AMENDMENT NO. 1 TO THE FINAL REPORT FOR REQUEST FOR LETTER OF MAP REVISION PULSIPHER WASH ADJACENT TO FALCON RIDGE PARKWAY

CASE NO.: 06-09-B051P

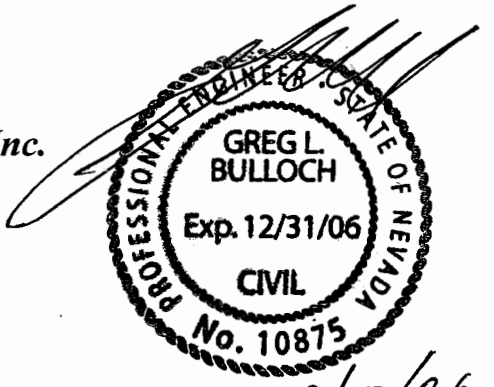
LOCATED IN: MESQUITE, CLARK COUNTY, NEVADA

Submitted to:

FEMA Map Coordination Contractor
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304-6425

Submitted by:

Bulloch Brothers Engineering, Inc.
750 West Pioneer Boulevard
Mesquite, Nevada 89027



2/17/06

February 2006

APPENDIX G

1. Review comments and response letter G1
2. Revised Table 3 ..... G2
3. Revised Table 4 ..... G3
4. Public Notice Information G5
5. Revised Post Projects HEC-RAS Model G9
6. Floodway Model HEC-RAS Model G54
7. Revised Figure 2 Annotated FEMA Flood Zone Map ..... Back
8. Revised Figure 3 Post Projects HEC-RAS Cross-Section Exhibit ..... Back
9. Revised Figure 4 Post Projects HEC-RAS Cross-Section Exhibit ..... Back
10. Data CD ..... Back

BULLOCH BROTHERS ENGINEERING
ENGINEERS ★ SURVEYORS ★ LAND PLANNERS
Established in 1972

FEMA Map Coordination Contractor
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304-6425

February 16, 2006

Regarding: **Amendment No. 1 to the Final Report for Request for Letter of Map Revision Pulsipher Wash Adjacent to Falcon Ridge Parkway**

Case No.: 06-09-B051P
Community: City of Mesquite, NV
Community No.: 320035

Please find submitted for your review a copy of this report entitled, *Amendment No. 1 to the Final Report for Request for Letter of Map Revision Pulsipher Wash Adjacent to Falcon Ridge Parkway.*

The previously submitted hydraulic models and drawings for the above-referenced project indicated the existing regulatory floodway Zone AE remain unchanged. Preliminary review comments indicated that a hydraulic analysis with encroached conditions must be provided to demonstrate the effect of the revised conditions on the regulatory floodway. An encroached conditions model has been run on the floodway using the limits of the revised flood plain as the west boundary of the floodway with the east boundary remaining unchanged.

Upon analysis of the floodway run, it was determined that cross section 2100 had not been revised from the Duplicate Effective HEC-RAS model. Therefore, the Post Projects HEC-RAS model was re-analyzed using the correct information for cross section 2100. Tables 3 and 4 from the Final Report have been revised with bold text representing revised cross-section Base Flood Elevations (BFE's). A copy of the revised Post Projects HEC-RAS model, encroached conditions model and revised Figures 2-4 are included with this report.

The City of Mesquite has run an add in the public notice section of the Las Vegas Review Journal and Desert Valley Times (Mesquite Paper) regarding flood plain and floodway revisions. Also, the City of Mesquite has written a letter stating that legal notice has been run in these newspapers on the dates specified. Included with this report are copies of the adds and the letter from the City of Mesquite.

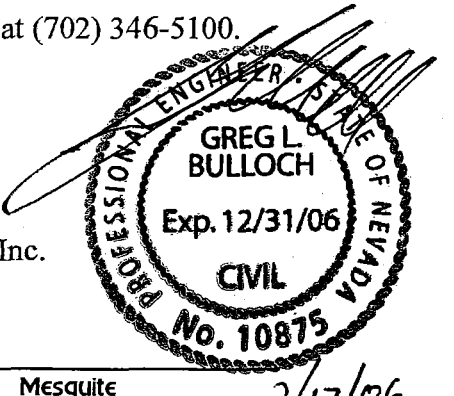
Should there be any questions or need additional information, please call us at (702) 346-5100.

Sincerely,

Lance Henrie, E.I.
Bulloch Brothers Engineering, Inc.

Reviewed by:

Greg L. Bulloch, P.E.
Bulloch Brothers Engineering, Inc.



2/17/06

Cedar City
P.O. Box 3174
Cedar City, UT 84721-3174
435.586.9592
435.586.4995 Fax

Pleasant Grove
1909 W. State Street, Suite 200
Pleasant Grove, UT 84062
801.763.8467
801-763-8472 Fax

Mesquite
750 W. Pioneer Blvd.
Mesquite, NV 89027
702.346.5100
702.346.5102 Fax

Table 3. Comparison of Duplicate Effective and Post Projects Models

Station[1]	Duplicate Effective HEC-RAS Model BFEs (ft)[2]	Post Projects HEC-RAS Model BFEs (ft)[2]	Difference (ft)
3900	1658.80	1658.78	-0.02
3800	1656.25	1655.66*	-0.59
3700	1650.06	1650.90	0.84
3500	1642.10	1641.86*	-0.24
3400	1639.17	1638.96*	-0.21
3300	1631.36	1638.19	6.83
3200	1627.54	1627.27	-0.27
3100	1624.66	1621.47	-3.19
3000	1620.68	1622.61	1.93
2900	1618.65	1618.87*	0.22
2800	1615.32	1616.65*	1.33
2700	1612.56	1612.77*	0.21
2500	1606.35	1605.42	-0.93
2400	1604.97	1604.77	-0.20
2330	1605.33	1605.15	-0.18
2300	1605.34	1605.37	0.03
2200	1605.37	1605.41	0.04
2100	1605.30	**1605.32**	**0.02**
2000	1598.84 [3]	1598.84 [3]	0.00
1900	1592.10	1592.09	-0.01

[1] The proposed Flood Zone 'A' ties into the existing Flood Zone 'A' at Stations 3900 and 2100. Stations 2200 through 3800 were revised to reflect post-projects conditions.
[2] Elevations shown are based on NGVD 29 benchmark.
[3] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.
* Critical depth used where supercritical flows occur in natural channel.

The downstream end of the post-projects model ties into the effective FIS model at Station 2100, with a BFE equal to 1605.32 (0.10' higher than the effective FIS HEC-2 model; 0.02' higher than the duplicate effective HEC-RAS model).

Table 4. Post Projects Model Results in NGVD29 and NAVD88.

Station	Post Projects HEC-RAS Model BEEs (ft) (NGVD29)	Post Projects HEC-RAS Model BEEs(ft) (NAVD88)	Difference (ft)
3900	1658.78	1661.62	2.84
3800	1655.66*	1658.50	2.84
3750	1652.75	1655.59	2.84
3700	1650.90	1653.74	2.84
3620	1647.35*	1650.19	2.84
3580	1646.24*	1649.08	2.84
3500	1641.86*	1644.70	2.84
3480	1641.11	1643.95	2.84
3400	1638.96*	1641.80	2.84
3375	1638.46	1641.30	2.84
3350	1638.45	1641.29	2.84
3325	1638.45	1641.29	2.84
3300	1638.19	1641.03	2.84
3280	1637.68	1640.52	2.84
3270	1634.72	1637.56	2.84
3260	1633.09	1635.93	2.84
3240	1630.85	1633.69	2.84
3220	1629.00	1631.84	2.84
3200	1627.27	1630.11	2.84
3175	1625.63	1628.47	2.84
3150	1624.01	1626.85	2.84
3125	1622.42	1625.26	2.84
3100	1621.47	1624.31	2.84
3080	1621.20	1624.04	2.84
3070	1623.90*	1626.74	2.84
3025	1622.99*	1625.83	2.84
3000	1622.61	1625.45	2.84
2970	1621.58	1624.42	2.84
2935	1620.22*	1623.06	2.84
2900	1618.87*	1621.71	2.84
2870	1618.37*	1621.21	2.84
2835	1617.27*	1620.11	2.84
2800	1616.65*	1619.49	2.84
2770	1615.08*	1617.92	2.84
2735	1614.59*	1617.43	2.84
2700	1612.77*	1615.61	2.84

2670	1613.14	1615.98	2.84
2660	1612.96	1615.80	2.84
2650	1612.70	1615.54	2.84
2590	1608.50	1611.34	2.84
2570	1607.94*	1610.78	2.84
2550	1606.60*	1609.44	2.84
2500	1605.42	1608.26	2.84
2400	1604.77	1607.61	2.84
2330	1605.15	1607.99	2.84
2300	1605.37	1608.21	2.84
2200	**1605.40**	**1608.24**	2.84
2120	**1605.37**	**1608.21**	2.84
2100	**1605.32**	**1608.16**	2.84
2000	1598.84 [2]	1601.68 [2]	2.84
1900	1592.09	1594.93	2.84

[1] The conversion factor to raise NGVD29 to North American Vertical Datum of 1988 (NAVD88) is +2.84 feet.
[2] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.
* Critical depth used where supercritical flows occur in natural channel.

Table 5. Floodway Model Results in NGVD29 and NAVD88.

Station	Floodway HEC-RAS Model WSELs (ft) (NGVD29)	Floodway HEC-RAS Model WSELs (ft) (NAVD88)	Difference (ft)
2300	1606.32	1609.16	2.84
2200	1606.32	1609.16	2.84
2120	1606.33	1609.17	2.84
2100	1606.27	1609.11	2.84
2000	1598.84 [2]	1601.68 [2]	2.84
1900	1592.05	1594.89	2.84

[1] The conversion factor to raise NGVD29 to North American Vertical Datum of 1988 (NAVD88) is +2.84 feet.
[2] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.

City of Mesquite
Nevada
"Come for a Day ... Stay for a Lifetime"

OFFICE OF THE CITY ENGINEER and ECONOMIC DEVELOPMENT
Allen Bell, *Director*
10 East Mesquite Boulevard
Mesquite, Nevada 89027
(702) 346-5295 Fax: (702) 346-2795
abell@ci.mesquite.nv.us

February 17, 2006

FEMA Map Coordination Contractor
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 223 04-6425

RE: Request for Letter of Map Revision,
Pulsipher Wash Adjacent to
Falcon Ridge Parkway

Case No.: 06-09-B051P
Community: City of Mesquite, NV
Community No.: 320035

Dear Sir:

This letter is to confirm that legal notices appeared in the Desert Valley Times and the Las Vegas Review Journal on February 10, 2006 concerning the above referenced LOMR.

If you have any questions or concerns, please call me.

Sincerely,

Allen Bell, P. E.
City Engineer
Director of Engineering and
Economic Development

Cc: Kevin Eubanks, Clark County Regional Flood Control District
Lance Henrie, Bulloch Brothers Engineering

AFFP DISTRICT COURT
Clark County, Nevada

AFFIDAVIT OF PUBLICATION

STATE OF NEVADA)
COUNTY OF CLARK) SS:

Donna Stark, being 1st duly sworn, deposes and says:
That she is the Legal Clerk for the Las Vegas Review-Journal and the Las Vegas Sun, daily newspapers regularly issued, published and circulated in the City of Las Vegas, County of Clark, State of Nevada, and that the advertisement, a true copy attached for,

BULLOCH BROS ENGINEERING INC
4495940

was continuously published in said Las Vegas Review Journal and/or Las Vegas Sun in 1 edition(s) of said newspaper issued from 02/12/2006 to 02/12/2006, on the following days: FEB. 12, 2006

Signed: Donna Stark

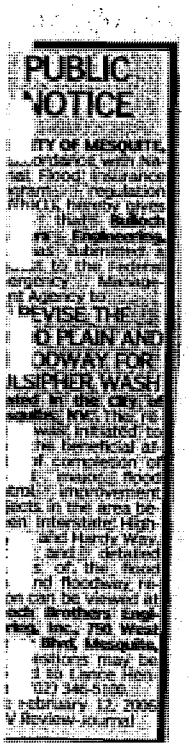
SUBSCRIBED AND SWORN BEFORE ME THIS THE 14

day of February 2006

Mary B. Sheffield

Notary Public

MARY B. SHEFFIELD
Notary Public State of Nevada
No. 99-53968-1
My appt. exp. Mar. 8, 2007


PUBLIC
NOTICE

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D, ADOPTED AND
VED this 7th day
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Y: SHIRLEY B.
AGUIRRE
County Clerk
PPROVED AS
TO FORM:
GER, DISTRICT
ORNEY
E THOMSON
Deputy
rict Attorney

COUNTY, NEVA-
AND OF COUNTY
SSIONERS
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contact Darla
Aviation Contract
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uary 12, 2006
ew-Journal

Las Vegas-Clark County
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those operators who meet a specified list of requirements. To qualify for this yearly permit, an operator must:

1) Have commercial equipment which meets National Sanitation Foundation International (NSFI) or equivalent standards,
2) Have portable handsink equipped with soap and paper towels, and
3) Prepare only low risk/non-PHFs.

Interested persons may appear at the PUBLIC HEARING and present their views thereon. Written comments will also be considered by the Clark County District Board of Health and must be forwarded by March 2, 2006 to Steven J. Goode, Environmental Health Manager, Environmental Health Division, Clark County Health District, P. O. Box 3902, Las Vegas, NV 89127.

Glenn D. Savage,
Environmental Health
Director
Environmental Health
Division, CCHD
Date: 2/2/06

Prior to the above PUBLIC HEARING before the District Board of Health on March 23, 2006, there will be WORKSHOPS for the public to present its views on the two proposed fees.

1. February 23, 2006, Thursday, 10:00 a.m. to 12:00 noon, Mesquite City Hall, Training Rooms A & B (upstairs), 10 East Mesquite Blvd, Mesquite, NV 89021
2. February 27, 2006, Monday, 10:00 a.m. to 12:00 noon, Regional Government Center, Room 2, 101 Civic Way, Laughlin, NV 89029
3. March 2, 2006, Thursday, 10:00 a.m. to 12:00 noon, Clark County Health District Ravenholt Public Health Center, Clemens Room, 625 Shadow Lane, Las Vegas, NV 89106
PUB: February 12, 2006
LV Review-Journal

HOUSING AUTHORITY OF THE CITY OF LAS VEGAS

NOTICE
OF REQUEST FOR PROPOSALS
RFP No. P06007
SECURITY GUARD SERVICES

LVHA CONTACT PERSON
Michael Gifford, C.P.M.,
Purchasing Manager
Telephone
702/386-2973,
TDD 702/386-0789

HOW TO OBTAIN THE RFP DOCUMENTS ON THE APPLICABLE INTERNET SITE
1. Access www.haclv.org
2. Click on the "BIDS/RFP'S" icon on left side and follow the directions.
3. Problems accessing system or registering? Call customer support, 1/866/526-9266.

PRE-PROPOSAL CONFERENCE
Thursday, 2/23/06, 2:00 p.m.,
340 N. 11th Street, LV, NV 89101

PROPOSAL SUBMITTAL RETURN
LVHA Contracts & Purchasing Office
340 N. 11th Street, Suite 180, LV, NV 89101

PROPOSAL SUBMITTAL DEADLINE
Thursday, 3/16/06, 4:00 p.m.

[Minority- and/or women-owned businesses are encouraged to respond]

PUB: February 12, 2006
LV Review-Journal

DA, herein called "LVHA," will receive sealed bids from General Contractors for the following work:

Provide labor and material to complete the Rehabilitation of Three Fire Damaged Apartments (NV39002010 /61/14) of the Housing Authority of the City of Las Vegas. Refer to Scope of Work (SOW) in the bid package for specific work items. Labor rates in accordance with Davis Bacon General Decision #NV030006, Residential, Modification #2, 2/11/2005.

until **3:00 p.m. local time, Friday, Feb 24, 2006,** at the LVHA's Contracts & Purchasing Office, 340 N 11th Street, Las Vegas, Nevada, 89101. At 3:00 p.m., proposals will be opened publicly and read aloud at the same office at **340 N 11th Street, Las Vegas, Nevada 89101.**
2. Copies of the Contract Documents may be examined or obtained at the LVHA's Contracts & Purchasing Office at 340 N 11th Street, Suite #180, Las Vegas, NV 89101. Please direct any technical questions regarding the bid documents to the attention of Mark Diaz, Contracts & Purchasing, at (702) 922-7030 or TDD (702) 386-0789.
3. Please direct any technical questions regarding the bid documents to the attention Mark Diaz, Contracts & Purchasing, at (702) 922-7030 or TDD (702) 386-0789.
4. The LVHA encourages Women, Minority and Disabled Veteran Owned firms to apply.
5. Each bid submitted must be accompanied by either: (a) a certified check or bank draft, payable to the Housing Authority of the City of Las Vegas, Nevada; U. S. Government Bonds; or (b) a satisfactory bid bond executed by the bidder and acceptable sureties in an amount equal to five percent (5%) of the bid. The successful bidder will be required to furnish and pay for satisfactory performance and payment bonds.
6. Award will be made to the responsive and responsible low bidder who submits the low bid that meets all requirements of the conditions and Form of Bid, General Requirements, and Contract requirements.
7. A Pre-Bid conference will be held on **Thursday, Feb 16, 2006, 1:00 pm.** All prospective bidders should attend. The purpose is to consider prospective bidders concerns. Attendance is not mandatory.
8. Bidder must be a duly licensed contractor in the State of Nevada for the category of work included. Bidder must also be licensed to do business in the City of Las Vegas.
9. The LVHA reserves the right to reject any and or all bids at any time during the bid process, or waive any informalities in the bidding.

HOUSING AUTHORITY OF THE CITY OF LAS VEGAS
Parviz Ghadiri,
Executive Director
PUB: Feb. 12, 2006
LV Review-Journal

BID NOTICE
FCI Constructors, a General Contractor, will be bidding the

PUB: Feb. 6, 9, 12, 16, 2006
LV Review-Journal

LEGAL NOTICE

Notice is hereby given that on the 23RD DAY OF FEBRUARY 2006, AT 5:30 P.M. in the Board Room at the Education Center of the Clark County School District at 2832 East Flamingo Road, Las Vegas, Nevada, the Board of School Trustees will be holding a public hearing to REVIEW THE DISTRICT'S APPLICATION FOR FEDERAL IMPACT AID (P.L. 103-382).

Copies of the discussion item are available for inspection in the Grants Development and Administration Department of the Clark County School District at the above address.

BOARD OF SCHOOL TRUSTEES
Clark County School District
Susan Brager-Wellman, Clerk
PUB: February 12, 2006
LV Review-Journal

ATTN:
CORPORATIONS
doing business in Nevada

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pursuant to NRS 80.190

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HOUSING AUTHORITY OF THE CITY OF LAS VEGAS

NOTICE
OF REQUEST FOR PROPOSALS
RFP No. P06006
HAZARDOUS MATERIALS CONSULTING SERVICES

LVHA CONTACT PERSON
Michael Gifford, C.P.M.,
Purchasing Manager
Telephone
702/386-2973,
TDD 702/386-0789

HOW TO OBTAIN THE RFP DOCUMENTS ON THE APPLICABLE INTERNET SITE
1. Access www.haclv.org
2. Click on the "BIDS/RFP'S" icon on left side and follow the directions.
3. Problems accessing system or registering? Call customer support, 1/866/526-9266.

PRE-PROPOSAL CONFERENCE
Wednesday, 2/22/06, 2:00 p.m.,
340 N. 11th Street, LV, NV 89101

PROPOSAL SUBMITTAL RETURN
LVHA Contracts & Purchasing Office
340 N. 11th Street, Suite 180, LV, NV 89101

PROPOSAL SUBMITTAL DEADLINE
Wednesday, 3/15/06, 4:00 p.m.

[Minority- and/or women-owned businesses are encouraged to respond]

PUB: February 12, 2006
LV Review-Journal

to satisfy themselves as to all general and local conditions that may affect the cost of performance of the contract to the extent such information is reasonably obtainable. In no event will a failure to inspect the site constitute grounds for withdrawal of a bid after opening or constitute grounds for a claim after contract award.

A bid guarantee in the form of a certified check or bank draft payable to the Owner, irrevocable letter of credit, U. S. Government bonds, or a satisfactory bid bond executed by the bidder in an amount equal to five percent (5%) of the bid, is required to be submitted with each bid. An itemized cost breakdown, separating materials and labor, is required with the bid proposal.

The contract will be awarded to the lowest responsive and responsible bidder whose bid does not exceed the amount of funds estimated by the Owner to be available for construction of the project, subject to any applicable Indian Preference requirements. Only bids meeting all the bid requirements included herein shall be considered for award. In the event that the lowest bidder is not awarded a contract, a dissenting contractor has 48 hours in which to file a written complaint.

Bids will be immediately opened and read aloud after the deadline for bid receipt, and taken under advisement for review. Bids may not be withdrawn for a period of 60 days following the opening of bids without the consent of the Owner.

Award of this contract is subject to a determination by the U.S. Department of Housing and Urban Development (HUD) that the contractor is eligible to contract for federally funded activities.

BIDDERS are to base their BIDS on the project funding being provided in whole or in part by Indian Community Development Block Grant funds which may require review and approve the contract award, contract agreement, partial and final payments, and CONTRACT CHANGE ORDERS. Payment and retainage will comply with the section of the general conditions entitled "Payment to Contractor." BIDDERS are notified that this CONTRACT does not permit retainage to be invested for the benefit of the CONTRACTOR.

BIDDERS are notified of the requirement for affirmative action to ensure equal employment opportunity (Executive Order No. 11246) as set forth in the Equal Opportunity Requirements. If BID amount exceeds $10,000, a completed and executed Compliance Statement/Certifications of Nonsegregated Facilities (RD 400-6) must be submitted with the BID.

If BID amount exceeds $25,000, a signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions (AD-1048) must be submitted with the BID.

If BID amount exceeds $100,000, a signed RD Instruction 1940-Q, Exhibit A-1, Certification for Contracts, Grants and Loans must be submitted with the BID.

TIMBISHA SHOSHONE TRIBE
PUB: Jan. 22, 29, Feb. 5, 12, 2006 LV Review-Journal

DOCUMENT #00020

Bidders will be required to provide a Security Deposit in the form of a Bid Bond, issued by a surety company licensed to do business in the State of Nevada and acceptable to the Owner or certified check. Bid bond or certified check shall be in the sum of five percent (5%) of the project.

Bids must be submitted on the Bid Form provided in the Bid Documents and shall be irrevocable for a period of sixty (60) days after bid closing.

Bids shall be on a lump sum basis, submitted on the provided Bid Form.

The Owner reserves the right to accept or reject any or all offers and to waive irregularity in the bidding and accept the bid which is determined by the Owner to be in his own best interest.

The Clark County School District is an equal opportunity employer and will not knowingly discriminate in any area of employment.

The Clark County School District invites all businesses which includes women-owned, minority-owned, and disadvantaged business enterprise companies to participate in our bidding process.

PUB: Feb. 12, 15, 2006
LV Review-Journal

PUBLIC NOTICE

THE CITY OF MESQUITE, in accordance with National Flood Insurance Program regulation 65.7(b)(1), hereby gives notice that: **Bulloch Brothers Engineering, Inc.,** has submitted a request to the Federal Emergency Management Agency to

REVISE THE FLOOD PLAIN AND FLOODWAY FOR PULSIPHER WASH

located in the City of Mesquite, NV. The request was initiated to show the beneficial affects of completion of several major flood control improvement projects in the area between Interstate Highway 15 and Hardy Way. Maps and detailed analysis of the flood plain and floodway revision can be viewed at **Bulloch Brothers Engineering, Inc., 750 West Pioneer Blvd, Mesquite, NV.** Questions may be directed to Lance Henrie at (702) 346-5100.
PUB: February 12, 2006
LV Review-Journal

The Henry Brent Company
dba as
Lady Luck Casino - Las Vegas

ANNOUNCES THE DISCONTINUANCE OF ALL CASINO CHIPS AND TOKENS EFFECTIVE FEBRUARY 11, 2006
Redemption of all $1, $5, $25, $100, $500 and $1,000 casino chips and $1, $2, $5, and $25 tokens issued by the Lady Luck Casino will be conducted at the casino cage of the Fitzgeralds Casino, 301 E. Fremont Street Las Vegas, Nevada 89101 24 hours per day through June 11, 2006.

PUB: February 12, 15, 19, 22, 26, 2006
LV Review-Journal

CLARK COUNTY NEVADA INTERNATIONAL • AIRPORT

NOTICE IS HEREBY GIVEN, t
County, Nevada, will receive sealed
for the Distributed Antenna Syster
McCarran International Airport.
The responses must be time-
2006. Proposal Forms time-stamp
and will be returned to respondent.
All responses must be submit
which can be obtained beginning
Contract Specialist, Business &
International Airport, Clark County
Nevada 89111, Telephone: (702) 2
All responses must be submitt
floor reception area at the Airpor
"REQUEST FOR PROPOSAL: F
Technical Services Concession
respondent in the upper left-hand c
This Request for Proposal (RF
Statute 496.090 which states: "the
enter into any such contracts, lea
provided in this section,...upon such
proper." The material to be supplie
purposes only and does not, in any
as such. The Board of County Co
agreement with any of the responde
The County reserves the right
may request that proponents supp
County.

PUB: February

NOTICE OF REAL

The real properties listed below as trustee and **will be sold at p** "Amount Due" shown includes to date, and must be received 5:00 p.m. After March 22, 200 costs of advertising the auctio cashier's check or money orde After March 29, 2006, those pr reconveyed. NOTE: Additions official advertisement of the auc

Parcel Number	Last Known
040-13-301-016	KELLER J M
071-11-601-017	WEST DESERT PROPE
128-31-110-030	LAWS CHLOE C
129-02-410-004	LEE CANYON ENTERPI
129-02-410-006	LEE CANYON ENTERPI
138-13-110-004	VAUGHN MICHAEL R &
138-26-812-002	WILCOX STEPHEN D
138-26-813-012	DIAZ ROSARIO & CHRI
138-35-312-102	GROVER FAMILY TRUS
138-35-617-001	CLUCAS GISELLE M
139-06-710-067	TARNOCI STEVE & SH
139-16-610-131	SANTOS ALEXANDER
139-16-710-055	BROTHERS GRACE
139-16-811-027	BROWN JOHN A
139-21-610-030	KLINE GABRIEL
139-21-710-003	RODGERS LETTIE V
139-22-112-019	HENDERSON LESSIE
139-22-310-094	CHANEY JOYCELYN
139-23-712-024	NESMITH ELIGAH E &
139-24-315-037	FEY THOMAS J
139-24-414-036	BURBANK STANLEY D
139-26-610-104	MARTINEZ ADOLFO &
139-27-210-123	CRISP RUSSELL & ELL
139-27-310-041	TROTTER MAURICE
139-28-110-046	JONES WALTER
139-30-515-006	CELESTE ANTHONY N
139-35-412-004	CUPICH JOSE & YOLA
140-05-702-001	FERRARI JAMES M &
140-05-702-002	FERRARI JAMES M &
140-15-414-131	GRIMES BETTE A
140-19-410-112	MOON ROBERT R
140-19-410-122	CAMPOLI CYNTHIA AN
140-21-510-041	RIFFE CHARLES A TR
140-21-510-125	HILL LYNDA SUE
140-21-610-043	GUERRERO ALFONSO
140-30-214-009	YEPEZ JORGE T & MA
140-30-310-001	BIVINS CONST CO INC
140-30-310-002	BIVINS CONST CO INC
140-30-310-003	BIVINS CONST CO INC
140-30-310-004	BIVINS CONST CO INC
140-30-310-005	BIVINS CONST CO INC
140-30-310-006	BIVINS CONST CO INC

550 - CONDOS/TOWNHOMES FOR RENT

STUDIO APT/SUITES with new décor, appliances, carpet/tile. Nicely furnished with linens and all. Upper & lower units w/views, or pool side. Includes utilities, cable, covered parking, pool, jacuzzi, and laundry. Pets on approval. Best location, steps to Oasis and Casablana Resorts.
Legendary Golf courses. Avail now short or long term $550-$750 month. Call for appt. 808-781-4575, 619-850-9866 or toll free 800-769-0398.

575 - MOBILE HOMES/PARK MODELS FOR RENT

SINGLE WIDE 2 bedroom, 1 bath in Beaver Dam, 2 car garage, fenced yard, all utilities included $800. a month. Call (702)346-8643.

SPACES AVAILABLE
Mobile Home Lots Available
In the Virgin Valley Mobile
Home Park:
Singles & Doubles
$270/Month Includes
Sewer & Trash
Dogs Permitted
Great Neighbors
Quiet & Peaceful
For More Information
Call 702-346-5640

600 - COMMERCIAL FOR RENT

COMMERCIAL OFFICE
Space available for lease. New Office bldg in Falcon Mesa Business Park. 8,000 sq. ft. of space available. For leasing information call REMAX Ridge Realty Michael Glieden (702)346-7800, Cell (702)300-3305.

COMMERCIAL OFFICE SPACE AVAILABLE New office Bldg in the Redd Hills Business Park. 3000 sq. ft. of space available. For lease information. Please call REMAX Ridge Realty Leasing Agent: Michael R. Glieden, LLC Office: (702)346-7800 Cell: (702)300-3305.

708 - APPLIANCES

New Today!

AMANA WHITE Refrigerator-freezer with ice maker and water filter. Excellent like new condition. $150. You haul. (702)345-3667.

USED MONTAGUE Grizzly commercial gas cook stove. 6 burner with griddle, broiler and 2 ovens. Great shape, worth over $9,000 new. Asking $4,500. OBO. (702)398-3754.

732 - CRAFTS

3 Drawers full of Crafts Materials including ribbons, lace, etc. Deluxe computer desk $50. (702)346-2143.

754 - FURNISHINGS

New Today!

48 INCH round oak table claw feet, 4 chairs with pads, 23 inch leaf. Excellent condition. $300 OBO (928)347-4597.

New Today!

FURNITURE, Ab worker II, 12 Gage shot gun-pump, tools. All great shape. (702)346-4322.

New Today!

SOFA AND chair with ottoman. Large, nice, new, greenish color. $800. OBO. (702)346-1920.

774 - MISCELLANEOUS

BISSELL CARPET Cleaner, $250, dollar system plus associated accessories Asking $125. (702)346-2524.

New Today!

WHITE DFX metal detector, carry bag, headset, Bullseye II, orig. box, used once. $800., call Henry (702)528-6576.

776 - MERCHANDISE WANTED

LOOKING FOR refrigerator. New or used. No side by sides please. (702)346-1165.

788 - SPORTING GOODS

New Today!

SET CALLOWAY X-18 irons, nearly new, sand wedge-4 iron, graphite shafts, regular flex. $775. OBO, call Henry (702)528-6576.

875 - YARD/GARAGE SALES

GARAGE SALE 670 Paloma Circle. Friday 2/10, Saturday 2/11, 8am-12pm. Small furniture, storage container, electronics, household items, lawnmower, etc.

New Today!
LARGE MOVING SALE 180 Sage Way 8am-4pm Saturday, Feb. 11 and Sunday, Feb. 12. Clothing, household items, crafts and much more!

MOVING SALE YOU WIN! WE LOSE! Great stuff at great prices. Friday 2/11, Saturday 2/12, 8am-1pm. 226 Thistle Street.

New Today!

MULTI-FAMILY GARAGE Sale Saturday 9-3. 844 Tucson Street, Riversbend. Xmas decor, clothing, dvds, videos, household, silk plants, toys, pictures, misc.

LEGAL NOTICES

New Today!

PUBLIC NOTICE
The City of Mesquite, in accordance with National Flood Insurance Program regulation 65.7(b)(1), hereby gives notice that Bulloch Brothers Engineering, Inc., has submitted a request to the Federal Emergency Management Agency to revise the flood plain and floodway for Pulsipher Wash located in the City of Mesquite, NV. The request was initiated to show the beneficial affects of completion of several major flood control improvement projects in the area between Interstate Highway 15 and Hardy Way. Maps and related analysis of the flood plain and floodway revision can be viewed at Bulloch Brothers Engineering, Inc., at 750 West Pioneer Blvd, Mesquite, NV. Questions may be directed to Lance Henrie at (702) 346-5100.

CLASSIFICADOS EN ESPAÑOL

30 - FINANCIAL

Está casi por perder su casa! Llamenos ahora! Nosotros le podemos ayudar a salvar su casa y eliminar todas sus deudas. Demos 30 segundos y podemos cambiar su vida! 800-272-0408.

Está casi por perder su casa! Llamenos ahora! Nosotros le podemos ayudar a salvar su casa y eliminar todas sus deudas. Demos 30 segundos y podemos cambiar su vida! 800-272-0408.

200 - AUTOS

Chevrolet Impala LS 2003, de dueño original. En excelente condición. 53,000 millas $11,500 (702)346-2303 Dan.

Lincoln Mark VIII, 1993 de color blanco perla, nuevo aire acondicionador, $4,200. Pontiac Trans AM 1994, 82,000 millas, rojo, automático $8,125. llame (702) 345-3061.

235 - TRUCKS

Ford F250 XLT 2001, 3/4 toneladas, paquete para remolcar, CD, 114k millas. $13,800. (702)346-6262 o (435)619-4717.

240 - SPORT UTILITY VEHICLES

GMC Jimmy 1998, automático, CD, AC, ventanas y puertas automáticas. 4 puertas, 90k, en excelente condición. $5,930. (702)346-2388.

284 - OFF-ROAD VEHICLES

Yamaha Kodiak 400 2005, automatica, 4x4, menos de 300 millas con trailer. $5400 o una mejor oferta (702)346-1404, deje mensaje.

