, Nevada

(COMMUNITY NAME AND STATE)

FLOOD INSURANCE STUDY

SUBMITTED BY: G. C. Wallace, Inc.

Study Contractor

DATE SUBMITTED OCTOBER 1997

DRAFT

FLAMINGO WASH
FLOOD INSURANCE STUDY RESTUDY

CLARK COUNTY, NEVADA

550.032

OCTOBER 1997

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 Wast 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

the Flamingo Wash. Approximately 2,700 cfs will flow into Boulder Highway. Boulder Highway is sagged in this location and will allow the overflow to spillover back into the Flamingo Wash to the east. Note the revised floodplain in this area is increased.

After discussions with the CCRFCD, it was decided to designate the Special Flood Hazard Area by approximate methods (Zone A) because of the extent of existing development and the narrow width of the floodplain along the majority of the entire study area.

TABLE 3
HYDRAULIC ANALYSIS DISCHARGES
FLAMINGO WASH FIS RESTUDY
Clark County, Nevada

Reach	Section Numbers	100-Year Peak Flow Rates (cfs)
Rainbow Blvd. to Jones Blvd.	520 - 700	3,900
Jones Blvd. to Industrial Rd.	10 - 510	3,900
Imperial Palace to Spencer St.	10 - 50	5,500
	60 - 280	4,600
	290 - 560	3,900
Eastern Ave. to Las Vegas Wash	10 - 140	6,400
	150 - 440	6,300
	450 - 660	5,800
	670 - 810	5,500

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

4.1 Floodplain Boundaries

Floodplain boundaries for the approximate method areas were delineated on topographic maps with a scale of 1" = 400' and a contour interval of 4-feet. Spot elevations were plotted and used in areas requiring greater definition. The

B.1.2 FIS Restudy Workmap and HEC-2 Model

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy, at north property line of 3745 Boulder Hwy, at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy, south of Dolhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod Interconnect near the pc of Pecos-McLeod interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod Interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983. UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-CSE.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

(IN FEET)
1 inch = 400 ft

JOINS PANEL FL4

1020
1814.92
CCBM 6C12 20N6

1022
1825.38
CCBM 6C12 18N4

1023
1895.32
CCBM 6C11 13E6

1028
1889.46
CCBM 6C01 13N6

SFHA TO BE ADDED

SFHA TO BE REMOVED

SFHA TO REMAIN

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- (80) CROSS-SECTION
- ELEVATION REFERENCE MARK
- SFHA SPECIAL FLOOD HAZARD AREA

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT

FIS NO. DATE 11962

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
CROSS SECTION EXHIBIT

SHEET FL3 OF 4 SHEETS

590.032
PLOTTED: November 17, 1997 - FL3-CSE.DWG

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
EASTERN AVE. TO LAS VEGAS WASH REACH

This reach from Eastern Avenue to Las Vegas Wash was flown as part of this project. Therefore, topography was generated. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach.

A supplemental HEC-2 model analysis was performed to estimate the limits of flooding between Desert Inn Road and Mojave Road using a supercritical run. This reach is completely concrete lined as demonstrated by the photographs. The starting water surface elevation was computed using critical depth.

* ELEVATIONS BASED ON NGVD 1929
ADD 2.26 FT FOR COMPARIBLE
NAVD 1988 ELEVATION

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version  4.6.2;  May 1991            *
*                                       *
*  RUN DATE   06OCT97    TIME  11:11:00 *
*****************************************
```


```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*        (916) 756-1104                 *
*****************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 06OCT97 11:11:01

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DELINEATION
T4      FILES: BASE3-4.DWG, BASE3-4.01
T4      STARTING WSE = NORMAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             0.004                         6400      1705

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                 -1                                      -2        -6

VARIABLE CODES FOR SUMMARY PRINTOUT

    100                 150

NC     0.03      0.03      0.03      0.1       0.3
X1       10        18      1000   1126.64
GR     1710      1000   1710.07   1002.71      1710   1003.06      1708   1012.39      1706   1021.7
GR     1704   1031.01      1702   1040.32   1701.54   1042.48   1700.33    1049.9   1700.55   1089.4
GR     1702   1095.84      1704   1104.89      1706   1114.24      1708   1123.66    1708.6   1126.64
GR     1710   1152.79   1710.41   1160.64      1712   1288.04

NC     0.03      0.03      0.03
X1       20        17   1182.02   1322.04    483.22    497.54    488.53
GR     1712      1000   1711.97   1182.02      1710   1190.86      1708   1199.75      1706   1208.56
GR     1704   1217.31   1703.12   1221.12   1703.59   1267.53      1704   1269.51      1706   1279.06
GR     1708    1288.6      1710   1298.12   1711.95   1307.42      1712    1307.8   1713.45   1322.04
GR   1712.7   1343.21    1713.7   1500.75

NC     0.03      0.03      0.03
X1       30        16   1053.23   1154.72    494.86    503.84    498.03
GR   1714.3      1000      1714   1012.26   1712.41   1053.23      1712   1055.19      1710   1064.74
GR     1708   1074.25      1706   1083.68   1705.86   1084.33   1705.85   1124.71      1706   1125.31
GR     1708   1133.14      1710   1140.87      1712   1148.55   1713.61   1154.72      1714   1175.89
GR   1715.8   1316.21

NC     0.03      0.03      0.03
       40        20    1146.2   1238.76    500.14    481.13    491.57
GR     1718      1000   1717.12   1101.53      1716    1146.2   1715.85   1152.03      1714   1159.77
GR     1712   1168.18      1710   1176.59      1708   1185.01   1707.75   1186.07   1707.38   1196.73
GR   1707.2   1216.01      1708   1218.57      1710   1225.27      1712   1231.97      1714   1238.76
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GR	1714.1	1239.39	1716	1283.03	1716.17	1284.32	1716.77	1316.26	1718	1327.96

[redacted]	0.03	0.03	0.03							
C1	50	21	1066.67	1235.55	334.29	277.63	305.6			
SR	1723	1000	1722	1020.92	1721.42	1037.11	1720.56	1066.67	1720	1068.75
SR	1718	1076.4	1716	1084.26	1714	1092.32	1712	1100.45	1710	1108.62
SR	1708.9	1112.98	1709	1152.91	1710	1158.04	1712	1168.25	1714	1178.41
SR	1714.6	1181.82	1716	1195.46	1717.14	1207.5	1718	1214.02	1720	1235.55
SR	1720	1249.78								
NC	0.03	0.03	0.03							
C1	60	31	1120.14	1223.41	499.62	502.1	499.27			
SR	1720	1000	1718.36	1013.98	1718	1035.26	1717.58	1105.92	1718	1119.77
SR	1718	1120.01	1718.01	1120.14	1716	1128.57	1714	1136.9	1712	1145.29
SR	1710.1	1153.14	1710	1183.08	1709.94	1194.72	1710	1194.99	1712	1203.55
SR	1714	1212.13	1716	1220.71	1716.63	1223.41	1717.35	1277.47	1718.05	1286.74
SR	1718	1287.48	1718	1296.95	1717.48	1310.09	1718	1314.87	1718.69	1321.04
SR	1718	1336.07	1717.62	1343.02	1718	1362.12	1718.73	1381.28	1718.4	1394.59
SR	1720	1400.91								
NC	0.03	0.03	0.03							
C1	70	17	1084.1	1197.56	493.27	498.08	497.95			
SR	1723.3	1000	1723.69	1084.1	1722	1090.63	1720	1098.35	1718	1106.05
SR	1716	1113.75	1714	1121.45	1712	1129.17	1712	1129.24	1712	1129.36
SR	1712.6	1169.17	1714	1174.59	1716	1182.8	1718	1191.03	1719.59	1197.56
SR	1720	1230.27	1720.07	1233.61						
N	0.03	0.03	0.03							
	80	18	1147.29	1269.91	455.76	481.96	470.68			
	1726	1000	1725.4	1007.66	1724.07	1115.85	1724	1116.84	1723.19	1147.29
SR	1722	1152.02	1720	1159.92	1718	1167.78	1716	1175.62	1714.38	1181.94
SR	1714.9	1227.68	1716	1232.07	1718	1240.31	1720	1248.54	1722	1256.76
SR	1724	1264.99	1725.21	1269.91	1724.85	1287.78				
NC	0.03	0.03	0.03							
C1	90	20	1056.45	1168.18	495.14	465.14	482.19			
SR	1726	1000	1725.75	1009.38	1724.96	1031.29	1724.64	1056.45	1724	1058.67
SR	1722	1065.64	1720	1072.62	1718	1079.6	1716	1086.6	1715.19	1089.42
SR	1716	1103.03	1717.15	1124.51	1718	1128.2	1720	1136.83	1722	1145.32
SR	1724	1153.73	1726	1162.18	1727.42	1168.18	1728	1186.62	1728.02	1187.5
NC	0.03	0.03	0.03							
C1	100	25	1022.27	1132.68	289.86	299.75	295.13			
SR	1732	1000	1732	1001	1732.08	1001.22	1730	1011.88	1728	1022.27
SR	1727.6	1024.44	1726	1027.45	1724	1031.2	1722	1034.85	1720	1038.4
SR	1718.7	1040.93	1719.04	1047.62	1718.99	1102.02	1719.04	1118.34	1720	1119.65
SR	1722	1123	1724	1126.5	1726	1130.15	1727.26	1132.68	1727.45	1139.16
SR	1728	1142.93	1728.68	1147.57	1730	1157.98	1730.09	1158.86	1730	1162.48
NC	0.03	0.03	0.015							
C1	110	21	1022.67	1137.41	25.99	26.18	25.69			
SR	1732.5	1000	1732	1002.64	1730	1012.69	1728	1022.67	1727.56	1024.87
SP	1726	1027.45	1724	1030.85	1722	1034.42	1720.5	1036.37	1720.5	1099.9
[redacted]	720.5	1122.88	1720.5	1123.19	1720.5	1123.29	1722	1126.96	1724	1130.74
SR	1726	1134.53	1727.52	1137.41	1728	1142.14	1729.05	1148.68	1730	1154.29

P	1731.7	1164.66								
[redacted]										
[redacted]	0.03	0.03	0.015							
X1	120	7	1029.49	1136.49	88.77	93.13	90.11			
X3	10			1029.49	1730	1136.49	1730			
GR	1730.3	1000	1730	1006.09	1728	1029.49	1721.9	1029.49	1721.9	1136.49
GR	1728	1136.49	1728	1146.34						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	145	107	7	500	0	1722.53	1721.9
X1	130	8	1035.81	1142.81	120.77	117.86	119.69			
X2			1	1727.53	1731.43			1.33		
X3	10			1035.81	1731	1142.81	1731			
GR	1728.6	1000	1728.71	1018.83	1728	1035.81	1722.53	1035.81	1722.53	1142.81
GR	1728	1142.81	1728.87	1157.29	1728.69	1174.35				
NC	0.02	0.02	0.015							
X1	140	13	1149.72	1265.63	64.74	64.09	64.14			
X3	10			1149.72	1730	1265.63	1730			
GR	1729.5	1000	1728.41	1149.72	1728	1150.76	1726	1155.81	1724	1161.07
GR	1722.8	1165.81	1722.6	1250.59	1724	1254.37	1726	1259.66	1728	1264.74
GR	1728.3	1265.63	1728.8	1316.23	1728.18	1343.83				
NC	0.02	0.02	0.02							
QT	1	6300								
X1	150	18	1018.39	1152.46	491.39	488.88	489.94			
G	1732	1000	1731.69	1018.39	1730	1024.12	1728	1030.88	1726.48	1035.9
[redacted]	1726.1	1066.83	1726	1067.43	1724.2	1074.87	1724	1083.96	1723.53	1107.26
	1724	1108.86	1725.23	1113.02	1726	1135.88	1725.99	1136.31	1728	1142.71
GR	1730	1149.03	1731.09	1152.46	1731.43	1169.72				
NC	0.02	0.02	0.02							
X1	160	22	1042.38	1195.86	501.43	502.7	501.51			
GR	1734	1000	1734.52	1002.52	1734	1015.73	1733.26	1042.38	1732	1045.87
GR	1730	1051.46	1728	1057.16	1727.61	1058.29	1727.59	1089.49	1726.47	1097.9
GR	1726	1115.47	1725.61	1127.39	1726	1131.14	1727.46	1145.07	1728	1162.54
GR	1728.2	1169.98	1730	1173.77	1732	1178.13	1733.38	1181.15	1734	1195.86
GR	1734.2	1200.57	1735.81	1203.67						
NC	0.02	0.02	0.02							
X1	170	20	1042.95	1183.42	486.67	487.82	487.26			
GR	1734.6	1000	1735.53	1003.78	1734.5	1042.95	1734	1044.42	1732	1050.31
GR	1730	1056.26	1728.7	1060.18	1728.42	1095.07	1728	1097.52	1727.66	1099.65
GR	1727.3	1123.92	1728	1128.46	1729.82	1140.57	1730	1146.01	1730.66	1167.12
GR	1732	1172.19	1734	1179.55	1735.09	1183.42	1735.4	1201.5	1736	1203.33
NC	0.02	0.02	0.02							
X1	180	19	1037.9	1178.31	490.6	492.37	491.83			
GR	1738.4	1000	1738	1017.86	1736.58	1037.9	1736	1039.45	1734	1044.91
GR	1732	1050.47	1730.22	1055.47	1730.42	1062.62	1730	1097.25	1729.6	1099.77
GR	1730	1119.42	1730.04	1121.41	1731.15	1155.75	1732	1158.51	1734	1165.22
GR	1736	1172.22	1737.72	1178.31	1738	1187.42	1738.27	1197.86		
[redacted]										

[redacted]	0.02	0.02	0.02							
X[redacted]	190	22	1000	1121.49	499.18	497.1	497.74			
GR	1743.5	950.33	1742.46	998.69	1742	1000	1740	1005.6	1738	1011
GR	1736	1016.29	1735.23	1018.97	1734.5	1040.24	1734	1042.17	1732.79	1046.61
GR	1732.9	1078.44	1734	1082	1734.71	1084.43	1736	1101.82	1736.3	1105.68
GR	1738	1110.9	1740	1116.85	1741.63	1121.49	1742	1135.5	1742.24	1142.58
GR	1742	1143.57	1741.64	1144.92						
NC	0.02	0.02	0.02							
X1	200	22	1000	1122.87	494.16	496.56	495.37			
GR	1748.8	956.38	1748	992.25	1747.84	995.39	1746	1000	1744	1004.98
GR	1742	1009.94	1740	1014.87	1738	1019.77	1737.9	1020.02	1737.52	1027.73
GR	1736.7	1037.66	1736.7	1061.55	1737.76	1074.9	1738	1083.37	1738.49	1103
GR	1740	1106.13	1742	1110.31	1744	1114.5	1746	1118.68	1748	1122.87
GR	1748.4	1123.7	1748.36	1144.3						
NC	0.02	0.02	0.02							
X1	210	25	1000	1113.22	499.74	500.05	500.38			
GR	1752	951.7	1752	1000	1750	1005.42	1748	1010.97	1746	1016.52
GR	1744	1022.03	1742	1027.65	1741.66	1028.59	1740.5	1037.62	1740	1039.36
GR	1738	1047.1	1737.52	1048.91	1737.8	1061.69	1738	1062.13	1740	1067.4
GR	1741.2	1071.1	1742	1079.44	1742.89	1088.66	1744	1091.26	1746	1095.98
GR	1748	1100.7	1750	1105.41	1752	1110.13	1753.31	1113.22	1753.21	1141.88
NC	0.02	0.02	0.02							
[redacted]	220	26	1041.51	1160.79	464.69	489.34	476.72			
	1759.7	1000	1759.83	1041.51	1758	1045.1	1756	1049.03	1754	1052.95
	1752	1056.86	1750	1060.75	1748	1064.59	1747.25	1066.03	1746.15	1087.16
GR	1746	1087.54	1744.18	1092.6	1744	1106.98	1744	1109.94	1743.96	1110.03
GR	1745.8	1113.56	1746	1116.26	1748	1139.68	1747.99	1139.83	1750	1144.13
GR	1752	1148.41	1754	1152.7	1756	1156.99	1757.77	1160.79	1758	1173.7
GR	1758.3	1199.32								
NC	0.02	0.02	0.02							
X1	230	28	1034.85	1169.03	490.46	498.91	494.76			
GR	1763.6	1000	1763.36	1034.85	1762	1040.25	1761.13	1043.65	1760.31	1056.95
GR	1760	1057.18	1758	1062.98	1756	1068.2	1754	1073.41	1753.53	1074.65
GR	1752.6	1090.81	1752	1093.04	1750.12	1100.45	1750.12	1113.46	1751.49	1119.83
GR	1752	1124.28	1753.26	1136.24	1754	1137.93	1756	1142.51	1758	1147.1
GR	1760	1151.69	1761.94	1156.15	1762	1156.82	1763.75	1168.26	1764	1169.03
GR	1766	1176.57	1766.64	1178.93	1766.86	1205.52				
NC	0.02	0.02	0.02							
X1	240	29	1026.08	1194.47	496.31	488.69	492			
GR	1774.8	1000	1774.34	1026.08	1774	1026.81	1772	1030.67	1770	1034.53
GR	1768	1038.38	1766	1042.19	1764	1045.88	1762	1049.77	1760	1053.67
GR	1758	1057.57	1757.43	1059.06	1757.79	1143.57	1758	1145.62	1758.74	1152.68
GR	1759.2	1157.83	1760	1159.46	1762	1163.99	1764	1168.57	1766	1173.21
GR	1768	1177.84	1770	1181.98	1772	1185.85	1774	1189.72	1776	1193.59
GR	1776.4	1194.47	1776.87	1267.84	1776	1276.18	1775.49	1280.88		

[redacted]

	0.02	0.02	0.015							
	250	24	1036.04	1171.85	57.45	58.44	58.6			
R	1775.4	1000	1775.23	1020.11	1774	1022.51	1772	1025.97	1770	1029.5
R	1768	1033.08	1766.5	1036.04	1766	1037.59	1764	1043.3	1762	1047.58
R	1760	1050.92	1758	1053.04	1758.34	1154.39	1760	1154.67	1762	1155.12
R	1764	1155.69	1766	1162.7	1766.67	1171.85	1768	1174.97	1770	1178.13
R	1772	1180.86	1774	1183.9	1776	1187.8	1776.99	1190.22		
C	0.02	0.02	0.015							
1	260	20	1033.31	1171.52	1	1	1			
R	1775.4	1000	1775.24	1020.49	1774	1022.9	1772	1026.35	1770	1029.81
R	1768	1033.31	1767.3	1042.07	1766	1048.18	1764	1050.85	1762	1051.85
R	1762	1154.61	1764	1155.13	1766	1155.64	1766.66	1171.52	1767.82	1173.98
R	1768	1174.12	1770	1176.75	1772	1179.4	1774	1183.08	1776	1187.74
C	0.02	0.02	0.015							
1	270	20	1008.92	1116.05	33.84	8.99	21.92			
R	1775.8	964	1775	1000	1774	1003.1	1772	1008.92	1772.04	1008.94
R	1770	1009.59	1768	1010.24	1766	1010.83	1764	1011.18	1762	1011.54
R	1762	1113.08	1762	1114.49	1762	1114.56	1764	1114.95	1766	1115.24
R	1768	1115.55	1770	1115.92	1771.04	1116.05	1772	1122.67	1774	1132.66
C	0.02	0.02	0.015							
1	280	18	1044.87	1151.21	1	1	1			
R	1775.8	1000	1775.02	1036.1	1774	1039.28	1772.37	1044.87	1772	1044.99
	1770	1045.65	1768	1046.31	1766	1047.17	1766	1103.57	1766.18	1146.5
	1766	1148.22	1766	1149.86	1768	1150.4	1770	1150.81	1772	1151.16
	1772.2	1151.21	1774.03	1160.57	1774	1160.65				
C	0.02	0.02	0.015							
1	290	7	1047.98	1151	14.68	12.7	14.95			
3	10			1047.98	1775	1150.91	1775			
R	1775.6	1000	1775.05	1036.02	1774	1047.98	1766.55	1047.98	1766.55	1151
R	1774	1151	1774.77	1160.59						
C	0.02	0.02	0.015							
B	0.9	1.56	2.6	106	103.02	5.02	588	0	1766.92	1766.55
1	300	8	1025.54	1128.56	102.54	98.55	102.75			
2			1	1772.92	1776.92			1.33		
3	10			1025.54	1775.19	1128.56	1775.56			
R	1774.8	1000	1775.19	1017.87	1775.12	1025.54	1766.92	1025.54	1766.92	1128.56
R	1775.1	1128.56	1775.56	1133.94	1775.35	1147.13				
C	0.02	0.02	0.015							
1	310	20	1022.98	1171.53	102.64	105.7	100.28			
R	1776.8	1000	1776	1016.17	1775.68	1022.98	1774	1028.26	1772	1034.5
R	1770	1040.77	1768.95	1044.12	1768	1047.77	1767.87	1048.18	1767.78	1072.14
R	1767.8	1131.12	1768	1132.45	1768.79	1137.38	1768.62	1147.75	1770	1152.28
R	1772	1158.91	1774	1165.6	1775.77	1171.53	1776	1177.59	1776.8	1198.8

	0.02	0.02	0.02							
	320	20	1022.11	1155.09	489.89	487.69	489.1			
R	1779.4	1000	1778.04	1022.01	1778	1022.11	1776	1030.73	1774	1039.26
R	1772	1047.79	1770.85	1052.67	1770.51	1061.45	1770	1063.83	1769.24	1067.59
R	1770	1104.76	1770.04	1107.08	1771.21	1112.55	1771.76	1130.75	1772	1131.67
R	1774	1139.29	1776	1146.67	1777.98	1153.84	1778	1155.09	1779.33	1191.2
C	0.02	0.02	0.02							
1	330	21	1027.28	1156.48	500.62	500.93	500.1			
R	1781	1000	1780.94	1027.28	1780	1031.83	1778	1041.53	1776	1051.25
R	1774	1060.96	1773.4	1063.9	1773.58	1078.46	1772	1084.27	1771.79	1085.02
R	1771.8	1109.74	1772	1110.11	1774	1116.37	1774.53	1118.12	1774.72	1134.82
R	1776	1138.9	1778	1145.34	1780	1151.87	1781.4	1156.48	1782	1173.24
R	1782.3	1189.26								
C	0.02	0.02	0.02							
1	340	19	1000	1116.66	496.19	495.64	496.21			
R	1783.7	907.67	1782.39	1000	1782	1002.25	1780	1013.68	1778	1025.11
R	1777	1030.73	1776.57	1040.34	1776	1043.31	1774.53	1051.15	1774.37	1080.76
R	1776	1084.3	1778	1088.43	1778.07	1088.55	1778.69	1101.43	1780	1107.4
R	1782	1116.66	1784	1125.98	1785.09	1131.04	1785.6	1161.06		
C	0.02	0.02	0.02							
1	350	22	1042.74	1155.28	460.23	420.27	436.71			
R	1786	1000	1786.37	1024.16	1787.1	1042.74	1786	1046.9	1784	1054.53
	1782	1062.22	1780	1069.93	1778	1077.61	1776.25	1084.32	1778.03	1100.93
	77.2	1111.98	1778	1120.32	1779.54	1134.41	1778.08	1145.13	1780	1148.5
	1782	1151.93	1784	1155.28	1784.22	1155.66	1785.25	1168.43	1786	1172.75
R	1787.2	1179.81	1787.3	1201.99						
C	0.02	0.02	0.02							
1	360	26	1014.07	1129.57	341.79	294.05	314.29			
3	10			1014.07	1792	1129.57	1792			
R	1798	1000	1796	1005.44	1794	1009.82	1792	1014.07	1790	1018.52
R	1788	1023.42	1787.25	1025.48	1786	1027.93	1784	1030.77	1782	1033.57
R	1781.8	1036.36	1781.62	1056.13	1780.02	1067.23	1780	1073	1779.67	1111.44
R	1780	1112.32	1782	1117.65	1784	1122.81	1786	1127.74	1786.74	1129.57
R	1786.9	1190.42	1786.92	1217.35	1788	1239.83	1788.97	1260.98	1789.6	1274.74
R	1790	1319.61								
C	0.02	0.02	0.02							
B		1.56	2.6	150	80		943	1.5	1781.68	1779.67
1	370	26	1019.93	1180.43	188.4	272.56	232.15			
2			1	1791.68	1803.16					
3	10			1019.93	1800	1180.43	1800			
R	1801.2	1000	1800	1006.14	1798	1012.48	1796	1019.93	1794	1026.84
R	1792	1033.63	1790	1039.5	1788	1044.33	1787.04	1047.52	1786	1050.99
R	1784	1063.28	1782.66	1069.39	1782	1116.66	1781.68	1141.49	1782	1142.19
R	1784	1147.19	1786	1151.46	1787.43	1154.02	1788	1156.17	1790	1161.17
R	1792	1166.33	1794	1173	1796	1180.43	1798	1186.39	1800	1192.83
R	1800.7	1196.96								

	0.03	0.03	0.02							
	380	14	1091.25	1151.34	174.12	176.08	170.96			
X3	10			1091.25	1794	1151.34	1794			
GR	1792	1090.66	1792.75	1091.25	1792	1091.78	1790	1093.21	1788	1094.63
GR	1786	1096.06	1785.68	1096.29	1785.8	1149.56	1786	1149.61	1788	1150.11
GR	1790	1150.6	1792	1151.08	1793.07	1151.34	1794	1227.86		
NC	0.03	0.03	0.02							
X1	390	21	1045.15	1103.45	420.9	420.21	420.9			
X3	10			1045.15	1797	1103.45	1797			
GR	1792.6	1000	1793.3	1031.19	1793.78	1040.57	1794	1041.52	1794.81	1045.15
GR	1794	1045.61	1792	1046.74	1790	1047.86	1788	1049.03	1787.41	1049.38
GR	1787.2	1074.16	1787.54	1100.36	1788	1100.54	1790	1101.34	1792	1102.12
GR	1794	1102.9	1795.44	1103.45	1795.23	1128.39	1795.21	1144.16	1796	1147.04
GR	1797.3	1153.05								
NC	0.03	0.03	0.02							
X1	400	18	1042.29	1103.68	216.05	217.6	216.12			
X3	10			1042.29	1797	1103.68	1797			
GR	1795.3	1000	1795.77	1024.49	1795.76	1038.23	1796	1040.26	1796.25	1042.29
GR	1796	1042.47	1794	1043.62	1792	1044.73	1790	1045.83	1789.06	1046.34
GR	1788.6	1075.55	1788.96	1100.77	1790	1101.12	1792	1101.81	1794	1102.54
GR	1796	1103.31	1796.96	1103.68	1796.49	1128.41				
NC	0.03	0.03	0.02							
X1	410	21	1041.49	1100.98	236.79	212.87	222.64			
	1799	1000	1799.04	1002.09	1799.01	1019.84	1798	1026.7	1797.57	1029.5
	1797.2	1041.49	1796	1044.75	1794	1049.87	1792	1054.82	1790	1059.57
GR	1789.3	1061.07	1789.8	1078.69	1790	1092.24	1790.1	1099.54	1792	1099.88
GR	1794	1100.24	1796	1100.6	1798	1100.94	1798.24	1100.98	1798.57	1108.1
GR	1799.4	1170.81								
NC	0.03	0.03	0.02							
X1	420	24	1148.62	1204.8	228.48	213.43	218.15			
GR	1805.1	1000	1804.85	1087.59	1804.56	1107.49	1804	1110.27	1802	1120.11
GR	1800	1129.91	1799.62	1132.29	1798.49	1148.62	1798	1150.2	1796	1155.64
GR	1794	1161.15	1792	1166.99	1790.86	1170.59	1791.29	1186.61	1790.88	1202.56
GR	1792	1202.83	1794	1203.37	1796	1203.9	1798	1204.44	1799.34	1204.8
GR	1800	1213.14	1800	1213.21	1800.65	1276.28	1800.8	1276.28		
NC	0.03	0.03	0.015							
X1	430	6	1034.79	1072.54	228.08	218.61	221.27			
X3	10			1034.79	1805	1072.54	1805			
GR	1804.5	1000	1804.31	1034.79	1793.29	1034.79	1793.29	1072.54	1803.82	1072.54
GR	1803.7	1113.05								
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	78	37.75	1.75	246	0	1794.3	1793.29
X1	440	9	1048.13	1085.88	183.21	206.01	197.38			
X2			1	1801.3	1802.38			1.33		
X3	10			1048.13	1805	1085.88	1805			
	1804	1000	1803.68	1007.43	1803.75	1048.13	1794.3	1048.13	1794.3	1085.88
	1803.7	1085.88	1803.91	1101.01	1804	1103.62	1805.3	1113.11		

	.025	0.025	0.04							
	1	5800								
1	450	23	1056.87	1133.42	163.22	162.13	163.47			
3	10			1056.87	1809	1133.42	1809			
R	1804	1000	1804.07	1006.32	1804.32	1034.41	1804.73	1043.05	1804.96	1056.87
R	1804	1058.72	1802	1062.07	1800	1065.72	1798	1069.89	1796	1074.12
R	1795.5	1075.14	1796	1079.17	1797.92	1096.15	1798	1097.82	1799.19	1110.76
R	1800	1121.55	1802	1125.68	1804	1129.41	1806	1133.42	1806.22	1133.91
R	1806.3	1148.02	1806.93	1155.61	1806.39	1170.62				
C	0.025	0.025	0.04							
1	460	23	1048.18	1141.84	281.81	289.57	285.08			
3	10			1048.18	1810	1141.84	1810			
R	1808	1000	1808.02	1003.22	1808	1005.04	1807.55	1048.18	1806	1052.89
R	1804	1059.32	1802.11	1065.59	1802	1067.54	1800.57	1088.15	1800	1090.66
R	1798	1099.31	1797.57	1101.27	1797.83	1115.39	1798	1115.66	1800	1118.79
R	1802	1121.96	1804	1125.23	1804.77	1126.62	1805.59	1139.81	1806	1140.19
R	1808.4	1141.84	1808	1142.64	1808	1161.75				
C	0.025	0.025	0.04							
1	470	20	1035.45	1104.62	277.36	272.97	275.07			
3	10			1035.45	1812	1104.62	1812			
R	1810.7	1000	1810.44	1019.05	1811.3	1035.45	1810	1039.08	1808	1044.69
R	1806	1050.13	1804	1055.32	1802	1061.49	1800.02	1066.39	1800	1067.21
R	1799.3	1081.38	1800	1082.49	1802	1085.74	1804	1089.17	1806	1092.65
	06.1	1092.79	1808	1096.72	1810	1100.89	1810.59	1104.62	1810.87	1120.75
	0.025	0.025	0.04							
D		1.56	2.6	100	20		288	2	1799.67	1799.29
1	480	23	1049.96	1121.92	29.43	28.85	29.16			
2			1	1808	1811.3					
3	10			1049.96	1815	1121.92	1815			
R	1810.8	1000	1810.29	1022.32	1810.42	1043.96	1811.06	1049.96	1810	1052.71
R	1808	1057.64	1806	1063.42	1804	1071.44	1802	1076.07	1800.34	1079.25
R	1800	1088.82	1799.67	1097.89	1800	1098.19	1802	1100.01	1804	1101.93
R	1806	1109.03	1808	1115.05	1810	1119.54	1810.67	1121.92	1811.24	1130.7
R	1810	1145.14	1809.57	1148.54	1809.64	1162.76				
C	0.025	0.025	0.04							
1	490	27	1050.08	1127.64	421.17	376.41	404.91			
3	10			1050	1816	1127.64	1816			
R	1816	1000	1816.02	1001.56	1814.9	1019.89	1814.74	1038.47	1815.04	1050.08
R	1814	1052.5	1812	1057.09	1810	1061.66	1808	1066.16	1806	1070.64
R	1804	1075.1	1803.66	1075.85	1804	1083.12	1804.15	1088.63	1806	1092.46
R	1808	1096.8	1810	1101.52	1810.26	1101.82	1810	1113.29	1809.88	1118.54
R	1810	1119.08	1812	1125.39	1812.71	1127.64	1812.65	1132.54	1812.36	1149.58
R	1812.4	1162.71	1812.58	1182.47						

	0.025	0.025	0.04							
	500	27	1035.57	1117.1	475.67	455.34	467.9			
3	10			1035.57	1821	1117.1	1821			
R	1820.6	1000	1820.49	1017.79	1820	1035.57	1820.01	1036.35	1818	1038.99
R	1816	1041.72	1814	1044.53	1812	1047.45	1816	1050.47	1808	1053.53
R	1807.5	1054.17	1808	1059.53	1808.27	1062.4	1810	1077.16	1811.11	1085.69
R	1812	1088.38	1814	1094.42	1816	1100.48	1817.15	1103.98	1818	1112.84
R	1818.4	1117.1	1818	1130.34	1817.52	1146.76	1817.56	1162.65	1817.78	1176.1
R	1818	1181.93	1818.33	1189.71						
C	0.02	0.02	0.03							
1	510	21	1051.63	1118	410.79	403.61	413.47			
R	1822.7	1000	1822	1014.17	1821.1	1051.63	1820	1053.73	1818	1057.54
R	1816	1061.35	1814	1065.16	1812	1068.96	1811.08	1070.77	1810.29	1084.94
R	1812	1091.3	1814	1098.08	1816	1104.27	1818	1110.29	1820	1116.14
R	1820.6	1118	1821.24	1184.8	1821.07	1201.95	1821.84	1211.83	1822	1218.61
R	1822.5	1218.61								
C	0.02	0.02	0.03							
1	520	29	1020.76	1156.45	494.67	471.93	477.37			
R	1830.9	1000	1830	1005.42	1829.57	1007.86	1828.53	1020.76	1828	1022.81
R	1826	1030.61	1824	1038.4	1822	1046.19	1820	1053.98	1818.67	1059.18
R	1818.1	1072.9	1818	1073.42	1816	1079.92	1814.82	1084.01	1816	1106.79
R	1816.3	1112.44	1817.17	1120.26	1818	1123.13	1820	1130.03	1822	1136.92
R	1824	1143.81	1825.52	1149.11	1826	1150.07	1828	1153.82	1829.41	1156.45
	1828	1169.03	1830	1185.2	1832	1235.46	1832.56	1257.15		
	0.02	0.02	0.03							
1	530	25	1016.88	1152.68	371.54	424.3	399.2			
R	1832	1000	1831.88	1004.01	1831.69	1016.88	1830	1021.18	1828	1026.26
R	1826	1031.34	1824	1036.37	1822.35	1040.5	1822.35	1059.95	1822	1060.65
R	1820	1064.77	1818	1068.85	1817.83	1069.21	1817.62	1090.03	1818	1090.71
R	1820	1093.58	1822	1096.4	1823.81	1099.05	1824	1102.34	1826	1121.49
R	1828	1130.45	1828.88	1133.79	1830	1143.91	1830.93	1152.68	1831.19	1159.85
C	0.02	0.02	0.03							
1	540	26	1018.16	1117.46	460.35	522.62	489.72			
R	1834.9	1000	1834.9	1018.16	1834	1020.8	1832	1026.45	1830	1031.95
R	1828	1037.42	1827.86	1037.75	1828	1041.19	1828.5	1054.97	1828	1055.74
R	1826	1058.87	1824	1062.02	1823.45	1062.88	1823.47	1092.33	1824	1093.02
R	1826	1095.58	1828	1098.1	1828.7	1098.97	1828.48	1106.52	1830	1108.88
R	1832	1111.99	1834	1115.1	1835.51	1117.46	1836	1133.36	1836.3	1144.44
R	1836.7	1152.23								
C	0.02	0.02	0.03							
1	550	28	1021.09	1124.94	438.1	474.94	456.26			
R	1840.1	1000	1840	1001.92	1839.99	1006.32	1839.32	1021.09	1838	1024.57
R	1836	1029.84	1833.93	1035.32	1834	1035.34	1833.46	1054.03	1832	1056.65
R	1830	1060.26	1828	1063.9	1826.66	1066.34	1826.79	1083.14	1828	1085.42
R	1830	1089.19	1832	1092.91	1834.1	1096.67	1834	1097.34	1834	1105.63
R	1834	1111.84	1833.95	1114.36	1836	1119.24	1838	1124.12	1838.31	1124.94
	839.6	1150.68	1840	1160.26	1840.11	1162.86				

	0.02	0.02	0.03							
	560	32	1011.15	1130.99	332.03	327.26	330.24			
R	1847.8	1000	1846.27	1003.9	1846	1006.41	1845.43	1011.15	1844	1015.37
R	1842	1021.39	1840	1027.57	1838	1033.9	1836.1	1039.95	1836	1045.57
R	1835.9	1053.25	1834	1056.42	1832	1059.77	1830	1063.2	1829.01	1064.93
R	1828	1072.16	1827.85	1073.13	1828	1074.51	1828.64	1080.27	1830	1082.5
R	1832	1085.3	1834	1088.32	1836	1091.45	1836.23	1091.7	1836.22	1110.34
R	1838	1115.46	1840	1121.18	1842	1126.85	1843.5	1130.99	1844	1135.55
R	1845.8	1151.17	1845.91	1156.17						
C	0.02	0.02	0.03							
1	570	31	1064.51	1140.01	229.29	230.35	228.38			
R	1847.9	1000	1846	1056.21	1845.65	1064.51	1844	1065.7	1842	1067.16
R	1840	1068.62	1838	1070.08	1836	1071.54	1834	1072.98	1832	1073.78
R	1832	1074.63	1832	1075.05	1832	1084.35	1832	1091.24	1831.69	1120.28
R	1832	1120.51	1832	1120.78	1832	1121.95	1834	1124.47	1836	1126.81
R	1838	1129.15	1840	1131.49	1842	1133.85	1844	1136.23	1846	1138.69
R	1847	1140.01	1847.35	1156.32	1848	1159.82	1849.6	1168.44	1850	1170.12
R	1850.7	1172.42								
C	0.02	0.02	0.015							
1	580	30	1055.05	1128.8	1	1	1			
R	1847.7	1000	1847.49	1012.37	1846	1049.98	1845.83	1055.05	1844	1056.21
R	1842	1057.48	1840	1058.71	1838	1059.87	1836	1060.93	1834	1061.78
R	1834	1062.46	1834	1063.07	1834	1063.47	1834	1064.19	1834	1080.22
	1834	1109.26	1834	1109.31	1834	1114.45	1836	1116.75	1838	1119.03
	1840	1121.3	1842	1123.52	1844	1125.65	1846	1127.71	1847.09	1128.8
	1847.5	1145.88	1848	1148.67	1849.67	1157.77	1850	1158.89	1851.05	1161.45
C	0.02	0.02	0.015							
1	590	11	1031.2	1085.04	16.02	16.7	15.77			
3	10			1031.2	1848	1085.04	1848			
R	1847.3	1000	1847.01	1010.93	1846.27	1031.2	1834.21	1031.2	1834.21	1085.04
R	1846.2	1085.04	1847.07	1099.88	1848	1120.18	1849.73	1131.49	1850	1132.09
R	1851.3	1134.18								
C	0.02	0.02	0.015							
B	0.9	1.56	2.6	60	53.84	3.84	400	0	1835.13	1834.21
1	600	15	1081.85	1135.69	93.41	94.92	93.51			
2			1	1843.13	1846.5			1.33		
3	10			1081.85	1848	1135.69	1848			
R	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
R	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
R	1835.1	1081.85	1835.13	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43
C	0.02	0.02	0.015							
1	610	20	1083.2	1136.14	230.78	201.73	215.38			
3	10			1061.48	1853	1207.54	1853			
R	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
R	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
R	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54

	0.02	0.02	0.015							
X1	620	20	1033.45	1086.27	223.64	202.43	212.31			
GR	1859.3	1000	1858	1007.7	1857.16	1012.48	1856	1018.28	1855.25	1022.06
GR	1855.4	1033.45	1854	1035.35	1852	1037.9	1850	1040.44	1848	1042.97
GR	1846	1045.49	1845.48	1046.14	1845.66	1075.97	1846	1076.49	1848	1079.51
GR	1850	1082.53	1852	1085.57	1852.46	1086.27	1854	1135.67	1855.53	1176.03
NC	0.02	0.02	0.015							
X1	630	18	1031	1084.55	229.09	213.86	221.03			
GR	1861.2	1000	1860	1004.03	1858.27	1009.63	1858	1010.62	1856	1018.67
GR	1855.9	1018.82	1855.06	1031	1854	1032.96	1852	1036.68	1850	1040.45
GR	1848.1	1044.02	1848.28	1071.6	1850	1074.89	1852	1078.71	1854	1082.53
GR	1855	1084.55	1856	1129.14	1857	1165.99				
NC	0.02	0.02	0.015	0.1	0.3					
X1	640	19	1026.88	1079.43	251.59	262.14	258.21			
GR	1864.5	1000	1864.16	1004.77	1864	1005.12	1862	1009.4	1860	1013.41
GR	1858.6	1016.12	1858.09	1026.88	1858	1027.05	1856	1030.75	1854	1034.43
GR	1852	1038.12	1851.39	1039.25	1851.37	1067.22	1852	1068.01	1854	1070.51
GR	1856	1073	1858	1075.48	1860	1077.94	1861.23	1079.43		
NC	0.02	0.02	0.015							
X1	650	8	1035.35	1088.02	196.87	225.93	211.31			
X3	10			1035.35	1867	1088.02	1867			
GR	1866	941.77	1867.8	1000	1866.17	1035.35	1853.8	1035.35	1853.8	1088.02
	1866.1	1088.02	1866.1	1156.84	1866	1161.59				
	0.02	0.02	0.015							
SB	0.9	1.56	2.6	150	52.67	2.67	400	0	1856.17	1853.8
X1	660	11	1077.26	1129.93	191.11	191.17	191.78			
X2			1	1864.17	1869.17			1.33		
X3	10			1077.26	1870	1129.93	1870			
GR	1870.6	1000	1870	1032.33	1869.6	1060.4	1869.67	1077.26	1856.17	1077.26
GR	1856.1	1129.93	1869.5	1129.93	1870.02	1166.85	1870	1168.76	1870	1172.88
GR	1868.6	1207.45								
NC	0.025	0.025	0.025							
QT	1	5500								
X1	670	31	1067.82	1168.26	476.18	438.91	452.82			
GR	1879.4	1000	1878	1007.84	1877.77	1009.03	1877.27	1027.56	1876.26	1048.09
GR	1876	1049.44	1875	1054.05	1874.27	1067.82	1874	1068.59	1872	1072.93
GR	1870	1077.28	1868	1081.62	1866	1085.96	1864	1090.29	1862	1094.57
GR	1860	1098.77	1859.16	1100.51	1859	1121.06	1860	1131.32	1860.34	1134.65
GR	1860.7	1147.65	1862	1149.57	1864	1152.62	1866	1155.67	1868	1158.72
GR	1870	1161.77	1872	1164.82	1874	1167.84	1874.29	1168.26	1875	1189.7
GR	1875.3	1193.35								
NC	0.025	0.025	0.025							
X1	680	28	1032.41	1126.45	478.66	448	461.54			
GR	1882.6	1000	1882	1011.76	1880.87	1032.41	1880	1034.16	1878	1038.48
GR	1876	1042.78	1874	1047.09	1872	1051.41	1870	1055.75	1868	1060.1
	1866	1064.48	1864.4	1067.99	1864	1071.62	1862.6	1085.72	1864.01	1092.79
GR	1864	1093.89	1864.2	1101.75	1866	1104.88	1868	1108.34	1870	1111.81

[redacted]	1872	1115.28	1874	1118.74	1876	1122.22	1878	1125.69	1878.44	1126.45
	1878.7	1156.41	1878	1161.77	1876.53	1173.07				
NC	0.025	0.025	0.025							
X1	690	10	1057.3	1141.3	408.17	434.4	422.9			
X3	10			1057.3	1894	1141.3	1894			
GR	1894	1000	1894	1014.18	1886	1057.29	1877	1057.3	1866	1079.3
GR	1866	1119.3	1877	1141.3	1886	1141.31	1894	1162.81	1894	1172.96
NC	0.025	0.025	0.025							
SB		1.56	2.6	90	40		1240	2	1866	1866
X1	700	8	1011.47	1095.49	132.78	172.81	153.08			
X2			1	1886	1894					
GR	1894	1000	1886	1011.47	1877	1011.48	1866	1033.48	1866	1073.48
GR	1877	1095.48	1886	1095.49	1894	1097.52				
NC	0.025	0.025	0.025							
X1	710	22	1055.32	1141.88	416	467.23	424.6			
GR	1887	1000	1887.65	1055.32	1886	1058.98	1884	1063.38	1882	1067.76
GR	1880	1072.17	1878	1076.59	1876.67	1079.53	1876.5	1091.93	1878	1098.6
GR	1878.2	1099.74	1880	1110.14	1880.28	1112.24	1882	1115.7	1884	1119.72
GR	1886	1123.75	1888	1127.78	1890	1131.82	1892	1135.86	1894	1139.91
GR	1894.9	1141.88	1896	1168.62						
NC	0.025	0.025	0.025							
X1	720	28	1031.02	1123.52	499.28	495.17	498.02			
[redacted]	1895.4	1000	1895.51	1008.85	1894	1013.03	1892	1018.46	1890.74	1021.86
[redacted]	1890.3	1031.02	1890	1031.86	1888	1036.41	1886	1041.01	1884	1045.63
[redacted]	1882	1050.25	1882	1050.99	1881.59	1059.51	1882	1063.99	1882.46	1068.23
GR	1882.7	1085.75	1884	1093.67	1884.05	1094.02	1885.72	1102.19	1886	1102.68
GR	1888	1106.25	1890	1109.82	1892	1113.4	1894	1117.01	1896	1120.66
GR	1897.5	1123.52	1898	1138.24	1898	1204.99				
NC	0.025	0.025	0.025							
X1	730	27	1056.08	1126.41	484.5	472.89	480.56			
GR	1895.5	980.55	1890	997.92	1888.44	1014.84	1888.81	1032	1890	1034.91
GR	1892	1040.78	1892.61	1042.69	1892.66	1056.08	1892	1058.03	1890	1063.82
GR	1888	1069.32	1887.87	1069.57	1887.34	1076.5	1886	1080.07	1885.41	1081.64
GR	1885.1	1105.73	1886	1106.9	1888	1109.69	1890	1112.46	1892	1115.21
GR	1894	1117.97	1896	1120.72	1898	1123.48	1900	1126.26	1900.12	1126.41
GR	1900.5	1149.64	1900	1152.55						
NC	0.025	0.025	0.025							
X1	740	30	1042.02	1119.91	502.08	483.58	492.38			
GR	1901.2	1000	1902	1005.26	1904	1021.59	1904.51	1025.97	1904	1027.47
GR	1902	1034.42	1900	1042.02	1900.03	1042.1	1898	1046.77	1896	1051.39
GR	1894	1056.04	1893.01	1058.37	1892.51	1063.92	1892	1064.96	1890	1068.86
GR	1889.5	1069.72	1889.67	1082.45	1889.35	1096.82	1890	1098.41	1892	1103.02
GR	1892.5	1104.29	1894	1106.26	1896	1108.92	1898	1111.43	1900	1113.86
GR	1902	1116.25	1904	1118.59	1905.14	1119.91	1904.81	1126.67	1904	1127.41

[illegible]	.025	0.025	0.025							
X1	750	40	1044.53	1148.05	361.65	431.03	391.69			
GR	1906.9	1000	1906	1004.65	1905.04	1009.47	1906	1015.43	1906.84	1019.12
GR	1906	1021.92	1904	1031.78	1903.79	1032.81	1903.79	1044.53	1902	1048.63
GR	1900	1053.26	1898	1057.91	1895.97	1062.64	1896	1063.05	1894.93	1077.63
GR	1894	1083.07	1893.44	1086.12	1893.85	1093.82	1894	1094.65	1895.88	1107.68
GR	1896	1108	1898	1113.7	1900	1119.39	1900.96	1122.14	1902	1123.57
GR	1904	1126.35	1906	1129.15	1908	1131.96	1910	1134.78	1912	1137.6
GR	1914	1140.41	1916	1143.23	1918	1146.05	1919.42	1148.05	1918	1155.65
GR	1916.8	1161.99	1916.93	1173.3	1916.59	1183.77	1916.83	1193	1918	1211.96
NC	0.025	0.025	0.025							
X1	760	24	1035.23	1131.59	409.52	457.63	428.24			
GR	1906.9	1000	1906.7	1035.23	1906	1036.91	1904	1042.08	1902	1047.23
GR	1901.2	1049.24	1900	1056.11	1898.24	1065.72	1898.23	1068.7	1899.02	1080.49
GR	1899.8	1088.61	1899.92	1101.11	1900	1101.27	1902	1105.14	1904	1109.01
GR	1906	1112.87	1908	1116.71	1910	1120.52	1912	1124.3	1914	1128.06
GR	1915.9	1131.59	1914.4	1139.1	1914	1153.98	1912.9	1195.72		
NC	0.025	0.025	0.025							
X1	770	24	1015.76	1126.99	456.52	419.22	434.78			
GR	1915	1000	1914	1015.76	1913.93	1016.79	1912	1022.95	1910	1029.33
GR	1908	1035.7	1906	1042.07	1905.12	1044.87	1904.51	1063.27	1904	1066.58
GR	1903.2	1072.95	1903.42	1081.93	1903.73	1095.61	1903.96	1105.84	1904	1105.97
GR	1906	1113.03	1906.63	1115.29	1908	1117.4	1910	1120.69	1912	1124.57
G	1913.1	1126.99	1912.81	1130.93	1912.89	1143.7	1914	1148.24		
	0.025	0.025	0.015							
X1	780	8	1058.72	1114.05	52.99	49.44	49.44			
X3	10			1058.72	1916.5	1114.05	1916.5			
GR	1916.4	1000	1916	1003.3	1914.9	1058.72	1903.78	1058.72	1903.78	1114.05
GR	1914	1114.05	1914	1121.8	1915.01	1149.26				
NC	0.025	0.025	0.015							
SB	1.25	1.56	2.6	80	55.33	5.33	400	0	1905.12	1903.78
X1	790	10	1028.58	1083.91	108.42	108.26	108.02			
X2			1	1913.12	1917.12			2		
X3	10			1028.58	1916	1083.91	1916			
GR	1916	1000	1915.8	1001.42	1915.93	1017.77	1914.87	1028.58	1905.12	1028.58
GR	1905.1	1083.91	1914.59	1083.91	1916	1104.86	1916.37	1109.9	1916	1131.78
NC	0.035	0.035	0.03							
X1	800	14	1012.48	1094.47	100.8	88.06	95.8			
X3	10			1000	1915.5	1094.47	1915.5			
GR	1914.6	1000	1914.21	1012.48	1914	1012.99	1912	1017.82	1910	1022.59
GR	1908	1027.3	1904.86	1031.73	1904.86	1053.16	1904.86	1061.2	1908	1072.68
GR	1910	1078.88	1912	1084.82	1914	1090.67	1915.12	1094.47		

	.035	0.035	0.03	0.1	0.3					
I	810	28	1144.23	1205.12	221.84	144.84	185.09			
R	1918	980.65	1917.34	990.58	1916	1000	1914	1016.18	1913.61	1019.48
R	1912	1086.58	1911.68	1097.61	1911.77	1130.03	1911.33	1144.23	1910.82	1158.38
R	1910	1162.77	1908	1167.25	1906	1172.16	1905.36	1173.67	1905.8	1185.18
R	1906	1185.5	1908	1188.52	1910	1192.61	1910.28	1194.53	1911.05	1205.12
R	1911.2	1228.44	1911.5	1247.06	1912	1258.22	1914	1295.39	1914.12	1296.38
R	1915.1	1324.03	1916	1338.5	1918	1370.57				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300

*SECNO 10.000

10.000	8.37	1708.70	1707.40	1705.00	1710.19	1.48	.00	.00	1710.00
6400.0	.0	6400.0	.0	.0	654.9	.1	.0	.0	1708.60
.00	.00	9.77	.03	.000	.030	.030	.000	1700.33	1009.11
.004017	0.	0.	0.	0	14	5	.00	119.45	1128.56

*SECNO 20.000

20.000	7.61	1710.73	1710.04	.00	1712.55	1.82	2.27	.10	1711.97
6400.0	.0	6400.0	.0	.0	591.5	.0	7.0	1.3	1713.45
.01	.00	10.82	.00	.000	.030	.000	.000	1703.12	1187.56
.005416	483.	489.	498.	2	12	0	.00	114.06	1301.62

*SECNO 30.000

30.000	7.51	1713.36	1712.99	.00	1715.48	2.12	2.84	.09	1712.41
6400.0	27.4	6372.6	.0	11.7	544.1	.0	13.5	2.7	1713.61
.02	2.34	11.71	.00	.030	.030	.000	.000	1705.85	1028.67
.006014	495.	498.	504.	2	12	0	.00	125.10	1153.77

*SECNO 40.000

40.000	9.07	1716.27	1715.79	.00	1718.18	1.91	2.67	.02	1716.00
6400.0	1.4	6177.9	220.7	1.5	548.8	55.2	20.1	4.3	1714.00
.04	.92	11.26	4.00	.030	.030	.030	.000	1707.20	1135.37
.004947	500.	492.	481.	2	8	0	.00	154.35	1289.72

*SECNO 50.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

50.000	9.46	1718.36	1716.06	.00	1719.32	.96	1.04	.10	1720.56
6400.0	.0	6400.0	.0	.0	815.2	.0	25.1	5.3	1720.00
.05	.00	7.85	.00	.000	.030	.000	.000	1708.90	1075.00
.002510	334.	306.	278.	2	15	0	.00	142.96	1217.96

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

60.000	9.73	1719.67	1717.29	.00	1720.20	.53	.84	.04	1718.01
6400.0	498.6	4971.7	929.7	199.2	769.7	335.3	37.2	8.4	1716.63
.07	2.50	6.46	2.77	.030	.030	.030	.000	1709.94	1002.76
.001193	500.	499.	502.	2	12	0	.00	396.87	1399.63

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	7.53	1719.53	1719.53	.00	1722.12	2.59	1.23	.62	1723.69
6400.0	.0	6400.0	.0	.0	495.4	.0	47.5	11.2	1719.59
.08	.00	12.92	.00	.000	.030	.000	.000	1712.00	1100.15
.007946	493.	498.	498.	0	12	0	.00	97.17	1197.32

*SECNO 80.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

80.000	8.83	1723.21	1721.50	.00	1724.56	1.35	2.31	.12	1723.19
6400.0	.0	6400.0	.0	.0	686.0	.0	53.9	12.3	1725.21
.10	.03	9.33	.00	.030	.030	.000	.000	1714.38	1146.51
.003339	456.	471.	482.	2	11	0	.00	115.23	1261.74

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

90.000	9.58	1724.77	1723.80	.00	1726.63	1.85	1.91	.15	1724.64
6400.0	.4	6399.6	.0	.7	585.5	.0	60.9	13.6	1727.42
.11	.55	10.93	.00	.030	.030	.000	.000	1715.19	1046.26
.004785	495.	482.	465.	3	8	0	.00	110.73	1156.98

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 100.000

100.000	7.72	1726.42	1724.67	.00	1727.81	1.40	1.14	.05	1728.00
6400.0	.0	6400.0	.0	.0	674.4	.0	65.2	14.3	1727.26
.12	.00	9.49	.00	.000	.030	.000	.000	1718.70	1026.65
.003204	290.	295.	300.	2	14	0	.00	104.36	1131.01

*SECNO 110.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	5.29	1725.79	1725.79	.00	1728.22	2.43	.06	.31	1728.00
6400.0	.0	6400.0	.0	.0	512.0	.0	65.5	14.4	1727.52
.12	.00	12.50	.00	.000	.015	.000	.000	1720.50	1027.80
.002026	26.	26.	26.	0	14	0	.00	106.34	1134.14

*SECNO 120.000
7 MINIMUM SPECIFIC ENERGY
* CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1029.5 1136.5 TYPE= 1 TARGET= 107.000
ELENCL= 1730.00 ELENCR= 1730.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1730.00

120.000	4.79	1726.69	1726.69	.00	1729.11	2.42	.19	.00	1728.00
6400.0	.0	6400.0	.0	.0	512.5	.0	66.6	14.6	1730.00
.12	.00	12.49	.00	.000	.015	.000	.000	1721.90	1029.49
.002207	89.	90.	93.	0	11	0	.00	107.00	1136.49

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1725.83 , NOT 1726.69 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

8 XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	145.00	107.00	7.00	500.00	.00	1722.53	1721.90

'SECNO 130.000
3280 CROSS SECTION 130.00 EXTENDED .83 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

PRESSURE FLOW

EGPRS	EGLWC	K3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1730.66	1730.30	.00	0.	6400.	500.	500.	1727.53	1731.43	0.

3470 ENCROACHMENT STATIONS= 1035.8 1142.8 TYPE= 1 TARGET= 107.000
ELENCL= 1731.00 ELENCR= 1731.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1731.00

.000	6.99	1729.52	.00	.00	1730.66	1.14	1.55	.00	1728.00
0.0	.0	6400.0	.0	.0	748.4	.0	68.3	14.9	1731.00
.12	.00	8.55	.00	.000	.015	.000	.000	1722.53	1035.81
.000645	121.	120.	118.	3	0	0	.00	107.00	1142.81

*SECNO 140.000
3280 CROSS SECTION 140.00 EXTENDED 1.27 FEET

3470 ENCROACHMENT STATIONS= 1149.7 1265.6 TYPE= 1 TARGET= 115.910
ELENCL= 1730.00 ELENCR= 1730.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.41 ELREA= 1730.00

140.000	6.85	1729.45	1727.93	.00	1730.75	1.30	.05	.05	1728.41
6400.0	.0	6400.0	.0	.0	698.7	.0	69.4	15.1	1730.00
.13	.00	9.16	.00	.000	.015	.000	.000	1722.60	1149.72
.000808	65.	64.	64.	2	15	0	.00	115.91	1265.63

SECNO 150.000

SECNO	DEPTH	EWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	FRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.46	1729.99	1729.99	.00	1732.17	2.18	.73	.26	1731.69
6300.0	.0	6300.0	.0	.0	532.2	.0	76.3	16.4	1731.09
.14	.00	11.84	.00	.000	.020	.000	.000	1723.53	1024.14
.003737	491.	490.	489.	0	11	0	.00	124.87	1149.01

*SECNO 160.000

3301 HV CHANGED MORE THAN HVINS

160.000	6.50	1732.11	1731.56	.00	1733.75	1.64	1.53	.05	1733.26
6300.0	.0	6300.0	.0	.0	613.0	.0	82.9	17.9	1734.00
.15	.00	10.28	.00	.000	.020	.000	.000	1725.61	1045.54
.002537	501.	502.	503.	2	11	0	.00	132.85	1178.39

*SECNO 170.000
5 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

170.000	6.04	1733.34	1733.34	.00	1735.45	2.11	1.49	.14	1734.50
6300.0	.0	6300.0	.0	.0	540.6	.0	89.4	19.4	1735.09
.16	.00	11.65	.00	.000	.020	.000	.000	1727.30	1046.37
.003759	487.	487.	488.	0	11	0	.00	130.75	1177.12

*SECNO 180.000

180.000	5.61	1735.21	1735.03	.00	1737.18	1.97	1.72	.01	1736.58
6300.0	.0	6300.0	.0	.0	559.5	.0	95.6	20.8	1737.72
.18	.00	11.26	.00	.000	.020	.000	.000	1729.60	1041.60
.003261	491.	492.	492.	2	11	0	.00	127.87	1169.47

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	6.70	1739.49	1739.49	.00	1741.88	2.39	1.71	.13	1742.00
6300.0	.0	6300.0	.0	.0	508.1	.0	101.7	22.2	1741.63
.19	.00	12.40	.00	.000	.020	.000	.000	1732.79	1006.97
.003627	499.	498.	497.	0	11	0	.00	108.37	1115.34

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	6.16	1742.86	1742.86	.00	1745.31	2.45	1.79	.02	1746.00
6300.0	.0	6300.0	.0	.0	502.0	.0	107.4	23.4	1748.00
.20	.00	12.55	.00	.000	.020	.000	.000	1736.70	1007.81
.003603	494.	495.	497.	0	11	0	.00	104.30	1112.11

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	9.31	1746.83	1746.83	.00	1749.68	2.85	1.78	.12	1752.00
6300.0	.0	6300.0	.0	.0	465.2	.0	113.0	24.5	1753.31
.21	.00	13.54	.00	.000	.020	.000	.000	1737.52	1014.22
.003528	500.	500.	500.	0	14	0	.00	83.71	1097.93

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

220.000	7.97	1751.93	1751.93	.00	1754.61	2.68	1.69	.02	1759.83
6300.0	.0	6300.0	.0	.0	479.2	.0	118.1	25.4	1757.77
.22	.00	13.15	.00	.000	.020	.000	.000	1743.96	1056.99
.003578	465.	477.	489.	0	15	0	.00	91.27	1148.26

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	8.28	1758.40	1758.40	.00	1761.19	2.78	1.75	.03	1763.36
6300.0	.0	6300.0	.0	.0	470.5	.0	123.5	26.4	1764.00
.23	.00	13.39	.00	.000	.020	.000	.000	1750.12	1061.81
.003514	490.	495.	499.	0	8	0	.00	86.22	1148.03

*SECNO 240.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

240.000	5.18	1762.61	1762.61	.00	1764.88	2.26	1.77	.05	1774.34
6300.0	.0	6300.0	.0	.0	522.0	.0	129.1	27.6	1776.40
.24	.00	12.07	.00	.000	.020	.000	.000	1757.43	1048.58
.003668	496.	492.	489.	0	14	0	.00	116.82	1165.40

SECNO	DEPTH	CWSEL	CRITWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

250.000	5.05	1763.05	1763.05	.00	1765.39	2.34	.16	.02	1766.50
6300.0	.0	6300.0	.0	.0	513.2	.0	129.8	27.7	1766.67
.24	.00	12.28	.00	.000	.015	.000	.000	1758.00	1045.34
.002101	57.	59.	58.	0	8	0	.00	110.08	1155.42

*SECNO 260.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

260.000	4.97	1766.97	1766.97	.00	1769.12	2.15	.00	.02	1768.00
6300.0	.0	6299.9	.1	.0	536.0	.1	129.8	27.7	1766.66
.24	.00	11.75	.95	.000	.015	.020	.000	1762.00	1043.60
.002196	1.	1.	1.	0	5	0	.00	128.59	1172.19

*SECNO 270.000
*185 MINIMUM SPECIFIC ENERGY
[illegible]RITICAL DEPTH ASSUMED

[illegible]000	4.86	1766.86	1766.86	.00	1769.28	2.42	.05	.08	1772.00
6300.0	.0	6300.0	.0	.0	504.7	.0	130.1	27.8	1771.04
.24	.00	12.48	.00	.000	.015	.000	.000	1762.00	1010.58
.002156	34.	22.	9.	0	8	0	.00	104.80	1115.37

SECNO 280.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

280.000	4.89	1770.89	1770.89	.00	1773.30	2.41	.00	.00	1772.37
6300.0	.0	6300.0	.0	.0	505.9	.0	130.1	27.8	1772.20
.24	.00	12.45	.00	.000	.015	.000	.000	1766.00	1045.36
.002139	1.	1.	1.	0	5	0	.00	105.61	1150.97

SECNO 290.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1048.0 1150.9 TYPE= 1 TARGET= 102.930
ELENCL= 1775.00 ELENCR= 1775.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1774.00 ELREA= 1775.00

290.000	4.86	1771.41	1771.41	.00	1773.87	2.46	.03	.02	1774.00
6300.0	.0	6300.0	.0	.0	500.6	.0	130.3	27.8	1775.00
.24	.00	12.58	.00	.000	.015	.000	.000	1766.55	1047.98
.002208	15.	15.	13.	0	5	0	.00	102.93	1150.91

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1770.65 , NOT 1771.41 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	106.00	103.02	5.02	588.00	.00	1766.92	1766.55

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1771.78 BRIDGE VELOCITY= 12.74 CALCULATED CHANNEL AREA= 476.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1774.19	1774.61	.00	0.	6300.	588.	588.	1772.92	1776.92	0.

3470 ENCROACHMENT STATIONS= 1025.5 1128.6 TYPE= 1 TARGET= 103.020
ELENCL= 1775.19 ELENCR= 1775.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1775.12 ELREA= 1775.56

300.000	6.16	1773.08	.00	.00	1774.61	1.53	.74	.00	1775.12
6300.0	.0	6300.0	.0	.0	634.9	.0	131.6	28.1	1775.56
.24	.00	9.92	.00	.000	.015	.000	.000	1766.92	1025.54
.001032	103.	103.	99.	0	0	0	.00	103.02	1128.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 310.000

310.000	5.24	1773.02	1772.67	.00	1774.82	1.80	.13	.08	1775.68
6300.0	.0	6300.0	.0	.0	584.9	.0	133.0	28.4	1775.77
.25	.00	10.77	.00	.000	.015	.000	.000	1767.78	1031.30
.001633	103.	100.	106.	2	15	0	.00	131.04	1162.34

*SECNO 320.000
*185 MINIMUM SPECIFIC ENERGY
*720 CRITICAL DEPTH ASSUMED

320.000	6.59	1775.83	1775.83	.00	1778.13	2.30	1.15	.15	1778.00
6300.0	.0	6300.0	.0	.0	517.7	.0	139.2	29.7	1778.00
.26	.00	12.17	.00	.000	.020	.000	.000	1769.24	1031.46
.003649	490.	489.	488.	0	11	0	.00	114.58	1146.04

*SECNO 330.000
*185 MINIMUM SPECIFIC ENERGY
*720 CRITICAL DEPTH ASSUMED

330.000	7.07	1778.86	1778.86	.00	1781.22	2.35	1.82	.02	1780.94
6300.0	.0	6300.0	.0	.0	511.8	.0	145.1	31.0	1781.40
.27	.00	12.31	.00	.000	.020	.000	.000	1771.79	1037.34
.003649	501.	500.	501.	0	8	0	.00	110.82	1148.16

*SECNO 340.000
*185 MINIMUM SPECIFIC ENERGY
*720 CRITICAL DEPTH ASSUMED

340.000	7.48	1781.85	1781.85	.00	1784.18	2.33	1.82	.00	1782.39
6300.0	.0	6300.0	.0	.0	514.5	.0	151.0	32.3	1782.00
.28	.00	12.24	.00	.000	.020	.000	.000	1774.37	1003.10
.003670	496.	496.	496.	0	8	0	.00	112.87	1115.97

*SECNO 350.000
*185 MINIMUM SPECIFIC ENERGY
*720 CRITICAL DEPTH ASSUMED

350.000	7.59	1783.84	1783.84	.00	1786.34	2.50	1.58	.05	1787.10
6300.0	.0	6300.0	.0	.0	496.9	.0	156.1	33.4	1784.00
.29	.00	12.68	.00	.000	.020	.000	.000	1776.25	1055.14
.003560	460.	437.	420.	0	5	0	.00	99.87	1155.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HI	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 360.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.1 1129.6 TYPE= 1 TARGET= 115.500
ELENCL= 1792.00 ELENCR= 1792.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.00 ELREA= 1792.00

360.000	6.39	1786.06	1786.06	.00	1788.58	2.51	1.13	.01	1792.00
6300.0	.0	6300.0	.0	.0	495.1	.0	159.6	34.1	1792.00
.30	.00	12.72	.00	.000	.020	.000	.000	1779.67	1027.81
.003601	342.	314.	294.	0	15	0	.00	100.88	1127.89

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	150.00	80.00	.00	943.00	1.50	1781.68	1779.67

370.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= .000 EGLWC= 1790.131 ELLC= 1791.680 PCWSE= 1786.061 ELTRD= 1803.160

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1803.16 MAX ELLC= 1791.68

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1019.9 1180.4 TYPE= 1 TARGET= 160.500
ELENCL= 1800.00 ELENCR= 1800.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.00 ELREA= 1800.00

370.000	6.08	1787.76	1787.76	.00	1790.11	2.35	.84	.02	1796.00
6300.0	.0	6300.0	.0	.0	512.6	.0	162.3	34.6	1800.00
.30	.00	12.29	.00	.000	.020	.000	.000	1781.68	1045.12
.003601	188.	232.	273.	0	15	0	.00	110.15	1155.27

*SECNO 380.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1091.3 1151.3 TYPE= 1 TARGET= 60.090
ELENCL= 1794.00 ELENCR= 1794.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.75 ELREA= 1794.00

380.000	7.42	1793.10	1793.10	.00	1796.62	3.52	.63	.35	1792.75
6300.0	.0	6300.0	.0	.0	418.2	.0	164.1	35.0	1794.00
.31	.00	15.06	.00	.000	.020	.000	.000	1785.68	1091.25
.003753	174.	171.	176.	0	11	0	.00	60.09	1151.34

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

ENCROACHMENT STATIONS= 1045.2 1103.4 TYPE= 1 TARGET= 58.300
ENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1794.81 ELREA= 1797.00

390.000	7.72	1794.92	1794.92	.00	1798.52	3.60	1.58	.02	1794.81
6300.0	.0	6300.0	.0	.0	413.7	.0	168.2	35.6	1797.00
.31	.00	15.23	.00	.000	.020	.000	.000	1787.20	1045.15
.003749	421.	421.	420.	0	8	0	.00	58.10	1103.25

*SECNO 400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1042.3 1103.7 TYPE= 1 TARGET= 61.390
ELENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.25 ELREA= 1797.00

400.000	7.54	1796.14	1796.14	.00	1799.60	3.46	.80	.01	1796.25
6300.0	.0	6300.0	.0	.0	421.9	.0	170.2	35.8	1797.00
.32	.00	14.93	.00	.000	.020	.000	.000	1788.60	1042.37
.003696	216.	216.	218.	0	8	0	.00	60.99	1103.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 410.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

410.000	8.94	1798.24	1798.24	.00	1801.57	3.33	.78	.01	1797.20
6300.0	28.9	6271.1	.0	11.7	427.1	.0	172.4	36.2	1798.24
.32	2.46	14.68	.00	.030	.020	.000	.000	1789.30	1025.06
.003361	237.	223.	213.	0	12	0	.00	75.96	1101.01

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

420.000	9.85	1800.71	1800.71	.00	1803.49	2.78	.62	.06	1798.49
6300.0	98.3	6149.1	52.6	30.3	454.1	32.8	174.8	36.8	1799.34
.33	3.24	13.54	1.60	.030	.020	.030	.000	1790.86	1126.45
.002436	228.	218.	213.	0	8	0	.00	149.83	1276.28

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1034.8 1072.5 TYPE= 1 TARGET= 37.750

ELENCL= 1805.00 ELENCR= 1805.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.31 ELREA= 1805.00

430.000	9.52	1802.81	1802.81	.00	1807.58	4.77	.56	.60	1804.31
6300.0	.0	6300.0	.0	.0	359.3	.0	177.1	37.2	1805.00
.33	.00	17.53	.00	.000	.015	.000	.000	1793.29	1034.79
.002676	228.	221.	219.	0	8	0	.00	37.75	1072.54

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PECIAL BRIDGE

227 DOWNSTREAM ELEV IS 1801.33 , NOT 1802.81 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

B	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	78.00	37.75	1.75	246.00	.00	1794.30	1793.29

SECNO 440.000
RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1818.70	1811.23	.00	2706.	3603.	246.	252.	1801.30	1802.38	78.

6685 20 TRIALS ATTEMPTED WSEL,CWSEL
6710 WSEL ASSUMED BASED ON MIN DIFF
6693 PROBABLE MINIMUM SPECIFIC ENERGY

ENCROACHMENT STATIONS= 1048.1 1085.9 TYPE= 1 TARGET= 37.750
ELENCL= 1805.00 ELENCR= 1805.00

6495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1803.75 ELREA= 1805.00

440.000	9.55	1803.85	1803.80	.00	1808.59	4.74	.53	-.10	1803.75
6300.0	.0	6300.0	.0	.0	360.4	.0	178.7	37.4	1805.00
.33	.00	17.48	.00	.000	.015	.000	.000	1794.30	1048.13
.002647	183.	197.	206.	20	5	3	.00	37.75	1085.88

SECNO 450.000
6280 CROSS SECTION 450.00 EXTENDED 1.94 FEET

6301 HV CHANGED MORE THAN HVINS

6470 ENCROACHMENT STATIONS= 1056.9 1133.4 TYPE= 1 TARGET= 76.550
ELENCL= 1809.00 ELENCR= 1809.00

6495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.96 ELREA= 1809.00

450.000	12.84	1808.34	1804.77	.00	1809.41	1.08	.46	.37	1804.96
5800.0	.0	5800.0	.0	.0	696.1	.0	180.7	37.6	1809.00
.34	.00	8.33	.00	.000	.040	.000	.000	1795.50	1056.87
.002944	163.	163.	162.	4	8	0	.00	76.55	1133.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	KV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 460.000
280 CROSS SECTION 460.00 EXTENDED 1.28 FEET

470 ENCROACHMENT STATIONS= 1048.2 1141.8 TYPE= 1 TARGET= 93.660
ELENCL= 1810.00 ELENCR= 1810.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1807.55 ELREA= 1810.00

460.000	11.72	1809.29	1806.55	.00	1810.35	1.06	.93	.00	1807.55
5800.0	.0	5800.0	.0	.0	702.3	.0	185.2	38.2	1810.00
.35	.00	8.26	.00	.000	.040	.000	.000	1797.57	1048.18
.003634	282.	285.	290.	2	19	0	.00	93.66	1141.84

*SECNO 470.000

5301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
[redacted]ITICAL DEPTH ASSUMED

0 ENCROACHMENT STATIONS= 1035.4 1104.6 TYPE= 1 TARGET= 69.170
ELENCL= 1812.00 ELENCR= 1812.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.30 ELREA= 1812.00

470.000	10.99	1810.29	1810.29	.00	1813.45	3.16	1.75	.63	1811.30
5800.0	.0	5800.0	.0	.0	406.6	.0	188.7	38.7	1812.00
.35	.00	14.27	.00	.000	.040	.000	.000	1799.30	1038.28
.013868	277.	275.	273.	0	11	0	.00	64.43	1102.71

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	100.00	20.00	.00	288.00	2.00	1799.67	1799.29

*SECNO 480.000
5280 CROSS SECTION 480.00 EXTENDED 4.18 FEET

5301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CUSFE	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNI	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.10

RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	K3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1820.11	1813.45	.00	1830.	4005.	288.	305.	1808.00	1811.30	100.

470 ENCROACHMENT STATIONS= 1050.0 1121.9 TYPE= 1 TARGET= 71.960
ELENCL= 1815.00 ELENCR= 1815.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.06 ELREA= 1815.00

480.000	14.15	1813.82	.00	.00	1814.97	1.15	1.53	.00	1811.06
5800.0	.0	5800.0	.0	.0	672.6	.0	189.1	38.7	1815.00
.35	.00	8.62	.00	.000	.040	.000	.000	1799.67	1049.96
157	29.	29.	29.	3	0	2	.00	71.96	1121.92

SECNO 490.000
280 CROSS SECTION 490.00 EXTENDED 2.62 FEET

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

470 ENCROACHMENT STATIONS= 1050.0 1127.6 TYPE= 1 TARGET= 77.640
ELENCL= 1816.00 ELENCR= 1816.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1815.04 ELREA= 1816.00

490.000	11.54	1815.20	1813.93	.00	1817.13	1.93	1.93	.23	1815.04
5800.0	.0	5800.0	.0	.0	519.9	.0	194.7	39.4	1816.00
.36	.05	11.16	.00	.025	.040	.000	.000	1803.66	1050.00
.007968	421.	405.	376.	3	19	0	.00	77.64	1127.64

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 500.000
280 CROSS SECTION 500.00 EXTENDED .67 FEET

270 ENCROACHMENT STATIONS= 1035.6 1117.1 TYPE= 1 TARGET= 81.530
ELENCL= 1821.00 ELENCR= 1821.00

295 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1820.00 ELREA= 1821.00

500.000	11.50	1819.00	1817.86	.00	1821.00	2.00	3.85	.02	1820.00
5800.0	.0	5800.0	.0	.0	511.4	.0	200.2	40.3	1821.00
.38	.00	11.34	.00	.000	.040	.000	.000	1807.50	1037.67
.008504	476.	468.	455.	3	11	0	.00	79.43	1117.10

SECNO 510.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

510.000	11.75	1822.04	1822.04	.00	1823.68	1.64	2.10	.04	1821.10
5800.0	48.7	5326.1	425.2	18.2	500.3	96.3	205.5	41.6	1820.60
.39	2.67	10.65	4.42	.020	.030	.020	.000	1810.29	1013.43
.005383	411.	413.	404.	0	8	0	.00	205.18	1218.61

SECNO 520.000

520.000	9.13	1823.95	1822.70	.00	1825.46	1.51	1.77	.01	1828.53
5800.0	.0	5800.0	.0	.0	588.5	.0	212.1	43.3	1829.41
.40	.00	9.86	.00	.000	.030	.000	.000	1814.82	1038.59
.004091	495.	477.	472.	3	14	0	.00	105.06	1143.65

SECNO 530.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

530.000	9.16	1826.78	1826.78	.00	1829.24	2.45	2.26	.28	1831.69
5800.0	.0	5800.0	.0	.0	461.5	.0	216.9	44.2	1830.93
.41	.00	12.57	.00	.000	.030	.000	.000	1817.62	1029.35
.008341	372.	399.	424.	0	5	0	.00	95.65	1125.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SS1A
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

540.000	8.31	1831.76	1831.76	.00	1834.43	2.67	4.08	.07	1834.90
5800.0	.0	5800.0	.0	.0	442.1	.0	222.0	45.2	1835.51
.42	.00	13.12	.00	.000	.030	.000	.000	1823.45	1027.12
.008330	460.	490.	523.	0	11	0	.00	84.49	1111.61

*SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	10.00	1836.66	1836.66	.00	1839.20	2.54	3.86	.01	1839.32
5800.0	.0	5800.0	.0	.0	453.2	.0	226.7	46.2	1838.31
.43	.00	12.80	.00	.000	.030	.000	.000	1826.66	1028.11
.008600	438.	456.	475.	0	11	0	.00	92.74	1120.84

*SECNO 560.000

560.000	11.65	1839.50	1839.24	.00	1841.81	2.31	2.59	.02	1845.43
5800.0	.0	5800.0	.0	.0	475.4	.0	230.2	46.9	1843.50
.44	.00	12.20	.00	.000	.030	.000	.000	1827.85	1029.17
.007179	332.	330.	327.	0	8	0	.00	90.56	1119.73

*SECNO 570.000

570.000	9.35	1841.04	1839.22	.00	1843.02	1.98	1.17	.03	1845.65
5800.0	.0	5800.0	.0	.0	514.1	.0	232.8	47.3	1847.00
.44	.00	11.28	.00	.000	.030	.000	.000	1831.69	1067.86
.003860	229.	228.	230.	2	14	0	.00	64.87	1132.73

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

580.000	6.94	1840.94	1840.94	.00	1844.13	3.18	.00	.36	1845.83
5800.0	.0	5800.0	.0	.0	405.1	.0	232.8	47.3	1847.09
.44	.00	14.32	.00	.000	.015	.000	.000	1834.00	1058.13
.002051	1.	1.	1.	0	15	0	.00	64.22	1122.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 590.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1031.2 1085.0 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.27 ELREA= 1848.00

590.000	7.09	1841.30	1841.30	.00	1844.88	3.58	.03	.12	1846.27
5800.0	.0	5800.0	.0	.0	381.8	.0	233.0	47.3	1848.00
.44	.00	15.19	.00	.000	.015	.000	.000	1834.21	1031.20
.002356	16.	16.	17.	0	8	0	.00	53.84	1085.04

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1839.99 , NOT 1841.30 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

[redacted]	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	60.00	53.84	3.84	400.00	.00	1835.13	1834.21

*SECNO 600.000
5840, FLOW IS BY WEIR AND LOW FLOW

5301 HV CHANGED MORE THAN HVINS

5302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

5420 BRIDGE W.S.= 1844.25 BRIDGE VELOCITY= 12.07 CALCULATED CHANNEL AREA= 456.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1846.40	1846.51	2.94	0.	5781.	400.	400.	1843.13	1846.50	60.

5470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.00 ELREA= 1848.00

600.000	9.34	1844.44	.00	.00	1846.51	2.07	1.63	.00	1846.00
[redacted]00.0	.0	5800.0	.0	.0	501.8	.0	233.9	47.4	1848.00
[redacted].44	.00	11.56	.00	.000	.015	.000	.000	1835.10	1081.85
.001031	93.	94.	95.	4	0	0	.00	53.84	1135.69

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 610.000
35 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

70 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
LENCL= 1853.00 ELENCR= 1853.00

610.000	9.68	1852.30	1852.30	.00	1854.80	2.50	.25	.13	1851.91
5800.0	2.2	5382.6	415.1	2.1	410.1	104.7	236.4	47.9	1849.56
.45	1.05	13.13	3.97	.020	.015	.020	.000	1842.62	1073.26
.001287	231.	215.	202.	0	8	0	.00	131.09	1204.36

SECNO 620.000

265 DIVIDED FLOW

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

620.000	9.83	1855.31	1855.31	.00	1857.66	2.35	.26	.02	1855.40
5800.0	.0	5322.5	477.4	.2	416.2	125.6	239.0	48.5	1852.46
[illegible]45	.24	12.79	3.80	.020	.015	.020	.000	1845.48	1021.74
.001208	224.	212.	202.	0	5	0	.00	141.80	1170.30

SECNO 630.000
280 CROSS SECTION 630.00 EXTENDED .66 FEET

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

630.000	9.56	1857.66	1857.66	.00	1859.80	2.14	.25	.02	1855.06
5800.0	121.6	5170.6	507.8	32.3	417.9	138.7	241.8	49.2	1855.00
.46	3.77	12.37	3.66	.020	.015	.020	.000	1848.10	1012.01
.001093	229.	221.	214.	0	8	0	.00	153.98	1165.99

CEHV= .100 CEHV= .300
*SECNO 640.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

640.000	9.28	1860.65	1860.65	.00	1863.91	3.25	.35	.33	1858.09
5800.0	146.1	5653.9	.0	29.0	386.3	.0	244.8	49.9	1861.23
.46	5.04	14.64	.00	.020	.015	.000	.000	1851.37	1012.10
[illegible]1695	252.	258.	262.	0	8	0	.00	66.64	1078.73

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 650.000
*185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.3 1088.0 TYPE= 1 TARGET= 52.670
ELENCL= 1867.00 ELENCR= 1867.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1866.17 ELREA= 1867.00

650.000	7.20	1861.00	1861.00	.00	1864.63	3.64	.42	.12	1866.17
5800.0	.0	5800.0	.0	.0	379.0	.0	246.7	50.2	1867.00
.47	.00	15.30	.00	.000	.015	.000	.000	1853.80	1035.35
.002370	197.	211.	226.	0	15	0	.00	52.67	1088.02

SPECIAL BRIDGE

3227 DOWNSTREAM ELEV IS 1859.85 , NOT 1861.00 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

	XKOR	COFQ	ROLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	150.00	52.67	2.67	400.00	.00	1856.17	1853.80

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1862.46 BRIDGE VELOCITY= 15.52 CALCULATED CHANNEL AREA= 314.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1866.09	1867.56	.00	0.	5800.	400.	400.	1864.17	1869.17	0.

3470 ENCROACHMENT STATIONS= 1077.3 1129.9 TYPE= 1 TARGET= 52.670
ELENCL= 1870.00 ELENCR= 1870.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1869.67 ELREA= 1870.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST
660.000	9.24	1865.34	.00	.00	1867.56	2.22	2.93	.00	1869.67
5800.0	.0	5800.0	.0	.0	484.6	.0	248.6	50.4	1870.00
.47	.00	11.97	.00	.000	.015	.000	.000	1856.10	1077.26
.001128	191.	192.	191.	0	0	0	.00	52.67	1129.93

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.49	1866.49	1866.49	.00	1869.36	2.87	.95	.19	1874.27
5500.0	.0	5500.0	.0	.0	404.4	.0	253.2	51.1	1874.29
.48	.00	13.60	.00	.000	.025	.000	.000	1859.00	1084.90
.005530	476.	453.	439.	0	15	0	.00	71.51	1156.41

*SECNO 680.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

680.000	9.22	1871.82	1871.82	.00	1874.94	3.13	2.54	.08	1880.87
5500.0	.0	5500.0	.0	.0	387.6	.0	257.4	51.8	1878.44
.49	.00	14.19	.00	.000	.025	.000	.000	1862.60	1051.81
.005493	479.	462.	448.	0	11	0	.00	63.15	1114.96

*SECNO 690.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 1057.3 1141.3 TYPE= 1 TARGET= 84.000
ELENCL= 1894.00 ELENCR= 1894.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1877.00 ELREA= 1894.00

690.000	8.87	1874.87	1873.33	.00	1876.66	1.79	1.59	.13	1877.00
5500.0	.0	5500.0	.0	.0	512.4	.0	261.8	52.5	1894.00
.50	.00	10.73	.00	.000	.025	.000	.000	1866.00	1061.55
.002727	408.	423.	434.	3	15	0	.00	75.49	1137.05

	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECIAL BRIDGE

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.00	1.56	2.60	90.00	40.00	.00	1240.00	2.00	1866.00	1866.00

SECNO 700.000

370,LOW FLOW BY NORMAL BRIDGE

GPRS= .000 EGLWC= 1876.664 ELLC= 1886.000 PCWSE= 1874.875 ELTRD= 1894.000

370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1894.00 MAX ELLC= 1886.00

700.000	9.60	1875.60	1873.33	.00	1877.06	1.45	.36	.03	1886.00
5500.0	.0	5500.0	.0	.0	568.2	.0	263.7	52.7	1886.00
.51	.00	9.68	.00	.000	.025	.000	.000	1866.00	1014.28
.002037	133.	153.	173.	3	19	0	.00	78.39	1092.68

710.000

3501 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

710.000	9.42	1885.92	1885.92	.00	1888.98	3.06	1.33	.48	1887.65
5500.0	.0	5500.0	.0	.0	391.6	.0	268.4	53.4	1894.90
.52	.00	14.04	.00	.000	.025	.000	.000	1876.50	1059.17
.005417	416.	425.	467.	0	8	0	.00	64.41	1123.58

*SECNO 720.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

720.000	7.74	1889.33	1889.33	.00	1892.11	2.78	2.73	.03	1890.30
5500.0	.0	5500.0	.0	.0	411.0	.0	273.0	54.2	1897.50
.53	.00	13.38	.00	.000	.025	.000	.000	1881.59	1033.38
.005533	499.	498.	495.	0	15	0	.00	75.25	1108.63

*SECNO 730.000

3301 HV CHANGED MORE THAN HVINS

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

730.000	7.69	1892.79	1892.79	.00	1894.82	2.02	2.47	.08	1892.66
5500.0	1557.3	3942.7	.0	167.8	324.5	.0	278.0	55.3	1900.12
.54	9.28	12.15	.00	.025	.025	.000	.000	1885.10	989.10
.004791	485.	481.	473.	0	5	0	.00	127.21	1116.31

*SECNO 740.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

740.000	8.50	1897.85	1897.85	.00	1900.93	3.08	2.53	.32	1900.00
5500.0	.0	5500.0	.0	.0	390.7	.0	283.0	56.4	1905.14
.55	.00	14.08	.00	.000	.025	.000	.000	1889.35	1047.11
.005489	502.	492.	484.	0	8	0	.00	64.13	1111.24

750.000
NIMUM SPECIFIC ENERGY
) CRITICAL DEPTH ASSUMED

750.000	8.37	1901.81	1901.81	.00	1904.64	2.83	2.17	.02	1903.79
5500.0	.0	5500.0	.0	.0	407.5	.0	286.6	57.0	1919.42
.56	.00	13.50	.00	.000	.025	.000	.000	1893.44	1049.07
.005581	362.	392.	431.	0	5	0	.00	74.23	1123.31

*SECNO 760.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

760.000	7.79	1906.02	1906.02	.00	1908.81	2.79	2.40	.00	1906.70
5500.0	.0	5500.0	.0	.0	410.3	.0	290.6	57.8	1915.90
.56	.00	13.40	.00	.000	.025	.000	.000	1898.23	1036.86
.005630	410.	428.	458.	0	9	0	.00	76.05	1112.91

*SECNO 770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

770.000	6.57	1909.77	1909.77	.00	1912.24	2.46	2.45	.03	1914.00
5500.0	.0	5500.0	.0	.0	436.8	.0	294.8	58.6	1913.10
.57	.00	12.59	.00	.000	.025	.000	.000	1903.20	1030.05
.005652	457.	435.	419.	0	15	0	.00	90.26	1120.32

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 780.000

5301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5470 ENCROACHMENT STATIONS= 1058.7 1114.1 TYPE= 1 TARGET= 55.330
ELENCL= 1916.50 ELENCR= 1916.50

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.90 ELREA= 1916.50

780.000	6.72	1910.50	1910.50	.00	1913.90	3.40	.17	.28	1914.90
5500.0	.0	5500.0	.0	.0	371.9	.0	295.3	58.7	1916.50
.57	.00	14.79	.00	.000	.015	.000	.000	1903.78	1058.72
.002347	53.	49.	49.	0	8	0	.00	55.33	1114.05

SPECIAL BRIDGE

DOWNSTREAM ELEV IS 1909.08 , NOT 1910.50 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	80.00	55.33	5.33	400.00	.00	1905.12	1903.78

*SECNO 790.000

5301 HV CHANGED MORE THAN HVINS

5302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

CLASS B LOW FLOW

5420 BRIDGE W.S.= 1911.67 BRIDGE VELOCITY= 15.25 CALCULATED CHANNEL AREA= 327.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1915.08	1916.39	.00	0.	5500.	400.	400.	1913.12	1917.12	0.

5470 ENCROACHMENT STATIONS= 1028.6 1083.9 TYPE= 1 TARGET= 55.330
ELENCL= 1916.00 ELENCR= 1916.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDSTA

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.87 ELREA= 1916.00

790.000	9.63	1914.73	.00	.00	1916.39	1.66	2.49	.00	1914.87
5500.0	.0	5500.0	.0	.0	532.3	.0	296.4	58.8	1916.00
.58	.00	10.33	.00	.000	.015	.000	.000	1905.10	1028.58
.000791	108.	108.	108.	0	0	0	.00	55.33	1083.91

*SECNO 800.000

3280 CROSS SECTION 800.00 EXTENDED .05 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3470 ENCROACHMENT STATIONS= 1000.0 1094.5 TYPE= 1 TARGET= 94.470
ELENCL= 1915.50 ELENCR= 1915.50

3[illegible] OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.21 ELREA= 1915.50

.000	10.31	1915.17	1912.90	.00	1916.55	1.38	.13	.03	1914.21
5500.0	17.7	5482.3	.0	9.6	581.3	.0	297.6	59.0	1915.50
.58	1.84	9.43	.00	.035	.030	.000	.000	1904.86	1000.00
.002830	101.	96.	88.	2	15	0	.00	94.47	1094.47

CCHV= .100 CEHV= .300
*SECNO 810.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.02

810.000	11.29	1916.65	1914.06	.00	1916.89	.24	.23	.11	1911.33
5500.0	1697.2	2353.7	1449.1	580.4	471.5	495.9	302.2	60.0	1911.05
.59	2.92	4.99	2.92	.035	.030	.035	.000	1905.36	995.44
.000695	222.	185.	145.	3	9	0	.00	353.45	1348.89

THIS RUN EXECUTED 060CT97 11:16:13

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	M3	DEPTH	CWSEL	VCH	EG
*	130.000	1730.30	1727.53	1730.66	1731.43	6400.00	.00	10.00	.00	6.99	1729.52	8.55	1730.66
*	300.000	1774.61	1772.92	1774.19	1776.92	6300.00	.00	2.00	.00	6.16	1773.08	9.92	1774.61
*	370.000	1790.13	1791.68	.00	1803.16	6300.00	.00	59.00	.00	6.08	1787.76	12.29	1790.11
*	440.000	1811.23	1801.30	1818.70	1802.38	3603.15	2705.88	30.00	.00	9.55	1803.85	17.48	1808.59
	480.000	1813.45	1808.00	1820.11	1811.30	4005.47	1830.21	30.00	.00	14.15	1813.82	8.62	1814.97
*	600.000	1846.51	1843.13	1846.40	1846.50	5780.91	.16	15.00	2.94	9.34	1844.44	11.56	1846.51
*	660.000	1867.56	1864.17	1866.09	1869.17	5800.00	.00	2.00	.00	9.24	1865.34	11.97	1867.56
	700.000	1876.66	1886.00	.00	1894.00	5500.00	.00	59.00	.00	9.60	1875.60	9.68	1877.06
*	790.000	1916.39	1913.12	1915.08	1917.12	5500.00	.00	2.00	.00	9.63	1914.73	10.33	1916.39

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRITWS	EG	10*KS	VCH	AREA	.01K
	10.000	.00	.00	.00	1700.33	6400.00	1708.70	1707.40	1710.19	40.17	9.77	654.99	1009.81
	20.000	488.53	.00	.00	1703.12	6400.00	1710.73	1710.04	1712.55	54.16	10.82	591.46	869.66
	30.000	498.03	.00	.00	1705.85	6400.00	1713.36	1712.99	1715.48	60.14	11.71	555.76	825.31
	40.000	491.57	.00	.00	1707.20	6400.00	1716.27	1715.79	1718.18	49.47	11.26	605.53	909.92
*	50.000	305.60	.00	.00	1708.90	6400.00	1718.36	1716.06	1719.32	25.10	7.85	815.17	1277.56
*	60.000	499.27	.00	.00	1709.94	6400.00	1719.67	1717.29	1720.20	11.93	6.46	1304.23	1852.60
*	70.000	497.95	.00	.00	1712.00	6400.00	1719.53	1719.53	1722.12	79.46	12.92	495.38	717.97
*	80.000	470.68	.00	.00	1714.38	6400.00	1723.21	1721.50	1724.56	33.39	9.33	685.96	1107.62
	90.000	482.19	.00	.00	1715.19	6400.00	1724.77	1723.80	1726.63	47.85	10.93	586.21	925.18
	100.000	295.13	.00	.00	1718.70	6400.00	1726.42	1724.67	1727.81	32.04	9.49	674.45	1130.66
	110.000	25.69	.00	.00	1720.50	6400.00	1725.79	1725.79	1728.22	20.26	12.50	512.01	1421.91
*	120.000	90.11	.00	.00	1721.90	6400.00	1726.69	1726.69	1729.11	22.07	12.49	512.45	1362.37
*	130.000	119.69	1731.43	1727.53	1722.53	6400.00	1729.52	.00	1730.66	6.45	8.55	748.45	2519.99
	140.000	64.14	.00	.00	1722.60	6400.00	1729.45	1727.93	1730.75	8.08	9.16	698.74	2252.04
*	150.000	489.94	.00	.00	1723.53	6300.00	1729.99	1729.99	1732.17	37.37	11.84	532.17	1030.53
	160.000	501.51	.00	.00	1725.61	6300.00	1732.11	1731.56	1733.75	25.37	10.28	612.98	1250.86
*	170.000	487.26	.00	.00	1727.30	6300.00	1733.34	1733.34	1735.45	37.59	11.65	540.60	1027.52
	180.000	491.83	.00	.00	1729.60	6300.00	1735.21	1735.03	1737.18	32.61	11.26	559.45	1103.29
*	190.000	497.74	.00	.00	1732.79	6300.00	1739.49	1739.49	1741.88	36.27	12.40	508.15	1046.09
*	200.000	495.37	.00	.00	1736.70	6300.00	1742.86	1742.86	1745.31	36.03	12.55	501.99	1049.50
*	210.000	500.38	.00	.00	1737.52	6300.00	1746.83	1746.83	1749.68	35.28	13.54	465.25	1060.72
*	220.000	476.72	.00	.00	1743.96	6300.00	1751.93	1751.93	1754.61	35.78	13.15	479.23	1053.22
*	230.000	494.76	.00	.00	1750.12	6300.00	1758.40	1758.40	1761.19	35.14	13.39	470.48	1062.73
*	240.000	492.00	.00	.00	1757.43	6300.00	1762.61	1762.61	1764.88	36.68	12.07	521.97	1040.16

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	58.60	.00	.00	1758.00	6300.00	1763.05	1763.05	1765.39	21.01	12.28	513.16	1374.32
*	260.000	1.00	.00	.00	1762.00	6300.00	1766.97	1766.97	1769.12	21.96	11.75	536.10	1344.52
*	270.000	21.92	.00	.00	1762.00	6300.00	1766.86	1766.86	1769.28	21.56	12.48	504.71	1356.90
*	280.000	1.00	.00	.00	1766.00	6300.00	1770.89	1770.89	1773.30	21.39	12.45	505.92	1362.04
*	290.000	14.95	.00	.00	1766.55	6300.00	1771.41	1771.41	1773.87	22.08	12.58	500.64	1340.65
*	300.000	102.75	1776.92	1772.92	1766.92	6300.00	1773.08	.00	1774.61	10.32	9.92	634.90	1960.95
	310.000	100.28	.00	.00	1767.78	6300.00	1773.02	1772.67	1774.82	16.33	10.77	584.86	1558.77
*	320.000	489.10	.00	.00	1769.24	6300.00	1775.83	1775.83	1778.13	36.49	12.17	517.70	1042.95
*	330.000	500.10	.00	.00	1771.79	6300.00	1778.86	1778.86	1781.22	36.49	12.31	511.82	1042.99
*	340.000	496.21	.00	.00	1774.37	6300.00	1781.85	1781.85	1784.18	36.70	12.24	514.52	1039.97
*	350.000	436.71	.00	.00	1776.25	6300.00	1783.84	1783.84	1786.34	35.60	12.68	496.89	1055.87
*	360.000	314.29	.00	.00	1779.67	6300.00	1786.06	1786.06	1788.58	36.01	12.72	495.11	1049.91
*	370.000	232.15	1803.16	1791.68	1781.68	6300.00	1787.76	1787.76	1790.11	36.01	12.29	512.65	1049.85
	380.000	170.96	.00	.00	1785.68	6300.00	1793.10	1793.10	1796.62	37.53	15.06	418.21	1028.38
*	390.000	420.90	.00	.00	1787.20	6300.00	1794.92	1794.92	1798.52	37.49	15.23	413.68	1028.90
*	400.000	216.12	.00	.00	1788.60	6300.00	1796.14	1796.14	1799.60	36.96	14.93	421.85	1036.24
*	410.000	222.64	.00	.00	1789.30	6300.00	1798.24	1798.24	1801.57	33.61	14.68	438.82	1086.66
*	420.000	218.15	.00	.00	1790.86	6300.00	1800.71	1800.71	1803.49	24.36	13.54	517.22	1276.55
*	430.000	221.27	.00	.00	1793.29	6300.00	1802.81	1802.81	1807.58	26.76	17.53	359.32	1217.88
*	440.000	197.38	1802.38	1801.30	1794.30	6300.00	1803.85	1803.80	1808.59	26.47	17.48	360.40	1224.55
	450.000	163.47	.00	.00	1795.50	5800.00	1808.34	1804.77	1809.41	29.44	8.33	696.14	1068.91
	460.000	285.08	.00	.00	1797.57	5800.00	1809.29	1806.55	1810.35	36.34	8.26	702.34	962.09
	470.000	275.07	.00	.00	1799.30	5800.00	1810.29	1810.29	1813.45	138.68	14.27	406.58	492.51
	480.000	29.16	1811.30	1808.00	1799.67	5800.00	1813.82	.00	1814.97	31.57	8.62	672.62	1032.30
	490.000	404.91	.00	.00	1803.66	5800.00	1815.20	1813.93	1817.13	79.68	11.16	519.90	649.77
	500.000	467.90	.00	.00	1807.50	5800.00	1819.00	1817.86	1821.00	85.04	11.34	511.37	628.96

	SECNO	XLOH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOPWS	VOH	AREA	.01K
*	510.000	413.47	.00	.00	1810.29	5800.00	1822.04	1822.04	1823.68	33.83	10.65	614.81	997.24
	520.000	477.37	.00	.00	1814.82	5800.00	1823.95	1822.70	1825.46	40.91	9.86	588.48	906.77
*	530.000	399.20	.00	.00	1817.62	5800.00	1826.78	1826.78	1829.24	83.41	12.57	461.47	635.06
*	540.000	489.72	.00	.00	1823.45	5800.00	1831.76	1831.76	1834.43	83.30	13.12	442.12	635.50
*	550.000	456.26	.00	.00	1826.66	5800.00	1836.66	1836.66	1839.20	86.00	12.80	453.18	625.44
	560.000	330.24	.00	.00	1827.85	5800.00	1839.50	1839.24	1841.81	71.79	12.20	475.41	684.51
	570.000	228.38	.00	.00	1831.69	5800.00	1841.04	1839.22	1843.02	38.60	11.28	514.15	933.54
*	580.000	1.00	.00	.00	1834.00	5800.00	1840.94	1840.94	1844.13	20.51	14.32	405.06	1280.79
*	590.000	15.77	.00	.00	1834.21	5800.00	1841.30	1841.30	1844.88	23.56	15.19	381.84	1194.84
*	600.000	93.51	1846.50	1843.13	1835.10	5800.00	1844.44	.00	1846.51	10.31	11.56	501.84	1806.12
*	610.000	215.38	.00	.00	1842.62	5800.00	1852.30	1852.30	1854.80	12.87	13.13	516.84	1616.89
*	620.000	212.31	.00	.00	1845.48	5800.00	1855.31	1855.31	1857.66	12.08	12.79	541.92	1668.78
	630.000	221.03	.00	.00	1848.10	5800.00	1857.66	1857.66	1859.80	10.93	12.37	588.88	1754.17
	640.000	258.21	.00	.00	1851.37	5800.00	1860.65	1860.65	1863.91	16.95	14.64	415.21	1408.60
*	650.000	211.31	.00	.00	1853.80	5800.00	1861.00	1861.00	1864.63	23.70	15.30	378.99	1191.31
*	660.000	191.78	1869.17	1864.17	1856.10	5800.00	1865.34	.00	1867.56	11.28	11.97	484.63	1726.55
*	670.000	452.82	.00	.00	1859.00	5500.00	1866.49	1866.49	1869.36	55.30	13.60	404.44	739.57
*	680.000	461.54	.00	.00	1862.60	5500.00	1871.82	1871.82	1874.94	54.93	14.19	387.58	742.12
*	690.000	422.90	.00	.00	1866.00	5500.00	1874.87	1873.33	1876.66	27.27	10.73	512.41	1053.31
	700.000	153.08	1894.00	1886.00	1866.00	5500.00	1875.60	1873.33	1877.06	20.37	9.68	568.21	1218.51
*	710.000	424.60	.00	.00	1876.50	5500.00	1885.92	1885.92	1888.98	54.17	14.04	391.63	747.29
	720.000	498.02	.00	.00	1881.59	5500.00	1889.33	1889.33	1892.11	55.33	13.38	410.97	739.40
	730.000	480.56	.00	.00	1885.10	5500.00	1892.79	1892.79	1894.82	47.91	12.15	492.26	794.59
	740.000	492.38	.00	.00	1889.35	5500.00	1897.85	1897.85	1900.93	54.89	14.08	390.66	742.38
	750.000	391.69	.00	.00	1893.44	5500.00	1901.81	1901.81	1904.64	55.81	13.50	407.50	736.20
	760.000	428.24	.00	.00	1898.23	5500.00	1906.02	1906.02	1908.81	56.30	13.40	410.34	733.03

SECNO	XLOB	ELTRO	ELTC	ELMIN	Q	CWSEL	CRIWS	EG	10**KS	VOH	AREA	.01K
770.000	434.78	.00	.00	1903.20	5500.00	1909.77	1909.77	1912.24	56.52	12.59	436.79	731.56
780.000	49.44	.00	.00	1903.78	5500.00	1910.50	1910.50	1913.90	23.47	14.79	371.91	1135.21
790.000	108.02	1917.12	1913.12	1905.10	5500.00	1914.73	.00	1916.39	7.91	10.33	532.29	1955.06
800.000	95.80	.00	.00	1904.86	5500.00	1915.17	1912.90	1916.55	28.30	9.43	590.89	1033.90
810.000	185.09	.00	.00	1905.36	5500.00	1916.65	1914.06	1916.89	6.95	4.99	1547.86	2086.34

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.000	6400.00	1708.70	.00	.00	3.70	119.45	.00
	20.000	6400.00	1710.73	.00	2.03	.00	114.06	488.53
	30.000	6400.00	1713.36	.00	2.63	.00	125.10	498.03
	40.000	6400.00	1716.27	.00	2.91	.00	154.35	491.57
*	50.000	6400.00	1718.36	.00	2.09	.00	142.96	305.60
*	60.000	6400.00	1719.67	.00	1.31	.00	396.87	499.27
*	70.000	6400.00	1719.53	.00	-.14	.00	97.17	497.95
*	80.000	6400.00	1723.21	.00	3.68	.00	115.23	470.68
	90.000	6400.00	1724.77	.00	1.56	.00	110.73	482.19
	100.000	6400.00	1726.42	.00	1.65	.00	104.36	295.13
	110.000	6400.00	1725.79	.00	-.62	.00	106.34	25.69
*	120.000	6400.00	1726.69	.00	.90	.00	107.00	90.11
*	130.000	6400.00	1729.52	.00	2.83	.00	107.00	119.69
	140.000	6400.00	1729.45	.00	-.07	.00	115.91	64.14
*	150.000	6300.00	1729.99	.00	.54	.00	124.87	489.94
	160.000	6300.00	1732.11	.00	2.12	.00	132.85	501.51
*	170.000	6300.00	1733.34	.00	1.23	.00	130.75	487.26
	180.000	6300.00	1735.21	.00	1.87	.00	127.87	491.83
*	190.000	6300.00	1739.49	.00	4.28	.00	108.37	497.74
*	200.000	6300.00	1742.86	.00	3.37	.00	104.30	495.37
*	210.000	6300.00	1746.83	.00	3.97	.00	83.71	500.38
*	220.000	6300.00	1751.93	.00	5.10	.00	91.27	476.72
*	230.000	6300.00	1758.40	.00	6.47	.00	86.22	494.76
	240.000	6300.00	1762.61	.00	4.21	.00	116.82	492.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	6300.00	1763.05	.00	.43	.00	110.08	58.60
*	260.000	6300.00	1766.97	.00	3.93	.00	128.59	1.00
*	270.000	6300.00	1766.86	.00	-.12	.00	104.80	21.92
*	280.000	6300.00	1770.89	.00	4.03	.00	105.61	1.00
*	290.000	6300.00	1771.41	.00	.52	.00	102.93	14.95
*	300.000	6300.00	1773.08	.00	1.67	.00	103.02	102.75
	310.000	6300.00	1773.02	.00	-.06	.00	131.04	100.28
*	320.000	6300.00	1775.83	.00	2.81	.00	114.58	489.10
*	330.000	6300.00	1778.86	.00	3.04	.00	110.82	500.10
*	340.000	6300.00	1781.85	.00	2.99	.00	112.87	496.21
*	350.000	6300.00	1783.84	.00	1.99	.00	99.87	436.71
*	360.000	6300.00	1786.06	.00	2.22	.00	100.08	314.29
*	370.000	6300.00	1787.76	.00	1.70	.00	110.15	232.15
	380.000	6300.00	1793.10	.00	5.34	.00	60.09	170.96
*	390.000	6300.00	1794.92	.00	1.82	.00	58.10	420.90
*	400.000	6300.00	1796.14	.00	1.21	.00	60.99	216.12
*	410.000	6300.00	1798.24	.00	2.10	.00	75.96	222.64
*	420.000	6300.00	1800.71	.00	2.47	.00	149.83	218.15
*	430.000	6300.00	1802.81	.00	2.10	.00	37.75	221.27
*	440.000	6300.00	1803.85	.00	1.04	.00	37.75	197.38
	450.000	5800.00	1808.34	.00	4.49	.00	76.55	163.47
	460.000	5800.00	1809.29	.00	.95	.00	93.66	285.08
*	470.000	5800.00	1810.29	.00	1.00	.00	64.43	275.07
*	480.000	5800.00	1813.82	.00	3.53	.00	71.96	29.16
*	490.000	5800.00	1815.20	.00	1.38	.00	77.64	404.91
	500.000	5800.00	1819.00	.00	3.81	.00	79.43	467.90

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	510.000	5800.00	1822.04	.00	3.03	.00	205.18	413.47
	520.000	5800.00	1823.95	.00	1.92	.00	105.06	477.37
*	530.000	5800.00	1826.78	.00	2.83	.00	95.65	399.20
*	540.000	5800.00	1831.76	.00	4.97	.00	84.49	489.72
*	550.000	5800.00	1836.66	.00	4.90	.00	92.74	456.26
	560.000	5800.00	1839.50	.00	2.85	.00	90.56	330.24
	570.000	5800.00	1841.04	.00	1.54	.00	64.87	228.38
*	580.000	5800.00	1840.94	.00	-.10	.00	64.22	1.00
*	590.000	5800.00	1841.30	.00	.36	.00	53.84	15.77
*	600.000	5800.00	1844.44	.00	3.13	.00	53.84	93.51
*	610.000	5800.00	1852.30	.00	7.87	.00	131.09	215.38
*	620.000	5800.00	1855.31	.00	3.01	.00	141.80	212.31
	630.000	5800.00	1857.66	.00	2.34	.00	153.98	221.03
	640.000	5800.00	1860.65	.00	3.00	.00	66.64	258.21
*	650.000	5800.00	1861.00	.00	.34	.00	52.67	211.31
*	660.000	5800.00	1865.34	.00	4.34	.00	52.67	191.78
*	670.000	5500.00	1866.49	.00	1.15	.00	71.51	452.82
*	680.000	5500.00	1871.82	.00	5.33	.00	63.15	461.54
*	690.000	5500.00	1874.87	.00	3.06	.00	75.49	422.90
	700.000	5500.00	1875.60	.00	.73	.00	78.39	153.08
*	710.000	5500.00	1885.92	.00	10.31	.00	64.41	424.60
*	720.000	5500.00	1889.33	.00	3.42	.00	75.25	498.02
*	730.000	5500.00	1892.79	.00	3.46	.00	127.21	480.56
*	740.000	5500.00	1897.85	.00	5.06	.00	64.13	492.38
*	750.000	5500.00	1901.81	.00	3.96	.00	74.23	391.69
	760.000	5500.00	1906.02	.00	4.21	.00	76.05	428.24

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
770.000	5500.00	1909.77	.00	3.75	.00	90.26	434.78
780.000	5500.00	1910.50	.00	.73	.00	55.33	49.44
790.000	5500.00	1914.73	.00	4.23	.00	55.33	108.02
800.000	5500.00	1915.17	.00	.44	.00	94.47	95.80
810.000	5500.00	1916.65	.00	1.48	.00	353.45	185.09

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 50.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 80.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 130.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 130.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 170.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 170.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 190.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 210.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 210.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 220.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 230.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 230.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 240.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO= 260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 270.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 270.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 280.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 280.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 300.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 300.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 320.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 320.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 330.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 350.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 350.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 360.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 360.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 370.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 370.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 380.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 410.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 410.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 420.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 420.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 430.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 440.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.

[redacted] SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

[redacted]G SECNO= 490.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 510.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 510.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 540.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 550.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 550.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 580.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 580.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 590.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 590.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 600.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 610.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 610.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]N SECNO= 620.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
JTION SECNO= 620.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 630.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 630.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 640.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 650.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 650.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 660.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 670.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 670.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 680.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 680.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 690.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 710.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 710.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]
CAUTION SECNO= 720.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

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 ION SECNO=    720.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

AUTION SECNO=    730.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
AUTION SECNO=    730.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

AUTION SECNO=    740.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
AUTION SECNO=    740.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

AUTION SECNO=    750.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
AUTION SECNO=    750.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

AUTION SECNO=    760.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
AUTION SECNO=    760.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

AUTION SECNO=    770.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
AUTION SECNO=    770.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    780.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    780.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    790.000  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=    790.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    800.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    810.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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B.1.3 FIS Restudy Corrected HEC-2 Model

Corrected Effective Model (Pre-Project Conditions)
Subcritical Flow HEC-2 Output File (NAVD88)

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    01JUL03    TIME   14:17:43 *
 *****************************************
```

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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

THIS RUN EXECUTED 01JUL03 14:17:43

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 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 ************************************
```

```
T1      REQUEST FOR LETTER OF MAP REVISION - FLAMINGO WASH
T2      CORRECTED EFFECTIVE MODEL
T3      DATUM = NAVD88
T4      ORIGINAL MODEL CREATED BY GC WALLACE INC FOR FLAMINGO WASH FIS RESTUDY
T4      ELEVATIONS RAISED BY BERGER 2.26 FEET TO CONVERT FROM NGVD 29 TO NAVD 88
T4      FILE: 879-F-C-SUB.DAT
T4      STARTING WSE = 1707.26
T4      SUBCRITICAL RUN
T4      CONCRETE CHANNEL LINING BETWEEN D.I. ROAD & MOJAVE ROAD
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.004			6400	1707.26	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1				-2	-6		

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

100 150

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NC      0.03        0.03        0.03        0.1         0.3
* FIELD X1.9 MODIFIED BY LBG
* 2.26 REPRESENTS DATUM CONVERSION FROM NGVD 29 TO NAVD 88
X1         10          18        1000     1126.64
GR       1710        1000     1710.07     1002.71        1710     1003.06        1708     1012.39        1706        1021.7
GR       1704     1031.01        1702     1040.32     1701.54     1042.48     1700.33      1049.9     1700.55      1089.4
GR       1702     1095.84        1704     1104.89        1706     1114.24        1708     1123.66      1708.6     1126.64
GR       1710     1152.79     1710.41     1160.64        1712     1288.04

NC      0.03        0.03        0.03
X1         20          17     1182.02     1322.04      483.22      497.54      488.53
GR       1712        1000     1711.97     1182.02        1710     1190.86        1708     1199.75        1706     1208.56
GR       1704     1217.31     1703.12     1221.12     1703.59     1267.53        1704     1269.51        1706     1279.06
GR       1708      1288.6        1710     1298.12     1711.95     1307.42        1712      1307.8     1713.45     1322.04
GR     1712.7     1343.21      1713.7     1500.75

NC      0.03        0.03        0.03
X1         30          16     1053.23     1154.72      494.86      503.84      498.03
GR     1714.3        1000        1714     1012.26     1712.41     1053.23        1712     1055.19        1710     1064.74
GR       1708     1074.25        1706     1083.68     1705.86     1084.33     1705.85     1124.71        1706     1125.31
GR       1708     1133.14        1710     1140.87        1712     1148.55     1713.61     1154.72        1714     1175.89
GR     1715.8     1316.21

NC      0.03        0.03        0.03
X1         40          20     1146.2     1238.76      500.14      481.13      491.57
GR       1718        1000     1717.12     1101.53        1716     1146.2     1715.85     1152.03        1714     1159.77
GR       1712     1168.18        1710     1176.59        1708     1185.01     1707.75     1186.07     1707.38     1196.73
GR     1707.2     1216.01        1708     1218.57        1710     1225.27        1712     1231.97        1714     1238.76
GR     1714.1     1239.39        1716     1283.03     1716.17     1284.32     1716.77     1316.26        1718     1327.96

NC      0.03        0.03        0.03
X1         50          21     1066.67     1235.55      334.29      277.63       305.6
GR       1723        1000        1722     1020.92     1721.42     1037.11     1720.56     1066.67        1720     1068.75
GR       1718      1076.4        1716     1084.26        1714     1092.32        1712     1100.45        1710     1108.62
GR     1708.9     1112.98        1709     1152.91        1710     1158.04        1712     1168.25        1714     1178.41
GR     1714.6     1181.82        1716     1195.46     1717.14      1207.5        1718     1214.02        1720     1235.55
GR       1720     1249.78

NC      0.03        0.03        0.03
X1         60          31     1120.14     1223.41      499.62       502.1      499.27
GR       1720        1000     1718.36     1013.98        1718     1035.26     1717.58     1105.92        1718     1119.77
GR       1718     1120.01     1718.01     1120.14        1716     1128.57        1714      1136.9        1712     1145.29
GR     1710.1     1153.14        1710     1183.08     1709.94     1194.72        1710     1194.99        1712     1203.55
GR       1714     1212.13        1716     1220.71     1716.63     1223.41     1717.35     1277.47     1718.05     1286.74
GR       1718     1287.48        1718     1296.95     1717.48     1310.09        1718     1314.87     1718.69     1321.04
GR       1718     1336.07     1717.62     1343.02        1718     1362.12     1718.73     1381.28      1718.4     1394.59
GR       1720     1400.91

NC      0.03        0.03        0.03
X1         70          17      1084.1     1197.56      493.27      498.08      497.95
GR     1723.3        1000     1723.69      1084.1        1722     1090.63        1720     1098.35        1718     1106.05
GR       1716     1113.75        1714     1121.45        1712     1129.17        1712     1129.24        1712     1129.36
GR     1712.6     1169.17        1714     1174.59        1716      1182.8        1718     1191.03     1719.59     1197.56
GR       1720     1230.27     1720.07     1233.61
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NC	0.03	0.03	0.03							
X1	80	18	1147.29	1269.91	455.76	481.96	470.68		2.26	
GR	1726	1000	1725.4	1007.66	1724.07	1115.85	1724	1116.84	1723.19	1147.29
GR	1722	1152.02	1720	1159.92	1718	1167.78	1716	1175.62	1714.38	1181.94
GR	1714.9	1227.68	1716	1232.07	1718	1240.31	1720	1248.54	1722	1256.76
GR	1724	1264.99	1725.21	1269.91	1724.85	1287.78				
NC	0.03	0.03	0.03							
X1	90	20	1056.45	1168.18	495.14	465.14	482.19		2.26	
GR	1726	1000	1725.75	1009.38	1724.96	1031.29	1724.64	1056.45	1724	1058.67
GR	1722	1065.64	1720	1072.62	1718	1079.6	1716	1086.6	1715.19	1089.42
GR	1716	1103.03	1717.15	1124.51	1718	1128.2	1720	1136.83	1722	1145.32
GR	1724	1153.73	1726	1162.18	1727.42	1168.18	1728	1186.62	1728.02	1187.5
NC	0.03	0.03	0.03							
X1	100	25	1022.27	1132.68	289.86	299.75	295.13		2.26	
GR	1732	1000	1732	1001	1732.08	1001.22	1730	1011.88	1728	1022.27
GR	1727.6	1024.44	1726	1027.45	1724	1031.2	1722	1034.85	1720	1038.4
GR	1718.7	1040.93	1719.04	1047.62	1718.99	1102.02	1719.04	1118.34	1720	1119.65
GR	1722	1123	1724	1126.5	1726	1130.15	1727.26	1132.68	1727.45	1139.16
GR	1728	1142.93	1728.68	1147.57	1730	1157.98	1730.09	1158.86	1730	1162.48
NC	0.03	0.03	0.015							
X1	110	21	1022.67	1137.41	25.99	26.18	25.69		2.26	
GR	1732.5	1000	1732	1002.64	1730	1012.69	1728	1022.67	1727.56	1024.87
GR	1726	1027.45	1724	1030.85	1722	1034.42	1720.5	1036.37	1720.5	1099.9
GR	1720.5	1122.88	1720.5	1123.19	1720.5	1123.29	1722	1126.96	1724	1130.74
GR	1726	1134.53	1727.52	1137.41	1728	1142.14	1729.05	1148.68	1730	1154.29
GR	1731.7	1164.66								
NC	0.03	0.03	0.015							
X1	120	7	1029.49	1136.49	88.77	93.13	90.11		2.26	
X3	10			1029.49	1732.26	1136.49	1732.26			
GR	1730.3	1000	1730	1006.09	1728	1029.49	1721.9	1029.49	1721.9	1136.49
GR	1728	1136.49	1728	1146.34						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	145	107	7	500	0	1724.79	1724.16
X1	130	8	1035.81	1142.81	120.77	117.86	119.69		2.26	
X2			1	1729.79	1733.69			1.33		
X3	10			1035.81	1733.26	1142.81	1733.26			
GR	1728.6	1000	1728.71	1018.83	1728	1035.81	1722.53	1035.81	1722.53	1142.81
GR	1728	1142.81	1728.87	1157.29	1728.69	1174.35				
NC	0.02	0.02	0.015							
X1	140	13	1149.72	1265.63	64.74	64.09	64.14		2.26	
X3	10			1149.72	1732.26	1265.63	1732.26			
GR	1729.5	1000	1728.41	1149.72	1728	1150.76	1726	1155.81	1724	1161.07
GR	1722.8	1165.81	1722.6	1250.59	1724	1254.37	1726	1259.66	1728	1264.74
GR	1728.3	1265.63	1728.8	1316.23	1728.18	1343.83				
NC	0.02	0.02	0.02							
QT	1	6300								
X1	150	18	1018.39	1152.46	491.39	488.88	489.94		2.26	
GR	1732	1000	1731.69	1018.39	1730	1024.12	1728	1030.88	1726.48	1035.9
GR	1726.1	1066.83	1726	1067.43	1724.2	1074.87	1724	1083.96	1723.53	1107.26

GR	1724	1108.86	1725.23	1113.02	1726	1135.88	1725.99	1136.31	1728	1142.71
GR	1730	1149.03	1731.09	1152.46	1731.43	1169.72				
NC	0.02	0.02	0.02							
X1	160	22	1042.38	1195.86	501.43	502.7	501.51		2.26	
GR	1734	1000	1734.52	1002.52	1734	1015.73	1733.26	1042.38	1732	1045.87
GR	1730	1051.46	1728	1057.16	1727.61	1058.29	1727.59	1089.49	1726.47	1097.9
GR	1726	1115.47	1725.61	1127.39	1726	1131.14	1727.46	1145.07	1728	1162.54
GR	1728.2	1169.98	1730	1173.77	1732	1178.13	1733.38	1181.15	1734	1195.86
GR	1734.2	1200.57	1735.81	1203.67						
NC	0.02	0.02	0.02							
X1	170	20	1042.95	1183.42	486.67	487.82	487.26		2.26	
GR	1734.6	1000	1735.53	1003.78	1734.5	1042.95	1734	1044.42	1732	1050.31
GR	1730	1056.26	1728.7	1060.18	1728.42	1095.07	1728	1097.52	1727.66	1099.65
GR	1727.3	1123.92	1728	1128.46	1729.82	1140.57	1730	1146.01	1730.66	1167.12
GR	1732	1172.19	1734	1179.55	1735.09	1183.42	1735.4	1201.5	1736	1203.33
NC	0.02	0.02	0.02							
X1	180	19	1037.9	1178.31	490.6	492.37	491.83		2.26	
GR	1738.4	1000	1738	1017.86	1736.58	1037.9	1736	1039.45	1734	1044.91
GR	1732	1050.47	1730.22	1055.47	1730.42	1062.62	1730	1097.25	1729.6	1099.77
GR	1730	1119.42	1730.04	1121.41	1731.15	1155.75	1732	1158.51	1734	1165.22
GR	1736	1172.22	1737.72	1178.31	1738	1187.42	1738.27	1197.86		

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NC	0.02	0.02	0.02							
X1	190	22	1000	1121.49	499.18	497.1	497.74		2.26	
GR	1743.5	950.33	1742.46	998.69	1742	1000	1740	1005.6	1738	1011
GR	1736	1016.29	1735.23	1018.97	1734.5	1040.24	1734	1042.17	1732.79	1046.61
GR	1732.9	1078.44	1734	1082	1734.71	1084.43	1736	1101.82	1736.3	1105.68
GR	1738	1110.9	1740	1116.85	1741.63	1121.49	1742	1135.5	1742.24	1142.58
GR	1742	1143.57	1741.64	1144.92						
NC	0.02	0.02	0.02							
X1	200	22	1000	1122.87	494.16	496.56	495.37		2.26	
GR	1748.8	956.38	1748	992.25	1747.84	995.39	1746	1000	1744	1004.98
GR	1742	1009.94	1740	1014.87	1738	1019.77	1737.9	1020.02	1737.52	1027.73
GR	1736.7	1037.66	1736.7	1061.55	1737.76	1074.9	1738	1083.37	1738.49	1103
GR	1740	1106.13	1742	1110.31	1744	1114.5	1746	1118.68	1748	1122.87
GR	1748.4	1123.7	1748.36	1144.3						
NC	0.02	0.02	0.02							
X1	210	25	1000	1113.22	499.74	500.05	500.38		2.26	
GR	1752	951.7	1752	1000	1750	1005.42	1748	1010.97	1746	1016.52
GR	1744	1022.03	1742	1027.65	1741.66	1028.59	1740.5	1037.62	1740	1039.36
GR	1738	1047.1	1737.52	1048.91	1737.8	1061.69	1738	1062.13	1740	1067.4
GR	1741.2	1071.1	1742	1079.44	1742.89	1088.66	1744	1091.26	1746	1095.98
GR	1748	1100.7	1750	1105.41	1752	1110.13	1753.31	1113.22	1753.21	1141.88
NC	0.02	0.02	0.02							
X1	220	26	1041.51	1160.79	464.69	489.34	476.72		2.26	
GR	1759.7	1000	1759.83	1041.51	1758	1045.1	1756	1049.03	1754	1052.95

GR	1752	1056.86	1750	1060.75	1748	1064.59	1747.25	1066.03	1746.15	1087.16
GR	1746	1087.54	1744.18	1092.6	1744	1106.98	1744	1109.94	1743.96	1110.03
GR	1745.8	1113.56	1746	1116.26	1748	1139.68	1747.99	1139.83	1750	1144.13
GR	1752	1148.41	1754	1152.7	1756	1156.99	1757.77	1160.79	1758	1173.7
GR	1758.3	1199.32								
NC	0.02	0.02	0.02							
X1	230	28	1034.85	1169.03	490.46	498.91	494.76		2.26	
GR	1763.6	1000	1763.36	1034.85	1762	1040.25	1761.13	1043.65	1760.31	1056.95
GR	1760	1057.18	1758	1062.98	1756	1068.2	1754	1073.41	1753.53	1074.65
GR	1752.6	1090.81	1752	1093.04	1750.12	1100.45	1750.12	1113.46	1751.49	1119.83
GR	1752	1124.28	1753.26	1136.24	1754	1137.93	1756	1142.51	1758	1147.1
GR	1760	1151.69	1761.94	1156.15	1762	1156.82	1763.75	1168.26	1764	1169.03
GR	1766	1176.57	1766.64	1178.93	1766.86	1205.52				
NC	0.02	0.02	0.02							
X1	240	29	1026.08	1194.47	496.31	488.69	492		2.26	
GR	1774.8	1000	1774.34	1026.08	1774	1026.81	1772	1030.67	1770	1034.53
GR	1768	1038.38	1766	1042.19	1764	1045.88	1762	1049.77	1760	1053.67
GR	1758	1057.57	1757.43	1059.06	1757.79	1143.57	1758	1145.62	1758.74	1152.68
GR	1759.2	1157.83	1760	1159.46	1762	1163.99	1764	1168.57	1766	1173.21
GR	1768	1177.84	1770	1181.98	1772	1185.85	1774	1189.72	1776	1193.59
GR	1776.4	1194.47	1776.87	1267.84	1776	1276.18	1775.49	1280.88		

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NC	0.02	0.02	0.015							
X1	250	24	1036.04	1171.85	57.45	58.44	58.6		2.26	
GR	1775.4	1000	1775.23	1020.11	1774	1022.51	1772	1025.97	1770	1029.5
GR	1768	1033.08	1766.5	1036.04	1766	1037.59	1764	1043.3	1762	1047.58
GR	1760	1050.92	1758	1053.04	1758.34	1154.39	1760	1154.67	1762	1155.12
GR	1764	1155.69	1766	1162.7	1766.67	1171.85	1768	1174.97	1770	1178.13
GR	1772	1180.86	1774	1183.9	1776	1187.8	1776.99	1190.22		
NC	0.02	0.02	0.015							
X1	260	20	1033.31	1171.52	1	1	1		2.26	
GR	1775.4	1000	1775.24	1020.49	1774	1022.9	1772	1026.35	1770	1029.81
GR	1768	1033.31	1767.3	1042.07	1766	1048.18	1764	1050.85	1762	1051.85
GR	1762	1154.61	1764	1155.13	1766	1155.64	1766.66	1171.52	1767.82	1173.98
GR	1768	1174.12	1770	1176.75	1772	1179.4	1774	1183.08	1776	1187.74
NC	0.02	0.02	0.015							
X1	270	20	1008.92	1116.05	33.84	8.99	21.92		2.26	
GR	1775.8	964	1775	1000	1774	1003.1	1772	1008.92	1772.04	1008.94
GR	1770	1009.59	1768	1010.24	1766	1010.83	1764	1011.18	1762	1011.54
GR	1762	1113.08	1762	1114.49	1762	1114.56	1764	1114.95	1766	1115.24
GR	1768	1115.55	1770	1115.92	1771.04	1116.05	1772	1122.67	1774	1132.66
NC	0.02	0.02	0.015							
X1	280	18	1044.87	1151.21	1	1	1		2.26	
GR	1775.8	1000	1775.02	1036.1	1774	1039.28	1772.37	1044.87	1772	1044.99
GR	1770	1045.65	1768	1046.31	1766	1047.17	1766	1103.57	1766.18	1146.5
GR	1766	1148.22	1766	1149.86	1768	1150.4	1770	1150.81	1772	1151.16
GR	1772.2	1151.21	1774.03	1160.57	1774	1160.65				

NC	0.02	0.02	0.015							
X1	290	7	1047.98	1151	14.68	12.7	14.95		2.26	
X3	10			1047.98	1777.26	1150.91	1777.26			
GR	1775.6	1000	1775.05	1036.02	1774	1047.98	1766.55	1047.98	1766.55	1151
GR	1774	1151	1774.77	1160.59						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	106	103.02	5.02	588	0	1769.18	1768.81
X1	300	8	1025.54	1128.56	102.54	98.55	102.75		2.26	
X2			1	1775.18	1779.18			1.33		
X3	10			1025.54	1777.45	1128.56	1777.82			
GR	1774.8	1000	1775.19	1017.87	1775.12	1025.54	1766.92	1025.54	1766.92	1128.56
GR	1775.1	1128.56	1775.56	1133.94	1775.35	1147.13				
NC	0.02	0.02	0.015							
X1	310	20	1022.98	1171.53	102.64	105.7	100.28		2.26	
GR	1776.8	1000	1776	1016.17	1775.68	1022.98	1774	1028.26	1772	1034.5
GR	1770	1040.77	1768.95	1044.12	1768	1047.77	1767.87	1048.18	1767.78	1072.14
GR	1767.8	1131.12	1768	1132.45	1768.79	1137.38	1768.62	1147.75	1770	1152.28
GR	1772	1158.91	1774	1165.6	1775.77	1171.53	1776	1177.59	1776.8	1198.8

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NC	0.02	0.02	0.02							
X1	320	20	1022.11	1155.09	489.89	487.69	489.1		2.26	
GR	1779.4	1000	1778.04	1022.01	1778	1022.11	1776	1030.73	1774	1039.26
GR	1772	1047.79	1770.85	1052.67	1770.51	1061.45	1770	1063.83	1769.24	1067.59
GR	1770	1104.76	1770.04	1107.08	1771.21	1112.55	1771.76	1130.75	1772	1131.67
GR	1774	1139.29	1776	1146.67	1777.98	1153.84	1778	1155.09	1779.33	1191.2
NC	0.02	0.02	0.02							
X1	330	21	1027.28	1156.48	500.62	500.93	500.1		2.26	
GR	1781	1000	1780.94	1027.28	1780	1031.83	1778	1041.53	1776	1051.25
GR	1774	1060.96	1773.4	1063.9	1773.58	1078.46	1772	1084.27	1771.79	1085.02
GR	1771.8	1109.74	1772	1110.11	1774	1116.37	1774.53	1118.12	1774.72	1134.82
GR	1776	1138.9	1778	1145.34	1780	1151.87	1781.4	1156.48	1782	1173.24
GR	1782.3	1189.26								
NC	0.02	0.02	0.02							
X1	340	19	1000	1116.66	496.19	495.64	496.21		2.26	
GR	1783.7	907.67	1782.39	1000	1782	1002.25	1780	1013.68	1778	1025.11
GR	1777	1030.73	1776.57	1040.34	1776	1043.31	1774.53	1051.15	1774.37	1080.76
GR	1776	1084.3	1778	1088.43	1778.07	1088.55	1778.69	1101.43	1780	1107.4
GR	1782	1116.66	1784	1125.98	1785.09	1131.04	1785.6	1161.06		
NC	0.02	0.02	0.02							
X1	350	22	1042.74	1155.28	460.23	420.27	436.71		2.26	
GR	1786	1000	1786.37	1024.16	1787.1	1042.74	1786	1046.9	1784	1054.53
GR	1782	1062.22	1780	1069.93	1778	1077.61	1776.25	1084.32	1778.03	1100.93
GR	1777.2	1111.98	1778	1120.32	1779.54	1134.41	1778.08	1145.13	1780	1148.5
GR	1782	1151.93	1784	1155.28	1784.22	1155.66	1785.25	1168.43	1786	1172.75
GR	1787.2	1179.81	1787.3	1201.99						

NC	0.02	0.02	0.02							
X1	360	26	1014.07	1129.57	341.79	294.05	314.29		2.26	
X3	10			1014.07	1794.26	1129.57	1794.26			
GR	1798	1000	1796	1005.44	1794	1009.82	1792	1014.07	1790	1018.52
GR	1788	1023.42	1787.25	1025.48	1786	1027.93	1784	1030.77	1782	1033.57
GR	1781.8	1036.36	1781.62	1056.13	1780.02	1067.23	1780	1073	1779.67	1111.44
GR	1780	1112.32	1782	1117.65	1784	1122.81	1786	1127.74	1786.74	1129.57
GR	1786.9	1190.42	1786.92	1217.35	1788	1239.83	1788.97	1260.98	1789.6	1274.74
GR	1790	1319.61								
NC	0.02	0.02	0.02							
SB		1.56	2.6	150	80		943	1.5	1783.94	1781.93
X1	370	26	1019.93	1180.43	188.4	272.56	232.15		2.26	
X2			1	1793.94	1805.42					
X3	10			1019.93	1802.26	1180.43	1802.26			
GR	1801.2	1000	1800	1006.14	1798	1012.48	1796	1019.93	1794	1026.84
GR	1792	1033.63	1790	1039.5	1788	1044.33	1787.04	1047.52	1786	1050.99
GR	1784	1063.28	1782.66	1069.39	1782	1116.66	1781.68	1141.49	1782	1142.19
GR	1784	1147.19	1786	1151.46	1787.43	1154.02	1788	1156.17	1790	1161.17
GR	1792	1166.33	1794	1173	1796	1180.43	1798	1186.39	1800	1192.83
GR	1800.7	1196.96								

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NC	0.03	0.03	0.02							
X1	380	14	1091.25	1151.34	174.12	176.08	170.96		2.26	
X3	10			1091.25	1796.26	1151.34	1796.26			
GR	1792	1090.66	1792.75	1091.25	1792	1091.78	1790	1093.21	1788	1094.63
GR	1786	1096.06	1785.68	1096.29	1785.8	1149.56	1786	1149.61	1788	1150.11
GR	1790	1150.6	1792	1151.08	1793.07	1151.34	1794	1227.86		
NC	0.03	0.03	0.02							
X1	390	21	1045.15	1103.45	420.9	420.21	420.9		2.26	
X3	10			1045.15	1799.26	1103.45	1799.26			
GR	1792.6	1000	1793.3	1031.19	1793.78	1040.57	1794	1041.52	1794.81	1045.15
GR	1794	1045.61	1792	1046.74	1790	1047.86	1788	1049.03	1787.41	1049.38
GR	1787.2	1074.16	1787.54	1100.36	1788	1100.54	1790	1101.34	1792	1102.12
GR	1794	1102.9	1795.44	1103.45	1795.23	1128.39	1795.21	1144.16	1796	1147.04
GR	1797.3	1153.05								
NC	0.03	0.03	0.02							
X1	400	18	1042.29	1103.68	216.05	217.6	216.12		2.26	
X3	10			1042.29	1799.26	1103.68	1799.26			
GR	1795.3	1000	1795.77	1024.49	1795.76	1038.23	1796	1040.26	1796.25	1042.29
GR	1796	1042.47	1794	1043.62	1792	1044.73	1790	1045.83	1789.06	1046.34
GR	1788.6	1075.55	1788.96	1100.77	1790	1101.12	1792	1101.81	1794	1102.54
GR	1796	1103.31	1796.96	1103.68	1796.49	1128.41				
NC	0.03	0.03	0.02							
X1	410	21	1041.49	1100.98	236.79	212.87	222.64		2.26	
GR	1799	1000	1799.04	1002.09	1799.01	1019.84	1798	1026.7	1797.57	1029.5
GR	1797.2	1041.49	1796	1044.75	1794	1049.87	1792	1054.82	1790	1059.57
GR	1789.3	1061.07	1789.8	1078.69	1790	1092.24	1790.1	1099.54	1792	1099.88
GR	1794	1100.24	1796	1100.6	1798	1100.94	1798.24	1100.98	1798.57	1108.1

GR	1799.4	1170.81								
NC	0.03	0.03	0.02							
X1	420	24	1148.62	1204.8	228.48	213.43	218.15		2.26	
GR	1805.1	1000	1804.85	1087.59	1804.56	1107.49	1804	1110.27	1802	1120.11
GR	1800	1129.91	1799.62	1132.29	1798.49	1148.62	1798	1150.2	1796	1155.64
GR	1794	1161.15	1792	1166.99	1790.86	1170.59	1791.29	1186.61	1790.88	1202.56
GR	1792	1202.83	1794	1203.37	1796	1203.9	1798	1204.44	1799.34	1204.8
GR	1800	1213.14	1800	1213.21	1800.65	1276.28	1800.8	1276.28		
NC	0.03	0.03	0.015							
X1	430	6	1034.79	1072.54	228.08	218.61	221.27		2.26	
X3	10			1034.79	1807.26	1072.54	1807.26			
GR	1804.5	1000	1804.31	1034.79	1793.29	1034.79	1793.29	1072.54	1803.82	1072.54
GR	1803.7	1113.05								
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	78	37.75	1.75	246	0	1796.56	1795.55
X1	440	9	1048.13	1085.88	183.21	206.01	197.38		2.26	
X2			1	1803.56	1804.64			1.33		
X3	10			1048.13	1807.26	1085.88	1807.26			
GR	1804	1000	1803.68	1007.43	1803.75	1048.13	1794.3	1048.13	1794.3	1085.88
GR	1803.7	1085.88	1803.91	1101.01	1804	1103.62	1805.3	1113.11		

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NC	0.025	0.025	0.04							
QT	1	5800								
X1	450	23	1056.87	1133.42	163.22	162.13	163.47		2.26	
X3	10			1056.87	1811.26	1133.42	1811.26			
GR	1804	1000	1804.07	1006.32	1804.32	1034.41	1804.73	1043.05	1804.96	1056.87
GR	1804	1058.72	1802	1062.07	1800	1065.72	1798	1069.89	1796	1074.12
GR	1795.5	1075.14	1796	1079.17	1797.92	1096.15	1798	1097.82	1799.19	1110.76
GR	1800	1121.55	1802	1125.68	1804	1129.41	1806	1133.42	1806.22	1133.91
GR	1806.3	1148.02	1806.93	1155.61	1806.39	1170.62				
NC	0.025	0.025	0.04							
X1	460	23	1048.18	1141.84	281.81	289.57	285.08		2.26	
X3	10			1048.18	1812.26	1141.84	1812.26			
GR	1808	1000	1808.02	1003.22	1808	1005.04	1807.55	1048.18	1806	1052.89
GR	1804	1059.32	1802.11	1065.59	1802	1067.54	1800.57	1088.15	1800	1090.66
GR	1798	1099.31	1797.57	1101.27	1797.83	1115.39	1798	1115.66	1800	1118.79
GR	1802	1121.96	1804	1125.23	1804.77	1126.62	1805.59	1139.81	1806	1140.19
GR	1808.4	1141.84	1808	1142.64	1808	1161.75				
NC	0.025	0.025	0.04							
X1	470	20	1035.45	1104.62	277.36	272.97	275.07		2.26	
X3	10			1035.45	1814.26	1104.62	1814.26			
GR	1810.7	1000	1810.44	1019.05	1811.3	1035.45	1810	1039.08	1808	1044.69
GR	1806	1050.13	1804	1055.32	1802	1061.49	1800.02	1066.39	1800	1067.21
GR	1799.3	1081.38	1800	1082.49	1802	1085.74	1804	1089.17	1806	1092.65
GR	1806.1	1092.79	1808	1096.72	1810	1100.89	1810.59	1104.62	1810.87	1120.75
NC	0.025	0.025	0.04							

SB		1.56	2.6	100	20		288	2	1801.93	1801.55
X1	480	23	1049.96	1121.92	29.43	28.85	29.16		2.26	
X2			1	1810.26	1813.56					
X3	10			1049.96	1817.26	1121.92	1817.26			
GR	1810.8	1000	1810.29	1022.32	1810.42	1043.96	1811.06	1049.96	1810	1052.71
GR	1808	1057.64	1806	1063.42	1804	1071.44	1802	1076.07	1800.34	1079.25
GR	1800	1088.82	1799.67	1097.89	1800	1098.19	1802	1100.01	1804	1101.93
GR	1806	1109.03	1808	1115.05	1810	1119.54	1810.67	1121.92	1811.24	1130.7
GR	1810	1145.14	1809.57	1148.54	1809.64	1162.76				
NC	0.025	0.025	0.04							
X1	490	27	1050.08	1127.64	421.17	376.41	404.91		2.26	
X3	10			1050	1818.26	1127.64	1818.26			
GR	1816	1000	1816.02	1001.56	1814.9	1019.89	1814.74	1038.47	1815.04	1050.08
GR	1814	1052.5	1812	1057.09	1810	1061.66	1808	1066.16	1806	1070.64
GR	1804	1075.1	1803.66	1075.85	1804	1083.12	1804.15	1088.63	1806	1092.46
GR	1808	1096.8	1810	1101.52	1810.26	1101.82	1810	1113.29	1809.88	1118.54
GR	1810	1119.08	1812	1125.39	1812.71	1127.64	1812.65	1132.54	1812.36	1149.58
GR	1812.4	1162.71	1812.58	1182.47						

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NC	0.025	0.025	0.04							
X1	500	27	1035.57	1117.1	475.67	455.34	467.9		2.26	
X3	10			1035.57	1823.26	1117.1	1823.26			
GR	1820.6	1000	1820.49	1017.79	1820	1035.57	1820.01	1036.35	1818	1038.99
GR	1816	1041.72	1814	1044.53	1812	1047.45	1810	1050.47	1808	1053.53
GR	1807.5	1054.17	1808	1059.53	1808.27	1062.4	1810	1077.16	1811.11	1085.69
GR	1812	1088.38	1814	1094.42	1816	1100.48	1817.15	1103.98	1818	1112.84
GR	1818.4	1117.1	1818	1130.34	1817.52	1146.76	1817.56	1162.65	1817.78	1176.1
GR	1818	1181.93	1818.33	1189.71						
NC	0.02	0.02	0.03							
X1	510	21	1051.63	1118	410.79	403.61	413.47		2.26	
GR	1822.7	1000	1822	1014.17	1821.1	1051.63	1820	1053.73	1818	1057.54
GR	1816	1061.35	1814	1065.16	1812	1068.96	1811.08	1070.77	1810.29	1084.94
GR	1812	1091.3	1814	1098.08	1816	1104.27	1818	1110.29	1820	1116.14
GR	1820.6	1118	1821.24	1184.8	1821.07	1201.95	1821.84	1211.83	1822	1218.61
GR	1822.5	1218.61								
NC	0.02	0.02	0.03							
X1	520	29	1020.76	1156.45	494.67	471.93	477.37		2.26	
GR	1830.9	1000	1830	1005.42	1829.57	1007.86	1828.53	1020.76	1828	1022.81
GR	1826	1030.61	1824	1038.4	1822	1046.19	1820	1053.98	1818.67	1059.18
GR	1818.1	1072.9	1818	1073.42	1816	1079.92	1814.82	1084.01	1816	1106.79
GR	1816.3	1112.44	1817.17	1120.26	1818	1123.13	1820	1130.03	1822	1136.92
GR	1824	1143.81	1825.52	1149.11	1826	1150.07	1828	1153.82	1829.41	1156.45
GR	1828	1169.03	1830	1185.2	1832	1235.46	1832.56	1257.15		
NC	0.02	0.02	0.03							
X1	530	25	1016.88	1152.68	371.54	424.3	399.2		2.26	
GR	1832	1000	1831.88	1004.01	1831.69	1016.88	1830	1021.18	1828	1026.26
GR	1826	1031.34	1824	1036.37	1822.35	1040.5	1822.35	1059.95	1822	1060.65
GR	1820	1064.77	1818	1068.85	1817.83	1069.21	1817.62	1090.03	1818	1090.71

GR	1820	1093.58	1822	1096.4	1823.81	1099.05	1824	1102.34	1826	1121.49
GR	1828	1130.45	1828.88	1133.79	1830	1143.91	1830.93	1152.68	1831.19	1159.85
NC	0.02	0.02	0.03							
X1	540	26	1018.16	1117.46	460.35	522.62	489.72		2.26	
GR	1834.9	1000	1834.9	1018.16	1834	1020.8	1832	1026.45	1830	1031.95
GR	1828	1037.42	1827.86	1037.75	1828	1041.19	1828.5	1054.97	1828	1055.74
GR	1826	1058.87	1824	1062.02	1823.45	1062.88	1823.47	1092.33	1824	1093.02
GR	1826	1095.58	1828	1098.1	1828.7	1098.97	1828.48	1106.52	1830	1108.88
GR	1832	1111.99	1834	1115.1	1835.51	1117.46	1836	1133.36	1836.3	1144.44
GR	1836.7	1152.23								
NC	0.02	0.02	0.03							
X1	550	28	1021.09	1124.94	438.1	474.94	456.26		2.26	
GR	1840.1	1000	1840	1001.92	1839.99	1006.32	1839.32	1021.09	1838	1024.57
GR	1836	1029.84	1833.93	1035.32	1834	1035.34	1833.46	1054.03	1832	1056.65
GR	1830	1060.26	1828	1063.9	1826.66	1066.34	1826.79	1083.14	1828	1085.42
GR	1830	1089.19	1832	1092.91	1834.1	1096.67	1834	1097.34	1834	1105.63
GR	1834	1111.84	1833.95	1114.36	1836	1119.24	1838	1124.12	1838.31	1124.94
GR	1839.6	1150.68	1840	1160.26	1840.11	1162.86				

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NC	0.02	0.02	0.03							
X1	560	32	1011.15	1130.99	332.03	327.26	330.24		2.26	
GR	1847.8	1000	1846.27	1003.9	1846	1006.41	1845.43	1011.15	1844	1015.37
GR	1842	1021.39	1840	1027.57	1838	1033.9	1836.1	1039.95	1836	1045.57
GR	1835.9	1053.25	1834	1056.42	1832	1059.77	1830	1063.2	1829.01	1064.93
GR	1828	1072.16	1827.85	1073.13	1828	1074.51	1828.64	1080.27	1830	1082.3
GR	1832	1085.3	1834	1088.32	1836	1091.45	1836.23	1091.7	1836.22	1110.34
GR	1838	1115.46	1840	1121.18	1842	1126.85	1843.5	1130.99	1844	1135.55
GR	1845.8	1151.17	1845.91	1156.17						
NC	0.02	0.02	0.03							
X1	570	31	1064.51	1140.01	229.29	230.35	228.38		2.26	
GR	1847.9	1000	1846	1056.21	1845.65	1064.51	1844	1065.7	1842	1067.16
GR	1840	1068.62	1838	1070.08	1836	1071.54	1834	1072.98	1832	1073.78
GR	1832	1074.63	1832	1075.05	1832	1084.35	1832	1091.24	1831.69	1120.28
GR	1832	1120.51	1832	1120.78	1832	1121.95	1834	1124.47	1836	1126.81
GR	1838	1129.15	1840	1131.49	1842	1133.85	1844	1136.23	1846	1138.69
GR	1847	1140.01	1847.35	1156.32	1848	1159.82	1849.6	1168.44	1850	1170.12
GR	1850.7	1172.42								
NC	0.02	0.02	0.015							
X1	580	30	1055.05	1128.8	1	1	1		2.26	
GR	1847.7	1000	1847.49	1012.37	1846	1049.98	1845.83	1055.05	1844	1056.21
GR	1842	1057.48	1840	1058.71	1838	1059.87	1836	1060.93	1834	1061.78
GR	1834	1062.46	1834	1063.07	1834	1063.47	1834	1064.19	1834	1080.22
GR	1834	1109.26	1834	1109.31	1834	1114.45	1836	1116.75	1838	1119.03
GR	1840	1121.3	1842	1123.52	1844	1125.65	1846	1127.71	1847.09	1128.8
GR	1847.5	1145.88	1848	1148.67	1849.67	1157.77	1850	1158.89	1851.05	1161.45
NC	0.02	0.02	0.015							
X1	590	11	1031.2	1085.04	16.02	16.7	15.77		2.26	

X3	10			1031.2	1850.26	1085.04	1850.26			
GR	1847.3	1000	1847.01	1010.93	1846.27	1031.2	1834.21	1031.2	1834.21	1085.04
GR	1846.2	1085.04	1847.07	1099.88	1848	1120.18	1849.73	1131.49	1850	1132.09
GR	1851.3	1134.18								
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	60	53.84	3.84	400	0	1837.39	1836.47
X1	600	15	1081.85	1135.69	93.41	94.92	93.51		2.26	
X2			1	1845.39	1848.76			1.33		
X3	10			1081.85	1850.26	1135.69	1850.26			
GR	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
GR	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
GR	1835.1	1081.85	1835.13	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43
NC	0.02	0.02	0.015							
X1	610	20	1083.2	1136.14	230.78	201.73	215.38		2.26	
X3	10			1061.48	1855.26	1207.54	1855.26			
GR	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
GR	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
GR	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
GR	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54

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NC	0.02	0.02	0.015							
X1	620	20	1033.45	1086.27	223.64	202.43	212.31		2.26	
GR	1859.3	1000	1858	1007.7	1857.16	1012.48	1856	1018.28	1855.25	1022.06
GR	1855.4	1033.45	1854	1035.35	1852	1037.9	1850	1040.44	1848	1042.97
GR	1846	1045.49	1845.48	1046.14	1845.66	1075.97	1846	1076.49	1848	1079.51
GR	1850	1082.53	1852	1085.57	1852.46	1086.27	1854	1135.67	1855.53	1176.03
NC	0.02	0.02	0.015							
X1	630	18	1031	1084.55	229.09	213.86	221.03		2.26	
GR	1861.2	1000	1860	1004.03	1858.27	1009.63	1858	1010.62	1856	1018.67
GR	1855.9	1018.82	1855.06	1031	1854	1032.96	1852	1036.68	1850	1040.45
GR	1848.1	1044.02	1848.28	1071.6	1850	1074.89	1852	1078.71	1854	1082.53
GR	1855	1084.55	1856	1129.14	1857	1165.99				
NC	0.02	0.02	0.015	0.1	0.3					
X1	640	19	1026.88	1079.43	251.59	262.14	258.21		2.26	
GR	1864.5	1000	1864.16	1004.77	1864	1005.12	1862	1009.4	1860	1013.41
GR	1858.6	1016.12	1858.09	1026.88	1858	1027.05	1856	1030.75	1854	1034.43
GR	1852	1038.12	1851.39	1039.25	1851.37	1067.22	1852	1068.01	1854	1070.51
GR	1856	1073	1858	1075.48	1860	1077.94	1861.23	1079.43		
NC	0.02	0.02	0.015							
X1	650	8	1035.35	1088.02	196.87	225.93	211.31		2.26	
X3	10			1035.35	1869.26	1088.02	1869.26			
GR	1866	941.77	1867.8	1000	1866.17	1035.35	1853.8	1035.35	1853.8	1088.02
GR	1866.1	1088.02	1866.1	1156.84	1866	1161.59				
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	150	52.67	2.67	400	0	1858.43	1856.06
X1	660	11	1077.26	1129.93	191.11	191.17	191.78		2.26	

X2			1	1866.43	1871.43			1.33		
X3	10			1077.26	1872.26	1129.93	1872.26			
GR	1870.6	1000	1870	1032.33	1869.6	1060.4	1869.67	1077.26	1856.17	1077.26
GR	1856.1	1129.93	1869.5	1129.93	1870.02	1166.85	1870	1168.76	1870	1172.88
GR	1868.6	1207.45								
NC	0.025	0.025	0.025							
QT	1	5500								
X1	670	31	1067.82	1168.26	476.18	438.91	452.82		2.26	
GR	1879.4	1000	1878	1007.84	1877.77	1009.03	1877.27	1027.56	1876.26	1048.09
GR	1876	1049.44	1875	1054.05	1874.27	1067.82	1874	1068.59	1872	1072.93
GR	1870	1077.28	1868	1081.62	1866	1085.96	1864	1090.29	1862	1094.57
GR	1860	1098.77	1859.16	1100.51	1859	1121.06	1860	1131.32	1860.34	1134.65
GR	1860.7	1147.65	1862	1149.57	1864	1152.62	1866	1155.67	1868	1158.72
GR	1870	1161.77	1872	1164.82	1874	1167.84	1874.29	1168.26	1875	1189.7
GR	1875.3	1193.35								
NC	0.025	0.025	0.025							
X1	680	28	1032.41	1126.45	478.66	448	461.54		2.26	
GR	1882.6	1000	1882	1011.76	1880.87	1032.41	1880	1034.16	1878	1038.48
GR	1876	1042.78	1874	1047.09	1872	1051.41	1870	1055.75	1868	1060.1
GR	1866	1064.48	1864.4	1067.99	1864	1071.62	1862.6	1085.72	1864.01	1092.79
GR	1864	1093.89	1864.2	1101.75	1866	1104.88	1868	1108.34	1870	1111.81

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GR	1872	1115.28	1874	1118.74	1876	1122.22	1878	1125.69	1878.44	1126.45
GR	1878.7	1156.41	1878	1161.77	1876.53	1173.07				
NC	0.025	0.025	0.025							
X1	690	10	1057.3	1141.3	408.17	434.4	422.9		2.26	
X3	10			1057.3	1896.26	1141.3	1896.26			
GR	1894	1000	1894	1014.18	1886	1057.29	1877	1057.3	1866	1079.3
GR	1866	1119.3	1877	1141.3	1886	1141.31	1894	1162.81	1894	1172.96
NC	0.025	0.025	0.025							
SB		1.56	2.6	90	40		1240	2	1868.26	1868.26
X1	700	8	1011.47	1095.49	132.78	172.81	153.08		2.26	
X2			1	1888.26	1896.26					
GR	1894	1000	1886	1011.47	1877	1011.48	1866	1033.48	1866	1073.48
GR	1877	1095.48	1886	1095.49	1894	1097.52				
NC	0.025	0.025	0.025							
X1	710	22	1055.32	1141.88	416	467.23	424.6		2.26	
GR	1887	1000	1887.65	1055.32	1886	1058.98	1884	1063.38	1882	1067.76
GR	1880	1072.17	1878	1076.59	1876.67	1079.53	1876.5	1091.93	1878	1098.6
GR	1878.2	1099.74	1880	1110.14	1880.28	1112.24	1882	1115.7	1884	1119.72
GR	1886	1123.75	1888	1127.78	1890	1131.82	1892	1135.86	1894	1139.91
GR	1894.9	1141.88	1896	1168.62						
NC	0.025	0.025	0.025							
X1	720	28	1031.02	1123.52	499.28	495.17	498.02		2.26	
GR	1895.4	1000	1895.51	1008.85	1894	1013.03	1892	1018.46	1890.74	1021.86
GR	1890.3	1031.02	1890	1031.86	1888	1036.41	1886	1041.01	1884	1045.63
GR	1882	1050.25	1882	1050.99	1881.59	1059.51	1882	1063.99	1882.46	1068.23

GR	1882.7	1085.75	1884	1093.67	1884.05	1094.02	1885.72	1102.19	1886	1102.68
GR	1888	1106.25	1890	1109.82	1892	1113.4	1894	1117.01	1896	1120.66
GR	1897.5	1123.52	1898	1138.24	1898	1204.99				
NC	0.025	0.025	0.025							
X1	730	27	1056.08	1126.41	484.5	472.89	480.56		2.26	
GR	1895.5	980.55	1890	997.92	1888.44	1014.84	1888.81	1032	1890	1034.91
GR	1892	1040.78	1892.61	1042.69	1892.66	1056.08	1892	1058.03	1890	1063.82
GR	1888	1069.32	1887.87	1069.57	1887.34	1076.5	1886	1080.07	1885.41	1081.64
GR	1885.1	1105.73	1886	1106.9	1888	1109.69	1890	1112.46	1892	1115.21
GR	1894	1117.97	1896	1120.72	1898	1123.48	1900	1126.26	1900.12	1126.41
GR	1900.5	1149.64	1900	1152.55						
NC	0.025	0.025	0.025							
X1	740	30	1042.02	1119.91	502.08	483.58	492.38		2.26	
GR	1901.2	1000	1902	1005.26	1904	1021.59	1904.51	1025.97	1904	1027.47
GR	1902	1034.42	1900	1042.02	1900.03	1042.1	1898	1046.77	1896	1051.39
GR	1894	1056.04	1893.01	1058.37	1892.51	1063.92	1892	1064.96	1890	1068.86
GR	1889.5	1069.72	1889.67	1082.45	1889.35	1096.82	1890	1098.41	1892	1103.02
GR	1892.5	1104.29	1894	1106.26	1896	1108.92	1898	1111.43	1900	1113.86
GR	1902	1116.25	1904	1118.59	1905.14	1119.91	1904.81	1126.67	1904	1127.41

1

NC	0.025	0.025	0.025							
X1	750	40	1044.53	1148.05	361.65	431.03	391.69		2.26	
GR	1906.9	1000	1906	1004.65	1905.04	1009.47	1906	1015.43	1906.84	1019.12
GR	1906	1021.92	1904	1031.78	1903.79	1032.81	1903.79	1044.53	1902	1048.63
GR	1900	1053.26	1898	1057.91	1895.97	1062.64	1896	1063.05	1894.93	1077.63
GR	1894	1083.07	1893.44	1086.12	1893.85	1093.82	1894	1094.65	1895.88	1107.68
GR	1896	1108	1898	1113.7	1900	1119.39	1900.96	1122.14	1902	1123.57
GR	1904	1126.35	1906	1129.15	1908	1131.96	1910	1134.78	1912	1137.6
GR	1914	1140.41	1916	1143.23	1918	1146.05	1919.42	1148.05	1918	1155.65
GR	1916.8	1161.99	1916.93	1173.3	1916.59	1183.77	1916.83	1193	1918	1211.96
NC	0.025	0.025	0.025							
X1	760	24	1035.23	1131.59	409.52	457.63	428.24		2.26	
GR	1906.9	1000	1906.7	1035.23	1906	1036.91	1904	1042.08	1902	1047.23
GR	1901.2	1049.24	1900	1056.11	1898.24	1065.72	1898.23	1068.7	1899.02	1080.49
GR	1899.8	1088.61	1899.92	1101.11	1900	1101.27	1902	1105.14	1904	1109.01
GR	1906	1112.87	1908	1116.71	1910	1120.52	1912	1124.3	1914	1128.06
GR	1915.9	1131.59	1914.4	1139.1	1914	1153.98	1912.9	1195.72		
NC	0.025	0.025	0.025							
X1	770	24	1015.76	1126.99	456.52	419.22	434.78		2.26	
GR	1915	1000	1914	1015.76	1913.93	1016.79	1912	1022.95	1910	1029.33
GR	1908	1035.7	1906	1042.07	1905.12	1044.87	1904.51	1063.27	1904	1066.58
GR	1903.2	1072.95	1903.42	1081.93	1903.73	1095.61	1903.96	1105.84	1904	1105.97
GR	1906	1113.03	1906.63	1115.29	1908	1117.4	1910	1120.69	1912	1124.57
GR	1913.1	1126.99	1912.81	1130.93	1912.89	1143.7	1914	1148.24		
NC	0.025	0.025	0.015							
X1	780	8	1058.72	1114.05	52.99	49.44	49.44		2.26	
X3	10			1058.72	1918.76	1114.05	1918.76			

```
GR   1916.4      1000      1916     1003.3     1914.9     1058.72    1903.78    1058.72    1903.78    1114.05
GR     1914   1114.05      1914     1121.8    1915.01     1149.26

NC    0.025     0.025     0.015
SB     1.25      1.56       2.6         80      55.33       5.33        400          0    1907.38    1906.04
X1      790        10   1028.58    1083.91     108.42     108.26     108.02                  2.26
X2                            1    1915.38    1919.38                                2
X3       10                      1028.58    1918.26    1083.91    1918.26
GR     1916      1000    1915.8    1001.42    1915.93    1017.77    1914.87    1028.58    1905.12    1028.58
GR   1905.1   1083.91   1914.59    1083.91       1916    1104.86    1916.37     1109.9       1916    1131.78

NC    0.035     0.035      0.03
X1      800        14   1012.48    1094.47      100.8      88.06       95.8                  2.26
X3       10                          1000    1917.76    1094.47    1917.76
GR   1914.6      1000    1914.21    1012.48       1914    1012.99       1912    1017.82       1910    1022.59
GR     1908    1027.3    1904.86    1031.73    1904.86    1053.16    1904.86     1061.2       1908    1072.68
GR     1910   1078.88       1912    1084.82       1914    1090.67    1915.12    1094.47
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NC    0.035     0.035      0.03       0.1       0.3
X1      810        28   1144.23    1205.12    221.84     144.84     185.09                  2.26
GR     1918    980.65   1917.34     990.58      1916       1000       1914    1016.18    1913.61    1019.48
GR     1912   1086.58   1911.68    1097.61   1911.77    1130.03    1911.33    1144.23    1910.82    1158.38
GR     1910   1162.77      1908    1167.25      1906    1172.16    1905.36    1173.67     1905.8    1185.18
GR     1906    1185.5      1908    1188.52      1910    1192.61    1910.28    1194.53    1911.05    1205.12
GR   1911.2   1228.44    1911.5    1247.06      1912    1258.22       1914    1295.39    1914.12    1296.38
GR   1915.1   1324.03      1916     1338.5      1918    1370.57
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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *PROF 1

 CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
 ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) =  2.000 PERCENT OF THE DEPTH

 CCHV=      .100 CEHV=      .300
 *SECNO 10.000
     10.000       8.37    1710.96    1709.66    1707.26    1712.45       1.48        .00        .00    1712.26
     6400.0         .0     6400.0         .0         .0      654.9         .1         .0         .0    1710.86
        .00        .00       9.77        .03       .000       .030       .030       .000    1702.59    1009.11
    .004017         0.         0.         0.          0         14          5        .00     119.45    1128.56
```

*SECNO 20.000

20.000	7.61	1712.99	1712.30	.00	1714.81	1.82	2.27	.10	1714.23
6400.0	.0	6400.0	.0	.0	591.5	.0	7.0	1.3	1715.71
.01	.00	10.82	.00	.000	.030	.000	.000	1705.38	1187.56
.005416	483.	489.	498.	2	12	0	.00	114.06	1301.62

*SECNO 30.000

30.000	7.51	1715.62	1715.25	.00	1717.74	2.12	2.84	.09	1714.67
6400.0	27.4	6372.6	.0	11.7	544.1	.0	13.5	2.7	1715.87
.02	2.34	11.71	.00	.030	.030	.000	.000	1708.11	1028.67
.006014	495.	498.	504.	2	12	0	.00	125.10	1153.77

*SECNO 40.000

40.000	9.07	1718.53	1718.05	.00	1720.44	1.91	2.67	.02	1718.26
6400.0	1.4	6177.9	220.7	1.5	548.8	55.2	20.1	4.3	1716.26
.04	.92	11.26	4.00	.030	.030	.030	.000	1709.46	1135.37
.004947	500.	492.	481.	2	8	0	.00	154.35	1289.72

*SECNO 50.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

50.000	9.46	1720.62	1718.32	.00	1721.58	.96	1.04	.10	1722.82
6400.0	.0	6400.0	.0	.0	815.2	.0	25.1	5.3	1722.26
.05	.00	7.85	.00	.000	.030	.000	.000	1711.16	1075.00
.002510	334.	306.	278.	2	15	0	.00	142.96	1217.96

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

60.000	9.73	1721.93	1719.55	.00	1722.46	.53	.84	.04	1720.27
6400.0	498.6	4971.7	929.7	199.2	769.7	335.3	37.2	8.4	1718.89
.07	2.50	6.46	2.77	.030	.030	.030	.000	1712.20	1002.76
.001193	500.	499.	502.	2	12	0	.00	396.87	1399.63

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	7.53	1721.79	1721.79	.00	1724.38	2.59	1.23	.62	1725.95
6400.0	.0	6400.0	.0	.0	495.4	.0	47.5	11.2	1721.85
.08	.00	12.92	.00	.000	.030	.000	.000	1714.26	1100.15
.007946	493.	498.	498.	0	12	0	.00	97.17	1197.32

*SECNO 80.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

80.000	8.83	1725.47	1723.76	.00	1726.82	1.35	2.31	.12	1725.45
6400.0	.0	6400.0	.0	.0	686.0	.0	53.9	12.3	1727.47
.10	.03	9.33	.00	.030	.030	.000	.000	1716.64	1146.51
.003339	456.	471.	482.	2	11	0	.00	115.23	1261.74

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

90.000	9.58	1727.03	1726.06	.00	1728.89	1.85	1.91	.15	1726.90
6400.0	.4	6399.6	.0	.7	585.5	.0	60.9	13.6	1729.68
.11	.55	10.93	.00	.030	.030	.000	.000	1717.45	1046.26
.004785	495.	482.	465.	3	8	0	.00	110.73	1156.98

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 100.000

100.000	7.72	1728.68	1726.93	.00	1730.07	1.40	1.14	.05	1730.26
6400.0	.0	6400.0	.0	.0	674.4	.0	65.2	14.3	1729.52
.12	.00	9.49	.00	.000	.030	.000	.000	1720.96	1026.65
.003204	290.	295.	300.	2	14	0	.00	104.36	1131.01

*SECNO 110.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	5.29	1728.05	1728.05	.00	1730.48	2.43	.06	.31	1730.26
6400.0	.0	6400.0	.0	.0	512.0	.0	65.5	14.4	1729.78
.12	.00	12.50	.00	.000	.015	.000	.000	1722.76	1027.80
.002026	26.	26.	26.	0	14	0	.00	106.34	1134.14

*SECNO 120.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1029.5 1136.5 TYPE= 1 TARGET= 107.000
ELENCL= 1732.26 ELENCR= 1732.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1730.26 ELREA= 1732.26

120.000	4.79	1728.95	1728.95	.00	1731.37	2.42	.19	.00	1730.26
6400.0	.0	6400.0	.0	.0	512.5	.0	66.6	14.6	1732.26
.12	.00	12.49	.00	.000	.015	.000	.000	1724.16	1029.49
.002207	89.	90.	93.	0	11	0	.00	107.00	1136.49

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1728.09 , NOT 1728.95 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	145.00	107.00	7.00	500.00	.00	1724.79	1724.16

*SECNO 130.000
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1732.92	1732.56	.00	0.	6400.	500.	500.	1729.79	1733.69	0.

3470 ENCROACHMENT STATIONS= 1035.8 1142.8 TYPE= 1 TARGET= 107.000

ELENCL= 1733.26 ELENCR= 1733.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1730.26 ELREA= 1733.26

130.000	6.99	1731.78	.00	.00	1732.92	1.14	1.55	.00	1730.26
6400.0	.0	6400.0	.0	.0	748.4	.0	68.3	14.9	1733.26
.12	.00	8.55	.00	.000	.015	.000	.000	1724.79	1035.81
.000645	121.	120.	118.	3	0	0	.00	107.00	1142.81

*SECNO 140.000

3470 ENCROACHMENT STATIONS= 1149.7 1265.6 TYPE= 1 TARGET= 115.910
ELENCL= 1732.26 ELENCR= 1732.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1730.67 ELREA= 1732.26

140.000	6.85	1731.71	1730.19	.00	1733.01	1.30	.05	.05	1730.67
6400.0	.0	6400.0	.0	.0	698.7	.0	69.4	15.1	1732.26
.13	.00	9.16	.00	.000	.015	.000	.000	1724.86	1149.72
.000808	65.	64.	64.	2	15	0	.00	115.91	1265.63

*SECNO 150.000

3301 HV CHANGED MORE THAN HVINS

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.46	1732.25	1732.25	.00	1734.43	2.18	.73	.26	1733.95
6300.0	.0	6300.0	.0	.0	532.2	.0	76.3	16.4	1733.35
.14	.00	11.84	.00	.000	.020	.000	.000	1725.79	1024.14
.003737	491.	490.	489.	0	11	0	.00	124.87	1149.01

*SECNO 160.000

3301 HV CHANGED MORE THAN HVINS

160.000	6.50	1734.37	1733.82	.00	1736.01	1.64	1.53	.05	1735.52
6300.0	.0	6300.0	.0	.0	613.0	.0	82.9	17.9	1736.26
.15	.00	10.28	.00	.000	.020	.000	.000	1727.87	1045.54
.002537	501.	502.	503.	2	11	0	.00	132.85	1178.39

*SECNO 170.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

170.000	6.04	1735.60	1735.60	.00	1737.71	2.11	1.49	.14	1736.76
6300.0	.0	6300.0	.0	.0	540.6	.0	89.4	19.4	1737.35
.16	.00	11.65	.00	.000	.020	.000	.000	1729.56	1046.37
.003759	487.	487.	488.	0	11	0	.00	130.75	1177.12

*SECNO 180.000

180.000	5.61	1737.47	1737.29	.00	1739.44	1.97	1.72	.01	1738.84
6300.0	.0	6300.0	.0	.0	559.5	.0	95.6	20.8	1739.98
.18	.00	11.26	.00	.000	.020	.000	.000	1731.86	1041.60
.003261	491.	492.	492.	2	11	0	.00	127.87	1169.47

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	6.70	1741.75	1741.75	.00	1744.14	2.39	1.71	.13	1744.26
6300.0	.0	6300.0	.0	.0	508.1	.0	101.7	22.2	1743.89
.19	.00	12.40	.00	.000	.020	.000	.000	1735.05	1006.97
.003627	499.	498.	497.	0	11	0	.00	108.37	1115.34

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	6.16	1745.12	1745.12	.00	1747.57	2.45	1.79	.02	1748.26
6300.0	.0	6300.0	.0	.0	502.0	.0	107.4	23.4	1750.26
.20	.00	12.55	.00	.000	.020	.000	.000	1738.96	1007.81
.003603	494.	495.	497.	0	11	0	.00	104.30	1112.11

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	9.31	1749.09	1749.09	.00	1751.94	2.85	1.78	.12	1754.26
6300.0	.0	6300.0	.0	.0	465.2	.0	113.0	24.5	1755.57
.21	.00	13.54	.00	.000	.020	.000	.000	1739.78	1014.22
.003528	500.	500.	500.	0	14	0	.00	83.71	1097.93

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

220.000	7.97	1754.19	1754.19	.00	1756.87	2.68	1.69	.02	1762.09

6300.0	.0	6300.0	.0	.0	479.2	.0	118.1	25.4	1760.03
.22	.00	13.15	.00	.000	.020	.000	.000	1746.22	1056.99
.003578	465.	477.	489.	0	15	0	.00	91.27	1148.26

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	8.28	1760.66	1760.66	.00	1763.45	2.78	1.75	.03	1765.62
6300.0	.0	6300.0	.0	.0	470.5	.0	123.5	26.4	1766.26
.23	.00	13.39	.00	.000	.020	.000	.000	1752.38	1061.81
.003514	490.	495.	499.	0	8	0	.00	86.22	1148.03

*SECNO 240.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	5.18	1764.87	1764.87	.00	1767.14	2.26	1.77	.05	1776.60
6300.0	.0	6300.0	.0	.0	522.0	.0	129.1	27.6	1778.66
.24	.00	12.07	.00	.000	.020	.000	.000	1759.69	1048.58
.003668	496.	492.	489.	0	14	0	.00	116.82	1165.40

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	5.05	1765.31	1765.31	.00	1767.65	2.34	.16	.02	1768.76
6300.0	.0	6300.0	.0	.0	513.2	.0	129.8	27.7	1768.93
.24	.00	12.28	.00	.000	.015	.000	.000	1760.26	1045.34
.002101	57.	59.	58.	0	8	0	.00	110.08	1155.42

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

260.000	4.97	1769.23	1769.23	.00	1771.38	2.15	.00	.02	1770.26
6300.0	.0	6299.9	.1	.0	536.0	.1	129.8	27.7	1768.92
.24	.00	11.75	.95	.000	.015	.020	.000	1764.26	1043.60
.002196	1.	1.	1.	0	5	0	.00	128.59	1172.19

*SECNO 270.000
7185 MINIMUM SPECIFIC ENERGY

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3720 CRITICAL DEPTH ASSUMED
   270.000      4.86   1769.12   1769.12       .00   1771.54      2.42       .05       .08   1774.26
    6300.0        .0    6300.0        .0        .0     504.7        .0     130.1      27.8   1773.30
       .24       .00     12.48       .00      .000      .015      .000      .000   1764.26   1010.58
   .002156       34.       22.        9.         0         8         0       .00    104.80   1115.37


*SECNO 280.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   280.000      4.89   1773.15   1773.15       .00   1775.56      2.41       .00       .00   1774.63
    6300.0        .0    6300.0        .0        .0     505.9        .0     130.1      27.8   1774.46
       .24       .00     12.45       .00      .000      .015      .000      .000   1768.26   1045.36
   .002139        1.        1.        1.         0         5         0       .00    105.61   1150.97


*SECNO 290.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1048.0    1150.9  TYPE=       1  TARGET=      102.930
 ELENCL=    1777.26  ELENCR=    1777.26
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1776.26 ELREA=      1777.26

   290.000      4.86   1773.67   1773.67       .00   1776.13      2.46       .03       .02   1776.26
    6300.0        .0    6300.0        .0        .0     500.6        .0     130.3      27.8   1777.26
       .24       .00     12.58       .00      .000      .015      .000      .000   1768.81   1047.98
   .002208       15.       15.       13.         0         5         0       .00    102.93   1150.91


SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS    1772.91 , NOT    1773.67 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB   XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
       .90       1.56       2.60     106.00     103.02       5.02     588.00        .00    1769.18    1768.81

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.46
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CLASS B LOW FLOW

3420 BRIDGE W.S.= 1774.04 BRIDGE VELOCITY= 12.74 CALCULATED CHANNEL AREA= 476.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1776.45	1776.87	.00	0.	6300.	588.	588.	1775.18	1779.18	0.

3470 ENCROACHMENT STATIONS= 1025.5 1128.6 TYPE= 1 TARGET= 103.020
ELENCL= 1777.45 ELENCR= 1777.82

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1777.38 ELREA= 1777.82

300.000	6.16	1775.34	.00	.00	1776.87	1.53	.74	.00	1777.38
6300.0	.0	6300.0	.0	.0	634.9	.0	131.6	28.1	1777.82
.24	.00	9.92	.00	.000	.015	.000	.000	1769.18	1025.54
.001032	103.	103.	99.	0	0	0	.00	103.02	1128.56

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 310.000

310.000	5.24	1775.28	1774.93	.00	1777.08	1.80	.13	.08	1777.94
6300.0	.0	6300.0	.0	.0	584.9	.0	133.0	28.4	1778.03
.25	.00	10.77	.00	.000	.015	.000	.000	1770.04	1031.30
.001633	103.	100.	106.	2	15	0	.00	131.04	1162.34

*SECNO 320.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

320.000	6.59	1778.09	1778.09	.00	1780.39	2.30	1.15	.15	1780.26
6300.0	.0	6300.0	.0	.0	517.7	.0	139.2	29.7	1780.26
.26	.00	12.17	.00	.000	.020	.000	.000	1771.50	1031.46
.003649	490.	489.	488.	0	11	0	.00	114.58	1146.04

*SECNO 330.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

330.000	7.07	1781.12	1781.12	.00	1783.48	2.35	1.82	.02	1783.20
6300.0	.0	6300.0	.0	.0	511.8	.0	145.1	31.0	1783.66
.27	.00	12.31	.00	.000	.020	.000	.000	1774.05	1037.34
.003649	501.	500.	501.	0	8	0	.00	110.82	1148.16

*SECNO 340.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

340.000	7.48	1784.11	1784.11	.00	1786.44	2.33	1.82	.00	1784.65
6300.0	.0	6300.0	.0	.0	514.5	.0	151.0	32.3	1784.26
.28	.00	12.24	.00	.000	.020	.000	.000	1776.63	1003.10
.003670	496.	496.	496.	0	8	0	.00	112.87	1115.97

*SECNO 350.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

350.000	7.59	1786.10	1786.10	.00	1788.60	2.50	1.58	.05	1789.36
6300.0	.0	6300.0	.0	.0	496.9	.0	156.1	33.4	1786.26
.29	.00	12.68	.00	.000	.020	.000	.000	1778.51	1055.14
.003560	460.	437.	420.	0	5	0	.00	99.87	1155.01

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 360.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.1 1129.6 TYPE= 1 TARGET= 115.500
ELENCL= 1794.26 ELENCR= 1794.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1794.26 ELREA= 1794.26

360.000	6.39	1788.32	1788.32	.00	1790.84	2.51	1.13	.01	1794.26
6300.0	.0	6300.0	.0	.0	495.1	.0	159.6	34.1	1794.26
.30	.00	12.72	.00	.000	.020	.000	.000	1781.93	1027.81
.003601	342.	314.	294.	0	15	0	.00	100.08	1127.89

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	150.00	80.00	.00	943.00	1.50	1783.94	1781.93

*SECNO 370.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= .000 EGLWC= 1792.391 ELLC= 1793.940 PCWSE= 1788.321 ELTRD= 1805.420

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1805.42 MAX ELLC= 1793.94

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1019.9 1180.4 TYPE= 1 TARGET= 160.500
ELENCL= 1802.26 ELENCR= 1802.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1798.26 ELREA= 1802.26

370.000	6.08	1790.02	1790.02	.00	1792.37	2.35	.84	.02	1798.26
6300.0	.0	6300.0	.0	.0	512.6	.0	162.3	34.6	1802.26
.30	.00	12.29	.00	.000	.020	.000	.000	1783.94	1045.12
.003603	188.	232.	273.	0	15	0	.00	110.15	1155.27

*SECNO 380.000
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1091.3 1151.3 TYPE= 1 TARGET= 60.090
ELENCL= 1796.26 ELENCR= 1796.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1795.01 ELREA= 1796.26

380.000	7.42	1795.36	1795.36	.00	1798.88	3.52	.63	.35	1795.01
6300.0	.0	6300.0	.0	.0	418.2	.0	164.1	35.0	1796.26
.31	.00	15.07	.00	.000	.020	.000	.000	1787.94	1091.25
.003754	174.	171.	176.	0	11	0	.00	60.09	1151.34

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1045.2 1103.4 TYPE= 1 TARGET= 58.300
ELENCL= 1799.26 ELENCR= 1799.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1797.07 ELREA= 1799.26

390.000	7.72	1797.18	1797.18	.00	1800.78	3.60	1.58	.02	1797.07
6300.0	.0	6300.0	.0	.0	413.7	.0	168.2	35.6	1799.26
.31	.00	15.23	.00	.000	.020	.000	.000	1789.46	1045.15
.003749	421.	421.	420.	0	8	0	.00	58.10	1103.25

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*SECNO 400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1042.3    1103.7  TYPE=      1  TARGET=       61.390
 ELENCL=   1799.26  ELENCR=   1799.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1798.51 ELREA=      1799.26

   400.000      7.54   1798.40   1798.40       .00   1801.86      3.46       .80       .01   1798.51
    6300.0        .0    6300.0        .0        .0     421.9        .0     170.2      35.8   1799.26
       .32       .00     14.93       .00      .000      .020      .000      .000   1790.86   1042.37
   .003696      216.      216.      218.         0         8         0       .00     60.99   1103.36


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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 410.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   410.000      8.94   1800.50   1800.50       .00   1803.83      3.33       .78       .01   1799.46
    6300.0      28.9    6271.1        .0      11.7     427.1        .0     172.4      36.2   1800.50
       .32      2.46     14.68       .00      .030      .020      .000      .000   1791.56   1025.06
   .003361      237.      223.      213.         0        12         0       .00     75.96   1101.01


*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   420.000      9.85   1802.97   1802.97       .00   1805.75      2.78       .62       .06   1800.75
    6300.0      98.3    6149.1      52.6      30.3     454.1      32.8     174.8      36.8   1801.60
       .33      3.24     13.54      1.60      .030      .020      .030      .000   1793.12   1126.45
   .002436      228.      218.      213.         0         8         0       .00     149.83   1276.28


*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1034.8    1072.5  TYPE=      1  TARGET=       37.750
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ELENCL= 1807.26 ELENCR= 1807.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1806.57 ELREA= 1807.26

430.000	9.52	1805.07	1805.07	.00	1809.84	4.77	.56	.60	1806.57
6300.0	.0	6300.0	.0	.0	359.3	.0	177.1	37.2	1807.26
.33	.00	17.53	.00	.000	.015	.000	.000	1795.55	1034.79
.002676	228.	221.	219.	0	8	0	.00	37.75	1072.54

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1803.59 , NOT 1805.07 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	78.00	37.75	1.75	246.00	.00	1796.56	1795.55

*SECNO 440.000
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1820.96	1813.49	.00	2706.	3603.	246.	252.	1803.56	1804.64	78.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
3693 PROBABLE MINIMUM SPECIFIC ENERGY

3470 ENCROACHMENT STATIONS= 1048.1 1085.9 TYPE= 1 TARGET= 37.750
ELENCL= 1807.26 ELENCR= 1807.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1806.01 ELREA= 1807.26

440.000	9.55	1806.11	1806.06	.00	1810.85	4.74	.53	-.10	1806.01
6300.0	.0	6300.0	.0	.0	360.4	.0	178.7	37.4	1807.26
.33	.00	17.48	.00	.000	.015	.000	.000	1796.56	1048.13
.002647	183.	197.	206.	20	5	3	.00	37.75	1085.88

*SECNO 450.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1056.9 1133.4 TYPE= 1 TARGET= 76.550
ELENCL= 1811.26 ELENCR= 1811.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1807.22 ELREA= 1811.26

450.000	12.84	1810.60	1807.03	.00	1811.67	1.08	.46	.37	1807.22
5800.0	.0	5800.0	.0	.0	696.1	.0	180.7	37.6	1811.26
.34	.00	8.33	.00	.000	.040	.000	.000	1797.76	1056.87
.002944	163.	163.	162.	4	8	0	.00	76.55	1133.42

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 460.000

3470 ENCROACHMENT STATIONS= 1048.2 1141.8 TYPE= 1 TARGET= 93.660
ELENCL= 1812.26 ELENCR= 1812.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1809.81 ELREA= 1812.26

460.000	11.72	1811.55	1808.81	.00	1812.61	1.06	.93	.00	1809.81
5800.0	.0	5800.0	.0	.0	702.3	.0	185.2	38.2	1812.26
.35	.00	8.26	.00	.000	.040	.000	.000	1799.83	1048.18
.003634	282.	285.	290.	2	19	0	.00	93.66	1141.84

*SECNO 470.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.4 1104.6 TYPE= 1 TARGET= 69.170
ELENCL= 1814.26 ELENCR= 1814.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1813.56 ELREA= 1814.26

470.000	10.99	1812.55	1812.55	.00	1815.71	3.16	1.75	.63	1813.56
5800.0	.0	5800.0	.0	.0	406.6	.0	188.7	38.7	1814.26
.35	.00	14.27	.00	.000	.040	.000	.000	1801.56	1038.28
.013868	277.	275.	273.	0	11	0	.00	64.43	1102.71

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	100.00	20.00	.00	288.00	2.00	1801.93	1801.55

*SECNO 480.000
3280 CROSS SECTION 480.00 EXTENDED 1.92 FEET

3301 HV CHANGED MORE THAN HVINS

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.10

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1822.37	1815.71	.00	1830.	4005.	288.	305.	1810.26	1813.56	100.

3470 ENCROACHMENT STATIONS= 1050.0 1121.9 TYPE= 1 TARGET= 71.960
ELENCL= 1817.26 ELENCR= 1817.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1813.32 ELREA= 1817.26

480.000	14.15	1816.08	.00	.00	1817.23	1.15	1.53	.00	1813.32
5800.0	.0	5800.0	.0	.0	672.6	.0	189.1	38.7	1817.26
.35	.00	8.62	.00	.000	.040	.000	.000	1801.93	1049.96
.003157	29.	29.	29.	3	0	2	.00	71.96	1121.92

*SECNO 490.000
3280 CROSS SECTION 490.00 EXTENDED .36 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

3470 ENCROACHMENT STATIONS= 1050.0 1127.6 TYPE= 1 TARGET= 77.640
ELENCL= 1818.26 ELENCR= 1818.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1817.30 ELREA= 1818.26

490.000	11.54	1817.46	1816.19	.00	1819.39	1.93	1.93	.23	1817.30
5800.0	.0	5800.0	.0	.0	519.9	.0	194.7	39.4	1818.26
.36	.05	11.16	.00	.025	.040	.000	.000	1805.92	1050.00
.007968	421.	405.	376.	3	19	0	.00	77.64	1127.64

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 500.000

3470 ENCROACHMENT STATIONS= 1035.6 1117.1 TYPE= 1 TARGET= 81.530
ELENCL= 1823.26 ELENCR= 1823.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1822.26 ELREA= 1823.26

500.000	11.50	1821.26	1820.12	.00	1823.26	2.00	3.85	.02	1822.26
5800.0	.0	5800.0	.0	.0	511.4	.0	200.2	40.3	1823.26
.38	.00	11.34	.00	.000	.040	.000	.000	1809.76	1037.67
.008504	476.	468.	455.	3	11	0	.00	79.43	1117.10

*SECNO 510.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

510.000	11.75	1824.30	1824.30	.00	1825.94	1.64	2.10	.04	1823.36
5800.0	48.7	5326.1	425.2	18.2	500.3	96.3	205.5	41.6	1822.86
.39	2.67	10.65	4.42	.020	.030	.020	.000	1812.55	1013.43
.003383	411.	413.	404.	0	8	0	.00	205.18	1218.61

*SECNO 520.000

520.000	9.13	1826.21	1824.96	.00	1827.72	1.51	1.77	.01	1830.79
5800.0	.0	5800.0	.0	.0	588.5	.0	212.1	43.3	1831.67
.40	.00	9.86	.00	.000	.030	.000	.000	1817.08	1038.59
.004091	495.	477.	472.	3	14	0	.00	105.06	1143.65

*SECNO 530.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

530.000	9.16	1829.04	1829.04	.00	1831.50	2.45	2.26	.28	1833.95
5800.0	.0	5800.0	.0	.0	461.5	.0	216.9	44.2	1833.19
.41	.00	12.57	.00	.000	.030	.000	.000	1819.88	1029.35
.008341	372.	399.	424.	0	5	0	.00	95.65	1125.00

*SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3720 CRITICAL DEPTH ASSUMED

540.000	8.31	1834.02	1834.02	.00	1836.69	2.67	4.08	.07	1837.16
5800.0	.0	5800.0	.0	.0	442.1	.0	222.0	45.2	1837.77
.42	.00	13.12	.00	.000	.030	.000	.000	1825.71	1027.12
.008330	460.	490.	523.	0	11	0	.00	84.49	1111.61

*SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	10.00	1838.92	1838.92	.00	1841.46	2.54	3.86	.01	1841.58
5800.0	.0	5800.0	.0	.0	453.2	.0	226.7	46.2	1840.57
.43	.00	12.80	.00	.000	.030	.000	.000	1828.92	1028.11
.008600	438.	456.	475.	0	11	0	.00	92.74	1120.84

*SECNO 560.000

560.000	11.65	1841.76	1841.50	.00	1844.07	2.31	2.59	.02	1847.69
5800.0	.0	5800.0	.0	.0	475.4	.0	230.2	46.9	1845.76
.44	.00	12.20	.00	.000	.030	.000	.000	1830.11	1029.17
.007179	332.	330.	327.	0	8	0	.00	90.56	1119.73

*SECNO 570.000

570.000	9.35	1843.30	1841.48	.00	1845.28	1.98	1.17	.03	1847.91
5800.0	.0	5800.0	.0	.0	514.1	.0	232.8	47.3	1849.26
.44	.00	11.28	.00	.000	.030	.000	.000	1833.95	1067.86
.003860	229.	228.	230.	2	14	0	.00	64.87	1132.73

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

580.000	6.94	1843.20	1843.20	.00	1846.39	3.18	.00	.36	1848.09
5800.0	.0	5800.0	.0	.0	405.1	.0	232.8	47.3	1849.35
.44	.00	14.32	.00	.000	.015	.000	.000	1836.26	1058.13
.002051	1.	1.	1.	0	15	0	.00	64.22	1122.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 590.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1031.2 1085.0 TYPE= 1 TARGET= 53.840
ELENCL= 1850.26 ELENCR= 1850.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1848.53 ELREA= 1850.26

590.000	7.09	1843.56	1843.56	.00	1847.14	3.58	.03	.12	1848.53
5800.0	.0	5800.0	.0	.0	381.8	.0	233.0	47.3	1850.26
.44	.00	15.19	.00	.000	.015	.000	.000	1836.47	1031.20
.002356	16.	16.	17.	0	8	0	.00	53.84	1085.04

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1842.25 , NOT 1843.56 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	60.00	53.84	3.84	400.00	.00	1837.39	1836.47

*SECNO 600.000
6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

3420 BRIDGE W.S.= 1846.51 BRIDGE VELOCITY= 12.07 CALCULATED CHANNEL AREA= 456.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1848.66	1848.77	2.94	0.	5781.	400.	400.	1845.39	1848.76	60.

3470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1850.26 ELENCR= 1850.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1848.26 ELREA= 1850.26

600.000	9.34	1846.70	.00	.00	1848.77	2.07	1.63	.00	1848.26
5800.0	.0	5800.0	.0	.0	501.8	.0	233.9	47.4	1850.26

```
      .44        .00      11.56        .00       .000       .015       .000       .000   1837.36   1081.85
   .001031       93.        94.        95.          4          0          0        .00     53.84   1135.69


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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 610.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     1061.5    1207.5  TYPE=       1  TARGET=      146.060
 ELENCL=   1855.26  ELENCR=   1855.26
   610.000       9.68    1854.56    1854.56        .00    1857.06       2.50        .25        .13    1854.17
    5800.0        2.2     5382.6      415.1        2.1      410.1      104.7      236.4       47.9    1851.82
       .45       1.05      13.13       3.97       .020       .015       .020       .000    1844.88    1073.26
   .001287       231.       215.       202.          0          8          0        .00     131.09    1204.36


*SECNO 620.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   620.000       9.83    1857.57    1857.57        .00    1859.92       2.35        .26        .02    1857.66
    5800.0         .0     5322.5      477.4         .2      416.2      125.6      239.0       48.5    1854.72
       .45        .24      12.79       3.80       .020       .015       .020       .000    1847.74    1021.74
   .001208       224.       212.       202.          0          5          0        .00     141.80    1170.30


*SECNO 630.000
3280 CROSS SECTION    630.00 EXTENDED       .66 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   630.000       9.56    1859.92    1859.92        .00    1862.06       2.14        .25        .02    1857.32
    5800.0      121.6     5170.6      507.8       32.3      417.9      138.7      241.8       49.2    1857.26
       .46       3.77      12.37       3.66       .020       .015       .020       .000    1850.36    1012.01
   .001093       229.       221.       214.          0          8          0        .00     153.98    1165.99


CCHV=      .100 CEHV=      .300
*SECNO 640.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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640.000	9.28	1862.91	1862.91	.00	1866.17	3.25	.35	.33	1860.35
5800.0	146.1	5653.9	.0	29.0	386.3	.0	244.8	49.9	1863.49
.46	5.04	14.64	.00	.020	.015	.000	.000	1853.63	1012.10
.001695	252.	258.	262.	0	8	0	.00	66.64	1078.73

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 650.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.3 1088.0 TYPE= 1 TARGET= 52.670
ELENCL= 1869.26 ELENCR= 1869.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1868.43 ELREA= 1869.26

650.000	7.20	1863.26	1863.26	.00	1866.89	3.64	.42	.12	1868.43
5800.0	.0	5800.0	.0	.0	379.0	.0	246.7	50.2	1869.26
.47	.00	15.30	.00	.000	.015	.000	.000	1856.06	1035.35
.002370	197.	211.	226.	0	15	0	.00	52.67	1088.02

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1862.11 , NOT 1863.26 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	150.00	52.67	2.67	400.00	.00	1858.43	1856.06

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1864.72 BRIDGE VELOCITY= 15.52 CALCULATED CHANNEL AREA= 314.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1868.35	1869.82	.00	0.	5800.	400.	400.	1866.43	1871.43	0.

3470 ENCROACHMENT STATIONS= 1077.3 1129.9 TYPE= 1 TARGET= 52.670
ELENCL= 1872.26 ELENCR= 1872.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1871.93 ELREA= 1872.26

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
660.000	9.24	1867.60	.00	.00	1869.82	2.22	2.93	.00	1871.93
5800.0	.0	5800.0	.0	.0	484.6	.0	248.6	50.4	1872.26
.47	.00	11.97	.00	.000	.015	.000	.000	1858.36	1077.26
.001128	191.	192.	191.	0	0	0	.00	52.67	1129.93

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.49	1868.75	1868.75	.00	1871.62	2.87	.95	.19	1876.53
5500.0	.0	5500.0	.0	.0	404.4	.0	253.2	51.1	1876.55
.48	.00	13.60	.00	.000	.025	.000	.000	1861.26	1084.90
.005530	476.	453.	439.	0	15	0	.00	71.51	1156.41

*SECNO 680.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

680.000	9.22	1874.08	1874.08	.00	1877.20	3.13	2.54	.08	1883.13
5500.0	.0	5500.0	.0	.0	387.6	.0	257.4	51.8	1880.70
.49	.00	14.19	.00	.000	.025	.000	.000	1864.86	1051.81
.005493	479.	462.	448.	0	11	0	.00	63.15	1114.96

*SECNO 690.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 1057.3 1141.3 TYPE= 1 TARGET= 84.000
ELENCL= 1896.26 ELENCR= 1896.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1879.26 ELREA= 1896.26

690.000	8.87	1877.13	1875.59	.00	1878.92	1.79	1.59	.13	1879.26

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    5500.0        .0     5500.0        .0        .0      512.4        .0      261.8      52.5   1896.26
       .50        .00     10.73        .00       .000     .025       .000      .000   1868.26   1061.55
   .002727       408.      423.       434.         3       15          0       .00     75.49   1137.05


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     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 SPECIAL BRIDGE

 SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
       .00       1.56       2.60      90.00      40.00        .00    1240.00       2.00    1868.26    1868.26

 *SECNO 700.000

 6070,LOW FLOW BY NORMAL BRIDGE

 EGPRS=        .000  EGLWC=    1878.924  ELLC=    1888.260  PCWSE=    1877.135  ELTRD=    1896.260

 3370 NORMAL BRIDGE, NRD=    0 MIN ELTRD=  1896.26 MAX ELLC=  1888.26

    700.000       9.60    1877.86    1875.59       .00     1879.32       1.45       .36        .03    1888.26
     5500.0        .0      5500.0        .0        .0       568.2         .0      263.7       52.7    1888.26
        .51        .00        9.68       .00       .000      .025       .000      .000    1868.26    1014.28
    .002037       133.       153.       173.         3         19          0       .00     78.39    1092.68


 *SECNO 710.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
    710.000       9.42    1888.18    1888.18       .00     1891.24       3.06      1.33        .48    1889.91
     5500.0        .0      5500.0        .0        .0       391.6         .0      268.4       53.4    1897.16
        .52        .00       14.04       .00       .000      .025       .000      .000    1878.76    1059.17
    .005417       416.       425.       467.         0          8          0       .00     64.41    1123.58


 *SECNO 720.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
    720.000       7.74    1891.59    1891.59       .00     1894.37       2.78      2.73        .03    1892.56
     5500.0        .0      5500.0        .0        .0       411.0         .0      273.0       54.2    1899.76
        .53        .00       13.38       .00       .000      .025       .000      .000    1883.85    1033.38
    .005533       499.       498.       495.         0         15          0       .00     75.25    1108.63
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*SECNO 730.000

3301 HV CHANGED MORE THAN HVINS

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

730.000	7.69	1895.05	1895.05	.00	1897.08	2.02	2.47	.08	1894.92
5500.0	1557.3	3942.7	.0	167.8	324.5	.0	278.0	55.3	1902.38
.54	9.28	12.15	.00	.025	.025	.000	.000	1887.36	989.10
.004791	485.	481.	473.	0	5	0	.00	127.21	1116.31

*SECNO 740.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

740.000	8.50	1900.11	1900.11	.00	1903.19	3.08	2.53	.32	1902.26
5500.0	.0	5500.0	.0	.0	390.7	.0	283.0	56.4	1907.40
.55	.00	14.08	.00	.000	.025	.000	.000	1891.61	1047.11
.005489	502.	492.	484.	0	8	0	.00	64.13	1111.24

*SECNO 750.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

750.000	8.37	1904.07	1904.07	.00	1906.90	2.83	2.17	.02	1906.05
5500.0	.0	5500.0	.0	.0	407.5	.0	286.6	57.0	1921.68
.56	.00	13.50	.00	.000	.025	.000	.000	1895.70	1049.07
.005581	362.	392.	431.	0	5	0	.00	74.23	1123.31

*SECNO 760.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

760.000	7.79	1908.28	1908.28	.00	1911.07	2.79	2.40	.00	1908.96
5500.0	.0	5500.0	.0	.0	410.3	.0	290.6	57.8	1918.16
.56	.00	13.40	.00	.000	.025	.000	.000	1900.49	1036.86
.005630	410.	428.	458.	0	9	0	.00	76.05	1112.91

*SECNO 770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

770.000	6.57	1912.03	1912.03	.00	1914.50	2.46	2.45	.03	1916.26

5500.0	.0	5500.0	.0	.0	436.8	.0	294.8	58.6	1915.36
.57	.00	12.59	.00	.000	.025	.000	.000	1905.46	1030.05
.005652	457.	435.	419.	0	15	0	.00	90.26	1120.32

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 780.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1058.7 1114.1 TYPE= 1 TARGET= 55.330
ELENCL= 1918.76 ELENCR= 1918.76

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1917.16 ELREA= 1918.76

780.000	6.72	1912.76	1912.76	.00	1916.16	3.40	.17	.28	1917.16
5500.0	.0	5500.0	.0	.0	371.9	.0	295.3	58.7	1918.76
.57	.00	14.79	.00	.000	.015	.000	.000	1906.04	1058.72
.002347	53.	49.	49.	0	8	0	.00	55.33	1114.05

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1911.34 , NOT 1912.76 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	80.00	55.33	5.33	400.00	.00	1907.38	1906.04

*SECNO 790.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1913.93 BRIDGE VELOCITY= 15.25 CALCULATED CHANNEL AREA= 327.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1917.34	1918.65	.00	0.	5500.	400.	400.	1915.38	1919.38	0.

3470 ENCROACHMENT STATIONS= 1028.6 1083.9 TYPE= 1 TARGET= 55.330
ELENCL= 1918.26 ELENCR= 1918.26

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1917.13 ELREA= 1918.26

790.000	9.63	1916.99	.00	.00	1918.65	1.66	2.49	.00	1917.13
5500.0	.0	5500.0	.0	.0	532.3	.0	296.4	58.8	1918.26
.58	.00	10.33	.00	.000	.015	.000	.000	1907.36	1028.58
.000791	108.	108.	108.	0	0	0	.00	55.33	1083.91

*SECNO 800.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3470 ENCROACHMENT STATIONS= 1000.0 1094.5 TYPE= 1 TARGET= 94.470
ELENCL= 1917.76 ELENCR= 1917.76

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1916.47 ELREA= 1917.76

800.000	10.31	1917.43	1915.16	.00	1918.81	1.38	.13	.03	1916.47
5500.0	17.7	5482.3	.0	9.6	581.3	.0	297.6	59.0	1917.76
.58	1.84	9.43	.00	.035	.030	.000	.000	1907.12	1000.00
.002830	101.	96.	88.	2	15	0	.00	94.47	1094.47

CCHV= .100 CEHV= .300
*SECNO 810.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.02

810.000	11.29	1918.91	1916.32	.00	1919.15	.24	.23	.11	1913.59
5500.0	1697.2	2353.7	1449.1	580.4	471.5	495.9	302.2	60.0	1913.31
.59	2.92	4.99	2.92	.035	.030	.035	.000	1907.62	995.44
.000695	222.	185.	145.	3	9	0	.00	353.45	1348.89

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THIS RUN EXECUTED 01JUL03 14:17:44

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION -

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	130.000	1732.56	1729.79	1732.92	1733.69	6400.00	.00	10.00	.00	6.99	1731.78	8.55	1732.92
*	300.000	1776.87	1775.18	1776.45	1779.18	6300.00	.00	2.00	.00	6.16	1775.34	9.92	1776.87
*	370.000	1792.39	1793.94	.00	1805.42	6300.00	.00	59.00	.00	6.08	1790.02	12.29	1792.37
*	440.000	1813.49	1803.56	1820.96	1804.64	3603.15	2705.88	30.00	.00	9.55	1806.11	17.48	1810.85
*	480.000	1815.71	1810.26	1822.37	1813.56	4005.47	1830.21	30.00	.00	14.15	1816.08	8.62	1817.23
*	600.000	1848.77	1845.39	1848.66	1848.76	5780.91	.16	15.00	2.94	9.34	1846.70	11.56	1848.77
*	660.000	1869.82	1866.43	1868.35	1871.43	5800.00	.00	2.00	.00	9.24	1867.60	11.97	1869.82
	700.000	1878.92	1888.26	.00	1896.26	5500.00	.00	59.00	.00	9.60	1877.86	9.68	1879.32
*	790.000	1918.65	1915.38	1917.34	1919.38	5500.00	.00	2.00	.00	9.63	1916.99	10.33	1918.65

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FLOODPLAIN DELINEATION -

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
10.000	.00	.00	.00	1702.59	6400.00	1710.96	1709.66	1712.45	40.17	9.77	654.99	1009.81
20.000	488.53	.00	.00	1705.38	6400.00	1712.99	1712.30	1714.81	54.16	10.82	591.46	869.66
30.000	498.03	.00	.00	1708.11	6400.00	1715.62	1715.25	1717.74	60.14	11.71	555.76	825.31

	40.000	491.57	.00	.00	1709.46	6400.00	1718.53	1718.05	1720.44	49.47	11.26	605.53	909.92
*	50.000	305.60	.00	.00	1711.16	6400.00	1720.62	1718.32	1721.58	25.10	7.85	815.17	1277.56
*	60.000	499.27	.00	.00	1712.20	6400.00	1721.93	1719.55	1722.46	11.93	6.46	1304.23	1852.60
*	70.000	497.95	.00	.00	1714.26	6400.00	1721.79	1721.79	1724.38	79.46	12.92	495.38	717.97
*	80.000	470.68	.00	.00	1716.64	6400.00	1725.47	1723.76	1726.82	33.39	9.33	685.96	1107.62
	90.000	482.19	.00	.00	1717.45	6400.00	1727.03	1726.06	1728.89	47.85	10.93	586.21	925.18
	100.000	295.13	.00	.00	1720.96	6400.00	1728.68	1726.93	1730.07	32.04	9.49	674.45	1130.66
*	110.000	25.69	.00	.00	1722.76	6400.00	1728.05	1728.05	1730.48	20.26	12.50	512.01	1421.91
*	120.000	90.11	.00	.00	1724.16	6400.00	1728.95	1728.95	1731.37	22.07	12.49	512.45	1362.37
*	130.000	119.69	1733.69	1729.79	1724.79	6400.00	1731.78	.00	1732.92	6.45	8.55	748.45	2519.99
	140.000	64.14	.00	.00	1724.86	6400.00	1731.71	1730.19	1733.01	8.08	9.16	698.74	2252.04
*	150.000	489.94	.00	.00	1725.79	6300.00	1732.25	1732.25	1734.43	37.37	11.84	532.17	1030.53
	160.000	501.51	.00	.00	1727.87	6300.00	1734.37	1733.82	1736.01	25.37	10.28	612.98	1250.86
*	170.000	487.26	.00	.00	1729.56	6300.00	1735.60	1735.60	1737.71	37.59	11.65	540.60	1027.52
	180.000	491.83	.00	.00	1731.86	6300.00	1737.47	1737.29	1739.44	32.61	11.26	559.45	1103.29
*	190.000	497.74	.00	.00	1735.05	6300.00	1741.75	1741.75	1744.14	36.27	12.40	508.15	1046.09
*	200.000	495.37	.00	.00	1738.96	6300.00	1745.12	1745.12	1747.57	36.03	12.55	501.99	1049.50
*	210.000	500.38	.00	.00	1739.78	6300.00	1749.09	1749.09	1751.94	35.28	13.54	465.25	1060.72
*	220.000	476.72	.00	.00	1746.22	6300.00	1754.19	1754.19	1756.87	35.78	13.15	479.23	1053.22
*	230.000	494.76	.00	.00	1752.38	6300.00	1760.66	1760.66	1763.45	35.14	13.39	470.48	1062.73
*	240.000	492.00	.00	.00	1759.69	6300.00	1764.87	1764.87	1767.14	36.68	12.07	521.97	1040.16

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	58.60	.00	.00	1760.26	6300.00	1765.31	1765.31	1767.65	21.01	12.28	513.16	1374.32
*	260.000	1.00	.00	.00	1764.26	6300.00	1769.23	1769.23	1771.38	21.96	11.75	536.10	1344.52
*	270.000	21.92	.00	.00	1764.26	6300.00	1769.12	1769.12	1771.54	21.56	12.48	504.71	1356.90
*	280.000	1.00	.00	.00	1768.26	6300.00	1773.15	1773.15	1775.56	21.39	12.45	505.92	1362.04

*	290.000	14.95	.00	.00	1768.81	6300.00	1773.67	1773.67	1776.13	22.08	12.58	500.64	1340.65
*	300.000	102.75	1779.18	1775.18	1769.18	6300.00	1775.34	.00	1776.87	10.32	9.92	634.90	1960.95
	310.000	100.28	.00	.00	1770.04	6300.00	1775.28	1774.93	1777.08	16.33	10.77	584.86	1558.77
*	320.000	489.10	.00	.00	1771.50	6300.00	1778.09	1778.09	1780.39	36.49	12.17	517.70	1042.95
*	330.000	500.10	.00	.00	1774.05	6300.00	1781.12	1781.12	1783.48	36.49	12.31	511.82	1042.99
*	340.000	496.21	.00	.00	1776.63	6300.00	1784.11	1784.11	1786.44	36.70	12.24	514.52	1039.97
*	350.000	436.71	.00	.00	1778.51	6300.00	1786.10	1786.10	1788.60	35.60	12.68	496.89	1055.87
*	360.000	314.29	.00	.00	1781.93	6300.00	1788.32	1788.32	1790.84	36.01	12.72	495.11	1049.91
*	370.000	232.15	1805.42	1793.94	1783.94	6300.00	1790.02	1790.02	1792.37	36.03	12.29	512.55	1049.57
*	380.000	170.96	.00	.00	1787.94	6300.00	1795.36	1795.36	1798.88	37.54	15.07	418.16	1028.18
*	390.000	420.90	.00	.00	1789.46	6300.00	1797.18	1797.18	1800.78	37.49	15.23	413.68	1028.90
*	400.000	216.12	.00	.00	1790.86	6300.00	1798.40	1798.40	1801.86	36.96	14.93	421.85	1036.24
*	410.000	222.64	.00	.00	1791.56	6300.00	1800.50	1800.50	1803.83	33.61	14.68	438.82	1086.66
*	420.000	218.15	.00	.00	1793.12	6300.00	1802.97	1802.97	1805.75	24.36	13.54	517.22	1276.55
*	430.000	221.27	.00	.00	1795.55	6300.00	1805.07	1805.07	1809.84	26.76	17.53	359.32	1217.88
*	440.000	197.38	1804.64	1803.56	1796.56	6300.00	1806.11	1806.06	1810.85	26.47	17.48	360.40	1224.55
	450.000	163.47	.00	.00	1797.76	5800.00	1810.60	1807.03	1811.67	29.44	8.33	696.14	1068.91
	460.000	285.08	.00	.00	1799.83	5800.00	1811.55	1808.81	1812.61	36.34	8.26	702.34	962.09
*	470.000	275.07	.00	.00	1801.56	5800.00	1812.55	1812.55	1815.71	138.68	14.27	406.58	492.51
*	480.000	29.16	1813.56	1810.26	1801.93	5800.00	1816.08	.00	1817.23	31.57	8.62	672.62	1032.30
*	490.000	404.91	.00	.00	1805.92	5800.00	1817.46	1816.19	1819.39	79.68	11.16	519.90	649.77
	500.000	467.90	.00	.00	1809.76	5800.00	1821.26	1820.12	1823.26	85.04	11.34	511.37	628.96

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	510.000	413.47	.00	.00	1812.55	5800.00	1824.30	1824.30	1825.94	33.83	10.65	614.81	997.24
	520.000	477.37	.00	.00	1817.08	5800.00	1826.21	1824.96	1827.72	40.91	9.86	588.48	906.77
*	530.000	399.20	.00	.00	1819.88	5800.00	1829.04	1829.04	1831.50	83.41	12.57	461.47	635.06

*	540.000	489.72	.00	.00	1825.71	5800.00	1834.02	1834.02	1836.69	83.30	13.12	442.12	635.50
*	550.000	456.26	.00	.00	1828.92	5800.00	1838.92	1838.92	1841.46	86.00	12.80	453.18	625.44
	560.000	330.24	.00	.00	1830.11	5800.00	1841.76	1841.50	1844.07	71.79	12.20	475.41	684.51
	570.000	228.38	.00	.00	1833.95	5800.00	1843.30	1841.48	1845.28	38.60	11.28	514.15	933.54
*	580.000	1.00	.00	.00	1836.26	5800.00	1843.20	1843.20	1846.39	20.51	14.32	405.06	1280.79
*	590.000	15.77	.00	.00	1836.47	5800.00	1843.56	1843.56	1847.14	23.56	15.19	381.84	1194.84
*	600.000	93.51	1848.76	1845.39	1837.36	5800.00	1846.70	.00	1848.77	10.31	11.56	501.84	1806.12
*	610.000	215.38	.00	.00	1844.88	5800.00	1854.56	1854.56	1857.06	12.87	13.13	516.84	1616.89
*	620.000	212.31	.00	.00	1847.74	5800.00	1857.57	1857.57	1859.92	12.08	12.79	541.92	1668.78
*	630.000	221.03	.00	.00	1850.36	5800.00	1859.92	1859.92	1862.06	10.93	12.37	588.88	1754,17
*	640.000	258.21	.00	.00	1853.63	5800.00	1862.91	1862.91	1866.17	16.95	14.64	415.21	1408.60
*	650.000	211.31	.00	.00	1856.06	5800.00	1863.26	1863.26	1866.89	23.70	15.30	378.99	1191.31
*	660.000	191.78	1871.43	1866.43	1858.36	5800.00	1867.60	.00	1869.82	11.28	11.97	484.63	1726.55
*	670.000	452.82	.00	.00	1861.26	5500.00	1868.75	1868.75	1871.62	55.30	13.60	404.44	739.57
*	680.000	461.54	.00	.00	1864.86	5500.00	1874.08	1874.08	1877.20	54.93	14.19	387.58	742.12
*	690.000	422.90	.00	.00	1868.26	5500.00	1877.13	1875.59	1878.92	27.27	10.73	512.41	1053.31
	700.000	153.08	1896.26	1888.26	1868.26	5500.00	1877.86	1875.59	1879.32	20.37	9.68	568.21	1218.51
*	710.000	424.60	.00	.00	1878.76	5500.00	1888.18	1888.18	1891.24	54.17	14.04	391.63	747.29
*	720.000	498.02	.00	.00	1883.85	5500.00	1891.59	1891.59	1894.37	55.33	13.38	410.97	739.40
*	730.000	480.56	.00	.00	1887.36	5500.00	1895.05	1895.05	1897.08	47.91	12.15	492.26	794.59
*	740.000	492.38	.00	.00	1891.61	5500.00	1900.11	1900.11	1903.19	54.89	14.08	390.66	742.38
*	750.000	391.69	.00	.00	1895.70	5500.00	1904.07	1904.07	1906.90	55.81	13.50	407.50	736.20
*	760.000	428.24	.00	.00	1900.49	5500.00	1908.28	1908.28	1911.07	56.30	13.40	410.34	733.03

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	770.000	434.78	.00	.00	1905.46	5500.00	1912.03	1912.03	1914.50	56.52	12.59	436.79	731.56
*	780.000	49.44	.00	.00	1906.04	5500.00	1912.76	1912.76	1916.16	23.47	14.79	371.91	1135.21

*	790.000	108.02	1919.38	1915.38	1907.36	5500.00	1916.99	.00	1918.65	7.91	10.33	532.29	1955.06
*	800.000	95.80	.00	.00	1907.12	5500.00	1917.43	1915.16	1918.81	28.30	9.43	590.89	1033.90
*	810.000	185.09	.00	.00	1907.62	5500.00	1918.91	1916.32	1919.15	6.95	4.99	1547.86	2086.34

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FLOODPLAIN DELINEATION -

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.000	6400.00	1710.96	.00	.00	3.70	119.45	.00
	20.000	6400.00	1712.99	.00	2.03	.00	114.06	488.53
	30.000	6400.00	1715.62	.00	2.63	.00	125.10	498.03
	40.000	6400.00	1718.53	.00	2.91	.00	154.35	491.57
*	50.000	6400.00	1720.62	.00	2.09	.00	142.96	305.60
*	60.000	6400.00	1721.93	.00	1.31	.00	396.87	499.27
*	70.000	6400.00	1721.79	.00	-.14	.00	97.17	497.95
*	80.000	6400.00	1725.47	.00	3.68	.00	115.23	470.68
	90.000	6400.00	1727.03	.00	1.56	.00	110.73	482.19
	100.000	6400.00	1728.68	.00	1.65	.00	104.36	295.13
*	110.000	6400.00	1728.05	.00	-.62	.00	106.34	25.69
*	120.000	6400.00	1728.95	.00	.90	.00	107.00	90.11
*	130.000	6400.00	1731.78	.00	2.83	.00	107.00	119.69
	140.000	6400.00	1731.71	.00	-.07	.00	115.91	64.14
*	150.000	6300.00	1732.25	.00	.54	.00	124.87	489.94
	160.000	6300.00	1734.37	.00	2.12	.00	132.85	501.51
*	170.000	6300.00	1735.60	.00	1.23	.00	130.75	487.26
	180.000	6300.00	1737.47	.00	1.87	.00	127.87	491.83
*	190.000	6300.00	1741.75	.00	4.28	.00	108.37	497.74
*	200.000	6300.00	1745.12	.00	3.37	.00	104.30	495.37

*	210.000	6300.00	1749.09	.00	3.97	.00	83.71	500.38
*	220.000	6300.00	1754.19	.00	5.10	.00	91.27	476.72
*	230.000	6300.00	1760.66	.00	6.47	.00	86.22	494.76
*	240.000	6300.00	1764.87	.00	4.21	.00	116.82	492.00

1

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	6300.00	1765.31	.00	.43	.00	110.08	58.60
*	260.000	6300.00	1769.23	.00	3.93	.00	128.59	1.00
*	270.000	6300.00	1769.12	.00	-.12	.00	104.80	21.92
*	280.000	6300.00	1773.15	.00	4.03	.00	105.61	1.00
*	290.000	6300.00	1773.67	.00	.52	.00	102.93	14.95
*	300.000	6300.00	1775.34	.00	1.67	.00	103.02	102.75
	310.000	6300.00	1775.28	.00	-.06	.00	131.04	100.28
*	320.000	6300.00	1778.09	.00	2.81	.00	114.58	489.10
*	330.000	6300.00	1781.12	.00	3.04	.00	110.82	500.10
*	340.000	6300.00	1784.11	.00	2.99	.00	112.87	496.21
*	350.000	6300.00	1786.10	.00	1.99	.00	99.87	436.71
*	360.000	6300.00	1788.32	.00	2.22	.00	100.08	314.29
*	370.000	6300.00	1790.02	.00	1.70	.00	110.15	232.15
*	380.000	6300.00	1795.36	.00	5.34	.00	60.09	170.96
*	390.000	6300.00	1797.18	.00	1.82	.00	58.10	420.90
*	400.000	6300.00	1798.40	.00	1.21	.00	60.99	216.12
*	410.000	6300.00	1800.50	.00	2.10	.00	75.96	222.64
*	420.000	6300.00	1802.97	.00	2.47	.00	149.83	218.15
*	430.000	6300.00	1805.07	.00	2.10	.00	37.75	221.27
*	440.000	6300.00	1806.11	.00	1.04	.00	37.75	197.38
	450.000	5800.00	1810.60	.00	4.49	.00	76.55	163.47

	460.000	5800.00	1811.55	.00	.95	.00	93.66	285.08
*	470.000	5800.00	1812.55	.00	1.00	.00	64.43	275.07
*	480.000	5800.00	1816.08	.00	3.53	.00	71.96	29.16
*	490.000	5800.00	1817.46	.00	1.38	.00	77.64	404.91
	500.000	5800.00	1821.26	.00	3.81	.00	79.43	467.90

1

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	510.000	5800.00	1824.30	.00	3.03	.00	205.18	413.47
	520.000	5800.00	1826.21	.00	1.92	.00	105.06	477.37
*	530.000	5800.00	1829.04	.00	2.83	.00	95.65	399.20
*	540.000	5800.00	1834.02	.00	4.97	.00	84.49	489.72
*	550.000	5800.00	1838.92	.00	4.90	.00	92.74	456.26
	560.000	5800.00	1841.76	.00	2.85	.00	90.56	330.24
	570.000	5800.00	1843.30	.00	1.54	.00	64.87	228.38
*	580.000	5800.00	1843.20	.00	-.10	.00	64.22	1.00
*	590.000	5800.00	1843.56	.00	.36	.00	53.84	15.77
*	600.000	5800.00	1846.70	.00	3.13	.00	53.84	93.51
*	610.000	5800.00	1854.56	.00	7.87	.00	131.09	215.38
*	620.000	5800.00	1857.57	.00	3.01	.00	141.80	212.31
*	630.000	5800.00	1859.92	.00	2.34	.00	153.98	221.03
*	640.000	5800.00	1862.91	.00	3.00	.00	66.64	258.21
*	650.000	5800.00	1863.26	.00	.34	.00	52.67	211.31
*	660.000	5800.00	1867.60	.00	4.34	.00	52.67	191.78
*	670.000	5500.00	1868.75	.00	1.15	.00	71.51	452.82
*	680.000	5500.00	1874.08	.00	5.33	.00	63.15	461.54
*	690.000	5500.00	1877.13	.00	3.06	.00	75.49	422.90
	700.000	5500.00	1877.86	.00	.73	.00	78.39	153.08

*	710.000	5500.00	1888.18	.00	10.31	.00	64.41	424.60
*	720.000	5500.00	1891.59	.00	3.42	.00	75.25	498.02
*	730.000	5500.00	1895.05	.00	3.46	.00	127.21	480.56
*	740.000	5500.00	1900.11	.00	5.06	.00	64.13	492.38
*	750.000	5500.00	1904.07	.00	3.96	.00	74.23	391.69
*	760.000	5500.00	1908.28	.00	4.21	.00	76.05	428.24

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	770.000	5500.00	1912.03	.00	3.75	.00	90.26	434.78
*	780.000	5500.00	1912.76	.00	.73	.00	55.33	49.44
*	790.000	5500.00	1916.99	.00	4.23	.00	55.33	108.02
*	800.000	5500.00	1917.43	.00	.44	.00	94.47	95.80
*	810.000	5500.00	1918.91	.00	1.48	.00	353.45	185.09

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=     50.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     70.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     70.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     80.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    110.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    110.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    120.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    120.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    130.000  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=    130.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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 CAUTION SECNO=    150.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    150.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    170.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    170.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    190.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    190.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    200.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    200.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    210.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    210.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    220.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    220.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    230.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    230.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    240.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    240.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    250.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    250.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    260.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    260.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    270.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    270.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
1
    01JUL03      14:17:43                                                PAGE   50


 CAUTION SECNO=    280.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    280.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    290.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    290.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    300.000  PROFILE=  1  HYDRAULIC JUMP D.S.
 WARNING SECNO=    300.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    320.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    320.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    330.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    330.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    340.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    340.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    350.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
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 CAUTION SECNO=    350.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    360.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    360.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    370.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    370.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    380.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    380.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    390.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    390.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    400.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    400.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    410.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    410.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    420.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    420.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    430.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    430.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    440.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=    440.000  PROFILE=  1  WSEL ASSUMED BASED ON MIN DIFF
 CAUTION SECNO=    440.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=    440.000  PROFILE=  1  HYDRAULIC JUMP D.S.

 CAUTION SECNO=    470.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    470.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=    480.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
1
    01JUL03      14:17:43                                                    PAGE   51


 WARNING SECNO=    490.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=    510.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    510.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    530.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    530.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    540.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    540.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    550.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    550.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=    580.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=    580.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

Corrected Effective Model (Pre-Project Conditions)
Supercritical Flow HEC-2 Output File (NAVD88)

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES         *
 *                                       *
 *  Version   4.6.2;  May 1991           *
 *                                       *
 *  RUN DATE    13AUG03    TIME   11:13:13  *
 *****************************************
```


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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

THIS RUN EXECUTED 13AUG03 11:13:13

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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```
T1      REQUEST FOR LETTER OF MAP REVISION - FLAMINGO WASH
T2      CORRECTED EFFECTIVE MODEL
T3      ORIGINAL MODEL CREATED BY GC WALLACE  FOR FLAMINGO WASH FIS
T4      ELEVATIONS RAISED BY BERGER 2.26 FEET TO CONVERT FROM NGVD29 TO NAVD88
T4      DATUM = NAVD88
T4      FILE: 879-F-C-SUPER.DAT
T4      STARTING WSE = CRITICAL DEPTH
T4      SUPERCRITICAL RUN
T4      CONCRETE CHANNEL LINING BETWEEN D.I. ROAD & MOJAVE ROAD
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2		1	-1			5800	1862.70	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1				-2	-6		

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	150	100

NC	0.02	0.02	0.015	0.1	0.3					
X1	640	19	1026.88	1079.43	251.59	262.14	258.21		2.26	
GR	1864.5	1000	1864.16	1004.77	1864	1005.12	1862	1009.4	1860	1013.41
GR	1858.6	1016.12	1858.09	1026.88	1858	1027.05	1856	1030.75	1854	1034.43
GR	1852	1038.12	1851.39	1039.25	1851.37	1067.22	1852	1068.01	1854	1070.51
GR	1856	1073	1858	1075.48	1860	1077.94	1861.23	1079.43		
NC	0.02	0.02	0.015							
X1	630	18	1031	1084.55	229.09	213.86	221.03		2.26	
GR	1861.2	1000	1860	1004.03	1858.27	1009.63	1858	1010.62	1856	1018.67
GR	1855.9	1018.82	1855.06	1031	1854	1032.96	1852	1036.68	1850	1040.45
GR	1848.1	1044.02	1848.28	1071.6	1850	1074.89	1852	1078.71	1854	1082.53
GR	1855	1084.55	1856	1129.14	1857	1165.99				
NC	0.02	0.02	0.015							
X1	620	20	1033.45	1086.27	223.64	202.43	212.31		2.26	
GR	1859.3	1000	1858	1007.7	1857.16	1012.48	1856	1018.28	1855.25	1022.06
GR	1855.4	1033.45	1854	1035.35	1852	1037.9	1850	1040.44	1848	1042.97
GR	1846	1045.49	1845.48	1046.14	1845.66	1075.97	1846	1076.49	1848	1079.51
GR	1850	1082.53	1852	1085.57	1852.46	1086.27	1854	1135.67	1855.53	1176.03

1

NC	0.02	0.02	0.015							
X1	610	20	1083.2	1136.14	230.78	201.73	215.38		2.26	
X3	10			1061.48	1855.26	1207.54	1855.26			
GR	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
GR	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
GR	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
GR	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54
NC	0.02	0.02	0.015							
X1	600	15	1081.85	1135.69					2.26	
X3	10			1081.85	1850.26	1135.69	1850.26			
GR	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
GR	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
GR	1835.1	1081.85	1835.1	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH
0

CCHV= .100 CEHV= .300
*SECNO 640.000
3720 CRITICAL DEPTH ASSUMED

640.000	9.27	1862.90	1862.90	1862.70	1866.17	3.27	.00	.00	1860.35
5800.0	144.5	5655.5	.0	28.7	385.3	.0	.0	.0	1863.49
.00	5.04	14.68	.00	.020	.015	.000	.000	1853.63	1012.14
.001710	0.	0.	0.	0	7	0	.00	66.57	1078.71

*SECNO 630.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.00

630.000	6.51	1856.87	1859.88	.00	1864.91	8.04	.78	.48	1857.32
5800.0	.0	5800.0	.0	.0	254.9	.0	2.0	.4	1857.26
.00	.00	22.75	.00	.000	.015	.000	.000	1850.36	1031.84
.006841	252.	258.	262.	9	8	0	.00	51.91	1083.75

*SECNO 620.000

3301 HV CHANGED MORE THAN HVINS

620.000	6.31	1854.05	1857.58	.00	1863.20	9.15	1.60	.11	1857.66
5800.0	.0	5800.0	.0	.0	238.9	.0	3.2	.6	1854.72
.01	.00	24.27	.00	.000	.015	.000	.000	1847.74	1038.17
.007680	229.	221.	214.	10	17	0	.00	47.08	1085.25

*SECNO 610.000

3301 HV CHANGED MORE THAN HVINS

1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
ELENCL= 1855.26 ELENCR= 1855.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1854.17 ELREA= 1851.82

610.000	6.01	1850.89	1854.56	.00	1861.28	10.39	1.79	.12	1854.17

5800.0	.0	5800.0	.0	.0	224.2	.0	4.4	.8	1851.82
.01	.00	25.86	.00	.000	.015	.000	.000	1844.88	1087.71
.009304	224.	212.	202.	9	14	0	.00	46.85	1134.55

*SECNO 600.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.69

3470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1850.26 ELENCR= 1850.26

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1848.26 ELREA= 1850.26

600.000	3.26	1840.62	1844.45	.00	1857.47	16.85	3.16	.65	1848.26
5800.0	.0	5800.0	.0	.0	176.1	.0	5.4	1.1	1850.26
.01	.00	32.94	.00	.000	.015	.000	.000	1837.36	1081.85
.026536	231.	215.	202.	6	11	0	.00	53.84	1135.69

1
13AUG03 11:13:13 PAGE 5

THIS RUN EXECUTED 13AUG03 11:13:13

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

DATUM = NAVD88

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

1
13AUG03 11:13:13 PAGE 6

DATUM = NAVD88

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	640.000	.00	.00	.00	1853.63	5800.00	1862.90	1862.90	1866.17	17.10	14.68	413.92	1402.59
*	630.000	258.21	.00	.00	1850.36	5800.00	1856.87	1859.88	1864.91	68.41	22.75	254.90	701.25
	620.000	221.03	.00	.00	1847.74	5800.00	1854.05	1857.58	1863.20	76.80	24.27	238.94	661.84
	610.000	212.31	.00	.00	1844.88	5800.00	1850.89	1854.56	1861.28	93.04	25.86	224.25	601.29
*	600.000	215.38	.00	.00	1837.36	5800.00	1840.62	1844.45	1857.47	265.36	32.94	176.07	356.05

1
13AUG03 11:13:13 PAGE 7

DATUM = NAVD88

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	640.000	5800.00	1862.90	.00	.00	.20	66.57	.00
*	630.000	5800.00	1856.87	.00	-6.03	.00	51.91	258.21
	620.000	5800.00	1854.05	.00	-2.82	.00	47.08	221.03
	610.000	5800.00	1850.89	.00	-3.15	.00	46.85	212.31
*	600.000	5800.00	1840.62	.00	-10.27	.00	53.84	215.38

1
13AUG03 11:13:13 PAGE 8

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 630.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

Flamingo Wash at Mojave Road to Boulder Highway

LOMR

Appendix B.2

B.2.1 LOMR Case No. 04-09-0167P

Federal Emergency Management Agency

Washington, D.C. 20472

MAR 12 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Chip Maxfield, P.E.
Chair, Clark County Board
of Commissioners
500 South Grand Central Parkway
Las Vegas, NV 89155

IN REPLY REFER TO:
Case No.: 04-09-0167P
Community Name: Clark County, NV
Community No.: 320003
Effective Date of This Revision: MAR 12 2004

Dear Mr. Maxfield:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7103, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

List of Enclosures:
Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. David Betley, P.E.
Principal Engineer
Civil Engineering Division
Department of Public Works
Clark County

Syndi J. Flippin-Dudley, Ph.D., P.E.
Director of Water Resources
The Louis Berger Group, Inc.

Mr. Kevin Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood Control District

2004 MAR 15 PM 3:09
RFCD

 | Issue Date: MAR 12 2004 | Effective Date: MAR 12 2004 | Case No.: 04-09-0167P | LOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Clark County Nevada (Unincorporated Areas)	BRIDGE CHANNELIZATION	HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 320003		
IDENTIFIER	Flamingo Wash – Maryland Parkway to Spencer Street	APPROXIMATE LATITUDE & LONGITUDE: 36.12, 115.14 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
FLOODING SOURCE(S) & REVISED REACH(ES)	Flamingo Wash – from approximately 700 feet downstream of Spencer Street to just upstream of Maryland Parkway		

SUMMARY OF REVISIONS

Effective Flooding: Zone A
Revised Flooding: Zone A
Increases: YES
Decreases: YES

* BFEs – Base Flood Elevations

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 32003C2557 E Date: September 27 2002	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

* FIRM – Flood Insurance Rate Map; ** FBFM – Flood Boundary and Floodway Map; *** FHBM – Flood Hazard Boundary Map

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090167-102IC

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the modified channel and bridge rests with your community. We may request that your community submit a description and schedule of channel and bridge activities.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Sally M. Ziolkowski
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7103

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

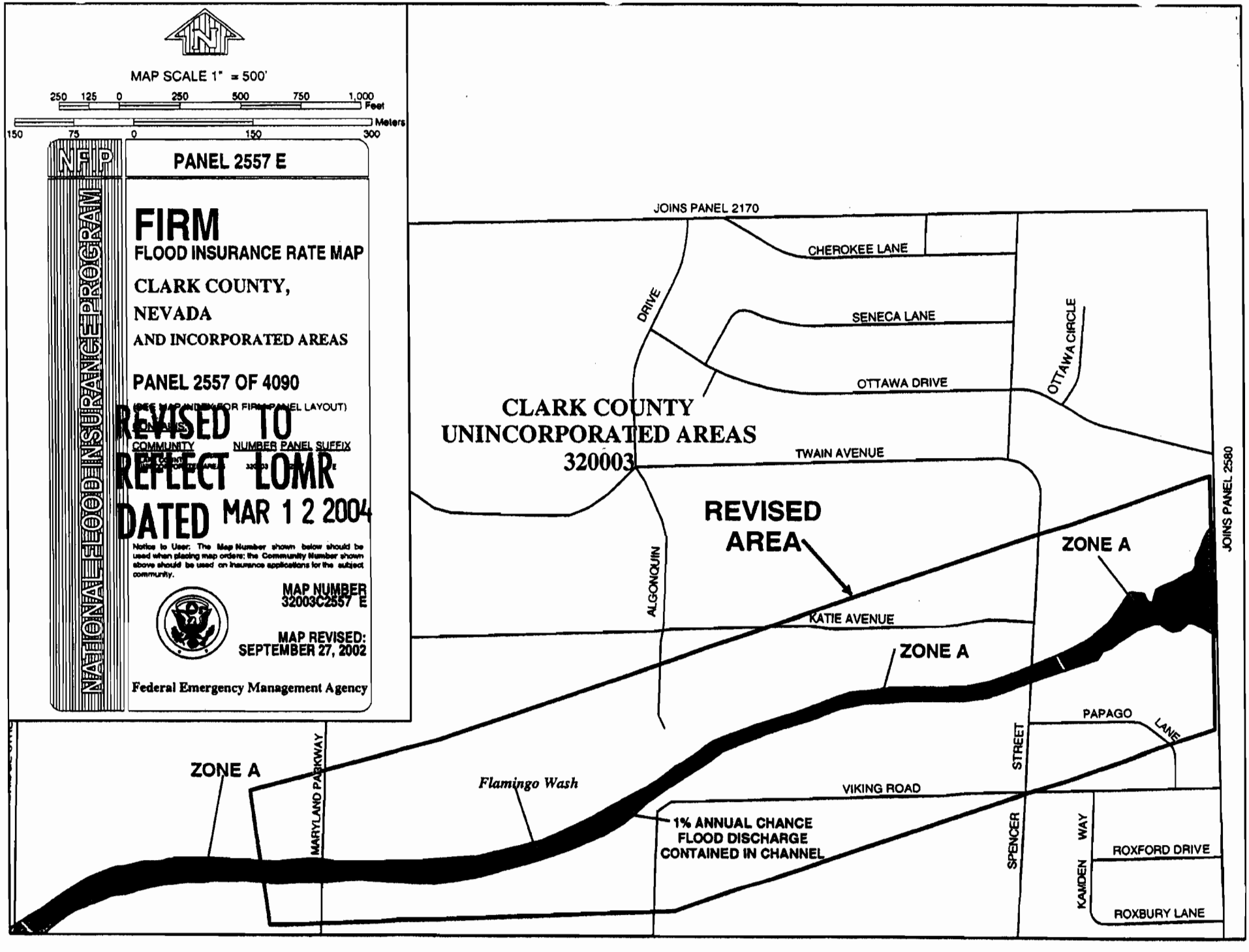
This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

As a result of the modifications, the Special Flood Hazard Area, the area that would be inundated by the base (1-percent-annual-chance) flood, along Flamingo Wash, from approximately 1,200 feet downstream to just upstream of Maryland Parkway, shifted approximately 30 feet to the north to better reflect existing topography. The base flood is contained in the channel in this reach.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090167-102IC


MAP SCALE 1" = 500'
250 125 0 250 500 750 1,000 Feet
150 75 0 150 300 Meters
PANEL 2557 E
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS
PANEL 2557 OF 4090
REVISED TO REFLECT LOMR DATED MAR 1 2 2004
COMMUNITY NUMBER PANEL SUFFIX
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
32003C2557 E
MAP REVISED:
SEPTEMBER 27, 2002
Federal Emergency Management Agency
JOINS PANEL 2170
CHEROKEE LANE
SENECA LANE
OTTAWA DRIVE
OTTAWA CIRCLE
DRIVE
CLARK COUNTY
UNINCORPORATED AREAS
320003
TWAIN AVENUE
REVISED
AREA
ALGONQUIN
KATIE AVENUE
ZONE A
ZONE A
ZONE A
JOINS PANEL 2580
PAPAGO
LANE
STREET
VIKING ROAD
MARYLAND PARKWAY
Flamingo Wash
1% ANNUAL CHANCE
FLOOD DISCHARGE
CONTAINED IN CHANNEL
SPENCER
KAMDEN WAY
ROXFORD DRIVE
ROXBURY LANE

B.2.2 Flamingo Wash at Spencer Street Workmap and Post Project HECRAS Model

Request for Conditional Letter of Map Revision
Flamingo Wash
at Spencer Street
Clark County, Nevada

Prepared for:
CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT
500 S. Grand Central Parkway
Las Vegas, NV 89155



Prepared by:
THE Louis Berger Group, Inc.
500 Amigo Court Suite 100
Las Vegas, NV 89119



November 26, 2003

TWAIN

TWAIN

ALG

SPENCER

DOWNSTREAM LIMIT OF STUDY

KATIE

MARYLAND

CAMBRIDGE

FLAMINGO WASH

VIKING

KAMDEN

ROXFORD

ROXBURY

CRAIGLEA

LIMIT OF STUDY

FLAMINGO

CLAYMONT

GROVE

MARYLAND

COTTAGE GROVE

ESCONDIDO

ALGONQUIN

TAMARACK

NEVSO

POST PROJECT ZONE A CONTAINED IN CHANNEL

SPENCER STREET BRIDGE

UPSTREAM LIMIT OF STUDY

EXISTING ZONE "A" BOUNDARY SHIFTED NORTH TO LINE UP WITH CHANNEL.

EXISTING ZONE "A" BOUNDARY

FLOODWAY

NOTES:

1. THE VERTICAL CONTROL IS BASED ON THE NGVD 29 AND HORIZONTAL CONTROL IS BASED ON THE NAVD 83, UTILIZING CLARK COUNTY MONUMENTS.
2. THE CORRECTION FACTOR FROM NGVD 29 TO NAVD 88 IS +2.26 ft. THE HECRAS MODEL CROSS-SECTION ELEVATIONS ARE BASED ON NAVD 88.
3. PLAN MODIFIED FROM "FLAMINGO WASH FIS-RESTUDY IMPERIAL PALACE TO SPENCER STREET CROSS SECTION EXHIBIT" PREPARED BY G.C. WALLACE INC. DATED 11-11-1997.
4. THE EXISTING FLOOD ZONE LIMITS SHOWN HEREON ARE FROM THE CLARK COUNTY GIS DATA.

LEGEND

(150) FLAMINGO WASH FIS RESTUDY CROSS SECTION (TYP)

[130] POST PROJECT CONDITIONS CROSS SECTION (TYP)

PROFESSIONAL ENGINEER-STATE OF NEVADA
SYNDI L. FUPPIANI-DUDLEY
No. 11070
EXP 12/31/05
CIVIL
10/15/03

N

200 100 0 200 400 800

WORK MAP

FLAMINGO WASH AT SPENCER

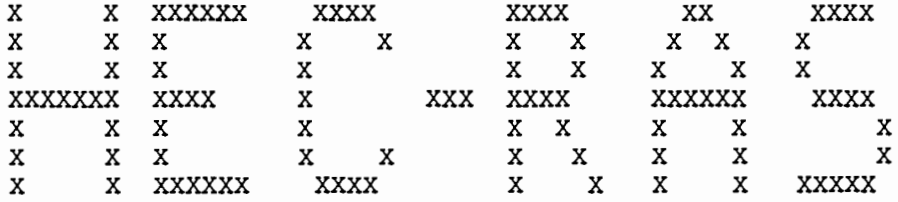
FIGURE 3

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-03.dgn - 10/15/2003 - 12:53:11 JPS

Post Project Conditions HECRAS Output File

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104



PROJECT DATA
Project Title: Flamingo Wash at Spencer
Project File : 879_D_Spnc.prj
Run Date and Time: 12/1/2003 9:57:57 AM

Project in English units

Project Description:
FLAMINGO WASH
  LETTER OF MAP REVISION
  EXISTING CHANNEL TO SPENCER
STREET
  STARTING WSE = NORMAL DEPTH
  SUBCRITICAL RUN

PLAN DATA

Plan Title: Post Project
Plan File : C:\Documents and Settings\jdouglas\Desktop\HEC-Ras\879_D_Spnc.p03

Geometry Title: Post Project Geometry
Geometry File : C:\Documents and Settings\jdouglas\Desktop\HEC-Ras\879_D_Spnc.g03

Flow Title : Post Project
Flow File : C:\Documents and Settings\jdouglas\Desktop\HEC-Ras\879_D_Spnc.f03

Plan Summary Information:
Number of: Cross Sections = 50 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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: Post Project
Flow File : C:\Documents and Settings\jdouglas\Desktop\HEC-Ras\879_D_Spnc.f02

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	180	5300
RIVER-1	Reach-1	50	5500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Critical	Normal S = .01

GEOMETRY DATA

Geometry Title: Post Project Geometry
Geometry File : C:\Documents and Settings\jdouglas\Desktop\HEC-Ras\879_D_Spnc.g03

CROSS SECTION RIVER: RIVER-1

REACH: Reach-1 RS: 180

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1972.26	1028.94	1971.67	1064.62	1970.62	1086	1970.89	1087.29	1972.26
1087.42	1972.36	1100.03	1972.26	1105.54	1972.23	1109.38	1970.26	1113.23	1968.26
1117.01	1966.26	1120.79	1964.26	1124.58	1962.26	1128.36	1960.26	1131.88	1958.41
1143	1959.06	1147.31	1958.26	1152.03	1957.33	1170.74	1958.26	1170.74	1958.19
1176.71	1960.26	1180.23	1961.75	1180.82	1962.26	1183.17	1964.26	1185.58	1966.26
1188.01	1968.26	1190.47	1970.26	1192.93	1972.26	1195.38	1974.26	1197.84	1976.26
1199.53	1977.56	1202.18	1978.26	1204.15	1978.79	1230.41	1980.26	1230.73	1980.32
1268.21	1981.86	1278.63	1982.26						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1105.54	.025	1192.93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1105.54	1192.93	358.08	363.91	374.39	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1968.30	Element			
Vel Head (ft)	2.94	Wt. n-Val.		0.025	
W.S. Elev (ft)	1965.36	Reach Len. (ft)	358.08	363.91	374.39
Crit W.S. (ft)	1965.36	Flow Area (sq ft)		385.47	
E.G. Slope (ft/ft)	0.005479	Area (sq ft)		385.47	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	65.80	Top Width (ft)		65.80	
Vel Total (ft/s)	13.75	Avg. Vel. (ft/s)		13.75	
Max Chl Dpth (ft)	8.03	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	71600.3	Conv. (cfs)		71600.3	
Length Wtd. (ft)	363.91	Wetted Per. (ft)		69.77	
Min Ch El (ft)	1957.33	Shear (lb/sq ft)		1.89	
Alpha	1.00	Stream Power (lb/ft s)		25.98	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.37	19.82	0.07
C & E Loss (ft)		Cum SA (acres)	0.35	3.40	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 170

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1969.26	1012.58	1968.26	1012.86	1968.25	1017.32	1966.26	1021.04	1964.26

```
1023.53 1963.56 1025.98 1962.26 1029.63 1960.26 1033.27 1958.26 1036.91 1956.26
1039.96 1954.56 1078.78 1954.75 1090.15 1955.06 1091.24 1956.26 1093.09 1958.26
1094.94 1960.26  1096.8 1962.26 1098.54 1964.14 1098.85 1964.26 1103.45 1966.26
1107.87 1968.26 1112.15 1970.26  1112.6 1970.48 1119.73 1970.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .025 1021.94    .015 1098.85    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1021.94 1098.85             98.31   97.13   96.38            .1       .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1965.20    Element                Left OB    Channel   Right OB
  Vel Head (ft)               1.32    Wt. n-Val.                        0.015
  W.S. Elev (ft)           1963.89    Reach Len. (ft)          98.31     97.13      96.38
  Crit W.S. (ft)           1961.31    Flow Area (sq ft)                 575.14
  E.G. Slope (ft/ft)      0.000642    Area (sq ft)                      575.14
  Q Total (cfs)            5300.00    Flow (cfs)                       5300.00
  Top Width (ft)             75.51    Top Width (ft)                     75.51
  Vel Total (ft/s)            9.22    Avg. Vel. (ft/s)                    9.22
  Max Chl Dpth (ft)           9.32    Hydr. Depth (ft)                    7.62
  Conv. Total (cfs)        209191.8    Conv. (cfs)                    209191.8
  Length Wtd. (ft)           97.13    Wetted Per. (ft)                   81.75
  Min Ch El (ft)           1954.56    Shear (lb/sq ft)                    0.28
  Alpha                       1.00    Stream Power (lb/ft s)              2.60
  Frctn Loss (ft)             0.10    Cum Volume (acre-ft)      0.37     15.81      0.07
  C & E Loss (ft)             0.20    Cum SA (acres)            0.35      2.81      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 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: RIVER-1
REACH: Reach-1            RS: 160

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1966.26 1020.85 1964.26  1022.9  1963.4 1024.28 1962.26 1026.68 1960.26
 1029.05 1958.26 1031.39 1956.26 1033.69 1954.26 1033.96 1954.02 1074.55 1954.03
 1074.73 1954.26  1076.3 1956.26 1077.86 1958.26 1079.44 1960.26 1081.05 1962.26
 1081.97 1963.36  1085.8 1964.26 1091.98 1966.26 1097.23 1968.26 1098.86 1968.94
 1124.37 1969.36
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1022.9	.015	1081.97	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1022.9	1081.97	119.51	114.85	110.97	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1964.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1961.61	Reach Len. (ft)	119.51	114.85	110.97
Crit W.S. (ft)	1961.61	Flow Area (sq ft)		363.92	
E.G. Slope (ft/ft)	0.002039	Area (sq ft)		363.92	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	55.47	Top Width (ft)		55.47	
Vel Total (ft/s)	14.56	Avg. Vel. (ft/s)		14.56	
Max Chl Dpth (ft)	7.59	Hydr. Depth (ft)		6.56	
Conv. Total (cfs)	117380.3	Conv. (cfs)		117380.3	
Length Wtd. (ft)	114.85	Wetted Per. (ft)		61.94	
Min Ch El (ft)	1954.02	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)		10.89	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	0.37	14.76	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	2.67	0.07

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: 150

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1967.66	1124.53	1966.51	1124.8	1966.26	1129.47	1964.26	1133.87	1962.26
1135	1961.76	1136.46	1960.26	1138.43	1958.26	1140.4	1956.26	1142.4	1954.26
1143.5	1952.76	1183.5	1952.76	1187.45	1954.26	1189.03	1956.26	1190.57	1958.26
1192.09	1960.26	1193.6	1962.25	1193.68	1962.26	1198.04	1964.26	1202.42	1966.26
1206.72	1968.26	1208.61	1969.15	1222.54	1969.43	1280.29	1968.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1135	.015	1193.6	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1135	1193.6	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1964.32	Element			
Vel Head (ft)	5.72	Wt. n-Val.		0.015	
W.S. Elev (ft)	1958.60	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1960.22	Flow Area (sq ft)		276.25	
E.G. Slope (ft/ft)	0.004649	Area (sq ft)		276.25	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	52.74	Top Width (ft)		52.74	
Vel Total (ft/s)	19.19	Avg. Vel. (ft/s)		19.19	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		5.24	
Conv. Total (cfs)	77729.7	Conv. (cfs)		77729.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		57.71	
Min Ch El (ft)	1952.76	Shear (lb/sq ft)		1.39	
Alpha	1.00	Stream Power (lb/ft s)		26.66	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.37	13.92	0.07
C & E Loss (ft)	0.24	Cum SA (acres)	0.35	2.53	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 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: Program found supercritical flow starting at this cross section.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 140

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1967.36	1109.48	1966.26	1112.94	1966.35	1117.49	1964.26	1121.87	1962.26
1123.53	1961.46	1124.74	1960.26	1126.67	1958.26	1128.54	1956.26	1130.26	1954.26
1131.84	1952.26	1132.5	1950.76	1172.5	1950.76	1175.19	1952.26	1176.29	1954.26
1177.52	1956.26	1178.95	1958.26	1180.42	1960.26	1181.8	1962.12	1182.12	1962.26
1186.57	1964.26	1191.03	1966.26	1195.47	1968.26	1197.34	1969.11	1258.33	1968.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1123.53	.015	1181.8	.025

Bank Sta: Left Right Lengths: Left Channel Right

1123.53	1181.8	57.23	55.76	56.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1964.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1955.95	Reach Len. (ft)	57.23	55.76	56.76
Crit W.S. (ft)	1958.44	Flow Area (sq ft)		231.74	
E.G. Slope (ft/ft)	0.007598	Area (sq ft)		231.74	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	48.52	Top Width (ft)		48.52	
Vel Total (ft/s)	22.87	Avg. Vel. (ft/s)		22.87	
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)		4.78	
Conv. Total (cfs)	60803.4	Conv. (cfs)		60803.4	
Length Wtd. (ft)	55.76	Wetted Per. (ft)		53.76	
Min Ch El (ft)	1950.76	Shear (lb/sq ft)		2.04	
Alpha	1.00	Stream Power (lb/ft s)		46.76	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	13.91	0.07
C & E Loss (ft)	0.24	Cum SA (acres)	0.35	2.52	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 130

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1965.26	1082.33	1964.26	1086.89	1962.26	1090.09	1960.83	1091.34	1960.26
1092.89	1958.26	1094.44	1956.26	1095.99	1954.26	1097.54	1952.26	1099.5	1950.26
1139.5	1950.26	1141.65	1952.26	1142.63	1954.26	1143.6	1956.26	1144.57	1958.26
1145.53	1960.26	1147.33	1962.26	1148.78	1963.65	1151.72	1964.26	1155.18	1965.09
1156.8	1966.26	1157.37	1966.73	1174.08	1967.42	1213.65	1967.97		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1091.34	.015	1145.53	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1091.34	1145.53	125.29	125.31	125.61	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1963.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.20	Wt. n-Val.		0.015	

Crit W.S. (ft)	1957.93	Flow Area (sq ft)		230.61		
E.G. Slope (ft/ft)	0.007633	Area (sq ft)		230.61		
Q Total (cfs)	5300.00	Flow (cfs)		5300.00		
Top Width (ft)	48.12	Top Width (ft)		48.12		
Vel Total (ft/s)	22.98	Avg. Vel. (ft/s)		22.98		
Max Chl Dpth (ft)	5.18	Hydr. Depth (ft)		4.79		
Conv. Total (cfs)	60664.7	Conv. (cfs)		60664.7		
Length Wtd. (ft)	125.31	Wetted Per. (ft)		53.29		
Min Ch El (ft)	1950.26	Shear (lb/sq ft)		2.06		
Alpha	1.00	Stream Power (lb/ft s)		47.39		
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	0.37	13.61	0.07	
C & E Loss (ft)	0.01	Cum SA (acres)	0.35	2.46	0.07	

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 120

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1961.96	1034.06	1962.26	1069.3	1962.96	1077.37	1962.26	1081.8	1961.8
1082.95	1960.26	1084.44	1958.26	1085.94	1956.26	1087.44	1954.26	1088.93	1952.26
1090.43	1950.26	1090.88	1949.76	1130.88	1949.76	1133.47	1950.26	1134.85	1952.26
1136.24	1954.26	1137.62	1956.26	1138.99	1958.26	1139.81	1959.48	1140.72	1960.26
1142.7	1962.26	1144.46	1964.26	1148.81	1964.28	1152.73	1964.26	1157.77	1964.26
1185.25	1964.66	1223.58	1966.04						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1082.95	.015	1140.72	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1082.95	1140.72	25.32	24.78	22.42	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1962.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.55	Wt. n-Val.		0.015	
W.S. Elev (ft)	1954.99	Reach Len. (ft)	25.32	24.78	22.42
Crit W.S. (ft)	1957.27	Flow Area (sq ft)		240.42	
E.G. Slope (ft/ft)	0.006924	Area (sq ft)		240.42	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	49.85	Top Width (ft)		49.85	
Vel Total (ft/s)	22.05	Avg. Vel. (ft/s)		22.05	
Max Chl Dpth (ft)	5.23	Hydr. Depth (ft)		4.82	
Conv. Total (cfs)	63694.8	Conv. (cfs)		63694.8	
Length Wtd. (ft)	24.78	Wetted Per. (ft)		54.97	

Alpha	1.00	Stream Power (lb/ft s)		41.68	
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	0.37	12.94	0.07
C & E Loss (ft)	0.20	Cum SA (acres)	0.35	2.32	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: RIVER-1
REACH: Reach-1 RS: 110

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1960.26	1058.72	1961.52	1069.8	1960.78	1070.23	1960.26	1071.86	1958.26
1073.49	1956.26	1075.13	1954.26	1076.77	1952.26	1078.41	1950.26	1079.37	1949.49
1119.37	1949.46	1122.31	1950.26	1123.63	1952.26	1124.96	1954.26	1126.29	1956.26
1127.61	1958.26	1128.23	1959.2	1130.3	1960.26	1134.23	1962.26	1137.72	1964.04
1156.11	1964.26	1162.57	1964.26	1167.55	1964.26	1180.81	1964.48	1218.4	1965.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1070.23	.015	1130.3	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070.23	1130.3	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1962.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.74	Wt. n-Val.		0.015	
W.S. Elev (ft)	1954.60	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1956.96	Flow Area (sq ft)		237.36	
E.G. Slope (ft/ft)	0.007247	Area (sq ft)		237.36	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	50.33	Top Width (ft)		50.33	
Vel Total (ft/s)	22.33	Avg. Vel. (ft/s)		22.33	
Max Chl Dpth (ft)	5.14	Hydr. Depth (ft)		4.72	
Conv. Total (cfs)	62257.1	Conv. (cfs)		62257.1	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		55.09	
Min Ch El (ft)	1949.46	Shear (lb/sq ft)		1.95	
Alpha	1.00	Stream Power (lb/ft s)		43.53	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.37	12.80	0.07
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	2.29	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 100

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1961.93	1057.4	1962.22	1068.55	1961.32	1068.7	1961.03	1070.39	1959.03
1071.98	1957.03	1073.58	1955.03	1075.17	1953.03	1076.75	1951.03	1078.32	1949.03
1079	1947.73	1119	1947.73	1119.77	1949.03	1121.07	1951.03	1122.37	1953.03
1123.68	1955.03	1124.99	1957.03	1126.31	1959.03	1126.86	1959.87	1129.14	1961.03
1133.08	1963.03	1136.43	1964.73	1161.01	1965.03	1164.12	1965.03	1169.92	1965.03
1180.79	1965.13	1218.41	1966.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1068.7	.015	1129.14	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1068.7	1129.14	346.14	342.73	339.84	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1962.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1952.70	Reach Len. (ft)	346.14	342.73	339.84
Crit W.S. (ft)	1955.55	Flow Area (sq ft)		214.74	
E.G. Slope (ft/ft)	0.009375	Area (sq ft)		214.74	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	46.72	Top Width (ft)		46.72	
Vel Total (ft/s)	24.68	Avg. Vel. (ft/s)		24.68	
Max Chl Dpth (ft)	4.97	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	54738.3	Conv. (cfs)		54738.3	
Length Wtd. (ft)	342.73	Wetted Per. (ft)		52.03	
Min Ch El (ft)	1947.73	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		59.62	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	12.80	0.07
C & E Loss (ft)	0.17	Cum SA (acres)	0.35	2.29	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 90

INPUT
Description:

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1958.08	1006.02	1956.88	1007.66	1956.56	1022.15	1955.35	1035.65	1954.88
1045.56	1954.48	1052.98	1953.95	1054.57	1952.88	1057.59	1950.88	1060.63	1948.88
1063.71	1946.88	1065.06	1945.98	1105.06	1945.98	1109.3	1946.88	1110.15	1948.88
1110.99	1950.88	1111.87	1952.88	1112.94	1954.88	1113.6	1955.91	1119.02	1956.88
1121.63	1957.18	1145.66	1956.88	1187.07	1956.55				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1052.98	.015	1113.6	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1052.98	1113.6	53.02	51.93	56.59	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1958.74	Element			
Vel Head (ft)	7.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1950.86	Reach Len. (ft)	53.02	51.93	56.59
Crit W.S. (ft)	1953.25	Flow Area (sq ft)		235.27	
E.G. Slope (ft/ft)	0.007910	Area (sq ft)		235.27	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	53.35	Top Width (ft)		53.35	
Vel Total (ft/s)	22.53	Avg. Vel. (ft/s)		22.53	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)		4.41	
Conv. Total (cfs)	59592.8	Conv. (cfs)		59592.8	
Length Wtd. (ft)	51.93	Wetted Per. (ft)		57.54	
Min Ch El (ft)	1945.98	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)		45.48	
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)	0.37	11.03	0.07
C & E Loss (ft)	0.47	Cum SA (acres)	0.35	1.90	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: RIVER-1
REACH: Reach-1 RS: 81

INPUT
Description: Begining of Phase 1 Improvements
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1954.26	1002.13	1954.26	1036.88	1953.71	1070.25	1953.68	1078.25	1945.72
1121.75	1945.72	1129.75	1953.68	1142.98	1954.14	1143.96	1954.26	1156.72	1956.26
1157.77	1956.26	1201.02	1956.64						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1070.25	.015	1129.75	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070.25	1129.75	50	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1958.25	Element			
Vel Head (ft)	7.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1950.67	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1952.99	Flow Area (sq ft)		239.88	
E.G. Slope (ft/ft)	0.007413	Area (sq ft)		239.88	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	53.45	Top Width (ft)		53.45	
Vel Total (ft/s)	22.09	Avg. Vel. (ft/s)		22.09	
Max Chl Dpth (ft)	4.95	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	61556.8	Conv. (cfs)		61556.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		57.53	
Min Ch El (ft)	1945.72	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)		42.63	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	0.37	10.74	0.07
C & E Loss (ft)	0.09	Cum SA (acres)	0.35	1.83	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 75

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1077.5	1952.32	1077.5	1944.52	1100	1944.07	1122.5	1944.52	1122.5	1952.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1077.5	.025	1077.5	.015	1122.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1077.5	1122.5	151.76	151.76	151.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1957.78	Element			
Vel Head (ft)	8.43	Wt. n-Val.		0.015	
W.S. Elev (ft)	1949.35	Reach Len. (ft)	151.76	151.76	151.76
Crit W.S. (ft)	1951.85	Flow Area (sq ft)		227.51	
E.G. Slope (ft/ft)	0.008262				

Q Total (cfs)	5300.00	Flow (cfs)		5300.00		
Top Width (ft)	45.00	Top Width (ft)		45.00		
Vel Total (ft/s)	23.30	Avg. Vel. (ft/s)		23.30		
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)		5.06		
Conv. Total (cfs)	58308.1	Conv. (cfs)		58308.1		
Length Wtd. (ft)	151.76	Wetted Per. (ft)		54.67		
Min Ch El (ft)	1944.07	Shear (lb/sq ft)		2.15		
Alpha	1.00	Stream Power (lb/ft s)		50.00		
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.37	10.47	0.07	
C & E Loss (ft)	0.08	Cum SA (acres)	0.35	1.78	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 70

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1077.5	1949.6	1077.5	1941.8	1100	1941.35	1122.5	1941.8	1122.5	1949.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1077.5	.025	1077.5	.015	1122.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1077.5	1122.5	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1956.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	1946.22	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1949.12	Flow Area (sq ft)		209.11	
E.G. Slope (ft/ft)	0.010727	Area (sq ft)		209.11	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	45.00	Top Width (ft)		45.00	
Vel Total (ft/s)	25.35	Avg. Vel. (ft/s)		25.35	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	51173.2	Conv. (cfs)		51173.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		53.85	
Min Ch El (ft)	1941.35	Shear (lb/sq ft)		2.60	
Alpha	1.00	Stream Power (lb/ft s)		65.91	
Frctn Loss (ft)	1.42	Cum Volume (acre-ft)	0.37	9.71	0.07
C & E Loss (ft)	0.15	Cum SA (acres)	0.35	1.62	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: RIVER-1
REACH: Reach-1 RS: 65

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1082.5	1947.71	1082.5	1939.91	1100	1939.56	1117.5	1939.91	1117.5	1947.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1082.5	.025	1082.5	.015	1117.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1082.5	1117.5	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1955.00	Element			
Vel Head (ft)	8.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1946.04	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1948.66	Flow Area (sq ft)		220.55	
E.G. Slope (ft/ft)	0.007546	Area (sq ft)		220.55	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	24.03	Avg. Vel. (ft/s)		24.03	
Max Chl Dpth (ft)	6.48	Hydr. Depth (ft)		6.30	
Conv. Total (cfs)	61013.1	Conv. (cfs)		61013.1	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		47.26	
Min Ch El (ft)	1939.56	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)		52.83	
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	0.37	9.22	0.07
C & E Loss (ft)	0.30	Cum SA (acres)	0.35	1.53	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: RIVER-1
REACH: Reach-1 RS: 60

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1082.5	1947.48	1082.5	1938.48	1100	1938.13	1117.5	1938.48	1117.5	1947.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1082.5	.025	1082.5	.015	1117.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1082.5	1117.5	166.19	166.19	166.19	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1954.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.78	Wt. n-Val.		0.015	
W.S. Elev (ft)	1944.34	Reach Len. (ft)	166.19	166.19	166.19
Crit W.S. (ft)	1947.22	Flow Area (sq ft)		211.19	
E.G. Slope (ft/ft)	0.008588	Area (sq ft)		211.19	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	25.10	Avg. Vel. (ft/s)		25.10	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		6.03	
Conv. Total (cfs)	57190.8	Conv. (cfs)		57190.8	
Length Wtd. (ft)	166.19	Wetted Per. (ft)		46.73	
Min Ch El (ft)	1938.13	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		60.82	
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	0.37	8.73	0.07
C & E Loss (ft)	0.08	Cum SA (acres)	0.35	1.45	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 55

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1082.5	1945.1	1082.5	1936.1	1100	1935.75	1117.5	1936.1	1117.5	1945.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1082.5	.025	1082.5	.015	1117.5	.025

Bank Sta: Left Right

1082.5 1117.5 290.11 288.11 286.11 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1952.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1941.66	Reach Len. (ft)	290.11	288.11	286.11
Crit W.S. (ft)	1944.85	Flow Area (sq ft)		200.83	
E.G. Slope (ft/ft)	0.009985	Area (sq ft)		200.83	
Q Total (cfs)	5300.00	Flow (cfs)		5300.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	26.39	Avg. Vel. (ft/s)		26.39	
Max Chl Dpth (ft)	5.91	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	53040.5	Conv. (cfs)		53040.5	
Length Wtd. (ft)	288.11	Wetted Per. (ft)		46.13	
Min Ch El (ft)	1935.75	Shear (lb/sq ft)		2.71	
Alpha	1.00	Stream Power (lb/ft s)		71.61	
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)	0.37	7.94	0.07
C & E Loss (ft)	0.10	Cum SA (acres)	0.35	1.32	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: RIVER-1
REACH: Reach-1 RS: 50

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1942.6	1093.5	1943.16	1100.84	1942.75	1115.98	1942.71	1129.89	1942.1
1182.5	1940.98	1182.5	1931.98	1200	1931.63	1217.5	1931.98	1217.5	1940.98
1239.96	1943.1	1254.01	1943.3	1350.42	1943.74				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1182.5	.015	1217.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1182.5	1217.5	101	99	97 .1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1182.5	1943.63	1217.5	1350.42	1943.63

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1949.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.49	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1940.95	Flow Area (sq ft)		199.05	
E.G. Slope (ft/ft)	0.011043	Area (sq ft)		199.05	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	27.63	Avg. Vel. (ft/s)		27.63	
Max Chl Dpth (ft)	5.86	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	52337.3	Conv. (cfs)		52337.3	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		46.03	
Min Ch El (ft)	1931.63	Shear (lb/sq ft)		2.98	
Alpha	1.00	Stream Power (lb/ft s)		82.38	
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	0.37	6.62	0.07
C & E Loss (ft)	0.10	Cum SA (acres)	0.35	1.08	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.

BRIDGE RIVER: RIVER-1
REACH: Reach-1 RS: 45

INPUT
Description: Bridge #1

Distance from Upstream XS = .1
Deck/Roadway Width = 98.8
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	1943.8	1941.63	1182.5	1943.8	1941.63	1182.5	1943.8	1941.63
1217.5	1943.8	1941.63	1217.5	1943.8	1941.63	1350.42	1943.8	1941.63

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1942.6	1093.5	1943.16	1100.84	1942.75	1115.98	1942.71	1129.89	1942.1
1182.5	1940.98	1182.5	1931.98	1200	1931.63	1217.5	1931.98	1217.5	1940.98
1239.96	1943.1	1254.01	1943.3	1350.42	1943.74				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.025	1182.5	.015	1217.5	.025

```
       1182.5  1217.5              .1        .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    1000  1182.5 1943.63  1217.5 1350.42 1943.63

Downstream  Deck/Roadway Coordinates
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1000  1943.8 1941.63  1132.5  1943.8 1941.63  1132.5  1943.8 1941.63
  1167.5  1943.8 1941.63  1167.5  1943.8 1941.63 1350.42  1943.8 1941.63

Downstream Bridge Cross Section Data
Station Elevation Data    num=       13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1940.65 1090.13  1940.8 1104.02 1941.12  1132.5 1941.12  1132.5 1931.12
    1150 1930.77  1167.5 1931.12  1167.5 1941.12 1206.88 1941.12 1232.32 1941.12
  1242.6 1941.35 1251.47 1941.95 1256.84 1943.35

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .025  1132.5    .015  1167.5    .025

Bank Sta: Left   Right    Coeff Contr.   Expan.
        1132.5  1167.5              .1        .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    1000  1132.5 1943.77  1167.5 1256.84 1943.77

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           = 1943.13
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =     1.2
Selected Low Flow Methods = Momentum

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.8006408
           Max Low Cord                = 1941.63
```

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
Opening : Single BR

			Inside BR US	Inside BR DS
E.G. US. (ft)	1947.50	Element		
W.S. US. (ft)	1937.49	E.G. Elev (ft)	1949.35	1947.49
Q Total (cfs)	5500.00	W.S. Elev (ft)	1937.49	1936.99
Q Bridge (cfs)	5500.00	Crit W.S. (ft)	1940.97	1940.11
Q Weir (cfs)		Max Chl Dpth (ft)	5.86	6.22
Weir Sta Lft (ft)		Vel Total (ft/s)	27.63	26.01
Weir Sta Rgt (ft)		Flow Area (sq ft)	199.05	211.44
Weir Submerg		Froude # Chl	2.04	1.87
Weir Max Depth (ft)		Specif Force (cu ft)	5285.78	5219.15
Min El Weir Flow (ft)	1943.81	Hydr Depth (ft)	5.69	6.04
Min El Prs (ft)	1941.63	W.P. Total (ft)	46.03	46.74
Delta EG (ft)	0.00	Conv. Total (cfs)	52337.3	57291.1
Delta WS (ft)	0.51	Top Width (ft)	35.00	35.00
BR Open Area (sq ft)	343.88	Frctn Loss (ft)		
BR Open Vel (ft/s)	27.63	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.98	2.60
Br Sel Method	Momentum	Power Total (lb/ft s)	82.38	67.71

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.
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: 40

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1940.65	1090.13	1940.8	1104.02	1941.12	1132.5	1941.12	1132.5	1931.12
1150	1930.77	1167.5	1931.12	1167.5	1941.12	1206.88	1941.12	1232.32	1941.12
1242.6	1941.35	1251.47	1941.95	1256.84	1943.35				

Manning's n Values num= 3

1000	.025	1132.5	.015	1167.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1132.5	1167.5	15	15	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1132.5	1943.77	1167.5	1256.84	1943.77

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1947.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.51	Wt. n-Val.		0.015	
W.S. Elev (ft)	1936.99	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	1940.10	Flow Area (sq ft)		211.41	
E.G. Slope (ft/ft)	0.009220	Area (sq ft)		211.41	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	26.02	Avg. Vel. (ft/s)		26.02	
Max Chl Dpth (ft)	6.22	Hydr. Depth (ft)		6.04	
Conv. Total (cfs)	57280.7	Conv. (cfs)		57280.7	
Length Wtd. (ft)	15.00	Wetted Per. (ft)		46.74	
Min Ch El (ft)	1930.77	Shear (lb/sq ft)		2.60	
Alpha	1.00	Stream Power (lb/ft s)		67.73	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.37	6.15	0.07
C & E Loss (ft)		Cum SA (acres)	0.35	1.00	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 35

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1082.5	1940.99	1082.5	1930.99	1100	1930.64	1117.5	1930.99	1117.5	1940.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1082.5	.025	1082.5	.015	1117.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1082.5	1117.5	102	102	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1947.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.51	Wt. n-Val.		0.015	
W.S. Elev (ft)	1936.86	Reach Len. (ft)	102.00	102.00	102.00

E.G. Slope (ft/ft)	0.009220	Area (sq ft)		211.41	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	35.00	Top Width (ft)		35.00	
Vel Total (ft/s)	26.02	Avg. Vel. (ft/s)		26.02	
Max Chl Dpth (ft)	6.22	Hydr. Depth (ft)		6.04	
Conv. Total (cfs)	57280.7	Conv. (cfs)		57280.7	
Length Wtd. (ft)	102.00	Wetted Per. (ft)		46.74	
Min Ch El (ft)	1930.64	Shear (lb/sq ft)		2.60	
Alpha	1.00	Stream Power (lb/ft s)		67.73	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.37	6.08	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.99	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 30

INPUT
Description: Begining of Energy Dissipator
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.25	1075	1930.25	1100	1929.75	1125	1930.25	1125	1940.25

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	2.49	2.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1946.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	12.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1933.95	Reach Len. (ft)	2.49	2.49	2.49
Crit W.S. (ft)	1937.21	Flow Area (sq ft)		197.23	
E.G. Slope (ft/ft)	0.015283	Area (sq ft)		197.23	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	27.89	Avg. Vel. (ft/s)		27.89	
Max Chl Dpth (ft)	4.19	Hydr. Depth (ft)		3.94	
Conv. Total (cfs)	44488.9	Conv. (cfs)		44488.9	
Length Wtd. (ft)	2.49	Wetted Per. (ft)		57.40	
Min Ch El (ft)	1929.75	Shear (lb/sq ft)		3.28	
Alpha	1.00	Stream Power (lb/ft s)		91.43	
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	0.37	5.60	0.07
C & E Loss (ft)	0.16	Cum SA (acres)	0.35	0.89	0.07

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: 29.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.3	1075	1929.2	1100	1928.7	1125	1929.2	1125	1940.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.04	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	2.49 2.49	2.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1945.84	Element			
Vel Head (ft)	13.10	Wt. n-Val.		0.040	
W.S. Elev (ft)	1932.74	Reach Len. (ft)	2.49	2.49	2.49
Crit W.S. (ft)	1936.16	Flow Area (sq ft)		189.37	
E.G. Slope (ft/ft)	0.123543	Area (sq ft)		189.37	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	29.04	Avg. Vel. (ft/s)		29.04	
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)		3.79	
Conv. Total (cfs)	15647.8	Conv. (cfs)		15647.8	
Length Wtd. (ft)	2.49	Wetted Per. (ft)		57.08	
Min Ch El (ft)	1928.70	Shear (lb/sq ft)		25.59	
Alpha	1.00	Stream Power (lb/ft s)		743.11	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.37	5.59	0.07
C & E Loss (ft)	0.10	Cum SA (acres)	0.35	0.89	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 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: 29.2*

INPUT
Description:

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.36	1075	1928.16	1100	1927.66	1125	1928.16	1125	1940.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.04	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	2.49	2.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1945.44	Element			
Vel Head (ft)	13.84	Wt. n-Val.		0.040	
W.S. Elev (ft)	1931.59	Reach Len. (ft)	2.49	2.49	2.49
Crit W.S. (ft)	1935.13	Flow Area (sq ft)		184.20	
E.G. Slope (ft/ft)	0.134844	Area (sq ft)		184.20	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	29.86	Avg. Vel. (ft/s)		29.86	
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)		3.68	
Conv. Total (cfs)	14977.8	Conv. (cfs)		14977.8	
Length Wtd. (ft)	2.49	Wetted Per. (ft)		56.88	
Min Ch El (ft)	1927.66	Shear (lb/sq ft)		27.26	
Alpha	1.00	Stream Power (lb/ft s)		814.03	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	0.37	5.58	0.07
C & E Loss (ft)	0.07	Cum SA (acres)	0.35	0.89	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.41	1075	1927.11	1100	1926.61	1125	1927.11	1125	1940.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.04	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	2.49	2.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1945.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	14.56	Wt. n-Val.		0.040	
W.S. Elev (ft)	1930.45	Reach Len. (ft)	2.49	2.49	2.49
Crit W.S. (ft)	1934.07	Flow Area (sq ft)		179.59	
E.G. Slope (ft/ft)	0.146092	Area (sq ft)		179.59	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	30.63	Avg. Vel. (ft/s)		30.63	
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)		3.59	
Conv. Total (cfs)	14389.6	Conv. (cfs)		14389.6	
Length Wtd. (ft)	2.49	Wetted Per. (ft)		56.69	
Min Ch El (ft)	1926.61	Shear (lb/sq ft)		28.89	
Alpha	1.00	Stream Power (lb/ft s)		884.81	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.37	5.57	0.07
C & E Loss (ft)	0.07	Cum SA (acres)	0.35	0.88	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.47	1075	1926.07	1100	1925.57	1125	1926.07	1125	1940.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.04	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	2.49	2.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1944.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	15.24	Wt. n-Val.		0.040	
W.S. Elev (ft)	1929.33	Reach Len. (ft)	2.49	2.49	2.49
Crit W.S. (ft)	1933.03	Flow Area (sq ft)		175.56	
E.G. Slope (ft/ft)	0.156972	Area (sq ft)		175.56	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	31.33	Avg. Vel. (ft/s)		31.33	
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)		3.51	

Conv. Total (cfs)	13882.0	Conv. (cfs)		13882.0	
Length Wtd. (ft)	2.49	Wetted Per. (ft)		56.53	
Min Ch El (ft)	1925.57	Shear (lb/sq ft)		30.43	
Alpha	1.00	Stream Power (lb/ft s)		953.41	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	0.37	5.56	0.07
C & E Loss (ft)	0.07	Cum SA (acres)	0.35	0.88	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 28

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.52	1075	1925.02	1100	1924.52	1125	1925.02	1125	1940.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1944.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	16.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1928.18	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1931.98	Flow Area (sq ft)		170.43	
E.G. Slope (ft/ft)	0.024248	Area (sq ft)		170.43	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	32.27	Avg. Vel. (ft/s)		32.27	
Max Chl Dpth (ft)	3.66	Hydr. Depth (ft)		3.41	
Conv. Total (cfs)	35320.0	Conv. (cfs)		35320.0	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		56.33	
Min Ch El (ft)	1924.52	Shear (lb/sq ft)		4.58	
Alpha	1.00	Stream Power (lb/ft s)		147.82	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.37	5.55	0.07
C & E Loss (ft)	0.09	Cum SA (acres)	0.35	0.88	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.

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: 27.6666*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.48	1075	1924.98	1100	1924.48	1125	1924.98	1125	1940.48

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1943.94	Element			
Vel Head (ft)	15.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1928.18	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1931.94	Flow Area (sq ft)		172.66	
E.G. Slope (ft/ft)	0.023270	Area (sq ft)		172.66	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	31.85	Avg. Vel. (ft/s)		31.85	
Max Chl Dpth (ft)	3.70	Hydr. Depth (ft)		3.45	
Conv. Total (cfs)	36054.8	Conv. (cfs)		36054.8	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		56.42	
Min Ch El (ft)	1924.48	Shear (lb/sq ft)		4.45	
Alpha	1.00	Stream Power (lb/ft s)		141.63	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	0.37	5.50	0.07
C & E Loss (ft)	0.12	Cum SA (acres)	0.35	0.87	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.3333*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.45	1075	1924.95	1100	1924.45	1125	1924.95	1125	1940.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.76	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1931.91	Flow Area (sq ft)		652.82	
E.G. Slope (ft/ft)	0.000408	Area (sq ft)		652.82	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.42	Avg. Vel. (ft/s)		8.42	
Max Chl Dpth (ft)	13.31	Hydr. Depth (ft)		13.06	
Conv. Total (cfs)	272139.1	Conv. (cfs)		272139.1	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		75.62	
Min Ch El (ft)	1924.45	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.85	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	5.39	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.85	0.07

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 27.*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.41	1075	1924.91	1100	1924.41	1125	1924.91	1125	1940.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.76	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)		Flow Area (sq ft)		654.80	
E.G. Slope (ft/ft)	0.000405	Area (sq ft)		654.80	
Q Total (cfs)	5500.00	Flow (cfs)			

Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.40	Avg. Vel. (ft/s)		8.40	
Max Chl Dpth (ft)	13.35	Hydr. Depth (ft)		13.10	
Conv. Total (cfs)	273327.6	Conv. (cfs)		273327.6	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		75.70	
Min Ch El (ft)	1924.41	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.84	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	5.21	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.84	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.6666*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.37	1075	1924.87	1100	1924.37	1125	1924.87	1125	1940.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.76	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)		Flow Area (sq ft)		656.79	
E.G. Slope (ft/ft)	0.000401	Area (sq ft)		656.79	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.37	Avg. Vel. (ft/s)		8.37	
Max Chl Dpth (ft)	13.39	Hydr. Depth (ft)		13.14	
Conv. Total (cfs)	274520.8	Conv. (cfs)		274520.8	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		75.78	
Min Ch El (ft)	1924.37	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.82	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	5.03	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.82	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26.3333*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.34	1075	1924.84	1100	1924.34	1125	1924.84	1125	1940.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1938.84	Element			
Vel Head (ft)	1.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.75	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)		Flow Area (sq ft)		658.22	
E.G. Slope (ft/ft)	0.000399	Area (sq ft)		658.22	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.36	Avg. Vel. (ft/s)		8.36	
Max Chl Dpth (ft)	13.41	Hydr. Depth (ft)		13.16	
Conv. Total (cfs)	275378.1	Conv. (cfs)		275378.1	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		75.84	
Min Ch El (ft)	1924.34	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		1.81	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	4.84	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.81	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 26

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.3	1075	1924.8	1100	1924.3	1125	1924.8	1125	1940.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.015	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1937.75	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)		Flow Area (sq ft)		660.21	
E.G. Slope (ft/ft)	0.000395	Area (sq ft)		660.21	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)		8.33	
Max Chl Dpth (ft)	13.45	Hydr. Depth (ft)		13.20	
Conv. Total (cfs)	276569.8	Conv. (cfs)		276569.8	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		75.92	
Min Ch El (ft)	1924.30	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.79	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	4.66	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.80	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 25.3333*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.41	1075	1924.97	1100	1924.47	1125	1924.97	1125	1940.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.018	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.		0.018	
W.S. Elev (ft)	1937.72	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)		Flow Area (sq ft)		649.77	
E.G. Slope (ft/ft)	0.000596	Area (sq ft)		649.77	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.46	Avg. Vel. (ft/s)		8.46	
Max Chl Dpth (ft)	13.25	Hydr. Depth (ft)		13.00	
Conv. Total (cfs)	225260.9	Conv. (cfs)		225260.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		75.50	
Min Ch El (ft)	1924.47	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)		[illegible]	

Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	4.65	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.80	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24.6666*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.51	1075	1925.13	1100	1924.63	1125	1925.13	1125	1940.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.022	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.		0.022	
W.S. Elev (ft)	1937.68	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)		Flow Area (sq ft)		639.81	
E.G. Slope (ft/ft)	0.000931	Area (sq ft)		639.81	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.60	Avg. Vel. (ft/s)		8.60	
Max Chl Dpth (ft)	13.05	Hydr. Depth (ft)		12.80	
Conv. Total (cfs)	180256.7	Conv. (cfs)		180256.7	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		75.10	
Min Ch El (ft)	1924.63	Shear (lb/sq ft)		0.50	
Alpha	1.00	Stream Power (lb/ft s)		4.26	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.37	4.63	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.79	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 24

INPUT
Description: End of Energy Dissipator
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.62	1075	1925.3	1100	1924.8	1125	1925.3	1125	1940.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.025	1125	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1075	1125	6	6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.19	Wt. n-Val.		0.025	
W.S. Elev (ft)	1937.63	Reach Len. (ft)	6.00	6.00	6.00
Crit W.S. (ft)		Flow Area (sq ft)		629.08	
E.G. Slope (ft/ft)	0.001262	Area (sq ft)		629.08	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.74	Avg. Vel. (ft/s)		8.74	
Max Chl Dpth (ft)	12.83	Hydr. Depth (ft)		12.58	
Conv. Total (cfs)	154807.4	Conv. (cfs)		154807.4	
Length Wtd. (ft)	6.00	Wetted Per. (ft)		74.67	
Min Ch El (ft)	1924.80	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)		5.80	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	4.62	0.07
C & E Loss (ft)	0.01	Cum SA (acres)	0.35	0.79	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 23.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1072.45	1940.47	1078.45	1925.21	1100	1924.78	1121.55	1925.21	1127.55	1940.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1072.45	.025	1072.45	.025	1127.55	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1072.45	1127.55	6	6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.		0.025	
W.S. Elev (ft)	1937.48	Reach Len. (ft)	6.00	6.00	6.00
Crit W.S. (ft)		Flow Area (sq ft)		597.38	
E.G. Slope (ft/ft)	0.001362	Area (sq ft)		597.38	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	

Top Width (ft)	52.75	Top Width (ft)		52.75	
Vel Total (ft/s)	9.21	Avg. Vel. (ft/s)		9.21	
Max Chl Dpth (ft)	12.70	Hydr. Depth (ft)		11.32	
Conv. Total (cfs)	149016.4	Conv. (cfs)		149016.4	
Length Wtd. (ft)	6.00	Wetted Per. (ft)		69.48	
Min Ch El (ft)	1924.78	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		6.73	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	4.53	0.07
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.79	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 23.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1069.9	1940.32	1081.9	1925.13	1100	1924.76	1118.1	1925.13	1130.1	1940.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1069.9	.025	1069.9	.025	1130.1	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1069.9	1130.1	6	6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.48	Wt. n-Val.		0.025	
W.S. Elev (ft)	1937.30	Reach Len. (ft)	6.00	6.00	6.00
Crit W.S. (ft)		Flow Area (sq ft)		564.06	
E.G. Slope (ft/ft)	0.001578	Area (sq ft)		564.06	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.42	Top Width (ft)		55.42	
Vel Total (ft/s)	9.75	Avg. Vel. (ft/s)		9.75	
Max Chl Dpth (ft)	12.54	Hydr. Depth (ft)		10.18	
Conv. Total (cfs)	138445.2	Conv. (cfs)		138445.2	
Length Wtd. (ft)	6.00	Wetted Per. (ft)		67.22	
Min Ch El (ft)	1924.76	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		8.06	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	4.45	0.07
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.78	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 22.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1067.35	1940.17	1085.35	1925.04	1100	1924.75	1114.65	1925.04	1132.65	1940.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1067.35	.025	1067.35	.025	1132.65	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1067.35	1132.65	6	6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1938.74	Element			
Vel Head (ft)	1.68	Wt. n-Val.		0.025	
W.S. Elev (ft)	1937.06	Reach Len. (ft)	6.00	6.00	6.00
Crit W.S. (ft)		Flow Area (sq ft)		528.17	
E.G. Slope (ft/ft)	0.001943	Area (sq ft)		528.17	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	57.89	Top Width (ft)		57.89	
Vel Total (ft/s)	10.41	Avg. Vel. (ft/s)		10.41	
Max Chl Dpth (ft)	12.31	Hydr. Depth (ft)		9.12	
Conv. Total (cfs)	124770.0	Conv. (cfs)		124770.0	
Length Wtd. (ft)	6.00	Wetted Per. (ft)		66.66	
Min Ch El (ft)	1924.75	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		10.01	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.37	4.38	0.07
C & E Loss (ft)	0.03	Cum SA (acres)	0.35	0.77	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 22.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.8	1940.02	1088.8	1924.95	1100	1924.73	1111.2	1924.95	1135.2	1940.02

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.8	.025	1064.8	.025	1135.2	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1064.8	1135.2	6	6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.99	Wt. n-Val.		0.025	
W.S. Elev (ft)	1936.71	Reach Len. (ft)	6.00	6.00	6.00
Crit W.S. (ft)		Flow Area (sq ft)		485.93	
E.G. Slope (ft/ft)	0.002564	Area (sq ft)		485.93	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	59.85	Top Width (ft)		59.85	
Vel Total (ft/s)	11.32	Avg. Vel. (ft/s)		11.32	
Max Chl Dpth (ft)	11.98	Hydr. Depth (ft)		8.12	
Conv. Total (cfs)	108627.4	Conv. (cfs)		108627.4	
Length Wtd. (ft)	6.00	Wetted Per. (ft)		66.62	
Min Ch El (ft)	1924.73	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)		13.21	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.37	4.31	0.07
C & E Loss (ft)	0.13	Cum SA (acres)	0.35	0.76	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 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: 22

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.25	1939.865	1092.25	1924.865	1100	1924.71	1107.75	1924.865	1137.75	1939.865

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.25	.025	1062.25	.025	1137.75	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.25	1137.75	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1935.21	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1935.21	Flow Area (sq ft)		375.72	
E.G. Slope (ft/ft)	0.005464	Area (sq ft)		375.72	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	56.89	Top Width (ft)		56.89	

Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	74407.0	Conv. (cfs)		74407.0	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		61.78	
Min Ch El (ft)	1924.71	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)		30.37	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	4.25	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.75	0.07

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.

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: 21.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.46	1939.5	1091.8	1924.84	1100	1924.67	1108.2	1924.84	1137.54	1939.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.46	.025	1062.46	.025	1137.54	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.46	1137.54	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.91	Wt. n-Val.		0.025	
W.S. Elev (ft)	1934.50	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1935.03	Flow Area (sq ft)		346.57	
E.G. Slope (ft/ft)	0.006822	Area (sq ft)		346.57	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.07	Top Width (ft)		55.07	
Vel Total (ft/s)	15.87	Avg. Vel. (ft/s)		15.87	
Max Chl Dpth (ft)	9.83	Hydr. Depth (ft)		6.29	
Conv. Total (cfs)	66590.1	Conv. (cfs)		66590.1	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		59.63	
Min Ch El (ft)	1924.67	Shear (lb/sq ft)		2.48	
Alpha	1.00	Stream Power (lb/ft s)		39.28	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	4.15	0.07
C & E Loss (ft)	0.06	Cum SA (acres)	0.35	0.74	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 21.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.68	1939.14	1091.34	1924.81	1100	1924.64	1108.66	1924.81	1137.32	1939.14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.68	.025	1062.68	.025	1137.32	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.68	1137.32	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1938.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1934.85	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.85	Flow Area (sq ft)		377.06	
E.G. Slope (ft/ft)	0.005452	Area (sq ft)		377.06	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	57.49	Top Width (ft)		57.49	
Vel Total (ft/s)	14.59	Avg. Vel. (ft/s)		14.59	
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)		6.56	
Conv. Total (cfs)	74485.8	Conv. (cfs)		74485.8	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		62.23	
Min Ch El (ft)	1924.64	Shear (lb/sq ft)		2.06	
Alpha	1.00	Stream Power (lb/ft s)		30.08	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	4.05	0.07
C & E Loss (ft)	0.00	Cum SA (acres)	0.35	0.72	0.07

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.
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: 21.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.9	1938.78	1090.89	1924.78	1100	1924.6	1109.11	1924.78	1137.1	1938.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.9	.025	1062.9	.025	1137.1	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.9	1137.1	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1938.03	Element			
Vel Head (ft)	3.87	Wt. n-Val.		0.025	
W.S. Elev (ft)	1934.16	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.68	Flow Area (sq ft)		348.51	
E.G. Slope (ft/ft)	0.006777	Area (sq ft)		348.51	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.73	Top Width (ft)		55.73	
Vel Total (ft/s)	15.78	Avg. Vel. (ft/s)		15.78	
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		6.25	
Conv. Total (cfs)	66811.7	Conv. (cfs)		66811.7	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		60.17	
Min Ch El (ft)	1924.60	Shear (lb/sq ft)		2.45	
Alpha	1.00	Stream Power (lb/ft s)		38.68	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	3.95	0.07
C & E Loss (ft)	0.06	Cum SA (acres)	0.35	0.71	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 21.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.11	1938.41	1090.43	1924.75	1100	1924.56	1109.57	1924.75	1136.89	1938.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.11	.025	1063.11	.025	1136.89	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.11	1136.89	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1934.48	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.48	Flow Area (sq ft)		377.56	
E.G. Slope (ft/ft)	0.005479	Area (sq ft)		377.56	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	58.07	Top Width (ft)		58.07	
Vel Total (ft/s)	14.57	Avg. Vel. (ft/s)		14.57	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)		6.50	
Conv. Total (cfs)	74301.3	Conv. (cfs)		74301.3	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		62.67	
Min Ch El (ft)	1924.56	Shear (lb/sq ft)		2.06	
Alpha	1.00	Stream Power (lb/ft s)		30.02	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	3.85	0.07
C & E Loss (ft)	0.17	Cum SA (acres)	0.35	0.69	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 21.*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.32	1938.05	1089.97	1924.73	1100	1924.52	1110.03	1924.73	1136.68	1938.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.32	.025	1063.32	.025	1136.68	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.32	1136.68	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.82	Wt. n-Val.		0.025	
W.S. Elev (ft)	1933.84	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.33	Flow Area (sq ft)		350.82	
E.G. Slope (ft/ft)	0.006724	Area (sq ft)		350.82	

Top Width (ft)	56.51	Top Width (ft)		56.51	
Vel Total (ft/s)	15.68	Avg. Vel. (ft/s)		15.68	
Max Chl Dpth (ft)	9.32	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	67072.1	Conv. (cfs)		67072.1	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		60.81	
Min Ch El (ft)	1924.52	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		37.97	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.37	3.75	0.07
C & E Loss (ft)	0.05	Cum SA (acres)	0.35	0.68	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.

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 20.8*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.54	1937.69	1089.52	1924.7	1100	1924.49	1110.48	1924.7	1136.46	1937.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.54	.025	1063.54	.025	1136.46	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.54	1136.46	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1933.46	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.17	Flow Area (sq ft)		339.35	
E.G. Slope (ft/ft)	0.007402	Area (sq ft)		339.35	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	56.00	Top Width (ft)		56.00	
Vel Total (ft/s)	16.21	Avg. Vel. (ft/s)		16.21	
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)		6.06	
Conv. Total (cfs)	63925.5	Conv. (cfs)		63925.5	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		60.15	
Min Ch El (ft)	1924.49	Shear (lb/sq ft)		2.61	
Alpha	1.00	Stream Power (lb/ft s)		42.26	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.37	3.65	0.07
C & E Loss (ft)	0.03	Cum SA (acres)	0.35	0.66	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 20.6*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.76	1937.32	1089.06	1924.67	1100	1924.45	1110.94	1924.67	1136.24	1937.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.76	.025	1063.76	.025	1136.24	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1063.76	1136.24	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1937.42	Element			
Vel Head (ft)	4.29	Wt. n-Val.		0.025	
W.S. Elev (ft)	1933.14	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1934.00	Flow Area (sq ft)		330.99	
E.G. Slope (ft/ft)	0.007973	Area (sq ft)		330.99	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.74	Top Width (ft)		55.74	
Vel Total (ft/s)	16.62	Avg. Vel. (ft/s)		16.62	
Max Chl Dpth (ft)	8.69	Hydr. Depth (ft)		5.94	
Conv. Total (cfs)	61595.6	Conv. (cfs)		61595.6	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		59.75	
Min Ch El (ft)	1924.45	Shear (lb/sq ft)		2.76	
Alpha	1.00	Stream Power (lb/ft s)		45.82	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.37	3.56	0.07
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.65	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 20.4*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1063.97	1936.96	1088.61	1924.64	1100	1924.41	1111.39	1924.64	1136.03	1936.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1063.97	.025	1063.97	.025	1136.03	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1063.97 1136.03 12 12 12 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.45	Wt. n-Val.		0.025	
W.S. Elev (ft)	1932.86	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1933.84	Flow Area (sq ft)		325.02	
E.G. Slope (ft/ft)	0.008434	Area (sq ft)		325.02	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.66	Top Width (ft)		55.66	
Vel Total (ft/s)	16.92	Avg. Vel. (ft/s)		16.92	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		5.84	
Conv. Total (cfs)	59887.4	Conv. (cfs)		59887.4	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		59.55	
Min Ch El (ft)	1924.41	Shear (lb/sq ft)		2.87	
Alpha	1.00	Stream Power (lb/ft s)		48.64	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.37	3.47	0.07
C & E Loss (ft)	0.02	Cum SA (acres)	0.35	0.63	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 20.2*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.19	1936.6	1088.15	1924.61	1100	1924.38	1111.85	1924.61	1135.81	1936.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.19	.025	1064.19	.025	1135.81	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1064.19	1135.81	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.57	Wt. n-Val.		0.025	
W.S. Elev (ft)	1932.62	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	1933.69	Flow Area (sq ft)		320.47	
E.G. Slope (ft/ft)	0.008827	Area (sq ft)		320.47	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.69	Top Width (ft)		55.69	
Vel Total (ft/s)	17.16	Avg. Vel. (ft/s)		17.16	
Max Chl Dpth (ft)	8.23	Hydr. Depth (ft)		5.75	
Conv. Total (cfs)	58541.5	Conv. (cfs)		58541.5	

Length Wtd. (ft)	12.00	Wetted Per. (ft)		59.48			
Min Ch El (ft)	1924.38	Shear (lb/sq ft)		2.97			
Alpha	1.00	Stream Power (lb/ft s)		50.96			
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.37	3.38	0.07		
C & E Loss (ft)	0.01	Cum SA (acres)	0.35	0.61	0.07		

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 20

INPUT
Description: End of Phase 1 Improvements
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.4	1936.236	1087.7	1924.586	1100	1924.34	1112.3	1924.586	1135.6	1936.236

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.4	.025	1064.4	.025	1135.6	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1064.4	1135.6	382.58	367.78	346.32	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1937.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.68	Wt. n-Val.		0.025	
W.S. Elev (ft)	1932.39	Reach Len. (ft)	382.58	367.78	346.32
Crit W.S. (ft)	1933.54	Flow Area (sq ft)		316.95	
E.G. Slope (ft/ft)	0.009166	Area (sq ft)		316.95	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	55.83	Top Width (ft)		55.83	
Vel Total (ft/s)	17.35	Avg. Vel. (ft/s)		17.35	
Max Chl Dpth (ft)	8.05	Hydr. Depth (ft)		5.68	
Conv. Total (cfs)	57447.6	Conv. (cfs)		57447.6	
Length Wtd. (ft)		Wetted Per. (ft)		59.52	
Min Ch El (ft)	1924.34	Shear (lb/sq ft)		3.05	
Alpha	1.00	Stream Power (lb/ft s)		52.88	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.37	3.30	0.07
C & E Loss (ft)	0.01	Cum SA (acres)	0.35	0.60	0.07

CROSS SECTION RIVER: RIVER-1
REACH: Reach-1 RS: 10

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
   1000 1937.36 1049.49 1936.26 1095.06 1934.26 1144.27 1932.26 1220.49 1930.39
 1220.83 1930.26 1228.41 1928.26  1235.7 1926.26 1237.99 1925.61  1249.9 1924.26
 1252.38 1923.96 1254.61 1924.26 1271.01 1926.26 1272.95 1926.49  1279.8  1927.8
 1285.65 1928.26 1306.65 1930.26 1322.46 1932.26 1329.96 1933.29 1344.12 1934.26
 1372.27 1936.26 1402.27 1938.26 1409.32 1938.72 1418.36 1939.14 1426.01 1940.26
 1436.49 1941.26 1496.07 1942.26 1580.86 1943.11 1671.03 1944.26 1677.54 1944.52
 1685.16 1944.66  1718.9 1946.26

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    1000    .035 1220.49     .03 1306.65    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1220.49 1306.65                0       0       0              .1      .3

CROSS SECTION OUTPUT    Profile #PF 1

  E.G. Elev (ft)           1934.25    Element                 Left OB    Channel   Right OB
  Vel Head (ft)               1.82    Wt. n-Val.                0.035      0.030      0.035
  W.S. Elev (ft)           1932.43    Reach Len. (ft)
  Crit W.S. (ft)           1932.43    Flow Area (sq ft)         84.57     463.60      18.60
  E.G. Slope (ft/ft)      0.005458    Area (sq ft)              84.57     463.60      18.60
  Q Total (cfs)            5500.00    Flow (cfs)               274.31    5164.19      61.51
  Top Width (ft)            183.61    Top Width (ft)            80.40      86.16      17.05
  Vel Total (ft/s)            9.70    Avg. Vel. (ft/s)           3.24      11.14       3.31
  Max Chl Dpth (ft)           8.47    Hydr. Depth (ft)           1.05       5.38       1.09
  Conv. Total (cfs)        74444.3    Conv. (cfs)              3712.8    69898.9      832.5
  Length Wtd. (ft)                    Wetted Per. (ft)          80.43      87.29      17.18
  Min Ch El (ft)           1923.96    Shear (lb/sq ft)           0.36       1.81       0.37
  Alpha                       1.24    Stream Power (lb/ft s)     1.16      20.16       1.22
  Frctn Loss (ft)                     Cum Volume (acre-ft)
  C & E Loss (ft)                     Cum SA (acres)

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.