292 - UTILITY TRAILERS



Trailer para jalar carro, 2004, 18 pies. En excelente condición. $2,300. (435)862-2168.

300 - LOTS

.41 acre/ 20,839 pies cuadrados. En el Campo de Golf Falcon Ridge en la comunidad privada de Calais. Excelente vista, bajo en el mercado. $235,000.Llame (702)391-1914.

2 lotes en Summercrest, para cualquie constructor, 75x105. 663 Mountain View Drive. $144,000. (303)697-0347. Mesquite, NV

300 - LOTS

3 terrenos de venta en Scenic Arizona cada terreno es de 1.13 acres. Electricidad, agua y tanque séptico, #162-163-164 Los tres por $350,000 o una mejor oferta (801)301-9491.

5.25 acres con vista hermosa de las montañas y del lago 1031 Valerie Court Lote #214. El precio se ha reducido para que se venda pronto. $399,900. Llame a Chuck Schrader (702)345-3623.

325 - ACREAGE

Atención Inmobiliarios. Hurricane, Utah se agregarán 40 acres a la ciudad cerca de Sand Hollow y hay sistema de riego para un campo de golf propuesto. De venta por propietario $85,000 por acre. Los agentes y compradores son bienvenidos. Llame a Dave (435)785-8502, (801)541-1691.

PROPIEDADES EN ARIZONA 10 acres en Scenic, en un lugar excelente, calle pavimentada (Las Vegas Way) hasta la linea de propiedad. El propietario está dispuesto a vender terrenos de 5 acres.

Terreno hermoso de 2 acres con casa movil de 2 recamaras; 2 baños. Electricidad, Agua, teléfono, tanque séptico, a 600 pies de Scenic Blvd.

Terreno de 10 acres en Desert Springs con vista al Valle de Beaver Dam y al Cañón de Virgin River. Vendedor motivado por un sitio hermoso.

5 acres en Desert Springs, electricidad de la linea de terreno, acceso al Norte y Este de este terreno con vista al Valle de Beaver Dam. Llame a: Dick Lungrin RE/MAX Ridge Realty (702)346-7800 ext 215 (702)581-3261

Se Vende Terreno con nueva casa y una casa modular en Desert Spring, Arizona. Llame (937)748-6531.

375 - HOMES FOR SALE

Casa nueva bajo construcción en Beaver Dam, en una comunidad para adultos.1000 pies cuadrados, 2 recamaras 2 baños, jardinería, electrodomésticos, solamente $136,000. (435)619-4404.

Comunidad cercada en campo de golf! 2 recamaras y un estudio, 2 baños, aproximadamente 1900 pies cuadrados con armarios de madera, granito y azulejo. Vista del campo de golf. Esta listo para ocupar. Todos los electrodomésticos y tratamiento de ventanas. No tiene que poner entre o puede poner poco dinero de entre. Los pagos son de $1295 al mes. El propietario puede el costo de cierre. Si su credito no es tan bueno está bien. (503)502-0737. 1277 Vista del Monte. o czcasey@aol.com

DE VENTA POR PROPIETARIO 3 recamaras, 2 baños, aproximadamente 1700 pies cuadrados. Garaje para 3 autos. Estacionamiento para RV, patio cerrado. Muchas mejoras! No hay Asociación. $310,000. 662 Prosperity Lane, Mesquite. (702)346-0488.

De Venta por propietario En Comunidad para Adultos Retirados. Casa de 3 años. 2 recamaras, 2 baños, todos los electrodomésticos, cochera para 2 atuos, patio cubierto y taller. Techo de Stucco y azulejo. $155,000. Llame al (928) 347-4123 o (435)619-4404.

De venta por propietario Lista para mudarse 2 recamaras, 2 baños con estudio, 1364 pies cuadrados, garaje para 3 autos, no hay asociación, la cocina tiene azulejo, jardinería en el patio de enfrente, patio cubierto y está cercado. Usted debe de verla! $259,900 por favor llame y deje mensaje (702)808-5480.

Nueva casa en terreno de 1 acre en Scenic, AZ. Nuestro plan o el suyo! Nuestra especialidad es el estilo Southwest. Llame (775)727-4849 o (435)862-4354 Agente

Post Projects Model HEC-RAS Output File (NGVD 29)

Revised 01-30-06

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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: Post Projects Model
Project File : Postex4.prj
Run Date and Time: 1/30/2006 3:44:45 PM

Project in English units

Project Description:
Pulsipher Wash adjacent to Falcon Ridge Parkway. Improved channel adjacent to Falcon Ridge Parkway and Triad Hospital. Existing channel from Sta: 15+48.39 to 22+39.15 is a concrete U channel with a 24.67' bottom and 8' in height. Includes two culverts (12' x 8') under Bertha Howe Avenue. Ties into existing channel between Bertha Howe Avenue and existing Pioneer Blvd. Box culverts (5 - 12' x 10'). Existing, newly graded channel south of Pioneer Blvd. to I-15.

****

PLAN DATA

Plan Title: Plan 21
Plan File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Postex4.p21

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Postex4.g10

Flow Title : Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Postex4.f01

Plan Summary Information:
Number of: Cross Sections = 51 Multiple Openings = 0
Culverts = 1 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

****

FLOW DATA

Flow Title: Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Postex4.f01

Flow Data (cfs)

River	Reach	RS	PF#1
Pulsipher Wash	Falcon Ridge	3900	2318
Pulsipher Wash	Falcon Ridge	3300	2450
Pulsipher Wash	Falcon Ridge	3080	3000
Pulsipher Wash	Falcon Ridge	2500	3100
Pulsipher Wash	Falcon Ridge	2000	2138

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Pulsipher Wash	Falcon Ridge	PF#1	Critical	Critical

****

GEOMETRY DATA

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Postex4.g10

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3900

INPUT
Description: Section: 3900 (Match existing cross section 3900 from effective model)
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-250	1670	-192.33	1668	-164.1	1666	-151.7	1664	-132.18	1662
-119.39	1660	-92.09	1658.8	-68.52	1660	-57.76	1662	-35.72	1662
-7.01	1660	7.46	1658.3	10.61	1658	35.32	1656	67.98	1656
148.8	1658	153.01	1658	167.76	1658	186.8	1658	220.25	1660
227.84	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
**********************************************
    -250     .04  -35.72    .025  220.25     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -35.72  220.25             238.03   320.4   468.3             .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1659.61  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.83  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1658.78  * Reach Len. (ft)      *  238.03  *   320.40  *  468.30  *
* Crit W.S. (ft)        * 1658.78  * Flow Area (sq ft)    *          *   317.01  *          *
* E.G. Slope (ft/ft)    *0.008011  * Area (sq ft)         *          *   317.01  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  196.56  * Top Width (ft)       *          *   196.56  *          *
* Vel Total (ft/s)      *    7.31  * Avg. Vel. (ft/s)     *          *     7.31  *          *
* Max Chl Dpth (ft)     *    2.78  * Hydr. Depth (ft)     *          *     1.61  *          *
* Conv. Total (cfs)     * 25897.6  * Conv. (cfs)          *          * 25897.6  *          *
* Length Wtd. (ft)      *  320.40  * Wetted Per. (ft)     *          *   196.73  *          *
* Min Ch El (ft)        * 1656.00  * Shear (lb/sq ft)     *          *     0.81  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *     5.89  *          *
* Frctn Loss (ft)       *          * Cum Volume (acre-ft)  *   32.92  *    50.54  *    7.45  *
* C & E Loss (ft)       *          * Cum SA (acres)        *    5.98  *    18.65  *    1.92  *
**********************************************************************************************

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3800

INPUT
Description: Section: 43 (Existing cross section 3800 from effective model)
Station Elevation Data    num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 -260.99    1670 -215.04    1668 -210.96    1666 -206.01    1664 -195.96    1662
 -188.56    1660 -178.68    1658 -168.44    1656  -49.33    1656  -29.72    1656
   -22.32   1654  163.52    1654  177.34    1656  181.03    1658  183.61    1660
   201.75   1670

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 -260.99     .04 -178.68     .025  183.61     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -178.68  183.61             421.12  355.77  288.45             .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1656.50  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.03  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1655.47  * Reach Len. (ft)      *  421.12  *   355.77  *  288.45  *
* Crit W.S. (ft)        * 1655.66  * Flow Area (sq ft)    *          *   284.32  *          *
* E.G. Slope (ft/ft)    *0.011905  * Area (sq ft)         *          *   284.32  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  201.42  * Top Width (ft)       *          *   201.42  *          *
* Vel Total (ft/s)      *    8.15  * Avg. Vel. (ft/s)     *          *     8.15  *          *
* Max Chl Dpth (ft)     *    1.47  * Hydr. Depth (ft)     *          *     1.41  *          *
* Conv. Total (cfs)     * 21244.3  * Conv. (cfs)          *          * 21244.3  *          *
* Length Wtd. (ft)      *  355.77  * Wetted Per. (ft)     *          *   201.72  *          *
* Min Ch El (ft)        * 1654.00  * Shear (lb/sq ft)     *          *     1.05  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *     8.54  *          *
* Frctn Loss (ft)       *    3.10  * Cum Volume (acre-ft)  *   32.92  *    48.32  *    7.45  *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)        *    5.98  *    17.19  *    1.92  *
**********************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3750

INPUT
Description: Section: 3750
Station Elevation Data    num=      15
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 -204.93    1657 -194.93 1653.44 -144.93 1654.25  -94.93 1653.44  -89.93 1653.54
   -56.23   1652   29.67    1650   35.24 1648.81      50 1648.25   67.21 1648.85
    69.86   1650   78.18    1652   86.94    1654   91.55    1656   96.91    1658

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 -204.93     .016  -89.93     .025   96.91     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -89.93   96.91              240     221     221             .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1653.50  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.75  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1652.75  * Reach Len. (ft)      *  240.00  *   221.00  *  221.00  *
* Crit W.S. (ft)        * 1652.46  * Flow Area (sq ft)    *          *   333.47  *          *
* E.G. Slope (ft/ft)    *0.004912  * Area (sq ft)         *          *   333.47  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  153.97  * Top Width (ft)       *          *   153.97  *          *
* Vel Total (ft/s)      *    6.95  * Avg. Vel. (ft/s)     *          *     6.95  *          *
* Max Chl Dpth (ft)     *    4.49  * Hydr. Depth (ft)     *          *     2.17  *          *
* Conv. Total (cfs)     * 33072.7  * Conv. (cfs)          *          * 33072.7  *          *
* Length Wtd. (ft)      *  221.00  * Wetted Per. (ft)     *          *   154.72  *          *
* Min Ch El (ft)        * 1648.25  * Shear (lb/sq ft)     *          *     0.66  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *     4.59  *          *
* Frctn Loss (ft)       *    1.26  * Cum Volume (acre-ft)  *   32.92  *    45.80  *    7.45  *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)        *    5.98  *    15.74  *    1.92  *
**********************************************************************************************

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:    Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION
```

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3700

INPUT
Description: Section: 3700 (Appoximate location of cross section 3700 from effective model)
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-123.78	1655	-113.78	1651.46	-63.78	1652.27	-13.78	1651.46	-8.78	1651.56
.44	1652.1	5.13	1652	22.5	1650	41.64	1648	50	1646.87
77.46	1646.88	89.37	1648	105.38	1650	126.38	1652	144.97	1654
216.57	1656	223.14	1658	234.09	1660				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-123.78	.016	.44	.025	234.09	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
.44	234.09	282	284	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1652.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1650.90	Reach Len. (ft)	282.00	284.00	355.00
Crit W.S. (ft)	1650.90	Flow Area (sq ft)		255.57	
E.G. Slope (ft/ft)	0.006723	Area (sq ft)		255.57	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	100.21	Top Width (ft)		100.21	
Vel Total (ft/s)	9.07	Avg. Vel. (ft/s)		9.07	
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)		2.55	
Conv. Total (cfs)	28270.2	Conv. (cfs)		28270.2	
Length Wtd. (ft)	284.00	Wetted Per. (ft)		100.66	
Min Ch El (ft)	1646.87	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		9.67	
Frctn Loss (ft)	2.05	Cum Volume (acre-ft)	32.92	44.31	7.45
C & E Loss (ft)	0.11	Cum SA (acres)	5.98	15.09	1.92

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for tbe 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: Pulsipher Wash
REACH: Falcon Ridge RS: 3620

INPUT
Description: Section: 3620
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-120.79	1653	-110.79	1648.98	-60.79	1649.79	-10.79	1648.98	-5.79	1649.08
7.9	1649.01	43.21	1644	45.66	1643.73	50	1643.5	83.23	1643.32
91.12	1646.06	110.97	1645.9	118.71	1646	228.85	1648	324.25	1648
341.14	1650								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-120.79	.016	-5.79	.025	341.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.79	341.14	151	149	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1648.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1646.61	Reach Len. (ft)	151.00	149.00	106.00
Crit W.S. (ft)	1647.35	Flow Area (sq ft)		193.46	
E.G. Slope (ft/ft)	0.023515	Area (sq ft)		193.46	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	127.68	Top Width (ft)		127.68	
Vel Total (ft/s)	11.98	Avg. Vel. (ft/s)		11.98	
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	15116.2	Conv. (cfs)		15116.2	
Length Wtd. (ft)	149.00	Wetted Per. (ft)		128.35	
Min Ch El (ft)	1643.32	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		26.51	
Frctn Loss (ft)	3.24	Cum Volume (acre-ft)	32.92	42.84	7.45
C & E Loss (ft)	0.10	Cum SA (acres)	5.98	14.35	1.92

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: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3580

INPUT
Description: Section: 3580
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-119.71	1651.5	-109.71	1647.65	-59.71	1648.46	-9.71	1647.65	-4.71	1647.75
3.89	1648.87	34.73	1641.67	66.07	1641.59	84.69	1644.92	200.92	1646
314.16	1646	320.54	1648	326.39	1650	332.19	1650		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-119.71	.016	3.89	.025	326.39	.04

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3.89  326.39              288     297     315            .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1646.87  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.64  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1646.24  * Reach Len. (ft)      *  288.00  *   297.00  *  315.00  *
* Crit W.S. (ft)        * 1646.24  * Flow Area (sq ft)    *          *   361.98  *          *
* E.G. Slope (ft/ft)    *0.009061  * Area (sq ft)         *          *   361.98  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  299.75  * Top Width (ft)       *          *   299.75  *          *
* Vel Total (ft/s)      *    6.40  * Avg. Vel. (ft/s)     *          *     6.40  *          *
* Max Chl Dpth (ft)     *    4.65  * Hydr. Depth (ft)     *          *     1.21  *          *
* Conv. Total (cfs)     * 24351.0  * Conv. (cfs)          *          *  24351.0  *          *
* Length Wtd. (ft)      *  297.00  * Wetted Per. (ft)     *          *   300.62  *          *
* Min Ch El (ft)        * 1641.59  * Shear (lb/sq ft)     *          *     0.68  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *     4.36  *          *
* Frctn Loss (ft)       *    2.59  * Cum Volume (acre-ft)  *  32.92  *    41.89  *    7.45  *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)        *   5.98  *    13.62  *    1.92  *
**********************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3500

INPUT
Description: Section: 3500 (Appoximate location of cross section 3500 from
             effective model)
Station Elevation Data    num=      16
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 -137.38     1649 -127.38 1645.27  -77.38 1646.08  -27.38 1645.27  -22.38 1645.37
  -15.42 1645.95    27.2     1642   39.86     1640   53.43 1638.87   74.09     1640
   80.06 1641.93   98.07     1642  180.21     1642  368.72     1640  416.34     1640
  450.57     1646

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**************************************************
 -137.38    .016  -15.42    .025  450.57     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -15.42  450.57              109     113     108            .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1642.76  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.32  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1641.44  * Reach Len. (ft)      *  109.00  *   113.00  *  108.00  *
* Crit W.S. (ft)        * 1641.86  * Flow Area (sq ft)    *          *   251.42  *          *
* E.G. Slope (ft/ft)    *0.022651  * Area (sq ft)         *          *   251.42  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  239.73  * Top Width (ft)       *          *   239.73  *          *
* Vel Total (ft/s)      *    9.22  * Avg. Vel. (ft/s)     *          *     9.22  *          *
* Max Chl Dpth (ft)     *    2.57  * Hydr. Depth (ft)     *          *     1.05  *          *
* Conv. Total (cfs)     * 15401.7  * Conv. (cfs)          *          *  15401.7  *          *
* Length Wtd. (ft)      *  113.00  * Wetted Per. (ft)     *          *   240.28  *          *
* Min Ch El (ft)        * 1638.87  * Shear (lb/sq ft)     *          *     1.48  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    13.64  *          *
* Frctn Loss (ft)       *    4.04  * Cum Volume (acre-ft)  *  32.92  *    39.80  *    7.45  *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)        *   5.98  *    11.78  *    1.92  *
**********************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3480

INPUT
Description: Section: 3480
Station Elevation Data    num=      18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 -154.37     1648 -144.37  1644.7  -94.37 1645.51  -44.37  1644.7  -39.37  1644.8
  -33.37 1644.95  -10.43     1642   18.69     1640   48.39 1638.25   71.31     1640
  116.55 1640.86     119  1639.6   142.4 1639.86  148.64 1641.06  342.47     1640
  394.05 1639.3  443.84     1640   468.1     1646

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**************************************************
 -154.37    .016  -39.37    .025   468.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -39.37   468.1              249     239     282            .1      .3

CROSS SECTION OUTPUT  Profile #PF#1
**********************************************************************************************
* E.G. Elev (ft)        * 1641.53  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.42  * Wt. n-Val.           *          *    0.025  *          *
* W.S. Elev (ft)        * 1641.11  * Reach Len. (ft)      *  249.00  *   239.00  *  282.00  *
* Crit W.S. (ft)        * 1641.05  * Flow Area (sq ft)    *          *   446.02  *          *
* E.G. Slope (ft/ft)    *0.007658  * Area (sq ft)         *          *   446.02  *          *
* Q Total (cfs)         * 2318.00  * Flow (cfs)           *          *  2318.00  *          *
* Top Width (ft)        *  445.82  * Top Width (ft)       *          *   445.82  *          *
* Vel Total (ft/s)      *    5.20  * Avg. Vel. (ft/s)     *          *     5.20  *          *
* Max Chl Dpth (ft)     *    2.86  * Hydr. Depth (ft)     *          *     1.00  *          *
* Conv. Total (cfs)     * 26489.1  * Conv. (cfs)          *          *  26489.1  *          *
* Length Wtd. (ft)      *  239.00  * Wetted Per. (ft)     *          *   446.55  *          *
* Min Ch El (ft)        * 1638.25  * Shear (lb/sq ft)     *          *     0.48  *          *
```

Alpha		1.00	Stream Power (lb/ft s)				2.48				
Frctn Loss (ft)		1.99	Cum Volume (acre-ft)		32.92		38.90		7.45		
C & E Loss (ft)		0.02	Cum SA (acres)		5.98		10.89		1.92		

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3400

INPUT
Description: Section: 3400 (Appoximate location of cross section 3400 from effective model)
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-140.42	1646	-130.42	1641.92	-80.42	1642.83	-30.42	1641.92	-25.42	1642.02
-19.42	1642.08	5.51	1640	37.49	1638.5	59.46	1638	60.54	1636
78.62	1636	88.91	1638	125.03	1638	140.54	1637	148.5	1638
192.74	1638	194.15	1636	198.36	1636	199.47	1638	285.58	1638.81
289.66	1636.63	300.18	1635.9	301.01	1638.17	336.12	1637.25	358.86	1638
375.15	1640	402.94	1650						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-140.42	.016	-19.42	.025	375.15	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.42	375.15	118	116	388	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1639.53	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.57	Wt. n-Val.		0.025		
W.S. Elev (ft)	1638.96	Reach Len. (ft)	118.00	116.00	388.00	
Crit W.S. (ft)	1638.96	Flow Area (sq ft)		382.51		
E.G. Slope (ft/ft)	0.009055	Area (sq ft)		382.51		
Q Total (cfs)	2318.00	Flow (cfs)		2318.00		
Top Width (ft)	338.93	Top Width (ft)		338.93		
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)		6.06		
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)		1.13		
Conv. Total (cfs)	24359.4	Conv. (cfs)		24359.4		
Length Wtd. (ft)	116.00	Wetted Per. (ft)		344.89		
Min Ch El (ft)	1635.90	Shear (lb/sq ft)		0.63		
Alpha	1.00	Stream Power (lb/ft s)		3.80		
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	32.92	36.62	7.45	
C & E Loss (ft)	0.16	Cum SA (acres)	5.98	8.74	1.92	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3375

INPUT
Description: Section: 3375; 300' +/- Upstream of existing U channel.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-132.28	1645	-122.28	1640.83	-72.28	1641.64	-22.28	1640.83	-17.28	1640.93
-1.55	1640.29	10.16	1638	35.68	1637.55	55.26	1638	67.89	1638.23
78.39	1638	144.57	1636	146.03	1634	158.44	1634	163.57	1636
216.48	1636	219	1634	232.51	1634	233.22	1636	243.59	1636
247.04	1634	258.46	1634	260.46	1636	262.46	1638	313.39	1638
317.86	1635.21	331.8	1636	332.22	1638.33	519.22	1636	559.19	1634
614.39	1634	633.19	1636	672.22	1638	680.29	1640		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-132.28	.016	-17.28	.025	680.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-17.28	680.29	73	85	303	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.51	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.05	Wt. n-Val.		0.025		
W.S. Elev (ft)	1638.46	Reach Len. (ft)	73.00	85.00	303.00	
Crit W.S. (ft)	1636.37	Flow Area (sq ft)		1337.67		
E.G. Slope (ft/ft)	0.000342	Area (sq ft)		1337.67		
Q Total (cfs)	2318.00	Flow (cfs)		2318.00		
Top Width (ft)	666.30	Top Width (ft)		666.30		
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)		1.73		
Max Chl Dpth (ft)	4.46	Hydr. Depth (ft)		2.01		
Conv. Total (cfs)	125422.6	Conv. (cfs)		125422.6		
Length Wtd. (ft)	85.00	Wetted Per. (ft)		675.14		
Min Ch El (ft)	1634.00	Shear (lb/sq ft)		0.04		
Alpha	1.00	Stream Power (lb/ft s)		0.07		
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	32.92	34.33	7.45	
C & E Loss (ft)	0.00	Cum SA (acres)	5.98	7.40	1.92	

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: Pulsipher Wash

REACH: Falcon Ridge RS: 3350

INPUT
Description: Section: 3350; 200' +/- Upstream of existing U channel.
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.21	1644	-117.21	1640.2	-67.21	1641.01	-17.21	1640.2	-12.21	1640.3
-1.83	1640.35	2.58	1640	12.9	1638	23.46	1636	50	1634.5
63.1	1636	79.67	1637.3	118.31	1636	124.15	1634	139.18	1634
142.46	1636	177.91	1636	180.91	1634	190.05	1632	225.18	1632
227.68	1634	231.25	1636	384.9	1636	388.43	1634	391.6	1632
396.68	1630	432.01	1632	435.49	1634	443.22	1636	445.86	1638
478.56	1639								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.21	.016	-1.83	.025	478.56	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-1.83	478.56	101	104	110	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	101.00	104.00	110.00
Crit W.S. (ft)		Flow Area (sq ft)		1500.97	
E.G. Slope (ft/ft)	0.000138	Area (sq ft)		1500.97	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	450.11	Top Width (ft)		450.11	
Vel Total (ft/s)	1.54	Avg. Vel. (ft/s)		1.54	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		3.33	
Conv. Total (cfs)	197268.7	Conv. (cfs)		197268.7	
Length Wtd. (ft)	104.00	Wetted Per. (ft)		456.49	
Min Ch El (ft)	1630.00	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.92	31.56	7.45
C & E Loss (ft)	0.00	Cum SA (acres)	5.98	6.31	1.92

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3325

INPUT
Description: Section: 3325; 100' +/- Upstream of existing U channel.
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.45	1643	-117.45	1639.31	-67.45	1640.12	-17.45	1639.31	-12.45	1639.41
-6.02	1639.5	1.95	1638	17.75	1636	32.49	1634	43.56	1632
54.5	1631.01	96	1630	101.75	1630	110.64	1632	117.8	1636
164.54	1636	170.34	1634	171.71	1632	179.75	1630	191.7	1630
197.44	1632	199.28	1636	229.11	1636	238.7	1634	243.13	1632
250.76	1630	258.29	1629.5	274.39	1629.5	281.15	1630	290.37	1635.9
322.08	1636	332.15	1638.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.45	.016	-6.02	.025	332.15	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-6.02	332.15	133	117	132	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	133.00	117.00	132.00
Crit W.S. (ft)		Flow Area (sq ft)		1636.71	
E.G. Slope (ft/ft)	0.000070	Area (sq ft)		1636.71	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	331.73	Top Width (ft)		331.73	
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)		1.42	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	276778.8	Conv. (cfs)		276778.8	
Length Wtd. (ft)	120.87	Wetted Per. (ft)		341.05	
Min Ch El (ft)	1629.50	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.92	27.82	7.45
C & E Loss (ft)	0.02	Cum SA (acres)	5.98	5.38	1.92

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3300

INPUT
Description: Section: 3300 (Station 22+74.15) End of transition section; End of alignment. Grade break; begin 1.52% slope to upstream end of culverts at Bertha Howe Ave.. (Appoximate location of cross section 3300 from effective model)
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10.48	1638.45	-5.14	1638	7.18	1636	28.26	1634	31.67	1632
36.49	1630	37.67	1629.65	37.67	1628.65	50	1628.41	62.33	1628.65
62.33	1629.65	77.44	1630	92.66	1632	112.97	1634	122.88	1636
129.24	1638	138.38	1638.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-10.48	.022	37.67	.015	62.33	.022

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	20	20	20	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.022	0.015	0.022
W.S. Elev (ft)	1638.19	Reach Len. (ft)	20.00	20.00	20.00

Crit W.S. (ft)		Flow Area (sq ft)	144.27	238.17	380.62
E.G. Slope (ft/ft)	0.000149	Area (sq ft)	144.27	238.17	380.62
Q Total (cfs)	2450.00	Flow (cfs)	253.33	1237.85	958.82
Top Width (ft)	140.05	Top Width (ft)	45.04	24.66	70.35
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	1.76	5.20	2.52
Max Chl Dpth (ft)	9.78	Hydr. Depth (ft)	3.20	9.66	5.41
Conv. Total (cfs)	201030.2	Conv. (cfs)	20786.7	101569.2	78674.3
Length Wtd. (ft)	20.00	Wetted Per. (ft)	46.30	26.66	71.10
Min Ch El (ft)	1628.41	Shear (lb/sq ft)	0.03	0.08	0.05
Alpha	1.60	Stream Power (lb/ft s)	0.05	0.43	0.13
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	32.70	25.30	6.88
C & E Loss (ft)	0.05	Cum SA (acres)	5.91	4.90	1.81

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3280

INPUT
Description: Section: 3280 (Station: 22+54.15) Concrete transition section.
Transition from existing channel to 24.67' x 8' existing U channel.

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10.51	1638.27	-8.1	1638	10.05	1636	33.56	1634	37.67	1633.35
37.67	1628.35	50	1628.1	62.33	1628.35	62.33	1633.35	94.13	1634
102.46	1636	109.01	1638	117.51	1638.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-10.51	.025	37.67	.015	62.33	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	15	15	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.025	0.015	0.025
W.S. Elev (ft)	1637.68	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	1635.61	Flow Area (sq ft)	92.38	233.22	154.41
E.G. Slope (ft/ft)	0.000479	Area (sq ft)	92.38	233.22	154.41
Q Total (cfs)	2450.00	Flow (cfs)	199.61	1801.14	449.24
Top Width (ft)	113.19	Top Width (ft)	42.89	24.66	45.64
Vel Total (ft/s)	5.10	Avg. Vel. (ft/s)	2.16	7.72	2.91
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	2.15	9.46	3.38
Conv. Total (cfs)	111995.7	Conv. (cfs)	9124.9	82334.9	20536.0
Length Wtd. (ft)	15.00	Wetted Per. (ft)	43.12	34.67	46.13
Min Ch El (ft)	1628.10	Shear (lb/sq ft)	0.06	0.20	0.10
Alpha	1.76	Stream Power (lb/ft s)	0.14	1.55	0.29
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.65	25.19	6.75
C & E Loss (ft)	0.27	Cum SA (acres)	5.89	4.89	1.79

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: Pulsipher Wash
REACH: Falcon Ridge RS: 3270

INPUT
Description: Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line; Begin 24.67' x 8' existing concrete U channel.

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1636.12	37.67	1628.12	50	1627.87	62.33	1628.12	62.33	1636.12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	39.15	39.15	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1638.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.39	Wt. n-Val.		0.015	
W.S. Elev (ft)	1634.72	Reach Len. (ft)	39.15	39.15	39.15
Crit W.S. (ft)	1634.72	Flow Area (sq ft)		165.76	
E.G. Slope (ft/ft)	0.003108	Area (sq ft)		165.76	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	14.78	Avg. Vel. (ft/s)		14.78	
Max Chl Dpth (ft)	6.85	Hydr. Depth (ft)		6.72	
Conv. Total (cfs)	43945.4	Conv. (cfs)		43945.4	
Length Wtd. (ft)	39.15	Wetted Per. (ft)		37.86	
Min Ch El (ft)	1627.87	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)		12.56	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	32.63	25.12	6.73
C & E Loss (ft)	0.00	Cum SA (acres)	5.88	4.88	1.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3260

INPUT

Description: Section: 3260 (Station: 22+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1635.52	37.67	1627.52	50	1627.27	62.33	1627.52	62.33	1635.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1637.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.73	Wt. n-Val.		0.015	
W.S. Elev (ft)	1633.09	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1634.12	Flow Area (sq ft)		140.36	
E.G. Slope (ft/ft)	0.005022	Area (sq ft)		140.36	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	17.46	Avg. Vel. (ft/s)		17.46	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	34571.2	Conv. (cfs)		34571.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		35.80	
Min Ch El (ft)	1627.27	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		21.46	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	32.63	24.99	6.73
C & E Loss (ft)	0.14	Cum SA (acres)	5.88	4.86	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3240

INPUT
Description: Section: 3240 (Station 21+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1634.01	37.67	1626.01	50	1625.76	62.33	1626.01	62.33	1634.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1637.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1630.85	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1632.61	Flow Area (sq ft)		122.51	
E.G. Slope (ft/ft)	0.007479	Area (sq ft)		122.51	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	20.00	Avg. Vel. (ft/s)		20.00	
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	28330.4	Conv. (cfs)		28330.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		34.35	
Min Ch El (ft)	1625.76	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)		33.30	
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	32.63	24.68	6.73
C & E Loss (ft)	0.15	Cum SA (acres)	5.88	4.80	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3220

INPUT
Description: Section: 3220 (Station: 20+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1632.49	37.67	1624.49	50	1624.24	62.33	1624.49	62.33	1632.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1636.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.14	Wt. n-Val.		0.015	
W.S. Elev (ft)	1629.00	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1631.09	Flow Area (sq ft)		114.22	
E.G. Slope (ft/ft)	0.009202	Area (sq ft)		114.22	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	21.45	Avg. Vel. (ft/s)		21.45	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	25540.4	Conv. (cfs)		25540.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		33.68	
Min Ch El (ft)	1624.24	Shear (lb/sq ft)		1.95	
Alpha	1.00	Stream Power (lb/ft s)		41.79	
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	32.63	24.41	6.73
C & E Loss (ft)	0.09	Cum SA (acres)	5.88	4.74	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3200

INPUT
Description: Section: 3200 (Station 19+00); Existing concrete U channel.
(Appoximate location of cross section 3200 from effective model)

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1630.97	37.67	1622.97	50	1622.72	62.33	1622.97	62.33	1630.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	103	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1635.09	Element	Left OB	Channel	Right OB	
Vel Head (ft)	7.82	Wt. n-Val.		0.015		
W.S. Elev (ft)	1627.27	Reach Len. (ft)	97.00	100.00	103.00	
Crit W.S. (ft)	1629.57	Flow Area (sq ft)		109.19		
E.G. Slope (ft/ft)	0.010519	Area (sq ft)		109.19		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	22.44	Avg. Vel. (ft/s)		22.44		
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		4.43		
Conv. Total (cfs)	23887.6	Conv. (cfs)		23887.6		
Length Wtd. (ft)	100.00	Wetted Per. (ft)		33.27		
Min Ch El (ft)	1622.72	Shear (lb/sq ft)		2.16		
Alpha	1.00	Stream Power (lb/ft s)		48.36		
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	32.63	24.16	6.73	
C & E Loss (ft)	0.07	Cum SA (acres)	5.88	4.69	1.78	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 3175

INPUT
Description: Section: 3175 (Station 18+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1629.46	37.67	1621.46	50	1621.21	62.33	1621.46	62.33	1629.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	96	100	102	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1633.94	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.31	Wt. n-Val.		0.015		
W.S. Elev (ft)	1625.63	Reach Len. (ft)	96.00	100.00	102.00	
Crit W.S. (ft)	1628.06	Flow Area (sq ft)		105.88		
E.G. Slope (ft/ft)	0.011531	Area (sq ft)		105.88		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	23.14	Avg. Vel. (ft/s)		23.14		
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		4.29		
Conv. Total (cfs)	22815.5	Conv. (cfs)		22815.5		
Length Wtd. (ft)	100.00	Wetted Per. (ft)		33.00		
Min Ch El (ft)	1621.21	Shear (lb/sq ft)		2.31		
Alpha	1.00	Stream Power (lb/ft s)		53.44		
Frctn Loss (ft)	1.10	Cum Volume (acre-ft)	32.63	23.91	6.73	
C & E Loss (ft)	0.05	Cum SA (acres)	5.88	4.63	1.78	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3150