SUMMARY OF MANNING'S N VALUES

River:RIVER-1

      Reach          River Sta.       n1        n2        n3
```

Reach-1	180	.03	.025	.03
Reach-1	170	.025	.015	.025
Reach-1	160	.025	.015	.025
Reach-1	150	.025	.015	.025
Reach-1	140	.025	.015	.025
Reach-1	130	.025	.015	.025
Reach-1	120	.025	.015	.025
Reach-1	110	.025	.015	.025
Reach-1	100	.025	.015	.025
Reach-1	90	.025	.015	.025
Reach-1	81	.025	.015	.025
Reach-1	75	.025	.015	.025
Reach-1	70	.025	.015	.025
Reach-1	65	.025	.015	.025
Reach-1	60	.025	.015	.025
Reach-1	55	.025	.015	.025
Reach-1	50	.025	.015	.025
Reach-1	45	Bridge		
Reach-1	40	.025	.015	.025
Reach-1	35	.025	.015	.025
Reach-1	30	.025	.015	.025
Reach-1	29.6*	.025	.04	.025
Reach-1	29.2*	.025	.04	.025
Reach-1	28.8*	.025	.04	.025
Reach-1	28.4*	.025	.04	.025
Reach-1	28	.025	.015	.025
Reach-1	27.6666*	.025	.015	.025
Reach-1	27.3333*	.025	.015	.025
Reach-1	27.*	.025	.015	.025
Reach-1	26.6666*	.025	.015	.025
Reach-1	26.3333*	.025	.015	.025
Reach-1	26	.025	.015	.025
Reach-1	25.3333*	.025	.018	.025
Reach-1	24.6666*	.025	.022	.025
Reach-1	24	.025	.025	.025
Reach-1	23.6*	.025	.025	.025
Reach-1	23.2*	.025	.025	.025
Reach-1	22.8*	.025	.025	.025
Reach-1	22.4*	.025	.025	.025
Reach-1	22	.025	.025	.025
Reach-1	21.8*	.025	.025	.025
Reach-1	21.6*	.025	.025	.025
Reach-1	21.4*	.025	.025	.025
Reach-1	21.2*	.025	.025	.025
Reach-1	21.*	.025	.025	.025
Reach-1	20.8*	.025	.025	.025
Reach-1	20.6*	.025	.025	.025
Reach-1	20.4*	.025	.025	.025
Reach-1	20.2*	.025	.025	.025

Reach-1	20	.025	.025	.025
Reach-1	10	.035	.03	.035

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	180	358.08	363.91	374.39
Reach-1	170	98.31	97.13	96.38
Reach-1	160	119.51	114.85	110.97
Reach-1	150	1	1	1
Reach-1	140	57.23	55.76	56.76
Reach-1	130	125.29	125.31	125.61
Reach-1	120	25.32	24.78	22.42
Reach-1	110	1	1	1
Reach-1	100	346.14	342.73	339.84
Reach-1	90	53.02	51.93	56.59
Reach-1	81	50	50	50
Reach-1	75	151.76	151.76	151.76
Reach-1	70	100	100	100
Reach-1	65	100	100	100
Reach-1	60	166.19	166.19	166.19
Reach-1	55	290.11	288.11	286.11
Reach-1	50	101	99	97
Reach-1	45	Bridge		
Reach-1	40	15	15	15
Reach-1	35	102	102	102
Reach-1	30	2.49	2.49	2.49
Reach-1	29.6*	2.49	2.49	2.49
Reach-1	29.2*	2.49	2.49	2.49
Reach-1	28.8*	2.49	2.49	2.49
Reach-1	28.4*	2.49	2.49	2.49
Reach-1	28	12	12	12
Reach-1	27.6666*	12	12	12
Reach-1	27.3333*	12	12	12
Reach-1	27.*	12	12	12
Reach-1	26.6666*	12	12	12
Reach-1	26.3333*	12	12	12
Reach-1	26	1	1	1
Reach-1	25.3333*	1	1	1
Reach-1	24.6666*	1	1	1
Reach-1	24	6	6	6
Reach-1	23.6*	6	6	6
Reach-1	23.2*	6	6	6

Reach-1	22.8*	6	6	6
Reach-1	22.4*	6	6	6
Reach-1	22	12	12	12
Reach-1	21.8*	12	12	12
Reach-1	21.6*	12	12	12
Reach-1	21.4*	12	12	12
Reach-1	21.2*	12	12	12
Reach-1	21.*	12	12	12
Reach-1	20.8*	12	12	12
Reach-1	20.6*	12	12	12
Reach-1	20.4*	12	12	12
Reach-1	20.2*	12	12	12
Reach-1	20	382.58	367.78	346.32
Reach-1	10	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
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	120	.1	.3
Reach-1	110	.1	.3
Reach-1	100	.1	.3
Reach-1	90	.1	.3
Reach-1	81	.1	.3
Reach-1	75	.1	.3
Reach-1	70	.1	.3
Reach-1	65	.1	.3
Reach-1	60	.1	.3
Reach-1	55	.1	.3
Reach-1	50	.1	.3
Reach-1	45	Bridge	
Reach-1	40	.1	.3
Reach-1	35	.1	.3
Reach-1	30	.1	.3
Reach-1	29.6*	.1	.3
Reach-1	29.2*	.1	.3
Reach-1	28.8*	.1	.3
Reach-1	28.4*	.1	.3

Reach-1	28	.1	.3
Reach-1	27.6666*	.1	.3
Reach-1	27.3333*	.1	.3
Reach-1	27.*	.1	.3
Reach-1	26.6666*	.1	.3
Reach-1	26.3333*	.1	.3
Reach-1	26	.1	.3
Reach-1	25.3333*	.1	.3
Reach-1	24.6666*	.1	.3
Reach-1	24	.1	.3
Reach-1	23.6*	.1	.3
Reach-1	23.2*	.1	.3
Reach-1	22.8*	.1	.3
Reach-1	22.4*	.1	.3
Reach-1	22	.1	.3
Reach-1	21.8*	.1	.3
Reach-1	21.6*	.1	.3
Reach-1	21.4*	.1	.3
Reach-1	21.2*	.1	.3
Reach-1	21.*	.1	.3
Reach-1	20.8*	.1	.3
Reach-1	20.6*	.1	.3
Reach-1	20.4*	.1	.3
Reach-1	20.2*	.1	.3
Reach-1	20	.1	.3
Reach-1	10	.1	.3

Profile Output Table - CHECKRAS

Reach	River Sta	Froude # Chl	Top Wdth Act	Conv.	Total	Prof Delta WS	Left Sta Eff	Enc Sta L	Center Station	Enc Sta R	Rght Sta Eff
		Min Ch El	Left Stagn	Right Stagn							
(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Reach-1	180		1.00	65.80	71600.3		1118.70			1149.24	
		1184.50	1957.33								
Reach-1	170		0.59	75.51	209191.8		1022.79			1060.40	
		1098.30	1954.56								
Reach-1	160		1.00	55.47	117380.3		1025.06			1052.44	
		1080.53	1954.02								
Reach-1	150		1.48	52.74	77729.7		1138.09			1164.30	
		1190.83	1952.76								
Reach-1	140		1.84	48.52	60803.4		1128.81			1152.67	
		1177.33	1950.76								
Reach-1	130		1.85	48.12	60664.7		1095.08			1118.44	
		1143.20	1950.26								
Reach-1	120		1.77	49.85	63694.8		1086.89			1111.84	
		1136.74	1949.76								

Reach-1	110		1.81	50.33	62257.1		1074.85
1100.27		1125.19	1949.46				
Reach-1	100		2.03	46.72	54738.3		1075.43
1098.92		1122.16	1947.73				
Reach-1	90		1.89	53.35	59592.8		1057.63
1083.29		1110.98	1945.98				
Reach-1	81		1.84	53.45	61556.8		1073.28
1100.00		1126.72	1945.72				
Reach-1	75		1.83	45.00	58308.1		1077.50
1100.00		1122.50	1944.07				
Reach-1	70		2.07	45.00	51173.2		1077.50
1100.00		1122.50	1941.35				
Reach-1	65		1.69	35.00	61013.1		1082.50
1100.00		1117.50	1939.56				
Reach-1	60		1.80	35.00	57190.8		1082.50
1100.00		1117.50	1938.13				
Reach-1	55		1.94	35.00	53040.5		1082.50
1100.00		1117.50	1935.75				
Reach-1	50		2.04	35.00	52337.3		1182.50
1200.00		1217.50	1931.63				
Reach-1	45	BR U	2.04	35.00	52337.3		1182.50
1200.00		1217.50	1931.63				
Reach-1	45	BR D	1.87	35.00	57291.1		1132.50
1150.00		1167.50	1930.77				
Reach-1	40		1.87	35.00	57280.7		1132.50
1150.00		1167.50	1930.77				
Reach-1	35		1.87	35.00	57280.7		1082.50
1100.00		1117.50	1930.64				
Reach-1	30		2.47	50.00	44488.9		1075.00
1100.00		1125.00	1929.75				
Reach-1	29.6*		2.63	50.00	15647.8		1075.00
1100.00		1125.00	1928.70				
Reach-1	29.2*		2.74	50.00	14977.8		1075.00
1100.00		1125.00	1927.66				
Reach-1	28.8*		2.85	50.00	14389.6		1075.00
1100.00		1125.00	1926.61				
Reach-1	28.4*		2.95	50.00	13882.0		1075.00
1100.00		1125.00	1925.57				
Reach-1	28		3.08	50.00	35320.0		1075.00
1100.00		1125.00	1924.52				
Reach-1	27.6666*		3.02	50.00	36054.8		1075.00
1100.00		1125.00	1924.48				
Reach-1	27.3333*		0.41	50.00	272139.1		1075.00
1100.00		1125.00	1924.45				
Reach-1	27.*		0.41	50.00	273327.6		1075.00
1100.00		1125.00	1924.41				
Reach-1	26.6666*		0.41	50.00	274520.8		1075.00
1100.00		1125.00	1924.37				
Reach-1	26.3333*		0.41	50.00	275370.1		

1100.00		1125.00	1924.34			
Reach-1	26		0.40	50.00	276569.8	1075.00
1100.00		1125.00	1924.30			
Reach-1	25.3333*		0.41	50.00	225260.9	1075.00
1100.00		1125.00	1924.47			
Reach-1	24.6666*		0.42	50.00	180256.7	1075.00
1100.00		1125.00	1924.63			
Reach-1	24		0.43	50.00	154807.4	1075.00
1100.00		1125.00	1924.80			
Reach-1	23.6*		0.48	52.75	149016.4	1073.63
1100.00		1126.38	1924.78			
Reach-1	23.2*		0.54	55.42	138445.2	1072.29
1100.00		1127.71	1924.76			
Reach-1	22.8*		0.61	57.89	124770.0	1071.05
1100.00		1128.95	1924.75			
Reach-1	22.4*		0.70	59.85	108627.4	1070.08
1100.00		1129.92	1924.73			
Reach-1	22		1.00	56.89	74407.0	1071.56
1100.00		1128.45	1924.71			
Reach-1	21.8*		1.11	55.07	66590.1	1072.47
1100.00		1127.53	1924.67			
Reach-1	21.6*		1.00	57.49	74485.8	1071.26
1100.00		1128.74	1924.64			
Reach-1	21.4*		1.11	55.73	66811.7	1072.14
1100.00		1127.87	1924.60			
Reach-1	21.2*		1.01	58.07	74301.3	1070.96
1100.00		1129.04	1924.56			
Reach-1	21.*		1.11	56.51	67072.1	1071.75
1100.00		1128.25	1924.52			
Reach-1	20.8*		1.16	56.00	63925.5	1072.00
1100.00		1128.00	1924.49			
Reach-1	20.6*		1.20	55.74	61595.6	1072.13
1100.00		1127.87	1924.45			
Reach-1	20.4*		1.23	55.66	59887.4	1072.17
1100.00		1127.83	1924.41			
Reach-1	20.2*		1.26	55.69	58541.5	1072.15
1100.00		1127.85	1924.38			
Reach-1	20		1.28	55.83	57447.6	1072.09
1100.00		1127.91	1924.34			
Reach-1	10		0.85	183.61	74444.3	1140.09
1263.57		1323.70	1923.96			

HEC-RAS H . Post River: RIVER-1 Reach: Reach-1 Profile: PF 1

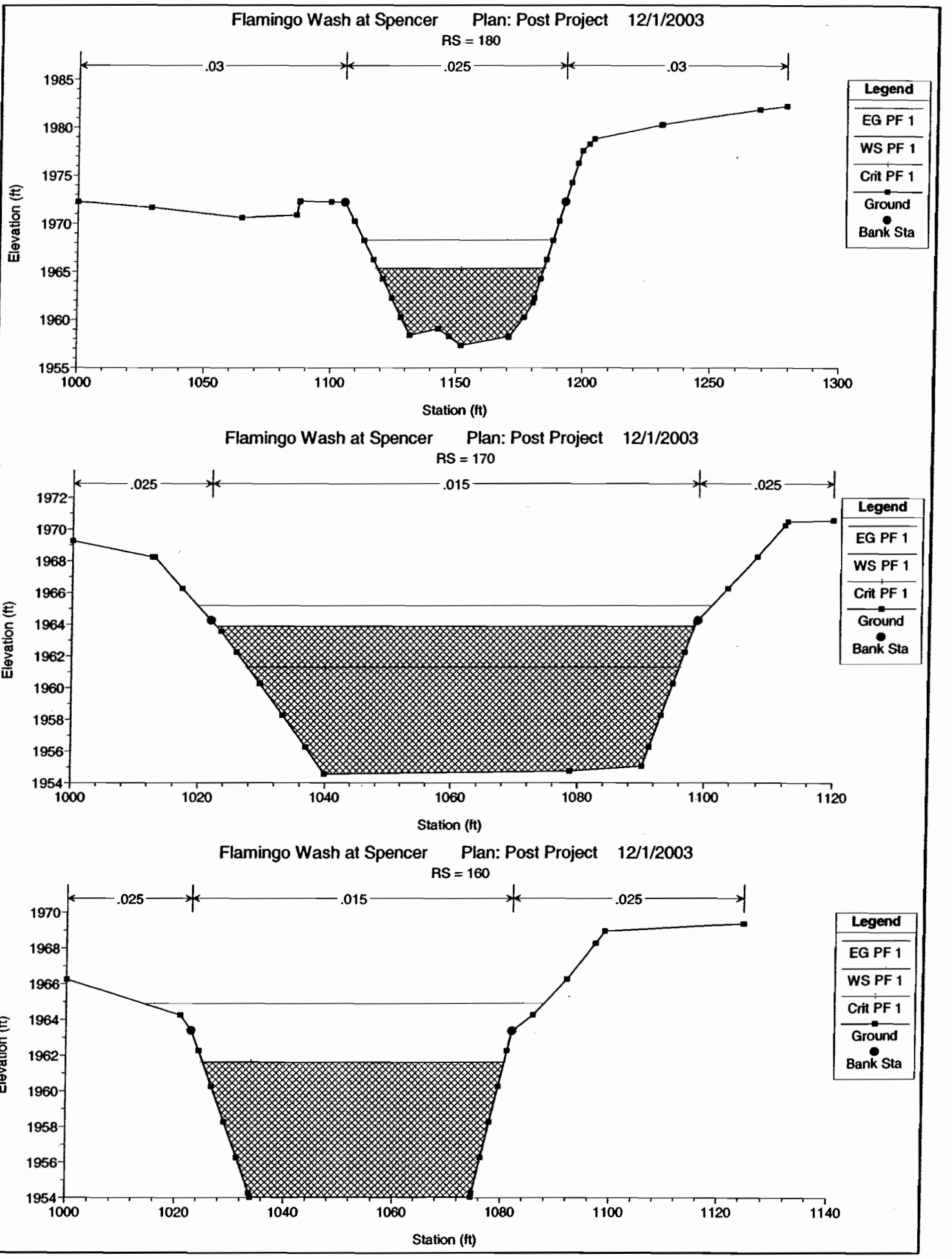
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	180	PF 1	5300.00	1957.33	1965.36	1965.36	1968.30	0.005479	13.75	385.47	65.80	1.00
Reach-1	170	PF 1	5300.00	1954.56	1963.89	1961.31	1965.20	0.000642	9.22	575.14	75.51	0.59
Reach-1	160	PF 1	5300.00	1954.02	1961.61	1961.61	1964.90	0.002039	14.56	363.92	55.47	1.00
Reach-1	150	PF 1	5300.00	1952.76	1958.60	1960.22	1964.32	0.004649	19.19	276.25	52.74	1.48
Reach-1	140	PF 1	5300.00	1950.76	1955.95	1958.44	1964.07	0.007598	22.87	231.74	48.52	1.84
Reach-1	130	PF 1	5300.00	1950.26	1955.44	1957.93	1963.64	0.007633	22.98	230.61	48.12	1.85
Reach-1	120	PF 1	5300.00	1949.76	1954.99	1957.27	1962.54	0.006924	22.05	240.42	49.85	1.77
Reach-1	110	PF 1	5300.00	1949.46	1954.60	1956.96	1962.34	0.007247	22.33	237.36	50.33	1.81
Reach-1	100	PF 1	5300.00	1947.73	1952.70	1955.55	1962.16	0.009375	24.68	214.74	46.72	2.03
Reach-1	90	PF 1	5300.00	1945.98	1950.86	1953.25	1958.74	0.007910	22.53	235.27	53.35	1.89
Reach-1	81	PF 1	5300.00	1945.72	1950.67	1952.99	1958.25	0.007413	22.09	239.88	53.45	1.84
Reach-1	75	PF 1	5300.00	1944.07	1949.35	1951.85	1957.78	0.008262	23.30	227.51	45.00	1.83
Reach-1	70	PF 1	5300.00	1941.35	1946.22	1949.12	1956.20	0.010727	25.35	209.11	45.00	2.07
Reach-1	65	PF 1	5300.00	1939.56	1946.04	1948.66	1955.00	0.007546	24.03	220.55	35.00	1.69
Reach-1	60	PF 1	5300.00	1938.13	1944.34	1947.22	1954.12	0.008588	25.10	211.19	35.00	1.80
Reach-1	55	PF 1	5300.00	1935.75	1941.66	1944.85	1952.48	0.009985	26.39	200.83	35.00	1.94
Reach-1	50	PF 1	5500.00	1931.63	1937.49	1940.95	1949.35	0.011043	27.63	199.05	35.00	2.04
Reach-1	45		Bridge									
Reach-1	40	PF 1	5500.00	1930.77	1936.99	1940.10	1947.50	0.009220	26.02	211.41	35.00	1.87
Reach-1	35	PF 1	5500.00	1930.64	1936.86	1939.97	1947.37	0.009220	26.02	211.41	35.00	1.87
Reach-1	30	PF 1	5500.00	1929.75	1933.95	1937.21	1946.02	0.015283	27.89	197.23	50.00	2.47
Reach-1	29.6*	PF 1	5500.00	1928.70	1932.74	1936.16	1945.84	0.123543	29.04	189.37	50.00	2.63
Reach-1	29.2*	PF 1	5500.00	1927.66	1931.59	1935.13	1945.44	0.134844	29.86	184.20	50.00	2.74
Reach-1	28.8*	PF 1	5500.00	1926.61	1930.45	1934.07	1945.02	0.146092	30.63	179.59	50.00	2.85
Reach-1	28.4*	PF 1	5500.00	1925.57	1929.33	1933.03	1944.57	0.156972	31.33	175.56	50.00	2.95
Reach-1	28	PF 1	5500.00	1924.52	1928.18	1931.98	1944.35	0.024248	32.27	170.43	50.00	3.08
Reach-1	27.6666*	PF 1	5500.00	1924.48	1928.18	1931.94	1943.94	0.023270	31.85	172.66	50.00	3.02
Reach-1	27.3333*	PF 1	5500.00	1924.45	1937.76	1931.91	1938.86	0.000408	8.42	652.82	50.00	0.41
Reach-1	27*	PF 1	5500.00	1924.41	1937.76		1938.85	0.000405	8.40	654.80	50.00	0.41
Reach-1	26.6666*	PF 1	5500.00	1924.37	1937.76		1938.85	0.000401	8.37	656.79	50.00	0.41
Reach-1	26.3333*	PF 1	5500.00	1924.34	1937.75		1938.84	0.000399	8.36	658.22	50.00	0.41
Reach-1	26	PF 1	5500.00	1924.30	1937.75		1938.83	0.000395	8.33	660.21	50.00	0.40
Reach-1	25.3333*	PF 1	5500.00	1924.47	1937.72		1938.83	0.000596	8.46	649.77	50.00	0.41
Reach-1	24.6666*	PF 1	5500.00	1924.63	1937.68		1938.82	0.000931	8.60	639.81	50.00	0.42
Reach-1	24	PF 1	5500.00	1924.80	1937.63		1938.82	0.001262	8.74	629.08	50.00	0.43
Reach-1	23.6*	PF 1	5500.00	1924.78	1937.48		1938.80	0.001362	9.21	597.38	52.75	0.48
Reach-1	23.2*	PF 1	5500.00	1924.76	1937.30		1938.77	0.001578	9.75	564.06	55.42	0.54
Reach-1	22.8*	PF 1	5500.00	1924.75	1937.06		1938.74	0.001943	10.41	528.17	57.89	0.61
Reach-1	22.4*	PF 1	5500.00	1924.73	1936.71		1938.70	0.002564	11.32	485.93	59.85	0.70
Reach-1	22	PF 1	5500.00	1924.71	1935.21	1935.21	1938.54	0.005464	14.64	375.72	56.89	1.00
Reach-1	21.8*	PF 1	5500.00	1924.67	1934.50	1935.03	1938.41	0.006822	15.87	346.57	55.07	1.11
Reach-1	21.6*	PF 1	5500.00	1924.64	1934.85	1934.85	1938.16	0.005452	14.59	377.06	57.49	1.00

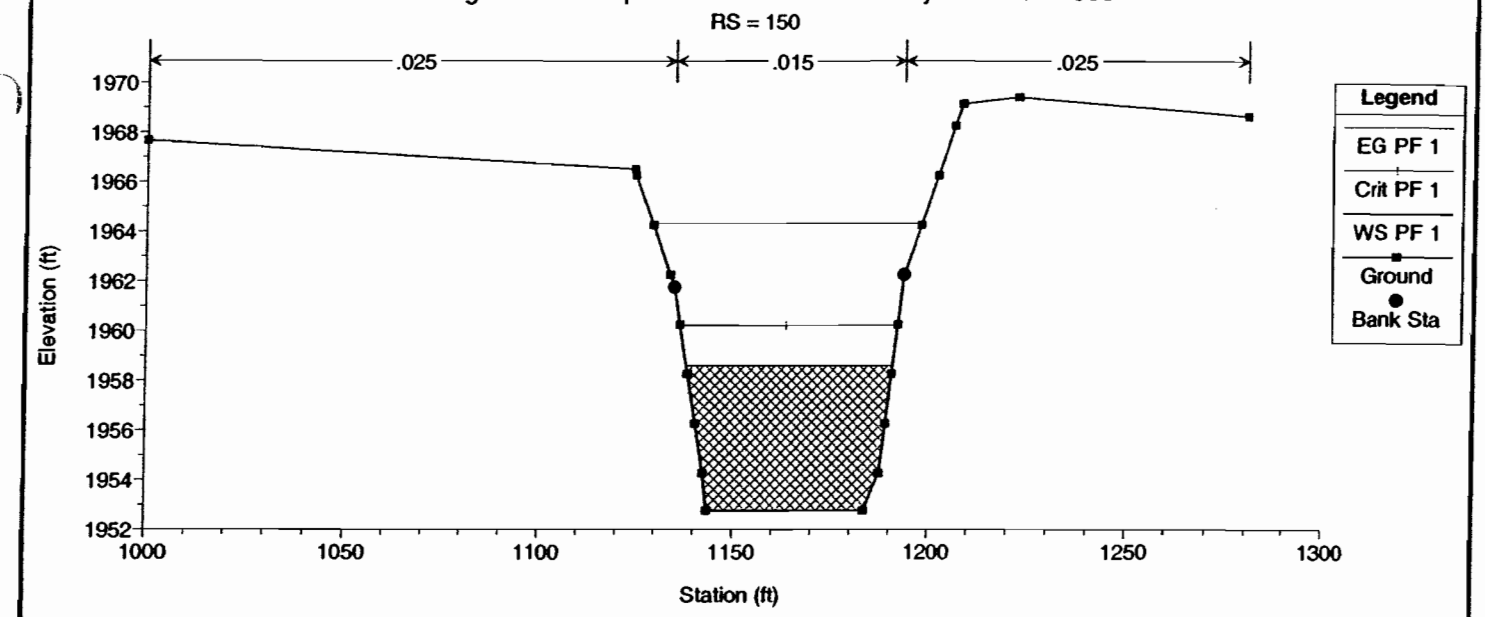
HEC-RAS Plan: Post River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

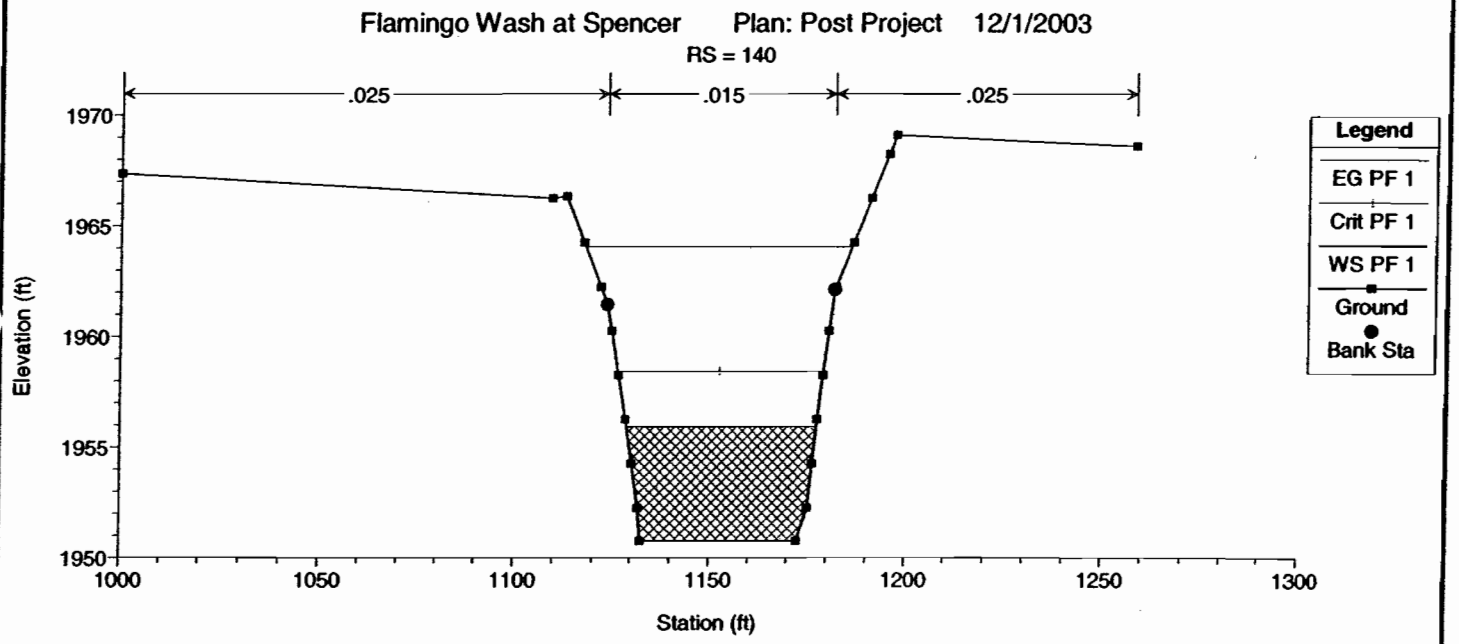
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	21.4*	PF 1	5500.00	1924.60	1934.16	1934.68	1938.03	0.006777	15.78	348.51	55.73	1.11
Reach-1	21.2*	PF 1	5500.00	1924.56	1934.48	1934.48	1937.78	0.005479	14.57	377.56	58.07	1.01
Reach-1	21*	PF 1	5500.00	1924.52	1933.84	1934.33	1937.66	0.006724	15.68	350.82	56.51	1.11
Reach-1	20.8*	PF 1	5500.00	1924.49	1933.46	1934.17	1937.54	0.007402	16.21	339.35	56.00	1.16
Reach-1	20.6*	PF 1	5500.00	1924.45	1933.14	1934.00	1937.42	0.007973	16.62	330.99	55.74	1.20
Reach-1	20.4*	PF 1	5500.00	1924.41	1932.86	1933.84	1937.31	0.008434	16.92	325.02	55.66	1.23
Reach-1	20.2*	PF 1	5500.00	1924.38	1932.62	1933.69	1937.19	0.008827	17.16	320.47	55.69	1.26
Reach-1	20	PF 1	5500.00	1924.34	1932.39	1933.54	1937.07	0.009166	17.35	316.95	55.83	1.28
Reach-1	10	PF 1	5500.00	1923.96	1932.43	1932.43	1934.25	0.005458	11.14	566.77	183.61	0.85

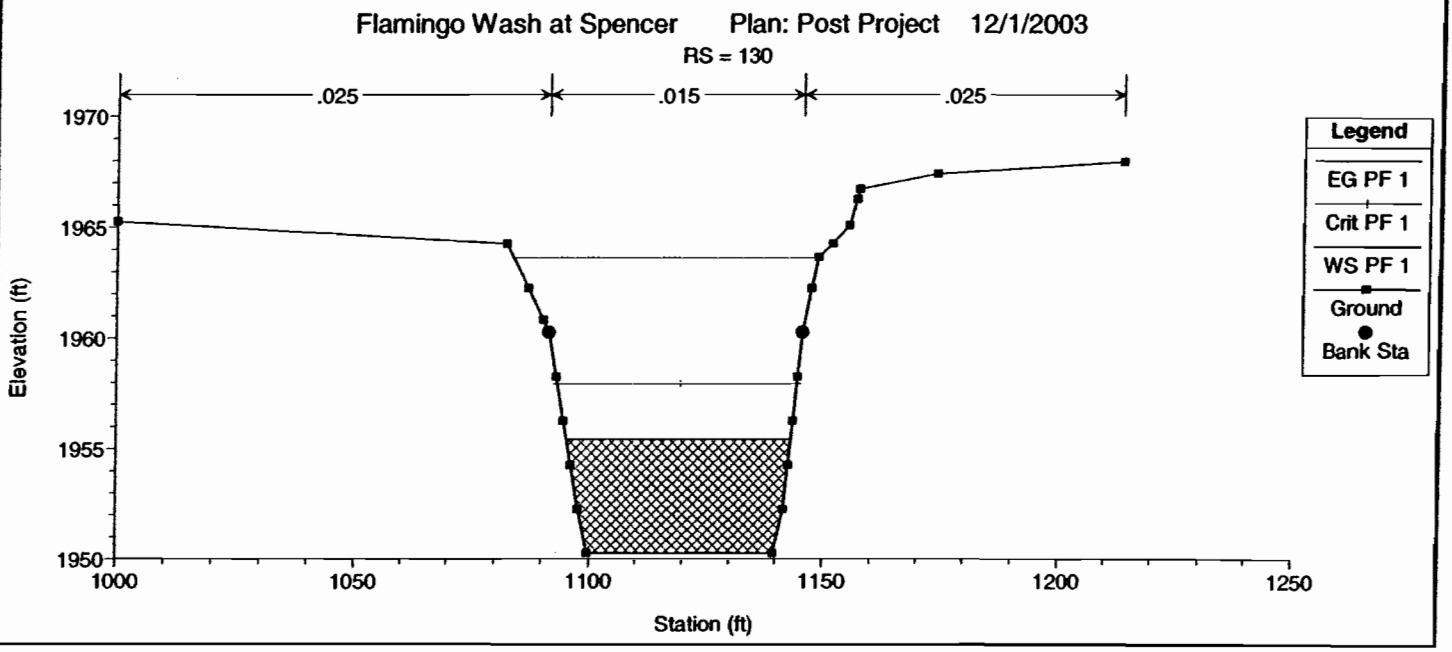
HEC-RAS Plan: Post River: RIVER-1 Reach: Reach-1 Profile: PF 1

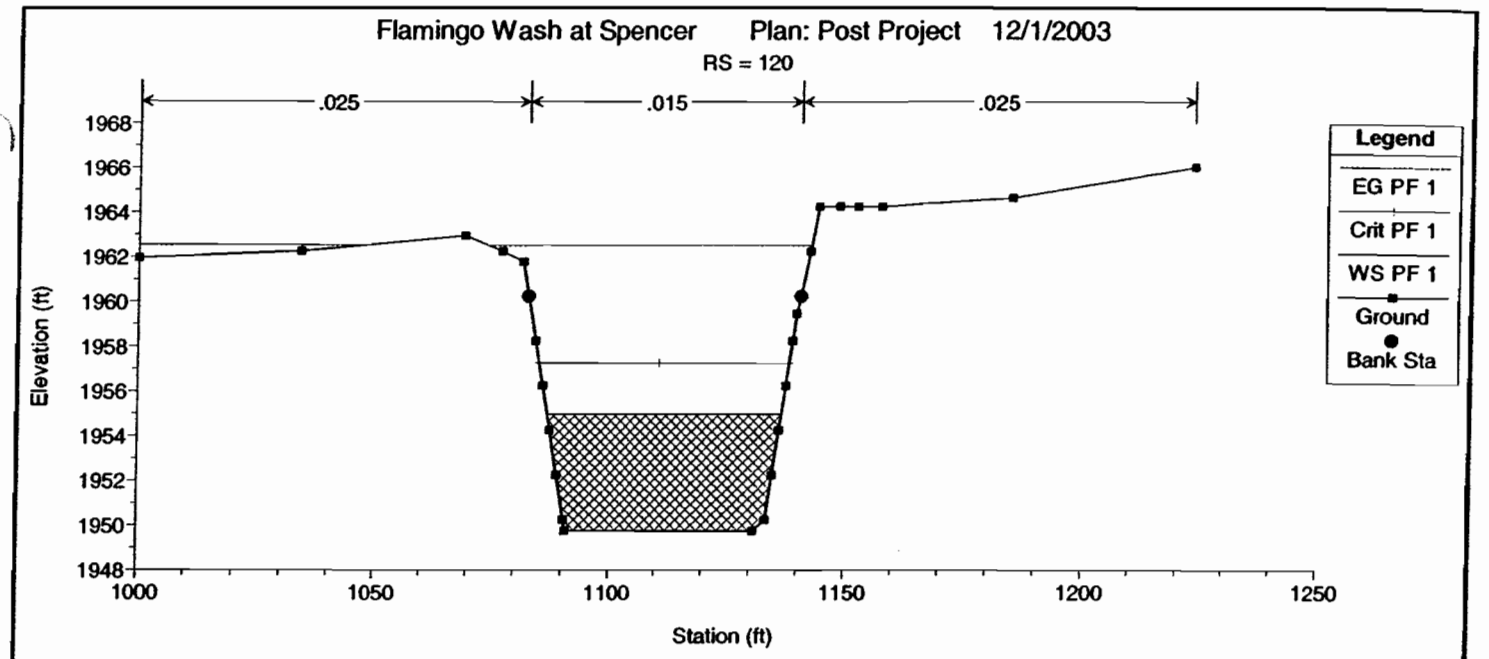
Reach	River Sta	Profile	E.G. US.	Min El Prs	BR Open Area	Prs O WS	Q Total	Min El Weir Flow	Q Weir	Delta EG
			(ft)	(ft)	(sq ft)	(ft)	(cfs)	(ft)	(cfs)	(ft)
Reach-1	45	PF 1	1947.50	1941.63	343.88	1937.49	5500.00	1943.81		0.00

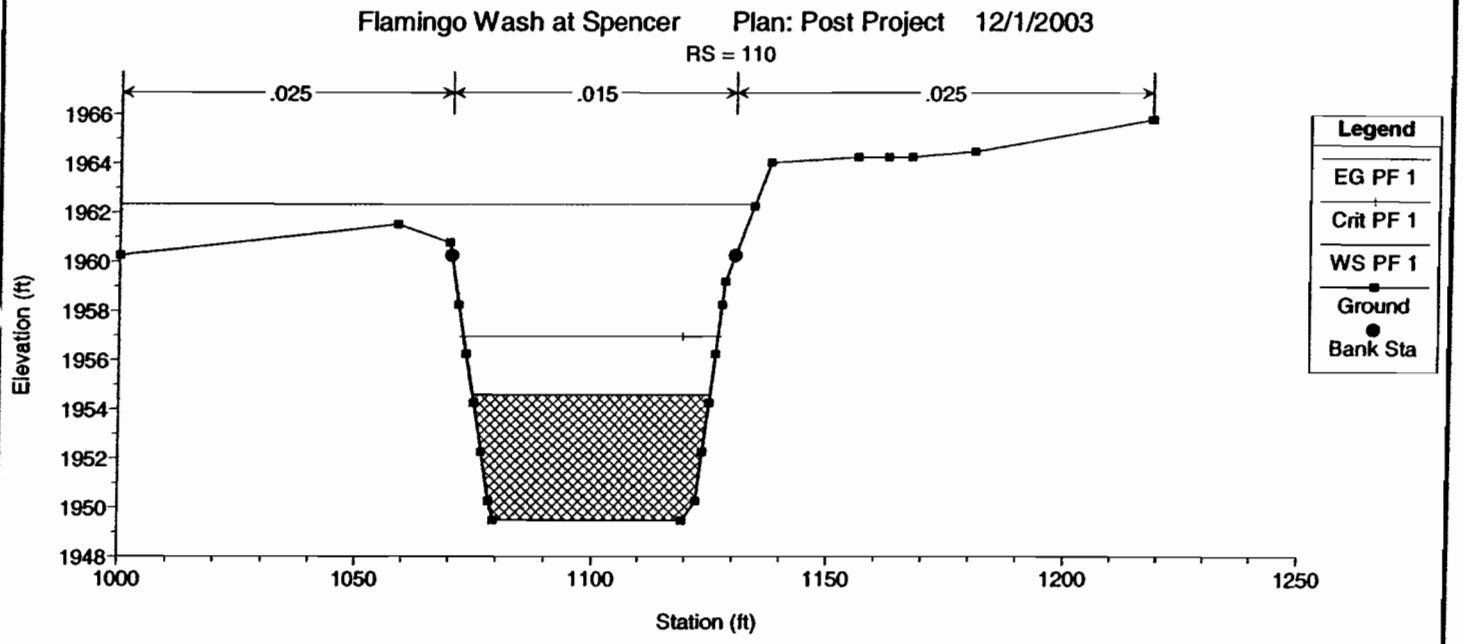

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 180
.03
.025
.03
Elevation (ft)
1985
1980
1975
1970
1965
1960
1955
1000
1050
1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 170
.025
.015
.025
Elevation (ft)
1972
1970
1968
1966
1964
1962
1960
1958
1956
1954
1000
1020
1040
1060
1080
1100
1120
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 160
.025
.015
.025
Elevation (ft)
1970
1968
1966
1964
1962
1960
1958
1956
1954
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

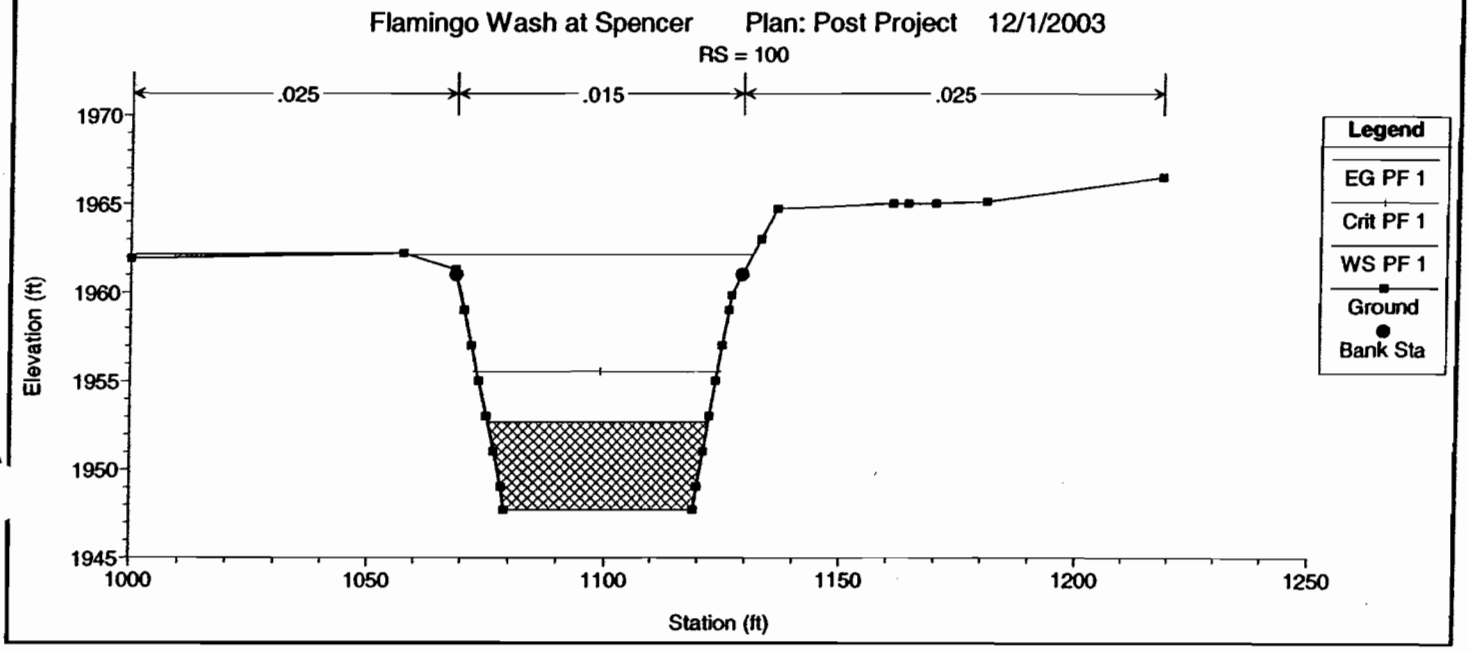

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 150
.025
.015
.025
Elevation (ft)
1970
1968
1966
1964
1962
1960
1958
1956
1954
1952
1000
1050
1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

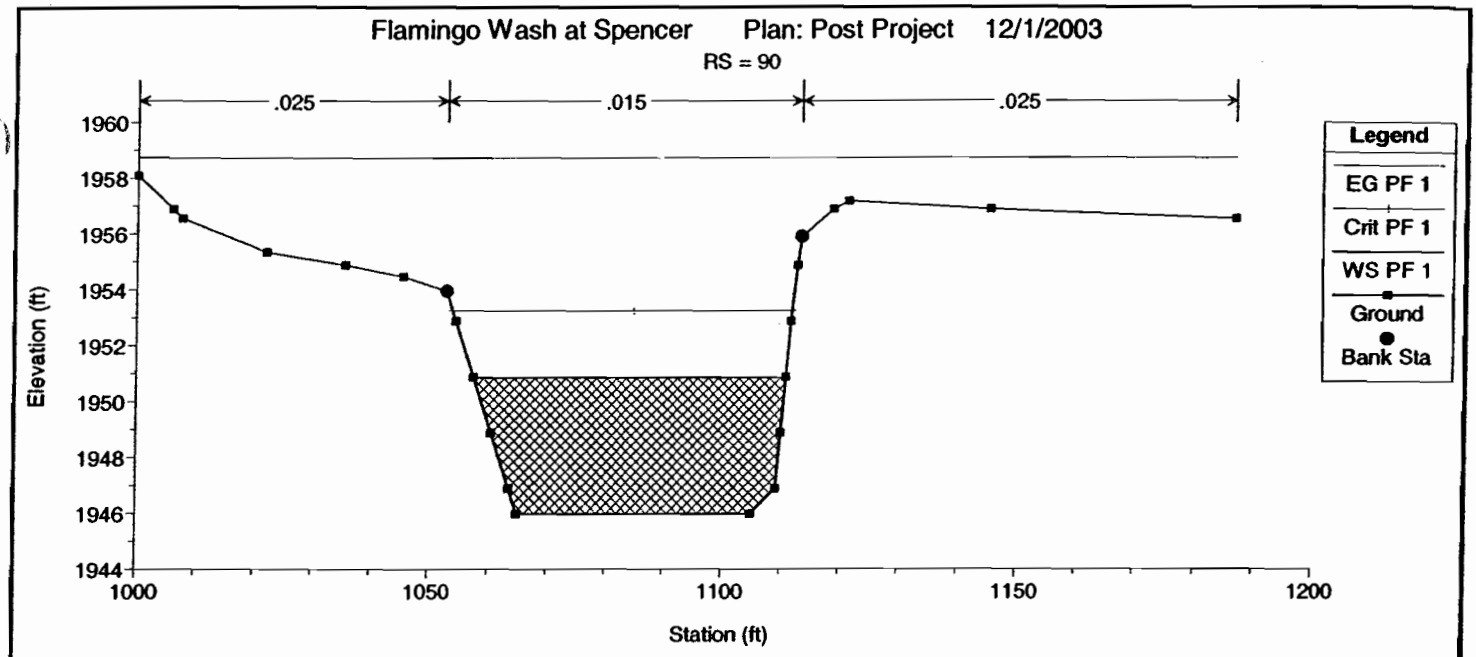

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 140
.025
.015
.025
Elevation (ft)
1970
1965
1960
1955
1950
1000
1050
1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

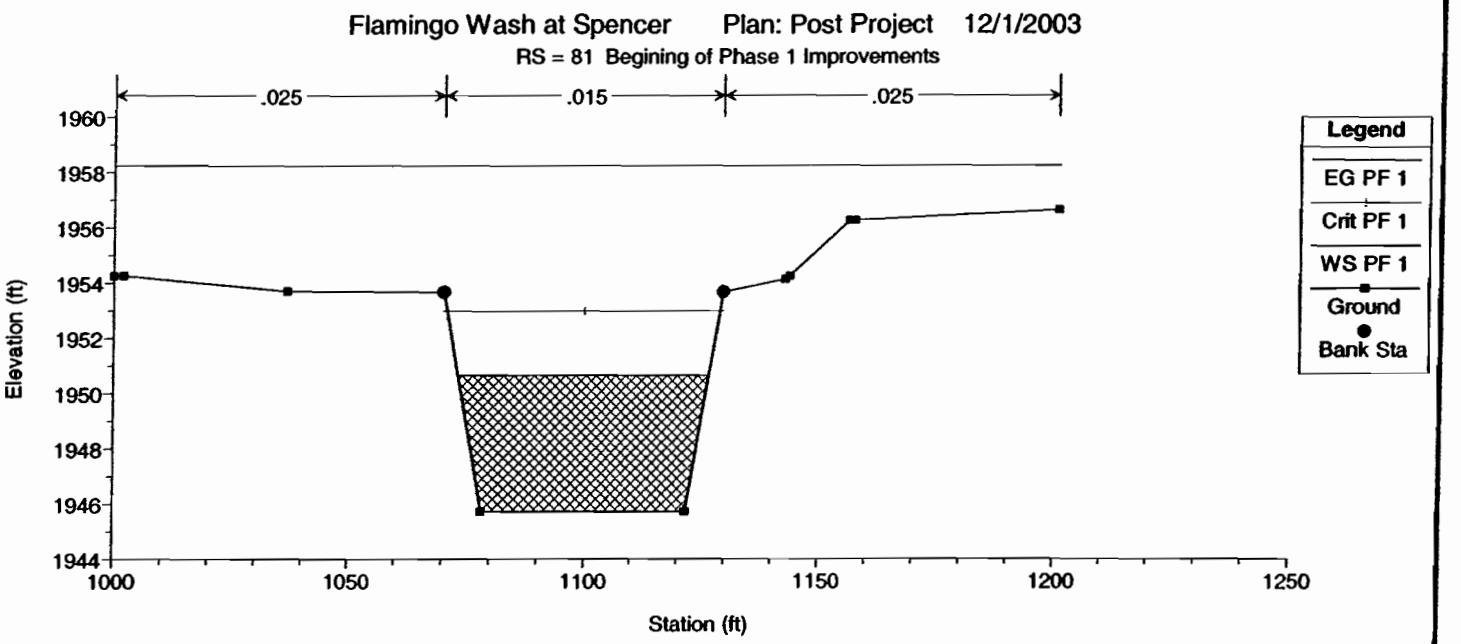

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 130
.025
.015
.025
Elevation (ft)
1970
1965
1960
1955
1950
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

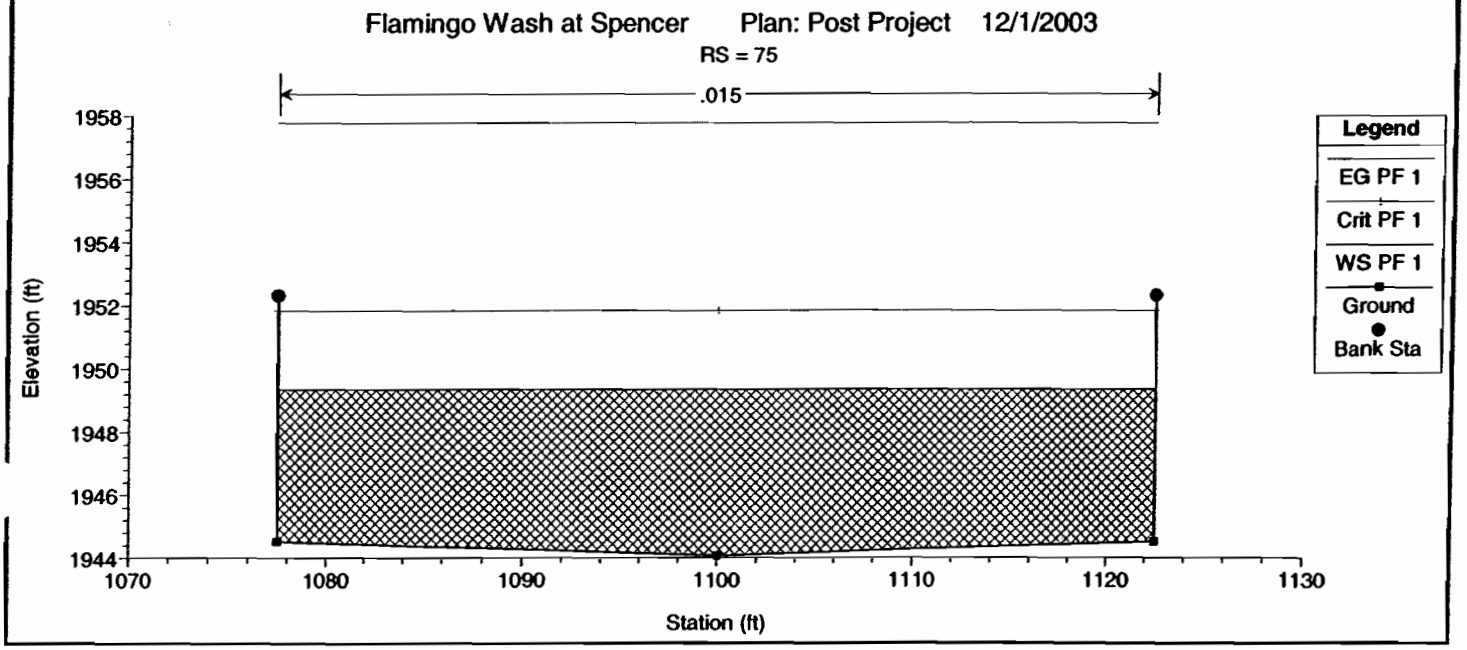

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 120
.025
.015
.025
Elevation (ft)
1968
1966
1964
1962
1960
1958
1956
1954
1952
1950
1948
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

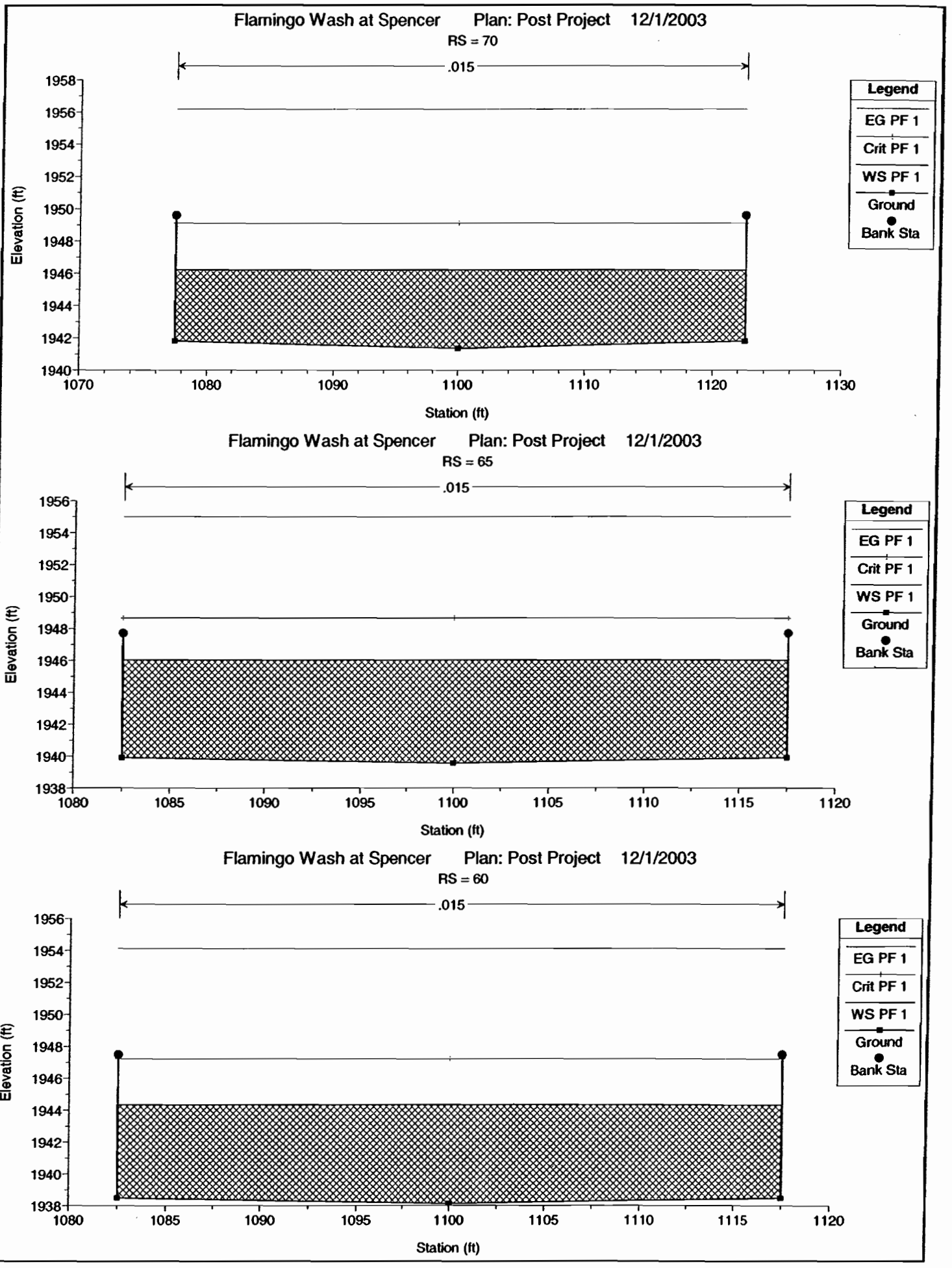

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 110
.025
.015
.025
Elevation (ft)
1966
1964
1962
1960
1958
1956
1954
1952
1950
1948
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

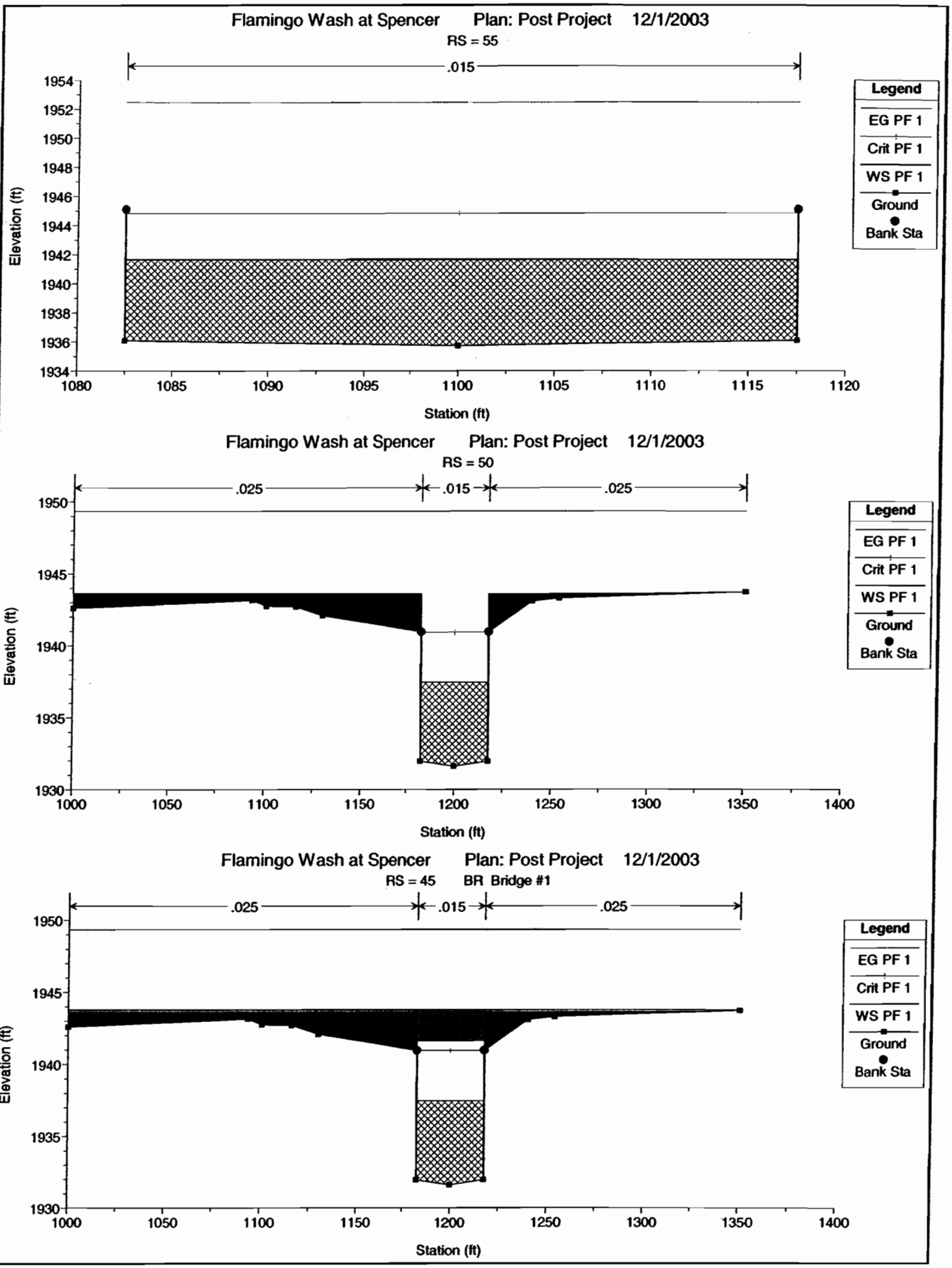

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 100
.025
.015
.025
Elevation (ft)
1970
1965
1960
1955
1950
1945
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

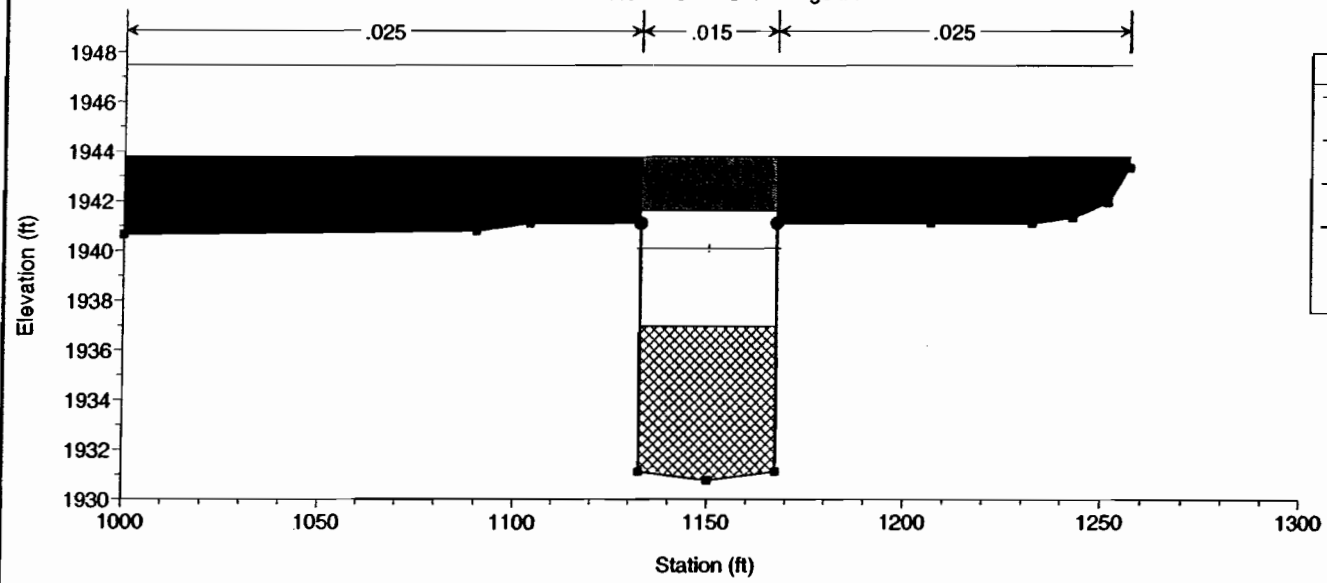

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 90
.025
.015
.025
Elevation (ft)
1960
1958
1956
1954
1952
1950
1948
1946
1944
1000
1050
1100
1150
1200
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

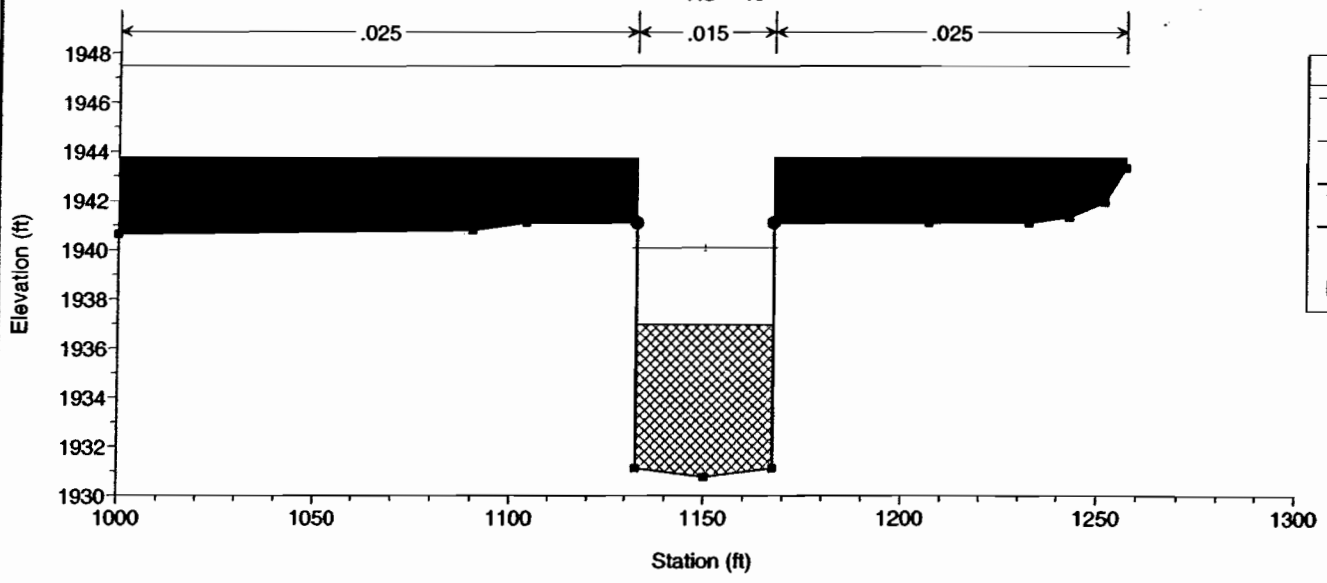

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 81 Begining of Phase 1 Improvements
.025
.015
.025
Elevation (ft)
1960
1958
1956
1954
1952
1950
1948
1946
1944
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

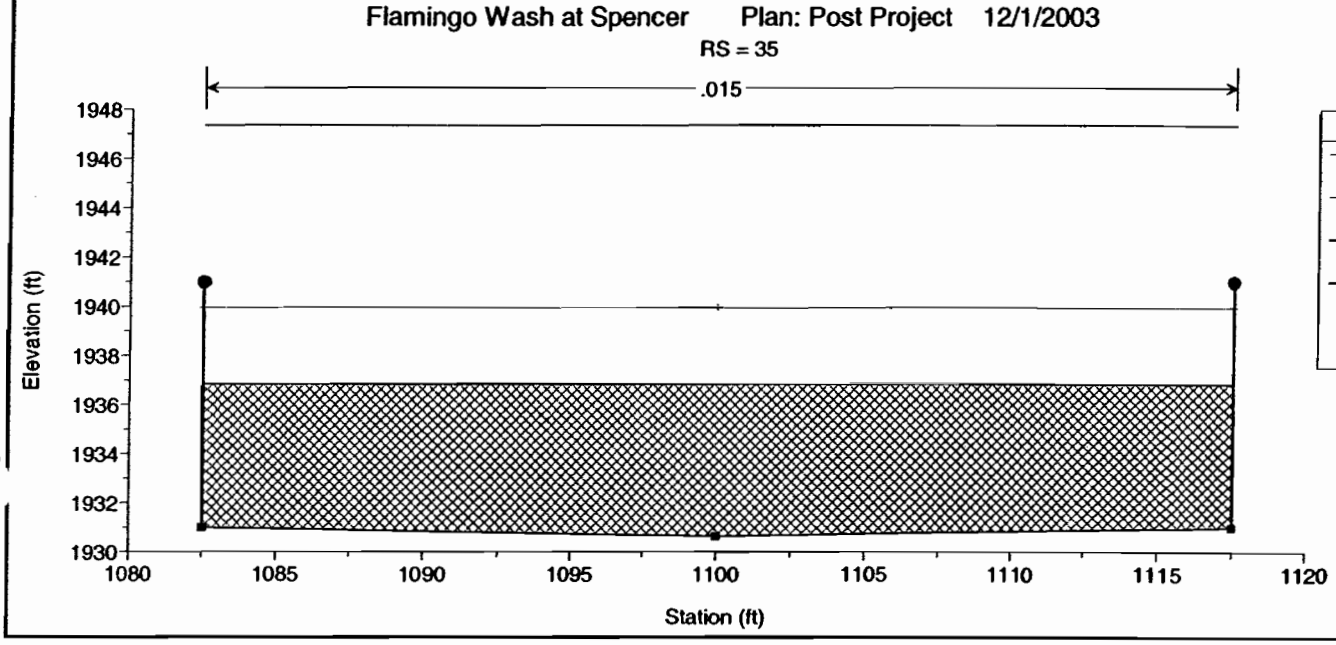

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 75
.015
Elevation (ft)
1958
1956
1954
1952
1950
1948
1946
1944
1070
1080
1090
1100
1110
1120
1130
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

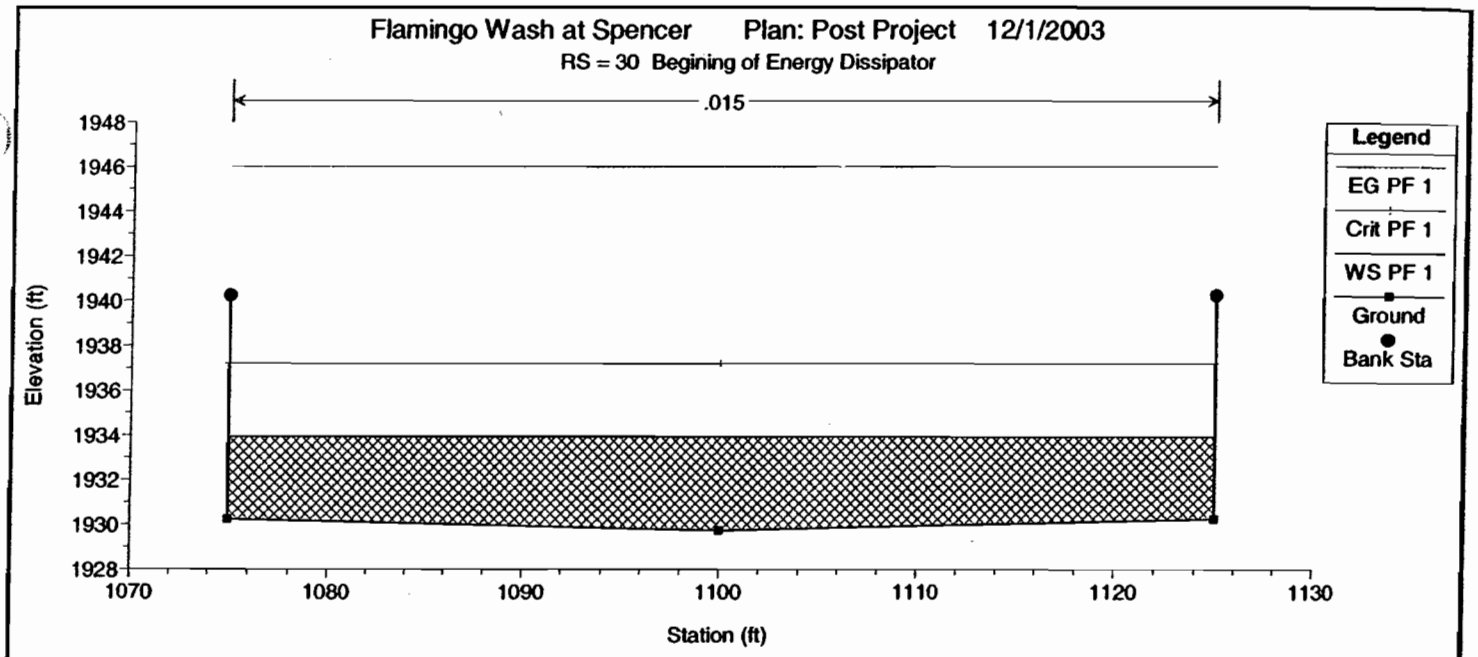

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 70
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 65
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 60
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

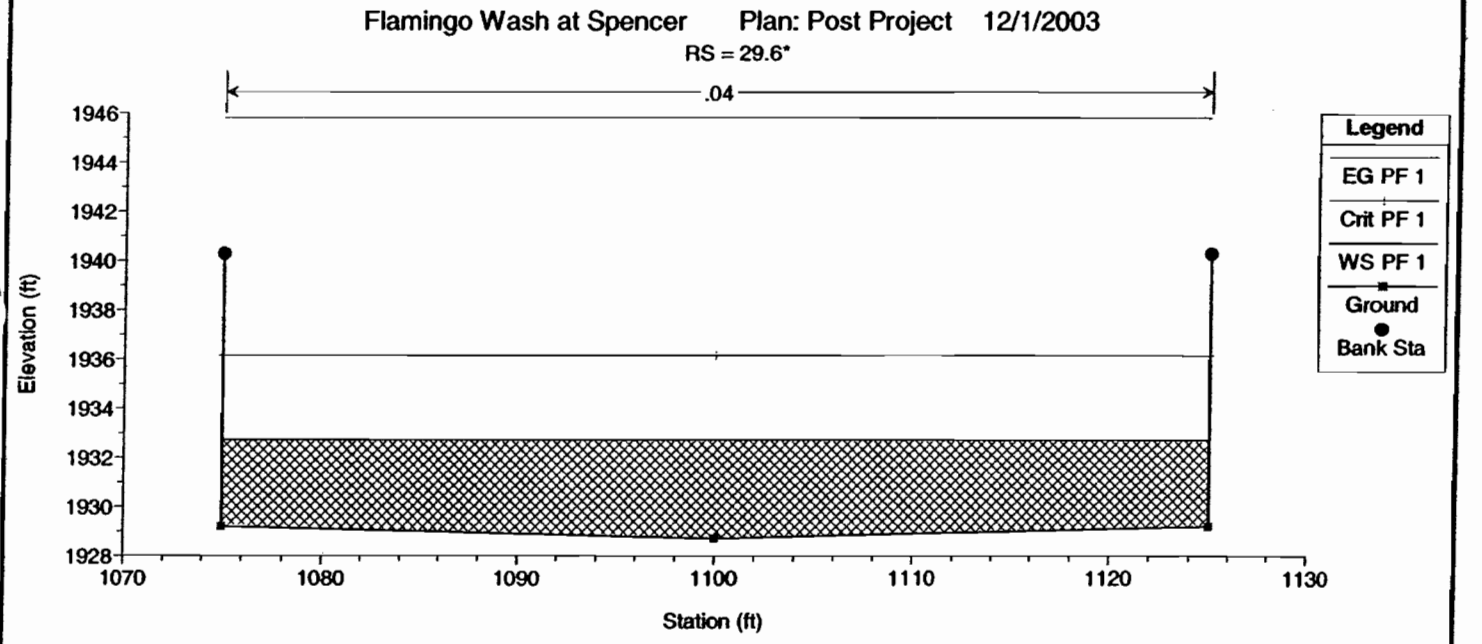

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 55
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 50
.025
.015
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 45 BR Bridge #1
.025
.015
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

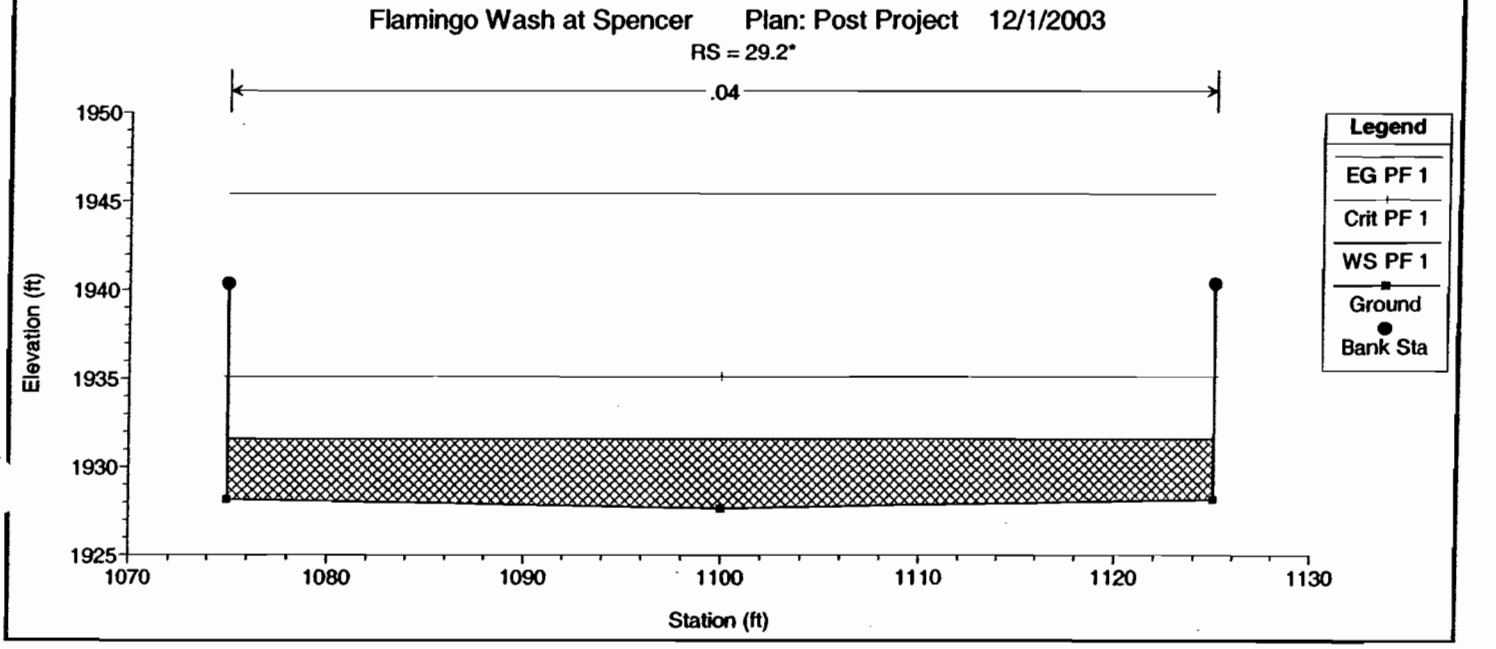

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 45 BR Bridge #1
.025
.015
.025
Elevation (ft)
1948
1946
1944
1942
1940
1938
1936
1934
1932
1930
1000
1050
1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

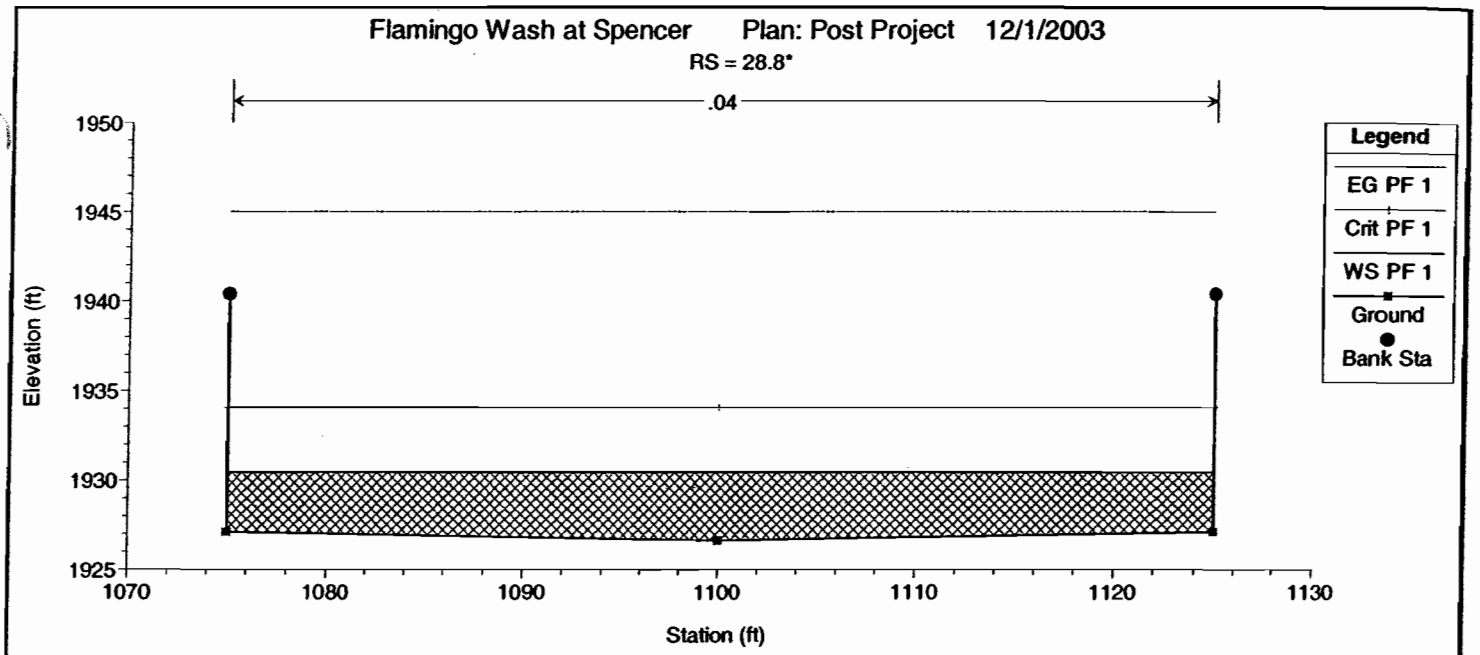

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 40
.025
.015
.025
Elevation (ft)
1948
1946
1944
1942
1940
1938
1936
1934
1932
1930
1000
1050
1100
1150
1200
1250
1300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

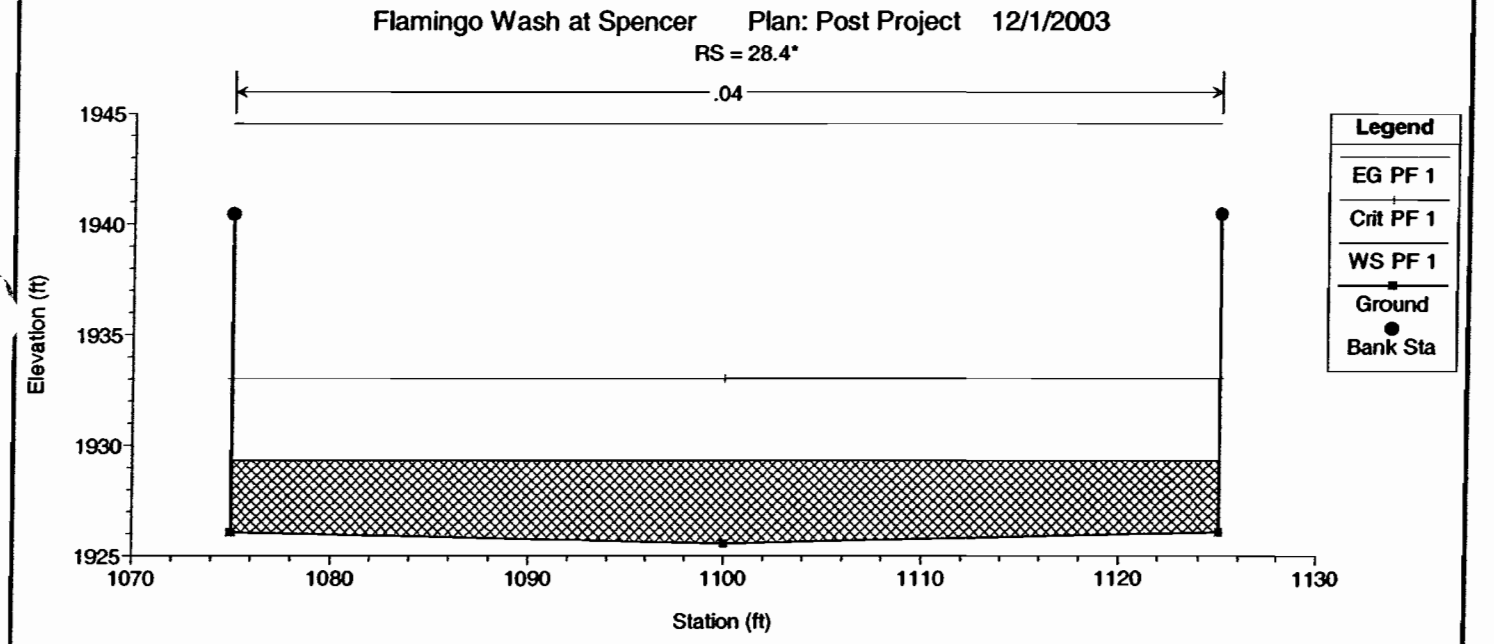

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 35
.015
Elevation (ft)
1948
1946
1944
1942
1940
1938
1936
1934
1932
1930
1080
1085
1090
1095
1100
1105
1110
1115
1120
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

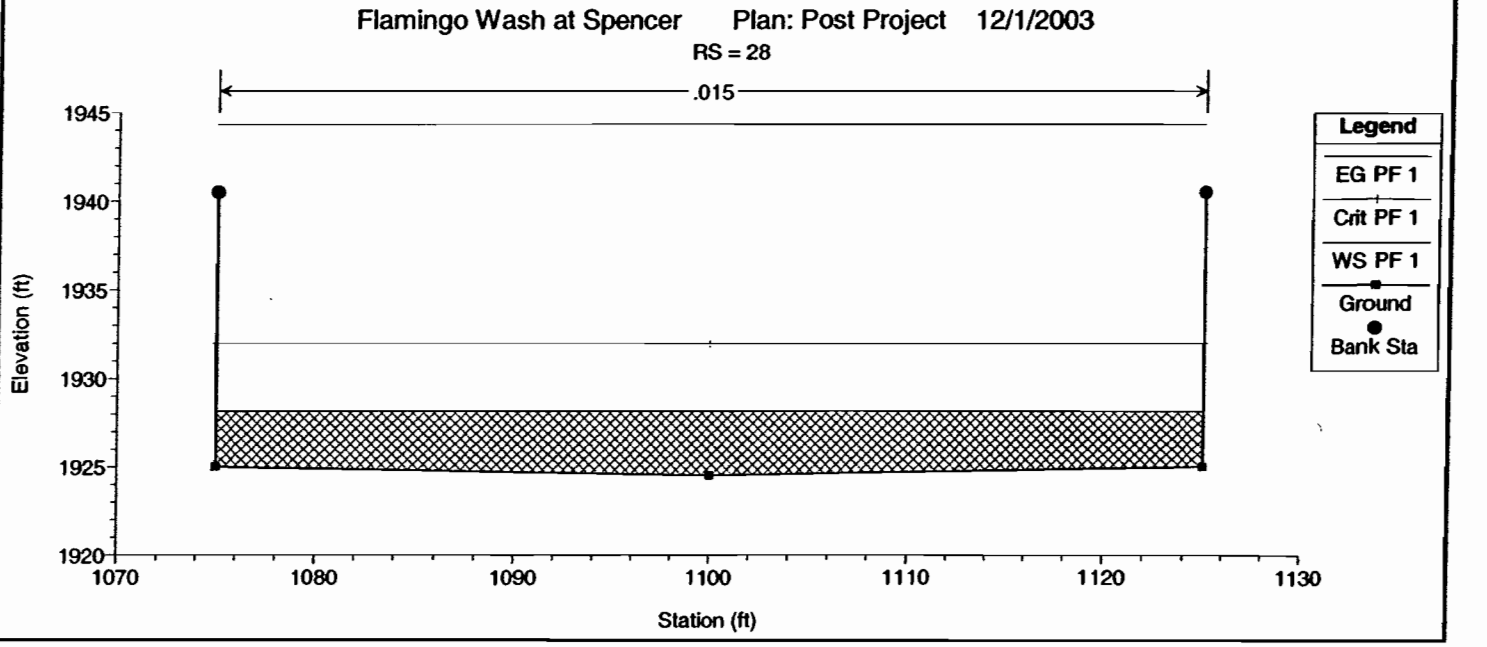

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 30 Begining of Energy Dissipator
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

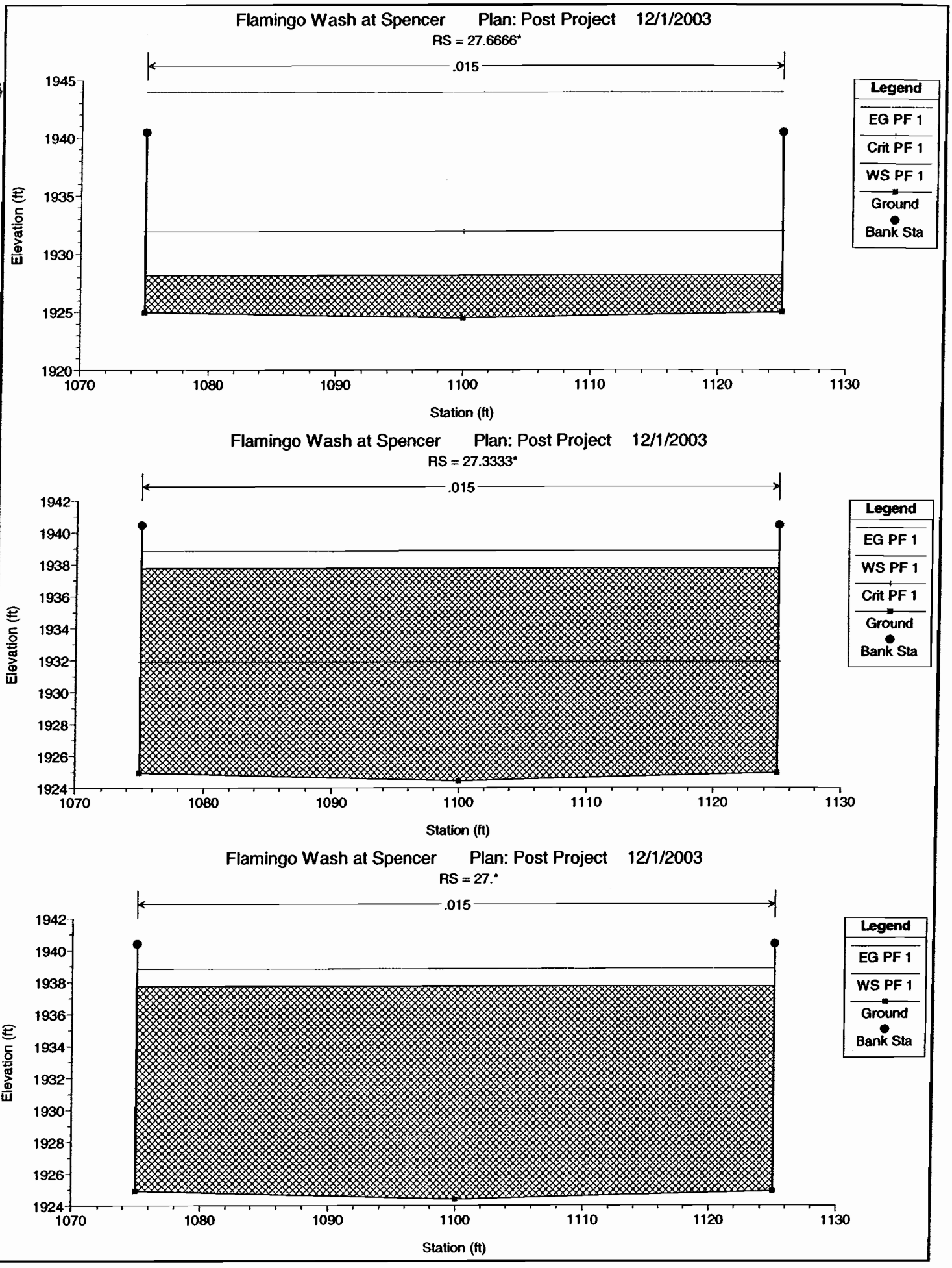

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 29.6*
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

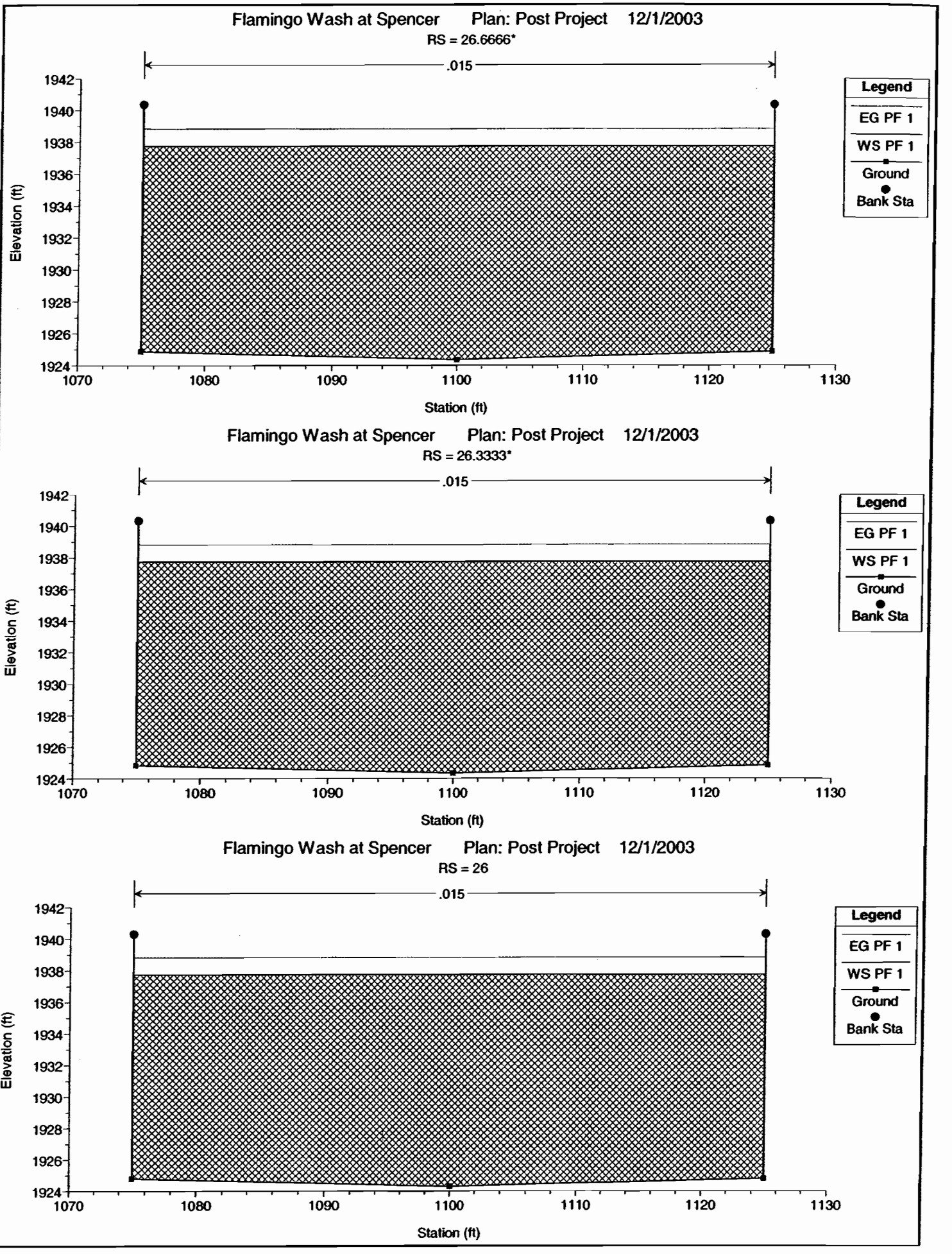

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 29.2*
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

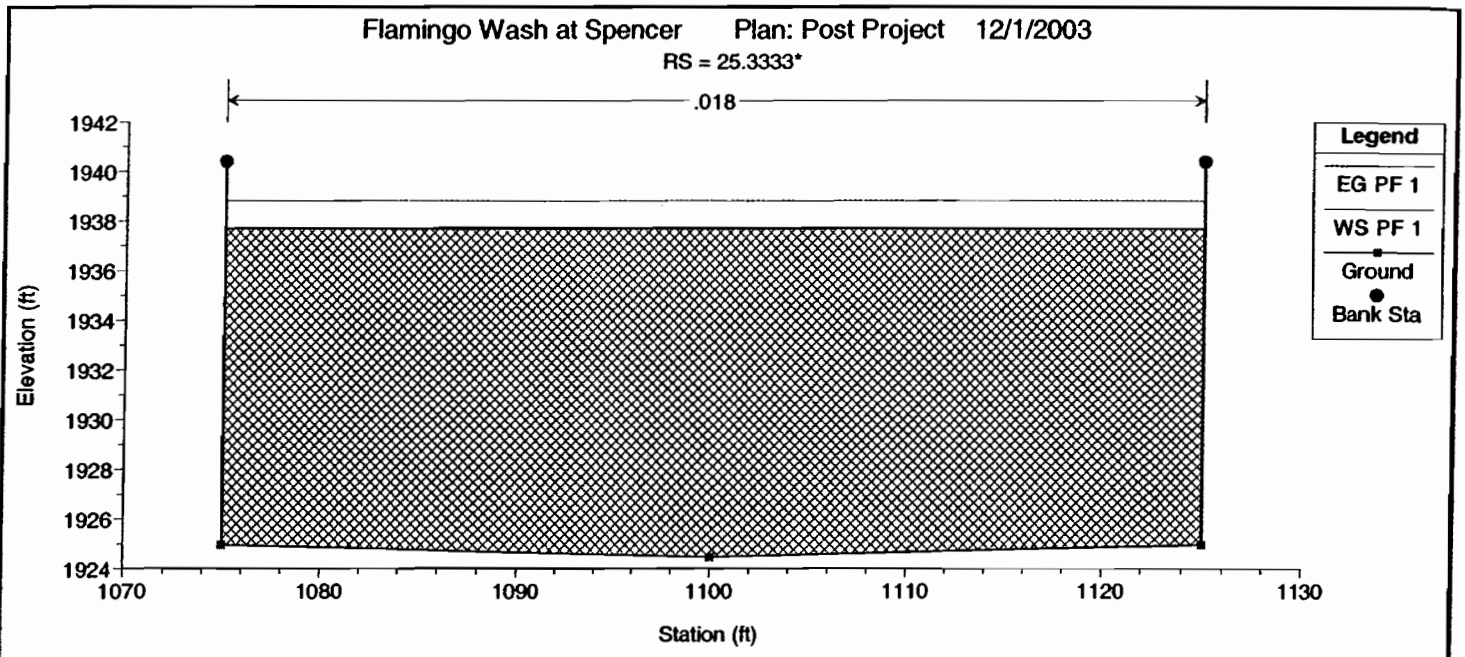

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 28.8*
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1950
1945
1940
1935
1930
1925
1070
1080
1090
1100
1110
1120
1130
Station (ft)

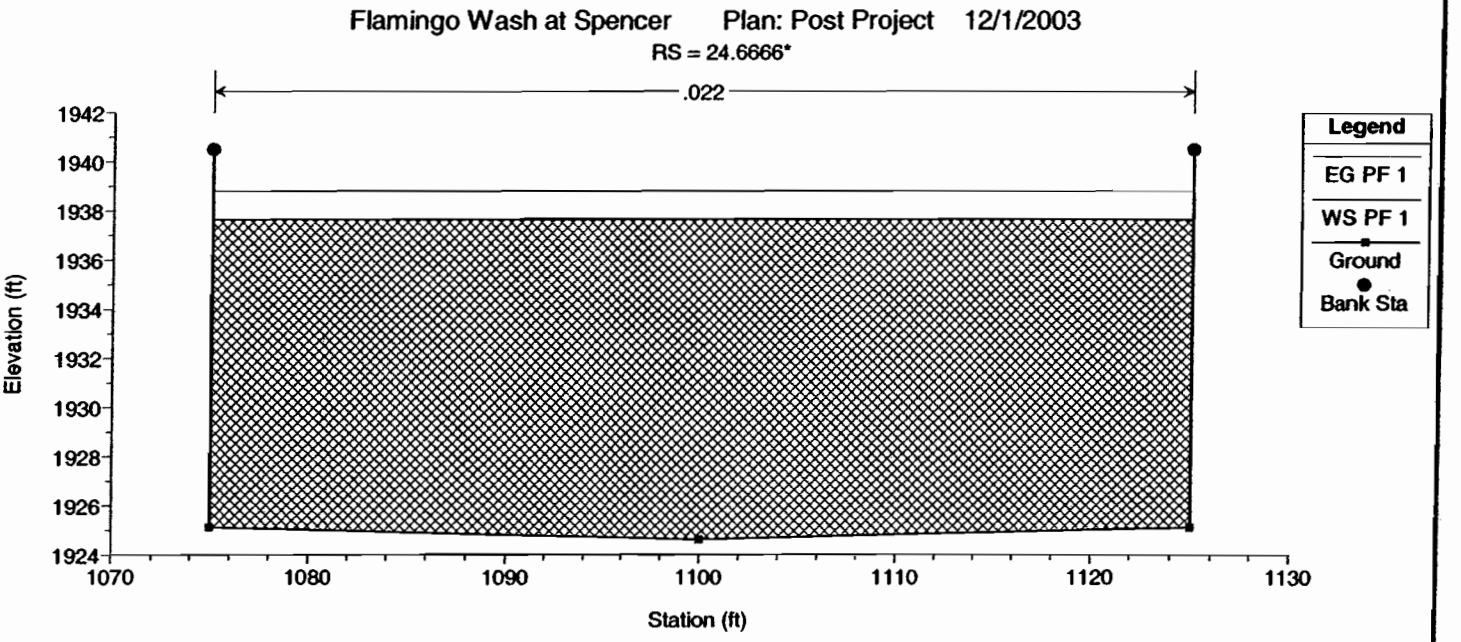

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 28.4*
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1945
1940
1935
1930
1925
1070
1080
1090
1100
1110
1120
1130
Station (ft)

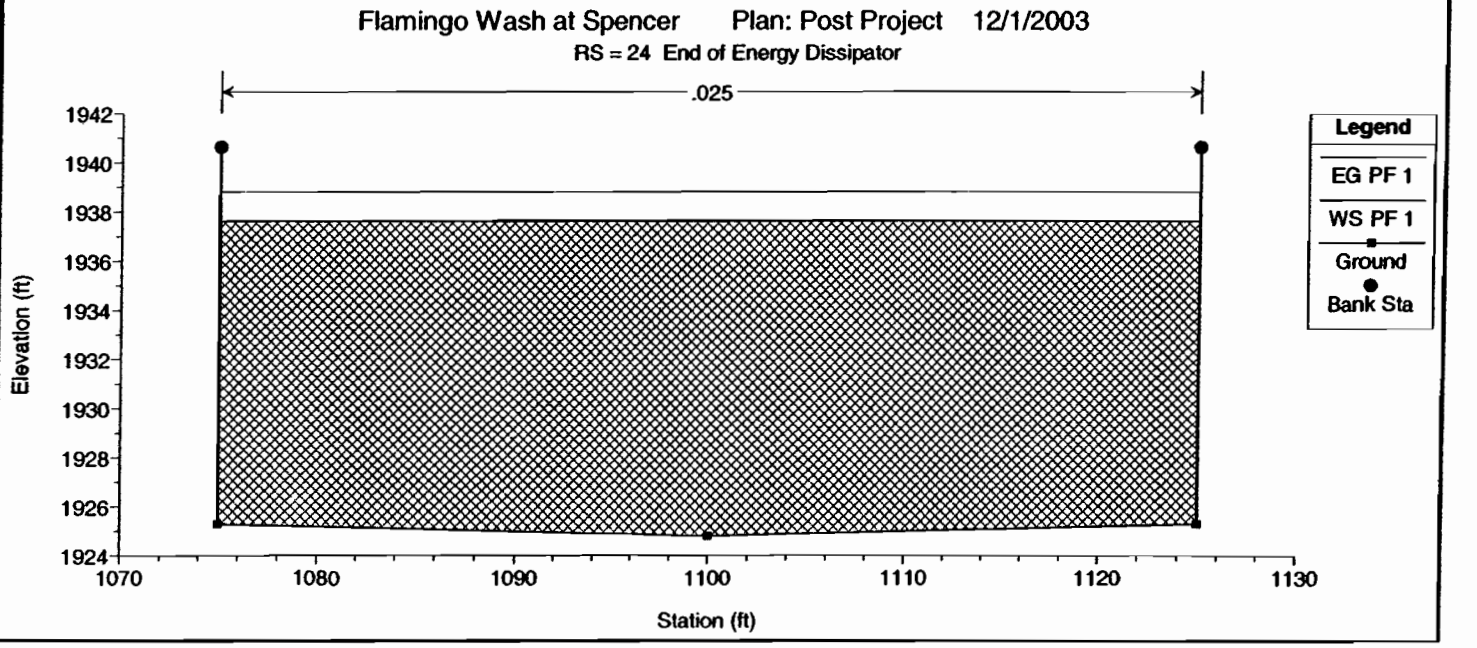

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 28
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1945
1940
1935
1930
1925
1920
1070
1080
1090
1100
1110
1120
1130
Station (ft)

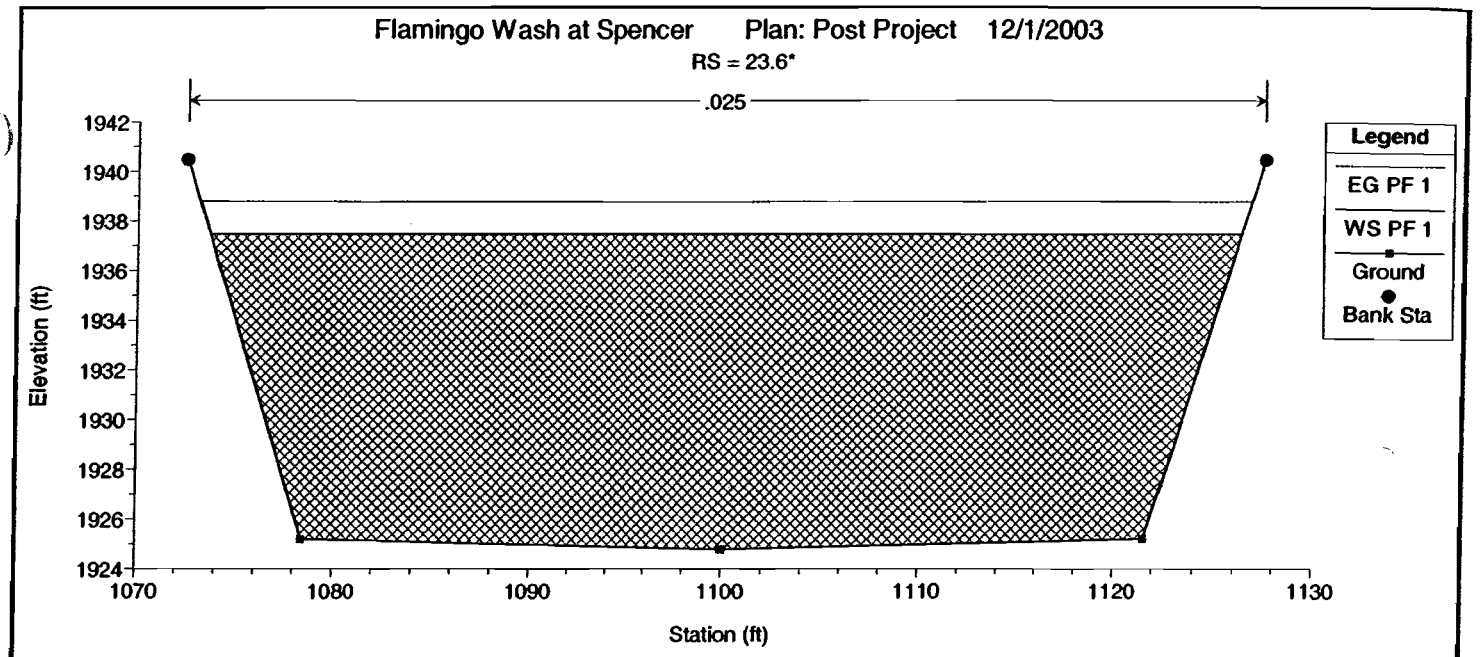

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 27.6666*
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 27.3333*
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 27.*
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta

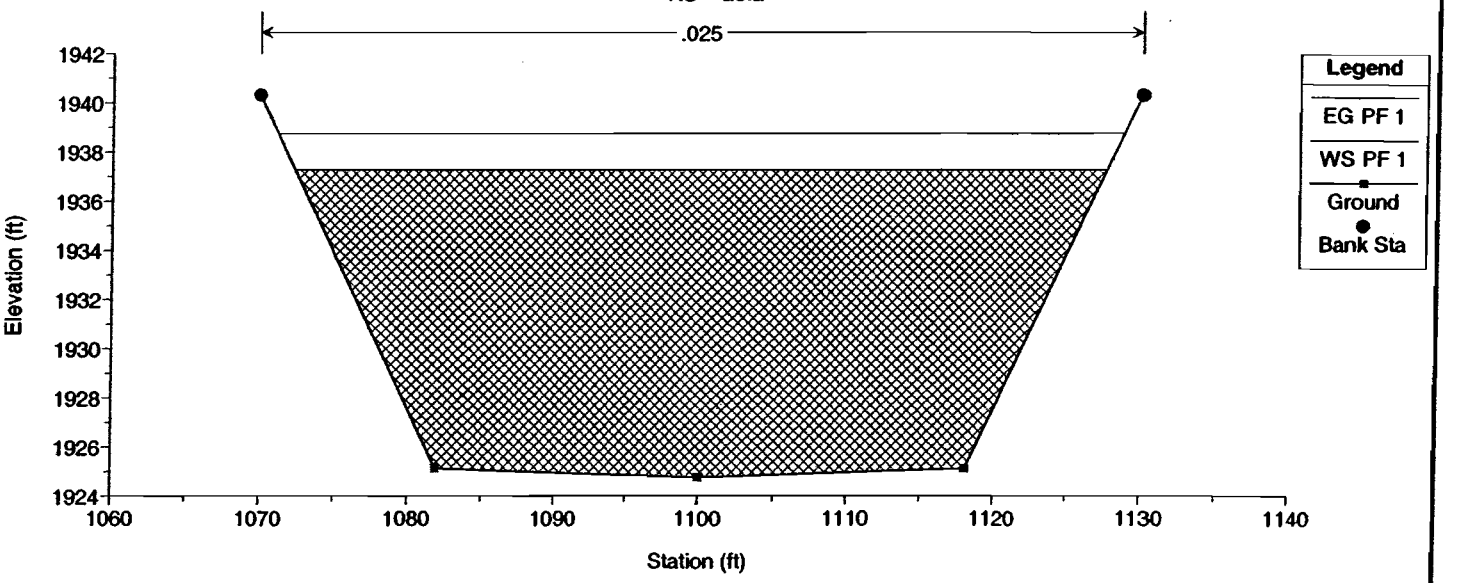

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 26.6666*
.015
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1070
1080
1090
1100
1110
1120
1130
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 26.3333*
.015
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 26
.015
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

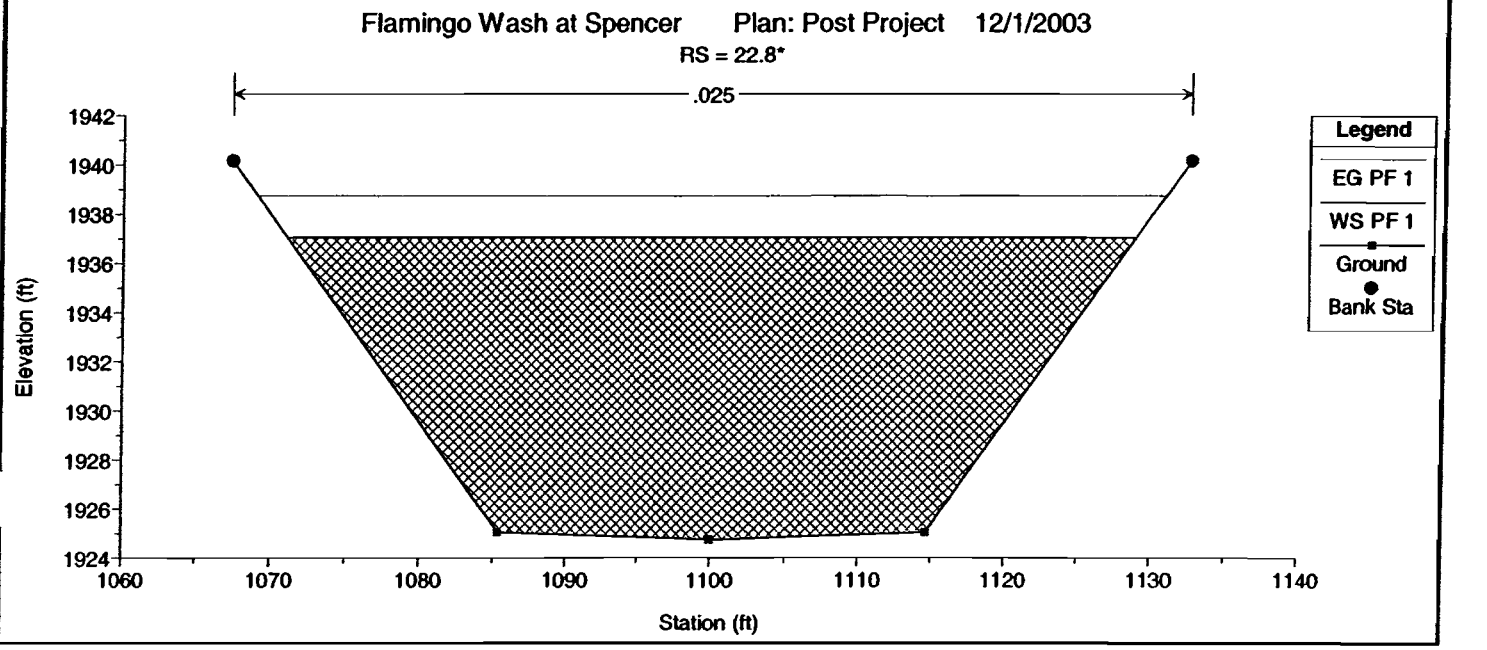

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 25.3333*
.018
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1070
1080
1090
1100
1110
1120
1130
Station (ft)

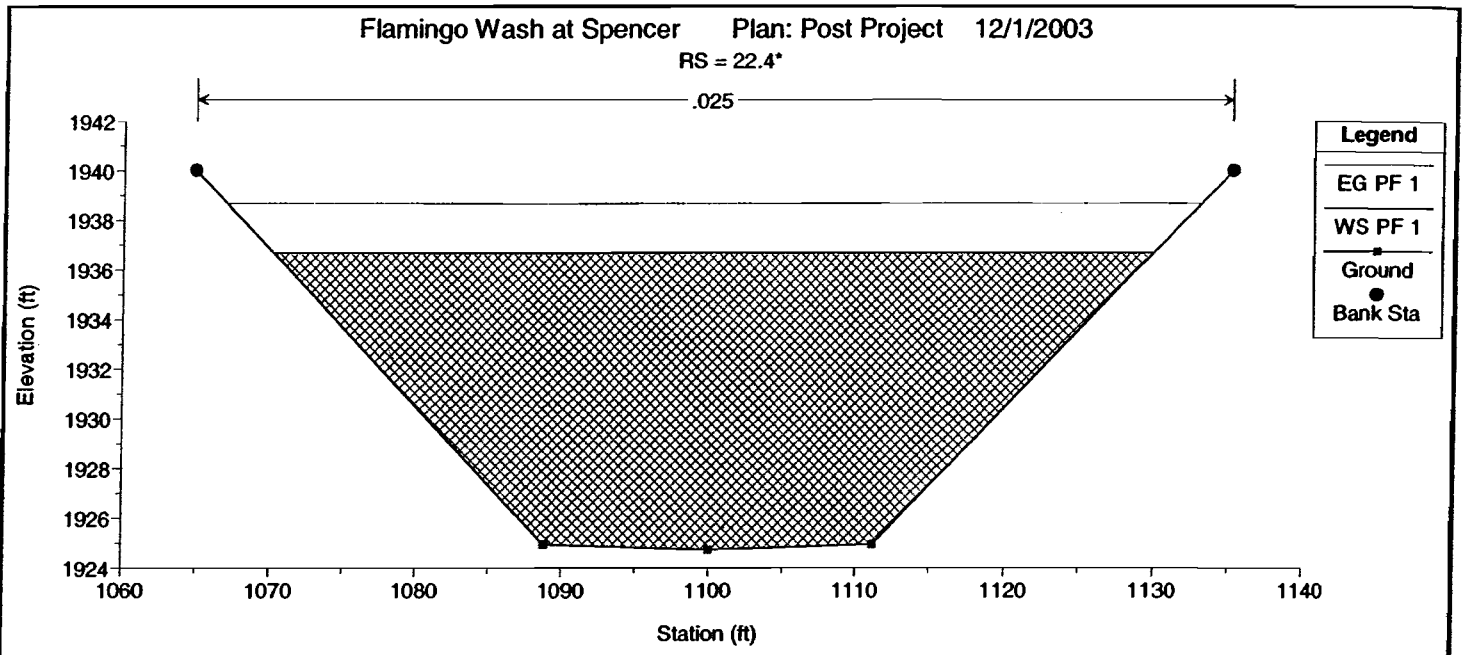

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 24.6666*
.022
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1070
1080
1090
1100
1110
1120
1130
Station (ft)

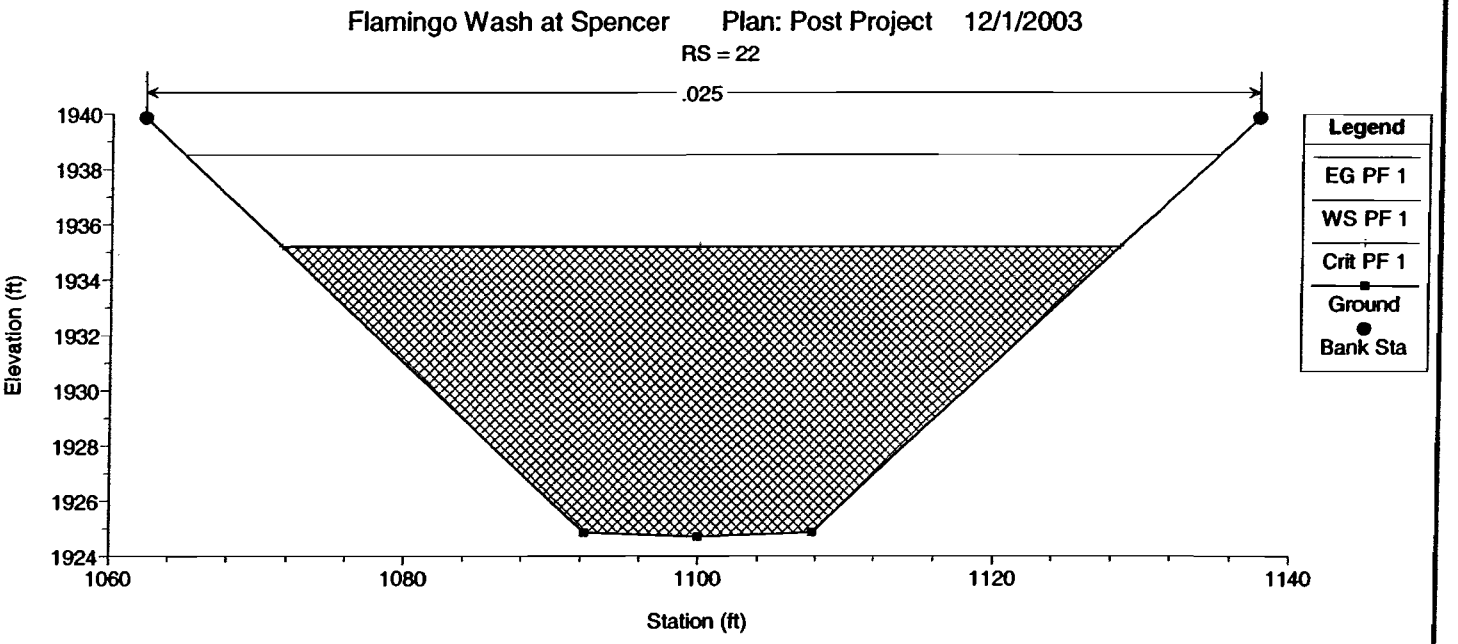

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 24 End of Energy Dissipator
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1070
1080
1090
1100
1110
1120
1130
Station (ft)

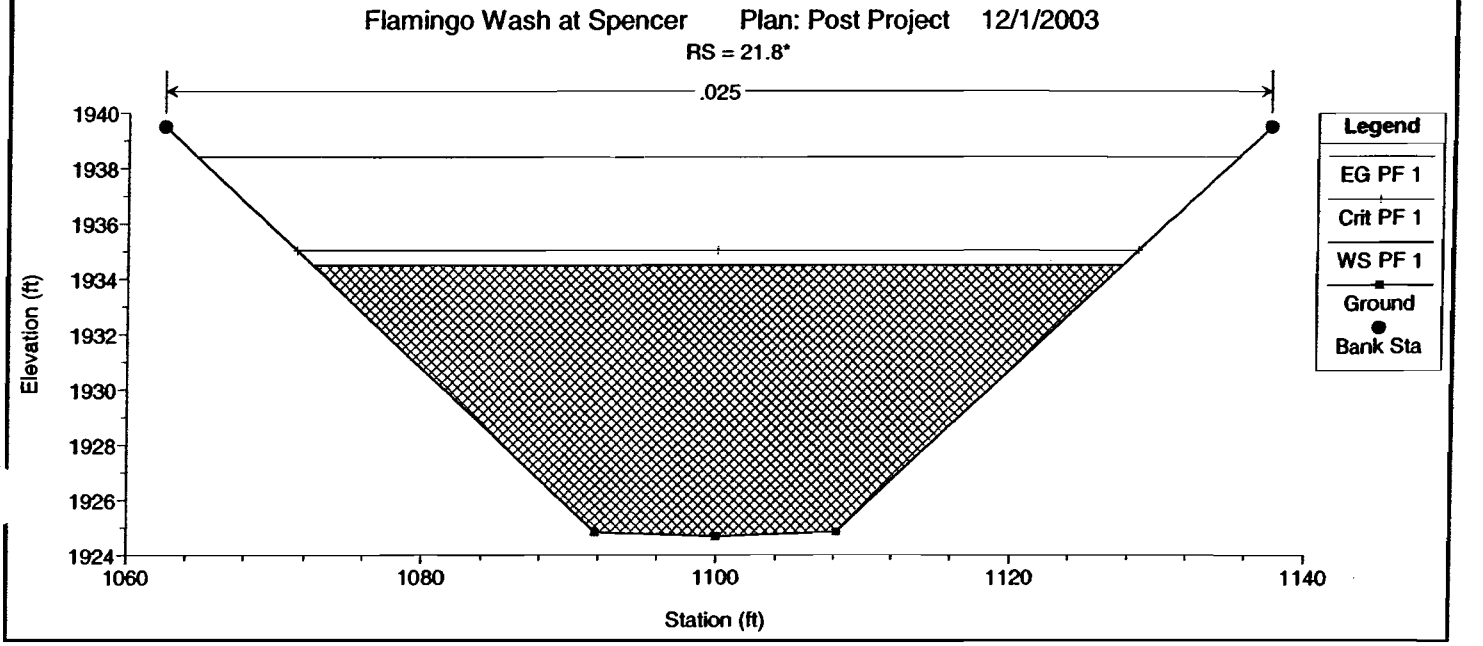

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 23.6*
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1070
1080
1090
1100
1110
1120
1130
Station (ft)

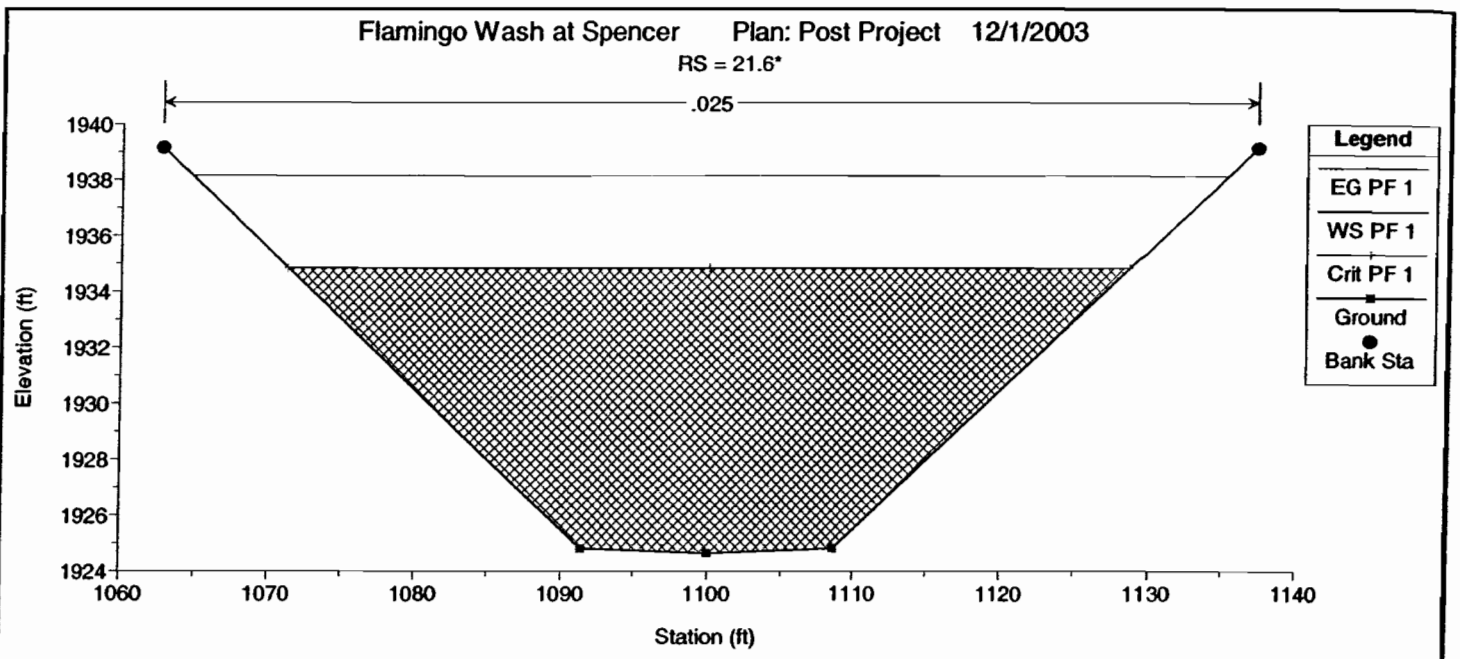

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 23.2*
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1060
1070
1080
1090
1100
1110
1120
1130
1140
Station (ft)

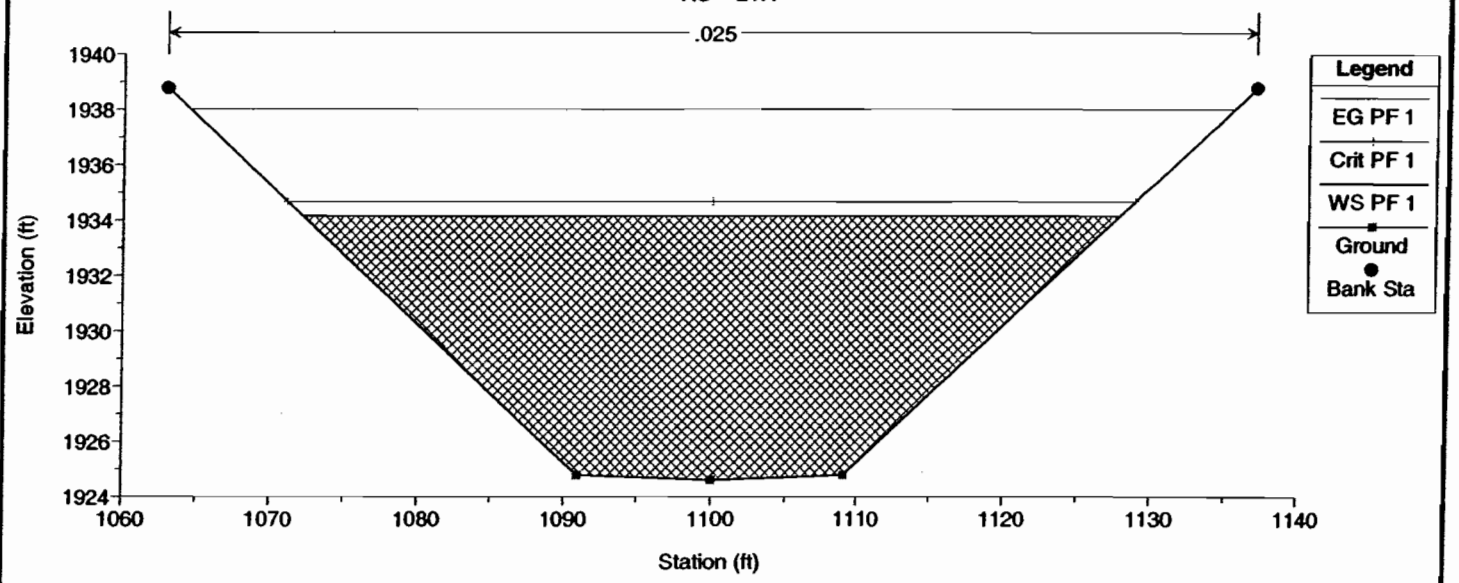

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 22.8*
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1060
1070
1080
1090
1100
1110
1120
1130
1140
Station (ft)

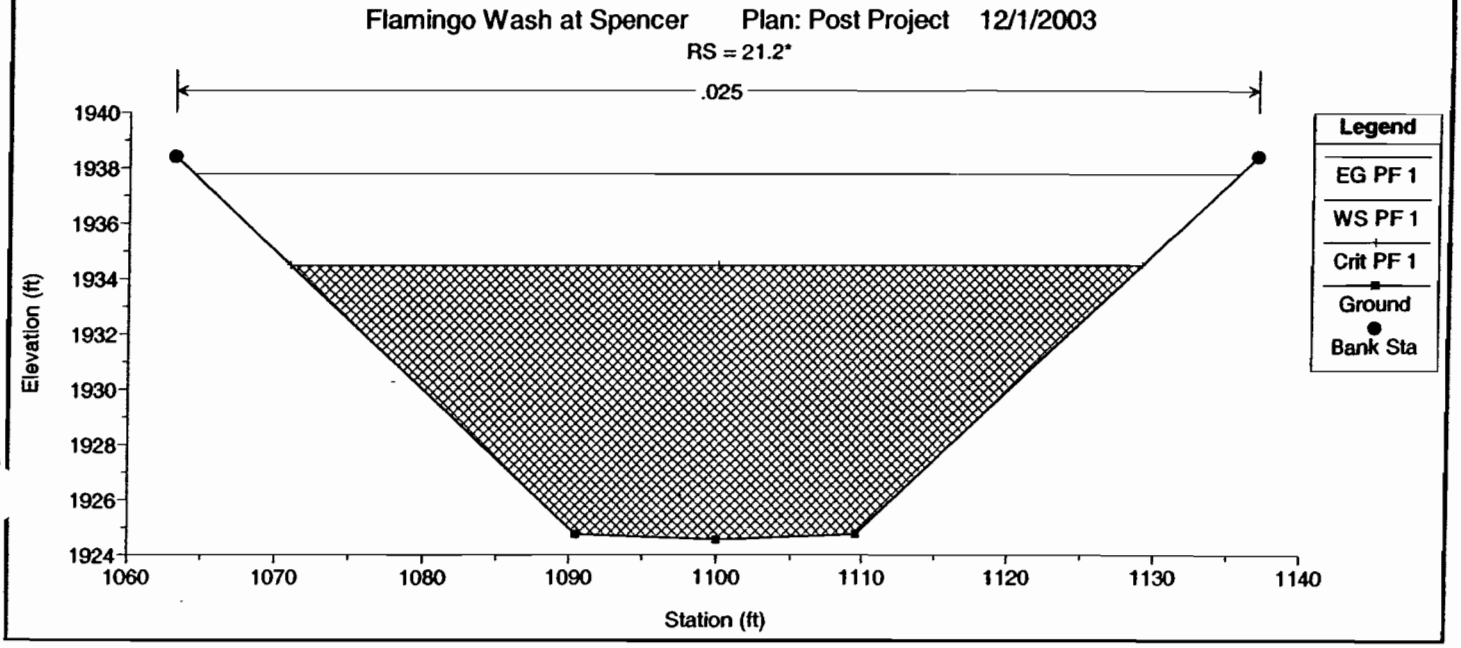

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 22.4*
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1942
1940
1938
1936
1934
1932
1930
1928
1926
1924
1060
1070
1080
1090
1100
1110
1120
1130
1140

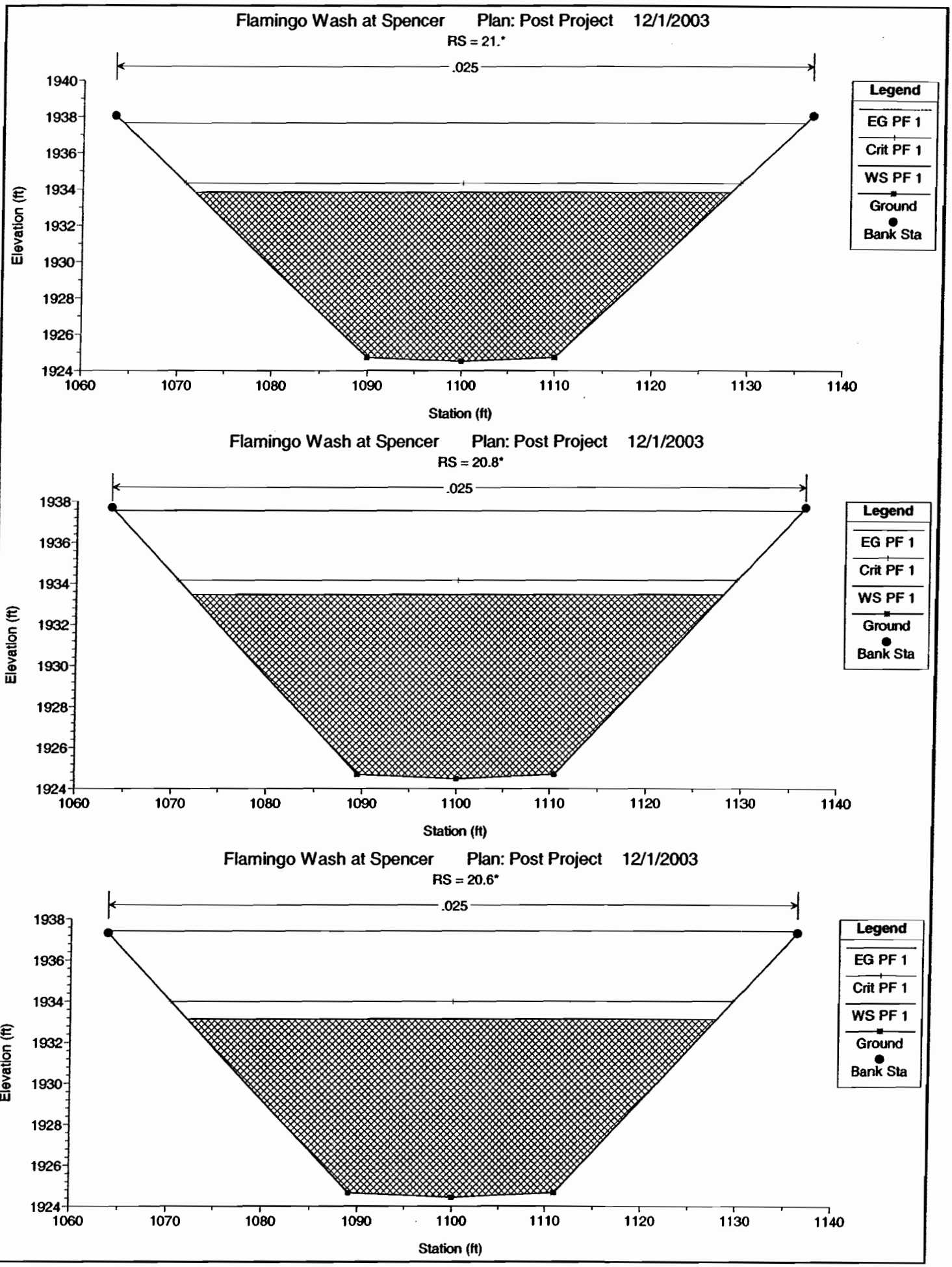

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 22
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1940
1938
1936
1934
1932
1930
1928
1926
1924
1060
1080
1100
1120
1140


Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 21.8*
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1940
1938
1936
1934
1932
1930
1928
1926
1924
1060
1080
1100
1120
1140


Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 21.6*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

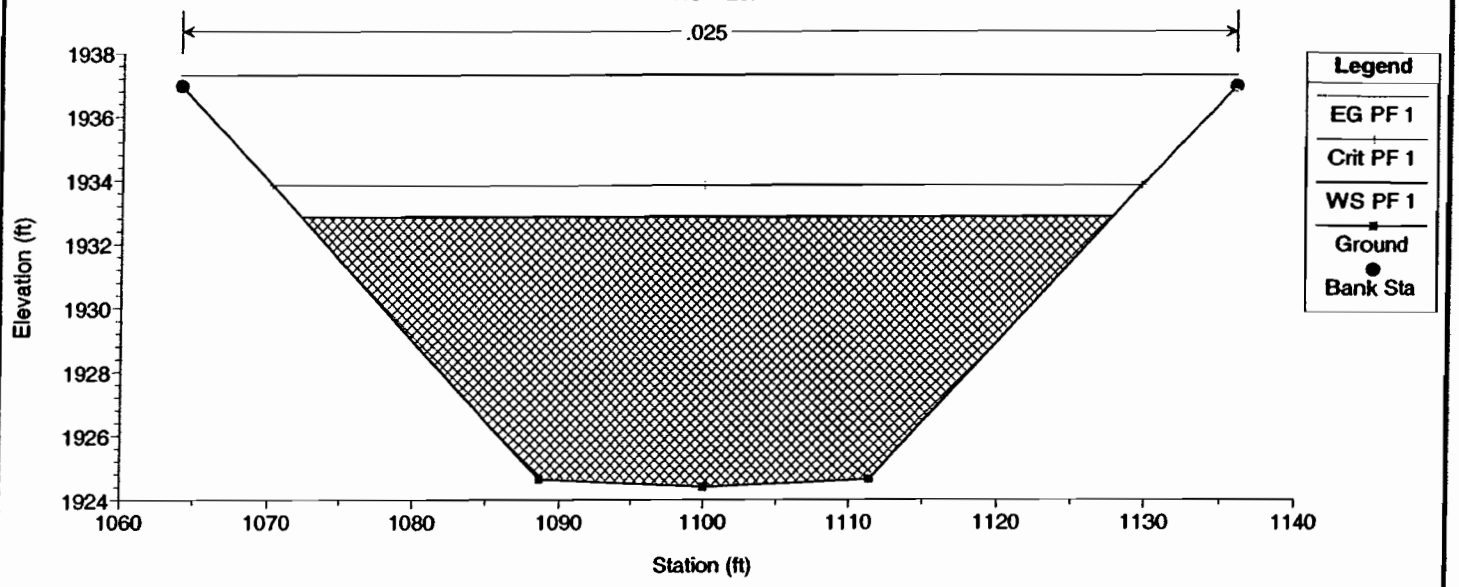

Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 21.4*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 21.2*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 21.*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 20.8*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 20.6*
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

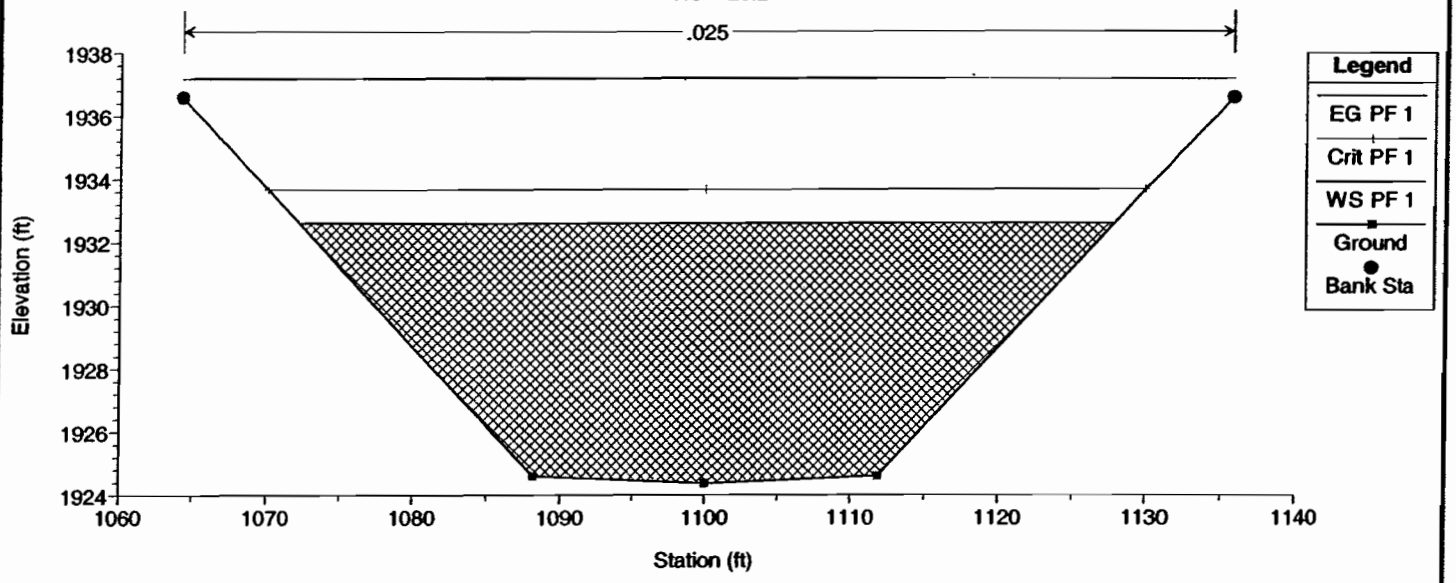
Flamingo Wash at Spencer Plan: Post Project 12/1/2003

RS = 20.4*



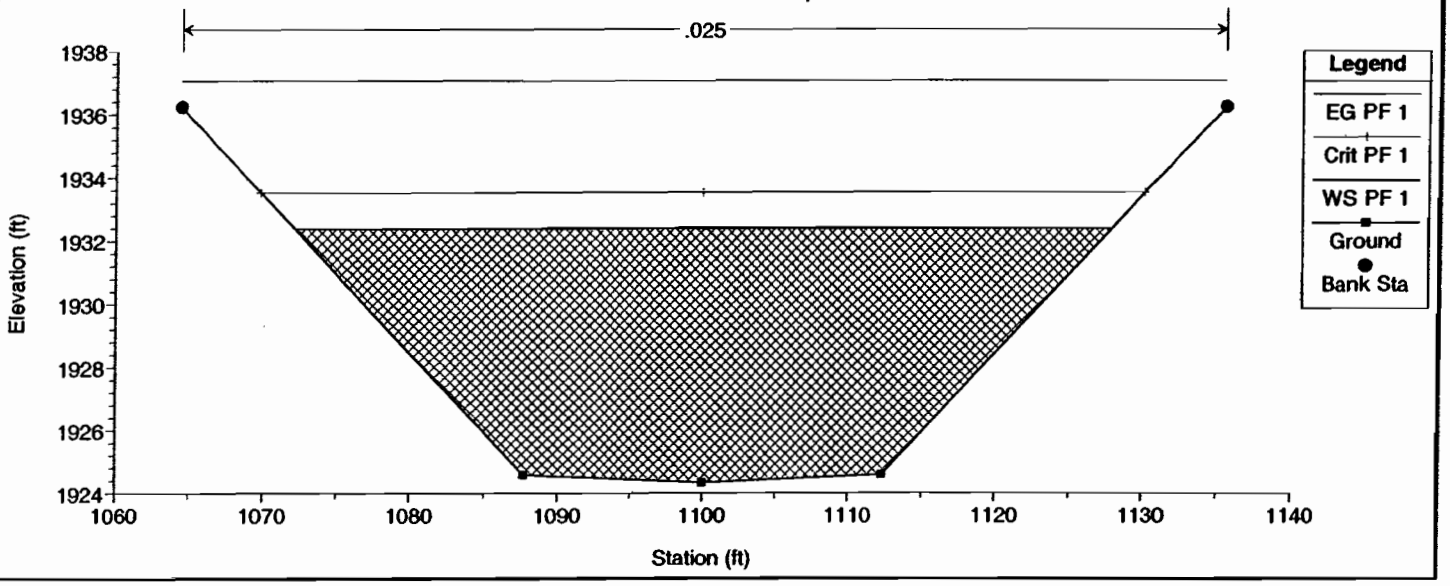
Flamingo Wash at Spencer Plan: Post Project 12/1/2003

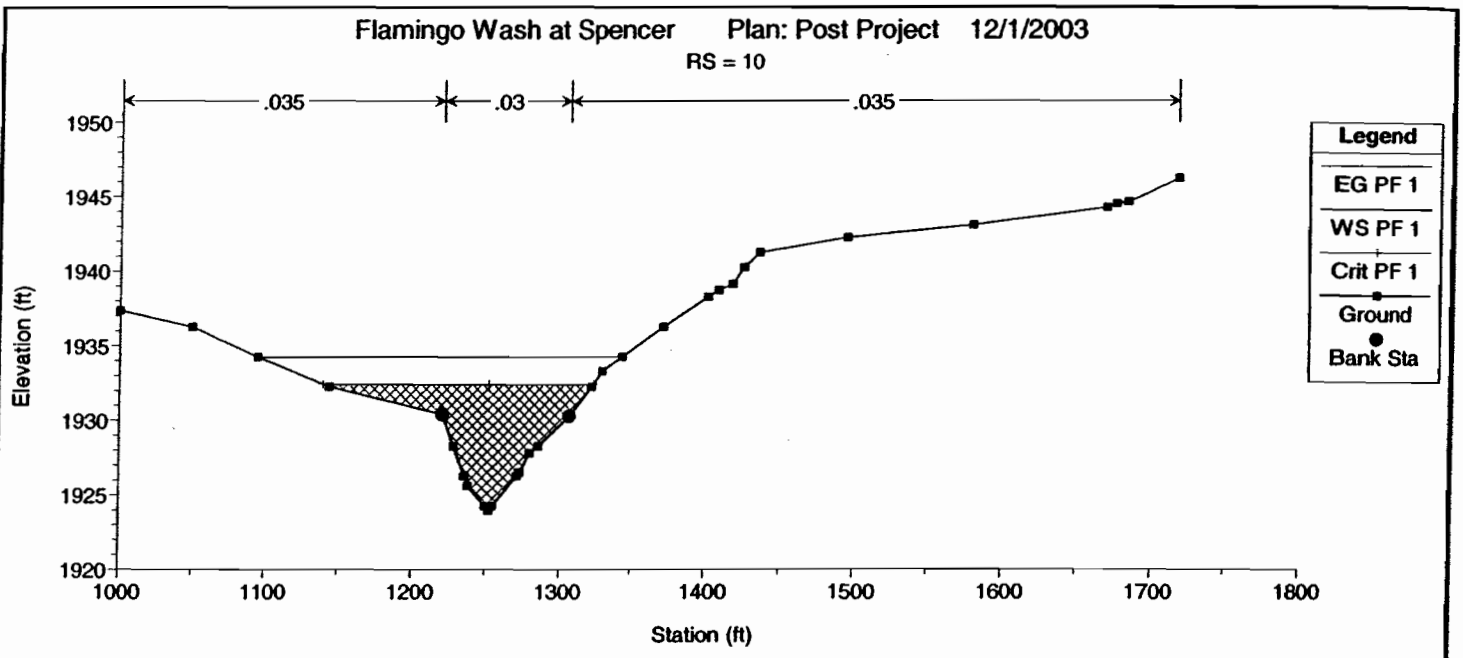
RS = 20.2*



Flamingo Wash at Spencer Plan: Post Project 12/1/2003

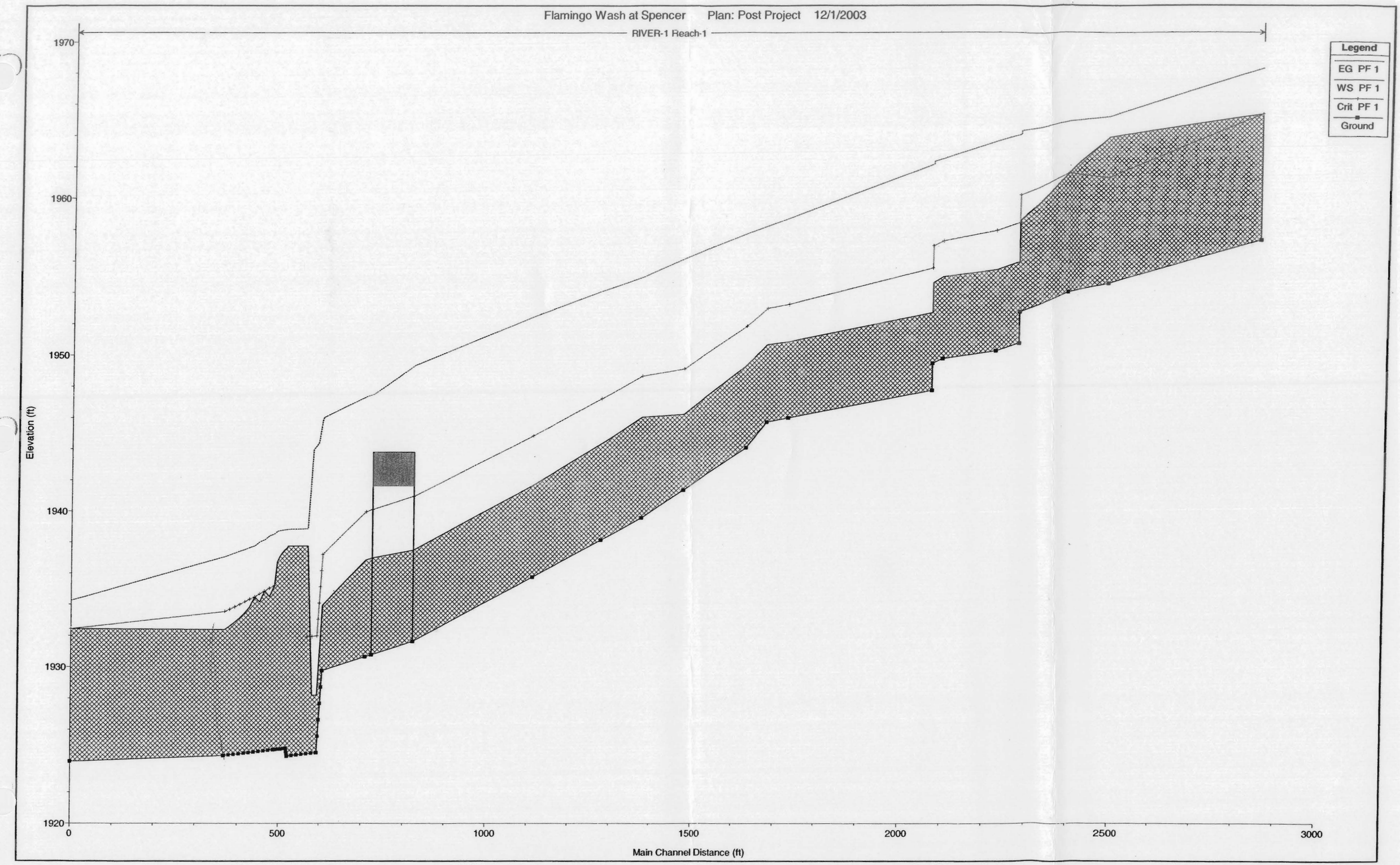
RS = 20 End of Phase 1 Improvements




Flamingo Wash at Spencer Plan: Post Project 12/1/2003
RS = 10
.035
.03
.035
Elevation (ft)
1950
1945
1940
1935
1930
1925
1920
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

Flamingo Wash at Spencer Plan: Post Project 12/1/2003

RIVER-1 Reach-1



Flamingo Wash at Mojave Road to Boulder Highway

LOMR

Appendix B.3

B.3.1 LOMR Case No. 04-09-0166P

Federal Emergency Management Agency

Washington, D.C. 20472

RFCD

MAR 12 2004

2004 MAR 15 PM 2:13

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Chip Maxfield, P.E.
Chair, Clark County Board
of Commissioners
500 South Grand Central Parkway
Las Vegas, NV 89155

IN REPLY REFER TO:
Case No.: 04-09-0166P
Community Name: Clark County, NV
Community No.: 320003
Effective Date of This Revision: MAR 12 2004

Dear Mr. Maxfield:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7103, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

For: Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

List of Enclosures:
Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. David Betley, P.E.
Principal Engineer
Civil Engineering Division
Department of Public Works
Clark County

Mr. Kevin Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood Control District

Syndi J. Flippin-Dudley, Ph.D., P.E.
Director of Water Resources
The Louis Berger Group, Inc.

 | Issue Date: MAR 12 2004 | Effective Date: MAR 12 2004 | Case No.: 04-09-0166P | LOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Clark County Nevada (Unincorporated Areas)	BRIDGE CHANNELIZATION	HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 320003		
IDENTIFIER	Flamingo Wash – Mohave Road to Boulder Highway	APPROXIMATE LATITUDE & LONGITUDE: 36.16, 115.09 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
FLOODING SOURCE(S) & REVISED REACH(ES)	Flamingo Wash – from approximately 500 feet downstream of Boulder Highway to just upstream of Mohave Road		

SUMMARY OF REVISIONS

Effective Flooding: Zone A
Revised Flooding: Zone A
Increases: NONE
Decreases: YES

* BFEs – Base Flood Elevations

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 32003C2190 E Date: September 27 2002	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

* FIRM – Flood Insurance Rate Map; ** FBFM – Flood Boundary and Floodway Map; *** FHBM – Flood Hazard Boundary Map

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090166-102D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the modified channel and bridge rests with your community. We may request that your community submit a description and schedule of channel and bridge activities.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090166-102D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Sally M. Ziolkowski
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7103

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090166-102D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

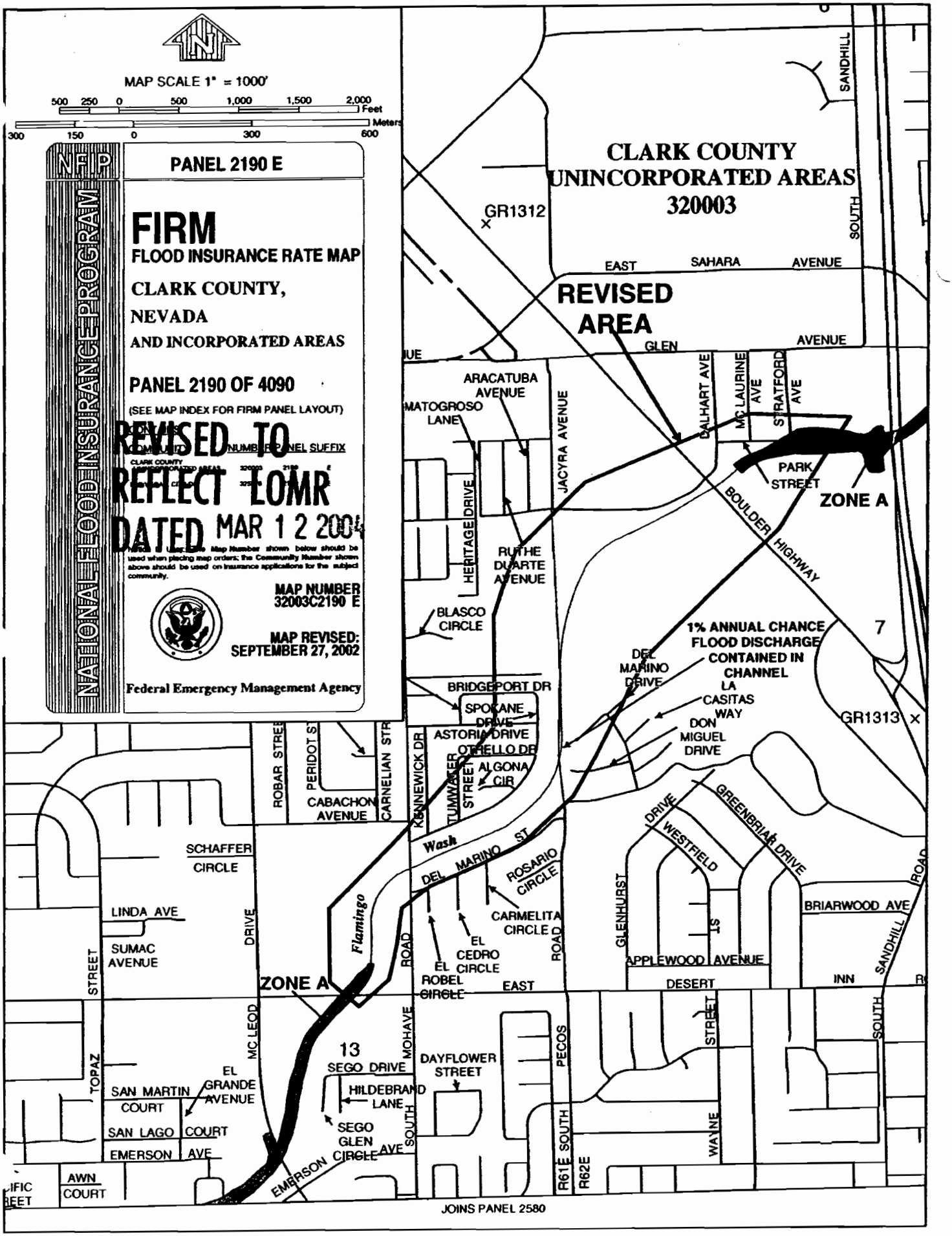
PUBLIC NOTIFICATION OF REVISION

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2677 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Doug Bellomo, P.E., CFM, Acting Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness and Response Directorate

102426DA04090166-102D


MAP SCALE 1" = 1000'
500 250 0 500 1,000 1,500 2,000 Feet
300 150 0 300 600 Meters
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 2190 E
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA
AND INCORPORATED AREAS
PANEL 2190 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
REVISED TO REFLECT LOMR DATED MAR 12 2004
MAP NUMBER
32003C2190 E
MAP REVISED:
SEPTEMBER 27, 2002
Federal Emergency Management Agency
CLARK COUNTY
UNINCORPORATED AREAS
320003
REVISED AREA
GR1312
GR1313
EAST SAHARA AVENUE
SOUTH SANDHILL
GLEN AVENUE
ARACATUBA AVENUE
MATOGROSO LANE
JACYRA AVENUE
GALHART AVE
MC LAURINE AVE
STRATFORD AVE
PARK STREET
ZONE A
BOULDER HIGHWAY
HERITAGE DRIVE
RUTHE DUARTE AVENUE
BLASCO CIRCLE
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CHANNEL
DEL MARINO DRIVE
LA CASITAS WAY
DON MIGUEL DRIVE
BRIDGEPORT DR
SPOKANE DRIVE
ASTORIA DRIVE
OTHELLO DR
ALGONA CIR
KENNEWICK DR
TUMWATER STREET
ROBAR STREET
PERIDOT ST
CARNELIAN STR
CABACHON AVENUE
Wash
DEL MARINO ST
ROSARIO CIRCLE
CARMELITA CIRCLE
EL CEDRO CIRCLE
EL ROBEL CIRCLE
EAST DESERT INN ROAD
GREENBRIAR DRIVE
WESTFIELD DRIVE
GLENHURST ST
APPLEWOOD AVENUE
BRIARWOOD AVE
SANDHILL ROAD
SCHAFFER CIRCLE
LINDA AVE
SUMAC AVENUE
TOPAZ STREET
MC LEOD DRIVE
Flamingo ROAD
ZONE A
13
SEGO DRIVE
HILDEBRAND LANE
SEGO GLEN CIRCLE
EMERSON AVE
SAN MARTIN COURT
SAN LAGO COURT
EMERSON AVE
EL GRANDE AVENUE
AWN COURT
MOHAVE SOUTH
DAYFLOWER STREET
PECOS STREET
WAYNE
R61E SOUTH
R62E
JOINS PANEL 2580

B.3.2 Flamingo Wash Mojave Road to Boulder Highway Workmap and Post Project HECRAS Model

Request for Conditional Letter of Map Revision
Flamingo Wash
Mojave Road to Boulder Highway
Clark County, Nevada

Prepared for:
CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT
500 S. Grand Central Parkway
Las Vegas, NV 89155



Prepared by:
THE Louis Berger Group, Inc.
500 Amigo Court Suite 100
Las Vegas, NV 89119



November 26, 2003

NOTES:

1. VERTICAL CONTROL IS BASED ON THE NGVD 29 AND HORIZONTAL CONTROL IS BASED ON THE NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.
2. THE CORRECTION FACTOR FROM NGVD 29 TO NAVD 88 IS +2.26 ft. THE HECRAS MODEL CROSS-SECTION ELEVATIONS ARE BASED ON NAVD 88.
3. PLAN MODIFIED FROM "FLAMINGO WASH FIS RE-STUDY EASTERN AVE TO US 95 CROSS SECTION EXHIBIT" PREPARED BY G.C. WALLACE INC. DATED 11-11-1997.
4. THE EXISTING FLOOD ZONE LIMITS SHOWN HEREON ARE FROM THE CLARK COUNTY GIS DATA.

POST-PROJECT ZONE "A" CONTAINED IN CHANNEL

UPSTREAM LIMIT OF STUDY

PRE-PROJECT ZONE "A" LIMIT

CLARK COUNTY BENCH MARK 6C11 13N6
REFERENCE MARK #1029
ELEVATION = 1889.46 FT. (NGVD)

LEGEND

(410) FLAMINGO WASH FIS CROSS SECTION (TYP)

[420] POST-PROJECT CONDITIONS CROSS SECTION (TYP)

WORK MAP

FLAMINGO WASH
MOJAVE RD TO BOULDER HWY
LOMR
FIGURE 3A

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

PROFESSIONAL ENGINEER-STATE OF NEVADA
SYNDI J. FLIPPIN-DUDLEY
No. 17070
CIVIL

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-05.dgn - 10/15/2003 - 12:14:46 JPS

NOTES:

1. VERTICAL CONTROL IS BASED ON THE NGVD 29 AND HORIZONTAL CONTROL IS BASED ON THE NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.
2. THE CORRECTION FACTOR FROM NGVD 29 TO NAVD 88 IS +2.26 ft. THE HECRAS MODEL CROSS-SECTION ELEVATIONS ARE BASED ON NAVD 88.
3. PLAN MODIFIED FROM "FLAMINGO WASH FIS RE-STUDY EASTERN AVE TO US 95 CROSS SECTION EXHIBIT" PREPARED BY G.C. WALLACE INC. DATED 11-11-1997.
4. THE EXISTING FLOOD ZONE LIMITS SHOWN HEREON ARE FROM THE CLARK COUNTY GIS DATA.

CLARK COUNTY BENCH MARK 6C12 7NW6
REFERENCE MARK #1021
ELEVATION = 1804.74 FT. (NGVD)

CLARK COUNTY BENCH MARK 6C12 7C4
REFERENCE MARK #1020
ELEVATION = 1814.92 FT. (NGVD)

POST-PROJECT ZONE "A" CONTAINED IN CHANNEL

PRE-PROJECT ZONE "A" LIMIT PER FLAMINGO WASH RESTUDY

100-YEAR FLOOD CONTAINED IN CHANNEL

BOULDER HIGHWAY BRIDGE

DOWNSTREAM LIMIT OF STUDY

FLAMINGO WASH

LEGEND

(410) FLAMINGO WASH FIS CROSS SECTION (TYP)

[420] POST-PROJECT CONDITIONS CROSS SECTION (TYP)

WORK MAP
FLAMINGO WASH
MOJAVE RD TO BOULDER HWY
LOMR
FIGURE 3B

THE LOUIS BERGER GROUP, INC.
LAS VEGAS, NEVADA

PROFESSIONAL ENGINEER-STATE OF NEVADA
SYNDI A. FLIPPIN-DUDLEY
EXP. 12/31/05
CIVIL
10/15/03

FILE NAME: X:\879-Flamingo\Exhibit\879-FIGURE-04.dgn - 10/15/2003 - 11:59:52 JPS

Post Project Conditions HECRAS Output File

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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
XXXXXXX  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  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Request for Letter of Map Revision
Project File : 879_P_Flamingo.prj
Run Date and Time: 8/29/2003 4:22:25 PM

Project in English units

Project Description:
REQUEST FOR LETTER OF MAP REVISION - FLAMINGO WASH
POST PROJECT CONDITIONS MODEL
DATUM - NAVD88
FILE: 879_P_FLAMINGO.PRJ
STARTING WSE = CRITICAL DEPTH
SUPERCRITICAL RUN
PHASE 1&2 OF THE FLAMINGO WASH IMPROVEMENTS FROM MOJAVE ROAD TO BOULDER HIGHWAY

PLAN DATA

Plan Title: Post Project Conditions
Plan File : E:\879-Flamingo\HEC-Ras\879_P_Flamingo.p02

Geometry Title: Flamingo Wash - Mojave Road to Boulder Highway
Geometry File : E:\879-Flamingo\HEC-Ras\879_P_Flamingo.g02

Flow Title : Flamingo Wash 100-year Storm
Flow File : E:\879-Flamingo\HEC-Ras\879_P_Flamingo.f02

Plan Summary Information:

Number of:	Cross Sections	= 30	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 2	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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:     Supercritical Flow



FLOW DATA

Flow Title: Flamingo Wash 100-year Storm
Flow File : E:\879-Flamingo\HEC-Ras\879_P_Flamingo.f02

Flow Data (cfs)

  River           Reach           RS                  PF 1
  RIVER-1         Reach-1         640                 5800
  RIVER-1         Reach-1         420                 6300


Boundary Conditions

  River           Reach           Profile                     Upstream              Downstream

  RIVER-1         Reach-1         PF 1                          Critical



GEOMETRY DATA

Geometry Title: Flamingo Wash - Mojave Road to Boulder Highway
Geometry File : E:\879-Flamingo\HEC-Ras\879_P_Flamingo.g02

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 640

INPUT
Description: FIS Cross Section
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 1866.76 1004.77 1866.42 1005.12 1866.26  1009.4 1864.26 1013.41 1862.26
 1016.12 1860.86 1026.88 1860.35 1027.05 1860.26 1030.75 1858.26 1034.43 1856.26
 1038.12 1854.26 1039.25 1853.65 1067.22 1853.63 1068.01 1854.26 1070.51 1856.26
    1073 1858.26 1075.48 1860.26 1077.94 1862.26 1079.43 1863.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .02 1026.88    .015 1079.43     .02
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1026.88	1079.43	251.59	258.21 262.14	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1866.18	Element			
Vel Head (ft)	3.29	Wt. n-Val.	0.020	0.015	
W.S. Elev (ft)	1862.89	Reach Len. (ft)	251.59	258.21	262.14
Crit W.S. (ft)	1862.89	Flow Area (sq ft)	28.60	385.00	
E.G. Slope (ft/ft)	0.001720	Area (sq ft)	28.60	385.00	
Q Total (cfs)	5800.00	Flow (cfs)	134.08	5665.92	
Top Width (ft)	66.56	Top Width (ft)	14.73	51.82	
Vel Total (ft/s)	14.02	Avg. Vel. (ft/s)	4.69	14.72	
Max Chl Dpth (ft)	9.26	Hydr. Depth (ft)	1.94	7.43	
Conv. Total (cfs)	139845.0	Conv. (cfs)	3232.9	136612.1	
Length Wtd. (ft)	258.13	Wetted Per. (ft)	15.23	56.79	
Min Ch El (ft)	1853.63	Shear (lb/sq ft)	0.20	0.73	
Alpha	1.08	Stream Power (lb/ft s)	0.95	10.71	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.11	44.54	
C & E Loss (ft)		Cum SA (acres)	0.10	10.12	

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 630

INPUT
Description: FIS Cross Section
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1863.46	1004.03	1862.26	1009.63	1860.53	1010.62	1860.26	1018.67	1858.26
1018.82	1858.16	1031	1857.32	1032.96	1856.26	1036.68	1854.26	1040.45	1852.26
1044.02	1850.36	1071.6	1850.54	1074.89	1852.26	1078.71	1854.26	1082.53	1856.26
1084.55	1857.26	1129.14	1858.26	1165.99	1859.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1031	.015	1084.55	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1031	1084.55	229.09	221.03 213.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1864.92	Element			
Vel Head (ft)	8.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1856.86	Reach Len. (ft)	229.09	221.03	213.86
Crit W.S. (ft)	1859.94	Flow Area (sq ft)		254.51	
E.G. Slope (ft/ft)	0.006872	Area (sq ft)		254.51	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	51.88	Top Width (ft)		51.88	
Vel Total (ft/s)	22.79	Avg. Vel. (ft/s)		22.79	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)		4.91	
Conv. Total (cfs)	69965.0	Conv. (cfs)		69965.0	
Length Wtd. (ft)	221.03	Wetted Per. (ft)		55.05	

Min Ch El (ft)	1850.36	Shear (lb/sq ft)		1.98
Alpha	1.00	Stream Power (lb/ft s)		45.20
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	0.03	42.65
C & E Loss (ft)	0.48	Cum SA (acres)	0.06	9.81

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: 620

INPUT
Description: FIS Cross Section
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1861.56	1007.7	1860.26	1012.48	1859.42	1018.28	1858.26	1022.06	1857.51
1033.45	1857.66	1035.35	1856.26	1037.9	1854.26	1040.44	1852.26	1042.97	1850.26
1045.49	1848.26	1046.14	1847.74	1075.97	1847.92	1076.49	1848.26	1079.51	1850.26
1082.53	1852.26	1085.57	1854.26	1086.27	1854.72	1135.67	1856.26	1176.03	1857.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1033.45	.015	1086.27	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1033.45	1086.27	223.64	212.31	202.43	.1	.3

CROSS SECTION OUTPUT Profile #PF 1 TIE IN

E.G. Elev (ft)	1863.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.17	Wt. n-Val.		0.015	
W.S. Elev (ft)	1854.04	Reach Len. (ft)	223.64	212.31	202.43
Crit W.S. (ft)	1857.57	Flow Area (sq ft)		238.69	
E.G. Slope (ft/ft)	0.007704	Area (sq ft)		238.69	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	47.06	Top Width (ft)		47.06	
Vel Total (ft/s)	24.30	Avg. Vel. (ft/s)		24.30	
Max Chl Dpth (ft)	6.30	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	66078.2	Conv. (cfs)		66078.2	
Length Wtd. (ft)	212.31	Wetted Per. (ft)		51.09	
Min Ch El (ft)	1847.74	Shear (lb/sq ft)		2.25	
Alpha	1.00	Stream Power (lb/ft s)		54.60	
Frctn Loss (ft)	1.61	Cum Volume (acre-ft)	0.03	41.40	
C & E Loss (ft)	0.11	Cum SA (acres)	0.06	9.56	

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: 610

INPUT
Description: FIS Cross Section
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1853.96	1029.96	1853.34	1046.46	1854.26	1061.48	1855.09	1068.39	1854.78
1080.06	1854.26	1083.2	1854.17	1085.83	1852.26	1088.59	1850.26	1091.36	1848.26
1094.17	1846.26	1095.99	1844.97	1124.12	1844.88	1126.53	1846.26	1130	1848.26
1133.45	1850.26	1136.14	1851.82	1155.27	1852.26	1197.8	1854.26	1207.54	1854.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1083.2	.015	1136.14	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1083.2	1136.14	230.78	215.38 201.73	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1083.2	1854.17	F
1136.14	1207.54	1851.82	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1061.48	1855.26	1207.54	1207.54	1855.26

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1861.29	Element			
Vel Head (ft)	10.39	Wt. n-Val.		0.015	
W.S. Elev (ft)	1850.90	Reach Len. (ft)	230.78	215.38	201.73
Crit W.S. (ft)	1854.54	Flow Area (sq ft)		224.17	
E.G. Slope (ft/ft)	0.009315	Area (sq ft)		224.17	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	46.84	Top Width (ft)		46.84	
Vel Total (ft/s)	25.87	Avg. Vel. (ft/s)		25.87	
Max Chl Dpth (ft)	6.02	Hydr. Depth (ft)		4.79	
Conv. Total (cfs)	60094.6	Conv. (cfs)		60094.6	
Length Wtd. (ft)	215.38	Wetted Per. (ft)		50.36	
Min Ch El (ft)	1844.88	Shear (lb/sq ft)		2.59	
Alpha	1.00	Stream Power (lb/ft s)		66.98	
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	0.03	40.27	
C & E Loss (ft)	0.12	Cum SA (acres)	0.06	9.33	

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 cross section had to be extended vertically during the critical depth 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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 600

INPUT
Description: FIS Cross Section
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1853.26	1003.75	1852.26	1011.09	1850.26	1012.57	1849.86	1032.47	1849.9
1035.82	1850.26	1065.44	1851.53	1070.71	1850.26	1074.22	1849.46	1081.85	1848.26
1081.85	1837.36	1135.69	1837.39	1135.69	1849.82	1152.6	1849.94	1170.43	1850.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1081.85	.015	1135.69	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1081.85	1135.69	93.41	93.51	94.92	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1081.85	1848.26	F
1135.69	1170.43	1849.82	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1081.85	1850.26	1135.69	1170.43	1850.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1857.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	16.84	Wt. n-Val.		0.015	
W.S. Elev (ft)	1840.65	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1844.49	Flow Area (sq ft)		176.13	
E.G. Slope (ft/ft)	0.026515	Area (sq ft)		176.13	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	53.84	Top Width (ft)		53.84	
Vel Total (ft/s)	32.93	Avg. Vel. (ft/s)		32.93	
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)		3.27	
Conv. Total (cfs)	35619.2	Conv. (cfs)		35619.2	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		60.38	
Min Ch El (ft)	1837.36	Shear (lb/sq ft)		4.83	
Alpha	1.00	Stream Power (lb/ft s)		159.00	
Frctn Loss (ft)	3.16	Cum Volume (acre-ft)	0.03	39.28	
C & E Loss (ft)	0.64	Cum SA (acres)	0.06	9.09	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 595

INPUT
Description: Bridge #1

Distance from Upstream XS = 1
Deck/Roadway Width = 91.51
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 5

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1000	1848.76	1836.47	1081.85	1848.76	1836.47	1081.85	1848.76	1845.39
1134.18	1848.76	1845.39	1135.69	1848.76	1845.39			

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1853.26	1003.75	1852.26	1011.09	1850.26	1012.57	1849.86	1032.47	1849.9
1035.82	1850.26	1065.44	1851.53	1070.71	1850.26	1074.22	1849.46	1081.85	1848.26
1081.85	1837.36	1135.69	1837.39	1135.69	1849.82	1152.6	1849.94	1170.43	1850.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1081.85	.015	1135.69	.02

Bank Sta: Left Right Coeff Contr. Expan.
1081.85 1135.69 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1081.85	1848.26	F
1135.69	1170.43	1849.82	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1081.85	1850.26	1135.69	1170.43	1850.26

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1000	1848.76	1836.47	1031.2	1848.76	1836.47	1031.2	1848.76	1845.39
1085.04	1848.76	1845.39	1085.04	1848.76	1836.47	1134.18	1848.76	1836.47

Downstream Bridge Cross Section Data
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1849.56	1010.93	1849.27	1031.2	1848.53	1031.2	1836.47	1085.04	1836.47
1085.04	1848.46	1099.88	1849.33	1120.18	1850.26	1131.49	1851.99	1132.09	1852.26
1134.18	1853.56								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1031.2	.015	1085.04	.02

Bank Sta: Left Right Coeff Contr. Expan.
1031.2 1085.04 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1031.2	1848.53	F
1085.04	1134.18	1848.46	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1031.2	1850.26	1085.04	1134.18	1850.26

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 = 1848.76
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= 1108.77 Downstream= 1058.12

Upstream num= 2

Width	Elev	Width	Elev
3.84	1837.36	3.84	1845.39

Downstream num= 2

Width	Elev	Width	Elev
3.84	1836.47	3.84	1845.39

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 =.8006408
Max Low Cord = 1845.39

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

			Inside BR US	Inside BR DS
E.G. US. (ft)	1857.49	Element		
W.S. US. (ft)	1840.65	E.G. Elev (ft)	1857.33	1854.40
Q Total (cfs)	5800.00	W.S. Elev (ft)	1840.95	1840.32
Q Bridge (cfs)	5800.00	Crit W.S. (ft)	1844.87	1843.96
Q Weir (cfs)		Max Chl Dpth (ft)	3.59	3.85
Weir Sta Lft (ft)		Vel Total (ft/s)	32.48	30.11
Weir Sta Rgt (ft)		Flow Area (sq ft)	178.55	192.63
Weir Submerg		Froude # Chl	3.03	2.70
Weir Max Depth (ft)		Specif Force (cu ft)	6170.05	5794.45
Min El Weir Flow (ft)	1848.77	Hydr Depth (ft)	3.57	3.85

Min El Prs (ft)	1845.39	W.P. Total (ft)	64.28	65.41
Delta EG (ft)	3.14	Conv. Total (cfs)	34947.9	39206.3
Delta WS (ft)	0.63	Top Width (ft)	50.00	50.00
BR Open Area (sq ft)	400.75	Frctn Loss (ft)	0.03	2.24
BR Open Vel (ft/s)	32.48	C & E Loss (ft)	0.14	0.69
Coef of Q		Shear Total (lb/sq ft)	4.78	4.02
Br Sel Method	Energy only	Power Total (lb/ft s)	155.14	121.15

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: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
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: 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: 590

INPUT
Description: END OF PHASE II IMPROVEMENTS
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1849.56	1010.93	1849.27	1031.2	1848.53	1031.2	1836.47	1085.04	1836.47
1085.04	1848.46	1099.88	1849.33	1120.18	1850.26	1131.49	1851.99	1132.09	1852.26
1134.18	1853.56								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1031.2	.015	1085.04	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1031.2	1085.04	16.02 15.77	16.7	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1031.2	1848.53	F
1085.04	1134.18	1848.46	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1031.2	1850.26	1085.04	1134.18	1850.26

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1854.35				
Vel Head (ft)	14.33	Wt. n-Val.		0.015	
W.S. Elev (ft)	1840.02	Reach Len. (ft)	16.02	15.77	16.70
Crit W.S. (ft)	1843.60	Flow Area (sq ft)		190.90	
E.G. Slope (ft/ft)	0.020517	Area (sq ft)		190.90	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	53.84	Top Width (ft)		53.84	

Vel Total (ft/s)	30.38	Avg. Vel. (ft/s)			30.38
Max Chl Dpth (ft)	3.55	Hydr. Depth (ft)			3.55
Conv. Total (cfs)	40492.1	Conv. (cfs)			40492.1
Length Wtd. (ft)	15.77	Wetted Per. (ft)			60.93
Min Ch El (ft)	1836.47	Shear (lb/sq ft)			4.01
Alpha	1.00	Stream Power (lb/ft s)			121.93
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		0.03	38.88
C & E Loss (ft)	0.03	Cum SA (acres)		0.06	8.98

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: 580

INPUT
Description: Station 74+05 - Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1843.79	1070	1836.29	1100	1835.69	1130	1836.29	1145	1843.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	658	658	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1853.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	14.92	Wt. n-Val.		0.015	
W.S. Elev (ft)	1838.88	Reach Len. (ft)	658.00	658.00	658.00
Crit W.S. (ft)	1842.21	Flow Area (sq ft)		187.13	
E.G. Slope (ft/ft)	0.027202	Area (sq ft)		187.13	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	70.38	Top Width (ft)		70.38	
Vel Total (ft/s)	31.00	Avg. Vel. (ft/s)		31.00	
Max Chl Dpth (ft)	3.19	Hydr. Depth (ft)		2.66	
Conv. Total (cfs)	35166.4	Conv. (cfs)		35166.4	
Length Wtd. (ft)	658.00	Wetted Per. (ft)		71.61	
Min Ch El (ft)	1835.69	Shear (lb/sq ft)		4.44	
Alpha	1.00	Stream Power (lb/ft s)		137.54	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	0.03	38.81	
C & E Loss (ft)	0.18	Cum SA (acres)	0.06	8.96	

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: 570

INPUT
Description: Station 67+47 - PT

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1837.58	1070	1830.08	1100	1829.48	1130	1830.08	1145	1837.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	566.67	584.2 601.73	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1841.47	Element			
Vel Head (ft)	7.80	Wt. n-Val.		0.015	
W.S. Elev (ft)	1833.66	Reach Len. (ft)	566.67	584.20	601.73
Crit W.S. (ft)	1836.00	Flow Area (sq ft)		258.76	
E.G. Slope (ft/ft)	0.010002	Area (sq ft)		258.76	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	74.34	Top Width (ft)		74.34	
Vel Total (ft/s)	22.41	Avg. Vel. (ft/s)		22.41	
Max Chl Dpth (ft)	4.18	Hydr. Depth (ft)		3.48	
Conv. Total (cfs)	57993.0	Conv. (cfs)		57993.0	
Length Wtd. (ft)	584.20	Wetted Per. (ft)		76.04	
Min Ch El (ft)	1829.48	Shear (lb/sq ft)		2.12	
Alpha	1.00	Stream Power (lb/ft s)		47.63	
Frctn Loss (ft)	10.20	Cum Volume (acre-ft)	0.03	35.45	
C & E Loss (ft)	2.13	Cum SA (acres)	0.06	7.86	

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.
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: 560

INPUT
Description: Station 61+63- PCC

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1832.08	1070	1824.58	1100	1823.98	1130	1824.58	1145	1832.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	252.78	262.84	272.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1835.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1828.24	Reach Len. (ft)	252.78	262.84	272.87
Crit W.S. (ft)	1830.50	Flow Area (sq ft)		264.36	
E.G. Slope (ft/ft)	0.009369	Area (sq ft)		264.36	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	74.64	Top Width (ft)		74.64	
Vel Total (ft/s)	21.94	Avg. Vel. (ft/s)		21.94	
Max Chl Dpth (ft)	4.26	Hydr. Depth (ft)		3.54	
Conv. Total (cfs)	59920.5	Conv. (cfs)		59920.5	
Length Wtd. (ft)	262.84	Wetted Per. (ft)		76.38	
Min Ch El (ft)	1823.98	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)		44.42	
Frctn Loss (ft)	5.65	Cum Volume (acre-ft)	0.03	31.94	
C & E Loss (ft)	0.10	Cum SA (acres)	0.06	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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 550

INPUT
Description: Station 59+00 - Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1829.6	1070	1822.1	1100	1821.5	1130	1822.1	1145	1829.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	209.44	217.76	226.09	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1833.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.50	Wt. n-Val.		0.015	
W.S. Elev (ft)	1825.75	Reach Len. (ft)	209.44	217.76	226.09
Crit W.S. (ft)	1828.02	Flow Area (sq ft)		263.93	
E.G. Slope (ft/ft)	0.009416	Area (sq ft)		263.93	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	74.62	Top Width (ft)		74.62	
Vel Total (ft/s)	21.98	Avg. Vel. (ft/s)		21.98	
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)		3.54	
Conv. Total (cfs)	59772.2	Conv. (cfs)		59772.2	

Length Wtd. (ft)	217.76	Wetted Per. (ft)			76.35
Min Ch El (ft)	1821.50	Shear (lb/sq ft)			2.03
Alpha	1.00	Stream Power (lb/ft s)			44.65
Frctn Loss (ft)	2.47	Cum Volume (acre-ft)		0.03	30.34
C & E Loss (ft)	0.00	Cum SA (acres)		0.06	6.41

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: 540

INPUT
Description: Station 56+82 - PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1828.18	1070	1820.68	1100	1820.08	1130	1820.68	1145	1828.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	232.24	232.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1831.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1824.58	Reach Len. (ft)	232.24	232.24	232.24
Crit W.S. (ft)	1826.60	Flow Area (sq ft)		282.55	
E.G. Slope (ft/ft)	0.007647	Area (sq ft)		282.55	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	75.61	Top Width (ft)		75.61	
Vel Total (ft/s)	20.53	Avg. Vel. (ft/s)		20.53	
Max Chl Dpth (ft)	4.50	Hydr. Depth (ft)		3.74	
Conv. Total (cfs)	66326.0	Conv. (cfs)		66326.0	
Length Wtd. (ft)	232.24	Wetted Per. (ft)		77.46	
Min Ch El (ft)	1820.08	Shear (lb/sq ft)		1.74	
Alpha	1.00	Stream Power (lb/ft s)		35.75	
Frctn Loss (ft)	1.84	Cum Volume (acre-ft)	0.03	28.98	
C & E Loss (ft)	0.29	Cum SA (acres)	0.06	6.04	

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: 530

INPUT
Description: Station 54+50 - Grade Break / Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1055	1826.67	1070	1819.17	1100	1818.57	1130	1819.17	1145	1826.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1055	.025	1055	.015	1145	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1055	1145	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1829.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.11	Wt. n-Val.		0.015	
W.S. Elev (ft)	1823.20	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1825.09	Flow Area (sq ft)		292.38	
E.G. Slope (ft/ft)	0.006892	Area (sq ft)		292.38	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	76.13	Top Width (ft)		76.13	
Vel Total (ft/s)	19.84	Avg. Vel. (ft/s)		19.84	
Max Chl Dpth (ft)	4.63	Hydr. Depth (ft)		3.84	
Conv. Total (cfs)	69866.7	Conv. (cfs)		69866.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		78.04	
Min Ch El (ft)	1818.57	Shear (lb/sq ft)		1.61	
Alpha	1.00	Stream Power (lb/ft s)		31.98	
Frctn Loss (ft)	1.68	Cum Volume (acre-ft)	0.03	27.45	
C & E Loss (ft)	0.13	Cum SA (acres)	0.06	5.63	

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: 520

INPUT
Description: Station 53+50 - Grade Break / Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1824.3	1070	1817.32	1100	1816.72	1130	1817.32	1130	1824.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	201.5	201.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1828.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1821.59	Reach Len. (ft)	201.50	201.50	201.50
Crit W.S. (ft)	1823.64	Flow Area (sq ft)		274.31	
E.G. Slope (ft/ft)	0.007172	Area (sq ft)		274.31	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	21.14	Avg. Vel. (ft/s)		21.14	
Max Chl Dpth (ft)	4.87	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	68487.6	Conv. (cfs)		68487.6	
Length Wtd. (ft)	201.50	Wetted Per. (ft)		68.56	
Min Ch El (ft)	1816.72	Shear (lb/sq ft)		1.79	
Alpha	1.00	Stream Power (lb/ft s)		37.88	
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	0.03	26.79	
C & E Loss (ft)	0.08	Cum SA (acres)	0.06	5.48	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 510

INPUT
Description: Station 51+48.5 - PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1822.26	1070	1815.28	1100	1814.68	1130	1815.28	1130	1822.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	806.7 793.47	780.25	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1826.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1819.36	Reach Len. (ft)	806.70	793.47	780.25
Crit W.S. (ft)	1821.58	Flow Area (sq ft)		262.68	
E.G. Slope (ft/ft)	0.008224	Area (sq ft)		262.68	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	22.08	Avg. Vel. (ft/s)		22.08	
Max Chl Dpth (ft)	4.68	Hydr. Depth (ft)		4.38	
Conv. Total (cfs)	63957.8	Conv. (cfs)		63957.8	
Length Wtd. (ft)	793.47	Wetted Per. (ft)		68.17	
Min Ch El (ft)	1814.68	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)		43.68	
Frctn Loss (ft)	1.55	Cum Volume (acre-ft)	0.03	25.55	
C & E Loss (ft)	0.06	Cum SA (acres)	0.06	5.20	

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: 505

INPUT
Description: Station 43+55 - PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1814.25	1070	1807.27	1100	1806.67	1130	1807.27	1130	1814.25

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	59	59	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1819.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	1811.09	Reach Len. (ft)	59.00	59.00	59.00
Crit W.S. (ft)	1813.57	Flow Area (sq ft)		247.05	
E.G. Slope (ft/ft)	0.009987	Area (sq ft)		247.05	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.48	Avg. Vel. (ft/s)		23.48	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	58037.9	Conv. (cfs)		58037.9	
Length Wtd. (ft)	59.00	Wetted Per. (ft)		67.65	
Min Ch El (ft)	1806.67	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		53.46	
Frctn Loss (ft)	7.17	Cum Volume (acre-ft)	0.03	20.91	
C & E Loss (ft)	0.10	Cum SA (acres)	0.06	4.11	

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: 500

INPUT

Description: Station 42+96 - PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1813.66	1070	1806.68	1100	1806.08	1130	1806.68	1130	1813.66

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	454.21	432.58	410.95	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1819.05	Element			
Vel Head (ft)	8.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	1810.50	Reach Len. (ft)	454.21	432.58	410.95
Crit W.S. (ft)	1812.98	Flow Area (sq ft)		247.26	
E.G. Slope (ft/ft)	0.009960	Area (sq ft)		247.26	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.46	Avg. Vel. (ft/s)		23.46	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	58115.7	Conv. (cfs)		58115.7	
Length Wtd. (ft)	432.58	Wetted Per. (ft)		67.65	
Min Ch El (ft)	1806.08	Shear (lb/sq ft)		2.27	
Alpha	1.00	Stream Power (lb/ft s)		53.31	
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	0.03	20.58	
C & E Loss (ft)	0.00	Cum SA (acres)	0.06	4.03	

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 490

INPUT
Description: Station 38+63 - PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1809.28	1070	1802.3	1100	1801.7	1130	1802.3	1130	1809.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	64.61	64.61	64.61	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1814.71	Element			
Vel Head (ft)	8.60	Wt. n-Val.		0.015	
W.S. Elev (ft)	1806.11	Reach Len. (ft)	64.61	64.61	64.61
Crit W.S. (ft)	1808.60	Flow Area (sq ft)		246.45	
E.G. Slope (ft/ft)	0.010065	Area (sq ft)		246.45	

Q Total (cfs)	5800.00	Flow (cfs)		5800.00
Top Width (ft)	60.00	Top Width (ft)		60.00
Vel Total (ft/s)	23.53	Avg. Vel. (ft/s)		23.53
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)		4.11
Conv. Total (cfs)	57813.0	Conv. (cfs)		57813.0
Length Wtd. (ft)	64.61	Wetted Per. (ft)		67.63
Min Ch El (ft)	1801.70	Shear (lb/sq ft)		2.29
Alpha	1.00	Stream Power (lb/ft s)		53.89
Frctn Loss (ft)	4.33	Cum Volume (acre-ft)	0.03	18.12
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	3.43

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: 480

INPUT
Description: Station 37+98.5
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1808.65	1070	1801.67	1100	1801.07	1130	1801.67	1130	1808.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	20	20	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1814.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1805.48	Reach Len. (ft)	20.00	20.00	20.00
Crit W.S. (ft)	1807.97	Flow Area (sq ft)		246.76	
E.G. Slope (ft/ft)	0.010024	Area (sq ft)		246.76	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.50	Avg. Vel. (ft/s)		23.50	
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)		4.11	
Conv. Total (cfs)	57930.2	Conv. (cfs)		57930.2	
Length Wtd. (ft)	20.00	Wetted Per. (ft)		67.64	
Min Ch El (ft)	1801.07	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		53.66	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	0.03	17.76	
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	3.34	

CROSS SECTION

RIVER: RIVER-1

REACH: Reach-1 RS: 470

INPUT
Description: Station 37+78.5

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1808.57	1070	1801.59	1100	1800.99	1130	1801.59	1130	1808.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	342.31	342.31 342.31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1813.79	Element			
Vel Head (ft)	8.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	1805.47	Reach Len. (ft)	342.31	342.31	342.31
Crit W.S. (ft)	1807.89	Flow Area (sq ft)		250.49	
E.G. Slope (ft/ft)	0.009558	Area (sq ft)		250.49	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	23.15	Avg. Vel. (ft/s)		23.15	
Max Chl Dpth (ft)	4.47	Hydr. Depth (ft)		4.17	
Conv. Total (cfs)	59324.9	Conv. (cfs)		59324.9	
Length Wtd. (ft)	342.31	Wetted Per. (ft)		67.76	
Min Ch El (ft)	1800.99	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		51.08	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.03	17.64	
C & E Loss (ft)	0.08	Cum SA (acres)	0.06	3.31	

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 460

INPUT
Description: Station 37+36 PT

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1807.32	1070	1800.34	1100	1799.74	1130	1800.34	1130	1807.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	232.69	236.24 239.78	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1810.65	Element			
Vel Head (ft)	5.45	Wt. n-Val.		0.015	

W.S. Elev (ft)	1805.20	Reach Len. (ft)	232.69	236.24	239.78
Crit W.S. (ft)	1806.64	Flow Area (sq ft)		309.67	
E.G. Slope (ft/ft)	0.004897	Area (sq ft)		309.67	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	18.73	Avg. Vel. (ft/s)		18.73	
Max Chl Dpth (ft)	5.46	Hydr. Depth (ft)		5.16	
Conv. Total (cfs)	82878.4	Conv. (cfs)		82878.4	
Length Wtd. (ft)	236.24	Wetted Per. (ft)		69.73	
Min Ch El (ft)	1799.74	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)		25.43	
Frctn Loss (ft)	2.28	Cum Volume (acre-ft)	0.03	15.44	
C & E Loss (ft)	0.86	Cum SA (acres)	0.06	2.84	

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: 450

INPUT
Description: Station 32+00 - Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1070	1806.46	1070	1799.48	1100	1798.88	1130	1799.48	1130	1806.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1070	.025	1070	.015	1130	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1070	1130	48.98	49.72	50.47	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1809.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	1804.82	Reach Len. (ft)	48.98	49.72	50.47
Crit W.S. (ft)	1805.78	Flow Area (sq ft)		338.23	
E.G. Slope (ft/ft)	0.003716	Area (sq ft)		338.23	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	60.00	Top Width (ft)		60.00	
Vel Total (ft/s)	17.15	Avg. Vel. (ft/s)		17.15	
Max Chl Dpth (ft)	5.94	Hydr. Depth (ft)		5.64	
Conv. Total (cfs)	95140.3	Conv. (cfs)		95140.3	
Length Wtd. (ft)	49.72	Wetted Per. (ft)		70.69	
Min Ch El (ft)	1798.88	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)		19.04	
Frctn Loss (ft)	1.00	Cum Volume (acre-ft)	0.03	13.69	
C & E Loss (ft)	0.26	Cum SA (acres)	0.06	2.52	

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: 445

INPUT
Description: Station 31+50 - Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.5	1807.03	1062.5	1799.45	1100	1798.7	1137.5	1799.45	1137.5	1807.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.5	.025	1062.5	.015	1137.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1062.5	1137.5	94.83	106.25	100.54	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1808.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	1803.02	Reach Len. (ft)	94.83	106.25	100.54
Crit W.S. (ft)	1804.76	Flow Area (sq ft)		295.72	
E.G. Slope (ft/ft)	0.007105	Area (sq ft)		295.72	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	75.00	Top Width (ft)		75.00	
Vel Total (ft/s)	19.61	Avg. Vel. (ft/s)		19.61	
Max Chl Dpth (ft)	4.32	Hydr. Depth (ft)		3.94	
Conv. Total (cfs)	68808.3	Conv. (cfs)		68808.3	
Length Wtd. (ft)	106.25	Wetted Per. (ft)		82.15	
Min Ch El (ft)	1798.70	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)		31.32	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.03	13.32	
C & E Loss (ft)	0.14	Cum SA (acres)	0.06	2.44	

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: 440

INPUT
Description: Upstream Face - Mojave Road Bridge
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
   1000  1806.3 1007.43 1805.94 1010.88 1806.82 1010.88 1797.82 1085.88 1797.82
 1085.88  1806.8 1101.01 1806.17 1103.62 1806.26 1113.11 1807.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .03 1010.88    .015 1085.88     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1010.88 1085.88           183.21  197.38  206.01             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1000 1010.88 1806.82       F
 1085.88 1113.11  1806.8       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    1000 1010.88 1806.82 1085.88 1113.11  1806.8

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1808.12    Element                Left OB    Channel   Right OB
  Vel Head (ft)               6.53    Wt. n-Val.                        0.015
  W.S. Elev (ft)           1801.59    Reach Len. (ft)           1.00       1.00      1.00
  Crit W.S. (ft)           1803.54    Flow Area (sq ft)                  282.82
  E.G. Slope (ft/ft)      0.008297    Area (sq ft)                       282.82
  Q Total (cfs)            5800.00    Flow (cfs)                        5800.00
  Top Width (ft)             75.00    Top Width (ft)                      75.00
  Vel Total (ft/s)           20.51    Avg. Vel. (ft/s)                    20.51
  Max Chl Dpth (ft)           3.77    Hydr. Depth (ft)                     3.77
  Conv. Total (cfs)        63673.7    Conv. (cfs)                       63673.7
  Length Wtd. (ft)            1.00    Wetted Per. (ft)                    82.54
  Min Ch El (ft)           1797.82    Shear (lb/sq ft)                     1.77
  Alpha                       1.00    Stream Power (lb/ft s)              36.40
  Frctn Loss (ft)             0.81    Cum Volume (acre-ft)      0.03      12.62
  C & E Loss (ft)             0.06    Cum SA (acres)            0.06       2.26


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 435

INPUT
Description: Bridge #2

Distance from Upstream XS =       1
Deck/Roadway Width        =  195.38
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
     900 1807.75 1796.29 1010.88 1807.75 1796.29 1010.88 1807.75 1805.75
```

```
1085.88 1807.75 1805.75 1085.88 1807.75 1796.29 1113.05 1807.75 1796.29

Upstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1806.3 1007.43 1805.94 1010.88 1806.82 1010.88 1797.82 1085.88 1797.82
 1085.88  1806.8 1101.01 1806.17 1103.62 1806.26 1113.11 1807.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .03 1010.88    .015 1085.88     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1010.88 1085.88             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1000 1010.88 1806.82       F
 1085.88 1113.11  1806.8       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    1000 1010.88 1806.82 1085.88 1113.11  1806.8

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     900 1807.75 1796.29    1000 1807.75 1796.29    1000 1807.75 1805.75
    1075 1807.75 1805.75    1075 1807.75 1796.29 1113.05 1807.75 1796.29

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     900  1806.8    1000 1806.29    1000 1796.29    1075 1796.29    1075 1806.29
 1113.05    1806

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     900     .03    1000    .015    1075     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
         1000    1075             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     900    1000 1806.29       F
    1075 1113.05 1806.29       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     900    1000 1806.29    1075 1113.05 1806.29

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        = 1807.75
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= 1048.38    Downstream=  1037.5
Upstream     num=        2
    Width   Elev    Width   Elev
       3 1797.82        3 1805.75
Downstream     num=        2
    Width   Elev    Width   Elev
       3 1796.29        3 1805.75

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 =.8006408
           Max Low Cord                = 1805.75

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)              1808.12    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)              1801.59    E.G. Elev (ft)            1807.63       1806.19
  Q Total (cfs)              5800.00    W.S. Elev (ft)            1802.08       1800.50
  Q Bridge (cfs)             5800.00    Crit W.S. (ft)            1803.68       1802.14
  Q Weir (cfs)                          Max Chl Dpth (ft)            4.26          4.21
  Weir Sta Lft (ft)                     Vel Total (ft/s)            18.90         19.15
  Weir Sta Rgt (ft)                     Flow Area (sq ft)          306.89        302.92
  Weir Submerg                          Froude # Chl                 1.61          1.65
  Weir Max Depth (ft)                   Specif Force (cu ft)      4058.27       4086.03
  Min El Weir Flow (ft)      1807.76    Hydr Depth (ft)              4.26          4.21
  Min El Prs (ft)            1805.75    W.P. Total (ft)             89.05         88.83
  Delta EG (ft)                 1.99    Conv. Total (cfs)          69361.1       67986.5
  Delta WS (ft)                 1.32    Top Width (ft)              72.00         72.00
  BR Open Area (sq ft)        570.96    Frctn Loss (ft)              0.01          1.39
  BR Open Vel (ft/s)           19.15    C & E Loss (ft)              0.49          0.04
  Coef of Q                             Shear Total (lb/sq ft)       1.50          1.55
  Br Sel Method          Energy only    Power Total (lb/ft s)       28.43         29.67


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,
         energy 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.
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: 430

INPUT
Description: Downstream Face - Mojave Road Bridge
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
900	1806.8	1000	1806.29	1000	1796.29	1075	1796.29	1075	1806.29
1113.05	1806								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
900	.03	1000	.015	1075	.03

Bank Sta: Left 1000 Right 1075 Lengths: Left Channel 193.4 Right 187.5 181.7 Coeff Contr. .3 Expan. .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
900	1000	1806.29	F
1075	1113.05	1806.29	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
900	1000	1806.29	1075	1113.05	1806.29

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1806.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.86	Wt. n-Val.		0.015	
W.S. Elev (ft)	1800.27	Reach Len. (ft)	193.40	187.50	181.70
Crit W.S. (ft)	1802.01	Flow Area (sq ft)		298.52	
E.G. Slope (ft/ft)	0.006977	Area (sq ft)		298.52	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	75.00	Top Width (ft)		75.00	
Vel Total (ft/s)	19.43	Avg. Vel. (ft/s)		19.43	
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)		3.98	
Conv. Total (cfs)	69439.2	Conv. (cfs)		69439.2	
Length Wtd. (ft)	187.50	Wetted Per. (ft)		82.96	
Min Ch El (ft)	1796.29	Shear (lb/sq ft)		1.57	
Alpha	1.00	Stream Power (lb/ft s)		30.45	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.03	11.24	
C & E Loss (ft)	0.05	Cum SA (acres)	0.06	1.93	

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: 420

INPUT
Description: Station 19+10 (Phase 1)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1803	1016	1794.97	1061	1794.52	1098.5	1794.9	1098.5	1802.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1000	.02	1098.5	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1098.5	143.6	140	136.6	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1804.36	Element			
Vel Head (ft)	5.84	Wt. n-Val.		0.020	
W.S. Elev (ft)	1798.52	Reach Len. (ft)	143.60	140.00	136.60
Crit W.S. (ft)	1800.26	Flow Area (sq ft)		324.85	
E.G. Slope (ft/ft)	0.013045	Area (sq ft)		324.85	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	89.56	Top Width (ft)		89.56	
Vel Total (ft/s)	19.39	Avg. Vel. (ft/s)		19.39	
Max Chl Dpth (ft)	3.99	Hydr. Depth (ft)		3.63	
Conv. Total (cfs)	55158.4	Conv. (cfs)		55158.4	
Length Wtd. (ft)		Wetted Per. (ft)		94.02	
Min Ch El (ft)	1794.52	Shear (lb/sq ft)		2.81	
Alpha	1.00	Stream Power (lb/ft s)		54.57	
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	0.03	9.90	
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	1.58	

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: 415

INPUT
Description: Station 17+70 - Begining of Phase 1 Improvements
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1801.5	1016	1793.48	1031.5	1793.32	1069	1793.7	1069	1801.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1000	.02	1069	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1069	109.9	108.5	106.7	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1803.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.24	Wt. n-Val.		0.020	
W.S. Elev (ft)	1800.72	Reach Len. (ft)	109.90	108.50	106.70
Crit W.S. (ft)	1800.72	Flow Area (sq ft)		436.27	
E.G. Slope (ft/ft)	0.003688	Area (sq ft)		436.27	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	67.45	Top Width (ft)		67.45	
Vel Total (ft/s)	14.44	Avg. Vel. (ft/s)		14.44	
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	103746.3	Conv. (cfs)		103746.3	
Length Wtd. (ft)	108.50	Wetted Per. (ft)		76.19	
Min Ch El (ft)	1793.32	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)		19.04	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.03	8.67	
C & E Loss (ft)		Cum SA (acres)	0.06	1.32	

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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 410

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1801.26	1002.09	1801.3	1019.84	1801.27	1026.7	1800.26	1029.5	1799.83
1041.49	1799.46	1044.75	1798.26	1049.87	1796.26	1054.82	1794.26	1059.57	1792.26
1061.07	1791.56	1078.69	1792.06	1092.24	1792.26	1099.54	1792.36	1099.88	1794.26
1100.24	1796.26	1100.6	1798.26	1100.94	1800.26	1100.98	1800.5	1108.1	1800.83
1170.81	1801.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1041.49	.02	1100.98	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1041.49	1100.98	236.79	222.64	212.87	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1803.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.	0.030	0.020	
W.S. Elev (ft)	1800.24	Reach Len. (ft)	236.79	222.64	212.87
Crit W.S. (ft)	1800.52	Flow Area (sq ft)	7.69	411.56	
E.G. Slope (ft/ft)	0.003800	Area (sq ft)	7.69	411.56	
Q Total (cfs)	6300.00	Flow (cfs)	15.25	6284.75	
Top Width (ft)	74.11	Top Width (ft)	14.66	59.45	

Vel Total (ft/s)	15.03	Avg. Vel. (ft/s)	1.98	15.27
Max Chl Dpth (ft)	8.68	Hydr. Depth (ft)	0.52	6.92
Conv. Total (cfs)	102194.9	Conv. (cfs)	247.3	101947.6
Length Wtd. (ft)	222.66	Wetted Per. (ft)	14.70	67.60
Min Ch El (ft)	1791.56	Shear (lb/sq ft)	0.12	1.44
Alpha	1.03	Stream Power (lb/ft s)	0.25	22.06
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	0.02	7.62
C & E Loss (ft)	0.02	Cum SA (acres)	0.04	1.17

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: RIVER-1
REACH: Reach-1 RS: 400

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1797.56	1024.49	1798.03	1038.23	1798.02	1040.26	1798.26	1042.29	1798.51
1042.47	1798.26	1043.62	1796.26	1044.73	1794.26	1045.83	1792.26	1046.34	1791.32
1075.55	1790.86	1100.77	1791.22	1101.12	1792.26	1101.81	1794.26	1102.54	1796.26
1103.31	1798.26	1103.68	1799.22	1128.41	1798.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1042.29	.02	1103.68	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1042.29	1103.68	216.05	216.12	217.6	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1042.29	1798.51	F
1103.68	1128.41	1799.22	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1042.29	1799.26	1103.68	1128.41	1799.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1802.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.58	Wt. n-Val.		0.020	
W.S. Elev (ft)	1796.91	Reach Len. (ft)	216.05	216.12	217.60
Crit W.S. (ft)	1798.52	Flow Area (sq ft)		332.48	
E.G. Slope (ft/ft)	0.007665	Area (sq ft)		332.48	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	59.55	Top Width (ft)		59.55	
Vel Total (ft/s)	18.95	Avg. Vel. (ft/s)		18.95	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		5.58	
Conv. Total (cfs)	71957.2	Conv. (cfs)		71957.2	
Length Wtd. (ft)	216.12	Wetted Per. (ft)		66.87	
Min Ch El (ft)	1790.86	Shear (lb/sq ft)		2.38	

Alpha	1.00	Stream Power (lb/ft s)	45.08
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	5.72
C & E Loss (ft)	0.20	Cum SA (acres)	0.86

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.
Warning: The cross section had to be extended vertically during the critical depth 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.
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: 390

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1794.86	1031.19	1795.56	1040.57	1796.04	1041.52	1796.26	1045.15	1797.07
1045.61	1796.26	1046.74	1794.26	1047.86	1792.26	1049.03	1790.26	1049.38	1789.67
1074.16	1789.46	1100.36	1789.8	1100.54	1790.26	1101.34	1792.26	1102.12	1794.26
1102.9	1796.26	1103.45	1797.7	1128.39	1797.49	1144.16	1797.47	1147.04	1798.26
1153.05	1799.56								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.03	1045.15	.02	1103.45	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1045.15	1103.45	420.9	420.9 420.21	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1045.15	1797.07	F
1103.45	1153.05	1797.7	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1045.15	1799.26	1103.45	1153.05	1799.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1800.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.020	
W.S. Elev (ft)	1797.18	Reach Len. (ft)	420.90	420.90	420.21
Crit W.S. (ft)	1797.22	Flow Area (sq ft)		413.22	
E.G. Slope (ft/ft)	0.003763	Area (sq ft)		413.22	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	58.10	Top Width (ft)		58.10	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.72	Hydr. Depth (ft)		7.11	
Conv. Total (cfs)	102703.2	Conv. (cfs)		102703.2	

Length Wtd. (ft)	420.90	Wetted Per. (ft)	67.53
Min Ch El (ft)	1789.46	Shear (lb/sq ft)	1.44
Alpha	1.00	Stream Power (lb/ft s)	21.91
Frctn Loss (ft)	1.12	Cum Volume (acre-ft)	3.87
C & E Loss (ft)	0.59	Cum SA (acres)	0.57

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 cross section had to be extended vertically during the critical depth 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.
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: 380

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1090.66	1794.26	1091.25	1795.01	1091.78	1794.26	1093.21	1792.26	1094.63	1790.26
1096.06	1788.26	1096.29	1787.94	1149.56	1788.06	1149.61	1788.26	1150.11	1790.26
1150.6	1792.26	1151.08	1794.26	1151.34	1795.33	1227.86	1796.26		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1090.66	.03	1091.25	.02	1151.34	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1091.25	1151.34	0 420.9	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1090.66	1091.25	1795.01	F
1151.34	1227.86	1795.33	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1090.66	1091.25	1796.26	1151.34	1227.86	1796.26

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1798.96	Element			
Vel Head (ft)	4.12	Wt. n-Val.		0.020	
W.S. Elev (ft)	1794.84	Reach Len. (ft)			
Crit W.S. (ft)	1795.41	Flow Area (sq ft)		386.94	
E.G. Slope (ft/ft)	0.004794	Area (sq ft)		386.94	
Q Total (cfs)	6300.00	Flow (cfs)		6300.00	
Top Width (ft)	59.85	Top Width (ft)		59.85	
Vel Total (ft/s)	16.28	Avg. Vel. (ft/s)		16.28	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	90986.1	Conv. (cfs)		90986.1	
Length Wtd. (ft)		Wetted Per. (ft)		68.72	
Min Ch El (ft)	1787.94	Shear (lb/sq ft)		1.69	

Alpha	1.00	Stream Power (lb/ft s)	27.44
Frctn Loss (ft)	1.78	Cum Volume (acre-ft)	
C & E Loss (ft)	0.05	Cum SA (acres)	

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 cross section had to be extended vertically during the critical depth 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.

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	640	.02	.015	.02
Reach-1	630	.02	.015	.02
Reach-1	620	.02	.015	.02
Reach-1	610	.02	.015	.02
Reach-1	600	.02	.015	.02
Reach-1	595	Bridge		
Reach-1	590	.02	.015	.02
Reach-1	580	.025	.015	.025
Reach-1	570	.025	.015	.025
Reach-1	560	.025	.015	.025
Reach-1	550	.025	.015	.025
Reach-1	540	.025	.015	.025
Reach-1	530	.025	.015	.025
Reach-1	520	.025	.015	.025
Reach-1	510	.025	.015	.025
Reach-1	505	.025	.015	.025
Reach-1	500	.025	.015	.025
Reach-1	490	.025	.015	.025
Reach-1	480	.025	.015	.025
Reach-1	470	.025	.015	.025
Reach-1	460	.025	.015	.025
Reach-1	450	.025	.015	.025
Reach-1	445	.025	.015	.025
Reach-1	440	.03	.015	.03
Reach-1	435	Bridge		
Reach-1	430	.03	.015	.03
Reach-1	420	.03	.02	.03
Reach-1	415	.03	.02	.03
Reach-1	410	.03	.02	.03
Reach-1	400	.03	.02	.03
Reach-1	390	.03	.02	.03
Reach-1	380	.03	.02	.03

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	640	251.59	258.21	262.14
Reach-1	630	229.09	221.03	213.86
Reach-1	620	223.64	212.31	202.43
Reach-1	610	230.78	215.38	201.73
Reach-1	600	93.41	93.51	94.92
Reach-1	595	Bridge		
Reach-1	590	16.02	15.77	16.7
Reach-1	580	658	658	658
Reach-1	570	566.67	584.2	601.73
Reach-1	560	252.78	262.84	272.87
Reach-1	550	209.44	217.76	226.09
Reach-1	540	232.24	232.24	232.24
Reach-1	530	100	100	100
Reach-1	520	201.5	201.5	201.5
Reach-1	510	806.7	793.47	780.25
Reach-1	505	59	59	59
Reach-1	500	454.21	432.58	410.95
Reach-1	490	64.61	64.61	64.61
Reach-1	480	20	20	20
Reach-1	470	342.31	342.31	342.31
Reach-1	460	232.69	236.24	239.78
Reach-1	450	48.98	49.72	50.47
Reach-1	445	94.83	106.25	100.54
Reach-1	440	183.21	197.38	206.01
Reach-1	435	Bridge		
Reach-1	430	193.4	187.5	181.7
Reach-1	420	143.6	140	136.6
Reach-1	415	109.9	108.5	106.7
Reach-1	410	236.79	222.64	212.87
Reach-1	400	216.05	216.12	217.6
Reach-1	390	420.9	420.9	420.21
Reach-1	380	0	420.9	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	640	.1	.3
Reach-1	630	.1	.3
Reach-1	620	.1	.3
Reach-1	610	.1	.3
Reach-1	600	.1	.3
Reach-1	595	Bridge	
Reach-1	590	.3	.5
Reach-1	580	.1	.3
Reach-1	570	.1	.3
Reach-1	560	.1	.3
Reach-1	550	.1	.3

Reach-1	540		.1	.3
Reach-1	530		.1	.3
Reach-1	520		.1	.3
Reach-1	510		.1	.3
Reach-1	505		.1	.3
Reach-1	500		.1	.3
Reach-1	490		.1	.3
Reach-1	480		.1	.3
Reach-1	470		.1	.3
Reach-1	460		.1	.3
Reach-1	450		.1	.3
Reach-1	445		.1	.3
Reach-1	440		.3	.5
Reach-1	435	Bridge		
Reach-1	430		.3	.5
Reach-1	420		.3	.5
Reach-1	415		.3	.5
Reach-1	410		.1	.3
Reach-1	400		.1	.3
Reach-1	390		.1	.3
Reach-1	380		.1	.3

HEC-RAS Plan: Post River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	640	PF 1	5800.00	1853.63	1862.89	1862.89	1866.18	0.001720	14.72	413.60	66.56	0.95
Reach-1	630	PF 1	5800.00	1850.36	1856.86	1859.94	1864.92	0.006872	22.79	254.51	51.88	1.81
Reach-1	620	PF 1	5800.00	1847.74	1854.04	1857.57	1863.21	0.007704	24.30	238.69	47.06	1.90
Reach-1	610	PF 1	5800.00	1844.88	1850.90	1854.54	1861.29	0.009315	25.87	224.17	46.84	2.08
Reach-1	600	PF 1	5800.00	1837.36	1840.65	1844.49	1857.49	0.026515	32.93	176.13	53.84	3.21
Reach-1	595		Bridge									
Reach-1	590	PF 1	5800.00	1836.47	1840.02	1843.60	1854.35	0.020517	30.38	190.90	53.84	2.84
Reach-1	580	PF 1	5800.00	1835.69	1838.88	1842.21	1853.80	0.027202	31.00	187.13	70.38	3.35
Reach-1	570	PF 1	5800.00	1829.48	1833.66	1836.00	1841.47	0.010002	22.41	258.76	74.34	2.12
Reach-1	560	PF 1	5800.00	1823.98	1828.24	1830.50	1835.71	0.009369	21.94	264.36	74.64	2.05
Reach-1	550	PF 1	5800.00	1821.50	1825.75	1828.02	1833.25	0.009416	21.98	263.93	74.62	2.06
Reach-1	540	PF 1	5800.00	1820.08	1824.58	1826.60	1831.13	0.007647	20.53	282.55	75.61	1.87
Reach-1	530	PF 1	5800.00	1818.57	1823.20	1825.09	1829.31	0.006892	19.84	292.38	76.13	1.78
Reach-1	520	PF 1	5800.00	1816.72	1821.59	1823.64	1828.53	0.007172	21.14	274.31	60.00	1.74
Reach-1	510	PF 1	5800.00	1814.68	1819.36	1821.58	1826.93	0.008224	22.08	262.68	60.00	1.86
Reach-1	505	PF 1	5800.00	1806.67	1811.09	1813.57	1819.65	0.009987	23.48	247.05	60.00	2.04
Reach-1	500	PF 1	5800.00	1806.08	1810.50	1812.98	1819.05	0.009960	23.46	247.26	60.00	2.04
Reach-1	490	PF 1	5800.00	1801.70	1806.11	1808.60	1814.71	0.010065	23.53	246.45	60.00	2.05
Reach-1	480	PF 1	5800.00	1801.07	1805.48	1807.97	1814.06	0.010024	23.50	246.76	60.00	2.04
Reach-1	470	PF 1	5800.00	1800.99	1805.47	1807.89	1813.79	0.009558	23.15	250.49	60.00	2.00
Reach-1	460	PF 1	5800.00	1799.74	1805.20	1806.64	1810.65	0.004897	18.73	309.67	60.00	1.45
Reach-1	450	PF 1	5800.00	1798.88	1804.82	1805.78	1809.38	0.003716	17.15	338.23	60.00	1.27
Reach-1	445	PF 1	5800.00	1798.70	1803.02	1804.76	1808.99	0.007105	19.61	295.72	75.00	1.74
Reach-1	440	PF 1	5800.00	1797.82	1801.59	1803.54	1808.12	0.008297	20.51	282.82	75.00	1.86
Reach-1	435		Bridge									
Reach-1	430	PF 1	5800.00	1796.29	1800.27	1802.01	1806.13	0.006977	19.43	298.52	75.00	1.72
Reach-1	420	PF 1	6300.00	1794.52	1798.52	1800.26	1804.36	0.013045	19.39	324.85	89.56	1.79
Reach-1	415	PF 1	6300.00	1793.32	1800.72	1800.72	1803.96	0.003688	14.44	436.27	67.45	1.00
Reach-1	410	PF 1	6300.00	1791.56	1800.24	1800.52	1803.85	0.003800	15.27	419.25	74.11	1.02
Reach-1	400	PF 1	6300.00	1790.86	1796.91	1798.52	1802.49	0.007665	18.95	332.48	59.55	1.41
Reach-1	390	PF 1	6300.00	1789.46	1797.18	1797.22	1800.79	0.003763	15.25	413.22	58.10	1.01
Reach-1	380	PF 1	6300.00	1787.94	1794.84	1795.41	1798.96	0.004794	16.28	386.94	59.85	1.13

HEC-RAS Plan: Post River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	E.G. US. (ft)	Min El. Prs (ft)	BR Open Area (sq ft)	Prs O.W.S. (ft)	Q Total (cfs)	Min El. Weir Flow (ft)	Q Weir (cfs)	Delta EG (ft)
Reach-1	595	PF 1	1857.49	1845.39	400.75	1840.65	5800.00	1848.77		3.14
Reach-1	435	PF 1	1808.12	1805.75	570.96	1801.59	5800.00	1807.76		1.99

Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

RIVER-1 Reach-1

Legend

EG PF 1

Crit PF 1

WS PF 1

Ground

Elevation (ft)

1880

1860

1840

1820

1800

1780

0

1000

2000

3000

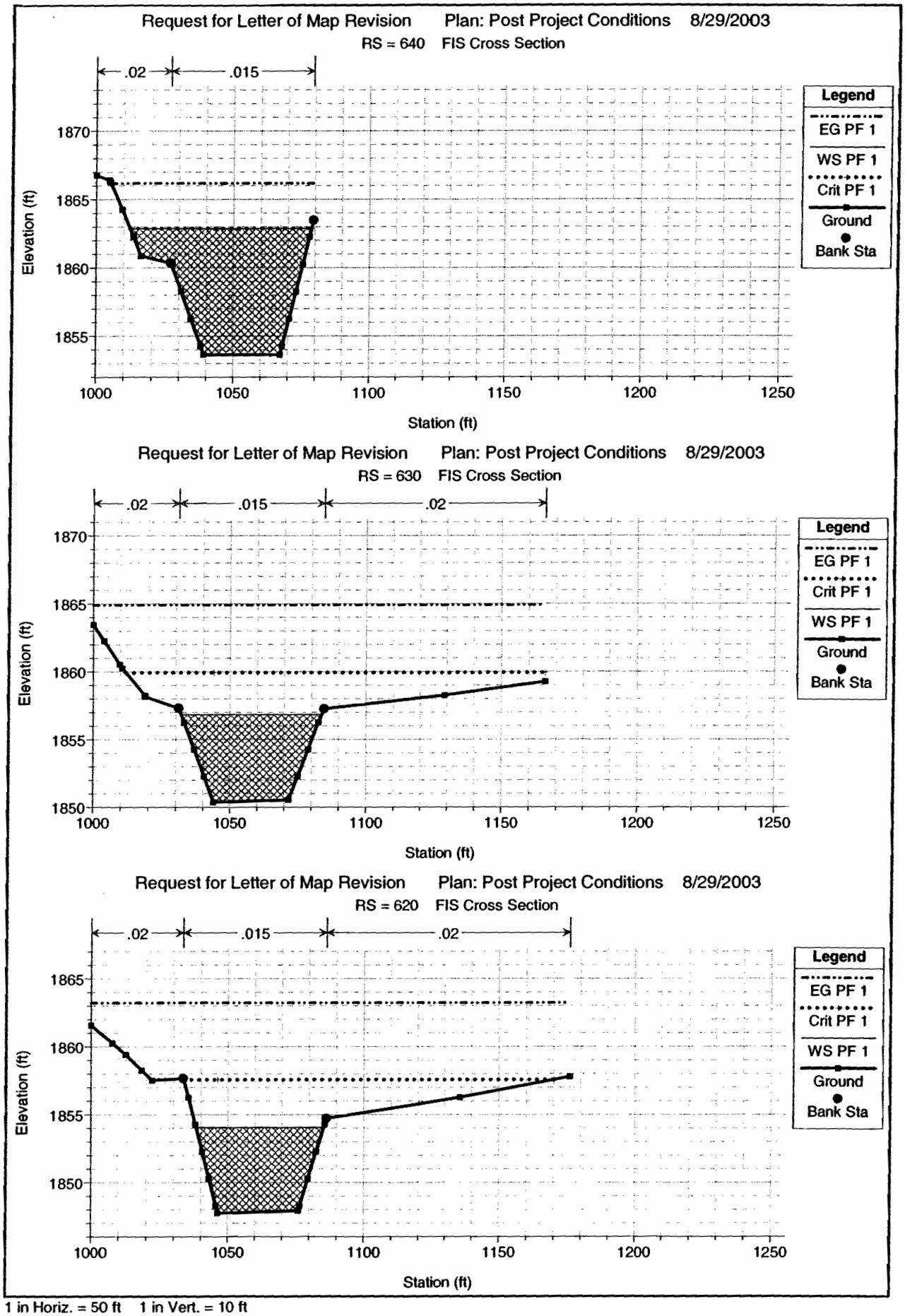
4000

5000

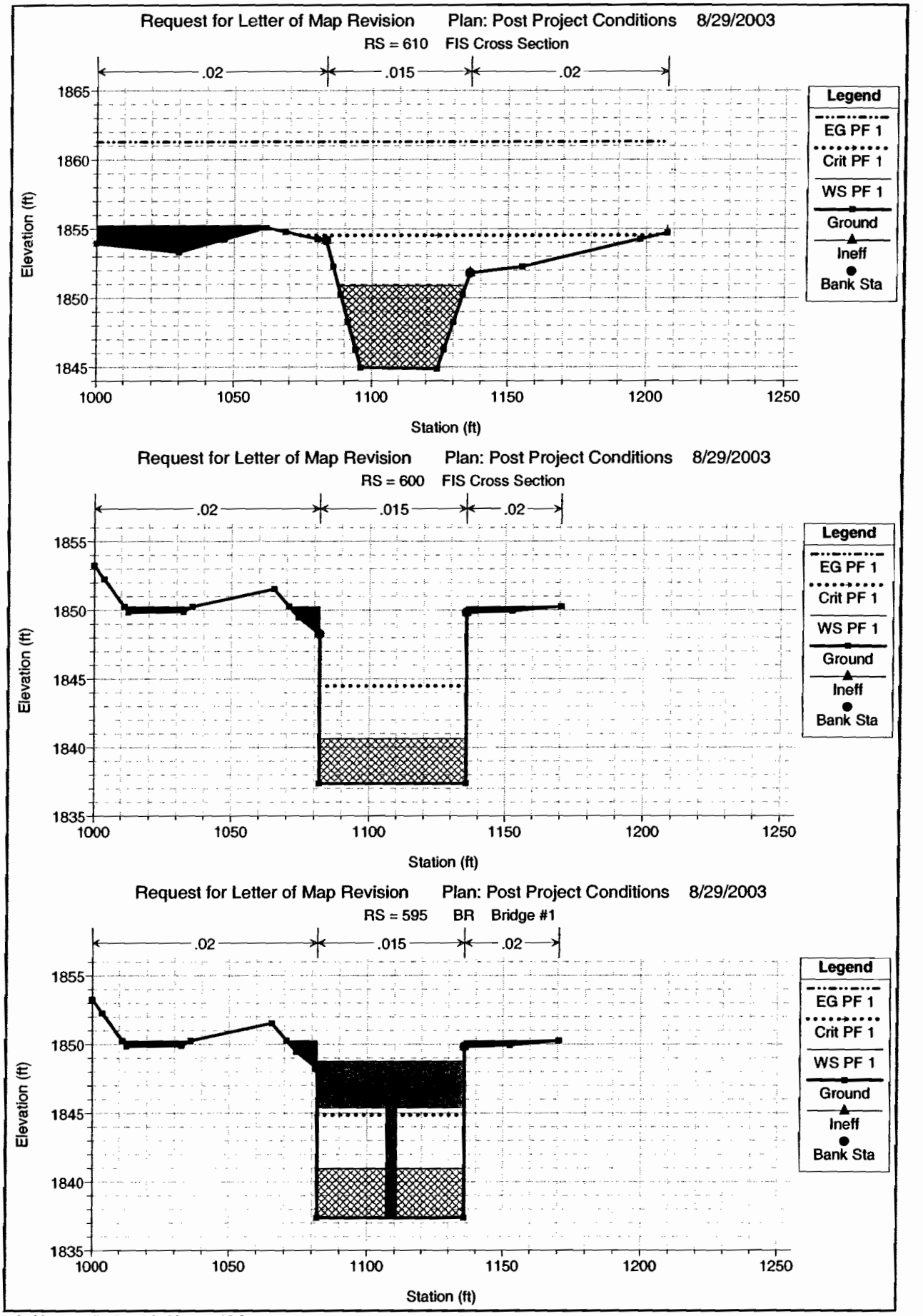
6000

7000

Main Channel Distance (ft)



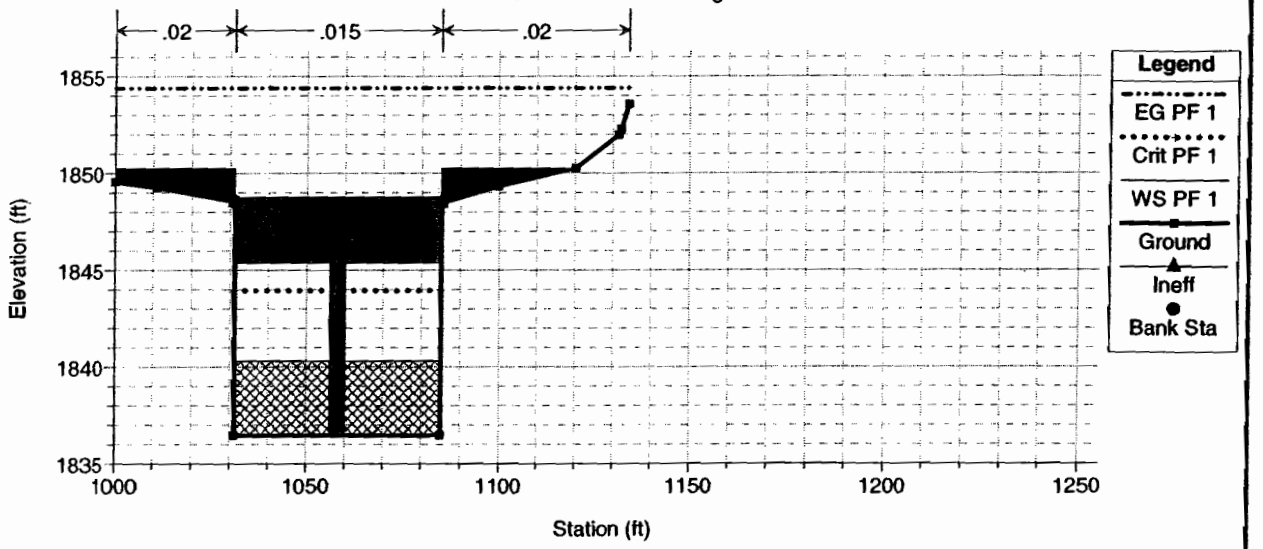
1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft

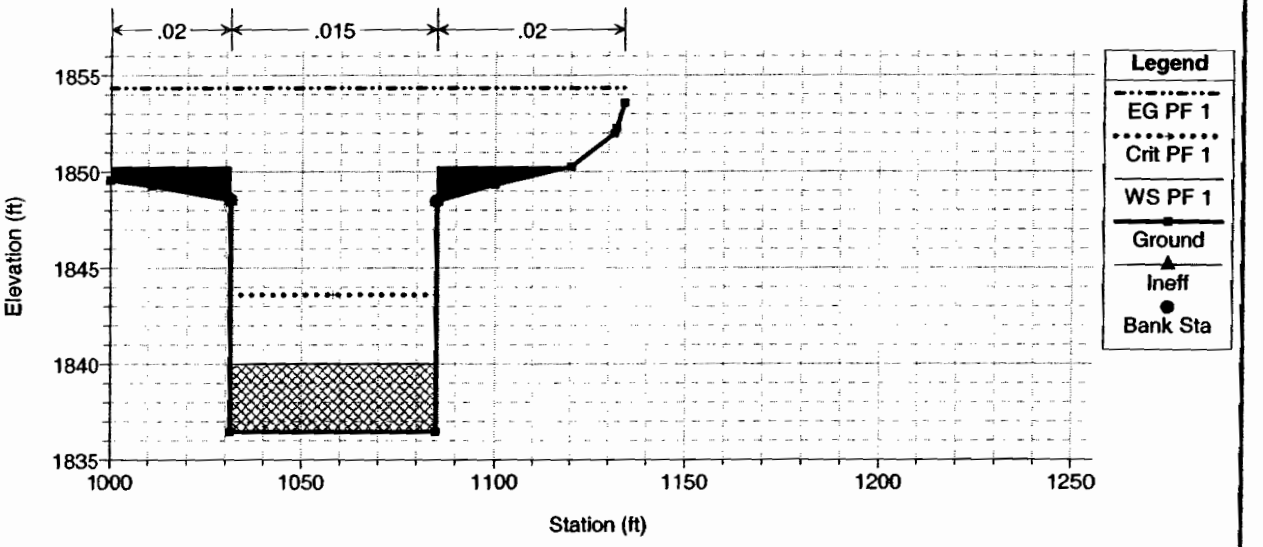
Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

RS = 595 BR Bridge #1



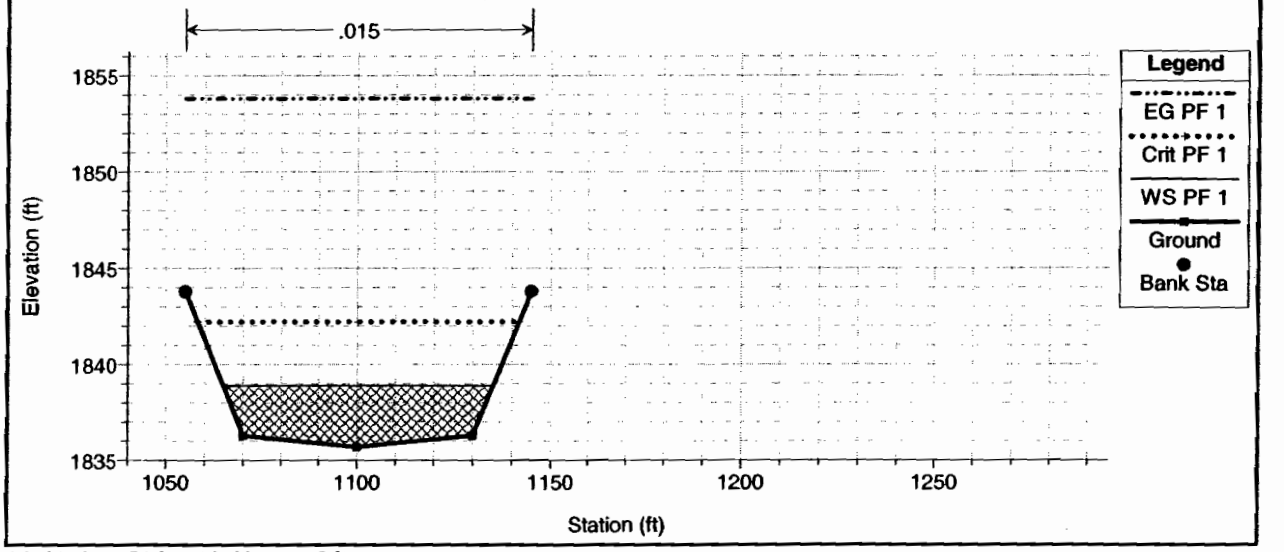
Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

RS = 590 END OF PHASE II IMPROVEMENTS

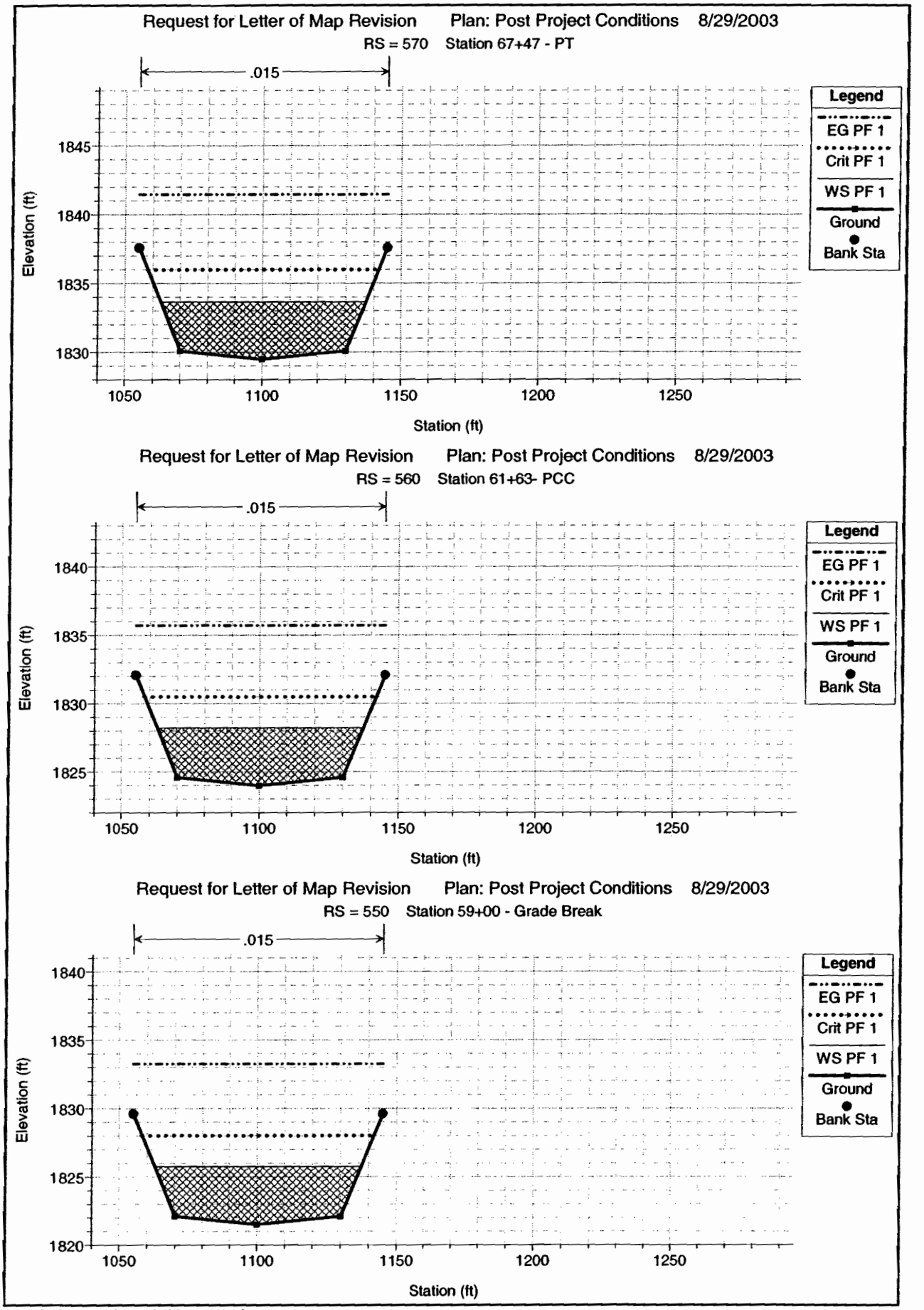


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RS = 580 Station 74+05 - Transition



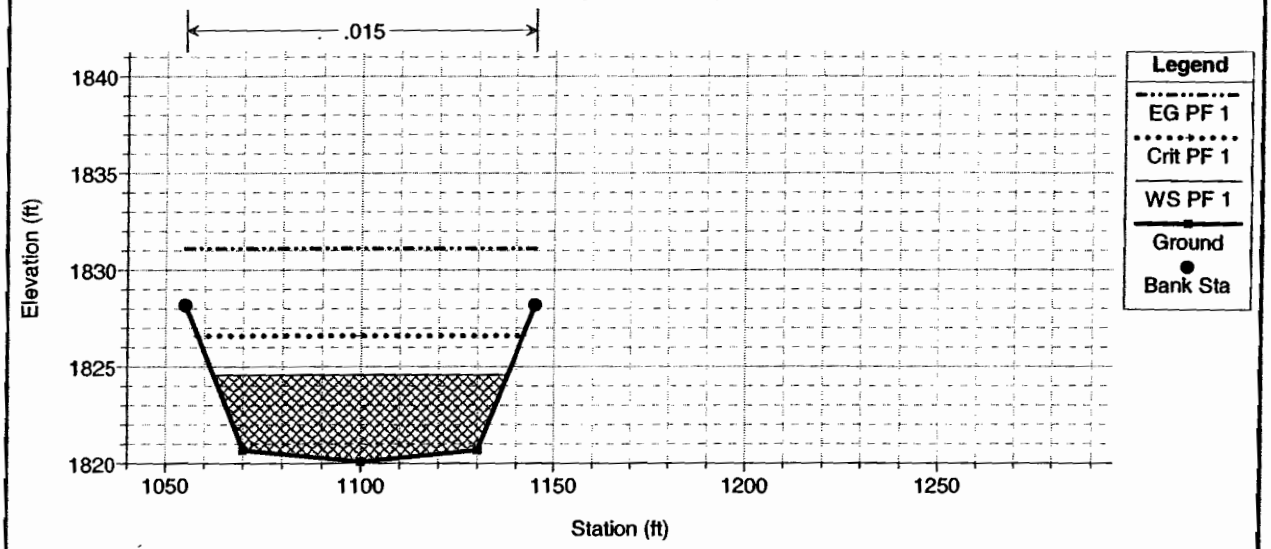
1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft

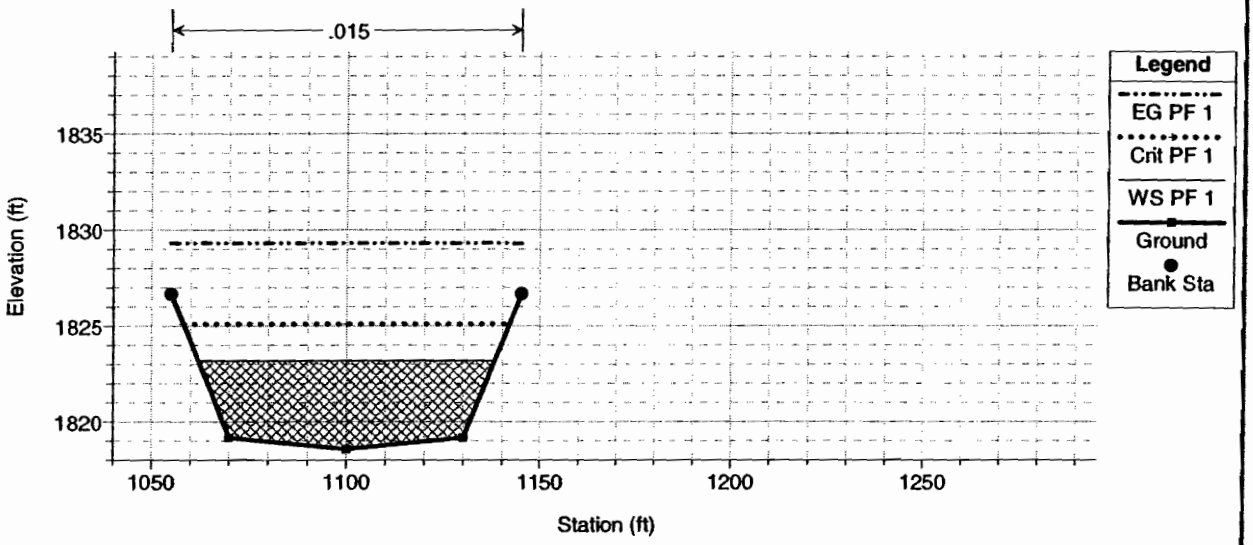
Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

RS = 540 Station 56+82 - PC



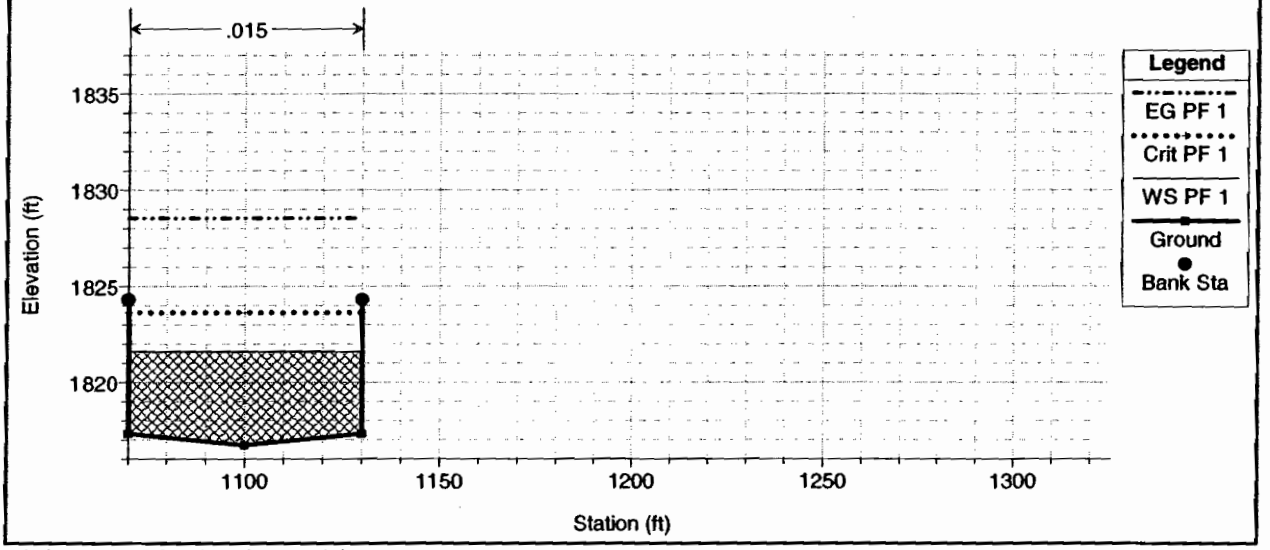
Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

RS = 530 Station 54+50 - Grade Break / Transition

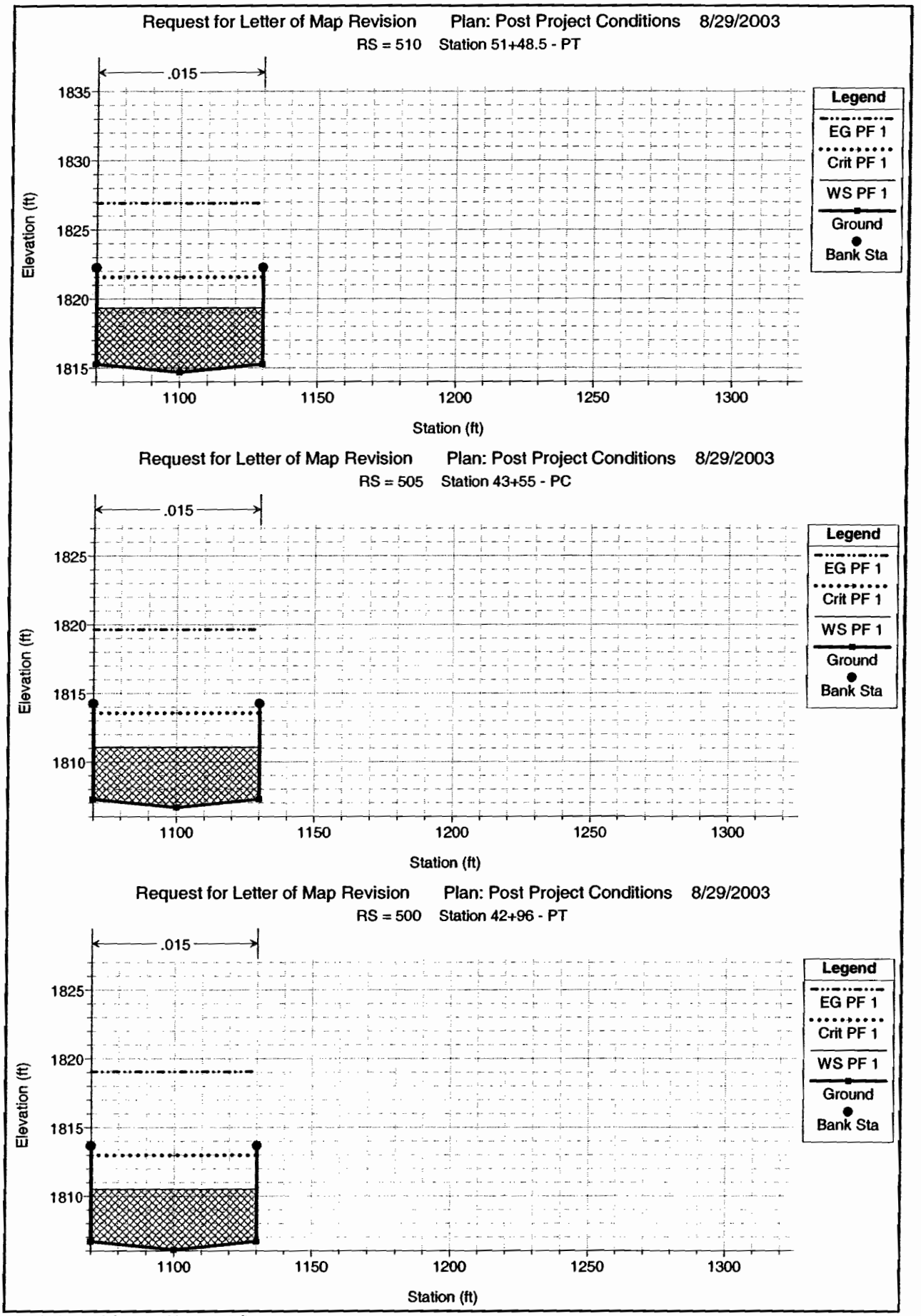


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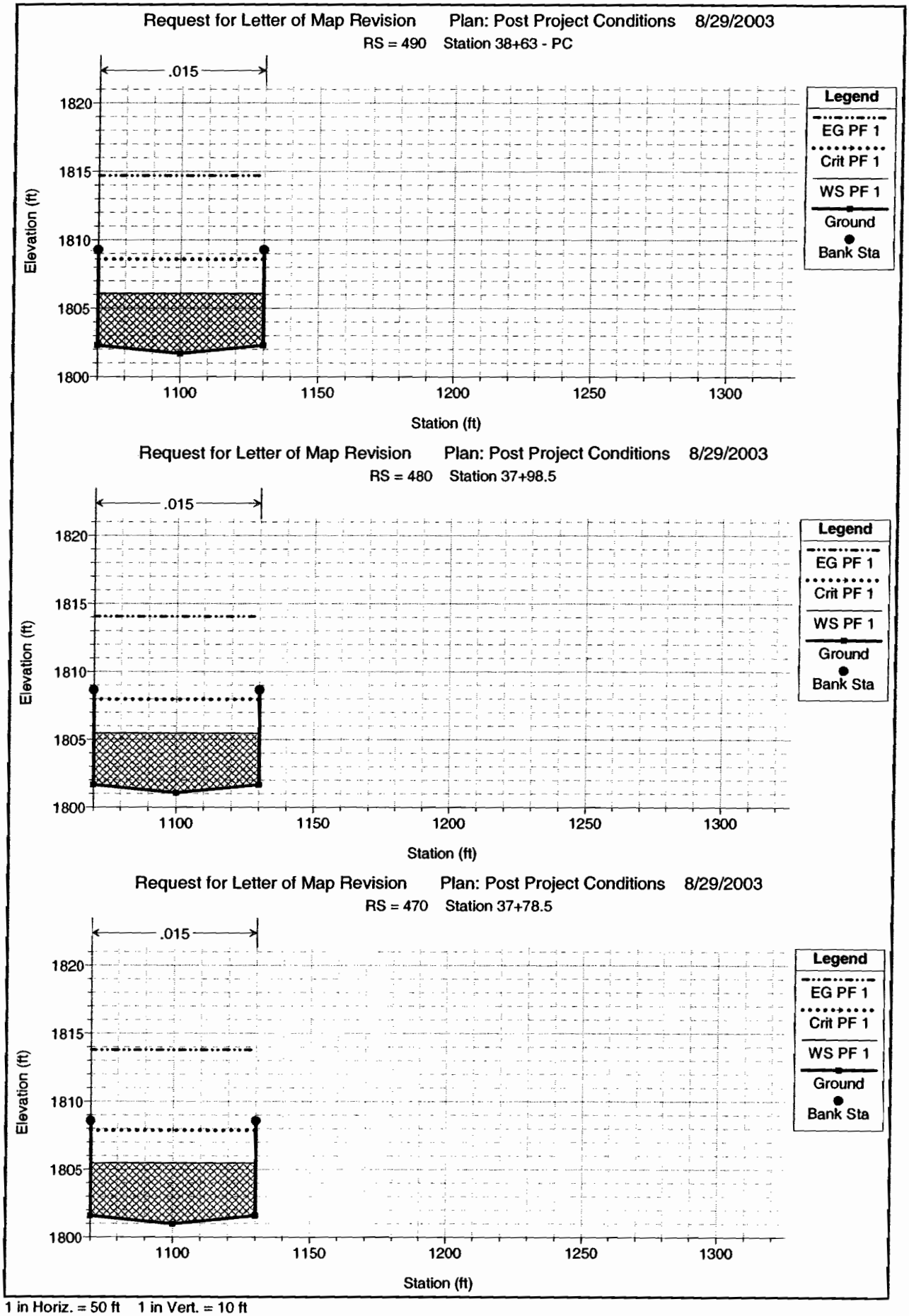
RS = 520 Station 53+50 - Grade Break / Transition



1 in Horiz. = 50 ft 1 in Vert. = 10 ft



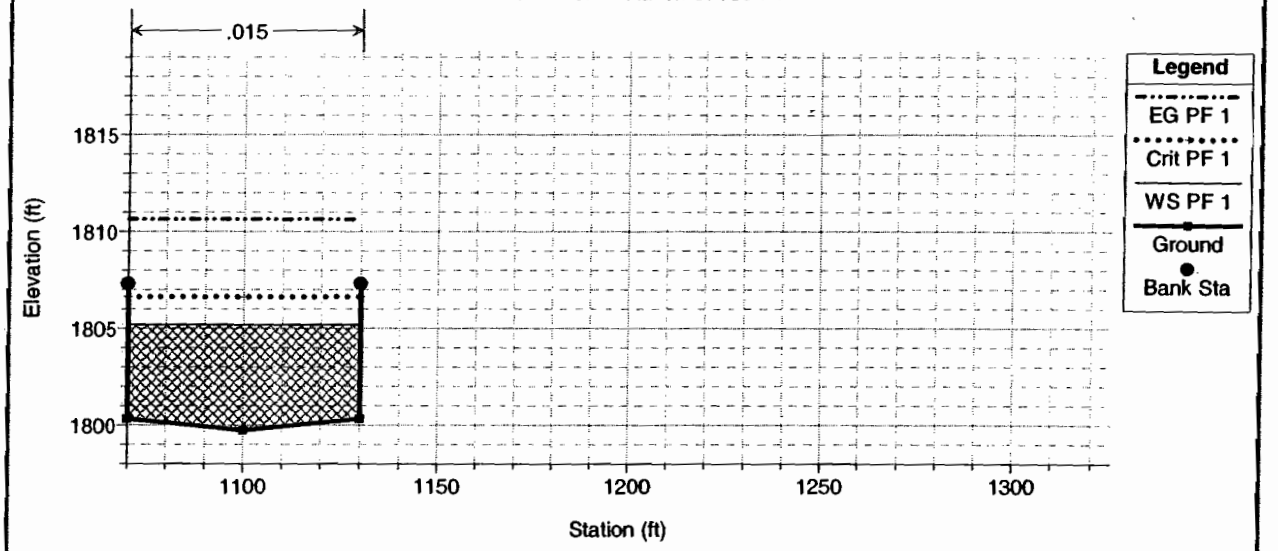
1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft

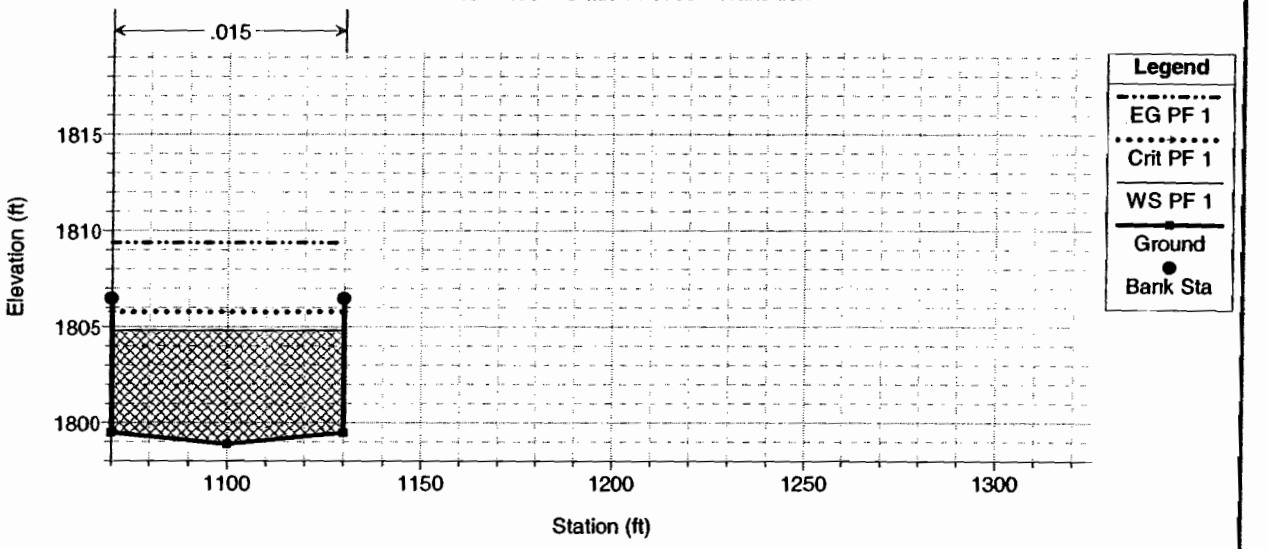
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RS = 460 Station 37+36 PT



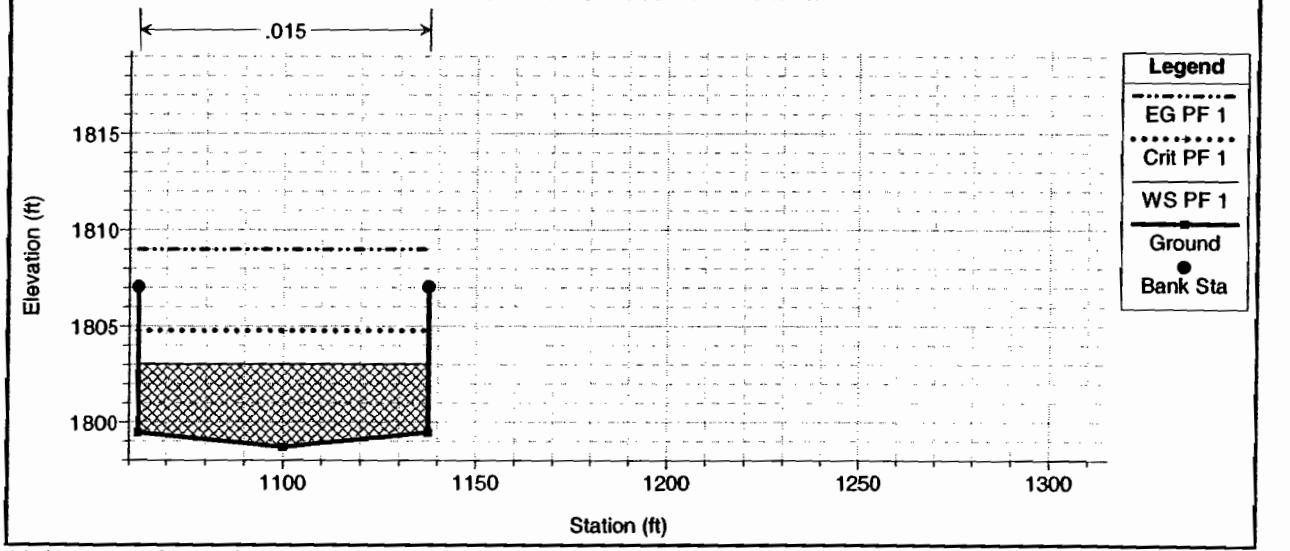
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RS = 450 Station 32+00 - Transition

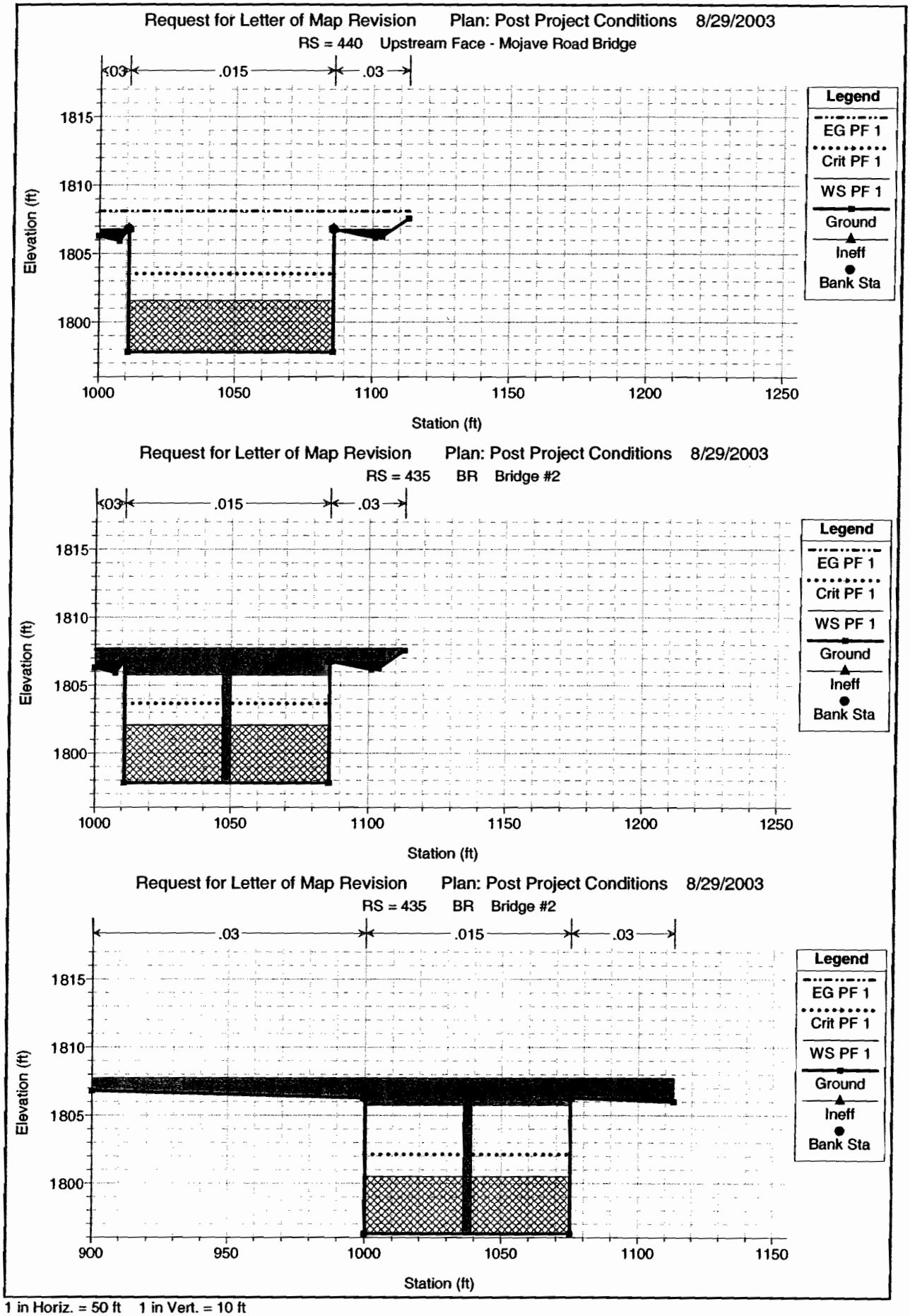


Request for Letter of Map Revision Plan: Post Project Conditions 8/29/2003

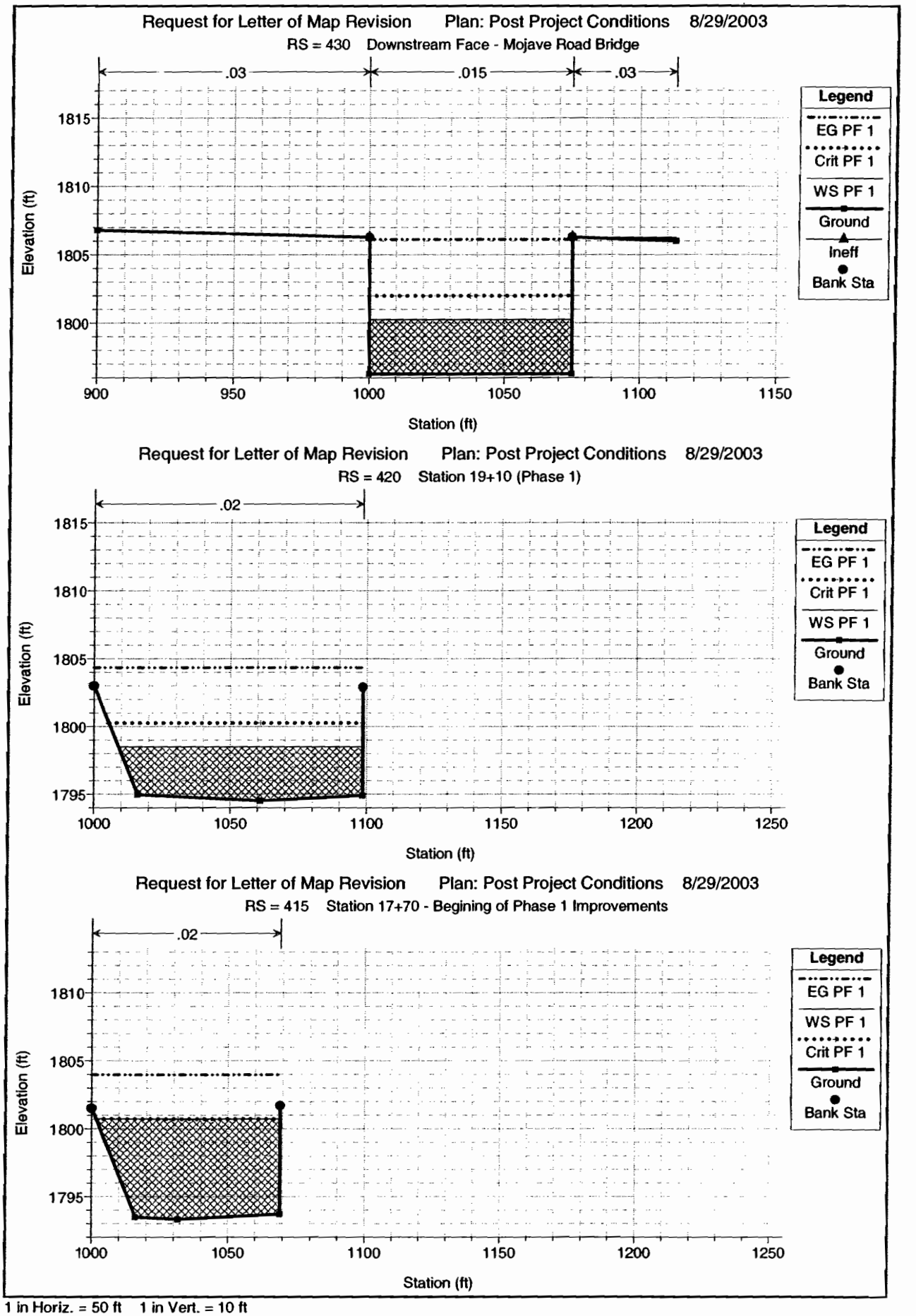
RS = 445 Station 31+50 - Transition



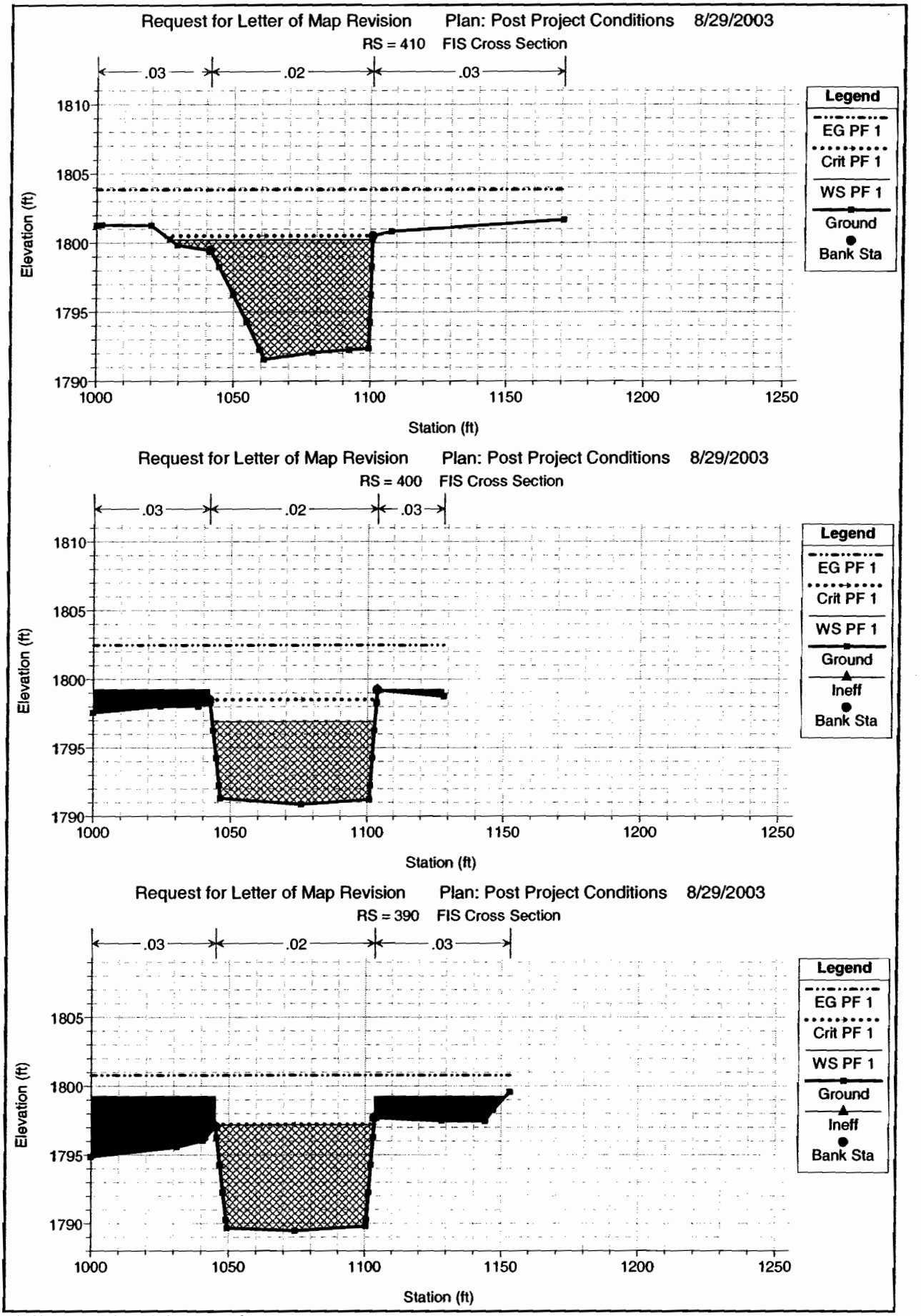
1 in Horiz. = 50 ft 1 in Vert. = 10 ft



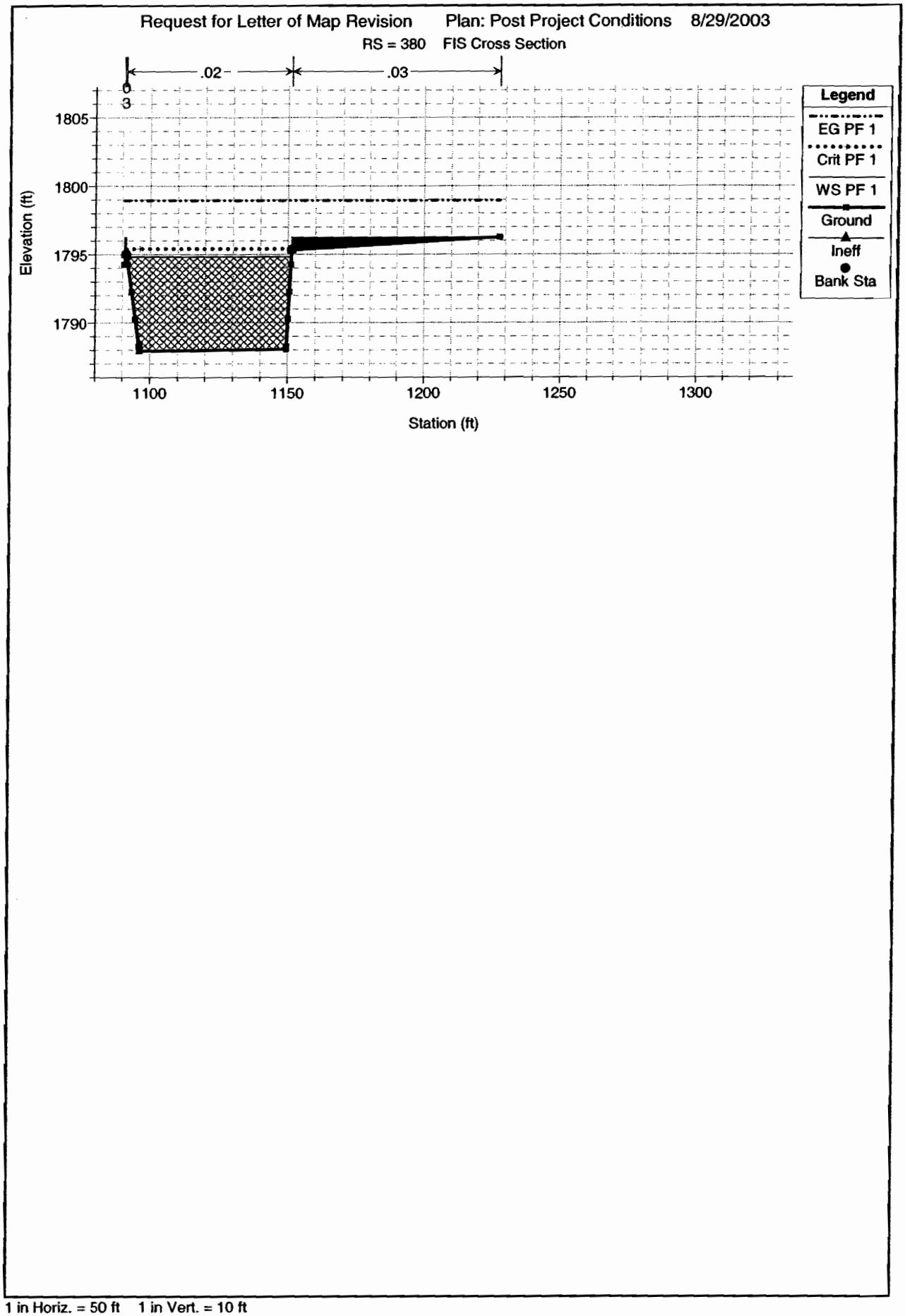
1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft



1 in Horiz. = 50 ft 1 in Vert. = 10 ft

CHECKRAS Output Files

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.prj
Plan File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.p02
Geometry File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.g02
Flow File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.f02
Report File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.nt
Selected profiles: PF 1
Date: 9/5/2003
Time: 10:12:33 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
RIVER-1,Reach-1						
640		0.02	0.015	0.02	0.1	0.3
630		0.02	0.015	0.02	0.1	0.3
620		0.02	0.015	0.02	0.1	0.3
610		0.02	0.015	0.02	0.1	0.3
600		0.02	0.015	0.02	0.1	0.3
595	Bridge-Up	0.02	0.015	0.02	0.1	0.3
595	Bridge-Dn	0.02	0.015	0.02	0.3	0.5
590		0.02	0.015	0.02	0.3	0.5
580		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
570		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
560		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
550		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
540		-----	0.015	0.025	0.1	0.3
		-----	0.025	-----		
530		-----	0.015	0.025	0.1	0.3
		-----	0.025	-----		
520		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
510		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
505		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
500		-----	0.015	0.025	0.1	0.3
		-----	0.025	-----		
490		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
480		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
470		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
460		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
450		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
445		-----	0.025	0.025	0.1	0.3
		-----	0.015	-----		
440		0.03	0.015	0.03	0.3	0.5
435	Bridge-Up	0.03	0.015	0.03	0.3	0.5
435	Bridge-Dn	0.03	0.015	0.03	0.3	0.5
430		0.03	0.015	0.03	0.3	0.5
420		-----	0.03	0.03	0.3	0.5
		-----	0.02	-----		
415		-----	0.02	0.03	0.3	0.5
		-----	0.03	-----		
410		0.03	0.02	0.03	0.1	0.3
400		0.03	0.02	0.03	0.1	0.3
390		0.03	0.02	0.03	0.1	0.3
380		0.03	0.02	0.03	0.1	0.3

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.02	0.03
Right Overbank n Value:	0.02	0.03

Channel n Value:	0.015	0.03
Contraction Coefficient:	0.1	0.3
Expansion Coefficient:	0.3	0.5

ROUGHNESS COEFFICIENT CHECK

RS: 640
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 640
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 640
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 630
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 630
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 630
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 620
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 620
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 620
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 610
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 610
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 610
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 600

NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 600
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 600
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 595
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 595
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 595
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 595
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 595
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 595
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 590
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 590
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 590
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 580
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 580
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

```
RS:       570
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       570
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       560
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       560
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       550
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       550
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       540
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       540
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       530
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       530
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       520
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       520
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       510
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       510
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
```

The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 505
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 505
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 500
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 500
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 490
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 490
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 480
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 480
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 470
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 470
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 460
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 460
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a concrete lined channel.

RS: 450
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

```
RS:       450
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       445
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       445
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       440
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       440
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       440
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       435
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       435
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       435
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       435
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       435
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       435
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       430
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       430
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
```

```
RS:       430
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       420
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       415
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       410
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       410
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       410
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       400
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       400
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       400
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:       390
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       390
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       390
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

TRANSITION LOSS COEFFICIENT CHECK
---------------------------------

RS:       610
NT TL 01 This is section 4
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:       600
```

```
NT TL 01 This is section 3
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      595
NT TL 01 This is section Bridge-Up
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      445
NT TL 01 This is section 4
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      420
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      415
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

ROUGHNESS COEFFICIENT AT STRUCTURES
-----------------------------------

RS:      595
NT RS 02 The channel n value of 0.015 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 3.
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

RS:      595
NT RS 02 The channel n value of 0.015 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.