INPUT
Description: Section: 3150 (Station 17+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1627.94	37.67	1619.94	50	1619.69	62.33	1619.94	62.33	1627.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	102	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1632.71	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.70	Wt. n-Val.		0.015		
W.S. Elev (ft)	1624.01	Reach Len. (ft)	97.00	100.00	102.00	
Crit W.S. (ft)	1626.56	Flow Area (sq ft)		103.50		
E.G. Slope (ft/ft)	0.012340	Area (sq ft)		103.50		

* Q Total (cfs)	*	2450.00	* Flow (cfs)	*		*	2450.00	*		*	
* Top Width (ft)	*	24.66	* Top Width (ft)	*		*	24.66	*		*	
* Vel Total (ft/s)	*	23.67	* Avg. Vel. (ft/s)	*		*	23.67	*		*	
* Max Chl Dpth (ft)	*	4.32	* Hydr. Depth (ft)	*		*	4.20	*		*	
* Conv. Total (cfs)	*	22054.8	* Conv. (cfs)	*		*	22054.8	*		*	
* Length Wtd. (ft)	*	100.00	* Wetted Per. (ft)	*		*	32.81	*		*	
* Min Ch El (ft)	*	1619.69	* Shear (lb/sq ft)	*		*	2.43	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	57.53	*		*	
* Frctn Loss (ft)	*	1.19	* Cum Volume (acre-ft)	*	32.63	*	23.67	*	6.73	*	
* C & E Loss (ft)	*	0.04	* Cum SA (acres)	*	5.88	*	4.57	*	1.78	*	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3125

INPUT
Description: Section: 3125 (Station 16+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1626.42	37.67	1618.42	50	1618.17	62.33	1618.42	62.33	1626.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	50	51.61	54	.3 .5

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	*	1631.42	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	*	8.99	* Wt. n-Val.	*		*	0.015	*		*	
* W.S. Elev (ft)	*	1622.42	* Reach Len. (ft)	*	50.00	*	51.61	*	54.00	*	
* Crit W.S. (ft)	*	1625.04	* Flow Area (sq ft)	*		*	101.81	*		*	
* E.G. Slope (ft/ft)	*	0.012967	* Area (sq ft)	*		*	101.81	*		*	
* Q Total (cfs)	*	2450.00	* Flow (cfs)	*		*	2450.00	*		*	
* Top Width (ft)	*	24.66	* Top Width (ft)	*		*	24.66	*		*	
* Vel Total (ft/s)	*	24.07	* Avg. Vel. (ft/s)	*		*	24.07	*		*	
* Max Chl Dpth (ft)	*	4.25	* Hydr. Depth (ft)	*		*	4.13	*		*	
* Conv. Total (cfs)	*	21515.4	* Conv. (cfs)	*		*	21515.4	*		*	
* Length Wtd. (ft)	*	51.61	* Wetted Per. (ft)	*		*	32.67	*		*	
* Min Ch El (ft)	*	1618.17	* Shear (lb/sq ft)	*		*	2.52	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	60.70	*		*	
* Frctn Loss (ft)	*	1.26	* Cum Volume (acre-ft)	*	32.63	*	23.43	*	6.73	*	
* C & E Loss (ft)	*	0.03	* Cum SA (acres)	*	5.88	*	4.52	*	1.78	*	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3100

INPUT
Description: Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha Howe Ave. (2 - 12 x 8's); Grade Break s=0.08; End of existing concrete U channel. (Appoximate location of cross section 3100 from effective model)
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1625.39	37.67	1617.39	62.33	1617.39	62.33	1625.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	127.02	127.02	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	*	1630.67	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	*	9.20	* Wt. n-Val.	*		*	0.015	*		*	
* W.S. Elev (ft)	*	1621.47	* Reach Len. (ft)	*	0.01	*	0.01	*	0.01	*	
* Crit W.S. (ft)	*	1624.11	* Flow Area (sq ft)	*		*	100.66	*		*	
* E.G. Slope (ft/ft)	*	0.013549	* Area (sq ft)	*		*	100.66	*		*	
* Q Total (cfs)	*	2450.00	* Flow (cfs)	*		*	2450.00	*		*	
* Top Width (ft)	*	24.66	* Top Width (ft)	*		*	24.66	*		*	
* Vel Total (ft/s)	*	24.34	* Avg. Vel. (ft/s)	*		*	24.34	*		*	
* Max Chl Dpth (ft)	*	4.08	* Hydr. Depth (ft)	*		*	4.08	*		*	
* Conv. Total (cfs)	*	21047.7	* Conv. (cfs)	*		*	21047.7	*		*	
* Length Wtd. (ft)	*	0.01	* Wetted Per. (ft)	*		*	32.82	*		*	
* Min Ch El (ft)	*	1617.39	* Shear (lb/sq ft)	*		*	2.59	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	63.14	*		*	
* Frctn Loss (ft)	*	0.68	* Cum Volume (acre-ft)	*	32.63	*	23.31	*	6.73	*	
* C & E Loss (ft)	*	0.06	* Cum SA (acres)	*	5.88	*	4.49	*	1.78	*	

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3090

INPUT
Description: Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled with pier bulking (1' of debris on each side of pier).
Distance from Upstream XS = .01
Deck/Roadway Width = 127
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
37.67	1631 1625.39	62.33	1631 1625.39

Upstream Bridge Cross Section Data

```
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************************
   37.67 1625.39   37.67 1617.39   49.67 1617.39   49.67 1625.39   50.33 1625.39
   50.33 1617.39   62.33 1617.39   62.33 1625.39

Manning's n Values         num=       1
     Sta    n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         37.67   62.33             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************
   37.67    1631 1624.37   62.33    1631 1624.37

Downstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************************
   37.67 1624.37   37.67 1616.37   49.67 1616.37   49.67 1624.37   50.33 1624.37
   50.33 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values         num=       1
     Sta    n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         37.67   62.33             .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         =    1631
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=      50    Downstream=      50
Upstream     num=       2
    Width    Elev     Width    Elev
*********************************
     .67 1617.08      .67 1627.08
Downstream     num=       2
    Width    Elev     Width    Elev
*********************************
     .67  1616.4      .67  1626.4
Debris Width  =     2.67
Debris Height =       10

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF#1
*********************************************************************************************
* E.G. US. (ft)           *    1630.67  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)           *    1621.47  * E.G. Elev (ft)        *    1630.47  *    1627.82  *
* Q Total (cfs)           *    2450.00  * W.S. Elev (ft)        *    1621.69  *    1621.39  *
* Q Bridge (cfs)          *    2450.00  * Crit W.S. (ft)        *    1624.27  *    1623.25  *
* Q Weir (cfs)            *             * Max Chl Dpth (ft)     *       4.29  *       5.02  *
* Weir Sta Lft (ft)       *             * Vel Total (ft/s)      *      23.78  *      20.35  *
* Weir Sta Rgt (ft)       *             * Flow Area (sq ft)     *     103.03  *     120.42  *
* Weir Submerg            *             * Froude # Chl          *       2.02  *       1.60  *
* Weir Max Depth (ft)     *             * Specif Force (cu ft)  *    2030.56  *    1850.24  *
* Min El Weir Flow (ft)   *    1631.01  * Hydr Depth (ft)       *       4.29  *       5.02  *
* Min El Prs (ft)         *    1625.39  * W.P. Total (ft)       *      36.87  *      39.08  *
* Delta EG (ft)           *       2.90  * Conv. Total (cfs)     *    20246.9  *    25260.9  *
* Delta WS (ft)           *       0.27  * Top Width (ft)        *      23.99  *      23.99  *
* BR Open Area (sq ft)    *     191.92  * Frctn Loss (ft)       *       0.00  *       1.47  *
* BR Open Vel (ft/s)      *      23.78  * C & E Loss (ft)       *       0.21  *       1.18  *
* Coef of Q               *             * Shear Total (lb/sq ft) *       2.55  *       1.81  *
* Br Sel Method           *Energy only  * Power Total (lb/ft s)  *      60.74  *      36.82  *
*********************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge        RS: 3080

INPUT
Description: Section: 3080 (Station: 14+21.37); Outlet of culverts under public
             access road (2 - 12 x 8's)  Begin existing channel.
Station Elevation Data    num=       4
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************
   37.67 1624.37   37.67 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
*************************************************
   37.67    .015   37.67    .015   62.33    .015
```

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	33.23	10	25.61	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1627.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.58	Wt. n-Val.		0.015	
W.S. Elev (ft)	1621.20	Reach Len. (ft)	33.23	10.00	25.61
Crit W.S. (ft)	1623.11	Flow Area (sq ft)		119.06	
E.G. Slope (ft/ft)	0.008216	Area (sq ft)		119.06	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	20.58	Avg. Vel. (ft/s)		20.58	
Max Chl Dpth (ft)	4.83	Hydr. Depth (ft)		4.83	
Conv. Total (cfs)	27028.6	Conv. (cfs)		27028.6	
Length Wtd. (ft)		Wetted Per. (ft)		34.32	
Min Ch El (ft)	1616.37	Shear (lb/sq ft)		1.78	
Alpha	1.00	Stream Power (lb/ft s)		36.62	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	32.63	23.31	6.73
C & E Loss (ft)	0.04	Cum SA (acres)	5.88	4.49	1.78

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3070

INPUT
Description: Section: 3070 (Station 14+11.37); Existing channel just south of Bertha Howe culverts.

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1629	5.57	1628.01	38	1618	38.61	1617.89	50	1617.35
62	1617.89	63.33	1618	87.09	1630	106.15	1632		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	5.57	.025	106.15	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5.57	106.15	105.7	111.35	117.11	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1626.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.25	Wt. n-Val.		0.025	
W.S. Elev (ft)	1623.90	Reach Len. (ft)	105.70	111.35	117.11
Crit W.S. (ft)	1623.90	Flow Area (sq ft)		249.20	
E.G. Slope (ft/ft)	0.005934	Area (sq ft)		249.20	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	56.12	Top Width (ft)		56.12	
Vel Total (ft/s)	12.04	Avg. Vel. (ft/s)		12.04	
Max Chl Dpth (ft)	6.55	Hydr. Depth (ft)		4.44	
Conv. Total (cfs)	38943.0	Conv. (cfs)		38943.0	
Length Wtd. (ft)	111.35	Wetted Per. (ft)		58.45	
Min Ch El (ft)	1617.35	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		19.02	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.63	23.27	6.73
C & E Loss (ft)		Cum SA (acres)	5.88	4.48	1.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3025

INPUT
Description: Section: 3025 (Station 13+00); Existing channel

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1628.4	5.82	1628	37.06	1618	40.65	1616.86	70.69	1617.79
71.1	1618	97.44	1632						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	5.82	.025	97.44	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5.82	97.44	99.1	100	101.11	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1625.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.91	Wt. n-Val.		0.025	
W.S. Elev (ft)	1622.38	Reach Len. (ft)	99.10	100.00	101.11
Crit W.S. (ft)	1622.99	Flow Area (sq ft)		219.28	
E.G. Slope (ft/ft)	0.008988	Area (sq ft)		219.28	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	55.95	Top Width (ft)		55.95	
Vel Total (ft/s)	13.68	Avg. Vel. (ft/s)		13.68	
Max Chl Dpth (ft)	5.52	Hydr. Depth (ft)		3.92	
Conv. Total (cfs)	31644.6	Conv. (cfs)		31644.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		57.96	
Min Ch El (ft)	1616.86	Shear (lb/sq ft)		2.12	
Alpha	1.00	Stream Power (lb/ft s)		29.04	
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	32.63	22.67	6.73
C & E Loss (ft)	0.07	Cum SA (acres)	5.88	4.34	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3000

INPUT
Description: Section: 3000 (Station 12+00); Existing channel. (Appoximate location of cross section 3000 from effective model)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1627.8	9.72	1626	35.66	1618	51.35	1616	63.6	1615
66.77	1616	93.57	1632						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9.72	.025	93.57	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.72	93.57	97.73	100 102.94	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1624.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.94	Wt. n-Val.		0.025	
W.S. Elev (ft)	1622.61	Reach Len. (ft)	97.73	100.00	102.94
Crit W.S. (ft)	1622.26	Flow Area (sq ft)		268.58	
E.G. Slope (ft/ft)	0.004783	Area (sq ft)		268.58	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	57.12	Top Width (ft)		57.12	
Vel Total (ft/s)	11.17	Avg. Vel. (ft/s)		11.17	
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)		4.70	
Conv. Total (cfs)	43380.3	Conv. (cfs)		43380.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		59.96	
Min Ch El (ft)	1615.00	Shear (lb/sq ft)		1.34	
Alpha	1.00	Stream Power (lb/ft s)		14.94	
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	32.63	22.11	6.73
C & E Loss (ft)	0.05	Cum SA (acres)	5.88	4.21	1.78

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2970

INPUT
Description: Section: 2970 (Station: 11+00); Existing channel
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1627	9.3	1626	37.67	1616	41.39	1614	41.68	1613.8
42.66	1614	63.54	1616	80.41	1626				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9.3	.025	80.41	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.3	80.41	97.69	100 112.99	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1623.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.39	Wt. n-Val.		0.025	
W.S. Elev (ft)	1621.58	Reach Len. (ft)	97.69	100.00	112.99
Crit W.S. (ft)	1621.58	Flow Area (sq ft)		241.84	
E.G. Slope (ft/ft)	0.005939	Area (sq ft)		241.84	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	51.09	Top Width (ft)		51.09	
Vel Total (ft/s)	12.41	Avg. Vel. (ft/s)		12.41	
Max Chl Dpth (ft)	7.78	Hydr. Depth (ft)		4.73	
Conv. Total (cfs)	38929.8	Conv. (cfs)		38929.8	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		54.26	
Min Ch El (ft)	1613.80	Shear (lb/sq ft)		1.65	
Alpha	1.00	Stream Power (lb/ft s)		20.50	
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	32.63	21.53	6.73
C & E Loss (ft)	0.23	Cum SA (acres)	5.88	4.08	1.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2935

INPUT
Description: Section: 2935 (Station: 10+00); Existing channel
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1627	7.47	1626	48.92	1614	51.58	1613.37	67.67	1614
70.82	1616	85.16	1618	119.77	1620	127.42	1624		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	7.47	.025	127.42	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
7.47	127.42	95.45	100 88.53	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1622.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.88	Wt. n-Val.		0.025	
W.S. Elev (ft)	1618.96	Reach Len. (ft)	95.45	100.00	88.53
Crit W.S. (ft)	1620.22	Flow Area (sq ft)		189.88	

* E.G. Slope (ft/ft)	*0.019215	* Area (sq ft)	*	* 189.88	*	*	*	*
* Q Total (cfs)	* 3000.00	* Flow (cfs)	*	* 3000.00	*	*	*	*
* Top Width (ft)	* 69.96	* Top Width (ft)	*	* 69.96	*	*	*	*
* Vel Total (ft/s)	* 15.80	* Avg. Vel. (ft/s)	*	* 15.80	*	*	*	*
* Max Chl Dpth (ft)	* 5.59	* Hydr. Depth (ft)	*	* 2.71	*	*	*	*
* Conv. Total (cfs)	* 21642.4	* Conv. (cfs)	*	* 21642.4	*	*	*	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 71.50	*	*	*	*
* Min Ch El (ft)	* 1613.37	* Shear (lb/sq ft)	*	* 3.19	*	*	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 50.33	*	*	*	*
* Frctn Loss (ft)	* 0.98	* Cum Volume (acre-ft)	*	32.63	*	21.03	*	6.73 *
* C & E Loss (ft)	* 0.15	* Cum SA (acres)	*	5.88	*	3.94	*	1.78 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2900

INPUT
Description: Section: 2900 (Station: 9+00); Existing channel. (Appoximate location of cross section 2900 from effective model)
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1626.8	9.83	1626	32.37	1614	35.6	1612.95	63.82	1612.28
66.9	1614	70.26	1616	72.86	1617.43	94.62	1617.71	117.47	1618
144.58	1620								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9.83	.025	144.58	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.83	144.58	100.3	100	130.51	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	* 1620.76	* Element	* Left OB *	Channel *	Right OB *
* Vel Head (ft)	* 2.71	* Wt. n-Val.	*	* 0.025 *	*
* W.S. Elev (ft)	* 1618.05	* Reach Len. (ft)	* 100.30 *	100.00 *	130.51 *
* Crit W.S. (ft)	* 1618.87	* Flow Area (sq ft)	*	* 227.24 *	*
* E.G. Slope (ft/ft)	*0.015623	* Area (sq ft)	*	* 227.24 *	*
* Q Total (cfs)	* 3000.00	* Flow (cfs)	*	* 3000.00 *	*
* Top Width (ft)	* 93.37	* Top Width (ft)	*	* 93.37 *	*
* Vel Total (ft/s)	* 13.20	* Avg. Vel. (ft/s)	*	* 13.20 *	*
* Max Chl Dpth (ft)	* 5.77	* Hydr. Depth (ft)	*	* 2.43 *	*
* Conv. Total (cfs)	* 24001.5	* Conv. (cfs)	*	* 24001.5 *	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 95.93 *	*
* Min Ch El (ft)	* 1612.28	* Shear (lb/sq ft)	*	* 2.31 *	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 30.50 *	*
* Frctn Loss (ft)	* 1.73	* Cum Volume (acre-ft)	* 32.63 *	20.55 *	6.73 *
* C & E Loss (ft)	* 0.35	* Cum SA (acres)	* 5.88 *	3.76 *	1.78 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 2870

INPUT
Description: Section: 2870 (Station: 8+00); Existing channel
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1624.4	15.72	1624	44.88	1612	47.46	1611.48	64.23	1611.53
66.32	1612	70.97	1616	128.74	1617.29	180.97	1618	256.17	1620

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	15.72	.025	256.17	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
15.72	256.17	99.36	100	106.02	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	* 1619.48	* Element	* Left OB *	Channel *	Right OB *
* Vel Head (ft)	* 1.12	* Wt. n-Val.	*	* 0.025 *	*
* W.S. Elev (ft)	* 1618.35	* Reach Len. (ft)	* 99.36 *	100.00 *	106.02 *
* Crit W.S. (ft)	* 1618.37	* Flow Area (sq ft)	*	* 352.99 *	*
* E.G. Slope (ft/ft)	*0.007578	* Area (sq ft)	*	* 352.99 *	*
* Q Total (cfs)	* 3000.00	* Flow (cfs)	*	* 3000.00 *	*
* Top Width (ft)	* 164.81	* Top Width (ft)	*	* 164.81 *	*
* Vel Total (ft/s)	* 8.50	* Avg. Vel. (ft/s)	*	* 8.50 *	*
* Max Chl Dpth (ft)	* 6.87	* Hydr. Depth (ft)	*	* 2.14 *	*
* Conv. Total (cfs)	* 34461.3	* Conv. (cfs)	*	* 34461.3 *	*
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 167.68 *	*
* Min Ch El (ft)	* 1611.48	* Shear (lb/sq ft)	*	* 1.00 *	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.46 *	*
* Frctn Loss (ft)	* 0.71	* Cum Volume (acre-ft)	* 32.63 *	19.89 *	6.73 *
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 5.88 *	3.46 *	1.78 *

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2835

INPUT
Description: Section: 2835 (Station: 7+00); Existing channel
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1624.4	13.55	1624	40.98	1612	52.5	1611	62.9	1612
66.73	1614	123.58	1616	153.7	1618	184.52	1618.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	13.55	.025	153.7	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.55	153.7	100	100 100.01	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1618.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.		0.025	
W.S. Elev (ft)	1617.14	Reach Len. (ft)	100.00	100.00	100.01
Crit W.S. (ft)	1617.27	Flow Area (sq ft)		301.03	
E.G. Slope (ft/ft)	*0.007633	Area (sq ft)		301.03	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	111.50	Top Width (ft)		111.50	
Vel Total (ft/s)	9.97	Avg. Vel. (ft/s)		9.97	
Max Chl Dpth (ft)	6.14	Hydr. Depth (ft)		2.70	
Conv. Total (cfs)	34336.8	Conv. (cfs)		34336.8	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		113.23	
Min Ch El (ft)	1611.00	Shear (lb/sq ft)		1.27	
Alpha	1.00	Stream Power (lb/ft s)		12.63	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	32.63	19.14	6.73
C & E Loss (ft)	0.04	Cum SA (acres)	5.88	3.14	1.78

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2800

INPUT
Description: Section: 2800 (Station: 6+00); Existing channel. (Appoximate location of cross section 2800 from effective model)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1622.8	14.31	1622	35.25	1612	52.54	1610.5	61.97	1612
68.11	1614	149.82	1616	154.85	1618				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	14.31	.025	154.85	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
14.31	154.85	100	100 101.66	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1617.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.		0.025	
W.S. Elev (ft)	1616.56	Reach Len. (ft)	100.00	100.00	101.66
Crit W.S. (ft)	1616.65	Flow Area (sq ft)		313.92	
E.G. Slope (ft/ft)	*0.007753	Area (sq ft)		313.92	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	125.55	Top Width (ft)		125.55	
Vel Total (ft/s)	9.56	Avg. Vel. (ft/s)		9.56	
Max Chl Dpth (ft)	6.06	Hydr. Depth (ft)		2.50	
Conv. Total (cfs)	34071.5	Conv. (cfs)		34071.5	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		127.21	
Min Ch El (ft)	1610.50	Shear (lb/sq ft)		1.19	
Alpha	1.00	Stream Power (lb/ft s)		11.41	
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	32.63	18.43	6.73
C & E Loss (ft)	0.07	Cum SA (acres)	5.88	2.87	1.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2770

INPUT
Description: Section: 2770 (Station: 5+00); Existing channel
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1622.5	13.42	1622	27.96	1612	70.35	1610	78.84	1609.5
83.79	1610	84.86	1612	106.07	1614	163.38	1616	173.14	1618

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	13.42	.025	173.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
13.42	173.14	100.25	100 100.75	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1616.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.62	Wt. n-Val.		0.025	
W.S. Elev (ft)	1614.23	Reach Len. (ft)	100.25	100.00	100.75
Crit W.S. (ft)	1615.08	Flow Area (sq ft)		230.89	
E.G. Slope (ft/ft)	*0.013601	Area (sq ft)		230.89	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	87.89	Top Width (ft)		87.89	
Vel Total (ft/s)	12.99	Avg. Vel. (ft/s)		12.99	
Max Chl Dpth (ft)	4.73	Hydr. Depth (ft)		2.63	
Conv. Total (cfs)	25724.2	Conv. (cfs)		25724.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		89.96	
Min Ch El (ft)	1609.50	Shear (lb/sq ft)		2.18	

* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	28.31	*		*	
* Frctn Loss (ft)	*	1.01	* Cum Volume (acre-ft)	*	32.63	*	17.80	*	6.73	*	
* C & E Loss (ft)	*	0.12	* Cum SA (acres)	*	5.88	*	2.63	*	1.78	*	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 2735

INPUT
Description: Section: 2735 (Station: 4+00); Existing channel
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1621	9.46	1620	38.08	1610	44.5	1608.5	63	1608.5
74.61	1610	76.09	1612	108.36	1614	157.57	1616		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	9.46	.025	157.57	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.46	157.57	107.76	100	95.13	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	* 1616.14	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.55	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1614.59	* Reach Len. (ft)	* 107.76	* 100.00	* 95.13 *
* Crit W.S. (ft)	* 1614.59	* Flow Area (sq ft)	*	* 300.00	* *
* E.G. Slope (ft/ft)	*0.006548	* Area (sq ft)	*	* 300.00	* *
* Q Total (cfs)	* 3000.00	* Flow (cfs)	*	* 3000.00	* *
* Top Width (ft)	* 97.93	* Top Width (ft)	*	* 97.93	* *
* Vel Total (ft/s)	* 10.00	* Avg. Vel. (ft/s)	*	* 10.00	* *
* Max Chl Dpth (ft)	* 6.09	* Hydr. Depth (ft)	*	* 3.06	* *
* Conv. Total (cfs)	* 37073.6	* Conv. (cfs)	*	* 37073.6	* *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 100.06	* *
* Min Ch El (ft)	* 1608.50	* Shear (lb/sq ft)	*	* 1.23	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 12.26	* *
* Frctn Loss (ft)	* 0.63	* Cum Volume (acre-ft)	* 32.63	* 17.19	* 6.73 *
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 5.88	* 2.41	* 1.78 *

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2700

INPUT
Description: Section: 2700 (Station: 3+00); Existing channel. (Appoximate location of cross section 2700 from effective model)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1620.4	8.39	1620	26.92	1610	39	1607.4	65.72	1607.75
80.65	1610	92.33	1616	114.68	1616				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	0	.025	92.33	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	92.33	108.35	100	91.94	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	* 1615.13	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 3.16	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1611.97	* Reach Len. (ft)	* 108.35	* 100.00	* 91.94 *
* Crit W.S. (ft)	* 1612.77	* Flow Area (sq ft)	*	* 210.19	* *
* E.G. Slope (ft/ft)	*0.011472	* Area (sq ft)	*	* 210.19	* *
* Q Total (cfs)	* 3000.00	* Flow (cfs)	*	* 3000.00	* *
* Top Width (ft)	* 61.20	* Top Width (ft)	*	* 61.20	* *
* Vel Total (ft/s)	* 14.27	* Avg. Vel. (ft/s)	*	* 14.27	* *
* Max Chl Dpth (ft)	* 4.56	* Hydr. Depth (ft)	*	* 3.43	* *
* Conv. Total (cfs)	* 28009.6	* Conv. (cfs)	*	* 28009.6	* *
* Length Wtd. (ft)	* 100.00	* Wetted Per. (ft)	*	* 62.61	* *
* Min Ch El (ft)	* 1607.40	* Shear (lb/sq ft)	*	* 2.40	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 34.31	* *
* Frctn Loss (ft)	* 0.85	* Cum Volume (acre-ft)	* 32.63	* 16.61	* 6.73 *
* C & E Loss (ft)	* 0.16	* Cum SA (acres)	* 5.88	* 2.23	* 1.78 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 2670

INPUT
Description: Section: 2670 (Station 2+00); Existing channel;
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-8.23	1618	17.09	1608	39	1606.6	73	1606.62	89.68	1608

105.37 1616 139.44 1616

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-8.23	.04	-8.23	.025	105.37	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left Channel	Right	Coeff Contr.	Expan.
-8.23	105.37	26.88	26.87	28.46	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1613.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.025	
W.S. Elev (ft)	1613.14	Reach Len. (ft)	26.88	26.87	28.46
Crit W.S. (ft)	1610.70	Flow Area (sq ft)		506.79	
E.G. Slope (ft/ft)	0.001109	Area (sq ft)		506.79	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	95.70	Top Width (ft)		95.70	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	6.54	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	90070.0	Conv. (cfs)		90070.0	
Length Wtd. (ft)	26.87	Wetted Per. (ft)		98.01	
Min Ch El (ft)	1606.60	Shear (lb/sq ft)		0.36	
Alpha	1.00	Stream Power (lb/ft s)		2.12	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	32.63	15.79	6.73
C & E Loss (ft)	0.01	Cum SA (acres)	5.88	2.05	1.78

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2660

INPUT
Description: Section: 2660 (Station 1+73.13); Edge of wing walls; North end of
Pioneer Blvd. culverts.
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-7.66	1618	18.28	1608	39	1606.39	75.93	1606.39	82.71	1608
95.99	1616								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-7.66	.04	-7.66	.025	95.99	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left Channel	Right	Coeff Contr.	Expan.
-7.66	95.99	26.8	8.13	16.76	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1613.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.025	
W.S. Elev (ft)	1612.96	Reach Len. (ft)	26.80	8.13	16.76
Crit W.S. (ft)		Flow Area (sq ft)		453.24	
E.G. Slope (ft/ft)	0.001396	Area (sq ft)		453.24	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	85.52	Top Width (ft)		85.52	
Vel Total (ft/s)	6.62	Avg. Vel. (ft/s)		6.62	
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	80301.4	Conv. (cfs)		80301.4	
Length Wtd. (ft)	8.13	Wetted Per. (ft)		88.07	
Min Ch El (ft)	1606.39	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		2.97	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.63	15.49	6.73
C & E Loss (ft)	0.06	Cum SA (acres)	5.88	1.99	1.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2650

INPUT
Description: Section: 2650 (Station: 1+65); Inlet of existing Pioneer Blvd.
culverts (5 - 12 x 10's)
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
18.67	1616.32	18.67	1606.32	81.34	1606.32	81.34	1616.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
18.67	.015	18.67	.015	81.34	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left Channel	Right	Coeff Contr.	Expan.
18.67	81.34	165	165	165	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1613.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.70	Reach Len. (ft)	165.00	165.00	165.00
Crit W.S. (ft)	1610.45	Flow Area (sq ft)		399.56	
E.G. Slope (ft/ft)	0.000622	Area (sq ft)		399.56	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	62.67	Top Width (ft)		62.67	
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)		7.51	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	120284.8	Conv. (cfs)		120284.8	
Length Wtd. (ft)	165.00	Wetted Per. (ft)		75.42	
Min Ch El (ft)	1606.32	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.54	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.63	15.41	6.73
C & E Loss (ft)		Cum SA (acres)	5.88	1.98	1.78

CULVERT

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2620

INPUT
Description: Section: 2620; Existing Pioneer Blvd. culverts (5 - 12 x 10's).
Distance from Upstream XS = .1
Deck/Roadway Width = 164.8
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
18.67	1619	1605	81.34	1619	1605

Upstream Bridge Cross Section Data
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
18.67	1616.32	18.67	1606.32	81.34	1606.32	81.34	1616.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
18.67	.015	18.67	.015	81.34	.015

Bank Sta: Left Right Coeff Contr. Expan.
18.67 81.34 .3 .5

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
18.67	1619	1605	81.34	1619	1605

Downstream Bridge Cross Section Data
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
18.67	1615	18.67	1605	81.34	1605	81.34	1615

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
18.67	.015	18.67	.015	81.34	.015

Bank Sta: Left Right Coeff Contr. Expan.
18.67 81.34 .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 = 1619
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 10 12
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
.1	164.9	.015	.015	0	.4	1

Number of Barrels = 5
Upstream Elevation = 1606.32
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.
24.67	37.34	50	62.67	75.34

Downstream Elevation = 1605
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.
24.67	37.34	50	62.67	75.34

CULVERT OUTPUT Profile #PF#1 Culv Group: Culvert #1

Q Culv Group (cfs)	3000.00	Culv Full Len (ft)	
# Barrels	5	Culv Vel US (ft/s)	11.72
Q Barrel (cfs)	600.00	Culv Vel DS (ft/s)	14.29
E.G. US. (ft)	1613.57	Culv Inv El Up (ft)	1606.32
W.S. US. (ft)	1612.70	Culv Inv El Dn (ft)	1605.00
E.G. DS (ft)	1611.22	Culv Frctn Ls (ft)	1.05
W.S. DS (ft)	1609.14	Culv Exit Loss (ft)	0.45
Delta EG (ft)	2.36	Culv Entr Loss (ft)	0.85
Delta WS (ft)	3.56	Q Weir (cfs)	
E.G. IC (ft)	1613.09	Weir Sta Lft (ft)	
E.G. OC (ft)	1613.57	Weir Sta Rgt (ft)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (ft)	1610.59	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1608.50	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.38	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.27	Min El Weir Flow (ft)	1619.01

Note: The flow in the culvert is entirely supercritical.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2590

INPUT
Description: Section: 2590 (Station: 0+00); Outlet of existing Pioneer Blvd.
culverts (5 - 12 x 10's)
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
18.67	1615	18.67	1605	81.34	1605	81.34	1615

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
18.67	.015	18.67	.015	81.34	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
18.67 81.34 12.07 8.13 12.07 .3 .5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1611.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	1608.50	Reach Len. (ft)	12.07	8.13	12.07
Crit W.S. (ft)	1609.13	Flow Area (sq ft)		219.51	
E.G. Slope (ft/ft)	*0.004121	Area (sq ft)		219.51	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	62.67	Top Width (ft)		62.67	
Vel Total (ft/s)	13.67	Avg. Vel. (ft/s)		13.67	
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)		3.50	
Conv. Total (cfs)	46732.5	Conv. (cfs)		46732.5	
Length Wtd. (ft)	8.13	Wetted Per. (ft)		69.68	
Min Ch El (ft)	1605.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		11.08	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.63	14.24	6.73
C & E Loss (ft)		Cum SA (acres)	5.88	1.74	1.78

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2570

INPUT
Description: Section: 2570 (Station: -0+08.13) Rip-Rap; Edge of Wing walls;
South end of Pioneer Blvd. culverts.
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.74	1615	9.74	1606	18.67	1604.25	81.34	1604.25	90.26	1606
90.26	1615								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.74	.04	9.74	.025	90.26	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9.74	90.26	76.23 20.17	18.01	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1610.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1606.70	Reach Len. (ft)	76.23	20.17	18.01
Crit W.S. (ft)	1607.94	Flow Area (sq ft)		181.85	
E.G. Slope (ft/ft)	*0.026754	Area (sq ft)		181.85	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	80.52	Top Width (ft)		80.52	
Vel Total (ft/s)	16.50	Avg. Vel. (ft/s)		16.50	
Max Chl Dpth (ft)	2.45	Hydr. Depth (ft)		2.26	
Conv. Total (cfs)	18341.2	Conv. (cfs)		18341.2	
Length Wtd. (ft)	21.69	Wetted Per. (ft)		82.26	
Min Ch El (ft)	1604.25	Shear (lb/sq ft)		3.69	
Alpha	1.00	Stream Power (lb/ft s)		60.91	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	32.63	14.20	6.73
C & E Loss (ft)	0.40	Cum SA (acres)	5.88	1.73	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 2550