RS:      435
NT RS 02 The channel n value of 0.015 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 3.
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

RS:      435
NT RS 02 The channel n value of 0.015 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.

---END---
```

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.prj
Plan File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.p02
Geometry File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.g02
Flow File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.f02
Report File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.xs
Selected profiles: PF 1
Date: 9/5/2003
Time: 10:12:11 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
RIVER-1,Reach-1						
640	251.59	258.21	262.14	66.56	5800	C
630	229.09	221.03	213.86	51.88	5800	
620	223.64	212.31	202.43	47.06	5800	
610	230.78	215.38	201.73	46.84	5800	B
600	93.41	93.51	94.92	53.84	5800	B
595	Single BR-Up					
595	Single BR-Dn					
590	16.02	15.77	16.7	53.84	5800	B
580	658	658	658	70.38	5800	
570	566.67	584.2	601.73	74.34	5800	
560	252.78	262.84	272.87	74.64	5800	
550	209.44	217.76	226.09	74.62	5800	
540	232.24	232.24	232.24	75.61	5800	
530	100	100	100	76.13	5800	
520	201.5	201.5	201.5	60	5800	
510	806.7	793.47	780.25	60	5800	
505	59	59	59	60	5800	
500	454.21	432.58	410.95	60	5800	
490	64.61	64.61	64.61	60	5800	
480	20	20	20	60	5800	
470	342.31	342.31	342.31	60	5800	
460	232.69	236.24	239.78	60	5800	
450	48.98	49.72	50.47	60	5800	
445	94.83	106.25	100.54	75	5800	
440	183.21	197.38	206.01	75	5800	B
435	Single BR-Up					
435	Single BR-Dn					
430	193.4	187.5	181.7	75	5800	B
420	143.6	140	136.6	89.56	6300	
415	109.9	108.5	106.7	67.45	6300	C
410	236.79	222.64	212.87	74.11	6300	
400	216.05	216.12	217.6	59.55	6300	B
390	420.9	420.9	420.21	58.1	6300	E,B
380	0	420.9	0	59.85	6300	E,B

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

RS: 590
XS DT 01 Both right and left overbank distances are longer than the channel distance.

SPACING CHECK

INEFFECTIVE FLOW CHECK

DISCHARGE CHECK

LOCATION CHECK

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is RIVER-1,Reach-1
Critical is specified as the upstream boundary
for profile PF 1

XS FR 01 The profile is computed as supercritical flow regime.

---END---

CHECK-RAS Program: Structure Check

Project File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.prj
Plan File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.p02
Geometry File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.g02
Flow File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.f02
Report File: E:\879-Flamingo\HEC-Ras\879_P_Flamingo.br
Selected profiles: PF 1
Date: 9/5/2003
Time: 10:12:14 AM

RS	MaxLoChord	MnTpRd	EGEL	WSEL	MinChEl	Structure
RIVER-1,Reach-1						
640			1866.18	1862.89	1853.63	
630			1864.92	1856.86	1850.36	
620			1863.21	1854.04	1847.74	
610			1861.29	1850.9	1844.88	
600			1857.49	1840.65	1837.36	
590			1854.35	1840.02	1836.47	
580			1853.8	1838.88	1835.69	
570			1841.47	1833.66	1829.48	
560			1835.71	1828.24	1823.98	
550			1833.25	1825.75	1821.5	
540			1831.13	1824.58	1820.08	
530			1829.31	1823.2	1818.57	
520			1828.53	1821.59	1816.72	
510			1826.93	1819.36	1814.68	
505			1819.65	1811.09	1806.67	
500			1819.05	1810.5	1806.08	
490			1814.71	1806.11	1801.7	
480			1814.06	1805.48	1801.07	
470			1813.79	1805.47	1800.99	
460			1810.65	1805.2	1799.74	
450			1809.38	1804.82	1798.88	
445			1808.99	1803.02	1798.7	
440			1808.12	1801.59	1797.82	
430			1806.13	1800.27	1796.29	
420			1804.36	1798.52	1794.52	
415			1803.96	1800.72	1793.32	
410			1803.85	1800.24	1791.56	
400			1802.49	1796.91	1790.86	
390			1800.79	1797.18	1789.46	
380			1798.96	1794.84	1787.94	

RIVER/REACH: RIVER-1, Reach-1
RIVER STATION: 595
TYPE OF STRUCTURE: Bridge

Description:	Bridge #1
Distance from Upstream XS:	1
Deck/Roadway Width:	91.51
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	1848.76
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	610	215.38	1850.9		1861.29	46.84	
3	600	93.51	1840.65		1857.49	53.84	
	595	91.51	0		0	Null	Single BR-Up
	595	1.00	0		0	Null	Single BR-Dn
2	590	15.77	1840.02		1854.35	53.84	
1	580	658.00	1838.88		1853.8	70.38	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	888	0	0	888	0	0
2	0	0	0	0	0	0

BRIDGE:
Bridge Name: Single BR
LowFlowMethod: Yarnell
Momentum Cd: 0
HighFlowMethod: Pressure and Weir flow
SluiceGate Cd: 0 Submerged Cd: 0.8006408

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

---

MaxLowChord: 1845.39 MinTopRd: 0 MinElPrs: 1845.39

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS
Bridge					0	U
					0	D

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd
Single BR	1081.85	1135.69	1837.39	1837.39	1837.39	1845.39 U
	1031.20	1085.04	1848.76	1848.76	1848.76	1845.39 D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Single BR	5800	5800	0	Energy only	UNKNOWN

GEOMETRIC CHECK

RS: 595
ST GD 03 The end station of 1135.69 from upstream road/weir data
is less than the end station of 1170.43 from upstream internal
section/section 3.
The high chord elevation of 1848.76 for the end road/weir station is
greater than the ground elevation of 1837.39 for the same ground station.
The road/weir profile may need to be extended.

TYPE OF FLOW CHECK

RS: 595 This is Single BR
BR TF 01 Type of flow is UNKNOWN.
CHECKRAS can not find MxLoCd or MnTpRd elevation
or the given conditions do not satisfy the type of flow
specified in the CHECK-RAS program.
Please review the ground and road data, and encroachment stations.
or please review the messages, BR LF 01, BR PF 01, BR PF 02, BR LW 01
BR PW 01 for bridges to determine the type of flow.

RIVER/REACH: RIVER-1, Reach-1
RIVER STATION: 435
TYPE OF STRUCTURE: Bridge

Description:	Bridge #2
Distance from Upstream XS:	1
Deck/Roadway Width:	195.38
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	1807.75
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	445	106.25	1803.02		1808.99	75	
3	440	197.38	1801.59		1808.12	75	
	435	195.38	0		0	Null	Single BR-Up
	435	1.00	0		0	Null	Single BR-Dn
2	430	187.50	1800.27		1806.13	75	
1	420	140.00	1798.52		1804.36	89.56	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	888	0	0	888	0	0
2	0	0	0	0	0	0

BRIDGE:
Bridge Name: Single BR
LowFlowMethod: Yarnell
Momentum Cd: 0
HighFlowMethod: Pressure and Weir flow
SluiceGate Cd: 0 Submerged Cd: 0.8006408

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

MaxLowChord: 1805.75 MinTopRd: 0 MinElPrs: 1805.75

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Bridge					0		U
					0		D

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Single BR	1010.88	1085.88	1807.75	1807.55	1807.55	1805.75	U
	1000.00	1075.00	1807.75	1807.75	1807.75	1805.75	D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Single BR	5800	5800	0	Energy only	UNKNOWN

GEOMETRIC CHECK

RS: 435
ST GD 03 The starting station of 900 from upstream road/weir data
is less than the starting station of 1000 from upstream internal
section/ secion 3.
The high chord elevation of 1807.75 for the starting road/weir station is

greater than the ground elevation of 1806.3 for the starting ground station.
The EGEL at section 3 of 1808.12 is greater than the ground elevation.
The road/weir data should be included in the ground data

RS: 435
ST GD 03 The end station of 1113.05 from upstream road/weir data
is less than the end station of 1113.11 from upstream internal
section/section 3.
The high chord elevation of 1807.75 for the end road/weir station is
greater than the ground elevation of 1807.552 for the same ground station.
The road/weir profile may need to be extended.

RS: 435
ST GD 04 There is only one bridge. This is upstream bridge section.
However, the low chord line crosses the ground line at more than
two locations.
The ground and deck/roadway data should be checked.

---END

Proposed Hydraulic Model

Appendix C

Proposed Subcritical HECRAS Model

Appendix C.1

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
XXXXXXX  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  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: FWash LOMR Sp St. to DI Subcritical run
Project File : sub.prj
Run Date and Time: 2/3/2012 12:01:10 PM

Project in English units

Project Description:
FWash LOMR Sp St. to DI Subcritical run

****

PLAN DATA

Plan Title: Subcritical
Plan File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Subcritical HECRAS Model\sub.p08

Geometry Title: FMWash LOMR Geometry 2011 import
Geometry File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Subcritical HECRAS Model\sub.g03

Flow Title : 100-yr +
Flow File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Subcritical HECRAS Model\sub.f04

Plan Summary Information:
Number of: Cross Sections = 105 Multiple Openings = 0
Culverts = 2 Inline Structures = 0
Bridges = 4 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: 100-yr +
Flow File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Subcritical HECRAS Model\sub.f04

Flow Data (cfs)

River	Reach	RS	100-yr FIS
Flamingo Wash	1	8837.78	5500
Flamingo Wash	1	5796	5280
Flamingo Wash	1	5109.79	5500
Flamingo Wash	1	2702.87	5500
Flamingo Wash	1	1558.62	5800
Flamingo Wash	1	926	5800
Flamingo Wash	1	702.71	5800
Flamingo Wash	1	223.47	5800
FW	FW	8837.78	5500
FW	FW	5796	5280
FW	FW	5109.79	5500
FW	FW	2702.87	5500
FW	FW	1558.62	5800
FW	FW	926	5800
FW	FW	702.71	5800
FW	FW	223.47	5800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
FW	FW	100-yr FIS	Normal S = 0.0087	Normal S = 0.01

****

GEOMETRY DATA

Geometry Title: FMWash LOMR Geometry 2011 import
Geometry File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Subcritical HECRAS Model\sub.g03

CROSS SECTION

RIVER: FW
REACH: FW RS: 8837.78

INPUT
Description: X-section 24 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.62	1075	1925.3	1100	1924.8	1125	1925.3	1125	1940.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.025	1125	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1075 1125 30 30 30 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1938.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.19	Wt. n-Val.		0.025	
W.S. Elev (ft)	1937.64	Reach Len. (ft)	30.00	30.00	30.00
Crit W.S. (ft)		Flow Area (sq ft)		629.31	
E.G. Slope (ft/ft)	*0.001261	Area (sq ft)		629.31	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	8.74	Avg. Vel. (ft/s)		8.74	
Max Chl Dpth (ft)	12.84	Hydr. Depth (ft)		12.59	
Conv. Total (cfs)	*154887.5	Conv. (cfs)		*154887.5	
Length Wtd. (ft)	30.00	Wetted Per. (ft)		74.68	
Min Ch El (ft)	1924.80	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)	1125.00	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	14.93	80.55	13.75
C & E Loss (ft)	0.21	Cum SA (acres)	6.59	10.75	6.14

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: FW
REACH: FW RS: 8807.78

INPUT
Description: X-section 22 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.25	1939.865	1092.25	1924.865	1100	1924.71	1107.75	1924.865	1137.75	1939.865

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.25	.025	1062.25	.025	1137.75	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062.25 1137.75 120 120 120 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1938.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1935.21	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)	1935.21	Flow Area (sq ft)		375.68	
E.G. Slope (ft/ft)	*0.005466	Area (sq ft)		375.68	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	56.89	Top Width (ft)		56.89	
Vel Total (ft/s)	14.64	Avg. Vel. (ft/s)		14.64	
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	74394.1	Conv. (cfs)		74394.1	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		61.77	
Min Ch El (ft)	1924.71	Shear (lb/sq ft)		2.08	
Alpha	1.00	Stream Power (lb/ft s)	1137.75	0.00	0.00
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	14.93	80.21	13.75
C & E Loss (ft)	0.04	Cum SA (acres)	6.59	10.72	6.14

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: FW
REACH: FW RS: 8687.78

INPUT
Description: X-section 20 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1064.41	936.236	1087.71	924.586	1100	1924.34	1112.31	924.586	1135.61	936.236

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1064.4	.025	1064.4	.025	1135.6	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1064.4 1135.6 382.58 367.78 346.32 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1936.73	Element	Left OB	Channel / Right OB
Vel Head (ft)	3.20	Wt. n-Val.		0.025
W.S. Elev (ft)	1933.54	Reach Len. (ft)	382.58	367.78 / 346.32
Crit W.S. (ft)	1933.54	Flow Area (sq ft)		383.41
E.G. Slope (ft/ft)	*0.005424	Area (sq ft)		383.41
Q Total (cfs)	5500.00	Flow (cfs)		5500.00
Top Width (ft)	60.40	Top Width (ft)		60.40
Vel Total (ft/s)	14.35	Avg. Vel. (ft/s)		14.35
Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)		6.35
Conv. Total (cfs)	74678.6	Conv. (cfs)		74678.6
Length Wtd. (ft)	368.03	Wetted Per. (ft)		64.63
Min Ch El (ft)	1924.34	Shear (lb/sq ft)		2.01
Alpha	1.00	Stream Power (lb/ft s)	1135.60	0.00 / 0.00
Frctn Loss (ft)	2.00	Cum Volume (acre-ft)	14.93	79.16 / 13.75
C & E Loss (ft)	0.41	Cum SA (acres)	6.59	10.55 / 6.14

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: FW
REACH: FW RS: 8320

INPUT
Description: X-section 10 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1937.36	1049.49	1936.26	1095.06	1934.26	1144.27	1932.26	1220.49	1930.39
1220.83	1930.26	1228.41	1928.26	1235.7	1926.26	1237.99	1925.61	1249.9	1924.26
1252.38	1923.96	1254.61	1924.26	1271.01	1926.26	1272.95	1926.49	1279.8	1927.8
1285.65	1928.26	1306.65	1930.26	1322.46	1932.26	1329.96	1933.29	1344.12	1934.26
1372.27	1936.26	1402.27	1938.26	1409.32	1938.72	1418.36	1939.14	1426.01	1940.26
1436.49	1941.26	1496.07	1942.26	1580.86	1943.11	1671.03	1944.26	1677.54	1944.52
1685.16	1944.66	1718.9	1946.26						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.035	1220.49	.03	1306.65	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1220.49 1306.65 120 120 120 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1934.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.82	Wt. n-Val.	0.035	0.030	0.035
W.S. Elev (ft)	1932.43	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)	1932.43	Flow Area (sq ft)	84.57	463.60	18.60
E.G. Slope (ft/ft)	*0.005458	Area (sq ft)	84.57	463.60	18.60
Q Total (cfs)	5500.00	Flow (cfs)	274.31	5164.19	61.51
Top Width (ft)	183.61	Top Width (ft)	80.40	86.16	17.05
Vel Total (ft/s)	9.70	Avg. Vel. (ft/s)	3.24	11.14	3.31
Max Chl Dpth (ft)	8.47	Hydr. Depth (ft)	1.05	5.38	1.09
Conv. Total (cfs)	74444.3	Conv. (cfs)	3712.8	69898.9	832.5
Length Wtd. (ft)	120.00	Wetted Per. (ft)	80.43	87.29	17.18
Min Ch El (ft)	1923.96	Shear (lb/sq ft)	0.36	1.81	0.37
Alpha	1.24	Stream Power (lb/ft s)	1718.90	0.00	0.00
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	14.56	75.59	13.67
C & E Loss (ft)	0.05	Cum SA (acres)	6.24	9.94	6.08

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: FW
REACH: FW RS: 8200

INPUT
Description: 8200
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1937.82	3.6581	937.838	10.6881	937.934	19.7231	938.023	20.9691	938.058
29.6781	937.831	41.0151	937.492	43.7331	937.428	44.6641	937.407	45.484	1937.36
47.7651	937.247	70.8731	936.194	76.421	935.774	80.1531	935.466	85.5271	935.228
96.2841	934.653	109.7221	934.061	121.6841	933.445	129.993	1933.07	147.0811	932.337
150.484	1932.13	159.1321	931.786	171.7981	931.641	172.4861	931.644	176.2051	931.575
197.891	931.208	200.14	1931.31	207.2751	931.405	215.4191	931.054	223.2911	930.635
238.404	1930.16	239.6571	930.113	243.561	928.243	251.3841	924.516	252.5161	924.447
260.111	923.987	262.0981	923.188	264.9271	921.795	279.1551	922.147	279.7531	922.158
285.4441	923.947	288.8411	924.505	293.9851	926.031	300.481	927.722	301.7351	928.178
308.1061	928.621	321.971	929.582	323.1111	929.671	324.8981	929.797	326.1821	929.909
342.5171	931.044	342.9141	931.073	347.3781	931.407	350.2991	931.558	359.656	1932.29
372.8841	933.413	373.621	933.478	385.3711	934.642	396.29	1935.73	398.941	935.916
412.717	1936.97	414.8221	937.122						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	239.657	.04	301.735	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
239.657 301.735 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1933.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1931.73	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1931.18	Flow Area (sq ft)	45.03	448.31	89.83
E.G. Slope (ft/ft)	*0.006424	Area (sq ft)	45.03	448.31	89.83
Q Total (cfs)	5500.00	Flow (cfs)	126.55	4852.42	521.02
Top Width (ft)	188.39	Top Width (ft)	75.56	62.08	50.75
Vel Total (ft/s)	9.43	Avg. Vel. (ft/s)	2.81	10.82	5.80
Max Chl Dpth (ft)	9.93	Hydr. Depth (ft)	0.60	7.22	1.77
Conv. Total (cfs)	68618.9	Conv. (cfs)	1578.9	60539.6	6500.4
Length Wtd. (ft)	100.00	Wetted Per. (ft)	75.59	64.68	50.88
Min Ch El (ft)	1921.80	Shear (lb/sq ft)	0.24	2.78	0.71
Alpha	1.20	Stream Power (lb/ft s)	414.82	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	14.38	74.33	13.52
C & E Loss (ft)	0.18	Cum SA (acres)	6.03	9.73	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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 8100.*

INPUT
Description:
Station Elevation Data num= 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1937.05	4.27	1936.95	7	1936.89	9.01	1936.8	12.47	1936.76
19.96	1936.67	23.01	1936.65	24.47	1936.65	28.4	1936.56	29.58	1936.53
31.21	1936.48	33.18	1936.36	34.63	1936.34	46.76	1936.15	47.86	1936.13
51.03	1936.07	52.12	1936.05	52.84	1936.03	53.07	1936.02	55.74	1935.92
56.96	1935.88	74.73	1935.27	82.7	1934.99	89.17	1934.68	91.16	1934.58
93.53	1934.47	96.61	1934.38	99.8	1934.31	112.25	1933.97	112.35	1933.97
118.5	1933.81	125.25	1933.65	128.03	1933.58	140.38	1933.26	141.99	1933.21
151.17	1932.95	151.69	1932.94	157.16	1932.82	159.24	1932.64	168.92	1932.1
171.63	1931.94	174.99	1931.7	175.6	1931.67	179.66	1931.52	184.16	1931.39
185.69	1931.35	200.47	1931.11	201.27	1931.1	201.63	1931.09	205.61	1931.03
206.98	1931.01	225.06	1929.68	225.71	1929.63	226.32	1929.58	226.33	1929.58
230.92	1929.55	233.54	1929.61	237.15	1929.63	241.87	1929.72	246.15	1929.69
249.85	1929.68	251.37	1929.61	260.56	1929.17	261.75	1929.13	271.71	1928.64
278.19	1928.44	279.52	1928.39	279.65	1928.39	279.97	1928.27	280.55	1928.09
284.64	1926.74	292.17	1924.26	294.63	1923.62	296.08	1923.43	302.29	1922.59
305.78	1922.35	307.07	1922.09	308.32	1921.82	311.29	1921.08	311.93	1920.92
321.07	1922.4	321.46	1922.46	325.11	1923.88	327.29	1924.47	330.6	1925.7
331.28	1925.94	334.77	1927.13	335.58	1927.47	340.83	1927.83	346.35	1928.31
347.09	1928.37	352.54	1928.5	364.85	1929.04	369.34	1929.23	369.8	1929.26
371.73	1929.35	374.75	1929.48	376.92	1929.59	377.35	1929.61	381.29	1929.88
382.6	1930.05	389.11	1930.81	396.28	1931.74	398.67	1931.76	400.41	1931.8
401.64	1932.02	404.55	1932.15	405.22	1932.19	412.77	1932.54	415.65	1932.66
417.71	1932.75	418.13	1932.77	419.3	1932.83	419.54	1932.86	433.54	1933.23
434.95	1933.27	435.88	1933.3	452.01	1933.79	453.65	1933.83	455.14	1933.89
455.91	1933.92	457.15	1933.95	471.41	1934.42	472.12	1934.45	477.03	1934.79
477.42	1934.81	489.05	1935.12	489.16	1935.12	489.34	1935.13	493.91	1935.26
495.49	1935.32	499.98	1935.44	506.75	1935.65	506.78	1935.68	517.8	1937.29
523.28	1938.07	524.34	1938.22	524.58	1938.25	524.65	1938.25	525.24	1938.35
525.74	1938.42	526.84	1938.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	279.65	.04	335.58	.03

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        279.65  335.58              100     100     100             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1932.69  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.04  * Wt. n-Val.             *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1931.65  * Reach Len. (ft)        *  100.00  *  100.00  *  100.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *  164.10  *  433.71  *  145.65  *
* E.G. Slope (ft/ft)     *0.004117  * Area (sq ft)           *  164.10  *  433.71  *  145.65  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)             *  708.76  * 3956.86  *  834.38  *
* Top Width (ft)         *  219.41  * Top Width (ft)         *  103.48  *   55.93  *   60.00  *
* Vel Total (ft/s)       *    7.40  * Avg. Vel. (ft/s)       *    4.32  *    9.12  *    5.73  *
* Max Chl Dpth (ft)      *   10.73  * Hydr. Depth (ft)       *    1.59  *    7.75  *    2.43  *
* Conv. Total (cfs)      * 85720.2  * Conv. (cfs)            * 11046.4  * 61669.5  * 13004.2  *
* Length Wtd. (ft)       *  100.00  * Wetted Per. (ft)       *  103.57  *   57.91  *   60.18  *
* Min Ch El (ft)         * 1920.92  * Shear (lb/sq ft)       *    0.41  *    1.92  *    0.62  *
* Alpha                  *    1.23  * Stream Power (lb/ft s) *  526.84  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.28  * Cum Volume (acre-ft)   *   14.14  *   73.32  *   13.25  *
* C & E Loss (ft)        *    0.15  * Cum SA (acres)         *    5.82  *    9.60  *    5.86  *
*********************************************************************************************

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: FW
REACH: FW                RS: 8000

INPUT
Description: 8000
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01936.271   8.0031935.919  10.3031935.706  22.8191935.348  32.457 1935.15
  33.8161935.121  35.672 1935.05  37.9261934.857  53.443 1934.78  60.3941934.681
  65.106 1934.56  85.414 1934.03 104.2011933.517 110.4241933.416 128.3051933.289
  135.451933.197 143.1661933.131 160.4631933.004 172.7951932.809 179.6421932.766
 182.0131932.482 193.0821931.772 200.0141931.239  205.35 1931.04 210.4981930.941
 230.465 1930.55 236.5791930.467 257.2511928.058 257.996 1927.97 258.6891927.886
 258.7011927.888 271.0631927.907 281.3521928.135 285.5831928.248 299.1831927.651
 310.5761926.955 319.4991926.665  319.651926.659 320.0371926.556 320.7391926.409
 334.8821923.083 337.886 1922.73 347.2011921.022 353.0181920.591 358.1561920.121
 358.935 1920.05 367.5151925.568 369.4211926.765 376.8141927.267 385.6331928.094
 393.3091928.122 410.651  1928.7 416.9781928.906 428.2631929.295  433.821929.675
 435.662 1929.96 444.8351931.204 454.9351932.777 458.2931932.715 460.7481932.733
 462.4781933.119 482.2271933.824 485.7111933.962 487.3681934.028 487.693 1934.07
 509.4111934.187 510.7131934.201  533.441934.354 535.7461934.362 537.8571934.413
 560.7671934.526 561.7751934.544 569.2421934.961 585.6221934.885 585.7821934.884
 586.029 1934.89 592.461 1934.88 610.5511935.068 610.5991935.136 626.1251937.862
 635.3341939.415 635.6681939.479 635.772 1939.47 636.5991939.648  637.311939.764
  638.851940.195

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  319.65     .04 369.421     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        319.65 369.421              100     100     100             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1932.26  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.53  * Wt. n-Val.             *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1931.73  * Reach Len. (ft)        *  100.00  *  100.00  *  100.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *  339.40  *  441.04  *  231.70  *
* E.G. Slope (ft/ft)     *0.001973  * Area (sq ft)           *  339.40  *  441.04  *  231.70  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)             * 1443.49  * 3012.42  * 1044.10  *
* Top Width (ft)         *  254.62  * Top Width (ft)         *  126.05  *   49.77  *   78.80  *
* Vel Total (ft/s)       *    5.43  * Avg. Vel. (ft/s)       *    4.25  *    6.83  *    4.51  *
* Max Chl Dpth (ft)      *   11.68  * Hydr. Depth (ft)       *    2.69  *    8.86  *    2.94  *
* Conv. Total (cfs)      *123822.3  * Conv. (cfs)            * 32497.5  * 67819.0  * 23505.9  *
* Length Wtd. (ft)       *  100.00  * Wetted Per. (ft)       *  126.27  *   52.37  *   79.04  *
* Min Ch El (ft)         * 1920.05  * Shear (lb/sq ft)       *    0.33  *    1.04  *    0.36  *
* Alpha                  *    1.16  * Stream Power (lb/ft s) *  638.85  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.27  * Cum Volume (acre-ft)   *   13.57  *   72.32  *   12.82  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *    5.56  *    9.47  *    5.70  *
*********************************************************************************************

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: FW
REACH: FW                RS: 7900.*

INPUT
Description:
Station Elevation Data    num=     164
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
```

```
       0 1935.96    6.88 1935.52    6.98 1935.52    8.32 1935.47    8.99 1935.42
   13.66 1935.28    19.9 1935.11   21.52 1935.07   21.91 1935.06   28.31 1934.81
   29.48 1934.76   29.49 1934.76   31.11  1934.7   33.08 1934.56   34.56 1934.52
    36.2 1934.46   46.61    1934   47.77 1933.94   52.68 1933.78   56.79 1933.62
   57.43 1933.59   64.63 1933.36    67.4 1933.32    74.5  1933.1   90.88 1932.59
   95.23 1932.48   96.31 1932.46   96.79 1932.45  111.91 1932.24  116.81 1932.15
  118.14 1932.13  124.87 1932.04  126.15 1932.02  126.45 1932.01  127.17    1932
   133.8 1931.94  139.96 1931.78  147.28 1931.56  150.71 1931.48  152.71 1931.44
  155.52 1931.38  156.68 1931.35  158.75 1931.18  168.41 1930.66  174.45 1930.29
  179.11 1930.11   180.3 1930.07   183.6 1929.97  184.88 1929.93  187.23 1929.88
  189.27  1929.8  201.01 1929.46  201.63 1929.44  203.32 1929.49  206.34 1929.58
  214.25 1929.35  218.59 1929.43  223.37 1929.41  224.37  1929.4  225.02 1929.39
  225.63 1929.38  225.64 1929.38  231.97 1929.73  236.42 1929.65   245.4 1929.61
   246.1  1929.6  249.09 1929.64     251 1929.59  255.63 1929.35  260.95 1929.02
  270.88 1928.31  274.27 1928.13  275.88 1928.07  276.27 1928.02  278.67 1927.46
   278.8 1927.43  279.14  1927.3  279.75  1927.1   292.1 1922.83  294.72  1922.1
  298.19 1921.01  300.58 1920.25  301.23 1920.18  302.86    1920  307.94 1919.76
  312.43 1919.51  313.11 1919.47  317.18 1921.64   323.6 1925.17  325.93 1926.43
  331.71 1926.84  332.93 1926.93  336.76 1927.26  341.27 1927.65  345.09  1927.8
  348.53 1927.91  349.78 1927.97  352.88 1928.06  358.37 1928.16  364.93 1928.28
  370.91 1928.38   380.9 1928.55  381.59 1928.56  383.92 1928.64  384.12 1928.65
  386.84 1928.79  388.59 1928.95  389.92 1929.07   391.7 1929.21  394.12 1929.18
  397.26 1929.15  398.37 1929.15  405.71 1929.95  406.81 1930.08  409.99 1930.15
  410.66 1930.17  412.31 1930.24  413.05 1930.36  413.95 1930.47  421.43 1930.64
  427.36 1930.87  432.63 1931.01  433.01 1931.02  435.92  1931.1  437.49 1931.15
  437.51 1931.15   437.8 1931.18  458.34 1931.65  459.52 1931.68  459.57 1931.68
  481.06 1932.24  483.25 1932.29   485.1 1932.36  485.24 1932.36  486.19 1932.39
  489.14 1932.47  491.11 1932.51  506.91 1932.79  507.86 1932.82  510.11 1932.92
  513.01 1933.06  513.73 1933.09  514.93 1933.15  521.69 1933.25  530.42 1933.39
  530.57 1933.39   530.8  1933.4   532.9 1933.44  536.89 1933.54  540.88 1933.67
  546.93 1933.93     554 1934.47  554.04  1934.5  557.21 1935.02  566.57 1936.65
  568.73 1937.07     570 1937.31  577.44 1938.06  577.75  1938.1  577.85 1938.09
  578.63 1938.19   579.3 1938.26  580.29 1938.41  580.76 1938.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03   278.8     .04  325.93     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         278.8  325.93              100     100     100             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1931.94  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.04  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1930.90  * Reach Len. (ft)       *  100.00  *  100.00  *  100.00  *
* Crit W.S. (ft)         * 1930.44  * Flow Area (sq ft)     *  160.12  *  396.92  *  221.16  *
* E.G. Slope (ft/ft)     *0.004019  * Area (sq ft)          *  160.12  *  396.92  *  221.16  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)           *  626.74  * 3715.94  * 1157.32  *
* Top Width (ft)         *  264.66  * Top Width (ft)       *  114.89  *   47.13  *  102.64  *
* Vel Total (ft/s)       *    7.07  * Avg. Vel. (ft/s)     *    3.91  *    9.36  *    5.23  *
* Max Chl Dpth (ft)      *   11.43  * Hydr. Depth (ft)     *    1.39  *    8.42  *    2.15  *
* Conv. Total (cfs)      * 86752.0  * Conv. (cfs)          *  9885.7  * 58611.7  * 18254.5  *
* Length Wtd. (ft)       *  100.00  * Wetted Per. (ft)     *  115.06  *   50.08  *  102.80  *
* Min Ch El (ft)         * 1919.47  * Shear (lb/sq ft)     *    0.35  *    1.99  *    0.54  *
* Alpha                  *    1.34  * Stream Power (lb/ft s) *  580.76  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.50  * Cum Volume (acre-ft) *   12.99  *   71.35  *   12.30  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)       *    5.28  *    9.36  *    5.49  *
*************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 7800

INPUT
Description: 7800
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01935.645   5.869 1935.12     7.11935.155  11.6611934.999   18.371934.832
  18.697 1934.82  25.1591934.408  29.4921934.198  30.8971934.073  40.7721933.118
  49.0151932.649  55.1591932.392  57.5251932.401  81.2761931.532  82.6061931.478
  99.6931931.087 107.6651930.921  107.921930.912 108.5371930.887 114.1961930.817
 125.7031930.251  130.331930.085 132.7331929.981 153.8821929.132 157.7941928.957
 159.7951928.894 161.5331928.778 172.0871928.339  173.531928.466 182.8561929.286
 186.5581930.022  190.641930.636 197.9761931.558 210.036 1931.05  214.221931.029
 218.1741930.777 234.079 1929.43 235.454 1929.37 235.7891929.287 237.9471928.194
 254.5241920.011 256.571    1919 257.1211918.993 267.2781918.883 272.0971921.083
 282.4491926.098 287.8891926.502 292.654 1926.87 300.5111927.487 304.9321927.767
 307.8541927.841 313.0231927.857 334.2621927.839 337.1141927.813 337.2991927.821
 342.7691927.987 344.445 1928.02  346.731927.601 350.7331926.911 357.6511927.314
 362.3151927.625 364.5741927.809 372.4681927.884 378.0591928.118 383.3851928.205
 387.633 1928.27 408.3821929.155 432.4941930.306  433.52 1930.36 436.305  1930.5
  438.161930.573 456.0711931.156 458.8081931.262 459.4811931.288 466.9891931.571
 477.5521931.984 485.0781932.415 490.783 1932.87  500.471934.315 509.291 1935.84
 512.5271936.536 522.227 1936.77 522.673 1936.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03 237.947     .04 282.449     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       237.947 282.449              100     100     100             .1       .3
Left Levee      Station=  197.98      Elevation= 1931.56
```

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1931.39	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 1.51	* Wt. n-Val.	* 0.030	* 0.040	* 0.030	*
* W.S. Elev (ft)	* 1929.88	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00	*
* Crit W.S. (ft)	* 1929.88	* Flow Area (sq ft)	* 4.53	* 347.07	* 269.15	*
* E.G. Slope (ft/ft)	*0.006421	* Area (sq ft)	* 4.53	* 347.07	* 269.15	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 10.96	* 3848.43	* 1640.61	*
* Top Width (ft)	* 194.90	* Top Width (ft)	* 9.22	* 44.50	* 141.18	*
* Vel Total (ft/s)	* 8.86	* Avg. Vel. (ft/s)	* 2.42	* 11.09	* 6.10	*
* Max Chl Dpth (ft)	* 11.00	* Hydr. Depth (ft)	* 0.49	* 7.80	* 1.91	*
* Conv. Total (cfs)	* 68635.7	* Conv. (cfs)	* 136.7	* 48025.4	* 20473.6	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 9.51	* 48.28	* 141.42	*
* Min Ch El (ft)	* 1918.88	* Shear (lb/sq ft)	* 0.19	* 2.88	* 0.76	*
* Alpha	* 1.24	* Stream Power (lb/ft s)	* 522.67	* 197.98	* 0.00	*
* Frctn Loss (ft)	* 0.57	* Cum Volume (acre-ft)	* 12.80	* 70.50	* 11.74	*
* C & E Loss (ft)	* 0.11	* Cum SA (acres)	* 5.14	* 9.26	* 5.21	*

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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: FW
REACH: FW   RS: 7700.*

INPUT
Description:
Station Elevation Data   num=   126

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1932.42	4.3	1932.11	5.2	1932.12	8.54	1932	10.77	1931.94
13.46	1931.88	13.7	1931.87	18.43	1931.64	21.61	1931.51	22.64	1931.44
23.44	1931.38	29.87	1930.91	35.91	1930.62	40.41	1930.46	42.15	1930.45
50.15	1930.19	59.55	1929.8	60.52	1929.76	63.6	1929.66	73.04	1929.39
78.88	1929.24	79.07	1929.23	79.52	1929.21	83.67	1929.12	89.5	1928.85
92.1	1928.72	95.49	1928.57	97.25	1928.48	103.76	1928.18	112.74	1927.79
115.61	1927.66	117.08	1927.6	118.35	1927.52	126.08	1927.18	127.14	1927.23
128.88	1927.31	133.97	1927.55	136.68	1927.88	139.68	1928.15	145.05	1928.55
153.89	1928.18	156.95	1928.13	157.35	1928.11	159.85	1927.97	171.5	1927.14
171.57	1927.13	172.51	1927.09	172.75	1927.04	174.34	1926.47	187.5	1920.76
191.53	1918.99	192.64	1918.5	193.65	1918.25	194.22	1918.23	195.8	1918.2
204.76	1918.01	208.82	1920.15	208.89	1920.19	213.62	1922.74	215.56	1924.02
217.76	1925.3	222.2	1925.78	223.11	1925.87	223.65	1925.92	225.4	1926.01
227.79	1926.13	235.52	1926.53	239.87	1926.71	242.75	1926.78	247.15	1926.83
247.83	1926.84	259.24	1926.9	261.5	1926.89	268.72	1926.71	271.53	1926.63
271.71	1926.63	276.4	1926.6	277.09	1926.59	278.74	1926.57	280.99	1926.31
281.56	1926.25	282.01	1926.2	282.21	1926.19	283.12	1926.1	284.92	1925.93
287.96	1926.01	290.66	1926.16	291.73	1926.22	296.32	1926.49	297.9	1926.59
298.54	1926.62	306.3	1926.66	310.57	1926.75	311.8	1926.78	317.04	1926.83
321.22	1926.87	323.34	1926.92	335.62	1927.25	341.63	1927.43	348.78	1927.65
360.45	1927.86	365.35	1927.95	366.36	1927.97	369.1	1928.02	370.92	1928.04
374.09	1928.08	388.54	1928.69	391.23	1928.81	391.89	1928.84	396.48	1929.05
399.28	1929.13	401.68	1929.2	406.61	1929.91	409.67	1930.3	417.07	1931.32
422.68	1932.16	425.39	1932.66	432.21	1933.9	439.22	1935.26	439.45	1935.3
439.6	1935.32	440.89	1935.5	444.07	1936	448.12	1936.25	453.61	1936.31
454.05	1936.32								

Manning's n Values   num=   3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	174.34	.04	217.76	.03

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        174.34 217.76   100   100   100   .1   .3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1930.04	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 1.14	* Wt. n-Val.	* 0.030	* 0.040	* 0.030	*
* W.S. Elev (ft)	* 1928.90	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00	*
* Crit W.S. (ft)	* 1928.90	* Flow Area (sq ft)	* 84.70	* 343.32	* 325.39	*
* E.G. Slope (ft/ft)	*0.005176	* Area (sq ft)	* 84.70	* 343.32	* 325.39	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 298.21	* 3452.97	* 1748.83	*
* Top Width (ft)	* 304.92	* Top Width (ft)	* 85.99	* 43.42	* 175.51	*
* Vel Total (ft/s)	* 7.30	* Avg. Vel. (ft/s)	* 3.52	* 10.06	* 5.37	*
* Max Chl Dpth (ft)	* 10.89	* Hydr. Depth (ft)	* 0.98	* 7.91	* 1.85	*
* Conv. Total (cfs)	* 76451.1	* Conv. (cfs)	* 4145.1	* 47996.9	* 24309.1	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 86.23	* 47.03	* 175.65	*
* Min Ch El (ft)	* 1918.01	* Shear (lb/sq ft)	* 0.32	* 2.36	* 0.60	*
* Alpha	* 1.38	* Stream Power (lb/ft s)	* 454.05	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.54	* Cum Volume (acre-ft)	* 12.70	* 69.71	* 11.06	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 5.03	* 9.16	* 4.84	*

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: FW
REACH: FW RS: 7600

INPUT
Description: 7600
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01929.193	6.8381928.963	14.885	1928.8	31.851928.374	40.3951927.939				
56.8421927.284	65.8991926.732	81.8551925.937	99.9391925.227	108.9671924.843					
110.7251924.744	124.3591919.593	129.691917.526	132.9551917.427	142.2421917.137					
145.619 1919.26	149.6191921.725	151.2371923.188	153.0641924.508	157.4341925.128					
158.8611925.301	160.5781925.348	181.9691925.815	193.8591925.947	196.081925.929					
210.7281925.227	215.8031924.989	216.2481924.979	216.4471924.984	217.3391924.969					
222.1031924.931	224.7531925.071	231.881925.428	244.3351925.444	256.8881925.479					
268.9681925.607	281.9091925.802	293.3811925.651	306.7981925.473	328.8141926.627					
333.9291926.725	338.7761927.957	357.2471932.032	370.851934.972	371.0681935.017					
371.2241935.029	379.6031935.866	385.4321935.859							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	110.725	.04	153.064	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
110.725 153.064 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1928.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1927.45	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1927.45	Flow Area (sq ft)	82.16	319.95	333.33
E.G. Slope (ft/ft)	0.005677	Area (sq ft)	82.16	319.95	333.33
Q Total (cfs)	5500.00	Flow (cfs)	386.65	3264.29	1849.05
Top Width (ft)	283.98	Top Width (ft)	57.94	42.34	183.70
Vel Total (ft/s)	7.48	Avg. Vel. (ft/s)	4.71	10.20	5.55
Max Chl Dpth (ft)	10.31	Hydr. Depth (ft)	1.42	7.56	1.81
Conv. Total (cfs)	72998.5	Conv. (cfs)	5131.8	43325.1	24541.5
Length Wtd. (ft)	100.00	Wetted Per. (ft)	58.01	45.97	183.92
Min Ch El (ft)	1917.14	Shear (lb/sq ft)	0.50	2.47	0.64
Alpha	1.32	Stream Power (lb/ft s)	385.43	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	12.51	68.95	10.30
C & E Loss (ft)	0.14	Cum SA (acres)	4.86	9.06	4.43

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: FW
REACH: FW RS: 7500.*

INPUT
Description:
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.85	4.1	1928.75	8.3	1928.62	18.08	1928.39	20.22	1928.34
26.79	1928.19	38.68	1927.98	41.52	1927.9	49.06	1927.55	54.59	1927.33
62.8	1926.96	69.03	1926.63	74.75	1926.27	80.03	1926.14	84.08	1926.05
94.58	1925.56	99.4	1925.39	105.77	1925.2	114.95	1925.17	121.37	1924.99
126.66	1924.83	132.33	1924.64	133.46	1924.6	134.46	1924.55	144.41	1919.32
146.28	1918.33	146.38	1918.32	147.05	1918.21	147.79	1918.09	149.98	1917.75
152.2	1917.39	152.9	1917.34	153.01	1917.31	153.94	1917.3	155.09	1917.28
156.2	1917.23	156.43	1917.21	160.03	1917.03	165.28	1916.78	167.65	1918.11
169.12	1919	173.67	1921.71	175.5	1923.04	177.58	1924.37	181.58	1924.72
181.63	1924.72	182.88	1924.82	184.45	1924.85	189.57	1924.96	191.46	1925.23
191.74	1925.31	200.95	1924.88	202.82	1924.84	204	1924.82	204.15	1924.81
214.86	1924.48	216.89	1924.4	218.75	1924.28	223.31	1924	224.03	1923.98
229.94	1923.75	230.28	1923.74	231.1	1923.73	234.92	1923.63	235.33	1923.63
235.51	1923.63	236.32	1923.62	240.68	1923.61	243.1	1923.68	249.61	1923.86
252.28	1923.87	257.21	1923.87	260.41	1923.95	260.99	1923.96	272.47	1924.24
283.51	1924.55	284.86	1924.59	295.33	1924.74	305.82	1924.72	312.39	1924.71
312.52	1924.71	314.46	1924.73	318.08	1924.77	338.2	1925.73	338.68	1925.74
340.11	1925.79	341.81	1925.89	342.87	1925.95	347.3	1926.78	364.19	1929.61
366.13	1929.94	366.79	1930.03	367.18	1930.09	367.58	1930.12	370.96	1930.85
376.62	1931.91	376.82	1931.95	376.96	1931.96	384.62	1932.91	388.1	1933.15
389.94	1933.21								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	134.46	.04	177.58	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
134.46 177.58 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1927.89	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.69	Wt. n-Val.	0.030	0.040	0.030	
W.S. Elev (ft)	1927.20	Reach Len. (ft)	100.00	100.00	100.00	
Crit W.S. (ft)		Flow Area (sq ft)	115.65	338.43	443.64	
E.G. Slope (ft/ft)	0.003302	Area (sq ft)	115.65	338.43	443.64	
Q Total (cfs)	5500.00	Flow (cfs)	431.93	2697.20	2370.87	
Top Width (ft)	292.20	Top Width (ft)	76.88	43.12	172.20	
Vel Total (ft/s)	6.13	Avg. Vel. (ft/s)	3.73	7.97	5.34	
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)	1.50	7.85	2.58	
Conv. Total (cfs)	95711.3	Conv. (cfs)	7516.4	46936.8	41258.0	
Length Wtd. (ft)	100.00	Wetted Per. (ft)	76.93	46.91	172.44	
Min Ch El (ft)	1916.78	Shear (lb/sq ft)	0.31	1.49	0.53	
Alpha	1.19	Stream Power (lb/ft s)	389.94	0.00	0.00	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	12.28	68.19	9.41	
C & E Loss (ft)	0.08	Cum SA (acres)	4.71	8.96	4.02	

CROSS SECTION

RIVER: FW
REACH: FW RS: 7400

INPUT
Description: 7400
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01928.499	4.8291928.416	23.7941927.916	31.5251927.758	48.8481927.536					
64.231926.897	73.89 1926.44	87.9481925.541	98.921 1925.54	111.2741924.977					
124.4471924.663	135.2411924.905	149.0171924.624	157.0171924.411	158.202 1924.36					
167.926 1917.74	169.7531916.485	169.851916.496	170.4971916.529	173.3681916.773					
175.5361916.944	176.2141917.104	177.2311917.103	178.3581917.104	179.6661917.007					
183.1871916.763	188.3151916.429	190.971917.781	202.11924.231	205.7691924.312					
212.9571924.446	214.668 1924.95	214.9221925.093	223.2651924.013	224.9591923.897					
226.1691923.811	239.3881922.731	243.5231922.408	244.1691922.399	249.5271922.259					
250.5721922.272	269.7631922.306	274.228 1922.3	277.1251922.459	299.273 1923.56					
324.2071923.856	324.3221923.859	326.0791923.931	348.0181924.852	349.3161924.917					
350.861925.073	372.887 1927.38	373.4851927.406	373.8321927.445	374.1991927.401					
377.2581928.066	392.7841930.429	394.4551930.557							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	158.202	.04	202.1	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
158.202	202.1	77.52	100	117	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1927.56	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.43	Wt. n-Val.	0.030	0.040	0.030	
W.S. Elev (ft)	1927.14	Reach Len. (ft)	77.52	100.00	117.00	
Crit W.S. (ft)		Flow Area (sq ft)	174.67	364.29	567.71	
E.G. Slope (ft/ft)	0.001858	Area (sq ft)	174.67	364.29	567.71	
Q Total (cfs)	5500.00	Flow (cfs)	541.64	2238.63	2719.74	
Top Width (ft)	312.04	Top Width (ft)	99.70	43.90	168.45	
Vel Total (ft/s)	4.97	Avg. Vel. (ft/s)	3.10	6.15	4.79	
Max Chl Dpth (ft)	10.71	Hydr. Depth (ft)	1.75	8.30	3.37	
Conv. Total (cfs)	127611.5	Conv. (cfs)	12567.1	51940.8	63103.5	
Length Wtd. (ft)	103.39	Wetted Per. (ft)	99.77	48.45	168.87	
Min Ch El (ft)	1916.43	Shear (lb/sq ft)	0.20	0.87	0.39	
Alpha	1.12	Stream Power (lb/ft s)	394.46	0.00	0.00	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	11.95	67.38	8.25	
C & E Loss (ft)	0.04	Cum SA (acres)	4.51	8.86	3.63	

CROSS SECTION

RIVER: FW
REACH: FW RS: 7300.*

INPUT
Description:
Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0 1928.84	.03 1928.84	.89 1928.82	5.01 1928.8	10.84 1928.74					
13.59 1928.69	18.79 1928.53	22.56 1928.44	24.69 1928.46	27.71 1928.49					
28.66 1928.39	30.5 1928.32	32.71 1928.11	45.73 1926.94	46.85 1926.91					
49.92 1926.77	50.69 1926.74	65.68 1925.87	66.65 1925.79	71.41 1925.38					
76.68 1925.09	78.23 1924.99	88.75 1924.42	91.26 1924.3	93.06 1924.27					
98.92 1924.56	102.65 1924.73	104.05 1924.76	110.3 1925.06	110.98 1925.03					
114.49 1924.8	115.47 1924.75	118.19 1924.66	120.75 1924.63	122.16 1924.59					
123.59 1924.57	129.14 1924.55	139.7 1924.73	140.34 1924.72	148.46 1924.48					
154.64 1924.35	159.28 1924.24	162.94 1924	164.17 1923.9	171.74 1919.95					
174.12 1918.72	177.47 1917.82	179.1 1917.38	179.97 1917.14	180.1 1917.14					
180.99 1917.14	184.92 1917.18	185.61 1917.18	187.88 1917.21	188.81 1917.28					
190.2 1917.26	191.74 1917.24	191.96 1917.23	193.53 1917.13	194.17 1917.08					
198.35 1916.86	204.71 1916.52	205.37 1916.49	206.29 1916.86	207.07 1917.18					
208.32 1917.73	220.68 1923.61	223.58 1923.76	229.27 1924.03	230.62 1924.34					
230.82 1924.42	237.43 1924.12	238.77 1924.11	239.73 1924.1	242.45 1924.06					
250.19 1923.75	252.29 1923.67	253.46 1923.59	253.97 1923.58	258.21 1923.42					
259.04 1923.41	259.45 1923.4	260.61 1923.38	260.99 1923.35	261.6 1923.35					
268.7 1923.47	274.23 1923.54	277.76 1923.58	280.06 1923.69	283.3 1923.82					
285.33 1923.94	297.58 1924.66	305.98 1924.95	317.32 1925.31	317.41 1925.32					

```
   318.8 1925.39  321.46 1925.52  336.16 1926.33  337.19 1926.39  338.41  1926.5
  354.71 1928.05  355.85 1928.15  356.32 1928.17  356.59 1928.19  356.89 1928.18
  357.59 1928.29  358.93 1928.51  359.31 1928.57  362.63 1928.94  371.59 1929.95
  372.92 1930.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  164.17     .04  220.68     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        164.17  220.68             77.52     100     117             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1927.27  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.80  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1926.48  * Reach Len. (ft)       *   77.52  *  100.00  *  117.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)     *  179.58  *  441.16  *  243.97  *
* E.G. Slope (ft/ft)     *0.003401  * Area (sq ft)          *  179.58  *  441.16  *  243.97  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *  723.43  * 3630.31  * 1146.25  *
* Top Width (ft)         *  282.87  * Top Width (ft)        *  108.91  *   56.51  *  117.45  *
* Vel Total (ft/s)       *    6.36  * Avg. Vel. (ft/s)      *    4.03  *    8.23  *    4.70  *
* Max Chl Dpth (ft)      *    9.98  * Hydr. Depth (ft)      *    1.65  *    7.81  *    2.08  *
* Conv. Total (cfs)      * 94312.9  * Conv. (cfs)           * 12405.3  * 62251.9  * 19655.7  *
* Length Wtd. (ft)       *   99.38  * Wetted Per. (ft)      *  109.03  *   59.59  *  117.61  *
* Min Ch El (ft)         * 1916.49  * Shear (lb/sq ft)      *    0.35  *    1.57  *    0.44  *
* Alpha                  *    1.27  * Stream Power (lb/ft s) *  372.92  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.45  * Cum Volume (acre-ft)  *   11.63  *   66.46  *    7.16  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)        *    4.32  *    8.75  *    3.25  *
*************************************************************************************************

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: FW
REACH: FW                RS: 7200

INPUT
Description: 7200
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01929.176    .0281929.178    .9211929.159  11.2291929.203  14.0881929.178
  19.4741928.997  23.3761928.912  28.722 1929.12  29.7031928.938  31.604 1928.83
  47.397 1926.29  48.5541926.229  51.7361926.003  68.0721924.799   74.011924.083
  81.0681923.637  91.9711923.146  96.4431922.998 102.5111923.578 107.8321924.048
 114.3071924.907 115.0081924.887  118.651924.575 122.4831924.406 125.1361924.397
 126.5951924.363 128.0781924.357 144.7771924.561 153.8571924.224 165.0681923.971
 170.1341923.448 179.7481919.317 182.7671918.042 189.0791917.829 197.3491917.551
 205.4031917.365 208.2061917.195 221.5881916.581 222.4181916.548 223.4291916.876
 224.2871917.148 239.2531922.987 255.292  1924.6 262.5371924.824 267.8121924.532
 268.6641924.481 268.9431924.428  269.391924.419 274.622 1924.65 285.3731924.986
 286.8721925.082 302.0821926.222 313.4821926.972 337.9671928.861 340.0921928.989
 341.0811929.064 343.7991929.174 351.3791929.518

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03 170.134     .04 239.253     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       170.134 239.253              69     100  115.52             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1926.76  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.45  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1925.32  * Reach Len. (ft)       *   69.00  *  100.00  *  115.52  *
* Crit W.S. (ft)         * 1925.32  * Flow Area (sq ft)     *  129.35  *  467.75  *   43.73  *
* E.G. Slope (ft/ft)     *0.006185  * Area (sq ft)          *  129.35  *  467.75  *   43.73  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *  563.64  * 4782.34  *  154.02  *
* Top Width (ft)         *  228.94  * Top Width (ft)        *  109.08  *   69.12  *   50.74  *
* Vel Total (ft/s)       *    8.58  * Avg. Vel. (ft/s)      *    4.36  *   10.22  *    3.52  *
* Max Chl Dpth (ft)      *    8.77  * Hydr. Depth (ft)      *    1.19  *    6.77  *    0.86  *
* Conv. Total (cfs)      * 69932.1  * Conv. (cfs)           *  7166.6  * 60807.2  *  1958.3  *
* Length Wtd. (ft)       *   96.53  * Wetted Per. (ft)      *  109.33  *   71.45  *   50.86  *
* Min Ch El (ft)         * 1916.55  * Shear (lb/sq ft)      *    0.46  *    2.53  *    0.33  *
* Alpha                  *    1.27  * Stream Power (lb/ft s) *  351.38  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.65  * Cum Volume (acre-ft)  *   11.36  *   65.42  *    6.77  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)        *    4.13  *    8.60  *    3.02  *
*************************************************************************************************

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: FW
REACH: FW                RS: 7100.*

INPUT
Description:
```

Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1930.64	.03	1930.64	.85	1930.6	10.36	1930.31	10.74	1930.3
11.59	1930.12	13	1929.84	15.29	1929.37	17.96	1929.19	21.56	1928.97
24.61	1928.88	26.49	1928.76	27.4	1928.6	29.15	1928.39	43.72	1925.89
44.79	1925.77	46.45	1925.56	47.72	1925.49	49.4	1925.39	50.42	1925.31
51.64	1925.23	57.61	1924.89	59.55	1924.79	62.79	1924.66	66.5	1924.41
68.27	1924.26	74.78	1923.92	82.31	1923.61	84.84	1923.39	86.22	1923.29
88.96	1923.05	94.56	1922.95	96.68	1922.9	99.47	1922.79	100.02	1922.78
105.44	1922.76	106.09	1922.71	107.46	1922.54	109.45	1922.42	112.98	1922.29
114.37	1922.27	115.43	1922.25	116.77	1922.22	118.14	1922.2	123.67	1922.18
133.55	1922.29	139.83	1922.19	141.92	1922.17	150.71	1922.15	152.26	1922.15
156.93	1921.96	164.45	1919.38	165.34	1919.06	167.98	1918.15	173.5	1917.47
174.87	1917.3	180.73	1916.92	181.83	1916.86	187.77	1916.56	190.22	1916.38
190.37	1916.38	197.64	1916.12	201.92	1916.01	202.65	1915.99	203.83	1916.16
204.84	1916.29	209.84	1917.13	213.96	1918.77	214.6	1919.03	217.69	1919.32
217.71	1919.32	222.08	1921.02	222.29	1921.11	222.42	1921.17	229.72	1923.52
231.19	1923.66	238.67	1924.21	246.02	1924.49	251.37	1924.47	252.23	1924.47
252.51	1924.45	252.97	1924.45	256.3	1924.61	258.27	1924.74	259.7	1924.82
263.9	1925.11	269.17	1925.46	270.69	1925.58	286.11	1926.93	287.92	1927.08
297.66	1927.94	300.2	1928.18	303.36	1928.48	304.48	1928.6	305.09	1928.72
306.66	1928.89	307.73	1929.02	308.73	1929.11	310.62	1929.39	311.53	1929.51
313.24	1929.66	314.59	1929.83	315.85	1929.9	317.39	1929.85	318.58	1929.89
320.34	1929.91	322.48	1929.78	323.17	1929.74	324.64	1929.75	325.64	1929.77
325.69	1929.77	328.4	1929.74	329.64	1929.73	332.99	1929.84	336.08	1929.93

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	156.93	.04	222.42	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
156.93	222.42	69	100	115.52	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1925.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1924.25	Reach Len. (ft)	69.00	100.00	115.52
Crit W.S. (ft)	1924.15	Flow Area (sq ft)	136.93	424.71	17.19
E.G. Slope (ft/ft)	0.007401	Area (sq ft)	136.93	424.71	17.19
Q Total (cfs)	5500.00	Flow (cfs)	780.71	4647.19	72.10
Top Width (ft)	171.09	Top Width (ft)	88.40	65.49	17.20
Vel Total (ft/s)	9.50	Avg. Vel. (ft/s)	5.70	10.94	4.19
Max Chl Dpth (ft)	8.26	Hydr. Depth (ft)	1.55	6.49	1.00
Conv. Total (cfs)	63933.0	Conv. (cfs)	9075.1	54019.8	838.2
Length Wtd. (ft)	93.78	Wetted Per. (ft)	88.47	67.04	17.60
Min Ch El (ft)	1915.99	Shear (lb/sq ft)	0.72	2.93	0.45
Alpha	1.17	Stream Power (lb/ft s)	336.08	0.00	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	11.15	64.39	6.69
C & E Loss (ft)	0.20	Cum SA (acres)	3.97	8.45	2.93

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: FW
REACH: FW RS: 7000

INPUT
Description: 7000
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1932.104	9.84	1931.401	10.612	1931.044	14.002	1929.636	22.544	1928.726
42.545	1925.027	45.248	1924.907	46.18	1924.823	47.301	1924.769	52.766	1924.574
54.541	1924.522	60.909	1924.507	75.383	1923.943	78.973	1923.478	88.545	1922.018
91.607	1921.424	98.423	1920.323	104.753	1920.131	113.266	1919.927	128.069	1920.065
138.034	1920.294	143.736	1920.473	150.169	1918.996	159.094	1916.826	165.055	1916.195
172.365	1915.563	178.591	1915.443	182.877	1915.437	191.135	1915.443	195.869	1917.353
196.607	1917.676	200.149	1917.215	200.174	1917.225	205.192	1919.158	205.436	1919.266
205.578	1919.344	212.984	1923.321	214.474	1923.457	239.92	1924.647	243.37	1924.947
247.629	1925.405	271.973	1927.823	284.418	1929.191	287.622	1929.555	288.754	1929.705
289.37	1929.91	290.962	1930.125	292.053	1930.302	293.057	1930.4	294.977	1930.818
295.895	1931.002	297.636	1931.153	298.996	1931.404	300.275	1931.447	301.843	1931.226
303.051	1931.215	304.833	1931.115	307.699	1930.572	310.256	1930.479	314.254	1930.233
317.653	1930.297	320.783	1930.339						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	143.736	.04	205.578	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
143.736	205.578	100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1925.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1924.22	Reach Len. (ft)	80.00	80.00	80.00
Crit W.S. (ft)	1922.74	Flow Area (sq ft)	232.95	454.79	28.83
E.G. Slope (ft/ft)	0.003828	Area (sq ft)	232.95	454.79	28.83
Q Total (cfs)	5500.00	Flow (cfs)	1509.71	3896.16	94.14
Top Width (ft)	162.49	Top Width (ft)	75.45	61.84	25.20
Vel Total (ft/s)	7.68	Avg. Vel. (ft/s)	6.48	8.57	3.26

* Max Chl Dpth (ft)	*	8.78	* Hydr. Depth (ft)	*	3.09	*	7.35	*	1.14	*
* Conv. Total (cfs)	*	88889.1	* Conv. (cfs)	*	24399.4	*	62968.3	*	1521.4	*
* Length Wtd. (ft)	*	80.00	* Wetted Per. (ft)	*	75.75	*	63.20	*	26.22	*
* Min Ch El (ft)	*	1915.44	* Shear (lb/sq ft)	*	0.74	*	1.72	*	0.26	*
* Alpha	*	1.08	* Stream Power (lb/ft s)	*	320.78	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.15	* Cum Volume (acre-ft)	*	10.86	*	63.38	*	6.63	*
* C & E Loss (ft)	*	0.23	* Cum SA (acres)	*	3.84	*	8.30	*	2.88	*

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.

BRIDGE

RIVER: FW
REACH: FW RS: 6925

INPUT
Description: Bridge #3
Distance from Upstream XS = 80
Deck/Roadway Width = 6.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 182

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1924.76		9.865	1924.01		14.128	1923.53	
19.036	1923.48		22.568	1923.31		36.902	1921.52	
37.857	1921.5		39.029	1921.4		39.471	1921.35	
40.317	1921.24		44.502	1920.85		50	1920.66	
59.812	1920.33		64.014	1920.1		67.172	1920.01	
79.924	1919.48		86.757	1919.36		94.41	1918.81	
101.392	1918.33		101.393	1918.33		101.399	1918.33	
105.828	1918.22		109.037	1918.15		116.26	1918	
117.438	1918		122.804	1917.91		123.681	1917.9	
130.06	1918.05		131.14	1918.04		132.507	1918.03	
132.916	1918.03		139.139	1918.06		141.068	1918.02	
146.4	1918.25		147.269	1918.25		148.226	1918.3	
150.483	1918.43		158.935	1918.89		159.855	1918.8	
168.727	1919.44		174.185	1919.49		175.995	1919.61	
182.377	1920.42		185.236	1920.79		191.111	1920.98	
197.477	1921.24		204.974	1921.36		205.184	1921.37	
206.21	1921.35		211.068	1921.29		225.117	1921.83	
229.88	1921.37	1919.37	265.132	1921.81	1919.37	305.037	1921.8	1919.37
305.037	1921.8	1919.37	325.352	1921.36	1919.37	333.108	1921.5	
338.081	1921.58		340.892	1921.66		353.911	1922.01	
362.57	1922.15		364.634	1921.64		365.329	1921.64	
366.105	1921.66		372.985	1922.35		375.482	1922.39	
378.346	1922.43		378.529	1922.43		381.131	1922.46	
382.092	1922.48		385.564	1922.58		388.163	1922.67	
388.741	1922.69		390.023	1922.73		390.3	1922.75	
395.638	1923.04		398.48	1923.1		402.141	1923.12	
418.02	1924.22		420.032	1924.39		422.062	1924.45	
427.656	1924.71		433.913	1924.99		447.209	1925.62	
447.209	1925.59		449.108	1926		452.687	1926.2	
459.678	1926.44		460.106	1926.47		464.704	1926.74	
467.138	1926.96		467.844	1926.97		473.702	1927.06	
473.887	1927.06		475.903	1927.28		481.464	1927.91	
482.192	1927.84		484.507	1927.64		485.911	1927.69	
488.579	1927.82		489.41	1927.86		490.008	1927.87	
490.274	1927.87		496.306	1928		497.825	1928.02	
499.448	1928.01		503.449	1927.96		510.393	1927.9	
512.789	1927.91		514.718	1927.92		531.564	1927.5	
531.909	1927.5		533.986	1927.5		550.837	1927.94	
560.451	1928.37		566.646	1928.63		567.399	1928.65	
568.019	1928.67		568.557	1928.64		568.985	1928.63	
570.185	1928.62		585.044	1928.14		590.085	1928.11	
595.513	1928.08		602.996	1928.04		603.632	1928.03	
604.081	1928.02		605.243	1928		622.958	1927.76	
623.761	1927.76		638.882	1927.72		639.107	1927.71	
639.41	1927.72		653.51	1927.58		654.216	1927.59	
660.712	1927.67		661.307	1927.67		666.828	1927.71	
667.175	1927.71		667.469	1927.7		669.247	1927.8	
670.525	1927.87		670.619	1927.88		672.525	1928.17	
672.808	1928.17		672.853	1928.17		672.874	1928.17	
674.139	1926.08		674.329	1926.07		675.5	1926.01	
676.09	1925.99		678.744	1925.9		686.7	1925.64	
695.807	1925.36		696.206	1925.36		696.578	1925.35	
696.863	1925.34		697.334	1925.34		704.467	1925.26	
719.593	1925.11		721.052	1925.11		722.54	1925.11	
724.825	1925.11		730.49	1925.06		744.14	1924.94	
745.344	1924.94		746.701	1924.95		748.232	1924.94	
750.193	1924.94		750.962	1924.93		751.728	1924.92	
753.236	1924.91		753.297	1924.91		760.281	1925	
763.94	1925.05		769.841	1925.13		770.233	1925.15	
770.277	1925.14		771.215	1924.98		772.729	1924.69	
776.45	1923.98		776.876	1923.99				

Upstream Bridge Cross Section Data
Station Elevation Data num= 175

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1925.79	6.729	1925.28	12.453	1924.64	19.044	1924.57	23.787	1924.35
31.553	1923.38	34.621	1923.29	38.387	1922.96	39.807	1922.82	42.523	1922.46
55.968	1921.22	61.428	1921.03	62.927	1920.95	64.053	1920.92	68.601	1920.73
86.462	1920.4	92.022	1920	97.094	1919.66	102.658	1919.42	105.706	1919.26
108.883	1919.13	119.861	1918.43	121.084	1918.41	123.705	1918.43	132.817	1918.77

134.16	1918.81	141.443	1918.74	145.56	1918.59	153.853	1918.75	155.856	1918.86
156.937	1918.92	162.28	1919.26	168.312	1919.6	173.509	1919.88	182.382	1920.51
183.021	1920.56	188.827	1920.74	199.363	1921.19	203.881	1921.19	207.142	1921.38
224.137	1921.81	226.002	1921.89	228.424	1921.94	228.811	1921.8	228.929	1921.78
234.408	1919.98	237.664	1918.92	239.091	1918.71	239.4	1918.61	250.172	1914.87
251.57	1914.79	254.401	1913.56	256.736	1913.56	259.279	1913.57	262.936	1913.64
265.379	1913.71	270.484	1913.99	271.739	1914	273.311	1914	275.922	1913.93
277.269	1913.96	281.767	1914.07	283.442	1914.01	283.909	1914	286.588	1913.96
294.162	1913.5	300.035	1913.55	300.487	1913.68	302.909	1913.6	305.6	1918.88
309.801	1918.63	313.734	1917.07	314.238	1917.24	314.408	1917.27	318.737	1918.49
325.725	1921.45	332.807	1921.51	336.205	1921.54	336.432	1921.54	337.182	1921.56
345.498	1921.71	346.125	1921.75	346.358	1921.78	346.958	1921.79	362.881	1922.02
366.007	1922.06	368.264	1922.19	371.467	1922.25	377.341	1922.34	379.992	1922.4
382.497	1922.46	384.638	1922.51	386.336	1922.56	387.607	1922.6	388.478	1922.63
388.514	1922.63	388.649	1922.64	398.689	1923.2	400.624	1923.24	403.116	1923.25
413.926	1924	419.073	1924.42	424.264	1924.59	433.67	1924.02	438.68	1925.25
445.068	1925.54	445.699	1925.67	446.926	1925.74	446.951	1925.74	457.586	1926.12
459.753	1926.24	465.262	1926.57	466.282	1926.66	467.674	1926.68	469.004	1926.7
471.062	1926.67	475.836	1927.21	475.888	1927.21	477.738	1927.03	482.278	1927.16
485.01	1927.25	488.49	1927.42	488.779	1927.43	491.257	1927.56	496.587	1927.05
499.037	1926.82	499.143	1926.84	499.471	1926.89	500.029	1926.97	505.458	1928.04
510.409	1928	513.755	1928.01	516.169	1928.02	525.325	1927.79	529.196	1927.81
532.648	1927.73	533.049	1927.73	536.653	1927.7	538.413	1927.66	540.308	1927.71
552.479	1928.02	561.784	1928.44	561.823	1928.44	565.358	1928.51	568.308	1928.6
570.869	1928.49	572.904	1928.43	578.614	1928.37	586.376	1928.12	592.725	1928.08
597.144	1928.06	598.996	1928.05	604.089	1927.97	607.685	1927.86	616.993	1927.74
624.961	1927.63	625.56	1927.63	632.411	1927.61	636.375	1927.55	641.944	1927.53
654.221	1927.36	654.539	1927.35	654.829	1927.36	656.308	1927.37	662.627	1927.43
663.784	1927.43	668.388	1927.47	669.682	1927.47	672.279	1927.5	672.345	1927.5
673.682	1927.56	674.447	1927.68	677.507	1927.7	677.806	1927.71	678.326	1927.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.03	237.664	.04	318.737	.03	345.498	.03

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
228.424	325.725	.1	.3

Downstream Deck/Roadway Coordinates

num= 182

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1924.76		9.865	1924.01		14.128	1923.53	
19.036	1923.48		22.568	1923.31		36.902	1921.52	
37.857	1921.5		39.029	1921.4		39.471	1921.35	
40.317	1921.24		44.502	1920.85		50	1920.66	
59.812	1920.33		64.014	1920.1		67.172	1920.01	
79.924	1919.48		86.757	1919.36		94.41	1918.81	
101.392	1918.33		101.393	1918.33		101.399	1918.33	
105.828	1918.22		109.037	1918.15		116.26	1918	
117.438	1918		122.804	1917.91		123.681	1917.9	
130.06	1918.05		131.14	1918.04		132.507	1918.03	
132.916	1918.03		139.139	1918.06		141.068	1918.02	
146.4	1918.25		147.269	1918.25		148.226	1918.3	
150.483	1918.43		158.935	1918.89		159.855	1918.8	
168.727	1919.44		174.185	1919.49		175.995	1919.61	
182.377	1920.42		185.236	1920.79		191.111	1920.98	
197.477	1921.24		204.974	1921.36		205.184	1921.37	
206.21	1921.35		211.068	1921.29		225.117	1921.83	
229.88	1921.37	1919.37	265.132	1921.81	1919.37	305.037	1921.8	1919.37
305.037	1921.8	1919.37	325.352	1921.36	1919.37	333.108	1921.5	
338.081	1921.58		340.892	1921.66		353.911	1922.01	
362.57	1922.15		364.634	1921.64		365.329	1921.64	
366.105	1921.66		372.985	1922.35		375.482	1922.39	
378.346	1922.43		378.529	1922.43		381.131	1922.46	
382.092	1922.48		385.564	1922.58		388.163	1922.67	
388.741	1922.69		390.023	1922.73		390.3	1922.75	
395.638	1923.04		398.48	1923.1		402.141	1923.12	
418.02	1924.22		420.032	1924.39		422.062	1924.45	
427.656	1924.71		433.913	1924.99		447.209	1925.62	
447.209	1925.59		449.108	1926		452.687	1926.2	
459.678	1926.44		460.106	1926.47		464.704	1926.74	
467.138	1926.96		467.844	1926.97		473.702	1927.06	
473.887	1927.06		475.903	1927.28		481.464	1927.91	
482.192	1927.84		484.507	1927.64		485.911	1927.69	
488.579	1927.82		489.41	1927.86		490.008	1927.87	
490.274	1927.87		496.306	1928		497.825	1928.02	
499.448	1928.01		503.449	1927.96		510.393	1927.9	
512.789	1927.91		514.718	1927.92		531.564	1927.5	
531.909	1927.5		533.986	1927.5		550.837	1927.94	
560.451	1928.37		566.646	1928.63		567.399	1928.65	
568.019	1928.67		568.557	1928.64		568.985	1928.63	
570.185	1928.62		585.044	1928.14		590.085	1928.11	
595.513	1928.08		602.996	1928.04		603.632	1928.03	
604.081	1928.02		605.243	1928		622.958	1927.76	
623.761	1927.76		638.882	1927.72		639.107	1927.71	
639.41	1927.72		653.51	1927.58		654.216	1927.59	
660.712	1927.67		661.307	1927.67		666.828	1927.71	
667.175	1927.71		667.469	1927.7		669.247	1927.8	
670.525	1927.87		670.619	1927.88		672.525	1928.17	
672.808	1928.17		672.853	1928.17		672.874	1928.17	
674.139	1926.08		674.329	1926.07		675.5	1926.01	
676.09	1925.99		678.744	1925.9		686.7	1925.64	
695.807	1925.36		696.206	1925.36		696.578	1925.35	
696.863	1925.34		697.334	1925.34		704.467	1925.26	
719.593	1925.11		721.052	1925.11		722.54	1925.11	
724.825	1925.11		730.49	1925.06		744.14	1924.94	
745.344	1924.94		746.701	1924.95		748.232	1924.94	

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 750.193 1924.94         750.962 1924.93         751.728 1924.92
 753.236 1924.91         753.297 1924.91         760.281    1925
  763.94 1925.05         769.841 1925.13         770.233 1925.15
 770.277 1925.14         771.215 1924.98         772.729 1924.69
  776.45 1923.98         776.876 1923.99

Downstream Bridge Cross Section Data
Station Elevation Data    num=     175
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1925.79   6.729 1925.28  12.453 1924.64  19.044 1924.57  23.787 1924.35
  31.553 1923.38  34.621 1923.29  38.387 1922.96  39.807 1922.82  42.523 1922.46
  55.968 1921.22  61.428 1921.03  62.927 1920.95  64.053 1920.92  68.601 1920.73
  86.462  1920.4  92.022    1920  97.094 1919.66 102.658 1919.42 105.706 1919.26
 108.883 1919.13 119.861 1918.43 121.084 1918.41 123.705 1918.43 132.817 1918.77
  134.16 1918.81 141.443 1918.74  145.56 1918.59 153.853 1918.75 155.856 1918.86
 156.937 1918.92  162.28 1919.26 168.312  1919.6 173.509 1919.88 182.382 1920.51
 183.021 1920.56 188.827 1920.74 199.363 1921.19 203.881 1921.19 207.142 1921.38
 224.137 1921.81 226.002 1921.89 228.424 1921.94 228.811  1921.8 228.929 1921.78
 234.408 1919.98 237.664 1918.92 239.091 1918.71   239.4 1918.61 250.172 1914.87
  251.57 1914.79 254.401 1913.56 256.736 1913.56 259.279 1913.57 262.936 1913.64
 265.379 1913.71 270.484 1913.99 271.739    1914 273.311    1914 275.922 1913.93
 277.269 1913.96 281.767 1914.07 283.442 1914.01 283.909    1914 286.588 1913.96
 294.162  1913.5 300.035 1913.55 300.487 1913.68 302.909  1913.6   305.6 1918.88
 309.801 1918.63 313.734 1917.07 314.238 1917.24 314.408 1917.27 318.737 1918.49
 325.725 1921.45 332.807 1921.51 336.205 1921.54 336.432 1921.54 337.182 1921.56
 345.498 1921.71 346.125 1921.75 346.358 1921.78 346.958 1921.79 362.881 1922.02
 366.007 1922.06 368.264 1922.19 371.467 1922.25 377.341 1922.34 379.992  1922.4
 382.497 1922.46 384.638 1922.51 386.336 1922.56 387.607  1922.6 388.478 1922.63
 388.514 1922.63 388.649 1922.64 398.689  1923.2 400.624 1923.24 403.116 1923.25
 413.926    1924 419.073 1924.42 424.264 1924.59  433.67 1924.02  438.68 1925.25
 445.068 1925.54 445.699 1925.67 446.926 1925.74 446.951 1925.74 457.586 1926.12
 459.753 1926.24 465.262 1926.57 466.282 1926.66 467.674 1926.68 469.004  1926.7
 471.062 1926.67 475.836 1927.21 475.888 1927.21 477.738 1927.03 482.278 1927.16
  485.01 1927.25  488.49 1927.42 488.779 1927.43 491.257 1927.56 496.587 1927.05
 499.037 1926.82 499.143 1926.84 499.471 1926.89 500.029 1926.97 505.458 1928.04
 510.409    1928 513.755 1928.01 516.169 1928.02 525.325 1927.79 529.196 1927.81
 532.648 1927.73 533.049 1927.73 536.653  1927.7 538.413 1927.66 540.308 1927.71
 552.479 1928.02 561.784 1928.44 561.823 1928.44 565.358 1928.51 568.308  1928.6
 570.869 1928.49 572.904 1928.43 578.614 1928.37 586.376 1928.12 592.725 1928.08
 597.144 1928.06 598.996 1928.05 604.089 1927.97 607.685 1927.86 616.993 1927.74
 624.961 1927.63  625.56 1927.63 632.411 1927.61 636.375 1927.55 641.944 1927.53
 654.221 1927.36 654.539 1927.35 654.829 1927.36 656.308 1927.37 662.627 1927.43
 663.784 1927.43 668.388 1927.47 669.682 1927.47 672.279  1927.5 672.345  1927.5
 673.682 1927.56 674.447 1927.68 677.507  1927.7 677.806 1927.71 678.326 1927.77

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*****************************************************************
       0     .03  61.428     .03 237.664     .04 318.737     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       228.424 325.725             .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         =
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=  268.08    Downstream=  268.08
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.69
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.69

Pier Data
Pier Station     Upstream=  307.57    Downstream=  307.57
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.74
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.74

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =     1.2
Selected Low Flow Methods = Momentum

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 #100-yr FIS

E.G. US. (ft)	1925.21	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1924.22	E.G. Elev (ft)	1924.82	1924.81
Q Total (cfs)	5500.00	W.S. Elev (ft)	1924.61	1924.59
Q Bridge (cfs)	640.43	Crit W.S. (ft)	1920.34	1920.34
Q Weir (cfs)		Max Chl Dpth (ft)	11.11	11.09
Weir Sta Lft (ft)		Vel Total (ft/s)	3.29	3.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	1669.81	1662.82
Weir Submerg		Froude # Chl	0.20	0.20
Weir Max Depth (ft)		Specif Force (cu ft)	5858.12	5841.14
Min El Weir Flow (ft)	1918.42	Hydr Depth (ft)	4.07	4.08
Min El Prs (ft)	1919.37	W.P. Total (ft)	588.84	586.86
Delta EG (ft)	0.44	Conv. Total (cfs)	161517.8	165452.1
Delta WS (ft)	-0.06	Top Width (ft)	410.02	408.05
BR Open Area (sq ft)	335.89	Frctn Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	1.91	C & E Loss (ft)	0.00	0.03
Coef of Q		Shear Total (lb/sq ft)	0.21	0.20
Br Sel Method	Energy only	Power Total (lb/ft s)	0.00	0.00

Note: The weir over a bridge is submerged, the energy answer was used.
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: Manning's n values were composited to a single value in the main channel.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: FW
REACH: FW RS: 6868.*

INPUT
Description:
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.45	1.04	1928.51	11.75	1928.84	13.6	1928.84	14	1928.86
15.1	1928.75	15.87	1928.68	19.93	1928.27	21.44	1928.28	22.3	1928.28
25.3	1928.13	27.34	1927.94	30.14	1927.73	32.08	1927.6	34.16	1927.4
36.17	1927.26	36.54	1927.24	42.09	1926.78	42.49	1926.76	46.43	1926.48
49.52	1926.32	52.08	1926.19	52.68	1926.19	58.14	1926.06	60.54	1925.98
61.61	1926	64.39	1926.07	65.54	1926.08	65.72	1926.07	67.31	1925.99
72.86	1925.74	74.78	1925.66	75.09	1925.67	75.39	1925.68	75.94	1925.67
76.62	1925.61	77.61	1925.51	80.54	1925.22	86.68	1924.9	91.95	1924.56
104.9	1923.52	105.58	1923.48	105.6	1923.47	105.77	1923.45	107.27	1923.28
107.95	1923.18	109.73	1922.92	112.38	1922.51	112.96	1922.41	114.86	1922.09
115.58	1922.05	118.36	1922.02	119.65	1922	119.98	1921.98	126	1921.61
130.36	1921.28	131.36	1921.22	132.85	1921.11	134.43	1920.97	140.06	1920.46
146.48	1920.17	149.07	1920.11	157.94	1919.93	161.18	1919.89	163.16	1919.9
182.25	1919.69	184.27	1919.68	190.33	1919.53	194.55	1919.53	196.43	1919.53
204.54	1919.54	206.12	1918.88	209.55	1917.35	211.26	1916.57	214.78	1915.85
216.5	1915.49	221.15	1914.91	222.09	1914.81	224.65	1914.62	226.84	1914.49
231.69	1914.42	235.03	1914.4	238.54	1914.41	239.66	1914.6	242.89	1915.26
248.87	1915.77	249.13	1915.79	254.52	1916.87	254.75	1916.95	257.21	1917.33
258.48	1917.54	261.64	1917.53	264.52	1917.59	264.57	1917.6	273.13	1919.07
273.55	1919.15	273.79	1919.2	280.06	1921.52	281.32	1921.65	282.58	1921.75
292.35	1922.18	302.85	1922.74	304.68	1922.88	305.77	1923	309.38	1923.42
315.9	1924.15	329.98	1925.54	336.52	1926.23	340.51	1926.57	343.22	1926.81
344.18	1926.9	344.7	1927.02	346.05	1927.15	346.97	1927.26	347.43	1927.3
347.82	1927.34	349.44	1927.62	350.22	1927.75	351.69	1927.89	352.84	1928.06
353.93	1928.14	355.25	1928.08	356.27	1928.12	357.71	1928.14	357.78	1928.14
360.21	1927.95	362.37	1927.97	365.76	1927.95	368.63	1928.08	371.28	1928.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	204.54	.04	273.79	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
204.54 273.79 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1924.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1924.28	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)		Flow Area (sq ft)	376.29	558.57	84.07
E.G. Slope (ft/ft)	0.001751	Area (sq ft)	376.29	558.57	84.07
Q Total (cfs)	5500.00	Flow (cfs)	1778.81	3452.51	268.69
Top Width (ft)	221.67	Top Width (ft)	109.04	69.25	43.38
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	4.73	6.18	3.20
Max Chl Dpth (ft)	9.88	Hydr. Depth (ft)	3.45	8.07	1.94
Conv. Total (cfs)	131428.3	Conv. (cfs)	42506.4	82501.3	6420.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	109.25	70.45	43.91
Min Ch El (ft)	1914.40	Shear (lb/sq ft)	0.38	0.87	0.21
Alpha	1.09	Stream Power (lb/ft s)	371.28	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	9.55	62.12	6.34
C & E Loss (ft)	0.06	Cum SA (acres)	3.49	8.11	2.73

CROSS SECTION

RIVER: FW
REACH: FW RS: 6736

INPUT
Description: 67+36
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01924.794	1.3461924.969	15.2461926.171	17.6431926.264	20.587 1926.55					
27.8161927.031	28.9281927.102	32.8221927.026	35.4641926.789	39.106 1926.59					
44.3171926.342	46.9251926.321	47.4031926.328	54.5981926.138	55.1231926.138					
60.2341926.109	64.241926.177	67.561 1926.25	68.3421926.341	75.4191926.773					
79.9261927.012	85.0291927.325	94.5141926.848	97.0131926.729	97.7981926.798					
98.513 1926.79	99.3991926.683	104.481925.931	119.2861924.754	136.0831923.027					
136.9611922.978	136.9961922.959	137.2131922.907	140.0441922.479	142.351922.123					
146.5371921.412	149.0021920.975	149.9341920.958	153.5441921.199	155.2181921.303					
155.6451921.298	170.4091921.127	172.3411921.088	174.396 1920.97	190.0271920.154					
204.8871919.874	211.6581919.854	239.0451919.256	246.9151918.865	252.3911918.797					
265.345 1918.61	266.4791917.755	270.161914.676	272.6791914.343	277.9141913.526					
279.7461913.435	287.1841913.371	292.1461913.386	293.735 1913.76	298.3051915.076					
306.7591916.089	314.7481917.017	315.0681917.136	324.818 1917.63	342.0091919.063					
349.1981919.973	357.1971920.288	367.2851920.927	376.4651922.128	393.3391923.782					
402.2611924.237	410.6731925.164	421.7781926.029							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	265.345	.04	342.009	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
265.345	342.009	190	159	150 .1	.3

Left Levee Station= 28.93 Elevation= 1927.1

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1924.58	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.28	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1924.30	* Reach Len. (ft)	* 190.00	* 159.00	* 150.00 *
* Crit W.S. (ft)	* 1921.50	* Flow Area (sq ft)	* 541.60	* 640.28	* 155.49 *
* E.G. Slope (ft/ft)	*0.000975	* Area (sq ft)	* 541.60	* 640.28	* 155.49 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 2045.30	* 3006.26	* 448.43 *
* Top Width (ft)	* 279.06	* Top Width (ft)	* 141.60	* 76.66	* 60.79 *
* Vel Total (ft/s)	* 4.11	* Avg. Vel. (ft/s)	* 3.78	* 4.70	* 2.88 *
* Max Chl Dpth (ft)	* 10.93	* Hydr. Depth (ft)	* 3.82	* 8.35	* 2.56 *
* Conv. Total (cfs)	*176181.7	* Conv. (cfs)	* 65517.3	* 96299.7	* 14364.7 *
* Length Wtd. (ft)	* 166.26	* Wetted Per. (ft)	* 141.90	* 78.59	* 61.04 *
* Min Ch El (ft)	* 1913.37	* Shear (lb/sq ft)	* 0.23	* 0.50	* 0.15 *
* Alpha	* 1.07	* Stream Power (lb/ft s)	* 421.78	* 28.93	* 0.00 *
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 8.49	* 60.74	* 6.07 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 3.21	* 7.95	* 2.61 *

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: FW
REACH: FW RS: 6577

INPUT
Description: 65+77 US Face of bridge at Tioga
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1925.09	2.13	1924.49	23.48	1922.44	30.09	1922.23	30.65	1922.17
47.37	1922.26	57.99	1922.27	67.44	1921.64	67.56	1921.63	68.49	1921.62
75.85	1921.76	79.97	1922.05	80.73	1922.11	81.82	1922.06	85.98	1922.06
86.43	1921.98	103.08	1922.23	109.77	1922.11	113.74	1922.12	117.28	1922.11
121.67	1922.15	123.75	1922.18	129.14	1922.19	137.78	1921.89	141.02	1921.99
144.6	1922.26	145.64	1922.19	146.66	1922.1	161.65	1920.63	166.42	1917.85
167.46	1917.82	175.34	1914.56	175.58	1914.53	175.75	1914.52	176.35	1914.47
183.3	1913.85	188.35	1913.63	189.55	1913.54	192.64	1913.51	193.95	1913.45
194.1	1913.46	194.38	1913.46	194.73	1913.41	195.47	1913.42	195.74	1913.42
199.27	1913.24	201.73	1913.2	203.16	1913.2	205.27	1913.2	206.83	1913.18
208.13	1913.19	209.43	1913.21	211.32	1913.23	211.45	1913.2	211.71	1913.24
214.48	1913.34	219.02	1913.49	219.4	1913.5	225.07	1913.18	226.68	1913.08
230.01	1912.92	236.91	1915.35	237.7	1915.65	245.05	1918.09	246.45	1918.5
249.99	1919.03	252.05	1919.34	252.57	1919.45	273.83	1921.03	275.63	1921.14
275.8	1921.14	293.51	1921.69	303.02	1921.79	313.26	1922.21	330.31	1923.13
332.64	1923.24	338.03	1923.34	355.27	1923.92	357.58	1923.93	368.89	1925.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	161.65	.04	273.83	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
161.65	273.83	108	108	108 .1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1924.41	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.31	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *

* W.S. Elev (ft)	* 1924.10	* Reach Len. (ft)	* 108.00	* 108.00	* 108.00 *
* Crit W.S. (ft)	* 1919.71	* Flow Area (sq ft)	* 301.00	* 922.91	* 136.57 *
* E.G. Slope (ft/ft)	*0.001046	* Area (sq ft)	* 301.00	* 922.91	* 136.57 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 748.56	* 4452.52	* 298.92 *
* Top Width (ft)	* 353.04	* Top Width (ft)	* 155.41	* 112.18	* 85.45 *
* Vel Total (ft/s)	* 4.04	* Avg. Vel. (ft/s)	* 2.49	* 4.82	* 2.19 *
* Max Chl Dpth (ft)	* 11.18	* Hydr. Depth (ft)	* 1.94	* 8.23	* 1.60 *
* Conv. Total (cfs)	*170039.4	* Conv. (cfs)	* 23142.8	*137655.1	* 9241.6 *
* Length Wtd. (ft)	* 108.00	* Wetted Per. (ft)	* 155.64	* 114.71	* 85.52 *
* Min Ch El (ft)	* 1912.92	* Shear (lb/sq ft)	* 0.13	* 0.53	* 0.10 *
* Alpha	* 1.22	* Stream Power (lb/ft s)	* 368.89	* 0.00	* 0.00 *
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 6.66	* 57.89	* 5.57 *
* C & E Loss (ft)	*	* Cum SA (acres)	* 2.56	* 7.60	* 2.35 *

CULVERT

RIVER: FW
REACH: FW RS: 6500

INPUT
Description: Tioga
Distance from Upstream XS = 22
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew = 30
Upstream Deck/Roadway Coordinates
num= 46

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1925.67		9.287	1925.37		9.502	1925.37	
9.716	1925.36		22.549	1925.23		22.935	1925.23	
54.443	1924.69		81.789	1923.77		132.427	1922.86	
189.694	1922		234.361	1921.72		282.694	1921.65	
338.758	1921.99		384.152	1922.65		396.16	1923.01	
409.1	1923.56		418.919	1924.08		428.15	1924.5	
436.187	1924.6		443.868	1924.96		452.513	1925	
459.069	1925.19		476.798	1925.74		497.899	1926.14	
529.088	1926.18		567.1	1926.1		597.265	1925.7	
631.054	1925.49		642.52	1925.32		652.35	1925.1	
656.78	1925.09		663.536	1925		668.414	1924.95	
673.875	1924.87		675.804	1924.74		688.744	1924.56	
711.245	1923.96		738.867	1923.64		754.842	1923.58	
761.83	1923.35		765.155	1923.41		774.173	1923.4	
778.386	1923.56		784.521	1923.54		787.373	1923.54	
791.223	1923.45							

Upstream Bridge Cross Section Data
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01925.623	12.0721925.494	26.0041925.317	31.6091925.322	44.7491925.261					
50.5361925.215	53.1871925.106	53.2821925.108	64.0491925.405	76.4971925.504					
77.9461925.097	80.8431924.834	95.7471923.396	101.6621922.793	107.0971922.153					
108.6821922.034	109.4841922.019	111.0521922.092	127.2111922.185	132.4691922.191					
134.4541922.193	140.7991921.764	141.5741921.653	148.0011921.609	154.0021921.721					
158.0251922.003	165.1881922.486	167.1131922.421	174.5871922.546	175.5511922.567					
183.7361922.418	189.4781922.435	189.9651922.434	194.6761922.413	201.0561922.471					
204.0411922.508	211.7391922.517	211.8371922.514	211.9451922.517	217.8651921.998					
220.3261922.043	225.5061921.583	231.1241921.172	234.7781920.884	241.636 1920.33					
242.4191920.358	249.7361917.253	256.5 1913.2	305.5 1913.2	310.6131912.935					
315.0541914.494	315.5671914.687	320.2451916.228	323.5441917.196	327.321918.327					
328.8751918.558	330.1441918.825	339.0161919.476	342.8021919.761	348.2521920.335					
352.0021920.714	355.6831921.041	364.176 1921.31	374.0891921.622	379.3011921.676					
384.5951921.893	393.3881922.252	395.4331922.362	406.4051922.949	408.51923.046					
412.8951923.255	420.0641923.394	427.3521923.537	428.2571923.502	430.279 1923.6					
433.0191923.735	433.8661923.741	439.7831924.313	448.5491925.158	452.3971925.529					
457.9651925.412	462.2171925.315	464.491925.488	467.3861925.527	467.3951925.527					
471.0271925.642	476.0771925.952	481.838 1926.56	482.2311926.615	482.4631926.619					
483.0131926.649	488.7981927.147								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	242.419	.04	348.252	.03

Bank Sta: Left Right Coeff Contr. Expan.
242.419 348.252 .1 .3

Downstream Deck/Roadway Coordinates
num= 46

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1925.67		9.287	1925.37		9.502	1925.37	
9.716	1925.36		22.549	1925.23		22.935	1925.23	
54.443	1924.69		81.789	1923.77		132.427	1922.86	
189.694	1922		234.361	1921.72		282.694	1921.65	
338.758	1921.99		384.152	1922.65		396.16	1923.01	
409.1	1923.56		418.919	1924.08		428.15	1924.5	
436.187	1924.6		443.868	1924.96		452.513	1925	
459.069	1925.19		476.798	1925.74		497.899	1926.14	
529.088	1926.18		567.1	1926.1		597.265	1925.7	
631.054	1925.49		642.52	1925.32		652.35	1925.1	
656.78	1925.09		663.536	1925		668.414	1924.95	
673.875	1924.87		675.804	1924.74		688.744	1924.56	
711.245	1923.96		738.867	1923.64		754.842	1923.58	
761.83	1923.35		765.155	1923.41		774.173	1923.4	
778.386	1923.56		784.521	1923.54		787.373	1923.54	

791.223 1923.45

Downstream Bridge Cross Section Data
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01922.402	7.4111921.714	9.991921.537	12.3411921.283	13.7881921.145					
17.4631920.986	36.1611920.645	39.5931920.399	42.7241920.185	53.9451919.708					
55.5821919.623	58.8931919.491	67.5991918.934	73.441918.811	82.7161918.883					
85.5431918.864	88.7761918.956	91.308 1918.93	92.7391918.879	97.02 1918.96					
108.9091918.806	114.3211919.045	122.6871919.369	125.8021919.413	132.3861919.532					
146.9591919.823	147.1951919.819	147.781919.831	162.8781920.718	173.156 1920.98					
174.2841921.024	175.9211921.057	179.3631921.015	181.2941920.982	183.7741920.179					
184.151920.123	189.4291918.308	199.6481914.766	200.4891914.715	204.5 1912.45					
253.5 1912.45	256.341912.719	256.5611913.095	257.47 1913.04	263.5321914.627					
265.951915.358	271.1491917.328	273.0791918.035	275.841919.235	279.1751920.112					
282.7961920.116	283.51920.117	287.027 1920.18	292.2711920.529	294.2221920.802					
299.2371920.844	310.5161921.007	312.731921.038	319.1951921.414	321.7531921.456					
337.1421921.714	337.2791921.715	337.3741921.717	338.341921.769	338.5051921.778					
352.0871922.538	353.0991922.558	354.4031922.564	360.0581922.958	368.3921923.634					
376.7991923.914	383.7171924.228	388.1621924.431							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	181.294	.04	279.175	.03

Bank Sta: Left Right Coeff Contr. Expan.
179.363 279.175 .3 .5
Skew Angle = 30

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 Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Arch	7.5	15

FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
9	79	.021	.021	0	.7	1

Number of Barrels = 3
Upstream Elevation = 1913.2
Centerline Stations

Sta.	Sta.	Sta.
264	281	298

Downstream Elevation = 1912.45
Centerline Stations

Sta.	Sta.	Sta.
212	229	246

CULVERT OUTPUT Profile #100-yr FIS Culv Group: Culvert #1

Q Culv Group (cfs)	2975.78	Culv Full Len (ft)	79.00
# Barrels	3	Culv Vel US (ft/s)	11.23
Q Barrel (cfs)	991.93	Culv Vel DS (ft/s)	11.23
E.G. US. (ft)	1924.41	Culv Inv El Up (ft)	1913.20
W.S. US. (ft)	1924.10	Culv Inv El Dn (ft)	1912.45
E.G. DS (ft)	1921.84	Culv Frctn Ls (ft)	0.66
W.S. DS (ft)	1920.42	Culv Exit Loss (ft)	0.54
Delta EG (ft)	2.57	Culv Entr Loss (ft)	1.37
Delta WS (ft)	3.68	Q Weir (cfs)	2524.22
E.G. IC (ft)	1924.21	Weir Sta Lft (ft)	85.34
E.G. OC (ft)	1924.41	Weir Sta Rgt (ft)	425.95
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1920.70	Weir Max Depth (ft)	2.75
Culv WS Outlet (ft)	1919.95	Weir Avg Depth (ft)	1.95
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	663.63
Culv Crt Depth (ft)	5.06	Min El Weir Flow (ft)	1921.66

CROSS SECTION

RIVER: FW
REACH: FW RS: 6469

INPUT
Description: Sta 64+76 DS Face of bridge at Tioga
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1926.93	2.47	1926.92	20.23	1925.9	21.03	1925.82	22.86	1925.8
36.9	1925.14	39.75	1925.25	43.63	1925.11	47.3	1925.05	52.65	1924.82
55.63	1924.71	57.23	1924.6	63.75	1924.11	63.87	1924.11	64.3	1924.11
71.77	1923.58	79.24	1922.76	83.8	1922.32	95.22	1921.81	102.74	1921.66
104.14	1921.56	105.42	1921.47	122.01	1920.74	125.76	1920.55	132.59	1920.02
141.97	1919.69	157.8	1919.6	159.5	1919.54	177.37	1919.32	181.27	1919.5
187.28	1919.73	196.31	1919.86	213.93	1920.19	216.94	1920.13	224.17	1920.28
233.11	1920.81	239.42	1920.97	240.12	1921	241.14	1921.02	243.31	1920.99
247.34	1920.93	249.88	1920.96	252.13	1920.02	266.17	1915.18	266.69	1915.14
271.54	1913.05	272.14	1913.05	273.59	1914.63	287.31	1915.42	288.95	1913.89

```
  289.83 1913.87  292.41 1913.23  293.41 1913.27  294.96 1913.25  300.12 1913.33
  305.37 1912.66  309.76 1912.39  310.71  1912.4  313.47 1913.17  317.85 1912.99
  322.15 1912.86   325.1 1913.08   325.9 1912.74  326.26 1912.23  329.22 1913.17
  329.82 1913.67  333.88 1914.86  334.52 1915.28  334.79 1915.45  337.37 1915.93
   337.9 1916.12  342.69 1918.21  348.43 1919.73  348.44 1919.73  348.45 1919.73
    3561920.235  356.68 1920.28  359.72  1920.7  367.45 1920.77  375.92 1920.89
  377.59 1920.92  386.56 1921.44  388.74 1921.47  401.93 1921.69  403.39 1921.71
  404.41 1921.72   414.4 1922.27  420.93 1922.63  421.39 1922.64  421.99 1922.64
  424.55 1922.82  426.95 1923.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  247.34     .04     356     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        247.34     356            328.1  369.09   389.1             .3       .5
Skew Angle = 30

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1921.85  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.42  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)          * 1920.42  * Reach Len. (ft)       *   10.00  *   10.00  *   10.00  *
* Crit W.S. (ft)          * 1919.35  * Flow Area (sq ft)     *   61.61  *  545.31  *    0.18  *
* E.G. Slope (ft/ft)      *0.008046  * Area (sq ft)          *   61.61  *  545.31  *    0.18  *
* Q Total (cfs)           * 5500.00  * Flow (cfs)            *  199.35  * 5300.47  *    0.18  *
* Top Width (ft)          *  205.61  * Top Width (ft)        *   99.09  *  104.83  *    1.69  *
* Vel Total (ft/s)        *    9.06  * Avg. Vel. (ft/s)      *    3.24  *    9.72  *    1.00  *
* Max Chl Dpth (ft)       *    8.19  * Hydr. Depth (ft)      *    0.62  *    5.20  *    0.11  *
* Conv. Total (cfs)       * 61315.3  * Conv. (cfs)           *  2222.4  * 59090.9  *     2.0  *
* Length Wtd. (ft)        *   10.00  * Wetted Per. (ft)      *   99.14  *  109.45  *    1.70  *
* Min Ch El (ft)          * 1912.23  * Shear (lb/sq ft)      *    0.31  *    2.50  *    0.05  *
* Alpha                   *    1.11  * Stream Power (lb/ft s) *  426.95  *    0.00  *    0.00  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)  *    6.66  *   56.09  *    5.57  *
* C & E Loss (ft)         *          * Cum SA (acres)        *    2.24  *    7.33  *    2.25  *
*************************************************************************************************

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: 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: 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.

BRIDGE


RIVER: FW
REACH: FW                RS: 6450

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      10
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=     182
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
       01923.937           9.8651923.189          14.1281922.709
  19.0361922.658          22.5681922.493          36.9021920.705
  37.8571920.678          39.0291920.576          39.4711920.531
  40.3171920.421          44.5021920.032              501919.844
  59.8121919.508          64.0141919.282          67.1721919.191
  79.924 1918.66          86.7571918.536           94.411917.988
 101.3921917.509         101.3931917.509         101.3991917.509
 105.828  1917.4         109.0371917.326          116.261917.181
 117.4381917.177         122.8041917.092         123.6811917.078
  130.061917.229          131.14 1917.22         132.5071917.212
 132.9161917.215         139.139 1917.24         141.0681917.198
   146.41917.427         147.2691917.428         148.2261917.484
 150.483 1917.61         156.8551917.981         158.9351918.071
 168.7271918.624         174.1851918.671         175.9951918.787
 182.3771919.604         185.2361919.968         191.1111920.158
 197.4771920.422         204.9741920.542         205.1841920.546
  206.211920.533         211.0681920.467         225.1171921.008
  229.88 1920.55 1918.55 265.1321920.993 1918.55 305.037 1920.98 1918.55
 305.037 1920.98 1919.05 325.3521920.544 1919.05 333.1081920.679
 338.0811920.764         340.8921920.836         353.9111921.193
  362.571921.326         364.6341920.821         365.3291920.822
 366.1051920.842         372.9851921.534         375.4821921.569
 378.3461921.606         378.5291921.612         381.1311921.641
 382.0921921.665         385.5641921.765         388.1631921.848
 388.7411921.869         390.0231921.915           390.31921.926
 395.6381922.224          398.481922.282         402.1411922.298
  418.021923.403         420.0321923.567         422.0621923.634
 427.6561923.888         433.9131924.172         447.2091924.774
 447.3171924.797         449.108 1925.18         452.6871925.376
 459.6781925.623         460.1061925.647         464.7041925.923
 467.1381926.141         467.844 1926.15         473.7021926.239
 473.8871926.236         475.9031926.462         481.4641927.086
 482.1921927.016         484.5071926.821         485.9111926.866
 488.5791926.997          489.411927.037         490.008 1927.05
 490.2741927.048         496.3061927.176         497.8251927.205
 499.4481927.189         503.4491927.144         510.3931927.079
```

```
 512.789 1927.09          514.7181927.096          531.564 1926.68
 531.909 1926.68          533.9861926.681          550.8371927.119
 560.4511927.547          566.6461927.813          567.3991927.829
 568.0191927.848          568.5571927.825          568.9851927.813
 570.185  1927.8          585.0441927.325          590.0851927.292
 595.5131927.262          602.9961927.222          603.6321927.212
 604.0811927.199          605.2431927.183          622.958 1926.94
 623.7611926.937          638.8821926.897          639.1071926.892
  639.41  1926.9           653.511926.765          654.2161926.771
 660.7121926.848          661.3071926.849          666.8281926.887
 667.175 1926.89          667.4691926.877          669.247 1926.98
 670.5251927.054          670.6191927.058          672.5251927.347
 672.8081927.349          672.8531927.354          672.8741927.349
 674.139 1925.26          674.329 1925.25            675.51925.187
  676.091925.167          678.744 1925.08            686.71924.825
 695.8071924.541          696.2061924.544          696.5781924.534
 696.8631924.524          697.3341924.518          704.4671924.441
 719.5931924.294          721.0521924.288           722.541924.289
 724.8251924.289           730.491924.239           744.141924.118
 745.3441924.124          746.7011924.131          748.2321924.125
 750.1931924.117          750.9621924.114          751.7281924.104
 753.2361924.089          753.297 1924.09          760.281 1924.18
  763.941924.229          769.8411924.306          770.2331924.331
 770.2771924.324          771.2151924.158          772.7291923.871
  776.451923.164          776.8761923.172

Upstream Bridge Cross Section Data
Station Elevation Data    num=     182
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01925.638    .1961925.623   4.5951925.427   9.5671924.967  17.2941924.874
  19.0531924.855  25.0271924.577  26.1131924.442   31.33 1924.29  37.7341923.737
  40.1491923.493  44.7661922.888  57.4111921.714   59.991921.537  62.3411921.283
  63.7881921.145  67.4631920.986  86.1611920.645  89.5931920.399  92.7241920.185
 103.9451919.708 105.5821919.623 108.8931919.491 117.5991918.934  123.441918.811
 132.7161918.883 135.5431918.864 138.7761918.956 141.308 1918.93 142.7391918.879
  147.02 1918.96 158.9091918.806 164.3211919.045 172.6871919.369 175.8021919.413
 182.3861919.532 196.9591919.823 197.1951919.819  197.781919.831 212.8781920.718
 223.156 1920.98 224.2841921.024 225.9211921.057  229.88 1918.55 249.6481914.766
 250.4891914.715 254.5981912.938 255.8461912.934 257.2041912.944 259.1571912.979
 260.4631913.015  271.051913.607 271.735 1913.61 272.5921913.612 274.507 1913.56
 276.0031913.192 278.1331913.271 280.649 1913.25 281.4711913.237 283.9531913.087
 293.4291912.508 296.3591912.537 298.1881913.047  306.341912.719 306.5611913.095
  307.47 1913.04 313.5321914.627  315.951915.358 321.1491917.328 323.0791918.035
  325.34 1919.05 329.1751920.112 332.7961920.116   333.51920.117 337.027 1920.18
 342.2711920.529 344.2221920.802 349.2371920.844 360.5161921.007  362.731921.038
 369.1951921.414 371.7531921.456 387.1421921.714 387.2791921.715 387.3741921.717
  388.341921.769 388.5051921.778 402.0871922.538 403.0991922.558 404.4031922.564
 410.0581922.958 418.3921923.634 426.7991923.914 433.7171924.228 438.1621924.431
  441.991924.508 446.7671924.697 446.8741924.701 455.6161924.961 455.7631924.963
 455.8571924.968 459.6891925.158 466.0371925.501 467.795 1925.47 468.483 1925.46
 470.5941925.697 471.3891925.617 476.0621925.744 482.6611925.929 484.3891925.985
 487.1551926.121 489.2771926.229  492.86 1926.41 497.1671925.997 499.2231925.803
 500.914 1925.79 501.3561925.788 510.3871926.908 513.4281926.864 515.0321926.943
 518.046 1927.12 522.7291927.405 524.0211927.409 532.108 1927.24 534.5031927.218
 541.4871927.155 545.6091927.069 550.0481927.173 554.4451927.287 557.8071927.437
 563.5141927.545 563.5771927.546 568.8971927.715 573.5151927.513 577.185 1927.41
 587.4821927.297 588.025 1927.28   592.11927.253  595.341927.216 599.0981927.164
 601.8811927.128 604.8491927.081 611.6451926.882 612.6331926.869 627.1331926.682
 627.6851926.674 634.2551926.586 635.087 1926.54 643.632 1926.51 645.1751926.482
 647.9851926.443 658.0031926.283 658.7311926.288 663.2131926.333 666.5971926.342
 672.8811926.391 673.5371926.398 675.657 1926.41 676.7371926.417 677.0821926.407
 677.2161926.402 678.2321926.372 681.0351926.397 683.1571926.425 683.3481926.447
 684.1341926.541  684.591926.424  685.35 1925.11 686.8671925.028 689.067 1924.91
 695.6791924.698 700.4661924.549 704.0551924.572 707.4031924.488 709.9691924.394
 714.2021924.344 714.2851924.344 725.7721924.232 730.4691924.214  735.261924.216
 740.5911924.216 742.6971924.215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0     .03  229.88     .04  325.34     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
         229.88  325.34             .3       .5
Skew Angle = 30

Downstream  Deck/Roadway Coordinates
    num=     182
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*********************************************************************************
       01923.937           9.8651923.189          14.1281922.709
  19.0361922.658          22.5681922.493          36.9021920.705
  37.8571920.678          39.0291920.576          39.4711920.531
  40.3171920.421          44.5021920.032              501919.844
  59.8121919.508          64.0141919.282          67.1721919.191
  79.924 1918.66          86.7571918.536           94.411917.988
 101.3921917.509         101.3931917.509         101.3991917.509
 105.828  1917.4         109.0371917.326          116.261917.181
 117.4381917.177         122.8041917.092         123.6811917.078
  130.061917.229          131.14 1917.22         132.5071917.212
 132.9161917.215         139.139 1917.24         141.0681917.198
   146.41917.427         147.2691917.428         148.2261917.484
 150.483 1917.61         156.8551917.981         158.9351918.071
 168.7271918.624         174.1851918.671         175.9951918.787
 182.3771919.604         185.2361919.968         191.1111920.158
 197.4771920.422         204.9741920.542         205.1841920.546
  206.211920.533         211.0681920.467         225.1171921.008
  229.88 1920.55 1918.55 265.1321920.993 1918.55 305.037 1920.98 1918.55
```

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 305.037 1920.98 1919.05 325.3521920.544 1919.05 333.1081920.679
 338.0811920.764          340.8921920.836          353.9111921.193
  362.571921.326          364.6341920.821          365.3291920.822
 366.1051920.842          372.9851921.534          375.4821921.569
 378.3461921.606          378.5291921.612          381.1311921.641
 382.0921921.665          385.5641921.765          388.1631921.848
 388.7411921.869          390.0231921.915            390.31921.926
 395.6381922.224           398.481922.282          402.1411922.298
  418.021923.403          420.0321923.567          422.0621923.634
 427.6561923.888          433.9131924.172          447.2091924.774
 447.3171924.797          449.108 1925.18          452.6871925.376
 459.6781925.623          460.1061925.647          464.7041925.923
 467.1381926.141          467.844 1926.15          473.7021926.239
 473.8871926.236          475.9031926.462          481.4641927.086
 482.1921927.016          484.5071926.821          485.9111926.866
 488.5791926.997           489.411927.037          490.008 1927.05
 490.2741927.048          496.3061927.176          497.8251927.205
 499.4481927.189          503.4491927.144          510.3931927.079
 512.789 1927.09          514.7181927.096          531.564 1926.68
 531.909 1926.68          533.9861926.681          550.8371927.119
 560.4511927.547          566.6461927.813          567.3991927.829
 568.0191927.848          568.5571927.825          568.9851927.813
 570.185  1927.8          585.0441927.325          590.0851927.292
 595.5131927.262          602.9961927.222          603.6321927.212
 604.0811927.199          605.2431927.183          622.958 1926.94
 623.7611926.937          638.8821926.897          639.1071926.892
  639.41  1926.9           653.511926.765          654.2161926.771
 660.7121926.848          661.3071926.849          666.8281926.887
 667.175 1926.89          667.4691926.877          669.247 1926.98
 670.5251927.054          670.6191927.058          672.5251927.347
 672.8081927.349          672.8531927.354          672.8741927.349
 674.139 1925.26          674.329 1925.25            675.51925.187
  676.091925.167          678.744 1925.08            686.71924.825
 695.8071924.541          696.2061924.544          696.5781924.534
 696.8631924.524          697.3341924.518          704.4671924.441
 719.5931924.294          721.0521924.288           722.541924.289
 724.8251924.289           730.491924.239           744.141924.118
 745.3441924.124          746.7011924.131          748.2321924.125
 750.1931924.117          750.9621924.114          751.7281924.104
 753.2361924.089          753.297 1924.09          760.281 1924.18
  763.941924.229          769.8411924.306          770.2331924.331
 770.2771924.324          771.2151924.158          772.7291923.871
  776.451923.164          776.8761923.172

Downstream Bridge Cross Section Data
Station Elevation Data    num=     158
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01918.557  16.2051918.219  21.8111917.887  27.1741917.412  28.8541917.346
  33.3621917.314  48.1241916.324  48.804 1916.28  49.056 1916.26  49.2391916.253
  49.6061916.232  69.8821916.382  76.867 1916.59   86.391916.759  89.4121916.704
  96.3421916.757  98.3231916.727 105.5331916.561 106.4461916.553 108.6161916.537
 114.524 1916.49  130.121916.544 133.4191916.617 147.3811916.911 157.3231917.071
 159.364 1917.16  160.11 1917.19 161.1681917.199 162.6531917.382 165.649 1917.53
 167.1761917.652 179.1361917.579 182.355 1917.58 184.7271917.584 188.228 1917.66
 202.5791918.327 203.7911918.318 204.8921918.336 208.0421918.373 209.7921918.364
 210.9081918.148 213.6751918.221 216.5291918.351  229.88 1918.55 233.7851911.781
 238.2181911.977 239.2281912.014  240.831912.072 245.0961912.187 246.5741912.232
 250.3111912.432 250.3831912.434 250.4611912.436 251.3011912.447 255.6371912.528
  260.881912.635 262.495 1912.66 265.7011912.682  268.861912.686 271.5561912.946
  276.571913.024 277.3081913.032 277.6561913.078 279.4721913.726 281.6211914.085
 283.6441914.452 284.9441914.683  325.34 1919.05 332.8741921.278 334.9271921.317
 341.4851921.435 347.8041921.511 353.2951921.516 369.7961920.936 374.9491920.832
 388.3131921.627 392.9791921.904 400.7831922.139   402.51922.192 407.515  1922.3
 407.6021922.306 407.6491922.307 409.2031922.408 429.5361923.762 432.261 1923.89
 433.3871924.015 437.0351924.416 447.4141925.368 452.3361925.819 453.873 1925.82
 456.468 1925.85 460.1131925.945 460.1351925.946 466.9441926.234  474.481926.548
 478.3641926.708 479.9881926.755 481.3871926.796 482.7851926.866 484.515 1926.96
 485.4851926.983 485.7981926.934 485.8161926.932 486.2981926.942  492.491926.886
 493.1151926.881 494.7331926.869 506.1141926.781 514.7031926.715 524.349 1926.73
 533.0521926.744  540.79  1926.7 547.2291926.817 551.7091926.963 558.5131927.167
 570.138 1927.21 576.189 1927.31 582.2721927.313 585.4531927.315 605.1841927.326
 611.1121927.246 612.8451927.257 618.5411927.283 627.7521927.041 634.8011927.228
 638.608 1927.17 641.8121927.289 642.7811927.327 643.0831926.718 644.1781925.066
 646.9491925.088 650.5451925.113 652.0671925.123 654.5491925.138 656.4011925.088
  656.771925.078 657.2451925.064  663.041924.899 666.2271924.807 667.0741924.779
 678.6931924.635 688.3511924.524 692.3741924.486 704.0021924.521 710.9971924.539
 717.5631924.463 718.3551924.461 722.2491924.463 725.2541924.464  731.331924.467
 732.4371924.469 734.7421924.476 740.6231924.489 741.1691924.427 741.4361924.397
 743.4431923.869  746.011923.192 747.7221922.759

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0     .03  229.88     .04  325.34     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        229.88  325.34             .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=  265.13    Downstream=  265.13
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1921.01
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1921.01

Pier Data
Pier Station     Upstream=  305.04    Downstream=  305.04
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1920.99
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1920.99

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =     1.2
Selected Low Flow Methods = Momentum

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 #100-yr FIS
*************************************************************************************************
* E.G. US. (ft)          *    1921.85  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1920.42  * E.G. Elev (ft)         *    1921.84  *    1920.91  *
* Q Total (cfs)          *    5500.00  * W.S. Elev (ft)         *    1920.42  *    1919.84  *
* Q Bridge (cfs)         *    3845.14  * Crit W.S. (ft)         *    1918.56  *    1919.03  *
* Q Weir (cfs)           *    1654.87  * Max Chl Dpth (ft)      *       7.91  *       8.06  *
* Weir Sta Lft (ft)      *      56.06  * Vel Total (ft/s)       *       6.40  *       5.10  *
* Weir Sta Rgt (ft)      *     387.90  * Flow Area (sq ft)      *     859.56  *    1078.55  *
* Weir Submerg           *       0.06  * Froude # Chl           *       0.68  *       0.58  *
* Weir Max Depth (ft)    *       3.03  * Specif Force (cu ft)   *    3601.12  *    3273.25  *
* Min El Weir Flow (ft)  *    1918.82  * Hydr Depth (ft)        *       7.95  *       8.05  *
* Min El Prs (ft)        *    1919.05  * W.P. Total (ft)        *     315.87  *     337.08  *
* Delta EG (ft)          *       2.39  * Conv. Total (cfs)      *             *             *
* Delta WS (ft)          *       1.11  * Top Width (ft)         *     108.13  *     133.99  *
* BR Open Area (sq ft)   *     375.42  * Frctn Loss (ft)        *             *             *
* BR Open Vel (ft/s)     *      10.24  * C & E Loss (ft)        *             *             *
* Coef of Q              *             * Shear Total (lb/sq ft) *             *             *
* Br Sel Method          * Press/Weir  * Power Total (lb/ft s)  *       0.00  *       0.00  *
*************************************************************************************************

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:    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.
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.
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: FW
REACH: FW                RS: 6100

INPUT
Description: Sta 61+00
Station Elevation Data    num=     109
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
   -12.5    1922       0  1920.3       6 1919.49    9.18 1919.12      10 1918.95
   17.46 1918.42   39.83 1916.72   48.69 1916.11   56.57 1915.42    57.8 1915.37
   60.65 1915.26   69.65 1915.08   97.64  1914.2   99.16 1914.18   99.44 1914.18
   99.87 1914.17  101.46 1914.18  112.99 1914.23  115.47 1914.24  115.57 1914.23
  120.16 1914.24  123.49  1914.2  126.03 1914.11  130.73 1913.99   134.2 1913.97
   143.5  1914.1  156.88 1913.92  158.72 1913.83   164.5  1913.6  164.97 1913.63
  180.53 1914.34   188.2  1914.7  188.47 1914.71   188.7 1914.72  188.91 1914.73
  189.03 1914.73  189.13 1914.73  189.64 1914.75  208.93 1915.42  208.95 1915.42
    2131913.964  219.35 1911.68  221.16 1911.05  227.04 1910.47  231.07 1909.53
   237.1 1909.49  243.23 1909.48   243.5 1909.48  244.02 1909.49  246.79 1910.15
```

```
                                                                      sub.rep
  247.91 1910.48  251.94 1911.32  253.14 1911.48  253.61 1911.48     2571913.218
  258.31 1913.89  258.43 1913.86  259.28  1913.6  276.21 1913.71  278.49 1913.69
  279.26 1913.69   281.2 1913.63  308.23 1913.52  309.95 1913.82  315.51 1914.13
  325.37  1914.8  328.21 1914.96  333.67 1915.45  338.03 1915.64  351.34 1916.64
  361.45 1917.39  362.69 1917.46  367.52 1917.62  368.78 1917.68  369.91 1917.75
   373.6  1917.9  397.68 1919.16  418.68 1919.94  427.49  1920.4  441.27 1921.64
  454.27 1921.62   459.3 1922.24  460.02 1923.19  461.32 1923.25  464.32  1923.3
  466.42 1923.44  468.08 1923.56  474.08 1924.15  476.27  1924.4  479.81 1924.44
   484.2 1924.54  485.67 1924.55  487.99 1924.71  489.66 1924.72  510.92 1924.45
  515.38 1924.65  515.75 1924.69  517.31 1924.73  520.86 1924.91   538.4 1925.42
  543.31 1925.92  548.53 1925.58  549.22  1925.6  550.18 1925.49  558.96 1925.61
   563.7 1925.36  568.04    1925  572.01 1924.81  577.65    1924

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
   -12.5     .03  208.93     .04  258.31     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        208.93  258.31            225.1     195   182.1             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1919.47  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1919.31  * Reach Len. (ft)       *  170.00  *  170.00  *  170.00  *
* Crit W.S. (ft)         * 1916.17  * Flow Area (sq ft)     *  842.50  *  403.80  *  527.51  *
* E.G. Slope (ft/ft)     *0.000572  * Area (sq ft)          *  842.50  *  403.80  *  527.51  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            * 2589.12  * 1423.60  * 1487.28  *
* Top Width (ft)         *  394.17  * Top Width (ft)        *  201.38  *   49.38  *  143.41  *
* Vel Total (ft/s)       *    3.10  * Avg. Vel. (ft/s)      *    3.07  *    3.53  *    2.82  *
* Max Chl Dpth (ft)      *    9.83  * Hydr. Depth (ft)      *    4.18  *    8.18  *    3.68  *
* Conv. Total (cfs)      *229977.5  * Conv. (cfs)           *108261.7  * 59526.5  * 62189.3  *
* Length Wtd. (ft)       *  170.00  * Wetted Per. (ft)      *  201.62  *   51.08  *  143.65  *
* Min Ch El (ft)         * 1909.48  * Shear (lb/sq ft)      *    0.15  *    0.28  *    0.13  *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *  577.65  *    0.00  *    0.00  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *    2.33  *   52.77  *    3.45  *
* C & E Loss (ft)        *          * Cum SA (acres)        *    0.85  *    7.12  *    1.67  *
*************************************************************************************************

BRIDGE


RIVER: FW
REACH: FW                RS: 6000

INPUT
Description:
Distance from Upstream XS =     170
Deck/Roadway Width        =      10
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      64
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
       0  1922.7           1.2081922.633           2.9731922.616
   5.8561922.623           8.9721922.409          14.8161922.042
  16.3231921.964          23.2041921.604          25.5391921.431
  30.0971921.116          30.9261921.056           32.111920.984
  34.7021920.842          37.5981920.692          39.2951920.657
  42.7091920.503          46.0131920.357          46.9481920.299
  52.121 1919.73          54.1631919.654           56.481919.382
  69.5851918.756          69.885 1918.74          77.878  1918.5
  80.5951917.948          81.8031917.916           92.911917.307
  95.5051917.097         105.3411916.862         110.9961916.862
  118.911916.896         125.2141917.031         128.834 1917.04 1915.04
 149.082 1917.71 1915.04 188.083 1917.76 1915.04 210.114 1917.28 1915.04
 216.1041916.967          218.941916.864          225.311916.462
 230.8071916.083         235.2461915.677         239.0311915.371
 246.972 1915.27          248.041915.207         250.0921915.147
 256.7641914.714         263.6311914.595         266.1971914.496
 274.5611914.613         278.0851914.586         281.0241914.593
 284.6561914.608          301.221914.954         304.5731915.084
 309.5131915.348         314.9081915.617         334.8811916.573
 346.2251917.095         358.1381917.765         360.2571917.806
 363.221 1917.84          385.3911919.029         400.7921919.289
 406.8941919.553

Upstream Bridge Cross Section Data
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01923.064  10.886 1923.35  18.4831923.249   21.441923.241  26.2631922.965
  28.6631923.123  29.4531923.292  30.3381923.472  41.783 1921.71  45.0191921.205
  46.8251920.832  51.0551920.289  51.3271920.261  52.545 1920.15  75.1771918.032
   76.761917.905  81.8641917.689  102.141916.388 124.5941915.784  125.831915.753
 129.1091914.253 142.948 1908.55 149.6391908.733 154.4021908.996 171.7221909.675
 175.3091909.788  176.851910.203 183.233 1911.58 189.1071913.125  191.431913.708
 202.178 1914.55 202.8121914.615 203.7611914.716 204.0351914.699 226.2811915.121
 229.0071914.965 232.1011914.699 235.895 1914.53 254.3751913.795 257.7211913.848
 266.5221913.862 268.0151913.885 272.4451914.013 282.775 1914.04 287.4881914.221
 291.396  1914.5 293.5661914.656 296.2721914.886 299.347 1915.08 303.0321915.345
 306.5621915.419 327.7051916.533  330.521916.707 344.3571917.075 355.8941917.406
  375.811918.425 381.2691918.771 389.0281918.979 398.0891919.448

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  125.83     .04 202.178     .03
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       125.83 202.178             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      70
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**********************************************************************
-169.7391923.322        -168.3641923.217        -167.7041923.205
-164.8141923.161        -162.2681923.115        -150.4181922.938
-148.4881922.813        -145.3421922.633        -143.5771922.616
-140.6941922.623        -137.5781922.409        -131.7341922.042
-130.2271921.964        -123.3461921.604        -121.0111921.431
-116.4531921.116        -115.6241921.056         -114.441920.984
-111.8481920.842        -108.9521920.692        -107.2551920.657
-103.8411920.503        -100.5371920.357         -99.6021920.299
 -94.429 1919.73         -92.3871919.654          -90.071919.382
 -76.9651918.756         -76.665 1918.74         -68.672  1918.5
 -65.9551917.948         -64.7471917.916          -53.641917.307
 -51.0451917.097         -41.2091916.862         -35.5541916.862
  -27.641916.896         -21.3361917.031         -17.716 1917.04 1915.04
    2.532 1917.71 1915.04  41.533 1917.76 1915.04  63.564 1917.28 1915.04
  69.5541916.967           72.391916.864           78.761916.462
  84.2571916.083          88.6961915.677          92.4811915.371
 100.422 1915.27          101.491915.207         103.5421915.147
 110.2141914.714         117.0811914.595         119.6471914.496
 128.0111914.613         131.5351914.586         134.4741914.593
 138.1061914.608          154.671914.954         158.0231915.084
 162.9631915.348         168.3581915.617         188.3311916.573
 199.6751917.095         211.5881917.765         213.7071917.806
 216.671 1917.84         238.8411919.029         254.2421919.289
 260.3441919.553

Downstream Bridge Cross Section Data
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
********************************************************************************
    -1401924.051-138.7851923.913-126.5421921.682-124.8071921.424-119.2441921.014
-111.6341920.395-110.0121920.342 -86.7741919.439 -85.7911919.403 -84.684 1919.32
 -68.1791918.352 -63.998 1917.94 -63.1941918.081 -62.6151918.255 -58.1461917.907
 -55.0311917.864 -53.8931917.759 -38.6711916.274 -37.3551916.271 -35.9391916.123
 -20.6611915.969 -17.0151915.895 -10.7441913.481  -1.1871910.068   2.4491908.687
   4.6691908.576   6.6211908.461  17.6731908.564  21.6061908.628  25.4491908.664
  27.6511908.699  31.8491908.636  34.5361908.589  38.9691908.535   43.311908.567
  61.5251915.141  64.161 1915.95  64.8981915.868  65.9931915.846  68.9831916.215
  71.2761916.459  74.698 1916.21  81.9291915.669  84.6661915.482  96.6981914.736
 104.8581914.497 107.8831914.503 110.4091914.571 116.5621914.592 136.1261914.961
 141.3361915.099  143.911915.322 148.6271915.481  168.691916.569 172.0551916.769
 192.6821917.816 193.5841917.867 198.9781917.973 215.6121918.217 218.1291918.272
 236.3941918.384 242.7831918.484 253.2071918.628 260.3431918.917

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
    -140     .03 -17.015     .04  61.525     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       -17.015  61.525             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    -140    -135    1925       T

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=     149    Downstream=       9
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04

Pier Data
Pier Station     Upstream=     179    Downstream=      39
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =       2
```

Selected Low Flow Methods = Momentum

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 #100-yr FIS

E.G. US. (ft)	1919.47	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1919.31	E.G. Elev (ft)	1919.46	1919.46
Q Total (cfs)	5500.00	W.S. Elev (ft)	1919.31	1918.72
Q Bridge (cfs)	1630.15	Crit W.S. (ft)	1917.28	1916.43
Q Weir (cfs)	3869.85	Max Chl Dpth (ft)	10.76	10.26
Weir Sta Lft (ft)	59.89	Vel Total (ft/s)	4.81	4.81
Weir Sta Rgt (ft)	398.09	Flow Area (sq ft)	1143.42	1144.23
Weir Submerg	0.74	Froude # Chl	0.30	0.36
Weir Max Depth (ft)	4.97	Specif Force (cu ft)	4111.60	4087.98
Min El Weir Flow (ft)	1914.61	Hydr Depth (ft)	3.42	3.72
Min El Prs (ft)	1915.04	W.P. Total (ft)	512.72	480.31
Delta EG (ft)	0.18	Conv. Total (cfs)		
Delta WS (ft)	0.64	Top Width (ft)	333.90	307.52
BR Open Area (sq ft)	285.29	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.71	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)	0.00	-140.00

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: 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 is based on critical depth over the weir. The energy has been projected.

CROSS SECTION

RIVER: FW
REACH: FW RS: 5917

INPUT
Description: 59+05 US Face of Eastern Ave. Bridge
Station Elevation Data num= 167

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-172.5	1923.76	-171.906	1923.76	-170.8671	923.776	-170.5971	923.755	-170.5181	923.763
-169.8261	923.821	-169.81	923.822	-168.439	1923.65	-165.8611	922.875	-160.7461	922.822
-148.4981	922.469	-141.5351	922.393	-136.0541	922.169	-129.6581	922.015	-124.4481	921.893
-122.176	1921.84	-114.9291	918.452	-112.9411	917.892	-112.6931	917.919	-110.3091	917.941
-109.0051	918.031	-104.9631	918.085	-103.3821	918.105	-99.6911	918.274	-99.6691	918.274
-99.5811	918.275	-95.8711	918.462	-95.2791	918.523	-90.9961	918.872	-88.9121	919.049
-81.5241	919.718	-80.721	919.771	-80.571	919.781	-79.8951	919.844	-75.095	1919.96
-74.3641	919.954	-70.3621	920.197	-65.3381	920.022	-65.1581	920.026	-64.6581	920.013
-64.2111	920.009	-63.5951	919.999	-63.0011	920.001	-601	920.105	-59	1920.14
-54.371	1920.3	-52.3961	920.299	-49.6541	920.253	-45.6511	920.255	-45.0011	920.245
-44.213	1920.21	-41.5841	919.181	-40.211	918.723	-40.071	918.704	-39.8881	918.683
-39.3181	918.609	-36.8311	918.217	-30.2271	917.193	-19.907	1917.02	-18.561	917.017
-18.508	1917.04	-18.421	917.023	-15.6091	917.038	-15.4521	916.831	-2.0991	911.426
4.5211	908.752	7.2571	908.704	9.4941	908.686	11.9381	908.621	13.8651	908.574
21.2031	908.391	29.3891	908.315	42.3841	908.125	42.5641	908.128	42.9781	908.135
49.6521	908.224	51.4121	908.295	52.7471	908.936	64.3721	913.793	66.2391	914.676
69.921	916.515	70.1671	916.655	70.2491	916.653	77.8511	917.408	78.321	917.442
78.7531	917.422	81.5981	917.365	84.7841	917.247	88.7931	916.972	901	916.889
92.024	1916.75	981	916.424	109.5681	915.792	111.6741	915.713	116.8771	915.436
119.7151	915.317	124.1261	915.423	129.0241	915.593	134.6871	915.789	138.0081	916.103
140.2611	916.213	143.9431	916.257	146.8151	916.478	149.3031	916.667	152.6091	916.933
155.4311	917.094	158.4511	917.227	161.4831	917.511	167.831	917.619	168.731	1917.64
171.1761	917.671	179.9651	917.743	184.8421	917.682	192.6311	917.813	209.7931	918.207
217.8991	918.265	234.4581	918.519	252.52	1918.76	260.1441	919.123	268.3711	919.405
284.9661	919.736	295.528	1920.66	297.5481	920.742	298.1721	920.745	299.1021	920.768
307.791	1921.12	310.2661	921.264	310.5621	921.327	311.0431	921.411	316.4211	921.872
317.881	922.012	321.599	1922.44	322.7351	922.544	324.6671	922.636	326.8781	922.699
328.6281	922.671	331.293	1922.74	333.0641	922.671	336.8051	922.711	338.1571	922.678
341.771	922.761	344.5751	922.778	344.806	1922.78	347.181	922.799	349.1091	922.951
350.7881	923.237	355.1951	923.449	356.3121	923.567	358.3761	923.728	359.6041	923.721
362.7091	923.714	364.544	1923.62	368.6831	923.239	369.4851	923.172	372.121	922.854
376.0761	922.416	379.6991	922.019	382.3581	921.665	385.9961	921.243	391.9931	920.458
392.9411	920.507	401.6531	920.859	409.926	1921.08	421.2731	921.399	434.9591	922.172
449.4831	922.194	459.4281	921.693						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-172.5	.03	-18.42	.033	7.257	.013	52.747	.033	77.851	.03
129.024	.16								

```
                                                                    sub.rep
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -60      90             121     121     121             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  -172.5    -135    1925       T

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1919.28  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.61  * Wt. n-Val.           *   0.030  *   0.026  *   0.043  *
* W.S. Elev (ft)         * 1918.67  * Reach Len. (ft)      *  121.00  *  121.00  *  121.00  *
* Crit W.S. (ft)         * 1915.08  * Flow Area (sq ft)    *   10.51  *  779.92  *  230.76  *
* E.G. Slope (ft/ft)     *0.001255  * Area (sq ft)         *   10.51  *  779.92  *  230.76  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)           *   11.23  * 5075.97  *  412.80  *
* Top Width (ft)         *  307.79  * Top Width (ft)       *   21.97  *  129.81  *  156.01  *
* Vel Total (ft/s)       *    5.39  * Avg. Vel. (ft/s)     *    1.07  *    6.51  *    1.79  *
* Max Chl Dpth (ft)      *   10.55  * Hydr. Depth (ft)     *    0.48  *    6.01  *    1.48  *
* Conv. Total (cfs)      *155274.0  * Conv. (cfs)          *   317.2  *143302.9  * 11653.9  *
* Length Wtd. (ft)       *  121.00  * Wetted Per. (ft)     *   22.12  *  133.46  *  156.14  *
* Min Ch El (ft)         * 1908.13  * Shear (lb/sq ft)     *    0.04  *    0.46  *    0.12  *
* Alpha                  *    1.36  * Stream Power (lb/ft s) *  459.43  *    0.00  *    0.00  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *    0.44  *   50.87  *    1.10  *
* C & E Loss (ft)        *          * Cum SA (acres)        *    0.30  *    6.82  *    0.92  *
*********************************************************************************************

CULVERT


RIVER: FW
REACH: FW                RS: 5800

INPUT
Description: Eastern
Distance from Upstream XS =    10.9
Deck/Roadway Width        =      85
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*****************************************************************************
 -198.44 1919.63    1906 -188.71 1919.53    1906 -178.67 1919.41    1906
 -169.29 1919.32    1906 -159.26  1919.2    1906 -149.36 1919.08    1906
 -139.46 1918.97    1906 -129.34 1918.83    1906  -119.1 1918.74    1906
 -108.74 1918.64    1906  -98.56 1918.56    1906   -88.5 1918.48    1906
  -78.38 1918.39    1906  -68.47 1918.32    1906  -58.39 1918.27    1906
  -48.18 1918.21    1906  -38.27 1918.16    1906  -27.67 1918.11    1906
  -17.31 1918.08           -7.11 1918.05            3.07 1918.01
   13.37 1917.99           23.84 1917.97           34.25 1917.96
    44.4 1917.95           54.67 1917.96           64.73 1917.97
   75.02 1917.97          227.16    1919          337.17    1920

Upstream Bridge Cross Section Data
Station Elevation Data    num=     167
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
  -172.5 1923.76-171.906 1923.76-170.8671923.776-170.5971923.755-170.5181923.763
-169.8261923.821  -169.81923.822-168.439 1923.65-165.8611922.875-160.7461922.822
-148.4981922.469-141.5351922.393-136.0541922.169-129.6581922.015-124.4481921.893
-122.176 1921.84-114.9291918.452-112.9411917.892-112.6931917.919-110.3091917.941
-109.0051918.031-104.9631918.085-103.3821918.105 -99.6911918.274 -99.6691918.274
 -99.5811918.275 -95.8711918.462 -95.2791918.523 -90.9961918.872 -88.9121919.049
 -81.5241919.718  -80.721919.771  -80.571919.781 -79.8951919.844 -75.095 1919.96
 -74.3641919.954 -70.3621920.197 -65.3381920.022 -65.1581920.026 -64.6581920.013
 -64.2111920.009 -63.5951919.999 -63.0011920.001     -601920.105     -59 1920.14
 -54.371  1920.3 -52.3961920.299 -49.6541920.253 -45.6511920.255 -45.0011920.245
 -44.213 1920.21 -41.5841919.181  -40.211918.723  -40.071918.704 -39.8881918.683
 -39.3181918.609 -36.8311918.217 -30.2271917.193 -19.907 1917.02  -18.561917.017
 -18.508 1917.04  -18.421917.023 -15.6091917.038 -15.4521916.831  -2.0991911.426
   4.5211908.752   7.2571908.704   9.4941908.686  11.9381908.621  13.8651908.574
  21.2031908.391  29.3891908.315  42.3841908.125  42.5641908.128  42.9781908.135
  49.6521908.224  51.4121908.295  52.7471908.936  64.3721913.793  66.2391914.676
   69.921916.515  70.1671916.655  70.2491916.653  77.8511917.408   78.321917.442
  78.7531917.422  81.5981917.365  84.7841917.247  88.7931916.972     901916.889
  92.024 1916.75      981916.424 109.5681915.792 111.6741915.713 116.8771915.436
 119.7151915.317 124.1261915.423 129.0241915.593 134.6871915.789 138.0081916.103
 140.2611916.213 143.9431916.257 146.8151916.478 149.3031916.667 152.6091916.933
 155.4311917.094 158.4511917.227 161.4831917.511  167.831917.619 168.731 1917.64
 171.1761917.671 179.9651917.743 184.8421917.682 192.6311917.813 209.7931918.207
 217.8991918.265 234.4581918.519  252.52 1918.76 260.1441919.123 268.3711919.405
 284.9661919.736 295.528 1920.66 297.5481920.742 298.1721920.745 299.1021920.768
 307.791 1921.12 310.2661921.264 310.5621921.327 311.0431921.411 316.4211921.872
  317.881922.012 321.599 1922.44 322.7351922.544 324.6671922.636 326.8781922.699
 328.6281922.671 331.293 1922.74 333.0641922.671 336.8051922.711 338.1571922.678
  341.771922.761 344.5751922.778 344.806 1922.78  347.181922.799 349.1091922.951
 350.7881923.237 355.1951923.449 356.3121923.567 358.3761923.728 359.6041923.721
 362.7091923.714 364.544 1923.62 368.6831923.239 369.4851923.172  372.121922.854
 376.0761922.416 379.6991922.019 382.3581921.665 385.9961921.243 391.9931920.458
 392.9411920.507 401.6531920.859 409.926 1921.08 421.2731921.399 434.9591922.172
 449.4831922.194 459.4281921.693

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************************************************
  -172.5     .03  -18.42    .033   7.257    .013  52.747    .033  77.851     .03
 129.024     .16

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -60      90             .1       .3
Ineffective Flow     num=       1
```

```
   Sta L   Sta R    Elev  Permanent
  -172.5    -135    1925       T

Downstream  Deck/Roadway Coordinates
    num=      30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*****************************************************************************
 -198.44 1919.63    1906 -188.71 1919.53    1906 -178.67 1919.41    1906
 -169.29 1919.32    1906 -159.26  1919.2    1906 -149.36 1919.08    1906
 -139.46 1918.97    1906 -129.34 1918.83    1906  -119.1 1918.74    1906
 -108.74 1918.64    1906  -98.56 1918.56    1906   -88.5 1918.48    1906
  -78.38 1918.39    1906  -68.47 1918.32    1906  -58.39 1918.27    1906
  -48.18 1918.21    1906  -38.27 1918.16    1906  -27.67 1918.11    1906
  -17.31 1918.08           -7.11 1918.05            3.07 1918.01
   13.37 1917.99           23.84 1917.97           34.25 1917.96
    44.4 1917.95           54.67 1917.96           64.73 1917.97
   75.02 1917.97          227.16    1919          337.17    1920

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0    1918       0  1906.3   28.15  1906.3    56.3  1906.3    56.3    1918

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
*******************************
       0    .015    56.3    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
            0    56.3             .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         = 1917.95
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 16      99     .015     .015        0                   .4               .1
Number of Barrels =  5
Upstream   Elevation =  1907.6
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       5  16.575   28.15  39.725    51.3
Downstream Elevation =  1906.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       5  16.575   28.15  39.725    51.3

CULVERT OUTPUT  Profile #100-yr FIS  Culv Group:  Culvert #1
*****************************************************************************
* Q Culv Group (cfs)     * 4732.65  * Culv Full Len (ft)     *          *
* # Barrels              *       5  * Culv Vel US (ft/s)     *   14.50  *
* Q Barrel (cfs)         *  946.53  * Culv Vel DS (ft/s)     *   18.01  *
* E.G. US. (ft)          * 1919.29  * Culv Inv El Up (ft)    * 1907.60  *
* W.S. US. (ft)          * 1918.67  * Culv Inv El Dn (ft)    * 1906.30  *
* E.G. DS (ft)           * 1916.03  * Culv Frctn Ls (ft)     *    0.80  *
* W.S. DS (ft)           * 1912.77  * Culv Exit Loss (ft)    *    0.56  *
* Delta EG (ft)          *    3.25  * Culv Entr Loss (ft)    *    1.89  *
* Delta WS (ft)          *    5.90  * Q Weir (cfs)           *  767.35  *
* E.G. IC (ft)           * 1919.29  * Weir Sta Lft (ft)      * -116.73  *
* E.G. OC (ft)           * 1918.70  * Weir Sta Rgt (ft)      *  259.22  *
* Culvert Control        *   Inlet  * Weir Submerg           *    0.00  *
* Culv WS Inlet (ft)     * 1914.13  * Weir Max Depth (ft)    *    1.34  *
* Culv WS Outlet (ft)    * 1911.56  * Weir Avg Depth (ft)    *    0.88  *
* Culv Nml Depth (ft)    *    4.64  * Weir Flow Area (sq ft) *  291.70  *
* Culv Crt Depth (ft)    *    6.53  * Min El Weir Flow (ft)  * 1917.96  *
*****************************************************************************

Note:    The flow in the culvert is entirely supercritical.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 5796

INPUT
Description: Sta 57+96
 DS of Eastern Ave. Bridge
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0    1918       0  1906.3   28.15  1906.3    56.3  1906.3    56.3  1920.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015    56.3    .015
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0    56.3               20      20      20             .3       .5

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1916.03  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.26  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1912.77  * Reach Len. (ft)       *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)         * 1912.77  * Flow Area (sq ft)     *          *  364.27  *          *
* E.G. Slope (ft/ft)     *0.002340  * Area (sq ft)          *          *  364.27  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)            *          * 5280.00  *          *
* Top Width (ft)         *   56.30  * Top Width (ft)        *          *   56.30  *          *
* Vel Total (ft/s)       *   14.49  * Avg. Vel. (ft/s)      *          *   14.49  *          *
* Max Chl Dpth (ft)      *    6.47  * Hydr. Depth (ft)      *          *    6.47  *          *
* Conv. Total (cfs)      *109154.7  * Conv. (cfs)           *          *109154.7  *          *
* Length Wtd. (ft)       *   20.00  * Wetted Per. (ft)      *          *   69.24  *          *
* Min Ch El (ft)         * 1906.30  * Shear (lb/sq ft)      *          *    0.77  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   56.30  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.05  * Cum Volume (acre-ft)   *    0.44  *   49.57  *    1.10  *
* C & E Loss (ft)        *    0.34  * Cum SA (acres)         *    0.27  *    6.57  *    0.70  *
************************************************************************************************

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: FW
REACH: FW                RS: 5776

INPUT
Description: "FW" 57+37.74 End 79.77' Channel. Begin transition
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1915.79       0  1906.1   39.84 1905.99   79.77  1906.1   79.77 1915.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015   79.77    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   79.77            38.26   38.26   38.26             .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1913.76  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.59  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1911.17  * Reach Len. (ft)       *   38.26  *   38.26  *   38.26  *
* Crit W.S. (ft)         * 1911.17  * Flow Area (sq ft)     *          *  408.94  *          *
* E.G. Slope (ft/ft)     *0.002254  * Area (sq ft)          *          *  408.94  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)            *          * 5280.00  *          *
* Top Width (ft)         *   79.77  * Top Width (ft)        *          *   79.77  *          *
* Vel Total (ft/s)       *   12.91  * Avg. Vel. (ft/s)      *          *   12.91  *          *
* Max Chl Dpth (ft)      *    5.18  * Hydr. Depth (ft)      *          *    5.13  *          *
* Conv. Total (cfs)      *111205.3  * Conv. (cfs)           *          *111205.3  *          *
* Length Wtd. (ft)       *   38.26  * Wetted Per. (ft)      *          *   89.91  *          *
* Min Ch El (ft)         * 1905.99  * Shear (lb/sq ft)      *          *    0.64  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   79.77  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.09  * Cum Volume (acre-ft)   *    0.44  *   49.39  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.27  *    6.53  *    0.70  *
************************************************************************************************

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: FW
REACH: FW                RS: 5737.74

INPUT
Description: 57+37.74 Begin 79.77' Channel. End transition
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1915.23       0 1905.75   39.84 1905.43   79.77 1905.75   79.77 1915.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015   79.77    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   79.77            89.32   89.32   89.32             .01      .03
```

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1913.31	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 2.57	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1910.73	* Reach Len. (ft)	* 89.32	* 89.32	* 89.32	*
* Crit W.S. (ft)	* 1910.73	* Flow Area (sq ft)	*	* 410.23	*	*
* E.G. Slope (ft/ft)	*0.002225	* Area (sq ft)	*	* 410.23	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 79.77	* Top Width (ft)	*	* 79.77	*	*
* Vel Total (ft/s)	* 12.87	* Avg. Vel. (ft/s)	*	* 12.87	*	*
* Max Chl Dpth (ft)	* 5.30	* Hydr. Depth (ft)	*	* 5.14	*	*
* Conv. Total (cfs)	*111934.2	* Conv. (cfs)	*	*111934.2	*	*
* Length Wtd. (ft)	* 89.32	* Wetted Per. (ft)	*	* 89.74	*	*
* Min Ch El (ft)	* 1905.43	* Shear (lb/sq ft)	*	* 0.64	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 79.77	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.20	* Cum Volume (acre-ft)	* 0.44	* 49.03	* 1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 6.46	* 0.70	*

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: FW
REACH: FW RS: 5648.42

INPUT
Description: 56+48.42 begin transition from 75' to 79.77' and PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1913.89	0	1904.84	37.5	1904.09	75	1904.84	75	1913.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	99.6	99.6	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1912.50	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 2.68	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1909.82	* Reach Len. (ft)	* 99.60	* 99.60	* 99.60	*
* Crit W.S. (ft)	* 1909.82	* Flow Area (sq ft)	*	* 401.89	*	*
* E.G. Slope (ft/ft)	*0.002216	* Area (sq ft)	*	* 401.89	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	*	*
* Vel Total (ft/s)	* 13.14	* Avg. Vel. (ft/s)	*	* 13.14	*	*
* Max Chl Dpth (ft)	* 5.73	* Hydr. Depth (ft)	*	* 5.36	*	*
* Conv. Total (cfs)	*112166.4	* Conv. (cfs)	*	*112166.4	*	*
* Length Wtd. (ft)	* 99.60	* Wetted Per. (ft)	*	* 84.98	*	*
* Min Ch El (ft)	* 1904.09	* Shear (lb/sq ft)	*	* 0.65	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.22	* Cum Volume (acre-ft)	* 0.44	* 48.20	* 1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 6.31	* 0.70	*

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: FW
REACH: FW RS: 5548.82*

INPUT
Description: "FW" 58+48.82
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1912.39	0	1903.34	37.5	1902.59	75	1903.34	75	1912.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	99.59	99.59	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1911.00	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 2.68	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1908.32	* Reach Len. (ft)	* 99.59	* 99.59	* 99.59	*

* Crit W.S. (ft)	* 1908.32	* Flow Area (sq ft)	*	* 401.85	*	*
* E.G. Slope (ft/ft)	*0.002216	* Area (sq ft)	*	* 401.85	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	*	*
* Vel Total (ft/s)	* 13.14	* Avg. Vel. (ft/s)	*	* 13.14	*	*
* Max Chl Dpth (ft)	* 5.73	* Hydr. Depth (ft)	*	* 5.36	*	*
* Conv. Total (cfs)	*112150.2	* Conv. (cfs)	*	*112150.2	*	*
* Length Wtd. (ft)	* 99.59	* Wetted Per. (ft)	*	* 84.98	*	*
* Min Ch El (ft)	* 1902.59	* Shear (lb/sq ft)	*	* 0.65	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.22	* Cum Volume (acre-ft)	* 0.44	* 47.28	* 1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 6.13	* 0.70	*

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: FW
REACH: FW RS: 5449.23

INPUT
Description: "FW" 54+49.23
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1910.89	0	1901.84	37.5	1901.09	75	1901.84	75	1910.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	.12	.12	.12	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1909.50	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.68	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1906.82	* Reach Len. (ft)	* 0.12	* 0.12	* 0.12	*
* Crit W.S. (ft)	* 1906.82	* Flow Area (sq ft)	*	* 401.81	*	*
* E.G. Slope (ft/ft)	*0.002217	* Area (sq ft)	*	* 401.81	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	*	*
* Vel Total (ft/s)	* 13.14	* Avg. Vel. (ft/s)	*	* 13.14	*	*
* Max Chl Dpth (ft)	* 5.73	* Hydr. Depth (ft)	*	* 5.36	*	*
* Conv. Total (cfs)	*112130.0	* Conv. (cfs)	*	*112130.0	*	*
* Length Wtd. (ft)	* 0.12	* Wetted Per. (ft)	*	* 84.98	*	*
* Min Ch El (ft)	* 1901.09	* Shear (lb/sq ft)	*	* 0.65	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.00	* Cum Volume (acre-ft)	* 0.44	* 46.36	* 1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.96	* 0.70	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 5449.11

INPUT
Description: 54+49.11 PC, End Transition and Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1910.89	0	1901.84	37.5	1901.09	75	1901.84	75	1910.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	50	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1909.50	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.68	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1906.82	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00	*
* Crit W.S. (ft)	* 1906.82	* Flow Area (sq ft)	*	* 401.71	*	*
* E.G. Slope (ft/ft)	*0.002219	* Area (sq ft)	*	* 401.71	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	*	*
* Vel Total (ft/s)	* 13.14	* Avg. Vel. (ft/s)	*	* 13.14	*	*
* Max Chl Dpth (ft)	* 5.73	* Hydr. Depth (ft)	*	* 5.36	*	*
* Conv. Total (cfs)	*112085.5	* Conv. (cfs)	*	*112085.5	*	*
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 84.98	*	*
* Min Ch El (ft)	* 1901.09	* Shear (lb/sq ft)	*	* 0.65	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.11	* Cum Volume (acre-ft)	* 0.44	* 46.36	* 1.10	*

* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.96	* 0.70	*

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: FW
REACH: FW RS: 5399.11

INPUT
Description: "FW" 53+99.11
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1909.97	0	1900.85	33.81	1900.17	67.61	1900.85	67.61	1909.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	67.61	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	67.61	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1909.12	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.87	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1906.25	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00 *
* Crit W.S. (ft)	* 1906.25	* Flow Area (sq ft)	*	* 388.16	* *
* E.G. Slope (ft/ft)	*0.002235	* Area (sq ft)	*	* 388.16	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 67.61	* Top Width (ft)	*	* 67.61	* *
* Vel Total (ft/s)	* 13.60	* Avg. Vel. (ft/s)	*	* 13.60	* *
* Max Chl Dpth (ft)	* 6.08	* Hydr. Depth (ft)	*	* 5.74	* *
* Conv. Total (cfs)	*111674.5	* Conv. (cfs)	*	*111674.5	* *
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 78.43	* *
* Min Ch El (ft)	* 1900.17	* Shear (lb/sq ft)	*	* 0.69	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 67.61	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 45.91	* 1.10 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 0.27	* 5.88	* 0.70 *

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: FW
REACH: FW RS: 5349.11

INPUT
Description: "FW" 53+49.11
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1909.06	0	1899.86	30.11	1899.26	60.22	1899.86	60.22	1909.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	60.22	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	60.22	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1908.92	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.65	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1906.27	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00 *
* Crit W.S. (ft)	* 1905.76	* Flow Area (sq ft)	*	* 403.90	* *
* E.G. Slope (ft/ft)	*0.001781	* Area (sq ft)	*	* 403.90	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 60.22	* Top Width (ft)	*	* 60.22	* *
* Vel Total (ft/s)	* 13.07	* Avg. Vel. (ft/s)	*	* 13.07	* *
* Max Chl Dpth (ft)	* 7.01	* Hydr. Depth (ft)	*	* 6.71	* *
* Conv. Total (cfs)	*125111.5	* Conv. (cfs)	*	*125111.5	* *
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 73.05	* *
* Min Ch El (ft)	* 1899.26	* Shear (lb/sq ft)	*	* 0.61	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 60.22	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.09	* Cum Volume (acre-ft)	* 0.44	* 45.45	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.81	* 0.70 *

CROSS SECTION

RIVER: FW

REACH: FW RS: 5299.11

INPUT
Description: "FW" 52+99.11
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1908.14	0	1898.87	26.42	1898.34	52.84	1898.87	52.84	1908.14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	52.84	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 52.84 19.19 19.19 19.19 .01 .03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1908.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	1905.95	Reach Len. (ft)	19.19	19.19	19.19
Crit W.S. (ft)	1905.35	Flow Area (sq ft)		388.08	
E.G. Slope (ft/ft)	0.001814	Area (sq ft)		388.08	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	52.84	Top Width (ft)		52.84	
Vel Total (ft/s)	13.61	Avg. Vel. (ft/s)		13.61	
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)		7.34	
Conv. Total (cfs)	123980.3	Conv. (cfs)		123980.3	
Length Wtd. (ft)	19.19	Wetted Per. (ft)		67.01	
Min Ch El (ft)	1898.34	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)	52.84	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.44	45.00	1.10
C & E Loss (ft)	0.01	Cum SA (acres)	0.27	5.74	0.70

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: FW
REACH: FW RS: 5279.92

INPUT
Description: 52+79.92 begin transition from 50' to 75' and PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907.79	0	1898.49	25	1897.99	50	1898.49	50	1907.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 24.76 24.76 24.76 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1908.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.53	Wt. n-Val.		0.015	
W.S. Elev (ft)	1905.24	Reach Len. (ft)	24.76	24.76	24.76
Crit W.S. (ft)	1905.24	Flow Area (sq ft)		350.00	
E.G. Slope (ft/ft)	0.002382	Area (sq ft)		350.00	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.09	Avg. Vel. (ft/s)		15.09	
Max Chl Dpth (ft)	7.25	Hydr. Depth (ft)		7.00	
Conv. Total (cfs)	108173.9	Conv. (cfs)		108173.9	
Length Wtd. (ft)	24.76	Wetted Per. (ft)		63.51	
Min Ch El (ft)	1897.99	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.44	44.84	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	5.72	0.70

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: FW
REACH: FW RS: 5255.16

INPUT
Description: 52+55.16 Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907.34	0	1898.04	25	1897.54	50	1898.04	50	1907.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
**********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            48.46   48.46   48.46              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1908.32  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.54  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1904.79  * Reach Len. (ft)       *   48.46  *   48.46  *   48.46  *
* Crit W.S. (ft)         * 1904.79  * Flow Area (sq ft)     *          *  349.88  *          *
* E.G. Slope (ft/ft)     *0.002385  * Area (sq ft)          *          *  349.88  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)           *          * 5280.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)       *   15.09  * Avg. Vel. (ft/s)     *          *   15.09  *          *
* Max Chl Dpth (ft)      *    7.25  * Hydr. Depth (ft)     *          *    7.00  *          *
* Conv. Total (cfs)      *108119.5  * Conv. (cfs)          *          *108119.5  *          *
* Length Wtd. (ft)       *   48.46  * Wetted Per. (ft)     *          *   63.51  *          *
* Min Ch El (ft)         * 1897.54  * Shear (lb/sq ft)     *          *    0.82  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.12  * Cum Volume (acre-ft)  *    0.44  *   44.64  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.27  *    5.69  *    0.70  *
*****************************************************************************************

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: FW
REACH: FW                RS: 5206.70

INPUT
Description: "FW" 52+06.70
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1910.86       0 1897.66      25 1897.16      50 1897.66      50 1910.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            48.46   48.46   48.46              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1907.94  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.53  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1904.41  * Reach Len. (ft)       *   48.46  *   48.46  *   48.46  *
* Crit W.S. (ft)         * 1904.41  * Flow Area (sq ft)     *          *  350.05  *          *
* E.G. Slope (ft/ft)     *0.002381  * Area (sq ft)          *          *  350.05  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)           *          * 5280.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)       *   15.08  * Avg. Vel. (ft/s)     *          *   15.08  *          *
* Max Chl Dpth (ft)      *    7.25  * Hydr. Depth (ft)     *          *    7.00  *          *
* Conv. Total (cfs)      *108199.7  * Conv. (cfs)          *          *108199.7  *          *
* Length Wtd. (ft)       *   48.46  * Wetted Per. (ft)     *          *   63.51  *          *
* Min Ch El (ft)         * 1897.16  * Shear (lb/sq ft)     *          *    0.82  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.11  * Cum Volume (acre-ft)  *    0.44  *   44.25  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.27  *    5.64  *    0.70  *
*****************************************************************************************

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: FW
REACH: FW                RS: 5158.24

INPUT
Description: "FW" 51+58.24
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1911.58       0 1897.28      25 1896.78      50 1897.28      50 1912.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            48.45   48.45   48.45              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
```

E.G. Elev (ft)	1907.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.29	Wt. n-Val.		0.015	
W.S. Elev (ft)	1904.28	Reach Len. (ft)	48.45	48.45	48.45
Crit W.S. (ft)	1904.03	Flow Area (sq ft)		362.72	
E.G. Slope (ft/ft)	0.002138	Area (sq ft)		362.72	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	14.56	Avg. Vel. (ft/s)		14.56	
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)		7.25	
Conv. Total (cfs)	114196.0	Conv. (cfs)		114196.0	
Length Wtd. (ft)	48.45	Wetted Per. (ft)		64.02	
Min Ch El (ft)	1896.78	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.44	43.85	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	5.58	0.70

CROSS SECTION

RIVER: FW
REACH: FW RS: 5109.79

INPUT
Description: "FW"51+09.79
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907	0	1896.9	25	1896.4	50	1896.9	50	1909.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.46	48.46	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1907.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1903.86	Reach Len. (ft)	48.46	48.46	48.46
Crit W.S. (ft)	1903.86	Flow Area (sq ft)		360.60	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.60	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113186.7	Conv. (cfs)		113186.7	
Length Wtd. (ft)	48.46	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1896.40	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.44	43.45	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	5.52	0.70

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: FW
REACH: FW RS: 5061.33

INPUT
Description: "FW" 50+61.33
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1905.82	0	1896.52	25	1896.02	50	1896.52	50	1905.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.45	48.45	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1907.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1903.48	Reach Len. (ft)	48.45	48.45	48.45
Crit W.S. (ft)	1903.48	Flow Area (sq ft)		360.60	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.60	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113183.8	Conv. (cfs)		113183.8	
Length Wtd. (ft)	48.45	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1896.02	Shear (lb/sq ft)		0.83	

* Alpha	*	1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00 *
* Frctn Loss (ft)	*	0.11	* Cum Volume (acre-ft)	*	0.44	*	43.05	*	1.10 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.27	*	5.47	*	0.70 *

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: FW
REACH: FW RS: 5012.88

INPUT
Description: "FW" 50+12.88 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1905.44	0	1896.14	25	1895.64	50	1896.14	50	1905.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	67.84	67.84	67.84	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1906.71	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1903.10	* Reach Len. (ft)	* 67.84	* 67.84	* 67.84 *
* Crit W.S. (ft)	* 1903.10	* Flow Area (sq ft)	*	* 360.59	* *
* E.G. Slope (ft/ft)	*0.002361	* Area (sq ft)	*	* 360.59	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113180.9	* Conv. (cfs)	*	*113180.9	* *
* Length Wtd. (ft)	* 67.84	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1895.64	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.16	* Cum Volume (acre-ft)	* 0.44	* 42.65	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.41	* 0.70 *

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: FW
REACH: FW RS: 4945.04

INPUT
Description: 49+45.04 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1904.91	0	1895.61	25	1895.11	50	1895.61	50	1904.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	81.68	81.68	81.68	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1906.18	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1902.57	* Reach Len. (ft)	* 81.68	* 81.68	* 81.68 *
* Crit W.S. (ft)	* 1902.57	* Flow Area (sq ft)	*	* 360.61	* *
* E.G. Slope (ft/ft)	*0.002361	* Area (sq ft)	*	* 360.61	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113189.6	* Conv. (cfs)	*	*113189.6	* *
* Length Wtd. (ft)	* 81.68	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1895.11	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.19	* Cum Volume (acre-ft)	* 0.44	* 42.09	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.34	* 0.70 *

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: FW
REACH: FW RS: 4863.36

INPUT
Description: "FW" 48+63.36
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1904.28	0	1894.98	25	1894.48	50	1894.98	50	1904.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 81.68 81.68 81.68 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1905.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1901.94	Reach Len. (ft)	81.68	81.68	81.68
Crit W.S. (ft)	1901.94	Flow Area (sq ft)		360.60	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.60	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113183.8	Conv. (cfs)		113183.8	
Length Wtd. (ft)	81.68	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1894.48	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.44	41.41	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	5.24	0.70

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: FW
REACH: FW RS: 4781.68

INPUT
Description: "FW" 47+81.68
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1903.64	0	1894.34	25	1893.84	50	1894.34	50	1903.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 81.68 81.68 81.68 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1904.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1901.30	Reach Len. (ft)	81.68	81.68	81.68
Crit W.S. (ft)	1901.30	Flow Area (sq ft)		360.59	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.59	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113180.9	Conv. (cfs)		113180.9	
Length Wtd. (ft)	81.68	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1893.84	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.44	40.73	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	5.15	0.70

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: FW
REACH: FW RS: 4700

INPUT
Description: "FW" 47+00.00 Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1903	0	1893.7	25	1893.2	50	1893.7	50	1903

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 100 100 100 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1904.27	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1900.66	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1900.66	* Flow Area (sq ft)	*	* 360.61	* *
* E.G. Slope (ft/ft)	*0.002361	* Area (sq ft)	*	* 360.61	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113189.6	* Conv. (cfs)	*	*113189.6	* *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1893.20	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.24	* Cum Volume (acre-ft)	* 0.44	* 40.06	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 5.05	* 0.70 *

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: FW
REACH: FW RS: 4600

INPUT
Description: "FW" 46+00.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1902.22	0	1892.92	25	1892.42	50	1892.92	50	1902.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 100 100 100 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1903.49	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1899.88	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1899.88	* Flow Area (sq ft)	*	* 360.60	* *
* E.G. Slope (ft/ft)	*0.002361	* Area (sq ft)	*	* 360.60	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113186.7	* Conv. (cfs)	*	*113186.7	* *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1892.42	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.24	* Cum Volume (acre-ft)	* 0.44	* 39.23	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.94	* 0.70 *

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: FW
REACH: FW RS: 4500

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1901.43	0	1892.13	25	1891.63	50	1892.13	50	1901.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	74.31	74.31	74.31	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1902.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1899.09	Reach Len. (ft)	74.31	74.31	74.31
Crit W.S. (ft)	1899.09	Flow Area (sq ft)		360.59	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.59	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113180.9	Conv. (cfs)		113180.9	
Length Wtd. (ft)	74.31	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1891.63	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.44	38.40	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	4.82	0.70

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: FW
REACH: FW RS: 4425.69

INPUT
Description: "FW" 44+25.69 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1900.85	0	1891.55	25	1891.05	50	1891.55	50	1900.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	75.69	75.69	75.69	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1902.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1898.51	Reach Len. (ft)	75.69	75.69	75.69
Crit W.S. (ft)	1898.51	Flow Area (sq ft)		360.61	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113189.6	Conv. (cfs)		113189.6	
Length Wtd. (ft)	75.69	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1891.05	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.44	37.79	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	4.74	0.70

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: FW
REACH: FW RS: 4350

INPUT
Description: "FW" 43+50 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1900.26	0	1890.96	25	1890.46	50	1890.96	50	1900.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50               75      75      75              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1901.53  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.61  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1897.92  * Reach Len. (ft)       *   75.00  *   75.00  *   75.00  *
* Crit W.S. (ft)         * 1897.92  * Flow Area (sq ft)     *          *  360.60  *          *
* E.G. Slope (ft/ft)     *0.002361  * Area (sq ft)          *          *  360.60  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)        *          *   50.00  *          *
* Vel Total (ft/s)       *   15.25  * Avg. Vel. (ft/s)      *          *   15.25  *          *
* Max Chl Dpth (ft)      *    7.46  * Hydr. Depth (ft)      *          *    7.21  *          *
* Conv. Total (cfs)      *113186.7  * Conv. (cfs)           *          *113186.7  *          *
* Length Wtd. (ft)       *   75.00  * Wetted Per. (ft)      *          *   63.93  *          *
* Min Ch El (ft)         * 1890.46  * Shear (lb/sq ft)      *          *    0.83  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.18  * Cum Volume (acre-ft)   *    0.44  *   37.16  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.27  *    4.65  *    0.70  *
************************************************************************************************

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: FW
REACH: FW                RS: 4275.*

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
       0 1899.51       0 1890.21      25 1889.71      50 1890.21      50 1899.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50               75      75      75              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1900.78  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.61  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1897.17  * Reach Len. (ft)       *   75.00  *   75.00  *   75.00  *
* Crit W.S. (ft)         * 1897.17  * Flow Area (sq ft)     *          *  360.60  *          *
* E.G. Slope (ft/ft)     *0.002361  * Area (sq ft)          *          *  360.60  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)        *          *   50.00  *          *
* Vel Total (ft/s)       *   15.25  * Avg. Vel. (ft/s)      *          *   15.25  *          *
* Max Chl Dpth (ft)      *    7.46  * Hydr. Depth (ft)      *          *    7.21  *          *
* Conv. Total (cfs)      *113183.8  * Conv. (cfs)           *          *113183.8  *          *
* Length Wtd. (ft)       *   75.00  * Wetted Per. (ft)      *          *   63.93  *          *
* Min Ch El (ft)         * 1889.71  * Shear (lb/sq ft)      *          *    0.83  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.18  * Cum Volume (acre-ft)   *    0.44  *   36.54  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.27  *    4.57  *    0.70  *
************************************************************************************************

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: FW
REACH: FW                RS: 4200.00

INPUT
Description: "FW" 42+00 grade break
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
       0 1898.76       0 1889.46      25 1888.96      50 1889.46      50 1898.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            72.75   72.75   72.75              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1900.03  * Element               *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	*			*
* W.S. Elev (ft)	* 1896.42	* Reach Len. (ft)	* 72.75	* 72.75	* 72.75	*		
* Crit W.S. (ft)	* 1896.42	* Flow Area (sq ft)	*	* 360.58	*			*
* E.G. Slope (ft/ft)	*0.002362	* Area (sq ft)	*	* 360.58	*			*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*			*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*			*
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	*			*
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	*			*
* Conv. Total (cfs)	*113178.0	* Conv. (cfs)	*	*113178.0	*			*
* Length Wtd. (ft)	* 72.75	* Wetted Per. (ft)	*	* 63.93	*			*
* Min Ch El (ft)	* 1888.96	* Shear (lb/sq ft)	*	* 0.83	*			*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	*	0.00	*	
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 0.44	* 35.92	*	1.10	*	
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.48	*	0.70	*	

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: FW
REACH: FW RS: 4127.25*

INPUT
Description: "FW" 41+27.25
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1898.4	0	1889.1	25	1888.6	50	1889.1	50	1898.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	72.75	72.75	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1899.67	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1896.06	* Reach Len. (ft)	* 72.75	* 72.75	* 72.75 *
* Crit W.S. (ft)	* 1896.06	* Flow Area (sq ft)	*	* 360.58	*
* E.G. Slope (ft/ft)	*0.002362	* Area (sq ft)	*	* 360.58	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	*
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	*
* Conv. Total (cfs)	*113175.1	* Conv. (cfs)	*	*113175.1	*
* Length Wtd. (ft)	* 72.75	* Wetted Per. (ft)	*	* 63.93	*
* Min Ch El (ft)	* 1888.60	* Shear (lb/sq ft)	*	* 0.83	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 0.44	* 35.32	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.40	* 0.70 *

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: FW
REACH: FW RS: 4054.5*

INPUT
Description: "FW"40+54.50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1898.03	0	1888.73	25	1888.23	50	1888.73	50	1898.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	77.42	77.42	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1899.30	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1895.69	* Reach Len. (ft)	* 77.42	* 77.42	* 77.42 *
* Crit W.S. (ft)	* 1895.69	* Flow Area (sq ft)	*	* 360.57	*
* E.G. Slope (ft/ft)	*0.002362	* Area (sq ft)	*	* 360.57	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	*

* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	*	*		
* Conv. Total (cfs)	*113172.2	* Conv. (cfs)	*	*113172.2	*	*		
* Length Wtd. (ft)	* 77.42	* Wetted Per. (ft)	*	* 63.93	*	*		
* Min Ch El (ft)	* 1888.23	* Shear (lb/sq ft)	*	* 0.83	*	*		
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	*	0.00	*	
* Frctn Loss (ft)	* 0.18	* Cum Volume (acre-ft)	* 0.44	* 34.71	*	1.10	*	
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.31	*	0.70	*	

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: FW
REACH: FW RS: 3977.08

INPUT
Description: 39+77.08 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1897.65	0	1888.35	25	1887.85	50	1888.35	50	1897.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.2	86.2	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1898.92	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1895.31	* Reach Len. (ft)	* 86.20	* 86.20	* 86.20 *
* Crit W.S. (ft)	* 1895.31	* Flow Area (sq ft)	*	* 360.57	* *
* E.G. Slope (ft/ft)	*0.002362	* Area (sq ft)	*	* 360.57	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113172.2	* Conv. (cfs)	*	*113172.2	* *
* Length Wtd. (ft)	* 86.20	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1887.85	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.20	* Cum Volume (acre-ft)	* 0.44	* 34.07	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.22	* 0.70 *

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: FW
REACH: FW RS: 3890.88*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1897.21	0	1887.91	25	1887.41	50	1887.91	50	1897.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	90.88	90.88	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1898.48	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1894.87	* Reach Len. (ft)	* 90.88	* 90.88	* 90.88 *
* Crit W.S. (ft)	* 1894.87	* Flow Area (sq ft)	*	* 360.57	* *
* E.G. Slope (ft/ft)	*0.002362	* Area (sq ft)	*	* 360.57	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113172.2	* Conv. (cfs)	*	*113172.2	* *
* Length Wtd. (ft)	* 90.88	* Wetted Per. (ft)	*	* 63.93	* *
* Min Ch El (ft)	* 1887.41	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.21	* Cum Volume (acre-ft)	* 0.44	* 33.36	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 4.13	* 0.70 *

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: FW
REACH: FW RS: 3800

INPUT
Description: 38+00 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1896.76	0	1887.46	25	1886.96	50	1887.46	50	1896.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	100	100	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1898.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1894.42	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1894.42	Flow Area (sq ft)		360.57	
E.G. Slope (ft/ft)	0.002362	Area (sq ft)		360.57	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113172.2	Conv. (cfs)		113172.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1886.96	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.44	32.61	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	4.02	0.70

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: FW
REACH: FW RS: 3700.*

INPUT
Description: "FW" 37+00.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1895.76	0	1886.46	25	1885.96	50	1886.46	50	1895.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	106.45 106.45	106.45	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1897.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1893.42	Reach Len. (ft)	106.45	106.45	106.45
Crit W.S. (ft)	1893.42	Flow Area (sq ft)		360.54	
E.G. Slope (ft/ft)	0.002362	Area (sq ft)		360.54	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113157.7	Conv. (cfs)		113157.7	
Length Wtd. (ft)	106.45	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1885.96	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.44	31.78	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.91	0.70

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: FW
REACH: FW RS: 3593.55

INPUT
Description: 35+93.55 grade break.End Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1894.7	0	1885.4	25	1884.9	50	1885.4	50	1894.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 50 50 50 .01 .03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1895.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1892.36	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1892.36	Flow Area (sq ft)		360.48	
E.G. Slope (ft/ft)	*0.002364	Area (sq ft)		360.48	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.26	Avg. Vel. (ft/s)		15.26	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	*113128.6	Conv. (cfs)		*113128.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		63.93	
Min Ch El (ft)	1884.90	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.44	30.90	1.10
C & E Loss (ft)	0.01	Cum SA (acres)	0.27	3.78	0.70

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: FW
REACH: FW RS: 3543.55

INPUT
Description: "FW" 35+43.55
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1894.13	0	1884.36	22.88	1883.9	45.75	1884.36	45.75	1894.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	45.75	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 45.75 50 50 50 .01 .03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1895.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.37	Wt. n-Val.		0.015	
W.S. Elev (ft)	1892.29	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1891.76	Flow Area (sq ft)		373.25	
E.G. Slope (ft/ft)	*0.002004	Area (sq ft)		373.25	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	45.75	Top Width (ft)		45.75	
Vel Total (ft/s)	14.74	Avg. Vel. (ft/s)		14.74	
Max Chl Dpth (ft)	8.39	Hydr. Depth (ft)		8.16	
Conv. Total (cfs)	*122867.9	Conv. (cfs)		*122867.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		61.62	
Min Ch El (ft)	1883.90	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)	45.75	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.44	30.48	1.10
C & E Loss (ft)	0.01	Cum SA (acres)	0.27	3.73	0.70

CROSS SECTION

RIVER: FW
REACH: FW RS: 3493.55

INPUT
Description: "FW" 34+93.55
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*****************************************************************************
       0 1893.55       0 1883.31   20.75  1882.9    41.5 1883.31    41.5 1893.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015    41.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0    41.5               50      50      50             .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1895.56  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.15  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)         * 1892.41  * Reach Len. (ft)        *   50.00  *   50.00  *   50.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *          *  386.09  *          *
* E.G. Slope (ft/ft)     *0.001716  * Area (sq ft)           *          *  386.09  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)             *          * 5500.00  *          *
* Top Width (ft)         *   41.50  * Top Width (ft)         *          *   41.50  *          *
* Vel Total (ft/s)       *   14.25  * Avg. Vel. (ft/s)       *          *   14.25  *          *
* Max Chl Dpth (ft)      *    9.51  * Hydr. Depth (ft)       *          *    9.30  *          *
* Conv. Total (cfs)      *132754.0  * Conv. (cfs)            *          *132754.0  *          *
* Length Wtd. (ft)       *   50.00  * Wetted Per. (ft)       *          *   59.70  *          *
* Min Ch El (ft)         * 1882.90  * Shear (lb/sq ft)       *          *    0.69  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   41.50  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.09  * Cum Volume (acre-ft)   *    0.44  *   30.04  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.27  *    3.68  *    0.70  *
*********************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 3443.55

INPUT
Description: "FW" 34+43.55
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0 1892.98       0 1882.27   18.62  1881.9   37.25 1882.27   37.25 1892.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015   37.25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   37.25               50      50      50             .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1895.47  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.39  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)         * 1892.07  * Reach Len. (ft)        *   50.00  *   50.00  *   50.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *          *  372.10  *          *
* E.G. Slope (ft/ft)     *0.001819  * Area (sq ft)           *          *  372.10  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)             *          * 5500.00  *          *
* Top Width (ft)         *   37.25  * Top Width (ft)         *          *   37.25  *          *
* Vel Total (ft/s)       *   14.78  * Avg. Vel. (ft/s)       *          *   14.78  *          *
* Max Chl Dpth (ft)      *   10.17  * Hydr. Depth (ft)       *          *    9.99  *          *
* Conv. Total (cfs)      *128953.0  * Conv. (cfs)            *          *128953.0  *          *
* Length Wtd. (ft)       *   50.00  * Wetted Per. (ft)       *          *   56.87  *          *
* Min Ch El (ft)         * 1881.90  * Shear (lb/sq ft)       *          *    0.74  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   37.25  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.11  * Cum Volume (acre-ft)   *    0.44  *   29.61  *    1.10  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    0.27  *    3.63  *    0.70  *
*********************************************************************************************

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: FW
REACH: FW                RS: 3393.55