INPUT
Description: Section: 2550 (Station: -0+28.30) End Rip-Rap; South end of
Pioneer Blvd. culverts.
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-57.84	1610	-45.94	1608	-27.94	1606	9.73	1604	18.41	1602.89
50	1602.65	73	1602.65	84.95	1604	94.81	1609.42	106.56	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-57.84	.04	18.41	.025	94.81	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
18.41	94.81	251.8 237.27	216.73	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1610.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.08	Wt. n-Val.	0.040	0.025	
W.S. Elev (ft)	1605.11	Reach Len. (ft)	251.80	237.27	216.73
Crit W.S. (ft)	1606.60	Flow Area (sq ft)	26.07	152.99	
E.G. Slope (ft/ft)	*0.033619	Area (sq ft)	26.07	152.99	
Q Total (cfs)	3000.00	Flow (cfs)	162.83	2837.17	
Top Width (ft)	98.16	Top Width (ft)	29.60	68.56	
Vel Total (ft/s)	16.75	Avg. Vel. (ft/s)	6.25	18.54	
Max Chl Dpth (ft)	2.46	Hydr. Depth (ft)	0.88	2.23	
Conv. Total (cfs)	16361.7	Conv. (cfs)	888.0	15473.7	
Length Wtd. (ft)	237.01	Wetted Per. (ft)	29.70	68.92	
Min Ch El (ft)	1602.65	Shear (lb/sq ft)	1.84	4.66	
Alpha	1.17	Stream Power (lb/ft s)	11.51	86.40	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	32.61	14.12	6.73
C & E Loss (ft)	0.09	Cum SA (acres)	5.86	1.69	1.78

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2500

INPUT
Description: Section: 2500 (Sta: -2+68.47); South of Pioneer Blvd. existing
channel. (Existing cross section 2500 from effective model)
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-133.77	1610	-27.29	1610	-13.41	1608	16.34	1606	28.78	1600
31.33	1599.18	57.38	1599.18	79.48	1606.75	84.41	1608	106.08	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-133.77	.04	-13.41	.025	57.38	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-13.41	57.38	179.44	182.7	186.16 .1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1607.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.		0.025	0.030
W.S. Elev (ft)	1605.42	Reach Len. (ft)	179.44	182.70	186.16
Crit W.S. (ft)	1605.42	Flow Area (sq ft)		207.96	56.88
E.G. Slope (ft/ft)	0.005406	Area (sq ft)		207.96	56.88
Q Total (cfs)	3100.00	Flow (cfs)		2673.70	426.31
Top Width (ft)	58.07	Top Width (ft)		39.84	18.22
Vel Total (ft/s)	11.71	Avg. Vel. (ft/s)		12.86	7.50
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		5.22	3.12
Conv. Total (cfs)	42163.4	Conv. (cfs)		36365.2	5798.2
Length Wtd. (ft)	182.98	Wetted Per. (ft)		41.21	19.26
Min Ch El (ft)	1599.18	Shear (lb/sq ft)		1.70	1.00
Alpha	1.10	Stream Power (lb/ft s)		21.90	7.47
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	32.53	13.14	6.59
C & E Loss (ft)	0.30	Cum SA (acres)	5.77	1.40	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2400

INPUT
Description: Section: 2400 (Sta: -4+51.17); South of Pioneer Blvd. existing channel. (Existing cross section 2400 from effective model)
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-94.58	1610	-59.74	1608	-53.45	1606	-39.47	1604	3.47	1602
27.1	1602	37.66	1598	38.67	1597.66	58.81	1597.67	83.88	1605.15
86.62	1606	116.41	1615.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-94.58	.04	27.1	.025	58.81	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
27.1	58.81	132.22	136	140.41 .1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1606.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1604.77	Reach Len. (ft)	132.22	136.00	140.41
Crit W.S. (ft)	1604.41	Flow Area (sq ft)	143.21	200.33	84.37
E.G. Slope (ft/ft)	0.002867	Area (sq ft)	143.21	200.33	84.37
Q Total (cfs)	3100.00	Flow (cfs)	450.45	2143.62	505.93
Top Width (ft)	127.41	Top Width (ft)	71.92	31.71	23.78
Vel Total (ft/s)	7.24	Avg. Vel. (ft/s)	3.15	10.70	6.00
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)	1.99	6.32	3.55
Conv. Total (cfs)	57891.7	Conv. (cfs)	8412.1	40031.5	9448.2
Length Wtd. (ft)	135.91	Wetted Per. (ft)	72.02	32.50	24.82
Min Ch El (ft)	1597.66	Shear (lb/sq ft)	0.36	1.10	0.61
Alpha	1.65	Stream Power (lb/ft s)	1.12	11.81	3.65
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	32.24	12.28	6.28
C & E Loss (ft)	0.26	Cum SA (acres)	5.62	1.25	1.64

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: Pulsipher Wash
REACH: Falcon Ridge RS: 2330

INPUT
Description: Section: 2330 (Sta: -6+06.38); South of Pioneer Blvd. existing channel. (Existing cross section 2330 from effective model)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-232.34	1610	-213.57	1608	-202.51	1606	-170.02	1604	21.93	1602
41.1	1596.83	60.96	1596.94	84.75	1604.16	116.81	1615.73		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-232.34	.04	21.93	.025	60.96	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
21.93	60.96	244.91	239.77	234.33 .1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.15	Reach Len. (ft)	244.91	239.77	234.33
Crit W.S. (ft)		Flow Area (sq ft)	422.46	273.90	110.67

E.G. Slope (ft/ft)	0.001006	Area (sq ft)	422.46	273.90	110.67
Q Total (cfs)	3100.00	Flow (cfs)	791.80	1871.07	437.13
Top Width (ft)	276.11	Top Width (ft)	210.56	39.03	26.52
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)	1.87	6.83	3.95
Max Chl Dpth (ft)	8.32	Hydr. Depth (ft)	2.01	7.02	4.17
Conv. Total (cfs)	97728.1	Conv. (cfs)	24961.7	58985.9	13780.5
Length Wtd. (ft)	241.13	Wetted Per. (ft)	210.60	39.72	27.76
Min Ch El (ft)	1596.83	Shear (lb/sq ft)	0.13	0.43	0.25
Alpha	2.12	Stream Power (lb/ft s)	0.24	2.96	0.99
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	31.38	11.54	5.97
C & E Loss (ft)	0.12	Cum SA (acres)	5.19	1.14	1.56

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2300

INPUT
Description: Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing channel. (Existing cross section 2300 from effective model)

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-279.66	1608	-273.24	1606	-243.69	1604	-228.95	1602	-211.85	1600
-199.32	1600	-189.03	1602	-163.66	1602	-112.79	1600	12.87	1598.85
31.05	1596	39.89	1595.82	63.64	1595.82	86.88	1603.39	121.14	1615.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-279.66	.04	12.87	.025	63.64	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
12.87	63.64	134.71	313.73	323.04	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)		Flow Area (sq ft)	1289.34	454.65	139.39
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	1289.34	454.65	139.39
Q Total (cfs)	3100.00	Flow (cfs)	1539.51	1340.49	219.99
Top Width (ft)	356.33	Top Width (ft)	276.73	50.77	28.83
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.19	2.95	1.58
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	4.66	8.95	4.84
Conv. Total (cfs)	268695.9	Conv. (cfs)	133439.1	116188.7	19068.2
Length Wtd. (ft)	198.07	Wetted Per. (ft)	277.27	50.99	30.37
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.04	0.07	0.04
Alpha	1.71	Stream Power (lb/ft s)	0.05	0.22	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	26.57	9.54	5.30
C & E Loss (ft)	0.02	Cum SA (acres)	3.82	0.89	1.41

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2200

INPUT
Description: Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing channel. (Existing cross section 2200 from effective model)

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-529.7	1606	-504.93	1602	-433.36	1600	-422.03	1598	-411.07	1596
-393.06	1596	-382.49	1598	-358.9	1598	-351.33	1596	-339.14	1596
-324.81	1598	-311.83	1596	-284.98	1596	-17.67	1598	19.38	1598
32.13	1594	33.2	1593.65	51.03	1593	71.7	1598.5	111.8	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-529.7	.04	19.38	.025	51.03	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.38	51.03	230.85	258.71	280.12	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.40	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	4128.81	347.61	261.15
E.G. Slope (ft/ft)	0.000018	Area (sq ft)	4128.81	347.61	261.15
Q Total (cfs)	3100.00	Flow (cfs)	2487.25	424.06	188.69
Top Width (ft)	615.56	Top Width (ft)	545.38	31.65	38.53
Vel Total (ft/s)	0.65	Avg. Vel. (ft/s)	0.60	1.22	0.72
Max Chl Dpth (ft)	12.40	Hydr. Depth (ft)	7.57	10.98	6.78
Conv. Total (cfs)	735769.2	Conv. (cfs)	590336.8	100647.4	44785.0
Length Wtd. (ft)	242.41	Wetted Per. (ft)	546.78	32.33	40.53
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.23	Stream Power (lb/ft s)	0.01	0.01	0.01
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	18.19	6.65	3.81
C & E Loss (ft)	0.00	Cum SA (acres)	2.55	0.59	1.16

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2120

INPUT
Description: Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing channel. End of bank protection (rip-rap) west sided of channel.

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-219.24	1608	-197.58	1606	-180.07	1604	-146.34	1598	-109.19	1596
-99.41	1594	-92.4	1594	-41.72	1596	23.32	1595.11	27.27	1594

36.27	1592	42.09	1590.38	64.49	1591	80.92	1594.43	84.7	1596
112.56	1606								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.24	.04	23.32	.025	64.49	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.32	64.49	73	68.06	68.56	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1812.34	565.55	368.77
E.G. Slope (ft/ft)	0.000033	Area (sq ft)	1812.34	565.55	368.77
Q Total (cfs)	3100.00	Flow (cfs)	1596.75	1097.87	405.39
Top Width (ft)	302.91	Top Width (ft)	215.41	41.17	46.32
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.88	1.94	1.10
Max Chl Dpth (ft)	14.99	Hydr. Depth (ft)	8.41	13.74	7.96
Conv. Total (cfs)	539168.4	Conv. (cfs)	277714.3	190947.2	70506.9
Length Wtd. (ft)	69.36	Wetted Per. (ft)	216.32	41.77	48.62
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.49	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.45	3.94	1.79
C & E Loss (ft)	0.00	Cum SA (acres)	0.54	0.38	0.89

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2100

INPUT
Description: Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing channel. (Existing cross section 2100 from effective model)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-81.41	1606	-56.47	1604	-45.38	1602	-37.37	1600	-26.85	1598
-14.73	1596	27.52	1594	32.71	1592	38.34	1590	50	1589.6
61.03	1590	79.71	1600	95.92	1606				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-81.41	.04	-81.41	.025	95.92	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81.41	95.92	68.04	62.28	67.59	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1605.32	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1402.05	
E.G. Slope (ft/ft)	0.000084	Area (sq ft)		1402.05	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	166.99	Top Width (ft)		166.99	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	15.72	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	337444.2	Conv. (cfs)		337444.2	
Length Wtd. (ft)	63.72	Wetted Per. (ft)		172.06	
Min Ch El (ft)	1589.60	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.93	2.40	1.50
C & E Loss (ft)	0.03	Cum SA (acres)	0.36	0.22	0.86

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2000

INPUT
Description: Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of I-15 box culvert. (Existing cross section 2000 from effective model)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	303.13	319.65	320.07	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1605.17	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1601.38	Flow Area (sq ft)	215.53	195.42	212.36
E.G. Slope (ft/ft)	0.000144	Area (sq ft)	215.53	195.42	212.36
Q Total (cfs)	2138.00	Flow (cfs)	677.95	775.84	684.21
Top Width (ft)	104.82	Top Width (ft)	48.53	12.00	44.29
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)	3.15	3.97	3.22
Max Chl Dpth (ft)	16.29	Hydr. Depth (ft)	4.44	16.29	4.79
Conv. Total (cfs)	178233.2	Conv. (cfs)	56516.8	64677.6	57038.8
Length Wtd. (ft)	0.10	Wetted Per. (ft)	50.05	32.00	47.57
Min Ch El (ft)	1588.88	Shear (lb/sq ft)	0.04	0.05	0.04
Alpha	1.04	Stream Power (lb/ft s)	0.12	0.22	0.13
Frctn Loss (ft)		Cum Volume (acre-ft)	0.76	1.26	1.33
C & E Loss (ft)		Cum SA (acres)	0.32	0.09	0.82

```
**********************************************************************************************

BRIDGE


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 1950

INPUT
Description: Section: 1950; Existing I-15 culvert (12' x 10')
Distance from Upstream XS =       .1
Deck/Roadway Width        =  319.65
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
**********************************************************************
   -4.53 1603.83 1582.19      44 1603.83 1582.19      44 1603.83 1598.88
      56 1603.83 1598.88      56 1603.83 1582.19  100.29 1603.83 1582.19

Upstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
   -4.53    1604    7.52    1602   19.96    1600      44 1598.88      44 1588.88
      56 1588.88      56 1598.88   73.88    1600  100.29    1602

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
   -4.53    .015      44    .015      56    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
            44      56             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   -4.53 1603.83 1598.88 1104.82 1603.83 1598.88

Downstream Bridge Cross Section Data
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
    5.56    1600    17.2    1598   24.99    1596   27.96    1594      44 1592.19
      44 1582.19      56 1582.19      56 1592.19   75.01    1596  130.66    1598
  193.09    1600  214.49    1602  232.29    1604  249.33    1606

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
    5.56    .015      44    .015      56    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
            44      56             .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         = 1603.83
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
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
        Pressure and Weir flow
            Submerged Inlet Cd          =
            Submerged Inlet + Outlet Cd =.8164966
            Max Low Cord                = 1598.88

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)          *    1605.35  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1605.17  * E.G. Elev (ft)         *    1605.35  *    1604.64  *
* Q Total (cfs)          *    2138.00  * W.S. Elev (ft)         *    1605.17  *    1604.37  *
* Q Bridge (cfs)         *    1624.24  * Crit W.S. (ft)         *    1598.84  *    1594.60  *
* Q Weir (cfs)           *     513.76  * Max Chl Dpth (ft)      *      16.29  *      22.18  *
* Weir Sta Lft (ft)      *      -4.53  * Vel Total (ft/s)       *       8.23  *       3.28  *
* Weir Sta Rgt (ft)      *     100.29  * Flow Area (sq ft)      *     259.86  *     652.15  *
* Weir Submerg           *       0.00  * Froude # Chl           *       0.36  *       0.19  *
* Weir Max Depth (ft)    *       1.52  * Specif Force (cu ft)  *    2016.42  *    5524.01  *
* Min El Weir Flow (ft)  *    1603.84  * Hydr Depth (ft)       *       2.48  *       2.84  *
* Min El Prs (ft)        *    1598.88  * W.P. Total (ft)       *     151.33  *     544.03  *
* Delta EG (ft)          *       8.23  * Conv. Total (cfs)     *             *             *
* Delta WS (ft)          *      13.08  * Top Width (ft)        *     104.82  *     229.89  *
* BR Open Area (sq ft)   *     120.00  * Frctn Loss (ft)       *             *             *
* BR Open Vel (ft/s)     *      13.54  * C & E Loss (ft)       *             *             *
* Coef of Q              *             * Shear Total (lb/sq ft) *             *             *
* Br Sel Method          * Press/Weir  * Power Total (lb/ft s) *             *             *
**********************************************************************************************

Note:    Momentum answer is not valid if the water surface is above the low chord or if there is weir
         flow.  The momentum answer has been disregarded.
Note:    The downstream water surface is below the minimum elevation for pressure flow.  The sluice
         gate equations were used for pressure flow.
Note:    For the cross section inside the bridge at the upstream end, the water surface and energy have
         been projected from the upstream cross section.  The selected bridge modeling method does
         not compute answers inside the bridge.
Note:    For the cross section inside the bridge at the downstream end, the water surface and energy
         are based on critical depth over the weir.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION
```

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1900

INPUT
Description: Section: 1900; South I-15. Outlet of existing box culvert at I-15. (12x10) (Match existing cross section 1900 from effective model)

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	60.81 58.98	66.92	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1597.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.09	Reach Len. (ft)			
Crit W.S. (ft)	1592.09	Flow Area (sq ft)		118.76	
E.G. Slope (ft/ft)	0.005698	Area (sq ft)		118.76	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		9.90	
Conv. Total (cfs)	28323.5	Conv. (cfs)		28323.5	
Length Wtd. (ft)		Wetted Per. (ft)		31.79	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)		23.92	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Pulsipher Wash

Reach	River Sta.	n1	n2	n3
Falcon Ridge	3900	.04	.025	.04
Falcon Ridge	3800	.04	.025	.04
Falcon Ridge	3750	.016	.025	.04
Falcon Ridge	3700	.016	.025	.04
Falcon Ridge	3620	.016	.025	.04
Falcon Ridge	3580	.016	.025	.04
Falcon Ridge	3500	.016	.025	.04
Falcon Ridge	3480	.016	.025	.04
Falcon Ridge	3400	.016	.025	.04
Falcon Ridge	3375	.016	.025	.04
Falcon Ridge	3350	.016	.025	.04
Falcon Ridge	3325	.016	.025	.03
Falcon Ridge	3300	.022	.015	.022
Falcon Ridge	3280	.025	.015	.025
Falcon Ridge	3270	.015	.015	.015
Falcon Ridge	3260	.015	.015	.015
Falcon Ridge	3240	.015	.015	.015
Falcon Ridge	3220	.015	.015	.015
Falcon Ridge	3200	.015	.015	.015
Falcon Ridge	3175	.015	.015	.015
Falcon Ridge	3150	.015	.015	.015
Falcon Ridge	3125	.015	.015	.015
Falcon Ridge	3100	.015	.015	.015
Falcon Ridge	3090	Bridge		
Falcon Ridge	3080	.015	.015	.015
Falcon Ridge	3070	.04	.025	.04
Falcon Ridge	3025	.04	.025	.04
Falcon Ridge	3000	.04	.025	.04
Falcon Ridge	2970	.04	.025	.04
Falcon Ridge	2935	.04	.025	.04
Falcon Ridge	2900	.04	.025	.04
Falcon Ridge	2870	.04	.025	.04
Falcon Ridge	2835	.04	.025	.04
Falcon Ridge	2800	.04	.025	.04
Falcon Ridge	2770	.04	.025	.04
Falcon Ridge	2735	.04	.025	.04
Falcon Ridge	2700	.04	.025	.04
Falcon Ridge	2670	.04	.025	.04
Falcon Ridge	2660	.04	.025	.04
Falcon Ridge	2650	.015	.015	.015
Falcon Ridge	2620	Culvert		
Falcon Ridge	2590	.015	.015	.015
Falcon Ridge	2570	.04	.025	.03
Falcon Ridge	2550	.04	.025	.03
Falcon Ridge	2500	.04	.025	.03
Falcon Ridge	2400	.04	.025	.03
Falcon Ridge	2330	.04	.025	.03
Falcon Ridge	2300	.04	.025	.03
Falcon Ridge	2200	.04	.025	.03
Falcon Ridge	2120	.04	.025	.03
Falcon Ridge	2100	.04	.025	.03
Falcon Ridge	2000	.015	.015	.015
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Pulsipher Wash

Reach	River Sta.	Left	Channel	Right
Falcon Ridge	3900	238.03	320.4	468.3
Falcon Ridge	3600	421.12	355.77	288.45
Falcon Ridge	3750	240	221	221
Falcon Ridge	3700	282	284	355
Falcon Ridge	3620	151	149	106
Falcon Ridge	3580	288	297	315
Falcon Ridge	3500	109	113	108

*Falcon Ridge	*	3480	*	249*	239*	282*
*Falcon Ridge	*	3400	*	118*	116*	388*
*Falcon Ridge	*	3375	*	73*	85*	303*
*Falcon Ridge	*	3350	*	101*	104*	110*
*Falcon Ridge	*	3325	*	133*	117*	132*
*Falcon Ridge	*	3300	*	20*	20*	20*
*Falcon Ridge	*	3280	*	15*	15*	15*
*Falcon Ridge	*	3270	*	39.15*	39.15*	39.15*
*Falcon Ridge	*	3260	*	100*	100*	100*
*Falcon Ridge	*	3240	*	100*	100*	100*
*Falcon Ridge	*	3220	*	100*	100*	100*
*Falcon Ridge	*	3200	*	97*	100*	103*
*Falcon Ridge	*	3175	*	96*	100*	102*
*Falcon Ridge	*	3150	*	97*	100*	102*
*Falcon Ridge	*	3125	*	50*	51.61*	54*
*Falcon Ridge	*	3100	*	127.02*	127.02*	127.02*
*Falcon Ridge	*	3090	*Bridge	*	*	*
*Falcon Ridge	*	3080	*	33.23*	10*	25.61*
*Falcon Ridge	*	3070	*	105.7*	111.35*	117.11*
*Falcon Ridge	*	3025	*	99.1*	100*	101.11*
*Falcon Ridge	*	3000	*	97.73*	100*	102.94*
*Falcon Ridge	*	2970	*	97.69*	100*	112.99*
*Falcon Ridge	*	2935	*	95.45*	100*	88.53*
*Falcon Ridge	*	2900	*	100.3*	100*	130.51*
*Falcon Ridge	*	2870	*	99.36*	100*	106.02*
*Falcon Ridge	*	2835	*	100*	100*	100.01*
*Falcon Ridge	*	2800	*	100*	100*	101.66*
*Falcon Ridge	*	2770	*	100.25*	100*	100.75*
*Falcon Ridge	*	2735	*	107.76*	100*	95.13*
*Falcon Ridge	*	2700	*	108.35*	100*	91.94*
*Falcon Ridge	*	2670	*	26.88*	26.87*	28.46*
*Falcon Ridge	*	2660	*	26.8*	8.13*	16.76*
*Falcon Ridge	*	2650	*	165*	165*	165*
*Falcon Ridge	*	2620	*Culvert	*	*	*
*Falcon Ridge	*	2590	*	12.07*	8.13*	12.07*
*Falcon Ridge	*	2570	*	76.23*	20.17*	18.01*
*Falcon Ridge	*	2550	*	251.8*	237.27*	216.73*
*Falcon Ridge	*	2500	*	179.44*	182.7*	186.16*
*Falcon Ridge	*	2400	*	132.22*	136*	140.41*
*Falcon Ridge	*	2330	*	244.91*	239.77*	234.33*
*Falcon Ridge	*	2300	*	134.71*	313.73*	323.04*
*Falcon Ridge	*	2200	*	230.85*	258.71*	280.12*
*Falcon Ridge	*	2120	*	73*	68.06*	68.56*
*Falcon Ridge	*	2100	*	68.04*	62.28*	67.59*
*Falcon Ridge	*	2000	*	303.13*	319.85*	320.07*
*Falcon Ridge	*	1950	*Bridge	*	*	*
*Falcon Ridge	*	1900	*	60.81*	58.98*	66.92*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Pulsipher Wash

Reach		River Sta.	Contr.	Expan.
*Falcon Ridge	*	3900	.1	.3
*Falcon Ridge	*	3800	.1	.3
*Falcon Ridge	*	3750	.1	.3
*Falcon Ridge	*	3700	.1	.3
*Falcon Ridge	*	3620	.1	.3
*Falcon Ridge	*	3580	.1	.3
*Falcon Ridge	*	3500	.1	.3
*Falcon Ridge	*	3480	.1	.3
*Falcon Ridge	*	3400	.1	.3
*Falcon Ridge	*	3375	.1	.3
*Falcon Ridge	*	3350	.1	.3
*Falcon Ridge	*	3325	.1	.3
*Falcon Ridge	*	3300	.1	.3
*Falcon Ridge	*	3280	.1	.3
*Falcon Ridge	*	3270	.1	.3
*Falcon Ridge	*	3260	.1	.3
*Falcon Ridge	*	3240	.1	.3
*Falcon Ridge	*	3220	.1	.3
*Falcon Ridge	*	3200	.1	.3
*Falcon Ridge	*	3175	.1	.3
*Falcon Ridge	*	3150	.1	.3
*Falcon Ridge	*	3125	.3	.5
*Falcon Ridge	*	3100	.3	.5
*Falcon Ridge	*	3090	*Bridge	*
*Falcon Ridge	*	3080	.3	.5
*Falcon Ridge	*	3070	.1	.3
*Falcon Ridge	*	3025	.1	.3
*Falcon Ridge	*	3000	.1	.3
*Falcon Ridge	*	2970	.1	.3
*Falcon Ridge	*	2935	.1	.3
*Falcon Ridge	*	2900	.1	.3
*Falcon Ridge	*	2870	.1	.3
*Falcon Ridge	*	2835	.1	.3
*Falcon Ridge	*	2800	.1	.3
*Falcon Ridge	*	2770	.1	.3
*Falcon Ridge	*	2735	.1	.3
*Falcon Ridge	*	2700	.1	.3
*Falcon Ridge	*	2670	.1	.3
*Falcon Ridge	*	2660	.3	.5
*Falcon Ridge	*	2650	.3	.5
*Falcon Ridge	*	2620	*Culvert	*
*Falcon Ridge	*	2590	.3	.5
*Falcon Ridge	*	2570	.1	.3
*Falcon Ridge	*	2550	.1	.3
*Falcon Ridge	*	2500	.1	.3
*Falcon Ridge	*	2400	.1	.3
*Falcon Ridge	*	2330	.1	.3
*Falcon Ridge	*	2300	.1	.3
*Falcon Ridge	*	2200	.1	.3
*Falcon Ridge	*	2120	.1	.3
*Falcon Ridge	*	2100	.3	.5
*Falcon Ridge	*	2000	.3	.5
*Falcon Ridge	*	1950	*Bridge	*
*Falcon Ridge	*	1900	.3	.5

Profile Output Table - Standard Table 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)	

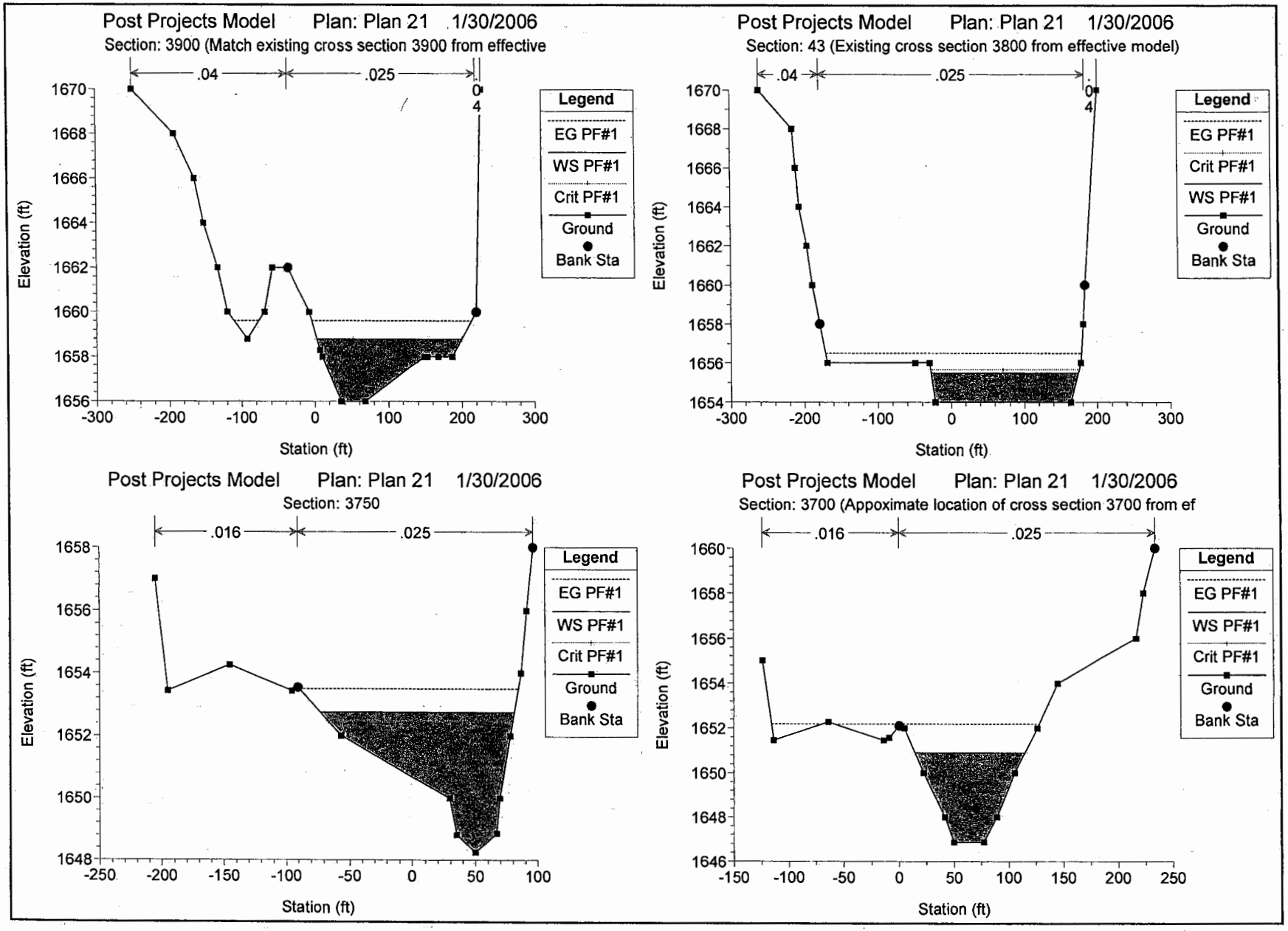
Falcon Ridge	3900	PF#1	2318.00	1656.00	1658.78	1658.78	1659.61	0.008011	7.31	317.01	196.56
1.01											
Falcon Ridge	3800	PF#1	2318.00	1654.00	1655.47	1655.66	1656.50	0.011905	8.15	284.32	201.42
1.21											
Falcon Ridge	3750	PF#1	2318.00	1648.25	1652.75	1652.46	1653.50	0.004912	6.95	333.47	153.97
0.83											
Falcon Ridge	3700	PF#1	2318.00	1646.87	1650.90	1650.90	1652.18	0.006723	9.07	255.57	100.21
1.00											
Falcon Ridge	3620	PF#1	2318.00	1643.32	1646.61	1647.35	1648.84	0.023515	11.98	193.46	127.68
1.72											
Falcon Ridge	3580	PF#1	2318.00	1641.59	1646.24	1646.24	1646.87	0.009061	6.40	361.98	299.75
1.03											
Falcon Ridge	3500	PF#1	2318.00	1638.87	1641.44	1641.86	1642.76	0.022651	9.22	251.42	239.73
1.59											
Falcon Ridge	3480	PF#1	2318.00	1638.25	1641.11	1641.05	1641.53	0.007658	5.20	446.02	445.82
0.92											
Falcon Ridge	3400	PF#1	2318.00	1635.90	1638.96	1638.96	1639.53	0.009055	6.06	382.51	338.93
1.01											
Falcon Ridge	3375	PF#1	2318.00	1634.00	1638.46	1636.37	1638.51	0.000342	1.73	1337.67	666.30
0.22											
Falcon Ridge	3350	PF#1	2318.00	1630.00	1638.45		1638.49	0.000138	1.54	1500.97	450.11
0.15											
Falcon Ridge	3325	PF#1	2318.00	1629.50	1638.45		1638.48	0.000070	1.42	1636.71	331.73
0.11											
Falcon Ridge	3300	PF#1	2450.00	1628.41	1638.19		1638.44	0.000149	5.20	763.06	140.05
0.29											
Falcon Ridge	3280	PF#1	2450.00	1628.10	1637.68	1635.61	1638.39	0.000479	7.72	480.01	113.19
0.44											
Falcon Ridge	3270	PF#1	2450.00	1627.87	1634.72	1634.72	1638.11	0.003108	14.78	165.76	24.66
1.00											
Falcon Ridge	3260	PF#1	2450.00	1627.27	1633.09	1634.12	1637.82	0.005022	17.46	140.36	24.66
1.29											
Falcon Ridge	3240	PF#1	2450.00	1625.76	1630.85	1632.61	1637.06	0.007479	20.00	122.51	24.66
1.58											
Falcon Ridge	3220	PF#1	2450.00	1624.24	1629.00	1631.09	1636.14	0.009202	21.45	114.22	24.66
1.76											
Falcon Ridge	3200	PF#1	2450.00	1622.72	1627.27	1629.57	1635.09	0.010519	22.44	109.19	24.66
1.88											
Falcon Ridge	3175	PF#1	2450.00	1621.21	1625.63	1628.06	1633.94	0.011531	23.14	105.88	24.66
1.97											
Falcon Ridge	3150	PF#1	2450.00	1619.69	1624.01	1626.56	1632.71	0.012340	23.67	103.50	24.66
2.04											
Falcon Ridge	3125	PF#1	2450.00	1618.17	1622.42	1625.04	1631.42	0.012967	24.07	101.81	24.66
2.09											
Falcon Ridge	3100	PF#1	2450.00	1617.39	1621.47	1624.11	1630.67	0.013549	24.34	100.66	24.66
2.12											
Falcon Ridge	3090		Bridge								
Falcon Ridge	3080	PF#1	2450.00	1616.37	1621.20	1623.11	1627.77	0.008216	20.58	119.06	24.66
1.65											
Falcon Ridge	3070	PF#1	3000.00	1617.35	1623.90	1623.90	1626.15	0.005934	12.04	249.20	56.12
1.01											
Falcon Ridge	3025	PF#1	3000.00	1616.86	1622.38	1622.99	1625.28	0.008988	13.68	219.28	55.95
1.22											
Falcon Ridge	3000	PF#1	3000.00	1615.00	1622.61	1622.26	1624.55	0.004783	11.17	268.58	57.12
0.91											
Falcon Ridge	2970	PF#1	3000.00	1613.80	1621.58	1621.58	1623.97	0.005939	12.41	241.84	51.09
1.00											
Falcon Ridge	2935	PF#1	3000.00	1613.37	1618.96	1620.22	1622.84	0.019215	15.80	189.88	69.96
1.69											
Falcon Ridge	2900	PF#1	3000.00	1612.28	1618.05	1618.87	1620.76	0.015623	13.20	227.24	93.37
1.49											
Falcon Ridge	2870	PF#1	3000.00	1611.48	1618.35	1618.37	1619.48	0.007578	8.50	352.99	164.81
1.02											
Falcon Ridge	2835	PF#1	3000.00	1611.00	1617.14	1617.27	1618.68	0.007633	9.97	301.03	111.50
1.07											
Falcon Ridge	2800	PF#1	3000.00	1610.50	1616.56	1616.65	1617.98	0.007753	9.56	313.92	125.55
1.07											
Falcon Ridge	2770	PF#1	3000.00	1609.50	1614.23	1615.08	1616.85	0.013601	12.99	230.89	87.89
1.41											
Falcon Ridge	2735	PF#1	3000.00	1608.50	1614.59	1614.59	1616.14	0.006548	10.00	300.00	97.93
1.01											
Falcon Ridge	2700	PF#1	3000.00	1607.40	1611.97	1612.77	1615.13	0.011472	14.27	210.19	61.20
1.36											
Falcon Ridge	2670	PF#1	3000.00	1606.60	1613.14	1610.70	1613.69	0.001109	5.92	506.79	95.70
0.45											
Falcon Ridge	2660	PF#1	3000.00	1606.39	1612.96		1613.64	0.001396	6.62	453.24	85.52
0.51											
Falcon Ridge	2650	PF#1	3000.00	1606.32	1612.70	1610.45	1613.57	0.000622	7.51	399.56	62.67
0.52											
Falcon Ridge	2620		Culvert								
Falcon Ridge	2590	PF#1	3000.00	1605.00	1608.50	1609.13	1611.40	0.004121	13.67	219.51	62.67
0.52											
Falcon Ridge	2570	PF#1	3000.00	1604.25	1606.70	1607.94	1610.93	0.026754	16.50	181.85	80.52
1.93											
Falcon Ridge	2550	PF#1	3000.00	1602.65	1605.11	1606.60	1610.19	0.033619	18.54	179.06	98.16
2.19											
Falcon Ridge	2500	PF#1	3100.00	1599.18	1605.42	1605.42	1607.76	0.005406	12.86	264.84	58.07
0.99											
Falcon Ridge	2400	PF#1	3100.00	1597.66	1604.77	1604.41	1606.11	0.002867	10.70	427.91	127.41
0.75											
Falcon Ridge	2330	PF#1	3100.00	1596.83	1605.15		1605.63	0.001006	6.83	807.04	276.11
0.45											
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37		1605.44	0.000133	2.95	1883.38	356.33
0.17											
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56
0.06											
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91
0.09											
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99
0.13											
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82
0.17											
Falcon Ridge	1950		Bridge								
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00
1.01											

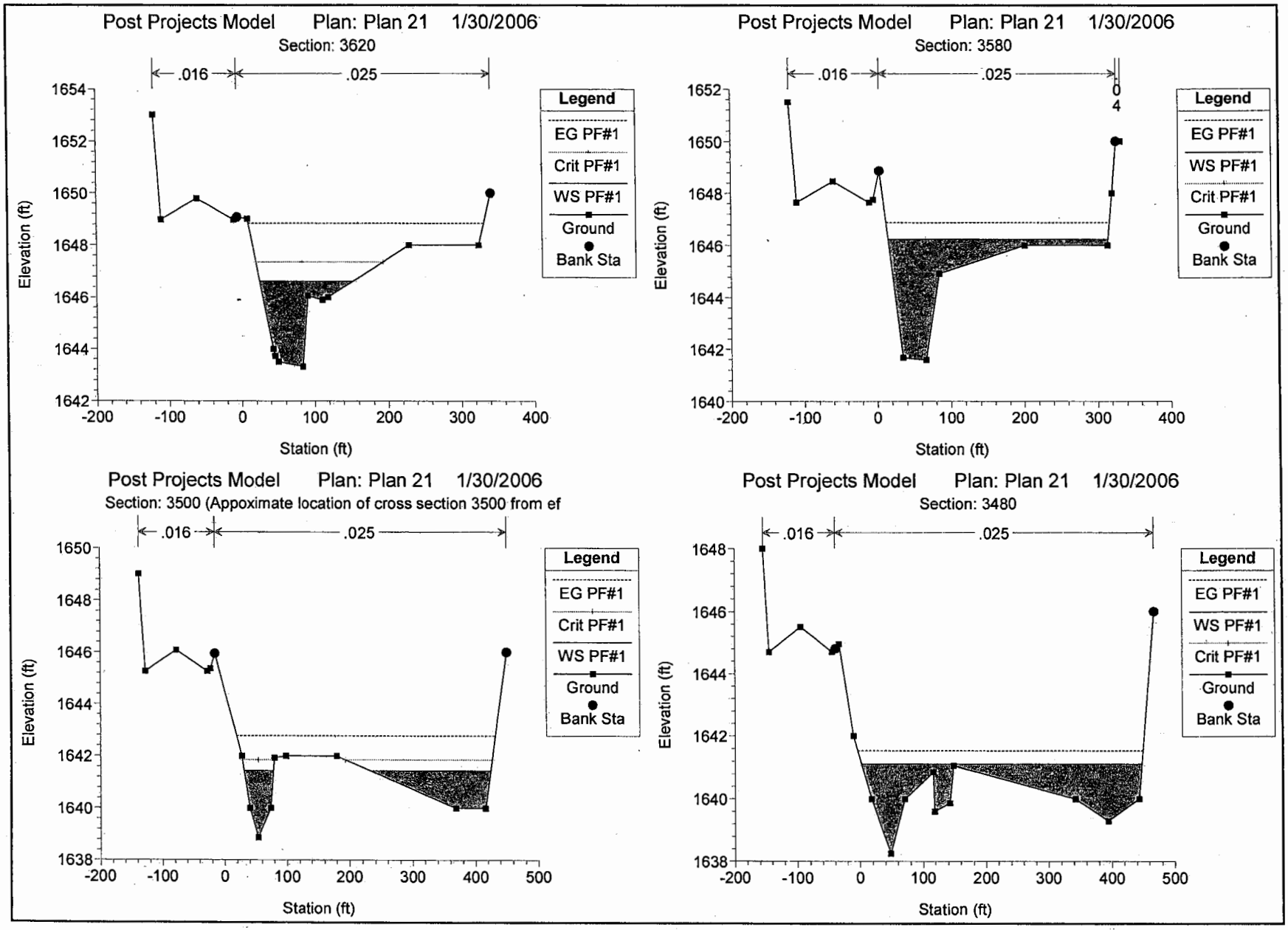
HEC-RAS Plan: Plan 21 River: Pulsipher Wash Reach: Falcon Ridge Profile: PF#1

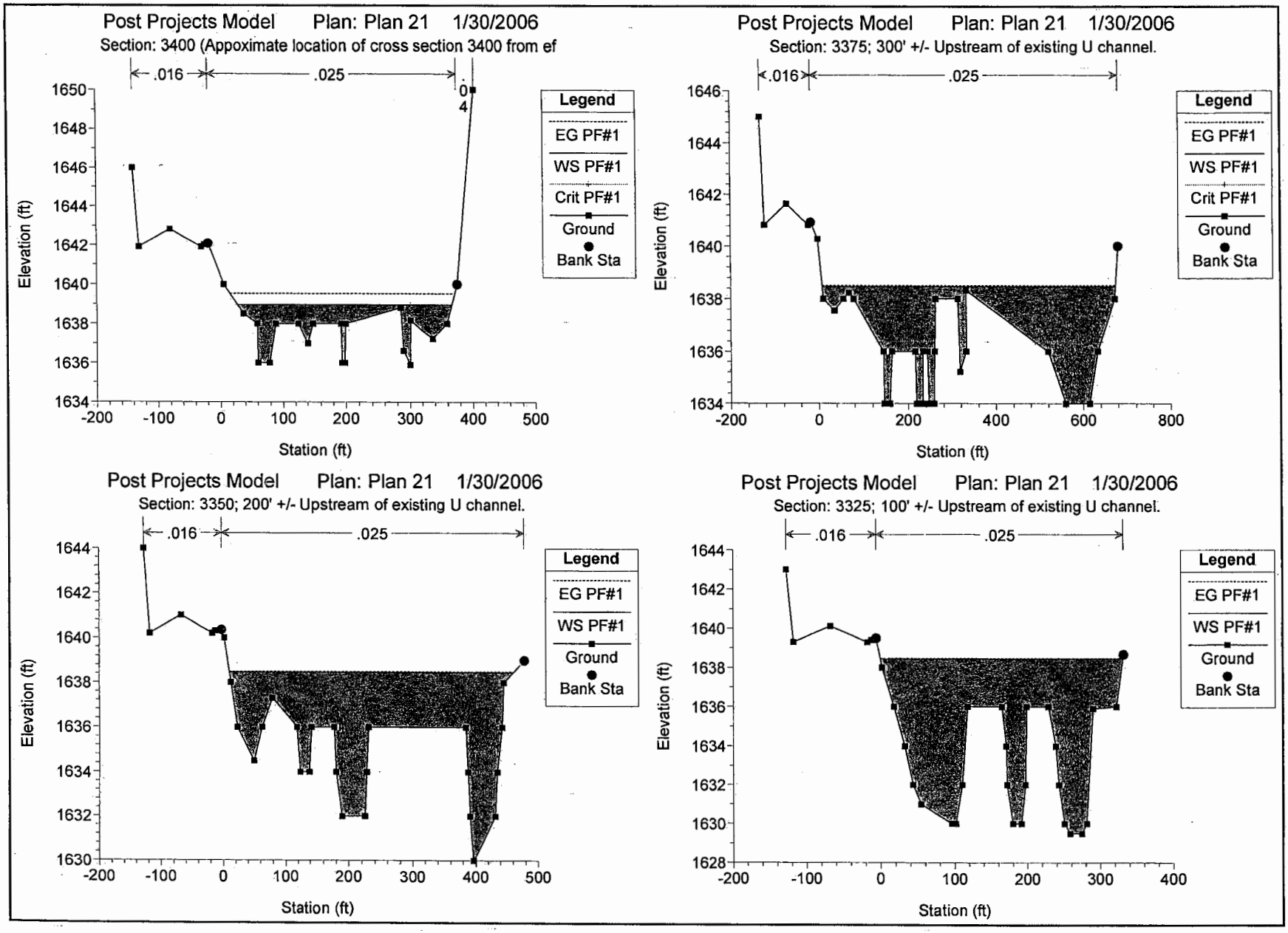
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Falcon Ridge	3900	PF#1	2318.00	1656.00	1658.78	1658.78	1659.61	0.008011	7.31	317.01	196.56	1.01
Falcon Ridge	3800	PF#1	2318.00	1654.00	1655.47	1655.66	1656.50	0.011905	8.15	284.32	201.42	1.21
Falcon Ridge	3750	PF#1	2318.00	1648.25	1652.75	1652.46	1653.50	0.004912	6.95	333.47	153.97	0.83
Falcon Ridge	3700	PF#1	2318.00	1646.87	1650.90	1650.90	1652.18	0.006723	9.07	255.57	100.21	1.00
Falcon Ridge	3620	PF#1	2318.00	1643.32	1646.61	1647.35	1648.84	0.023515	11.98	193.46	127.68	1.72
Falcon Ridge	3580	PF#1	2318.00	1641.59	1646.24	1646.24	1646.87	0.009061	6.40	361.98	299.75	1.03
Falcon Ridge	3500	PF#1	2318.00	1638.87	1641.44	1641.86	1642.76	0.022651	9.22	251.42	239.73	1.59
Falcon Ridge	3480	PF#1	2318.00	1638.25	1641.11	1641.05	1641.53	0.007658	5.20	446.02	445.82	0.92
Falcon Ridge	3400	PF#1	2318.00	1635.90	1638.96	1638.96	1639.53	0.009055	6.06	382.51	338.93	1.01
Falcon Ridge	3375	PF#1	2318.00	1634.00	1638.46	1636.37	1638.51	0.000342	1.73	1337.67	666.30	0.22
Falcon Ridge	3350	PF#1	2318.00	1630.00	1638.45		1638.49	0.000138	1.54	1500.97	450.11	0.15
Falcon Ridge	3325	PF#1	2318.00	1629.50	1638.45		1638.48	0.000070	1.42	1636.71	331.73	0.11
Falcon Ridge	3300	PF#1	2450.00	1628.41	1638.19		1638.44	0.000149	5.20	763.06	140.05	0.29
Falcon Ridge	3280	PF#1	2450.00	1628.10	1637.68	1635.61	1638.39	0.000479	7.72	480.01	113.19	0.44
Falcon Ridge	3270	PF#1	2450.00	1627.87	1634.72	1634.72	1638.11	0.003108	14.78	165.76	24.66	1.00
Falcon Ridge	3260	PF#1	2450.00	1627.27	1633.09	1634.12	1637.82	0.005022	17.46	140.36	24.66	1.29
Falcon Ridge	3240	PF#1	2450.00	1625.76	1630.85	1632.61	1637.06	0.007479	20.00	122.51	24.66	1.58
Falcon Ridge	3220	PF#1	2450.00	1624.24	1629.00	1631.09	1636.14	0.009202	21.45	114.22	24.66	1.76
Falcon Ridge	3200	PF#1	2450.00	1622.72	1627.27	1629.57	1635.09	0.010519	22.44	109.19	24.66	1.88
Falcon Ridge	3175	PF#1	2450.00	1621.21	1625.63	1628.06	1633.94	0.011531	23.14	105.88	24.66	1.97
Falcon Ridge	3150	PF#1	2450.00	1619.69	1624.01	1626.56	1632.71	0.012340	23.67	103.50	24.66	2.04
Falcon Ridge	3125	PF#1	2450.00	1618.17	1622.42	1625.04	1631.42	0.012967	24.07	101.81	24.66	2.09
Falcon Ridge	3100	PF#1	2450.00	1617.39	1621.47	1624.11	1630.67	0.013549	24.34	100.66	24.66	2.12
Falcon Ridge	3090		Bridge									
Falcon Ridge	3080	PF#1	2450.00	1616.37	1621.20	1623.11	1627.77	0.008216	20.58	119.06	24.66	1.65
Falcon Ridge	3070	PF#1	3000.00	1617.35	1623.90	1623.90	1626.15	0.005934	12.04	249.20	56.12	1.01
Falcon Ridge	3025	PF#1	3000.00	1616.86	1622.38	1622.99	1625.28	0.008988	13.68	219.28	55.95	1.22
Falcon Ridge	3000	PF#1	3000.00	1615.00	1622.61	1622.26	1624.55	0.004783	11.17	268.58	57.12	0.91
Falcon Ridge	2970	PF#1	3000.00	1613.80	1621.58	1621.58	1623.97	0.005939	12.41	241.84	51.09	1.00
Falcon Ridge	2935	PF#1	3000.00	1613.37	1618.96	1620.22	1622.84	0.019215	15.80	189.88	69.96	1.69
Falcon Ridge	2900	PF#1	3000.00	1612.28	1618.05	1618.87	1620.76	0.015623	13.20	227.24	93.37	1.49
Falcon Ridge	2870	PF#1	3000.00	1611.48	1618.35	1618.37	1619.48	0.007578	8.50	352.99	164.81	1.02
Falcon Ridge	2835	PF#1	3000.00	1611.00	1617.14	1617.27	1618.68	0.007633	9.97	301.03	111.50	1.07
Falcon Ridge	2800	PF#1	3000.00	1610.50	1616.56	1616.65	1617.98	0.007753	9.56	313.92	125.55	1.07
Falcon Ridge	2770	PF#1	3000.00	1609.50	1614.23	1615.08	1616.85	0.013601	12.99	230.89	87.89	1.41
Falcon Ridge	2735	PF#1	3000.00	1608.50	1614.59	1614.59	1616.14	0.006548	10.00	300.00	97.93	1.01
Falcon Ridge	2700	PF#1	3000.00	1607.40	1611.97	1612.77	1615.13	0.011472	14.27	210.19	61.20	1.36
Falcon Ridge	2670	PF#1	3000.00	1606.60	1613.14	1610.70	1613.69	0.001109	5.92	506.79	95.70	0.45
Falcon Ridge	2660	PF#1	3000.00	1606.39	1612.96		1613.64	0.001396	6.62	453.24	85.52	0.51
Falcon Ridge	2650	PF#1	3000.00	1606.32	1612.70	1610.45	1613.57	0.000622	7.51	399.56	62.67	0.52

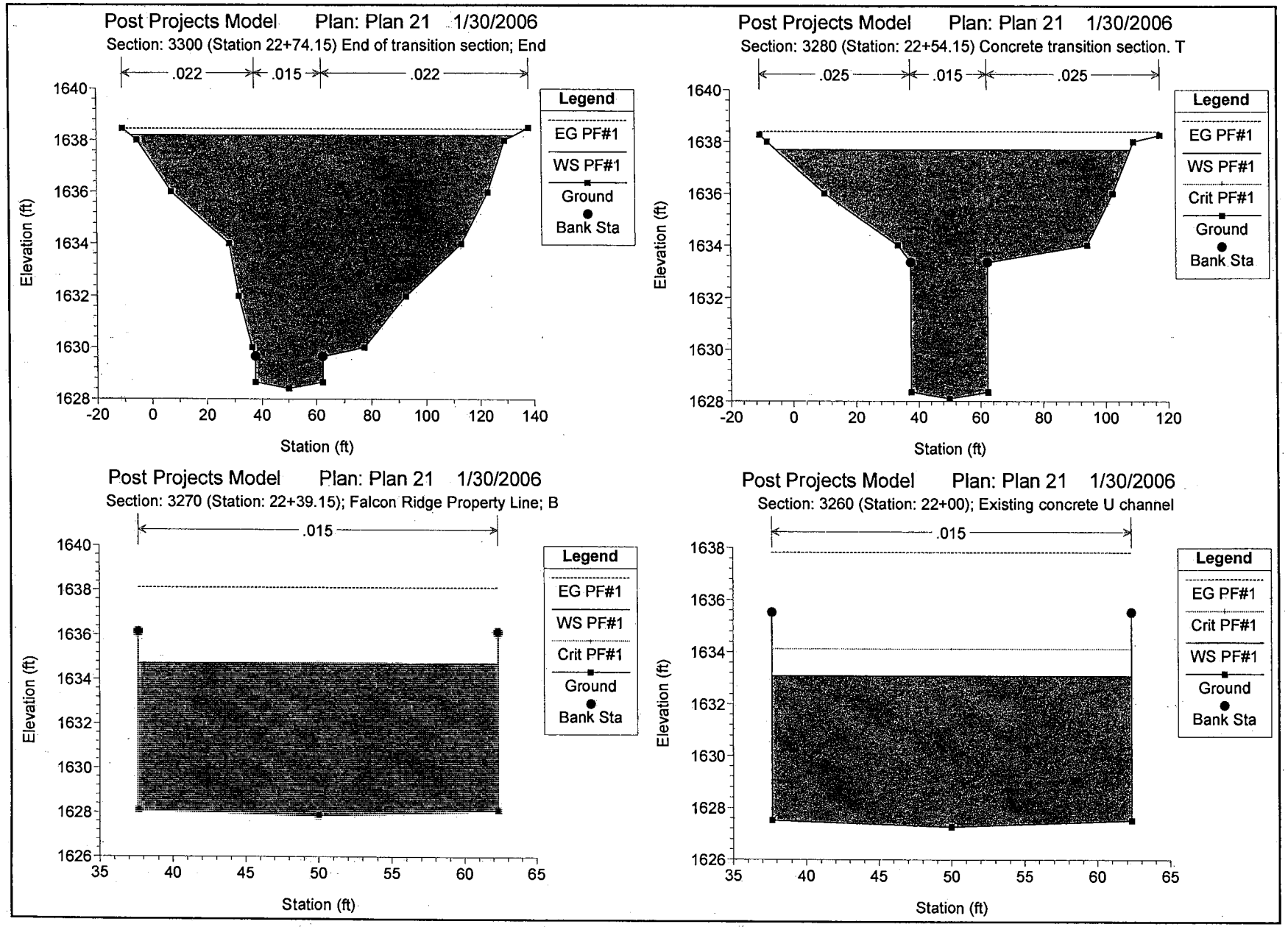
HEC-RAS Plan: Plan 21 River: Pulsipher Wash Reach: Falcon Ridge Profile: PF#1 (Continued)

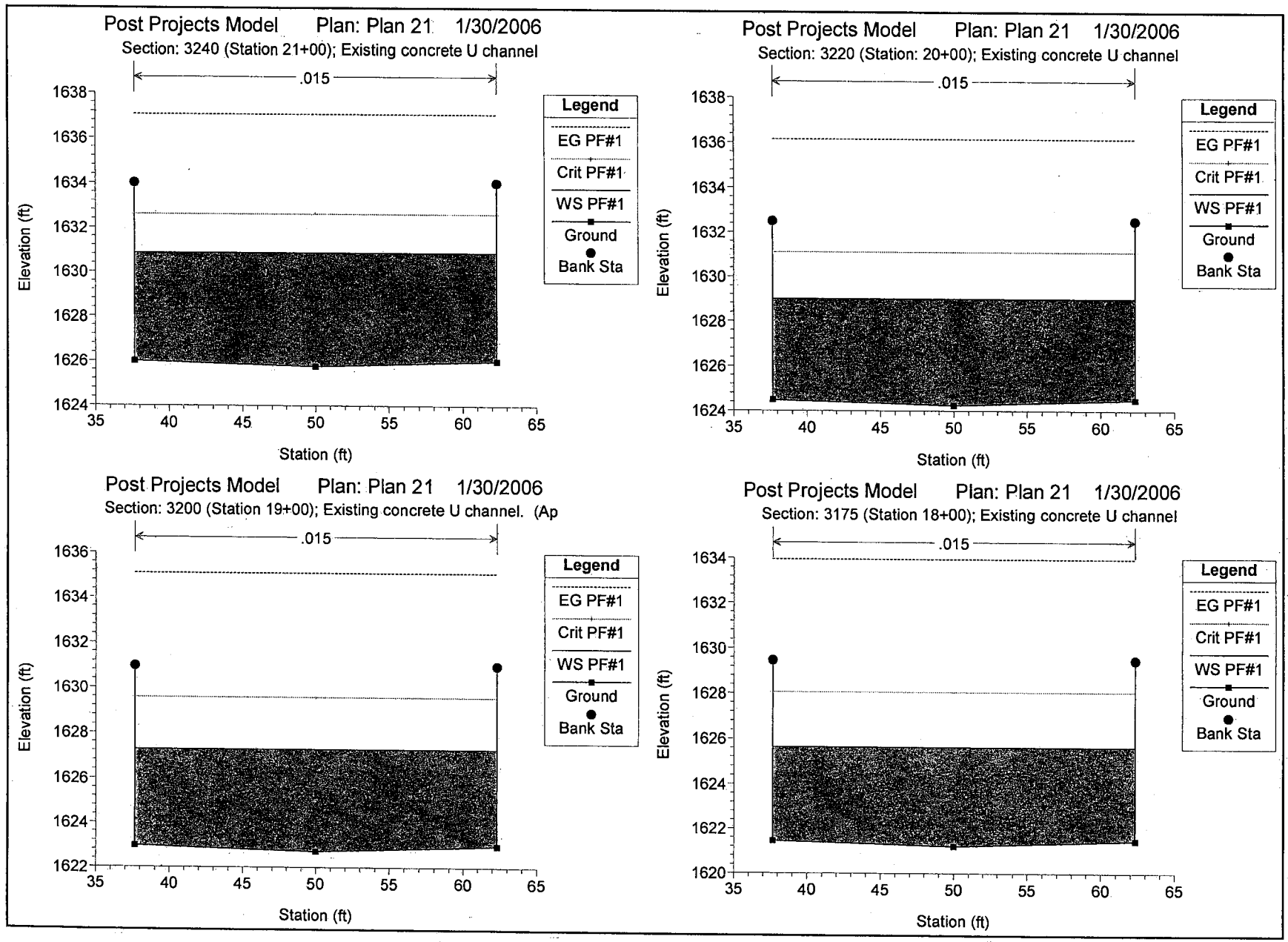
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Falcon Ridge	2620		Culvert									
Falcon Ridge	2590	PF#1	3000.00	1605.00	1608.50	1609.13	1611.40	0.004121	13.67	219.51	62.67	0.52
Falcon Ridge	2570	PF#1	3000.00	1604.25	1606.70	1607.94	1610.93	0.026754	16.50	181.85	80.52	1.93
Falcon Ridge	2550	PF#1	3000.00	1602.65	1605.11	1606.60	1610.19	0.033619	18.54	179.06	98.16	2.19
Falcon Ridge	2500	PF#1	3100.00	1599.18	1605.42	1605.42	1607.76	0.005406	12.86	264.84	58.07	0.99
Falcon Ridge	2400	PF#1	3100.00	1597.66	1604.77	1604.41	1606.11	0.002867	10.70	427.91	127.41	0.75
Falcon Ridge	2330	PF#1	3100.00	1596.83	1605.15		1605.63	0.001006	6.83	807.04	276.11	0.45
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37		1605.44	0.000133	2.95	1883.38	356.33	0.17
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56	0.06
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91	0.09
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99	0.13
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01

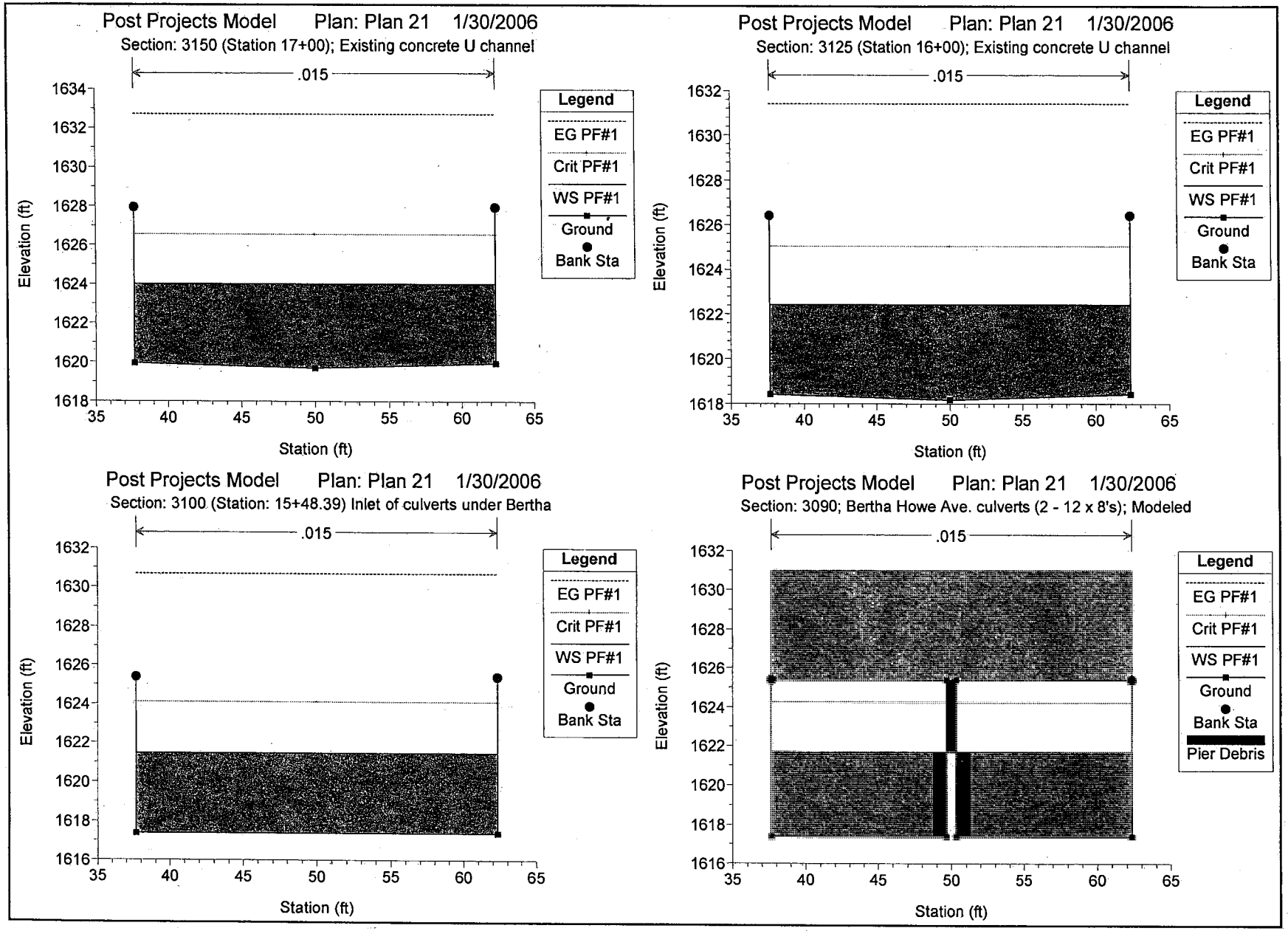

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3900 (Match existing cross section 3900 from effective
.04
.025
0
4
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 43 (Existing cross section 3800 from effective model)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3750
.016
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3700 (Appoximate location of cross section 3700 from ef

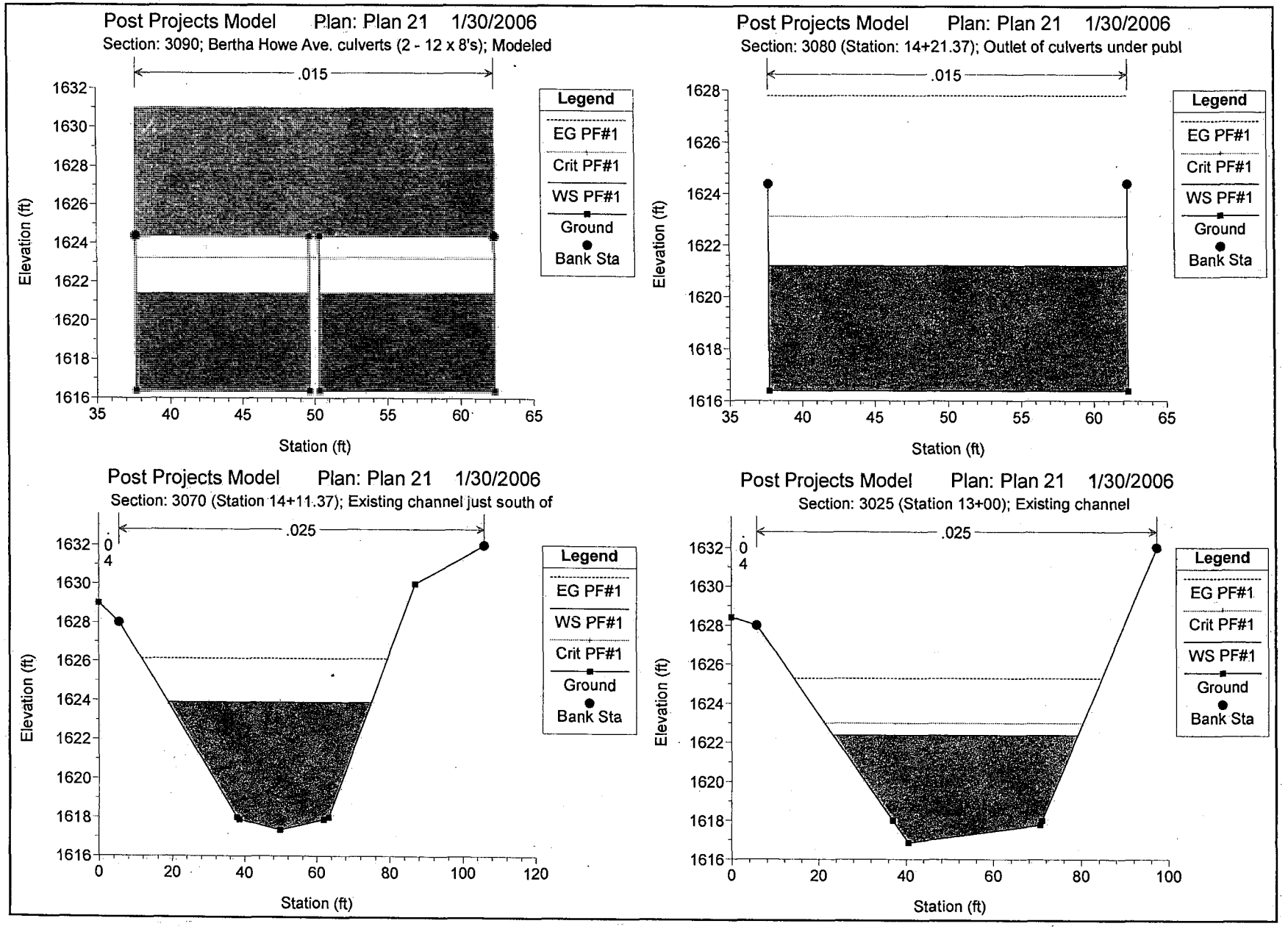

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3620
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3580
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3500 (Appoximate location of cross section 3500 from ef
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3480
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