INPUT
Description: 33+93.55 grade break. Begin Transition from 33' to 50'
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0  1892.4       0 1881.23    16.5  1880.9      33 1881.23      33  1892.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      33              97.57   97.57   97.57               0       0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1895.34  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.79  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)         * 1890.56  * Reach Len. (ft)        *   97.57  *   97.57  *   97.57  *
* Crit W.S. (ft)         * 1890.56  * Flow Area (sq ft)      *          *  313.16  *          *
```

* E.G. Slope (ft/ft)	*0.002844	* Area (sq ft)	*	*	313.16	*	*				
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	*	5500.00	*	*				
* Top Width (ft)	* 33.00	* Top Width (ft)	*	*	33.00	*	*				
* Vel Total (ft/s)	* 17.56	* Avg. Vel. (ft/s)	*	*	17.56	*	*				
* Max Chl Dpth (ft)	* 9.65	* Hydr. Depth (ft)	*	*	9.49	*	*				
* Conv. Total (cfs)	*103139.5	* Conv. (cfs)	*	*103139.5		*	*				
* Length Wtd. (ft)	* 97.57	* Wetted Per. (ft)	*	*	51.66	*	*				
* Min Ch El (ft)	* 1880.90	* Shear (lb/sq ft)	*	*	1.08	*	*				
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	33.00	*	0.00	*	0.00	*		
* Frctn Loss (ft)	* 0.28	* Cum Volume (acre-ft)	*	0.44	*	29.21	*	1.10	*		
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	0.27	*	3.59	*	0.70	*		

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: FW
REACH: FW RS: 3295.98

INPUT
Description: "FW" 32+95.98
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1891.41	0	1880.24	16.5	1879.91	33	1880.24	33	1891.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	97.57	97.57	97.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1894.35	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 4.79	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1889.57	* Reach Len. (ft)	* 97.57	* 97.57	* 97.57 *
* Crit W.S. (ft)	* 1889.57	* Flow Area (sq ft)	*	* 313.22	* *
* E.G. Slope (ft/ft)	*0.002842	* Area (sq ft)	*	* 313.22	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 17.56	* Avg. Vel. (ft/s)	*	* 17.56	* *
* Max Chl Dpth (ft)	* 9.66	* Hydr. Depth (ft)	*	* 9.49	* *
* Conv. Total (cfs)	*103171.6	* Conv. (cfs)	*	*103171.6	* *
* Length Wtd. (ft)	* 97.57	* Wetted Per. (ft)	*	* 51.66	* *
* Min Ch El (ft)	* 1879.91	* Shear (lb/sq ft)	*	* 1.08	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 33.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.28	* Cum Volume (acre-ft)	* 0.44	* 28.51	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 3.52	* 0.70 *

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: FW
REACH: FW RS: 3198.41

INPUT
Description: "FW"31+98.41
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1890.42	0	1879.25	16.5	1878.92	33	1879.25	33	1890.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	97.57	97.57	97.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1893.36	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 4.79	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1888.57	* Reach Len. (ft)	* 97.57	* 97.57	* 97.57 *
* Crit W.S. (ft)	* 1888.57	* Flow Area (sq ft)	*	* 313.15	* *
* E.G. Slope (ft/ft)	*0.002844	* Area (sq ft)	*	* 313.15	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 17.56	* Avg. Vel. (ft/s)	*	* 17.56	* *
* Max Chl Dpth (ft)	* 9.65	* Hydr. Depth (ft)	*	* 9.49	* *
* Conv. Total (cfs)	*103135.7	* Conv. (cfs)	*	*103135.7	* *
* Length Wtd. (ft)	* 97.57	* Wetted Per. (ft)	*	* 51.66	* *

* Min Ch El (ft)	* 1878.92	* Shear (lb/sq ft)	*	*	1.08	*	*		
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	33.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	* 0.28	* Cum Volume (acre-ft)	*	0.44	*	27.81	*	1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	0.27	*	3.45	*	0.70	*

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: FW
REACH: FW RS: 3100.84

INPUT
Description: "FW" 31+00.84 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1889.43	0	1878.26	16.5	1877.93	33	1878.26	33	1889.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 50 50 50 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1892.37	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 4.79	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1887.59	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00 *
* Crit W.S. (ft)	* 1887.59	* Flow Area (sq ft)	*	* 313.25	* *
* E.G. Slope (ft/ft)	*0.002841	* Area (sq ft)	*	* 313.25	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 17.56	* Avg. Vel. (ft/s)	*	* 17.56	* *
* Max Chl Dpth (ft)	* 9.66	* Hydr. Depth (ft)	*	* 9.49	* *
* Conv. Total (cfs)	*103182.9	* Conv. (cfs)	*	*103182.9	* *
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 51.66	* *
* Min Ch El (ft)	* 1877.93	* Shear (lb/sq ft)	*	* 1.08	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 33.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.14	* Cum Volume (acre-ft)	* 0.44	* 27.11	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 3.37	* 0.70 *

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: FW
REACH: FW RS: 3050.84

INPUT
Description: "FW"30+50.84
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.92	0	1877.75	16.5	1877.42	33	1877.75	33	1888.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 50 50 50 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1891.86	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 4.79	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1887.07	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00 *
* Crit W.S. (ft)	* 1887.07	* Flow Area (sq ft)	*	* 313.12	* *
* E.G. Slope (ft/ft)	*0.002844	* Area (sq ft)	*	* 313.12	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 17.56	* Avg. Vel. (ft/s)	*	* 17.56	* *
* Max Chl Dpth (ft)	* 9.65	* Hydr. Depth (ft)	*	* 9.49	* *
* Conv. Total (cfs)	*103124.4	* Conv. (cfs)	*	*103124.4	* *
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 51.65	* *
* Min Ch El (ft)	* 1877.42	* Shear (lb/sq ft)	*	* 1.08	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 33.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.14	* Cum Volume (acre-ft)	* 0.44	* 26.75	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 3.33	* 0.70 *

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: FW
REACH: FW RS: 3000.84

INPUT
Description: "FW" 30+00.84
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.42	0	1877.25	16.5	1876.92	33	1877.25	33	1888.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 36.63 36.63 36.63 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1891.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1886.58	Reach Len. (ft)	36.63	36.63	36.63
Crit W.S. (ft)	1886.58	Flow Area (sq ft)		313.24	
E.G. Slope (ft/ft)	*0.002841	Area (sq ft)		313.24	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	*103179.1	Conv. (cfs)		*103179.1	
Length Wtd. (ft)	36.63	Wetted Per. (ft)		51.66	
Min Ch El (ft)	1876.92	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.44	26.39	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.30	0.70

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: FW
REACH: FW RS: 2964.21

INPUT
Description: "FW" 29+64.21 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.04	0	1876.87	16.5	1876.54	33	1876.87	33	1888.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 42.33 42.33 42.33 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1890.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1886.20	Reach Len. (ft)	42.33	42.33	42.33
Crit W.S. (ft)	1886.20	Flow Area (sq ft)		313.18	
E.G. Slope (ft/ft)	*0.002843	Area (sq ft)		313.18	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	*103150.8	Conv. (cfs)		*103150.8	
Length Wtd. (ft)	42.33	Wetted Per. (ft)		51.66	
Min Ch El (ft)	1876.54	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.44	26.13	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.27	0.70

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: FW
REACH: FW RS: 2921.88

INPUT
Description: "FW" 29+21.88 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1887.61	0	1876.44	16.5	1876.11	33	1876.44	33	1887.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	84.01	84.01	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

			Left OB	Channel	Right OB
E.G. Elev (ft)	1890.55	Element			
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1885.77	Reach Len. (ft)	84.01	84.01	84.01
Crit W.S. (ft)	1885.77	Flow Area (sq ft)		313.19	
E.G. Slope (ft/ft)	0.002843	Area (sq ft)		313.19	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	103154.6	Conv. (cfs)		103154.6	
Length Wtd. (ft)	84.01	Wetted Per. (ft)		51.66	
Min Ch El (ft)	1876.11	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.44	25.82	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.24	0.70

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: FW
REACH: FW RS: 2837.87*

INPUT
Description: "FW" 28+37.87
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1886.76	0	1875.59	16.5	1875.26	33	1875.59	33	1886.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	84	84	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

			Left OB	Channel	Right OB
E.G. Elev (ft)	1889.70	Element			
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1884.91	Reach Len. (ft)	84.00	84.00	84.00
Crit W.S. (ft)	1884.91	Flow Area (sq ft)		313.13	
E.G. Slope (ft/ft)	0.002844	Area (sq ft)		313.13	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	103126.3	Conv. (cfs)		103126.3	
Length Wtd. (ft)	84.00	Wetted Per. (ft)		51.65	
Min Ch El (ft)	1875.26	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	0.44	25.22	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.17	0.70

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: FW
REACH: FW RS: 2753.87

INPUT
Description: "FW" 27+53.87
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.91	0	1874.74	16.5	1874.41	33	1874.74	33	1885.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	31.43	31.43	31.43	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1888.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1884.07	Reach Len. (ft)	31.43	31.43	31.43
Crit W.S. (ft)	1884.07	Flow Area (sq ft)		313.24	
E.G. Slope (ft/ft)	*0.002841	Area (sq ft)		313.24	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	*103181.0	Conv. (cfs)		*103181.0	
Length Wtd. (ft)	31.43	Wetted Per. (ft)		51.66	
Min Ch El (ft)	1874.41	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.44	24.62	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.11	0.70

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: FW
REACH: FW RS: 2722.44*

INPUT
Description: "FW" 27+22.44, Grade Break
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.59	0	1874.42	16.5	1874.09	21.84	1874.09	33	1874.31
33	1885.59								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	18.57	18.57	18.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1888.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	1883.70	Reach Len. (ft)	18.57	18.57	18.57
Crit W.S. (ft)	1883.70	Flow Area (sq ft)		313.17	
E.G. Slope (ft/ft)	*0.002845	Area (sq ft)		313.17	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.56	Avg. Vel. (ft/s)		17.56	
Max Chl Dpth (ft)	9.61	Hydr. Depth (ft)		9.49	
Conv. Total (cfs)	*103120.3	Conv. (cfs)		*103120.3	
Length Wtd. (ft)	18.57	Wetted Per. (ft)		51.67	
Min Ch El (ft)	1874.09	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.44	24.39	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.09	0.70

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: FW
REACH: FW RS: 2703.87

INPUT
Description: 27+03.87 Van Buskirk confluence / begin 33' channel
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.5	0	1874.33	16.5	1874	25	1874	33	1874.16
33	1885.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 1 1 1 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1888.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.77	Wt. n-Val.		0.015	
W.S. Elev (ft)	1883.62	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	1883.62	Flow Area (sq ft)		313.96	
E.G. Slope (ft/ft)	*0.002826	Area (sq ft)		313.96	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	17.52	Avg. Vel. (ft/s)		17.52	
Max Chl Dpth (ft)	9.62	Hydr. Depth (ft)		9.51	
Conv. Total (cfs)	*103458.6	Conv. (cfs)		*103458.6	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		51.75	
Min Ch El (ft)	1874.00	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.44	24.26	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.07	0.70

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: FW
REACH: FW RS: 2702.87

INPUT
Description: 27+02.87 Van Buskirk confluence
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.49	0	1874.32	16.5	1873.99	25	1873.99	52.82	1874.53
52.82	1889.99								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	52.82	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 52.82 54.32 54.32 54.32 .01 .03
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
33	52.82	1885.49	T

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1888.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	1883.61	Reach Len. (ft)	54.32	54.32	54.32
Crit W.S. (ft)	1883.61	Flow Area (sq ft)		314.06	
E.G. Slope (ft/ft)	*0.002157	Area (sq ft)		497.81	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	52.82	Top Width (ft)		52.82	
Vel Total (ft/s)	17.51	Avg. Vel. (ft/s)		17.51	
Max Chl Dpth (ft)	9.62	Hydr. Depth (ft)		9.52	
Conv. Total (cfs)	*118418.8	Conv. (cfs)		*118418.8	
Length Wtd. (ft)	54.32	Wetted Per. (ft)		42.29	
Min Ch El (ft)	1873.99	Shear (lb/sq ft)		1.00	
Alpha	1.00	Stream Power (lb/ft s)	52.82	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.44	24.25	1.10
C & E Loss (ft)	0.03	Cum SA (acres)	0.27	3.07	0.70

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: FW
REACH: FW RS: 2648.55

INPUT
Description: 26+48.52 end 50' channel / begin transition to confluence
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.22	0	1874.22	25	1873.72	50	1874.22	50	1887.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 52.41 52.41 52.41 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1884.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1881.18	Reach Len. (ft)	52.41	52.41	52.41
Crit W.S. (ft)	1881.18	Flow Area (sq ft)		360.63	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.63	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113201.3	Conv. (cfs)		113201.3	
Length Wtd. (ft)	52.41	Wetted Per. (ft)		63.94	
Min Ch El (ft)	1873.72	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.44	23.71	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	3.01	0.70

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: FW
REACH: FW RS: 2596.14

INPUT
Description: "FW"25+96.14
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1884.42	0	1873.96	25	1873.46	50	1873.96	50	1885.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 40.96 40.96 40.96 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1884.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.015	
W.S. Elev (ft)	1880.92	Reach Len. (ft)	40.96	40.96	40.96
Crit W.S. (ft)	1880.92	Flow Area (sq ft)		360.63	
E.G. Slope (ft/ft)	0.002361	Area (sq ft)		360.63	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.25	Avg. Vel. (ft/s)		15.25	
Max Chl Dpth (ft)	7.46	Hydr. Depth (ft)		7.21	
Conv. Total (cfs)	113201.3	Conv. (cfs)		113201.3	
Length Wtd. (ft)	40.96	Wetted Per. (ft)		63.94	
Min Ch El (ft)	1873.46	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.44	23.28	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.95	0.70

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: FW
REACH: FW RS: 2555.18

INPUT
Description: "FW"25+55.18
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1883.25	0	1873.75	25	1873.25	50	1873.75	50	1883.25

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 40.96 40.96 40.96 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1884.32	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1880.71	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.71	* Flow Area (sq ft)	*	* 360.63	* *
* E.G. Slope (ft/ft)	*0.002361	* Area (sq ft)	*	* 360.63	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113201.3	* Conv. (cfs)	*	*113201.3	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 63.94	* *
* Min Ch El (ft)	* 1873.25	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 22.94	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 2.90	* 0.70 *

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: FW
REACH: FW RS: 2514.22

INPUT
Description: "FW"25+14.22
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1883.04	0	1873.54	25	1873.04	50	1873.54	50	1883.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 40.96 40.96 40.96 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1884.11	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1880.50	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.50	* Flow Area (sq ft)	*	* 360.66	* *
* E.G. Slope (ft/ft)	*0.002360	* Area (sq ft)	*	* 360.66	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113212.9	* Conv. (cfs)	*	*113212.9	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 63.94	* *
* Min Ch El (ft)	* 1873.04	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 22.60	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 2.85	* 0.70 *

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: FW
REACH: FW RS: 2473.26

INPUT
Description: "FW" 24+73.26
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1882.84	0	1873.34	25	1872.84	50	1873.34	50	1882.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 40.96 40.96 40.96 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1883.91	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1880.30	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.30	* Flow Area (sq ft)	*	* 360.68	* *
* E.G. Slope (ft/ft)	*0.002360	* Area (sq ft)	*	* 360.68	* *

* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	*	*
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	*	*
* Conv. Total (cfs)	*113224.5	* Conv. (cfs)	*	*113224.5	*	*
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 63.94	*	*
* Min Ch El (ft)	* 1872.84	* Shear (lb/sq ft)	*	* 0.83	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 22.26	* 1.10	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 2.80	* 0.70	*

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: FW
REACH: FW RS: 2432.30

INPUT
Description: "FW" 24+32.30 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1880.63	0	1873.13	25	1872.63	50	1873.13	50	1882.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	98.19	98.19	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1883.70	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1880.09	* Reach Len. (ft)	* 98.19	* 98.19	* 98.19 *
* Crit W.S. (ft)	* 1880.09	* Flow Area (sq ft)	*	* 360.71	* *
* E.G. Slope (ft/ft)	*0.002359	* Area (sq ft)	*	* 360.71	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.25	* Avg. Vel. (ft/s)	*	* 15.25	* *
* Max Chl Dpth (ft)	* 7.46	* Hydr. Depth (ft)	*	* 7.21	* *
* Conv. Total (cfs)	*113239.0	* Conv. (cfs)	*	*113239.0	* *
* Length Wtd. (ft)	* 98.19	* Wetted Per. (ft)	*	* 63.94	* *
* Min Ch El (ft)	* 1872.63	* Shear (lb/sq ft)	*	* 0.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.23	* Cum Volume (acre-ft)	* 0.44	* 21.92	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 2.76	* 0.70 *

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: FW
REACH: FW RS: 2334.09*

INPUT
Description: "FW"23+34.09
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1881.85	0	1872.35	25	1871.85	50	1872.35	50	1881.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	98.21	98.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1882.92	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.63	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1879.29	* Reach Len. (ft)	* 98.21	* 98.21	* 98.21 *
* Crit W.S. (ft)	* 1879.29	* Flow Area (sq ft)	*	* 359.61	* *
* E.G. Slope (ft/ft)	*0.002381	* Area (sq ft)	*	* 359.61	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.29	* Avg. Vel. (ft/s)	*	* 15.29	* *
* Max Chl Dpth (ft)	* 7.44	* Hydr. Depth (ft)	*	* 7.19	* *
* Conv. Total (cfs)	*112716.4	* Conv. (cfs)	*	*112716.4	* *
* Length Wtd. (ft)	* 98.21	* Wetted Per. (ft)	*	* 63.89	* *
* Min Ch El (ft)	* 1871.85	* Shear (lb/sq ft)	*	* 0.84	* *

* Alpha	*	1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.23	* Cum Volume (acre-ft)	*	0.44	*	21.11	*	1.10	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.27	*	2.65	*	0.70	*

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: FW
REACH: FW RS: 2235.88*

INPUT
Description: "FW"22+35.88
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1881.06	0	1871.56	25	1871.06	50	1871.56	50	1881.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	98.2	98.2	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	*	1882.14	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	3.63	* Wt. n-Val.	*		*	0.015	*		*
* W.S. Elev (ft)	*	1878.50	* Reach Len. (ft)	*	98.20	*	98.20	*	98.20	*
* Crit W.S. (ft)	*	1878.50	* Flow Area (sq ft)	*		*	359.61	*		*
* E.G. Slope (ft/ft)	*	0.002381	* Area (sq ft)	*		*	359.61	*		*
* Q Total (cfs)	*	5500.00	* Flow (cfs)	*		*	5500.00	*		*
* Top Width (ft)	*	50.00	* Top Width (ft)	*		*	50.00	*		*
* Vel Total (ft/s)	*	15.29	* Avg. Vel. (ft/s)	*		*	15.29	*		*
* Max Chl Dpth (ft)	*	7.44	* Hydr. Depth (ft)	*		*	7.19	*		*
* Conv. Total (cfs)	*	112716.4	* Conv. (cfs)	*		*	112716.4	*		*
* Length Wtd. (ft)	*	98.20	* Wetted Per. (ft)	*		*	63.89	*		*
* Min Ch El (ft)	*	1871.06	* Shear (lb/sq ft)	*		*	0.84	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.23	* Cum Volume (acre-ft)	*	0.44	*	20.30	*	1.10	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.27	*	2.53	*	0.70	*

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: FW
REACH: FW RS: 2137.68

INPUT
Description: "FW"21+37.68 PC grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1880.28	0	1870.78	25	1870.28	50	1870.78	50	1880.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	78.1	78.1	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	*	1881.35	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	3.63	* Wt. n-Val.	*		*	0.015	*		*
* W.S. Elev (ft)	*	1877.72	* Reach Len. (ft)	*	78.10	*	78.10	*	78.10	*
* Crit W.S. (ft)	*	1877.72	* Flow Area (sq ft)	*		*	359.61	*		*
* E.G. Slope (ft/ft)	*	0.002381	* Area (sq ft)	*		*	359.61	*		*
* Q Total (cfs)	*	5500.00	* Flow (cfs)	*		*	5500.00	*		*
* Top Width (ft)	*	50.00	* Top Width (ft)	*		*	50.00	*		*
* Vel Total (ft/s)	*	15.29	* Avg. Vel. (ft/s)	*		*	15.29	*		*
* Max Chl Dpth (ft)	*	7.44	* Hydr. Depth (ft)	*		*	7.19	*		*
* Conv. Total (cfs)	*	112716.4	* Conv. (cfs)	*		*	112716.4	*		*
* Length Wtd. (ft)	*	78.10	* Wetted Per. (ft)	*		*	63.89	*		*
* Min Ch El (ft)	*	1870.28	* Shear (lb/sq ft)	*		*	0.84	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.19	* Cum Volume (acre-ft)	*	0.44	*	19.49	*	1.10	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.27	*	2.42	*	0.70	*

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: FW
REACH: FW RS: 2059.60*

INPUT
Description: "FW"20+59.60
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1878.74	0	1869.24	25	1868.74	50	1869.24	50	1878.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	39.44	39.44	39.44	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1879.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1876.18	Reach Len. (ft)	39.44	39.44	39.44
Crit W.S. (ft)	1876.18	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	112716.4	Conv. (cfs)		112716.4	
Length Wtd. (ft)	39.44	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1868.74	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.44	18.84	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.33	0.70

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: FW
REACH: FW RS: 2020.16

INPUT
Description: "FW"20+20.16
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1877.96	0	1868.46	25	1867.96	50	1868.46	50	1877.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	38.63	38.63	38.63	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1879.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1875.40	Reach Len. (ft)	38.63	38.63	38.63
Crit W.S. (ft)	1875.40	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	112716.4	Conv. (cfs)		112716.4	
Length Wtd. (ft)	38.63	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1867.96	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.44	18.52	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.28	0.70

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: FW
REACH: FW RS: 1981.53*

INPUT
Description: "FW" 19+81.53
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1877.19	0	1867.69	25	1867.19	50	1867.69	50	1877.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	78.1	78.1	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1878.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1874.63	Reach Len. (ft)	78.10	78.10	78.10
Crit W.S. (ft)	1874.63	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	*0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	*112716.4	Conv. (cfs)		*112716.4	
Length Wtd. (ft)	78.10	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1867.19	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.44	18.20	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.24	0.70

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: FW
REACH: FW RS: 1903.46

INPUT
Description: " FW"19+03.46 PT grade break
19+03.46 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1875.15	0	1866.15	25	1865.65	50	1866.15	50	1875.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.21	86.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1876.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1873.09	Reach Len. (ft)	86.21	86.21	86.21
Crit W.S. (ft)	1873.09	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	*0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	*112716.4	Conv. (cfs)		*112716.4	
Length Wtd. (ft)	86.21	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1865.65	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.44	17.55	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.15	0.70

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: FW
REACH: FW RS: 1817.25*

INPUT
Description: "FW" 18+17.25
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1874.45	0	1865.45	25	1864.95	50	1865.45	50	1874.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.21	86.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1876.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1872.39	Reach Len. (ft)	86.21	86.21	86.21
Crit W.S. (ft)	1872.39	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	*0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	*112716.4	Conv. (cfs)		*112716.4	
Length Wtd. (ft)	86.21	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1864.95	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.44	16.84	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	2.05	0.70

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: FW
REACH: FW RS: 1731.04*

INPUT
Description: "FW" 17+31.04
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.74	0	1864.74	25	1864.24	50	1864.74	50	1873.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.21	86.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1875.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1871.68	Reach Len. (ft)	86.21	86.21	86.21
Crit W.S. (ft)	1871.68	Flow Area (sq ft)		359.61	
E.G. Slope (ft/ft)	*0.002381	Area (sq ft)		359.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.29	Avg. Vel. (ft/s)		15.29	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		7.19	
Conv. Total (cfs)	*112716.4	Conv. (cfs)		*112716.4	
Length Wtd. (ft)	86.21	Wetted Per. (ft)		63.89	
Min Ch El (ft)	1864.24	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.44	16.13	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	1.95	0.70

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: FW
REACH: FW RS: 1644.83*

INPUT
Description: "FW" 16+44.83
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.04	0	1864.04	25	1863.54	50	1864.04	50	1873.04

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            86.21   86.21   86.21              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1874.62  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.63  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1870.98  * Reach Len. (ft)       *   86.21  *   86.21  *   86.21  *
* Crit W.S. (ft)         * 1870.98  * Flow Area (sq ft)     *          *  359.61  *          *
* E.G. Slope (ft/ft)     *0.002381  * Area (sq ft)          *          *  359.61  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)           *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)       *   15.29  * Avg. Vel. (ft/s)     *          *   15.29  *          *
* Max Chl Dpth (ft)      *    7.44  * Hydr. Depth (ft)     *          *    7.19  *          *
* Conv. Total (cfs)      *112716.4  * Conv. (cfs)          *          *112716.4  *          *
* Length Wtd. (ft)       *   86.21  * Wetted Per. (ft)     *          *   63.89  *          *
* Min Ch El (ft)         * 1863.54  * Shear (lb/sq ft)     *          *    0.84  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.20  * Cum Volume (acre-ft)  *    0.44  *   15.42  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.27  *    1.85  *    0.70  *
*****************************************************************************************

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: FW
REACH: FW                RS: 1558.62

INPUT
Description: "FW" 15+58.62
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1872.34       0 1863.34      25 1862.84      50 1863.34      50 1872.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50           58.62   58.62   58.62              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1874.30  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.74  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1870.56  * Reach Len. (ft)       *   58.62  *   58.62  *   58.62  *
* Crit W.S. (ft)         * 1870.56  * Flow Area (sq ft)     *          *  373.71  *          *
* E.G. Slope (ft/ft)     *0.002357  * Area (sq ft)          *          *  373.71  *          *
* Q Total (cfs)          * 5800.00  * Flow (cfs)           *          * 5800.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)       *   15.52  * Avg. Vel. (ft/s)     *          *   15.52  *          *
* Max Chl Dpth (ft)      *    7.72  * Hydr. Depth (ft)     *          *    7.47  *          *
* Conv. Total (cfs)      *119475.6  * Conv. (cfs)          *          *119475.6  *          *
* Length Wtd. (ft)       *   58.62  * Wetted Per. (ft)     *          *   64.46  *          *
* Min Ch El (ft)         * 1862.84  * Shear (lb/sq ft)     *          *    0.85  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.12  * Cum Volume (acre-ft)  *    0.44  *   14.69  *    1.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.27  *    1.76  *    0.70  *
*****************************************************************************************

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: FW
REACH: FW                RS: 1500

INPUT
Description: "FW" 15+00.00, Wall height change
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1871.86       0 1862.36      25 1862.36      50 1862.36      50 1871.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 18.49 18.49 18.49 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1873.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.00	Wt. n-Val.		0.015	
W.S. Elev (ft)	1870.71	Reach Len. (ft)	18.49	18.49	18.49
Crit W.S. (ft)	1869.81	Flow Area (sq ft)		417.53	
E.G. Slope (ft/ft)	*0.001705	Area (sq ft)		417.53	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	13.89	Avg. Vel. (ft/s)		13.89	
Max Chl Dpth (ft)	8.35	Hydr. Depth (ft)		8.35	
Conv. Total (cfs)	*140483.9	Conv. (cfs)		*140483.9	
Length Wtd. (ft)	18.49	Wetted Per. (ft)		66.70	
Min Ch El (ft)	1862.36	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.44	14.16	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	1.69	0.70

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: FW
REACH: FW RS: 1481.51

INPUT
Description: "FW" 14+81.51 Wall Height changed (Right Bank)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.71	0	1862.71	25	1862.21	50	1862.71	50	1871.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 44.5 44.5 44.5 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1873.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.74	Wt. n-Val.		0.015	
W.S. Elev (ft)	1869.93	Reach Len. (ft)	44.50	44.50	44.50
Crit W.S. (ft)	1869.93	Flow Area (sq ft)		373.60	
E.G. Slope (ft/ft)	*0.002359	Area (sq ft)		373.60	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	15.52	Avg. Vel. (ft/s)		15.52	
Max Chl Dpth (ft)	7.72	Hydr. Depth (ft)		7.47	
Conv. Total (cfs)	*119419.6	Conv. (cfs)		*119419.6	
Length Wtd. (ft)	44.50	Wetted Per. (ft)		64.45	
Min Ch El (ft)	1862.21	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.44	13.99	1.10
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	1.67	0.70

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: FW
REACH: FW RS: 1437.01

INPUT
Description: "FW" 14+37.01
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.34	0	1862.34	25	1861.84	50	1862.34	50	1871.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 44.49 44.49 44.49 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1873.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.74	Wt. n-Val.		0.015	
W.S. Elev (ft)	1869.56	Reach Len. (ft)	44.49	44.49	44.49
Crit W.S. (ft)	1869.56	Flow Area (sq ft)		373.59	
E.G. Slope (ft/ft)	*0.002359	Area (sq ft)		373.59	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	

* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*		
* Vel Total (ft/s)	* 15.53	* Avg. Vel. (ft/s)	*	* 15.53	*	*		
* Max Chl Dpth (ft)	* 7.72	* Hydr. Depth (ft)	*	* 7.47	*	*		
* Conv. Total (cfs)	*119416.6	* Conv. (cfs)	*	*119416.6	*	*		
* Length Wtd. (ft)	* 44.49	* Wetted Per. (ft)	*	* 64.45	*	*		
* Min Ch El (ft)	* 1861.84	* Shear (lb/sq ft)	*	* 0.85	*	*		
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	*	0.44	*	13.61	*	1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	0.27	*	1.62	*	0.70 *

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: FW
REACH: FW RS: 1392.52

INPUT
Description: "FW" 13+92.52
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.98	0	1861.98	25	1861.48	50	1861.98	50	1870.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.5	44.5	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1872.94	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.74	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1869.20	* Reach Len. (ft)	* 44.50	* 44.50	* 44.50 *
* Crit W.S. (ft)	* 1869.20	* Flow Area (sq ft)	*	* 373.61	* *
* E.G. Slope (ft/ft)	*0.002359	* Area (sq ft)	*	* 373.61	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.52	* Avg. Vel. (ft/s)	*	* 15.52	* *
* Max Chl Dpth (ft)	* 7.72	* Hydr. Depth (ft)	*	* 7.47	* *
* Conv. Total (cfs)	*119425.5	* Conv. (cfs)	*	*119425.5	* *
* Length Wtd. (ft)	* 44.50	* Wetted Per. (ft)	*	* 64.45	* *
* Min Ch El (ft)	* 1861.48	* Shear (lb/sq ft)	*	* 0.85	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 13.23	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 1.56	* 0.70 *

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: FW
REACH: FW RS: 1348.02

INPUT
Description: "FW" 13+48.02
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.62	0	1861.62	25	1861.12	50	1861.62	50	1870.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.49	44.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1872.58	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.74	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1868.84	* Reach Len. (ft)	* 44.49	* 44.49	* 44.49 *
* Crit W.S. (ft)	* 1868.84	* Flow Area (sq ft)	*	* 373.61	* *
* E.G. Slope (ft/ft)	*0.002359	* Area (sq ft)	*	* 373.61	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.52	* Avg. Vel. (ft/s)	*	* 15.52	* *
* Max Chl Dpth (ft)	* 7.72	* Hydr. Depth (ft)	*	* 7.47	* *
* Conv. Total (cfs)	*119428.4	* Conv. (cfs)	*	*119428.4	* *
* Length Wtd. (ft)	* 44.49	* Wetted Per. (ft)	*	* 64.45	* *
* Min Ch El (ft)	* 1861.12	* Shear (lb/sq ft)	*	* 0.85	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *

* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 12.85	* 1.10	*		
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 1.51	* 0.70	*		

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: FW
REACH: FW RS: 1303.53

INPUT
Description: "FW" 13+03.53
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.26	0	1861.26	25	1860.76	50	1861.26	50	1870.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.5	44.5	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1872.22	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.74	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1868.48	* Reach Len. (ft)	* 44.50	* 44.50	* 44.50 *
* Crit W.S. (ft)	* 1868.48	* Flow Area (sq ft)	*	* 373.65	* *
* E.G. Slope (ft/ft)	*0.002358	* Area (sq ft)	*	* 373.65	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.52	* Avg. Vel. (ft/s)	*	* 15.52	* *
* Max Chl Dpth (ft)	* 7.72	* Hydr. Depth (ft)	*	* 7.47	* *
* Conv. Total (cfs)	*119443.2	* Conv. (cfs)	*	*119443.2	* *
* Length Wtd. (ft)	* 44.50	* Wetted Per. (ft)	*	* 64.46	* *
* Min Ch El (ft)	* 1860.76	* Shear (lb/sq ft)	*	* 0.85	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 0.44	* 12.47	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 1.46	* 0.70 *

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: FW
REACH: FW RS: 1259.03

INPUT
Description: "FW" 12+59.03
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.89	0	1860.89	25	1860.39	50	1860.89	50	1869.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.49	44.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1871.85	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.74	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1868.11	* Reach Len. (ft)	* 44.49	* 44.49	* 44.49 *
* Crit W.S. (ft)	* 1868.11	* Flow Area (sq ft)	*	* 373.69	* *
* E.G. Slope (ft/ft)	*0.002357	* Area (sq ft)	*	* 373.69	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 15.52	* Avg. Vel. (ft/s)	*	* 15.52	* *
* Max Chl Dpth (ft)	* 7.72	* Hydr. Depth (ft)	*	* 7.47	* *
* Conv. Total (cfs)	*119463.8	* Conv. (cfs)	*	*119463.8	* *
* Length Wtd. (ft)	* 44.49	* Wetted Per. (ft)	*	* 64.46	* *
* Min Ch El (ft)	* 1860.39	* Shear (lb/sq ft)	*	* 0.85	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.09	* Cum Volume (acre-ft)	* 0.44	* 12.08	* 1.10 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.27	* 1.41	* 0.70 *

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: FW
REACH: FW RS: 1214.54

INPUT
Description: 12+14.54 end transition / begin 50' channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.53	0	1860.53	25	1860.03	50	1860.53	50	1869.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	40.94 40.94	40.94	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1871.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.20	Wt. n-Val.		0.015	
W.S. Elev (ft)	1868.36	Reach Len. (ft)	40.94	40.94	40.94
Crit W.S. (ft)	1867.75	Flow Area (sq ft)		404.16	
E.G. Slope (ft/ft)	0.001861	Area (sq ft)		404.16	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	14.35	Avg. Vel. (ft/s)		14.35	
Max Chl Dpth (ft)	8.33	Hydr. Depth (ft)		8.08	
Conv. Total (cfs)	134449.0	Conv. (cfs)		134449.0	
Length Wtd. (ft)	40.94	Wetted Per. (ft)		65.68	
Min Ch El (ft)	1860.03	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.44	11.69	1.10
C & E Loss (ft)	0.02	Cum SA (acres)	0.27	1.36	0.70

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: FW
REACH: FW RS: 1173.6

INPUT
Description: "FW" 11+73.60 Wall height Change point (right bank)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.19	0	1860.2	25	1859.7	50	1860.2	50	1869.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	84.66 84.66	84.66	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1871.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.66	Wt. n-Val.		0.015	
W.S. Elev (ft)	1868.81	Reach Len. (ft)	84.66	84.66	84.66
Crit W.S. (ft)		Flow Area (sq ft)		443.18	
E.G. Slope (ft/ft)	0.001412	Area (sq ft)		443.18	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	13.09	Avg. Vel. (ft/s)		13.09	
Max Chl Dpth (ft)	9.11	Hydr. Depth (ft)		8.86	
Conv. Total (cfs)	154336.3	Conv. (cfs)		154336.3	
Length Wtd. (ft)	84.66	Wetted Per. (ft)		67.24	
Min Ch El (ft)	1859.70	Shear (lb/sq ft)		0.58	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.44	11.29	1.10
C & E Loss (ft)	0.03	Cum SA (acres)	0.27	1.31	0.70

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: FW
REACH: FW RS: 1088.94

INPUT
Description: 10+88.94 begin channel improvements
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74.58	1874.05	81.76	1873.87	83.101	1873.79	84.89	1873.76	91.809	1872.99
95.599	1872.91	99.44	1872.85	102.9	1872.82	105.09	1872.79	106.25	1872.75
107.24	1872.22	107.301	1872.22	107.97	1872.2	108.22	1872.2	108.409	1871.76
112.1	1868.81	134.601	1868.6	134.601	1859	160.619	1859	186.639	1859
186.639	1868.6	219.569	1870.43	220.33	1870.4	224.17	1870.54	231.16	1870.54
231.939	1870.54	238.849	1870.96	239.539	1871	243.53	1870.79	248.409	1870.52
251.241	1870.45	252.83	1870.6	260.02	1870.91	269.379	1870.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
74.58	.015	134.601	.015	186.639	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
134.601	186.639	174	174	.05	.1

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1871.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.59	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1869.77	Reach Len. (ft)	20.90	20.90	20.90
Crit W.S. (ft)	1866.28	Flow Area (sq ft)	24.52	560.41	12.30
E.G. Slope (ft/ft)	*0.000677	Area (sq ft)	24.52	560.41	12.30
Q Total (cfs)	5800.00	Flow (cfs)	64.05	5713.81	22.14
Top Width (ft)	96.78	Top Width (ft)	23.70	52.04	21.04
Vel Total (ft/s)	9.71	Avg. Vel. (ft/s)	2.61	10.20	1.80
Max Chl Dpth (ft)	10.77	Hydr. Depth (ft)	1.03	10.77	0.58
Conv. Total (cfs)	*222896.3	Conv. (cfs)	2461.3	*219584.0	850.9
Length Wtd. (ft)	20.90	Wetted Per. (ft)	24.04	71.24	21.07
Min Ch El (ft)	1859.00	Shear (lb/sq ft)	0.04	0.33	0.02
Alpha	1.09	Stream Power (lb/ft s)	269.38	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.41	10.31	1.09
C & E Loss (ft)		Cum SA (acres)	0.25	1.21	0.68

BRIDGE

RIVER: FW
REACH: FW RS: 1000

INPUT
Description: Desert Inn Rd.
Distance from Upstream XS = 20.9
Deck/Roadway Width = 140
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 19

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
01874.432		8.6131874.273		56.3921873.321	
64.8431873.184		114.2841872.349		120.3921872.248	
134.601	1872	1866.97	189.3	1871.2	1866.97
224.5061870.766		277.4061869.719		281.1921869.662	
338.9371868.818		347.8651868.643		397.6781868.255	
401.555	1868.25	448.627	1867.71	452.199	1867.68
469.342	1867.71				

Upstream Bridge Cross Section Data
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01878.392	2.7721878.027	8.1841877.637	24.2831875.318	25.1931875.363					
31.3281875.098	34.3311875.065	36.1541875.018	38.7921874.989	41.4921874.895					
52.684	1875.01	55.3541875.266	59.1231875.431	62.3721875.445	62.9421875.452				
66.6521875.281	70.181875.144	70.4771875.131	75.2841874.616	78.0171874.315					
80.8581874.058	82.7161873.832	83.891873.698	89.7211872.911	90.2641872.737					
93.8781871.624	102.4631870.291	104.4451869.983	105.8281869.768	110.6881869.684					
116.569	1869.6	134.601	1867	134.601	1858.97	189.3	1858.97	189.3	1867
199.1471869.218	211.7021869.356	211.811869.364	211.8391869.366	212.5351869.419					
212.7591869.436	212.7611869.436	212.775	1869.43	213.8041869.006	214.125	1869.55			
216.1461869.746	218.628	1870.27	224.9991870.598	228.7151870.595	231.711870.759				
232.8391870.827	234.0521870.759	250.733	1870.37	256.131870.886	256.5741870.999				
259.3221870.907	260.0161870.858	263.7011870.682	276.6221870.018	277.451869.924					
294.598	1870.91	297.0681871.061	314.9141871.908	315.5051871.939	315.6851871.946				
316.6211871.974	326.9921872.171	339.4481872.205	351.9911872.189	384.7521872.277					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	134.601	.015	199.147	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
134.601	189.3	.05	.1

Downstream Deck/Roadway Coordinates
num= 19

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
01874.432		8.6131874.273		56.3921873.321	
64.8431873.184		114.2841872.349		120.3921872.248	
170.4641871.576		175.1981871.507		220.1461870.842	
224.5061870.766		264.599	1870.1	1863.1	319.3	1869.2	1863.1
338.9371868.818		347.8651868.643		397.6781868.255	
401.555	1868.25	448.627	1867.71	452.199	1867.68
469.342	1867.71				

Downstream Bridge Cross Section Data
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.63	8.065	1873.41	18.183	1873.36	39.113	1873.34	45.473	1873.4
47.947	1873.25	52.794	1873.36	58.448	1873.37	63.644	1873.42	69.726	1873.41
73.125	1873.41	84.455	1873.39	90.759	1873.49	94.498	1873.45	100.57	1873.41
106.193	1873.38	110.925	1873.3	115.428	1873.23	120.244	1873.13	124.212	1873.09
128.155	1873.07	133.572	1872.54	136.46	1872.61	137.494	1872.02	143.908	1872.02
163.038	1871.7	167.632	1871.89	168.911	1871.9	169.317	1871.89	169.339	1871.88
169.559	1871.85	170.213	1871.76	182.581	1872.04	183.088	1872.05	190.475	1871.88
192.217	1871.89	195.83	1871.77	199.012	1871.82	200.393	1871.83	202.37	1871.62
202.695	1871.6	203.231	1871.55	206.093	1871.25	207.237	1871.16	209.186	1870.99
209.91	1870.75	210.677	1870.5	211.514	1870.42	233.365	1869.96	234.318	1869.95
236.441	1869.72	238.968	1869.63	243.202	1869.53	244.279	1869.24	245.233	1869.05
246.148	1869.08	249.821	1868.27	250.674	1868.16	252.061	1867.95	252.32	1864.9
264.599	1863.1	264.599	1855.1	319.3	1855.1	319.3	1863.1	328.96	1866.2
330.796	1866.29	332.006	1866.61	336.306	1866.57	349.997	1867.01	354.697	1866.89
371.242	1866.49	380.126	1866.39	388.769	1866.21	404.854	1866.27	420.758	1865.68
422.706	1865.71	423.358	1865.73	433.326	1866.31	444.178	1866.41	454.863	1866.4
464.508	1866.32	469.342	1866.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	264.599	.015	328.96	.04

Bank Sta: Left Right Coeff Contr. Expan.
264.599 319.3 .05 .1
Right Levee Station= 349.94 Elevation= 1867.14

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 = .95
Elevation at which weir flow begins = 1890
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= 145.441 Downstream= 275.439
Upstream num= 2

Width	Elev	Width	Elev
1.5	0	1.5	1870

Downstream num= 2

Width	Elev	Width	Elev
1.5	0	1.5	1870

Debris Width = 3
Debris Height = 8

Pier Data
Pier Station Upstream= 156.691 Downstream= 286.689
Upstream num= 2

Width	Elev	Width	Elev
.83	0	.83	1870

Downstream num= 2

Width	Elev	Width	Elev
.83	0	.83	1870

Debris Width = 1.67
Debris Height = 8

Pier Data
Pier Station Upstream= 167.521 Downstream= 297.519
Upstream num= 2

Width	Elev	Width	Elev
.83	0	.83	1870

Downstream num= 2

Width	Elev	Width	Elev
.83	0	.83	1870

Debris Width = 1.67
Debris Height = 8

Pier Data
Pier Station Upstream= 178.769 Downstream= 308.769
Upstream num= 2

Width	Elev	Width	Elev
1.5	0	1.5	1870

Downstream num= 2

Width	Elev	Width	Elev
1.5	0	1.5	1870

Debris Width = 3
Debris Height = 8

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Momentum Cd = 1.33
Selected Low Flow Methods = Momentum

```
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
       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 water surface

BRIDGE OUTPUT  Profile #100-yr FIS
*******************************************************************************************
* E.G. US. (ft)          *    1871.37  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1869.77  * E.G. Elev (ft)        *    1871.36  *    1866.84  *
* Q Total (cfs)          *    5800.00  * W.S. Elev (ft)        *    1866.97  *    1863.10  *
* Q Bridge (cfs)         *    5800.00  * Crit W.S. (ft)        *    1872.99  *    1862.59  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)     *       8.00  *       8.00  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)      *      15.98  *      14.49  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)     *     362.87  *     400.33  *
* Weir Submerg           *             * Froude # Chl          *       1.00  *       0.90  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)  *    4330.52  *    4210.97  *
* Min El Weir Flow (ft)  *    1890.00  * Hydr Depth (ft)       *   90080.18  *       8.00  *
* Min El Prs (ft)        *    1866.97  * W.P. Total (ft)       *     202.71  *     130.04  *
* Delta EG (ft)          *       4.53  * Conv. Total (cfs)     *    52995.3  *    83922.2  *
* Delta WS (ft)          *       4.60  * Top Width (ft)        *             *      50.04  *
* BR Open Area (sq ft)   *     362.87  * Frctn Loss (ft)       *             *             *
* BR Open Vel (ft/s)     *      15.98  * C & E Loss (ft)       *             *             *
* Coef of Q              *             * Shear Total (lb/sq ft) *       1.34  *       0.92  *
* Br Sel Method          * Press Only  * Power Total (lb/ft s)  *       0.00  *       0.00  *
*******************************************************************************************

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:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was used.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was used.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 926

INPUT
Description:
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1873.63   8.065 1873.41  18.183 1873.36  39.113 1873.34  45.473  1873.4
  47.947 1873.25  52.794 1873.36  58.448 1873.37  63.644 1873.42  69.726 1873.41
  73.125 1873.41  84.455 1873.39  90.759 1873.49  94.498 1873.45  100.57 1873.41
 106.193 1873.38 110.925  1873.3 115.428 1873.23 120.244 1873.13 124.212 1873.09
 128.155 1873.07 133.572 1872.54  136.46 1872.61 137.494 1872.02 143.908 1872.02
 163.038  1871.7 167.632 1871.89 168.911  1871.9 169.317 1871.89 169.339 1871.88
 169.559 1871.85 170.213 1871.76 182.581 1872.04 183.088 1872.05 190.475 1871.88
 192.217 1871.89  195.83 1871.77 199.012 1871.82 200.393 1871.83  202.37 1871.62
 202.695  1871.6 203.231 1871.55 206.093 1871.25 207.237 1871.16 209.186 1870.99
  209.91 1870.75 210.677  1870.5 211.514 1870.42 233.365 1869.96 234.318 1869.95
 236.441 1869.72 238.968 1869.63 243.202 1869.53 244.279 1869.24 245.233 1869.05
 246.148 1869.08 249.821 1868.27 250.674 1868.16 252.061 1867.95  252.32  1864.9
 264.599  1863.1 264.599  1855.1   319.3  1855.1   319.3  1863.1  328.96  1866.2
 330.796 1866.29 332.006 1866.61 336.306 1866.57 349.997 1867.01 354.697 1866.89
 371.242 1866.49 380.126 1866.39 388.769 1866.21 404.854 1866.27 420.758 1865.68
 422.706 1865.71 423.358 1865.73 433.326 1866.31 444.178 1866.41 454.863  1866.4
 464.508 1866.32 469.342  1866.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0    .015 264.599    .015   319.3    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       264.599   319.3            11.98   11.98   11.98            .05       .1
Right Levee     Station=  349.94      Elevation= 1867.14

CROSS SECTION OUTPUT  Profile #100-yr FIS
*******************************************************************************************
* E.G. Elev (ft)         * 1866.84  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.67  * Wt. n-Val.           *   0.015  *   0.015  *   0.015  *
* W.S. Elev (ft)         * 1865.17  * Reach Len. (ft)       *   11.98  *   11.98  *   11.98  *
* Crit W.S. (ft)         * 1862.16  * Flow Area (sq ft)     *   14.35  *  550.76  *    6.67  *
* E.G. Slope (ft/ft)     *0.000717  * Area (sq ft)          *   14.35  *  550.76  *    6.67  *
* Q Total (cfs)          * 5800.00  * Flow (cfs)            *   41.35  * 5741.15  *   17.51  *
* Top Width (ft)         *   73.45  * Top Width (ft)        *   12.30  *   54.70  *    6.45  *
* Vel Total (ft/s)       *   10.14  * Avg. Vel. (ft/s)      *    2.88  *   10.42  *    2.63  *
* Max Chl Dpth (ft)      *   10.07  * Hydr. Depth (ft)      *    1.17  *   10.07  *    1.03  *
* Conv. Total (cfs)      *216599.3  * Conv. (cfs)           *  1544.1  *214401.4  *   653.8  *
* Length Wtd. (ft)       *   11.98  * Wetted Per. (ft)      *   12.68  *   70.70  *    6.77  *
* Min Ch El (ft)         * 1855.10  * Shear (lb/sq ft)      *    0.05  *    0.35  *    0.04  *
* Alpha                  *    1.05  * Stream Power (lb/ft s) *  469.34  *    0.00  *  349.94  *
* Frctn Loss (ft)        *    0.01  * Cum Volume (acre-ft)  *    0.40  *    8.72  *    1.08  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)        *    0.24  *    1.11  *    0.67  *
*******************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
```

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: FW
REACH: FW RS: 914.02*

INPUT
Description:
Station Elevation Data num= 129

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.39	6.93	1871.29	7.99	1871.3	15.63	1871.28	23.95	1871.28
33.62	1871.28	39.09	1871.32	41.22	1871.21	41.63	1871.22	45.38	1871.29
50.25	1871.28	54.71	1871.31	59.57	1871.3	59.94	1871.29	62.86	1871.26
72.6	1871.15	76.07	1871.16	77.14	1871.17	78.02	1871.18	80.36	1871.15
81.24	1871.15	86.46	1871.15	91.29	1871.16	95.36	1871.13	99.23	1871.11
103.37	1871.07	106.67	1871.06	106.78	1871.06	110.17	1871.04	114.83	1870.66
117.31	1870.71	118.2	1870.29	123.71	1870.29	133.28	1870.15	140.16	1870.08
144.11	1870.23	145.21	1870.24	145.55	1870.24	145.57	1870.23	145.76	1870.21
146.33	1870.15	147.57	1870.18	156.96	1870.37	157.39	1870.38	162.27	1870.3
163.74	1870.27	165.24	1870.29	168.35	1870.22	171.08	1870.26	172.27	1870.27
173.97	1870.13	174.25	1870.12	174.71	1870.09	177.17	1869.88	178.15	1869.83
179.83	1869.71	180.45	1869.54	181.11	1869.37	181.83	1869.32	189.64	1869.22
197.42	1869.12	200.61	1869.04	201.43	1869.03	203.26	1868.86	205.43	1868.78
209.07	1868.69	209.97	1868.49	210	1868.48	210.82	1868.33	211.6	1868.34
214.76	1867.73	215.49	1867.64	216.69	1867.47	216.91	1865.31	223.57	1864.41
226.01	1864.09	227.46	1863.32	227.85	1855.12	229.57	1855.13	230.09	1854.95
268.81	1854.95	280.51	1860.68	280.78	1862.35	280.81	1862.45	281.01	1862.55
282.62	1863.21	288.36	1864.72	291.24	1865.48	292.87	1865.56	293.74	1865.75
293.95	1865.8	296.74	1865.87	297.78	1865.94	308.18	1866.98	309.99	1867.14
312.75	1867.26	314.18	1867.3	316.12	1867.36	319.08	1867.45	328.93	1867.17
336.85	1867.02	337.14	1867.02	341.47	1866.9	343.41	1866.86	343.77	1866.85
343.99	1866.84	344.36	1866.84	344.56	1866.83	345.3	1866.83	358.89	1866.81
373.07	1866.32	374.81	1866.34	375.04	1866.34	375.39	1866.35	380.16	1866.53
384.28	1866.68	388.32	1866.67	393.45	1866.71	393.95	1866.71	394.47	1866.71
395.77	1866.7	398.86	1866.73	401.74	1866.75	403.48	1866.77	410.13	1866.78
412.08	1866.77	414.74	1866.69	415.86	1866.64	416.38	1866.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	227.46	.015	282.62	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
227.46 282.62 397.98 413.98 419.98 .05 .1

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1866.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.31	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1864.48	Reach Len. (ft)	397.98	413.98	419.98
Crit W.S. (ft)		Flow Area (sq ft)	1.70	473.84	3.06
E.G. Slope (ft/ft)	*0.001098	Area (sq ft)	1.70	473.84	3.06
Q Total (cfs)	5800.00	Flow (cfs)	2.87	*5789.87	7.26
Top Width (ft)	64.39	Top Width (ft)	4.40	55.16	4.83
Vel Total (ft/s)	12.12	Avg. Vel. (ft/s)	1.69	12.22	2.37
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)	0.39	8.59	0.63
Conv. Total (cfs)	*175016.8	Conv. (cfs)	86.5	*174711.1	219.2
Length Wtd. (ft)	413.79	Wetted Per. (ft)	4.62	65.99	4.99
Min Ch El (ft)	1854.95	Shear (lb/sq ft)	0.03	0.49	0.04
Alpha	1.01	Stream Power (lb/ft s)	416.38	0.00	0.00
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.40	8.58	1.08
C & E Loss (ft)	0.05	Cum SA (acres)	0.24	1.09	0.67

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: FW
REACH: FW RS: 702.71

INPUT
Description: X-section 640 from Case no. 04-09-0166P LOMR
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1866.76	1004.77	1866.42	1005.12	1866.26	1009.4	1864.26	1013.41	1862.26
1016.12	1860.86	1026.88	1860.35	1027.05	1860.26	1030.75	1858.26	1034.43	1856.26
1038.12	1854.26	1039.25	1853.65	1067.22	1853.63	1068.01	1854.26	1070.51	1856.26
1073	1858.26	1075.48	1860.26	1077.94	1862.26	1079.43	1863.49		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1026.88	.015	1079.43	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1026.88 1079.43 251.59 258.21 262.14 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1866.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.28	Wt. n-Val.	0.020	0.015	
W.S. Elev (ft)	1862.90	Reach Len. (ft)	251.59	258.21	262.14
Crit W.S. (ft)	1862.90	Flow Area (sq ft)	28.77	385.61	

* E.G. Slope (ft/ft)	*0.001711	* Area (sq ft)	*	28.77	*	385.61	*		*		
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	134.94	*	5665.06	*		*		
* Top Width (ft)	* 66.60	* Top Width (ft)	*	14.76	*	51.84	*		*		
* Vel Total (ft/s)	* 14.00	* Avg. Vel. (ft/s)	*	4.69	*	14.69	*		*		
* Max Chl Dpth (ft)	* 9.27	* Hydr. Depth (ft)	*	1.95	*	7.44	*		*		
* Conv. Total (cfs)	*140207.4	* Conv. (cfs)	*	3262.1	*	136945.3	*		*		
* Length Wtd. (ft)	* 258.24	* Wetted Per. (ft)	*	15.26	*	56.81	*		*		
* Min Ch El (ft)	* 1853.63	* Shear (lb/sq ft)	*	0.20	*	0.73	*		*		
* Alpha	* 1.08	* Stream Power (lb/ft s)	*	1079.43	*	0.00	*	0.00	*		
* Frctn Loss (ft)	* 0.35	* Cum Volume (acre-ft)	*	0.26	*	4.50	*	1.07	*		
* C & E Loss (ft)	* 0.34	* Cum SA (acres)	*	0.15	*	0.58	*	0.65	*		

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: FW
REACH: FW RS: 444.5

INPUT
Description: X-section 630 from Case no. 04-09-0166P LOMR
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1863.46	1004.03	1862.26	1009.63	1860.53	1010.62	1860.26	1018.67	1858.26
1018.82	1858.16	1031	1857.32	1032.96	1856.26	1036.68	1854.26	1040.45	1852.26
1044.02	1850.36	1071.6	1850.54	1074.89	1852.26	1078.71	1854.26	1082.53	1856.26
1084.55	1857.26	1129.14	1858.26	1165.99	1859.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1031	.015	1084.55	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1031 1084.55 229.09 221.03 213.86 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1862.09	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.15	* Wt. n-Val.	* 0.020	* 0.015	* 0.020 *
* W.S. Elev (ft)	* 1859.94	* Reach Len. (ft)	* 229.09	* 221.03	* 213.86 *
* Crit W.S. (ft)	* 1859.94	* Flow Area (sq ft)	* 32.70	* 419.12	* 140.52 *
* E.G. Slope (ft/ft)	*0.001092	* Area (sq ft)	* 32.70	* 419.12	* 140.52 *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	* 113.91	* 5192.54	* 493.56 *
* Top Width (ft)	* 154.07	* Top Width (ft)	* 19.08	* 53.55	* 81.44 *
* Vel Total (ft/s)	* 9.79	* Avg. Vel. (ft/s)	* 3.48	* 12.39	* 3.51 *
* Max Chl Dpth (ft)	* 9.58	* Hydr. Depth (ft)	* 1.71	* 7.83	* 1.73 *
* Conv. Total (cfs)	*175494.2	* Conv. (cfs)	* 3446.6	* 157113.7	* 14933.9 *
* Length Wtd. (ft)	* 220.55	* Wetted Per. (ft)	* 19.35	* 56.93	* 82.14 *
* Min Ch El (ft)	* 1850.36	* Shear (lb/sq ft)	* 0.12	* 0.50	* 0.12 *
* Alpha	* 1.45	* Stream Power (lb/ft s)	* 1165.99	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.26	* Cum Volume (acre-ft)	* 0.09	* 2.11	* 0.64 *
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 0.05	* 0.27	* 0.40 *

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 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: FW
REACH: FW RS: 223.47

INPUT
Description: X-section 620 from Case no. 04-09-0166P LOMR
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1861.56	1007.7	1860.26	1012.48	1859.42	1018.28	1858.26	1022.06	1857.51
1033.45	1857.66	1035.35	1856.26	1037.9	1854.26	1040.44	1852.26	1042.97	1850.26
1045.49	1848.26	1046.14	1847.74	1075.97	1847.92	1076.49	1848.26	1079.51	1850.26
1082.53	1852.26	1085.57	1854.26	1086.27	1854.72	1135.67	1856.26	1176.03	1857.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1033.45	.015	1086.27	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1033.45 1086.27 0 0 0 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1859.98	Element	Left OB	Channel	Right OB	
Vel Head (ft)	2.46	Wt. n-Val.	0.000	0.015	0.020	
W.S. Elev (ft)	1857.52	Reach Len. (ft)				
Crit W.S. (ft)	1857.52	Flow Area (sq ft)	0.00	413.36	121.19	
E.G. Slope (ft/ft)	0.001263	Area (sq ft)	0.00	413.36	121.19	
Q Total (cfs)	5800.00	Flow (cfs)	0.00	5387.04	412.97	
Top Width (ft)	136.04	Top Width (ft)	0.78	52.63	82.63	
Vel Total (ft/s)	10.85	Avg. Vel. (ft/s)	0.08	13.03	3.41	
Max Chl Dpth (ft)	9.78	Hydr. Depth (ft)	0.00	7.85	1.47	
Conv. Total (cfs)	163188.9	Conv. (cfs)	0.0	151569.7	11619.2	
Length Wtd. (ft)		Wetted Per. (ft)	0.78	58.04	82.68	
Min Ch El (ft)	1847.74	Shear (lb/sq ft)		0.56	0.12	
Alpha	1.35	Stream Power (lb/ft s)	1176.03	0.00	0.00	
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

Warning: Divided flow computed for this cross-section.
Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth).
Water surface set to critical depth.

SUMMARY OF MANNING'S N VALUES

River:FW

Reach	River Sta.	n1	n2	n3	n4	n5	n6
FW	8837.78	.025	.025	.025			
FW	8807.78	.025	.025	.025			
FW	8687.78	.025	.025	.025			
FW	8320	.035	.03	.035			
FW	8200	.03	.04	.03			
FW	8100.*	.03	.04	.03			
FW	8000	.03	.04	.03			
FW	7900.*	.03	.04	.03			
FW	7800	.03	.04	.03			
FW	7700.*	.03	.04	.03			
FW	7600	.03	.04	.03			
FW	7500.*	.03	.04	.03			
FW	7400	.03	.04	.03			
FW	7300.*	.03	.04	.03			
FW	7200	.03	.04	.03			
FW	7100.*	.03	.04	.03			
FW	7000	.03	.04	.03			
FW	6925	Bridge					
FW	6868.*	.03	.04	.03			
FW	6736	.03	.04	.03			
FW	6577	.03	.04	.03			
FW	6500	Culvert					
FW	6469	.03	.04	.03			
FW	6450	Bridge					
FW	6100	.03	.04	.03			
FW	6000	Bridge					
FW	5917	.03	.033	.013	.033	.03	.16
FW	5800	Culvert					
FW	5796	.015	.015	.015			
FW	5776	.015	.015	.015			
FW	5737.74	.015	.015	.015			
FW	5648.42	.015	.015	.015			
FW	5548.82*	.015	.015	.015			
FW	5449.23	.015	.015	.015			
FW	5449.11	.015	.015	.015			
FW	5399.11	.015	.015	.015			
FW	5349.11	.015	.015	.015			
FW	5299.11	.015	.015	.015			
FW	5279.92	.015	.015	.015			
FW	5255.16	.015	.015	.015			
FW	5206.70	.015	.015	.015			
FW	5158.24	.015	.015	.015			
FW	5109.79	.015	.015	.015			
FW	5061.33	.015	.015	.015			
FW	5012.88	.015	.015	.015			
FW	4945.04	.015	.015	.015			
FW	4863.36	.015	.015	.015			
FW	4781.68	.015	.015	.015			
FW	4700	.015	.015	.015			
FW	4600	.015	.015	.015			
FW	4500	.015	.015	.015			
FW	4425.69	.015	.015	.015			
FW	4350	.015	.015	.015			
FW	4275.*	.015	.015	.015			
FW	4200.00	.015	.015	.015			
FW	4127.25*	.015	.015	.015			
FW	4054.5*	.015	.015	.015			
FW	3977.08	.015	.015	.015			
FW	3890.88*	.015	.015	.015			
FW	3800	.015	.015	.015			
FW	3700.*	.015	.015	.015			
FW	3593.55	.015	.015	.015			
FW	3543.55	.015	.015	.015			
FW	3493.55	.015	.015	.015			
FW	3443.55	.015	.015	.015			
FW	3393.55	.015	.015	.015			
FW	3295.98	.015	.015	.015			
FW	3198.41	.015	.015	.015			
FW	3100.84	.015	.015	.015			

						sub.rep				
*FW	*	3050.84	*	.015*	.015*	.015*	*	*	*	
*FW	*	3000.84	*	.015*	.015*	.015*	*	*	*	
*FW	*	2964.21	*	.015*	.015*	.015*	*	*	*	
*FW	*	2921.88	*	.015*	.015*	.015*	*	*	*	
*FW	*	2837.87*	*	.015*	.015*	.015*	*	*	*	
*FW	*	2753.87	*	.015*	.015*	.015*	*	*	*	
*FW	*	2722.44*	*	.015*	.015*	.015*	*	*	*	
*FW	*	2703.87	*	.015*	.015*	.015*	*	*	*	
*FW	*	2702.87	*	.015*	.015*	.015*	*	*	*	
*FW	*	2648.55	*	.015*	.015*	.015*	*	*	*	
*FW	*	2596.14	*	.015*	.015*	.015*	*	*	*	
*FW	*	2555.18	*	.015*	.015*	.015*	*	*	*	
*FW	*	2514.22	*	.015*	.015*	.015*	*	*	*	
*FW	*	2473.26	*	.015*	.015*	.015*	*	*	*	
*FW	*	2432.30	*	.015*	.015*	.015*	*	*	*	
*FW	*	2334.09*	*	.015*	.015*	.015*	*	*	*	
*FW	*	2235.88*	*	.015*	.015*	.015*	*	*	*	
*FW	*	2137.68	*	.015*	.015*	.015*	*	*	*	
*FW	*	2059.60*	*	.015*	.015*	.015*	*	*	*	
*FW	*	2020.16	*	.015*	.015*	.015*	*	*	*	
*FW	*	1981.53*	*	.015*	.015*	.015*	*	*	*	
*FW	*	1903.46	*	.015*	.015*	.015*	*	*	*	
*FW	*	1817.25*	*	.015*	.015*	.015*	*	*	*	
*FW	*	1731.04*	*	.015*	.015*	.015*	*	*	*	
*FW	*	1644.83*	*	.015*	.015*	.015*	*	*	*	
*FW	*	1558.62	*	.015*	.015*	.015*	*	*	*	
*FW	*	1500	*	.015*	.015*	.015*	*	*	*	
*FW	*	1481.51	*	.015*	.015*	.015*	*	*	*	
*FW	*	1437.01	*	.015*	.015*	.015*	*	*	*	
*FW	*	1392.52	*	.015*	.015*	.015*	*	*	*	
*FW	*	1348.02	*	.015*	.015*	.015*	*	*	*	
*FW	*	1303.53	*	.015*	.015*	.015*	*	*	*	
*FW	*	1259.03	*	.015*	.015*	.015*	*	*	*	
*FW	*	1214.54	*	.015*	.015*	.015*	*	*	*	
*FW	*	1173.6	*	.015*	.015*	.015*	*	*	*	
*FW	*	1088.94	*	.015*	.015*	.015*	*	*	*	
*FW	*	1000	*Bridge	*	*	*	*	*	*	
*FW	*	926	*	.015*	.015*	.015*	*	*	*	
*FW	*	914.02*	*	.015*	.015*	.015*	*	*	*	
*FW	*	702.71	*	.02*	.015*	.02*	*	*	*	
*FW	*	444.5	*	.02*	.015*	.02*	*	*	*	
*FW	*	223.47	*	.02*	.015*	.02*	*	*	*	

SUMMARY OF REACH LENGTHS

River: FW

Reach	River Sta.	Left	Channel	Right
*FW	8837.78	30*	30*	30*
*FW	8807.78	120*	120*	120*
*FW	8687.78	382.58*	367.78*	346.32*
*FW	8320	120*	120*	120*
*FW	8200	100*	100*	100*
*FW	8100.*	100*	100*	100*
*FW	8000	100*	100*	100*
*FW	7900.*	100*	100*	100*
*FW	7800	100*	100*	100*
*FW	7700.*	100*	100*	100*
*FW	7600	100*	100*	100*
*FW	7500.*	100*	100*	100*
*FW	7400	77.52*	100*	117*
*FW	7300.*	77.52*	100*	117*
*FW	7200	69*	100*	115.52*
*FW	7100.*	69*	100*	115.52*
*FW	7000	100*	100*	100*
*FW	6925	*Bridge	*	*	*
*FW	6868.*	100*	100*	100*
*FW	6736	190*	159*	150*
*FW	6577	108*	108*	108*
*FW	6500	*Culvert	*	*	*
*FW	6469	328.1*	369.09*	389.1*
*FW	6450	*Bridge	*	*	*
*FW	6100	225.1*	195*	182.1*
*FW	6000	*Bridge	*	*	*
*FW	5917	121*	121*	121*
*FW	5800	*Culvert	*	*	*
*FW	5796	20*	20*	20*
*FW	5776	38.26*	38.26*	38.26*
*FW	5737.74	89.32*	89.32*	89.32*
*FW	5648.42	99.6*	99.6*	99.6*
*FW	5548.82*	99.59*	99.59*	99.59*
*FW	5449.23	.12*	.12*	.12*
*FW	5449.11	50*	50*	50*
*FW	5399.11	50*	50*	50*
*FW	5349.11	50*	50*	50*
*FW	5299.11	19.19*	19.19*	19.19*
*FW	5279.92	24.76*	24.76*	24.76*
*FW	5255.16	48.46*	48.46*	48.46*
*FW	5206.70	48.46*	48.46*	48.46*
*FW	5158.24	48.45*	48.45*	48.45*
*FW	5109.79	48.46*	48.46*	48.46*
*FW	5061.33	48.45*	48.45*	48.45*
*FW	5012.88	67.84*	67.84*	67.84*
*FW	4945.04	81.68*	81.68*	81.68*
*FW	4863.36	81.68*	81.68*	81.68*

*FW	*	4781.68	* 81.68*	81.68*	81.68*
*FW	*	4700	* 100*	100*	100*
*FW	*	4600	* 100*	100*	100*
*FW	*	4500	* 74.31*	74.31*	74.31*
*FW	*	4425.69	* 75.69*	75.69*	75.69*
*FW	*	4350	* 75*	75*	75*
*FW	*	4275.*	* 75*	75*	75*
*FW	*	4200.00	* 72.75*	72.75*	72.75*
*FW	*	4127.25*	* 72.75*	72.75*	72.75*
*FW	*	4054.5*	* 77.42*	77.42*	77.42*
*FW	*	3977.08	* 86.2*	86.2*	86.2*
*FW	*	3890.88*	* 90.88*	90.88*	90.88*
*FW	*	3800	* 100*	100*	100*
*FW	*	3700.*	* 106.45*	106.45*	106.45*
*FW	*	3593.55	* 50*	50*	50*
*FW	*	3543.55	* 50*	50*	50*
*FW	*	3493.55	* 50*	50*	50*
*FW	*	3443.55	* 50*	50*	50*
*FW	*	3393.55	* 97.57*	97.57*	97.57*
*FW	*	3295.98	* 97.57*	97.57*	97.57*
*FW	*	3198.41	* 97.57*	97.57*	97.57*
*FW	*	3100.84	* 50*	50*	50*
*FW	*	3050.84	* 50*	50*	50*
*FW	*	3000.84	* 36.63*	36.63*	36.63*
*FW	*	2964.21	* 42.33*	42.33*	42.33*
*FW	*	2921.88	* 84.01*	84.01*	84.01*
*FW	*	2837.87*	* 84*	84*	84*
*FW	*	2753.87	* 31.43*	31.43*	31.43*
*FW	*	2722.44*	* 18.57*	18.57*	18.57*
*FW	*	2703.87	* 1*	1*	1*
*FW	*	2702.87	* 54.32*	54.32*	54.32*
*FW	*	2648.55	* 52.41*	52.41*	52.41*
*FW	*	2596.14	* 40.96*	40.96*	40.96*
*FW	*	2555.18	* 40.96*	40.96*	40.96*
*FW	*	2514.22	* 40.96*	40.96*	40.96*
*FW	*	2473.26	* 40.96*	40.96*	40.96*
*FW	*	2432.30	* 98.19*	98.19*	98.19*
*FW	*	2334.09*	* 98.21*	98.21*	98.21*
*FW	*	2235.88*	* 98.2*	98.2*	98.2*
*FW	*	2137.68	* 78.1*	78.1*	78.1*
*FW	*	2059.60*	* 39.44*	39.44*	39.44*
*FW	*	2020.16	* 38.63*	38.63*	38.63*
*FW	*	1981.53*	* 78.1*	78.1*	78.1*
*FW	*	1903.46	* 86.21*	86.21*	86.21*
*FW	*	1817.25*	* 86.21*	86.21*	86.21*
*FW	*	1731.04*	* 86.21*	86.21*	86.21*
*FW	*	1644.83*	* 86.21*	86.21*	86.21*
*FW	*	1558.62	* 58.62*	58.62*	58.62*
*FW	*	1500	* 18.49*	18.49*	18.49*
*FW	*	1481.51	* 44.5*	44.5*	44.5*
*FW	*	1437.01	* 44.49*	44.49*	44.49*
*FW	*	1392.52	* 44.5*	44.5*	44.5*
*FW	*	1348.02	* 44.49*	44.49*	44.49*
*FW	*	1303.53	* 44.5*	44.5*	44.5*
*FW	*	1259.03	* 44.49*	44.49*	44.49*
*FW	*	1214.54	* 40.94*	40.94*	40.94*
*FW	*	1173.6	* 84.66*	84.66*	84.66*
*FW	*	1088.94	* 174*	174*	174*
*FW	*	1000	*Bridge *	*	*
*FW	*	926	* 11.98*	11.98*	11.98*
*FW	*	914.02*	* 397.98*	413.98*	419.98*
*FW	*	702.71	* 251.59*	258.21*	262.14*
*FW	*	444.5	* 229.09*	221.03*	213.86*
*FW	*	223.47	* 0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: FW

Reach	River Sta.	Contr.	Expan.
*FW	* 8837.78	* .1*	.3*
*FW	* 8807.78	* .1*	.3*
*FW	* 8687.78	* .1*	.3*
*FW	* 8320	* .1*	.3*
*FW	* 8200	* .1*	.3*
*FW	* 8100.*	* .1*	.3*
*FW	* 8000	* .1*	.3*
*FW	* 7900.*	* .1*	.3*
*FW	* 7800	* .1*	.3*
*FW	* 7700.*	* .1*	.3*
*FW	* 7600	* .1*	.3*
*FW	* 7500.*	* .1*	.3*
*FW	* 7400	* .1*	.3*
*FW	* 7300.*	* .1*	.3*
*FW	* 7200	* .1*	.3*
*FW	* 7100.*	* .1*	.3*
*FW	* 7000	* .1*	.3*
*FW	* 6925	*Bridge *	*
*FW	* 6868.*	* .1*	.3*
*FW	* 6736	* .1*	.3*
*FW	* 6577	* .1*	.3*
*FW	* 6500	*Culvert *	*
*FW	* 6469	* .3*	.5*
*FW	* 6450	*Bridge *	*
*FW	* 6100	* .1*	.3*

```
*FW             *    6000    *Bridge   *         *
*FW             *    5917    *       .1*       .3*
*FW             *    5800    *Culvert  *         *
*FW             *    5796    *       .3*       .5*
*FW             *    5776    *      .01*      .03*
*FW             *    5737.74 *      .01*      .03*
*FW             *    5648.42 *        0*        0*
*FW             *    5548.82**        0*        0*
*FW             *    5449.23 *      .01*      .03*
*FW             *    5449.11 *      .01*      .03*
*FW             *    5399.11 *      .01*      .03*
*FW             *    5349.11 *      .01*      .03*
*FW             *    5299.11 *      .01*      .03*
*FW             *    5279.92 *        0*        0*
*FW             *    5255.16 *        0*        0*
*FW             *    5206.70 *        0*        0*
*FW             *    5158.24 *        0*        0*
*FW             *    5109.79 *        0*        0*
*FW             *    5061.33 *        0*        0*
*FW             *    5012.88 *        0*        0*
*FW             *    4945.04 *        0*        0*
*FW             *    4863.36 *        0*        0*
*FW             *    4781.68 *        0*        0*
*FW             *    4700    *        0*        0*
*FW             *    4600    *        0*        0*
*FW             *    4500    *        0*        0*
*FW             *    4425.69 *        0*        0*
*FW             *    4350    *        0*        0*
*FW             *    4275.*  *        0*        0*
*FW             *    4200.00 *        0*        0*
*FW             *    4127.25**        0*        0*
*FW             *    4054.5* *        0*        0*
*FW             *    3977.08 *        0*        0*
*FW             *    3890.88**        0*        0*
*FW             *    3800    *        0*        0*
*FW             *    3700.*  *        0*        0*
*FW             *    3593.55 *      .01*      .03*
*FW             *    3543.55 *      .01*      .03*
*FW             *    3493.55 *      .01*      .03*
*FW             *    3443.55 *      .01*      .03*
*FW             *    3393.55 *        0*        0*
*FW             *    3295.98 *        0*        0*
*FW             *    3198.41 *        0*        0*
*FW             *    3100.84 *        0*        0*
*FW             *    3050.84 *        0*        0*
*FW             *    3000.84 *        0*        0*
*FW             *    2964.21 *        0*        0*
*FW             *    2921.88 *        0*        0*
*FW             *    2837.87**        0*        0*
*FW             *    2753.87 *        0*        0*
*FW             *    2722.44**        0*        0*
*FW             *    2703.87 *        0*        0*
*FW             *    2702.87 *      .01*      .03*
*FW             *    2648.55 *        0*        0*
*FW             *    2596.14 *        0*        0*
*FW             *    2555.18 *        0*        0*
*FW             *    2514.22 *        0*        0*
*FW             *    2473.26 *        0*        0*
*FW             *    2432.30 *        0*        0*
*FW             *    2334.09**        0*        0*
*FW             *    2235.88**        0*        0*
*FW             *    2137.68 *        0*        0*
*FW             *    2059.60**        0*        0*
*FW             *    2020.16 *        0*        0*
*FW             *    1981.53**        0*        0*
*FW             *    1903.46 *        0*        0*
*FW             *    1817.25**        0*        0*
*FW             *    1731.04**        0*        0*
*FW             *    1644.83**        0*        0*
*FW             *    1558.62 *        0*        0*
*FW             *    1500    *        0*        0*
*FW             *    1481.51 *        0*        0*
*FW             *    1437.01 *        0*        0*
*FW             *    1392.52 *        0*        0*
*FW             *    1348.02 *        0*        0*
*FW             *    1303.53 *        0*        0*
*FW             *    1259.03 *        0*        0*
*FW             *    1214.54 *      .01*      .03*
*FW             *    1173.6  *      .01*      .03*
*FW             *    1088.94 *      .05*       .1*
*FW             *    1000    *Bridge   *         *
*FW             *    926     *      .05*       .1*
*FW             *    914.02* *      .05*       .1*
*FW             *    702.71  *       .1*       .3*
*FW             *    444.5   *       .1*       .3*
*FW             *    223.47  *       .1*       .3*
**************************************************

Profile Output Table - Standard Table 1
*****************************************************************************************************************************************************
********
* Reach       * River Sta * 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) *
      *
*****************************************************************************************************************************************************
********
* FW          * 8837.78   * 5500.00 *   1924.80 *   1937.64 *           *   1938.82 *   0.001261 *     8.74 *    629.31 *     50.00 *
 0.43 *
```

* FW	* 8807.78	* 5500.00 *	1924.71 *	1935.21 *	1935.21 *	1938.54 *	0.005466 *	14.64 *	375.68 *	56.89 *	1.00 *
* FW	* 8687.78	* 5500.00 *	1924.34 *	1933.54 *	1933.54 *	1936.73 *	0.005424 *	14.35 *	383.41 *	60.40 *	1.00 *
* FW	* 8320	* 5500.00 *	1923.96 *	1932.43 *	1932.43 *	1934.25 *	0.005458 *	11.14 *	566.77 *	183.61 *	0.85 *
* FW	* 8200	* 5500.00 *	1921.80 *	1931.73 *	1931.18 *	1933.39 *	0.006424 *	10.82 *	583.17 *	188.39 *	0.71 *
* FW	* 8100.*	* 5500.00 *	1920.92 *	1931.65 *	*	1932.69 *	0.004117 *	9.12 *	743.46 *	219.41 *	0.58 *
* FW	* 8000	* 5500.00 *	1920.05 *	1931.73 *	*	1932.26 *	0.001973 *	6.83 *	1012.13 *	254.62 *	0.40 *
* FW	* 7900.*	* 5500.00 *	1919.47 *	1930.90 *	1930.44 *	1931.94 *	0.004019 *	9.36 *	778.20 *	264.66 *	0.57 *
* FW	* 7800	* 5500.00 *	1918.88 *	1929.88 *	1929.88 *	1931.39 *	0.006421 *	11.09 *	620.75 *	194.90 *	0.70 *
* FW	* 7700.*	* 5500.00 *	1918.01 *	1928.90 *	1928.90 *	1930.04 *	0.005176 *	10.06 *	753.41 *	304.92 *	0.63 *
* FW	* 7600	* 5500.00 *	1917.14 *	1927.45 *	1927.45 *	1928.59 *	0.005677 *	10.20 *	735.43 *	283.98 *	0.65 *
* FW	* 7500.*	* 5500.00 *	1916.78 *	1927.20 *	*	1927.89 *	0.003302 *	7.97 *	897.72 *	292.20 *	0.50 *
* FW	* 7400	* 5500.00 *	1916.43 *	1927.14 *	*	1927.56 *	0.001858 *	6.15 *	1106.67 *	312.04 *	0.38 *
* FW	* 7300.*	* 5500.00 *	1916.49 *	1926.48 *	*	1927.27 *	0.003401 *	8.23 *	864.71 *	282.87 *	0.52 *
* FW	* 7200	* 5500.00 *	1916.55 *	1925.32 *	1925.32 *	1926.76 *	0.006185 *	10.22 *	640.83 *	228.94 *	0.69 *
* FW	* 7100.*	* 5500.00 *	1915.99 *	1924.25 *	1924.15 *	1925.89 *	0.007401 *	10.94 *	578.83 *	171.09 *	0.76 *
* FW	* 7000	* 5500.00 *	1915.44 *	1924.22 *	1922.74 *	1925.21 *	0.003828 *	8.57 *	716.57 *	162.49 *	0.56 *
* FW	* 6925	* Bridge *	*	*	*	*	*	*	*	*	*
* FW	* 6868.*	* 5500.00 *	1914.40 *	1924.28 *	*	1924.77 *	0.001751 *	6.18 *	1018.93 *	221.67 *	0.38 *
* FW	* 6736	* 5500.00 *	1913.37 *	1924.30 *	1921.50 *	1924.58 *	0.000975 *	4.70 *	1337.37 *	279.06 *	0.29 *
* FW	* 6577	* 5500.00 *	1912.92 *	1924.10 *	1919.71 *	1924.41 *	0.001046 *	4.82 *	1360.48 *	353.04 *	0.30 *
* FW	* 6500	* Culvert *	*	*	*	*	*	*	*	*	*
* FW	* 6469	* 5500.00 *	1912.23 *	1920.42 *	1919.35 *	1921.85 *	0.008046 *	9.72 *	607.11 *	205.61 *	0.75 *
* FW	* 6450	* Bridge *	*	*	*	*	*	*	*	*	*
* FW	* 6100	* 5500.00 *	1909.48 *	1919.31 *	1916.17 *	1919.47 *	0.000572 *	3.53 *	1773.81 *	394.17 *	0.22 *
* FW	* 6000	* Bridge *	*	*	*	*	*	*	*	*	*
* FW	* 5917	* 5500.00 *	1908.13 *	1918.67 *	1915.08 *	1919.28 *	0.001255 *	6.51 *	1021.19 *	307.79 *	0.47 *
* FW	* 5800	* Culvert *	*	*	*	*	*	*	*	*	*
* FW	* 5796	* 5280.00 *	1906.30 *	1912.77 *	1912.77 *	1916.03 *	0.002340 *	14.49 *	364.27 *	56.30 *	1.00 *
* FW	* 5776	* 5280.00 *	1905.99 *	1911.17 *	1911.17 *	1913.76 *	0.002254 *	12.91 *	408.94 *	79.77 *	1.00 *
* FW	* 5737.74	* 5280.00 *	1905.43 *	1910.73 *	1910.73 *	1913.31 *	0.002225 *	12.87 *	410.23 *	79.77 *	1.00 *
* FW	* 5648.42	* 5280.00 *	1904.09 *	1909.82 *	1909.82 *	1912.50 *	0.002216 *	13.14 *	401.89 *	75.00 *	1.00 *
* FW	* 5548.82*	* 5280.00 *	1902.59 *	1908.32 *	1908.32 *	1911.00 *	0.002216 *	13.14 *	401.85 *	75.00 *	1.00 *
* FW	* 5449.23	* 5280.00 *	1901.09 *	1906.82 *	1906.82 *	1909.50 *	0.002217 *	13.14 *	401.81 *	75.00 *	1.00 *
* FW	* 5449.11	* 5280.00 *	1901.09 *	1906.82 *	1906.82 *	1909.50 *	0.002219 *	13.14 *	401.71 *	75.00 *	1.00 *
* FW	* 5399.11	* 5280.00 *	1900.17 *	1906.25 *	1906.25 *	1909.12 *	0.002235 *	13.60 *	388.16 *	67.61 *	1.00 *
* FW	* 5349.11	* 5280.00 *	1899.26 *	1906.27 *	1905.76 *	1908.92 *	0.001781 *	13.07 *	403.90 *	60.22 *	0.89 *
* FW	* 5299.11	* 5280.00 *	1898.34 *	1905.95 *	1905.35 *	1908.82 *	0.001814 *	13.61 *	388.08 *	52.84 *	0.88 *
* FW	* 5279.92	* 5280.00 *	1897.99 *	1905.24 *	1905.24 *	1908.77 *	0.002382 *	15.09 *	350.00 *	50.00 *	1.00 *
* FW	* 5255.16	* 5280.00 *	1897.54 *	1904.79 *	1904.79 *	1908.32 *	0.002385 *	15.09 *	349.88 *	50.00 *	1.01 *
* FW	* 5206.70	* 5280.00 *	1897.16 *	1904.41 *	1904.41 *	1907.94 *	0.002381 *	15.08 *	350.05 *	50.00 *	1.00 *
* FW	* 5158.24	* 5280.00 *	1896.78 *	1904.28 *	1904.03 *	1907.58 *	0.002138 *	14.56 *	362.72 *	50.00 *	0.95 *
* FW	* 5109.79	* 5500.00 *	1896.40 *	1903.86 *	1903.86 *	1907.47 *	0.002361 *	15.25 *	360.60 *	50.00 *	1.00 *
* FW	* 5061.33	* 5500.00 *	1896.02 *	1903.48 *	1903.48 *	1907.09 *	0.002361 *	15.25 *	360.60 *	50.00 *	1.00 *
* FW	* 5012.88	* 5500.00 *	1895.64 *	1903.10 *	1903.10 *	1906.71 *	0.002361 *	15.25 *	360.59 *	50.00 *	1.00 *
* FW	* 4945.04	* 5500.00 *	1895.11 *	1902.57 *	1902.57 *	1906.18 *	0.002361 *	15.25 *	360.61 *	50.00 *	1.00 *
* FW	* 4863.36	* 5500.00 *	1894.48 *	1901.94 *	1901.94 *	1905.55 *	0.002361 *	15.25 *	360.60 *	50.00 *	1.00 *
* FW	* 4781.68	* 5500.00 *	1893.84 *	1901.30 *	1901.30 *	1904.91 *	0.002361 *	15.25 *	360.59 *	50.00 *	1.00 *
* FW	* 4700	* 5500.00 *	1893.20 *	1900.66 *	1900.66 *	1904.27 *	0.002361 *	15.25 *	360.61 *	50.00 *	1.00 *
* FW	* 4600	* 5500.00 *	1892.42 *	1899.88 *	1899.88 *	1903.49 *	0.002361 *	15.25 *	360.60 *	50.00 *	1.00 *
* FW	* 4500	* 5500.00 *	1891.63 *	1899.09 *	1899.09 *	1902.70 *	0.002361 *	15.25 *	360.59 *	50.00 *	

1.00											
FW	4425.69	5500.00	1891.05	1898.51	1898.51	1902.12	0.002361	15.25	360.61	50.00	
1.00											
FW	4350	5500.00	1890.46	1897.92	1897.92	1901.53	0.002361	15.25	360.60	50.00	
1.00											
FW	4275.*	5500.00	1889.71	1897.17	1897.17	1900.78	0.002361	15.25	360.60	50.00	
1.00											
FW	4200.00	5500.00	1888.96	1896.42	1896.42	1900.03	0.002362	15.25	360.58	50.00	
1.00											
FW	4127.25*	5500.00	1888.60	1896.06	1896.06	1899.67	0.002362	15.25	360.58	50.00	
1.00											
FW	4054.5*	5500.00	1888.23	1895.69	1895.69	1899.30	0.002362	15.25	360.57	50.00	
1.00											
FW	3977.08	5500.00	1887.85	1895.31	1895.31	1898.92	0.002362	15.25	360.57	50.00	
1.00											
FW	3890.88*	5500.00	1887.41	1894.87	1894.87	1898.48	0.002362	15.25	360.57	50.00	
1.00											
FW	3800	5500.00	1886.96	1894.42	1894.42	1898.03	0.002362	15.25	360.57	50.00	
1.00											
FW	3700.*	5500.00	1885.96	1893.42	1893.42	1897.03	0.002362	15.25	360.54	50.00	
1.00											
FW	3593.55	5500.00	1884.90	1892.36	1892.36	1895.97	0.002364	15.26	360.48	50.00	
1.00											
FW	3543.55	5500.00	1883.90	1892.29	1891.76	1895.66	0.002004	14.74	373.25	45.75	
0.91											
FW	3493.55	5500.00	1882.90	1892.41		1895.56	0.001716	14.25	386.09	41.50	
0.82											
FW	3443.55	5500.00	1881.90	1892.07		1895.47	0.001819	14.78	372.10	37.25	
0.82											
FW	3393.55	5500.00	1880.90	1890.56	1890.56	1895.34	0.002844	17.56	313.16	33.00	
1.00											
FW	3295.98	5500.00	1879.91	1889.57	1889.57	1894.35	0.002842	17.56	313.22	33.00	
1.00											
FW	3198.41	5500.00	1878.92	1888.57	1888.57	1893.36	0.002844	17.56	313.15	33.00	
1.00											
FW	3100.84	5500.00	1877.93	1887.59	1887.59	1892.37	0.002841	17.56	313.25	33.00	
1.00											
FW	3050.84	5500.00	1877.42	1887.07	1887.07	1891.86	0.002844	17.56	313.12	33.00	
1.00											
FW	3000.84	5500.00	1876.92	1886.58	1886.58	1891.36	0.002841	17.56	313.24	33.00	
1.00											
FW	2964.21	5500.00	1876.54	1886.20	1886.20	1890.98	0.002843	17.56	313.18	33.00	
1.00											
FW	2921.88	5500.00	1876.11	1885.77	1885.77	1890.55	0.002843	17.56	313.19	33.00	
1.00											
FW	2837.87*	5500.00	1875.26	1884.91	1884.91	1889.70	0.002844	17.56	313.13	33.00	
1.00											
FW	2753.87	5500.00	1874.41	1884.07	1884.07	1888.85	0.002841	17.56	313.24	33.00	
1.00											
FW	2722.44*	5500.00	1874.09	1883.70	1883.70	1888.49	0.002845	17.56	313.17	33.00	
1.00											
FW	2703.87	5500.00	1874.00	1883.62	1883.62	1888.38	0.002826	17.52	313.96	33.00	
1.00											
FW	2702.87	5500.00	1873.99	1883.61	1883.61	1888.37	0.002157	17.51	314.06	52.82	
1.00											
FW	2648.55	5500.00	1873.72	1881.18	1881.18	1884.79	0.002361	15.25	360.63	50.00	
1.00											
FW	2596.14	5500.00	1873.46	1880.92	1880.92	1884.53	0.002361	15.25	360.63	50.00	
1.00											
FW	2555.18	5500.00	1873.25	1880.71	1880.71	1884.32	0.002361	15.25	360.63	50.00	
1.00											
FW	2514.22	5500.00	1873.04	1880.50	1880.50	1884.11	0.002360	15.25	360.66	50.00	
1.00											
FW	2473.26	5500.00	1872.84	1880.30	1880.30	1883.91	0.002360	15.25	360.68	50.00	
1.00											
FW	2432.30	5500.00	1872.63	1880.09	1880.09	1883.70	0.002359	15.25	360.71	50.00	
1.00											
FW	2334.09*	5500.00	1871.85	1879.29	1879.29	1882.92	0.002381	15.29	359.61	50.00	
1.01											
FW	2235.88*	5500.00	1871.06	1878.50	1878.50	1882.14	0.002381	15.29	359.61	50.00	
1.01											
FW	2137.68	5500.00	1870.28	1877.72	1877.72	1881.35	0.002381	15.29	359.61	50.00	
1.01											
FW	2059.60*	5500.00	1868.74	1876.18	1876.18	1879.81	0.002381	15.29	359.61	50.00	
1.01											
FW	2020.16	5500.00	1867.96	1875.40	1875.40	1879.03	0.002381	15.29	359.61	50.00	
1.01											
FW	1981.53*	5500.00	1867.19	1874.63	1874.63	1878.26	0.002381	15.29	359.61	50.00	
1.01											
FW	1903.46	5500.00	1865.65	1873.09	1873.09	1876.72	0.002381	15.29	359.61	50.00	
1.01											
FW	1817.25*	5500.00	1864.95	1872.39	1872.39	1876.02	0.002381	15.29	359.61	50.00	
1.01											
FW	1731.04*	5500.00	1864.24	1871.68	1871.68	1875.31	0.002381	15.29	359.61	50.00	
1.01											
FW	1644.83*	5500.00	1863.54	1870.98	1870.98	1874.62	0.002381	15.29	359.61	50.00	
1.01											
FW	1558.62	5800.00	1862.84	1870.56	1870.56	1874.30	0.002357	15.52	373.71	50.00	
1.00											
FW	1500	5800.00	1862.36	1870.71	1869.81	1873.71	0.001705	13.89	417.53	50.00	
0.85											
FW	1481.51	5800.00	1862.21	1869.93	1869.93	1873.67	0.002359	15.52	373.60	50.00	
1.00											
FW	1437.01	5800.00	1861.84	1869.56	1869.56	1873.30	0.002359	15.53	373.59	50.00	
1.00											
FW	1392.52	5800.00	1861.48	1869.20	1869.20	1872.94	0.002359	15.52	373.61	50.00	
1.00											
FW	1348.02	5800.00	1861.12	1868.84	1868.84	1872.58	0.002359	15.52	373.61	50.00	
1.00											

* FW	* 1303.53	* 5800.00 *	1860.76 *	1868.48 *	1868.48 *	1872.22 *	0.002358 *	15.52 *	373.65 *	50.00 *	1.00 *
* FW	* 1259.03	* 5800.00 *	1860.39 *	1868.11 *	1868.11 *	1871.85 *	0.002357 *	15.52 *	373.69 *	50.00 *	1.00 *
* FW	* 1214.54	* 5800.00 *	1860.03 *	1868.36 *	1867.75 *	1871.56 *	0.001861 *	14.35 *	404.16 *	50.00 *	0.89 *
* FW	* 1173.6	* 5800.00 *	1859.70 *	1868.81 *	*	1871.47 *	0.001412 *	13.09 *	443.18 *	50.00 *	0.77 *
* FW	* 1088.94	* 5800.00 *	1859.00 *	1869.77 *	1866.28 *	1871.37 *	0.000677 *	10.20 *	597.22 *	96.78 *	0.55 *
* FW	* 1000	* Bridge *	*	*	*	*	*	*	*	*	*
* FW	* 926	* 5800.00 *	1855.10 *	1865.17 *	1862.16 *	1866.84 *	0.000717 *	10.42 *	571.78 *	73.45 *	0.58 *
* FW	* 914.02*	* 5800.00 *	1854.95 *	1864.48 *	*	1866.79 *	0.001098 *	12.22 *	478.61 *	64.39 *	0.73 *
* FW	* 702.71	* 5800.00 *	1853.63 *	1862.90 *	1862.90 *	1866.18 *	0.001711 *	14.69 *	414.39 *	66.60 *	0.95 *
* FW	* 444.5	* 5800.00 *	1850.36 *	1859.94 *	1859.94 *	1862.09 *	0.001092 *	12.39 *	592.34 *	154.07 *	0.78 *
* FW	* 223.47	* 5800.00 *	1847.74 *	1857.52 *	1857.52 *	1859.98 *	0.001263 *	13.03 *	534.56 *	136.04 *	0.82 *

Profile Output Table - Standard Table 2

Reach	River Sta	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)
* FW	* 8837.78	* 1938.82 *	1937.64 *	1.19 *	0.07 *	0.21 *	*	5500.00 *	*	50.00 *
* FW	* 8807.78	* 1938.54 *	1935.21 *	3.33 *	0.65 *	0.04 *	*	5500.00 *	*	56.89 *
* FW	* 8687.78	* 1936.73 *	1933.54 *	3.20 *	2.00 *	0.41 *	*	5500.00 *	*	60.40 *
* FW	* 8320	* 1934.25 *	1932.43 *	1.82 *	0.71 *	0.05 *	274.31 *	5164.19 *	61.51 *	183.61 *
* FW	* 8200	* 1933.39 *	1931.73 *	1.66 *	0.51 *	0.18 *	126.55 *	4852.42 *	521.02 *	188.39 *
* FW	* 8100.*	* 1932.69 *	1931.65 *	1.04 *	0.28 *	0.15 *	708.76 *	3956.86 *	834.38 *	219.41 *
* FW	* 8000	* 1932.26 *	1931.73 *	0.53 *	0.27 *	0.05 *	1443.49 *	3012.42 *	1044.10 *	254.62 *
* FW	* 7900.*	* 1931.94 *	1930.90 *	1.04 *	0.50 *	0.05 *	626.74 *	3715.94 *	1157.32 *	264.66 *
* FW	* 7800	* 1931.39 *	1929.88 *	1.51 *	0.57 *	0.11 *	10.96 *	3848.43 *	1640.61 *	194.90 *
* FW	* 7700.*	* 1930.04 *	1928.90 *	1.14 *	0.54 *	0.00 *	298.21 *	3452.97 *	1748.83 *	304.92 *
* FW	* 7600	* 1928.59 *	1927.45 *	1.14 *	0.43 *	0.14 *	386.65 *	3264.29 *	1849.05 *	283.98 *
* FW	* 7500.*	* 1927.89 *	1927.20 *	0.69 *	0.24 *	0.08 *	431.93 *	2697.20 *	2370.87 *	292.20 *
* FW	* 7400	* 1927.56 *	1927.14 *	0.43 *	0.25 *	0.04 *	541.64 *	2238.63 *	2719.74 *	312.04 *
* FW	* 7300.*	* 1927.27 *	1926.48 *	0.80 *	0.45 *	0.06 *	723.43 *	3630.31 *	1146.25 *	282.87 *
* FW	* 7200	* 1926.76 *	1925.32 *	1.45 *	0.65 *	0.02 *	563.64 *	4782.34 *	154.02 *	228.94 *
* FW	* 7100.*	* 1925.89 *	1924.25 *	1.65 *	0.49 *	0.20 *	780.71 *	4647.19 *	72.10 *	171.09 *
* FW	* 7000	* 1925.21 *	1924.22 *	0.99 *	0.15 *	0.23 *	1509.71 *	3896.16 *	94.14 *	162.49 *
* FW	* 6925	* Bridge *	*	*	*	*	*	*	*	*
* FW	* 6868.*	* 1924.77 *	1924.28 *	0.49 *	0.13 *	0.06 *	1778.81 *	3452.51 *	268.69 *	221.67 *
* FW	* 6736	* 1924.58 *	1924.30 *	0.28 *	0.17 *	0.00 *	2045.30 *	3006.26 *	448.43 *	279.06 *
* FW	* 6577	* 1924.41 *	1924.10 *	0.31 *	*	*	748.56 *	4452.52 *	298.92 *	353.04 *
* FW	* 6500	* Culvert *	*	*	*	*	*	*	*	*
* FW	* 6469	* 1921.85 *	1920.42 *	1.42 *	*	*	199.35 *	5300.47 *	0.18 *	205.61 *
* FW	* 6450	* Bridge *	*	*	*	*	*	*	*	*
* FW	* 6100	* 1919.47 *	1919.31 *	0.15 *	*	*	2589.12 *	1423.60 *	1487.28 *	394.17 *
* FW	* 6000	* Bridge *	*	*	*	*	*	*	*	*
* FW	* 5917	* 1919.28 *	1918.67 *	0.61 *	*	*	11.23 *	5075.97 *	412.80 *	307.79 *
* FW	* 5800	* Culvert *	*	*	*	*	*	*	*	*
* FW	* 5796	* 1916.03 *	1912.77 *	3.26 *	0.05 *	0.34 *	*	5280.00 *	*	56.30 *
* FW	* 5776	* 1913.76 *	1911.17 *	2.59 *	0.09 *	0.00 *	*	5280.00 *	*	79.77 *
* FW	* 5737.74	* 1913.31 *	1910.73 *	2.57 *	0.20 *	0.00 *	*	5280.00 *	*	79.77 *
* FW	* 5648.42	* 1912.50 *	1909.82 *	2.68 *	0.22 *	0.00 *	*	5280.00 *	*	75.00 *
* FW	* 5548.82*	* 1911.00 *	1908.32 *	2.68 *	0.22 *	0.00 *	*	5280.00 *	*	75.00 *
* FW	* 5449.23	* 1909.50 *	1906.82 *	2.68 *	0.00 *	0.00 *	*	5280.00 *	*	75.00 *
* FW	* 5449.11	* 1909.50 *	1906.82 *	2.68 *	0.11 *	0.00 *	*	5280.00 *	*	75.00 *
* FW	* 5399.11	* 1909.12 *	1906.25 *	2.87 *	0.10 *	0.01 *	*	5280.00 *	*	67.61 *
* FW	* 5349.11	* 1908.92 *	1906.27 *	2.65 *	0.09 *	0.00 *	*	5280.00 *	*	60.22 *
* FW	* 5299.11	* 1908.82 *	1905.95 *	2.87 *	0.04 *	0.01 *	*	5280.00 *	*	52.84 *
* FW	* 5279.92	* 1908.77 *	1905.24 *	3.53 *	0.06 *	0.00 *	*	5280.00 *	*	50.00 *
* FW	* 5255.16	* 1908.32 *	1904.79 *	3.54 *	0.12 *	0.00 *	*	5280.00 *	*	50.00 *
* FW	* 5206.70	* 1907.94 *	1904.41 *	3.53 *	0.11 *	0.00 *	*	5280.00 *	*	50.00 *
* FW	* 5158.24	* 1907.58 *	1904.28 *	3.29 *	0.11 *	0.00 *	*	5280.00 *	*	50.00 *
* FW	* 5109.79	* 1907.47 *	1903.86 *	3.61 *	0.11 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 5061.33	* 1907.09 *	1903.48 *	3.61 *	0.11 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 5012.88	* 1906.71 *	1903.10 *	3.61 *	0.16 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4945.04	* 1906.18 *	1902.57 *	3.61 *	0.19 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4863.36	* 1905.55 *	1901.94 *	3.61 *	0.19 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4781.68	* 1904.91 *	1901.30 *	3.61 *	0.19 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4700	* 1904.27 *	1900.66 *	3.61 *	0.24 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4600	* 1903.49 *	1899.88 *	3.61 *	0.24 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4500	* 1902.70 *	1899.09 *	3.61 *	0.18 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4425.69	* 1902.12 *	1898.51 *	3.61 *	0.18 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4350	* 1901.53 *	1897.92 *	3.61 *	0.18 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4275.*	* 1900.78 *	1897.17 *	3.61 *	0.18 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4200.00	* 1900.03 *	1896.42 *	3.61 *	0.17 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4127.25*	* 1899.67 *	1896.06 *	3.61 *	0.17 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4054.5*	* 1899.30 *	1895.69 *	3.61 *	0.18 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3977.08	* 1898.92 *	1895.31 *	3.61 *	0.20 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3890.88*	* 1898.48 *	1894.87 *	3.61 *	0.21 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3800	* 1898.03 *	1894.42 *	3.61 *	0.24 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3700.*	* 1897.03 *	1893.42 *	3.61 *	0.25 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3593.55	* 1895.97 *	1892.36 *	3.61 *	0.11 *	0.01 *	*	5500.00 *	*	50.00 *
* FW	* 3543.55	* 1895.66 *	1892.29 *	3.37 *	0.09 *	0.01 *	*	5500.00 *	*	45.75 *
* FW	* 3493.55	* 1895.56 *	1892.41 *	3.15 *	0.09 *	0.00 *	*	5500.00 *	*	41.50 *
* FW	* 3443.55	* 1895.47 *	1892.07 *	3.39 *	0.11 *	0.01 *	*	5500.00 *	*	37.25 *
* FW	* 3393.55	* 1895.34 *	1890.56 *	4.79 *	0.28 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3295.98	* 1894.35 *	1889.57 *	4.79 *	0.28 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3198.41	* 1893.36 *	1888.57 *	4.79 *	0.28 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3100.84	* 1892.37 *	1887.59 *	4.79 *	0.14 *	0.00 *	*	5500.00 *	*	33.00 *

sub.rep

FW	3050.84		1891.86	1887.07	4.79	0.14	0.00		5500.00		33.00
FW	3000.84		1891.36	1886.58	4.79	0.10	0.00		5500.00		33.00
FW	2964.21		1890.98	1886.20	4.79	0.12	0.00		5500.00		33.00
FW	2921.88		1890.55	1885.77	4.79	0.24	0.00		5500.00		33.00
FW	2837.87*		1889.70	1884.91	4.79	0.24	0.00		5500.00		33.00
FW	2753.87		1888.85	1884.07	4.79	0.09	0.00		5500.00		33.00
FW	2722.44*		1888.49	1883.70	4.79	0.05	0.00		5500.00		33.00
FW	2703.87		1888.38	1883.62	4.77	0.00	0.00		5500.00		33.00
FW	2702.87		1888.37	1883.61	4.76	0.12	0.03		5500.00		52.82
FW	2648.55		1884.79	1881.18	3.61	0.12	0.00		5500.00		50.00
FW	2596.14		1884.53	1880.92	3.61	0.10	0.00		5500.00		50.00
FW	2555.18		1884.32	1880.71	3.61	0.10	0.00		5500.00		50.00
FW	2514.22		1884.11	1880.50	3.61	0.10	0.00		5500.00		50.00
FW	2473.26		1883.91	1880.30	3.61	0.10	0.00		5500.00		50.00
FW	2432.30		1883.70	1880.09	3.61	0.23	0.00		5500.00		50.00
FW	2334.09*		1882.92	1879.29	3.63	0.23	0.00		5500.00		50.00
FW	2235.88*		1882.14	1878.50	3.63	0.23	0.00		5500.00		50.00
FW	2137.68		1881.35	1877.72	3.63	0.19	0.00		5500.00		50.00
FW	2059.60*		1879.81	1876.18	3.63	0.09	0.00		5500.00		50.00
FW	2020.16		1879.03	1875.40	3.63	0.09	0.00		5500.00		50.00
FW	1981.53*		1878.26	1874.63	3.63	0.19	0.00		5500.00		50.00
FW	1903.46		1876.72	1873.09	3.63	0.21	0.00		5500.00		50.00
FW	1817.25*		1876.02	1872.39	3.63	0.21	0.00		5500.00		50.00
FW	1731.04*		1875.31	1871.68	3.63	0.21	0.00		5500.00		50.00
FW	1644.83*		1874.62	1870.98	3.63	0.20	0.00		5500.00		50.00
FW	1558.62		1874.30	1870.56	3.74	0.12	0.00		5800.00		50.00
FW	1500		1873.71	1870.71	3.00	0.04	0.00		5800.00		50.00
FW	1481.51		1873.67	1869.93	3.74	0.10	0.00		5800.00		50.00
FW	1437.01		1873.30	1869.56	3.74	0.10	0.00		5800.00		50.00
FW	1392.52		1872.94	1869.20	3.74	0.10	0.00		5800.00		50.00
FW	1348.02		1872.58	1868.84	3.74	0.10	0.00		5800.00		50.00
FW	1303.53		1872.22	1868.48	3.74	0.10	0.00		5800.00		50.00
FW	1259.03		1871.85	1868.11	3.74	0.09	0.00		5800.00		50.00
FW	1214.54		1871.56	1868.36	3.20	0.07	0.02		5800.00		50.00
FW	1173.6		1871.47	1868.81	2.66	0.08	0.03		5800.00		50.00
FW	1088.94		1871.37	1869.77	1.59			64.05	5713.81	22.14	96.78
FW	1000		Bridge								
FW	926		1866.84	1865.17	1.67	0.01	0.03	41.35	5741.15	17.51	73.45
FW	914.02*		1866.79	1864.48	2.31	0.56	0.05	2.87	5789.87	7.26	64.39
FW	702.71		1866.18	1862.90	3.28	0.35	0.34	134.94	5665.06		66.60
FW	444.5		1862.09	1859.94	2.15	0.26	0.03	113.91	5192.54	493.56	154.07
FW	223.47		1859.98	1857.52	2.46			0.00	5387.04	412.97	136.04

HEC-RAS Plan: subcritical River: FW Reach: FW Profile: 100-yr FIS

Reach	River Sta	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)	
FW	8837.78	5500.00	1924.80	1937.64		1938.82	0.001261	8.74	629.31	50.00	0.43
FW	8807.78	5500.00	1924.71	1935.21	1935.21	1938.54	0.005466	14.64	375.68	56.89	1.00
FW	8687.78	5500.00	1924.34	1933.54	1933.54	1936.73	0.005424	14.35	383.41	60.40	1.00
FW	8320	5500.00	1923.96	1932.43	1932.43	1934.25	0.005458	11.14	566.77	183.61	0.85
FW	8200	5500.00	1921.80	1931.73	1931.18	1933.39	0.006424	10.82	583.17	188.39	0.71
FW	8100.*	5500.00	1920.92	1931.65		1932.69	0.004117	9.12	743.46	219.41	0.58
FW	8000	5500.00	1920.05	1931.73		1932.26	0.001973	6.83	1012.13	254.62	0.40
FW	7900.*	5500.00	1919.47	1930.90	1930.44	1931.94	0.004019	9.36	778.20	264.66	0.57
FW	7800	5500.00	1918.88	1929.88	1929.88	1931.39	0.006421	11.09	620.75	194.90	0.70
FW	7700.*	5500.00	1918.01	1928.90	1928.90	1930.04	0.005176	10.06	753.41	304.92	0.63
FW	7600	5500.00	1917.14	1927.45	1927.45	1928.59	0.005677	10.20	735.43	283.98	0.65
FW	7500.*	5500.00	1916.78	1927.20		1927.89	0.003302	7.97	897.72	292.20	0.50
FW	7400	5500.00	1916.43	1927.14		1927.56	0.001858	6.15	1106.67	312.04	0.38
FW	7300.*	5500.00	1916.49	1926.48		1927.27	0.003401	8.23	864.71	282.87	0.52
FW	7200	5500.00	1916.55	1925.32	1925.32	1926.76	0.006185	10.22	640.83	228.94	0.69
FW	7100.*	5500.00	1915.99	1924.25	1924.15	1925.89	0.007401	10.94	578.83	171.09	0.76
FW	7000	5500.00	1915.44	1924.22	1922.74	1925.21	0.003828	8.57	716.57	162.49	0.56
FW	6925	Bridge									
FW	6868.*	5500.00	1914.40	1924.28		1924.77	0.001751	6.18	1018.93	221.67	0.38
FW	6736	5500.00	1913.37	1924.30	1921.50	1924.58	0.000975	4.70	1337.37	279.06	0.29
FW	6577	5500.00	1912.92	1924.10	1919.71	1924.41	0.001046	4.82	1360.48	353.04	0.30
FW	6500	Culvert									
FW	6469	5500.00	1912.23	1920.42	1919.35	1921.85	0.008046	9.72	607.11	205.61	0.75
FW	6450	Bridge									
FW	6100	5500.00	1909.48	1919.31	1916.17	1919.47	0.000572	3.53	1773.81	394.17	0.22
FW	6000	Bridge									
FW	5917	5500.00	1908.13	1918.67	1915.08	1919.28	0.001255	6.51	1021.19	307.79	0.47
FW	5800	Culvert									
FW	5796	5280.00	1906.30	1912.77	1912.77	1916.03	0.002340	14.49	364.27	56.30	1.00
FW	5776	5280.00	1905.99	1911.17	1911.17	1913.76	0.002254	12.91	408.94	79.77	1.00
FW	5737.74	5280.00	1905.43	1910.73	1910.73	1913.31	0.002225	12.87	410.23	79.77	1.00
FW	5648.42	5280.00	1904.09	1909.82	1909.82	1912.50	0.002216	13.14	401.89	75.00	1.00
FW	5548.82*	5280.00	1902.59	1908.32	1908.32	1911.00	0.002216	13.14	401.85	75.00	1.00
FW	5449.23	5280.00	1901.09	1906.82	1906.82	1909.50	0.002217	13.14	401.81	75.00	1.00
FW	5449.11	5280.00	1901.09	1906.82	1906.82	1909.50	0.002219	13.14	401.71	75.00	1.00
FW	5399.11	5280.00	1900.17	1906.25	1906.25	1909.12	0.002235	13.60	388.16	67.61	1.00
FW	5349.11	5280.00	1899.26	1906.27	1905.76	1908.92	0.001781	13.07	403.90	60.22	0.89
FW	5299.11	5280.00	1898.34	1905.95	1905.35	1908.82	0.001814	13.61	388.08	52.84	0.88
FW	5279.92	5280.00	1897.99	1905.24	1905.24	1908.77	0.002382	15.09	350.00	50.00	1.00
FW	5255.16	5280.00	1897.54	1904.79	1904.79	1908.32	0.002385	15.09	349.88	50.00	1.01
FW	5206.70	5280.00	1897.16	1904.41	1904.41	1907.94	0.002381	15.08	350.05	50.00	1.00
FW	5158.24	5280.00	1896.78	1904.28	1904.03	1907.58	0.002138	14.56	362.72	50.00	0.95
FW	5109.79	5500.00	1896.40	1903.86	1903.86	1907.47	0.002361	15.25	360.60	50.00	1.00
FW	5061.33	5500.00	1896.02	1903.48	1903.48	1907.09	0.002361	15.25	360.60	50.00	1.00
FW	5012.88	5500.00	1895.64	1903.10	1903.10	1906.71	0.002361	15.25	360.59	50.00	1.00
FW	4945.04	5500.00	1895.11	1902.57	1902.57	1906.18	0.002361	15.25	360.61	50.00	1.00
FW	4863.36	5500.00	1894.48	1901.94	1901.94	1905.55	0.002361	15.25	360.60	50.00	1.00
FW	4781.68	5500.00	1893.84	1901.30	1901.30	1904.91	0.002361	15.25	360.59	50.00	1.00
FW	4700	5500.00	1893.20	1900.66	1900.66	1904.27	0.002361	15.25	360.61	50.00	1.00
FW	4600	5500.00	1892.42	1899.88	1899.88	1903.49	0.002361	15.25	360.60	50.00	1.00
FW	4500	5500.00	1891.63	1899.09	1899.09	1902.70	0.002361	15.25	360.59	50.00	1.00
FW	4425.69	5500.00	1891.05	1898.51	1898.51	1902.12	0.002361	15.25	360.61	50.00	1.00
FW	4350	5500.00	1890.46	1897.92	1897.92	1901.53	0.002361	15.25	360.60	50.00	1.00
FW	4275.*	5500.00	1889.71	1897.17	1897.17	1900.78	0.002361	15.25	360.60	50.00	1.00
FW	4200.00	5500.00	1888.96	1896.42	1896.42	1900.03	0.002362	15.25	360.58	50.00	1.00
FW	4127.25*	5500.00	1888.60	1896.06	1896.06	1899.67	0.002362	15.25	360.58	50.00	1.00
FW	4054.5*	5500.00	1888.23	1895.69	1895.69	1899.30	0.002362	15.25	360.57	50.00	1.00
FW	3977.08	5500.00	1887.85	1895.31	1895.31	1898.92	0.002362	15.25	360.57	50.00	1.00
FW	3890.88*	5500.00	1887.41	1894.87	1894.87	1898.48	0.002362	15.25	360.57	50.00	1.00
FW	3800	5500.00	1886.96	1894.42	1894.42	1898.03	0.002362	15.25	360.57	50.00	1.00
FW	3700.*	5500.00	1885.96	1893.42	1893.42	1897.03	0.002362	15.25	360.54	50.00	1.00
FW	3593.55	5500.00	1884.90	1892.36	1892.36	1895.97	0.002364	15.26	360.48	50.00	1.00
FW	3543.55	5500.00	1883.90	1892.29	1891.76	1895.66	0.002004	14.74	373.25	45.75	0.91
FW	3493.55	5500.00	1882.90	1892.41		1895.56	0.001716	14.25	386.09	41.50	0.82
FW	3443.55	5500.00	1881.90	1892.07		1895.47	0.001819	14.78	372.10	37.25	0.82
FW	3393.55	5500.00	1880.90	1890.56	1890.56	1895.34	0.002844	17.56	313.16	33.00	1.00
FW	3295.98	5500.00	1879.91	1889.57	1889.57	1894.35	0.002842	17.56	313.22	33.00	1.00
FW	3198.41	5500.00	1878.92	1888.57	1888.57	1893.36	0.002844	17.56	313.15	33.00	1.00
FW	3100.84	5500.00	1877.93	1887.59	1887.59	1892.37	0.002841	17.56	313.25	33.00	1.00
FW	3050.84	5500.00	1877.42	1887.07	1887.07	1891.86	0.002844	17.56	313.12	33.00	1.00
FW	3000.84	5500.00	1876.92	1886.58	1886.58	1891.36	0.002841	17.56	313.24	33.00	1.00
FW	2964.21	5500.00	1876.54	1886.20	1886.20	1890.98	0.002843	17.56	313.18	33.00	1.00
FW	2921.88	5500.00	1876.11	1885.77	1885.77	1890.55	0.002843	17.56	313.19	33.00	1.00
FW	2837.87*	5500.00	1875.26	1884.91	1884.91	1889.70	0.002844	17.56	313.13	33.00	1.00

HEC-RAS Plan: subcritical River: FW Reach: FW Profile: 100-yr FIS (Continued)

Reach	River Sta	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)	
FW	2753.87	5500.00	1874.41	1884.07	1884.07	1888.85	0.002841	17.56	313.24	33.00	1.00
FW	2722.44*	5500.00	1874.09	1883.70	1883.70	1888.49	0.002845	17.56	313.17	33.00	1.00
FW	2703.87	5500.00	1874.00	1883.62	1883.62	1888.38	0.002826	17.52	313.96	33.00	1.00
FW	2702.87	5500.00	1873.99	1883.61	1883.61	1888.37	0.002157	17.51	314.06	52.82	1.00
FW	2648.55	5500.00	1873.72	1881.18	1881.18	1884.79	0.002361	15.25	360.63	50.00	1.00
FW	2596.14	5500.00	1873.46	1880.92	1880.92	1884.53	0.002361	15.25	360.63	50.00	1.00
FW	2555.18	5500.00	1873.25	1880.71	1880.71	1884.32	0.002361	15.25	360.63	50.00	1.00
FW	2514.22	5500.00	1873.04	1880.50	1880.50	1884.11	0.002360	15.25	360.66	50.00	1.00
FW	2473.26	5500.00	1872.84	1880.30	1880.30	1883.91	0.002360	15.25	360.68	50.00	1.00
FW	2432.30	5500.00	1872.63	1880.09	1880.09	1883.70	0.002359	15.25	360.71	50.00	1.00
FW	2334.09*	5500.00	1871.85	1879.29	1879.29	1882.92	0.002381	15.29	359.61	50.00	1.01
FW	2235.88*	5500.00	1871.06	1878.50	1878.50	1882.14	0.002381	15.29	359.61	50.00	1.01
FW	2137.68	5500.00	1870.28	1877.72	1877.72	1881.35	0.002381	15.29	359.61	50.00	1.01
FW	2059.60*	5500.00	1868.74	1876.18	1876.18	1879.81	0.002381	15.29	359.61	50.00	1.01
FW	2020.16	5500.00	1867.96	1875.40	1875.40	1879.03	0.002381	15.29	359.61	50.00	1.01
FW	1981.53*	5500.00	1867.19	1874.63	1874.63	1878.26	0.002381	15.29	359.61	50.00	1.01
FW	1903.46	5500.00	1865.65	1873.09	1873.09	1876.72	0.002381	15.29	359.61	50.00	1.01
FW	1817.25*	5500.00	1864.95	1872.39	1872.39	1876.02	0.002381	15.29	359.61	50.00	1.01
FW	1731.04*	5500.00	1864.24	1871.68	1871.68	1875.31	0.002381	15.29	359.61	50.00	1.01
FW	1644.83*	5500.00	1863.54	1870.98	1870.98	1874.62	0.002381	15.29	359.61	50.00	1.01
FW	1558.62	5800.00	1862.84	1870.56	1870.56	1874.30	0.002357	15.52	373.71	50.00	1.00
FW	1500	5800.00	1862.36	1870.71	1869.81	1873.71	0.001705	13.89	417.53	50.00	0.85
FW	1481.51	5800.00	1862.21	1869.93	1869.93	1873.67	0.002359	15.52	373.60	50.00	1.00
FW	1437.01	5800.00	1861.84	1869.56	1869.56	1873.30	0.002359	15.53	373.59	50.00	1.00
FW	1392.52	5800.00	1861.48	1869.20	1869.20	1872.94	0.002359	15.52	373.61	50.00	1.00
FW	1348.02	5800.00	1861.12	1868.84	1868.84	1872.58	0.002359	15.52	373.61	50.00	1.00
FW	1303.53	5800.00	1860.76	1868.48	1868.48	1872.22	0.002358	15.52	373.65	50.00	1.00
FW	1259.03	5800.00	1860.39	1868.11	1868.11	1871.85	0.002357	15.52	373.69	50.00	1.00
FW	1214.54	5800.00	1860.03	1868.36	1867.75	1871.56	0.001861	14.35	404.16	50.00	0.89
FW	1173.6	5800.00	1859.70	1868.81		1871.47	0.001412	13.09	443.18	50.00	0.77
FW	1088.94	5800.00	1859.00	1869.77	1866.28	1871.37	0.000677	10.20	597.22	96.78	0.55
FW	1000	Bridge									
FW	926	5800.00	1855.10	1865.17	1862.16	1866.84	0.000717	10.42	571.78	73.45	0.58
FW	914.02*	5800.00	1854.95	1864.48		1866.79	0.001098	12.22	478.61	64.39	0.73
FW	702.71	5800.00	1853.63	1862.90	1862.90	1866.18	0.001711	14.69	414.39	66.60	0.95
FW	444.5	5800.00	1850.36	1859.94	1859.94	1862.09	0.001092	12.39	592.34	154.07	0.78
FW	223.47	5800.00	1847.74	1857.52	1857.52	1859.98	0.001263	13.03	534.56	136.04	0.82

HEC-RAS Plan: subcritical River: FW Reach: FW Profile: 100-yr FIS

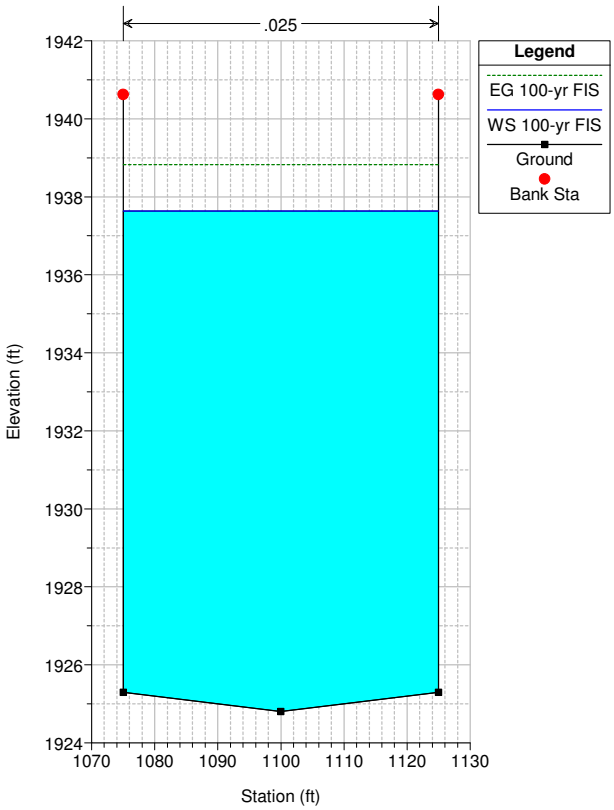
Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
FW	8837.78	1938.82	1937.64	1.19	0.07	0.21		5500.00		50.00
FW	8807.78	1938.54	1935.21	3.33	0.65	0.04		5500.00		56.89
FW	8687.78	1936.73	1933.54	3.20	2.00	0.41		5500.00		60.40
FW	8320	1934.25	1932.43	1.82	0.71	0.05	274.31	5164.19	61.51	183.61
FW	8200	1933.39	1931.73	1.66	0.51	0.18	126.55	4852.42	521.02	188.39
FW	8100.*	1932.69	1931.65	1.04	0.28	0.15	708.76	3956.86	834.38	219.41
FW	8000	1932.26	1931.73	0.53	0.27	0.05	1443.49	3012.42	1044.10	254.62
FW	7900.*	1931.94	1930.90	1.04	0.50	0.05	626.74	3715.94	1157.32	264.66
FW	7800	1931.39	1929.88	1.51	0.57	0.11	10.96	3848.43	1640.61	194.90
FW	7700.*	1930.04	1928.90	1.14	0.54	0.00	298.21	3452.97	1748.83	304.92
FW	7600	1928.59	1927.45	1.14	0.43	0.14	386.65	3264.29	1849.05	283.98
FW	7500.*	1927.89	1927.20	0.69	0.24	0.08	431.93	2697.20	2370.87	292.20
FW	7400	1927.56	1927.14	0.43	0.25	0.04	541.64	2238.63	2719.74	312.04
FW	7300.*	1927.27	1926.48	0.80	0.45	0.06	723.43	3630.31	1146.25	282.87
FW	7200	1926.76	1925.32	1.45	0.65	0.02	563.64	4782.34	154.02	228.94
FW	7100.*	1925.89	1924.25	1.65	0.49	0.20	780.71	4647.19	72.10	171.09
FW	7000	1925.21	1924.22	0.99	0.15	0.23	1509.71	3896.16	94.14	162.49
FW	6925	Bridge								
FW	6868.*	1924.77	1924.28	0.49	0.13	0.06	1778.81	3452.51	268.69	221.67
FW	6736	1924.58	1924.30	0.28	0.17	0.00	2045.30	3006.26	448.43	279.06
FW	6577	1924.41	1924.10	0.31			748.56	4452.52	298.92	353.04
FW	6500	Culvert								
FW	6469	1921.85	1920.42	1.42			199.35	5300.47	0.18	205.61
FW	6450	Bridge								
FW	6100	1919.47	1919.31	0.15			2589.12	1423.60	1487.28	394.17
FW	6000	Bridge								
FW	5917	1919.28	1918.67	0.61			11.23	5075.97	412.80	307.79
FW	5800	Culvert								
FW	5796	1916.03	1912.77	3.26	0.05	0.34		5280.00		56.30
FW	5776	1913.76	1911.17	2.59	0.09	0.00		5280.00		79.77
FW	5737.74	1913.31	1910.73	2.57	0.20	0.00		5280.00		79.77
FW	5648.42	1912.50	1909.82	2.68	0.22	0.00		5280.00		75.00
FW	5548.82*	1911.00	1908.32	2.68	0.22	0.00		5280.00		75.00
FW	5449.23	1909.50	1906.82	2.68	0.00	0.00		5280.00		75.00
FW	5449.11	1909.50	1906.82	2.68	0.11	0.00		5280.00		75.00
FW	5399.11	1909.12	1906.25	2.87	0.10	0.01		5280.00		67.61
FW	5349.11	1908.92	1906.27	2.65	0.09	0.00		5280.00		60.22
FW	5299.11	1908.82	1905.95	2.87	0.04	0.01		5280.00		52.84
FW	5279.92	1908.77	1905.24	3.53	0.06	0.00		5280.00		50.00
FW	5255.16	1908.32	1904.79	3.54	0.12	0.00		5280.00		50.00
FW	5206.70	1907.94	1904.41	3.53	0.11	0.00		5280.00		50.00
FW	5158.24	1907.58	1904.28	3.29	0.11	0.00		5280.00		50.00
FW	5109.79	1907.47	1903.86	3.61	0.11	0.00		5500.00		50.00
FW	5061.33	1907.09	1903.48	3.61	0.11	0.00		5500.00		50.00
FW	5012.88	1906.71	1903.10	3.61	0.16	0.00		5500.00		50.00
FW	4945.04	1906.18	1902.57	3.61	0.19	0.00		5500.00		50.00
FW	4863.36	1905.55	1901.94	3.61	0.19	0.00		5500.00		50.00
FW	4781.68	1904.91	1901.30	3.61	0.19	0.00		5500.00		50.00
FW	4700	1904.27	1900.66	3.61	0.24	0.00		5500.00		50.00
FW	4600	1903.49	1899.88	3.61	0.24	0.00		5500.00		50.00
FW	4500	1902.70	1899.09	3.61	0.18	0.00		5500.00		50.00
FW	4425.69	1902.12	1898.51	3.61	0.18	0.00		5500.00		50.00
FW	4350	1901.53	1897.92	3.61	0.18	0.00		5500.00		50.00
FW	4275.*	1900.78	1897.17	3.61	0.18	0.00		5500.00		50.00
FW	4200.00	1900.03	1896.42	3.61	0.17	0.00		5500.00		50.00
FW	4127.25*	1899.67	1896.06	3.61	0.17	0.00		5500.00		50.00
FW	4054.5*	1899.30	1895.69	3.61	0.18	0.00		5500.00		50.00
FW	3977.08	1898.92	1895.31	3.61	0.20	0.00		5500.00		50.00
FW	3890.88*	1898.48	1894.87	3.61	0.21	0.00		5500.00		50.00
FW	3800	1898.03	1894.42	3.61	0.24	0.00		5500.00		50.00
FW	3700.*	1897.03	1893.42	3.61	0.25	0.00		5500.00		50.00
FW	3593.55	1895.97	1892.36	3.61	0.11	0.01		5500.00		50.00
FW	3543.55	1895.66	1892.29	3.37	0.09	0.01		5500.00		45.75
FW	3493.55	1895.56	1892.41	3.15	0.09	0.00		5500.00		41.50
FW	3443.55	1895.47	1892.07	3.39	0.11	0.01		5500.00		37.25
FW	3393.55	1895.34	1890.56	4.79	0.28	0.00		5500.00		33.00

HEC-RAS Plan: subcritical River: FW Reach: FW Profile: 100-yr FIS (Continued)

Reach	River Sta	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)
FW	3295.98	1894.35	1889.57	4.79	0.28	0.00		5500.00		33.00
FW	3198.41	1893.36	1888.57	4.79	0.28	0.00		5500.00		33.00
FW	3100.84	1892.37	1887.59	4.79	0.14	0.00		5500.00		33.00
FW	3050.84	1891.86	1887.07	4.79	0.14	0.00		5500.00		33.00
FW	3000.84	1891.36	1886.58	4.79	0.10	0.00		5500.00		33.00
FW	2964.21	1890.98	1886.20	4.79	0.12	0.00		5500.00		33.00
FW	2921.88	1890.55	1885.77	4.79	0.24	0.00		5500.00		33.00
FW	2837.87*	1889.70	1884.91	4.79	0.24	0.00		5500.00		33.00
FW	2753.87	1888.85	1884.07	4.79	0.09	0.00		5500.00		33.00
FW	2722.44*	1888.49	1883.70	4.79	0.05	0.00		5500.00		33.00
FW	2703.87	1888.38	1883.62	4.77	0.00	0.00		5500.00		33.00
FW	2702.87	1888.37	1883.61	4.76	0.12	0.03		5500.00		52.82
FW	2648.55	1884.79	1881.18	3.61	0.12	0.00		5500.00		50.00
FW	2596.14	1884.53	1880.92	3.61	0.10	0.00		5500.00		50.00
FW	2555.18	1884.32	1880.71	3.61	0.10	0.00		5500.00		50.00
FW	2514.22	1884.11	1880.50	3.61	0.10	0.00		5500.00		50.00
FW	2473.26	1883.91	1880.30	3.61	0.10	0.00		5500.00		50.00
FW	2432.30	1883.70	1880.09	3.61	0.23	0.00		5500.00		50.00
FW	2334.09*	1882.92	1879.29	3.63	0.23	0.00		5500.00		50.00
FW	2235.88*	1882.14	1878.50	3.63	0.23	0.00		5500.00		50.00
FW	2137.68	1881.35	1877.72	3.63	0.19	0.00		5500.00		50.00
FW	2059.60*	1879.81	1876.18	3.63	0.09	0.00		5500.00		50.00
FW	2020.16	1879.03	1875.40	3.63	0.09	0.00		5500.00		50.00
FW	1981.53*	1878.26	1874.63	3.63	0.19	0.00		5500.00		50.00
FW	1903.46	1876.72	1873.09	3.63	0.21	0.00		5500.00		50.00
FW	1817.25*	1876.02	1872.39	3.63	0.21	0.00		5500.00		50.00
FW	1731.04*	1875.31	1871.68	3.63	0.21	0.00		5500.00		50.00
FW	1644.83*	1874.62	1870.98	3.63	0.20	0.00		5500.00		50.00
FW	1558.62	1874.30	1870.56	3.74	0.12	0.00		5800.00		50.00
FW	1500	1873.71	1870.71	3.00	0.04	0.00		5800.00		50.00
FW	1481.51	1873.67	1869.93	3.74	0.10	0.00		5800.00		50.00
FW	1437.01	1873.30	1869.56	3.74	0.10	0.00		5800.00		50.00
FW	1392.52	1872.94	1869.20	3.74	0.10	0.00		5800.00		50.00
FW	1348.02	1872.58	1868.84	3.74	0.10	0.00		5800.00		50.00
FW	1303.53	1872.22	1868.48	3.74	0.10	0.00		5800.00		50.00
FW	1259.03	1871.85	1868.11	3.74	0.09	0.00		5800.00		50.00
FW	1214.54	1871.56	1868.36	3.20	0.07	0.02		5800.00		50.00
FW	1173.6	1871.47	1868.81	2.66	0.08	0.03		5800.00		50.00
FW	1088.94	1871.37	1869.77	1.59			64.05	5713.81	22.14	96.78
FW	1000	Bridge								
FW	926	1866.84	1865.17	1.67	0.01	0.03	41.35	5741.15	17.51	73.45
FW	914.02*	1866.79	1864.48	2.31	0.56	0.05	2.87	5789.87	7.26	64.39
FW	702.71	1866.18	1862.90	3.28	0.35	0.34	134.94	5665.06		66.60
FW	444.5	1862.09	1859.94	2.15	0.26	0.03	113.91	5192.54	493.56	154.07
FW	223.47	1859.98	1857.52	2.46			0.00	5387.04	412.97	136.04

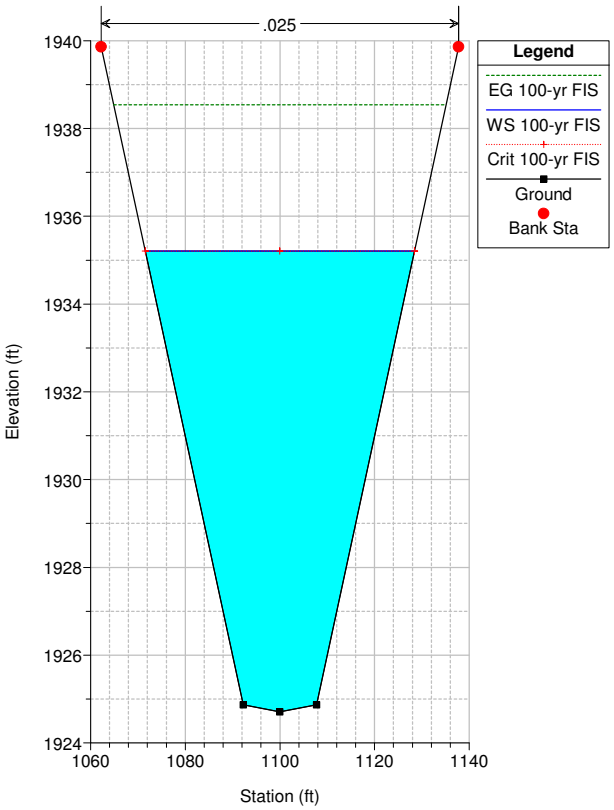
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 8837.78 X-section 24 from Case no. 04-09-0167P LOMR



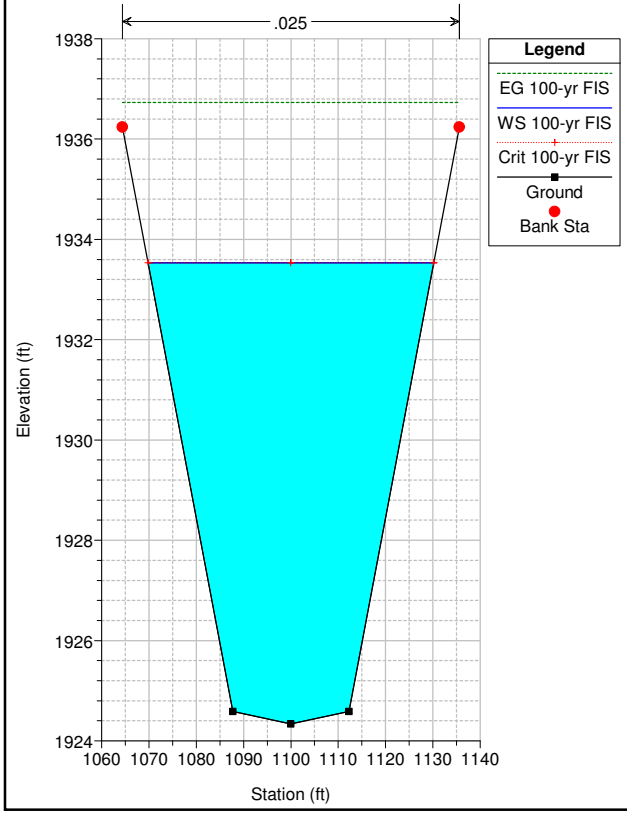
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 8807.78 X-section 22 from Case no. 04-09-0167P LOMR



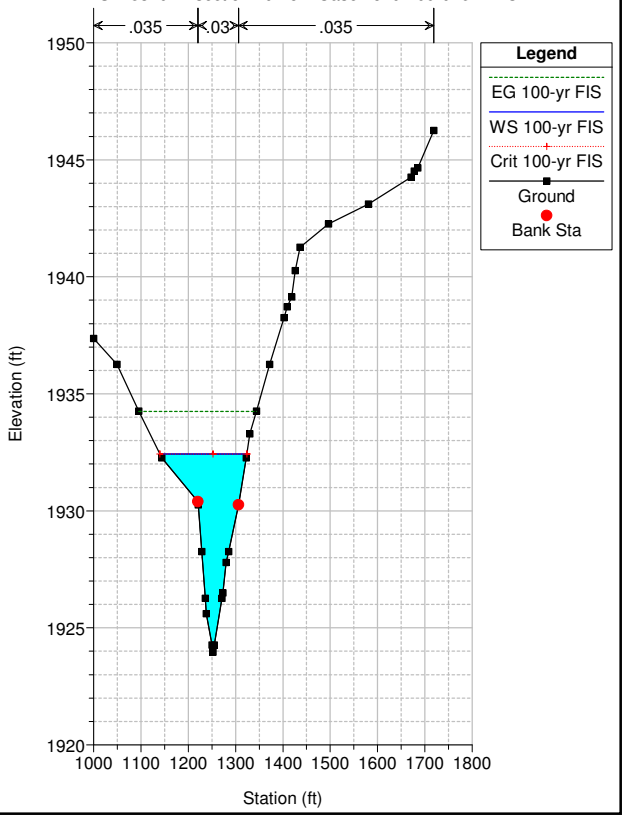
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

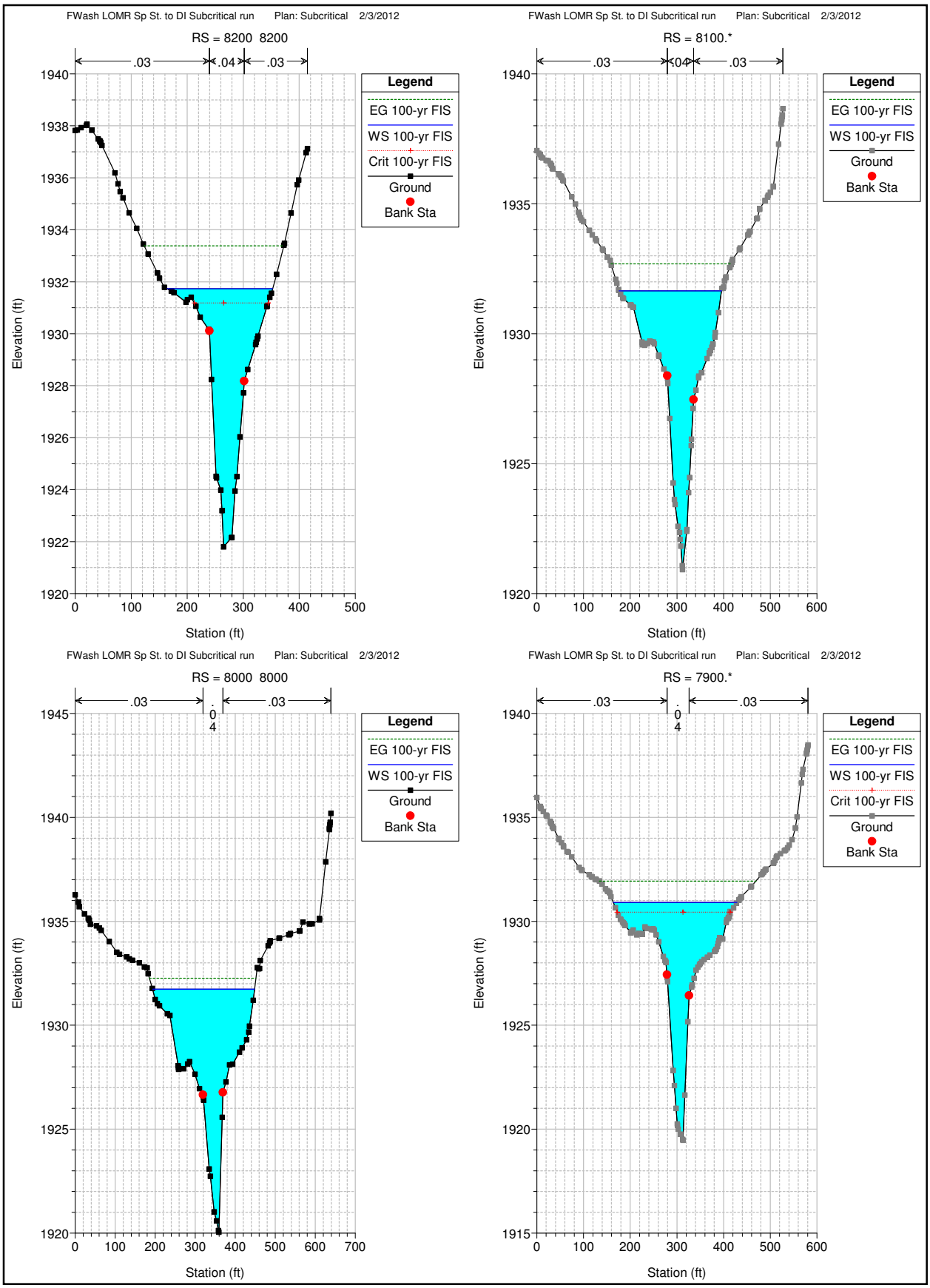
RS = 8687.78 X-section 20 from Case no. 04-09-0167P LOMR

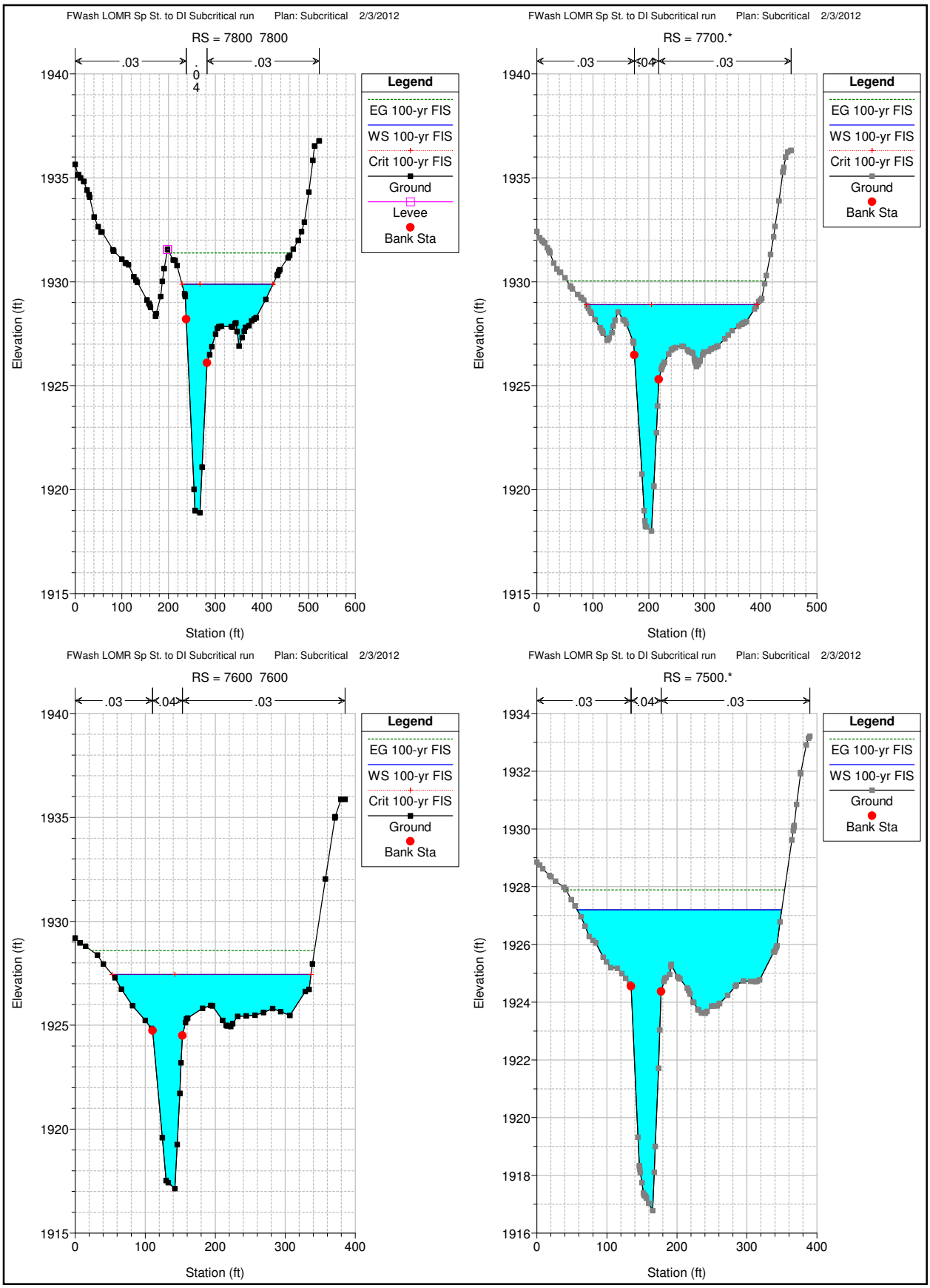


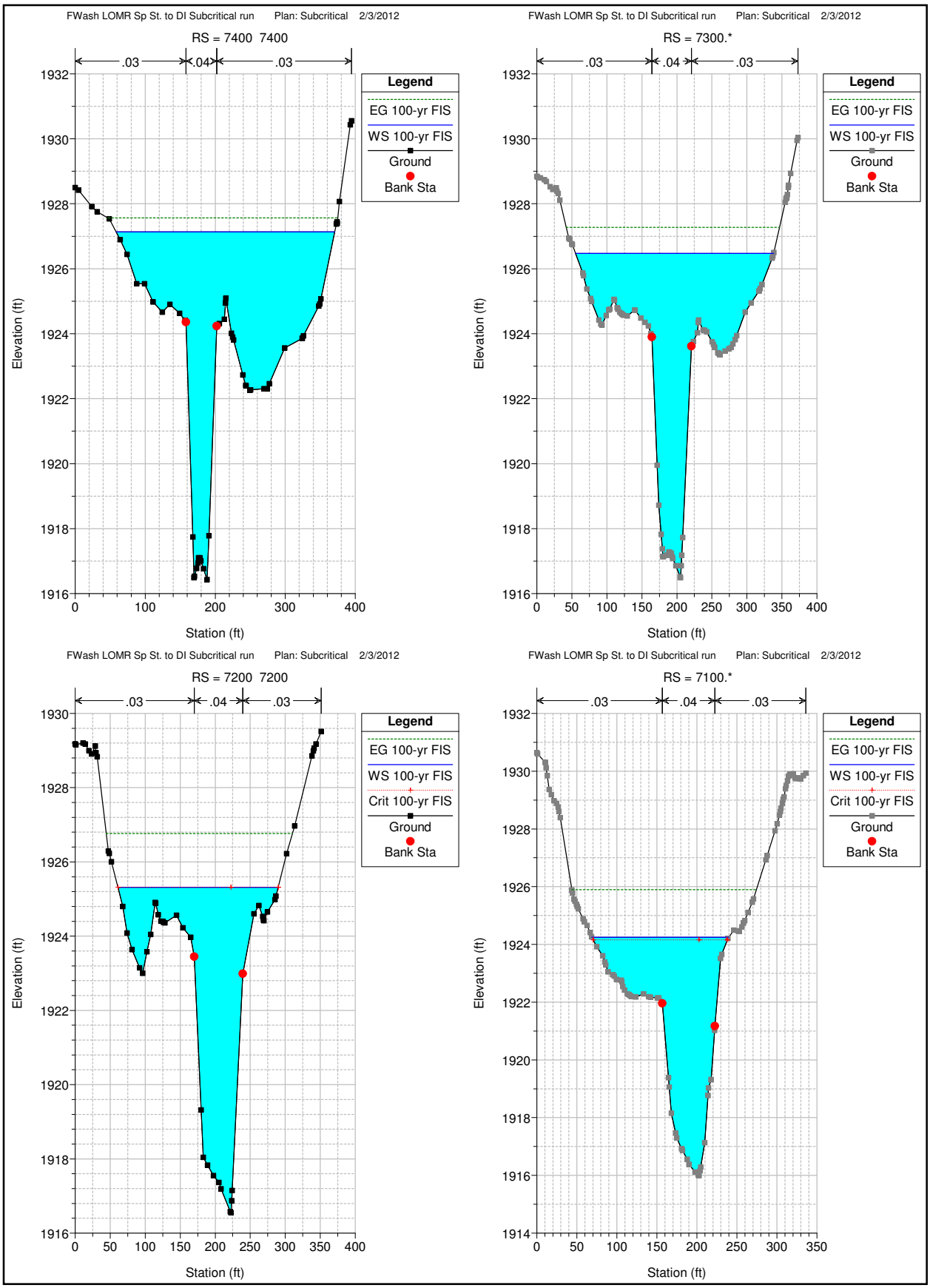
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

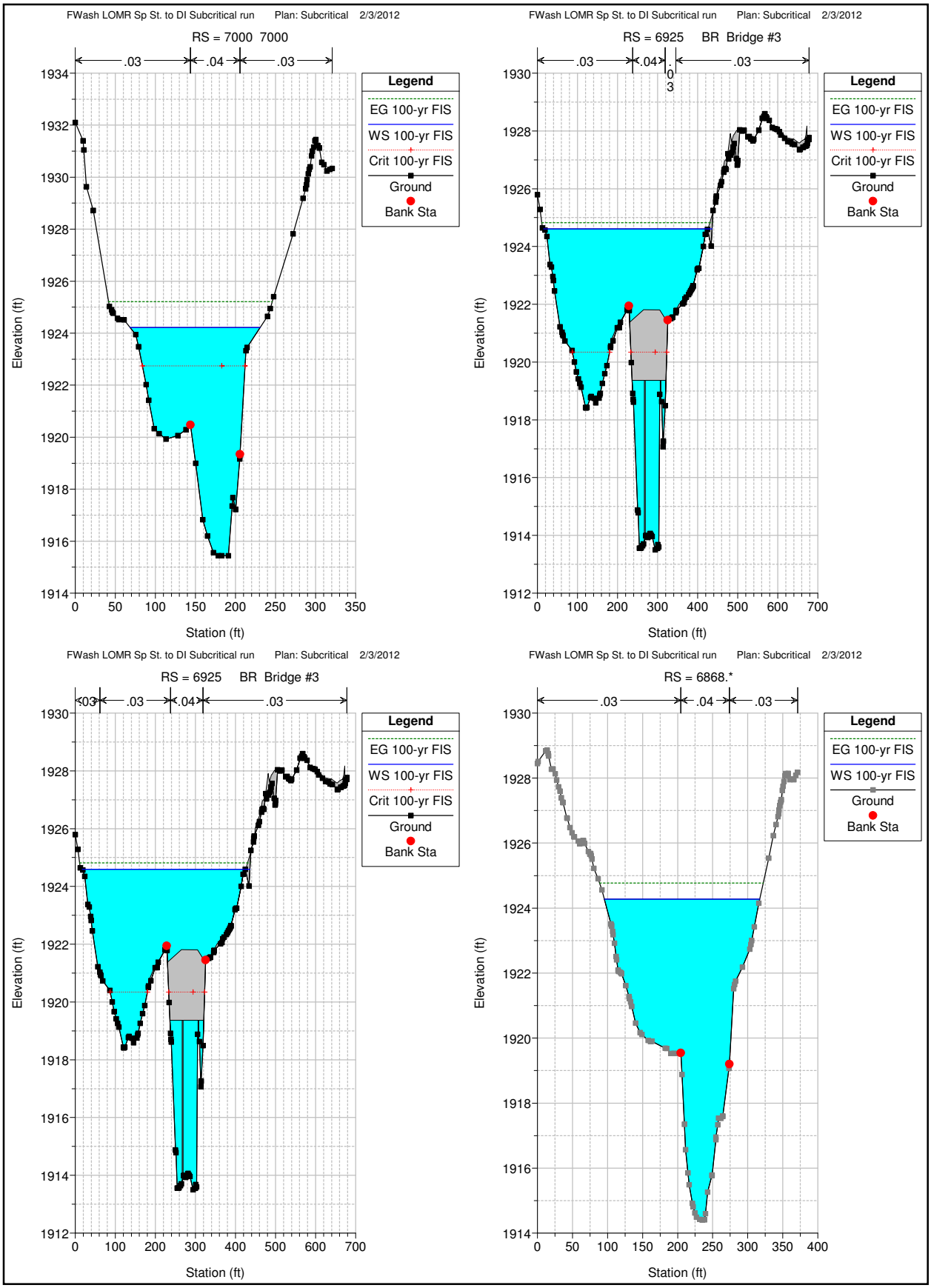
RS = 8320 X-section 10 from Case no. 04-09-0167P LOMR

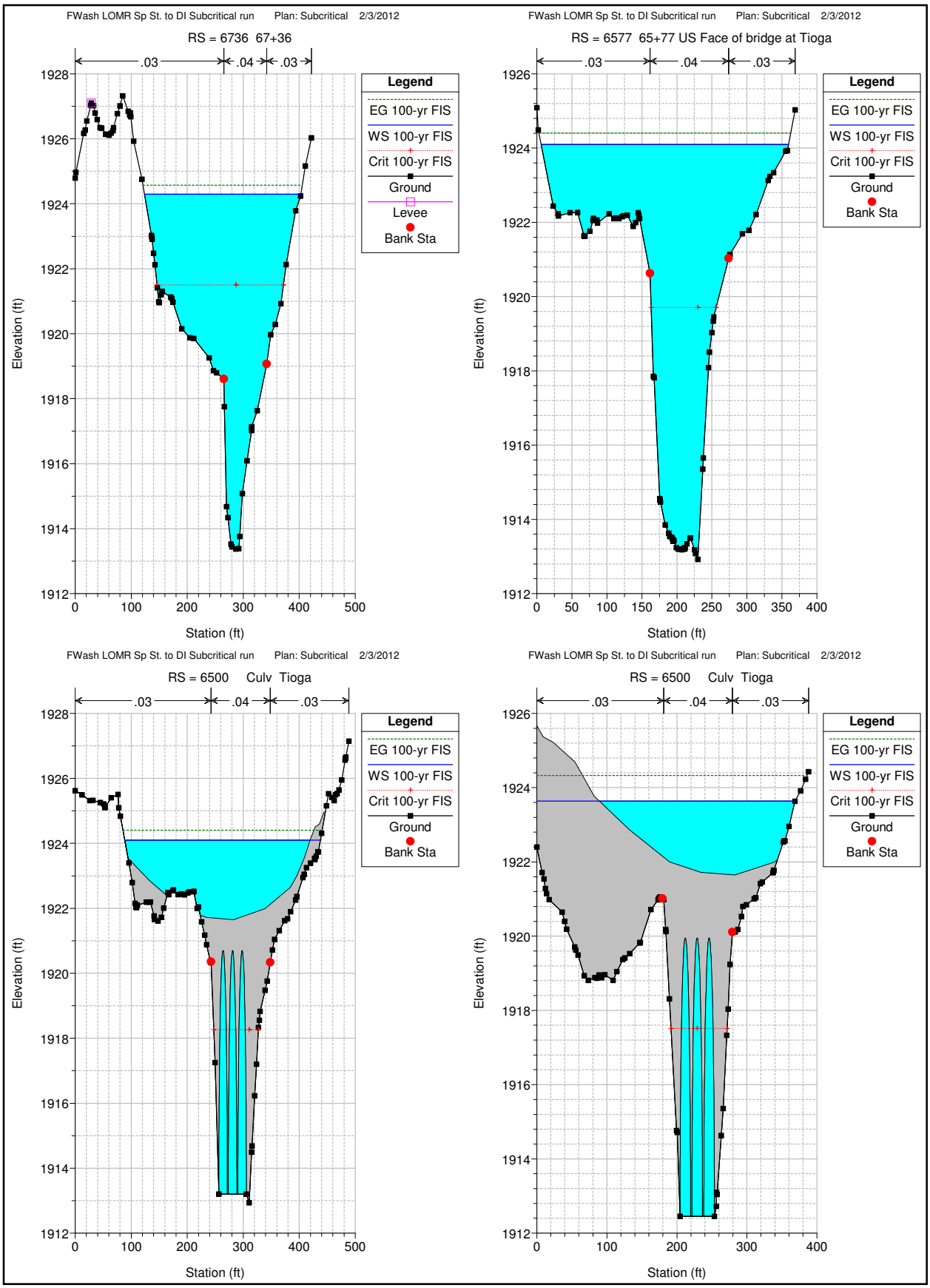


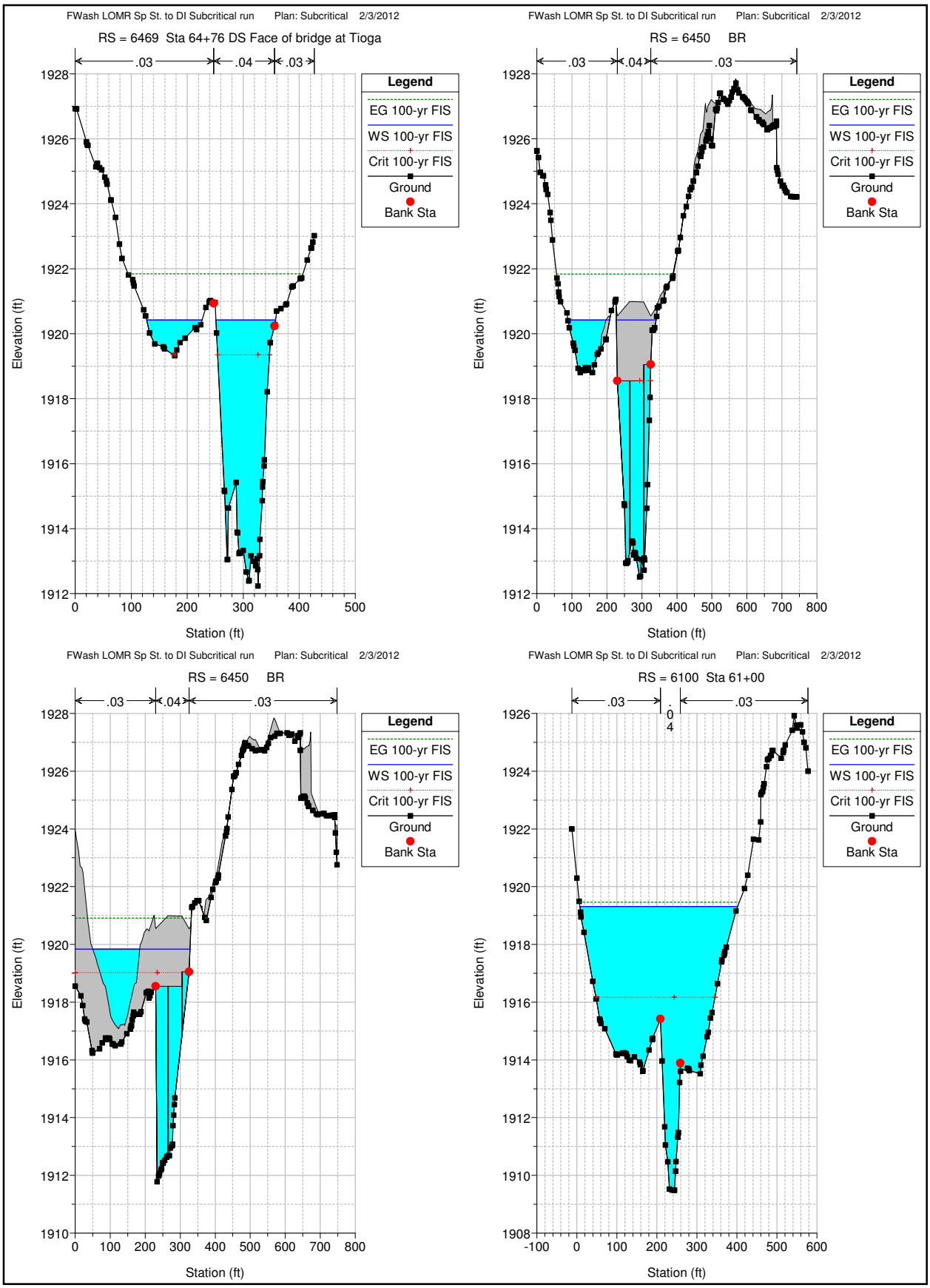

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 8200 8200
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 8100.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 8000 8000
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7900.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

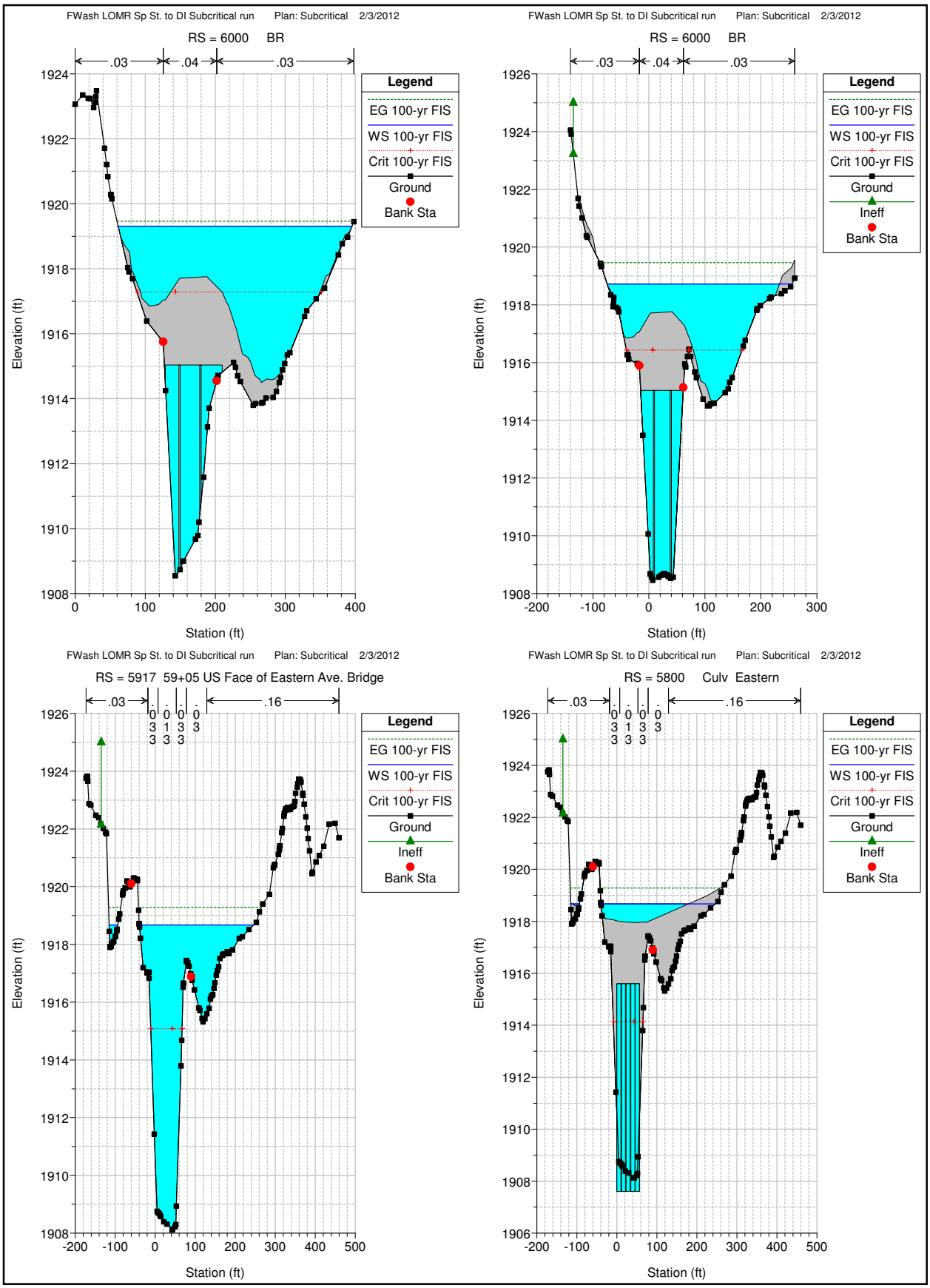

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7800 7800
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7700.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7600 7600
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7500.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

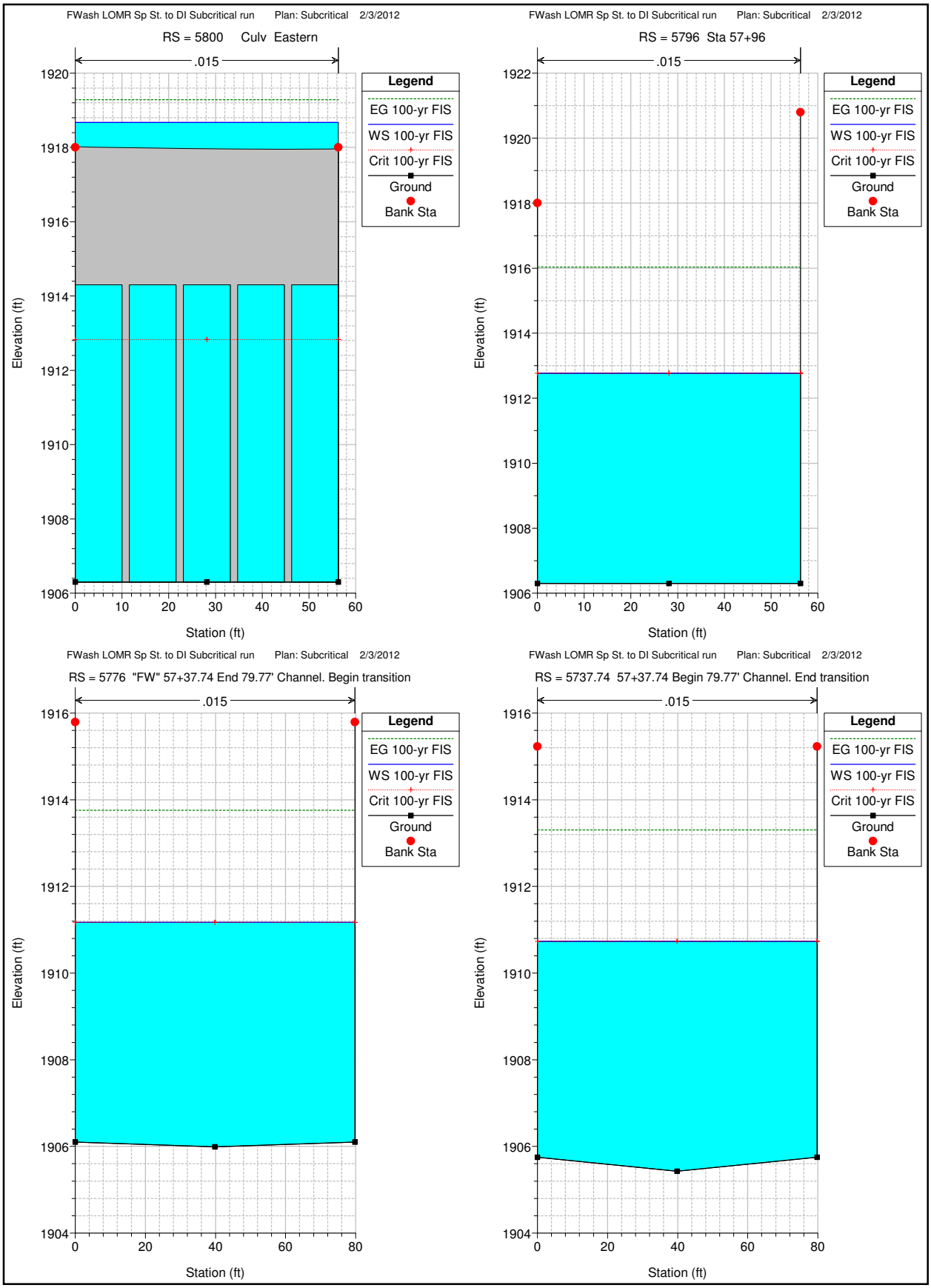

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7400 7400
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7300.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7200 7200
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7100.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

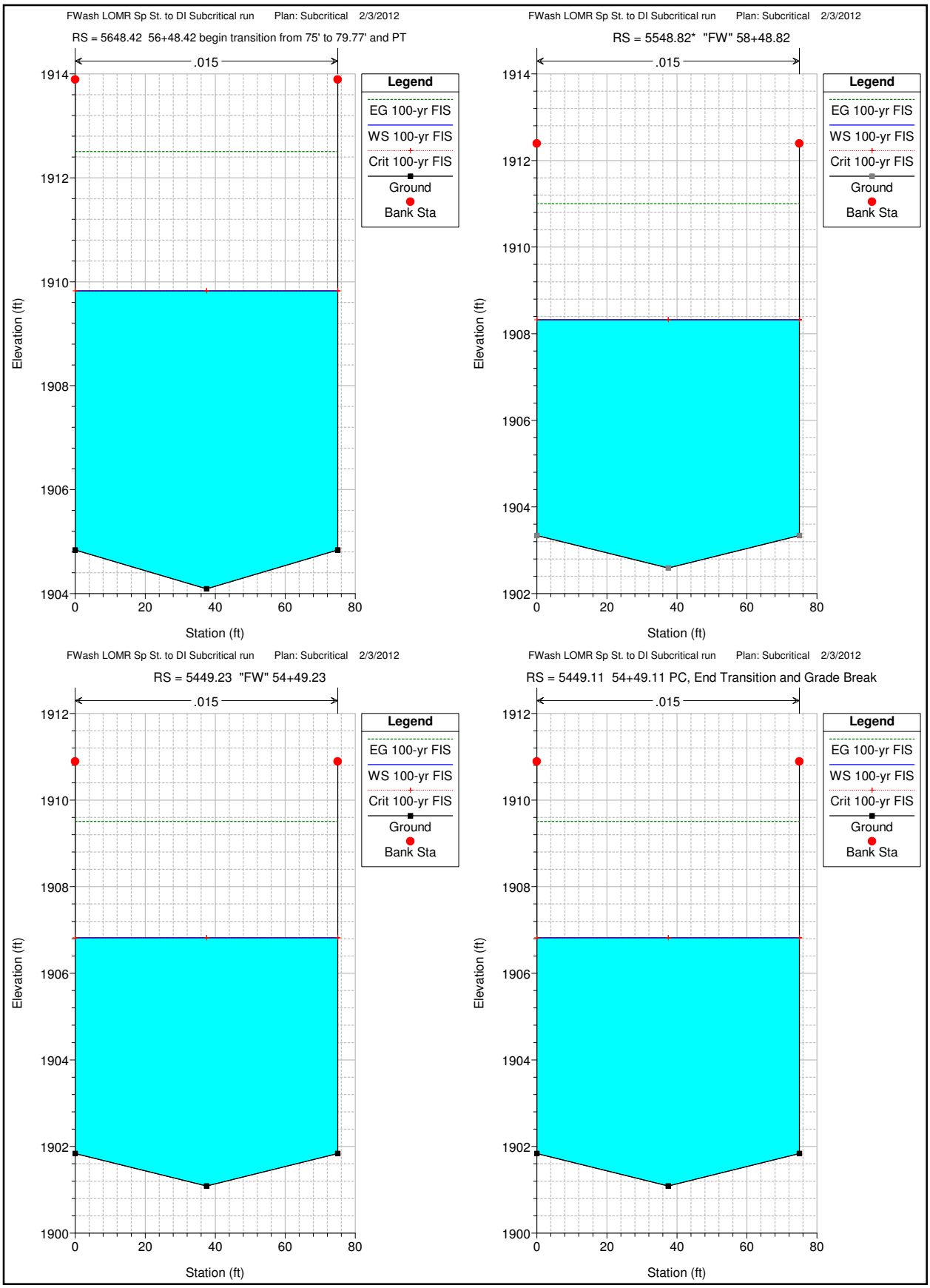

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 7000 7000
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6925 BR Bridge #3
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6925 BR Bridge #3
.03
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6868.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

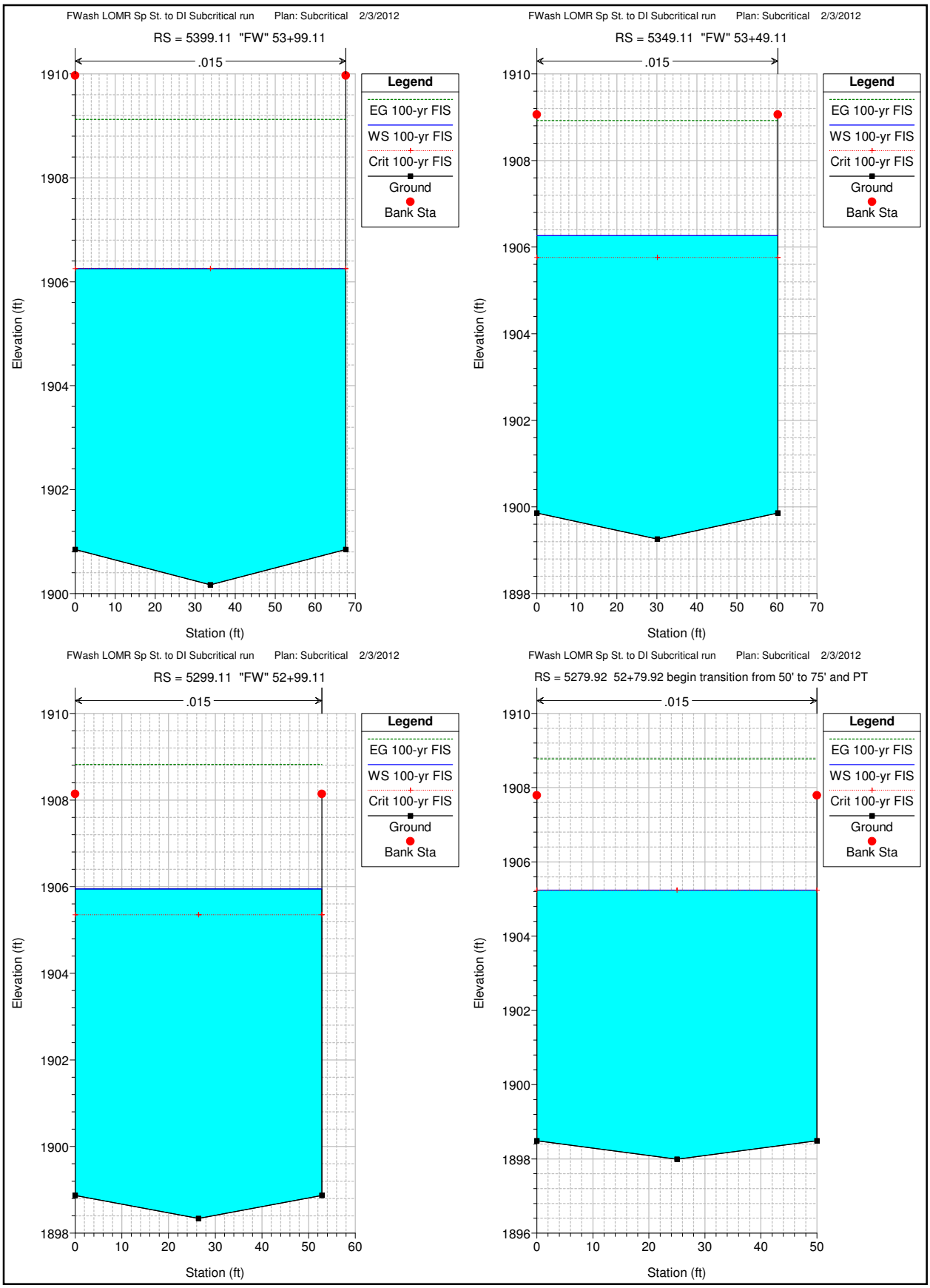

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6736 67+36
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6577 65+77 US Face of bridge at Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6500 Culv Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6500 Culv Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

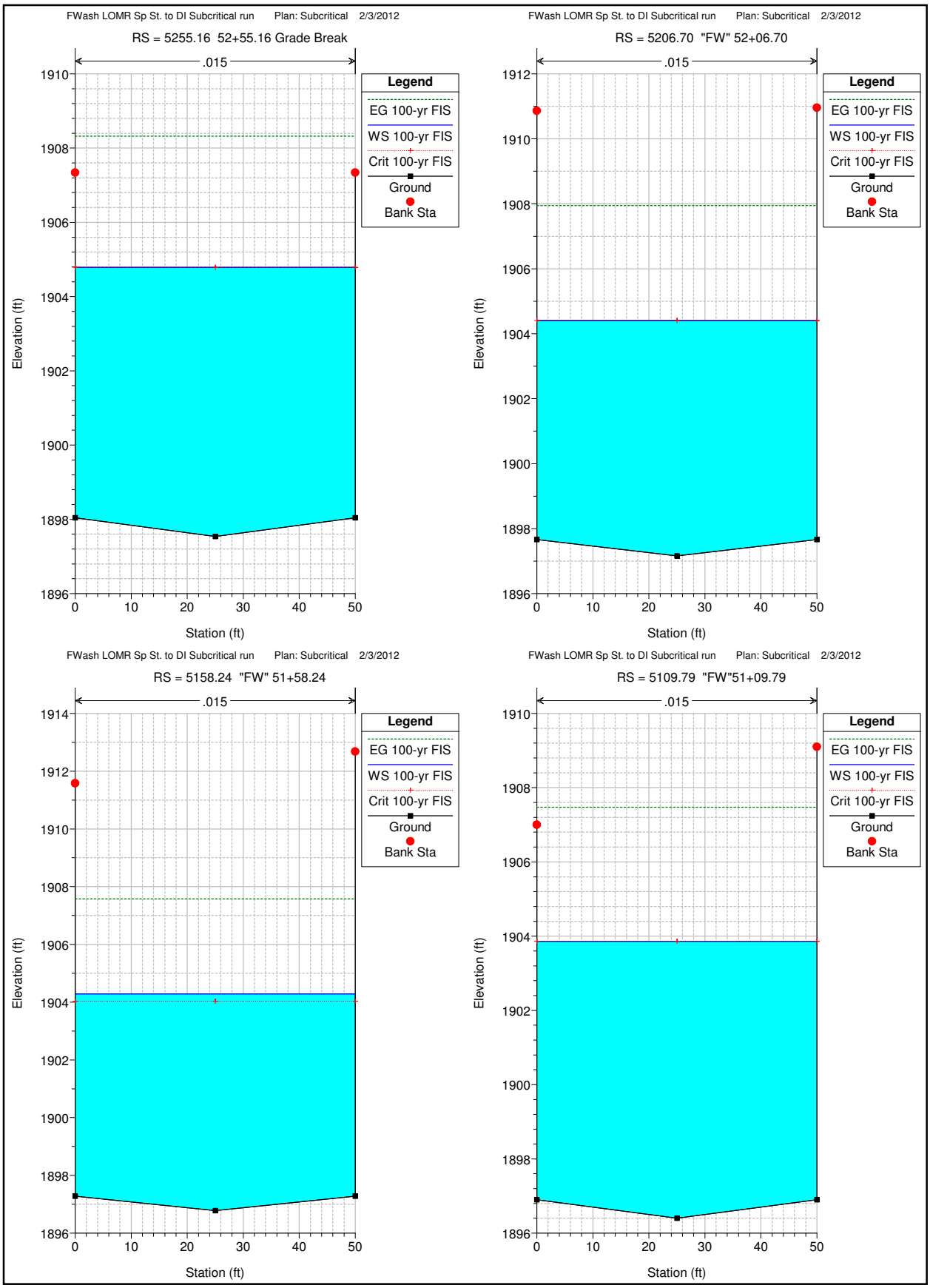

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6469 Sta 64+76 DS Face of bridge at Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6450 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6450 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6100 Sta 61+00
.03
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

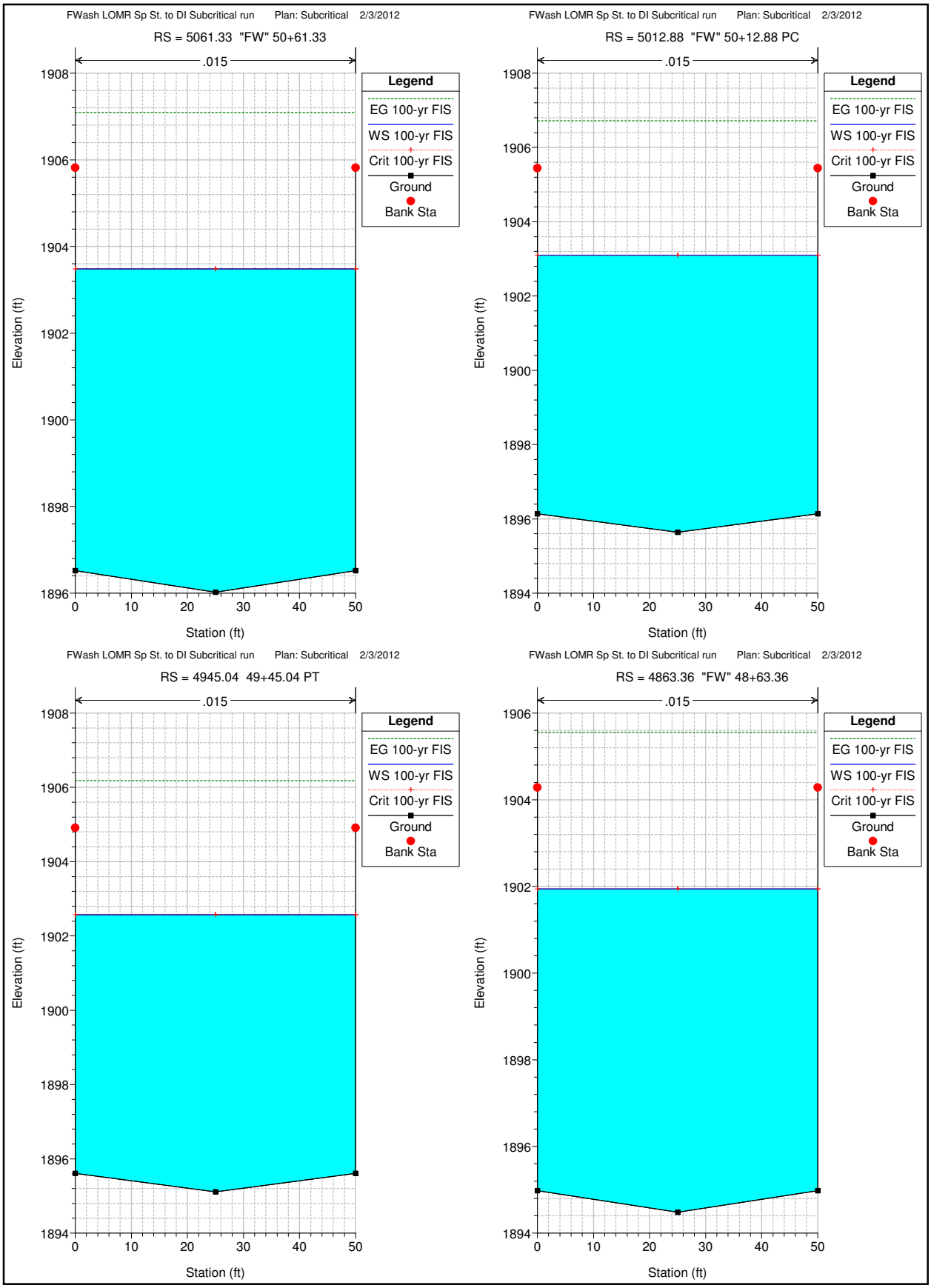

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6000 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 6000 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5917 59+05 US Face of Eastern Ave. Bridge
.03
.03
.01
.03
.03
.16
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5800 Culv Eastern
.03
.03
.01
.03
.03
.16
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5800 Culv Eastern
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5796 Sta 57+96
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5776 "FW" 57+37.74 End 79.77' Channel. Begin transition
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5737.74 57+37.74 Begin 79.77' Channel. End transition
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5648.42 56+48.42 begin transition from 75' to 79.77' and PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5548.82* "FW" 58+48.82
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5449.23 "FW" 54+49.23
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5449.11 54+49.11 PC, End Transition and Grade Break
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

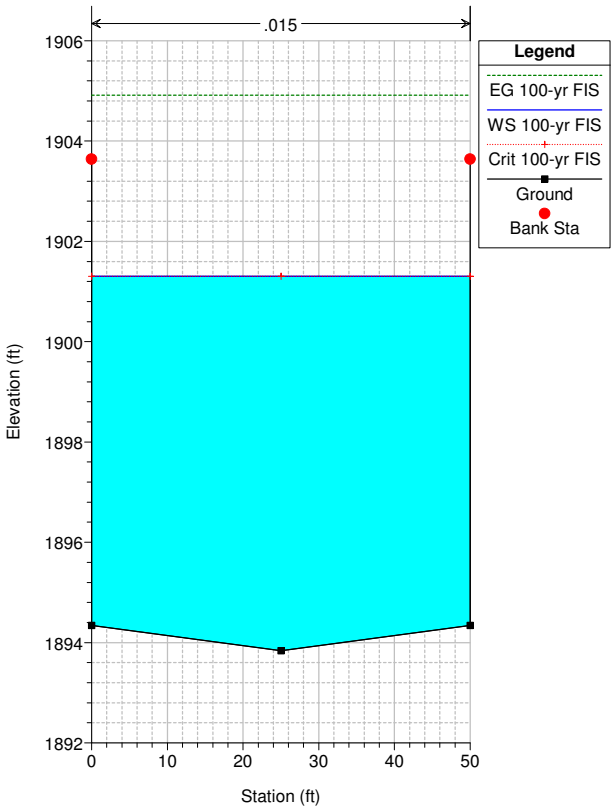

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5399.11 "FW" 53+99.11
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5349.11 "FW" 53+49.11
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5299.11 "FW" 52+99.11
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5279.92 52+79.92 begin transition from 50' to 75' and PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5255.16 52+55.16 Grade Break
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5206.70 "FW" 52+06.70
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5158.24 "FW" 51+58.24
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5109.79 "FW"51+09.79
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5061.33 "FW" 50+61.33
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 5012.88 "FW" 50+12.88 PC
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 4945.04 49+45.04 PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 4863.36 "FW" 48+63.36
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

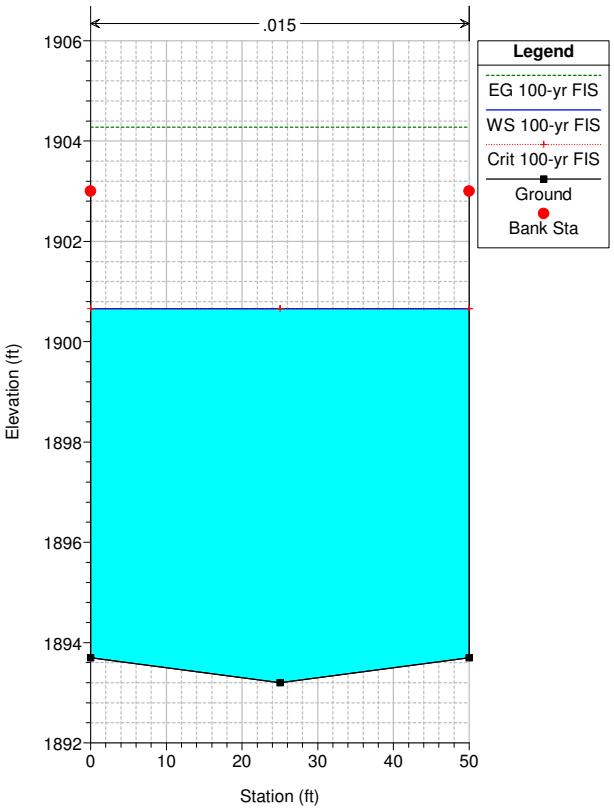
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4781.68 "FW" 47+81.68



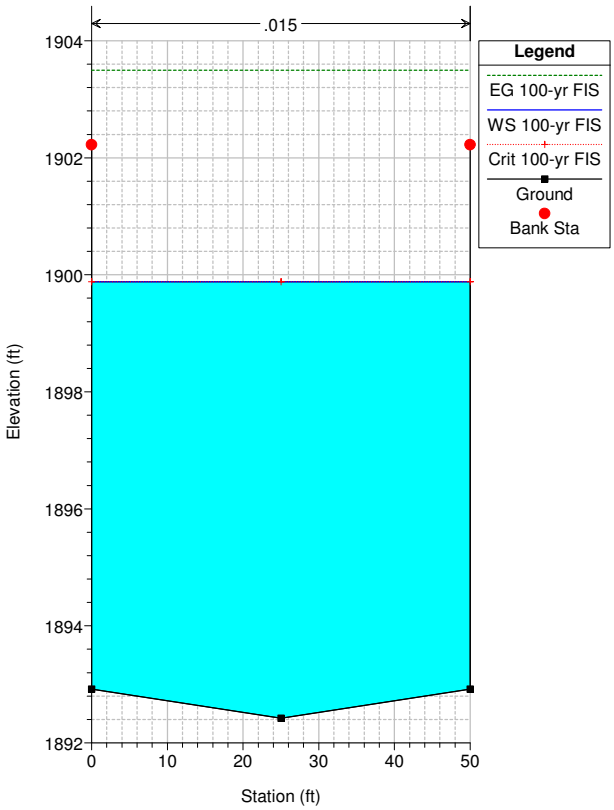
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4700 "FW" 47+00.00 Grade Break



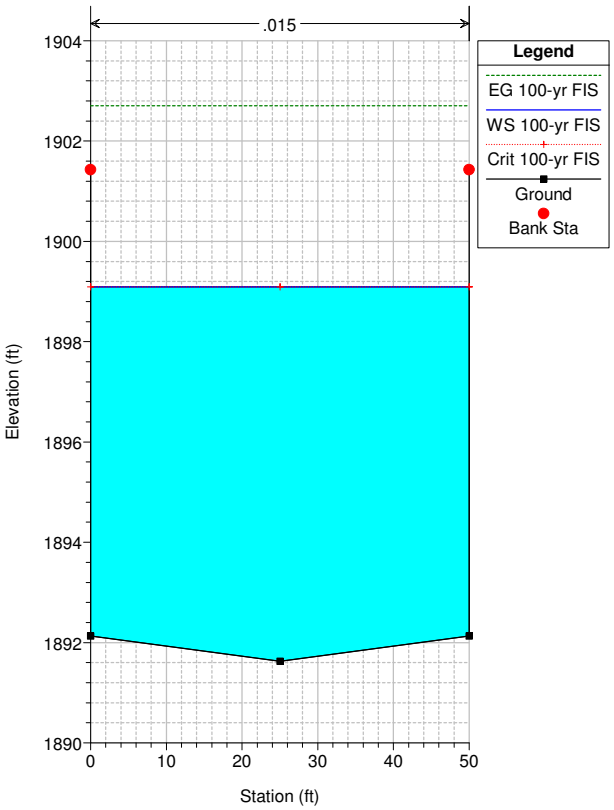
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4600 "FW" 46+00.00



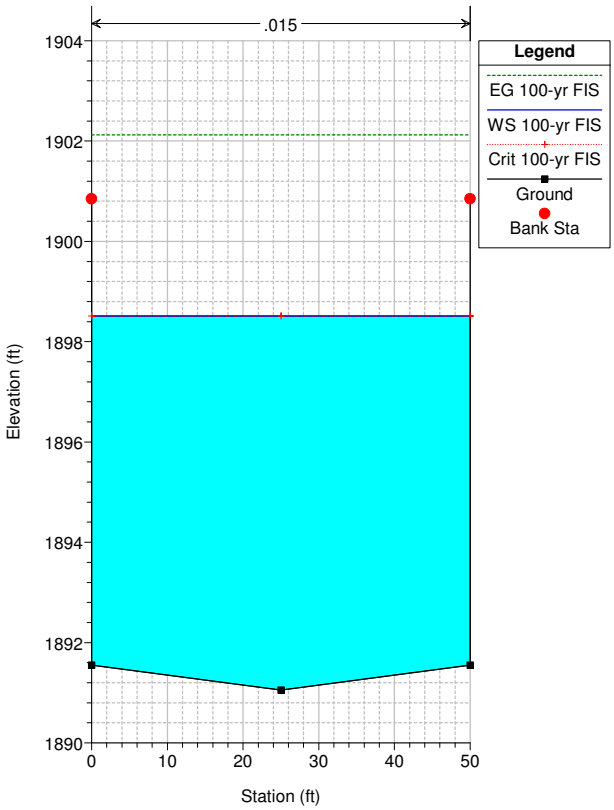
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4500



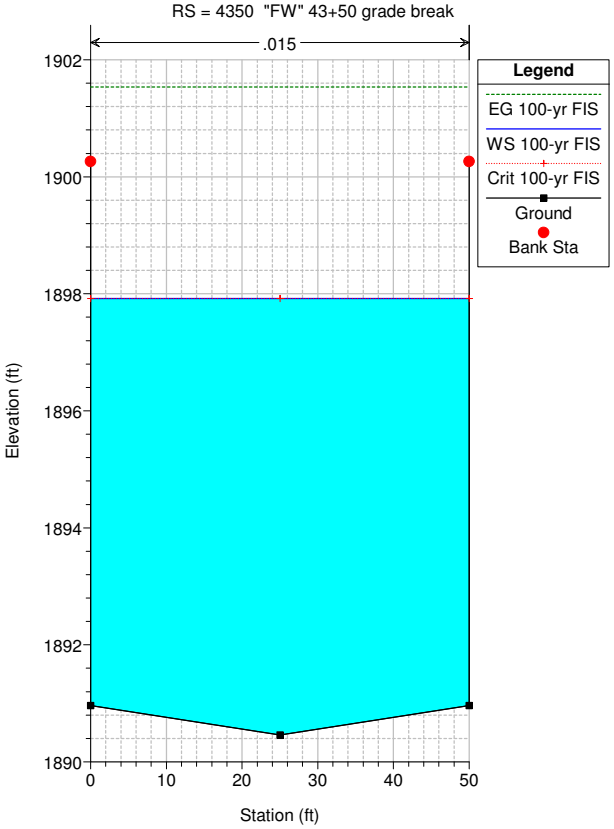
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4425.69 "FW" 44+25.69 PC



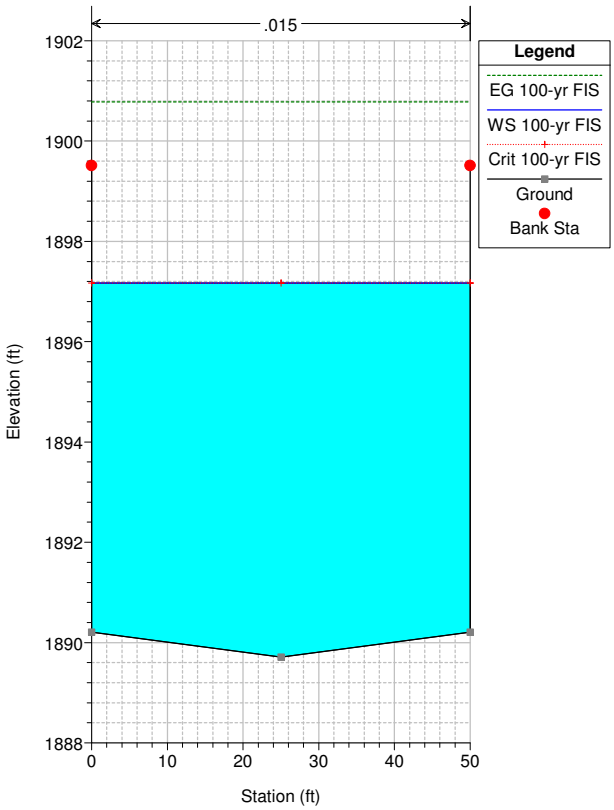
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 4350 "FW" 43+50 grade break



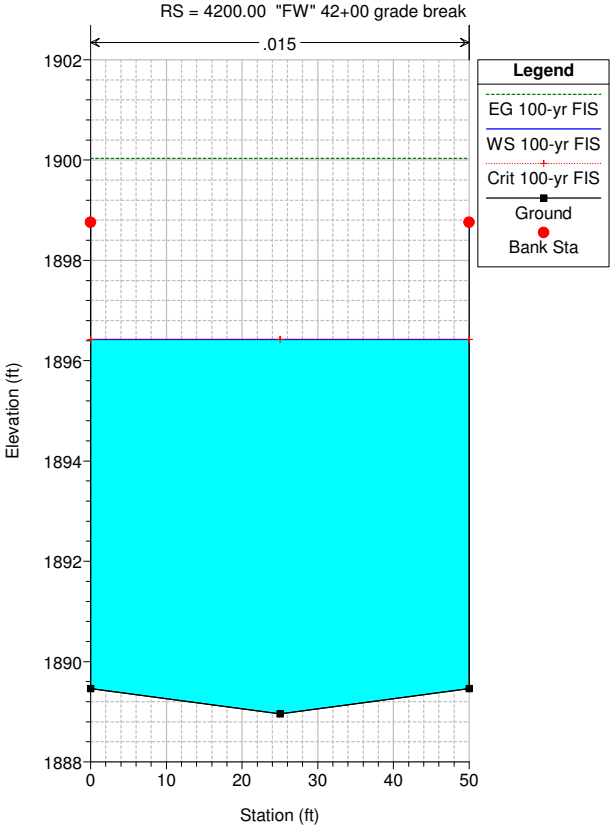
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

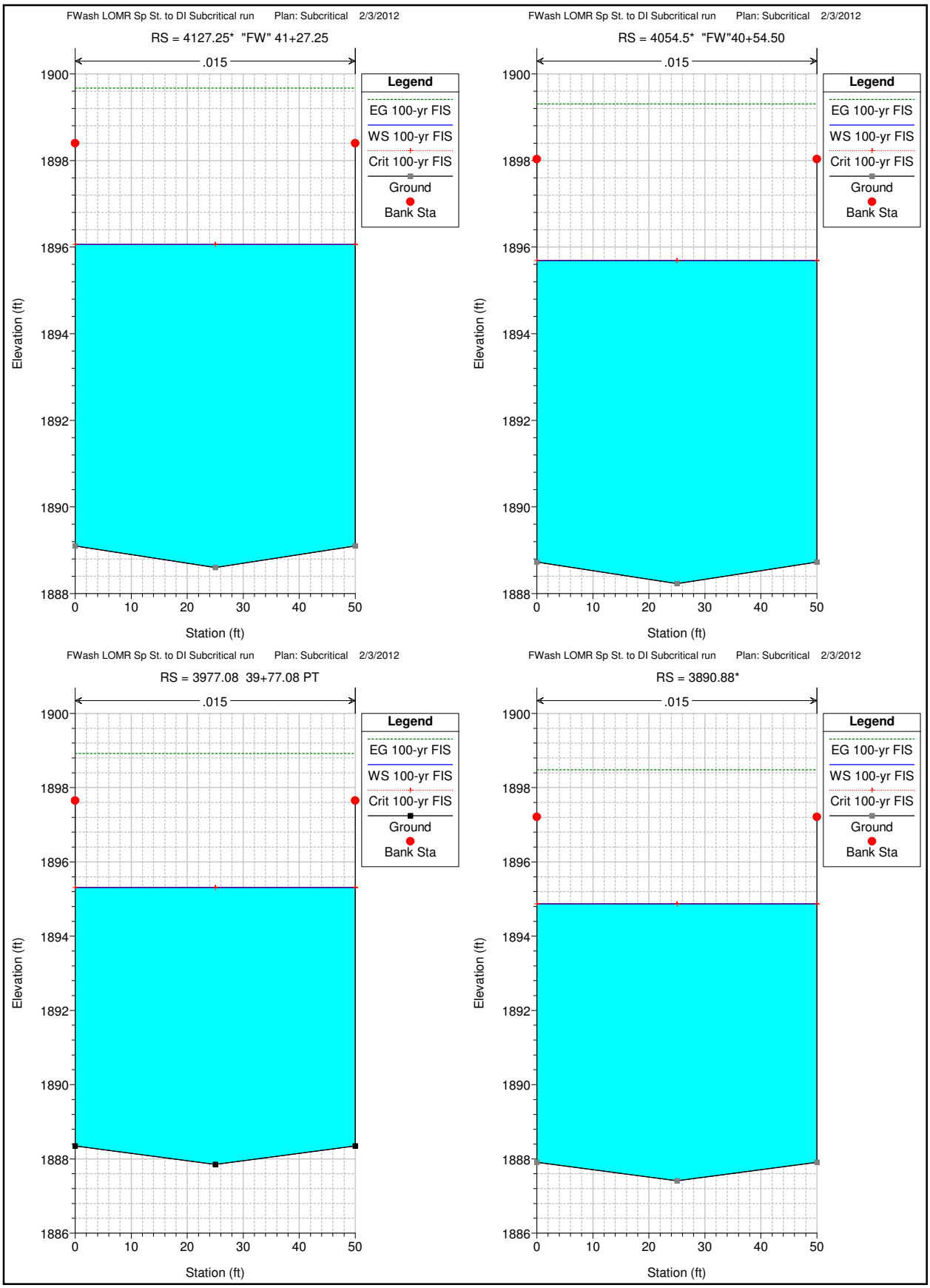
RS = 4275.*

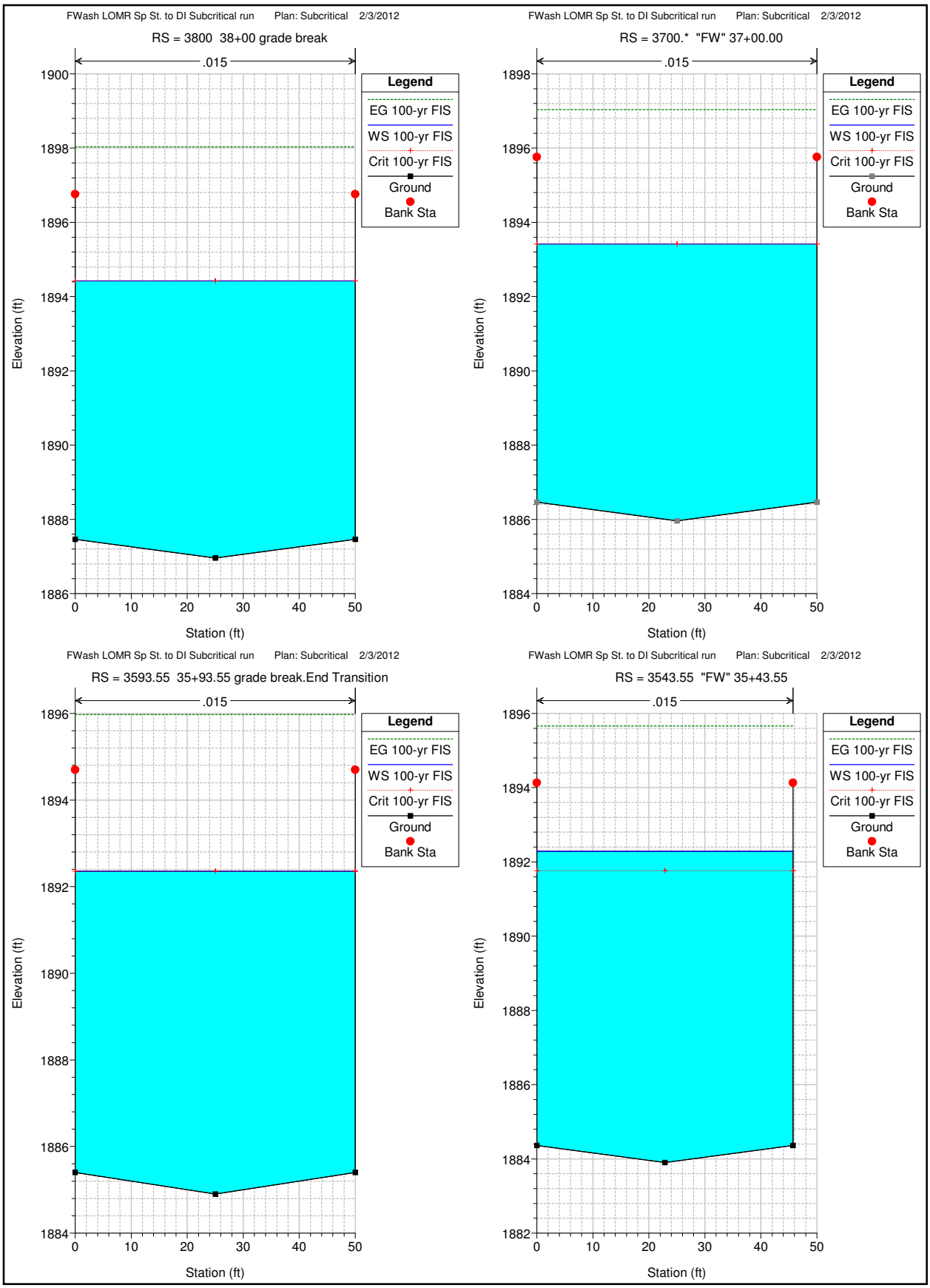


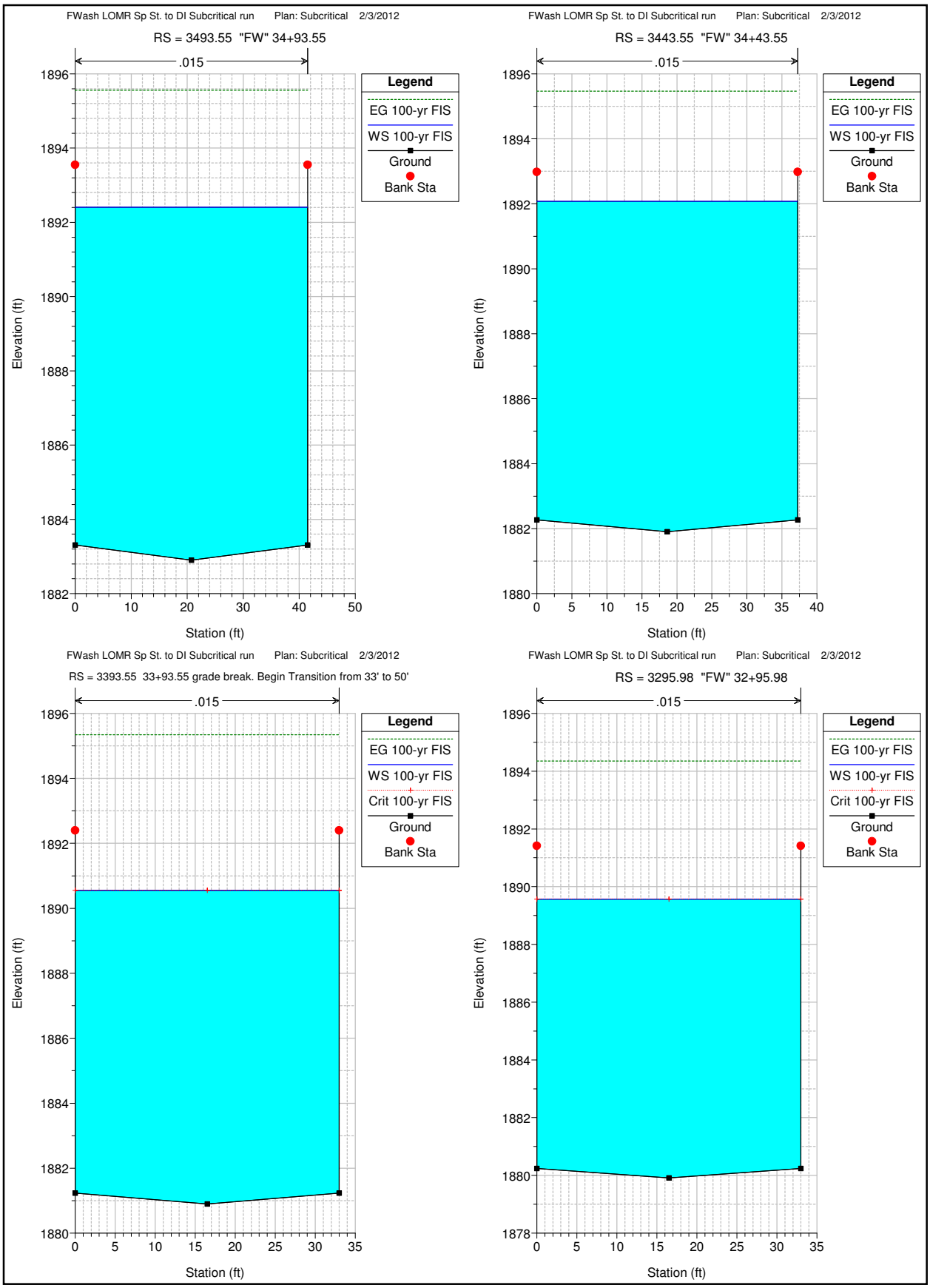
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

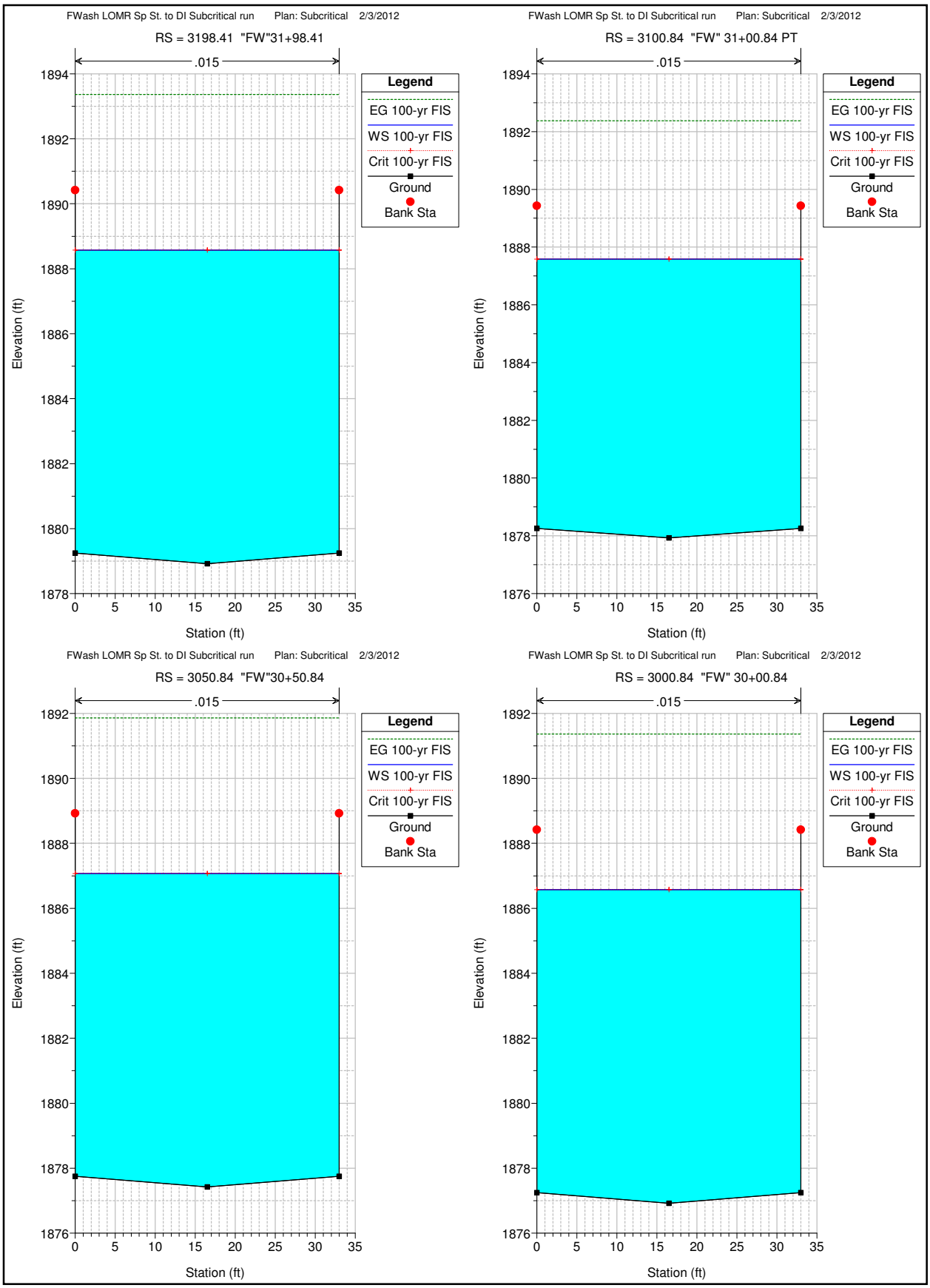
RS = 4200.00 "FW" 42+00 grade break

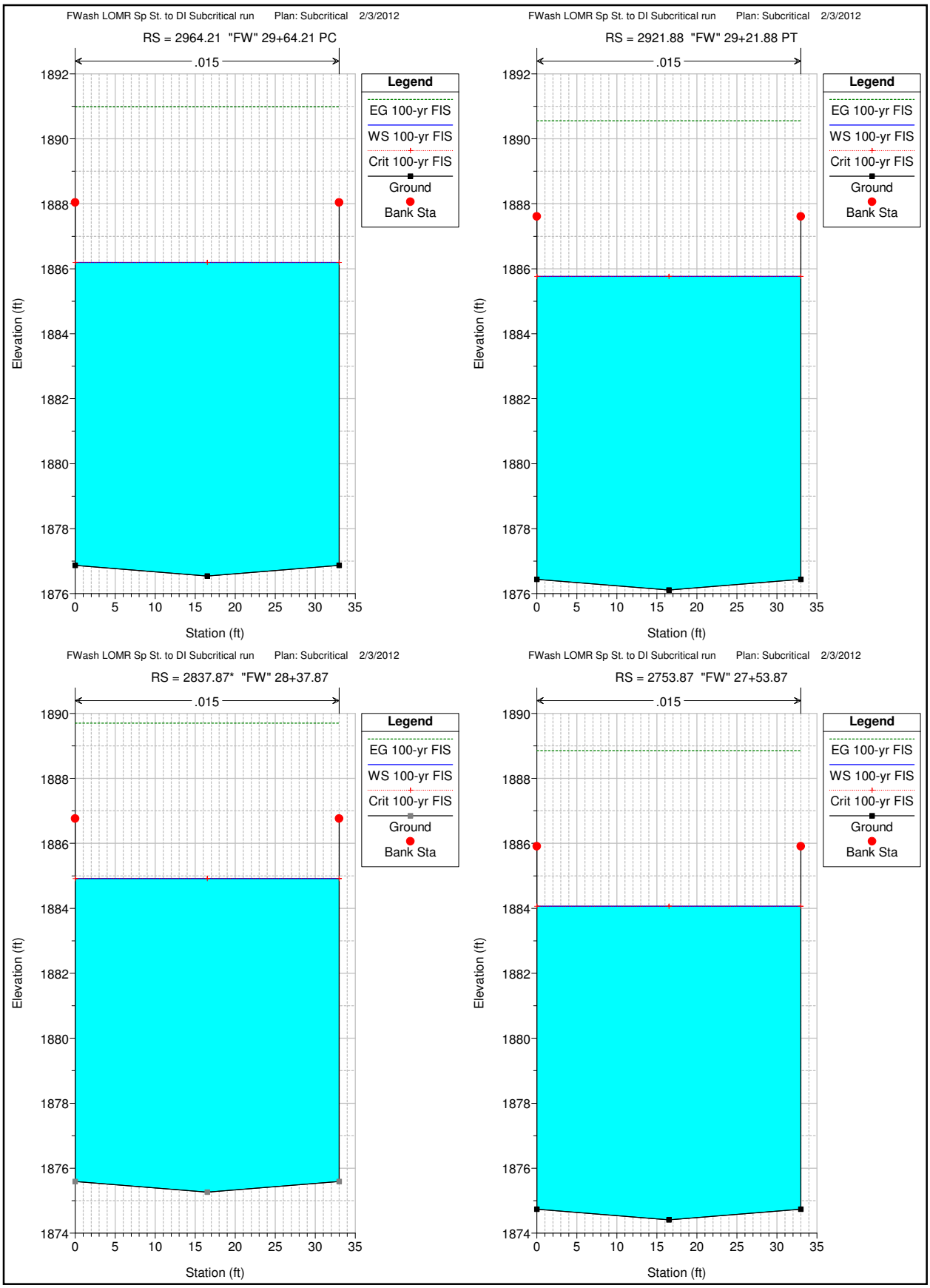



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 4127.25* "FW" 41+27.25
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 4054.5* "FW"40+54.50
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3977.08 39+77.08 PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3890.88*
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3800 38+00 grade break
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3700.* "FW" 37+00.00
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3593.55 35+93.55 grade break.End Transition
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3543.55 "FW" 35+43.55
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

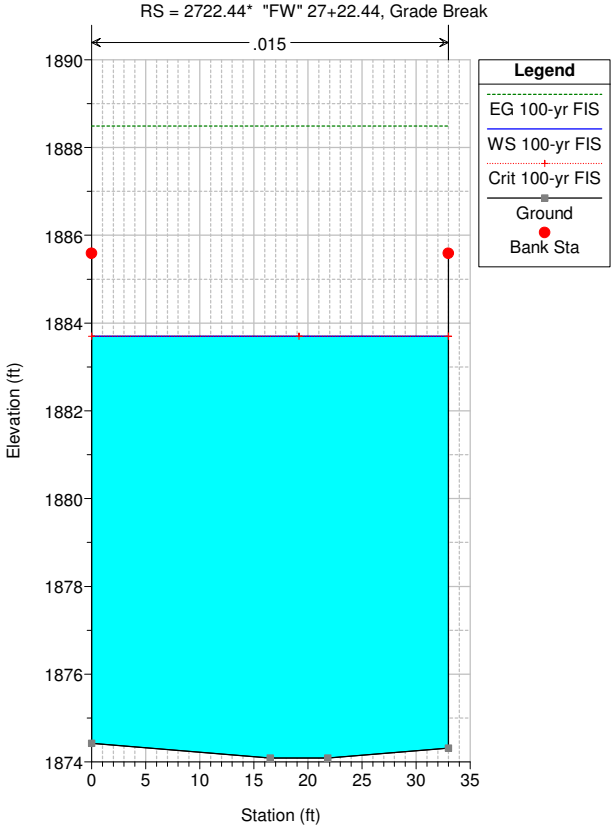

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3493.55 "FW" 34+93.55
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3443.55 "FW" 34+43.55
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3393.55 33+93.55 grade break. Begin Transition from 33' to 50'
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3295.98 "FW" 32+95.98
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3198.41 "FW"31+98.41
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3100.84 "FW" 31+00.84 PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3050.84 "FW"30+50.84
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 3000.84 "FW" 30+00.84
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2964.21 "FW" 29+64.21 PC
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2921.88 "FW" 29+21.88 PT
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2837.87* "FW" 28+37.87
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2753.87 "FW" 27+53.87
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

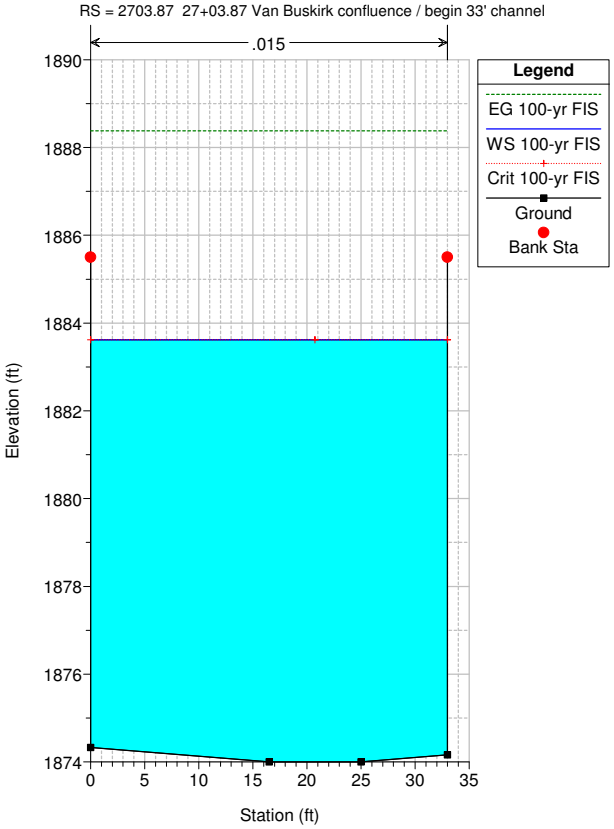
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 2722.44* "FW" 27+22.44, Grade Break



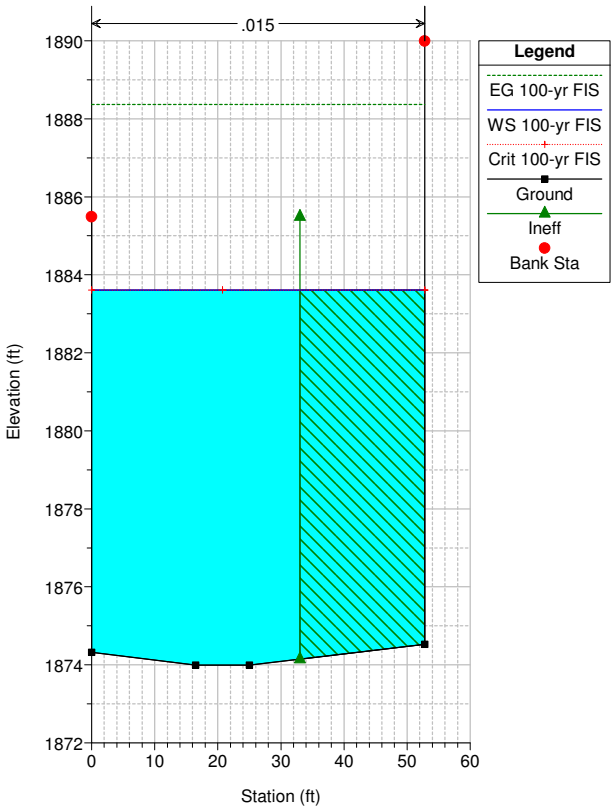
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 2703.87 27+03.87 Van Buskirk confluence / begin 33' channel



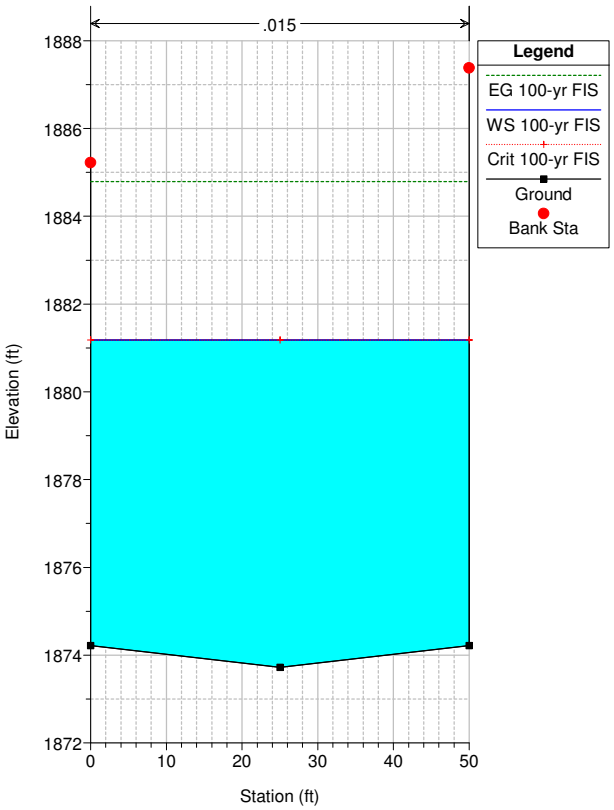
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

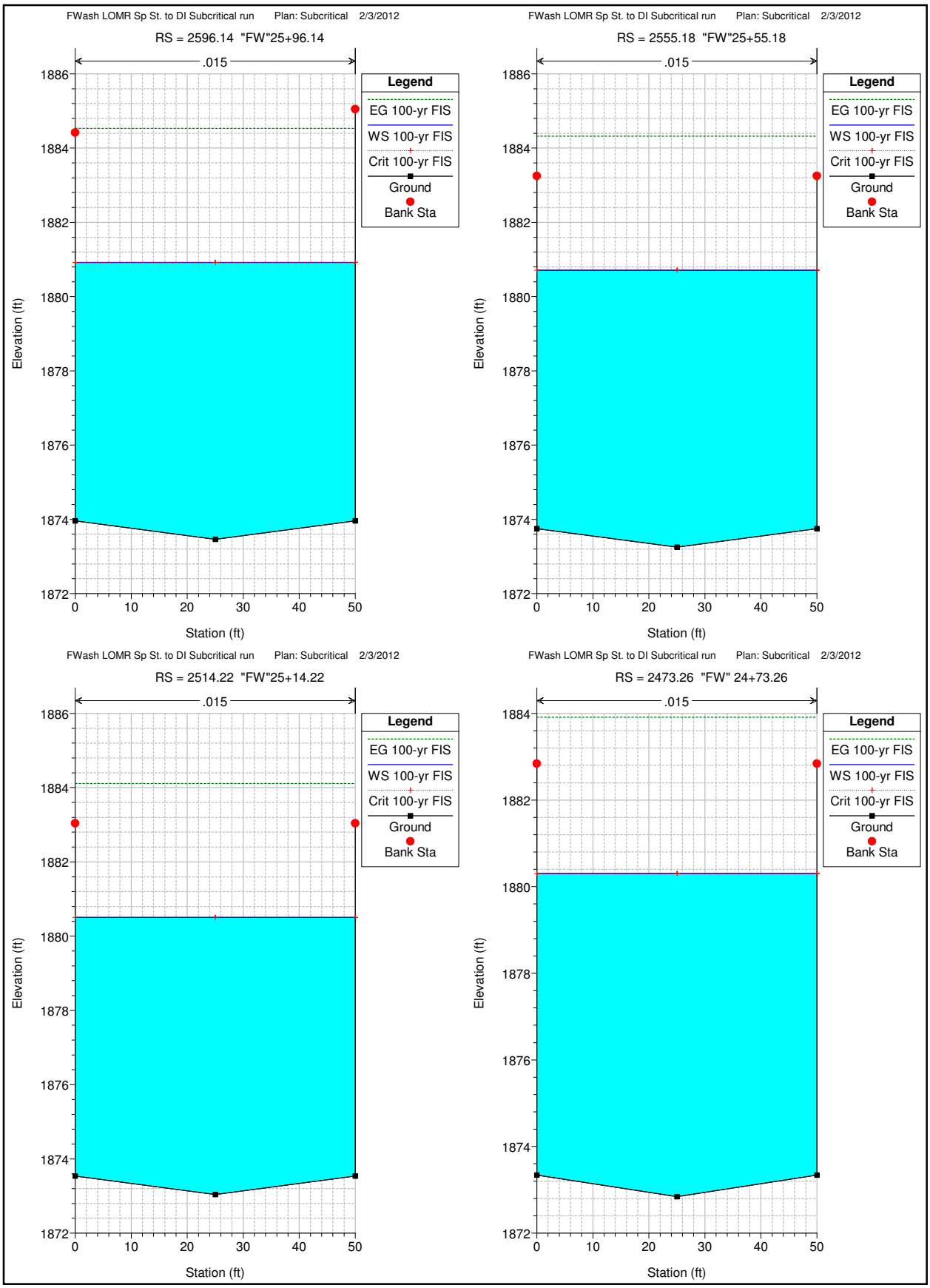
RS = 2702.87 27+02.87 Van Buskirk confluence



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

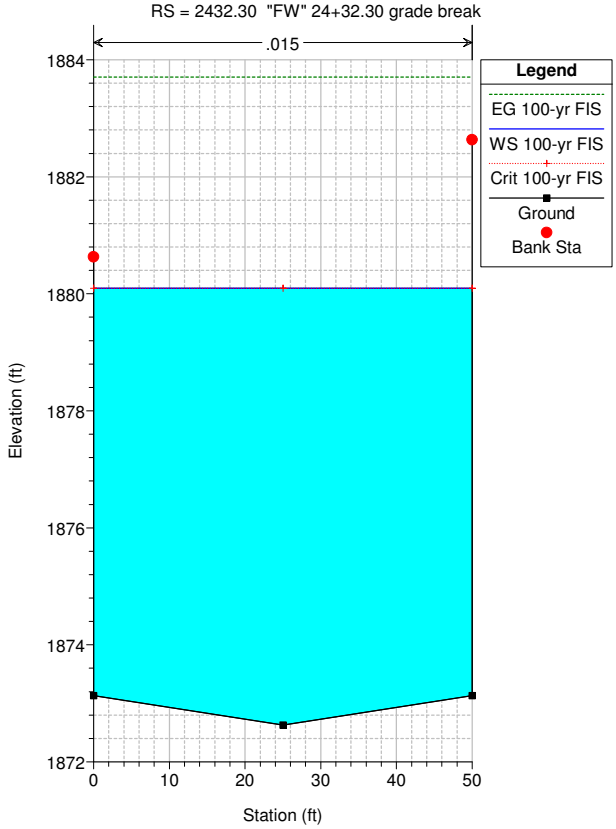
RS = 2648.55 26+48.52 end 50' channel / begin transition to confluence




FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2596.14 "FW"25+96.14
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2555.18 "FW"25+55.18
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2514.22 "FW"25+14.22
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2473.26 "FW" 24+73.26
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

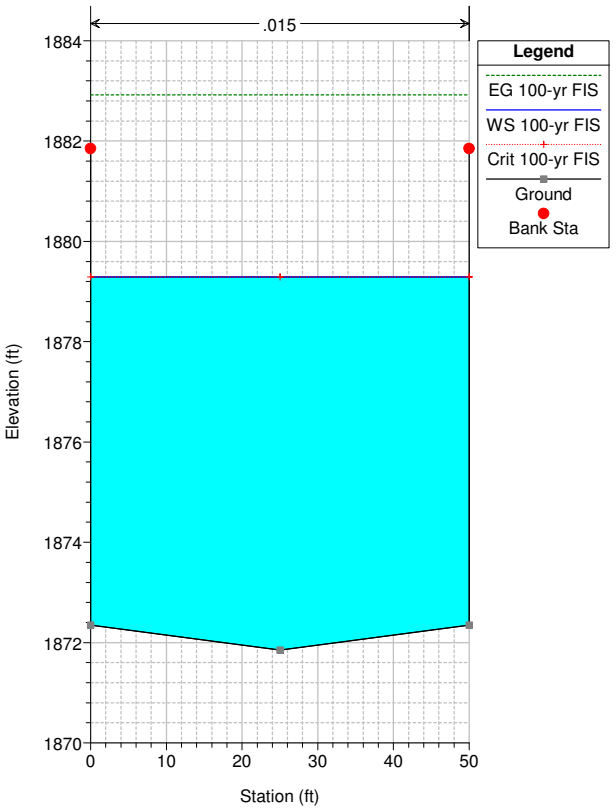
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 2432.30 "FW" 24+32.30 grade break



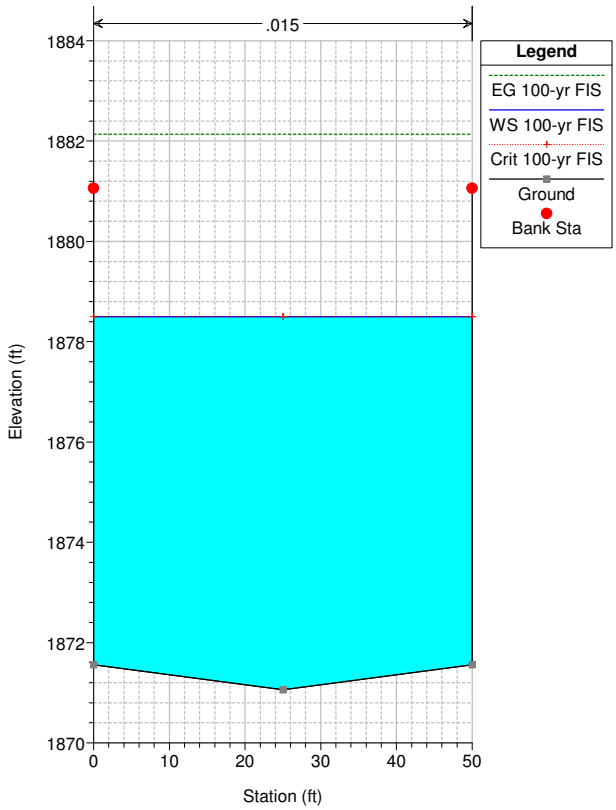
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 2334.09* "FW"23+34.09



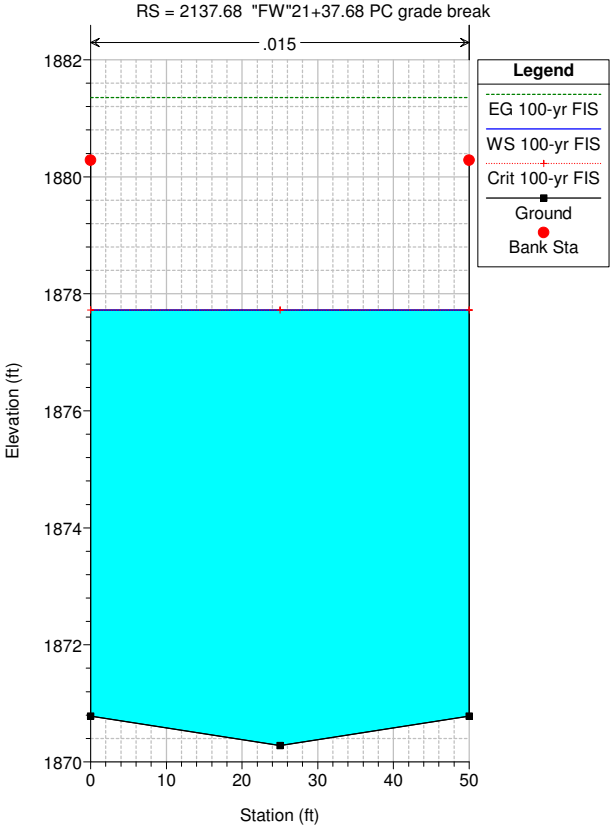
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

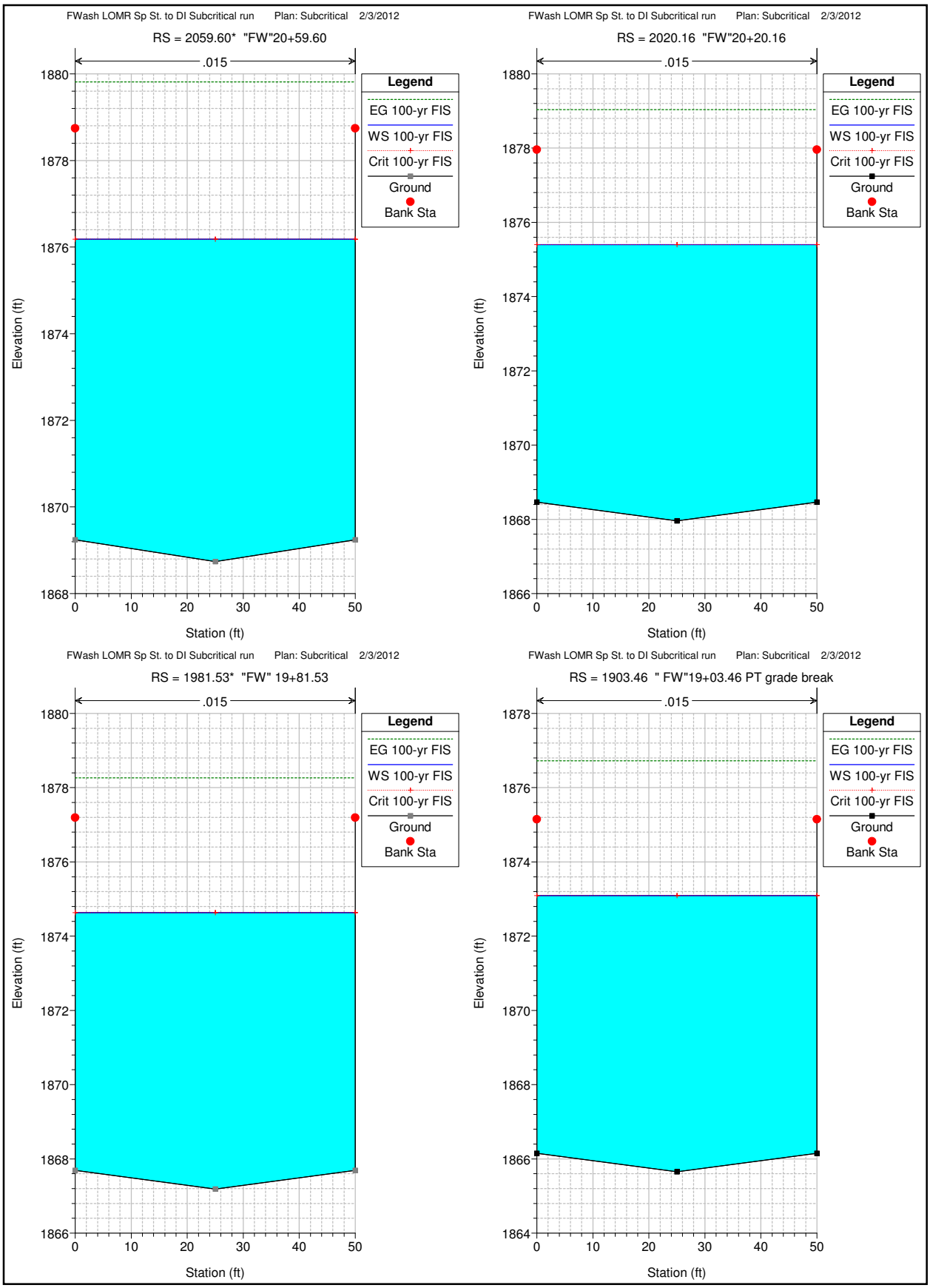
RS = 2235.88* "FW"22+35.88



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

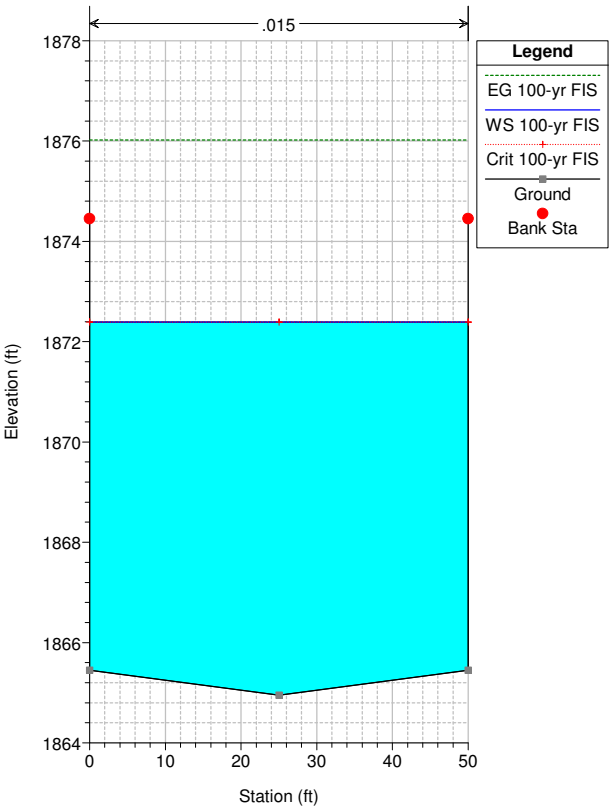
RS = 2137.68 "FW"21+37.68 PC grade break




FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2059.60* "FW"20+59.60
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 2020.16 "FW"20+20.16
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1981.53* "FW" 19+81.53
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1903.46 " FW"19+03.46 PT grade break
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

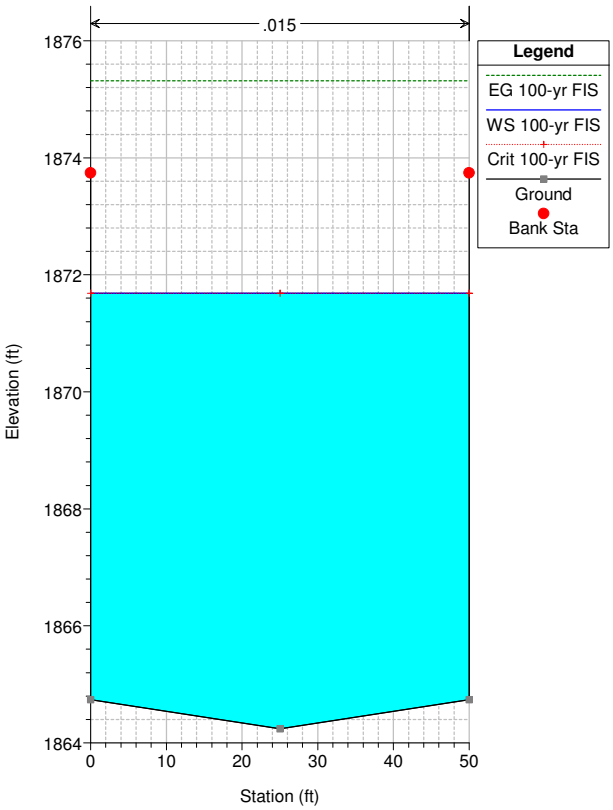
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 1817.25* "FW" 18+17.25



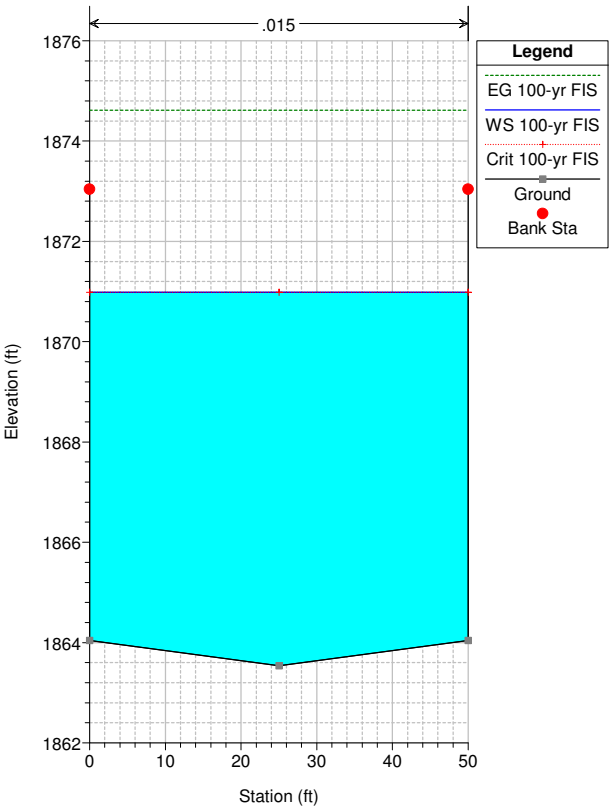
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 1731.04* "FW" 17+31.04



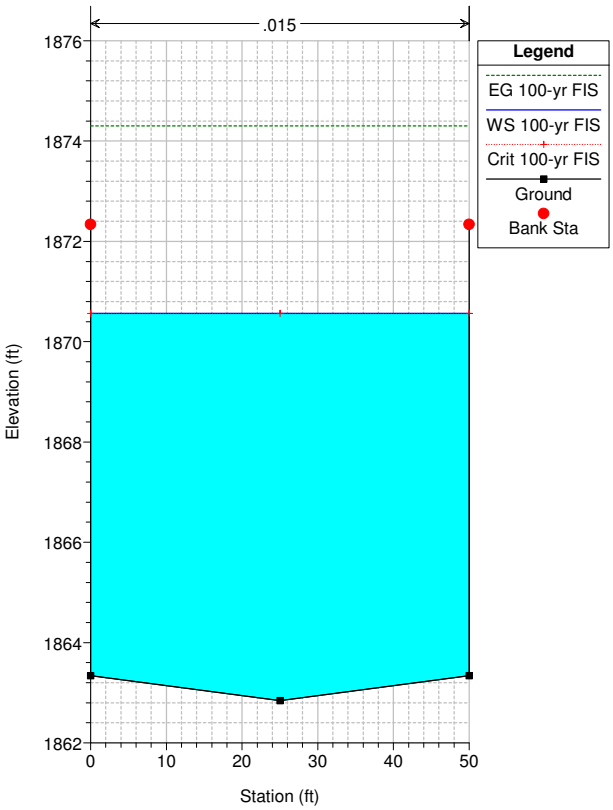
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

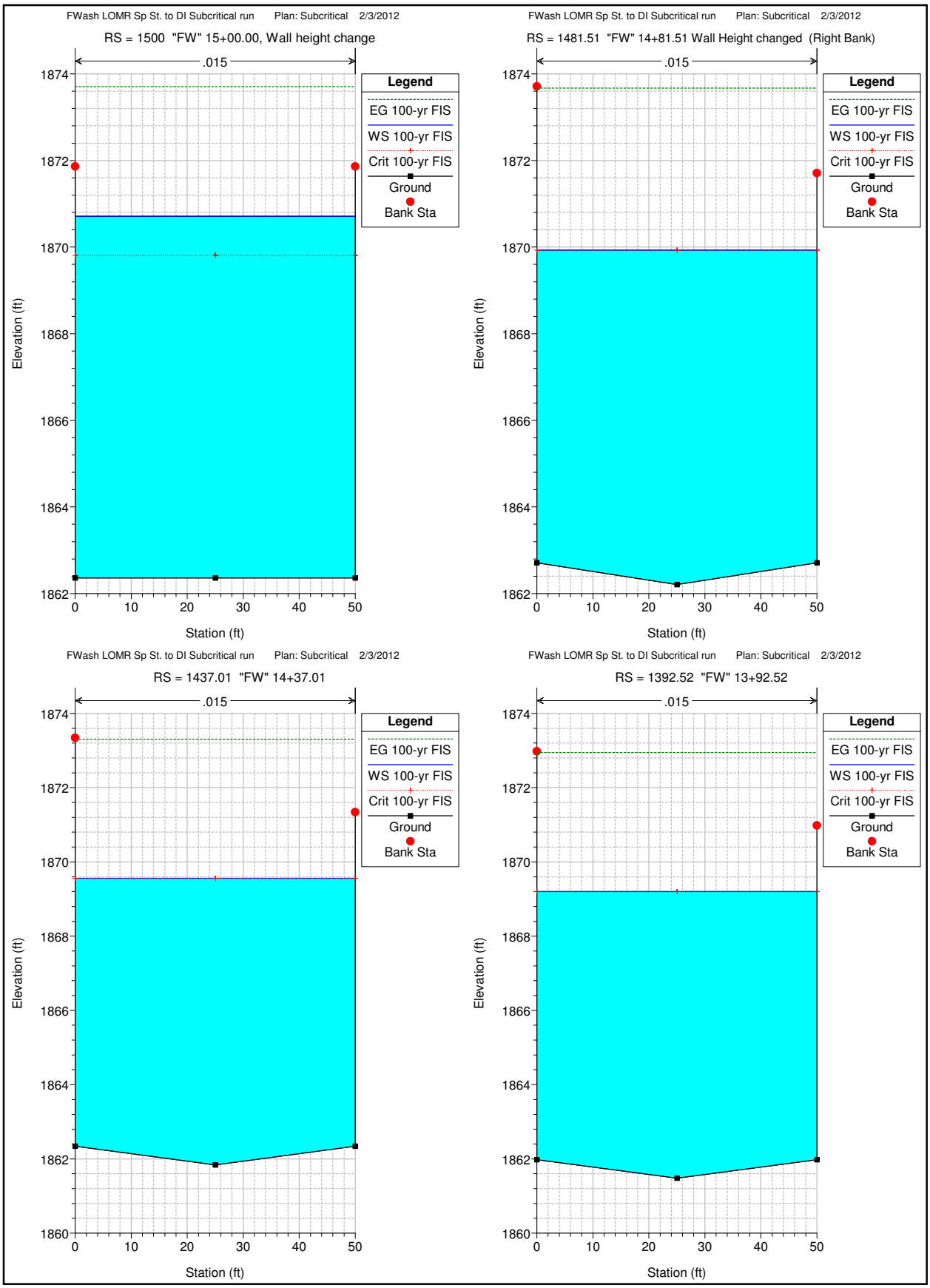
RS = 1644.83* "FW" 16+44.83



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

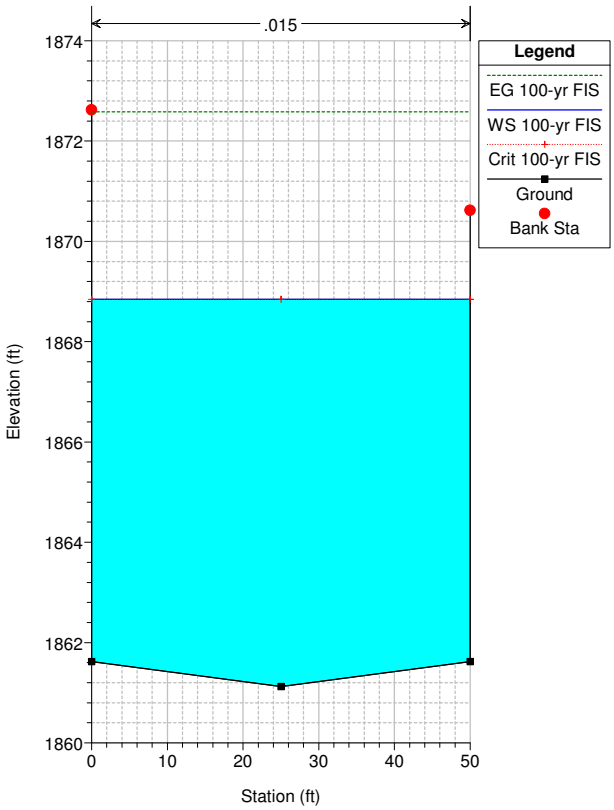
RS = 1558.62 "FW" 15+58.62




FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1500 "FW" 15+00.00, Wall height change
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1481.51 "FW" 14+81.51 Wall Height changed (Right Bank)
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1437.01 "FW" 14+37.01
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1392.52 "FW" 13+92.52
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

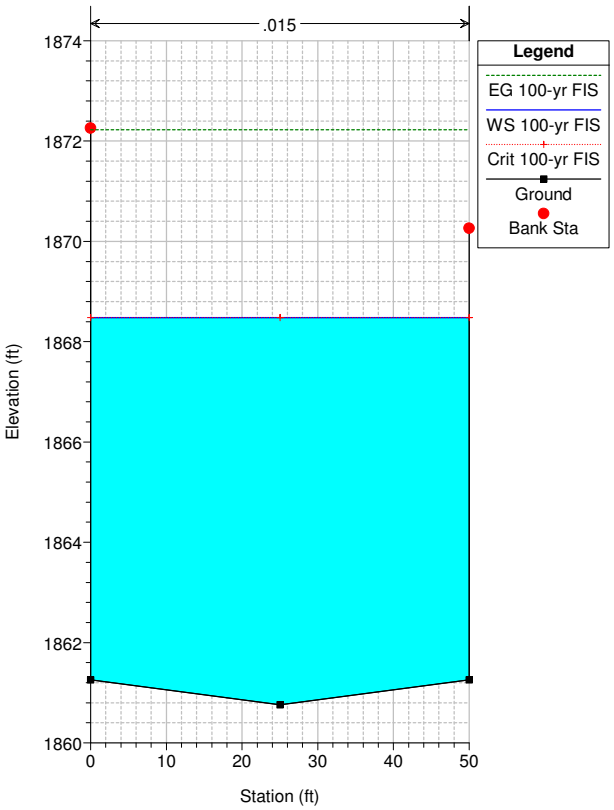
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 1348.02 "FW" 13+48.02



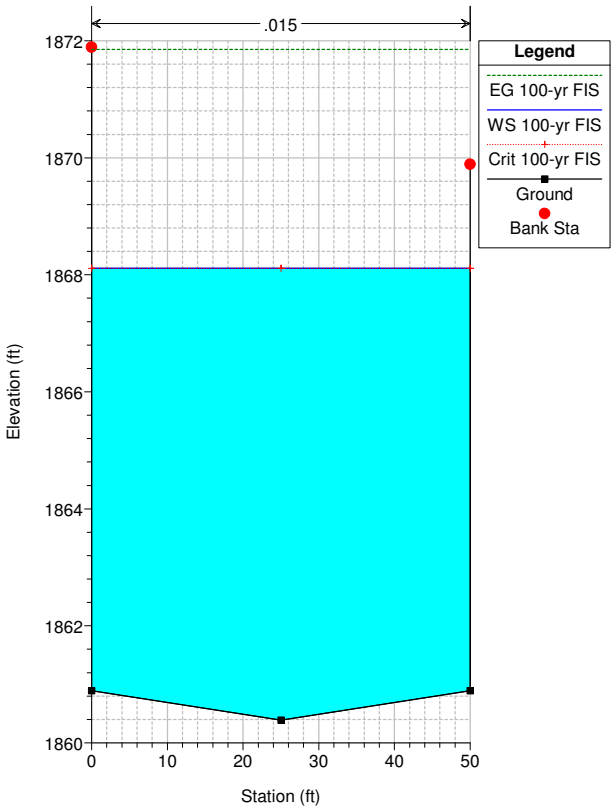
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 1303.53 "FW" 13+03.53



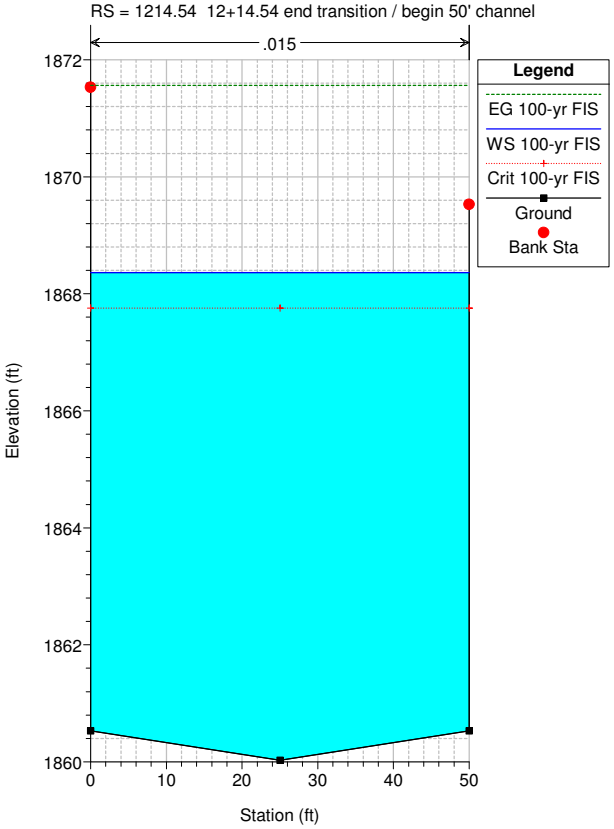
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

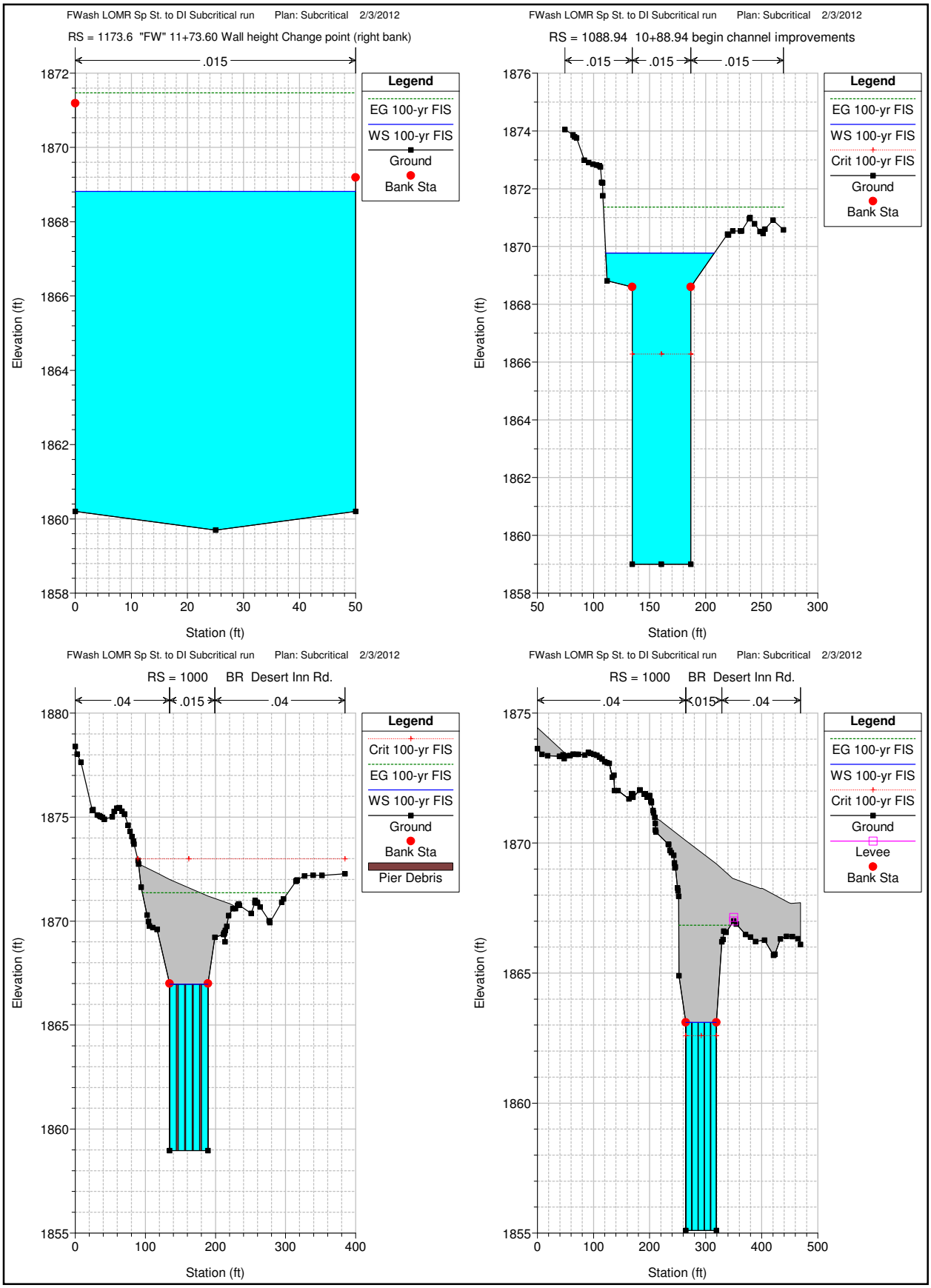
RS = 1259.03 "FW" 12+59.03

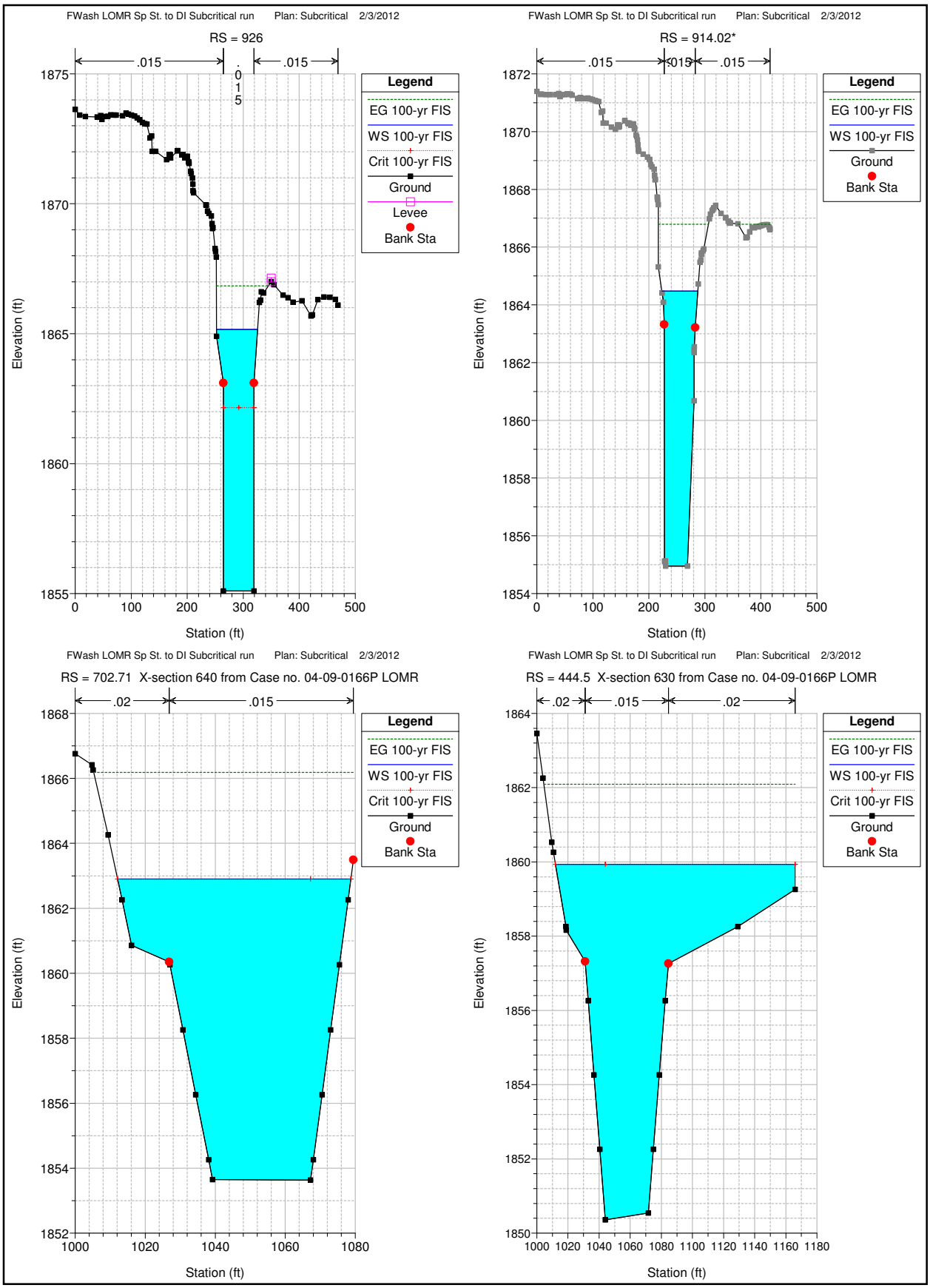


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 1214.54 12+14.54 end transition / begin 50' channel

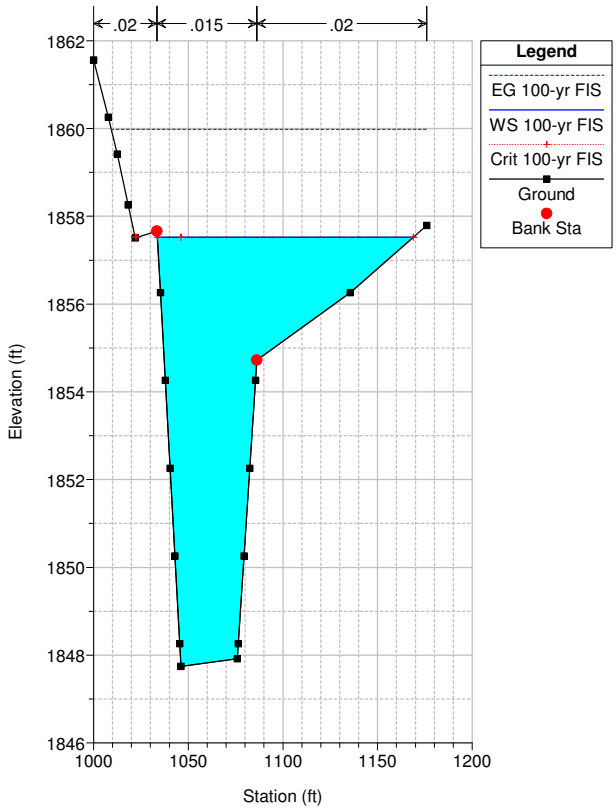



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1173.6 "FW" 11+73.60 Wall height Change point (right bank)
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1088.94 10+88.94 begin channel improvements
.015
.015
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1000 BR Desert Inn Rd.
.04
.015
.04
Legend
Crit 100-yr FIS
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Pier Debris
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 1000 BR Desert Inn Rd.
.04
.015
.04
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 926
.015
.015
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 914.02*
.015
.015
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 702.71 X-section 640 from Case no. 04-09-0166P LOMR
.02
.015
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012
RS = 444.5 X-section 630 from Case no. 04-09-0166P LOMR
.02
.015
.02
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

RS = 223.47 X-section 620 from Case no. 04-09-0166P LOMR



FWash LOMR Sp St. to DI Subcritical run Plan: Subcritical 2/3/2012

FW FW

Legend

EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Left Levee
Right Levee

Elevation (ft)

1940
1920
1900
1880
1860
1840

0
2000
4000
6000
8000
10000

Main Channel Distance (ft)

Proposed Supercritical HECRAS Model

Appendix C.2

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
XXXXXXX  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  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: FWash LOMR Sp St. to DI Supcritical run
Project File : FWLomr_sup.prj
Run Date and Time: 2/3/2012 11:58:52 AM

Project in English units

Project Description:
FWash LOMR Sp St. to DI Supercritical run

****

PLAN DATA

Plan Title: Supercritical
Plan File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.p01

Geometry Title: FMWash LOMR Geometry 2011 import
Geometry File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.g03

Flow Title : 100-yr +
Flow File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.f04

Plan Summary Information:
Number of: Cross Sections = 105 Multiple Openings = 0
Culverts = 2 Inline Structures = 0
Bridges = 4 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: Supercritical Flow

****

FLOW DATA

Flow Title: 100-yr +
Flow File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.f04

Flow Data (cfs)

River	Reach	RS	100-yr FIS
Flamingo Wash	1	8837.78	5500
Flamingo Wash	1	5796	5280
Flamingo Wash	1	5109.79	5500
Flamingo Wash	1	2702.87	5500
Flamingo Wash	1	1558.62	5800
Flamingo Wash	1	926	5800
Flamingo Wash	1	702.71	5800
Flamingo Wash	1	223.47	5800
FW	FW	8837.78	5500
FW	FW	5796	5280
FW	FW	5109.79	5500
FW	FW	2702.87	5500
FW	FW	1558.62	5800
FW	FW	926	5800
FW	FW	702.71	5800
FW	FW	223.47	5800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
FW	FW	100-yr FIS	Normal S = 0.0087	Normal S = 0.01

****

GEOMETRY DATA

Geometry Title: FMWash LOMR Geometry 2011 import
Geometry File : F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.g03

CROSS SECTION

RIVER: FW
REACH: FW RS: 8837.78

INPUT
Description: X-section 24 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1075	1940.62	1075	1925.3	1100	1924.8	1125	1925.3	1125	1940.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1075	.025	1075	.025	1125	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1075 1125 30 30 30 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1935.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.35	Wt. n-Val.		0.025	
W.S. Elev (ft)	1931.62	Reach Len. (ft)	30.00	30.00	30.00
Crit W.S. (ft)	1932.26	Flow Area (sq ft)		328.61	
E.G. Slope (ft/ft)	*0.008702	Area (sq ft)		328.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	16.74	Avg. Vel. (ft/s)		16.74	
Max Chl Dpth (ft)	6.82	Hydr. Depth (ft)		6.57	
Conv. Total (cfs)	58958.9	Conv. (cfs)		58958.9	
Length Wtd. (ft)	30.00	Wetted Per. (ft)		62.65	
Min Ch El (ft)	1924.80	Shear (lb/sq ft)		2.85	
Alpha	1.00	Stream Power (lb/ft s)	1125.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	3.86	50.73	5.45
C & E Loss (ft)		Cum SA (acres)	3.21	9.92	3.52

CROSS SECTION

RIVER: FW
REACH: FW RS: 8807.78

INPUT
Description: X-section 22 from Case no. 04-09-0167P LOMR
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1062.251	939.865	1092.251	924.865	1100	1924.71	1107.751	924.865	1137.751	939.865

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1062.25	.025	1062.25	.025	1137.75	.025

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1062.25 1137.75 120 120 120 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1938.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1935.21	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)	1935.21	Flow Area (sq ft)		375.60	
E.G. Slope (ft/ft)	*0.005469	Area (sq ft)		375.60	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	56.88	Top Width (ft)		56.88	
Vel Total (ft/s)	14.64	Avg. Vel. (ft/s)		14.64	
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)		6.60	
Conv. Total (cfs)	74373.7	Conv. (cfs)		74373.7	
Length Wtd. (ft)	120.00	Wetted Per. (ft)		61.77	
Min Ch El (ft)	1924.71	Shear (lb/sq ft)		2.08	
Alpha	1.00	Stream Power (lb/ft s)	1137.75	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	3.86	50.49	5.45
C & E Loss (ft)	0.31	Cum SA (acres)	3.21	9.88	3.52

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 8687.78

INPUT
Description: X-section 20 from Case no. 04-09-0167P LOMR

```
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  1064.41936.236  1087.71924.586    1100 1924.34  1112.31924.586  1135.61936.236

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  1064.4    .025  1064.4    .025  1135.6    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1064.4  1135.6           382.58  367.78  346.32             .1       .3
```

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1937.42	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 5.45	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1931.97	* Reach Len. (ft)	* 382.58	* 367.78	* 346.32 *
* Crit W.S. (ft)	* 1933.52	* Flow Area (sq ft)	*	* 293.55	* *
* E.G. Slope (ft/ft)	*0.011334	* Area (sq ft)	*	* 293.55	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 54.12	* Top Width (ft)	*	* 54.12	* *
* Vel Total (ft/s)	* 18.74	* Avg. Vel. (ft/s)	*	* 18.74	* *
* Max Chl Dpth (ft)	* 7.63	* Hydr. Depth (ft)	*	* 5.42	* *
* Conv. Total (cfs)	* 51661.5	* Conv. (cfs)	*	* 51661.5	* *
* Length Wtd. (ft)	*	* Wetted Per. (ft)	*	* 57.61	* *
* Min Ch El (ft)	* 1924.34	* Shear (lb/sq ft)	*	* 3.61	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 1135.60	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.91	* Cum Volume (acre-ft)	* 3.86	* 49.56	* 5.45 *
* C & E Loss (ft)	* 0.21	* Cum SA (acres)	* 3.21	* 9.73	* 3.52 *

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: FW
REACH: FW RS: 8320

INPUT
Description: X-section 10 from Case no. 04-09-0167P LOMR

```
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
    1000 1937.36 1049.49 1936.26 1095.06 1934.26 1144.27 1932.26 1220.49 1930.39
 1220.83 1930.26 1228.41 1928.26  1235.7 1926.26 1237.99 1925.61  1249.9 1924.26
 1252.38 1923.96 1254.61 1924.26 1271.01 1926.26 1272.95 1926.49  1279.8  1927.8
 1285.65 1928.26 1306.65 1930.26 1322.46 1932.26 1329.96 1933.29 1344.12 1934.26
 1372.27 1936.26 1402.27 1938.26 1409.32 1938.72 1418.36 1939.14 1426.01 1940.26
 1436.49 1941.26 1496.07 1942.26 1580.86 1943.11 1671.03 1944.26 1677.54 1944.52
 1685.16 1944.66  1718.9 1946.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    1000    .035 1220.49     .03 1306.65    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1220.49 1306.65             120     120     120             .1       .3
```

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1934.25	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.82	* Wt. n-Val.	* 0.035	* 0.030	* 0.035 *
* W.S. Elev (ft)	* 1932.43	* Reach Len. (ft)	* 120.00	* 120.00	* 120.00 *
* Crit W.S. (ft)	* 1932.43	* Flow Area (sq ft)	* 84.57	* 463.60	* 18.60 *
* E.G. Slope (ft/ft)	*0.005458	* Area (sq ft)	* 84.57	* 463.60	* 18.60 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 274.31	* 5164.19	* 61.51 *
* Top Width (ft)	* 183.61	* Top Width (ft)	* 80.40	* 86.16	* 17.05 *
* Vel Total (ft/s)	* 9.70	* Avg. Vel. (ft/s)	* 3.24	* 11.14	* 3.31 *
* Max Chl Dpth (ft)	* 8.47	* Hydr. Depth (ft)	* 1.05	* 5.38	* 1.09 *
* Conv. Total (cfs)	* 74444.3	* Conv. (cfs)	* 3712.8	* 69898.9	* 832.5 *
* Length Wtd. (ft)	* 120.00	* Wetted Per. (ft)	* 80.43	* 87.29	* 17.18 *
* Min Ch El (ft)	* 1923.96	* Shear (lb/sq ft)	* 0.36	* 1.81	* 0.37 *
* Alpha	* 1.24	* Stream Power (lb/ft s)	* 1718.90	* 0.00	* 0.00 *
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 3.49	* 46.37	* 5.38 *
* C & E Loss (ft)	*	* Cum SA (acres)	* 2.85	* 9.14	* 3.45 *

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 8200

INPUT

Description: 8200
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1937.82	3.6581	937.838	10.6881	937.934	19.7231	938.023	20.9691	938.058
29.6781	937.831	41.0151	937.492	43.7331	937.428	44.6641	937.407	45.484	1937.36
47.7651	937.247	70.8731	936.194	76.421	935.774	80.1531	935.466	85.5271	935.228
96.2841	934.653	109.7221	934.061	121.6841	933.445	129.993	1933.07	147.0811	932.337
150.484	1932.13	159.1321	931.786	171.7981	931.641	172.4861	931.644	176.2051	931.575
197.891	931.208	200.14	1931.31	207.2751	931.405	215.4191	931.054	223.2911	930.635
238.404	1930.16	239.6571	930.113	243.561	928.243	251.3841	924.516	252.5161	924.447
260.111	923.987	262.0981	923.188	264.9271	921.795	279.1551	922.147	279.7531	922.158
285.4441	923.947	288.8411	924.505	293.9851	926.031	300.481	927.722	301.7351	928.178
308.1061	928.621	321.971	929.582	323.1111	929.671	324.8981	929.797	326.1821	929.909
342.5171	931.044	342.9141	931.073	347.3781	931.407	350.2991	931.558	359.656	1932.29
372.8841	933.413	373.621	933.478	385.3711	934.642	396.29	1935.73	398.941	935.916
412.717	1936.97	414.8221	937.122						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	239.657	.04	301.735	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
239.657	301.735		100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1933.35	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.30	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1931.06	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1931.18	* Flow Area (sq ft)	* 12.76	* 406.50	* 59.01 *
* E.G. Slope (ft/ft)	*0.009800	* Area (sq ft)	* 12.76	* 406.50	* 59.01 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 40.72	* 5090.71	* 368.57 *
* Top Width (ft)	* 127.29	* Top Width (ft)	* 24.27	* 62.08	* 40.94 *
* Vel Total (ft/s)	* 11.50	* Avg. Vel. (ft/s)	* 3.19	* 12.52	* 6.25 *
* Max Chl Dpth (ft)	* 9.26	* Hydr. Depth (ft)	* 0.53	* 6.55	* 1.44 *
* Conv. Total (cfs)	* 55558.8	* Conv. (cfs)	* 411.3	* 51424.3	* 3723.2 *
* Length Wtd. (ft)	*	* Wetted Per. (ft)	* 24.29	* 64.68	* 41.04 *
* Min Ch El (ft)	* 1921.80	* Shear (lb/sq ft)	* 0.32	* 3.84	* 0.88 *
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 414.82	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.86	* Cum Volume (acre-ft)	* 3.35	* 45.17	* 5.27 *
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 2.71	* 8.93	* 3.37 *

CROSS SECTION

RIVER: FW
REACH: FW RS: 8100.*

INPUT
Description:
Station Elevation Data num= 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1937.05	4.27	1936.95	7	1936.89	9.01	1936.8	12.47	1936.76
19.96	1936.67	23.01	1936.65	24.47	1936.65	28.4	1936.56	29.58	1936.53
31.21	1936.48	33.18	1936.36	34.63	1936.34	46.76	1936.15	47.86	1936.13
51.03	1936.07	52.12	1936.05	52.84	1936.03	53.07	1936.02	55.74	1935.92
56.96	1935.88	74.73	1935.27	82.7	1934.99	89.17	1934.68	91.16	1934.58
93.53	1934.47	96.61	1934.38	99.8	1934.31	112.25	1933.97	112.35	1933.97
118.5	1933.81	125.25	1933.65	128.03	1933.58	140.38	1933.26	141.99	1933.21
151.17	1932.95	151.69	1932.94	157.16	1932.82	159.24	1932.64	168.92	1932.1
171.63	1931.94	174.99	1931.7	175.6	1931.67	179.66	1931.52	184.16	1931.39
185.69	1931.35	200.47	1931.11	201.27	1931.1	201.63	1931.09	205.61	1931.03
206.98	1931.01	225.06	1929.68	225.71	1929.63	226.32	1929.58	226.33	1929.58
230.92	1929.55	233.54	1929.61	237.15	1929.63	241.87	1929.72	246.15	1929.69
249.85	1929.68	251.37	1929.61	260.56	1929.17	261.75	1929.13	271.71	1928.64
278.19	1928.44	279.52	1928.39	279.65	1928.39	279.97	1928.27	280.55	1928.09
284.64	1926.74	292.17	1924.26	294.63	1923.62	296.08	1923.43	302.29	1922.59
305.78	1922.35	307.07	1922.09	308.32	1921.82	311.29	1921.08	311.93	1920.92
321.07	1922.4	321.46	1922.46	325.11	1923.88	327.29	1924.47	330.6	1925.7
331.28	1925.94	334.77	1927.13	335.58	1927.47	340.83	1927.83	346.35	1928.31
347.09	1928.37	352.54	1928.5	364.85	1929.04	369.34	1929.23	369.8	1929.26
371.73	1929.35	374.75	1929.48	376.92	1929.59	377.35	1929.61	381.29	1929.88
382.6	1930.05	389.11	1930.81	396.28	1931.74	398.67	1931.76	400.41	1931.8
401.64	1932.02	404.55	1932.15	405.22	1932.19	412.77	1932.54	415.65	1932.66
417.71	1932.75	418.13	1932.77	419.3	1932.83	419.54	1932.86	433.54	1933.23
434.95	1933.27	435.88	1933.3	452.01	1933.79	453.65	1933.83	455.14	1933.89
455.91	1933.92	457.15	1933.95	471.41	1934.42	472.12	1934.45	477.03	1934.79
477.42	1934.81	489.05	1935.12	489.16	1935.12	489.34	1935.13	493.91	1935.26
495.49	1935.32	499.98	1935.44	506.75	1935.65	506.78	1935.68	517.8	1937.29
523.28	1938.07	524.34	1938.22	524.58	1938.25	524.65	1938.25	525.24	1938.35
525.74	1938.42	526.84	1938.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	279.65	.04	335.58	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
279.65	335.58		100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1932.52	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.64	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1930.88	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *

* Crit W.S. (ft)	* 1930.88	* Flow Area (sq ft)	* 96.59	* 390.55	* 101.65	*
* E.G. Slope (ft/ft)	*0.007090	* Area (sq ft)	* 96.59	* 390.55	* 101.65	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 494.79	* 4360.35	* 644.85	*
* Top Width (ft)	* 180.85	* Top Width (ft)	* 70.87	* 55.93	* 54.05	*
* Vel Total (ft/s)	* 9.34	* Avg. Vel. (ft/s)	* 5.12	* 11.16	* 6.34	*
* Max Chl Dpth (ft)	* 9.96	* Hydr. Depth (ft)	* 1.36	* 6.98	* 1.88	*
* Conv. Total (cfs)	* 65320.2	* Conv. (cfs)	* 5876.4	* 51785.3	* 7658.5	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 70.95	* 57.91	* 54.18	*
* Min Ch El (ft)	* 1920.92	* Shear (lb/sq ft)	* 0.60	* 2.98	* 0.83	*
* Alpha	* 1.21	* Stream Power (lb/ft s)	* 526.84	* 0.00	* 0.00	*
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 3.23	* 44.25	* 5.09	*
* C & E Loss (ft)	*	* Cum SA (acres)	* 2.60	* 8.80	* 3.26	*

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 8000

INPUT
Description: 8000
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01936.271	8.0031935.919	10.3031935.706	22.8191935.348	32.457 1935.15
33.8161935.121	35.672 1935.05	37.9261934.857	53.443 1934.78	60.3941934.681
65.106 1934.56	85.414 1934.03	104.2011933.517	110.4241933.416	128.3051933.289
135.451933.197	143.1661933.131	160.4631933.004	172.7951932.809	179.6421932.766
182.0131932.482	193.0821931.772	200.0141931.239	205.35 1931.04	210.4981930.941
230.465 1930.55	236.5791930.467	257.2511928.058	257.996 1927.97	258.6891927.886
258.7011927.888	271.0631927.907	281.3521928.135	285.5831928.248	299.1831927.651
310.5761926.955	319.4991926.665	319.651926.659	320.0371926.556	320.7391926.409
334.8821923.083	337.886 1922.73	347.2011921.022	353.0181920.591	358.1561920.121
358.935 1920.05	367.5151925.568	369.4211926.765	376.8141927.267	385.6331928.094
393.3091928.122	410.651 1928.7	416.9781928.906	428.2631929.295	433.821929.675
435.662 1929.96	444.8351931.204	454.9351932.777	458.2931932.715	460.7481932.733
462.4781933.119	482.2271933.824	485.7111933.962	487.3681934.028	487.693 1934.07
509.4111934.187	510.7131934.201	533.441934.354	535.7461934.362	537.8571934.413
560.7671934.526	561.7751934.544	569.2421934.961	585.6221934.885	585.7821934.884
586.029 1934.89	592.461 1934.88	610.5511935.068	610.5991935.136	626.1251937.862
635.3341939.415	635.6681939.479	635.772 1939.47	636.5991939.648	637.311939.764
638.851940.195				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	319.65	.04	369.421	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
319.65 369.421 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1931.63	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.13	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1929.50	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1930.04	* Flow Area (sq ft)	* 122.20	* 329.91	* 73.16 *
* E.G. Slope (ft/ft)	*0.010282	* Area (sq ft)	* 122.20	* 329.91	* 73.16 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 850.47	* 4238.82	* 410.71 *
* Top Width (ft)	* 186.37	* Top Width (ft)	* 74.77	* 49.77	* 61.83 *
* Vel Total (ft/s)	* 10.47	* Avg. Vel. (ft/s)	* 6.96	* 12.85	* 5.61 *
* Max Chl Dpth (ft)	* 9.45	* Hydr. Depth (ft)	* 1.63	* 6.63	* 1.18 *
* Conv. Total (cfs)	* 54241.8	* Conv. (cfs)	* 8387.4	* 41803.9	* 4050.5 *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 74.90	* 52.37	* 61.91 *
* Min Ch El (ft)	* 1920.05	* Shear (lb/sq ft)	* 1.05	* 4.04	* 0.76 *
* Alpha	* 1.25	* Stream Power (lb/ft s)	* 638.85	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.85	* Cum Volume (acre-ft)	* 2.98	* 43.43	* 4.89 *
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 2.43	* 8.68	* 3.13 *

CROSS SECTION

RIVER: FW
REACH: FW RS: 7900.*

INPUT
Description:
Station Elevation Data num= 164

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0 1935.96	6.88 1935.52	6.98 1935.52	8.32 1935.47	8.99 1935.42
13.66 1935.28	19.9 1935.11	21.52 1935.07	21.91 1935.06	28.31 1934.81
29.48 1934.76	29.49 1934.76	31.11 1934.7	33.08 1934.56	34.56 1934.52
36.2 1934.46	46.61 1934	47.77 1933.94	52.68 1933.78	56.79 1933.62
57.43 1933.59	64.63 1933.36	67.4 1933.32	74.5 1933.1	90.88 1932.59
95.23 1932.48	96.31 1932.46	96.79 1932.45	111.91 1932.24	116.81 1932.15
118.14 1932.13	124.87 1932.04	126.15 1932.02	126.45 1932.01	127.17 1932
133.8 1931.94	139.96 1931.78	147.28 1931.56	150.71 1931.48	152.71 1931.44
155.52 1931.38	156.68 1931.35	158.75 1931.18	168.41 1930.66	174.45 1930.29
179.11 1930.11	180.3 1930.07	183.6 1929.97	184.88 1929.93	187.23 1929.88
189.27 1929.8	201.01 1929.46	201.63 1929.44	203.32 1929.49	206.34 1929.58
214.25 1929.35	218.59 1929.43	223.37 1929.41	224.37 1929.4	225.02 1929.39
225.63 1929.38	225.64 1929.38	231.97 1929.73	236.42 1929.65	245.4 1929.61

```
   246.1  1929.6  249.09 1929.64     251 1929.59  255.63 1929.35  260.95 1929.02
  270.88 1928.31  274.27 1928.13  275.88 1928.07  276.27 1928.02  278.67 1927.46
   278.8 1927.43  279.14  1927.3  279.75  1927.1   292.1 1922.83  294.72  1922.1
  298.19 1921.01  300.58 1920.25  301.23 1920.18  302.86    1920  307.94 1919.76
  312.43 1919.51  313.11 1919.47  317.18 1921.64   323.6 1925.17  325.93 1926.43
  331.71 1926.84  332.93 1926.93  336.76 1927.26  341.27 1927.65  345.09  1927.8
  348.53 1927.91  349.78 1927.97  352.88 1928.06  358.37 1928.16  364.93 1928.28
  370.91 1928.38   380.9 1928.55  381.59 1928.56  383.92 1928.64  384.12 1928.65
  386.84 1928.79  388.59 1928.95  389.92 1929.07   391.7 1929.21  394.12 1929.18
  397.26 1929.15  398.37 1929.15  405.71 1929.95  406.81 1930.08  409.99 1930.15
  410.66 1930.17  412.31 1930.24  413.05 1930.36  413.95 1930.47  421.43 1930.64
  427.36 1930.87  432.63 1931.01  433.01 1931.02  435.92  1931.1  437.49 1931.15
  437.51 1931.15   437.8 1931.18  458.34 1931.65  459.52 1931.68  459.57 1931.68
  481.06 1932.24  483.25 1932.29   485.1 1932.36  485.24 1932.36  486.19 1932.39
  489.14 1932.47  491.11 1932.51  506.91 1932.79  507.86 1932.82  510.11 1932.92
  513.01 1933.06  513.73 1933.09  514.93 1933.15  521.69 1933.25  530.42 1933.39
  530.57 1933.39   530.8  1933.4   532.9 1933.44  536.89 1933.54  540.88 1933.67
  546.93 1933.93     554 1934.47  554.04  1934.5  557.21 1935.02  566.57 1936.65
  568.73 1937.07     570 1937.31  577.44 1938.06  577.75  1938.1  577.85 1938.09
  578.63 1938.19   579.3 1938.26  580.29 1938.41  580.76 1938.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03   278.8     .04  325.93     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         278.8  325.93             100     100     100             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1931.88  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.43  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)          * 1930.44  * Reach Len. (ft)       *  100.00  *  100.00  *  100.00  *
* Crit W.S. (ft)          * 1930.44  * Flow Area (sq ft)     *  109.30  *  375.30  *  177.28  *
* E.G. Slope (ft/ft)      *0.005694  * Area (sq ft)          *  109.30  *  375.30  *  177.28  *
* Q Total (cfs)           * 5500.00  * Flow (cfs)            *  414.34  * 4028.41  * 1057.25  *
* Top Width (ft)          *  241.79  * Top Width (ft)        *  106.85  *   47.13  *   87.80  *
* Vel Total (ft/s)        *    8.31  * Avg. Vel. (ft/s)      *    3.79  *   10.73  *    5.96  *
* Max Chl Dpth (ft)       *   10.97  * Hydr. Depth (ft)      *    1.02  *    7.96  *    2.02  *
* Conv. Total (cfs)       * 72888.9  * Conv. (cfs)           *  5491.1  * 53386.6  * 14011.2  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)      *  107.01  *   50.08  *   87.96  *
* Min Ch El (ft)          * 1919.47  * Shear (lb/sq ft)      *    0.36  *    2.66  *    0.72  *
* Alpha                   *    1.34  * Stream Power (lb/ft s) *  580.76  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    0.75  * Cum Volume (acre-ft)  *    2.71  *   42.62  *    4.60  *
* C & E Loss (ft)         *    0.21  * Cum SA (acres)        *    2.22  *    8.56  *    2.96  *
*************************************************************************************************

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.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 7800

INPUT
Description: 7800
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************
       01935.645   5.869 1935.12     7.11935.155  11.6611934.999   18.371934.832
  18.697 1934.82  25.1591934.408  29.4921934.198  30.8971934.073  40.7721933.118
  49.0151932.649  55.1591932.392  57.5251932.401  81.2761931.532  82.6061931.478
  99.6931931.087 107.6651930.921  107.921930.912 108.5371930.887 114.1961930.817
 125.7031930.251  130.331930.085 132.7331929.981 153.8821929.132 157.7941928.957
 159.7951928.894 161.5331928.778 172.0871928.339  173.531928.466 182.8561929.286
 186.5581930.022  190.641930.636 197.9761931.558 210.036 1931.05  214.221931.029
 218.1741930.777 234.079 1929.43 235.454 1929.37 235.7891929.287 237.9471928.194
 254.5241920.011 256.571    1919 257.1211918.993 267.2781918.883 272.0971921.083
 282.4491926.098 287.8891926.502 292.654 1926.87 300.5111927.487 304.9321927.767
 307.8541927.841 313.0231927.857 334.2621927.839 337.1141927.813 337.2991927.821
 342.7691927.987 344.445 1928.02  346.731927.601 350.7331926.911 357.6511927.314
 362.3151927.625 364.5741927.809 372.4681927.884 378.0591928.118 383.3851928.205
 387.633 1928.27 408.3821929.155 432.4941930.306  433.52 1930.36 436.305  1930.5
  438.161930.573 456.0711931.156 458.8081931.262 459.4811931.288 466.9891931.571
 477.5521931.984 485.0781932.415 490.783 1932.87  500.471934.315 509.291 1935.84
 512.5271936.536 522.227 1936.77 522.673 1936.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03 237.947     .04 282.449     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       237.947 282.449             100     100     100             .1       .3
Left Levee      Station=  197.98      Elevation= 1931.56

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1931.39  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.51  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)          * 1929.88  * Reach Len. (ft)       *  100.00  *  100.00  *  100.00  *
* Crit W.S. (ft)          * 1929.88  * Flow Area (sq ft)     *    4.53  *  347.07  *  269.15  *
* E.G. Slope (ft/ft)      *0.006421  * Area (sq ft)          *    4.53  *  347.07  *  269.15  *
* Q Total (cfs)           * 5500.00  * Flow (cfs)            *   10.96  * 3848.43  * 1640.61  *
* Top Width (ft)          *  194.90  * Top Width (ft)        *    9.22  *   44.50  *  141.18  *
```

* Vel Total (ft/s)	* 8.86	* Avg. Vel. (ft/s)	* 2.42	* 11.09	* 6.10	*
* Max Chl Dpth (ft)	* 11.00	* Hydr. Depth (ft)	* 0.49	* 7.80	* 1.91	*
* Conv. Total (cfs)	* 68635.7	* Conv. (cfs)	* 136.7	* 48025.4	* 20473.6	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 9.51	* 48.28	* 141.42	*
* Min Ch El (ft)	* 1918.88	* Shear (lb/sq ft)	* 0.19	* 2.88	* 0.76	*
* Alpha	* 1.24	* Stream Power (lb/ft s)	* 522.67	* 197.98	* 0.00	*
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 2.58	* 41.79	* 4.09	*
* C & E Loss (ft)	*	* Cum SA (acres)	* 2.09	* 8.46	* 2.70	*

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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: FW
REACH: FW RS: 7700.*

INPUT
Description:
Station Elevation Data num= 126

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1932.42	4.3	1932.11	5.2	1932.12	8.54	1932	10.77	1931.94
13.46	1931.88	13.7	1931.87	18.43	1931.64	21.61	1931.51	22.64	1931.44
23.44	1931.38	29.87	1930.91	35.91	1930.62	40.41	1930.46	42.15	1930.45
50.15	1930.19	59.55	1929.8	60.52	1929.76	63.6	1929.66	73.04	1929.39
78.88	1929.24	79.07	1929.23	79.52	1929.21	83.67	1929.12	89.5	1928.85
92.1	1928.72	95.49	1928.57	97.25	1928.48	103.76	1928.18	112.74	1927.79
115.61	1927.66	117.08	1927.6	118.35	1927.52	126.08	1927.18	127.14	1927.23
128.88	1927.31	133.97	1927.55	136.68	1927.88	139.68	1928.15	145.05	1928.55
153.89	1928.18	156.95	1928.13	157.35	1928.11	159.85	1927.97	171.5	1927.14
171.57	1927.13	172.51	1927.09	172.75	1927.04	174.34	1926.47	187.5	1920.76
191.53	1918.99	192.64	1918.5	193.65	1918.25	194.22	1918.23	195.8	1918.2
204.76	1918.01	208.82	1920.15	208.89	1920.19	213.62	1922.74	215.56	1924.02
217.76	1925.3	222.2	1925.78	223.11	1925.87	223.65	1925.92	225.4	1926.01
227.79	1926.13	235.52	1926.53	239.87	1926.71	242.75	1926.78	247.15	1926.83
247.83	1926.84	259.24	1926.9	261.5	1926.89	268.72	1926.71	271.53	1926.63
271.71	1926.63	276.4	1926.6	277.09	1926.59	278.74	1926.57	280.99	1926.31
281.56	1926.25	282.01	1926.2	282.21	1926.19	283.12	1926.1	284.92	1925.93
287.96	1926.01	290.66	1926.16	291.73	1926.22	296.32	1926.49	297.9	1926.59
298.54	1926.62	306.3	1926.66	310.57	1926.75	311.8	1926.78	317.04	1926.83
321.22	1926.87	323.34	1926.92	335.62	1927.25	341.63	1927.43	348.78	1927.65
360.45	1927.86	365.35	1927.95	366.36	1927.97	369.1	1928.02	370.92	1928.04
374.09	1928.08	388.54	1928.69	391.23	1928.81	391.89	1928.84	396.48	1929.05
399.28	1929.13	401.68	1929.2	406.61	1929.91	409.67	1930.3	417.07	1931.32
422.68	1932.16	425.39	1932.66	432.21	1933.9	439.22	1935.26	439.45	1935.3
439.6	1935.32	440.89	1935.5	444.07	1936	448.12	1936.25	453.61	1936.31
454.05	1936.32								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	174.34	.04	217.76	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
174.34 217.76 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1930.48	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.35	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1928.13	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1928.90	* Flow Area (sq ft)	* 27.75	* 309.64	* 196.14 *
* E.G. Slope (ft/ft)	*0.010951	* Area (sq ft)	* 27.75	* 309.64	* 196.14 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 94.97	* 4228.61	* 1176.42 *
* Top Width (ft)	* 252.66	* Top Width (ft)	* 51.79	* 43.42	* 157.45 *
* Vel Total (ft/s)	* 10.31	* Avg. Vel. (ft/s)	* 3.42	* 13.66	* 6.00 *
* Max Chl Dpth (ft)	* 10.12	* Hydr. Depth (ft)	* 0.54	* 7.13	* 1.25 *
* Conv. Total (cfs)	* 52557.5	* Conv. (cfs)	* 907.5	* 40408.2	* 11241.8 *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	* 51.99	* 47.03	* 157.58 *
* Min Ch El (ft)	* 1918.01	* Shear (lb/sq ft)	* 0.36	* 4.50	* 0.85 *
* Alpha	* 1.42	* Stream Power (lb/ft s)	* 454.05	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.82	* Cum Volume (acre-ft)	* 2.54	* 41.03	* 3.55 *
* C & E Loss (ft)	* 0.08	* Cum SA (acres)	* 2.02	* 8.36	* 2.35 *

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 7600

INPUT
Description: 7600
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1929.193	6.8381	928.963	14.885	1928.8	31.8519	28.374	40.3951	927.939
56.8421	927.284	65.8991	926.732	81.8551	925.937	99.9391	925.227	108.9671	924.843
110.7251	924.744	124.3591	919.593	129.691	917.526	132.9551	917.427	142.2421	917.137
145.619	1919.26	149.6191	921.725	151.2371	923.188	153.0641	924.508	157.4341	925.128
158.8611	925.301	160.5781	925.348	181.9691	925.815	193.8591	925.947	196.081	925.929
210.7281	925.227	215.8031	924.989	216.2481	924.979	216.4471	924.984	217.3391	924.969

222.1031924.931 224.7531925.071 231.881925.428 244.3351925.444 256.8881925.479
268.9681925.607 281.9091925.802 293.3811925.651 306.7981925.473 328.8141926.627
333.9291926.725 338.7761927.957 357.2471932.032 370.851934.972 371.0681935.017
371.2241935.029 379.6031935.866 385.4321935.859

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	110.725	.04	153.064	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
110.725 153.064 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1929.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.61	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1926.64	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1927.45	Flow Area (sq ft)	41.78	285.78	186.54
E.G. Slope (ft/ft)	*0.013403	Area (sq ft)	41.78	285.78	186.54
Q Total (cfs)	5500.00	Flow (cfs)	234.99	4155.18	1109.83
Top Width (ft)	261.66	Top Width (ft)	42.95	42.34	176.37
Vel Total (ft/s)	10.70	Avg. Vel. (ft/s)	5.63	14.54	5.95
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)	0.97	6.75	1.06
Conv. Total (cfs)	47508.2	Conv. (cfs)	2029.8	35891.8	9586.6
Length Wtd. (ft)	100.00	Wetted Per. (ft)	43.00	45.97	176.50
Min Ch El (ft)	1917.14	Shear (lb/sq ft)	0.81	5.20	0.88
Alpha	1.47	Stream Power (lb/ft s)	385.43	0.00	0.00
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	2.46	40.35	3.11
C & E Loss (ft)	0.03	Cum SA (acres)	1.91	8.26	1.97

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: FW
REACH: FW RS: 7500.*

INPUT
Description:
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.85	4.1	1928.75	8.3	1928.62	18.08	1928.39	20.22	1928.34
26.79	1928.19	38.68	1927.98	41.52	1927.9	49.06	1927.55	54.59	1927.33
62.8	1926.96	69.03	1926.63	74.75	1926.27	80.03	1926.14	84.08	1926.05
94.58	1925.56	99.4	1925.39	105.77	1925.2	114.95	1925.17	121.37	1924.99
126.66	1924.83	132.33	1924.64	133.46	1924.6	134.46	1924.55	144.41	1919.32
146.28	1918.33	146.38	1918.32	147.05	1918.21	147.79	1918.09	149.98	1917.75
152.2	1917.39	152.9	1917.34	153.01	1917.31	153.94	1917.3	155.09	1917.28
156.2	1917.23	156.43	1917.21	160.03	1917.03	165.28	1916.78	167.65	1918.11
169.12	1919	173.67	1921.71	175.5	1923.04	177.58	1924.37	181.58	1924.72
181.63	1924.72	182.88	1924.82	184.45	1924.85	189.57	1924.96	191.46	1925.23
191.74	1925.31	200.95	1924.88	202.82	1924.84	204	1924.82	204.15	1924.81
214.86	1924.48	216.89	1924.4	218.75	1924.28	223.31	1924	224.03	1923.98
229.94	1923.75	230.28	1923.74	231.1	1923.73	234.92	1923.63	235.33	1923.63
235.51	1923.63	236.32	1923.62	240.68	1923.61	243.1	1923.68	249.61	1923.86
252.28	1923.87	257.21	1923.87	260.41	1923.95	260.99	1923.96	272.47	1924.24
283.51	1924.55	284.86	1924.59	295.33	1924.74	305.82	1924.72	312.39	1924.71
312.52	1924.71	314.46	1924.73	318.08	1924.77	338.2	1925.73	338.68	1925.74
340.11	1925.79	341.81	1925.89	342.87	1925.95	347.3	1926.78	364.19	1929.61
366.13	1929.94	366.79	1930.03	367.18	1930.09	367.58	1930.12	370.96	1930.85
376.62	1931.91	376.82	1931.95	376.96	1931.96	384.62	1932.91	388.1	1933.15
389.94	1933.21								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	134.46	.04	177.58	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
134.46 177.58 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1927.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.73	Wt. n-Val.	0.030	0.040	0.030
W.S. Elev (ft)	1926.14	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1926.56	Flow Area (sq ft)	45.40	292.75	264.47
E.G. Slope (ft/ft)	*0.009411	Area (sq ft)	45.40	292.75	264.47
Q Total (cfs)	5500.00	Flow (cfs)	193.63	3575.93	1730.44
Top Width (ft)	263.65	Top Width (ft)	54.25	43.12	166.28
Vel Total (ft/s)	9.13	Avg. Vel. (ft/s)	4.27	12.21	6.54
Max Chl Dpth (ft)	9.36	Hydr. Depth (ft)	0.84	6.79	1.59
Conv. Total (cfs)	56695.8	Conv. (cfs)	1996.0	36861.8	17837.9
Length Wtd. (ft)	100.00	Wetted Per. (ft)	54.28	46.91	166.43
Min Ch El (ft)	1916.78	Shear (lb/sq ft)	0.49	3.67	0.93
Alpha	1.33	Stream Power (lb/ft s)	389.94	0.00	0.00
Frctn Loss (ft)	1.11	Cum Volume (acre-ft)	2.36	39.69	2.60
C & E Loss (ft)	0.27	Cum SA (acres)	1.80	8.16	1.58

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 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: FW
REACH: FW RS: 7400

INPUT
Description: 7400
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01928.499	4.8291928.416	23.7941927.916	31.5251927.758	48.8481927.536					
64.231926.897	73.89 1926.44	87.9481925.541	98.921 1925.54	111.2741924.977					
124.4471924.663	135.2411924.905	149.0171924.624	157.0171924.411	158.202 1924.36					
167.926 1917.74	169.7531916.485	169.851916.496	170.4971916.529	173.3681916.773					
175.5361916.944	176.2141917.104	177.2311917.103	178.3581917.104	179.6661917.007					
183.1871916.763	188.3151916.429	190.971917.781	202.11924.231	205.7691924.312					
212.9571924.446	214.668 1924.95	214.9221925.093	223.2651924.013	224.9591923.897					
226.1691923.811	239.3881922.731	243.5231922.408	244.1691922.399	249.5271922.259					
250.5721922.272	269.7631922.306	274.228 1922.3	277.1251922.459	299.273 1923.56					
324.2071923.856	324.3221923.859	326.0791923.931	348.0181924.852	349.3161924.917					
350.861925.073	372.887 1927.38	373.4851927.406	373.8321927.445	374.1991927.401					
377.2581928.066	392.7841930.429	394.4551930.557							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	158.202	.04	202.1	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
158.202	202.1	77.52	100	117	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1926.91	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.40	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1925.51	* Reach Len. (ft)	* 77.52	* 100.00	* 117.00 *
* Crit W.S. (ft)	* 1925.68	* Flow Area (sq ft)	* 39.54	* 292.93	* 306.49 *
* E.G. Slope (ft/ft)	*0.007941	* Area (sq ft)	* 39.54	* 292.93	* 306.49 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 134.22	* 3218.43	* 2147.35 *
* Top Width (ft)	* 255.43	* Top Width (ft)	* 58.61	* 43.90	* 152.93 *
* Vel Total (ft/s)	* 8.61	* Avg. Vel. (ft/s)	* 3.39	* 10.99	* 7.01 *
* Max Chl Dpth (ft)	* 9.08	* Hydr. Depth (ft)	* 0.67	* 6.67	* 2.00 *
* Conv. Total (cfs)	* 61719.0	* Conv. (cfs)	* 1506.2	* 36116.0	* 24096.8 *
* Length Wtd. (ft)	* 103.46	* Wetted Per. (ft)	* 58.63	* 48.45	* 153.26 *
* Min Ch El (ft)	* 1916.43	* Shear (lb/sq ft)	* 0.33	* 3.00	* 0.99 *
* Alpha	* 1.22	* Stream Power (lb/ft s)	* 394.46	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.86	* Cum Volume (acre-ft)	* 2.27	* 39.02	* 1.94 *
* C & E Loss (ft)	* 0.10	* Cum SA (acres)	* 1.67	* 8.06	* 1.21 *

CROSS SECTION

RIVER: FW
REACH: FW RS: 7300.*

INPUT
Description:
Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.84	.03	1928.84	.89	1928.82	5.01	1928.8	10.84	1928.74
13.59	1928.69	18.79	1928.53	22.56	1928.44	24.69	1928.46	27.71	1928.49
28.66	1928.39	30.5	1928.32	32.71	1928.11	45.73	1926.94	46.85	1926.91
49.92	1926.77	50.69	1926.74	65.68	1925.87	66.65	1925.79	71.41	1925.38
76.68	1925.09	78.23	1924.99	88.75	1924.42	91.26	1924.3	93.06	1924.27
98.92	1924.56	102.65	1924.73	104.05	1924.76	110.3	1925.06	110.98	1925.03
114.49	1924.8	115.47	1924.75	118.19	1924.66	120.75	1924.63	122.16	1924.59
123.59	1924.57	129.14	1924.55	139.7	1924.73	140.34	1924.72	148.46	1924.48
154.64	1924.35	159.28	1924.24	162.94	1924	164.17	1923.9	171.74	1919.95
174.12	1918.72	177.47	1917.82	179.1	1917.38	179.97	1917.14	180.1	1917.14
180.99	1917.14	184.92	1917.18	185.61	1917.18	187.88	1917.21	188.81	1917.28
190.2	1917.26	191.74	1917.24	191.96	1917.23	193.53	1917.13	194.17	1917.08
198.35	1916.86	204.71	1916.52	205.37	1916.49	206.29	1916.86	207.07	1917.18
208.32	1917.73	220.68	1923.61	223.58	1923.76	229.27	1924.03	230.62	1924.34
230.82	1924.42	237.43	1924.12	238.77	1924.11	239.73	1924.1	242.45	1924.06
250.19	1923.75	252.29	1923.67	253.46	1923.59	253.97	1923.58	258.21	1923.42
259.04	1923.41	259.45	1923.4	260.61	1923.38	260.99	1923.35	261.6	1923.35
268.7	1923.47	274.23	1923.54	277.76	1923.58	280.06	1923.69	283.3	1923.82
285.33	1923.94	297.58	1924.66	305.98	1924.95	317.32	1925.31	317.41	1925.32
318.8	1925.39	321.46	1925.52	336.16	1926.33	337.19	1926.39	338.41	1926.5
354.71	1928.05	355.85	1928.15	356.32	1928.17	356.59	1928.19	356.89	1928.18
357.59	1928.29	358.93	1928.51	359.31	1928.57	362.63	1928.94	371.59	1929.95
372.92	1930.04								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	164.17	.04	220.68	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
164.17	220.68	77.52	100	117	.1	.3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1927.14	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.29	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1925.85	* Reach Len. (ft)	* 77.52	* 100.00	* 117.00 *

Crit W.S. (ft)	1925.85	Flow Area (sq ft)	114.81	405.81	173.67		
E.G. Slope (ft/ft)	*0.005778	Area (sq ft)	114.81	405.81	173.67		
Q Total (cfs)	5500.00	Flow (cfs)	479.31	4117.02	903.67		
Top Width (ft)	261.50	Top Width (ft)	98.24	56.51	106.75		
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)	4.17	10.15	5.20		
Max Chl Dpth (ft)	9.36	Hydr. Depth (ft)	1.17	7.18	1.63		
Conv. Total (cfs)	72355.5	Conv. (cfs)	6305.6	54161.6	11888.3		
Length Wtd. (ft)		Wetted Per. (ft)	98.34	59.59	106.89		
Min Ch El (ft)	1916.49	Shear (lb/sq ft)	0.42	2.46	0.59		
Alpha	1.32	Stream Power (lb/ft s)	372.92	0.00	0.00		
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	2.13	38.21	1.30		
C & E Loss (ft)	0.03	Cum SA (acres)	1.53	7.95	0.86		

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 7200

INPUT
Description: 7200
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01929.176	.0281929.178	.9211929.159	11.2291929.203	14.0881929.178					
19.4741928.997	23.3761928.912	28.722 1929.12	29.7031928.938	31.604 1928.83					
47.397 1926.29	48.5541926.229	51.7361926.003	68.0721924.799	74.011924.083					
81.0681923.637	91.9711923.146	96.4431922.998	102.5111923.578	107.8321924.048					
114.3071924.907	115.0081924.887	118.651924.575	122.4831924.406	125.1361924.397					
126.5951924.363	128.0781924.357	144.7771924.561	153.8571924.224	165.0681923.971					
170.1341923.448	179.7481919.317	182.7671918.042	189.0791917.829	197.3491917.551					
205.4031917.365	208.2061917.195	221.5881916.581	222.4181916.548	223.4291916.876					
224.2871917.148	239.2531922.987	255.292 1924.6	262.5371924.824	267.8121924.532					
268.6641924.481	268.9431924.428	269.391924.419	274.622 1924.65	285.3731924.986					
286.8721925.082	302.0821926.222	313.4821926.972	337.9671928.861	340.0921928.989					
341.0811929.064	343.7991929.174	351.3791929.518							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	170.134	.04	239.253	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
170.134 239.253 69 100 115.52 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1926.76	Element	Left OB	Channel	Right OB		
Vel Head (ft)	1.45	Wt. n-Val.	0.030	0.040	0.030		
W.S. Elev (ft)	1925.32	Reach Len. (ft)	69.00	100.00	115.52		
Crit W.S. (ft)	1925.32	Flow Area (sq ft)	129.35	467.75	43.73		
E.G. Slope (ft/ft)	*0.006185	Area (sq ft)	129.35	467.75	43.73		
Q Total (cfs)	5500.00	Flow (cfs)	563.64	4782.34	154.02		
Top Width (ft)	228.94	Top Width (ft)	109.08	69.12	50.74		
Vel Total (ft/s)	8.58	Avg. Vel. (ft/s)	4.36	10.22	3.52		
Max Chl Dpth (ft)	8.77	Hydr. Depth (ft)	1.19	6.77	0.86		
Conv. Total (cfs)	69932.1	Conv. (cfs)	7166.6	60807.2	1958.3		
Length Wtd. (ft)	97.07	Wetted Per. (ft)	109.33	71.45	50.86		
Min Ch El (ft)	1916.55	Shear (lb/sq ft)	0.46	2.53	0.33		
Alpha	1.27	Stream Power (lb/ft s)	351.38	0.00	0.00		
Frctn Loss (ft)		Cum Volume (acre-ft)	1.91	37.21	1.00		
C & E Loss (ft)		Cum SA (acres)	1.35	7.80	0.65		

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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 7100.*

INPUT
Description:
Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0 1930.64	.03 1930.64	.85 1930.6	10.36 1930.31	10.74 1930.3					
11.59 1930.12	13 1929.84	15.29 1929.37	17.96 1929.19	21.56 1928.97					
24.61 1928.88	26.49 1928.76	27.4 1928.6	29.15 1928.39	43.72 1925.89					
44.79 1925.77	46.45 1925.56	47.72 1925.49	49.4 1925.39	50.42 1925.31					
51.64 1925.23	57.61 1924.89	59.55 1924.79	62.79 1924.66	66.5 1924.41					
68.27 1924.26	74.78 1923.92	82.31 1923.61	84.84 1923.39	86.22 1923.29					
88.96 1923.05	94.56 1922.95	96.68 1922.9	99.47 1922.79	100.02 1922.78					
105.44 1922.76	106.09 1922.71	107.46 1922.54	109.45 1922.42	112.98 1922.29					
114.37 1922.27	115.43 1922.25	116.77 1922.22	118.14 1922.2	123.67 1922.18					
133.55 1922.29	139.83 1922.19	141.92 1922.17	150.71 1922.15	152.26 1922.15					
156.93 1921.96	164.45 1919.38	165.34 1919.06	167.98 1918.15	173.5 1917.47					
174.87 1917.3	180.73 1916.92	181.83 1916.86	187.77 1916.56	190.22 1916.38					
190.37 1916.38	197.64 1916.12	201.92 1916.01	202.65 1915.99	203.83 1916.16					
204.84 1916.29	209.84 1917.13	213.96 1918.77	214.6 1919.03	217.69 1919.32					
217.71 1919.32	222.08 1921.02	222.29 1921.11	222.42 1921.17	229.72 1923.52					
231.19 1923.66	238.67 1924.21	246.02 1924.49	251.37 1924.47	252.23 1924.47					
252.51 1924.45	252.97 1924.45	256.3 1924.61	258.27 1924.74	259.7 1924.82					

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   263.9 1925.11  269.17 1925.46  270.69 1925.58  286.11 1926.93  287.92 1927.08
  297.66 1927.94   300.2 1928.18  303.36 1928.48  304.48  1928.6  305.09 1928.72
  306.66 1928.89  307.73 1929.02  308.73 1929.11  310.62 1929.39  311.53 1929.51
  313.24 1929.66  314.59 1929.83  315.85  1929.9  317.39 1929.85  318.58 1929.89
  320.34 1929.91  322.48 1929.78  323.17 1929.74  324.64 1929.75  325.64 1929.77
  325.69 1929.77   328.4 1929.74  329.64 1929.73  332.99 1929.84  336.08 1929.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  156.93     .04  222.42     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        156.93  222.42               69     100  115.52             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************************
* E.G. Elev (ft)         * 1925.94  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.14  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1923.80  * Reach Len. (ft)       *   69.00  *  100.00  *  115.52  *
* Crit W.S. (ft)         * 1924.15  * Flow Area (sq ft)     *   99.27  *  395.35  *   11.04  *
* E.G. Slope (ft/ft)     *0.010297  * Area (sq ft)          *   99.27  *  395.35  *   11.04  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *  579.76  * 4864.69  *   55.55  *
* Top Width (ft)         *  155.33  * Top Width (ft)        *   79.19  *   65.49  *   10.65  *
* Vel Total (ft/s)       *   10.88  * Avg. Vel. (ft/s)      *    5.84  *   12.30  *    5.03  *
* Max Chl Dpth (ft)      *    7.81  * Hydr. Depth (ft)      *    1.25  *    6.04  *    1.04  *
* Conv. Total (cfs)      * 54202.3  * Conv. (cfs)           *  5713.5  * 47941.3  *   547.4  *
* Length Wtd. (ft)       *   95.77  * Wetted Per. (ft)      *   79.24  *   67.04  *   11.03  *
* Min Ch El (ft)         * 1915.99  * Shear (lb/sq ft)      *    0.81  *    3.79  *    0.64  *
* Alpha                  *    1.16  * Stream Power (lb/ft s) *  336.08  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.76  * Cum Volume (acre-ft)  *    1.73  *   36.22  *    0.93  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)        *    1.20  *    7.65  *    0.57  *
*****************************************************************************************************

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: FW
REACH: FW                RS: 7000

INPUT
Description: 7000
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01932.104    9.841931.401  10.6121931.044  14.0021929.636  22.5441928.726
  42.5451925.027  45.2481924.907   46.181924.823  47.3011924.769  52.7661924.574
  54.5411924.522  60.9091924.507  75.3831923.943  78.9731923.478  88.5451922.018
  91.6071921.424  98.4231920.323 104.7531920.131 113.2661919.927 128.0691920.065
 138.0341920.294 143.7361920.473 150.1691918.996 159.0941916.826 165.0551916.195
 172.3651915.563 178.5911915.443 182.8771915.437 191.1351915.443 195.8691917.353
 196.6071917.676 200.1491917.215 200.1741917.225 205.1921919.158 205.4361919.266
 205.5781919.344 212.9841923.321 214.4741923.457  239.921924.647  243.371924.947
 247.6291925.405 271.9731927.823 284.4181929.191 287.6221929.555 288.7541929.705
  289.37 1929.91 290.9621930.125 292.0531930.302 293.057  1930.4 294.9771930.818
 295.8951931.002 297.6361931.153 298.9961931.404 300.2751931.447 301.8431931.226
  303.051931.215 304.8331931.115 307.6991930.572 310.2561930.479 314.2541930.233
 317.6531930.297 320.7831930.339

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03 143.736     .04 205.578     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       143.736 205.578              100     100     100             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************************
* E.G. Elev (ft)         * 1924.76  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.49  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1922.26  * Reach Len. (ft)       *   80.00  *   80.00  *   80.00  *
* Crit W.S. (ft)         * 1922.74  * Flow Area (sq ft)     *  108.21  *  333.73  *    7.93  *
* E.G. Slope (ft/ft)     *0.014125  * Area (sq ft)          *  108.21  *  333.73  *    7.93  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *  977.06  * 4467.77  *   55.17  *
* Top Width (ft)         *  124.07  * Top Width (ft)        *   56.79  *   61.84  *    5.43  *
* Vel Total (ft/s)       *   12.23  * Avg. Vel. (ft/s)      *    9.03  *   13.39  *    6.96  *
* Max Chl Dpth (ft)      *    6.82  * Hydr. Depth (ft)      *    1.91  *    5.40  *    1.46  *
* Conv. Total (cfs)      * 46277.8  * Conv. (cfs)           *  8221.1  * 37592.5  *   464.2  *
* Length Wtd. (ft)       *   80.00  * Wetted Per. (ft)      *   56.97  *   63.20  *    6.17  *
* Min Ch El (ft)         * 1915.44  * Shear (lb/sq ft)      *    1.68  *    4.66  *    1.13  *
* Alpha                  *    1.07  * Stream Power (lb/ft s) *  320.78  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    1.15  * Cum Volume (acre-ft)  *    1.57  *   35.38  *    0.91  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)        *    1.09  *    7.50  *    0.55  *
*****************************************************************************************************

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.

BRIDGE


RIVER: FW
REACH: FW                RS: 6925

INPUT
Description: Bridge #3
```

Distance from Upstream XS = 80
Deck/Roadway Width = 6.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 182

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1924.76		9.865	1924.01		14.128	1923.53	
19.036	1923.48		22.568	1923.31		36.902	1921.52	
37.857	1921.5		39.029	1921.4		39.471	1921.35	
40.317	1921.24		44.502	1920.85		50	1920.66	
59.812	1920.33		64.014	1920.1		67.172	1920.01	
79.924	1919.48		86.757	1919.36		94.41	1918.81	
101.392	1918.33		101.393	1918.33		101.399	1918.33	
105.828	1918.22		109.037	1918.15		116.26	1918	
117.438	1918		122.804	1917.91		123.681	1917.9	
130.06	1918.05		131.14	1918.04		132.507	1918.03	
132.916	1918.03		139.139	1918.06		141.068	1918.02	
146.4	1918.25		147.269	1918.25		148.226	1918.3	
150.483	1918.43		158.935	1918.89		159.855	1918.8	
168.727	1919.44		174.185	1919.49		175.995	1919.61	
182.377	1920.42		185.236	1920.79		191.111	1920.98	
197.477	1921.24		204.974	1921.36		205.184	1921.37	
206.21	1921.35		211.068	1921.29		225.117	1921.83	
229.88	1921.37	1919.37	265.132	1921.81	1919.37	305.037	1921.8	1919.37
305.037	1921.8	1919.37	325.352	1921.36	1919.37	333.108	1921.5	
338.081	1921.58		340.892	1921.66		353.911	1922.01	
362.57	1922.15		364.634	1921.64		365.329	1921.64	
366.105	1921.66		372.985	1922.35		375.482	1922.39	
378.346	1922.43		378.529	1922.43		381.131	1922.46	
382.092	1922.48		385.564	1922.58		388.163	1922.67	
388.741	1922.69		390.023	1922.73		390.3	1922.75	
395.638	1923.04		398.48	1923.1		402.141	1923.12	
418.02	1924.22		420.032	1924.39		422.062	1924.45	
427.656	1924.71		433.913	1924.99		447.209	1925.62	
447.209	1925.59		449.108	1926		452.687	1926.2	
459.678	1926.44		460.106	1926.47		464.704	1926.74	
467.138	1926.96		467.844	1926.97		473.702	1927.06	
473.887	1927.06		475.903	1927.28		481.464	1927.91	
482.192	1927.84		484.507	1927.64		485.911	1927.69	
488.579	1927.82		489.41	1927.86		490.008	1927.87	
490.274	1927.87		496.306	1928		497.825	1928.02	
499.448	1928.01		503.449	1927.96		510.393	1927.9	
512.789	1927.91		514.718	1927.92		531.564	1927.5	
531.909	1927.5		533.986	1927.5		550.837	1927.94	
560.451	1928.37		566.646	1928.63		567.399	1928.65	
568.019	1928.67		568.557	1928.64		568.985	1928.63	
570.185	1928.62		585.044	1928.14		590.085	1928.11	
595.513	1928.08		602.996	1928.04		603.632	1928.03	
604.081	1928.02		605.243	1928		622.958	1927.76	
623.761	1927.76		638.882	1927.72		639.107	1927.71	
639.41	1927.72		653.51	1927.58		654.216	1927.59	
660.712	1927.67		661.307	1927.67		666.828	1927.71	
667.175	1927.71		667.469	1927.7		669.247	1927.8	
670.525	1927.87		670.619	1927.88		672.525	1928.17	
672.808	1928.17		672.853	1928.17		672.874	1928.17	
674.139	1926.08		674.329	1926.07		675.5	1926.01	
676.09	1925.99		678.744	1925.9		686.7	1925.64	
695.807	1925.36		696.206	1925.36		696.578	1925.35	
696.863	1925.34		697.334	1925.34		704.467	1925.26	
719.593	1925.11		721.052	1925.11		722.54	1925.11	
724.825	1925.11		730.49	1925.06		744.14	1924.94	
745.344	1924.94		746.701	1924.95		748.232	1924.94	
750.193	1924.94		750.962	1924.93		751.728	1924.92	
753.236	1924.91		753.297	1924.91		760.281	1925	
763.94	1925.05		769.841	1925.13		770.233	1925.15	
770.277	1925.14		771.215	1924.98		772.729	1924.69	
776.45	1923.98		776.876	1923.99				

Upstream Bridge Cross Section Data
Station Elevation Data num= 175

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1925.79	6.729	1925.28	12.453	1924.64	19.044	1924.57	23.787	1924.35
31.553	1923.38	34.621	1923.29	38.387	1922.96	39.807	1922.82	42.523	1922.46
55.968	1921.22	61.428	1921.03	62.927	1920.95	64.053	1920.92	68.601	1920.73
86.462	1920.4	92.022	1920	97.094	1919.66	102.658	1919.42	105.706	1919.26
108.883	1919.13	119.861	1918.43	121.084	1918.41	123.705	1918.43	132.817	1918.77
134.16	1918.81	141.443	1918.74	145.56	1918.59	153.853	1918.75	155.856	1918.86
156.937	1918.92	162.28	1919.26	168.312	1919.6	173.509	1919.88	182.382	1920.51
183.021	1920.56	188.827	1920.74	199.363	1921.19	203.881	1921.19	207.142	1921.38
224.137	1921.81	226.002	1921.89	228.424	1921.94	228.811	1921.8	228.929	1921.78
234.408	1919.98	237.664	1918.92	239.091	1918.71	239.4	1918.61	250.172	1914.87
251.57	1914.79	254.401	1913.56	256.736	1913.56	259.279	1913.57	262.936	1913.64
265.379	1913.71	270.484	1913.99	271.739	1914	273.311	1914	275.922	1913.93
277.269	1913.96	281.767	1914.07	283.442	1914.01	283.909	1914	286.588	1913.96
294.162	1913.5	300.035	1913.55	300.487	1913.68	302.909	1913.6	305.6	1918.88
309.801	1918.63	313.734	1917.07	314.238	1917.24	314.408	1917.27	318.737	1918.49
325.725	1921.45	332.807	1921.51	336.205	1921.54	336.432	1921.54	337.182	1921.56
345.498	1921.71	346.125	1921.75	346.358	1921.78	346.958	1921.79	362.881	1922.02
366.007	1922.06	368.264	1922.19	371.467	1922.25	377.341	1922.34	379.992	1922.4
382.497	1922.46	384.638	1922.51	386.336	1922.56	387.607	1922.6	388.478	1922.63
388.514	1922.63	388.649	1922.64	398.689	1923.2	400.624	1923.24	403.116	1923.25
413.926	1924	419.073	1924.42	424.264	1924.59	433.67	1924.02	438.68	1925.25
445.068	1925.54	445.699	1925.67	446.926	1925.74	446.951	1925.74	457.586	1926.12
459.753	1926.24	465.262	1926.57	466.282	1926.66	467.674	1926.68	469.004	1926.7
471.062	1926.67	475.836	1927.21	475.888	1927.21	477.738	1927.03	482.278	1927.16
485.01	1927.25	488.49	1927.42	488.779	1927.43	491.257	1927.56	496.587	1927.05
499.037	1926.82	499.143	1926.84	499.471	1926.89	500.029	1926.97	505.458	1928.04

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 510.409    1928 513.755 1928.01 516.169 1928.02 525.325 1927.79 529.196 1927.81
 532.648 1927.73 533.049 1927.73 536.653  1927.7 538.413 1927.66 540.308 1927.71
 552.479 1928.02 561.784 1928.44 561.823 1928.44 565.358 1928.51 568.308  1928.6
 570.869 1928.49 572.904 1928.43 578.614 1928.37 586.376 1928.12 592.725 1928.08
 597.144 1928.06 598.996 1928.05 604.089 1927.97 607.685 1927.86 616.993 1927.74
 624.961 1927.63  625.56 1927.63 632.411 1927.61 636.375 1927.55 641.944 1927.53
 654.221 1927.36 654.539 1927.35 654.829 1927.36 656.308 1927.37 662.627 1927.43
 663.784 1927.43 668.388 1927.47 669.682 1927.47 672.279  1927.5 672.345  1927.5
 673.682 1927.56 674.447 1927.68 677.507  1927.7 677.806 1927.71 678.326 1927.77

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************************
       0     .03 237.664     .04 318.737     .03 345.498     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       228.424 325.725             .1       .3

Downstream  Deck/Roadway Coordinates
    num=     182
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
       0 1924.76           9.865 1924.01          14.128 1923.53
  19.036 1923.48          22.568 1923.31          36.902 1921.52
  37.857  1921.5          39.029  1921.4          39.471 1921.35
  40.317 1921.24          44.502 1920.85              50 1920.66
  59.812 1920.33          64.014  1920.1          67.172 1920.01
  79.924 1919.48          86.757 1919.36           94.41 1918.81
 101.392 1918.33         101.393 1918.33         101.399 1918.33
 105.828 1918.22         109.037 1918.15          116.26    1918
 117.438    1918         122.804 1917.91         123.681  1917.9
  130.06 1918.05          131.14 1918.04         132.507 1918.03
 132.916 1918.03         139.139 1918.06         141.068 1918.02
   146.4 1918.25         147.269 1918.25         148.226  1918.3
 150.483 1918.43         158.935 1918.89         159.855  1918.8
 168.727 1919.44         174.185 1919.49         175.995 1919.61
 182.377 1920.42         185.236 1920.79         191.111 1920.98
 197.477 1921.24         204.974 1921.36         205.184 1921.37
  206.21 1921.35         211.068 1921.29         225.117 1921.83
  229.88 1921.37 1919.37 265.132 1921.81 1919.37 305.037  1921.8 1919.37
 305.037  1921.8 1919.37 325.352 1921.36 1919.37 333.108  1921.5
 338.081 1921.58         340.892 1921.66         353.911 1922.01
  362.57 1922.15         364.634 1921.64         365.329 1921.64
 366.105 1921.66         372.985 1922.35         375.482 1922.39
 378.346 1922.43         378.529 1922.43         381.131 1922.46
 382.092 1922.48         385.564 1922.58         388.163 1922.67
 388.741 1922.69         390.023 1922.73           390.3 1922.75
 395.638 1923.04          398.48  1923.1         402.141 1923.12
  418.02 1924.22         420.032 1924.39         422.062 1924.45
 427.656 1924.71         433.913 1924.99         447.209 1925.62
 447.209 1925.59         449.108    1926         452.687  1926.2
 459.678 1926.44         460.106 1926.47         464.704 1926.74
 467.138 1926.96         467.844 1926.97         473.702 1927.06
 473.887 1927.06         475.903 1927.28         481.464 1927.91
 482.192 1927.84         484.507 1927.64         485.911 1927.69
 488.579 1927.82          489.41 1927.86         490.008 1927.87
 490.274 1927.87         496.306    1928         497.825 1928.02
 499.448 1928.01         503.449 1927.96         510.393  1927.9
 512.789 1927.91         514.718 1927.92         531.564  1927.5
 531.909  1927.5         533.986  1927.5         550.837 1927.94
 560.451 1928.37         566.646 1928.63         567.399 1928.65
 568.019 1928.67         568.557 1928.64         568.985 1928.63
 570.185 1928.62         585.044 1928.14         590.085 1928.11
 595.513 1928.08         602.996 1928.04         603.632 1928.03
 604.081 1928.02         605.243    1928         622.958 1927.76
 623.761 1927.76         638.882 1927.72         639.107 1927.71
  639.41 1927.72          653.51 1927.58         654.216 1927.59
 660.712 1927.67         661.307 1927.67         666.828 1927.71
 667.175 1927.71         667.469  1927.7         669.247  1927.8
 670.525 1927.87         670.619 1927.88         672.525 1928.17
 672.808 1928.17         672.853 1928.17         672.874 1928.17
 674.139 1926.08         674.329 1926.07           675.5 1926.01
  676.09 1925.99         678.744  1925.9           686.7 1925.64
 695.807 1925.36         696.206 1925.36         696.578 1925.35
 696.863 1925.34         697.334 1925.34         704.467 1925.26
 719.593 1925.11         721.052 1925.11          722.54 1925.11
 724.825 1925.11          730.49 1925.06          744.14 1924.94
 745.344 1924.94         746.701 1924.95         748.232 1924.94
 750.193 1924.94         750.962 1924.93         751.728 1924.92
 753.236 1924.91         753.297 1924.91         760.281    1925
  763.94 1925.05         769.841 1925.13         770.233 1925.15
 770.277 1925.14         771.215 1924.98         772.729 1924.69
  776.45 1923.98         776.876 1923.99

Downstream Bridge Cross Section Data
Station Elevation Data    num=     175
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1925.79   6.729 1925.28  12.453 1924.64  19.044 1924.57  23.787 1924.35
  31.553 1923.38  34.621 1923.29  38.387 1922.96  39.807 1922.82  42.523 1922.46
  55.968 1921.22  61.428 1921.03  62.927 1920.95  64.053 1920.92  68.601 1920.73
  86.462  1920.4  92.022    1920  97.094 1919.66 102.658 1919.42 105.706 1919.26
 108.883 1919.13 119.861 1918.43 121.084 1918.41 123.705 1918.43 132.817 1918.77
  134.16 1918.81 141.443 1918.74  145.56 1918.59 153.853 1918.75 155.856 1918.86
 156.937 1918.92  162.28 1919.26 168.312  1919.6 173.509 1919.88 182.382 1920.51
 183.021 1920.56 188.827 1920.74 199.363 1921.19 203.881 1921.19 207.142 1921.38
 224.137 1921.81 226.002 1921.89 228.424 1921.94 228.811  1921.8 228.929 1921.78
 234.408 1919.98 237.664 1918.92 239.091 1918.71   239.4 1918.61 250.172 1914.87
  251.57 1914.79 254.401 1913.56 256.736 1913.56 259.279 1913.57 262.936 1913.64
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 265.379 1913.71 270.484 1913.99 271.739    1914 273.311    1914 275.922 1913.93
 277.269 1913.96 281.767 1914.07 283.442 1914.01 283.909    1914 286.588 1913.96
 294.162  1913.5 300.035 1913.55 300.487 1913.68 302.909  1913.6   305.6 1918.88
 309.801 1918.63 313.734 1917.07 314.238 1917.24 314.408 1917.27 318.737 1918.49
 325.725 1921.45 332.807 1921.51 336.205 1921.54 336.432 1921.54 337.182 1921.56
 345.498 1921.71 346.125 1921.75 346.358 1921.78 346.958 1921.79 362.881 1922.02
 366.007 1922.06 368.264 1922.19 371.467 1922.25 377.341 1922.34 379.992  1922.4
 382.497 1922.46 384.638 1922.51 386.336 1922.56 387.607  1922.6 388.478 1922.63
 388.514 1922.63 388.649 1922.64 398.689  1923.2 400.624 1923.24 403.116 1923.25
 413.926    1924 419.073 1924.42 424.264 1924.59  433.67 1924.02  438.68 1925.25
 445.068 1925.54 445.699 1925.67 446.926 1925.74 446.951 1925.74 457.586 1926.12
 459.753 1926.24 465.262 1926.57 466.282 1926.66 467.674 1926.68 469.004  1926.7
 471.062 1926.67 475.836 1927.21 475.888 1927.21 477.738 1927.03 482.278 1927.16
  485.01 1927.25  488.49 1927.42 488.779 1927.43 491.257 1927.56 496.587 1927.05
 499.037 1926.82 499.143 1926.84 499.471 1926.89 500.029 1926.97 505.458 1928.04
 510.409    1928 513.755 1928.01 516.169 1928.02 525.325 1927.79 529.196 1927.81
 532.648 1927.73 533.049 1927.73 536.653  1927.7 538.413 1927.66 540.308 1927.71
 552.479 1928.02 561.784 1928.44 561.823 1928.44 565.358 1928.51 568.308  1928.6
 570.869 1928.49 572.904 1928.43 578.614 1928.37 586.376 1928.12 592.725 1928.08
 597.144 1928.06 598.996 1928.05 604.089 1927.97 607.685 1927.86 616.993 1927.74
 624.961 1927.63  625.56 1927.63 632.411 1927.61 636.375 1927.55 641.944 1927.53
 654.221 1927.36 654.539 1927.35 654.829 1927.36 656.308 1927.37 662.627 1927.43
 663.784 1927.43 668.388 1927.47 669.682 1927.47 672.279  1927.5 672.345  1927.5
 673.682 1927.56 674.447 1927.68 677.507  1927.7 677.806 1927.71 678.326 1927.77

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************************************
       0     .03  61.428     .03 237.664     .04 318.737     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       228.424 325.725             .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         =
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=  268.08    Downstream=  268.08
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.69
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.69

Pier Data
Pier Station     Upstream=  307.57    Downstream=  307.57
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.74
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1924.74

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =     1.2
Selected Low Flow Methods = Momentum

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 #100-yr FIS
*******************************************************************************************
* E.G. US. (ft)           *    1924.76  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)           *    1922.26  * E.G. Elev (ft)         *    1922.73  *    1922.70  *
* Q Total (cfs)           *    5500.00  * W.S. Elev (ft)         *    1920.04  *    1920.34  *
* Q Bridge (cfs)          *    4519.27  * Crit W.S. (ft)         *    1920.34  *    1920.34  *
* Q Weir (cfs)            *             * Max Chl Dpth (ft)      *       6.54  *       6.84  *
* Weir Sta Lft (ft)       *             * Vel Total (ft/s)       *      13.11  *      12.31  *
* Weir Sta Rgt (ft)       *             * Flow Area (sq ft)      *     419.66  *     446.68  *
* Weir Submerg            *             * Froude # Chl           *       0.91  *       0.83  *
* Weir Max Depth (ft)     *             * Specif Force (cu ft)   *    3375.94  *    3366.48  *
* Min El Weir Flow (ft)   *    1918.42  * Hydr Depth (ft)        *       4.98  *       4.81  *
* Min El Prs (ft)         *    1919.37  * W.P. Total (ft)        *     262.58  *     271.14  *
* Delta EG (ft)           *       1.13  * Conv. Total (cfs)      *    23166.5  *    25207.0  *
```

* Delta WS (ft)	* 0.34	* Top Width (ft)	* 84.23	* 92.77	*
* BR Open Area (sq ft)	* 335.89	* Frctn Loss (ft)	* 2.01	*	*
* BR Open Vel (ft/s)	* 13.45	* C & E Loss (ft)	* 0.02	*	*
* Coef of Q	*	* Shear Total (lb/sq ft)	* 5.62	* 4.90	*
* Br Sel Method	*Energy only	* Power Total (lb/ft s)	* 0.00	* 0.00	*

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 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.
Note: Manning's n values were composited to a single value in the main channel.
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.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: FW
REACH: FW RS: 6868.*

INPUT
Description:
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1928.45	1.04	1928.51	11.75	1928.84	13.6	1928.84	14	1928.86
15.1	1928.75	15.87	1928.68	19.93	1928.27	21.44	1928.28	22.3	1928.28
25.3	1928.13	27.34	1927.94	30.14	1927.73	32.08	1927.6	34.16	1927.4
36.17	1927.26	36.54	1927.24	42.09	1926.78	42.49	1926.76	46.43	1926.48
49.52	1926.32	52.08	1926.19	52.68	1926.19	58.14	1926.06	60.54	1925.98
61.61	1926	64.39	1926.07	65.54	1926.08	65.72	1926.07	67.31	1925.99
72.86	1925.74	74.78	1925.66	75.09	1925.67	75.39	1925.68	75.94	1925.67
76.62	1925.61	77.61	1925.51	80.54	1925.22	86.68	1924.9	91.95	1924.56
104.9	1923.52	105.58	1923.48	105.6	1923.47	105.77	1923.45	107.27	1923.28
107.95	1923.18	109.73	1922.92	112.38	1922.51	112.96	1922.41	114.86	1922.09
115.58	1922.05	118.36	1922.02	119.65	1922	119.98	1921.98	126	1921.61
130.36	1921.28	131.36	1921.22	132.85	1921.11	134.43	1920.97	140.06	1920.46
146.48	1920.17	149.07	1920.11	157.94	1919.93	161.18	1919.89	163.16	1919.9
182.25	1919.69	184.27	1919.68	190.33	1919.53	194.55	1919.53	196.43	1919.53
204.54	1919.54	206.12	1918.88	209.55	1917.35	211.26	1916.57	214.78	1915.85
216.5	1915.49	221.15	1914.91	222.09	1914.81	224.65	1914.62	226.84	1914.49
231.69	1914.42	235.03	1914.4	238.54	1914.41	239.66	1914.6	242.89	1915.26
248.87	1915.77	249.13	1915.79	254.52	1916.87	254.75	1916.95	257.21	1917.33
258.48	1917.54	261.64	1917.53	264.52	1917.59	264.57	1917.6	273.13	1919.07
273.55	1919.15	273.79	1919.2	280.06	1921.52	281.32	1921.65	282.58	1921.75
292.35	1922.18	302.85	1922.74	304.68	1922.88	305.77	1923	309.38	1923.42
315.9	1924.15	329.98	1925.54	336.52	1926.23	340.51	1926.57	343.22	1926.81
344.18	1926.9	344.7	1927.02	346.05	1927.15	346.97	1927.26	347.43	1927.3
347.82	1927.34	349.44	1927.62	350.22	1927.75	351.69	1927.89	352.84	1928.06
353.93	1928.14	355.25	1928.08	356.27	1928.12	357.71	1928.14	357.78	1928.14
360.21	1927.95	362.37	1927.97	365.76	1927.95	368.63	1928.08	371.28	1928.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	204.54	.04	273.79	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
204.54 273.79 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1923.63	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.71	* Wt. n-Val.	* 0.030	* 0.040	* 0.030 *
* W.S. Elev (ft)	* 1921.92	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1921.92	* Flow Area (sq ft)	* 148.19	* 395.50	* 10.82 *
* E.G. Slope (ft/ft)	*0.009110	* Area (sq ft)	* 148.19	* 395.50	* 10.82 *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	* 1025.58	* 4429.41	* 45.01 *
* Top Width (ft)	* 165.51	* Top Width (ft)	* 83.59	* 69.25	* 12.66 *
* Vel Total (ft/s)	* 9.92	* Avg. Vel. (ft/s)	* 6.92	* 11.20	* 4.16 *
* Max Chl Dpth (ft)	* 7.52	* Hydr. Depth (ft)	* 1.77	* 5.71	* 0.85 *
* Conv. Total (cfs)	* 57623.3	* Conv. (cfs)	* 10744.9	* 46406.8	* 471.6 *
* Length Wtd. (ft)	*	* Wetted Per. (ft)	* 83.66	* 70.45	* 13.09 *
* Min Ch El (ft)	* 1914.40	* Shear (lb/sq ft)	* 1.01	* 3.19	* 0.47 *
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 371.28	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.24	* Cum Volume (acre-ft)	* 1.39	* 34.77	* 0.90 *
* C & E Loss (ft)	* 0.19	* Cum SA (acres)	* 0.96	* 7.45	* 0.54 *

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: 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: FW
REACH: FW RS: 6736

INPUT
Description: 67+36
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*****************************************************************************
       01924.794   1.3461924.969  15.2461926.171  17.6431926.264  20.587 1926.55
  27.8161927.031  28.9281927.102  32.8221927.026  35.4641926.789  39.106 1926.59
  44.3171926.342  46.9251926.321  47.4031926.328  54.5981926.138  55.1231926.138
  60.2341926.109   64.241926.177  67.561 1926.25  68.3421926.341  75.4191926.773
  79.9261927.012  85.0291927.325  94.5141926.848  97.0131926.729  97.7981926.798
  98.513 1926.79  99.3991926.683  104.481925.931 119.2861924.754 136.0831923.027
 136.9611922.978 136.9961922.959 137.2131922.907 140.0441922.479  142.351922.123
 146.5371921.412 149.0021920.975 149.9341920.958 153.5441921.199 155.2181921.303
 155.6451921.298 170.4091921.127 172.3411921.088 174.396 1920.97 190.0271920.154
 204.8871919.874 211.6581919.854 239.0451919.256 246.9151918.865 252.3911918.797
 265.345 1918.61 266.4791917.755  270.161914.676 272.6791914.343 277.9141913.526
 279.7461913.435 287.1841913.371 292.1461913.386 293.735 1913.76 298.3051915.076
 306.7591916.089 314.7481917.017 315.0681917.136 324.818 1917.63 342.0091919.063
 349.1981919.973 357.1971920.288 367.2851920.927 376.4651922.128 393.3391923.782
 402.2611924.237 410.6731925.164 421.7781926.029

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0     .03 265.345     .04 342.009     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       265.345 342.009              190     159     150             .1       .3
Left Levee      Station=   28.93      Elevation=  1927.1

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************************
* E.G. Elev (ft)         * 1922.84  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.34  * Wt. n-Val.            *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1921.50  * Reach Len. (ft)       *  190.00  *  159.00  *  150.00  *
* Crit W.S. (ft)         * 1921.50  * Flow Area (sq ft)     *  180.52  *  426.00  *   35.49  *
* E.G. Slope (ft/ft)     *0.007724  * Area (sq ft)          *  180.52  *  426.00  *   35.49  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            * 1034.89  * 4291.47  *  173.64  *
* Top Width (ft)         *  225.66  * Top Width (ft)        *  119.33  *   76.66  *   29.66  *
* Vel Total (ft/s)       *    8.57  * Avg. Vel. (ft/s)      *    5.73  *   10.07  *    4.89  *
* Max Chl Dpth (ft)      *    8.13  * Hydr. Depth (ft)      *    1.51  *    5.56  *    1.20  *
* Conv. Total (cfs)      * 62581.5  * Conv. (cfs)           * 11775.4  * 48830.3  *  1975.8  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)      *  119.44  *   78.59  *   29.78  *
* Min Ch El (ft)         * 1913.37  * Shear (lb/sq ft)      *    0.73  *    2.61  *    0.57  *
* Alpha                  *    1.17  * Stream Power (lb/ft s) *  421.78  *   28.93  *    0.00  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *    1.01  *   33.82  *    0.85  *
* C & E Loss (ft)        *          * Cum SA (acres)        *    0.73  *    7.28  *    0.49  *
*****************************************************************************************************

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.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 6577

INPUT
Description: 65+77 US Face of bridge at Tioga
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0 1925.09    2.13 1924.49   23.48 1922.44   30.09 1922.23   30.65 1922.17
   47.37 1922.26   57.99 1922.27   67.44 1921.64   67.56 1921.63   68.49 1921.62
   75.85 1921.76   79.97 1922.05   80.73 1922.11   81.82 1922.06   85.98 1922.06
   86.43 1921.98  103.08 1922.23  109.77 1922.11  113.74 1922.12  117.28 1922.11
  121.67 1922.15  123.75 1922.18  129.14 1922.19  137.78 1921.89  141.02 1921.99
   144.6 1922.26  145.64 1922.19  146.66  1922.1  161.65 1920.63  166.42 1917.85
  167.46 1917.82  175.34 1914.56  175.58 1914.53  175.75 1914.52  176.35 1914.47
   183.3 1913.85  188.35 1913.63  189.55 1913.54  192.64 1913.51  193.95 1913.45
   194.1 1913.46  194.38 1913.46  194.73 1913.41  195.47 1913.42  195.74 1913.42
  199.27 1913.24  201.73  1913.2  203.16  1913.2  205.27  1913.2  206.83 1913.18
  208.13 1913.19  209.43 1913.21  211.32 1913.23  211.45  1913.2  211.71 1913.24
  214.48 1913.34  219.02 1913.49   219.4  1913.5  225.07 1913.18  226.68 1913.08
  230.01 1912.92  236.91 1915.35   237.7 1915.65  245.05 1918.09  246.45  1918.5
  249.99 1919.03  252.05 1919.34  252.57 1919.45  273.83 1921.03  275.63 1921.14
   275.8 1921.14  293.51 1921.69  303.02 1921.79  313.26 1922.21  330.31 1923.13
  332.64 1923.24  338.03 1923.34  355.27 1923.92  357.58 1923.93  368.89 1925.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0     .03  161.65     .04  273.83     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        161.65  273.83              108     108     108             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************************
* E.G. Elev (ft)         * 1922.10  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.40  * Wt. n-Val.            *          *   0.040  *          *
* W.S. Elev (ft)         * 1919.70  * Reach Len. (ft)       *  108.00  *  108.00  *  108.00  *
* Crit W.S. (ft)         * 1919.70  * Flow Area (sq ft)     *          *  441.99  *          *
* E.G. Slope (ft/ft)     *0.014414  * Area (sq ft)          *          *  441.99  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   92.61  * Top Width (ft)        *          *   92.61  *          *
* Vel Total (ft/s)       *   12.44  * Avg. Vel. (ft/s)      *          *   12.44  *          *
* Max Chl Dpth (ft)      *    6.77  * Hydr. Depth (ft)      *          *    4.77  *          *
* Conv. Total (cfs)      * 45811.0  * Conv. (cfs)           *          * 45811.0  *          *
* Length Wtd. (ft)       *  108.00  * Wetted Per. (ft)      *          *   94.84  *          *
* Min Ch El (ft)         * 1912.92  * Shear (lb/sq ft)      *          *    4.19  *          *
```

* Alpha	*	1.00	* Stream Power (lb/ft s)	*	368.89	*	0.00	*	0.00	*
* Frctn Loss (ft)	*		* Cum Volume (acre-ft)	*	0.62	*	32.24	*	0.79	*
* C & E Loss (ft)	*		* Cum SA (acres)	*	0.47	*	6.97	*	0.44	*

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.

CULVERT

RIVER: FW
REACH: FW RS: 6500

INPUT
Description: Tioga
Distance from Upstream XS = 22
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew = 30
Upstream Deck/Roadway Coordinates
num= 46

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1925.67		9.287	1925.37		9.502	1925.37	
9.716	1925.36		22.549	1925.23		22.935	1925.23	
54.443	1924.69		81.789	1923.77		132.427	1922.86	
189.694	1922		234.361	1921.72		282.694	1921.65	
338.758	1921.99		384.152	1922.65		396.16	1923.01	
409.1	1923.56		418.919	1924.08		428.15	1924.5	
436.187	1924.6		443.868	1924.96		452.513	1925	
459.069	1925.19		476.798	1925.74		497.899	1926.14	
529.088	1926.18		567.1	1926.1		597.265	1925.7	
631.054	1925.49		642.52	1925.32		652.35	1925.1	
656.78	1925.09		663.536	1925		668.414	1924.95	
673.875	1924.87		675.804	1924.74		688.744	1924.56	
711.245	1923.96		738.867	1923.64		754.842	1923.58	
761.83	1923.35		765.155	1923.41		774.173	1923.4	
778.386	1923.56		784.521	1923.54		787.373	1923.54	
791.223	1923.45							

Upstream Bridge Cross Section Data
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1925.623	12.072	1925.494	26.004	1925.317	31.609	1925.322	44.749	1925.261
50.536	1925.215	53.187	1925.106	53.282	1925.108	64.049	1925.405	76.497	1925.504
77.946	1925.097	80.843	1924.834	95.747	1923.396	101.662	1922.793	107.097	1922.153
108.682	1922.034	109.484	1922.019	111.052	1922.092	127.211	1922.185	132.469	1922.191
134.454	1922.193	140.799	1921.764	141.574	1921.653	148.001	1921.609	154.002	1921.721
158.025	1922.003	165.188	1922.486	167.113	1922.421	174.587	1922.546	175.551	1922.567
183.736	1922.418	189.478	1922.435	189.965	1922.434	194.676	1922.413	201.056	1922.471
204.041	1922.508	211.739	1922.517	211.837	1922.514	211.945	1922.517	217.865	1921.998
220.326	1922.043	225.506	1921.583	231.124	1921.172	234.778	1920.884	241.636	1920.33
242.419	1920.358	249.736	1917.253	256.5	1913.2	305.5	1913.2	310.613	1912.935
315.054	1914.494	315.567	1914.687	320.245	1916.228	323.544	1917.196	327.321	1918.327
328.875	1918.558	330.144	1918.825	339.016	1919.476	342.802	1919.761	348.252	1920.335
352.002	1920.714	355.683	1921.041	364.176	1921.31	374.089	1921.622	379.301	1921.676
384.595	1921.893	393.388	1922.252	395.433	1922.362	406.405	1922.949	408.51	1923.046
412.895	1923.255	420.064	1923.394	427.352	1923.537	428.257	1923.502	430.279	1923.6
433.019	1923.735	433.866	1923.741	439.783	1924.313	448.549	1925.158	452.397	1925.529
457.965	1925.412	462.217	1925.315	464.491	1925.488	467.386	1925.527	467.395	1925.527
471.027	1925.642	476.077	1925.952	481.838	1926.56	482.231	1926.615	482.463	1926.619
483.013	1926.649	488.798	1927.147						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	242.419	.04	348.252	.03

Bank Sta: Left Right Coeff Contr. Expan.
242.419 348.252 .1 .3

Downstream Deck/Roadway Coordinates
num= 46

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	1925.67		9.287	1925.37		9.502	1925.37	
9.716	1925.36		22.549	1925.23		22.935	1925.23	
54.443	1924.69		81.789	1923.77		132.427	1922.86	
189.694	1922		234.361	1921.72		282.694	1921.65	
338.758	1921.99		384.152	1922.65		396.16	1923.01	
409.1	1923.56		418.919	1924.08		428.15	1924.5	
436.187	1924.6		443.868	1924.96		452.513	1925	
459.069	1925.19		476.798	1925.74		497.899	1926.14	
529.088	1926.18		567.1	1926.1		597.265	1925.7	
631.054	1925.49		642.52	1925.32		652.35	1925.1	
656.78	1925.09		663.536	1925		668.414	1924.95	
673.875	1924.87		675.804	1924.74		688.744	1924.56	
711.245	1923.96		738.867	1923.64		754.842	1923.58	
761.83	1923.35		765.155	1923.41		774.173	1923.4	
778.386	1923.56		784.521	1923.54		787.373	1923.54	
791.223	1923.45							

Downstream Bridge Cross Section Data
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
       01922.402   7.4111921.714    9.991921.537  12.3411921.283  13.7881921.145
  17.4631920.986  36.1611920.645  39.5931920.399  42.7241920.185  53.9451919.708
  55.5821919.623  58.8931919.491  67.5991918.934   73.441918.811  82.7161918.883
  85.5431918.864  88.7761918.956  91.308 1918.93  92.7391918.879   97.02 1918.96
 108.9091918.806 114.3211919.045 122.6871919.369 125.8021919.413 132.3861919.532
 146.9591919.823 147.1951919.819  147.781919.831 162.8781920.718 173.156 1920.98
 174.2841921.024 175.9211921.057 179.3631921.015 181.2941920.982 183.7741920.179
  184.151920.123 189.4291918.308 199.6481914.766 200.4891914.715   204.5 1912.45
   253.5 1912.45  256.341912.719 256.5611913.095  257.47 1913.04 263.5321914.627
  265.951915.358 271.1491917.328 273.0791918.035  275.841919.235 279.1751920.112
 282.7961920.116   283.51920.117 287.027 1920.18 292.2711920.529 294.2221920.802
 299.2371920.844 310.5161921.007  312.731921.038 319.1951921.414 321.7531921.456
 337.1421921.714 337.2791921.715 337.3741921.717  338.341921.769 338.5051921.778
 352.0871922.538 353.0991922.558 354.4031922.564 360.0581922.958 368.3921923.634
 376.7991923.914 383.7171924.228 388.1621924.431

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0     .03 181.294     .04 279.175     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       179.363 279.175             .3       .5
Skew Angle = 30

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 Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1         Arch     7.5      15
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  9      79     .021     .021        0                  .7               1
Number of Barrels =  3
Upstream   Elevation =  1913.2
Centerline Stations
    Sta.    Sta.    Sta.
     264     281     298
Downstream Elevation =  1912.45
Centerline Stations
    Sta.    Sta.    Sta.
     212     229     246

CULVERT OUTPUT  Profile #100-yr FIS  Culv Group:  Culvert #1
*************************************************************************
* Q Culv Group (cfs)     * 5500.00  * Culv Full Len (ft)     *          *
* # Barrels              *       3  * Culv Vel US (ft/s)     *   21.38  *
* Q Barrel (cfs)         * 1833.33  * Culv Vel DS (ft/s)     *   21.38  *
* E.G. US. (ft)          * 1922.10  * Culv Inv El Up (ft)    * 1913.20  *
* W.S. US. (ft)          * 1919.70  * Culv Inv El Dn (ft)    * 1912.45  *
* E.G. DS (ft)           * 1921.78  * Culv Frctn Ls (ft)     *    0.75  *
* W.S. DS (ft)           * 1919.31  * Culv Exit Loss (ft)    *    4.63  *
* Delta EG (ft)          *    0.32  * Culv Entr Loss (ft)    *    0.00  *
* Delta WS (ft)          *    0.38  * Q Weir (cfs)           *          *
* E.G. IC (ft)           *          * Weir Sta Lft (ft)      *          *
* E.G. OC (ft)           *          * Weir Sta Rgt (ft)      *          *
* Culvert Control        *  Outlet  * Weir Submerg           *          *
* Culv WS Inlet (ft)     * 1920.06  * Weir Max Depth (ft)    *          *
* Culv WS Outlet (ft)    * 1919.31  * Weir Avg Depth (ft)    *          *
* Culv Nml Depth (ft)    *    7.50  * Weir Flow Area (sq ft) *          *
* Culv Crt Depth (ft)    *    6.86  * Min El Weir Flow (ft)  * 1921.66  *
*************************************************************************

Warning: During the supercritical analysis, there was not enough energy for supercritical flow going into the culvert.  The program
         assumed critical depth at the inlet.
Warning: During supercritical calculations, the culvert inlet depth is at or above critical depth and the culvert slope is mild.  The
         outlet depth has defaulted to critical depth.  For best results, this profile should be run in a mixed flow regime.
Note:    The normal depth exceeds the height of the culvert.  The program assumes that the normal depth is equal to the height
         of the culvert.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 6469

INPUT
Description: Sta 64+76 DS Face of bridge at Tioga
Station Elevation Data     num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1926.93    2.47 1926.92   20.23  1925.9   21.03 1925.82   22.86  1925.8
    36.9 1925.14   39.75 1925.25   43.63 1925.11    47.3 1925.05   52.65 1924.82
   55.63 1924.71   57.23  1924.6   63.75 1924.11   63.87 1924.11    64.3 1924.11
   71.77 1923.58   79.24 1922.76    83.8 1922.32   95.22 1921.81  102.74 1921.66
  104.14 1921.56  105.42 1921.47  122.01 1920.74  125.76 1920.55  132.59 1920.02
  141.97 1919.69   157.8  1919.6   159.5 1919.54  177.37 1919.32  181.27  1919.5
  187.28 1919.73  196.31 1919.86  213.93 1920.19  216.94 1920.13  224.17 1920.28
  233.11 1920.81  239.42 1920.97  240.12    1921  241.14 1921.02  243.31 1920.99
  247.34 1920.93  249.88 1920.96  252.13 1920.02  266.17 1915.18  266.69 1915.14
```

```
  271.54 1913.05  272.14 1913.05  273.59 1914.63  287.31 1915.42  288.95 1913.89
  289.83 1913.87  292.41 1913.23  293.41 1913.27  294.96 1913.25  300.12 1913.33
  305.37 1912.66  309.76 1912.39  310.71  1912.4  313.47 1913.17  317.85 1912.99
  322.15 1912.86   325.1 1913.08   325.9 1912.74  326.26 1912.23  329.22 1913.17
  329.82 1913.67  333.88 1914.86  334.52 1915.28  334.79 1915.45  337.37 1915.93
   337.9 1916.12  342.69 1918.21  348.43 1919.73  348.44 1919.73  348.45 1919.73
    3561920.235  356.68 1920.28  359.72  1920.7  367.45 1920.77  375.92 1920.89
  377.59 1920.92  386.56 1921.44  388.74 1921.47  401.93 1921.69  403.39 1921.71
  404.41 1921.72   414.4 1922.27  420.93 1922.63  421.39 1922.64  421.99 1922.64
  424.55 1922.82  426.95 1923.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  247.34     .04     356     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        247.34     356            328.1  369.09   389.1             .3       .5
Skew Angle = 30

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************************
* E.G. Elev (ft)          * 1921.78  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    2.47  * Wt. n-Val.             *          *   0.040  *          *
* W.S. Elev (ft)          * 1919.31  * Reach Len. (ft)        *   10.00  *   10.00  *   10.00  *
* Crit W.S. (ft)          * 1919.42  * Flow Area (sq ft)      *          *  436.24  *          *
* E.G. Slope (ft/ft)      *0.015523  * Area (sq ft)           *          *  436.24  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)          *   92.67  * Top Width (ft)        *          *   92.67  *          *
* Vel Total (ft/s)        *   12.61  * Avg. Vel. (ft/s)      *          *   12.61  *          *
* Max Chl Dpth (ft)       *    7.08  * Hydr. Depth (ft)      *          *    4.71  *          *
* Conv. Total (cfs)       * 44143.6  * Conv. (cfs)           *          * 44143.6  *          *
* Length Wtd. (ft)        *   10.00  * Wetted Per. (ft)      *          *   97.03  *          *
* Min Ch El (ft)          * 1912.23  * Shear (lb/sq ft)      *          *    4.36  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *  426.95  *    0.00  *    0.00  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)   *    0.62  *   32.07  *    0.79  *
* C & E Loss (ft)         *          * Cum SA (acres)         *    0.47  *    6.74  *    0.44  *
*****************************************************************************************************

BRIDGE


RIVER: FW
REACH: FW                RS: 6450

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      10
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=     182
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
       01923.937           9.8651923.189          14.1281922.709
  19.0361922.658          22.5681922.493          36.9021920.705
  37.8571920.678          39.0291920.576          39.4711920.531
  40.3171920.421          44.5021920.032              501919.844
  59.8121919.508          64.0141919.282          67.1721919.191
  79.924 1918.66          86.7571918.536           94.411917.988
 101.3921917.509         101.3931917.509         101.3991917.509
 105.828  1917.4         109.0371917.326          116.261917.181
 117.4381917.177         122.8041917.092         123.6811917.078
  130.061917.229          131.14 1917.22         132.5071917.212
 132.9161917.215         139.139 1917.24         141.0681917.198
   146.41917.427         147.2691917.428         148.2261917.484
 150.483 1917.61         156.8551917.981         158.9351918.071
 168.7271918.624         174.1851918.671         175.9951918.787
 182.3771919.604         185.2361919.968         191.1111920.158
 197.4771920.422         204.9741920.542         205.1841920.546
  206.211920.533         211.0681920.467         225.1171921.008
  229.88 1920.55 1918.55 265.1321920.993 1918.55 305.037 1920.98 1918.55
 305.037 1920.98 1919.05 325.3521920.544 1919.05 333.1081920.679
 338.0811920.764         340.8921920.836         353.9111921.193
  362.571921.326         364.6341920.821         365.3291920.822
 366.1051920.842         372.9851921.534         375.4821921.569
 378.3461921.606         378.5291921.612         381.1311921.641
 382.0921921.665         385.5641921.765         388.1631921.848
 388.7411921.869         390.0231921.915           390.31921.926
 395.6381922.224          398.481922.282         402.1411922.298
  418.021923.403         420.0321923.567         422.0621923.634
 427.6561923.888         433.9131924.172         447.2091924.774
 447.3171924.797         449.108 1925.18         452.6871925.376
 459.6781925.623         460.1061925.647         464.7041925.923
 467.1381926.141         467.844 1926.15         473.7021926.239
 473.8871926.236         475.9031926.462         481.4641927.086
 482.1921927.016         484.5071926.821         485.9111926.866
 488.5791926.997          489.411927.037         490.008 1927.05
 490.2741927.048         496.3061927.176         497.8251927.205
 499.4481927.189         503.4491927.144         510.3931927.079
 512.789 1927.09         514.7181927.096         531.564 1926.68
 531.909 1926.68         533.9861926.681         550.8371927.119
 560.4511927.547         566.6461927.813         567.3991927.829
 568.0191927.848         568.5571927.825         568.9851927.813
 570.185  1927.8         585.0441927.325         590.0851927.292
 595.5131927.262         602.9961927.222         603.6321927.212
 604.0811927.199         605.2431927.183         622.958 1926.94
 623.7611926.937         638.8821926.897         639.1071926.892
  639.41  1926.9          653.511926.765         654.2161926.771
```

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 660.7121926.848         661.3071926.849         666.8281926.887
 667.175 1926.89         667.4691926.877         669.247 1926.98
 670.5251927.054         670.6191927.058         672.5251927.347
 672.8081927.349         672.8531927.354         672.8741927.349
 674.139 1925.26         674.329 1925.25           675.51925.187
  676.091925.167         678.744 1925.08           686.71924.825
 695.8071924.541         696.2061924.544         696.5781924.534
 696.8631924.524         697.3341924.518         704.4671924.441
 719.5931924.294         721.0521924.288          722.541924.289
 724.8251924.289          730.491924.239          744.141924.118
 745.3441924.124         746.7011924.131         748.2321924.125
 750.1931924.117         750.9621924.114         751.7281924.104
 753.2361924.089         753.297 1924.09         760.281 1924.18
  763.941924.229         769.8411924.306         770.2331924.331
 770.2771924.324         771.2151924.158         772.7291923.871
  776.451923.164         776.8761923.172

Upstream Bridge Cross Section Data
Station Elevation Data    num=     182
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01925.638    .1961925.623   4.5951925.427   9.5671924.967  17.2941924.874
  19.0531924.855  25.0271924.577  26.1131924.442   31.33 1924.29  37.7341923.737
  40.1491923.493  44.7661922.888  57.4111921.714   59.991921.537  62.3411921.283
  63.7881921.145  67.4631920.986  86.1611920.645  89.5931920.399  92.7241920.185
 103.9451919.708 105.5821919.623 108.8931919.491 117.5991918.934  123.441918.811
 132.7161918.883 135.5431918.864 138.7761918.956 141.308 1918.93 142.7391918.879
  147.02 1918.96 158.9091918.806 164.3211919.045 172.6871919.369 175.8021919.413
 182.3861919.532 196.9591919.823 197.1951919.819  197.781919.831 212.8781920.718
 223.156 1920.98 224.2841921.024 225.9211921.057  229.88 1918.55 249.6481914.766
 250.4891914.715 254.5981912.938 255.8461912.934 257.2041912.944 259.1571912.979
 260.4631913.015  271.051913.607 271.735 1913.61 272.5921913.612 274.507 1913.56
 276.0031913.192 278.1331913.271 280.649 1913.25 281.4711913.237 283.9531913.087
 293.4291912.508 296.3591912.537 298.1881913.047  306.341912.719 306.5611913.095
  307.47 1913.04 313.5321914.627  315.951915.358 321.1491917.328 323.0791918.035
  325.34 1919.05 329.1751920.112 332.7961920.116   333.51920.117 337.027 1920.18
 342.2711920.529 344.2221920.802 349.2371920.844 360.5161921.007  362.731921.038
 369.1951921.414 371.7531921.456 387.1421921.714 387.2791921.715 387.3741921.717
  388.341921.769 388.5051921.778 402.0871922.538 403.0991922.558 404.4031922.564
 410.0581922.958 418.3921923.634 426.7991923.914 433.7171924.228 438.1621924.431
  441.991924.508 446.7671924.697 446.8741924.701 455.6161924.961 455.7631924.963
 455.8571924.968 459.6891925.158 466.0371925.501 467.795 1925.47 468.483 1925.46
 470.5941925.697 471.3891925.617 476.0621925.744 482.6611925.929 484.3891925.985
 487.1551926.121 489.2771926.229  492.86 1926.41 497.1671925.997 499.2231925.803
 500.914 1925.79 501.3561925.788 510.3871926.908 513.4281926.864 515.0321926.943
 518.046 1927.12 522.7291927.405 524.0211927.409 532.108 1927.24 534.5031927.218
 541.4871927.155 545.6091927.069 550.0481927.173 554.4451927.287 557.8071927.437
 563.5141927.545 563.5771927.546 568.8971927.715 573.5151927.513 577.185 1927.41
 587.4821927.297 588.025 1927.28   592.11927.253  595.341927.216 599.0981927.164
 601.8811927.128 604.8491927.081 611.6451926.882 612.6331926.869 627.1331926.682
 627.6851926.674 634.2551926.586 635.087 1926.54 643.632 1926.51 645.1751926.482
 647.9851926.443 658.0031926.283 658.7311926.288 663.2131926.333 666.5971926.342
 672.8811926.391 673.5371926.398 675.657 1926.41 676.7371926.417 677.0821926.407
 677.2161926.402 678.2321926.372 681.0351926.397 683.1571926.425 683.3481926.447
 684.1341926.541  684.591926.424  685.35 1925.11 686.8671925.028 689.067 1924.91
 695.6791924.698 700.4661924.549 704.0551924.572 707.4031924.488 709.9691924.394
 714.2021924.344 714.2851924.344 725.7721924.232 730.4691924.214  735.261924.216
 740.5911924.216 742.6971924.215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0     .03  229.88     .04  325.34     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        229.88  325.34             .3       .5
Skew Angle = 30

Downstream  Deck/Roadway Coordinates
    num=     182
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*********************************************************************
       01923.937           9.8651923.189          14.1281922.709
  19.0361922.658          22.5681922.493          36.9021920.705
  37.8571920.678          39.0291920.576          39.4711920.531
  40.3171920.421          44.5021920.032              501919.844
  59.8121919.508          64.0141919.282          67.1721919.191
  79.924 1918.66          86.7571918.536           94.411917.988
 101.3921917.509         101.3931917.509         101.3991917.509
 105.828  1917.4         109.0371917.326          116.261917.181
 117.4381917.177         122.8041917.092         123.6811917.078
  130.061917.229          131.14 1917.22         132.5071917.212
 132.9161917.215         139.139 1917.24         141.0681917.198
   146.41917.427         147.2691917.428         148.2261917.484
 150.483 1917.61         156.8551917.981         158.9351918.071
 168.7271918.624         174.1851918.671         175.9951918.787
 182.3771919.604         185.2361919.968         191.1111920.158
 197.4771920.422         204.9741920.542         205.1841920.546
  206.211920.533         211.0681920.467         225.1171921.008
  229.88 1920.55 1918.55 265.1321920.993 1918.55 305.037 1920.98 1918.55
 305.037 1920.98 1919.05 325.3521920.544 1919.05 333.1081920.679
 338.0811920.764         340.8921920.836         353.9111921.193
  362.571921.326         364.6341920.821         365.3291920.822
 366.1051920.842         372.9851921.534         375.4821921.569
 378.3461921.606         378.5291921.612         381.1311921.641
 382.0921921.665         385.5641921.765         388.1631921.848
 388.7411921.869         390.0231921.915           390.31921.926
 395.6381922.224          398.481922.282         402.1411922.298
  418.021923.403         420.0321923.567         422.0621923.634
```

```
 427.6561923.888         433.9131924.172         447.2091924.774
 447.3171924.797         449.108 1925.18         452.6871925.376
 459.6781925.623         460.1061925.647         464.7041925.923
 467.1381926.141         467.844 1926.15         473.7021926.239
 473.8871926.236         475.9031926.462         481.4641927.086
 482.1921927.016         484.5071926.821         485.9111926.866
 488.5791926.997          489.411927.037         490.008 1927.05
 490.2741927.048         496.3061927.176         497.8251927.205
 499.4481927.189         503.4491927.144         510.3931927.079
 512.789 1927.09         514.7181927.096         531.564 1926.68
 531.909 1926.68         533.9861926.681         550.8371927.119
 560.4511927.547         566.6461927.813         567.3991927.829
 568.0191927.848         568.5571927.825         568.9851927.813
 570.185  1927.8         585.0441927.325         590.0851927.292
 595.5131927.262         602.9961927.222         603.6321927.212
 604.0811927.199         605.2431927.183         622.958 1926.94
 623.7611926.937         638.8821926.897         639.1071926.892
  639.41  1926.9          653.511926.765         654.2161926.771
 660.7121926.848         661.3071926.849         666.8281926.887
 667.175 1926.89         667.4691926.877         669.247 1926.98
 670.5251927.054         670.6191927.058         672.5251927.347
 672.8081927.349         672.8531927.354         672.8741927.349
 674.139 1925.26         674.329 1925.25           675.51925.187
  676.091925.167         678.744 1925.08           686.71924.825
 695.8071924.541         696.2061924.544         696.5781924.534
 696.8631924.524         697.3341924.518         704.4671924.441
 719.5931924.294         721.0521924.288          722.541924.289
 724.8251924.289          730.491924.239          744.141924.118
 745.3441924.124         746.7011924.131         748.2321924.125
 750.1931924.117         750.9621924.114         751.7281924.104
 753.2361924.089         753.297 1924.09         760.281 1924.18
  763.941924.229         769.8411924.306         770.2331924.331
 770.2771924.324         771.2151924.158         772.7291923.871
  776.451923.164         776.8761923.172

Downstream Bridge Cross Section Data
Station Elevation Data    num=     158
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01918.557  16.2051918.219  21.8111917.887  27.1741917.412  28.8541917.346
  33.3621917.314  48.1241916.324  48.804 1916.28  49.056 1916.26  49.2391916.253
  49.6061916.232  69.8821916.382  76.867 1916.59   86.391916.759  89.4121916.704
  96.3421916.757  98.3231916.727 105.5331916.561 106.4461916.553 108.6161916.537
 114.524 1916.49  130.121916.544 133.4191916.617 147.3811916.911 157.3231917.071
 159.364 1917.16  160.11 1917.19 161.1681917.199 162.6531917.382 165.649 1917.53
 167.1761917.652 179.1361917.579 182.355 1917.58 184.7271917.584 188.228 1917.66
 202.5791918.327 203.7911918.318 204.8921918.336 208.0421918.373 209.7921918.364
 210.9081918.148 213.6751918.221 216.5291918.351  229.88 1918.55 233.7851911.781
 238.2181911.977 239.2281912.014  240.831912.072 245.0961912.187 246.5741912.232
 250.3111912.432 250.3831912.434 250.4611912.436 251.3011912.447 255.6371912.528
  260.881912.635 262.495 1912.66 265.7011912.682  268.861912.686 271.5561912.946
  276.571913.024 277.3081913.032 277.6561913.078 279.4721913.726 281.6211914.085
 283.6441914.452 284.9441914.683  325.34 1919.05 332.8741921.278 334.9271921.317
 341.4851921.435 347.8041921.511 353.2951921.516 369.7961920.936 374.9491920.832
 388.3131921.627 392.9791921.904 400.7831922.139   402.51922.192 407.515  1922.3
 407.6021922.306 407.6491922.307 409.2031922.408 429.5361923.762 432.261 1923.89
 433.3871924.015 437.0351924.416 447.4141925.368 452.3361925.819 453.873 1925.82
 456.468 1925.85 460.1131925.945 460.1351925.946 466.9441926.234  474.481926.548
 478.3641926.708 479.9881926.755 481.3871926.796 482.7851926.866 484.515 1926.96
 485.4851926.983 485.7981926.934 485.8161926.932 486.2981926.942  492.491926.886
 493.1151926.881 494.7331926.869 506.1141926.781 514.7031926.715 524.349 1926.73
 533.0521926.744  540.79  1926.7 547.2291926.817 551.7091926.963 558.5131927.167
 570.138 1927.21 576.189 1927.31 582.2721927.313 585.4531927.315 605.1841927.326
 611.1121927.246 612.8451927.257 618.5411927.283 627.7521927.041 634.8011927.228
 638.608 1927.17 641.8121927.289 642.7811927.327 643.0831926.718 644.1781925.066
 646.9491925.088 650.5451925.113 652.0671925.123 654.5491925.138 656.4011925.088
  656.771925.078 657.2451925.064  663.041924.899 666.2271924.807 667.0741924.779
 678.6931924.635 688.3511924.524 692.3741924.486 704.0021924.521 710.9971924.539
 717.5631924.463 718.3551924.461 722.2491924.463 725.2541924.464  731.331924.467
 732.4371924.469 734.7421924.476 740.6231924.489 741.1691924.427 741.4361924.397
 743.4431923.869  746.011923.192 747.7221922.759

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0     .03  229.88     .04  325.34     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        229.88  325.34            .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=  265.13    Downstream=  265.13
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1921.01
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
```

```
       2       0       2 1921.01

Pier Data
Pier Station     Upstream=  305.04    Downstream=  305.04
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1920.99
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       2       0       2 1920.99

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =     1.2
Selected Low Flow Methods = Momentum

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 #100-yr FIS
*************************************************************************************************
* E.G. US. (ft)          *    1921.78  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1919.31  * E.G. Elev (ft)         *    1921.81  *    1920.95  *
* Q Total (cfs)          *    5500.00  * W.S. Elev (ft)         *    1918.56  *    1918.69  *
* Q Bridge (cfs)         *    5500.00  * Crit W.S. (ft)         *    1918.56  *    1919.03  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       6.05  *       6.91  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      14.47  *      11.95  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     380.01  *     460.10  *
* Weir Submerg           *             * Froude # Chl           *       1.24  *       0.81  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    3412.94  *    3135.21  *
* Min El Weir Flow (ft)  *    1918.82  * Hydr Depth (ft)        *       4.21  *       4.13  *
* Min El Prs (ft)        *    1919.05  * W.P. Total (ft)        *     114.50  *     275.31  *
* Delta EG (ft)          *       4.52  * Conv. Total (cfs)      *    31410.2  *    26505.5  *
* Delta WS (ft)          *       3.12  * Top Width (ft)         *      90.37  *     111.28  *
* BR Open Area (sq ft)   *     375.42  * Frctn Loss (ft)        *       0.21  *       0.36  *
* BR Open Vel (ft/s)     *      14.90  * C & E Loss (ft)        *       0.24  *       0.50  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       6.35  *       4.49  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *       0.00  *       0.00  *
*************************************************************************************************

Warning: There was not enough momentum to compute a supercritical answer through the bridge.  The momentum 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 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.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was used.
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: FW
REACH: FW                RS: 6100

INPUT
Description: Sta 61+00
Station Elevation Data    num=     109
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
   -12.5    1922       0  1920.3       6 1919.49    9.18 1919.12      10 1918.95
   17.46 1918.42   39.83 1916.72   48.69 1916.11   56.57 1915.42    57.8 1915.37
   60.65 1915.26   69.65 1915.08   97.64  1914.2   99.16 1914.18   99.44 1914.18
   99.87 1914.17  101.46 1914.18  112.99 1914.23  115.47 1914.24  115.57 1914.23
  120.16 1914.24  123.49  1914.2  126.03 1914.11  130.73 1913.99   134.2 1913.97
   143.5  1914.1  156.88 1913.92  158.72 1913.83   164.5  1913.6  164.97 1913.63
  180.53 1914.34   188.2  1914.7  188.47 1914.71   188.7 1914.72  188.91 1914.73
  189.03 1914.73  189.13 1914.73  189.64 1914.75  208.93 1915.42  208.95 1915.42
    2131913.964  219.35 1911.68  221.16 1911.05  227.04 1910.47  231.07 1909.53
   237.1 1909.49  243.23 1909.48   243.5 1909.48  244.02 1909.49  246.79 1910.15
  247.91 1910.48  251.94 1911.32  253.14 1911.48  253.61 1911.48    2571913.218
  258.31 1913.89  258.43 1913.86  259.28  1913.6  276.21 1913.71  278.49 1913.69
  279.26 1913.69   281.2 1913.63  308.23 1913.52  309.95 1913.82  315.51 1914.13
  325.37  1914.8  328.21 1914.96  333.67 1915.45  338.03 1915.64  351.34 1916.64
  361.45 1917.39  362.69 1917.46  367.52 1917.62  368.78 1917.68  369.91 1917.75
   373.6  1917.9  397.68 1919.16  418.68 1919.94  427.49  1920.4  441.27 1921.64
  454.27 1921.62   459.3 1922.24  460.02 1923.19  461.32 1923.25  464.32  1923.3
  466.42 1923.44  468.08 1923.56  474.08 1924.15  476.27  1924.4  479.81 1924.44
   484.2 1924.54  485.67 1924.55  487.99 1924.71  489.66 1924.72  510.92 1924.45
  515.38 1924.65  515.75 1924.69  517.31 1924.73  520.86 1924.91   538.4 1925.42
  543.31 1925.92  548.53 1925.58  549.22  1925.6  550.18 1925.49  558.96 1925.61
   563.7 1925.36  568.04    1925  572.01 1924.81  577.65    1924
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
   -12.5     .03  208.93     .04  258.31     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        208.93  258.31            225.1     195   182.1             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)         * 1917.26  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.07  * Wt. n-Val.             *   0.030  *   0.040  *   0.030  *
* W.S. Elev (ft)         * 1916.19  * Reach Len. (ft)        *  170.00  *  170.00  *  170.00  *
* Crit W.S. (ft)         * 1916.19  * Flow Area (sq ft)      *  273.02  *  249.75  *  176.08  *
* E.G. Slope (ft/ft)     *0.008445  * Area (sq ft)           *  273.02  *  249.75  *  176.08  *
* Q Total (cfs)          * 5500.00  * Flow (cfs)             * 1763.53  * 2456.03  * 1280.44  *
* Top Width (ft)         *  297.83  * Top Width (ft)         *  161.40  *   49.38  *   87.04  *
* Vel Total (ft/s)       *    7.87  * Avg. Vel. (ft/s)       *    6.46  *    9.83  *    7.27  *
* Max Chl Dpth (ft)      *    6.71  * Hydr. Depth (ft)       *    1.69  *    5.06  *    2.02  *
* Conv. Total (cfs)      * 59849.5  * Conv. (cfs)            * 19190.3  * 26725.8  * 13933.4  *
* Length Wtd. (ft)       *  170.00  * Wetted Per. (ft)       *  161.51  *   51.08  *   87.20  *
* Min Ch El (ft)         * 1909.48  * Shear (lb/sq ft)       *    0.89  *    2.58  *    1.06  *
* Alpha                  *    1.11  * Stream Power (lb/ft s) *  577.65  *    0.00  *    0.00  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)   *    0.62  *   31.97  *    0.79  *
* C & E Loss (ft)        *          * Cum SA (acres)         *    0.47  *    6.72  *    0.44  *
************************************************************************************************

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.

BRIDGE


RIVER: FW
REACH: FW                RS: 6000

INPUT
Description:
Distance from Upstream XS =     170
Deck/Roadway Width        =      10
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      64
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
       0  1922.7           1.2081922.633           2.9731922.616
   5.8561922.623           8.9721922.409          14.8161922.042
  16.3231921.964          23.2041921.604          25.5391921.431
  30.0971921.116          30.9261921.056           32.111920.984
  34.7021920.842          37.5981920.692          39.2951920.657
  42.7091920.503          46.0131920.357          46.9481920.299
  52.121 1919.73          54.1631919.654           56.481919.382
  69.5851918.756          69.885 1918.74          77.878  1918.5
  80.5951917.948          81.8031917.916           92.911917.307
  95.5051917.097         105.3411916.862         110.9961916.862
  118.911916.896         125.2141917.031         128.834 1917.04 1915.04
 149.082 1917.71 1915.04 188.083 1917.76 1915.04 210.114 1917.28 1915.04
 216.1041916.967          218.941916.864          225.311916.462
 230.8071916.083         235.2461915.677         239.0311915.371
 246.972 1915.27          248.041915.207         250.0921915.147
 256.7641914.714         263.6311914.595         266.1971914.496
 274.5611914.613         278.0851914.586         281.0241914.593
 284.6561914.608          301.221914.954         304.5731915.084
 309.5131915.348         314.9081915.617         334.8811916.573
 346.2251917.095         358.1381917.765         360.2571917.806
 363.221 1917.84         385.3911919.029         400.7921919.289
 406.8941919.553

Upstream Bridge Cross Section Data
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       01923.064  10.886 1923.35  18.4831923.249   21.441923.241  26.2631922.965
  28.6631923.123  29.4531923.292  30.3381923.472  41.783 1921.71  45.0191921.205
  46.8251920.832  51.0551920.289  51.3271920.261  52.545 1920.15  75.1771918.032
   76.761917.905  81.8641917.689  102.141916.388 124.5941915.784  125.831915.753
 129.1091914.253 142.948 1908.55 149.6391908.733 154.4021908.996 171.7221909.675
 175.3091909.788  176.851910.203 183.233 1911.58 189.1071913.125  191.431913.708
 202.178 1914.55 202.8121914.615 203.7611914.716 204.0351914.699 226.2811915.121
 229.0071914.965 232.1011914.699 235.895 1914.53 254.3751913.795 257.7211913.848
 266.5221913.862 268.0151913.885 272.4451914.013 282.775 1914.04 287.4881914.221
 291.396  1914.5 293.5661914.656 296.2721914.886 299.347 1915.08 303.0321915.345
 306.5621915.419 327.7051916.533  330.521916.707 344.3571917.075 355.8941917.406
  375.811918.425 381.2691918.771 389.0281918.979 398.0891919.448

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .03  125.83     .04 202.178     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        125.83 202.178             .1       .3
```

```
Downstream  Deck/Roadway Coordinates
    num=      70
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**********************************************************************
-169.7391923.322        -168.3641923.217        -167.7041923.205
-164.8141923.161        -162.2681923.115        -150.4181922.938
-148.4881922.813        -145.3421922.633        -143.5771922.616
-140.6941922.623        -137.5781922.409        -131.7341922.042
-130.2271921.964        -123.3461921.604        -121.0111921.431
-116.4531921.116        -115.6241921.056         -114.441920.984
-111.8481920.842        -108.9521920.692        -107.2551920.657
-103.8411920.503        -100.5371920.357         -99.6021920.299
 -94.429 1919.73         -92.3871919.654         -90.071919.382
 -76.9651918.756         -76.665 1918.74         -68.672  1918.5
 -65.9551917.948         -64.7471917.916          -53.641917.307
 -51.0451917.097         -41.2091916.862         -35.5541916.862
  -27.641916.896         -21.3361917.031         -17.716 1917.04 1915.04
   2.532 1917.71 1915.04  41.533 1917.76 1915.04  63.564 1917.28 1915.04
  69.5541916.967           72.391916.864           78.761916.462
  84.2571916.083          88.6961915.677          92.4811915.371
 100.422 1915.27          101.491915.207         103.5421915.147
 110.2141914.714         117.0811914.595         119.6471914.496
 128.0111914.613         131.5351914.586         134.4741914.593
 138.1061914.608          154.671914.954         158.0231915.084
 162.9631915.348         168.3581915.617         188.3311916.573
 199.6751917.095         211.5881917.765         213.7071917.806
 216.671 1917.84         238.8411919.029         254.2421919.289
 260.3441919.553

Downstream Bridge Cross Section Data
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
    -1401924.051-138.7851923.913-126.5421921.682-124.8071921.424-119.2441921.014
-111.6341920.395-110.0121920.342 -86.7741919.439 -85.7911919.403 -84.684 1919.32
 -68.1791918.352 -63.998 1917.94 -63.1941918.081 -62.6151918.255 -58.1461917.907
 -55.0311917.864 -53.8931917.759 -38.6711916.274 -37.3551916.271 -35.9391916.123
 -20.6611915.969 -17.0151915.895 -10.7441913.481  -1.1871910.068   2.4491908.687
   4.6691908.576   6.6211908.461  17.6731908.564  21.6061908.628  25.4491908.664
  27.6511908.699  31.8491908.636  34.5361908.589  38.9691908.535   43.311908.567
  61.5251915.141  64.161 1915.95  64.8981915.868  65.9931915.846  68.9831916.215
  71.2761916.459  74.698 1916.21  81.9291915.669  84.6661915.482  96.6981914.736
 104.8581914.497 107.8831914.503 110.4091914.571 116.5621914.592 136.1261914.961
 141.3361915.099  143.911915.322 148.6271915.481  168.691916.569 172.0551916.769
 192.6821917.816 193.5841917.867 198.9781917.973 215.6121918.217 218.1291918.272
 236.3941918.384 242.7831918.484 253.2071918.628 260.3431918.917

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
    -140     .03 -17.015     .04  61.525     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
       -17.015  61.525            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    -140    -135    1925       T

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=     149    Downstream=       9
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04

Pier Data
Pier Station     Upstream=     179    Downstream=      39
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
       21908.461       2 1915.04

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =       2
Selected Low Flow Methods = Momentum

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 #100-yr FIS

E.G. US. (ft)	1917.26	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1916.19	E.G. Elev (ft)	1919.13	1918.79
Q Total (cfs)	5500.00	W.S. Elev (ft)	1917.28	1916.34
Q Bridge (cfs)	2730.09	Crit W.S. (ft)	1917.28	1916.43
Q Weir (cfs)		Max Chl Dpth (ft)	8.73	7.88
Weir Sta Lft (ft)		Vel Total (ft/s)	10.54	12.52
Weir Sta Rgt (ft)		Flow Area (sq ft)	521.87	439.46
Weir Submerg		Froude # Chl	0.65	0.79
Weir Max Depth (ft)		Specif Force (cu ft)	3441.47	3665.54
Min El Weir Flow (ft)	1914.61	Hydr Depth (ft)	2.86	5.24
Min El Prs (ft)	1915.04	W.P. Total (ft)	361.32	256.40
Delta EG (ft)	-1.07	Conv. Total (cfs)	30234.0	25475.5
Delta WS (ft)	2.37	Top Width (ft)	182.67	83.84
BR Open Area (sq ft)	285.29	Frctn Loss (ft)	2.53	0.38
BR Open Vel (ft/s)	9.57	C & E Loss (ft)	0.08	0.05
Coef of Q		Shear Total (lb/sq ft)	2.98	4.99
Br Sel Method	Energy only	Power Total (lb/ft s)	0.00	-140.00

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 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
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.
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.

CROSS SECTION

RIVER: FW
REACH: FW RS: 5917

INPUT
Description: 59+05 US Face of Eastern Ave. Bridge
Station Elevation Data num= 167

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-172.5	1923.76	-171.906	1923.76	-170.8671	923.776	-170.5971	923.755	-170.5181	923.763
-169.8261	923.821	-169.81	923.822	-168.439	1923.65	-165.8611	922.875	-160.7461	922.822
-148.4981	922.469	-141.5351	922.393	-136.0541	922.169	-129.6581	922.015	-124.4481	921.893
-122.176	1921.84	-114.9291	918.452	-112.9411	917.892	-112.6931	917.919	-110.3091	917.941
-109.0051	918.031	-104.9631	918.085	-103.3821	918.105	-99.6911	918.274	-99.6691	918.274
-99.5811	918.275	-95.8711	918.462	-95.2791	918.523	-90.9961	918.872	-88.9121	919.049
-81.5241	919.718	-80.721	919.771	-80.571	919.781	-79.8951	919.844	-75.095	1919.96
-74.3641	919.954	-70.3621	920.197	-65.3381	920.022	-65.1581	920.026	-64.6581	920.013
-64.2111	920.009	-63.5951	919.999	-63.0011	920.001	-601	920.105	-59	1920.14
-54.371	1920.3	-52.3961	920.299	-49.6541	920.253	-45.6511	920.255	-45.0011	920.245
-44.213	1920.21	-41.5841	919.181	-40.211	918.723	-40.071	918.704	-39.8881	918.683
-39.3181	918.609	-36.8311	918.217	-30.2271	917.193	-19.907	1917.02	-18.561	917.017
-18.508	1917.04	-18.421	917.023	-15.6091	917.038	-15.4521	916.831	-2.0991	911.426
4.5211	908.752	7.2571	908.704	9.4941	908.686	11.9381	908.621	13.8651	908.574
21.2031	908.391	29.3891	908.315	42.3841	908.125	42.5641	908.128	42.9781	908.135
49.6521	908.224	51.4121	908.295	52.7471	908.936	64.3721	913.793	66.2391	914.676
69.921	916.515	70.1671	916.655	70.2491	916.653	77.8511	917.408	78.321	917.442
78.7531	917.422	81.5981	917.365	84.7841	917.247	88.7931	916.972	901	916.889
92.024	1916.75	981	916.424	109.5681	915.792	111.6741	915.713	116.8771	915.436
119.7151	915.317	124.1261	915.423	129.0241	915.593	134.6871	915.789	138.0081	916.103
140.2611	916.213	143.9431	916.257	146.8151	916.478	149.3031	916.667	152.6091	916.933
155.4311	917.094	158.4511	917.227	161.4831	917.511	167.831	917.619	168.731	1917.64
171.1761	917.671	179.9651	917.743	184.8421	917.682	192.6311	917.813	209.7931	918.207
217.8991	918.265	234.4581	918.519	252.52	1918.76	260.1441	919.123	268.3711	919.405
284.9661	919.736	295.528	1920.66	297.5481	920.742	298.1721	920.745	299.1021	920.768
307.791	1921.12	310.2661	921.264	310.5621	921.327	311.0431	921.411	316.4211	921.872
317.881	922.012	321.599	1922.44	322.7351	922.544	324.6671	922.636	326.8781	922.699
328.6281	922.671	331.293	1922.74	333.0641	922.671	336.8051	922.711	338.1571	922.678
341.771	922.761	344.5751	922.778	344.806	1922.78	347.181	922.799	349.1091	922.951
350.7881	923.237	355.1951	923.449	356.3121	923.567	358.3761	923.728	359.6041	923.721
362.7091	923.714	364.544	1923.62	368.6831	923.239	369.4851	923.172	372.121	922.854
376.0761	922.416	379.6991	922.019	382.3581	921.665	385.9961	921.243	391.9931	920.458
392.9411	920.507	401.6531	920.859	409.926	1921.08	421.2731	921.399	434.9591	922.172
449.4831	922.194	459.4281	921.693						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-172.5	.03	-18.42	.033	7.257	.013	52.747	.033	77.851	.03
129.024	.16								

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -60      90             121     121     121             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  -172.5    -135    1925       T
```

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1918.33	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 4.51	* Wt. n-Val.	*	* 0.022	* *
* W.S. Elev (ft)	* 1913.82	* Reach Len. (ft)	* 121.00	* 121.00	* 121.00 *
* Crit W.S. (ft)	* 1915.10	* Flow Area (sq ft)	*	* 322.77	* *
* E.G. Slope (ft/ft)	*0.008907	* Area (sq ft)	*	* 322.77	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 72.44	* Top Width (ft)	*	* 72.44	* *
* Vel Total (ft/s)	* 17.04	* Avg. Vel. (ft/s)	*	* 17.04	* *
* Max Chl Dpth (ft)	* 5.69	* Hydr. Depth (ft)	*	* 4.46	* *
* Conv. Total (cfs)	* 58277.8	* Conv. (cfs)	*	* 58277.8	* *
* Length Wtd. (ft)	* 121.00	* Wetted Per. (ft)	*	* 74.56	* *
* Min Ch El (ft)	* 1908.13	* Shear (lb/sq ft)	*	* 2.41	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 459.43	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.26	* Cum Volume (acre-ft)	* 0.07	* 30.93	* *
* C & E Loss (ft)	* 0.21	* Cum SA (acres)	* 0.09	* 6.60	* *

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: Manning's n values were composited to a single value in the main channel.