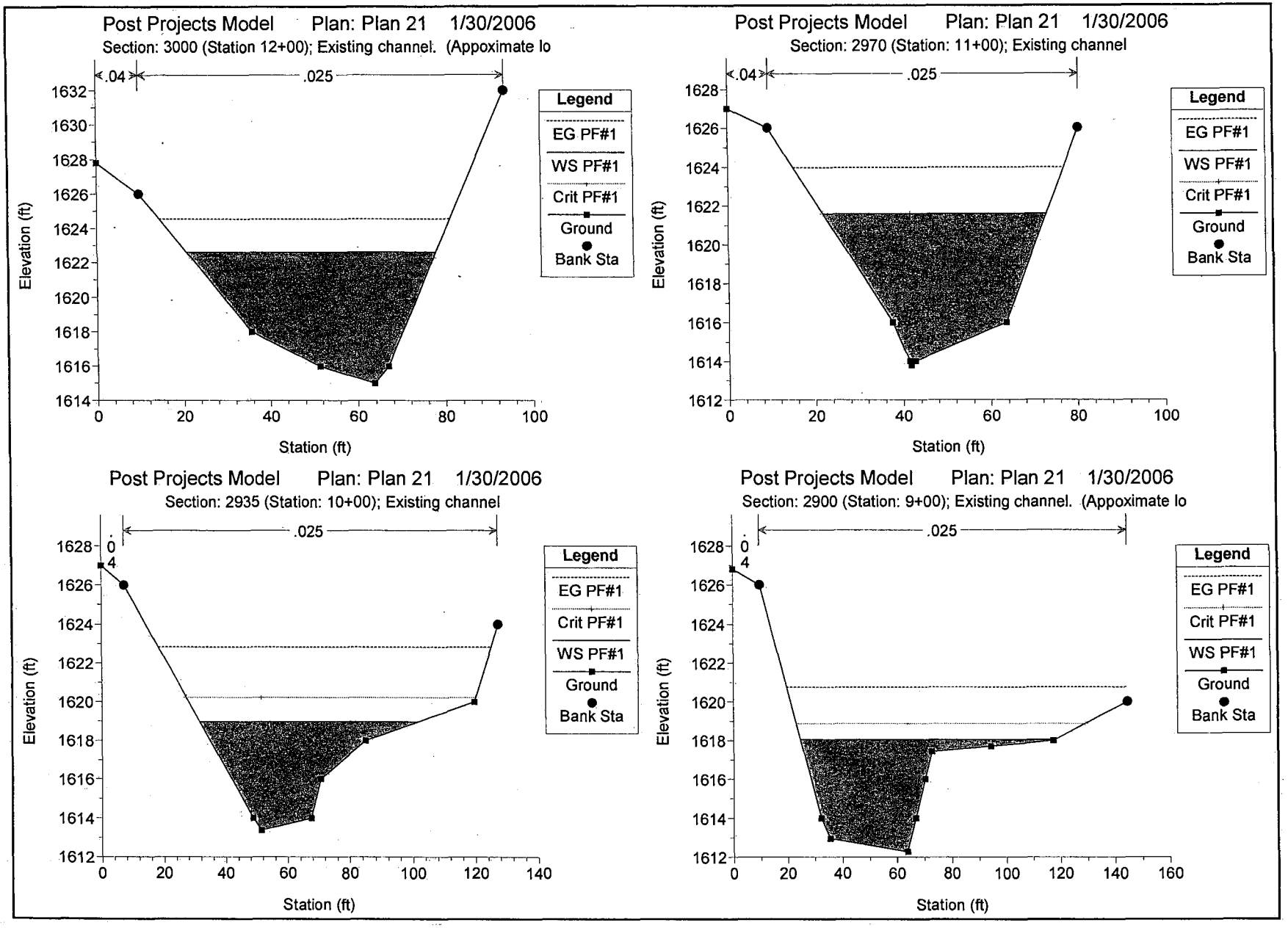

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3400 (Appoximate location of cross section 3400 from ef
.016
.025
.04
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3375; 300' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3350; 200' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3325; 100' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post Projects Model Plan: Plan 21 1/30/2006
Section: 3300 (Station 22+74.15) End of transition section; End
.022
.015
.022
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3280 (Station: 22+54.15) Concrete transition section. T
.025
.015
.025
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line; B
.015
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3260 (Station: 22+00); Existing concrete U channel
.015
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)

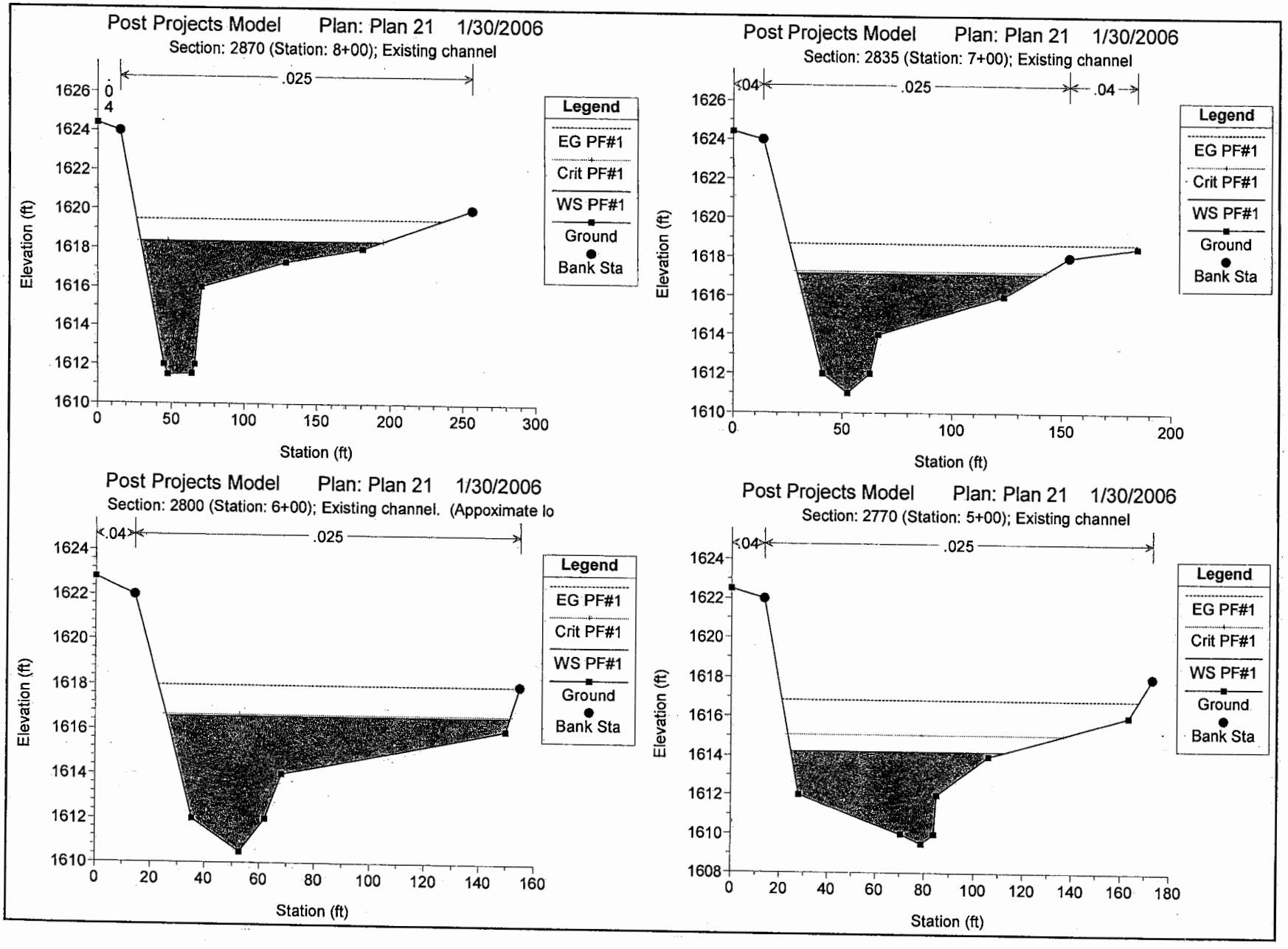

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3240 (Station 21+00); Existing concrete U channel
.015
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3220 (Station: 20+00); Existing concrete U channel
.015
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3200 (Station 19+00); Existing concrete U channel. (Ap
.015
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3175 (Station 18+00); Existing concrete U channel
.015
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)

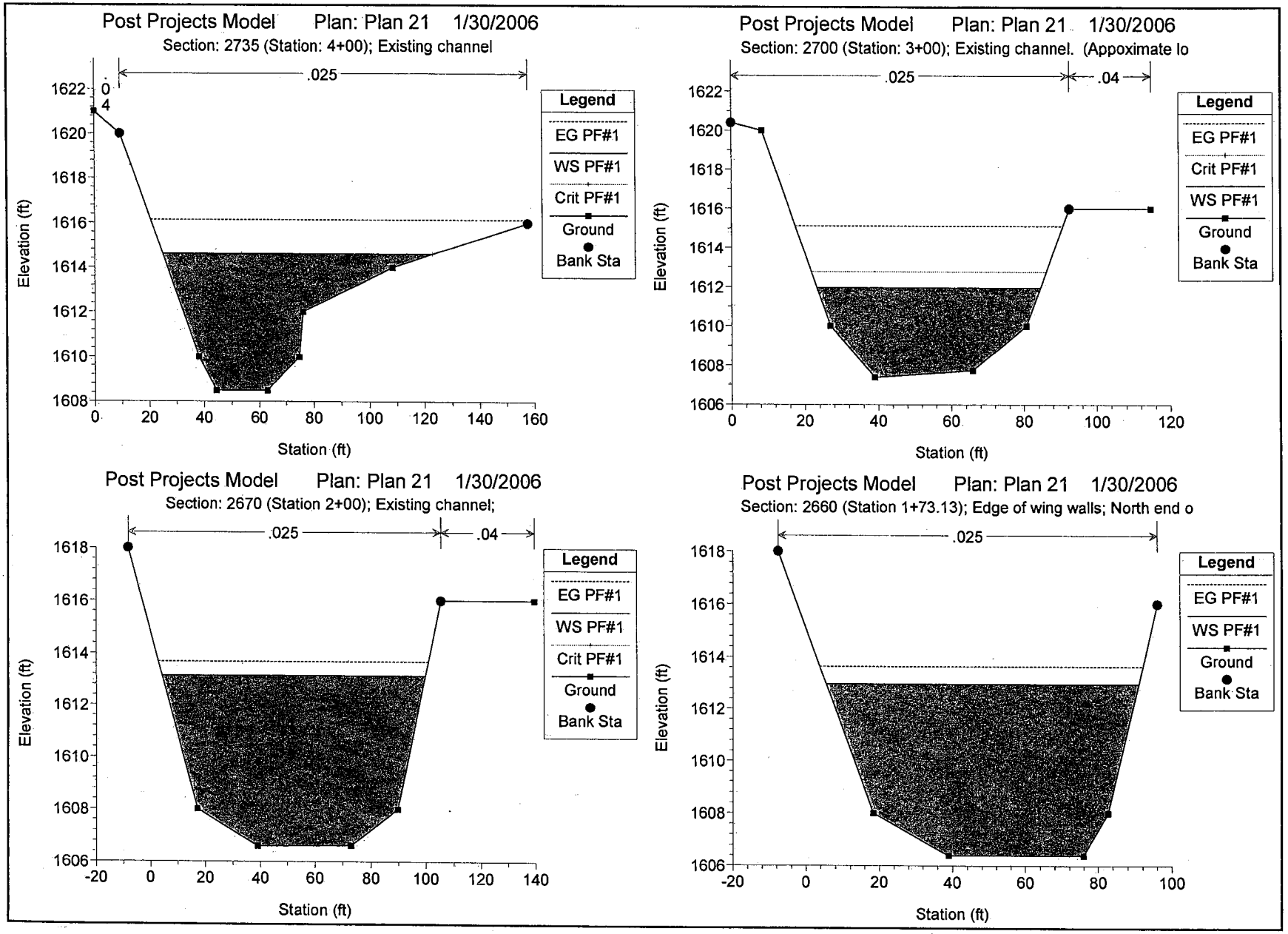

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3150 (Station 17+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3125 (Station 16+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Pier Debris

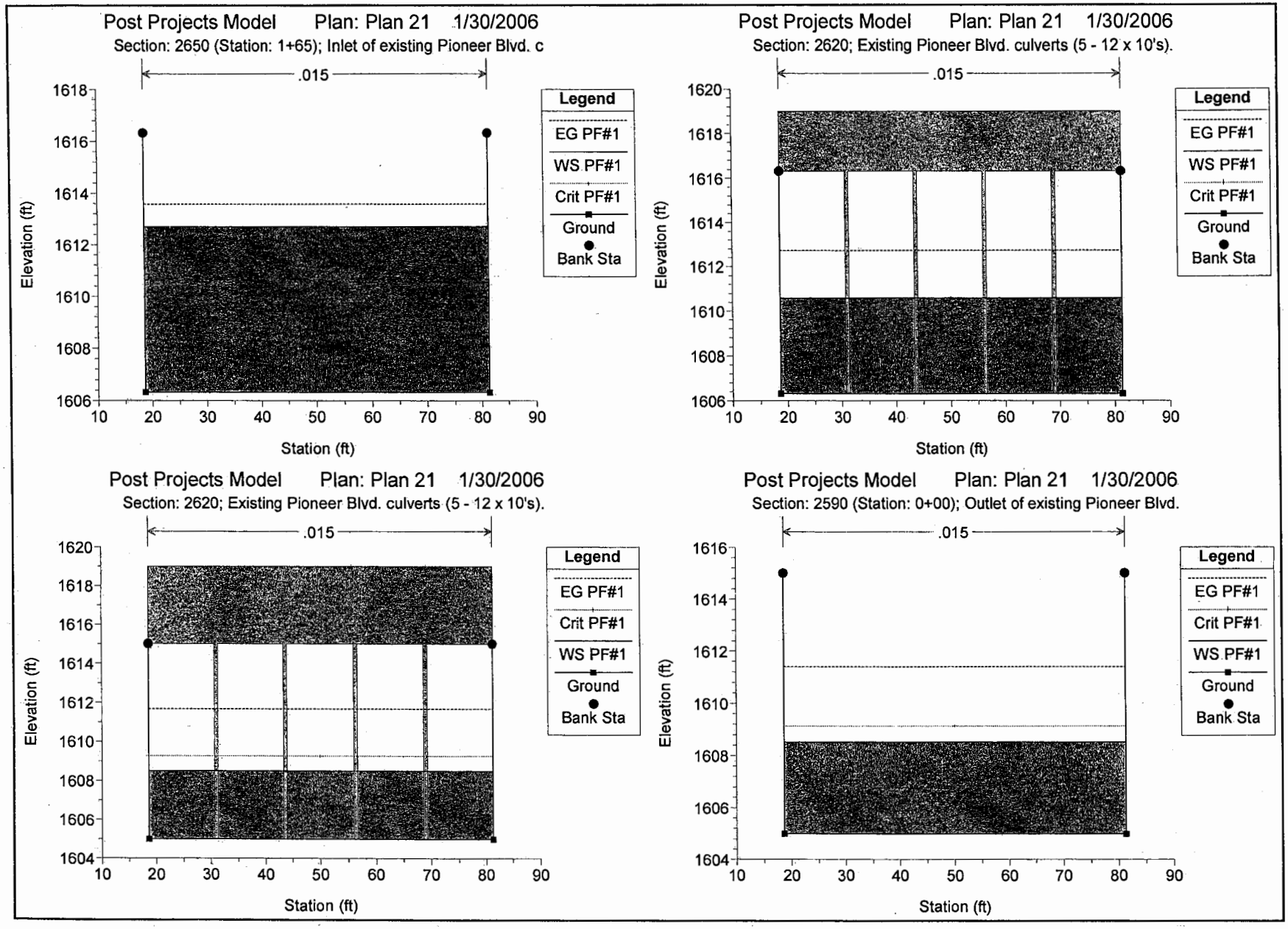

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3080 (Station: 14+21.37); Outlet of culverts under publ
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3070 (Station 14+11.37); Existing channel just south of
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 3025 (Station 13+00); Existing channel
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

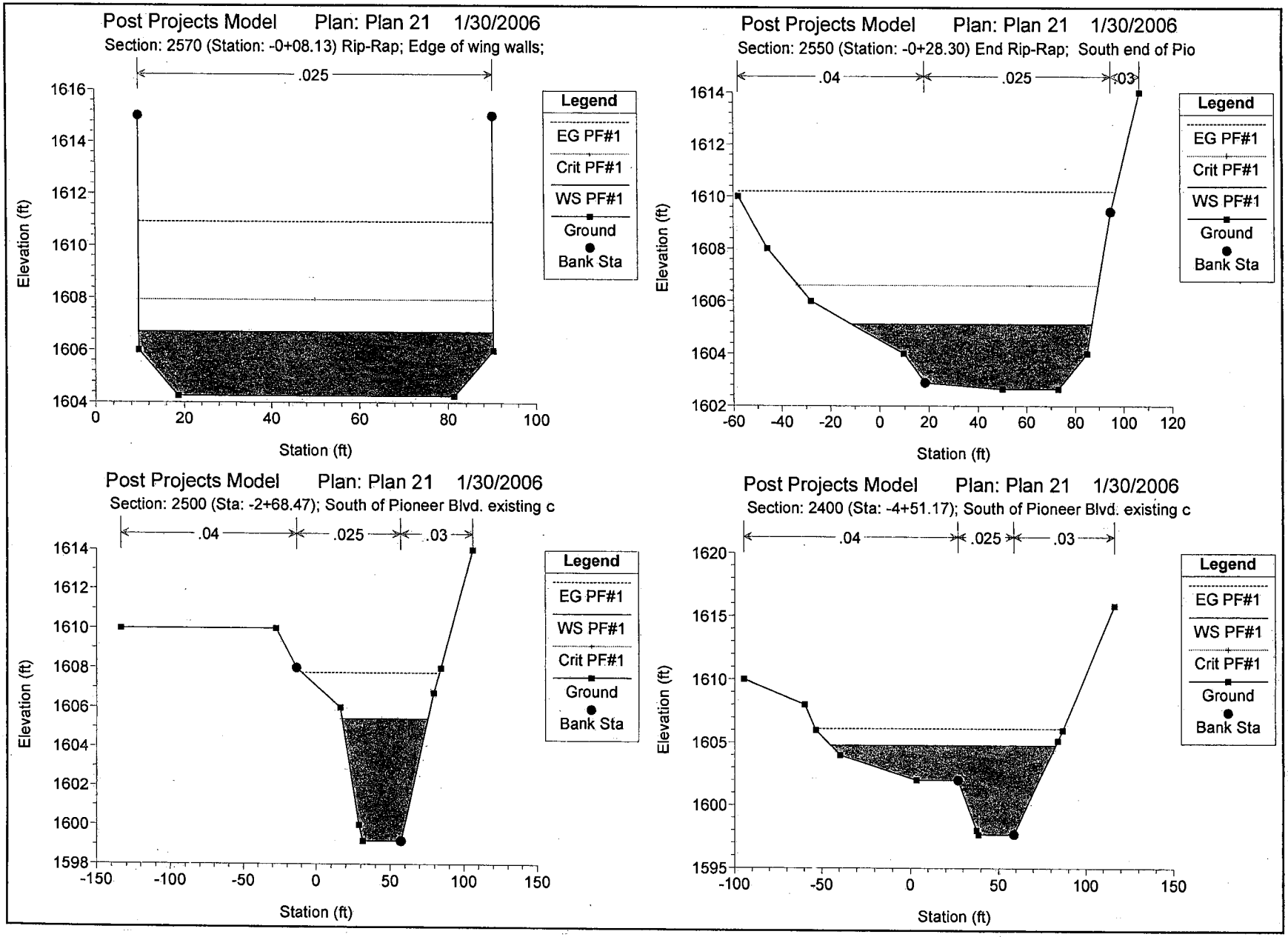

Post Projects Model Plan: Plan 21 1/30/2006
Section: 3000 (Station 12+00); Existing channel. (Appoximate lo
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2970 (Station: 11+00); Existing channel
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2935 (Station: 10+00); Existing channel
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2900 (Station: 9+00); Existing channel. (Appoximate lo
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

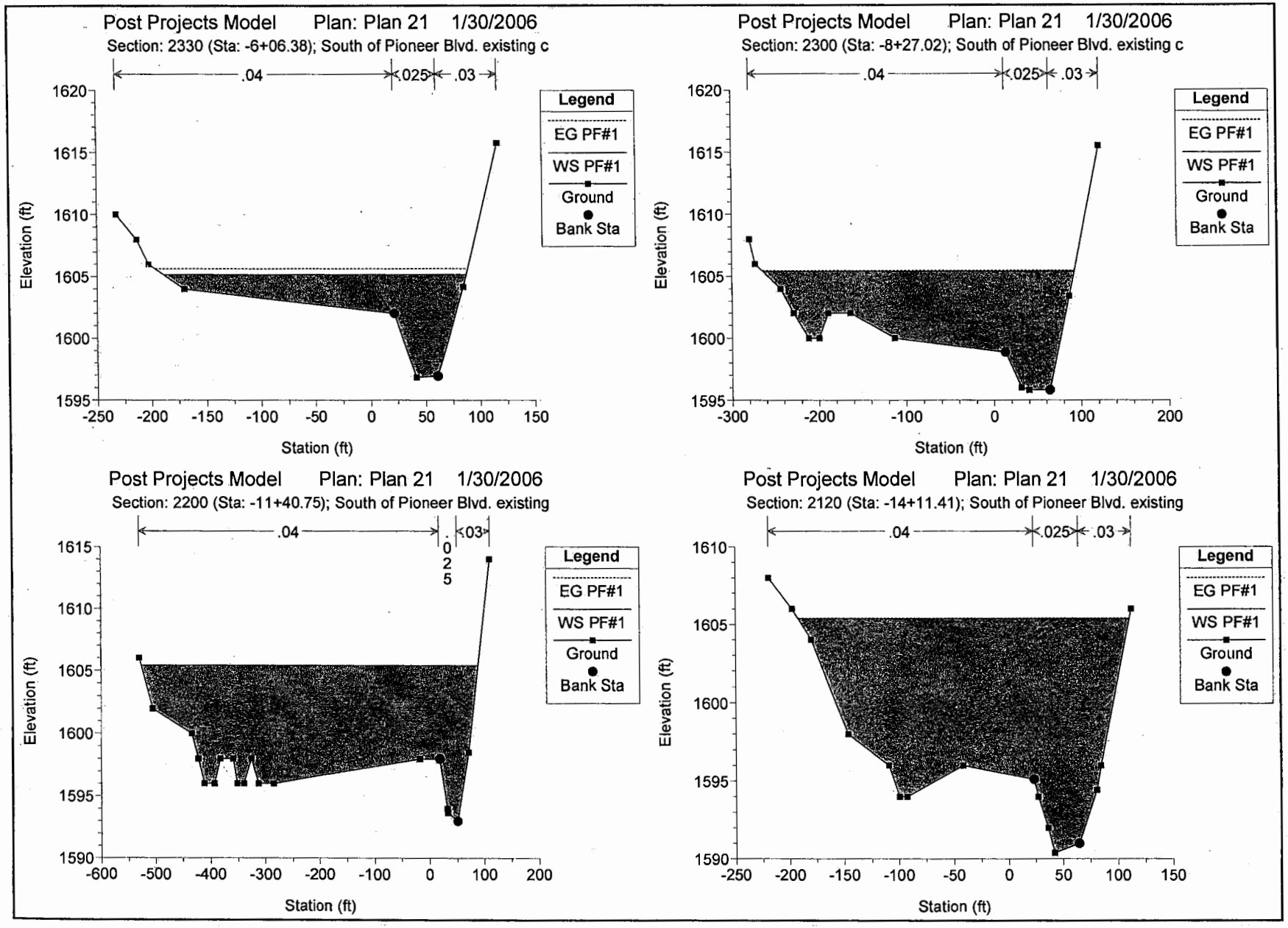
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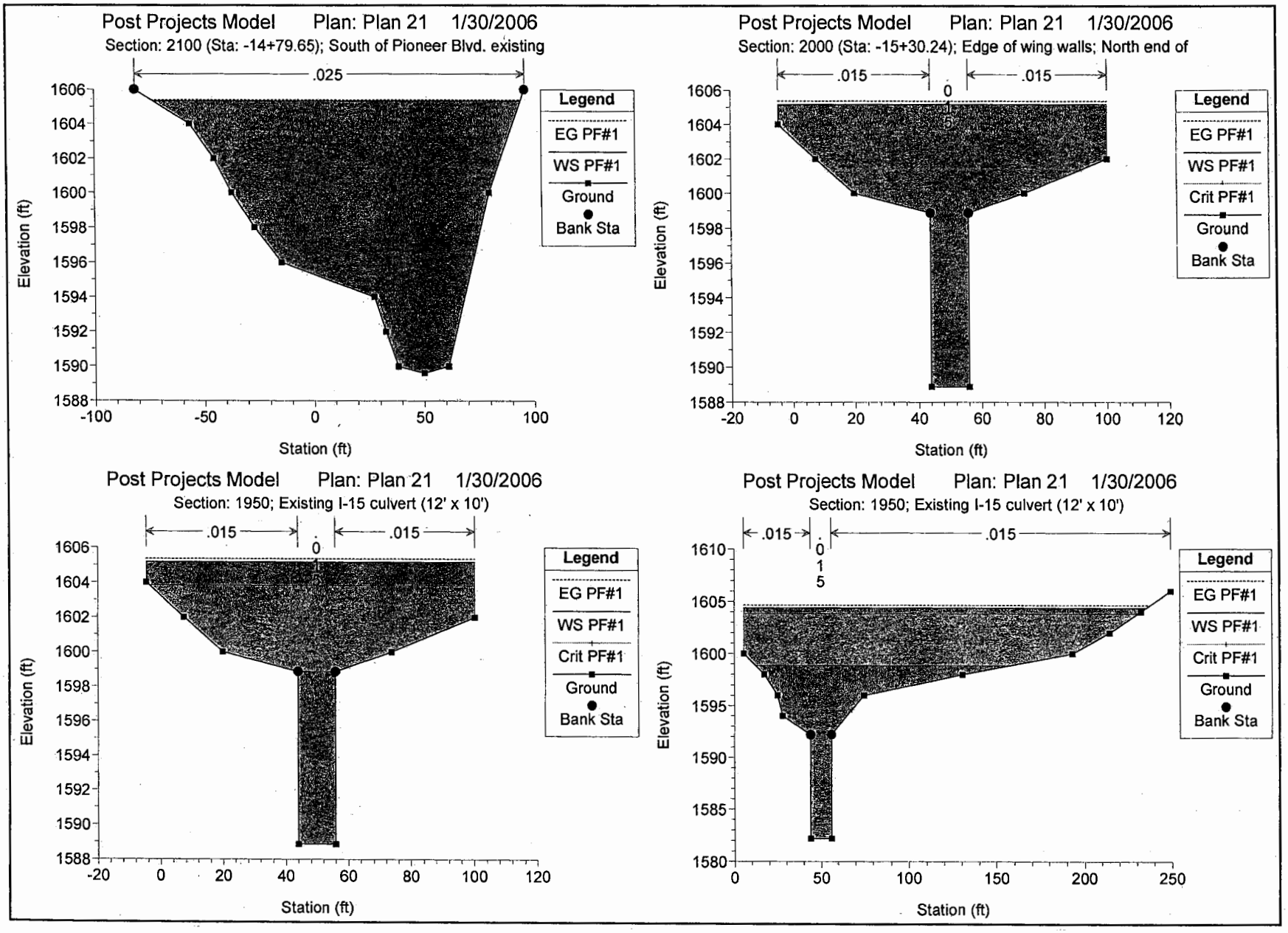

Post Projects Model Plan: Plan 21 1/30/2006
Section: 2870 (Station: 8+00); Existing channel
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2835 (Station: 7+00); Existing channel
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2800 (Station: 6+00); Existing channel. (Appoximate lo
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2770 (Station: 5+00); Existing channel
.04
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

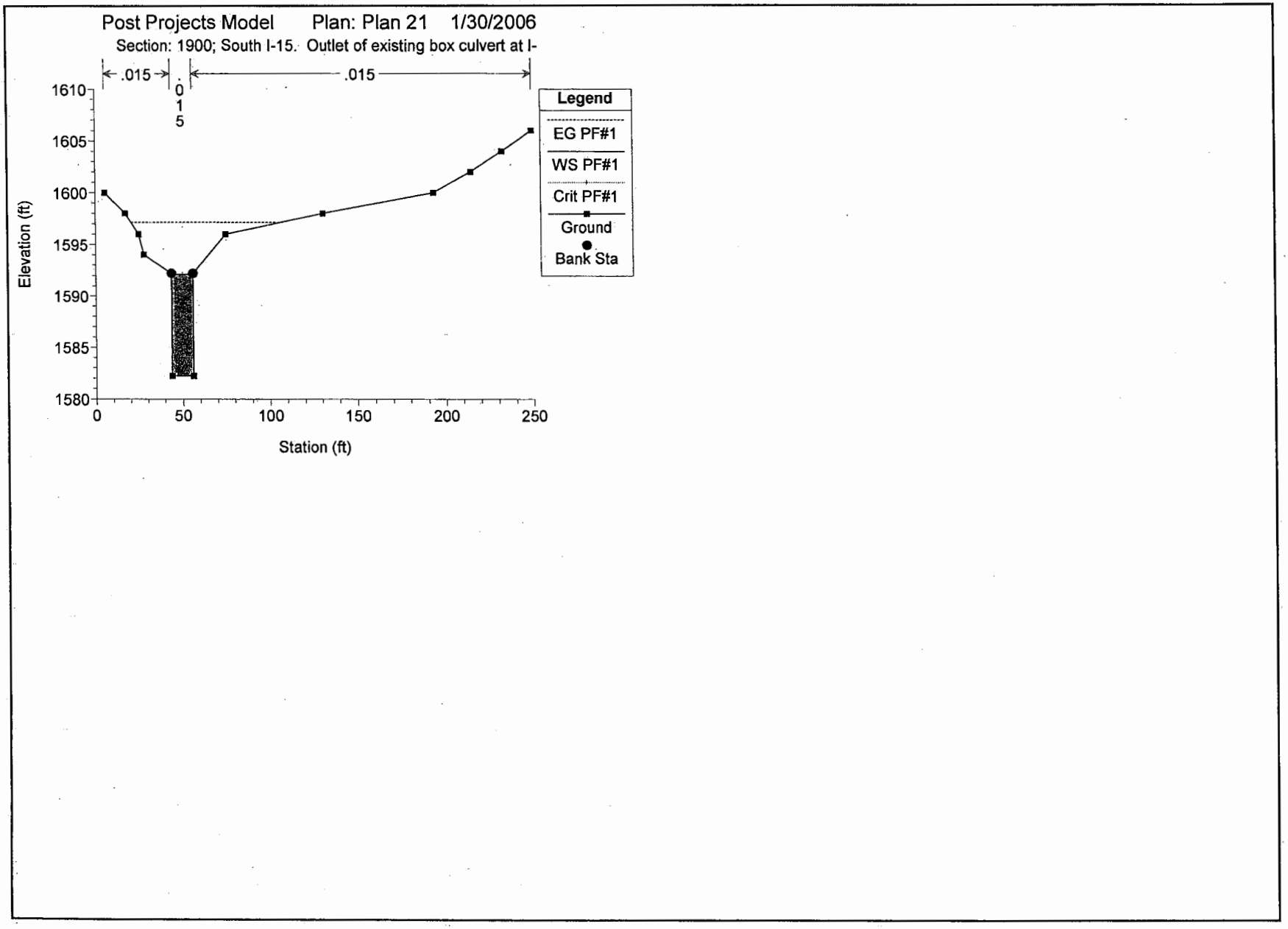

Post Projects Model Plan: Plan 21 1/30/2006
Section: 2735 (Station: 4+00); Existing channel
.025
0.4
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2700 (Station: 3+00); Existing channel. (Appoximate lo
.025
.04
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2670 (Station 2+00); Existing channel;
.025
.04
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2660 (Station 1+73.13); Edge of wing walls; North end o
.025
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)

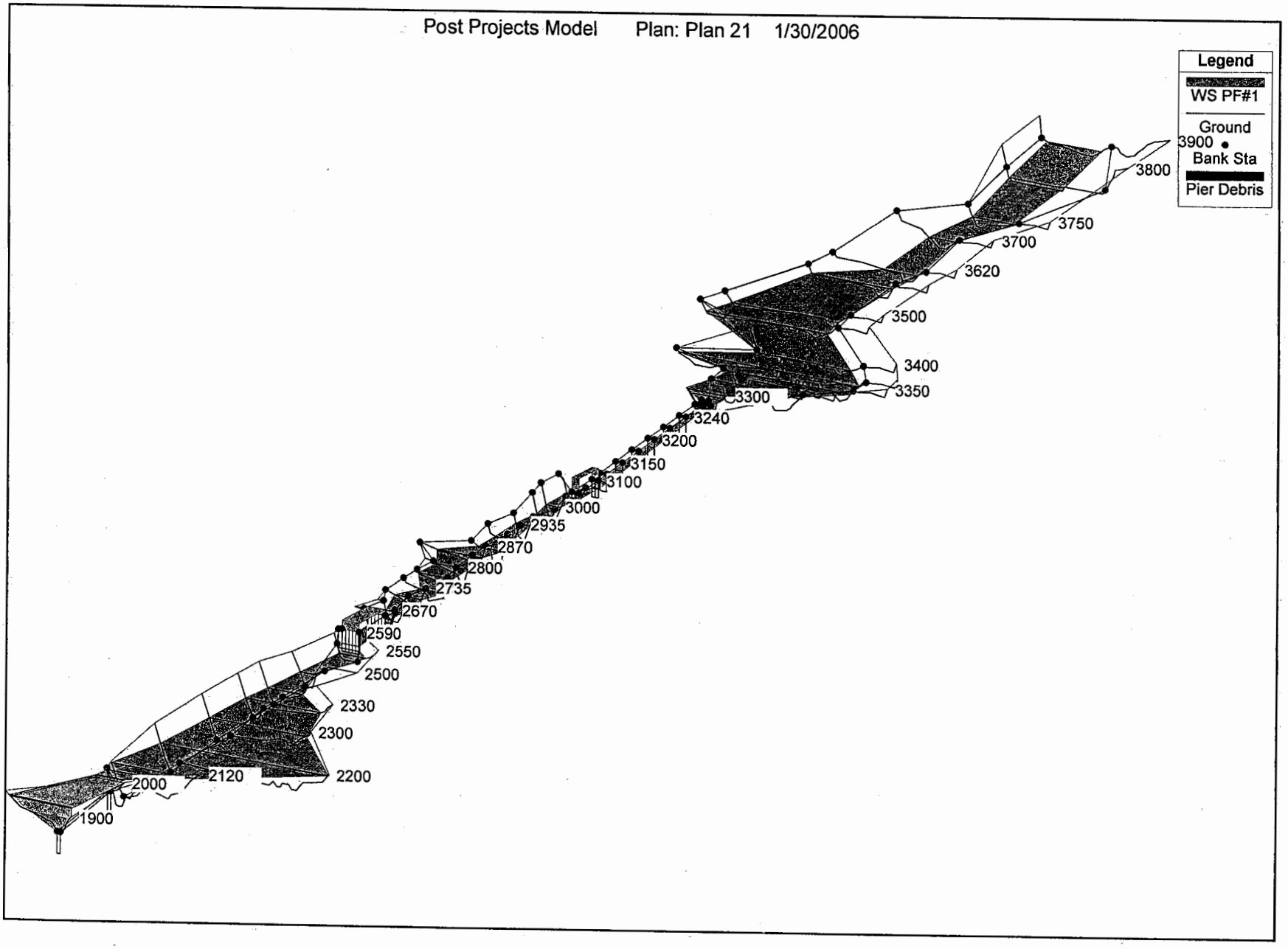

Post Projects Model Plan: Plan 21 1/30/2006
Section: 2650 (Station: 1+65); Inlet of existing Pioneer Blvd. c
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2620; Existing Pioneer Blvd. culverts (5 - 12 x 10's).
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2620; Existing Pioneer Blvd. culverts (5 - 12 x 10's).
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2590 (Station: 0+00); Outlet of existing Pioneer Blvd.
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


Post Projects Model Plan: Plan 21 1/30/2006
Section: 2570 (Station: -0+08.13) Rip-Rap; Edge of wing walls;
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2550 (Station: -0+28.30) End Rip-Rap; South end of Pio
.04
.025
.03
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2500 (Sta: -2+68.47); South of Pioneer Blvd. existing c
.04
.025
.03
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2400 (Sta: -4+51.17); South of Pioneer Blvd. existing c
.04
.025
.03
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post Projects Model Plan: Plan 21 1/30/2006
Section: 2330 (Sta: -6+06.38); South of Pioneer Blvd. existing c
.04
.025
.03
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing c
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing


Post Projects Model Plan: Plan 21 1/30/2006
Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing
.025
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of
.015
.015
0
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
0
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Post Projects Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.015
0
1
5
Elevation (ft)
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


Post Projects Model Plan: Plan 21 1/30/2006
Section: 1900; South I-15. Outlet of existing box culvert at I-
.015
.015
.015
1610
1605
1600
1595
1590
1585
1580
Elevation (ft)
0
50
100
150
200
250
Station (ft)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


Post Projects Model
Plan: Plan 21
1/30/2006
Legend
WS PF#1
Ground
3900
Bank Sta
Pier Debris
3800
3750
3700
3620
3500
3400
3350
3300
3240
3200
3150
3100
3000
2935
2870
2800
2735
2670
2590
2550
2500
2330
2300
2200
2120
2000
1900

Floodway Model HEC-RAS Output File (NGVD 29)

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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: Floodway Model
Project File : Floodway.prj
Run Date and Time: 1/30/2006 3:11:06 PM

Project in English units

Project Description:
Pulsipher Wash adjacent to Falcon Ridge Parkway. Revised floodway run along Pulsipher Wash from I-15 to limit of existing floodway. Limits of the revised floodplain used as the south boundary of the floodway with the north boundary remaining unchanged.