CULVERT

RIVER: FW
REACH: FW RS: 5800

INPUT
Description: Eastern
Distance from Upstream XS = 10.9
Deck/Roadway Width = 85
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 30

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-198.44	1919.63	1906	-188.71	1919.53	1906	-178.67	1919.41	1906
-169.29	1919.32	1906	-159.26	1919.2	1906	-149.36	1919.08	1906
-139.46	1918.97	1906	-129.34	1918.83	1906	-119.1	1918.74	1906
-108.74	1918.64	1906	-98.56	1918.56	1906	-88.5	1918.48	1906
-78.38	1918.39	1906	-68.47	1918.32	1906	-58.39	1918.27	1906
-48.18	1918.21	1906	-38.27	1918.16	1906	-27.67	1918.11	1906
-17.31	1918.08		-7.11	1918.05		3.07	1918.01	
13.37	1917.99		23.84	1917.97		34.25	1917.96	
44.4	1917.95		54.67	1917.96		64.73	1917.97	
75.02	1917.97		227.16	1919		337.17	1920	

Upstream Bridge Cross Section Data
Station Elevation Data num= 167

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-172.5	1923.76	-171.906	1923.76	-170.8671	1923.776	-170.5971	1923.755	-170.5181	1923.763
-169.8261	1923.821	-169.8	1923.822	-168.439	1923.65	-165.8611	1922.875	-160.7461	1922.822
-148.4981	1922.469	-141.5351	1922.393	-136.0541	1922.169	-129.6581	1922.015	-124.4481	1921.893
-122.176	1921.84	-114.9291	1918.452	-112.9411	1917.892	-112.6931	1917.919	-110.3091	1917.941
-109.0051	1918.031	-104.9631	1918.085	-103.3821	1918.105	-99.6911	1918.274	-99.6691	1918.274
-99.5811	1918.275	-95.8711	1918.462	-95.2791	1918.523	-90.9961	1918.872	-88.9121	1919.049
-81.5241	1919.718	-80.721	1919.771	-80.571	1919.781	-79.8951	1919.844	-75.095	1919.96
-74.3641	1919.954	-70.3621	1920.197	-65.3381	1920.022	-65.1581	1920.026	-64.6581	1920.013
-64.2111	1920.009	-63.5951	1919.999	-63.0011	1920.001	-601	1920.105	-59	1920.14
-54.371	1920.3	-52.3961	1920.299	-49.6541	1920.253	-45.6511	1920.255	-45.0011	1920.245
-44.213	1920.21	-41.5841	1919.181	-40.211	1918.723	-40.071	1918.704	-39.8881	1918.683
-39.3181	1918.609	-36.8311	1918.217	-30.2271	1917.193	-19.907	1917.02	-18.561	1917.017
-18.508	1917.04	-18.421	1917.023	-15.6091	1917.038	-15.4521	1916.831	-2.0991	911.426
4.5211	908.752	7.2571	908.704	9.4941	908.686	11.9381	908.621	13.8651	908.574
21.2031	908.391	29.3891	908.315	42.3841	908.125	42.5641	908.128	42.9781	908.135
49.6521	908.224	51.4121	908.295	52.7471	908.936	64.3721	913.793	66.2391	914.676
69.921	916.515	70.1671	916.655	70.2491	916.653	77.8511	917.408	78.321	917.442
78.7531	917.422	81.5981	917.365	84.7841	917.247	88.7931	916.972	901	916.889
92.024	1916.75	981	916.424	109.5681	915.792	111.6741	915.713	116.8771	915.436
119.7151	915.317	124.1261	915.423	129.0241	915.593	134.6871	915.789	138.0081	916.103
140.2611	916.213	143.9431	916.257	146.8151	916.478	149.3031	916.667	152.6091	916.933
155.4311	917.094	158.4511	917.227	161.4831	917.511	167.831	917.619	168.731	917.64
171.1761	917.671	179.9651	917.743	184.8421	917.682	192.6311	917.813	209.7931	918.207
217.8991	918.265	234.4581	918.519	252.52	918.76	260.1441	919.123	268.3711	919.405
284.9661	919.736	295.528	920.66	297.5481	920.742	298.1721	920.745	299.1021	920.768
307.791	921.12	310.2661	921.264	310.5621	921.327	311.0431	921.411	316.4211	921.872
317.881	922.012	321.599	922.44	322.7351	922.544	324.6671	922.636	326.8781	922.699
328.6281	922.671	331.293	922.74	333.0641	922.671	336.8051	922.711	338.1571	922.678
341.771	922.761	344.5751	922.778	344.806	922.78	347.181	922.799	349.1091	922.951
350.7881	923.237	355.1951	923.449	356.3121	923.567	358.3761	923.728	359.6041	923.721
362.7091	923.714	364.544	923.62	368.6831	923.239	369.4851	923.172	372.121	922.854
376.0761	922.416	379.6991	922.019	382.3581	921.665	385.9961	921.243	391.9931	920.458
392.9411	920.507	401.6531	920.859	409.926	921.08	421.2731	921.399	434.9591	922.172
449.4831	922.194	459.4281	921.693						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-172.5	.03	-18.42	.033	7.257	.013	52.747	.033	77.851	.03

```
 129.024     .16

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -60      90           .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  -172.5    -135    1925       T

Downstream  Deck/Roadway Coordinates
    num=      30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**********************************************************************
 -198.44 1919.63    1906 -188.71 1919.53    1906 -178.67 1919.41    1906
 -169.29 1919.32    1906 -159.26  1919.2    1906 -149.36 1919.08    1906
 -139.46 1918.97    1906 -129.34 1918.83    1906  -119.1 1918.74    1906
 -108.74 1918.64    1906  -98.56 1918.56    1906   -88.5 1918.48    1906
  -78.38 1918.39    1906  -68.47 1918.32    1906  -58.39 1918.27    1906
  -48.18 1918.21    1906  -38.27 1918.16    1906  -27.67 1918.11    1906
  -17.31 1918.08           -7.11 1918.05            3.07 1918.01
   13.37 1917.99           23.84 1917.97           34.25 1917.96
    44.4 1917.95           54.67 1917.96           64.73 1917.97
   75.02 1917.97          227.16    1919          337.17    1920

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
       0    1918       0  1906.3   28.15  1906.3    56.3  1906.3    56.3    1918

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
*******************************
       0    .015    56.3    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
            0    56.3           .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         = 1917.95
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 16      99     .015     .015        0                  .4               .1
Number of Barrels =  5
Upstream   Elevation =  1907.6
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       5  16.575   28.15  39.725    51.3
Downstream Elevation =  1906.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       5  16.575   28.15  39.725    51.3

CULVERT OUTPUT  Profile #100-yr FIS  Culv Group:  Culvert #1
**************************************************************************
* Q Culv Group (cfs)     * 5500.00  * Culv Full Len (ft)     *          *
* # Barrels              *       5  * Culv Vel US (ft/s)     *   15.24  *
* Q Barrel (cfs)         * 1100.00  * Culv Vel DS (ft/s)     *   18.70  *
* E.G. US. (ft)          * 1918.33  * Culv Inv El Up (ft)    * 1907.60  *
* W.S. US. (ft)          * 1913.82  * Culv Inv El Dn (ft)    * 1906.30  *
* E.G. DS (ft)           * 1917.52  * Culv Frctn Ls (ft)     *    0.81  *
* W.S. DS (ft)           * 1911.11  * Culv Exit Loss (ft)    *    0.10  *
* Delta EG (ft)          *    0.81  * Culv Entr Loss (ft)    *    0.00  *
* Delta WS (ft)          *    2.71  * Q Weir (cfs)           *          *
* E.G. IC (ft)           *          * Weir Sta Lft (ft)      *          *
* E.G. OC (ft)           *          * Weir Sta Rgt (ft)      *          *
* Culvert Control        *  Outlet  * Weir Submerg           *          *
* Culv WS Inlet (ft)     * 1914.82  * Weir Max Depth (ft)    *          *
* Culv WS Outlet (ft)    * 1912.18  * Weir Avg Depth (ft)    *          *
* Culv Nml Depth (ft)    *    5.19  * Weir Flow Area (sq ft) *          *
* Culv Crt Depth (ft)    *    7.22  * Min El Weir Flow (ft)  * 1917.96  *
**************************************************************************

Warning: During the supercritical analysis, there was not enough energy for supercritical flow going into the culvert.  The program
         assumed critical depth at the inlet.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 5796

INPUT
Description: Sta 57+96
 DS of Eastern Ave. Bridge
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
```

```
       0    1918       0  1906.3   28.15  1906.3    56.3  1906.3    56.3  1920.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
       0    .015       0    .015    56.3    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0    56.3               20      20      20             .3       .5

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1917.52  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    6.41  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1911.11  * Reach Len. (ft)       *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)         * 1912.96  * Flow Area (sq ft)     *          *  270.72  *          *
* E.G. Slope (ft/ft)     *0.005894  * Area (sq ft)          *          *  270.72  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)           *          * 5500.00  *          *
* Top Width (ft)         *   56.30  * Top Width (ft)       *          *   56.30  *          *
* Vel Total (ft/s)       *   20.32  * Avg. Vel. (ft/s)     *          *   20.32  *          *
* Max Chl Dpth (ft)      *    4.81  * Hydr. Depth (ft)     *          *    4.81  *          *
* Conv. Total (cfs)      * 68775.2  * Conv. (cfs)          *          * 68775.2  *          *
* Length Wtd. (ft)       *   20.00  * Wetted Per. (ft)     *          *   65.92  *          *
* Min Ch El (ft)         * 1906.30  * Shear (lb/sq ft)     *          *    1.51  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   56.30  *    0.00  *    0.00  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *    0.07  *   30.76  *          *
* C & E Loss (ft)        *          * Cum SA (acres)        *    0.09  *    6.42  *          *
*************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 5776

INPUT
Description: "FW" 57+37.74 End 79.77' Channel. Begin transition
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1915.79       0  1906.1   39.84 1905.99   79.77  1906.1   79.77 1915.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
       0    .015       0    .015   79.77    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   79.77            38.26   38.26   38.26             .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1916.89  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    7.91  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1908.98  * Reach Len. (ft)       *   38.26  *   38.26  *   38.26  *
* Crit W.S. (ft)         * 1911.19  * Flow Area (sq ft)     *          *  233.95  *          *
* E.G. Slope (ft/ft)     *0.013568  * Area (sq ft)          *          *  233.95  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)           *          * 5280.00  *          *
* Top Width (ft)         *   79.77  * Top Width (ft)       *          *   79.77  *          *
* Vel Total (ft/s)       *   22.57  * Avg. Vel. (ft/s)     *          *   22.57  *          *
* Max Chl Dpth (ft)      *    2.99  * Hydr. Depth (ft)     *          *    2.93  *          *
* Conv. Total (cfs)      * 45328.9  * Conv. (cfs)          *          * 45328.9  *          *
* Length Wtd. (ft)       *   38.26  * Wetted Per. (ft)     *          *   85.53  *          *
* Min Ch El (ft)         * 1905.99  * Shear (lb/sq ft)     *          *    2.32  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   79.77  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.18  * Cum Volume (acre-ft)  *    0.07  *   30.65  *          *
* C & E Loss (ft)        *    0.45  * Cum SA (acres)        *    0.09  *    6.39  *          *
*************************************************************************************************

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: FW
REACH: FW                RS: 5737.74

INPUT
Description: 57+37.74 Begin 79.77' Channel. End transition
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1915.23       0 1905.75   39.84 1905.43   79.77 1905.75   79.77 1915.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
       0    .015       0    .015   79.77    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   79.77            89.32   89.32   89.32             .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)         * 1916.37  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    7.83  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1908.54  * Reach Len. (ft)       *   89.32  *   89.32  *   89.32  *
```

* Crit W.S. (ft)	* 1910.72	* Flow Area (sq ft)	*	* 235.10	*	*
* E.G. Slope (ft/ft)	*0.013311	* Area (sq ft)	*	* 235.10	*	*
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	*	*
* Top Width (ft)	* 79.77	* Top Width (ft)	*	* 79.77	*	*
* Vel Total (ft/s)	* 22.46	* Avg. Vel. (ft/s)	*	* 22.46	*	*
* Max Chl Dpth (ft)	* 3.11	* Hydr. Depth (ft)	*	* 2.95	*	*
* Conv. Total (cfs)	* 45764.4	* Conv. (cfs)	*	* 45764.4	*	*
* Length Wtd. (ft)	* 89.32	* Wetted Per. (ft)	*	* 85.35	*	*
* Min Ch El (ft)	* 1905.43	* Shear (lb/sq ft)	*	* 2.29	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 79.77	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.51	* Cum Volume (acre-ft)	* 0.07	* 30.44	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 6.32	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 5648.42

INPUT
Description: 56+48.42 begin transition from 75' to 79.77' and PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1913.89	0	1904.84	37.5	1904.09	75	1904.84	75	1913.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	99.6	99.6	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1915.25	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.60	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1907.65	* Reach Len. (ft)	* 99.60	* 99.60	* 99.60 *
* Crit W.S. (ft)	* 1909.80	* Flow Area (sq ft)	*	* 238.65	* *
* E.G. Slope (ft/ft)	*0.011737	* Area (sq ft)	*	* 238.65	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	* *
* Vel Total (ft/s)	* 22.12	* Avg. Vel. (ft/s)	*	* 22.12	* *
* Max Chl Dpth (ft)	* 3.56	* Hydr. Depth (ft)	*	* 3.18	* *
* Conv. Total (cfs)	* 48735.7	* Conv. (cfs)	*	* 48735.7	* *
* Length Wtd. (ft)	* 99.60	* Wetted Per. (ft)	*	* 80.63	* *
* Min Ch El (ft)	* 1904.09	* Shear (lb/sq ft)	*	* 2.17	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 1.12	* Cum Volume (acre-ft)	* 0.07	* 29.96	* *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 0.09	* 6.16	* *

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: FW
REACH: FW RS: 5548.82*

INPUT
Description: "FW" 58+48.82
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1912.39	0	1903.34	37.5	1902.59	75	1903.34	75	1912.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	99.59	99.59	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1914.04	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.96	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1906.07	* Reach Len. (ft)	* 99.59	* 99.59	* 99.59 *
* Crit W.S. (ft)	* 1908.31	* Flow Area (sq ft)	*	* 233.16	* *
* E.G. Slope (ft/ft)	*0.012654	* Area (sq ft)	*	* 233.16	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 75.00	* Top Width (ft)	*	* 75.00	* *
* Vel Total (ft/s)	* 22.65	* Avg. Vel. (ft/s)	*	* 22.65	* *
* Max Chl Dpth (ft)	* 3.48	* Hydr. Depth (ft)	*	* 3.11	* *
* Conv. Total (cfs)	* 46937.3	* Conv. (cfs)	*	* 46937.3	* *
* Length Wtd. (ft)	* 99.59	* Wetted Per. (ft)	*	* 80.48	* *
* Min Ch El (ft)	* 1902.59	* Shear (lb/sq ft)	*	* 2.29	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 75.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 1.21	* Cum Volume (acre-ft)	* 0.07	* 29.42	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.99	* *

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: FW
REACH: FW RS: 5449.23

INPUT
Description: "FW" 54+49.23
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1910.89	0	1901.84	37.5	1901.09	75	1901.84	75	1910.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	.12	.12	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1912.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.22	Wt. n-Val.		0.015	
W.S. Elev (ft)	1904.52	Reach Len. (ft)	0.12	0.12	0.12
Crit W.S. (ft)	1906.81	Flow Area (sq ft)		229.46	
E.G. Slope (ft/ft)	*0.013325	Area (sq ft)		229.46	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	75.00	Top Width (ft)		75.00	
Vel Total (ft/s)	23.01	Avg. Vel. (ft/s)		23.01	
Max Chl Dpth (ft)	3.43	Hydr. Depth (ft)		3.06	
Conv. Total (cfs)	45740.3	Conv. (cfs)		45740.3	
Length Wtd. (ft)	0.12	Wetted Per. (ft)		80.38	
Min Ch El (ft)	1901.09	Shear (lb/sq ft)		2.37	
Alpha	1.00	Stream Power (lb/ft s)	75.00	0.00	0.00
Frctn Loss (ft)	1.29	Cum Volume (acre-ft)	0.07	28.89	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	5.82	

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: FW
REACH: FW RS: 5449.11

INPUT
Description: 54+49.11 PC, End Transition and Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1910.89	0	1901.84	37.5	1901.09	75	1901.84	75	1910.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	75	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	75	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1912.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.22	Wt. n-Val.		0.015	
W.S. Elev (ft)	1904.52	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1906.81	Flow Area (sq ft)		229.46	
E.G. Slope (ft/ft)	*0.013325	Area (sq ft)		229.46	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	75.00	Top Width (ft)		75.00	
Vel Total (ft/s)	23.01	Avg. Vel. (ft/s)		23.01	
Max Chl Dpth (ft)	3.43	Hydr. Depth (ft)		3.06	
Conv. Total (cfs)	45740.3	Conv. (cfs)		45740.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		80.38	
Min Ch El (ft)	1901.09	Shear (lb/sq ft)		2.37	
Alpha	1.00	Stream Power (lb/ft s)	75.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.07	28.89	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	5.82	

CROSS SECTION

RIVER: FW
REACH: FW RS: 5399.11

INPUT
Description: "FW" 53+99.11
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1909.97	0	1900.85	33.81	1900.17	67.61	1900.85	67.61	1909.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
*********************************************
       0    .015       0    .015   67.61    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   67.61               50      50      50            .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1912.11  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    8.21  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1903.91  * Reach Len. (ft)       *   50.00  *   50.00  *   50.00  *
* Crit W.S. (ft)         * 1906.25  * Flow Area (sq ft)     *          *  229.68  *          *
* E.G. Slope (ft/ft)     *0.011839  * Area (sq ft)          *          *  229.68  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)            *          * 5280.00  *          *
* Top Width (ft)         *   67.61  * Top Width (ft)        *          *   67.61  *          *
* Vel Total (ft/s)       *   22.99  * Avg. Vel. (ft/s)      *          *   22.99  *          *
* Max Chl Dpth (ft)      *    3.74  * Hydr. Depth (ft)      *          *    3.40  *          *
* Conv. Total (cfs)      * 48526.0  * Conv. (cfs)           *          * 48526.0  *          *
* Length Wtd. (ft)       *   50.00  * Wetted Per. (ft)      *          *   73.74  *          *
* Min Ch El (ft)         * 1900.17  * Shear (lb/sq ft)      *          *    2.30  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   67.61  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.63  * Cum Volume (acre-ft)  *    0.07  *   28.62  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.09  *    5.74  *          *
*****************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 5349.11

INPUT
Description: "FW" 53+49.11
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1909.06       0 1899.86   30.11 1899.26   60.22 1899.86   60.22 1909.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015   60.22    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   60.22               50      50      50            .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1911.56  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    8.18  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1903.38  * Reach Len. (ft)       *   50.00  *   50.00  *   50.00  *
* Crit W.S. (ft)         * 1905.76  * Flow Area (sq ft)     *          *  230.08  *          *
* E.G. Slope (ft/ft)     *0.010414  * Area (sq ft)          *          *  230.08  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)            *          * 5280.00  *          *
* Top Width (ft)         *   60.22  * Top Width (ft)        *          *   60.22  *          *
* Vel Total (ft/s)       *   22.95  * Avg. Vel. (ft/s)      *          *   22.95  *          *
* Max Chl Dpth (ft)      *    4.12  * Hydr. Depth (ft)      *          *    3.82  *          *
* Conv. Total (cfs)      * 51739.4  * Conv. (cfs)           *          * 51739.4  *          *
* Length Wtd. (ft)       *   50.00  * Wetted Per. (ft)      *          *   67.27  *          *
* Min Ch El (ft)         * 1899.26  * Shear (lb/sq ft)      *          *    2.22  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   60.22  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    0.55  * Cum Volume (acre-ft)  *    0.07  *   28.36  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.09  *    5.66  *          *
*****************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 5299.11

INPUT
Description: "FW" 52+99.11
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1908.14       0 1898.87   26.42 1898.34   52.84 1898.87   52.84 1908.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015   52.84    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0   52.84              19.19   19.19   19.19            .01      .03

CROSS SECTION OUTPUT  Profile #100-yr FIS
*****************************************************************************************
* E.G. Elev (ft)         * 1911.07  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    8.09  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1902.98  * Reach Len. (ft)       *   19.19  *   19.19  *   19.19  *
* Crit W.S. (ft)         * 1905.37  * Flow Area (sq ft)     *          *  231.32  *          *
* E.G. Slope (ft/ft)     *0.008994  * Area (sq ft)          *          *  231.32  *          *
* Q Total (cfs)          * 5280.00  * Flow (cfs)            *          * 5280.00  *          *
* Top Width (ft)         *   52.84  * Top Width (ft)        *          *   52.84  *          *
* Vel Total (ft/s)       *   22.83  * Avg. Vel. (ft/s)      *          *   22.83  *          *
* Max Chl Dpth (ft)      *    4.64  * Hydr. Depth (ft)      *          *    4.38  *          *
* Conv. Total (cfs)      * 55676.2  * Conv. (cfs)           *          * 55676.2  *          *
* Length Wtd. (ft)       *   19.19  * Wetted Per. (ft)      *          *   61.08  *          *
```

* Min Ch El (ft)	* 1898.34	* Shear (lb/sq ft)	*	* 2.13	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 52.84	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.48	* Cum Volume (acre-ft)	* 0.07	* 28.09	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.60	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 5279.92

INPUT
Description: 52+79.92 begin transition from 50' to 75' and PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907.79	0	1898.49	25	1897.99	50	1898.49	50	1907.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	24.76	24.76	24.76	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1910.91	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 8.02	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1902.89	* Reach Len. (ft)	* 24.76	* 24.76	* 24.76 *
* Crit W.S. (ft)	* 1905.26	* Flow Area (sq ft)	*	* 232.30	* *
* E.G. Slope (ft/ft)	*0.008430	* Area (sq ft)	*	* 232.30	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 22.73	* Avg. Vel. (ft/s)	*	* 22.73	* *
* Max Chl Dpth (ft)	* 4.90	* Hydr. Depth (ft)	*	* 4.65	* *
* Conv. Total (cfs)	* 57507.4	* Conv. (cfs)	*	* 57507.4	* *
* Length Wtd. (ft)	* 24.76	* Wetted Per. (ft)	*	* 58.80	* *
* Min Ch El (ft)	* 1897.99	* Shear (lb/sq ft)	*	* 2.08	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 0.07	* 27.99	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.58	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 5255.16

INPUT
Description: 52+55.16 Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907.34	0	1898.04	25	1897.54	50	1898.04	50	1907.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.46	48.46	48.46	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1910.69	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 8.35	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1902.34	* Reach Len. (ft)	* 48.46	* 48.46	* 48.46 *
* Crit W.S. (ft)	* 1904.81	* Flow Area (sq ft)	*	* 227.71	* *
* E.G. Slope (ft/ft)	*0.008972	* Area (sq ft)	*	* 227.71	* *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	*	* 5280.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 23.19	* Avg. Vel. (ft/s)	*	* 23.19	* *
* Max Chl Dpth (ft)	* 4.80	* Hydr. Depth (ft)	*	* 4.55	* *
* Conv. Total (cfs)	* 55742.3	* Conv. (cfs)	*	* 55742.3	* *
* Length Wtd. (ft)	* 48.46	* Wetted Per. (ft)	*	* 58.62	* *
* Min Ch El (ft)	* 1897.54	* Shear (lb/sq ft)	*	* 2.18	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.22	* Cum Volume (acre-ft)	* 0.07	* 27.86	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.55	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 5206.70

INPUT
Description: "FW" 52+06.70
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1910.86	0	1897.66	25	1897.16	50	1897.66	50	1910.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.46	48.46	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1910.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.28	Wt. n-Val.		0.015	
W.S. Elev (ft)	1901.98	Reach Len. (ft)	48.46	48.46	48.46
Crit W.S. (ft)	1904.43	Flow Area (sq ft)		228.67	
E.G. Slope (ft/ft)	*0.008855	Area (sq ft)		228.67	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	23.09	Avg. Vel. (ft/s)		23.09	
Max Chl Dpth (ft)	4.82	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	56109.3	Conv. (cfs)		56109.3	
Length Wtd. (ft)	48.46	Wetted Per. (ft)		58.66	
Min Ch El (ft)	1897.16	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.07	27.61	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	5.49	

CROSS SECTION

RIVER: FW
REACH: FW RS: 5158.24

INPUT
Description: "FW" 51+58.24
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1911.58	0	1897.28	25	1896.78	50	1897.28	50	1912.68

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.45	48.45	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1909.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.22	Wt. n-Val.		0.015	
W.S. Elev (ft)	1901.62	Reach Len. (ft)	48.45	48.45	48.45
Crit W.S. (ft)	1904.05	Flow Area (sq ft)		229.54	
E.G. Slope (ft/ft)	*0.008750	Area (sq ft)		229.54	
Q Total (cfs)	5280.00	Flow (cfs)		5280.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	23.00	Avg. Vel. (ft/s)		23.00	
Max Chl Dpth (ft)	4.84	Hydr. Depth (ft)		4.59	
Conv. Total (cfs)	56444.3	Conv. (cfs)		56444.3	
Length Wtd. (ft)	48.45	Wetted Per. (ft)		58.69	
Min Ch El (ft)	1896.78	Shear (lb/sq ft)		2.14	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.07	27.35	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	5.44	

CROSS SECTION

RIVER: FW
REACH: FW RS: 5109.79

INPUT
Description: "FW"51+09.79
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1907	0	1896.9	25	1896.4	50	1896.9	50	1909.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.46	48.46	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1909.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.91	Wt. n-Val.		0.015	
W.S. Elev (ft)	1901.52	Reach Len. (ft)	48.46	48.46	48.46
Crit W.S. (ft)	1903.86	Flow Area (sq ft)		243.61	
E.G. Slope (ft/ft)	*0.007887	Area (sq ft)		243.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	22.58	Avg. Vel. (ft/s)		22.58	
Max Chl Dpth (ft)	5.12	Hydr. Depth (ft)		4.87	

* Conv. Total (cfs)	* 61931.9	* Conv. (cfs)	*	* 61931.9	*	*
* Length Wtd. (ft)	* 48.46	* Wetted Per. (ft)	*	* 59.25	*	*
* Min Ch El (ft)	* 1896.40	* Shear (lb/sq ft)	*	* 2.02	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.40	* Cum Volume (acre-ft)	* 0.07	* 27.09	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.38	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 5061.33

INPUT
Description: "FW" 50+61.33
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1905.82	0	1896.52	25	1896.02	50	1896.52	50	1905.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	48.45	48.45	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1909.06	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.91	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1901.14	* Reach Len. (ft)	* 48.45	* 48.45	* 48.45 *
* Crit W.S. (ft)	* 1903.48	* Flow Area (sq ft)	*	* 243.61	* *
* E.G. Slope (ft/ft)	*0.007887	* Area (sq ft)	*	* 243.61	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 22.58	* Avg. Vel. (ft/s)	*	* 22.58	* *
* Max Chl Dpth (ft)	* 5.12	* Hydr. Depth (ft)	*	* 4.87	* *
* Conv. Total (cfs)	* 61931.9	* Conv. (cfs)	*	* 61931.9	* *
* Length Wtd. (ft)	* 48.45	* Wetted Per. (ft)	*	* 59.25	* *
* Min Ch El (ft)	* 1896.02	* Shear (lb/sq ft)	*	* 2.02	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.38	* Cum Volume (acre-ft)	* 0.07	* 26.82	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.33	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 5012.88

INPUT
Description: "FW" 50+12.88 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1905.44	0	1896.14	25	1895.64	50	1896.14	50	1905.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	67.84	67.84	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1908.68	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.91	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1900.76	* Reach Len. (ft)	* 67.84	* 67.84	* 67.84 *
* Crit W.S. (ft)	* 1903.10	* Flow Area (sq ft)	*	* 243.61	* *
* E.G. Slope (ft/ft)	*0.007887	* Area (sq ft)	*	* 243.61	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 22.58	* Avg. Vel. (ft/s)	*	* 22.58	* *
* Max Chl Dpth (ft)	* 5.12	* Hydr. Depth (ft)	*	* 4.87	* *
* Conv. Total (cfs)	* 61931.9	* Conv. (cfs)	*	* 61931.9	* *
* Length Wtd. (ft)	* 67.84	* Wetted Per. (ft)	*	* 59.25	* *
* Min Ch El (ft)	* 1895.64	* Shear (lb/sq ft)	*	* 2.02	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.38	* Cum Volume (acre-ft)	* 0.07	* 26.55	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 5.27	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 4945.04

INPUT
Description: 49+45.04 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
       0 1904.91       0 1895.61      25 1895.11      50 1895.61      50 1904.91

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            81.68   81.68   81.68              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)          * 1908.15  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    7.91  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)          * 1900.23  * Reach Len. (ft)       *   81.68  *   81.68  *   81.68  *
* Crit W.S. (ft)          * 1902.57  * Flow Area (sq ft)     *          *  243.61  *          *
* E.G. Slope (ft/ft)      *0.007887  * Area (sq ft)          *          *  243.61  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)           *          * 5500.00  *          *
* Top Width (ft)          *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)        *   22.58  * Avg. Vel. (ft/s)     *          *   22.58  *          *
* Max Chl Dpth (ft)       *    5.12  * Hydr. Depth (ft)     *          *    4.87  *          *
* Conv. Total (cfs)       * 61931.9  * Conv. (cfs)          *          * 61931.9  *          *
* Length Wtd. (ft)        *   81.68  * Wetted Per. (ft)     *          *   59.25  *          *
* Min Ch El (ft)          * 1895.11  * Shear (lb/sq ft)     *          *    2.02  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    0.54  * Cum Volume (acre-ft)  *    0.07  *   26.17  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)        *    0.09  *    5.19  *          *
************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 4863.36

INPUT
Description: "FW" 48+63.36
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1904.28       0 1894.98      25 1894.48      50 1894.98      50 1904.28

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            81.68   81.68   81.68              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)          * 1907.50  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    7.90  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)          * 1899.61  * Reach Len. (ft)       *   81.68  *   81.68  *   81.68  *
* Crit W.S. (ft)          * 1901.94  * Flow Area (sq ft)     *          *  243.90  *          *
* E.G. Slope (ft/ft)      *0.007858  * Area (sq ft)          *          *  243.90  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)           *          * 5500.00  *          *
* Top Width (ft)          *   50.00  * Top Width (ft)       *          *   50.00  *          *
* Vel Total (ft/s)        *   22.55  * Avg. Vel. (ft/s)     *          *   22.55  *          *
* Max Chl Dpth (ft)       *    5.13  * Hydr. Depth (ft)     *          *    4.88  *          *
* Conv. Total (cfs)       * 62045.5  * Conv. (cfs)          *          * 62045.5  *          *
* Length Wtd. (ft)        *   81.68  * Wetted Per. (ft)     *          *   59.27  *          *
* Min Ch El (ft)          * 1894.48  * Shear (lb/sq ft)     *          *    2.02  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    0.64  * Cum Volume (acre-ft)  *    0.07  *   25.71  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)        *    0.09  *    5.10  *          *
************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 4781.68

INPUT
Description: "FW" 47+81.68
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1903.64       0 1894.34      25 1893.84      50 1894.34      50 1903.64

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      50            81.68   81.68   81.68              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
************************************************************************************************
* E.G. Elev (ft)          * 1906.86  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    7.90  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)          * 1898.97  * Reach Len. (ft)       *   81.68  *   81.68  *   81.68  *
* Crit W.S. (ft)          * 1901.30  * Flow Area (sq ft)     *          *  243.90  *          *
* E.G. Slope (ft/ft)      *0.007858  * Area (sq ft)          *          *  243.90  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)           *          * 5500.00  *          *
* Top Width (ft)          *   50.00  * Top Width (ft)       *          *   50.00  *          *
```

* Vel Total (ft/s)	* 22.55	* Avg. Vel. (ft/s)	*	* 22.55	*			
* Max Chl Dpth (ft)	* 5.13	* Hydr. Depth (ft)	*	* 4.88	*			
* Conv. Total (cfs)	* 62045.5	* Conv. (cfs)	*	* 62045.5	*			
* Length Wtd. (ft)	* 81.68	* Wetted Per. (ft)	*	* 59.27	*			
* Min Ch El (ft)	* 1893.84	* Shear (lb/sq ft)	*	* 2.02	*			
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00 *
* Frctn Loss (ft)	* 0.64	* Cum Volume (acre-ft)	*	0.07	*	25.25	*	
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	0.09	*	5.01	*	

CROSS SECTION

RIVER: FW
REACH: FW RS: 4700

INPUT
Description: "FW" 47+00.00 Grade Break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1903	0	1893.7	25	1893.2	50	1893.7	50	1903

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	100	100	100	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1906.22	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.90	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1898.33	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1900.66	* Flow Area (sq ft)	*	* 243.90	*
* E.G. Slope (ft/ft)	*0.007858	* Area (sq ft)	*	* 243.90	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 22.55	* Avg. Vel. (ft/s)	*	* 22.55	*
* Max Chl Dpth (ft)	* 5.13	* Hydr. Depth (ft)	*	* 4.88	*
* Conv. Total (cfs)	* 62045.5	* Conv. (cfs)	*	* 62045.5	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 59.27	*
* Min Ch El (ft)	* 1893.20	* Shear (lb/sq ft)	*	* 2.02	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.64	* Cum Volume (acre-ft)	* 0.07	* 24.80	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.91	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 4600

INPUT
Description: "FW" 46+00.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1902.22	0	1892.92	25	1892.42	50	1892.92	50	1902.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	100	100	100	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1905.44	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.90	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1897.55	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1899.88	* Flow Area (sq ft)	*	* 243.90	*
* E.G. Slope (ft/ft)	*0.007858	* Area (sq ft)	*	* 243.90	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 22.55	* Avg. Vel. (ft/s)	*	* 22.55	*
* Max Chl Dpth (ft)	* 5.13	* Hydr. Depth (ft)	*	* 4.88	*
* Conv. Total (cfs)	* 62045.5	* Conv. (cfs)	*	* 62045.5	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 59.27	*
* Min Ch El (ft)	* 1892.42	* Shear (lb/sq ft)	*	* 2.02	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.79	* Cum Volume (acre-ft)	* 0.07	* 24.24	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.80	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 4500

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1901.43	0	1892.13	25	1891.63	50	1892.13	50	1901.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	74.31 74.31	74.31	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1904.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1896.76	Reach Len. (ft)	74.31	74.31	74.31
Crit W.S. (ft)	1899.09	Flow Area (sq ft)		243.81	
E.G. Slope (ft/ft)	*0.007866	Area (sq ft)		243.81	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	22.56	Avg. Vel. (ft/s)		22.56	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	62011.6	Conv. (cfs)		62011.6	
Length Wtd. (ft)	74.31	Wetted Per. (ft)		59.26	
Min Ch El (ft)	1891.63	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	0.07	23.68	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	4.68	

CROSS SECTION

RIVER: FW
REACH: FW RS: 4425.69

INPUT
Description: "FW" 44+25.69 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1900.85	0	1891.55	25	1891.05	50	1891.55	50	1900.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	75.69 75.69	75.69	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1904.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1896.18	Reach Len. (ft)	75.69	75.69	75.69
Crit W.S. (ft)	1898.51	Flow Area (sq ft)		243.81	
E.G. Slope (ft/ft)	*0.007866	Area (sq ft)		243.81	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	22.56	Avg. Vel. (ft/s)		22.56	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	62011.6	Conv. (cfs)		62011.6	
Length Wtd. (ft)	75.69	Wetted Per. (ft)		59.26	
Min Ch El (ft)	1891.05	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	0.07	23.26	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	4.60	

CROSS SECTION

RIVER: FW
REACH: FW RS: 4350

INPUT
Description: "FW" 43+50 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1900.26	0	1890.96	25	1890.46	50	1890.96	50	1900.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	75	75	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1903.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1895.59	Reach Len. (ft)	75.00	75.00	75.00
Crit W.S. (ft)	1897.92	Flow Area (sq ft)		243.81	
E.G. Slope (ft/ft)	*0.007866	Area (sq ft)		243.81	

* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*
* Vel Total (ft/s)	* 22.56	* Avg. Vel. (ft/s)	*	* 22.56	*	*
* Max Chl Dpth (ft)	* 5.13	* Hydr. Depth (ft)	*	* 4.88	*	*
* Conv. Total (cfs)	* 62011.6	* Conv. (cfs)	*	* 62011.6	*	*
* Length Wtd. (ft)	* 75.00	* Wetted Per. (ft)	*	* 59.26	*	*
* Min Ch El (ft)	* 1890.46	* Shear (lb/sq ft)	*	* 2.02	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.60	* Cum Volume (acre-ft)	* 0.07	* 22.84	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.51	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 4275.*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1899.51	0	1890.21	25	1889.71	50	1890.21	50	1899.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	75	75	75	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1902.89	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 8.11	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1894.77	* Reach Len. (ft)	* 75.00	* 75.00	* 75.00 *
* Crit W.S. (ft)	* 1897.17	* Flow Area (sq ft)	*	* 240.63	* *
* E.G. Slope (ft/ft)	*0.008195	* Area (sq ft)	*	* 240.63	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 22.86	* Avg. Vel. (ft/s)	*	* 22.86	* *
* Max Chl Dpth (ft)	* 5.06	* Hydr. Depth (ft)	*	* 4.81	* *
* Conv. Total (cfs)	* 60756.5	* Conv. (cfs)	*	* 60756.5	* *
* Length Wtd. (ft)	* 75.00	* Wetted Per. (ft)	*	* 59.14	* *
* Min Ch El (ft)	* 1889.71	* Shear (lb/sq ft)	*	* 2.08	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.60	* Cum Volume (acre-ft)	* 0.07	* 22.42	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.42	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 4200.00

INPUT
Description: "FW" 42+00 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1898.76	0	1889.46	25	1888.96	50	1889.46	50	1898.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	72.75	72.75	72.75	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1902.26	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 8.29	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1893.97	* Reach Len. (ft)	* 72.75	* 72.75	* 72.75 *
* Crit W.S. (ft)	* 1896.42	* Flow Area (sq ft)	*	* 238.07	* *
* E.G. Slope (ft/ft)	*0.008473	* Area (sq ft)	*	* 238.07	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 23.10	* Avg. Vel. (ft/s)	*	* 23.10	* *
* Max Chl Dpth (ft)	* 5.01	* Hydr. Depth (ft)	*	* 4.76	* *
* Conv. Total (cfs)	* 59750.7	* Conv. (cfs)	*	* 59750.7	* *
* Length Wtd. (ft)	* 72.75	* Wetted Per. (ft)	*	* 59.03	* *
* Min Ch El (ft)	* 1888.96	* Shear (lb/sq ft)	*	* 2.13	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.62	* Cum Volume (acre-ft)	* 0.07	* 22.01	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.34	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 4127.25*

INPUT

Description: "FW" 41+27.25
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1898.4	0	1889.1	25	1888.6	50	1889.1	50	1898.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	72.75	72.75	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1901.67	Element	Left OB	Channel / Right OB
Vel Head (ft)	7.96	Wt. n-Val.		0.015 /
W.S. Elev (ft)	1893.71	Reach Len. (ft)	72.75	72.75 / 72.75
Crit W.S. (ft)	1896.06	Flow Area (sq ft)		242.99 /
E.G. Slope (ft/ft)	*0.007950	Area (sq ft)		242.99 /
Q Total (cfs)	5500.00	Flow (cfs)		5500.00 /
Top Width (ft)	50.00	Top Width (ft)		50.00 /
Vel Total (ft/s)	22.63	Avg. Vel. (ft/s)		22.63 /
Max Chl Dpth (ft)	5.11	Hydr. Depth (ft)		4.86 /
Conv. Total (cfs)	61685.6	Conv. (cfs)		61685.6 /
Length Wtd. (ft)	72.75	Wetted Per. (ft)		59.23 /
Min Ch El (ft)	1888.60	Shear (lb/sq ft)		2.04 /
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00 / 0.00
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	0.07	21.61 /
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	4.25 /

CROSS SECTION

RIVER: FW
REACH: FW RS: 4054.5*

INPUT
Description: "FW"40+54.50
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1898.03	0	1888.73	25	1888.23	50	1888.73	50	1898.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	77.42	77.42	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1901.11	Element	Left OB	Channel / Right OB
Vel Head (ft)	7.68	Wt. n-Val.		0.015 /
W.S. Elev (ft)	1893.43	Reach Len. (ft)	77.42	77.42 / 77.42
Crit W.S. (ft)	1895.69	Flow Area (sq ft)		247.35 /
E.G. Slope (ft/ft)	*0.007522	Area (sq ft)		247.35 /
Q Total (cfs)	5500.00	Flow (cfs)		5500.00 /
Top Width (ft)	50.00	Top Width (ft)		50.00 /
Vel Total (ft/s)	22.24	Avg. Vel. (ft/s)		22.24 /
Max Chl Dpth (ft)	5.20	Hydr. Depth (ft)		4.95 /
Conv. Total (cfs)	63416.1	Conv. (cfs)		63416.1 /
Length Wtd. (ft)	77.42	Wetted Per. (ft)		59.40 /
Min Ch El (ft)	1888.23	Shear (lb/sq ft)		1.96 /
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00 / 0.00
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.07	21.20 /
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	4.17 /

CROSS SECTION

RIVER: FW
REACH: FW RS: 3977.08

INPUT
Description: 39+77.08 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1897.65	0	1888.35	25	1887.85	50	1888.35	50	1897.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.2	86.2	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1900.54	Element	Left OB	Channel / Right OB
Vel Head (ft)	7.40	Wt. n-Val.		0.015 /
W.S. Elev (ft)	1893.14	Reach Len. (ft)	86.20	86.20 / 86.20

* Crit W.S. (ft)	* 1895.31	* Flow Area (sq ft)	*	* 251.90	*
* E.G. Slope (ft/ft)	*0.007107	* Area (sq ft)	*	* 251.90	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 21.83	* Avg. Vel. (ft/s)	*	* 21.83	*
* Max Chl Dpth (ft)	* 5.29	* Hydr. Depth (ft)	*	* 5.04	*
* Conv. Total (cfs)	* 65242.8	* Conv. (cfs)	*	* 65242.8	*
* Length Wtd. (ft)	* 86.20	* Wetted Per. (ft)	*	* 59.59	*
* Min Ch El (ft)	* 1887.85	* Shear (lb/sq ft)	*	* 1.88	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.57	* Cum Volume (acre-ft)	* 0.07	* 20.75	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 4.08	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3890.88*

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1897.21	0	1887.91	25	1887.41	50	1887.91	50	1897.21

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	90.88	90.88	90.88	0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1899.95	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 7.16	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1892.78	* Reach Len. (ft)	* 90.88	* 90.88	* 90.88 *
* Crit W.S. (ft)	* 1894.87	* Flow Area (sq ft)	*	* 256.08	*
* E.G. Slope (ft/ft)	*0.006753	* Area (sq ft)	*	* 256.08	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 21.48	* Avg. Vel. (ft/s)	*	* 21.48	*
* Max Chl Dpth (ft)	* 5.37	* Hydr. Depth (ft)	*	* 5.12	*
* Conv. Total (cfs)	* 66929.9	* Conv. (cfs)	*	* 66929.9	*
* Length Wtd. (ft)	* 90.88	* Wetted Per. (ft)	*	* 59.75	*
* Min Ch El (ft)	* 1887.41	* Shear (lb/sq ft)	*	* 1.81	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.60	* Cum Volume (acre-ft)	* 0.07	* 20.25	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.98	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3800

INPUT
Description: 38+00 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1896.76	0	1887.46	25	1886.96	50	1887.46	50	1896.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	100	100	100	0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1899.35	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 6.93	* Wt. n-Val.	*	* 0.015	*
* W.S. Elev (ft)	* 1892.42	* Reach Len. (ft)	* 100.00	* 100.00	* 100.00 *
* Crit W.S. (ft)	* 1894.42	* Flow Area (sq ft)	*	* 260.33	*
* E.G. Slope (ft/ft)	*0.006417	* Area (sq ft)	*	* 260.33	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 21.13	* Avg. Vel. (ft/s)	*	* 21.13	*
* Max Chl Dpth (ft)	* 5.46	* Hydr. Depth (ft)	*	* 5.21	*
* Conv. Total (cfs)	* 68660.5	* Conv. (cfs)	*	* 68660.5	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 59.92	*
* Min Ch El (ft)	* 1886.96	* Shear (lb/sq ft)	*	* 1.74	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.60	* Cum Volume (acre-ft)	* 0.07	* 19.71	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.88	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3700.*

INPUT
Description: "FW" 37+00.00
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1895.76	0	1886.46	25	1885.96	50	1886.46	50	1895.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	50	106.45	106.45	106.45	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1898.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.44	Wt. n-Val.		0.015	
W.S. Elev (ft)	1891.24	Reach Len. (ft)	106.45	106.45	106.45
Crit W.S. (ft)	1893.42	Flow Area (sq ft)		251.25	
E.G. Slope (ft/ft)	*0.007164	Area (sq ft)		251.25	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	21.89	Avg. Vel. (ft/s)		21.89	
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)		5.03	
Conv. Total (cfs)	64980.2	Conv. (cfs)		64980.2	
Length Wtd. (ft)	106.45	Wetted Per. (ft)		59.56	
Min Ch El (ft)	1885.96	Shear (lb/sq ft)		1.89	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	0.07	19.12	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	3.76	

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: FW
REACH: FW RS: 3593.55

INPUT
Description: 35+93.55 grade break.End Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1894.7	0	1885.4	25	1884.9	50	1885.4	50	1894.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	50	50	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1897.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.84	Wt. n-Val.		0.015	
W.S. Elev (ft)	1890.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1892.36	Flow Area (sq ft)		244.78	
E.G. Slope (ft/ft)	*0.007770	Area (sq ft)		244.78	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	22.47	Avg. Vel. (ft/s)		22.47	
Max Chl Dpth (ft)	5.15	Hydr. Depth (ft)		4.90	
Conv. Total (cfs)	62396.3	Conv. (cfs)		62396.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		59.30	
Min Ch El (ft)	1884.90	Shear (lb/sq ft)		2.00	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	0.07	18.52	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	3.64	

CROSS SECTION

RIVER: FW
REACH: FW RS: 3543.55

INPUT
Description: "FW" 35+43.55
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1894.13	0	1884.36	22.88	1883.9	45.75	1884.36	45.75	1894.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	45.75	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	45.75	50	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1897.50	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 8.10	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1889.39	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00	*
* Crit W.S. (ft)	* 1891.79	* Flow Area (sq ft)	*	* 240.76	*	*
* E.G. Slope (ft/ft)	*0.007575	* Area (sq ft)	*	* 240.76	*	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*	*
* Top Width (ft)	* 45.75	* Top Width (ft)	*	* 45.75	*	*
* Vel Total (ft/s)	* 22.84	* Avg. Vel. (ft/s)	*	* 22.84	*	*
* Max Chl Dpth (ft)	* 5.49	* Hydr. Depth (ft)	*	* 5.26	*	*
* Conv. Total (cfs)	* 63193.1	* Conv. (cfs)	*	* 63193.1	*	*
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 55.82	*	*
* Min Ch El (ft)	* 1883.90	* Shear (lb/sq ft)	*	* 2.04	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 45.75	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.38	* Cum Volume (acre-ft)	* 0.07	* 18.24	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.59	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3493.55

INPUT
Description: "FW" 34+93.55
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1893.55	0	1883.31	20.75	1882.9	41.5	1883.31	41.5	1893.55

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	41.5	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	41.5	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1897.12	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 8.28	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1888.85	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00	*
* Crit W.S. (ft)	* 1891.27	* Flow Area (sq ft)	*	* 238.20	*	*
* E.G. Slope (ft/ft)	*0.007248	* Area (sq ft)	*	* 238.20	*	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*	*
* Top Width (ft)	* 41.50	* Top Width (ft)	*	* 41.50	*	*
* Vel Total (ft/s)	* 23.09	* Avg. Vel. (ft/s)	*	* 23.09	*	*
* Max Chl Dpth (ft)	* 5.94	* Hydr. Depth (ft)	*	* 5.74	*	*
* Conv. Total (cfs)	* 64604.8	* Conv. (cfs)	*	* 64604.8	*	*
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 52.58	*	*
* Min Ch El (ft)	* 1882.90	* Shear (lb/sq ft)	*	* 2.05	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 41.50	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.37	* Cum Volume (acre-ft)	* 0.07	* 17.96	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.54	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3443.55

INPUT
Description: "FW" 34+43.55
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1892.98	0	1882.27	18.62	1881.9	37.25	1882.27	37.25	1892.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	37.25	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	37.25	50	50	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1896.77	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 8.29	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1888.47	* Reach Len. (ft)	* 50.00	* 50.00	* 50.00	*
* Crit W.S. (ft)	* 1890.86	* Flow Area (sq ft)	*	* 238.00	*	*
* E.G. Slope (ft/ft)	*0.006736	* Area (sq ft)	*	* 238.00	*	*
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	*	*
* Top Width (ft)	* 37.25	* Top Width (ft)	*	* 37.25	*	*
* Vel Total (ft/s)	* 23.11	* Avg. Vel. (ft/s)	*	* 23.11	*	*
* Max Chl Dpth (ft)	* 6.57	* Hydr. Depth (ft)	*	* 6.39	*	*
* Conv. Total (cfs)	* 67012.5	* Conv. (cfs)	*	* 67012.5	*	*
* Length Wtd. (ft)	* 50.00	* Wetted Per. (ft)	*	* 49.67	*	*
* Min Ch El (ft)	* 1881.90	* Shear (lb/sq ft)	*	* 2.02	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 37.25	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.35	* Cum Volume (acre-ft)	* 0.07	* 17.69	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.49	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3393.55

INPUT
Description: 33+93.55 grade break. Begin Transition from 33' to 50'
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1892.4	0	1881.23	16.5	1880.9	33	1881.23	33	1892.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	97.57	97.57	97.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1896.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	1888.38	Reach Len. (ft)	97.57	97.57	97.57
Crit W.S. (ft)	1890.57	Flow Area (sq ft)		241.37	
E.G. Slope (ft/ft)	*0.006023	Area (sq ft)		241.37	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	22.79	Avg. Vel. (ft/s)		22.79	
Max Chl Dpth (ft)	7.48	Hydr. Depth (ft)		7.31	
Conv. Total (cfs)	70866.3	Conv. (cfs)		70866.3	
Length Wtd. (ft)	97.57	Wetted Per. (ft)		47.31	
Min Ch El (ft)	1880.90	Shear (lb/sq ft)		1.92	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	0.07	17.42	
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	3.45	

CROSS SECTION

RIVER: FW
REACH: FW RS: 3295.98

INPUT
Description: "FW" 32+95.98
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1891.41	0	1880.24	16.5	1879.91	33	1880.24	33	1891.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	97.57	97.57	97.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1895.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.71	Wt. n-Val.		0.015	
W.S. Elev (ft)	1887.11	Reach Len. (ft)	97.57	97.57	97.57
Crit W.S. (ft)	1889.58	Flow Area (sq ft)		232.21	
E.G. Slope (ft/ft)	*0.006745	Area (sq ft)		232.21	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	23.68	Avg. Vel. (ft/s)		23.68	
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)		7.04	
Conv. Total (cfs)	66967.4	Conv. (cfs)		66967.4	
Length Wtd. (ft)	97.57	Wetted Per. (ft)		46.75	
Min Ch El (ft)	1879.91	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	0.07	16.89	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	3.38	

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: FW
REACH: FW RS: 3198.41

INPUT
Description: "FW"31+98.41
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1890.42	0	1879.25	16.5	1878.92	33	1879.25	33	1890.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 97.57 97.57 97.57 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1895.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1885.93	Reach Len. (ft)	97.57	97.57	97.57
Crit W.S. (ft)	1888.59	Flow Area (sq ft)		225.84	
E.G. Slope (ft/ft)	*0.007320	Area (sq ft)		225.84	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	24.35	Avg. Vel. (ft/s)		24.35	
Max Chl Dpth (ft)	7.01	Hydr. Depth (ft)		6.84	
Conv. Total (cfs)	64285.4	Conv. (cfs)		64285.4	
Length Wtd. (ft)	97.57	Wetted Per. (ft)		46.36	
Min Ch El (ft)	1878.92	Shear (lb/sq ft)		2.23	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	0.07	16.37	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	3.30	

CROSS SECTION

RIVER: FW
REACH: FW RS: 3100.84

INPUT
Description: "FW" 31+00.84 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1889.43	0	1878.26	16.5	1877.93	33	1878.26	33	1889.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 50 50 50 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1894.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1884.80	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1887.60	Flow Area (sq ft)		221.26	
E.G. Slope (ft/ft)	*0.007774	Area (sq ft)		221.26	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	24.86	Avg. Vel. (ft/s)		24.86	
Max Chl Dpth (ft)	6.87	Hydr. Depth (ft)		6.70	
Conv. Total (cfs)	62378.0	Conv. (cfs)		62378.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		46.09	
Min Ch El (ft)	1877.93	Shear (lb/sq ft)		2.33	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	0.07	15.87	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	3.23	

CROSS SECTION

RIVER: FW
REACH: FW RS: 3050.84

INPUT
Description: "FW"30+50.84
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.92	0	1877.75	16.5	1877.42	33	1877.75	33	1888.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 33 50 50 50 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1894.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.77	Wt. n-Val.		0.015	
W.S. Elev (ft)	1884.23	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	1887.09	Flow Area (sq ft)		219.25	
E.G. Slope (ft/ft)	*0.007987	Area (sq ft)		219.25	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	33.00	Top Width (ft)		33.00	
Vel Total (ft/s)	25.09	Avg. Vel. (ft/s)		25.09	
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)		6.64	
Conv. Total (cfs)	61543.3	Conv. (cfs)		61543.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		45.96	
Min Ch El (ft)	1877.42	Shear (lb/sq ft)		2.38	
Alpha	1.00	Stream Power (lb/ft s)	33.00	0.00	0.00
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	0.07	15.62	

* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.19	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 3000.84

INPUT
Description: "FW" 30+00.84
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.42	0	1877.25	16.5	1876.92	33	1877.25	33	1888.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	36.63	36.63	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1893.59	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 9.91	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1883.68	* Reach Len. (ft)	* 36.63	* 36.63	* 36.63 *
* Crit W.S. (ft)	* 1886.59	* Flow Area (sq ft)	*	* 217.72	* *
* E.G. Slope (ft/ft)	*0.008152	* Area (sq ft)	*	* 217.72	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 25.26	* Avg. Vel. (ft/s)	*	* 25.26	* *
* Max Chl Dpth (ft)	* 6.76	* Hydr. Depth (ft)	*	* 6.60	* *
* Conv. Total (cfs)	* 60914.1	* Conv. (cfs)	*	* 60914.1	* *
* Length Wtd. (ft)	* 36.63	* Wetted Per. (ft)	*	* 45.87	* *
* Min Ch El (ft)	* 1876.92	* Shear (lb/sq ft)	*	* 2.42	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 33.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.40	* Cum Volume (acre-ft)	* 0.07	* 15.37	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.15	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2964.21

INPUT
Description: "FW" 29+64.21 PC
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1888.04	0	1876.87	16.5	1876.54	33	1876.87	33	1888.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	42.33	42.33	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1893.29	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.02	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1883.27	* Reach Len. (ft)	* 42.33	* 42.33	* 42.33 *
* Crit W.S. (ft)	* 1886.21	* Flow Area (sq ft)	*	* 216.49	* *
* E.G. Slope (ft/ft)	*0.008291	* Area (sq ft)	*	* 216.49	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 33.00	* Top Width (ft)	*	* 33.00	* *
* Vel Total (ft/s)	* 25.41	* Avg. Vel. (ft/s)	*	* 25.41	* *
* Max Chl Dpth (ft)	* 6.73	* Hydr. Depth (ft)	*	* 6.56	* *
* Conv. Total (cfs)	* 60404.3	* Conv. (cfs)	*	* 60404.3	* *
* Length Wtd. (ft)	* 42.33	* Wetted Per. (ft)	*	* 45.80	* *
* Min Ch El (ft)	* 1876.54	* Shear (lb/sq ft)	*	* 2.45	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 33.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.30	* Cum Volume (acre-ft)	* 0.07	* 15.19	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 3.13	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2921.88

INPUT
Description: "FW" 29+21.88 PT
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1887.61	0	1876.44	16.5	1876.11	33	1876.44	33	1887.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
       0    .015       0    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      33            84.01   84.01   84.01              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1892.93  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *   10.13  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)          * 1882.80  * Reach Len. (ft)        *   84.01  *   84.01  *   84.01  *
* Crit W.S. (ft)          * 1885.78  * Flow Area (sq ft)      *          *  215.32  *          *
* E.G. Slope (ft/ft)      *0.008424  * Area (sq ft)           *          *  215.32  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)             *          * 5500.00  *          *
* Top Width (ft)          *   33.00  * Top Width (ft)         *          *   33.00  *          *
* Vel Total (ft/s)        *   25.54  * Avg. Vel. (ft/s)       *          *   25.54  *          *
* Max Chl Dpth (ft)       *    6.69  * Hydr. Depth (ft)       *          *    6.52  *          *
* Conv. Total (cfs)       * 59923.8  * Conv. (cfs)            *          * 59923.8  *          *
* Length Wtd. (ft)        *   84.01  * Wetted Per. (ft)       *          *   45.73  *          *
* Min Ch El (ft)          * 1876.11  * Shear (lb/sq ft)       *          *    2.48  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *   33.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    0.35  * Cum Volume (acre-ft)   *    0.07  *   14.98  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    0.09  *    3.09  *          *
*************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 2837.87*

INPUT
Description: "FW" 28+37.87
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1886.76       0 1875.59    16.5 1875.26      33 1875.59      33 1886.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      33               84      84      84              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1892.21  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *   10.33  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)          * 1881.89  * Reach Len. (ft)        *   84.00  *   84.00  *   84.00  *
* Crit W.S. (ft)          * 1884.93  * Flow Area (sq ft)      *          *  213.29  *          *
* E.G. Slope (ft/ft)      *0.008663  * Area (sq ft)           *          *  213.29  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)             *          * 5500.00  *          *
* Top Width (ft)          *   33.00  * Top Width (ft)         *          *   33.00  *          *
* Vel Total (ft/s)        *   25.79  * Avg. Vel. (ft/s)       *          *   25.79  *          *
* Max Chl Dpth (ft)       *    6.63  * Hydr. Depth (ft)       *          *    6.46  *          *
* Conv. Total (cfs)       * 59091.1  * Conv. (cfs)            *          * 59091.1  *          *
* Length Wtd. (ft)        *   84.00  * Wetted Per. (ft)       *          *   45.60  *          *
* Min Ch El (ft)          * 1875.26  * Shear (lb/sq ft)       *          *    2.53  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *   33.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    0.72  * Cum Volume (acre-ft)   *    0.07  *   14.56  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    0.09  *    3.03  *          *
*************************************************************************************************

CROSS SECTION


RIVER: FW
REACH: FW                RS: 2753.87

INPUT
Description: "FW" 27+53.87
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1885.91       0 1874.74    16.5 1874.41      33 1874.74      33 1885.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      33            31.43   31.43   31.43              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1891.48  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *   10.49  * Wt. n-Val.             *          *   0.015  *          *
* W.S. Elev (ft)          * 1880.99  * Reach Len. (ft)        *   31.43  *   31.43  *   31.43  *
* Crit W.S. (ft)          * 1884.08  * Flow Area (sq ft)      *          *  211.61  *          *
* E.G. Slope (ft/ft)      *0.008868  * Area (sq ft)           *          *  211.61  *          *
* Q Total (cfs)           * 5500.00  * Flow (cfs)             *          * 5500.00  *          *
* Top Width (ft)          *   33.00  * Top Width (ft)         *          *   33.00  *          *
* Vel Total (ft/s)        *   25.99  * Avg. Vel. (ft/s)       *          *   25.99  *          *
* Max Chl Dpth (ft)       *    6.58  * Hydr. Depth (ft)       *          *    6.41  *          *
* Conv. Total (cfs)       * 58404.5  * Conv. (cfs)            *          * 58404.5  *          *
* Length Wtd. (ft)        *   31.43  * Wetted Per. (ft)       *          *   45.50  *          *
* Min Ch El (ft)          * 1874.41  * Shear (lb/sq ft)       *          *    2.57  *          *
```

* Alpha	*	1.00	* Stream Power (lb/ft s)	*	33.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.74	* Cum Volume (acre-ft)	*	0.07	*	14.15	*		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.09	*	2.97	*		*

CROSS SECTION

RIVER: FW
REACH: FW RS: 2722.44*

INPUT
Description: "FW" 27+22.44, Grade Break
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.59	0	1874.42	16.5	1874.09	21.84	1874.09	33	1874.31
33	1885.59								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	18.57	18.57	18.57	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	*	1891.19	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	10.61	* Wt. n-Val.	*		*	0.015	*		*
* W.S. Elev (ft)	*	1880.59	* Reach Len. (ft)	*	18.57	*	18.57	*	18.57	*
* Crit W.S. (ft)	*	1883.71	* Flow Area (sq ft)	*		*	210.46	*		*
* E.G. Slope (ft/ft)	*	0.009018	* Area (sq ft)	*		*	210.46	*		*
* Q Total (cfs)	*	5500.00	* Flow (cfs)	*		*	5500.00	*		*
* Top Width (ft)	*	33.00	* Top Width (ft)	*		*	33.00	*		*
* Vel Total (ft/s)	*	26.13	* Avg. Vel. (ft/s)	*		*	26.13	*		*
* Max Chl Dpth (ft)	*	6.50	* Hydr. Depth (ft)	*		*	6.38	*		*
* Conv. Total (cfs)	*	57918.7	* Conv. (cfs)	*		*	57918.7	*		*
* Length Wtd. (ft)	*	18.57	* Wetted Per. (ft)	*		*	45.45	*		*
* Min Ch El (ft)	*	1874.09	* Shear (lb/sq ft)	*		*	2.61	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	33.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.28	* Cum Volume (acre-ft)	*	0.07	*	14.00	*		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.09	*	2.94	*		*

CROSS SECTION

RIVER: FW
REACH: FW RS: 2703.87

INPUT
Description: 27+03.87 Van Buskirk confluence / begin 33' channel
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.5	0	1874.33	16.5	1874	25	1874	33	1874.16
33	1885.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	33	1	1	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	*	1891.03	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	10.52	* Wt. n-Val.	*		*	0.015	*		*
* W.S. Elev (ft)	*	1880.51	* Reach Len. (ft)	*	1.00	*	1.00	*	1.00	*
* Crit W.S. (ft)	*	1883.61	* Flow Area (sq ft)	*		*	211.29	*		*
* E.G. Slope (ft/ft)	*	0.008918	* Area (sq ft)	*		*	211.29	*		*
* Q Total (cfs)	*	5500.00	* Flow (cfs)	*		*	5500.00	*		*
* Top Width (ft)	*	33.00	* Top Width (ft)	*		*	33.00	*		*
* Vel Total (ft/s)	*	26.03	* Avg. Vel. (ft/s)	*		*	26.03	*		*
* Max Chl Dpth (ft)	*	6.50	* Hydr. Depth (ft)	*		*	6.40	*		*
* Conv. Total (cfs)	*	58240.1	* Conv. (cfs)	*		*	58240.1	*		*
* Length Wtd. (ft)	*	1.00	* Wetted Per. (ft)	*		*	45.52	*		*
* Min Ch El (ft)	*	1874.00	* Shear (lb/sq ft)	*		*	2.58	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	33.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	0.17	* Cum Volume (acre-ft)	*	0.07	*	13.91	*		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.09	*	2.93	*		*

CROSS SECTION

RIVER: FW
REACH: FW RS: 2702.87

INPUT
Description: 27+02.87 Van Buskirk confluence
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.49	0	1874.32	16.5	1873.99	25	1873.99	52.82	1874.53

52.82 1889.99

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	52.82	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	52.82	54.32	54.32	54.32	.01	.03

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
33	52.82	1885.49	T

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1891.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.52	Wt. n-Val.		0.015	
W.S. Elev (ft)	1880.50	Reach Len. (ft)	54.32	54.32	54.32
Crit W.S. (ft)	1883.60	Flow Area (sq ft)		211.35	
E.G. Slope (ft/ft)	*0.007295	Area (sq ft)		333.41	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	52.82	Top Width (ft)		52.82	
Vel Total (ft/s)	26.02	Avg. Vel. (ft/s)		26.02	
Max Chl Dpth (ft)	6.51	Hydr. Depth (ft)		6.40	
Conv. Total (cfs)	64396.2	Conv. (cfs)		64396.2	
Length Wtd. (ft)	54.32	Wetted Per. (ft)		39.18	
Min Ch El (ft)	1873.99	Shear (lb/sq ft)		2.46	
Alpha	1.00	Stream Power (lb/ft s)	52.82	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.07	13.91	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	2.93	

CROSS SECTION

RIVER: FW
REACH: FW RS: 2648.55

INPUT
Description: 26+48.52 end 50' channel / begin transition to confluence
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1885.22	0	1874.22	25	1873.72	50	1874.22	50	1887.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	50	52.41	52.41	52.41	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1890.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	12.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1877.83	Reach Len. (ft)	52.41	52.41	52.41
Crit W.S. (ft)	1881.19	Flow Area (sq ft)		193.15	
E.G. Slope (ft/ft)	*0.016324	Area (sq ft)		193.15	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	28.48	Avg. Vel. (ft/s)		28.48	
Max Chl Dpth (ft)	4.11	Hydr. Depth (ft)		3.86	
Conv. Total (cfs)	43048.3	Conv. (cfs)		43048.3	
Length Wtd. (ft)	52.41	Wetted Per. (ft)		57.24	
Min Ch El (ft)	1873.72	Shear (lb/sq ft)		3.44	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)	0.07	13.58	
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	2.86	

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: FW
REACH: FW RS: 2596.14

INPUT
Description: "FW"25+96.14
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1884.42	0	1873.96	25	1873.46	50	1873.96	50	1885.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

0	50	40.96	40.96	40.96	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1889.61	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 11.93	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1877.68	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.92	* Flow Area (sq ft)	*	* 198.46	* *
* E.G. Slope (ft/ft)	*0.014988	* Area (sq ft)	*	* 198.46	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 27.71	* Avg. Vel. (ft/s)	*	* 27.71	* *
* Max Chl Dpth (ft)	* 4.22	* Hydr. Depth (ft)	*	* 3.97	* *
* Conv. Total (cfs)	* 44925.5	* Conv. (cfs)	*	* 44925.5	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 57.45	* *
* Min Ch El (ft)	* 1873.46	* Shear (lb/sq ft)	*	* 3.23	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.82	* Cum Volume (acre-ft)	* 0.07	* 13.34	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.80	* *

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: FW
REACH: FW RS: 2555.18

INPUT
Description: "FW"25+55.18
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1883.25	0	1873.75	25	1873.25	50	1873.75	50	1883.25

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	40.96	40.96	40.96	0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1889.01	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 11.46	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1877.55	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.71	* Flow Area (sq ft)	*	* 202.44	* *
* E.G. Slope (ft/ft)	*0.014080	* Area (sq ft)	*	* 202.44	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 27.17	* Avg. Vel. (ft/s)	*	* 27.17	* *
* Max Chl Dpth (ft)	* 4.30	* Hydr. Depth (ft)	*	* 4.05	* *
* Conv. Total (cfs)	* 46351.3	* Conv. (cfs)	*	* 46351.3	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 57.61	* *
* Min Ch El (ft)	* 1873.25	* Shear (lb/sq ft)	*	* 3.09	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.59	* Cum Volume (acre-ft)	* 0.07	* 13.15	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.76	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2514.22

INPUT
Description: "FW"25+14.22
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1883.04	0	1873.54	25	1873.04	50	1873.54	50	1883.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	40.96	40.96	40.96	0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1888.44	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 11.02	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1877.42	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.50	* Flow Area (sq ft)	*	* 206.43	* *
* E.G. Slope (ft/ft)	*0.013241	* Area (sq ft)	*	* 206.43	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 26.64	* Avg. Vel. (ft/s)	*	* 26.64	* *
* Max Chl Dpth (ft)	* 4.38	* Hydr. Depth (ft)	*	* 4.13	* *
* Conv. Total (cfs)	* 47796.3	* Conv. (cfs)	*	* 47796.3	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 57.77	* *
* Min Ch El (ft)	* 1873.04	* Shear (lb/sq ft)	*	* 2.95	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.56	* Cum Volume (acre-ft)	* 0.07	* 12.96	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.71	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2473.26

INPUT
Description: "FW" 24+73.26
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1882.84	0	1873.34	25	1872.84	50	1873.34	50	1882.84

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	40.96	40.96	40.96	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1887.91	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.61	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1877.30	* Reach Len. (ft)	* 40.96	* 40.96	* 40.96 *
* Crit W.S. (ft)	* 1880.30	* Flow Area (sq ft)	*	* 210.40	* *
* E.G. Slope (ft/ft)	*0.012472	* Area (sq ft)	*	* 210.40	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 26.14	* Avg. Vel. (ft/s)	*	* 26.14	* *
* Max Chl Dpth (ft)	* 4.46	* Hydr. Depth (ft)	*	* 4.21	* *
* Conv. Total (cfs)	* 49249.2	* Conv. (cfs)	*	* 49249.2	* *
* Length Wtd. (ft)	* 40.96	* Wetted Per. (ft)	*	* 57.93	* *
* Min Ch El (ft)	* 1872.84	* Shear (lb/sq ft)	*	* 2.83	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.53	* Cum Volume (acre-ft)	* 0.07	* 12.76	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.66	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2432.30

INPUT
Description: "FW" 24+32.30 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1880.63	0	1873.13	25	1872.63	50	1873.13	50	1882.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	98.19	98.19	98.19	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1887.41	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.25	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1877.16	* Reach Len. (ft)	* 98.19	* 98.19	* 98.19 *
* Crit W.S. (ft)	* 1880.09	* Flow Area (sq ft)	*	* 214.12	* *
* E.G. Slope (ft/ft)	*0.011805	* Area (sq ft)	*	* 214.12	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 25.69	* Avg. Vel. (ft/s)	*	* 25.69	* *
* Max Chl Dpth (ft)	* 4.53	* Hydr. Depth (ft)	*	* 4.28	* *
* Conv. Total (cfs)	* 50621.2	* Conv. (cfs)	*	* 50621.2	* *
* Length Wtd. (ft)	* 98.19	* Wetted Per. (ft)	*	* 58.07	* *
* Min Ch El (ft)	* 1872.63	* Shear (lb/sq ft)	*	* 2.72	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.50	* Cum Volume (acre-ft)	* 0.07	* 12.56	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.61	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 2334.09*

INPUT
Description: "FW"23+34.09
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1881.85	0	1872.35	25	1871.85	50	1872.35	50	1881.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

```
            0      50            98.21   98.21   98.21              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1886.28  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    9.81  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1876.48  * Reach Len. (ft)       *   98.21  *   98.21  *   98.21  *
* Crit W.S. (ft)         * 1879.31  * Flow Area (sq ft)     *          *  218.86  *          *
* E.G. Slope (ft/ft)     *0.011021  * Area (sq ft)          *          *  218.86  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)        *          *   50.00  *          *
* Vel Total (ft/s)       *   25.13  * Avg. Vel. (ft/s)      *          *   25.13  *          *
* Max Chl Dpth (ft)      *    4.63  * Hydr. Depth (ft)      *          *    4.38  *          *
* Conv. Total (cfs)      * 52389.6  * Conv. (cfs)           *          * 52389.6  *          *
* Length Wtd. (ft)       *   98.21  * Wetted Per. (ft)      *          *   58.26  *          *
* Min Ch El (ft)         * 1871.85  * Shear (lb/sq ft)      *          *    2.58  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    1.12  * Cum Volume (acre-ft)   *    0.07  *   12.08  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.09  *    2.50  *          *
*********************************************************************************************

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: FW
REACH: FW                RS: 2235.88*

INPUT
Description: "FW"22+35.88
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1881.06       0 1871.56      25 1871.06      50 1871.56      50 1881.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            0      50             98.2    98.2    98.2              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1885.23  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    9.47  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1875.76  * Reach Len. (ft)       *   98.20  *   98.20  *   98.20  *
* Crit W.S. (ft)         * 1878.52  * Flow Area (sq ft)     *          *  222.72  *          *
* E.G. Slope (ft/ft)     *0.010435  * Area (sq ft)          *          *  222.72  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)        *          *   50.00  *          *
* Vel Total (ft/s)       *   24.69  * Avg. Vel. (ft/s)      *          *   24.69  *          *
* Max Chl Dpth (ft)      *    4.70  * Hydr. Depth (ft)      *          *    4.45  *          *
* Conv. Total (cfs)      * 53842.6  * Conv. (cfs)           *          * 53842.6  *          *
* Length Wtd. (ft)       *   98.20  * Wetted Per. (ft)      *          *   58.42  *          *
* Min Ch El (ft)         * 1871.06  * Shear (lb/sq ft)      *          *    2.48  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *   50.00  *    0.00  *    0.00  *
* Frctn Loss (ft)        *    1.05  * Cum Volume (acre-ft)   *    0.07  *   11.58  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    0.09  *    2.39  *          *
*********************************************************************************************

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: FW
REACH: FW                RS: 2137.68

INPUT
Description: "FW"21+37.68 PC grade break
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1880.28       0 1870.78      25 1870.28      50 1870.78      50 1880.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0    .015       0    .015      50    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            0      50             78.1    78.1    78.1              0        0

CROSS SECTION OUTPUT  Profile #100-yr FIS
*********************************************************************************************
* E.G. Elev (ft)         * 1884.24  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    9.18  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)         * 1875.05  * Reach Len. (ft)       *   78.10  *   78.10  *   78.10  *
* Crit W.S. (ft)         * 1877.74  * Flow Area (sq ft)     *          *  226.17  *          *
* E.G. Slope (ft/ft)     *0.009944  * Area (sq ft)          *          *  226.17  *          *
* Q Total (cfs)          * 5500.00  * Flow (cfs)            *          * 5500.00  *          *
* Top Width (ft)         *   50.00  * Top Width (ft)        *          *   50.00  *          *
* Vel Total (ft/s)       *   24.32  * Avg. Vel. (ft/s)      *          *   24.32  *          *
* Max Chl Dpth (ft)      *    4.77  * Hydr. Depth (ft)      *          *    4.52  *          *
```

* Conv. Total (cfs)	* 55154.8	* Conv. (cfs)	*	* 55154.8	*	*
* Length Wtd. (ft)	* 78.10	* Wetted Per. (ft)	*	* 58.56	*	*
* Min Ch El (ft)	* 1870.28	* Shear (lb/sq ft)	*	* 2.40	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 1.00	* Cum Volume (acre-ft)	* 0.07	* 11.07	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.28	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 2059.60*

INPUT
Description: "FW"20+59.60
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1878.74	0	1869.24	25	1868.74	50	1869.24	50	1878.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	39.44	39.44	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1883.40	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.09	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1873.31	* Reach Len. (ft)	* 39.44	* 39.44	* 39.44 *
* Crit W.S. (ft)	* 1876.20	* Flow Area (sq ft)	*	* 215.75	* *
* E.G. Slope (ft/ft)	*0.011527	* Area (sq ft)	*	* 215.75	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 25.49	* Avg. Vel. (ft/s)	*	* 25.49	* *
* Max Chl Dpth (ft)	* 4.56	* Hydr. Depth (ft)	*	* 4.31	* *
* Conv. Total (cfs)	* 51226.7	* Conv. (cfs)	*	* 51226.7	* *
* Length Wtd. (ft)	* 39.44	* Wetted Per. (ft)	*	* 58.14	* *
* Min Ch El (ft)	* 1868.74	* Shear (lb/sq ft)	*	* 2.67	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.84	* Cum Volume (acre-ft)	* 0.07	* 10.68	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.19	* *

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: FW
REACH: FW RS: 2020.16

INPUT
Description: "FW"20+20.16
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1877.96	0	1868.46	25	1867.96	50	1868.46	50	1877.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	38.63	38.63	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1882.93	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.49	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1872.44	* Reach Len. (ft)	* 38.63	* 38.63	* 38.63 *
* Crit W.S. (ft)	* 1875.42	* Flow Area (sq ft)	*	* 211.62	* *
* E.G. Slope (ft/ft)	*0.012247	* Area (sq ft)	*	* 211.62	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 25.99	* Avg. Vel. (ft/s)	*	* 25.99	* *
* Max Chl Dpth (ft)	* 4.48	* Hydr. Depth (ft)	*	* 4.23	* *
* Conv. Total (cfs)	* 49698.4	* Conv. (cfs)	*	* 49698.4	* *
* Length Wtd. (ft)	* 38.63	* Wetted Per. (ft)	*	* 57.97	* *
* Min Ch El (ft)	* 1867.96	* Shear (lb/sq ft)	*	* 2.79	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.47	* Cum Volume (acre-ft)	* 0.07	* 10.48	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 2.14	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 1981.53*

INPUT
Description: "FW" 19+81.53
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1877.19	0	1867.69	25	1867.19	50	1867.69	50	1877.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 78.1 78.1 78.1 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1882.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.84	Wt. n-Val.		0.015	
W.S. Elev (ft)	1871.60	Reach Len. (ft)	78.10	78.10	78.10
Crit W.S. (ft)	1874.65	Flow Area (sq ft)		208.12	
E.G. Slope (ft/ft)	*0.012906	Area (sq ft)		208.12	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	26.43	Avg. Vel. (ft/s)		26.43	
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	48412.8	Conv. (cfs)		48412.8	
Length Wtd. (ft)	78.10	Wetted Per. (ft)		57.83	
Min Ch El (ft)	1867.19	Shear (lb/sq ft)		2.90	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	0.07	10.30	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	2.10	

CROSS SECTION

RIVER: FW
REACH: FW RS: 1903.46

INPUT
Description: " FW"19+03.46 PT grade break
19+03.46 grade break
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1875.15	0	1866.15	25	1865.65	50	1866.15	50	1875.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 86.21 86.21 86.21 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1881.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.44	Wt. n-Val.		0.015	
W.S. Elev (ft)	1869.95	Reach Len. (ft)	86.21	86.21	86.21
Crit W.S. (ft)	1873.11	Flow Area (sq ft)		202.61	
E.G. Slope (ft/ft)	*0.014043	Area (sq ft)		202.61	
Q Total (cfs)	5500.00	Flow (cfs)		5500.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	27.15	Avg. Vel. (ft/s)		27.15	
Max Chl Dpth (ft)	4.30	Hydr. Depth (ft)		4.05	
Conv. Total (cfs)	46412.9	Conv. (cfs)		46412.9	
Length Wtd. (ft)	86.21	Wetted Per. (ft)		57.61	
Min Ch El (ft)	1865.65	Shear (lb/sq ft)		3.08	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	1.05	Cum Volume (acre-ft)	0.07	9.93	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	2.01	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: FW
REACH: FW RS: 1817.25*

INPUT
Description: "FW" 18+17.25
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1874.45	0	1865.45	25	1864.95	50	1865.45	50	1874.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 50 86.21 86.21 86.21 0 0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1880.23	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.88	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1869.36	* Reach Len. (ft)	* 86.21	* 86.21	* 86.21 *
* Crit W.S. (ft)	* 1872.41	* Flow Area (sq ft)	*	* 207.82	* *
* E.G. Slope (ft/ft)	*0.012965	* Area (sq ft)	*	* 207.82	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 26.47	* Avg. Vel. (ft/s)	*	* 26.47	* *
* Max Chl Dpth (ft)	* 4.41	* Hydr. Depth (ft)	*	* 4.16	* *
* Conv. Total (cfs)	* 48303.5	* Conv. (cfs)	*	* 48303.5	* *
* Length Wtd. (ft)	* 86.21	* Wetted Per. (ft)	*	* 57.82	* *
* Min Ch El (ft)	* 1864.95	* Shear (lb/sq ft)	*	* 2.91	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 1.16	* Cum Volume (acre-ft)	* 0.07	* 9.52	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.91	* *

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: FW
REACH: FW RS: 1731.04*

INPUT
Description: "FW" 17+31.04
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.74	0	1864.74	25	1864.24	50	1864.74	50	1873.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.21	86.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1879.15	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.41	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1868.74	* Reach Len. (ft)	* 86.21	* 86.21	* 86.21 *
* Crit W.S. (ft)	* 1871.70	* Flow Area (sq ft)	*	* 212.46	* *
* E.G. Slope (ft/ft)	*0.012096	* Area (sq ft)	*	* 212.46	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 25.89	* Avg. Vel. (ft/s)	*	* 25.89	* *
* Max Chl Dpth (ft)	* 4.50	* Hydr. Depth (ft)	*	* 4.25	* *
* Conv. Total (cfs)	* 50009.2	* Conv. (cfs)	*	* 50009.2	* *
* Length Wtd. (ft)	* 86.21	* Wetted Per. (ft)	*	* 58.01	* *
* Min Ch El (ft)	* 1864.24	* Shear (lb/sq ft)	*	* 2.77	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 1.08	* Cum Volume (acre-ft)	* 0.07	* 9.11	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.81	* *

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: FW
REACH: FW RS: 1644.83*

INPUT
Description: "FW" 16+44.83
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.04	0	1864.04	25	1863.54	50	1864.04	50	1873.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	86.21	86.21	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1878.13	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 10.01	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1868.12	* Reach Len. (ft)	* 86.21	* 86.21	* 86.21 *
* Crit W.S. (ft)	* 1871.00	* Flow Area (sq ft)	*	* 216.66	* *
* E.G. Slope (ft/ft)	*0.011375	* Area (sq ft)	*	* 216.66	* *
* Q Total (cfs)	* 5500.00	* Flow (cfs)	*	* 5500.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 25.39	* Avg. Vel. (ft/s)	*	* 25.39	* *
* Max Chl Dpth (ft)	* 4.58	* Hydr. Depth (ft)	*	* 4.33	* *
* Conv. Total (cfs)	* 51567.8	* Conv. (cfs)	*	* 51567.8	* *
* Length Wtd. (ft)	* 86.21	* Wetted Per. (ft)	*	* 58.18	* *
* Min Ch El (ft)	* 1863.54	* Shear (lb/sq ft)	*	* 2.64	* *

* Alpha	*	1.00	* Stream Power (lb/ft s)	*	50.00	*	0.00	*	0.00	*
* Frctn Loss (ft)	*	1.01	* Cum Volume (acre-ft)	*	0.07	*	8.68	*		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.09	*	1.71	*		*

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: FW
REACH: FW RS: 1558.62

INPUT
Description: "FW" 15+58.62
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.34	0	1863.34	25	1862.84	50	1863.34	50	1872.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	58.62	58.62	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1877.23	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 9.43	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1867.80	* Reach Len. (ft)	* 58.62	* 58.62	* 58.62	*
* Crit W.S. (ft)	* 1870.56	* Flow Area (sq ft)	*	* 235.40	*	*
* E.G. Slope (ft/ft)	*0.009760	* Area (sq ft)	*	* 235.40	*	*
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	*	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*
* Vel Total (ft/s)	* 24.64	* Avg. Vel. (ft/s)	*	* 24.64	*	*
* Max Chl Dpth (ft)	* 4.96	* Hydr. Depth (ft)	*	* 4.71	*	*
* Conv. Total (cfs)	* 58709.9	* Conv. (cfs)	*	* 58709.9	*	*
* Length Wtd. (ft)	* 58.62	* Wetted Per. (ft)	*	* 58.93	*	*
* Min Ch El (ft)	* 1862.84	* Shear (lb/sq ft)	*	* 2.43	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.91	* Cum Volume (acre-ft)	* 0.07	* 8.24	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.61	*	*

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: FW
REACH: FW RS: 1500

INPUT
Description: "FW" 15+00.00, Wall height change
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.86	0	1862.36	25	1862.36	50	1862.36	50	1871.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	18.49	18.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1876.63	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 9.61	* Wt. n-Val.	*	* 0.015	*	*
* W.S. Elev (ft)	* 1867.02	* Reach Len. (ft)	* 18.49	* 18.49	* 18.49	*
* Crit W.S. (ft)	* 1869.81	* Flow Area (sq ft)	*	* 233.17	*	*
* E.G. Slope (ft/ft)	*0.010165	* Area (sq ft)	*	* 233.17	*	*
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	*	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*
* Vel Total (ft/s)	* 24.87	* Avg. Vel. (ft/s)	*	* 24.87	*	*
* Max Chl Dpth (ft)	* 4.66	* Hydr. Depth (ft)	*	* 4.66	*	*
* Conv. Total (cfs)	* 57526.2	* Conv. (cfs)	*	* 57526.2	*	*
* Length Wtd. (ft)	* 18.49	* Wetted Per. (ft)	*	* 59.33	*	*
* Min Ch El (ft)	* 1862.36	* Shear (lb/sq ft)	*	* 2.49	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.58	* Cum Volume (acre-ft)	* 0.07	* 7.92	*	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.54	*	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 1481.51

INPUT
Description: "FW" 14+81.51 Wall Height changed (Right Bank)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.71	0	1862.71	25	1862.21	50	1862.71	50	1871.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.5	44.5	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1876.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.24	Wt. n-Val.		0.015	
W.S. Elev (ft)	1867.21	Reach Len. (ft)	44.50	44.50	44.50
Crit W.S. (ft)	1869.93	Flow Area (sq ft)		237.71	
E.G. Slope (ft/ft)	*0.009466	Area (sq ft)		237.71	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	24.40	Avg. Vel. (ft/s)		24.40	
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)		4.75	
Conv. Total (cfs)	59612.2	Conv. (cfs)		59612.2	
Length Wtd. (ft)	44.50	Wetted Per. (ft)		59.02	
Min Ch El (ft)	1862.21	Shear (lb/sq ft)		2.38	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.07	7.82	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	1.52	

CROSS SECTION

RIVER: FW
REACH: FW RS: 1437.01

INPUT
Description: "FW" 14+37.01
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1873.34	0	1862.34	25	1861.84	50	1862.34	50	1871.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.49	44.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1876.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	1866.86	Reach Len. (ft)	44.49	44.49	44.49
Crit W.S. (ft)	1869.56	Flow Area (sq ft)		238.55	
E.G. Slope (ft/ft)	*0.009363	Area (sq ft)		238.55	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	24.31	Avg. Vel. (ft/s)		24.31	
Max Chl Dpth (ft)	5.02	Hydr. Depth (ft)		4.77	
Conv. Total (cfs)	59939.4	Conv. (cfs)		59939.4	
Length Wtd. (ft)	44.49	Wetted Per. (ft)		59.05	
Min Ch El (ft)	1861.84	Shear (lb/sq ft)		2.36	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	0.07	7.58	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	1.47	

CROSS SECTION

RIVER: FW
REACH: FW RS: 1392.52

INPUT
Description: "FW" 13+92.52
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.98	0	1861.98	25	1861.48	50	1861.98	50	1870.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.5	44.5	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1875.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.11	Wt. n-Val.		0.015	
W.S. Elev (ft)	1866.52	Reach Len. (ft)	44.50	44.50	44.50
Crit W.S. (ft)	1869.20	Flow Area (sq ft)		239.48	
E.G. Slope (ft/ft)	*0.009250	Area (sq ft)		239.48	

* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	*	*		
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*	*		
* Vel Total (ft/s)	* 24.22	* Avg. Vel. (ft/s)	*	* 24.22	*	*		
* Max Chl Dpth (ft)	* 5.04	* Hydr. Depth (ft)	*	* 4.79	*	*		
* Conv. Total (cfs)	* 60305.6	* Conv. (cfs)	*	* 60305.6	*	*		
* Length Wtd. (ft)	* 44.50	* Wetted Per. (ft)	*	* 59.09	*	*		
* Min Ch El (ft)	* 1861.48	* Shear (lb/sq ft)	*	* 2.34	*	*		
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	*	0.00	*	
* Frctn Loss (ft)	* 0.41	* Cum Volume (acre-ft)	* 0.07	* 7.33	*	*		
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.42	*	*		

CROSS SECTION

RIVER: FW
REACH: FW RS: 1348.02

INPUT
Description: "FW" 13+48.02
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.62	0	1861.62	25	1861.12	50	1861.62	50	1870.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.49	44.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1875.22	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 9.04	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1866.18	* Reach Len. (ft)	* 44.49	* 44.49	* 44.49 *
* Crit W.S. (ft)	* 1868.84	* Flow Area (sq ft)	*	* 240.35	* *
* E.G. Slope (ft/ft)	*0.009146	* Area (sq ft)	*	* 240.35	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 24.13	* Avg. Vel. (ft/s)	*	* 24.13	* *
* Max Chl Dpth (ft)	* 5.06	* Hydr. Depth (ft)	*	* 4.81	* *
* Conv. Total (cfs)	* 60646.1	* Conv. (cfs)	*	* 60646.1	* *
* Length Wtd. (ft)	* 44.49	* Wetted Per. (ft)	*	* 59.12	* *
* Min Ch El (ft)	* 1861.12	* Shear (lb/sq ft)	*	* 2.32	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.41	* Cum Volume (acre-ft)	* 0.07	* 7.09	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.37	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 1303.53

INPUT
Description: "FW" 13+03.53
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1872.26	0	1861.26	25	1860.76	50	1861.26	50	1870.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.5	44.5	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1874.82	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 8.98	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1865.83	* Reach Len. (ft)	* 44.50	* 44.50	* 44.50 *
* Crit W.S. (ft)	* 1868.48	* Flow Area (sq ft)	*	* 241.15	* *
* E.G. Slope (ft/ft)	*0.009052	* Area (sq ft)	*	* 241.15	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	* *
* Vel Total (ft/s)	* 24.05	* Avg. Vel. (ft/s)	*	* 24.05	* *
* Max Chl Dpth (ft)	* 5.07	* Hydr. Depth (ft)	*	* 4.82	* *
* Conv. Total (cfs)	* 60960.7	* Conv. (cfs)	*	* 60960.7	* *
* Length Wtd. (ft)	* 44.50	* Wetted Per. (ft)	*	* 59.16	* *
* Min Ch El (ft)	* 1860.76	* Shear (lb/sq ft)	*	* 2.30	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.40	* Cum Volume (acre-ft)	* 0.07	* 6.84	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.32	* *

CROSS SECTION

RIVER: FW
REACH: FW RS: 1259.03

INPUT

Description: "FW" 12+59.03
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.89	0	1860.89	25	1860.39	50	1860.89	50	1869.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	44.49	44.49	0	0

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1874.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	1865.47	Reach Len. (ft)	44.49	44.49	44.49
Crit W.S. (ft)	1868.11	Flow Area (sq ft)		241.72	
E.G. Slope (ft/ft)	*0.008986	Area (sq ft)		241.72	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	23.99	Avg. Vel. (ft/s)		23.99	
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)		4.83	
Conv. Total (cfs)	61184.4	Conv. (cfs)		61184.4	
Length Wtd. (ft)	44.49	Wetted Per. (ft)		59.18	
Min Ch El (ft)	1860.39	Shear (lb/sq ft)		2.29	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	0.07	6.59	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	1.27	

CROSS SECTION

RIVER: FW
REACH: FW RS: 1214.54

INPUT
Description: 12+14.54 end transition / begin 50' channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.53	0	1860.53	25	1860.03	50	1860.53	50	1869.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	40.94	40.94	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1874.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.89	Wt. n-Val.		0.015	
W.S. Elev (ft)	1865.13	Reach Len. (ft)	40.94	40.94	40.94
Crit W.S. (ft)	1867.75	Flow Area (sq ft)		242.41	
E.G. Slope (ft/ft)	*0.008906	Area (sq ft)		242.41	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	50.00	Top Width (ft)		50.00	
Vel Total (ft/s)	23.93	Avg. Vel. (ft/s)		23.93	
Max Chl Dpth (ft)	5.10	Hydr. Depth (ft)		4.85	
Conv. Total (cfs)	61458.9	Conv. (cfs)		61458.9	
Length Wtd. (ft)	40.94	Wetted Per. (ft)		59.21	
Min Ch El (ft)	1860.03	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)	50.00	0.00	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	0.07	6.35	
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	1.22	

CROSS SECTION

RIVER: FW
REACH: FW RS: 1173.6

INPUT
Description: "FW" 11+73.60 Wall height Change point (right bank)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.19	0	1860.2	25	1859.7	50	1860.2	50	1869.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	50	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	50	84.66	84.66	.01	.03

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1873.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.84	Wt. n-Val.		0.015	
W.S. Elev (ft)	1864.81	Reach Len. (ft)	84.66	84.66	84.66

* Crit W.S. (ft)	* 1867.42	* Flow Area (sq ft)	*	* 243.02	*
* E.G. Slope (ft/ft)	*0.008837	* Area (sq ft)	*	* 243.02	*
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	*
* Top Width (ft)	* 50.00	* Top Width (ft)	*	* 50.00	*
* Vel Total (ft/s)	* 23.87	* Avg. Vel. (ft/s)	*	* 23.87	*
* Max Chl Dpth (ft)	* 5.11	* Hydr. Depth (ft)	*	* 4.86	*
* Conv. Total (cfs)	* 61697.7	* Conv. (cfs)	*	* 61697.7	*
* Length Wtd. (ft)	* 84.66	* Wetted Per. (ft)	*	* 59.23	*
* Min Ch El (ft)	* 1859.70	* Shear (lb/sq ft)	*	* 2.26	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 50.00	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.36	* Cum Volume (acre-ft)	* 0.07	* 6.12	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.17	*

CROSS SECTION

RIVER: FW
REACH: FW RS: 1088.94

INPUT
Description: 10+88.94 begin channel improvements
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74.58	1874.05	81.76	1873.87	83.101	1873.79	84.89	1873.76	91.809	1872.99
95.599	1872.91	99.44	1872.85	102.9	1872.82	105.09	1872.79	106.25	1872.75
107.24	1872.22	107.301	1872.22	107.97	1872.2	108.22	1872.2	108.409	1871.76
112.1	1868.81	134.601	1868.6	134.601	1859	160.619	1859	186.639	1859
186.639	1868.6	219.569	1870.43	220.33	1870.4	224.17	1870.54	231.16	1870.54
231.939	1870.54	238.849	1870.96	239.539	1871	243.53	1870.79	248.409	1870.52
251.241	1870.45	252.83	1870.6	260.02	1870.91	269.379	1870.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
74.58	.015	134.601	.015	186.639	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
134.601 186.639 174 174 174 .05 .1

CROSS SECTION OUTPUT Profile #100-yr FIS

* E.G. Elev (ft)	* 1872.85	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 9.30	* Wt. n-Val.	*	* 0.015	* *
* W.S. Elev (ft)	* 1863.55	* Reach Len. (ft)	* 20.90	* 20.90	* 20.90 *
* Crit W.S. (ft)	* 1866.28	* Flow Area (sq ft)	*	* 237.00	* *
* E.G. Slope (ft/ft)	*0.010025	* Area (sq ft)	*	* 237.00	* *
* Q Total (cfs)	* 5800.00	* Flow (cfs)	*	* 5800.00	* *
* Top Width (ft)	* 52.04	* Top Width (ft)	*	* 52.04	* *
* Vel Total (ft/s)	* 24.47	* Avg. Vel. (ft/s)	*	* 24.47	* *
* Max Chl Dpth (ft)	* 4.55	* Hydr. Depth (ft)	*	* 4.55	* *
* Conv. Total (cfs)	* 57929.0	* Conv. (cfs)	*	* 57929.0	* *
* Length Wtd. (ft)	* 20.90	* Wetted Per. (ft)	*	* 61.15	* *
* Min Ch El (ft)	* 1859.00	* Shear (lb/sq ft)	*	* 2.43	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 269.38	* 0.00	* 0.00 *
* Frctn Loss (ft)	* 0.80	* Cum Volume (acre-ft)	* 0.07	* 5.65	* *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.09	* 1.07	* *

BRIDGE

RIVER: FW
REACH: FW RS: 1000

INPUT
Description: Desert Inn Rd.
Distance from Upstream XS = 20.9
Deck/Roadway Width = 140
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 19

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
01874.432		8.6131874.273		56.3921873.321	
64.8431873.184		114.2841872.349		120.3921872.248	
134.601	1872 1866.97	189.3	1871.2 1866.97	220.1461870.842	
224.5061870.766		277.4061869.719		281.1921869.662	
338.9371868.818		347.8651868.643		397.6781868.255	
401.555 1868.25		448.627 1867.71		452.199 1867.68	
469.342 1867.71					

Upstream Bridge Cross Section Data
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
01878.392	2.7721878.027	8.1841877.637	24.2831875.318	25.1931875.363					
31.3281875.098	34.3311875.065	36.1541875.018	38.7921874.989	41.4921874.895					
52.684 1875.01	55.3541875.266	59.1231875.431	62.3721875.445	62.9421875.452					
66.6521875.281	70.181875.144	70.4771875.131	75.2841874.616	78.0171874.315					
80.8581874.058	82.7161873.832	83.891873.698	89.7211872.911	90.2641872.737					
93.8781871.624	102.4631870.291	104.4451869.983	105.8281869.768	110.6881869.684					
116.569	1869.6	134.601	1867	134.601	1858.97	189.3	1858.97	189.3	1867
199.1471869.218	211.7021869.356	211.811869.364	211.8391869.366	212.5351869.419					
212.7591869.436	212.7611869.436	212.775 1869.43	213.8041869.006	214.125 1869.55					
216.1461869.746	218.628 1870.27	224.9991870.598	228.7151870.595	231.711870.759					
232.8391870.827	234.0521870.759	250.733 1870.37	256.131870.886	256.5741870.999					
259.3221870.907	260.0161870.858	263.7011870.682	276.6221870.018	277.451869.924					

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 294.598 1870.91 297.0681871.061 314.9141871.908 315.5051871.939 315.6851871.946
 316.6211871.974 326.9921872.171 339.4481872.205 351.9911872.189 384.7521872.277

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .04 134.601    .015 199.147     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       134.601   189.3            .05       .1

Downstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*******************************************************************************
       01874.432           8.6131874.273          56.3921873.321
  64.8431873.184         114.2841872.349         120.3921872.248
 170.4641871.576         175.1981871.507         220.1461870.842
 224.5061870.766         264.599  1870.1  1863.1   319.3  1869.2  1863.1
 338.9371868.818         347.8651868.643         397.6781868.255
 401.555 1868.25         448.627 1867.71         452.199 1867.68
 469.342 1867.71

Downstream Bridge Cross Section Data
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1873.63   8.065 1873.41  18.183 1873.36  39.113 1873.34  45.473  1873.4
  47.947 1873.25  52.794 1873.36  58.448 1873.37  63.644 1873.42  69.726 1873.41
  73.125 1873.41  84.455 1873.39  90.759 1873.49  94.498 1873.45  100.57 1873.41
 106.193 1873.38 110.925  1873.3 115.428 1873.23 120.244 1873.13 124.212 1873.09
 128.155 1873.07 133.572 1872.54  136.46 1872.61 137.494 1872.02 143.908 1872.02
 163.038  1871.7 167.632 1871.89 168.911  1871.9 169.317 1871.89 169.339 1871.88
 169.559 1871.85 170.213 1871.76 182.581 1872.04 183.088 1872.05 190.475 1871.88
 192.217 1871.89  195.83 1871.77 199.012 1871.82 200.393 1871.83  202.37 1871.62
 202.695  1871.6 203.231 1871.55 206.093 1871.25 207.237 1871.16 209.186 1870.99
  209.91 1870.75 210.677  1870.5 211.514 1870.42 233.365 1869.96 234.318 1869.95
 236.441 1869.72 238.968 1869.63 243.202 1869.53 244.279 1869.24 245.233 1869.05
 246.148 1869.08 249.821 1868.27 250.674 1868.16 252.061 1867.95  252.32  1864.9
 264.599  1863.1 264.599  1855.1   319.3  1855.1   319.3  1863.1  328.96  1866.2
 330.796 1866.29 332.006 1866.61 336.306 1866.57 349.997 1867.01 354.697 1866.89
 371.242 1866.49 380.126 1866.39 388.769 1866.21 404.854 1866.27 420.758 1865.68
 422.706 1865.71 423.358 1865.73 433.326 1866.31 444.178 1866.41 454.863  1866.4
 464.508 1866.32 469.342  1866.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
       0     .04 264.599    .015  328.96     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       264.599   319.3            .05       .1
Right Levee     Station=  349.94      Elevation= 1867.14

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 =     .95
Elevation at which weir flow begins         =    1890
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= 145.441    Downstream= 275.439
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
     1.5       0     1.5    1870
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
     1.5       0     1.5    1870
Debris Width  =        3
Debris Height =        8

Pier Data
Pier Station     Upstream= 156.691    Downstream= 286.689
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .83       0     .83    1870
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .83       0     .83    1870
Debris Width  =     1.67
Debris Height =        8

Pier Data
Pier Station     Upstream= 167.521    Downstream= 297.519
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .83       0     .83    1870
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
```

```
     .83       0     .83    1870
Debris Width  =     1.67
Debris Height =        8

Pier Data
Pier Station     Upstream= 178.769    Downstream= 308.769
Upstream     num=        2
    Width   Elev    Width   Elev
*******************************
     1.5       0     1.5    1870
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
     1.5       0     1.5    1870
Debris Width  =        3
Debris Height =        8

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Momentum               Cd   =    1.33
Selected Low Flow Methods = Momentum

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
       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 water surface

BRIDGE OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. US. (ft)          *    1872.85  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1863.55  * E.G. Elev (ft)        *    1872.45  *    1869.87  *
* Q Total (cfs)          *    5800.00  * W.S. Elev (ft)        *    1864.69  *    1859.61  *
* Q Bridge (cfs)         *    5800.00  * Crit W.S. (ft)        *    1872.99  *    1862.59  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       5.72  *       4.51  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      22.35  *      25.71  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     259.46  *     225.62  *
* Weir Submerg           *             * Froude # Chl           *       1.65  *       2.13  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    4768.62  *    5139.00  *
* Min El Weir Flow (ft)  *    1890.00  * Hydr Depth (ft)        *       5.72  *       4.51  *
* Min El Prs (ft)        *    1866.97  * W.P. Total (ft)        *     102.56  *      95.13  *
* Delta EG (ft)          *       3.21  * Conv. Total (cfs)      *   47719.5   *   39750.1   *
* Delta WS (ft)          *       4.37  * Top Width (ft)         *      45.36  *      50.04  *
* BR Open Area (sq ft)   *     362.87  * Frctn Loss (ft)        *       0.25  *       2.46  *
* BR Open Vel (ft/s)     *      25.71  * C & E Loss (ft)        *       0.15  *       0.13  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       2.33  *       3.15  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *       0.00  *       0.00  *
*************************************************************************************************

Warning: There was not enough momentum to compute a supercritical answer through the bridge.  The momentum 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.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was used.
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:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, water surface was used.

CROSS SECTION


RIVER: FW
REACH: FW                RS: 926

INPUT
Description:
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
       0 1873.63   8.065 1873.41  18.183 1873.36  39.113 1873.34  45.473  1873.4
  47.947 1873.25  52.794 1873.36  58.448 1873.37  63.644 1873.42  69.726 1873.41
  73.125 1873.41  84.455 1873.39  90.759 1873.49  94.498 1873.45  100.57 1873.41
 106.193 1873.38 110.925  1873.3 115.428 1873.23 120.244 1873.13 124.212 1873.09
 128.155 1873.07 133.572 1872.54  136.46 1872.61 137.494 1872.02 143.908 1872.02
 163.038  1871.7 167.632 1871.89 168.911  1871.9 169.317 1871.89 169.339 1871.88
 169.559 1871.85 170.213 1871.76 182.581 1872.04 183.088 1872.05 190.475 1871.88
 192.217 1871.89  195.83 1871.77 199.012 1871.82 200.393 1871.83  202.37 1871.62
 202.695  1871.6 203.231 1871.55 206.093 1871.25 207.237 1871.16 209.186 1870.99
  209.91 1870.75 210.677  1870.5 211.514 1870.42 233.365 1869.96 234.318 1869.95
 236.441 1869.72 238.968 1869.63 243.202 1869.53 244.279 1869.24 245.233 1869.05
 246.148 1869.08 249.821 1868.27 250.674 1868.16 252.061 1867.95  252.32  1864.9
 264.599  1863.1 264.599  1855.1   319.3  1855.1   319.3  1863.1  328.96  1866.2
 330.796 1866.29 332.006 1866.61 336.306 1866.57 349.997 1867.01 354.697 1866.89
 371.242 1866.49 380.126 1866.39 388.769 1866.21 404.854 1866.27 420.758 1865.68
 422.706 1865.71 423.358 1865.73 433.326 1866.31 444.178 1866.41 454.863  1866.4
 464.508 1866.32 469.342  1866.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
*********************************************
       0    .015 264.599    .015   319.3    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       264.599   319.3            11.98   11.98   11.98            .05       .1
Right Levee     Station=  349.94      Elevation= 1867.14
```

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1869.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1859.19	Reach Len. (ft)	11.98	11.98	11.98
Crit W.S. (ft)	1862.16	Flow Area (sq ft)		223.44	
E.G. Slope (ft/ft)	*0.012659	Area (sq ft)		223.44	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	54.70	Top Width (ft)		54.70	
Vel Total (ft/s)	25.96	Avg. Vel. (ft/s)		25.96	
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		4.08	
Conv. Total (cfs)	51549.2	Conv. (cfs)		51549.2	
Length Wtd. (ft)	11.98	Wetted Per. (ft)		62.87	
Min Ch El (ft)	1855.10	Shear (lb/sq ft)		2.81	
Alpha	1.00	Stream Power (lb/ft s)	469.34	0.00	349.94
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.07	5.53	
C & E Loss (ft)	0.01	Cum SA (acres)	0.09	1.05	

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: FW
REACH: FW RS: 914.02*

INPUT
Description:
Station Elevation Data num= 129

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1871.39	6.93	1871.29	7.99	1871.3	15.63	1871.28	23.95	1871.28
33.62	1871.28	39.09	1871.32	41.22	1871.21	41.63	1871.22	45.38	1871.29
50.25	1871.28	54.71	1871.31	59.57	1871.3	59.94	1871.29	62.86	1871.26
72.6	1871.15	76.07	1871.16	77.14	1871.17	78.02	1871.18	80.36	1871.15
81.24	1871.15	86.46	1871.15	91.29	1871.16	95.36	1871.13	99.23	1871.11
103.37	1871.07	106.67	1871.06	106.78	1871.06	110.17	1871.04	114.83	1870.66
117.31	1870.71	118.2	1870.29	123.71	1870.29	133.28	1870.15	140.16	1870.08
144.11	1870.23	145.21	1870.24	145.55	1870.24	145.57	1870.23	145.76	1870.21
146.33	1870.15	147.57	1870.18	156.96	1870.37	157.39	1870.38	162.27	1870.3
163.74	1870.27	165.24	1870.29	168.35	1870.22	171.08	1870.26	172.27	1870.27
173.97	1870.13	174.25	1870.12	174.71	1870.09	177.17	1869.88	178.15	1869.83
179.83	1869.71	180.45	1869.54	181.11	1869.37	181.83	1869.32	189.64	1869.22
197.42	1869.12	200.61	1869.04	201.43	1869.03	203.26	1868.86	205.43	1868.78
209.07	1868.69	209.97	1868.49	210	1868.48	210.82	1868.33	211.6	1868.34
214.76	1867.73	215.49	1867.64	216.69	1867.47	216.91	1865.31	223.57	1864.41
226.01	1864.09	227.46	1863.32	227.85	1855.12	229.57	1855.13	230.09	1854.95
268.81	1854.95	280.51	1860.68	280.78	1862.35	280.81	1862.45	281.01	1862.55
282.62	1863.21	288.36	1864.72	291.24	1865.48	292.87	1865.56	293.74	1865.75
293.95	1865.8	296.74	1865.87	297.78	1865.94	308.18	1866.98	309.99	1867.14
312.75	1867.26	314.18	1867.3	316.12	1867.36	319.08	1867.45	328.93	1867.17
336.85	1867.02	337.14	1867.02	341.47	1866.9	343.41	1866.86	343.77	1866.85
343.99	1866.84	344.36	1866.84	344.56	1866.83	345.3	1866.83	358.89	1866.81
373.07	1866.32	374.81	1866.34	375.04	1866.34	375.39	1866.35	380.16	1866.53
384.28	1866.68	388.32	1866.67	393.45	1866.71	393.95	1866.71	394.47	1866.71
395.77	1866.7	398.86	1866.73	401.74	1866.75	403.48	1866.77	410.13	1866.78
412.08	1866.77	414.74	1866.69	415.86	1866.64	416.38	1866.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	227.46	.015	282.62	.015

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        227.46  282.62           397.98  413.98  419.98            .05       .1
```

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1869.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	9.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1860.07	Reach Len. (ft)	397.98	413.98	419.98
Crit W.S. (ft)	1862.84	Flow Area (sq ft)		236.47	
E.G. Slope (ft/ft)	*0.009320	Area (sq ft)		236.47	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	51.64	Top Width (ft)		51.64	
Vel Total (ft/s)	24.53	Avg. Vel. (ft/s)		24.53	
Max Chl Dpth (ft)	5.12	Hydr. Depth (ft)		4.58	
Conv. Total (cfs)	60078.4	Conv. (cfs)		60078.4	
Length Wtd. (ft)	413.94	Wetted Per. (ft)		57.57	
Min Ch El (ft)	1854.95	Shear (lb/sq ft)		2.39	
Alpha	1.00	Stream Power (lb/ft s)	416.38	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.07	5.47	
C & E Loss (ft)	0.11	Cum SA (acres)	0.09	1.03	

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: FW

REACH: FW RS: 702.71

INPUT
Description: X-section 640 from Case no. 04-09-0166P LOMR
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1866.76	1004.77	1866.42	1005.12	1866.26	1009.4	1864.26	1013.41	1862.26
1016.12	1860.86	1026.88	1860.35	1027.05	1860.26	1030.75	1858.26	1034.43	1856.26
1038.12	1854.26	1039.25	1853.65	1067.22	1853.63	1068.01	1854.26	1070.51	1856.26
1073	1858.26	1075.48	1860.26	1077.94	1862.26	1079.43	1863.49		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1026.88	.015	1079.43	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1026.88 1079.43 251.59 258.21 262.14 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1866.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.38	Wt. n-Val.	0.020	0.015	
W.S. Elev (ft)	1861.40	Reach Len. (ft)	251.59	258.21	262.14
Crit W.S. (ft)	1862.90	Flow Area (sq ft)	8.80	308.96	
E.G. Slope (ft/ft)	*0.003508	Area (sq ft)	8.80	308.96	
Q Total (cfs)	5800.00	Flow (cfs)	31.60	5768.40	
Top Width (ft)	61.80	Top Width (ft)	11.80	50.00	
Vel Total (ft/s)	18.25	Avg. Vel. (ft/s)	3.59	18.67	
Max Chl Dpth (ft)	7.77	Hydr. Depth (ft)	0.75	6.18	
Conv. Total (cfs)	97920.5	Conv. (cfs)	533.5	97387.0	
Length Wtd. (ft)	258.19	Wetted Per. (ft)	11.94	54.43	
Min Ch El (ft)	1853.63	Shear (lb/sq ft)	0.16	1.24	
Alpha	1.04	Stream Power (lb/ft s)	1079.43	0.00	0.00
Frctn Loss (ft)	2.23	Cum Volume (acre-ft)	0.03	2.88	
C & E Loss (ft)	0.40	Cum SA (acres)	0.03	0.55	

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: FW
REACH: FW RS: 444.5

INPUT
Description: X-section 630 from Case no. 04-09-0166P LOMR
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1863.46	1004.03	1862.26	1009.63	1860.53	1010.62	1860.26	1018.67	1858.26
1018.82	1858.16	1031	1857.32	1032.96	1856.26	1036.68	1854.26	1040.45	1852.26
1044.02	1850.36	1071.6	1850.54	1074.89	1852.26	1078.71	1854.26	1082.53	1856.26
1084.55	1857.26	1129.14	1858.26	1165.99	1859.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.02	1031	.015	1084.55	.02

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1031 1084.55 229.09 221.03 213.86 .1 .3

CROSS SECTION OUTPUT Profile #100-yr FIS

E.G. Elev (ft)	1865.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1856.74	Reach Len. (ft)	229.09	221.03	213.86
Crit W.S. (ft)	1859.94	Flow Area (sq ft)		248.38	
E.G. Slope (ft/ft)	*0.007361	Area (sq ft)		248.38	
Q Total (cfs)	5800.00	Flow (cfs)		5800.00	
Top Width (ft)	51.42	Top Width (ft)		51.42	
Vel Total (ft/s)	23.35	Avg. Vel. (ft/s)		23.35	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		4.83	
Conv. Total (cfs)	67603.6	Conv. (cfs)		67603.6	
Length Wtd. (ft)	221.03	Wetted Per. (ft)		54.54	
Min Ch El (ft)	1850.36	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)	1165.99	0.00	0.00
Frctn Loss (ft)	1.27	Cum Volume (acre-ft)		1.23	
C & E Loss (ft)	0.31	Cum SA (acres)		0.25	

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: FW
REACH: FW RS: 223.47

```
INPUT
Description: X-section 620 from Case no. 04-09-0166P LOMR
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    1000 1861.56  1007.7 1860.26 1012.48 1859.42 1018.28 1858.26 1022.06 1857.51
 1033.45 1857.66 1035.35 1856.26  1037.9 1854.26 1040.44 1852.26 1042.97 1850.26
 1045.49 1848.26 1046.14 1847.74 1075.97 1847.92 1076.49 1848.26 1079.51 1850.26
 1082.53 1852.26 1085.57 1854.26 1086.27 1854.72 1135.67 1856.26 1176.03 1857.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
    1000     .02 1033.45    .015 1086.27     .02

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1033.45 1086.27               0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #100-yr FIS
*************************************************************************************************
* E.G. Elev (ft)          * 1863.41  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    9.43  * Wt. n-Val.            *          *   0.015  *          *
* W.S. Elev (ft)          * 1853.97  * Reach Len. (ft)       *          *          *          *
* Crit W.S. (ft)          * 1857.57  * Flow Area (sq ft)     *          *  235.30  *          *
* E.G. Slope (ft/ft)      *0.008029  * Area (sq ft)          *          *  235.30  *          *
* Q Total (cfs)           * 5800.00  * Flow (cfs)           *          * 5800.00  *          *
* Top Width (ft)          *   46.86  * Top Width (ft)       *          *   46.86  *          *
* Vel Total (ft/s)        *   24.65  * Avg. Vel. (ft/s)     *          *   24.65  *          *
* Max Chl Dpth (ft)       *    6.23  * Hydr. Depth (ft)     *          *    5.02  *          *
* Conv. Total (cfs)       * 64729.7  * Conv. (cfs)          *          * 64729.7  *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)     *          *   50.85  *          *
* Min Ch El (ft)          * 1847.74  * Shear (lb/sq ft)     *          *    2.32  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) * 1176.03  *    0.00  *    0.00  *
* Frctn Loss (ft)         *    1.70  * Cum Volume (acre-ft)  *          *          *          *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)        *          *          *          *
*************************************************************************************************

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.

*********************************************************************************

SUMMARY OF MANNING'S N VALUES

River:FW
*************************************************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *   n4    *   n5    *   n6    *
*************************************************************************************************
*FW              *    8837.78     *     .025*     .025*     .025*         *         *         *
*FW              *    8807.78     *     .025*     .025*     .025*         *         *         *
*FW              *    8687.78     *     .025*     .025*     .025*         *         *         *
*FW              *    8320        *     .035*      .03*     .035*         *         *         *
*FW              *    8200        *      .03*      .04*      .03*         *         *         *
*FW              *    8100.*      *      .03*      .04*      .03*         *         *         *
*FW              *    8000        *      .03*      .04*      .03*         *         *         *
*FW              *    7900.*      *      .03*      .04*      .03*         *         *         *
*FW              *    7800        *      .03*      .04*      .03*         *         *         *
*FW              *    7700.*      *      .03*      .04*      .03*         *         *         *
*FW              *    7600        *      .03*      .04*      .03*         *         *         *
*FW              *    7500.*      *      .03*      .04*      .03*         *         *         *
*FW              *    7400        *      .03*      .04*      .03*         *         *         *
*FW              *    7300.*      *      .03*      .04*      .03*         *         *         *
*FW              *    7200        *      .03*      .04*      .03*         *         *         *
*FW              *    7100.*      *      .03*      .04*      .03*         *         *         *
*FW              *    7000        *      .03*      .04*      .03*         *         *         *
*FW              *    6925        *Bridge   *        *        *        *         *        *
*FW              *    6868.*      *      .03*      .04*      .03*         *         *         *
*FW              *    6736        *      .03*      .04*      .03*         *         *         *
*FW              *    6577        *      .03*      .04*      .03*         *         *         *
*FW              *    6500        *Culvert  *        *        *        *         *        *
*FW              *    6469        *      .03*      .04*      .03*         *         *         *
*FW              *    6450        *Bridge   *        *        *        *         *        *
*FW              *    6100        *      .03*      .04*      .03*         *         *         *
*FW              *    6000        *Bridge   *        *        *        *         *        *
*FW              *    5917        *      .03*     .033*     .013*     .033*      .03*      .16*
*FW              *    5800        *Culvert  *        *        *        *         *        *
*FW              *    5796        *     .015*     .015*     .015*         *         *         *
*FW              *    5776        *     .015*     .015*     .015*         *         *         *
*FW              *    5737.74     *     .015*     .015*     .015*         *         *         *
*FW              *    5648.42     *     .015*     .015*     .015*         *         *         *
*FW              *    5548.82*    *     .015*     .015*     .015*         *         *         *
*FW              *    5449.23     *     .015*     .015*     .015*         *         *         *
*FW              *    5449.11     *     .015*     .015*     .015*         *         *         *
*FW              *    5399.11     *     .015*     .015*     .015*         *         *         *
*FW              *    5349.11     *     .015*     .015*     .015*         *         *         *
*FW              *    5299.11     *     .015*     .015*     .015*         *         *         *
*FW              *    5279.92     *     .015*     .015*     .015*         *         *         *
*FW              *    5255.16     *     .015*     .015*     .015*         *         *         *
*FW              *    5206.70     *     .015*     .015*     .015*         *         *         *
*FW              *    5158.24     *     .015*     .015*     .015*         *         *         *
*FW              *    5109.79     *     .015*     .015*     .015*         *         *         *
*FW              *    5061.33     *     .015*     .015*     .015*         *         *         *
*FW              *    5012.88     *     .015*     .015*     .015*         *         *         *
*FW              *    4945.04     *     .015*     .015*     .015*         *         *         *
*FW              *    4863.36     *     .015*     .015*     .015*         *         *         *
*FW              *    4781.68     *     .015*     .015*     .015*         *         *         *
*FW              *    4700        *     .015*     .015*     .015*         *         *         *
```

*FW	*	4600	* .015*	.015*	.015*	*	*	*
*FW	*	4500	* .015*	.015*	.015*	*	*	*
*FW	*	4425.69	* .015*	.015*	.015*	*	*	*
*FW	*	4350	* .015*	.015*	.015*	*	*	*
*FW	*	4275.*	* .015*	.015*	.015*	*	*	*
*FW	*	4200.00	* .015*	.015*	.015*	*	*	*
*FW	*	4127.25*	* .015*	.015*	.015*	*	*	*
*FW	*	4054.5*	* .015*	.015*	.015*	*	*	*
*FW	*	3977.08	* .015*	.015*	.015*	*	*	*
*FW	*	3890.88*	* .015*	.015*	.015*	*	*	*
*FW	*	3800	* .015*	.015*	.015*	*	*	*
*FW	*	3700.*	* .015*	.015*	.015*	*	*	*
*FW	*	3593.55	* .015*	.015*	.015*	*	*	*
*FW	*	3543.55	* .015*	.015*	.015*	*	*	*
*FW	*	3493.55	* .015*	.015*	.015*	*	*	*
*FW	*	3443.55	* .015*	.015*	.015*	*	*	*
*FW	*	3393.55	* .015*	.015*	.015*	*	*	*
*FW	*	3295.98	* .015*	.015*	.015*	*	*	*
*FW	*	3198.41	* .015*	.015*	.015*	*	*	*
*FW	*	3100.84	* .015*	.015*	.015*	*	*	*
*FW	*	3050.84	* .015*	.015*	.015*	*	*	*
*FW	*	3000.84	* .015*	.015*	.015*	*	*	*
*FW	*	2964.21	* .015*	.015*	.015*	*	*	*
*FW	*	2921.88	* .015*	.015*	.015*	*	*	*
*FW	*	2837.87*	* .015*	.015*	.015*	*	*	*
*FW	*	2753.87	* .015*	.015*	.015*	*	*	*
*FW	*	2722.44*	* .015*	.015*	.015*	*	*	*
*FW	*	2703.87	* .015*	.015*	.015*	*	*	*
*FW	*	2702.87	* .015*	.015*	.015*	*	*	*
*FW	*	2648.55	* .015*	.015*	.015*	*	*	*
*FW	*	2596.14	* .015*	.015*	.015*	*	*	*
*FW	*	2555.18	* .015*	.015*	.015*	*	*	*
*FW	*	2514.22	* .015*	.015*	.015*	*	*	*
*FW	*	2473.26	* .015*	.015*	.015*	*	*	*
*FW	*	2432.30	* .015*	.015*	.015*	*	*	*
*FW	*	2334.09*	* .015*	.015*	.015*	*	*	*
*FW	*	2235.88*	* .015*	.015*	.015*	*	*	*
*FW	*	2137.68	* .015*	.015*	.015*	*	*	*
*FW	*	2059.60*	* .015*	.015*	.015*	*	*	*
*FW	*	2020.16	* .015*	.015*	.015*	*	*	*
*FW	*	1981.53*	* .015*	.015*	.015*	*	*	*
*FW	*	1903.46	* .015*	.015*	.015*	*	*	*
*FW	*	1817.25*	* .015*	.015*	.015*	*	*	*
*FW	*	1731.04*	* .015*	.015*	.015*	*	*	*
*FW	*	1644.83*	* .015*	.015*	.015*	*	*	*
*FW	*	1558.62	* .015*	.015*	.015*	*	*	*
*FW	*	1500	* .015*	.015*	.015*	*	*	*
*FW	*	1481.51	* .015*	.015*	.015*	*	*	*
*FW	*	1437.01	* .015*	.015*	.015*	*	*	*
*FW	*	1392.52	* .015*	.015*	.015*	*	*	*
*FW	*	1348.02	* .015*	.015*	.015*	*	*	*
*FW	*	1303.53	* .015*	.015*	.015*	*	*	*
*FW	*	1259.03	* .015*	.015*	.015*	*	*	*
*FW	*	1214.54	* .015*	.015*	.015*	*	*	*
*FW	*	1173.6	* .015*	.015*	.015*	*	*	*
*FW	*	1088.94	* .015*	.015*	.015*	*	*	*
*FW	*	1000	*Bridge *	*	*	*	*	*
*FW	*	926	* .015*	.015*	.015*	*	*	*
*FW	*	914.02*	* .015*	.015*	.015*	*	*	*
*FW	*	702.71	* .02*	.015*	.02*	*	*	*
*FW	*	444.5	* .02*	.015*	.02*	*	*	*
*FW	*	223.47	* .02*	.015*	.02*	*	*	*

SUMMARY OF REACH LENGTHS

River: FW

* Reach	* River Sta.	* Left	* Channel *	Right	*
*FW	* 8837.78	* 30*	30*	30*	
*FW	* 8807.78	* 120*	120*	120*	
*FW	* 8687.78	* 382.58*	367.78*	346.32*	
*FW	* 8320	* 120*	120*	120*	
*FW	* 8200	* 100*	100*	100*	
*FW	* 8100.*	* 100*	100*	100*	
*FW	* 8000	* 100*	100*	100*	
*FW	* 7900.*	* 100*	100*	100*	
*FW	* 7800	* 100*	100*	100*	
*FW	* 7700.*	* 100*	100*	100*	
*FW	* 7600	* 100*	100*	100*	
*FW	* 7500.*	* 100*	100*	100*	
*FW	* 7400	* 77.52*	100*	117*	
*FW	* 7300.*	* 77.52*	100*	117*	
*FW	* 7200	* 69*	100*	115.52*	
*FW	* 7100.*	* 69*	100*	115.52*	
*FW	* 7000	* 100*	100*	100*	
*FW	* 6925	*Bridge *	*	*	
*FW	* 6868.*	* 100*	100*	100*	
*FW	* 6736	* 190*	159*	150*	
*FW	* 6577	* 108*	108*	108*	
*FW	* 6500	*Culvert *	*	*	
*FW	* 6469	* 328.1*	369.09*	389.1*	
*FW	* 6450	*Bridge *	*	*	
*FW	* 6100	* 225.1*	195*	182.1*	
*FW	* 6000	*Bridge *	*	*	
*FW	* 5917	* 121*	121*	121*	

*FW	*	5800	*Culvert	*	*	*
*FW	*	5796	*	20*	20*	20*
*FW	*	5776	*	38.26*	38.26*	38.26*
*FW	*	5737.74	*	89.32*	89.32*	89.32*
*FW	*	5648.42	*	99.6*	99.6*	99.6*
*FW	*	5548.82*	*	99.59*	99.59*	99.59*
*FW	*	5449.23	*	.12*	.12*	.12*
*FW	*	5449.11	*	50*	50*	50*
*FW	*	5399.11	*	50*	50*	50*
*FW	*	5349.11	*	50*	50*	50*
*FW	*	5299.11	*	19.19*	19.19*	19.19*
*FW	*	5279.92	*	24.76*	24.76*	24.76*
*FW	*	5255.16	*	48.46*	48.46*	48.46*
*FW	*	5206.70	*	48.46*	48.46*	48.46*
*FW	*	5158.24	*	48.45*	48.45*	48.45*
*FW	*	5109.79	*	48.46*	48.46*	48.46*
*FW	*	5061.33	*	48.45*	48.45*	48.45*
*FW	*	5012.88	*	67.84*	67.84*	67.84*
*FW	*	4945.04	*	81.68*	81.68*	81.68*
*FW	*	4863.36	*	81.68*	81.68*	81.68*
*FW	*	4781.68	*	81.68*	81.68*	81.68*
*FW	*	4700	*	100*	100*	100*
*FW	*	4600	*	100*	100*	100*
*FW	*	4500	*	74.31*	74.31*	74.31*
*FW	*	4425.69	*	75.69*	75.69*	75.69*
*FW	*	4350	*	75*	75*	75*
*FW	*	4275.*	*	75*	75*	75*
*FW	*	4200.00	*	72.75*	72.75*	72.75*
*FW	*	4127.25*	*	72.75*	72.75*	72.75*
*FW	*	4054.5*	*	77.42*	77.42*	77.42*
*FW	*	3977.08	*	86.2*	86.2*	86.2*
*FW	*	3890.88*	*	90.88*	90.88*	90.88*
*FW	*	3800	*	100*	100*	100*
*FW	*	3700.*	*	106.45*	106.45*	106.45*
*FW	*	3593.55	*	50*	50*	50*
*FW	*	3543.55	*	50*	50*	50*
*FW	*	3493.55	*	50*	50*	50*
*FW	*	3443.55	*	50*	50*	50*
*FW	*	3393.55	*	97.57*	97.57*	97.57*
*FW	*	3295.98	*	97.57*	97.57*	97.57*
*FW	*	3198.41	*	97.57*	97.57*	97.57*
*FW	*	3100.84	*	50*	50*	50*
*FW	*	3050.84	*	50*	50*	50*
*FW	*	3000.84	*	36.63*	36.63*	36.63*
*FW	*	2964.21	*	42.33*	42.33*	42.33*
*FW	*	2921.88	*	84.01*	84.01*	84.01*
*FW	*	2837.87*	*	84*	84*	84*
*FW	*	2753.87	*	31.43*	31.43*	31.43*
*FW	*	2722.44*	*	18.57*	18.57*	18.57*
*FW	*	2703.87	*	1*	1*	1*
*FW	*	2702.87	*	54.32*	54.32*	54.32*
*FW	*	2648.55	*	52.41*	52.41*	52.41*
*FW	*	2596.14	*	40.96*	40.96*	40.96*
*FW	*	2555.18	*	40.96*	40.96*	40.96*
*FW	*	2514.22	*	40.96*	40.96*	40.96*
*FW	*	2473.26	*	40.96*	40.96*	40.96*
*FW	*	2432.30	*	98.19*	98.19*	98.19*
*FW	*	2334.09*	*	98.21*	98.21*	98.21*
*FW	*	2235.88*	*	98.2*	98.2*	98.2*
*FW	*	2137.68	*	78.1*	78.1*	78.1*
*FW	*	2059.60*	*	39.44*	39.44*	39.44*
*FW	*	2020.16	*	38.63*	38.63*	38.63*
*FW	*	1981.53*	*	78.1*	78.1*	78.1*
*FW	*	1903.46	*	86.21*	86.21*	86.21*
*FW	*	1817.25*	*	86.21*	86.21*	86.21*
*FW	*	1731.04*	*	86.21*	86.21*	86.21*
*FW	*	1644.83*	*	86.21*	86.21*	86.21*
*FW	*	1558.62	*	58.62*	58.62*	58.62*
*FW	*	1500	*	18.49*	18.49*	18.49*
*FW	*	1481.51	*	44.5*	44.5*	44.5*
*FW	*	1437.01	*	44.49*	44.49*	44.49*
*FW	*	1392.52	*	44.5*	44.5*	44.5*
*FW	*	1348.02	*	44.49*	44.49*	44.49*
*FW	*	1303.53	*	44.5*	44.5*	44.5*
*FW	*	1259.03	*	44.49*	44.49*	44.49*
*FW	*	1214.54	*	40.94*	40.94*	40.94*
*FW	*	1173.6	*	84.66*	84.66*	84.66*
*FW	*	1088.94	*	174*	174*	174*
*FW	*	1000	*Bridge	*	*	*
*FW	*	926	*	11.98*	11.98*	11.98*
*FW	*	914.02*	*	397.98*	413.98*	419.98*
*FW	*	702.71	*	251.59*	258.21*	262.14*
*FW	*	444.5	*	229.09*	221.03*	213.86*
*FW	*	223.47	*	0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: FW

Reach	River Sta.	Contr.	Expan.
*FW	8837.78	.1	.3
*FW	8807.78	.1	.3
*FW	8687.78	.1	.3
*FW	8320	.1	.3
*FW	8200	.1	.3

```
*FW             *    8100.*  *       .1*       .3*
*FW             *    8000    *       .1*       .3*
*FW             *    7900.*  *       .1*       .3*
*FW             *    7800    *       .1*       .3*
*FW             *    7700.*  *       .1*       .3*
*FW             *    7600    *       .1*       .3*
*FW             *    7500.*  *       .1*       .3*
*FW             *    7400    *       .1*       .3*
*FW             *    7300.*  *       .1*       .3*
*FW             *    7200    *       .1*       .3*
*FW             *    7100.*  *       .1*       .3*
*FW             *    7000    *       .1*       .3*
*FW             *    6925    *Bridge   *         *
*FW             *    6868.*  *       .1*       .3*
*FW             *    6736    *       .1*       .3*
*FW             *    6577    *       .1*       .3*
*FW             *    6500    *Culvert  *         *
*FW             *    6469    *       .3*       .5*
*FW             *    6450    *Bridge   *         *
*FW             *    6100    *       .1*       .3*
*FW             *    6000    *Bridge   *         *
*FW             *    5917    *       .1*       .3*
*FW             *    5800    *Culvert  *         *
*FW             *    5796    *       .3*       .5*
*FW             *    5776    *      .01*      .03*
*FW             *    5737.74 *      .01*      .03*
*FW             *    5648.42 *        0*        0*
*FW             *    5548.82**        0*        0*
*FW             *    5449.23 *      .01*      .03*
*FW             *    5449.11 *      .01*      .03*
*FW             *    5399.11 *      .01*      .03*
*FW             *    5349.11 *      .01*      .03*
*FW             *    5299.11 *      .01*      .03*
*FW             *    5279.92 *        0*        0*
*FW             *    5255.16 *        0*        0*
*FW             *    5206.70 *        0*        0*
*FW             *    5158.24 *        0*        0*
*FW             *    5109.79 *        0*        0*
*FW             *    5061.33 *        0*        0*
*FW             *    5012.88 *        0*        0*
*FW             *    4945.04 *        0*        0*
*FW             *    4863.36 *        0*        0*
*FW             *    4781.68 *        0*        0*
*FW             *    4700    *        0*        0*
*FW             *    4600    *        0*        0*
*FW             *    4500    *        0*        0*
*FW             *    4425.69 *        0*        0*
*FW             *    4350    *        0*        0*
*FW             *    4275.*  *        0*        0*
*FW             *    4200.00 *        0*        0*
*FW             *    4127.25**        0*        0*
*FW             *    4054.5* *        0*        0*
*FW             *    3977.08 *        0*        0*
*FW             *    3890.88**        0*        0*
*FW             *    3800    *        0*        0*
*FW             *    3700.*  *        0*        0*
*FW             *    3593.55 *      .01*      .03*
*FW             *    3543.55 *      .01*      .03*
*FW             *    3493.55 *      .01*      .03*
*FW             *    3443.55 *      .01*      .03*
*FW             *    3393.55 *        0*        0*
*FW             *    3295.98 *        0*        0*
*FW             *    3198.41 *        0*        0*
*FW             *    3100.84 *        0*        0*
*FW             *    3050.84 *        0*        0*
*FW             *    3000.84 *        0*        0*
*FW             *    2964.21 *        0*        0*
*FW             *    2921.88 *        0*        0*
*FW             *    2837.87**        0*        0*
*FW             *    2753.87 *        0*        0*
*FW             *    2722.44**        0*        0*
*FW             *    2703.87 *        0*        0*
*FW             *    2702.87 *      .01*      .03*
*FW             *    2648.55 *        0*        0*
*FW             *    2596.14 *        0*        0*
*FW             *    2555.18 *        0*        0*
*FW             *    2514.22 *        0*        0*
*FW             *    2473.26 *        0*        0*
*FW             *    2432.30 *        0*        0*
*FW             *    2334.09**        0*        0*
*FW             *    2235.88**        0*        0*
*FW             *    2137.68 *        0*        0*
*FW             *    2059.60**        0*        0*
*FW             *    2020.16 *        0*        0*
*FW             *    1981.53**        0*        0*
*FW             *    1903.46 *        0*        0*
*FW             *    1817.25**        0*        0*
*FW             *    1731.04**        0*        0*
*FW             *    1644.83**        0*        0*
*FW             *    1558.62 *        0*        0*
*FW             *    1500    *        0*        0*
*FW             *    1481.51 *        0*        0*
*FW             *    1437.01 *        0*        0*
*FW             *    1392.52 *        0*        0*
*FW             *    1348.02 *        0*        0*
*FW             *    1303.53 *        0*        0*
*FW             *    1259.03 *        0*        0*
*FW             *    1214.54 *      .01*      .03*
*FW             *    1173.6  *      .01*      .03*
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*FW             *    1088.94 *      .05*       .1*
*FW             *    1000    *Bridge   *         *
*FW             *    926     *      .05*       .1*
*FW             *    914.02* *      .05*       .1*
*FW             *    702.71  *       .1*       .3*
*FW             *    444.5   *       .1*       .3*
*FW             *    223.47  *       .1*       .3*
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Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
FW	8837.78	5500.00	1924.80	1931.62	1932.26	1935.97	0.008702	16.74	328.61	50.00	1.15
FW	8807.78	5500.00	1924.71	1935.21	1935.21	1938.54	0.005469	14.64	375.60	56.88	1.00
FW	8687.78	5500.00	1924.34	1931.97	1933.52	1937.42	0.011334	18.74	293.55	54.12	1.42
FW	8320	5500.00	1923.96	1932.43	1932.43	1934.25	0.005458	11.14	566.77	183.61	0.85
FW	8200	5500.00	1921.80	1931.06	1931.18	1933.35	0.009800	12.52	478.26	127.29	0.86
FW	8100.*	5500.00	1920.92	1930.88	1930.88	1932.52	0.007090	11.16	588.79	180.85	0.74
FW	8000	5500.00	1920.05	1929.50	1930.04	1931.63	0.010282	12.85	525.27	186.37	0.88
FW	7900.*	5500.00	1919.47	1930.44	1930.44	1931.88	0.005694	10.73	661.88	241.79	0.67
FW	7800	5500.00	1918.88	1929.88	1929.88	1931.39	0.006421	11.09	620.75	194.90	0.70
FW	7700.*	5500.00	1918.01	1928.13	1928.90	1930.48	0.010951	13.66	533.54	252.66	0.90
FW	7600	5500.00	1917.14	1926.64	1927.45	1929.25	0.013403	14.54	514.10	261.66	0.99
FW	7500.*	5500.00	1916.78	1926.14	1926.56	1927.86	0.009411	12.21	602.62	263.65	0.83
FW	7400	5500.00	1916.43	1925.51	1925.68	1926.91	0.007941	10.99	638.96	255.43	0.75
FW	7300.*	5500.00	1916.49	1925.85	1925.85	1927.14	0.005778	10.15	694.29	261.50	0.67
FW	7200	5500.00	1916.55	1925.32	1925.32	1926.76	0.006185	10.22	640.83	228.94	0.69
FW	7100.*	5500.00	1915.99	1923.80	1924.15	1925.94	0.010297	12.30	505.66	155.33	0.88
FW	7000	5500.00	1915.44	1922.26	1922.74	1924.76	0.014125	13.39	449.87	124.07	1.02
FW	6925	Bridge									
FW	6868.*	5500.00	1914.40	1921.92	1921.92	1923.63	0.009110	11.20	554.50	165.51	0.83
FW	6736	5500.00	1913.37	1921.50	1921.50	1922.84	0.007724	10.07	642.00	225.66	0.75
FW	6577	5500.00	1912.92	1919.70	1919.70	1922.10	0.014414	12.44	441.99	92.61	1.00
FW	6500	Culvert									
FW	6469	5500.00	1912.23	1919.31	1919.42	1921.78	0.015523	12.61	436.24	92.67	1.02
FW	6450	Bridge									
FW	6100	5500.00	1909.48	1916.19	1916.19	1917.26	0.008445	9.83	698.85	297.83	0.77
FW	6000	Bridge									
FW	5917	5500.00	1908.13	1913.82	1915.10	1918.33	0.008907	17.04	322.77	72.44	1.42
FW	5800	Culvert									
FW	5796	5280.00	1906.30	1911.11	1912.96	1917.52	0.005894	20.32	270.72	56.30	1.63
FW	5776	5280.00	1905.99	1908.98	1911.19	1916.89	0.013568	22.57	233.95	79.77	2.32
FW	5737.74	5280.00	1905.43	1908.54	1910.72	1916.37	0.013311	22.46	235.10	79.77	2.31
FW	5648.42	5280.00	1904.09	1907.65	1909.80	1915.25	0.011737	22.12	238.65	75.00	2.19
FW	5548.82*	5280.00	1902.59	1906.07	1908.31	1914.04	0.012654	22.65	233.16	75.00	2.26
FW	5449.23	5280.00	1901.09	1904.52	1906.81	1912.75	0.013325	23.01	229.46	75.00	2.32
FW	5449.11	5280.00	1901.09	1904.52	1906.81	1912.75	0.013325	23.01	229.46	75.00	2.32
FW	5399.11	5280.00	1900.17	1903.91	1906.25	1912.11	0.011839	22.99	229.68	67.61	2.20
FW	5349.11	5280.00	1899.26	1903.38	1905.76	1911.56	0.010414	22.95	230.08	60.22	2.07
FW	5299.11	5280.00	1898.34	1902.98	1905.37	1911.07	0.008994	22.83	231.32	52.84	1.92
FW	5279.92	5280.00	1897.99	1902.89	1905.26	1910.91	0.008430	22.73	232.30	50.00	1.86
FW	5255.16	5280.00	1897.54	1902.34	1904.81	1910.69	0.008972	23.19	227.71	50.00	1.91
FW	5206.70	5280.00	1897.16	1901.98	1904.43	1910.26	0.008855	23.09	228.67	50.00	

1.90 *										
* FW	* 5158.24	* 5280.00 *	1896.78 *	1901.62 *	1904.05 *	1909.84 *	0.008750 *	23.00 *	229.54 *	50.00 *
1.89 *										
* FW	* 5109.79	* 5500.00 *	1896.40 *	1901.52 *	1903.86 *	1909.44 *	0.007887 *	22.58 *	243.61 *	50.00 *
1.80 *										
* FW	* 5061.33	* 5500.00 *	1896.02 *	1901.14 *	1903.48 *	1909.06 *	0.007887 *	22.58 *	243.61 *	50.00 *
1.80 *										
* FW	* 5012.88	* 5500.00 *	1895.64 *	1900.76 *	1903.10 *	1908.68 *	0.007887 *	22.58 *	243.61 *	50.00 *
1.80 *										
* FW	* 4945.04	* 5500.00 *	1895.11 *	1900.23 *	1902.57 *	1908.15 *	0.007887 *	22.58 *	243.61 *	50.00 *
1.80 *										
* FW	* 4863.36	* 5500.00 *	1894.48 *	1899.61 *	1901.94 *	1907.50 *	0.007858 *	22.55 *	243.90 *	50.00 *
1.80 *										
* FW	* 4781.68	* 5500.00 *	1893.84 *	1898.97 *	1901.30 *	1906.86 *	0.007858 *	22.55 *	243.90 *	50.00 *
1.80 *										
* FW	* 4700	* 5500.00 *	1893.20 *	1898.33 *	1900.66 *	1906.22 *	0.007858 *	22.55 *	243.90 *	50.00 *
1.80 *										
* FW	* 4600	* 5500.00 *	1892.42 *	1897.55 *	1899.88 *	1905.44 *	0.007858 *	22.55 *	243.90 *	50.00 *
1.80 *										
* FW	* 4500	* 5500.00 *	1891.63 *	1896.76 *	1899.09 *	1904.66 *	0.007866 *	22.56 *	243.81 *	50.00 *
1.80 *										
* FW	* 4425.69	* 5500.00 *	1891.05 *	1896.18 *	1898.51 *	1904.08 *	0.007866 *	22.56 *	243.81 *	50.00 *
1.80 *										
* FW	* 4350	* 5500.00 *	1890.46 *	1895.59 *	1897.92 *	1903.49 *	0.007866 *	22.56 *	243.81 *	50.00 *
1.80 *										
* FW	* 4275.*	* 5500.00 *	1889.71 *	1894.77 *	1897.17 *	1902.89 *	0.008195 *	22.86 *	240.63 *	50.00 *
1.84 *										
* FW	* 4200.00	* 5500.00 *	1888.96 *	1893.97 *	1896.42 *	1902.26 *	0.008473 *	23.10 *	238.07 *	50.00 *
1.87 *										
* FW	* 4127.25*	* 5500.00 *	1888.60 *	1893.71 *	1896.06 *	1901.67 *	0.007950 *	22.63 *	242.99 *	50.00 *
1.81 *										
* FW	* 4054.5*	* 5500.00 *	1888.23 *	1893.43 *	1895.69 *	1901.11 *	0.007522 *	22.24 *	247.35 *	50.00 *
1.76 *										
* FW	* 3977.08	* 5500.00 *	1887.85 *	1893.14 *	1895.31 *	1900.54 *	0.007107 *	21.83 *	251.90 *	50.00 *
1.71 *										
* FW	* 3890.88*	* 5500.00 *	1887.41 *	1892.78 *	1894.87 *	1899.95 *	0.006753 *	21.48 *	256.08 *	50.00 *
1.67 *										
* FW	* 3800	* 5500.00 *	1886.96 *	1892.42 *	1894.42 *	1899.35 *	0.006417 *	21.13 *	260.33 *	50.00 *
1.63 *										
* FW	* 3700.*	* 5500.00 *	1885.96 *	1891.24 *	1893.42 *	1898.68 *	0.007164 *	21.89 *	251.25 *	50.00 *
1.72 *										
* FW	* 3593.55	* 5500.00 *	1884.90 *	1890.05 *	1892.36 *	1897.89 *	0.007770 *	22.47 *	244.78 *	50.00 *
1.79 *										
* FW	* 3543.55	* 5500.00 *	1883.90 *	1889.39 *	1891.79 *	1897.50 *	0.007575 *	22.84 *	240.76 *	45.75 *
1.75 *										
* FW	* 3493.55	* 5500.00 *	1882.90 *	1888.85 *	1891.27 *	1897.12 *	0.007248 *	23.09 *	238.20 *	41.50 *
1.70 *										
* FW	* 3443.55	* 5500.00 *	1881.90 *	1888.47 *	1890.86 *	1896.77 *	0.006736 *	23.11 *	238.00 *	37.25 *
1.61 *										
* FW	* 3393.55	* 5500.00 *	1880.90 *	1888.38 *	1890.57 *	1896.44 *	0.006023 *	22.79 *	241.37 *	33.00 *
1.48 *										
* FW	* 3295.98	* 5500.00 *	1879.91 *	1887.11 *	1889.58 *	1895.82 *	0.006745 *	23.68 *	232.21 *	33.00 *
1.57 *										
* FW	* 3198.41	* 5500.00 *	1878.92 *	1885.93 *	1888.59 *	1895.14 *	0.007320 *	24.35 *	225.84 *	33.00 *
1.64 *										
* FW	* 3100.84	* 5500.00 *	1877.93 *	1884.80 *	1887.60 *	1894.40 *	0.007774 *	24.86 *	221.26 *	33.00 *
1.69 *										
* FW	* 3050.84	* 5500.00 *	1877.42 *	1884.23 *	1887.09 *	1894.00 *	0.007987 *	25.09 *	219.25 *	33.00 *
1.72 *										
* FW	* 3000.84	* 5500.00 *	1876.92 *	1883.68 *	1886.59 *	1893.59 *	0.008152 *	25.26 *	217.72 *	33.00 *
1.73 *										
* FW	* 2964.21	* 5500.00 *	1876.54 *	1883.27 *	1886.21 *	1893.29 *	0.008291 *	25.41 *	216.49 *	33.00 *
1.75 *										
* FW	* 2921.88	* 5500.00 *	1876.11 *	1882.80 *	1885.78 *	1892.93 *	0.008424 *	25.54 *	215.32 *	33.00 *
1.76 *										
* FW	* 2837.87*	* 5500.00 *	1875.26 *	1881.89 *	1884.93 *	1892.21 *	0.008663 *	25.79 *	213.29 *	33.00 *
1.79 *										
* FW	* 2753.87	* 5500.00 *	1874.41 *	1880.99 *	1884.08 *	1891.48 *	0.008868 *	25.99 *	211.61 *	33.00 *
1.81 *										
* FW	* 2722.44*	* 5500.00 *	1874.09 *	1880.59 *	1883.71 *	1891.19 *	0.009018 *	26.13 *	210.46 *	33.00 *
1.82 *										
* FW	* 2703.87	* 5500.00 *	1874.00 *	1880.51 *	1883.61 *	1891.03 *	0.008918 *	26.03 *	211.29 *	33.00 *
1.81 *										
* FW	* 2702.87	* 5500.00 *	1873.99 *	1880.50 *	1883.60 *	1891.01 *	0.007295 *	26.02 *	211.35 *	52.82 *
1.81 *										
* FW	* 2648.55	* 5500.00 *	1873.72 *	1877.83 *	1881.19 *	1890.42 *	0.016324 *	28.48 *	193.15 *	50.00 *
2.55 *										
* FW	* 2596.14	* 5500.00 *	1873.46 *	1877.68 *	1880.92 *	1889.61 *	0.014988 *	27.71 *	198.46 *	50.00 *
2.45 *										
* FW	* 2555.18	* 5500.00 *	1873.25 *	1877.55 *	1880.71 *	1889.01 *	0.014080 *	27.17 *	202.44 *	50.00 *
2.38 *										
* FW	* 2514.22	* 5500.00 *	1873.04 *	1877.42 *	1880.50 *	1888.44 *	0.013241 *	26.64 *	206.43 *	50.00 *
2.31 *										
* FW	* 2473.26	* 5500.00 *	1872.84 *	1877.30 *	1880.30 *	1887.91 *	0.012472 *	26.14 *	210.40 *	50.00 *
2.25 *										
* FW	* 2432.30	* 5500.00 *	1872.63 *	1877.16 *	1880.09 *	1887.41 *	0.011805 *	25.69 *	214.12 *	50.00 *
2.19 *										
* FW	* 2334.09*	* 5500.00 *	1871.85 *	1876.48 *	1879.31 *	1886.28 *	0.011021 *	25.13 *	218.86 *	50.00 *
2.12 *										
* FW	* 2235.88*	* 5500.00 *	1871.06 *	1875.76 *	1878.52 *	1885.23 *	0.010435 *	24.69 *	222.72 *	50.00 *
2.06 *										
* FW	* 2137.68	* 5500.00 *	1870.28 *	1875.05 *	1877.74 *	1884.24 *	0.009944 *	24.32 *	226.17 *	50.00 *
2.01 *										
* FW	* 2059.60*	* 5500.00 *	1868.74 *	1873.31 *	1876.20 *	1883.40 *	0.011527 *	25.49 *	215.75 *	50.00 *
2.16 *										
* FW	* 2020.16	* 5500.00 *	1867.96 *	1872.44 *	1875.42 *	1882.93 *	0.012247 *	25.99 *	211.62 *	50.00 *
2.23 *										
* FW	* 1981.53*	* 5500.00 *	1867.19 *	1871.60 *	1874.65 *	1882.45 *	0.012906 *	26.43 *	208.12 *	50.00 *
2.28 *										

FW	1903.46	5500.00	1865.65	1869.95	1873.11	1881.40	0.014043	27.15	202.61	50.00
2.38										
FW	1817.25*	5500.00	1864.95	1869.36	1872.41	1880.23	0.012965	26.47	207.82	50.00
2.29										
FW	1731.04*	5500.00	1864.24	1868.74	1871.70	1879.15	0.012096	25.89	212.46	50.00
2.21										
FW	1644.83*	5500.00	1863.54	1868.12	1871.00	1878.13	0.011375	25.39	216.66	50.00
2.15										
FW	1558.62	5800.00	1862.84	1867.80	1870.56	1877.23	0.009760	24.64	235.40	50.00
2.00										
FW	1500	5800.00	1862.36	1867.02	1869.81	1876.63	0.010165	24.87	233.17	50.00
2.03										
FW	1481.51	5800.00	1862.21	1867.21	1869.93	1876.46	0.009466	24.40	237.71	50.00
1.97										
FW	1437.01	5800.00	1861.84	1866.86	1869.56	1876.04	0.009363	24.31	238.55	50.00
1.96										
FW	1392.52	5800.00	1861.48	1866.52	1869.20	1875.63	0.009250	24.22	239.48	50.00
1.95										
FW	1348.02	5800.00	1861.12	1866.18	1868.84	1875.22	0.009146	24.13	240.35	50.00
1.94										
FW	1303.53	5800.00	1860.76	1865.83	1868.48	1874.82	0.009052	24.05	241.15	50.00
1.93										
FW	1259.03	5800.00	1860.39	1865.47	1868.11	1874.42	0.008986	23.99	241.72	50.00
1.92										
FW	1214.54	5800.00	1860.03	1865.13	1867.75	1874.02	0.008906	23.93	242.41	50.00
1.91										
FW	1173.6	5800.00	1859.70	1864.81	1867.42	1873.66	0.008837	23.87	243.02	50.00
1.91										
FW	1088.94	5800.00	1859.00	1863.55	1866.28	1872.85	0.010025	24.47	237.00	52.04
2.02										
FW	1000	Bridge								
FW	926	5800.00	1855.10	1859.19	1862.16	1869.65	0.012659	25.96	223.44	54.70
2.26										
FW	914.02*	5800.00	1854.95	1860.07	1862.84	1869.41	0.009320	24.53	236.47	51.64
2.02										
FW	702.71	5800.00	1853.63	1861.40	1862.90	1866.78	0.003508	18.67	317.76	61.80
1.32										
FW	444.5	5800.00	1850.36	1856.74	1859.94	1865.21	0.007361	23.35	248.38	51.42
1.87										
FW	223.47	5800.00	1847.74	1853.97	1857.57	1863.41	0.008029	24.65	235.30	46.86
1.94										

Profile Output Table - Standard Table 2

Reach	River Sta	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)
FW	8837.78	1935.97	1931.62	4.35				5500.00		50.00
FW	8807.78	1938.54	1935.21	3.33	0.20	0.31		5500.00		56.88
FW	8687.78	1937.42	1931.97	5.45	0.91	0.21		5500.00		54.12
FW	8320	1934.25	1932.43	1.82			274.31	5164.19	61.51	183.61
FW	8200	1933.35	1931.06	2.30	0.86	0.05	40.72	5090.71	368.57	127.29
FW	8100.*	1932.52	1930.88	1.64			494.79	4360.35	644.85	180.85
FW	8000	1931.63	1929.50	2.13	0.85	0.05	850.47	4238.82	410.71	186.37
FW	7900.*	1931.88	1930.44	1.43	0.75	0.21	414.34	4028.41	1057.25	241.79
FW	7800	1931.39	1929.88	1.51			10.96	3848.43	1640.61	194.90
FW	7700.*	1930.48	1928.13	2.35	0.82	0.08	94.97	4228.61	1176.42	252.66
FW	7600	1929.25	1926.64	2.61	1.21	0.03	234.99	4155.18	1109.83	261.66
FW	7500.*	1927.86	1926.14	1.73	1.11	0.27	193.63	3575.93	1730.44	263.65
FW	7400	1926.91	1925.51	1.40	0.86	0.10	134.22	3218.43	2147.35	255.43
FW	7300.*	1927.14	1925.85	1.29	0.70	0.03	479.31	4117.02	903.67	261.50
FW	7200	1926.76	1925.32	1.45			563.64	4782.34	154.02	228.94
FW	7100.*	1925.94	1923.80	2.14	0.76	0.07	579.76	4864.69	55.55	155.33
FW	7000	1924.76	1922.26	2.49	1.15	0.04	977.06	4467.77	55.17	124.07
FW	6925	Bridge								
FW	6868.*	1923.63	1921.92	1.71	0.24	0.19	1025.58	4429.41	45.01	165.51
FW	6736	1922.84	1921.50	1.34			1034.89	4291.47	173.64	225.66
FW	6577	1922.10	1919.70	2.40				5500.00		92.61
FW	6500	Culvert								
FW	6469	1921.78	1919.31	2.47				5500.00		92.67
FW	6450	Bridge								
FW	6100	1917.26	1916.19	1.07			1763.53	2456.03	1280.44	297.83
FW	6000	Bridge								
FW	5917	1918.33	1913.82	4.51	0.26	0.21		5500.00		72.44
FW	5800	Culvert								
FW	5796	1917.52	1911.11	6.41				5500.00		56.30
FW	5776	1916.89	1908.98	7.91	0.18	0.45		5280.00		79.77
FW	5737.74	1916.37	1908.54	7.83	0.51	0.00		5280.00		79.77
FW	5648.42	1915.25	1907.65	7.60	1.12	0.01		5280.00		75.00
FW	5548.82*	1914.04	1906.07	7.96	1.21	0.00		5280.00		75.00
FW	5449.23	1912.75	1904.52	8.22	1.29	0.00		5280.00		75.00
FW	5449.11	1912.75	1904.52	8.22	0.00	0.00		5280.00		75.00
FW	5399.11	1912.11	1903.91	8.21	0.63	0.00		5280.00		67.61
FW	5349.11	1911.56	1903.38	8.18	0.55	0.00		5280.00		60.22
FW	5299.11	1911.07	1902.98	8.09	0.48	0.00		5280.00		52.84
FW	5279.92	1910.91	1902.89	8.02	0.17	0.00		5280.00		50.00
FW	5255.16	1910.69	1902.34	8.35	0.22	0.00		5280.00		50.00
FW	5206.70	1910.26	1901.98	8.28	0.43	0.00		5280.00		50.00
FW	5158.24	1909.84	1901.62	8.22	0.43	0.00		5280.00		50.00
FW	5109.79	1909.44	1901.52	7.91	0.40	0.00		5500.00		50.00
FW	5061.33	1909.06	1901.14	7.91	0.38	0.00		5500.00		50.00
FW	5012.88	1908.68	1900.76	7.91	0.38	0.00		5500.00		50.00
FW	4945.04	1908.15	1900.23	7.91	0.54	0.00		5500.00		50.00
FW	4863.36	1907.50	1899.61	7.90	0.64	0.00		5500.00		50.00
FW	4781.68	1906.86	1898.97	7.90	0.64	0.00		5500.00		50.00
FW	4700	1906.22	1898.33	7.90	0.64	0.00		5500.00		50.00

* FW	* 4600	*	1905.44 *	1897.55 *	7.90 *	0.79 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4500	*	1904.66 *	1896.76 *	7.90 *	0.79 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4425.69	*	1904.08 *	1896.18 *	7.90 *	0.58 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4350	*	1903.49 *	1895.59 *	7.90 *	0.60 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4275.*	*	1902.89 *	1894.77 *	8.11 *	0.60 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4200.00	*	1902.26 *	1893.97 *	8.29 *	0.62 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4127.25*	*	1901.67 *	1893.71 *	7.96 *	0.60 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 4054.5*	*	1901.11 *	1893.43 *	7.68 *	0.56 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3977.08	*	1900.54 *	1893.14 *	7.40 *	0.57 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3890.88*	*	1899.95 *	1892.78 *	7.16 *	0.60 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3800	*	1899.35 *	1892.42 *	6.93 *	0.60 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3700.*	*	1898.68 *	1891.24 *	7.44 *	0.68 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3593.55	*	1897.89 *	1890.05 *	7.84 *	0.79 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 3543.55	*	1897.50 *	1889.39 *	8.10 *	0.38 *	0.00 *	*	5500.00 *	*	45.75 *
* FW	* 3493.55	*	1897.12 *	1888.85 *	8.28 *	0.37 *	0.00 *	*	5500.00 *	*	41.50 *
* FW	* 3443.55	*	1896.77 *	1888.47 *	8.29 *	0.35 *	0.00 *	*	5500.00 *	*	37.25 *
* FW	* 3393.55	*	1896.44 *	1888.38 *	8.06 *	0.32 *	0.01 *	*	5500.00 *	*	33.00 *
* FW	* 3295.98	*	1895.82 *	1887.11 *	8.71 *	0.62 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3198.41	*	1895.14 *	1885.93 *	9.21 *	0.69 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3100.84	*	1894.40 *	1884.80 *	9.59 *	0.74 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3050.84	*	1894.00 *	1884.23 *	9.77 *	0.39 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 3000.84	*	1893.59 *	1883.68 *	9.91 *	0.40 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2964.21	*	1893.29 *	1883.27 *	10.02 *	0.30 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2921.88	*	1892.93 *	1882.80 *	10.13 *	0.35 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2837.87*	*	1892.21 *	1881.89 *	10.33 *	0.72 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2753.87	*	1891.48 *	1880.99 *	10.49 *	0.74 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2722.44*	*	1891.19 *	1880.59 *	10.61 *	0.28 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2703.87	*	1891.03 *	1880.51 *	10.52 *	0.17 *	0.00 *	*	5500.00 *	*	33.00 *
* FW	* 2702.87	*	1891.01 *	1880.50 *	10.52 *	0.01 *	0.00 *	*	5500.00 *	*	52.82 *
* FW	* 2648.55	*	1890.42 *	1877.83 *	12.59 *	0.57 *	0.02 *	*	5500.00 *	*	50.00 *
* FW	* 2596.14	*	1889.61 *	1877.68 *	11.93 *	0.82 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2555.18	*	1889.01 *	1877.55 *	11.46 *	0.59 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2514.22	*	1888.44 *	1877.42 *	11.02 *	0.56 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2473.26	*	1887.91 *	1877.30 *	10.61 *	0.53 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2432.30	*	1887.41 *	1877.16 *	10.25 *	0.50 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2334.09*	*	1886.28 *	1876.48 *	9.81 *	1.12 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2235.88*	*	1885.23 *	1875.76 *	9.47 *	1.05 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2137.68	*	1884.24 *	1875.05 *	9.18 *	1.00 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2059.60*	*	1883.40 *	1873.31 *	10.09 *	0.84 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 2020.16	*	1882.93 *	1872.44 *	10.49 *	0.47 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1981.53*	*	1882.45 *	1871.60 *	10.84 *	0.49 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1903.46	*	1881.40 *	1869.95 *	11.44 *	1.05 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1817.25*	*	1880.23 *	1869.36 *	10.88 *	1.16 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1731.04*	*	1879.15 *	1868.74 *	10.41 *	1.08 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1644.83*	*	1878.13 *	1868.12 *	10.01 *	1.01 *	0.00 *	*	5500.00 *	*	50.00 *
* FW	* 1558.62	*	1877.23 *	1867.80 *	9.43 *	0.91 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1500	*	1876.63 *	1867.02 *	9.61 *	0.58 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1481.51	*	1876.46 *	1867.21 *	9.24 *	0.18 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1437.01	*	1876.04 *	1866.86 *	9.18 *	0.42 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1392.52	*	1875.63 *	1866.52 *	9.11 *	0.41 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1348.02	*	1875.22 *	1866.18 *	9.04 *	0.41 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1303.53	*	1874.82 *	1865.83 *	8.98 *	0.40 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1259.03	*	1874.42 *	1865.47 *	8.94 *	0.40 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1214.54	*	1874.02 *	1865.13 *	8.89 *	0.40 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1173.6	*	1873.66 *	1864.81 *	8.84 *	0.36 *	0.00 *	*	5800.00 *	*	50.00 *
* FW	* 1088.94	*	1872.85 *	1863.55 *	9.30 *	0.80 *	0.00 *	*	5800.00 *	*	52.04 *
* FW	* 1000	*	Bridge *	*	*	*	*	*	*	*	*
* FW	* 926	*	1869.65 *	1859.19 *	10.46 *	0.21 *	0.01 *	*	5800.00 *	*	54.70 *
* FW	* 914.02*	*	1869.41 *	1860.07 *	9.34 *	0.13 *	0.11 *	*	5800.00 *	*	51.64 *
* FW	* 702.71	*	1866.78 *	1861.40 *	5.38 *	2.23 *	0.40 *	31.60 *	5768.40 *	*	61.80 *
* FW	* 444.5	*	1865.21 *	1856.74 *	8.47 *	1.27 *	0.31 *	*	5800.00 *	*	51.42 *
* FW	* 223.47	*	1863.41 *	1853.97 *	9.43 *	1.70 *	0.10 *	*	5800.00 *	*	46.86 *

HEC-RAS Plan: supercritical River: FW Reach: FW Profile: 100-yr FIS

Reach	River Sta	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)	
FW	8837.78	5500.00	1924.80	1931.62	1932.26	1935.97	0.008702	16.74	328.61	50.00	1.15
FW	8807.78	5500.00	1924.71	1935.21	1935.21	1938.54	0.005469	14.64	375.60	56.88	1.00
FW	8687.78	5500.00	1924.34	1931.97	1933.52	1937.42	0.011334	18.74	293.55	54.12	1.42
FW	8320	5500.00	1923.96	1932.43	1932.43	1934.25	0.005458	11.14	566.77	183.61	0.85
FW	8200	5500.00	1921.80	1931.06	1931.18	1933.35	0.009800	12.52	478.26	127.29	0.86
FW	8100.*	5500.00	1920.92	1930.88	1930.88	1932.52	0.007090	11.16	588.79	180.85	0.74
FW	8000	5500.00	1920.05	1929.50	1930.04	1931.63	0.010282	12.85	525.27	186.37	0.88
FW	7900.*	5500.00	1919.47	1930.44	1930.44	1931.88	0.005694	10.73	661.88	241.79	0.67
FW	7800	5500.00	1918.88	1929.88	1929.88	1931.39	0.006421	11.09	620.75	194.90	0.70
FW	7700.*	5500.00	1918.01	1928.13	1928.90	1930.48	0.010951	13.66	533.54	252.66	0.90
FW	7600	5500.00	1917.14	1926.64	1927.45	1929.25	0.013403	14.54	514.10	261.66	0.99
FW	7500.*	5500.00	1916.78	1926.14	1926.56	1927.86	0.009411	12.21	602.62	263.65	0.83
FW	7400	5500.00	1916.43	1925.51	1925.68	1926.91	0.007941	10.99	638.96	255.43	0.75
FW	7300.*	5500.00	1916.49	1925.85	1925.85	1927.14	0.005778	10.15	694.29	261.50	0.67
FW	7200	5500.00	1916.55	1925.32	1925.32	1926.76	0.006185	10.22	640.83	228.94	0.69
FW	7100.*	5500.00	1915.99	1923.80	1924.15	1925.94	0.010297	12.30	505.66	155.33	0.88
FW	7000	5500.00	1915.44	1922.26	1922.74	1924.76	0.014125	13.39	449.87	124.07	1.02
FW	6925	Bridge									
FW	6868.*	5500.00	1914.40	1921.92	1921.92	1923.63	0.009110	11.20	554.50	165.51	0.83
FW	6736	5500.00	1913.37	1921.50	1921.50	1922.84	0.007724	10.07	642.00	225.66	0.75
FW	6577	5500.00	1912.92	1919.70	1919.70	1922.10	0.014414	12.44	441.99	92.61	1.00
FW	6500	Culvert									
FW	6469	5500.00	1912.23	1919.31	1919.42	1921.78	0.015523	12.61	436.24	92.67	1.02
FW	6450	Bridge									
FW	6100	5500.00	1909.48	1916.19	1916.19	1917.26	0.008445	9.83	698.85	297.83	0.77
FW	6000	Bridge									
FW	5917	5500.00	1908.13	1913.82	1915.10	1918.33	0.008907	17.04	322.77	72.44	1.42
FW	5800	Culvert									
FW	5796	5280.00	1906.30	1911.11	1912.96	1917.52	0.005894	20.32	270.72	56.30	1.63
FW	5776	5280.00	1905.99	1908.98	1911.19	1916.89	0.013568	22.57	233.95	79.77	2.32
FW	5737.74	5280.00	1905.43	1908.54	1910.72	1916.37	0.013311	22.46	235.10	79.77	2.31
FW	5648.42	5280.00	1904.09	1907.65	1909.80	1915.25	0.011737	22.12	238.65	75.00	2.19
FW	5548.82*	5280.00	1902.59	1906.07	1908.31	1914.04	0.012654	22.65	233.16	75.00	2.26
FW	5449.23	5280.00	1901.09	1904.52	1906.81	1912.75	0.013325	23.01	229.46	75.00	2.32
FW	5449.11	5280.00	1901.09	1904.52	1906.81	1912.75	0.013325	23.01	229.46	75.00	2.32
FW	5399.11	5280.00	1900.17	1903.91	1906.25	1912.11	0.011839	22.99	229.68	67.61	2.20
FW	5349.11	5280.00	1899.26	1903.38	1905.76	1911.56	0.010414	22.95	230.08	60.22	2.07
FW	5299.11	5280.00	1898.34	1902.98	1905.37	1911.07	0.008994	22.83	231.32	52.84	1.92
FW	5279.92	5280.00	1897.99	1902.89	1905.26	1910.91	0.008430	22.73	232.30	50.00	1.86
FW	5255.16	5280.00	1897.54	1902.34	1904.81	1910.69	0.008972	23.19	227.71	50.00	1.91
FW	5206.70	5280.00	1897.16	1901.98	1904.43	1910.26	0.008855	23.09	228.67	50.00	1.90
FW	5158.24	5280.00	1896.78	1901.62	1904.05	1909.84	0.008750	23.00	229.54	50.00	1.89
FW	5109.79	5500.00	1896.40	1901.52	1903.86	1909.44	0.007887	22.58	243.61	50.00	1.80
FW	5061.33	5500.00	1896.02	1901.14	1903.48	1909.06	0.007887	22.58	243.61	50.00	1.80
FW	5012.88	5500.00	1895.64	1900.76	1903.10	1908.68	0.007887	22.58	243.61	50.00	1.80
FW	4945.04	5500.00	1895.11	1900.23	1902.57	1908.15	0.007887	22.58	243.61	50.00	1.80
FW	4863.36	5500.00	1894.48	1899.61	1901.94	1907.50	0.007858	22.55	243.90	50.00	1.80
FW	4781.68	5500.00	1893.84	1898.97	1901.30	1906.86	0.007858	22.55	243.90	50.00	1.80
FW	4700	5500.00	1893.20	1898.33	1900.66	1906.22	0.007858	22.55	243.90	50.00	1.80
FW	4600	5500.00	1892.42	1897.55	1899.88	1905.44	0.007858	22.55	243.90	50.00	1.80
FW	4500	5500.00	1891.63	1896.76	1899.09	1904.66	0.007866	22.56	243.81	50.00	1.80
FW	4425.69	5500.00	1891.05	1896.18	1898.51	1904.08	0.007866	22.56	243.81	50.00	1.80
FW	4350	5500.00	1890.46	1895.59	1897.92	1903.49	0.007866	22.56	243.81	50.00	1.80
FW	4275.*	5500.00	1889.71	1894.77	1897.17	1902.89	0.008195	22.86	240.63	50.00	1.84
FW	4200.00	5500.00	1888.96	1893.97	1896.42	1902.26	0.008473	23.10	238.07	50.00	1.87
FW	4127.25*	5500.00	1888.60	1893.71	1896.06	1901.67	0.007950	22.63	242.99	50.00	1.81
FW	4054.5*	5500.00	1888.23	1893.43	1895.69	1901.11	0.007522	22.24	247.35	50.00	1.76
FW	3977.08	5500.00	1887.85	1893.14	1895.31	1900.54	0.007107	21.83	251.90	50.00	1.71
FW	3890.88*	5500.00	1887.41	1892.78	1894.87	1899.95	0.006753	21.48	256.08	50.00	1.67
FW	3800	5500.00	1886.96	1892.42	1894.42	1899.35	0.006417	21.13	260.33	50.00	1.63
FW	3700.*	5500.00	1885.96	1891.24	1893.42	1898.68	0.007164	21.89	251.25	50.00	1.72
FW	3593.55	5500.00	1884.90	1890.05	1892.36	1897.89	0.007770	22.47	244.78	50.00	1.79
FW	3543.55	5500.00	1883.90	1889.39	1891.79	1897.50	0.007575	22.84	240.76	45.75	1.75
FW	3493.55	5500.00	1882.90	1888.85	1891.27	1897.12	0.007248	23.09	238.20	41.50	1.70
FW	3443.55	5500.00	1881.90	1888.47	1890.86	1896.77	0.006736	23.11	238.00	37.25	1.61
FW	3393.55	5500.00	1880.90	1888.38	1890.57	1896.44	0.006023	22.79	241.37	33.00	1.48
FW	3295.98	5500.00	1879.91	1887.11	1889.58	1895.82	0.006745	23.68	232.21	33.00	1.57
FW	3198.41	5500.00	1878.92	1885.93	1888.59	1895.14	0.007320	24.35	225.84	33.00	1.64
FW	3100.84	5500.00	1877.93	1884.80	1887.60	1894.40	0.007774	24.86	221.26	33.00	1.69
FW	3050.84	5500.00	1877.42	1884.23	1887.09	1894.00	0.007987	25.09	219.25	33.00	1.72
FW	3000.84	5500.00	1876.92	1883.68	1886.59	1893.59	0.008152	25.26	217.72	33.00	1.73
FW	2964.21	5500.00	1876.54	1883.27	1886.21	1893.29	0.008291	25.41	216.49	33.00	1.75
FW	2921.88	5500.00	1876.11	1882.80	1885.78	1892.93	0.008424	25.54	215.32	33.00	1.76
FW	2837.87*	5500.00	1875.26	1881.89	1884.93	1892.21	0.008663	25.79	213.29	33.00	1.79

HEC-RAS Plan: supercritical River: FW Reach: FW Profile: 100-yr FIS (Continued)

Reach	River Sta	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)	
FW	2753.87	5500.00	1874.41	1880.99	1884.08	1891.48	0.008868	25.99	211.61	33.00	1.81
FW	2722.44*	5500.00	1874.09	1880.59	1883.71	1891.19	0.009018	26.13	210.46	33.00	1.82
FW	2703.87	5500.00	1874.00	1880.51	1883.61	1891.03	0.008918	26.03	211.29	33.00	1.81
FW	2702.87	5500.00	1873.99	1880.50	1883.60	1891.01	0.007295	26.02	211.35	52.82	1.81
FW	2648.55	5500.00	1873.72	1877.83	1881.19	1890.42	0.016324	28.48	193.15	50.00	2.55
FW	2596.14	5500.00	1873.46	1877.68	1880.92	1889.61	0.014988	27.71	198.46	50.00	2.45
FW	2555.18	5500.00	1873.25	1877.55	1880.71	1889.01	0.014080	27.17	202.44	50.00	2.38
FW	2514.22	5500.00	1873.04	1877.42	1880.50	1888.44	0.013241	26.64	206.43	50.00	2.31
FW	2473.26	5500.00	1872.84	1877.30	1880.30	1887.91	0.012472	26.14	210.40	50.00	2.25
FW	2432.30	5500.00	1872.63	1877.16	1880.09	1887.41	0.011805	25.69	214.12	50.00	2.19
FW	2334.09*	5500.00	1871.85	1876.48	1879.31	1886.28	0.011021	25.13	218.86	50.00	2.12
FW	2235.88*	5500.00	1871.06	1875.76	1878.52	1885.23	0.010435	24.69	222.72	50.00	2.06
FW	2137.68	5500.00	1870.28	1875.05	1877.74	1884.24	0.009944	24.32	226.17	50.00	2.01
FW	2059.60*	5500.00	1868.74	1873.31	1876.20	1883.40	0.011527	25.49	215.75	50.00	2.16
FW	2020.16	5500.00	1867.96	1872.44	1875.42	1882.93	0.012247	25.99	211.62	50.00	2.23
FW	1981.53*	5500.00	1867.19	1871.60	1874.65	1882.45	0.012906	26.43	208.12	50.00	2.28
FW	1903.46	5500.00	1865.65	1869.95	1873.11	1881.40	0.014043	27.15	202.61	50.00	2.38
FW	1817.25*	5500.00	1864.95	1869.36	1872.41	1880.23	0.012965	26.47	207.82	50.00	2.29
FW	1731.04*	5500.00	1864.24	1868.74	1871.70	1879.15	0.012096	25.89	212.46	50.00	2.21
FW	1644.83*	5500.00	1863.54	1868.12	1871.00	1878.13	0.011375	25.39	216.66	50.00	2.15
FW	1558.62	5800.00	1862.84	1867.80	1870.56	1877.23	0.009760	24.64	235.40	50.00	2.00
FW	1500	5800.00	1862.36	1867.02	1869.81	1876.63	0.010165	24.87	233.17	50.00	2.03
FW	1481.51	5800.00	1862.21	1867.21	1869.93	1876.46	0.009466	24.40	237.71	50.00	1.97
FW	1437.01	5800.00	1861.84	1866.86	1869.56	1876.04	0.009363	24.31	238.55	50.00	1.96
FW	1392.52	5800.00	1861.48	1866.52	1869.20	1875.63	0.009250	24.22	239.48	50.00	1.95
FW	1348.02	5800.00	1861.12	1866.18	1868.84	1875.22	0.009146	24.13	240.35	50.00	1.94
FW	1303.53	5800.00	1860.76	1865.83	1868.48	1874.82	0.009052	24.05	241.15	50.00	1.93
FW	1259.03	5800.00	1860.39	1865.47	1868.11	1874.42	0.008986	23.99	241.72	50.00	1.92
FW	1214.54	5800.00	1860.03	1865.13	1867.75	1874.02	0.008906	23.93	242.41	50.00	1.91
FW	1173.6	5800.00	1859.70	1864.81	1867.42	1873.66	0.008837	23.87	243.02	50.00	1.91
FW	1088.94	5800.00	1859.00	1863.55	1866.28	1872.85	0.010025	24.47	237.00	52.04	2.02
FW	1000	Bridge									
FW	926	5800.00	1855.10	1859.19	1862.16	1869.65	0.012659	25.96	223.44	54.70	2.26
FW	914.02*	5800.00	1854.95	1860.07	1862.84	1869.41	0.009320	24.53	236.47	51.64	2.02
FW	702.71	5800.00	1853.63	1861.40	1862.90	1866.78	0.003508	18.67	317.76	61.80	1.32
FW	444.5	5800.00	1850.36	1856.74	1859.94	1865.21	0.007361	23.35	248.38	51.42	1.87
FW	223.47	5800.00	1847.74	1853.97	1857.57	1863.41	0.008029	24.65	235.30	46.86	1.94

HEC-RAS Plan: supercritical River: FW Reach: FW Profile: 100-yr FIS

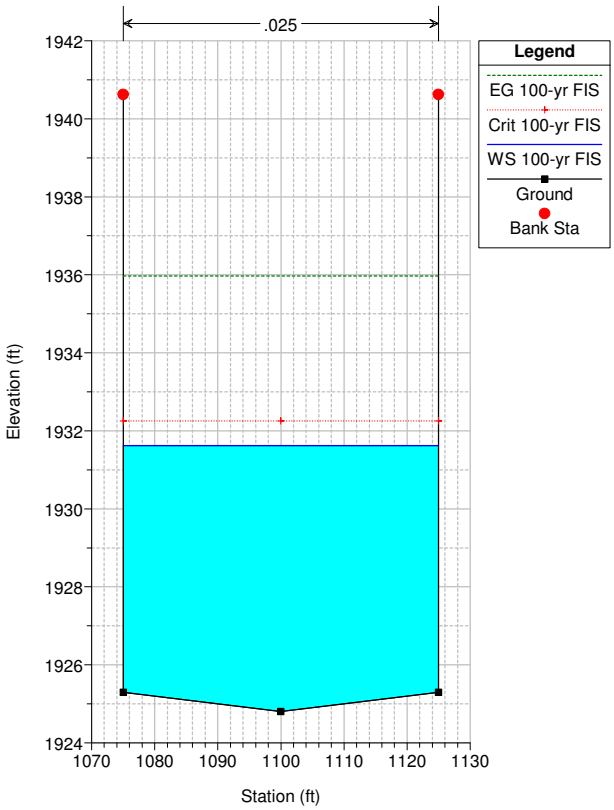
Reach	River Sta	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
FW	8837.78	1935.97	1931.62	4.35				5500.00		50.00
FW	8807.78	1938.54	1935.21	3.33	0.20	0.31		5500.00		56.88
FW	8687.78	1937.42	1931.97	5.45	0.91	0.21		5500.00		54.12
FW	8320	1934.25	1932.43	1.82			274.31	5164.19	61.51	183.61
FW	8200	1933.35	1931.06	2.30	0.86	0.05	40.72	5090.71	368.57	127.29
FW	8100.*	1932.52	1930.88	1.64			494.79	4360.35	644.85	180.85
FW	8000	1931.63	1929.50	2.13	0.85	0.05	850.47	4238.82	410.71	186.37
FW	7900.*	1931.88	1930.44	1.43	0.75	0.21	414.34	4028.41	1057.25	241.79
FW	7800	1931.39	1929.88	1.51			10.96	3848.43	1640.61	194.90
FW	7700.*	1930.48	1928.13	2.35	0.82	0.08	94.97	4228.61	1176.42	252.66
FW	7600	1929.25	1926.64	2.61	1.21	0.03	234.99	4155.18	1109.83	261.66
FW	7500.*	1927.86	1926.14	1.73	1.11	0.27	193.63	3575.93	1730.44	263.65
FW	7400	1926.91	1925.51	1.40	0.86	0.10	134.22	3218.43	2147.35	255.43
FW	7300.*	1927.14	1925.85	1.29	0.70	0.03	479.31	4117.02	903.67	261.50
FW	7200	1926.76	1925.32	1.45			563.64	4782.34	154.02	228.94
FW	7100.*	1925.94	1923.80	2.14	0.76	0.07	579.76	4864.69	55.55	155.33
FW	7000	1924.76	1922.26	2.49	1.15	0.04	977.06	4467.77	55.17	124.07
FW	6925	Bridge								
FW	6868.*	1923.63	1921.92	1.71	0.24	0.19	1025.58	4429.41	45.01	165.51
FW	6736	1922.84	1921.50	1.34			1034.89	4291.47	173.64	225.66
FW	6577	1922.10	1919.70	2.40				5500.00		92.61
FW	6500	Culvert								
FW	6469	1921.78	1919.31	2.47				5500.00		92.67
FW	6450	Bridge								
FW	6100	1917.26	1916.19	1.07			1763.53	2456.03	1280.44	297.83
FW	6000	Bridge								
FW	5917	1918.33	1913.82	4.51	0.26	0.21		5500.00		72.44
FW	5800	Culvert								
FW	5796	1917.52	1911.11	6.41				5500.00		56.30
FW	5776	1916.89	1908.98	7.91	0.18	0.45		5280.00		79.77
FW	5737.74	1916.37	1908.54	7.83	0.51	0.00		5280.00		79.77
FW	5648.42	1915.25	1907.65	7.60	1.12	0.01		5280.00		75.00
FW	5548.82*	1914.04	1906.07	7.96	1.21	0.00		5280.00		75.00
FW	5449.23	1912.75	1904.52	8.22	1.29	0.00		5280.00		75.00
FW	5449.11	1912.75	1904.52	8.22	0.00	0.00		5280.00		75.00
FW	5399.11	1912.11	1903.91	8.21	0.63	0.00		5280.00		67.61
FW	5349.11	1911.56	1903.38	8.18	0.55	0.00		5280.00		60.22
FW	5299.11	1911.07	1902.98	8.09	0.48	0.00		5280.00		52.84
FW	5279.92	1910.91	1902.89	8.02	0.17	0.00		5280.00		50.00
FW	5255.16	1910.69	1902.34	8.35	0.22	0.00		5280.00		50.00
FW	5206.70	1910.26	1901.98	8.28	0.43	0.00		5280.00		50.00
FW	5158.24	1909.84	1901.62	8.22	0.43	0.00		5280.00		50.00
FW	5109.79	1909.44	1901.52	7.91	0.40	0.00		5500.00		50.00
FW	5061.33	1909.06	1901.14	7.91	0.38	0.00		5500.00		50.00
FW	5012.88	1908.68	1900.76	7.91	0.38	0.00		5500.00		50.00
FW	4945.04	1908.15	1900.23	7.91	0.54	0.00		5500.00		50.00
FW	4863.36	1907.50	1899.61	7.90	0.64	0.00		5500.00		50.00
FW	4781.68	1906.86	1898.97	7.90	0.64	0.00		5500.00		50.00
FW	4700	1906.22	1898.33	7.90	0.64	0.00		5500.00		50.00
FW	4600	1905.44	1897.55	7.90	0.79	0.00		5500.00		50.00
FW	4500	1904.66	1896.76	7.90	0.79	0.00		5500.00		50.00
FW	4425.69	1904.08	1896.18	7.90	0.58	0.00		5500.00		50.00
FW	4350	1903.49	1895.59	7.90	0.60	0.00		5500.00		50.00
FW	4275.*	1902.89	1894.77	8.11	0.60	0.00		5500.00		50.00
FW	4200.00	1902.26	1893.97	8.29	0.62	0.00		5500.00		50.00
FW	4127.25*	1901.67	1893.71	7.96	0.60	0.00		5500.00		50.00
FW	4054.5*	1901.11	1893.43	7.68	0.56	0.00		5500.00		50.00
FW	3977.08	1900.54	1893.14	7.40	0.57	0.00		5500.00		50.00
FW	3890.88*	1899.95	1892.78	7.16	0.60	0.00		5500.00		50.00
FW	3800	1899.35	1892.42	6.93	0.60	0.00		5500.00		50.00
FW	3700.*	1898.68	1891.24	7.44	0.68	0.00		5500.00		50.00
FW	3593.55	1897.89	1890.05	7.84	0.79	0.00		5500.00		50.00
FW	3543.55	1897.50	1889.39	8.10	0.38	0.00		5500.00		45.75
FW	3493.55	1897.12	1888.85	8.28	0.37	0.00		5500.00		41.50
FW	3443.55	1896.77	1888.47	8.29	0.35	0.00		5500.00		37.25
FW	3393.55	1896.44	1888.38	8.06	0.32	0.01		5500.00		33.00

HEC-RAS Plan: supercritical River: FW Reach: FW Profile: 100-yr FIS (Continued)

Reach	River Sta	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)
FW	3295.98	1895.82	1887.11	8.71	0.62	0.00		5500.00		33.00
FW	3198.41	1895.14	1885.93	9.21	0.69	0.00		5500.00		33.00
FW	3100.84	1894.40	1884.80	9.59	0.74	0.00		5500.00		33.00
FW	3050.84	1894.00	1884.23	9.77	0.39	0.00		5500.00		33.00
FW	3000.84	1893.59	1883.68	9.91	0.40	0.00		5500.00		33.00
FW	2964.21	1893.29	1883.27	10.02	0.30	0.00		5500.00		33.00
FW	2921.88	1892.93	1882.80	10.13	0.35	0.00		5500.00		33.00
FW	2837.87*	1892.21	1881.89	10.33	0.72	0.00		5500.00		33.00
FW	2753.87	1891.48	1880.99	10.49	0.74	0.00		5500.00		33.00
FW	2722.44*	1891.19	1880.59	10.61	0.28	0.00		5500.00		33.00
FW	2703.87	1891.03	1880.51	10.52	0.17	0.00		5500.00		33.00
FW	2702.87	1891.01	1880.50	10.52	0.01	0.00		5500.00		52.82
FW	2648.55	1890.42	1877.83	12.59	0.57	0.02		5500.00		50.00
FW	2596.14	1889.61	1877.68	11.93	0.82	0.00		5500.00		50.00
FW	2555.18	1889.01	1877.55	11.46	0.59	0.00		5500.00		50.00
FW	2514.22	1888.44	1877.42	11.02	0.56	0.00		5500.00		50.00
FW	2473.26	1887.91	1877.30	10.61	0.53	0.00		5500.00		50.00
FW	2432.30	1887.41	1877.16	10.25	0.50	0.00		5500.00		50.00
FW	2334.09*	1886.28	1876.48	9.81	1.12	0.00		5500.00		50.00
FW	2235.88*	1885.23	1875.76	9.47	1.05	0.00		5500.00		50.00
FW	2137.68	1884.24	1875.05	9.18	1.00	0.00		5500.00		50.00
FW	2059.60*	1883.40	1873.31	10.09	0.84	0.00		5500.00		50.00
FW	2020.16	1882.93	1872.44	10.49	0.47	0.00		5500.00		50.00
FW	1981.53*	1882.45	1871.60	10.84	0.49	0.00		5500.00		50.00
FW	1903.46	1881.40	1869.95	11.44	1.05	0.00		5500.00		50.00
FW	1817.25*	1880.23	1869.36	10.88	1.16	0.00		5500.00		50.00
FW	1731.04*	1879.15	1868.74	10.41	1.08	0.00		5500.00		50.00
FW	1644.83*	1878.13	1868.12	10.01	1.01	0.00		5500.00		50.00
FW	1558.62	1877.23	1867.80	9.43	0.91	0.00		5800.00		50.00
FW	1500	1876.63	1867.02	9.61	0.58	0.00		5800.00		50.00
FW	1481.51	1876.46	1867.21	9.24	0.18	0.00		5800.00		50.00
FW	1437.01	1876.04	1866.86	9.18	0.42	0.00		5800.00		50.00
FW	1392.52	1875.63	1866.52	9.11	0.41	0.00		5800.00		50.00
FW	1348.02	1875.22	1866.18	9.04	0.41	0.00		5800.00		50.00
FW	1303.53	1874.82	1865.83	8.98	0.40	0.00		5800.00		50.00
FW	1259.03	1874.42	1865.47	8.94	0.40	0.00		5800.00		50.00
FW	1214.54	1874.02	1865.13	8.89	0.40	0.00		5800.00		50.00
FW	1173.6	1873.66	1864.81	8.84	0.36	0.00		5800.00		50.00
FW	1088.94	1872.85	1863.55	9.30	0.80	0.00		5800.00		52.04
FW	1000	Bridge								
FW	926	1869.65	1859.19	10.46	0.21	0.01		5800.00		54.70
FW	914.02*	1869.41	1860.07	9.34	0.13	0.11		5800.00		51.64
FW	702.71	1866.78	1861.40	5.38	2.23	0.40	31.60	5768.40		61.80
FW	444.5	1865.21	1856.74	8.47	1.27	0.31		5800.00		51.42
FW	223.47	1863.41	1853.97	9.43	1.70	0.10		5800.00		46.86

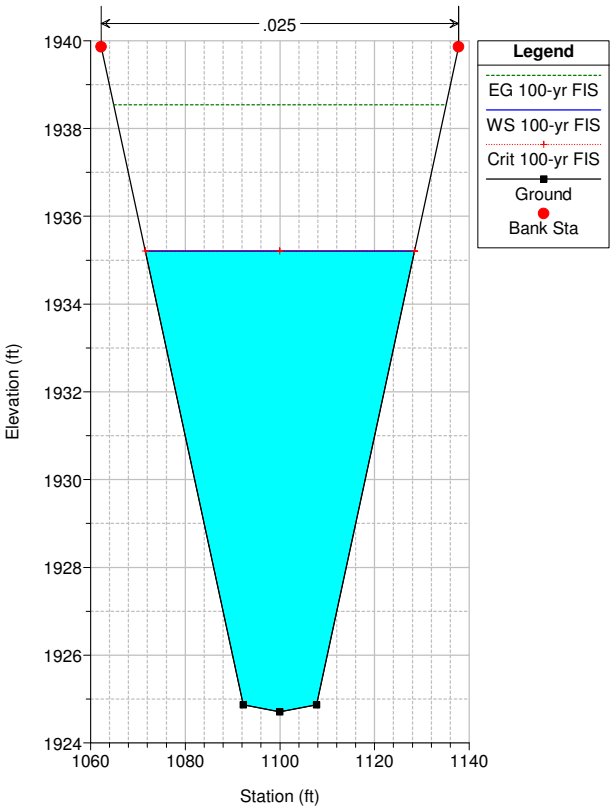
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

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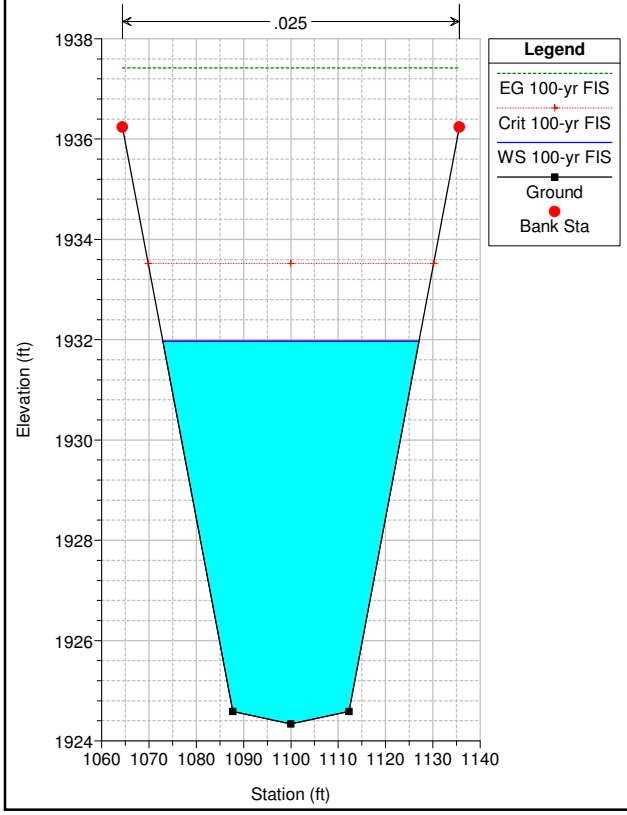
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

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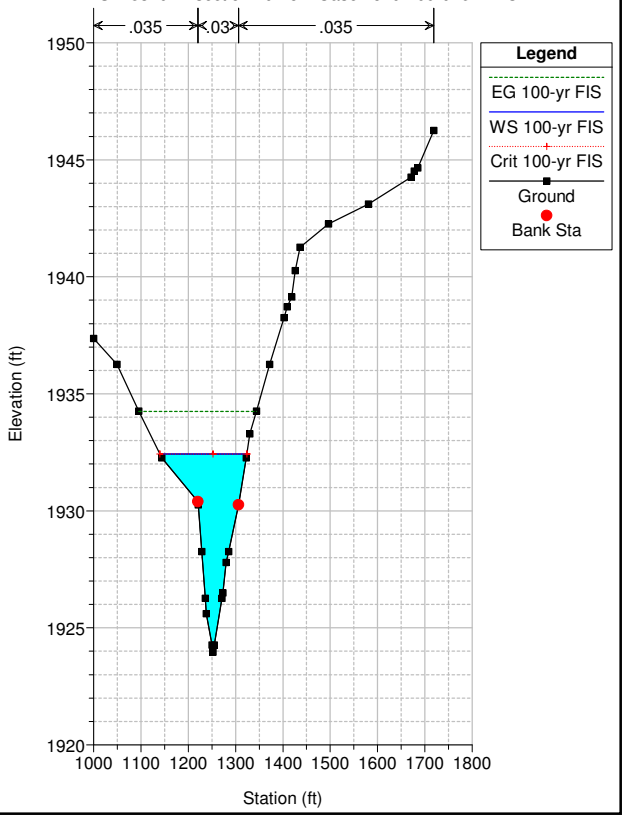
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

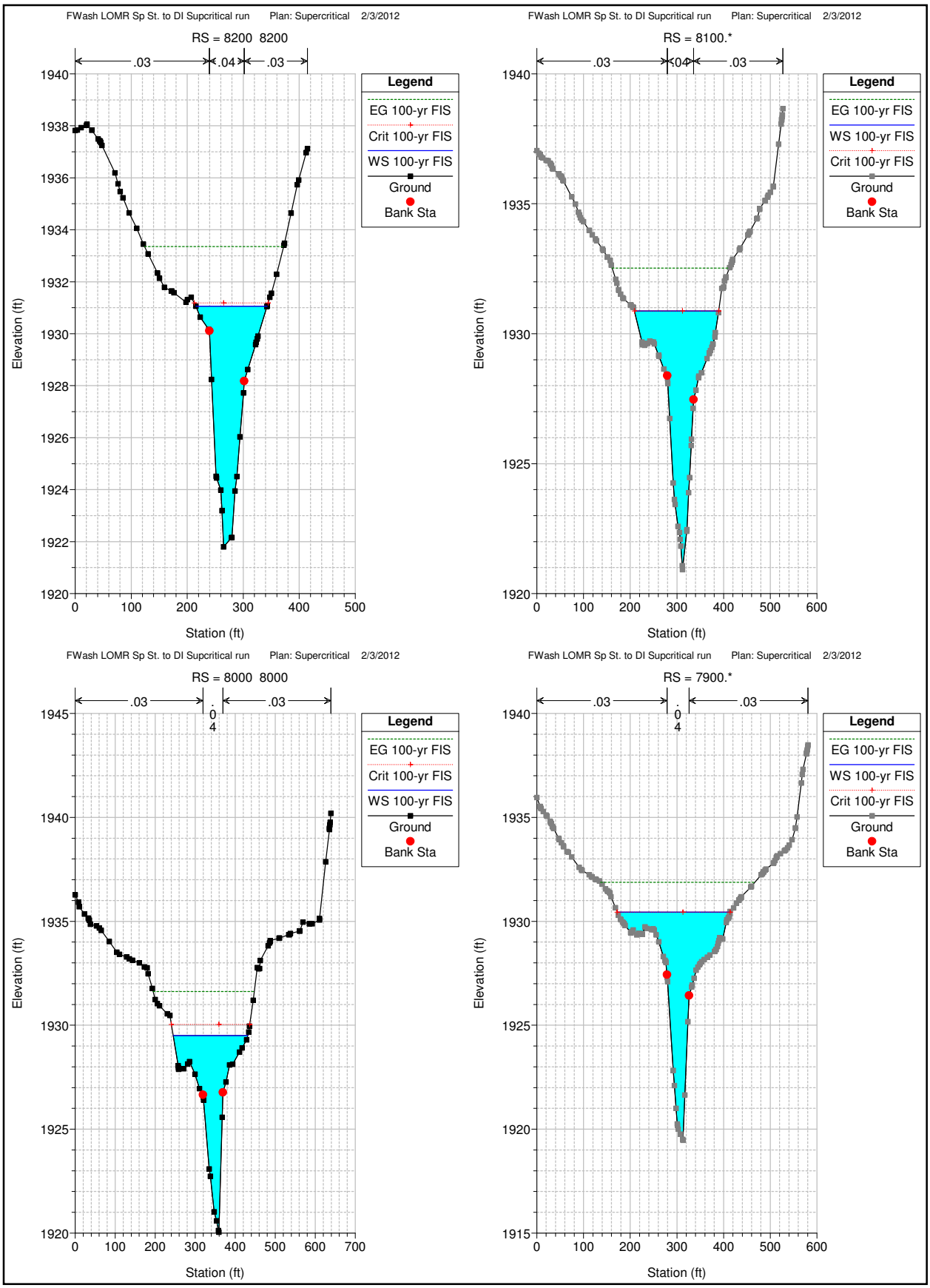
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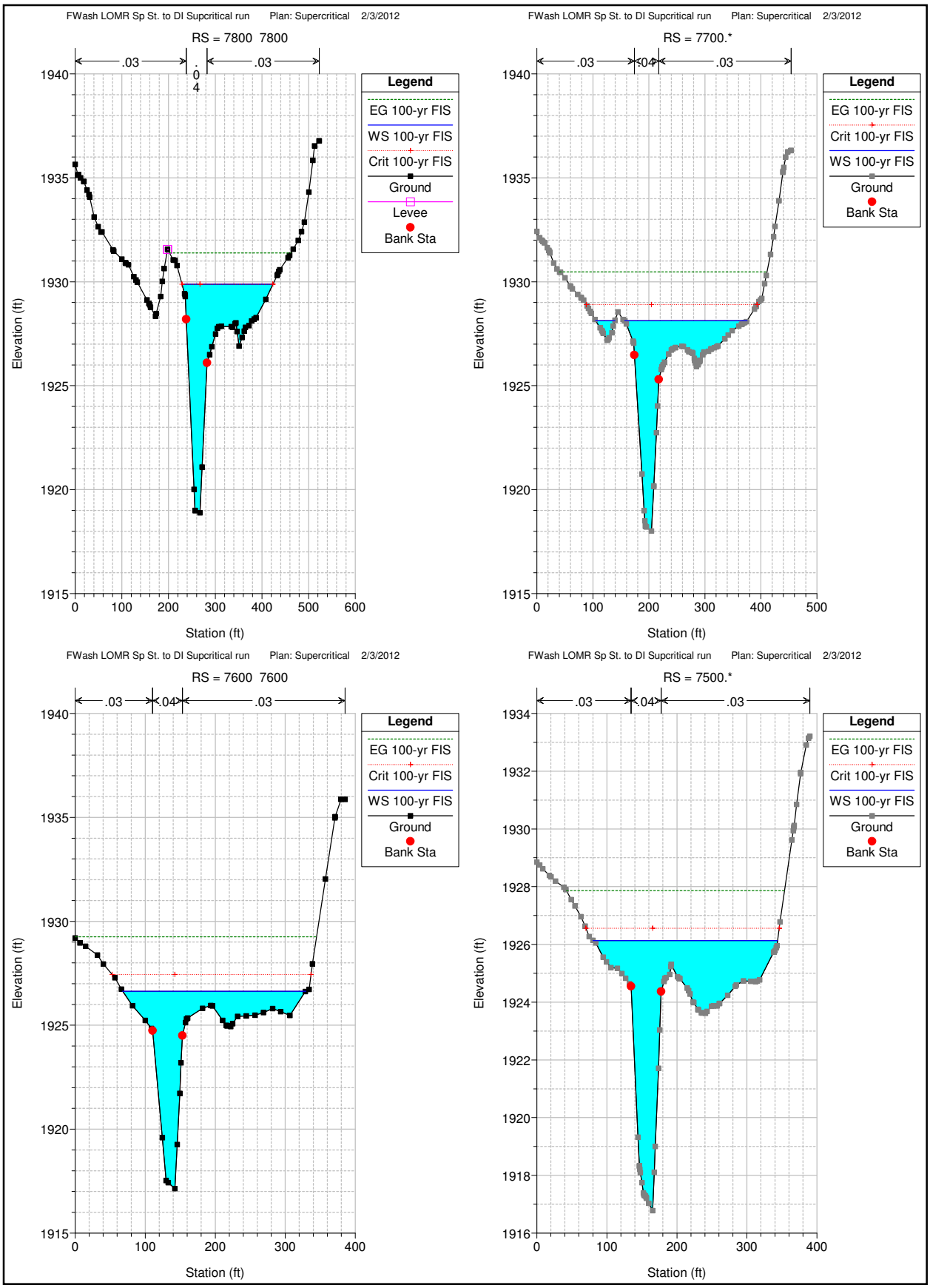


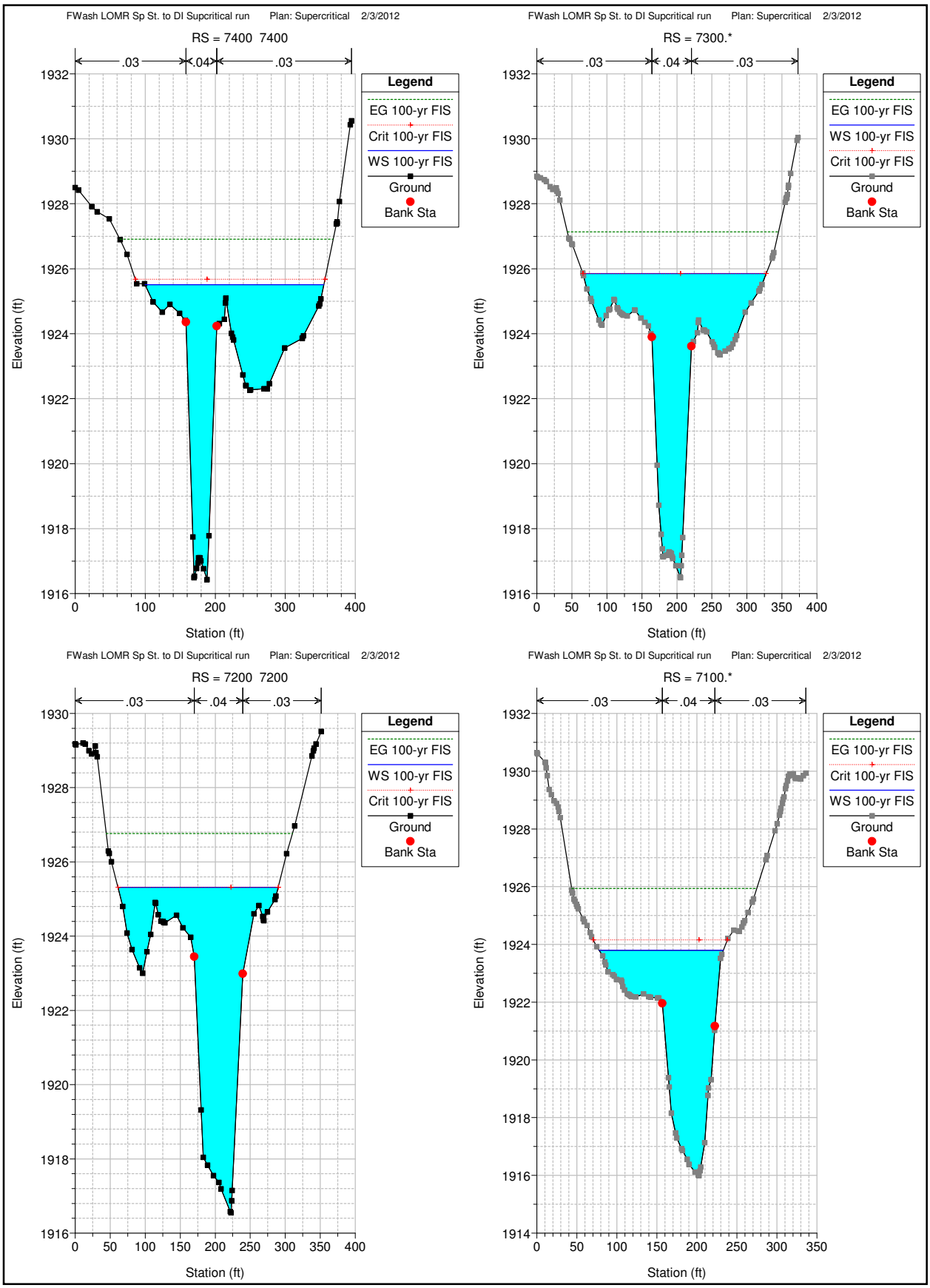
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

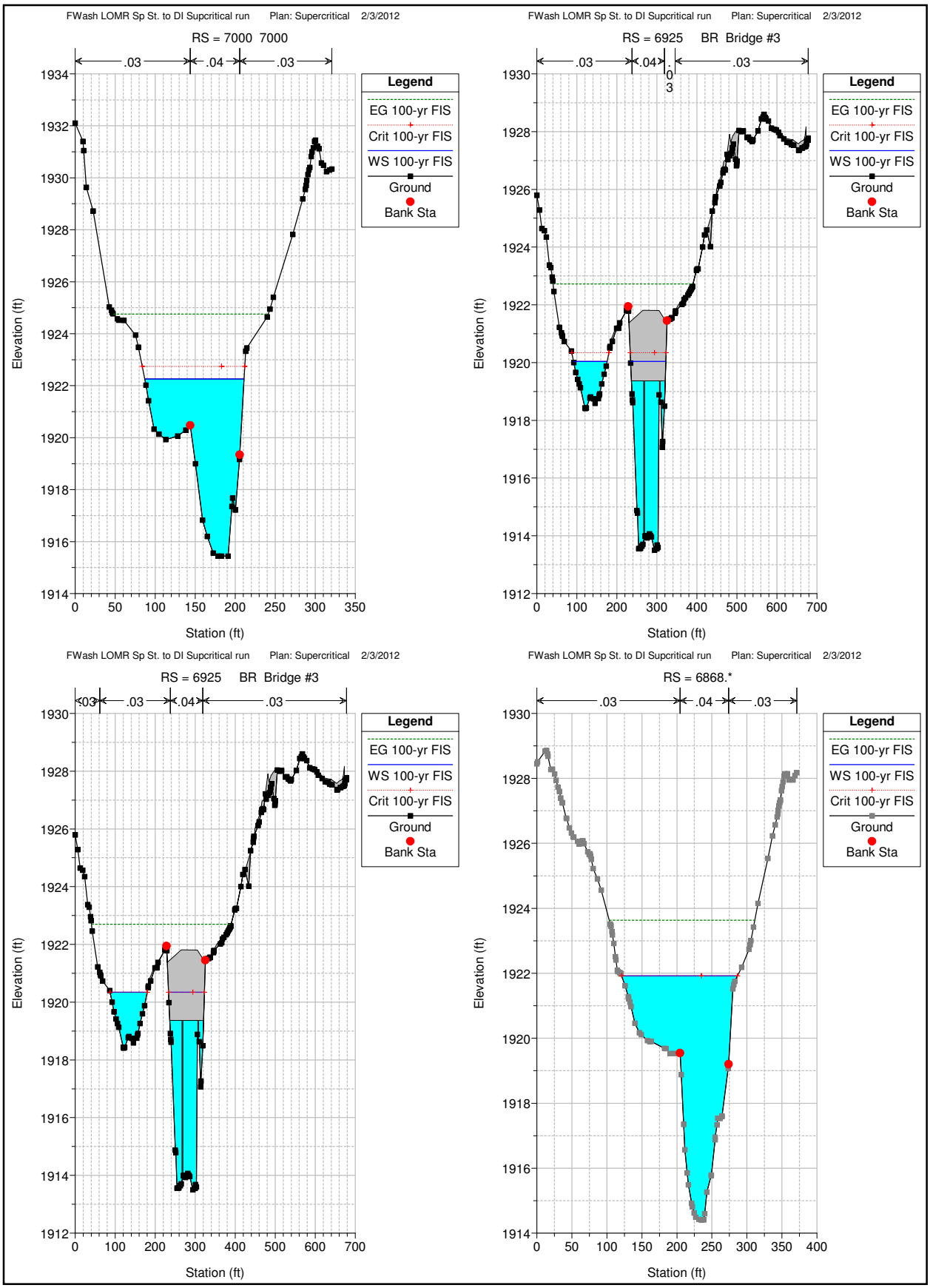
RS = 8320 X-section 10 from Case no. 04-09-0167P LOMR

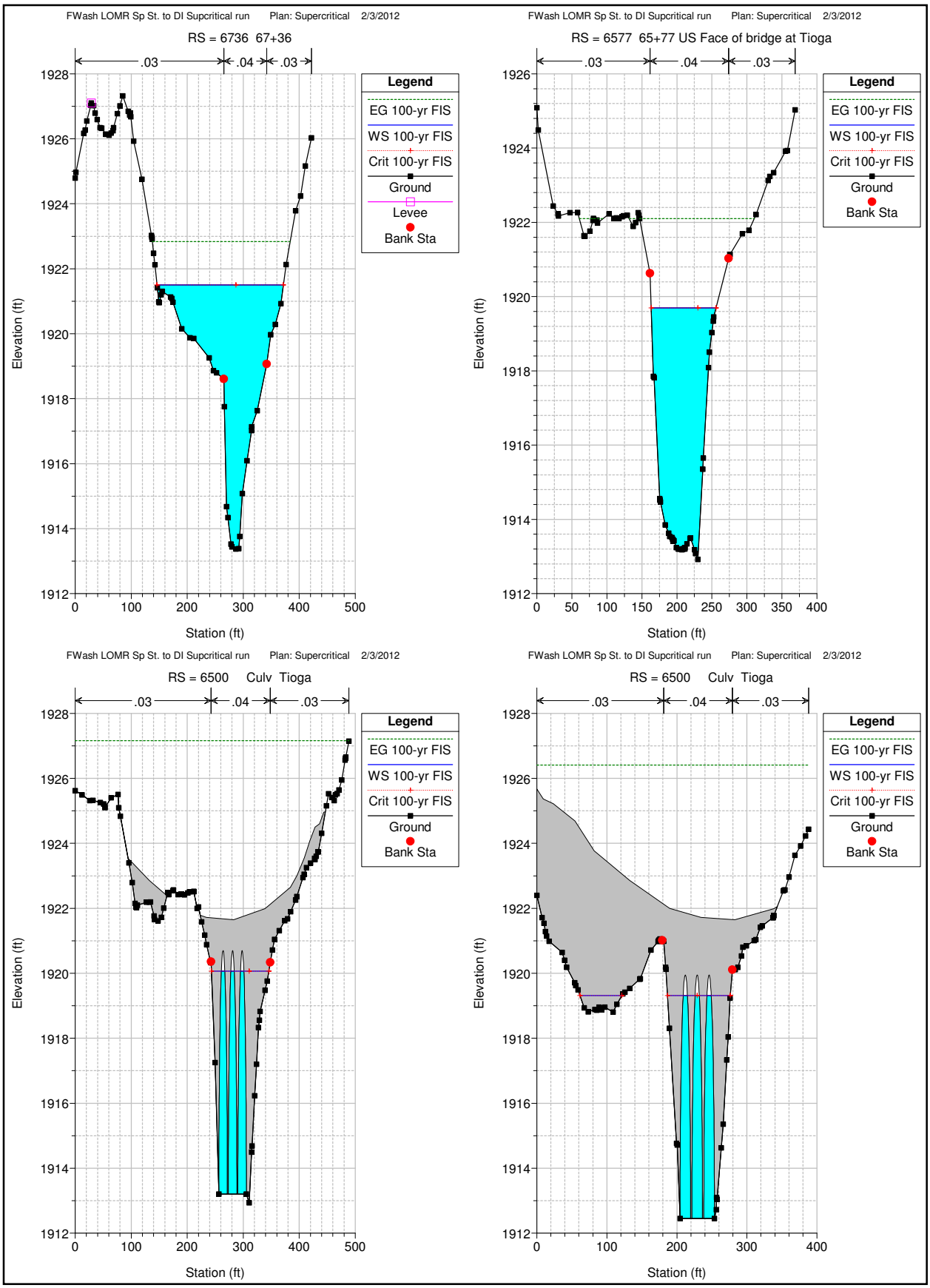


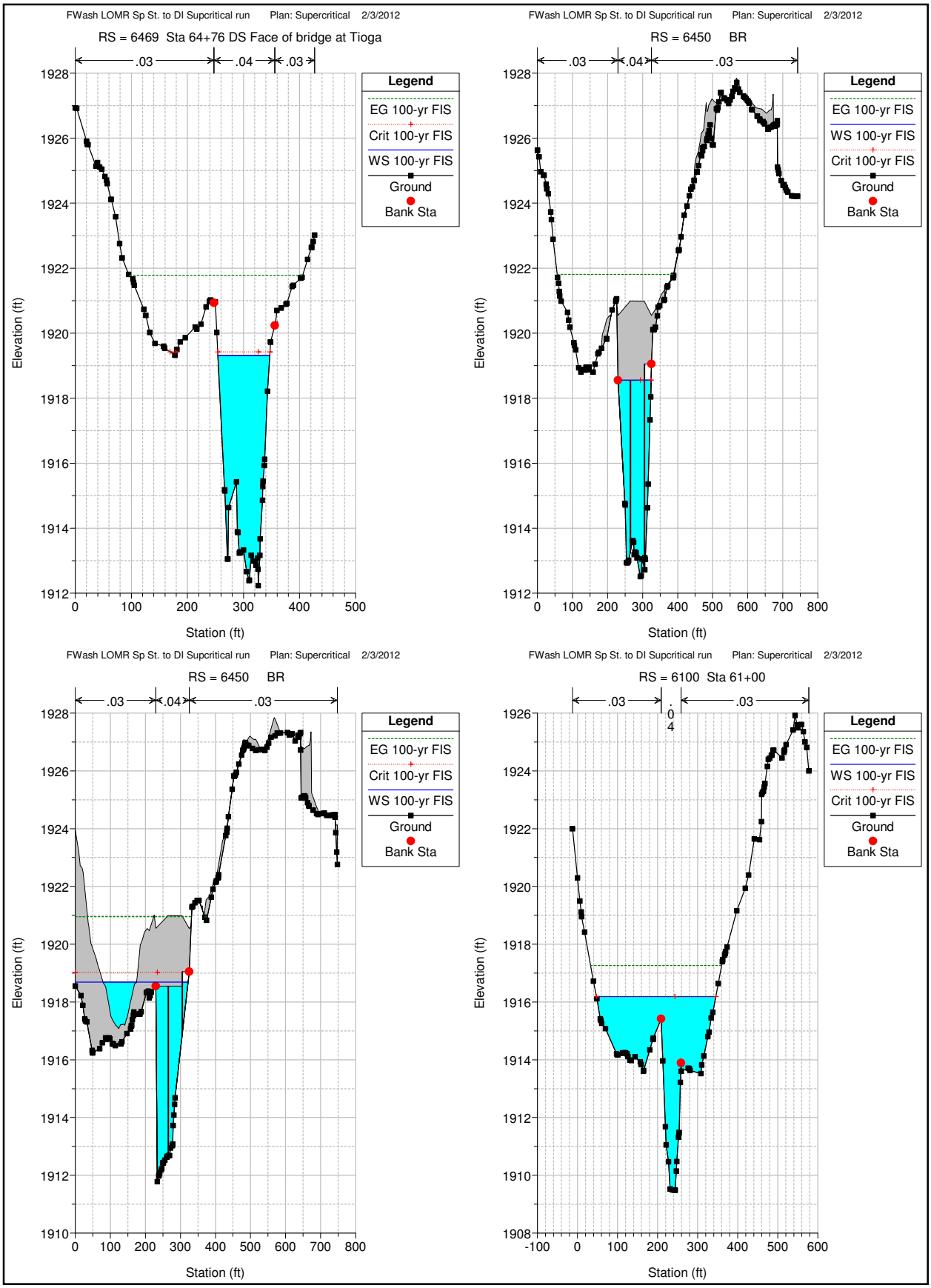

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 8200 8200
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 8100.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 8000 8000
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7900.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

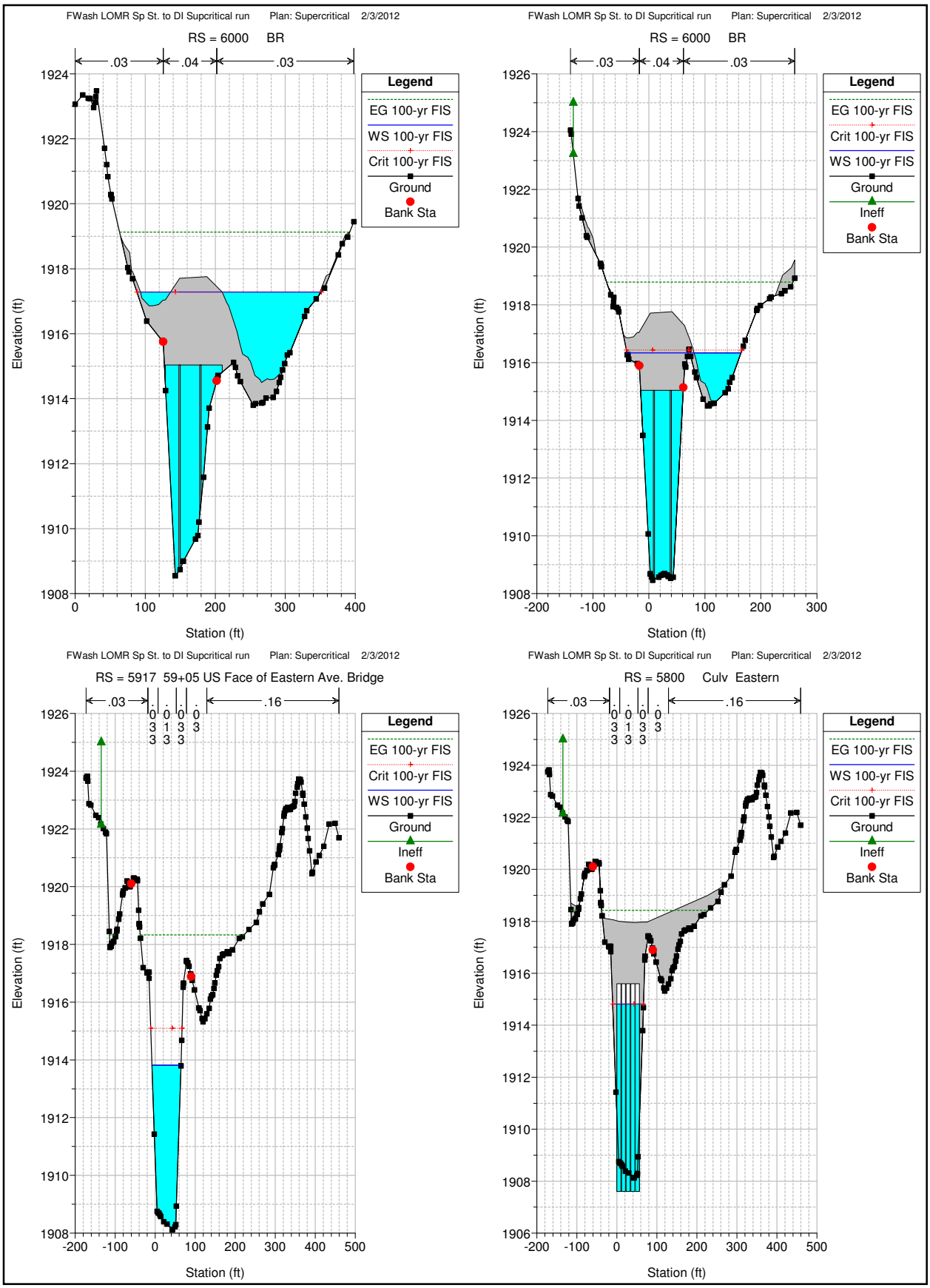

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7800 7800
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7700.*
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7600 7600
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7500.*
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

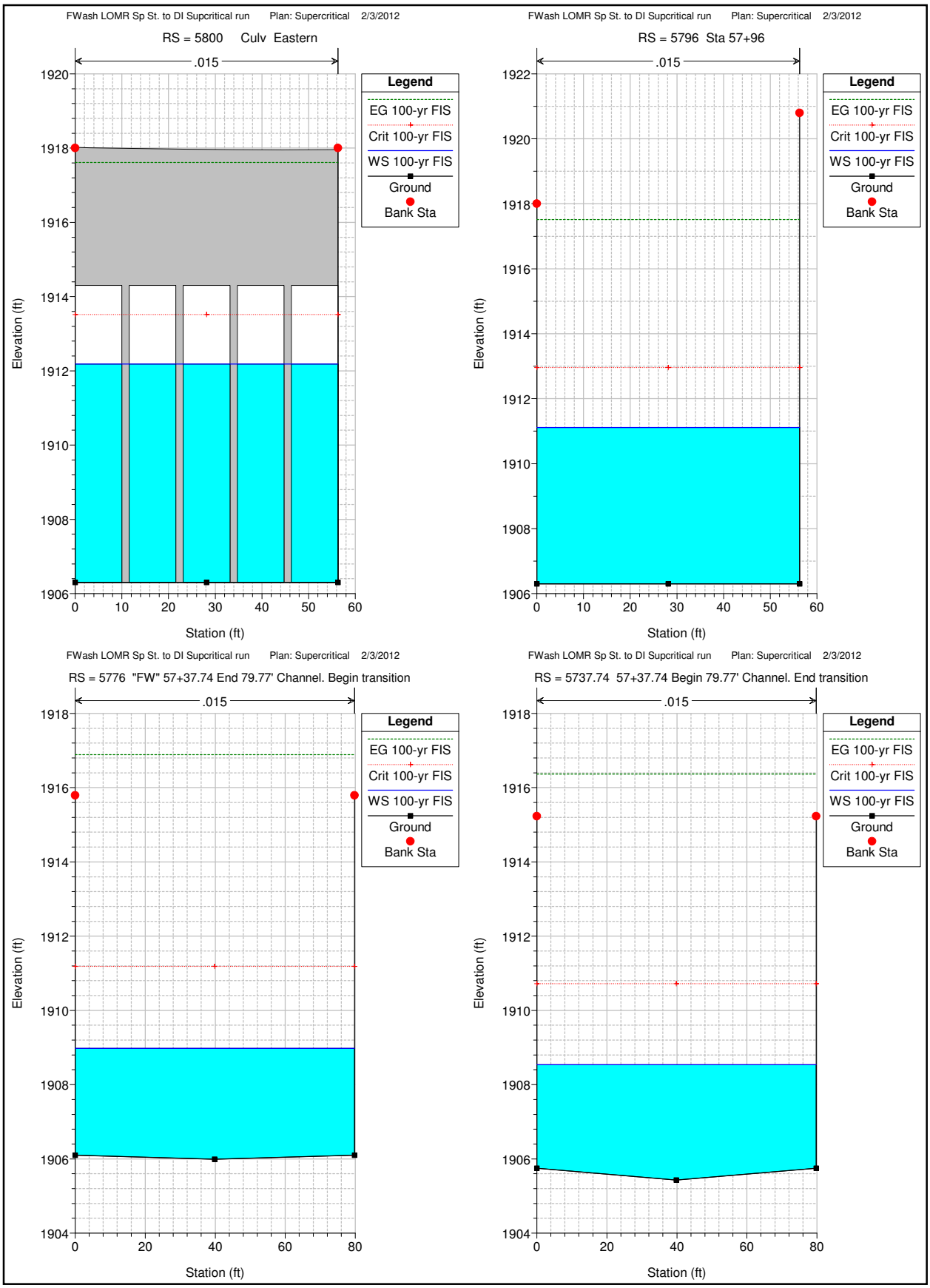

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7400 7400
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7300.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7200 7200
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7100.*
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 7000 7000
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6925 BR Bridge #3
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6925 BR Bridge #3
.03
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6868.*
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6736 67+36
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6577 65+77 US Face of bridge at Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6500 Culv Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6500 Culv Tioga
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

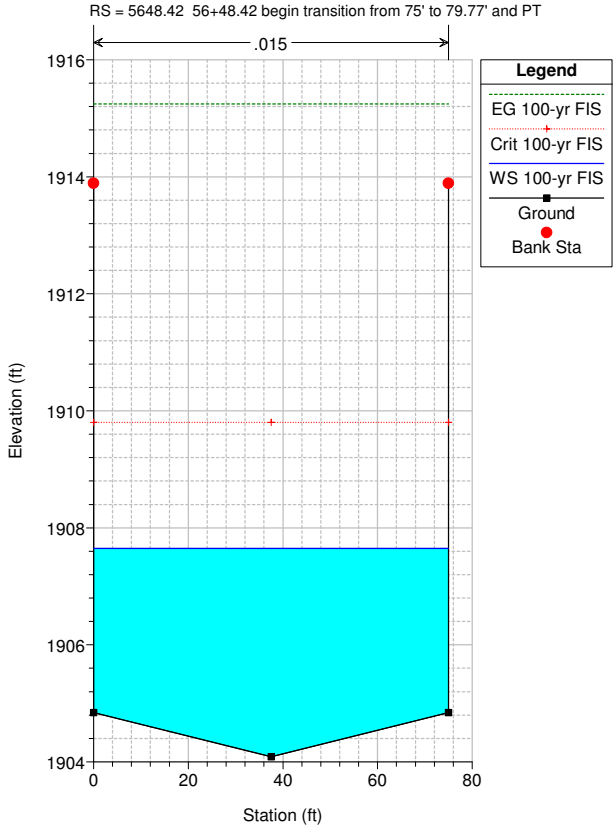

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6469 Sta 64+76 DS Face of bridge at Tioga
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6450 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6450 BR
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6100 Sta 61+00
.03
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6000 BR
.03
.04
.03
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 6000 BR
.03
.04
.03
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5917 59+05 US Face of Eastern Ave. Bridge
.03
.16
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5800 Culv Eastern
.03
.16
Legend
EG 100-yr FIS
WS 100-yr FIS
Crit 100-yr FIS
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5800 Culv Eastern
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5796 Sta 57+96
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5776 "FW" 57+37.74 End 79.77' Channel. Begin transition
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5737.74 57+37.74 Begin 79.77' Channel. End transition
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

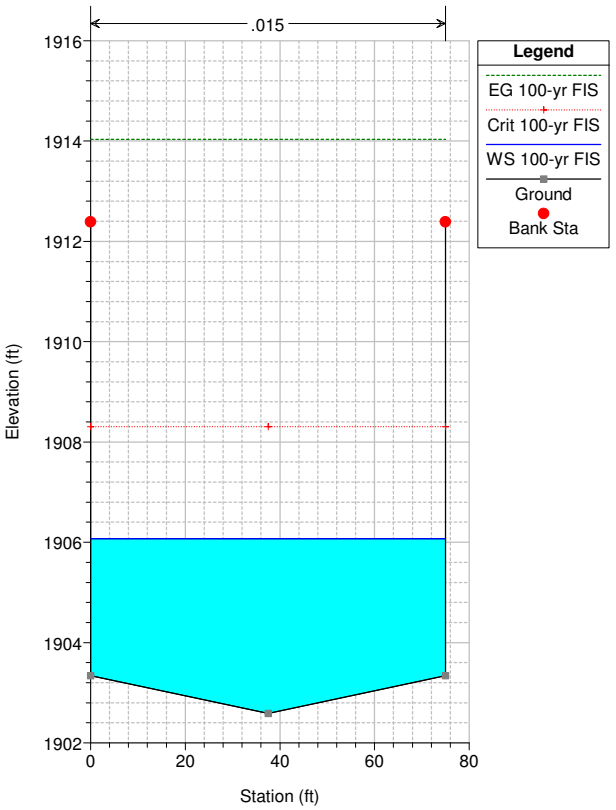
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 5648.42 56+48.42 begin transition from 75' to 79.77' and PT



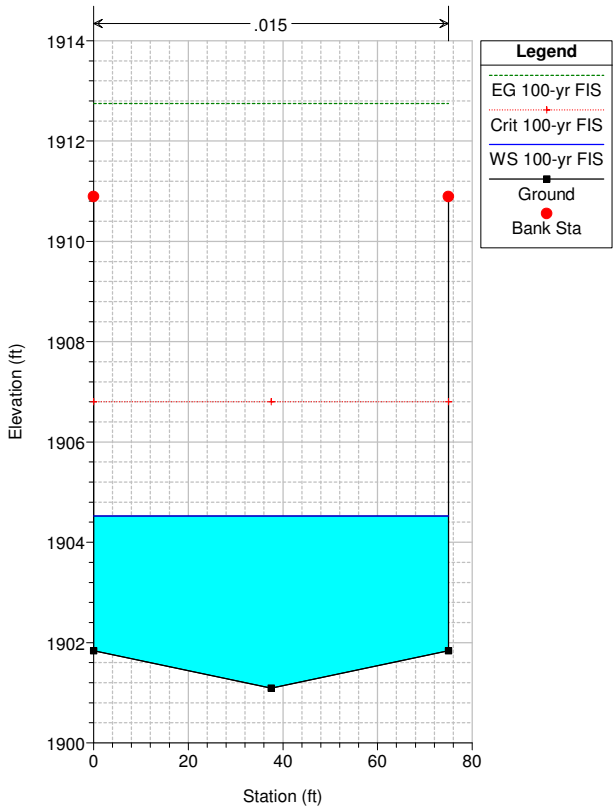
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 5548.82* "FW" 58+48.82



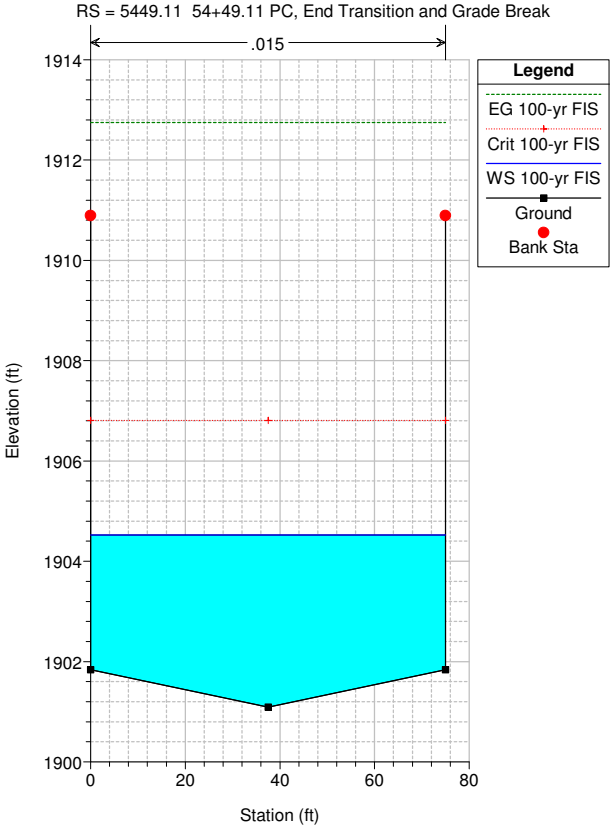
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

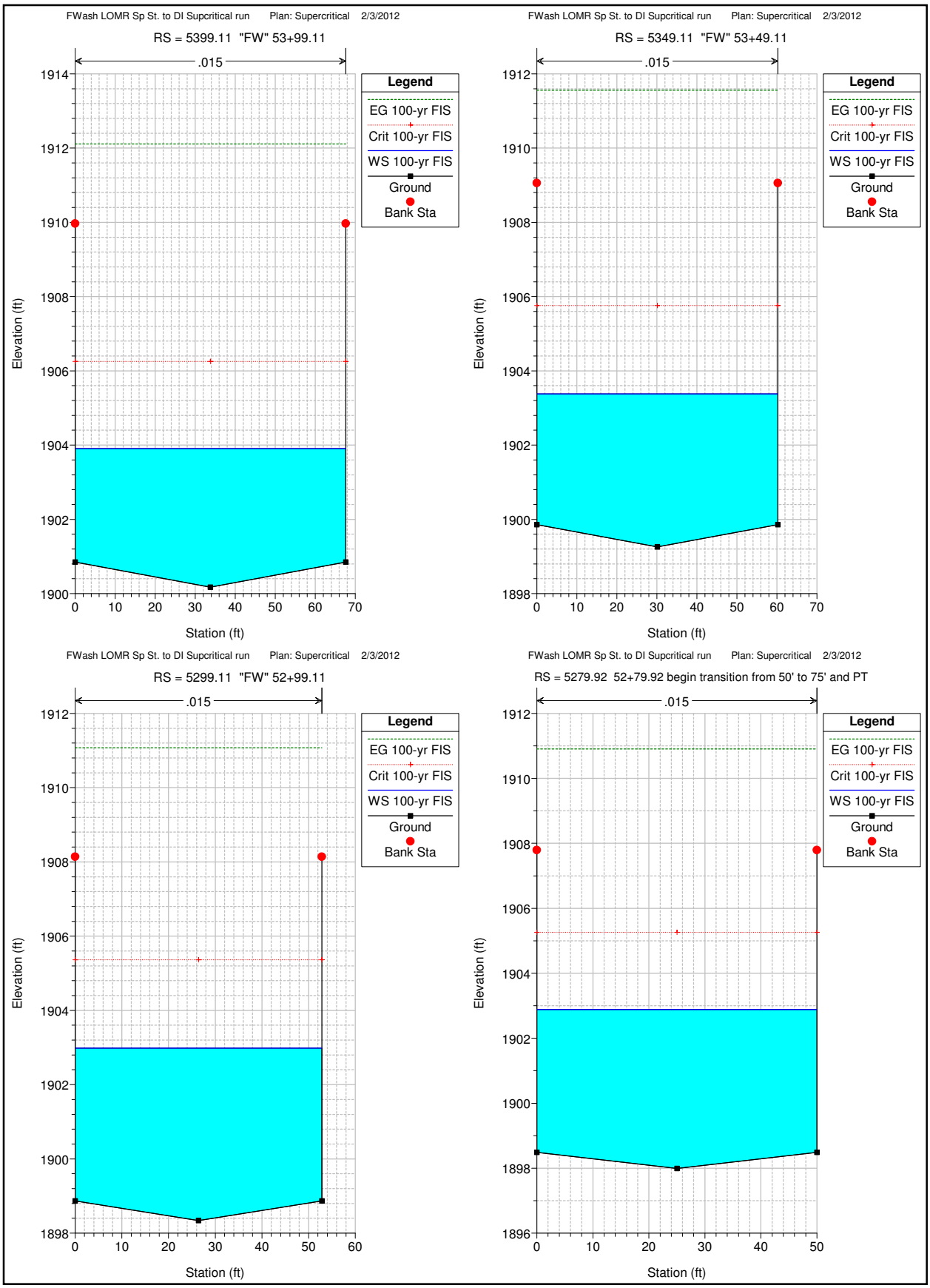
RS = 5449.23 "FW" 54+49.23



FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

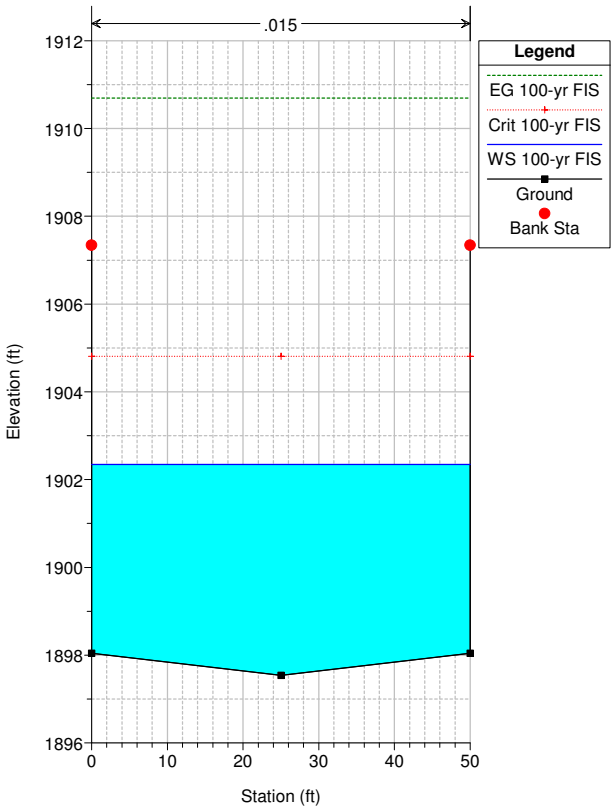
RS = 5449.11 54+49.11 PC, End Transition and Grade Break




FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5399.11 "FW" 53+99.11
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5349.11 "FW" 53+49.11
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5299.11 "FW" 52+99.11
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5279.92 52+79.92 begin transition from 50' to 75' and PT
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

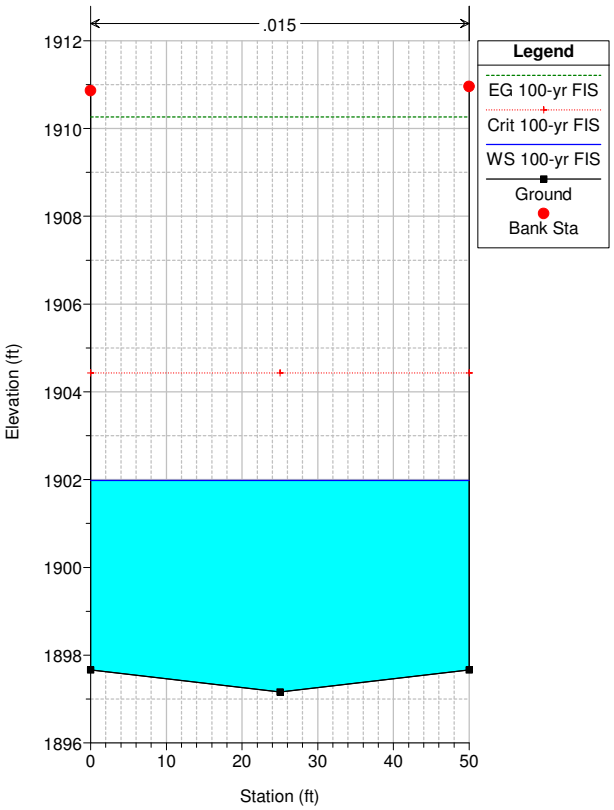
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 5255.16 52+55.16 Grade Break



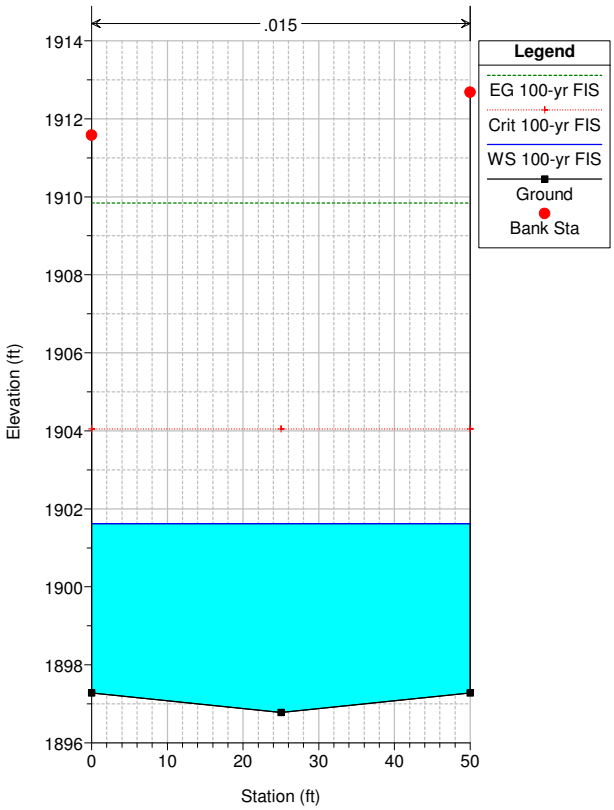
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 5206.70 "FW" 52+06.70



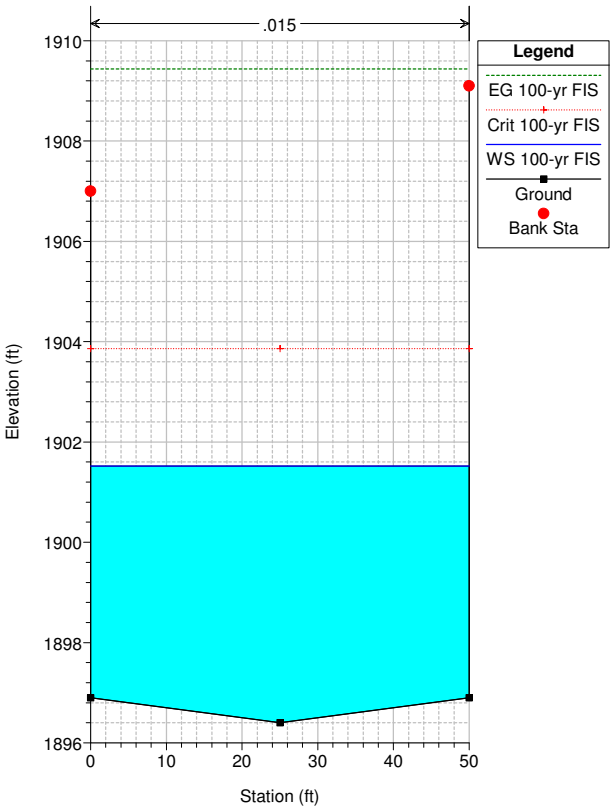
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

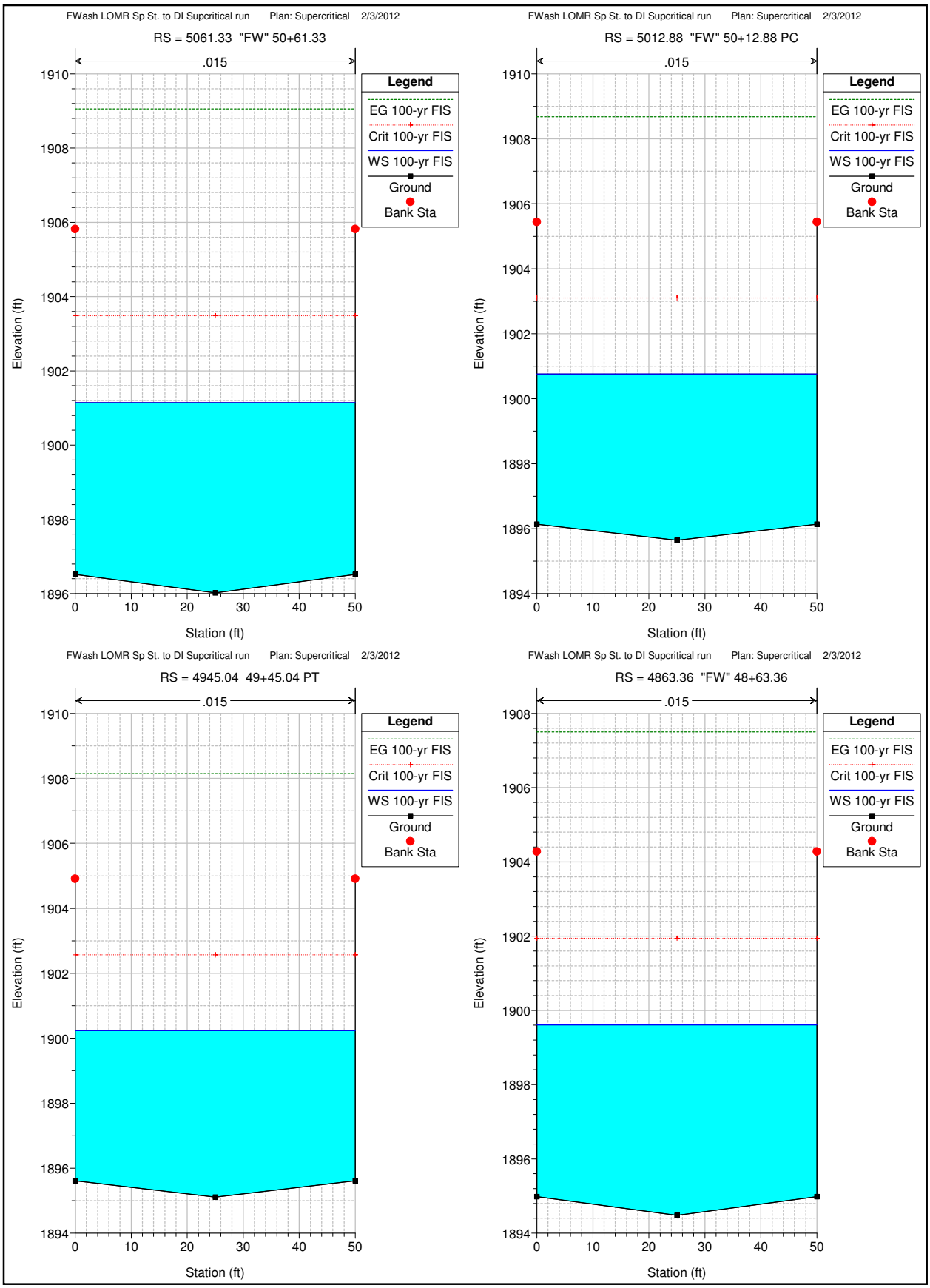
RS = 5158.24 "FW" 51+58.24

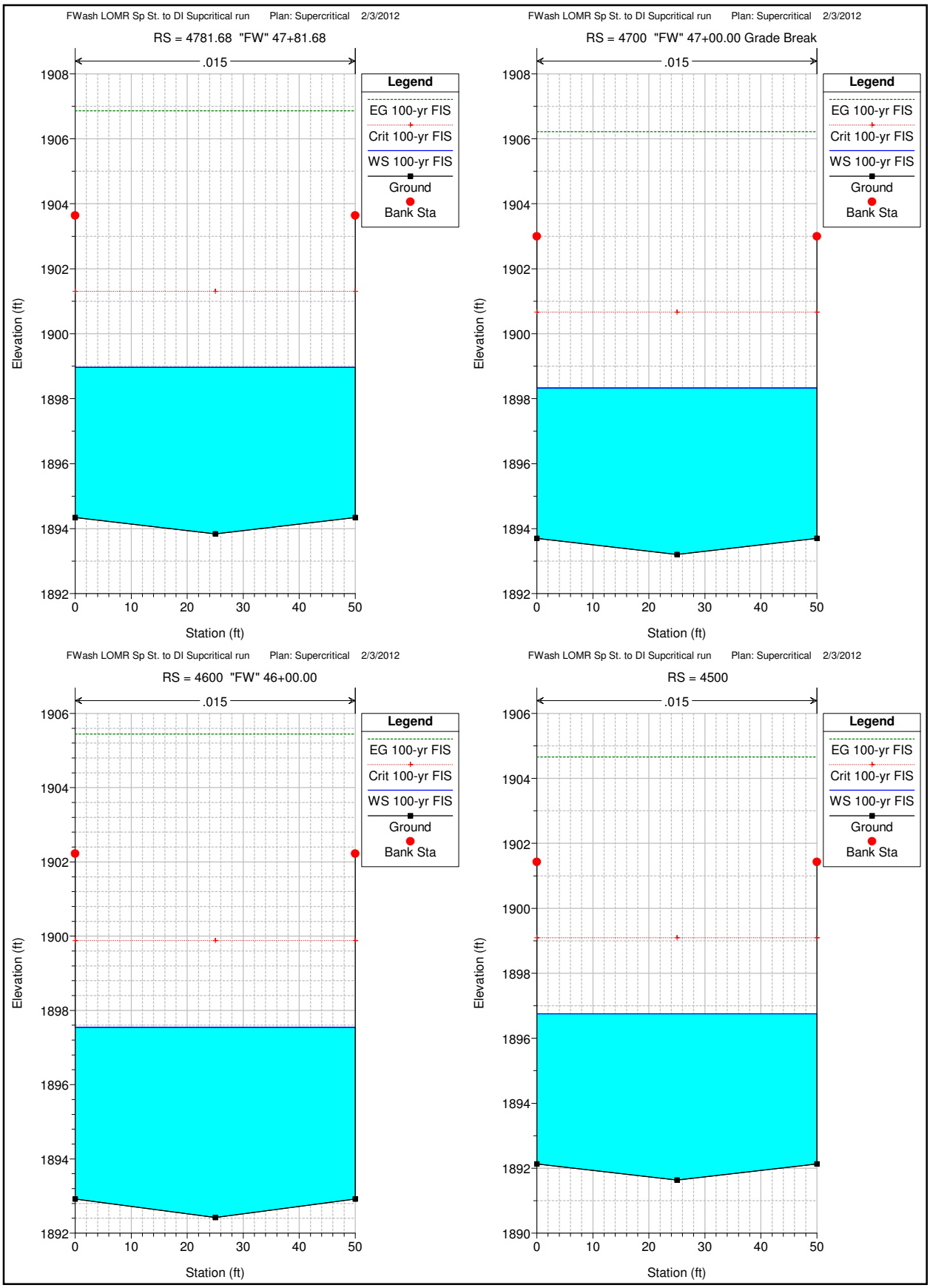


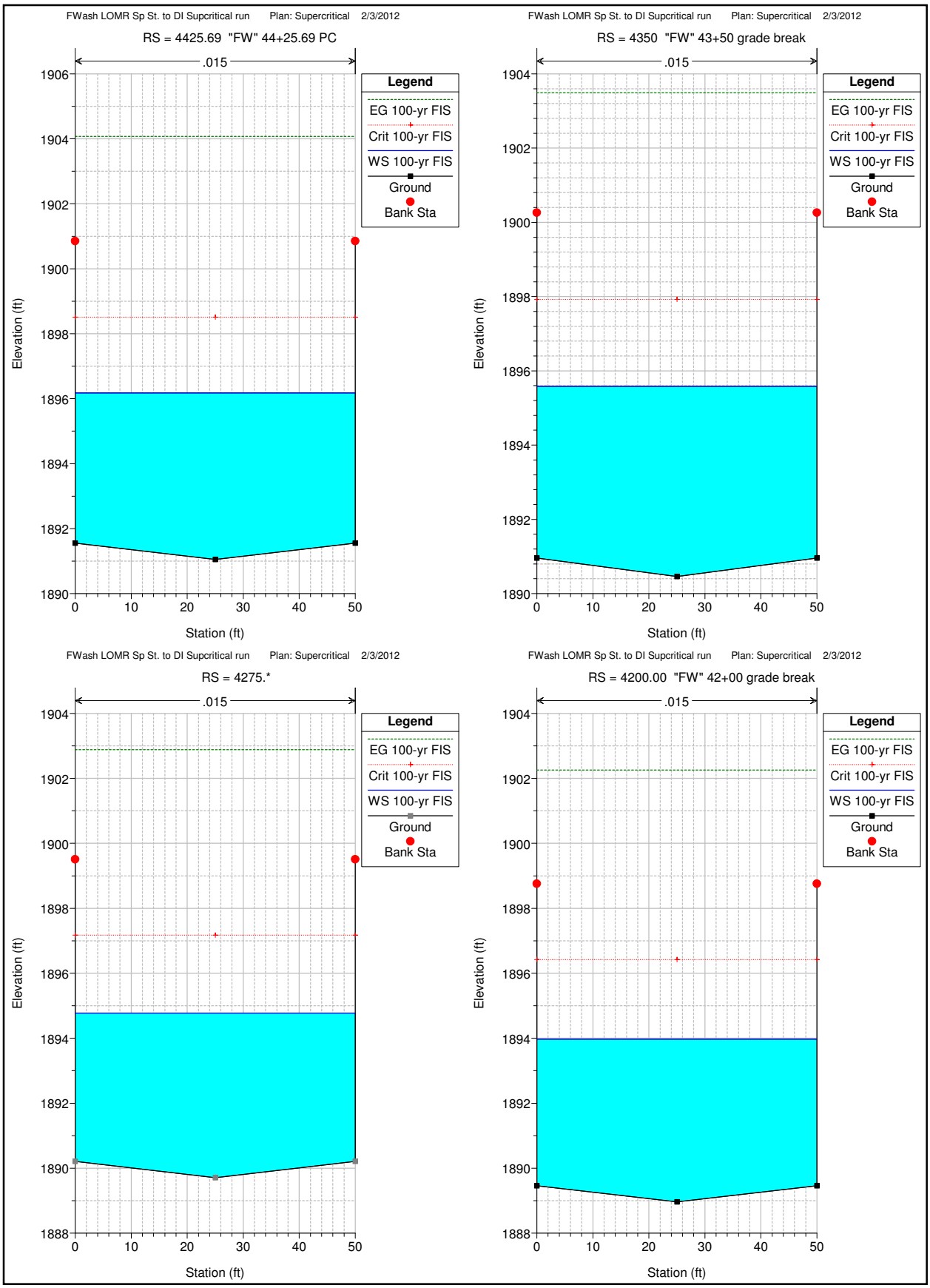
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

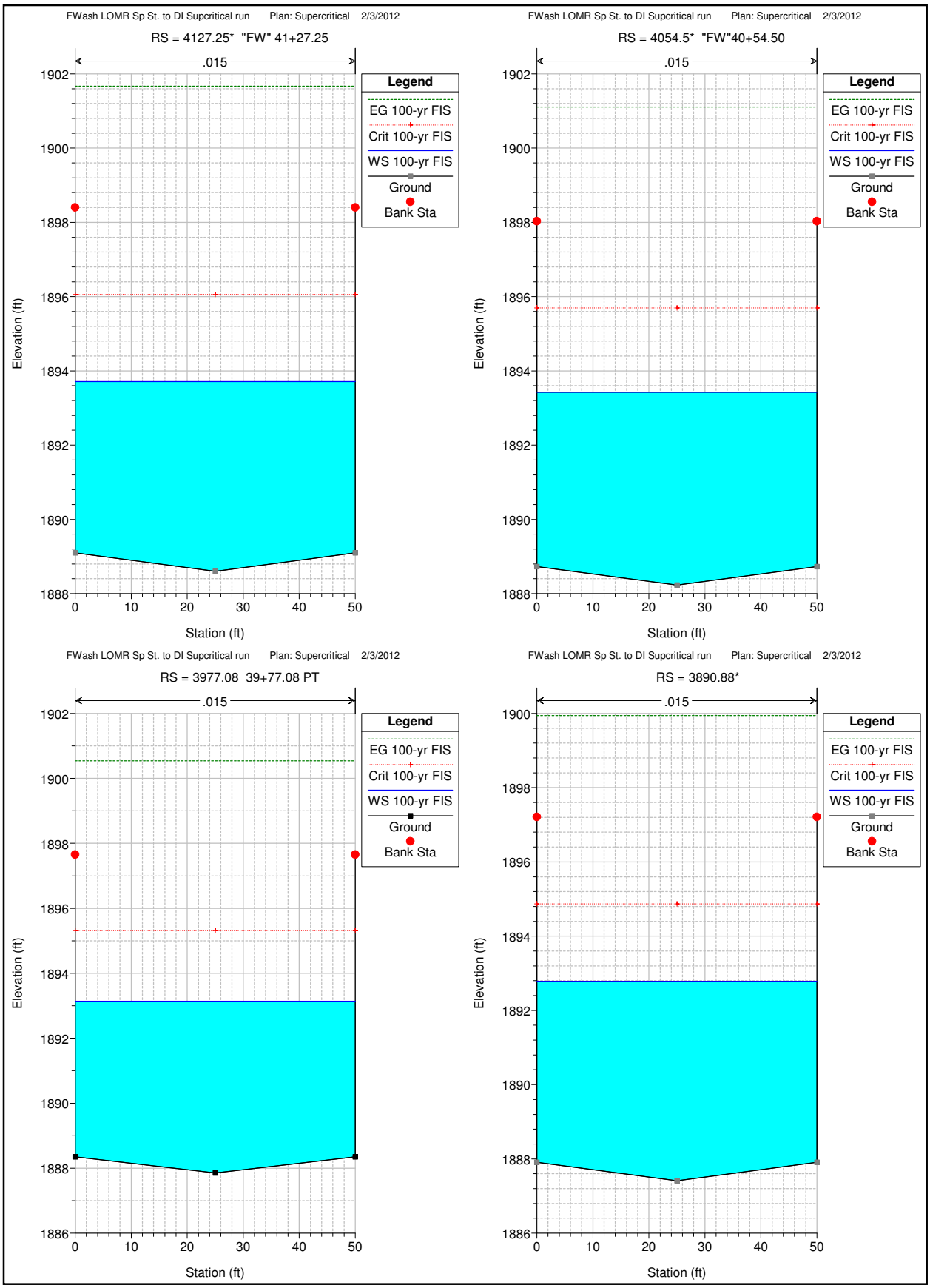
RS = 5109.79 "FW"51+09.79

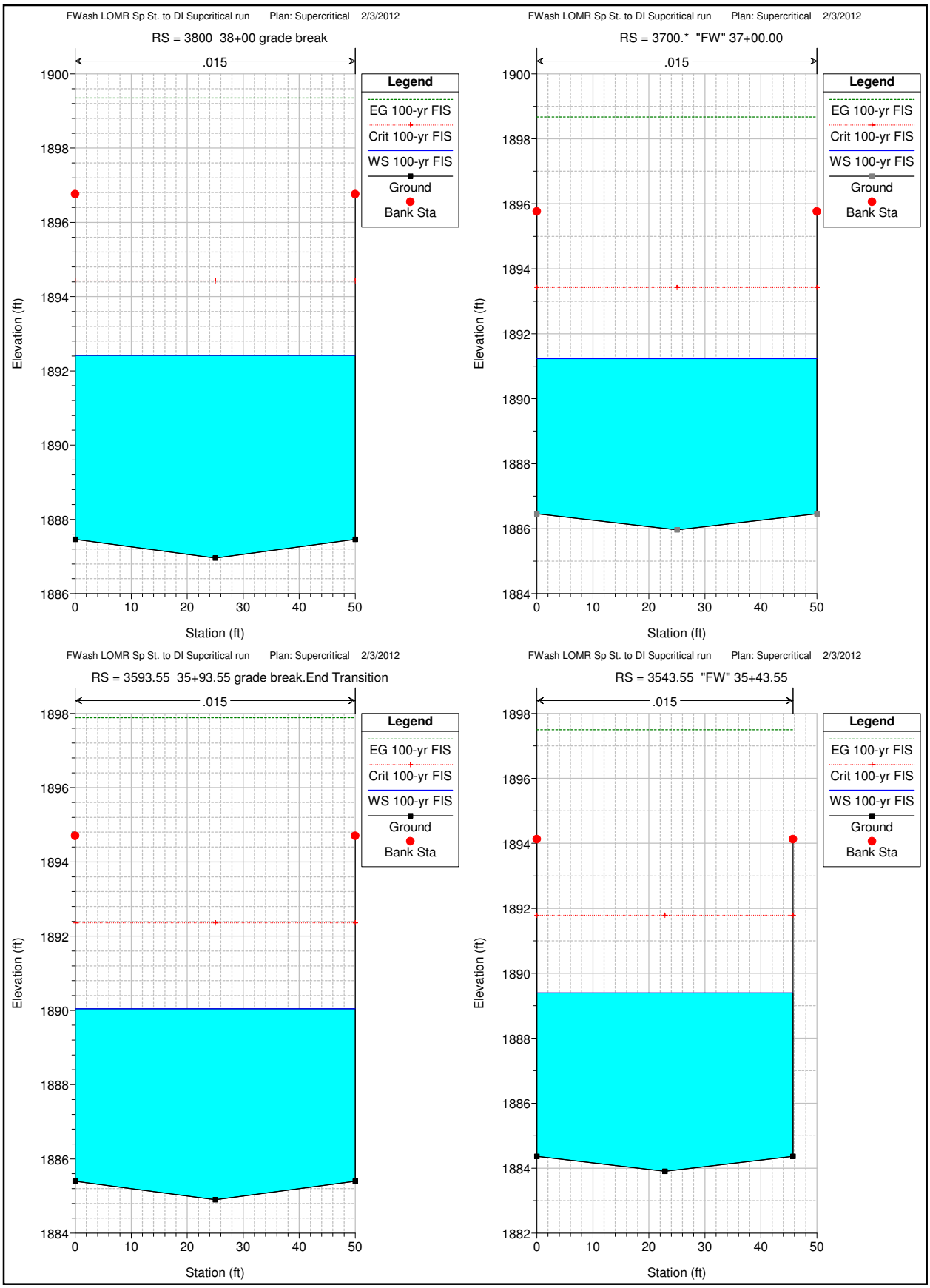



FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5061.33 "FW" 50+61.33
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 5012.88 "FW" 50+12.88 PC
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4945.04 49+45.04 PT
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4863.36 "FW" 48+63.36
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4781.68 "FW" 47+81.68
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4700 "FW" 47+00.00 Grade Break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4600 "FW" 46+00.00
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4500
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

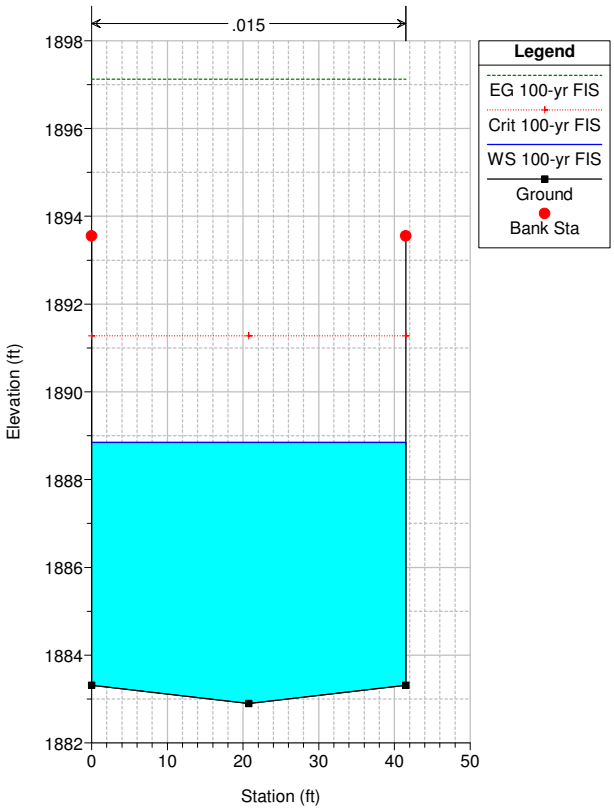

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4425.69 "FW" 44+25.69 PC
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4350 "FW" 43+50 grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4275.*
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4200.00 "FW" 42+00 grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4127.25* "FW" 41+27.25
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 4054.5* "FW"40+54.50
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3977.08 39+77.08 PT
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3890.88*
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3800 38+00 grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3700.* "FW" 37+00.00
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3593.55 35+93.55 grade break.End Transition
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 3543.55 "FW" 35+43.55
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

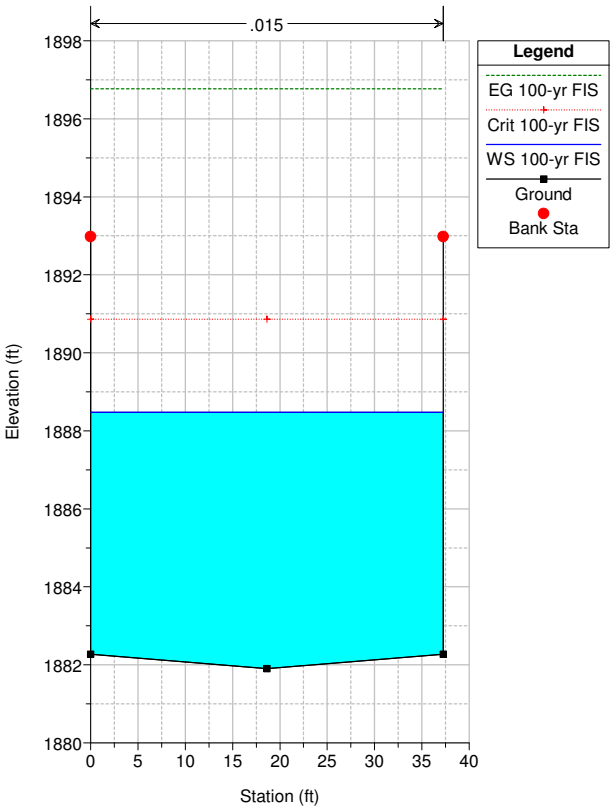
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3493.55 "FW" 34+93.55



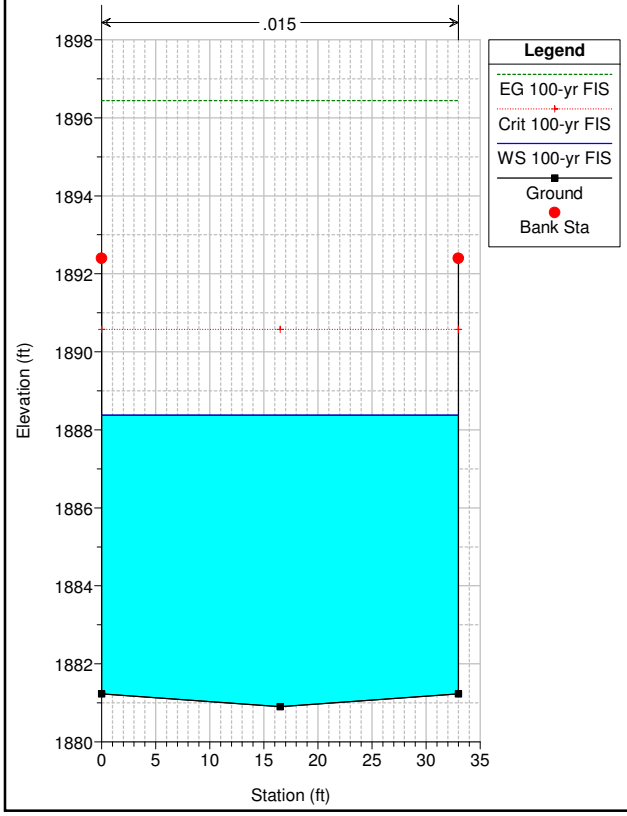
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3443.55 "FW" 34+43.55



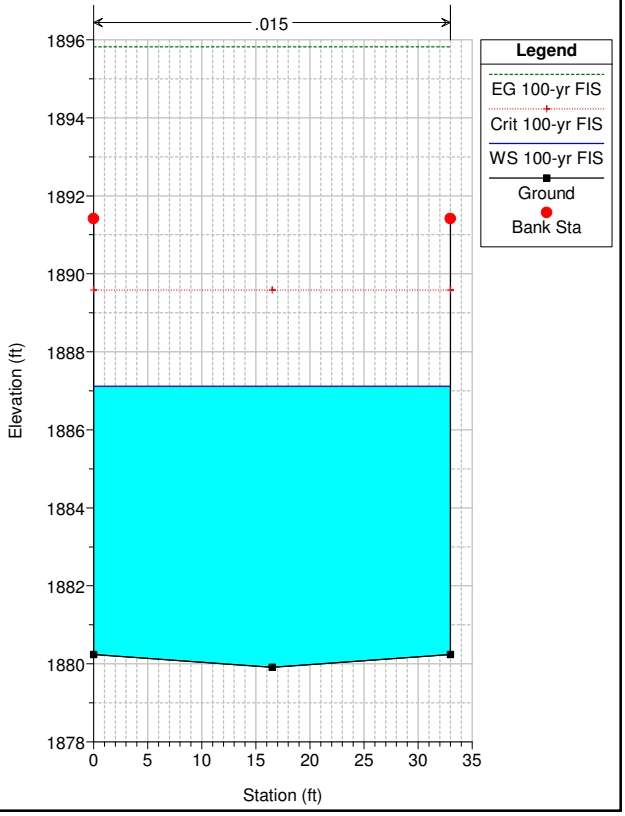
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3393.55 33+93.55 grade break. Begin Transition from 33' to 50'



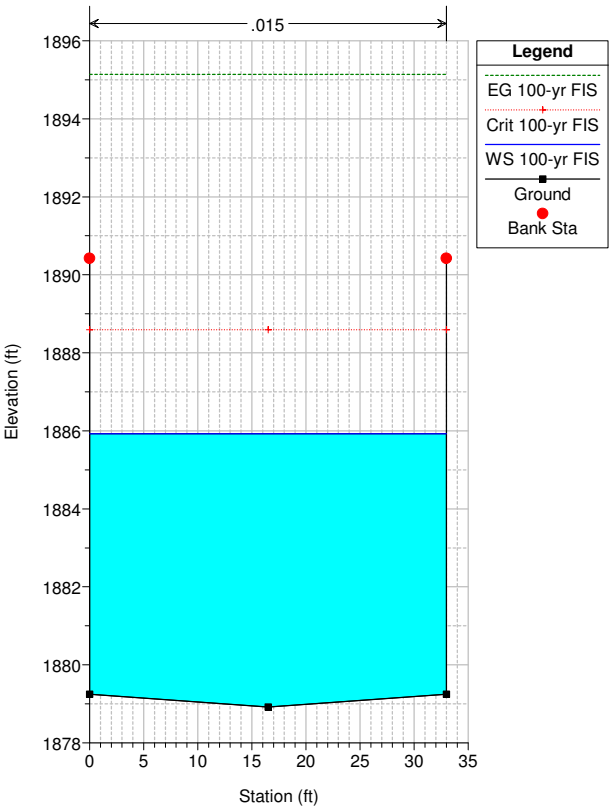
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3295.98 "FW" 32+95.98



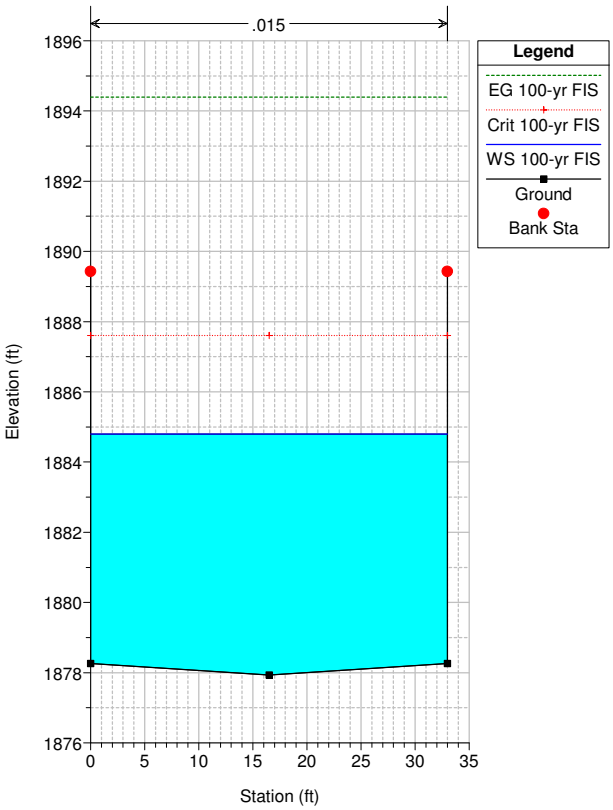
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3198.41 "FW"31+98.41



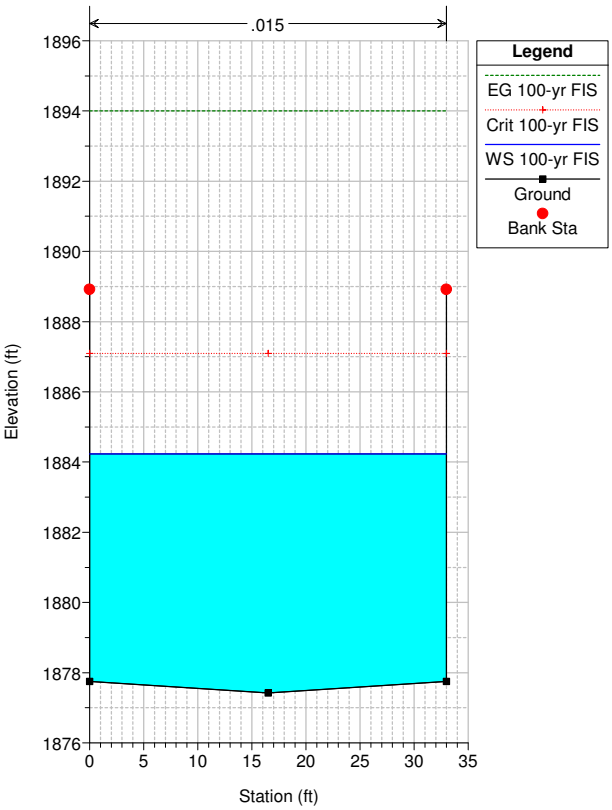
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3100.84 "FW" 31+00.84 PT



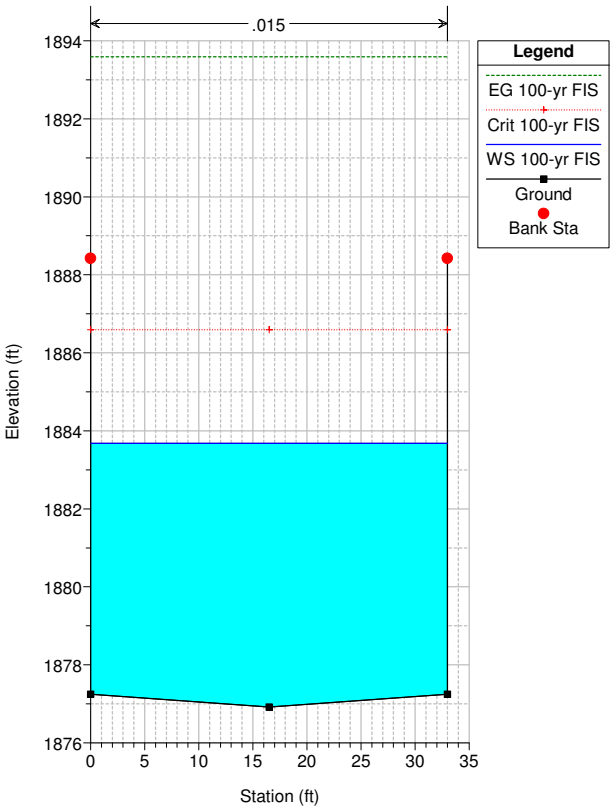
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3050.84 "FW"30+50.84



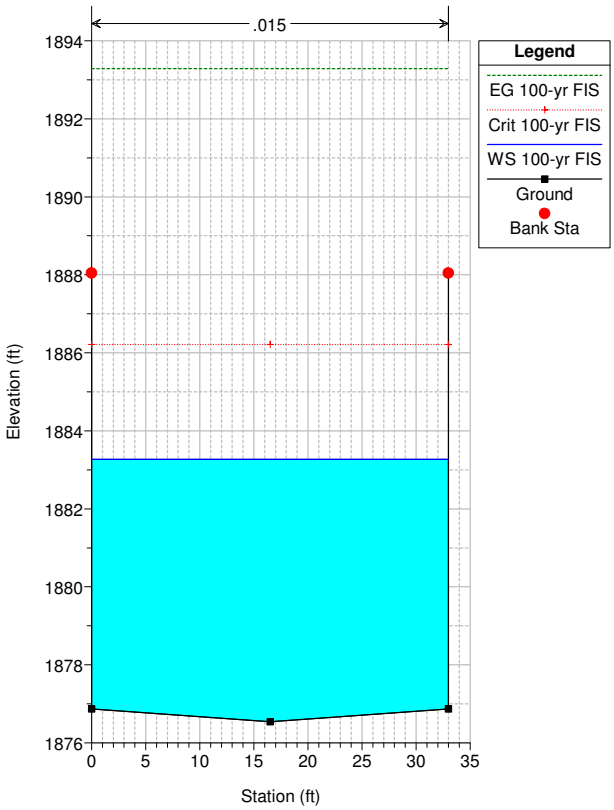
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 3000.84 "FW" 30+00.84



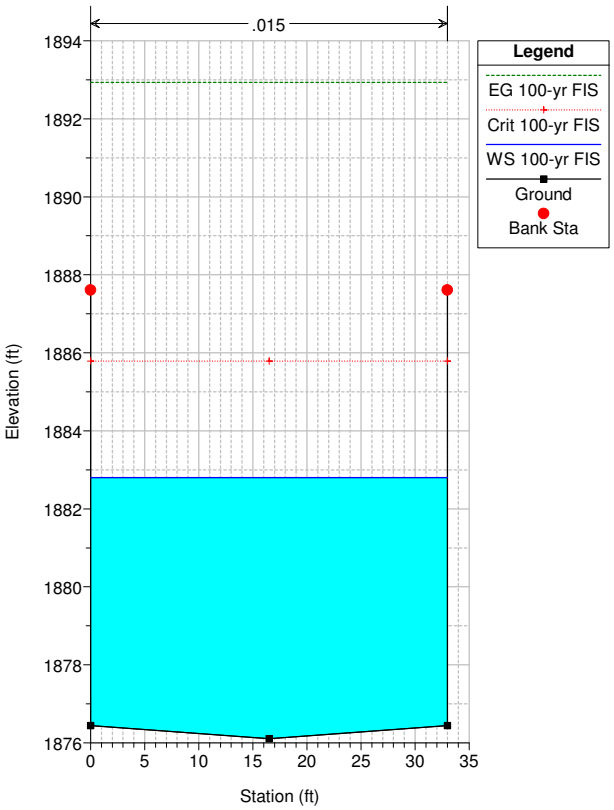
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2964.21 "FW" 29+64.21 PC



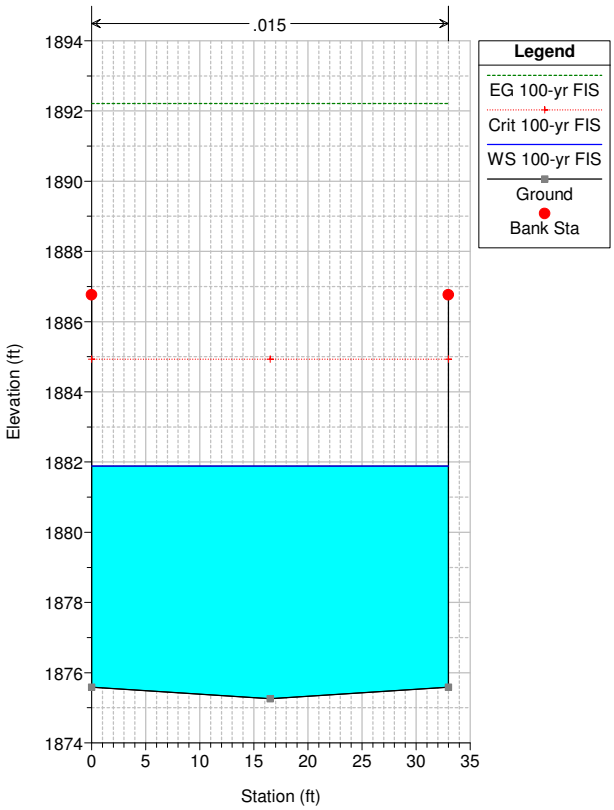
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2921.88 "FW" 29+21.88 PT



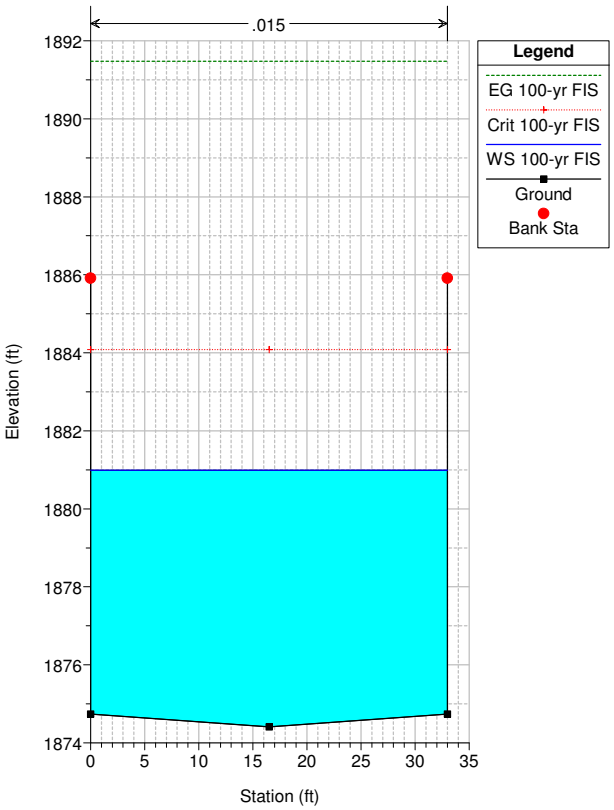
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2837.87* "FW" 28+37.87



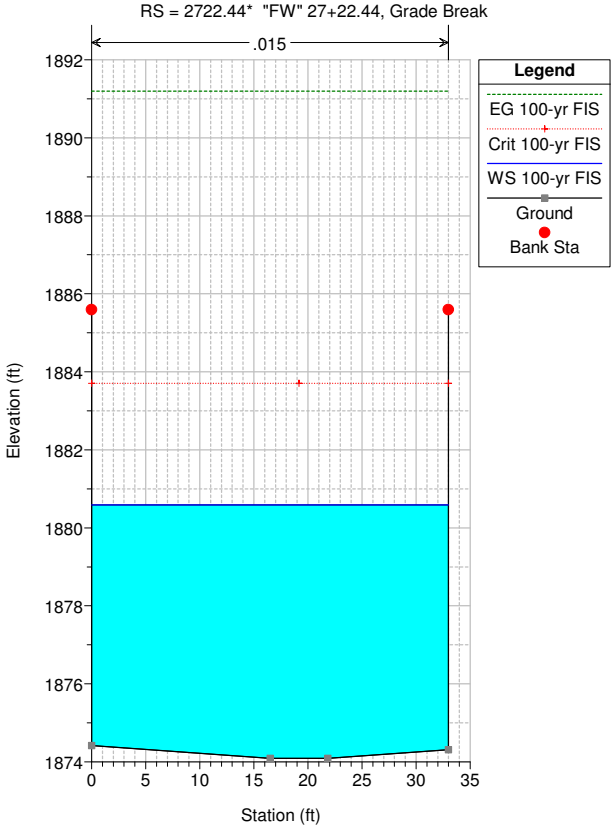
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2753.87 "FW" 27+53.87



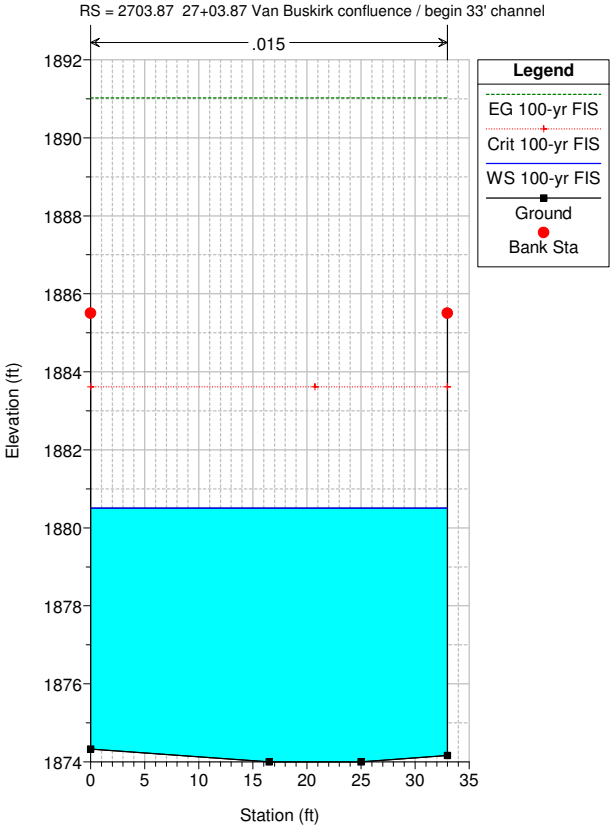
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2722.44* "FW" 27+22.44, Grade Break



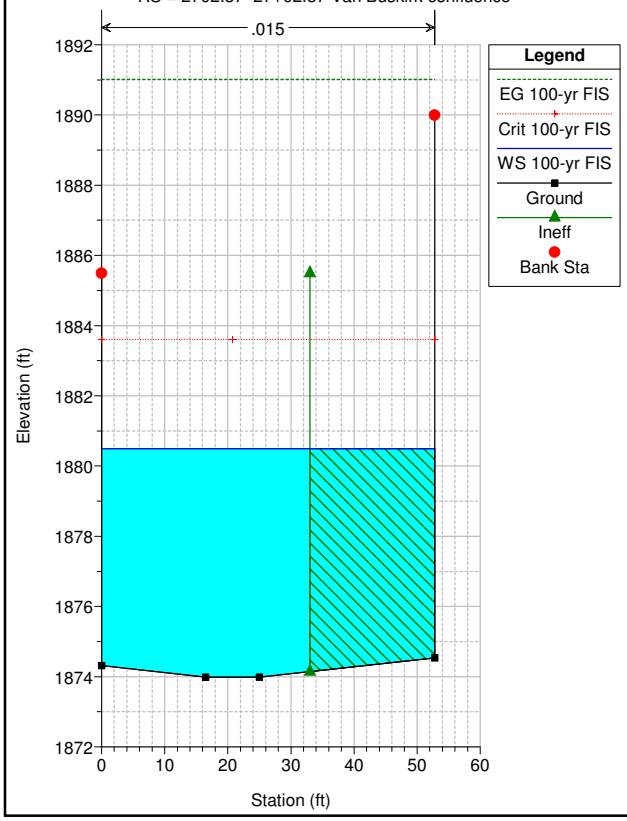
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2703.87 27+03.87 Van Buskirk confluence / begin 33' channel



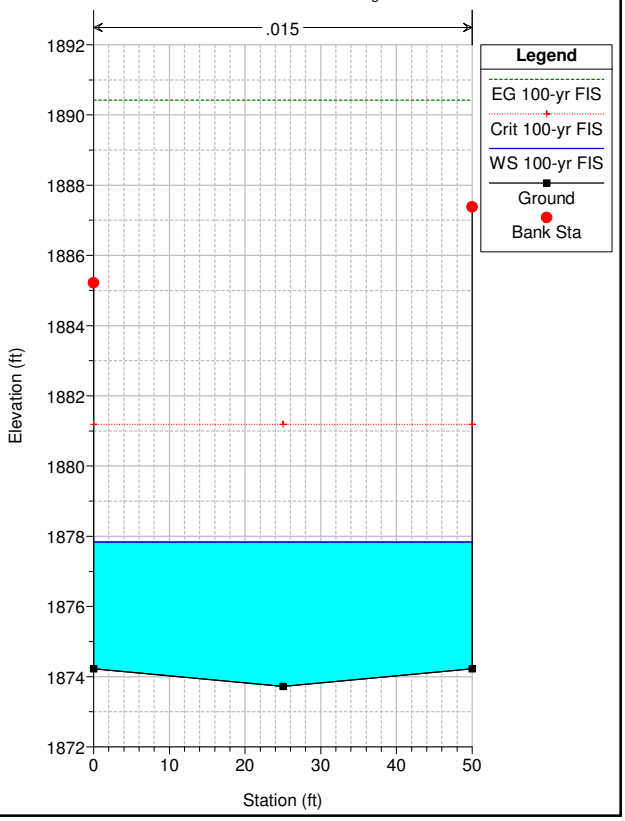
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

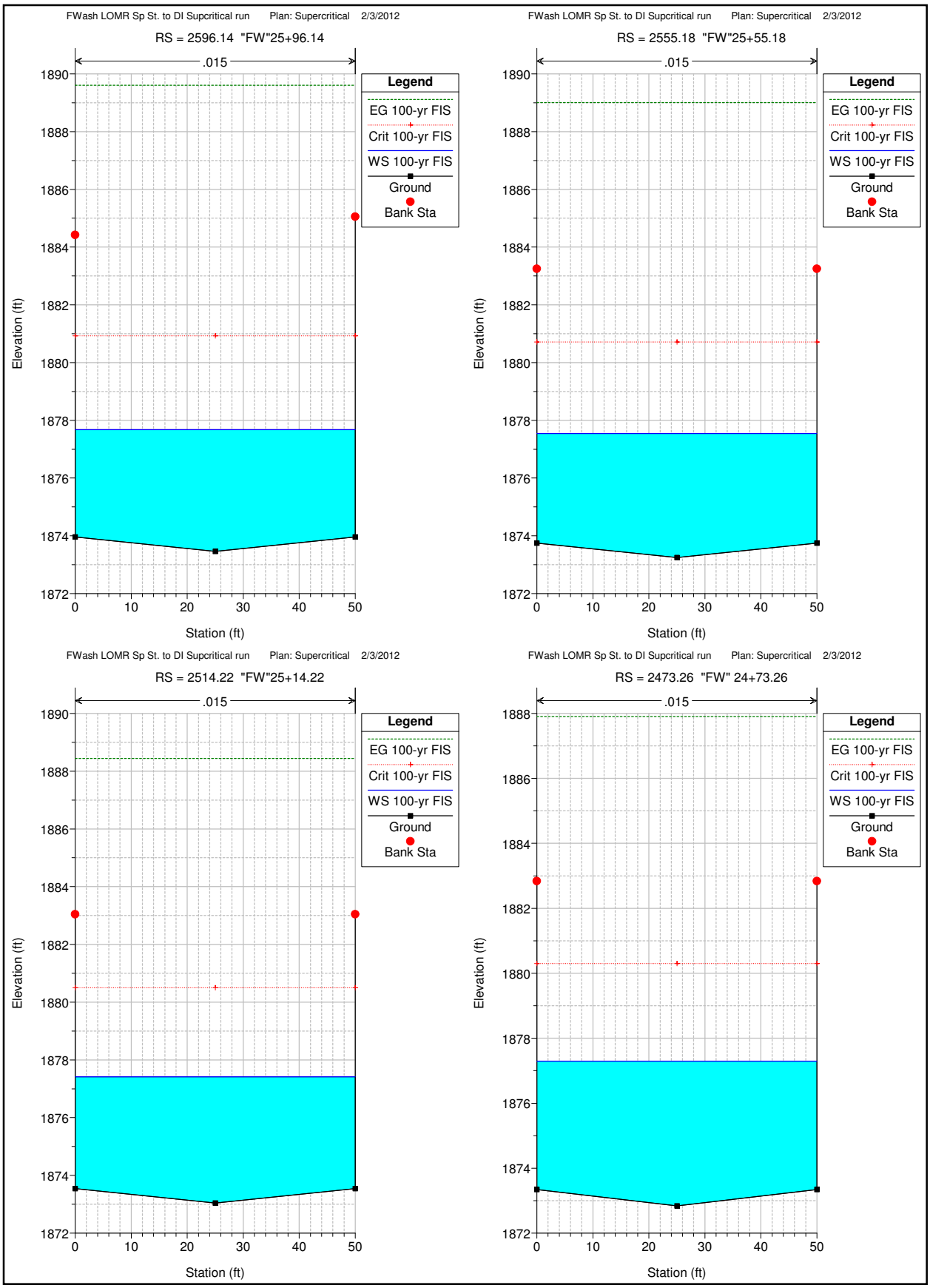
RS = 2702.87 27+02.87 Van Buskirk confluence

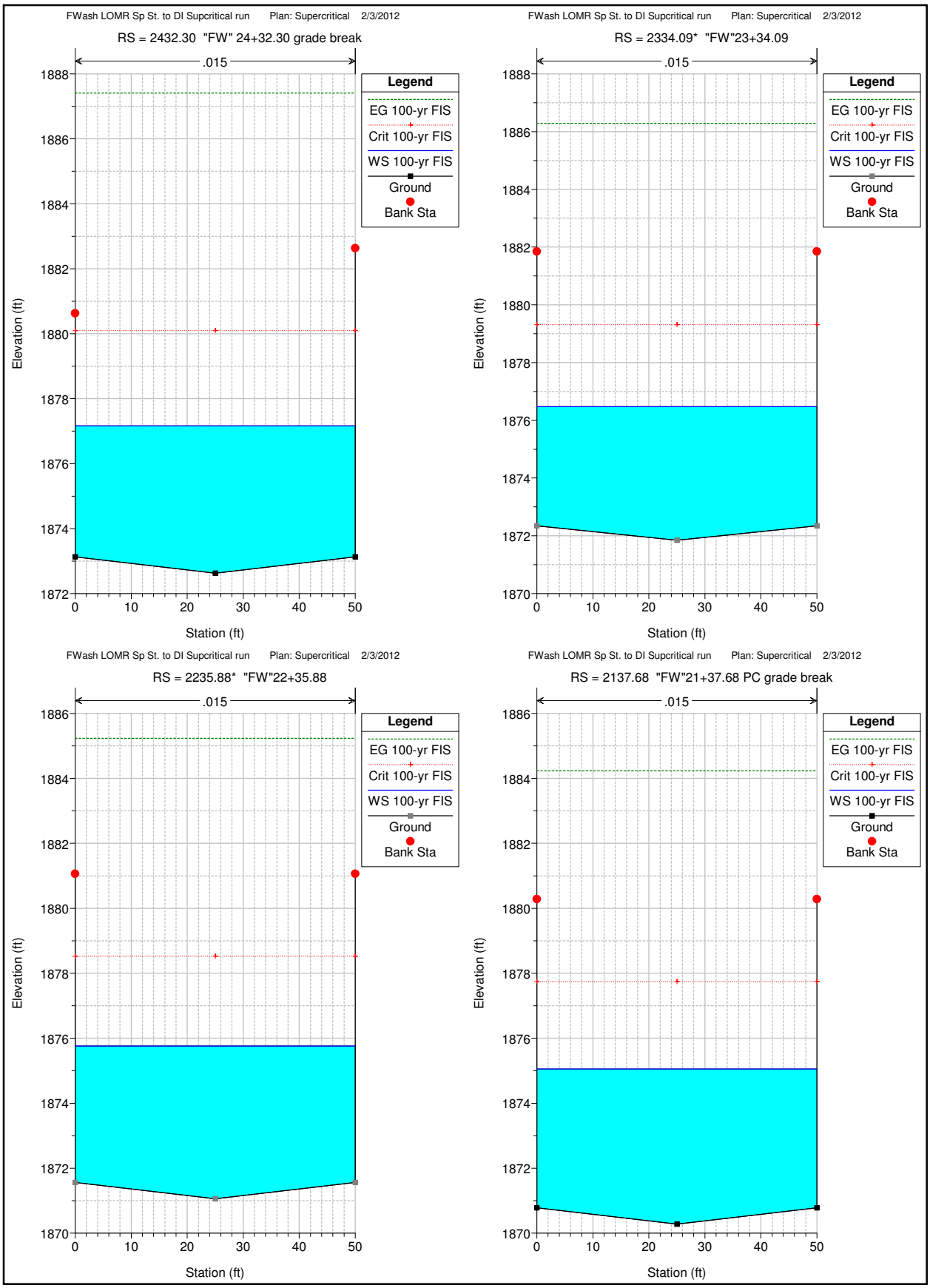


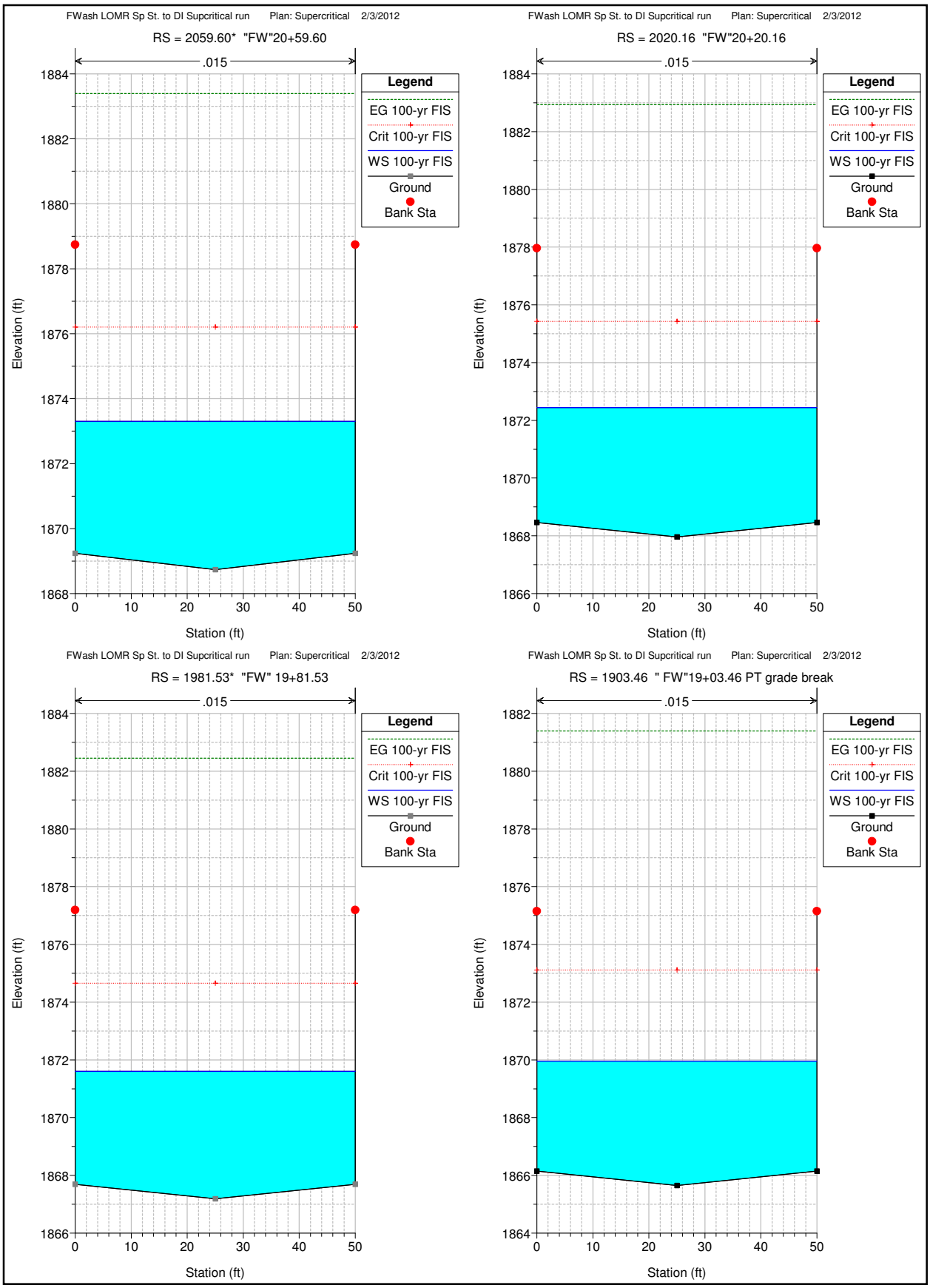
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 2648.55 26+48.52 end 50' channel / begin transition to confluence



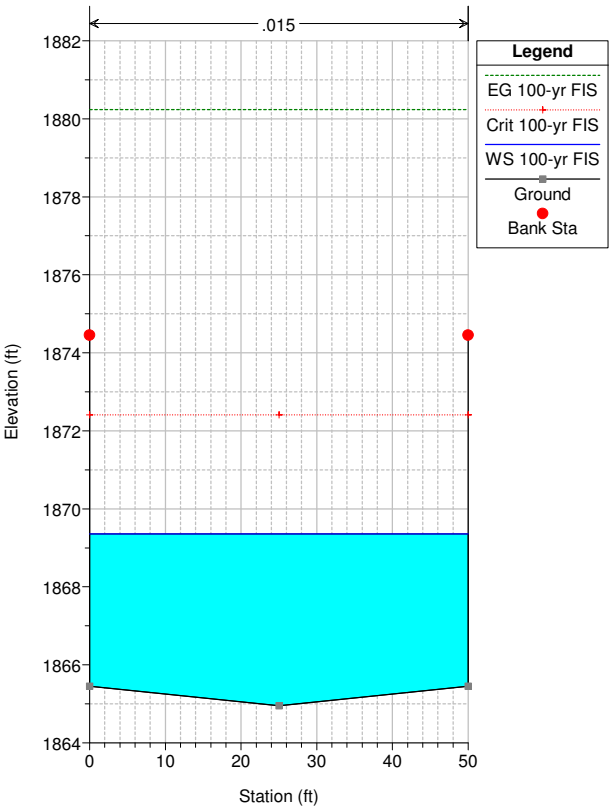

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2596.14 "FW"25+96.14
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2555.18 "FW"25+55.18
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2514.22 "FW"25+14.22
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2473.26 "FW" 24+73.26
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2432.30 "FW" 24+32.30 grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2334.09* "FW"23+34.09
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2235.88* "FW"22+35.88
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2137.68 "FW"21+37.68 PC grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2059.60* "FW"20+59.60
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 2020.16 "FW"20+20.16
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1981.53* "FW" 19+81.53
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1903.46 " FW"19+03.46 PT grade break
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

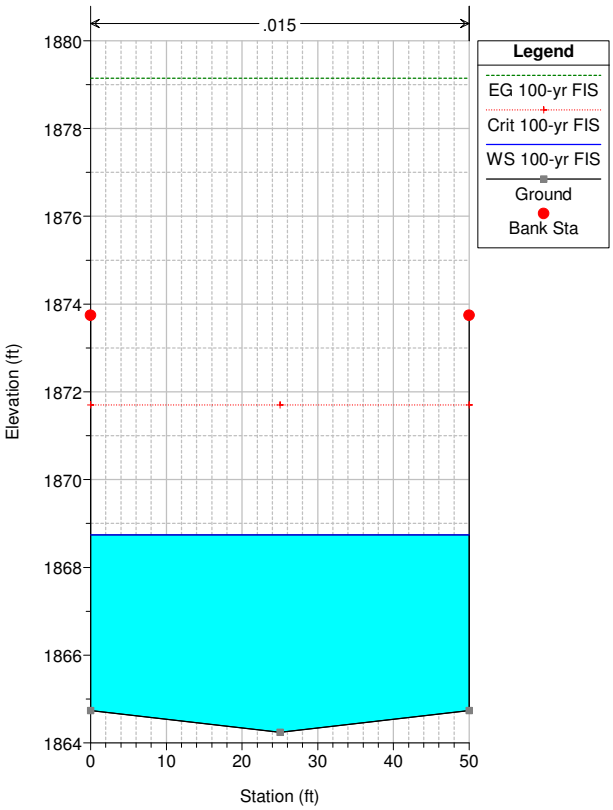
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 1817.25* "FW" 18+17.25



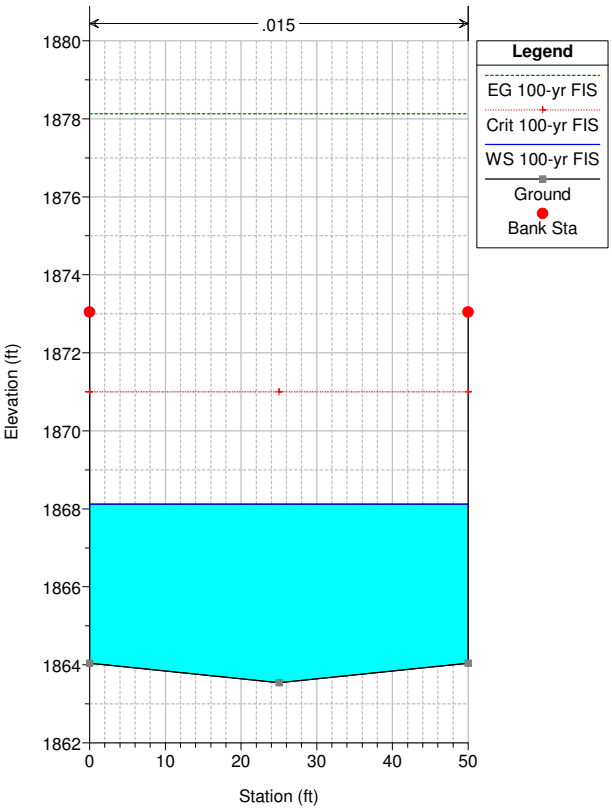
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

RS = 1731.04* "FW" 17+31.04



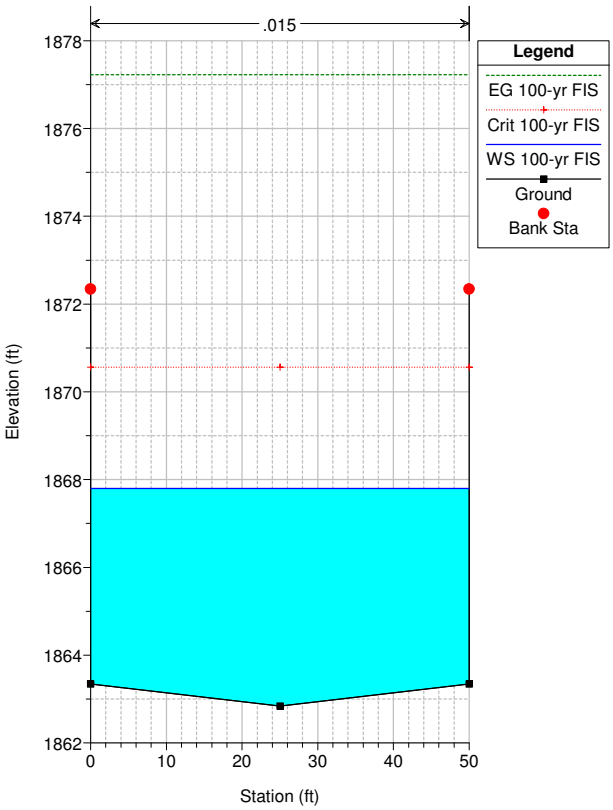
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

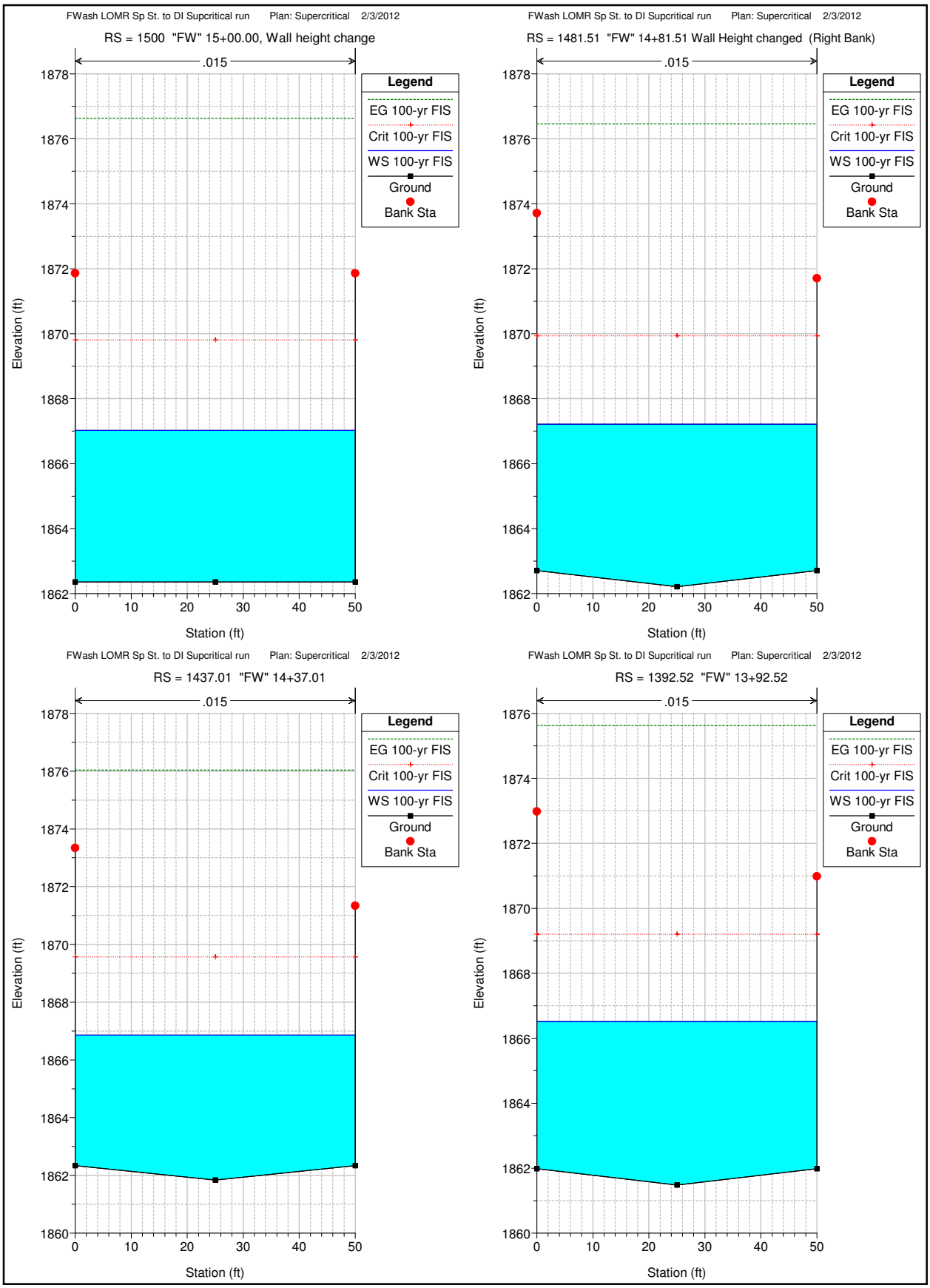
RS = 1644.83* "FW" 16+44.83

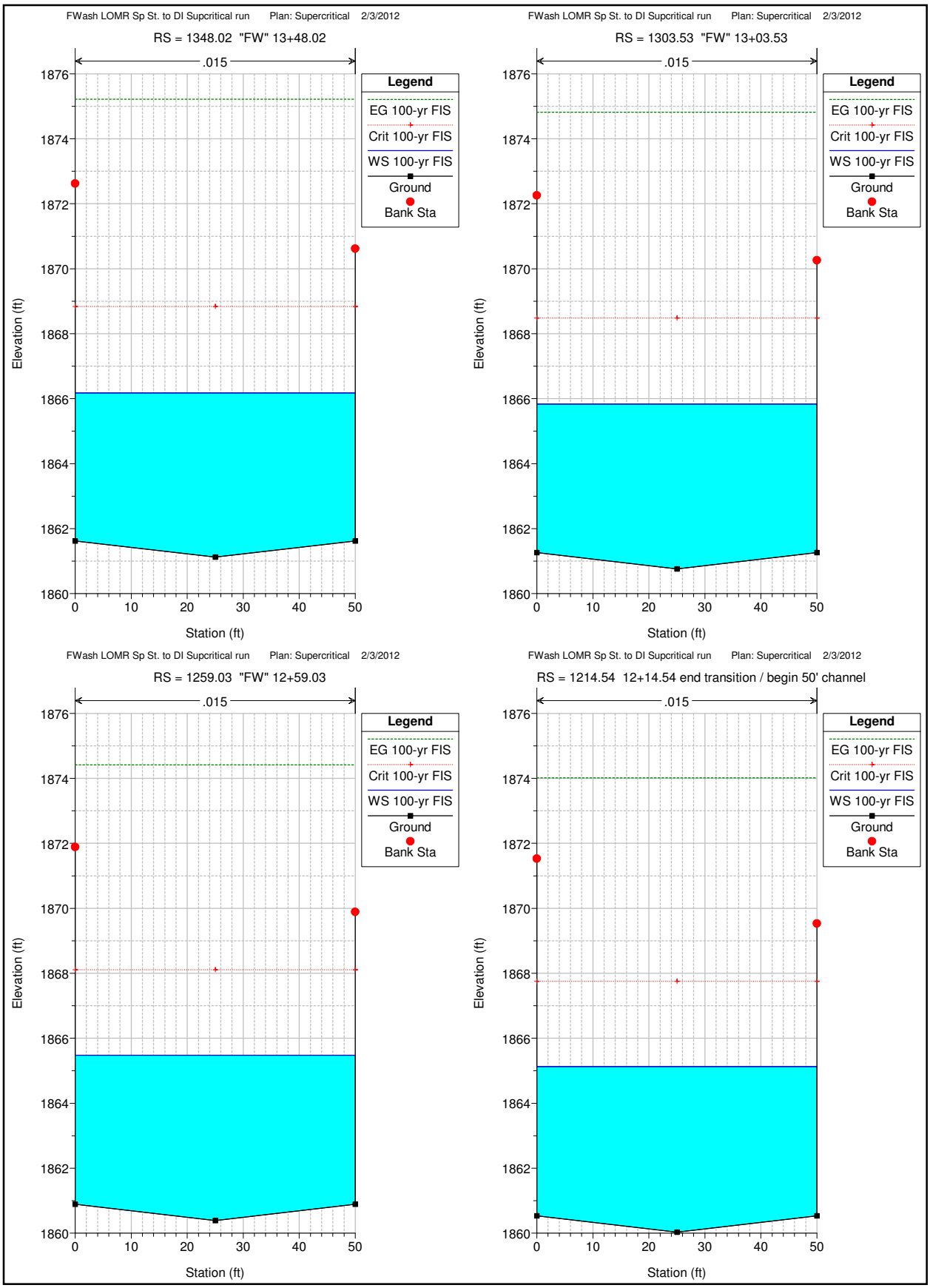


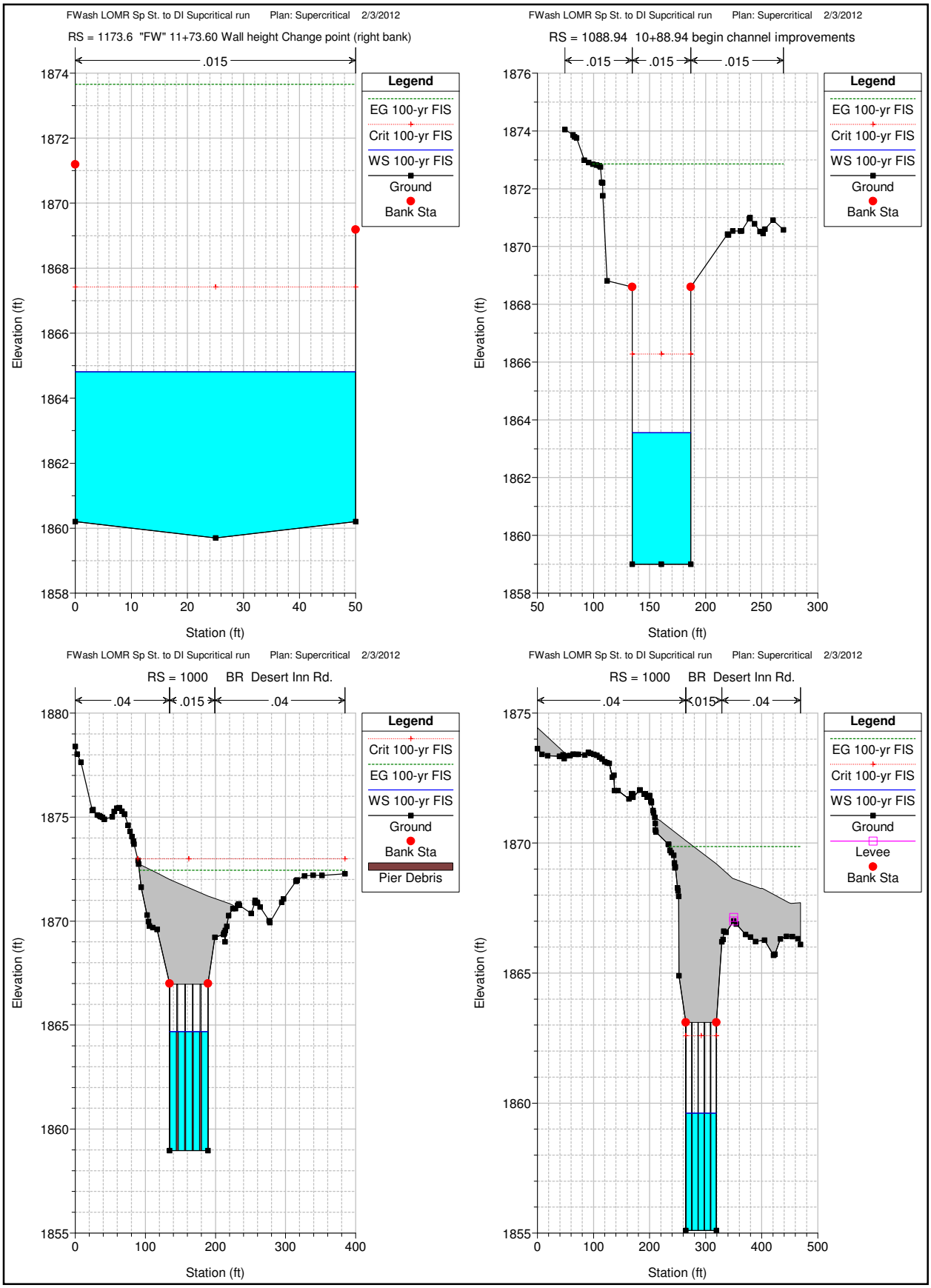
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

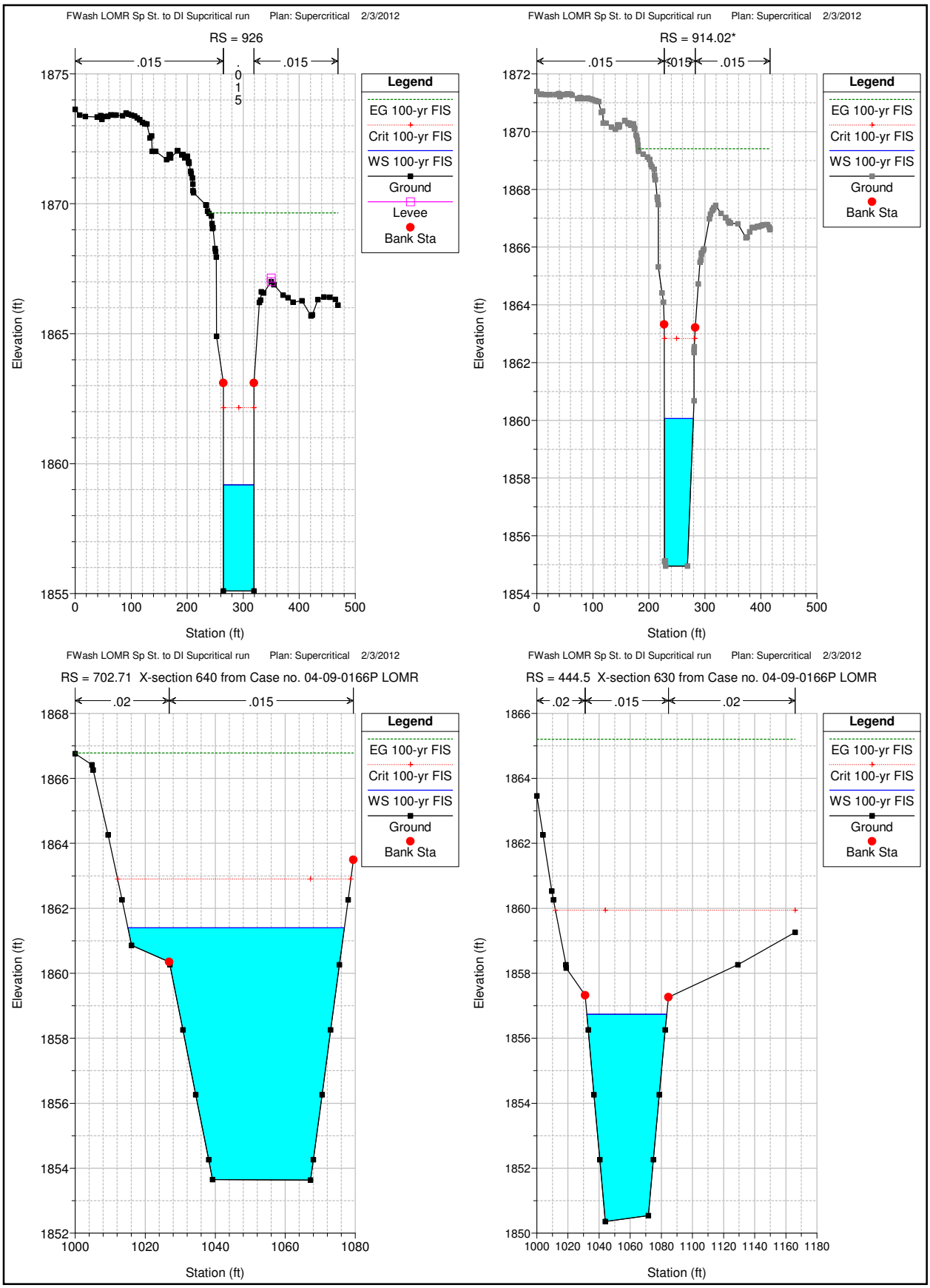
RS = 1558.62 "FW" 15+58.62

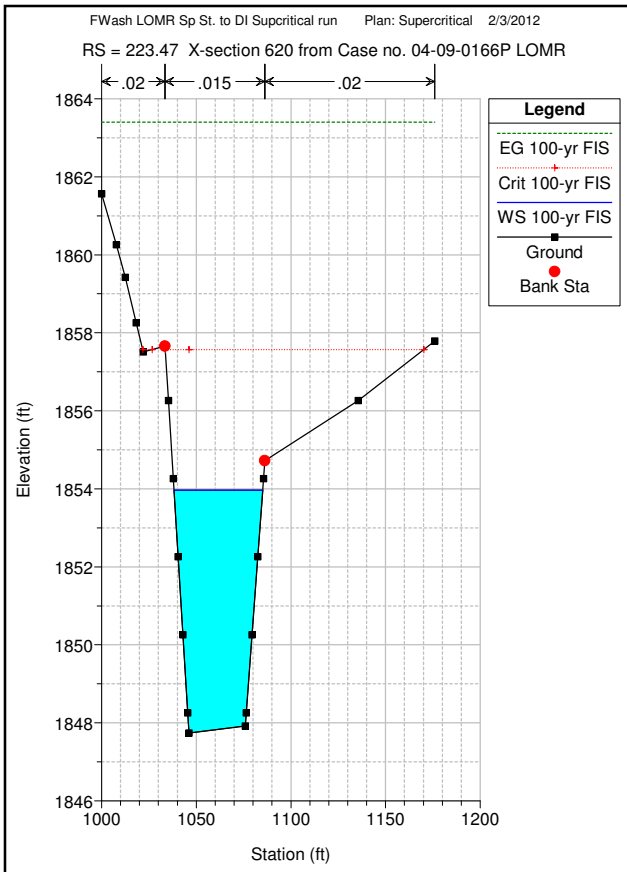



FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1500 "FW" 15+00.00, Wall height change
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1481.51 "FW" 14+81.51 Wall Height changed (Right Bank)
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1437.01 "FW" 14+37.01
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1392.52 "FW" 13+92.52
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1348.02 "FW" 13+48.02
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1303.53 "FW" 13+03.53
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1259.03 "FW" 12+59.03
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1214.54 12+14.54 end transition / begin 50' channel
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)

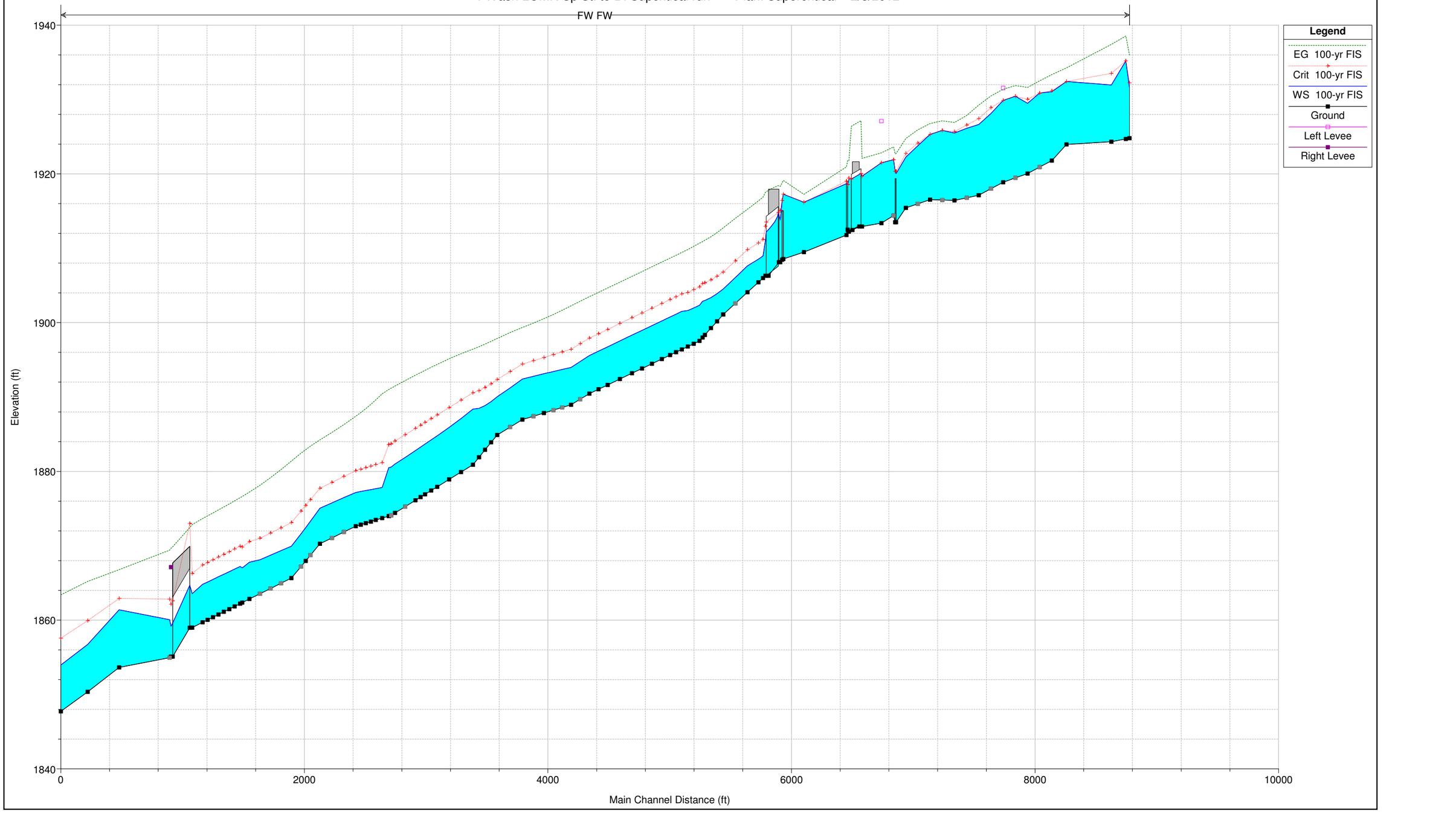

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1173.6 "FW" 11+73.60 Wall height Change point (right bank)
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1088.94 10+88.94 begin channel improvements
.015
.015
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1000 BR Desert Inn Rd.
.04
.015
.04
Legend
Crit 100-yr FIS
EG 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Pier Debris
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 1000 BR Desert Inn Rd.
.04
.015
.04
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 926
.015
.015
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 914.02*
.015
.015
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 702.71 X-section 640 from Case no. 04-09-0166P LOMR
.02
.015
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)
FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 444.5 X-section 630 from Case no. 04-09-0166P LOMR
.02
.015
.02
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
Station (ft)


FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012
RS = 223.47 X-section 620 from Case no. 04-09-0166P LOMR
.02
.015
.02
Legend
EG 100-yr FIS
Crit 100-yr FIS
WS 100-yr FIS
Ground
Bank Sta
Elevation (ft)
1864
1862
1860
1858
1856
1854
1852
1850
1848
1846
1000
1050
1100
1150
1200
Station (ft)

FWash LOMR Sp St. to DI Supcritical run Plan: Supercritical 2/3/2012

FW FW



Calculations for Overtopping Flow at Eastern Avenue

Appendix C.3

Twain Avenue Breakout Flow Calculations

			WSE_6	1919.13	
i	Station[1]	Elevation[2]	Depth[3] (ft)	Area[4] (sf)	
1	-198.44	1919.63			
2	-188.71	1919.53			
3	-178.67	1919.41			
4	-169.29	1919.32			
5	-159.26	1919.2			
6	-149.36	1919.08	0.05	0.99	
7	-139.46	1918.97	0.16	2.28	
8	-129.34	1918.83	0.30	3.48	
9	-119.1	1918.74	0.39	4.51	
10	-108.74	1918.64	0.49	5.35	
11	-98.56	1918.56	0.57	6.09	
12	-88.5	1918.48	0.65	6.99	
13	-78.38	1918.39	0.74	7.63	
14	-68.47	1918.32	0.81	8.37	
15	-58.39	1918.27	0.86	9.04	
16	-48.18	1918.21	0.92	9.32	
17	-38.27	1918.16	0.97	10.50	
18	-27.67	1918.11	1.02	10.67	
19	-17.31	1918.08	1.05	10.81	
20	-7.11	1918.05	1.08	11.15	
21	3.07	1918.01	1.12	11.59	
22	13.37	1917.99	1.14	11.99	
23	23.84	1917.97	1.16	12.08	
24	34.25	1917.96	1.17	11.88	
25	44.4	1917.95	1.18	12.02	
26	54.67	1917.96	1.17	11.67	
27	64.73	1917.97	1.16	11.89	
28	75.02	1917.97	1.16	17.58	
29	91.00	1918.08	1.05	79.69	
30	227.16	1919.00	0.13	4.13	
31	260.16	1919.30			
32	337.17	1920.00			
			Area Total[5]	**291.70**	

Station where flow breaks out down Twain Ave.

Total Area of Breakout Flow 83.8 sf

Area Ratio[7] 0.287

Breakout Flow[8] 220 cfs

Notes:

1) Station for internal cross section at HECRAS Culvert No. 5800

2) Elevation at the centerline of Eastern Avenue

3) Depth = WSE - Elevation

4) Flow Area = $0.5*(Depth_{i+1} + Depth_i) \times (Station_{i+1} - Station_i)$

5) Note that Area Total also equals total weir flow area from HECRAS Detailed Output Table for Culverts 5800 (Eastern Avenue)

6) Water Suface Elevation is set so that Area Total[5] equals weir flow area from HECRAS Detailed Ouput Table for Culverts 5800 (Eastern Avenue)

7) Ratio of Total Area of Breakout Flow to Area total = 83.8 sf / 291.70 sf

8) Breakout Flow = Weir Flow from HECRAS Detailed Output Table for Culverts 5800 (Eastern Avenue) x Area Ratio = 767 cfs x .287

Flowmaster Worksheet for Twain Avenue Street Section

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00590	ft/ft
Discharge	220.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.51	0.00
0+07.00	0.13
0+40.00	0.79
0+73.00	0.13
0+74.49	0.00
0+74.50	0.50
0+75.00	0.50
0+80.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+75.00, 0.50)	0.016
(0+75.00, 0.50)	(0+80.00, 0.60)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.02	ft
Elevation Range	0.00 to 0.79 ft	

Worksheet for Twain Avenue Street Section

Results

Flow Area		45.50	ft²
Wetted Perimeter		81.57	ft
Hydraulic Radius		0.56	ft
Top Width		80.00	ft
Normal Depth		1.02	ft
Critical Depth		1.07	ft
Critical Slope		0.00450	ft/ft
Velocity		4.83	ft/s
Velocity Head		0.36	ft
Specific Energy		1.39	ft
Froude Number		1.13	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.02	ft
Critical Depth	1.07	ft
Channel Slope	0.00590	ft/ft
Critical Slope	0.00450	ft/ft

$$\text{Hydraulic Depth} = \frac{\text{Flow Area}}{\text{Top Width}} = \frac{45.50\ \text{sf}}{80.00'} = 0.57'$$

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HECRAS Detailed Output for Eastern Avenue Culverts

Plan: subcritical FW FW RS: 5800 Culv Grou p: Culvert #1 Profile: 100-yr FIS

Q Culv Group (cfs)	4732.65	Culv Full Len (ft)	
# Barrels	5	Culv Vel US (ft/s)	14.50
Q Barrel (cfs)	946.53	Culv Vel DS (ft/s)	18.01
E.G. US. (ft)	1919.29	Culv Inv El Up (ft)	1907.60
W.S. US. (ft)	1918.67	Culv Inv El Dn (ft)	1906.30
E.G. DS (ft)	1916.03	Culv Frctn Ls (ft)	0.80
W.S. DS (ft)	1912.77	Culv Exit Loss (ft)	0.56
Delta EG (ft)	3.25	Culv Entr Loss (ft)	1.89
Delta WS (ft)	5.90	Q Weir (cfs)	767.35
E.G. IC (ft)	1919.29	Weir Sta Lft (ft)	-116.73
E.G. OC (ft)	1918.70	Weir Sta Rgt (ft)	259.22
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1914.13	Weir Max Depth (ft)	1.34
Culv WS Outlet (ft)	1911.56	Weir Avg Depth (ft)	0.88
Culv Nml Depth (ft)	4.64	Weir Flow Area (sq ft)	291.70
Culv Crt Depth (ft)	6.53	Min El Weir Flow (ft)	1917.96

CHECK-RAS OUTPUT FILES

Appendix C.4

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.prj
Plan File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.p05
Geometry File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.g03
Flow File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.f04
Report File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.nt
Selected profiles: 100-yr FIS
Date: 1/17/2012
Time: 1:42:07 PM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
FW,FW						
8837.78		-----	0.025	0.025	0.1	0.3
		-----	0.025	-----		
8807.78		-----	0.025	0.025	0.1	0.3
		-----	0.025	-----		
8687.78		-----	0.025	0.025	0.1	0.3
		-----	0.025	-----		
8320		0.035	0.03	0.035	0.1	0.3
8200		0.03	0.04	0.03	0.1	0.3
8100		0.03	0.04	0.03	0.1	0.3
8000		0.03	0.04	0.03	0.1	0.3
7900		0.03	0.04	0.03	0.1	0.3
7800		0.03	0.04	0.03	0.1	0.3
7700		0.03	0.04	0.03	0.1	0.3
7600		0.03	0.04	0.03	0.1	0.3
7500		0.03	0.04	0.03	0.1	0.3
7400		0.03	0.04	0.03	0.1	0.3
7300		0.03	0.04	0.03	0.1	0.3
7200		0.03	0.04	0.03	0.1	0.3
7100		0.03	0.04	0.03	0.1	0.3
7000		0.03	0.04	0.03	0.1	0.3
6925	Bridge-Up	0.03	-----	-----	0.1	0.3
6925	Bridge-Dn	0.03	-----	-----	0.1	0.3
		0.03	-----	-----		
6868		0.03	0.04	0.03	0.1	0.3
6736		0.03	0.04	0.03	0.1	0.3
6577		0.03	0.04	0.03	0.1	0.3
6500	Culvert-Up	0.03	0.04	0.03	0.1	0.3
6500	Culvert-Dn	0.03	0.03	0.03	0.3	0.5
		-----	0.04	-----		
6469		0.03	0.04	0.03	0.3	0.5
6450	Bridge-Up	0.03	0.04	0.03	0.3	0.5
6450	Bridge-Dn	0.03	0.04	0.03	0.1	0.3
6100		0.03	0.04	0.03	0.1	0.3
6000	Bridge-Up	0.03	0.04	0.03	0.1	0.3
6000	Bridge-Dn	0.03	0.04	0.03	0.1	0.3
5917		0.03	0.03	0.03	0.1	0.3
		-----	0.033	0.16		
		-----	0.013	-----		
		-----	0.033	-----		
		-----	0.03	-----		
5800	Culvert-Up	0.03	0.03	0.03	0.1	0.3
		-----	0.033	0.16		
		-----	0.013	-----		
		-----	0.033	-----		
		-----	0.03	-----		
5800	Culvert-Dn	-----	0.015	0.015	0.3	0.5
5796		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
5776		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5737.74		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5648.42		-----	0.015	0.015	0	0
		-----	0.015	-----		
5548.82		-----	0.015	0.015	0	0
		-----	0.015	-----		
5449.23		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5449.11		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5399.11		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5349.11		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5299.11		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
5279.92		-----	0.015	0.015	0	0
		-----	0.015	-----		
5255.16		-----	0.015	0.015	0	0
		-----	0.015	-----		
5206.7		-----	0.015	0.015	0	0
		-----	0.015	-----		
5158.24		-----	0.015	0.015	0	0
		-----	0.015	-----		
5109.79		-----	0.015	0.015	0	0
		-----	0.015	-----		
5061.33		-----	0.015	0.015	0	0
		-----	0.015	-----		
5012.88		-----	0.015	0.015	0	0
		-----	0.015	-----		
4945.04		-----	0.015	0.015	0	0
		-----	0.015	-----		
4863.36		-----	0.015	0.015	0	0
		-----	0.015	-----		
4781.68		-----	0.015	0.015	0	0
		-----	0.015	-----		
4700		-----	0.015	0.015	0	0
		-----	0.015	-----		
4600		-----	0.015	0.015	0	0
		-----	0.015	-----		
4500		-----	0.015	0.015	0	0
		-----	0.015	-----		

4425.69		-----	0.015	0.015	0	0
		-----	0.015	-----		
4350		-----	0.015	0.015	0	0
		-----	0.015	-----		
4275		-----	0.015	0.015	0	0
		-----	0.015	-----		
4200		-----	0.015	0.015	0	0
		-----	0.015	-----		
4127.25		-----	0.015	0.015	0	0
		-----	0.015	-----		
4054.5		-----	0.015	0.015	0	0
		-----	0.015	-----		
3977.08		-----	0.015	0.015	0	0
		-----	0.015	-----		
3890.88		-----	0.015	0.015	0	0
		-----	0.015	-----		
3800		-----	0.015	0.015	0	0
		-----	0.015	-----		
3700		-----	0.015	0.015	0	0
		-----	0.015	-----		
3593.55		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
3543.55		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
3493.55		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
3443.55		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
3393.55		-----	0.015	0.015	0	0
		-----	0.015	-----		
3295.98		-----	0.015	0.015	0	0
		-----	0.015	-----		
3198.41		-----	0.015	0.015	0	0
		-----	0.015	-----		
3100.84		-----	0.015	0.015	0	0
		-----	0.015	-----		
3050.84		-----	0.015	0.015	0	0
		-----	0.015	-----		
3000.84		-----	0.015	0.015	0	0
		-----	0.015	-----		
2964.21		-----	0.015	0.015	0	0
		-----	0.015	-----		
2921.88		-----	0.015	0.015	0	0
		-----	0.015	-----		
2837.87		-----	0.015	0.015	0	0
		-----	0.015	-----		
2753.87		-----	0.015	0.015	0	0
		-----	0.015	-----		
2722.44		-----	0.015	0.015	0	0
		-----	0.015	-----		
2703.87		-----	0.015	0.015	0	0
		-----	0.015	-----		
2702.87		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
2648.55		-----	0.015	0.015	0	0
		-----	0.015	-----		
2596.14		-----	0.015	0.015	0	0
		-----	0.015	-----		
2555.18		-----	0.015	0.015	0	0
		-----	0.015	-----		
2514.22		-----	0.015	0.015	0	0
		-----	0.015	-----		
2473.26		-----	0.015	0.015	0	0
		-----	0.015	-----		
2432.3		-----	0.015	0.015	0	0
		-----	0.015	-----		
2334.09		-----	0.015	0.015	0	0
		-----	0.015	-----		
2235.88		-----	0.015	0.015	0	0
		-----	0.015	-----		
2137.68		-----	0.015	0.015	0	0
		-----	0.015	-----		
2059.6		-----	0.015	0.015	0	0
		-----	0.015	-----		
2020.16		-----	0.015	0.015	0	0
		-----	0.015	-----		
1981.53		-----	0.015	0.015	0	0
		-----	0.015	-----		
1903.46		-----	0.015	0.015	0	0
		-----	0.015	-----		
1817.25		-----	0.015	0.015	0	0
		-----	0.015	-----		
1731.04		-----	0.015	0.015	0	0
		-----	0.015	-----		
1644.83		-----	0.015	0.015	0	0
		-----	0.015	-----		
1558.62		-----	0.015	0.015	0	0
		-----	0.015	-----		
1500		-----	0.015	0.015	0	0
		-----	0.015	-----		
1481.51		-----	0.015	0.015	0	0
		-----	0.015	-----		
1437.01		-----	0.015	0.015	0	0
		-----	0.015	-----		
1392.52		-----	0.015	0.015	0	0
		-----	0.015	-----		
1348.02		-----	0.015	0.015	0	0
		-----	0.015	-----		
1303.53		-----	0.015	0.015	0	0
		-----	0.015	-----		
1259.03		-----	0.015	0.015	0	0
		-----	0.015	-----		
1214.54		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
1173.6		-----	0.015	0.015	0.01	0.03
		-----	0.015	-----		
1088.94		0.015	0.015	0.015	0.05	0.1
1000	Bridge-Up	0.04	0.015	0.015	0.05	0.1

		-----	-----	0.04		
1000	Bridge-Dn	0.04	0.015	0.015	0.05	0.1
		-----	-----	0.04		
926		0.015	0.015	0.015	0.05	0.1
914.02		0.015	0.015	0.015	0.05	0.1
702.71		0.02	0.015	0.02	0.1	0.3
444.5		0.02	0.015	0.02	0.1	0.3
223.47		0.02	0.015	0.02	0.1	0.3

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.015	0.04
Right Overbank n Value:	0.015	0.16
Channel n Value:	0.013	0.04
Contraction Coefficient:	0	0.3
Expansion Coefficient:	0	0.5

ROUGHNESS COEFFICIENT CHECK

RS: 8837.78
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8837.78
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 8807.78
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8807.78
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 8687.78
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8687.78
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 8200
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8200
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8200
NT RC 05 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 0.04
The overbank n values should be reevaluated.

RS: 8100
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8100
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8100
NT RC 05 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 0.04
The overbank n values should be reevaluated.

RS: 8000
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8000
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 8000
NT RC 05 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 0.04
The overbank n values should be reevaluated.

RS: 7900
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 7900
NT RC 01 Right overbank n value is less than 0.035

```
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7900
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7800
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7800
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7800
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7700
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7700
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7700
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7600
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7600
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7600
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7500
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7500
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7500
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7400
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7400
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7400
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7300
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7300
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7300
NT RC 05 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 0.04
          The overbank n values should be reevaluated.

RS:       7200
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       7200
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.
```

```
RS:      7200
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      7100
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      7100
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      7100
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      7000
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      7000
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      7000
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6925
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6925
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6868
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6868
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6868
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6736
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6736
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6736
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6577
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6577
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6577
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6500
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6500
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6500
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6500
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
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         The n value should be reevaluated.

RS:      6500
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6500
NT RC 05 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
         The overbank n values should be reevaluated.

RS:      6469
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6469
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6469
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6450
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6450
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6450
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6450
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6450
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6450
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6100
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6100
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6100
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6000
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6000
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6000
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      6000
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6000
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6000
NT RC 05 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 0.04
         The overbank n values should be reevaluated.

RS:      5917
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      5800
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NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      5800
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5800
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5796
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5796
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5776
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5776
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5737.74
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5737.74
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5648.42
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5648.42
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5548.82
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5548.82
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5449.23
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5449.23
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5449.11
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5449.11
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5399.11
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5399.11
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      5349.11
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
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RS: 5349.11
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5299.11
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5299.11
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5279.92
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5279.92
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5255.16
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5255.16
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5206.7
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5206.7
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5158.24
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5158.24
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5109.79
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5109.79
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5061.33
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5061.33
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 5012.88
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 5012.88
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 4945.04
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 4945.04
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 4863.36
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.

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         The n value should be reevaluated.

RS:       4863.36
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4781.68
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4781.68
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4700
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4700
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4600
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4600
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4500
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4500
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4425.69
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4425.69
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4350
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4350
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4275
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4275
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4200
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4200
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4127.25
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4127.25
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      4054.5
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NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4054.5
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3977.08
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3977.08
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3890.88
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3890.88
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3800
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3800
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3700
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3700
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3593.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3593.55
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3543.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3543.55
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3493.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3493.55
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3443.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3443.55
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3393.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3393.55
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.
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RS:      3295.98
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3295.98
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3198.41
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3198.41
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3100.84
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3100.84
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3050.84
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3050.84
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      3000.84
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3000.84
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2964.21
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2964.21
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2921.88
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2921.88
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2837.87
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2837.87
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2753.87
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2753.87
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2722.44
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2722.44
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
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          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2703.87
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2703.87
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2702.87
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2702.87
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2648.55
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2648.55
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2596.14
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2596.14
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2555.18
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2555.18
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2514.22
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2514.22
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2473.26
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2473.26
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2432.3
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2432.3
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2334.09
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2334.09
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       2235.88
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        2235.88
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NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2137.68
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2137.68
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2059.6
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2059.6
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      2020.16
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2020.16
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1981.53
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1981.53
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1903.46
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1903.46
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1817.25
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1817.25
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1731.04
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1731.04
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1644.83
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1644.83
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1558.62
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1558.62
NT RC 03 Channel n value is equal to or less than 0.025
         The n value of the channel is usually larger than 0.025.
         The n value should be reevaluated it if is not representing a
         concrete lined channel.

RS:      1500
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
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RS: 1500
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1481.51
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1481.51
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1437.01
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1437.01
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1392.52
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1392.52
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1348.02
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1348.02
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1303.53
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1303.53
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1259.03
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1259.03
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1214.54
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1214.54
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1173.6
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1173.6
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.
The n value should be reevaluated it if is not representing a
concrete lined channel.

RS: 1088.94
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1088.94
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 1088.94
NT RC 03 Channel n value is equal to or less than 0.025
The n value of the channel is usually larger than 0.025.

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          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       1088.94
NT RC 05 The left overbank n value of 0.015 and the right overbank n value
          of 0.015 are less than or equal to the channel n value of 0.015
          The overbank n values should be reevaluated.

RS:        1000
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:        1000
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       926
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       926
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        926
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       926
NT RC 05 The left overbank n value of 0.015 and the right overbank n value
          of 0.015 are less than or equal to the channel n value of 0.015
          The overbank n values should be reevaluated.

RS:       914.02
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       914.02
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        914.02
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       914.02
NT RC 05 The left overbank n value of 0.015 and the right overbank n value
          of 0.015 are less than or equal to the channel n value of 0.015
          The overbank n values should be reevaluated.

RS:       702.71
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       702.71
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        702.71
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

RS:       444.5
NT RC 01 Left overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:       444.5
NT RC 01 Right overbank n value is less than 0.035
          The n value for overbank is usually larger then 0.035.
          The n value should be reevaluated.

RS:        444.5
NT RC 03 Channel n value is equal to or less than 0.025
          The n value of the channel is usually larger than 0.025.
          The n value should be reevaluated it if is not representing a
          concrete lined channel.

TRANSITION LOSS COEFFICIENT CHECK
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RS:       6577
NT TL 01 This is section 3
          Contraction and expansion loss coefficients are 0.1 and 0.3
          They should be equal to 0.3 and 0.5 respectively.

RS:       6450
NT TL 01 This is section Bridge-Dn
          Contraction and expansion loss coefficients are 0.1 and 0.3
          They should be equal to 0.3 and 0.5 respectively.

RS:       6100
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NT TL 01 This is section 2
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      6000
NT TL 01 This is section Bridge-Up
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      6000
NT TL 01 This is section Bridge-Dn
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      5917
NT TL 01 This is section 3
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      5776
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5737.74
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5648.42
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5548.82
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5449.23
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5449.11
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5399.11
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5349.11
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5299.11
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5279.92
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5255.16
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5206.7
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5158.24
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5109.79
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5061.33
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      5012.88
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      4945.04
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS:      4863.36
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.
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RS: 4781.68
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4700
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4600
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4500
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4425.69
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4350
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4275
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4200
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4127.25
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 4054.5
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3977.08
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3890.88
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3800
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3700
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3593.55
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3543.55
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3493.55
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3443.55
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3393.55
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3295.98
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3198.41
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 3100.84
NT TL 02 Contraction and expansion loss coefficients are 0 and 0

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          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       3050.84
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       3000.84
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2964.21
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2921.88
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2837.87
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2753.87
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2722.44
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2703.87
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2702.87
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2648.55
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2596.14
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2555.18
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2514.22
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2473.26
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2432.3
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2334.09
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2235.88
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2137.68
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2059.6
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       2020.16
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.

RS:       1981.53
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
          respectively. However, this cross section is not at the structure.
          They should be equal to 0.1 and 0.3.
```

RS: 1903.46
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1817.25
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1731.04
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1644.83
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1558.62
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1500
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1481.51
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1437.01
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1392.52
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1348.02
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1303.53
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1259.03
NT TL 02 Contraction and expansion loss coefficients are 0 and 0
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 1214.54
NT TL 02 Contraction and expansion loss coefficients are 0.01 and 0.03
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

RS: 914.02
NT TL 02 Contraction and expansion loss coefficients are 0.05 and 0.1
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.

ROUGHNESS COEFFICIENT AT STRUCTURES

RS: 6450
NT RS 02 The channel n value of 0.04 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.04 at Section 3.
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

RS: 6450
NT RS 02 The channel n value of 0.04 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.04 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.

RS: 6000
NT RS 02 The channel n value of 0.04 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.04 at Section 3.
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

RS: 6000
NT RS 02 The channel n value of 0.04 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.013 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.

RS: 1000
NT RS 02 The channel n value of 0.015 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 3.
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

```
RS:      1000
NT RS 02 The channel n value of 0.015 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.015 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.

---END---
```

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.prj
Plan File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.p05
Geometry File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.g03
Flow File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.f04
Report File: F:\882\LOMR Dec 2011\LOMR 2007\Proposed Supercritical HECRAS Model\FWLomr_sup.xs
Selected profiles: 100-yr FIS
Date: 1/17/2012
Time: 1:42:10 PM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
FW,FW						
8837.78	30	30	30	50	5500	
8807.78	120	120	120	56.89	5500	C
8687.78	382.58	367.78	346.32	60.4	5500	C
8320	120	120	120	183.61	5500	C
8200	100	100	100	188.39	5500	
8100*	100	100	100	219.41	5500	
8000	100	100	100	254.62	5500	
7900*	100	100	100	264.66	5500	
7800	100	100	100	194.9	5500	C
7700*	100	100	100	304.92	5500	C
7600	100	100	100	283.98	5500	C
7500*	100	100	100	292.2	5500	
7400	77.52	100	117	312.04	5500	
7300*	77.52	100	117	282.87	5500	
7200	69	100	115.52	228.94	5500	C
7100*	69	100	115.52	171.09	5500	
7000	100	100	100	162.49	5500	
6925	Bridge #1-Up					
6925	Bridge #1-Dn					
6868*	100	100	100	221.67	5500	
6736	190	159	150	279.06	5500	
6577	108	108	108	353.04	5500	
6500	Culvert #1-Up					
6500	Culvert #1-Dn					
6469	328.1	369.09	389.1	205.61	5500	D
6450	Bridge #1-Up					
6450	Bridge #1-Dn					
6100	225.1	195	182.1	394.17	5500	
6000	Bridge #1-Up					
6000	Bridge #1-Dn					
5917	121	121	121	307.79	5500	D
5800	Culvert #1-Up					
5800	Culvert #1-Dn					
5796	20	20	20	56.3	5280	C
5776	38.26	38.26	38.26	79.77	5280	C
5737.74	89.32	89.32	89.32	79.77	5280	C
5648.42	99.6	99.6	99.6	75	5280	C
5548.82*	99.59	99.59	99.59	75	5280	C
5449.23	0.12	0.12	0.12	75	5280	C
5449.11	50	50	50	75	5280	C
5399.11	50	50	50	67.61	5280	C
5349.11	50	50	50	60.22	5280	
5299.11	19.19	19.19	19.19	52.84	5280	
5279.92	24.76	24.76	24.76	50	5280	C
5255.16	48.46	48.46	48.46	50	5280	C
5206.7	48.46	48.46	48.46	50	5280	C
5158.24	48.45	48.45	48.45	50	5280	
5109.79	48.46	48.46	48.46	50	5500	C
5061.33	48.45	48.45	48.45	50	5500	C
5012.88	67.84	67.84	67.84	50	5500	C
4945.04	81.68	81.68	81.68	50	5500	C
4863.36	81.68	81.68	81.68	50	5500	C
4781.68	81.68	81.68	81.68	50	5500	C
4700	100	100	100	50	5500	C
4600	100	100	100	50	5500	C
4500	74.31	74.31	74.31	50	5500	C
4425.69	75.69	75.69	75.69	50	5500	C
4350	75	75	75	50	5500	C
4275*	75	75	75	50	5500	C
4200	72.75	72.75	72.75	50	5500	C
4127.25*	72.75	72.75	72.75	50	5500	C
4054.5*	77.42	77.42	77.42	50	5500	C
3977.08	86.2	86.2	86.2	50	5500	C
3890.88*	90.88	90.88	90.88	50	5500	C
3800	100	100	100	50	5500	C
3700*	106.45	106.45	106.45	50	5500	C
3593.55	50	50	50	50	5500	C
3543.55	50	50	50	45.75	5500	
3493.55	50	50	50	41.5	5500	
3443.55	50	50	50	37.25	5500	
3393.55	97.57	97.57	97.57	33	5500	C
3295.98	97.57	97.57	97.57	33	5500	C
3198.41	97.57	97.57	97.57	33	5500	C
3100.84	50	50	50	33	5500	C
3050.84	50	50	50	33	5500	C
3000.84	36.63	36.63	36.63	33	5500	C
2964.21	42.33	42.33	42.33	33	5500	C
2921.88	84.01	84.01	84.01	33	5500	C
2837.87*	84	84	84	33	5500	C
2753.87	31.43	31.43	31.43	33	5500	C
2722.44*	18.57	18.57	18.57	33	5500	C
2703.87	1	1	1	33	5500	C
2702.87	54.32	54.32	54.32	33	5500	D,C
2648.55	52.41	52.41	52.41	50	5500	C
2596.14	40.96	40.96	40.96	50	5500	C
2555.18	40.96	40.96	40.96	50	5500	C
2514.22	40.96	40.96	40.96	50	5500	C
2473.26	40.96	40.96	40.96	50	5500	C
2432.3	98.19	98.19	98.19	50	5500	C
2334.09*	98.21	98.21	98.21	50	5500	C
2235.88*	98.2	98.2	98.2	50	5500	C

2137.68	78.1	78.1	78.1	50	5500	C
2059.6*	39.44	39.44	39.44	50	5500	C
2020.16	38.63	38.63	38.63	50	5500	C
1981.53*	78.1	78.1	78.1	50	5500	C
1903.46	86.21	86.21	86.21	50	5500	C
1817.25*	86.21	86.21	86.21	50	5500	C
1731.04*	86.21	86.21	86.21	50	5500	C
1644.83*	86.21	86.21	86.21	50	5500	C
1558.62	58.62	58.62	58.62	50	5800	C
1500	18.49	18.49	18.49	50	5800	
1481.51	44.5	44.5	44.5	50	5800	C
1437.01	44.49	44.49	44.49	50	5800	C
1392.52	44.5	44.5	44.5	50	5800	C
1348.02	44.49	44.49	44.49	50	5800	C
1303.53	44.5	44.5	44.5	50	5800	C
1259.03	44.49	44.49	44.49	50	5800	C
1214.54	40.94	40.94	40.94	50	5800	
1173.6	84.66	84.66	84.66	50	5800	
1088.94	174	174	174	96.78	5800	
1000	Bridge #1-Up					
1000	Bridge #1-Dn					
926	11.98	11.98	11.98	73.45	5800	
914.02*	397.98	413.98	419.98	64.39	5800	
702.71	251.59	258.21	262.14	66.6	5800	C
444.5	229.09	221.03	213.86	154.07	5800	E,C
223.47	0	0	0	136.04	5800	D,C

B=blocked obstruction
C=critial depth
D=divided flow
E=cross section extended
K=known water-surface

XS SC 05
XS SC 03
XS SC 01
XS SC 02
XS SC 04

DISTANCE CHECK

SPACING CHECK

XS SP 02 This is an interpolated cross section.
Interpolation of the cross sections should be performed only when all of the following conditions are met.
Change in velocity head > 0.5
Conveyance Ratio < 0.7 or Conveyance Ratio > 1.4
Hydraulic Depth Ratio < 0.9 or Hydraulic Depth Ratio > 1.1
Top Wdth Act Ratio < 0.5 or Top Wdth Act Ratio > 2.0
Length Chnl Up / 500 > 1.1
Please review the file with no interpolation and select the cross sections that meet the above criteria to consider interpolation.
The following is the list of interpolated cross section:

FW,FW
8100
7900
7700
7500
7300
7100
6868
5548.82
4275
4127.25
4054.5
3890.88
3700
2837.87
2722.44
2334.09
2235.88
2059.6
1981.53
1817.25
1731.04
1644.83
914.02

INEFFECTIVE FLOW CHECK

RS: 7800
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements for levees are met.

RS: 6736
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements for levees are met.

RS: 926
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements for levees are met.

DISCHARGE CHECK

RS: 5796
XS DC 01 Discharge decreases in the downstream direction.

RS: 5796
XS DC 03 Discharge is different between the upstream side and downstream side of the structure

LOCATION CHECK

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is FW,FW
Normal S = 0.01 is specified as the downstream boundary
for profile 100-yr FIS

XS BC 02 The name of the stream is FW,FW
Normal S = 0.0087 is specified as the upstream boundary
for profile 100-yr FIS

XS BC 03 Maximum number of iterations is 0
It should not be less than 20.

LATERAL WEIRS CHECK

---END---

Flamingo Wash Spencer Street to Desert Inn Road Improvement Plans

Appendix D

Clark County Public Works
Flamingo Wash, Desert Inn Road to Eastern Avenue
Bid No. 601462-09 Project No. F990813A

This is to certify as-built conditions for the Clark County Public Works project, Flamingo Wash, Desert Inn Road to Eastern Avenue, Bid No. 601462-09 and Project No. F990813A. Based on field assessment the improvements, concrete channel, maintenance ramps, modification to existing facilities and associated slope protection appear to have been constructed in substantial conformance with the improvement plans prepared by The Louis Berger Group, Inc., dated March 16, 2009. The channel and associated improvements are in place and functioning.

Chad McDermott, P.E.
Resident Project Engineer
HDR Engineering, Inc.



CD ROM

Flamingo Wash at Spencer Street LOMR

- Flamingo Wash at Spencer Street LOMR Post Project Conditions HECRAS Model
- Flamingo Wash at Spencer LOMR Workmap

Flamingo Wash at Mojave Road to Boulder Highway LOMR

- Flamingo Wash at Mojave Road to Boulder Highway LOMR Post Project Conditions HECRAS Model
- Flamingo Wash at Mojave Road to Boulder Highway LOMR Workmap

Proposed Hydraulic Model

- Proposed Subcritical HECRAS Model
- Proposed Supercritical HECRAS Model
- CHECKRAS Output Files
- Hydraulic Workmap

Appendix E