****

PLAN DATA

Plan Title: Plan 21
Plan File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.p21

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.g10

Flow Title : Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.f01

Plan Summary Information:
Number of: Cross Sections = 6 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Pulsipher Wash Reach = Falcon Ridge

RS	Profile	Method	Value1	Value2
2300	PF 2	1	-102.41	91.35
2200	PF 2	1	-124.26	88.75
2120	PF 2	1	-109.9	109.8
2100	PF 2	1	-22.5	93.49
2000	PF 2	1	31.02	76.4

****

FLOW DATA

Flow Title: Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.f01

Flow Data (cfs)

River	Reach	RS		PF#1	PF 2
Pulsipher Wash	Falcon Ridge	2300	*	3100	3100 *
Pulsipher Wash	Falcon Ridge	2000	*	2138	2138 *

Boundary Conditions

River	Reach	Profile		Upstream	Downstream
Pulsipher Wash	Falcon Ridge	PF#1	*	Critical	Critical
Pulsipher Wash	Falcon Ridge	PF 2	*	Critical	Critical

****

GEOMETRY DATA

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.g10

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2300

INPUT
Description: Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing channel. (Existing cross section 2300 from effective model)
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

****

-279.66	1608	-273.24	1606	-243.69	1604	-228.95	1602	-211.85	1600
-199.32	1600	-189.03	1602	-163.66	1602	-112.79	1600	12.87	1598.85
31.05	1596	39.89	1595.82	63.64	1595.82	86.88	1603.39	121.14	1615.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-279.66	.04	12.87	.025	63.64	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
12.87	63.64	134.71	313.73 323.04	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)	1601.01	Flow Area (sq ft)	1289.34	454.65	139.39
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	1289.34	454.65	139.39
Q Total (cfs)	3100.00	Flow (cfs)	1539.51	1340.49	219.99
Top Width (ft)	356.33	Top Width (ft)	276.73	50.77	28.83
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.19	2.95	1.58
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	4.66	8.95	4.84
Conv. Total (cfs)	268695.9	Conv. (cfs)	133439.1	116188.7	19068.2
Length Wtd. (ft)	198.07	Wetted Per. (ft)	277.27	50.99	30.37
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.04	0.07	0.04
Alpha	1.71	Stream Power (lb/ft s)	0.05	0.22	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	26.57	9.54	5.30
C & E Loss (ft)	0.02	Cum SA (acres)	3.82	0.89	1.41

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.32	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)	1600.93	Flow Area (sq ft)	800.03	502.98	165.55
E.G. Slope (ft/ft)	0.000135	Area (sq ft)	800.03	502.98	165.55
Q Total (cfs)	3100.00	Flow (cfs)	1210.45	1595.81	293.74
Top Width (ft)	193.76	Top Width (ft)	115.28	50.77	27.71
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.51	3.17	1.77
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)	6.94	9.91	5.97
Conv. Total (cfs)	267099.5	Conv. (cfs)	104293.7	137497.1	25308.7
Length Wtd. (ft)	233.21	Wetted Per. (ft)	121.70	50.99	30.53
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.06	0.08	0.05
Alpha	1.43	Stream Power (lb/ft s)	0.08	0.26	0.08
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	12.27	9.99	5.64
C & E Loss (ft)	0.01	Cum SA (acres)	1.44	0.82	1.29

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2200

INPUT
Description: Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing channel. (Existing cross section 2200 from effective model)
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-529.7	1606	-504.93	1602	-433.36	1600	-422.03	1598	-411.07	1596
-393.06	1596	-382.49	1598	-358.9	1598	-351.33	1596	-339.14	1596
-324.81	1598	-311.83	1596	-284.98	1596	-17.67	1598	19.38	1598
32.13	1594	33.2	1593.65	51.03	1593	71.7	1598.5	111.8	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-529.7	.04	19.38	.025	51.03	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.38	51.03	230.85	258.71 280.12	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.40	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	4128.81	347.61	261.15
E.G. Slope (ft/ft)	0.000018	Area (sq ft)	4128.81	347.61	261.15
Q Total (cfs)	3100.00	Flow (cfs)	2487.25	424.06	188.69
Top Width (ft)	615.56	Top Width (ft)	545.38	31.65	38.53
Vel Total (ft/s)	0.65	Avg. Vel. (ft/s)	0.60	1.22	0.72
Max Chl Dpth (ft)	12.40	Hydr. Depth (ft)	7.57	10.98	6.78
Conv. Total (cfs)	735769.2	Conv. (cfs)	590336.8	100647.4	44785.0
Length Wtd. (ft)	242.41	Wetted Per. (ft)	546.78	32.33	40.53
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.23	Stream Power (lb/ft s)	0.01	0.01	0.01
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	18.19	6.65	3.81
C & E Loss (ft)	0.00	Cum SA (acres)	2.55	0.59	1.16

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.32	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	1238.23	376.79	295.80
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	1238.23	376.79	295.80
Q Total (cfs)	3100.00	Flow (cfs)	1618.43	1003.82	477.75
Top Width (ft)	213.01	Top Width (ft)	143.64	31.65	37.72
Vel Total (ft/s)	1.62	Avg. Vel. (ft/s)	1.31	2.66	1.62
Max Chl Dpth (ft)	13.32	Hydr. Depth (ft)	8.62	11.90	7.84
Conv. Total (cfs)	355513.2	Conv. (cfs)	185603.9	115119.8	54789.5
Length Wtd. (ft)	248.22	Wetted Per. (ft)	152.76	32.33	40.90
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.04	0.06	0.03
Alpha	1.36	Stream Power (lb/ft s)	0.05	0.15	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	9.12	6.83	3.93
C & E Loss (ft)	0.01	Cum SA (acres)	1.04	0.52	1.05

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2120

INPUT
Description: Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing channel. End of bank protection (rip-rap) west sided of channel.
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-219.24	1608	-197.58	1606	-180.07	1604	-146.34	1598	-109.19	1596
-99.41	1594	-92.4	1594	-41.72	1596	23.32	1595.11	27.27	1594
36.27	1592	42.09	1590.38	64.49	1591	80.92	1594.43	84.7	1596
112.56	1606								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.24	.04	23.32	.025	64.49	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.32	64.49	73	68.06	68.56	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1812.34	565.55	368.77
E.G. Slope (ft/ft)	0.000033	Area (sq ft)	1812.34	565.55	368.77
Q Total (cfs)	3100.00	Flow (cfs)	1596.75	1097.87	405.39
Top Width (ft)	302.91	Top Width (ft)	215.41	41.17	46.32
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.88	1.94	1.10
Max Chl Dpth (ft)	14.99	Hydr. Depth (ft)	8.41	13.74	7.96
Conv. Total (cfs)	539168.4	Conv. (cfs)	277714.3	190947.2	70506.9
Length Wtd. (ft)	69.36	Wetted Per. (ft)	216.32	41.77	48.62
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.49	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.45	3.94	1.79
C & E Loss (ft)	0.00	Cum SA (acres)	0.54	0.38	0.89

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.33	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1479.45	604.90	411.88
E.G. Slope (ft/ft)	0.000031	Area (sq ft)	1479.45	604.90	411.88
Q Total (cfs)	3100.00	Flow (cfs)	1444.27	1186.41	469.32
Top Width (ft)	219.70	Top Width (ft)	133.22	41.17	45.31
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)	0.98	1.96	1.14
Max Chl Dpth (ft)	15.95	Hydr. Depth (ft)	11.11	14.69	9.09
Conv. Total (cfs)	558116.0	Conv. (cfs)	260023.0	213597.3	84495.6
Length Wtd. (ft)	69.25	Wetted Per. (ft)	143.76	41.77	48.87
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.37	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.92	3.91	1.66
C & E Loss (ft)	0.01	Cum SA (acres)	0.31	0.30	0.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2100

INPUT
Description: Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing channel. (Existing cross section 2100 from effective model)
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-81.41	1606	-56.47	1604	-45.38	1602	-37.37	1600	-26.85	1598
-14.73	1596	27.52	1594	32.71	1592	38.34	1590	50	1589.6
61.03	1590	79.71	1600	95.92	1606				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-81.41	.04	-81.41	.025	95.92	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81.41	95.92	68.04	62.28	67.59	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1605.32	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1402.05	
E.G. Slope (ft/ft)	0.000084	Area (sq ft)		1402.05	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	166.99	Top Width (ft)		166.99	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	15.72	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	337444.2	Conv. (cfs)		337444.2	
Length Wtd. (ft)	63.72	Wetted Per. (ft)		172.06	
Min Ch El (ft)	1589.60	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.93	2.40	1.50
C & E Loss (ft)	0.03	Cum SA (acres)	0.36	0.22	0.86

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1606.27	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1341.40	
E.G. Slope (ft/ft)	0.000068	Area (sq ft)		1341.40	

* Q Total (cfs)	* 3100.00	* Flow (cfs)	*	* 3100.00	*	*		
* Top Width (ft)	* 115.99	* Top Width (ft)	*	* 115.99	*	*		
* Vel Total (ft/s)	* 2.31	* Avg. Vel. (ft/s)	*	* 2.31	*	*		
* Max Ch Dpth (ft)	* 16.67	* Hydr. Depth (ft)	*	* 11.56	*	*		
* Conv. Total (cfs)	*377006.2	* Conv. (cfs)	*	*377006.2	*	*		
* Length Wtd. (ft)	* 63.32	* Wetted Per. (ft)	*	* 130.45	*	*		
* Min Ch El (ft)	* 1589.60	* Shear (lb/sq ft)	*	* 0.04	*	*		
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.10	*	*		
* Frctn Loss (ft)	* 0.01	* Cum Volume (acre-ft)	*	0.68	*	2.39	*	1.33 *
* C & E Loss (ft)	* 0.10	* Cum SA (acres)	*	0.20	*	0.18	*	0.75 *

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2000

INPUT
Description: Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of I-15 box culvert. (Existing cross section 2000 from effective model)

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	303.13	319.85	320.07	.3 .5

CROSS SECTION OUTPUT Profile #PF#1

* E.G. Elev (ft)	* 1605.35	* Element	* Left OB *	Channel *	Right OB *	
* Vel Head (ft)	* 0.19	* Wt. n-Val.	* 0.015 *	0.015 *	0.015 *	
* W.S. Elev (ft)	* 1605.17	* Reach Len. (ft)	* 0.10 *	0.10 *	0.10 *	
* Crit W.S. (ft)	* 1601.38	* Flow Area (sq ft)	* 215.53 *	195.42 *	212.36 *	
* E.G. Slope (ft/ft)	*0.000144	* Area (sq ft)	* 215.53 *	195.42 *	212.36 *	
* Q Total (cfs)	* 2138.00	* Flow (cfs)	* 677.95 *	775.84 *	684.21 *	
* Top Width (ft)	* 104.82	* Top Width (ft)	* 48.53 *	12.00 *	44.29 *	
* Vel Total (ft/s)	* 3.43	* Avg. Vel. (ft/s)	* 3.15 *	3.97 *	3.22 *	
* Max Ch Dpth (ft)	* 16.29	* Hydr. Depth (ft)	* 4.44 *	16.29 *	4.79 *	
* Conv. Total (cfs)	*178233.2	* Conv. (cfs)	* 56516.8 *	64677.6 *	57038.8 *	
* Length Wtd. (ft)	* 0.10	* Wetted Per. (ft)	* 50.05 *	32.00 *	47.57 *	
* Min Ch El (ft)	* 1588.88	* Shear (lb/sq ft)	* 0.04 *	0.05 *	0.04 *	
* Alpha	* 1.04	* Stream Power (lb/ft s)	* 0.12 *	0.22 *	0.13 *	
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 0.76 *	1.26 *	1.33 *	
* C & E Loss (ft)	*	* Cum SA (acres)	* 0.32 *	0.09 *	0.82 *	

CROSS SECTION OUTPUT Profile #PF 2

* E.G. Elev (ft)	* 1606.25	* Element	* Left OB *	Channel *	Right OB *	
* Vel Head (ft)	* 0.42	* Wt. n-Val.	* 0.015 *	0.015 *	0.015 *	
* W.S. Elev (ft)	* 1605.83	* Reach Len. (ft)	* 0.10 *	0.10 *	0.10 *	
* Crit W.S. (ft)	* 1601.10	* Flow Area (sq ft)	* 86.27 *	203.39 *	128.68 *	
* E.G. Slope (ft/ft)	*0.000274	* Area (sq ft)	* 86.27 *	203.39 *	128.68 *	
* Q Total (cfs)	* 2138.00	* Flow (cfs)	* 383.15 *	1143.66 *	611.20 *	
* Top Width (ft)	* 45.38	* Top Width (ft)	* 12.98 *	12.00 *	20.40 *	
* Vel Total (ft/s)	* 5.11	* Avg. Vel. (ft/s)	* 4.44 *	5.62 *	4.75 *	
* Max Ch Dpth (ft)	* 16.95	* Hydr. Depth (ft)	* 6.65 *	16.95 *	6.31 *	
* Conv. Total (cfs)	*129238.3	* Conv. (cfs)	* 23160.6 *	69131.9 *	36945.9 *	
* Length Wtd. (ft)	* 0.10	* Wetted Per. (ft)	* 19.34 *	32.00 *	26.08 *	
* Min Ch El (ft)	* 1588.88	* Shear (lb/sq ft)	* 0.08 *	0.11 *	0.08 *	
* Alpha	* 1.03	* Stream Power (lb/ft s)	* 0.34 *	0.61 *	0.40 *	
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 0.61 *	1.29 *	1.23 *	
* C & E Loss (ft)	*	* Cum SA (acres)	* 0.19 *	0.09 *	0.73 *	

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1950

INPUT
Description: Section: 1950; Existing I-15 culvert (12' x 10')
Distance from Upstream XS = .1
Deck/Roadway Width = 319.65
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
-4.53	1603.83	1582.19	44	1603.83	1582.19	44	1603.83	1598.88
56	1603.83	1598.88	56	1603.83	1582.19	100.29	1603.83	1582.19

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
44	56	.3	.5

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
-4.53	1603.83	1598.88	1104.82	1603.83	1598.88

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
    5.56    1600    17.2    1598   24.99    1596   27.96    1594      44 1592.19
      44 1582.19      56 1582.19      56 1592.19   75.01    1596  130.66    1598
  193.09    1600  214.49    1602  232.29    1604  249.33    1606

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**************************************************
    5.56    .015       44    .015       56    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
            44      56             .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         = 1603.83
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
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.8164966
           Max Low Cord                = 1598.88

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)          *    1605.35  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1605.17  * E.G. Elev (ft)        *    1605.35  *    1604.64  *
* Q Total (cfs)          *    2138.00  * W.S. Elev (ft)        *    1605.17  *    1604.37  *
* Q Bridge (cfs)         *    1624.24  * Crit W.S. (ft)        *    1598.84  *    1594.60  *
* Q Weir (cfs)           *     513.76  * Max Chl Dpth (ft)      *      16.29  *      22.18  *
* Weir Sta Lft (ft)      *      -4.53  * Vel Total (ft/s)      *       8.23  *       3.28  *
* Weir Sta Rgt (ft)      *     100.29  * Flow Area (sq ft)     *     259.86  *     652.15  *
* Weir Submerg           *       0.00  * Froude # Chl          *       0.36  *       0.19  *
* Weir Max Depth (ft)    *       1.52  * Specif Force (cu ft)  *    2016.42  *    5524.01  *
* Min El Weir Flow (ft)  *    1603.84  * Hydr Depth (ft)       *       2.48  *       2.84  *
* Min El Prs (ft)        *    1598.88  * W.P. Total (ft)       *     151.33  *     544.03  *
* Delta EG (ft)          *       8.23  * Conv. Total (cfs)     *             *             *
* Delta WS (ft)          *      13.08  * Top Width (ft)        *     104.82  *     229.89  *
* BR Open Area (sq ft)   *     120.00  * Frctn Loss (ft)       *             *             *
* BR Open Vel (ft/s)     *      13.54  * C & E Loss (ft)       *             *             *
* Coef of Q              *             * Shear Total (lb/sq ft) *             *             *
* Br Sel Method          * Press/Weir  * Power Total (lb/ft s)  *             *             *
**********************************************************************************************

Note:    Momentum answer is not valid if the water surface is above the low chord or if there is weir
         flow.  The momentum answer has been disregarded.
Note:    The downstream water surface is below the minimum elevation for pressure flow.  The sluice
         gate equations were used for pressure flow.
Note:    For the cross section inside the bridge at the upstream end, the water surface and energy have
         been projected from the upstream cross section.  The selected bridge modeling method does
         not compute answers inside the bridge.
Note:    For the cross section inside the bridge at the downstream end, the water surface and energy
         are based on critical depth over the weir.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

BRIDGE OUTPUT  Profile #PF 2
**********************************************************************************************
* E.G. US. (ft)          *    1606.25  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1605.83  * E.G. Elev (ft)        *    1606.25  *    1604.57  *
* Q Total (cfs)          *    2138.00  * W.S. Elev (ft)        *    1605.83  *    1604.32  *
* Q Bridge (cfs)         *    1693.71  * Crit W.S. (ft)        *    1598.84  *    1594.60  *
* Q Weir (cfs)           *     444.30  * Max Chl Dpth (ft)      *      16.95  *      22.13  *
* Weir Sta Lft (ft)      *      31.02  * Vel Total (ft/s)      *      10.15  *       3.34  *
* Weir Sta Rgt (ft)      *      76.40  * Flow Area (sq ft)     *     210.72  *     641.05  *
* Weir Submerg           *       0.00  * Froude # Chl          *       0.43  *       0.16  *
* Weir Max Depth (ft)    *       2.42  * Specif Force (cu ft)  *    2206.09  *    5498.22  *
* Min El Weir Flow (ft)  *    1603.84  * Hydr Depth (ft)       *       4.64  *       2.79  *
* Min El Prs (ft)        *    1598.88  * W.P. Total (ft)       *      93.38  *     543.56  *
* Delta EG (ft)          *       9.13  * Conv. Total (cfs)     *             *             *
* Delta WS (ft)          *      13.78  * Top Width (ft)        *      45.38  *     229.47  *
* BR Open Area (sq ft)   *     120.00  * Frctn Loss (ft)       *             *             *
* BR Open Vel (ft/s)     *      14.11  * C & E Loss (ft)       *             *             *
* Coef of Q              *             * Shear Total (lb/sq ft) *             *             *
* Br Sel Method          * Press/Weir  * Power Total (lb/ft s)  *             *             *
**********************************************************************************************

Note:    Momentum answer is not valid if the water surface is above the low chord or if there is weir
         flow.  The momentum answer has been disregarded.
Note:    The downstream water surface is below the minimum elevation for pressure flow.  The sluice
         gate equations were used for pressure flow.
Note:    For the cross section inside the bridge at the upstream end, the water surface and energy have
         been projected from the upstream cross section.  The selected bridge modeling method does
         not compute answers inside the bridge.
Note:    For the cross section inside the bridge at the downstream end, the water surface and energy
         are based on critical depth over the weir.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 1900

INPUT
Description: Section: 1900; South I-15.  Outlet of existing box culvert at
             I-15. (12x10)    (Match existing cross section 1900 from effective
             model)
Station Elevation Data    num=      14
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	60.81	58.98	66.92	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1597.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.09	Reach Len. (ft)			
Crit W.S. (ft)	1592.09	Flow Area (sq ft)		118.76	
E.G. Slope (ft/ft)	0.005698	Area (sq ft)		118.76	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		9.90	
Conv. Total (cfs)	28323.5	Conv. (cfs)		28323.5	
Length Wtd. (ft)		Wetted Per. (ft)		31.79	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)		23.92	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	1597.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.05	Reach Len. (ft)			
Crit W.S. (ft)	1592.05	Flow Area (sq ft)		118.26	
E.G. Slope (ft/ft)	0.005759	Area (sq ft)		118.26	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.08	Avg. Vel. (ft/s)		18.08	
Max Chl Dpth (ft)	9.85	Hydr. Depth (ft)		9.85	
Conv. Total (cfs)	28173.1	Conv. (cfs)		28173.1	
Length Wtd. (ft)		Wetted Per. (ft)		31.71	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.34	
Alpha	1.00	Stream Power (lb/ft s)		24.24	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Pulsipher Wash

Reach	River Sta.	n1	n2	n3
Falcon Ridge	2300	.04	.025	.03
Falcon Ridge	2200	.04	.025	.03
Falcon Ridge	2120	.04	.025	.03
Falcon Ridge	2100	.04	.025	.03
Falcon Ridge	2000	.015	.015	.015
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Pulsipher Wash

Reach	River Sta.	Left	Channel	Right
Falcon Ridge	2300	134.71	313.73	323.04
Falcon Ridge	2200	230.85	258.71	280.12
Falcon Ridge	2120	73	68.06	68.56
Falcon Ridge	2100	68.04	62.28	67.59
Falcon Ridge	2000	303.13	319.85	320.07
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	60.81	58.98	66.92

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Pulsipher Wash

Reach	River Sta.	Contr.	Expan.
Falcon Ridge	2300	.1	.3
Falcon Ridge	2200	.1	.3
Falcon Ridge	2120	.1	.3
Falcon Ridge	2100	.3	.5
Falcon Ridge	2000	.3	.5
Falcon Ridge	1950	Bridge	
Falcon Ridge	1900	.3	.5

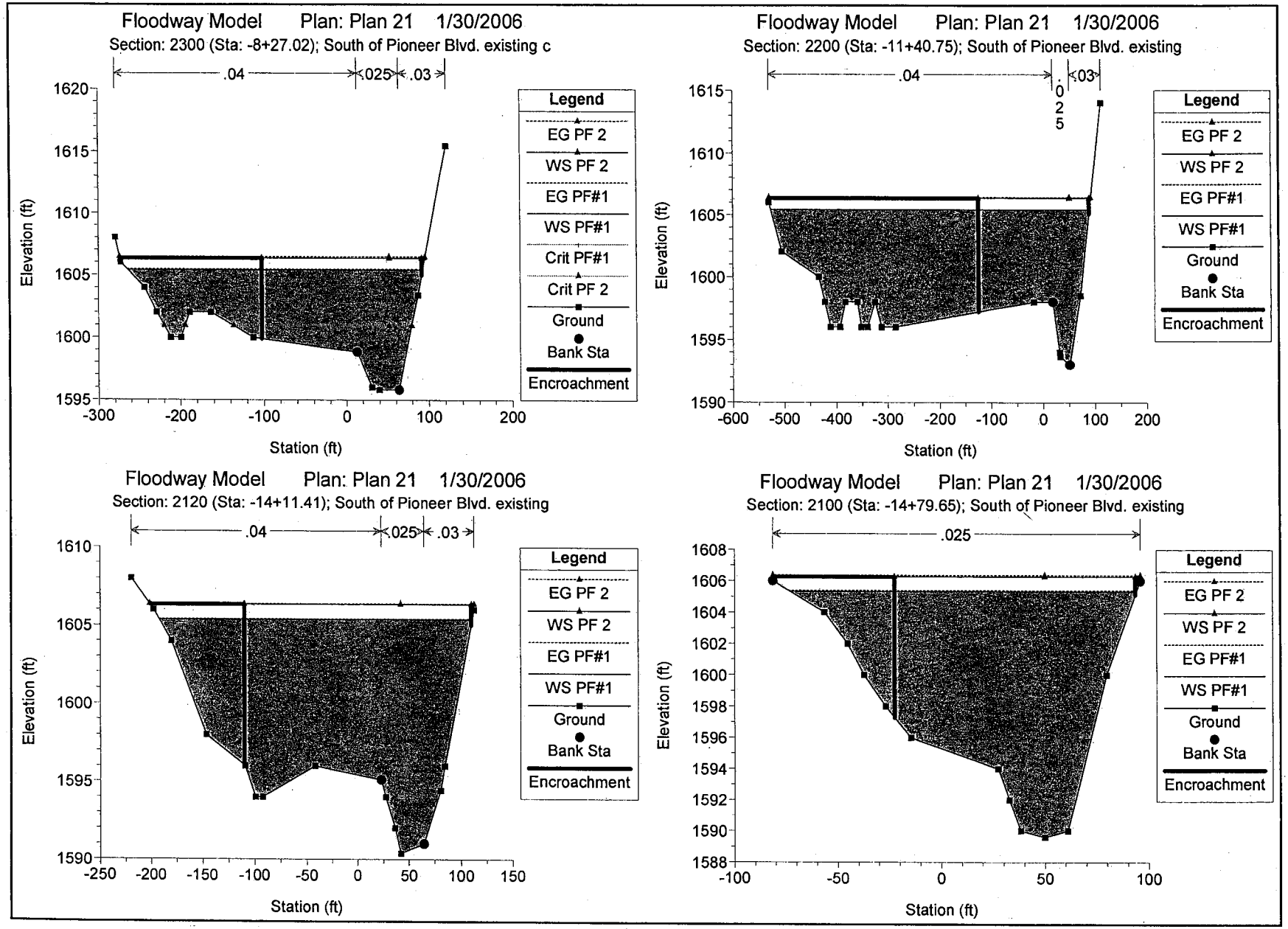
Profile Output Table - Standard Table 1

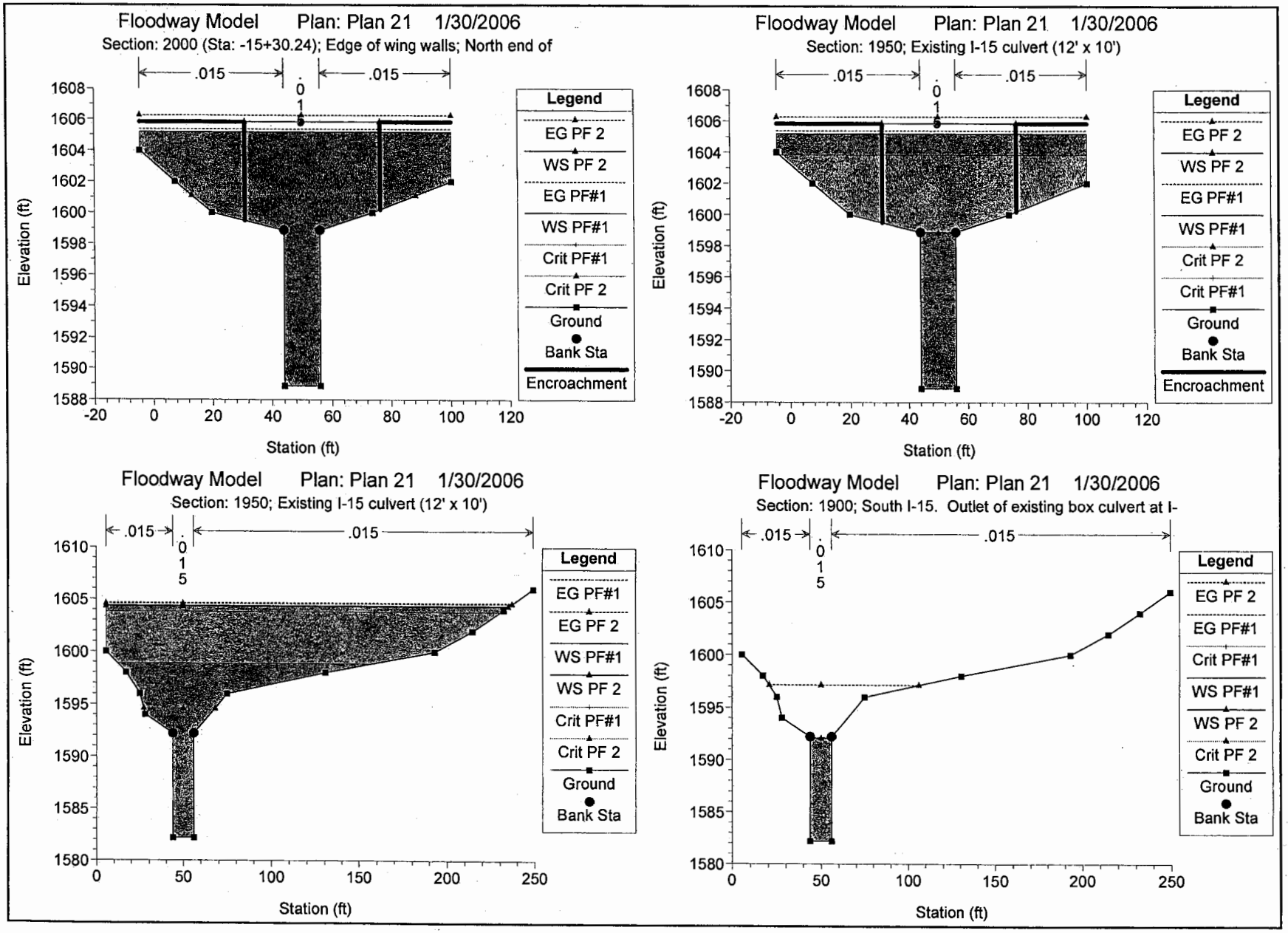
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37	1601.01	1605.44	0.000133	2.95	1883.38	356.33	0.17
Falcon Ridge	2300	PF 2	3100.00	1595.82	1606.32	1600.93	1606.42	0.000135	3.17	1468.56	193.76	0.18
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56	0.06
Falcon Ridge	2200	PF 2	3100.00	1593.00	1606.32		1606.38	0.000076	2.66	1910.82	213.01	0.14
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91	0.09
Falcon Ridge	2120	PF 2	3100.00	1590.38	1606.33		1606.36	0.000031	1.96	2496.23	219.70	0.09
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99	0.13
Falcon Ridge	2100	PF 2	3100.00	1589.60	1606.27		1606.35	0.000068	2.31	1341.40	115.99	0.12
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	2000	PF 2	2138.00	1588.88	1605.83	1601.10	1606.25	0.000274	5.62	418.34	45.38	0.24
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01
Falcon Ridge	1900	PF 2	2138.00	1582.19	1592.05	1592.05	1597.12	0.005759	18.08	118.26	12.00	1.01

HEC-RAS Plan: Plan 21 River: Pulsipher Wash Reach: Falcon Ridge

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)	
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37	1601.01	1605.44	0.000133	2.95	1883.38	356.33	0.17
Falcon Ridge	2300	PF 2	3100.00	1595.82	1606.32	1600.93	1606.42	0.000135	3.17	1468.56	193.76	0.18
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56	0.06
Falcon Ridge	2200	PF 2	3100.00	1593.00	1606.32		1606.38	0.000076	2.66	1910.82	213.01	0.14
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91	0.09
Falcon Ridge	2120	PF 2	3100.00	1590.38	1606.33		1606.36	0.000031	1.96	2496.23	219.70	0.09
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99	0.13
Falcon Ridge	2100	PF 2	3100.00	1589.60	1606.27		1606.35	0.000068	2.31	1341.40	115.99	0.12
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	2000	PF 2	2138.00	1588.88	1605.83	1601.10	1606.25	0.000274	5.62	418.34	45.38	0.24
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01
Falcon Ridge	1900	PF 2	2138.00	1582.19	1592.05	1592.05	1597.12	0.005759	18.08	118.26	12.00	1.01

662


Floodway Model Plan: Plan 21 1/30/2006
Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing c
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Crit PF#1
Crit PF 2
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing
.025
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment


Floodway Model Plan: Plan 21 1/30/2006
Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of
.015
.015
.01
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Crit PF#1
Crit PF 2
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.01
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Crit PF 2
Crit PF#1
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF#1
EG PF 2
WS PF#1
WS PF 2
Crit PF#1
Crit PF 2
Ground
Bank Sta
Floodway Model Plan: Plan 21 1/30/2006
Section: 1900; South I-15. Outlet of existing box culvert at I-
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 2
EG PF#1
Crit PF#1
WS PF#1
WS PF 2
Crit PF 2
Ground
Bank Sta

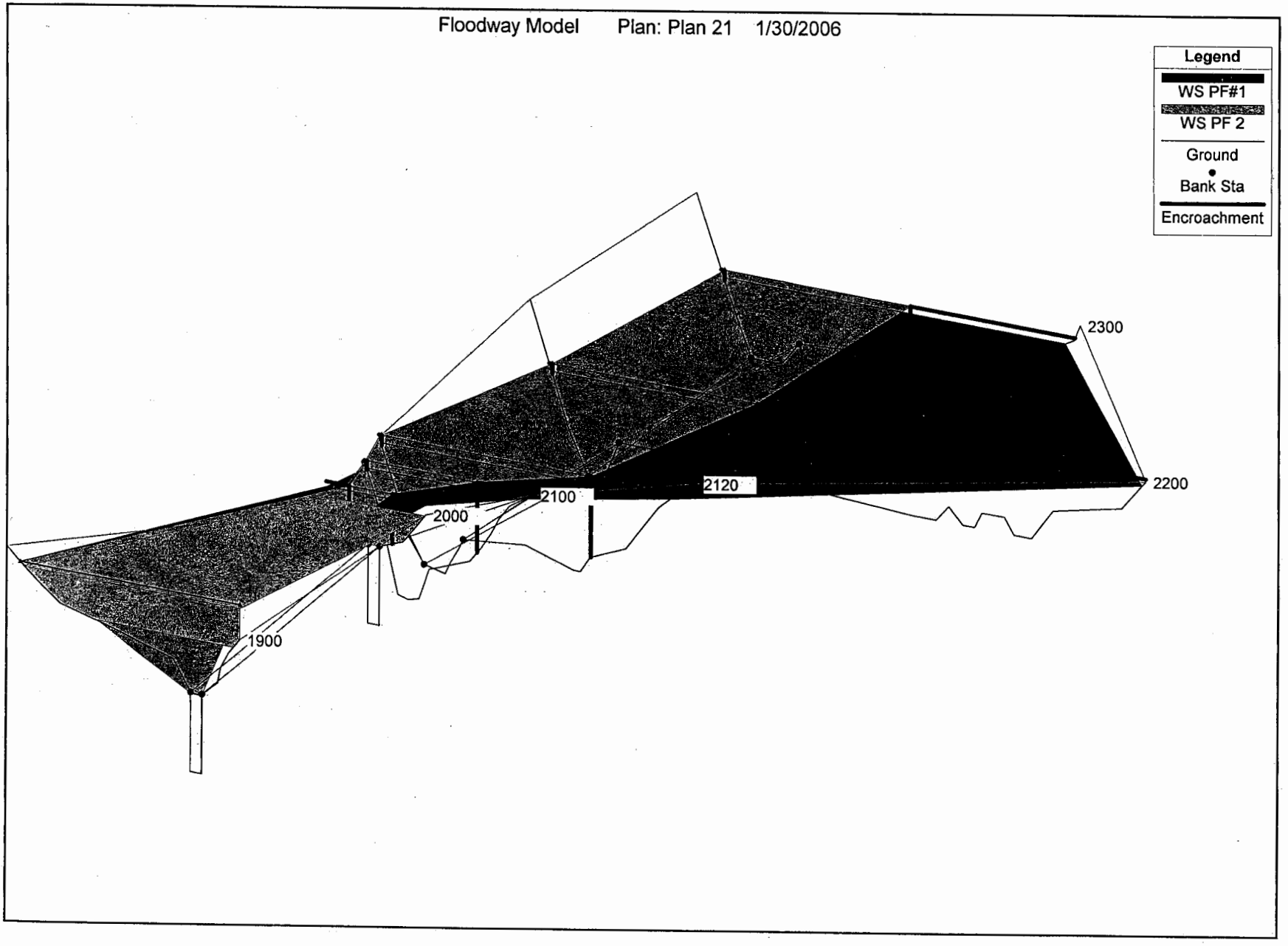
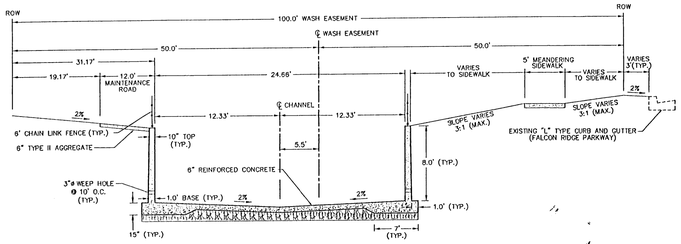
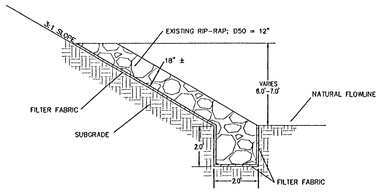

Floodway Model Plan: Plan 21 1/30/2006
Legend
WS PF#1
WS PF 2
Ground
Bank Sta
Encroachment
2300
2200
2120
2100
2000
1900

FIGURE 3
PULSIPHER WASH HEC-RAS CROSS-SECTION EXHIBIT



SECTION B–B

NO SCALE



SECTION C–C

NO SCALE



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

HORIZONTAL TIE
REF: FALCON RIDGE PARKWAY IMPROVEMENT PROJECT
STA:25+74.30 FALCON RIDGE PARKWAY ALIGNMENT
OFFSET=115.50' (L) TO CENTER OF DUAL BOX CULVERT

EXISTING 12' x 8' DOUBLE BARREL BOX CULVERT
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERTS

CHANNEL IMPROVEMENTS PER "PULSIPHER WASH IMPROVEMENTS" COMPLETED BY BULLOCH BROS. ENG. IN NOV. 2002. DESIGN FLOW Q_{100}= 2450 CFS (CONSTRUCTION OF CHANNEL COMPLETE, 1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CHANNEL)

EXISTING 12' x 10' QUINTUPLE BARREL REINFORCED CONCRETE BOX CULVERT, 1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERTS.

CENTERLINE MONUMENT INTERSECTION OF PIONEER BLVD & FALCON RIDGE PKWY ELEVATION=1620.98

EXISTING ZONE "A" BOUNDARY PER FIRM PANEL 386 OF 4090, MAP #32003C0386 E

NOTE: CRITICAL WATER SURFACE ELEVATION AT UPSTREAM END OF CULVERT = 1598.84, WHICH IS EQUAL TO EFFECTIVE MODEL SECTION 1900 NOT SHOWN ON FIGURE. SAME DATA AS EFFECTIVE MODEL.

Q_{100} SOUTH OF CULVERT=3100 CFS PER "CITY OF MESQUITE FLOOD CONTROL MASTER PLAN UPDATE 2001" BY PENTACORE

Q_{100} SOUTH OF CULVERT=3000 CFS PER "CITY OF MESQUITE FLOOD CONTROL MASTER PLAN UPDATE 2001" BY PENTACORE

*NOTE: CRITICAL DEPTH USED WHERE SUPERCRITICAL FLOWS OCCUR IN NATURAL CHANNEL

BREAKOUT AREA 100-YEAR FLOW – CONVEYANCE MUST BE MAINTAINED WITHIN LIMITS OF EXISTING FLOODWAY

WEST EDGE OF ZONE AE FLOODWAY REVISED TO MATCH LIMITS OF NEW SPECIAL FLOOD HAZARD ZONE 'A'.

APPROXIMATE LOCATION OF EXISTING FLOODWAY AREA ZONE "AE"

A.P.N. 001-18-399-001

A.P.N. 001-18-399-002

A.P.N. 001-18-201-010

A.P.N. 001-18-201-010

A.P.N. 002-13-701-011

EXISTING ZONE "A" BOUNDARY PER FIRM PANEL 386 OF 4090 MAP #32003C0386 E

A.P.N. 002-13-601-001

A.P.N. 002-13-501-006

A.P.N. 002-13-501-010

EXISTING ZONE "A" BOUNDARY PER FIRM PANEL 386 OF 4090 MAP #32003C0386 E

MESA VIEW HOSPITAL

SEE SHEET 2 (FIGURE 4) FOR CONTINUATION

PIONEER BLVD.

FALCON RIDGE PKWY.

WEST PIONEER BLVD.

BERTHA HOWE AVE.

50' PEDESTRIAN AND DRAINAGE EASEMENT

100' WASH EASEMENT

34' PEDESTRIAN AND DRAINAGE EASEMENT

17' PEDESTRIAN AND DRAINAGE EASEMENT

EXISTING TEMPORARY ACCESS ROAD

ABANDONED RAPID INFILTRATION BASINS

LEGEND

---- 1690 ----	= EXISTING 10' CONTOURS WITH ELEVATION SHOWN
------ 1692 ------	= EXISTING 2' CONTOURS
—℄—	= PROPERTY LINE
1648.72 TOP	= EXISTING TOP BANK OF WASH ELEVATION
1648.72 TOE	= EXISTING TOE OF WASH ELEVATION
⟸	= FLOW DIRECTION ARROW
SECTION 2900	= HEC-RAS CROSS-SECTION IDENTIFICATION (THIS STUDY)
CWSEL=1639.22	= COMPUTED WATER SURFACE ELEVATION
(3000)	= ABBOTT AND PULSIPHER WASHES FIS STUDY CROSS SECTION
	= EXISTING SPECIAL FLOOD HAZARD AREA ZONE 'A' PER FEMA FIRM PANEL 386 OF 4090. MAP# 32003C0386 E REVISED SEPT. 27, 2002
	= EXISTING FLOODWAY AREA ZONE 'AE'
	= REVISED FLOODWAY AREA ZONE 'AE'
	= REVISED SPECIAL FLOOD HAZARD AREA ZONE 'A'
	= EXISTING ASPHALT
	= EXISTING RIP-RAP / BANK PROTECTION
A ⟷ A	= TYPICAL STREET / CHANNEL CROSS SECTION



MESQUITE, NEVADA
VICINITY MAP

NO SCALE

BENCHMARK

N.G.S. MONUMENT Z-405
ELEV.=1595.65
ELEVATION DATUM: NGVD 1929
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

REVISIONS			
NO	DESCRIPTION	DATE	BY APPROVED

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1309 WEST STATE ST., SUITE 200, PLEASANT GROVE, UTAH 84062, (801) 763-8467
750 WEST PIONEER BLVD., MESQUITE, NEVADA 89027, (702) 346-3100

PULSIPHER WASH / FALCON RIDGE PARKWAY HEC-RAS EXHIBIT
FIGURE 3
MESQUITE, NEVADA

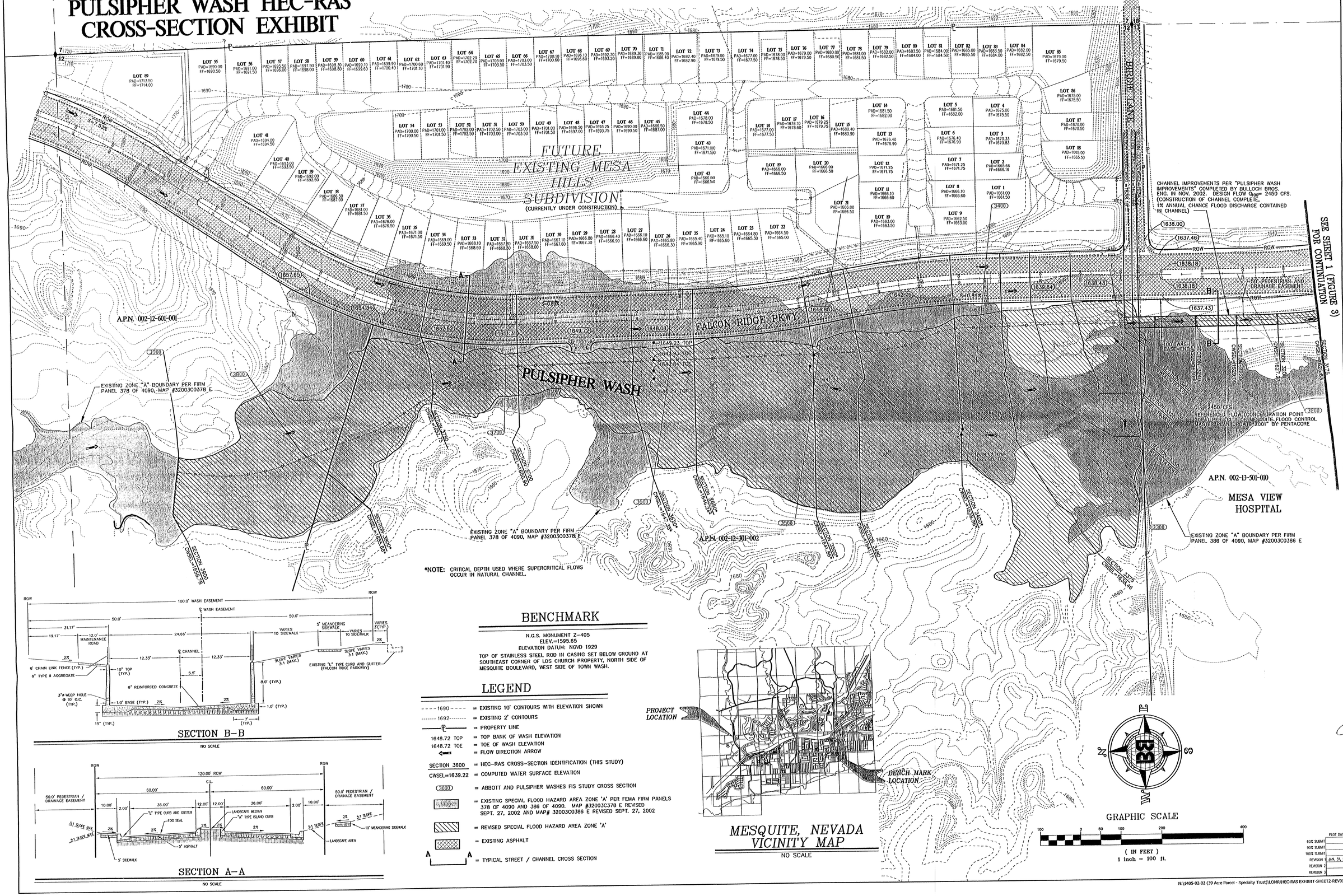
GREG L. BULLOCH, Exp. 12/31/06, CIVIL, No. 10873, STATE OF NEVADA, PROFESSIONAL ENGINEER
2/17/06

SCALE: 1"= 100'	DRAWN BY: L.H./B.C.	CHECKED BY: G.B.	
PROJECT NO: 1405-02-02	PLOT DATE: 60% SUBMIT		
DATE: JAN. 2006	90% SUBMIT		
SHEET NO: 1 OF 2	100% SUBMIT		
	REVISION 1: JAN. 31, 2006		
	REVISION 2		
	REVISION 3		

N:\1405-02-02 (39 Acre Parcel - Specialty Trust)\LOMR\HEC-RAS EXHIBIT-SHEET1-REV01-26-06.dwg, 1/31/2006 9:14:24 AM, Lance

FIGURE 4
PULSIPHER WASH HEC-RAS CROSS-SECTION EXHIBIT

FALCON RIDGE AREA



*NOTE: CRITICAL DEPTH USED WHERE SUPERCRITICAL FLOWS OCCUR IN NATURAL CHANNEL.

SECTION B–B

NO SCALE

SECTION A–A

NO SCALE

BENCHMARK

N.G.S. MONUMENT Z-405
ELEV.=1595.65
ELEVATION DATUM: NGVD 1929
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

LEGEND

- ----1690---- = EXISTING 10' CONTOURS WITH ELEVATION SHOWN
- ------1692------ = EXISTING 2' CONTOURS
- —℄— = PROPERTY LINE
- 1648.72 TOP = TOP BANK OF WASH ELEVATION
- 1648.72 TOE = TOE OF WASH ELEVATION
- = FLOW DIRECTION ARROW
- SECTION 3600 = HEC-RAS CROSS-SECTION IDENTIFICATION (THIS STUDY)
- CWSEL=1639.22 = COMPUTED WATER SURFACE ELEVATION
- (3000) = ABBOTT AND PULSIPHER WASHES FIS STUDY CROSS SECTION
- = EXISTING SPECIAL FLOOD HAZARD AREA ZONE 'A' PER FEMA FIRM PANELS 378 OF 4090 AND 386 OF 4090. MAP #32003C378 E REVISED SEPT. 27, 2002 AND MAP# 32003C0386 E REVISED SEPT. 27, 2002
- = REVISED SPECIAL FLOOD HAZARD AREA ZONE 'A'
- = EXISTING ASPHALT
- A A = TYPICAL STREET / CHANNEL CROSS SECTION

MESQUITE, NEVADA VICINITY MAP

NO SCALE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS			
NO	DESCRIPTION	DATE	BY APPROVED

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750 WEST PIONEER BLVD.
MESQUITE, NEVADA 89027
(702) 346-8100

PULSIPHER WASH / FALCON RIDGE PARKWAY HEC-RAS EXHIBIT
FIGURE 4
MESQUITE, NEVADA

PROFESSIONAL ENGINEER – STATE OF NEVADA – GREG L. BULLOCH – Exp. 12/31/06 – CIVIL – No. 10875 – 2/17/06

SCALE:	DRAWN BY:	CHECKED BY:
1"= 100'	LH./B.C.	G.B.

PROJECT NO:	DATE:	SHEET NO:
1405-02-02	JAN. 2006	2 OF 2

PLOT DATE
60% SUBMIT
90% SUBMIT
100% SUBMIT
REVISION 1 JAN. 31, 2006
REVISION 2
REVISION 3

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CITY OF M

ZONE A

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

N
W E
S

ZONE X

HARDY WAY

HARDY WAY

12

7

CORPORATE LIMITS

UPSTREAM LIMIT OF STUDY

FALCON RIDGE PARKWAY

FALCON NEST COURT

ZONE X

ZONE A

WOODS COURT

LONG IRON LANE

WEDGE WAY

HIGHLAND NEW COURT

SANDTRAP COURT

R70E R71E

R70E R71E

NEW ZONE A

12

HIGHLAND HILLS DRIVE

CALAIS DRIVE

CALAIS CIRCLE

7

BIRDIE LANE

NEW ZONE A CONTAINED IN CHANNEL

FALCON RIDGE PARKWAY

BERTHA HOWE AVENUE

ZONE X

NEW ZONE A CONTAINED IN CULVERT

DUMP ROAD

TRIBUTARIES AND DUMP ROAD ARE NO LONGER CURRENT

PIONEER BOULEVARD

NEW ZONE A CONTAINED IN CULVERT

WEST PIONEER BOULEVARD

13

LIMIT OF DETAILED STUDY

ZONE A

AREA SHOWN ON THIS PANEL IS LOCATED WITHIN 13 SOUTH, RANGE 70 EAST, AND TOWNSHIP 13 SOUTH, AST.

WEST EDGE OF ZONE AE FLOODWAY REVISED TO MATCH LIMITS OF NEW ZONE A. EAST EDGE OF FLOODWAY TO REMAIN UNCHANGED.

ZONE AE

D

1608

DOWNSTREAM LIMIT OF STUDY, I-15 BOX CULVERT

D

C

ZONE AE

1600

1595
1593

1595

1596

1594

C

1589

1587

B

CITY OF MESQUITE
320035

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0378 E

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 378 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HENDERSON, CITY OF	320035	0378	E
CLARK COUNTY	320003	0378	E
UNINCORPORATED AREAS			

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 communities.

MAP NUMBER
32003C0378 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0386 E

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 386 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESQUITE, CITY OF	320035	0386	E
CLARK COUNTY	320003	0386	E
UNINCORPORATED AREAS			

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 communities.

MAP NUMBER
32003C0386 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

PROJECT NO:	1405-02-02
SCALE:	1"= 300'
DATE:	JAN. 2006
DRAWN BY:	H.W.
SHEET NO:	1 OF 1
CHECKED BY:	L.H.

ANNOTATED FLOOD ZONE MAP
FIGURE 2
FROM
FIRM MAP NOS.
32003C0386E & 32003C0378E
MESQUITE, NEVADA

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REVISIONS				
NO	DESCRIPTION	DATE	BY	APPROVED

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MESQUITE BUILDING & PLANNING
RECEIVED
3/2/06 ch

REQUEST FOR CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR PROPOSED PULSIPHER WASH CHANNEL IMPROVEMENTS SOUTH OF BERTHA HOWE AVENUE

LOCATED IN: MESQUITE, CLARK COUNTY, NEVADA

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3/9/06
Project Number 06-12-1
Reviewed by

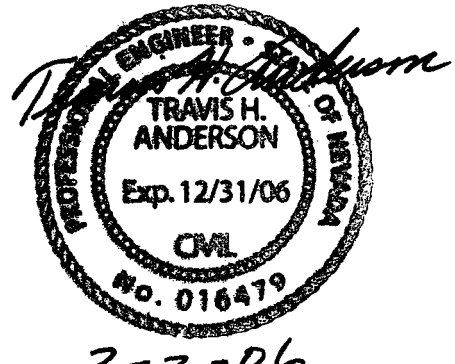
Submitted to:

FEMA Map Coordination Contractor
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304-6425

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 1006002
06-12-1

Submitted by:

Bulloch Brothers Engineering, Inc.
750 West Pioneer Boulevard
Mesquite, Nevada 89027



3-2-06

March 2006

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1.0 INTRODUCTION

This study provides a hydraulic model, improvement plans and as-built plans in support of the Conditional Letter of Map Revision for proposed Pulsipher Wash Channel Improvements South of Bertha Howe Avenue. The proposed project includes box culvert design from the existing Bertha Howe Avenue box culvert to the existing Pioneer Boulevard West box culvert; and from the existing Pioneer Boulevard West box culvert to approximately 430' south of Pioneer Boulevard West.

The study area is located within the City of Mesquite, Clark County, Nevada. The City of Mesquite is located in the northeast corner of Clark County, near the Arizona border. The city is adjacent to and north of the Virgin River.

Pulsipher Wash was previously analyzed in the Abbott and Pulsipher Washes FIS Restudy and Abbott and Pulsipher Washes FIS Restudy Supplement which were submitted by G.C. Wallace Inc. in October 1998 and November 2000, respectively. Many improvements to Pulsipher Wash have been completed since the submittal of these studies including the completion of Falcon Ridge Parkway to Hardy Way, channelization between Birdie Lane and Bertha Howe Ave. (including 12'x8' double barrel RCB culvert at Bertha Howe Ave.), Pioneer Boulevard West (including 12'x10' quintuple barrel RCB culvert) and Rough Grading of Parcels 26 and 27 for Specialty Financial between Pioneer Boulevard and I-15. These improvements have been analyzed and modeled in the *Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway* which is currently under FEMA review (Case No.: 06-09-B051P).

This study references the model used in the *Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. Cross section information between cross-sections 3080 and 2330 were revised to represent proposed conditions (2 -14' x 10' box culverts). Additional cross-sections were included with this study along the proposed improvements. Also, the flow change at cross-section 3080 in the above mentioned LOMR study has been moved downstream to cross-section 2935 where flows will enter the proposed box culverts.

The FIRM panel impacted by this study is Panel 32003C0386 E dated September 27, 2002. FIRM panel 32003C078 E is also impacted by this study due to the fact that the above mentioned LOMR request is not yet approved.

2.0 PRE-ANALYSIS CONDITIONS

Prior to the *Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*, which is currently under FEMA review, Pulsipher Wash analysis did not include any wash improvements north of I-15. The existing 12' x 10' RCB culvert at I-15 is undersized for the100-year storm event. The undersized culvert causes a backwater affect several hundred feet upstream of the culvert with breakout flows at I-15.

The Abbott and Pulsipher Washes FIS Restudy and Supplement used a modified version of the HEC-1 model form the 1995 City of Mesquite MPU for hydrologic modeling.

3.0 POST-ANALYSIS CONDITIONS

This study uses the hydrologic criteria provided in the *Clark County Regional Flood Control District (CCRFCD), City of Mesquite Flood Control Master Plan Update*, prepared by Pentacore Engineering, dated September of 2001. Future condition flows referenced from the MPU 2001 were rounded to the nearest, factor of ten, whole number and are considered to be a conservative estimate of existing condition flows for Pulsipher Wash at this time. The hydrologic criteria used in this study is summarized in Table 1.

Table 1. Summary of Hydrologic Criteria Used for Pulsipher Wash Watershed During the 100-Year Storm Event

Concentration Point	Description	Area (sq mi)	DARF	Q_{100} (cfs) Effective Model	Q_{100} (cfs) This Study
20	Pulsipher Wash 6,100 feet north of I-15	2.07	0.93	2,318	2,318 [1]
20P4	Pulsipher Wash 3,800 feet north of I-15	3.09	0.92	N/A	2,450
30	Pulsipher Wash 3,000 to1,500 feet north of I-15	4.34	0.92	3,474	3,000
50	Pulsipher Wash 1500 feet north of I-15 to I-15	4.70	0.91	3,478	3,100 [1]
@ I-15 Culvert	Split flow at I-15	--	--	2,138	2,138 [1]

N/A = Not applicable (not used in Abbott and Pulsipher Washes FIS)
[1] Flow from concentration point 20 to 20P4 and beyond concentration point 50 used Effective Model Q_{100} flows in order to reproduce FIS profiles.
* See Figure 5, Appendix B

4.0 HYDRAULIC MODELS

4.1 Effective and Duplicate Effective Models

The "effective" FIS model was performed using the U.S. Army Corps of Engineers HEC-2 Water Surface Profile computer program. The FIS model was performed by G.C. Wallace as part of the "Abbott and Pulsipher Washes FIS Restudy." The effective model was reproduced to produce a duplicate effective

HEC-2 model. A copy of the duplicate effective HEC-2 model with elevations in the National Geodetic Vertical Datum of 1929 (NGVD29) is provided in Appendix C.

Bulloch Brothers Engineering Inc. used the effective FIS model with one modification. The model was imported into HEC-RAS and re-analyzed to get a duplicate effective HEC-RAS model.

The modified FIS model is referred to herein as the duplicate effective HEC-RAS model. A comparison of the results is provided in Table 2. A copy of the duplicate effective HEC-RAS model with elevations in the National Geodetic Vertical Datum of 1929 (NGVD29) is provided in Appendix C.

Table 2. Comparison of Effective and Duplicate Effective Models

Station [1]	Effective FIS HEC-2 Model [2] BFEs (ft)	Duplicate Effective HEC-RAS Model BFEs (ft)	Difference (ft)
3900	1658.79	1658.80	0.01
3800	1656.25	1656.25	0.00
3700	1650.06	1650.06	0.00
3600	1647.42	1647.42	0.00
3500	1642.15	1642.10	-0.05
3400	1639.11	1639.17	0.06
3300	1631.38	1631.36	-0.02
3200	1627.52	1627.54	0.02
3100	1624.66	1624.66	0.00
3000	1620.69	1620.68	-0.01
2900	1618.57	1618.65	0.08
2800	1615.31	1615.32	0.01
2700	1612.56	1612.56	0.00
2600	1610.06	1610.08	0.02
2500	1606.37	1606.35	-0.02
2400	1604.90	1604.97	0.07
2350	1605.15	1605.26	0.11
2330	1605.24	1605.33	0.09
2300	1605.26	1605.34	0.08
2200	1605.28	1605.37	0.09
2100	1605.22	1605.30	0.08
2000	1598.88	1598.84 [3]	-0.04
1900	1592.09	1592.10	0.01

[1] Only sections in the vicinity of, and relevant to the project are shown.
[2] Elevations shown are based on NGVD 29 benchmark.
[3] The differences in water surface elevations are associated with the differences in the critical depth calculations performed by HEC-2 and HEC-RAS. HEC-2 calculates critical depth to ±2.5% of the flow

depth; whereas, HEC-RAS calculates critical depth to ±0.01 foot. The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.

4.2 Proposed-Project HEC-RAS Model (This Study)

Under proposed-project conditions, flow varies between subcritical and supercritical throughout the Pulsipher Wash reach analyzed. The results of the mixed flow proposed-project HEC-RAS model are compared to the duplicate effective HEC-RAS model in Table 3. Only cross-sections located at or in proximity to the effective model cross sections are compared in Table 3. Note that the effective and duplicate effective models used cross-section data looking downstream right to left. The proposed-project model analyzed cross-sections looking downstream left to right. Cross-sections duplicated at the upstream and downstream limits of this study were revised to reflect this change. The proposed-project model includes all sections affected by the before mentioned completed projects, as well as, proposed condition sections (Stations 2100 through 3900). Stations 2000 and 1900 were duplicated from the effective model in order analyze the backwater affect at I-15.

Table 3. Comparison of Duplicate Effective and Proposed Project Models

Station	Duplicate Effective HEC-RAS Model BPES (ft)	Proposed Project HEC-RAS Model BPES (ft)	Difference (ft)
3900	1658.80	1658.78	-0.02
3800	1656.25	1655.66*	-0.59
3700	1650.06	1650.90	0.84
3500	1642.10	1641.86*	-0.24
3400	1639.17	1638.96*	-0.21
3300	1631.36	1638.19	6.83
3200	1627.54	1627.27	-0.27
3100	1624.66	1621.47	-3.19
3000	1620.68	1619.26	-1.42
2900	1618.65	1618.43	-0.22
2800	1615.32	1615.62	0.30
2700	1612.56	1613.12	0.56
2500	1606.35	1608.06	1.71
2400	1604.97	1604.15*	-0.82
2350	1605.26	1605.36	0.10
2330	1605.33	1605.15	-0.18
2300	1605.34	1605.37	0.03
2200	1605.37	1605.41	0.04

2100	1605.30	1605.37	0.07
2000	1598.84 [3]	1598.84 [3]	0.00
1900	1592.10	1592.09	-0.01

[1] The proposed Flood Zone 'A' ties into the existing Flood Zone 'A' at Stations 3900 and 2100. Stations 2200 through 3800 were revised to reflect existing and proposed-project conditions.
[2] Elevations shown are based on NGVD 29 benchmark.
[3] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.
* Critical depth used where supercritical flows occur in natural channel.

Figures 3 and 4 in Appendix C are cross-section exhibits showing the locations of the HEC-RAS cross-sections, the effective and proposed Zone 'A' boundaries, existing and proposed Zone 'AE' boundary (referenced from *Amendment No. 1 to the Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. which is currently under FEMA review) and the upstream and downstream limits of this study. On these Figures, the circled station numbers were taken directly from the effective FIS model, and those not circled were created for the purpose of this study.

Since the before mentioned LOMR request has not yet been approved, the limits of the proposed-project model were extended upstream and downstream of the area analyzed a sufficient distance to tie into the effective FIS models. At the upstream end, the proposed-project model ties into the effective FIS model at Station 3900, with a Base Flood Elevation (BFE) equal to 1658.78 (0.01' lower than the effective FIS HEC-2 model; 0.02' lower than the duplicate effective HEC-RAS model). Critical depth was used for the upstream boundary condition because nearly all of the HEC-2 cross-sections from the effective model contained computed flows at critical depth. The downstream end of the proposed-project model ties into the effective FIS model at Station 2100, with a BFE equal to 1605.37 (0.15' higher than the effective FIS HEC-2 model; 0.07' higher than the duplicate effective HEC-RAS model).

Preliminary proposed storm drain stubs were sized using flow per acre calculations and the future condition flows from the *Clark County Regional Flood Control District (CCRFCD), City of Mesquite Flood Control Master Plan*, prepared by Pentacore Engineering, dated September of 2001. Three proposed 60-inch pipes were sized to handle flows from Basin P6 and P7, one 42-inch for flow from sub-basin "A" and "B" and two 24-inch for future flows from sub-basin "C" (See flow/acre calculations Appendix B).

Topographic data was generated for separate projects by Olympus Aerial Surveys, Inc. and additional surveys were conducted by Bulloch Brothers Engineering, Inc. to determine a portion of the physical dimensions of the Pulsipher Wash reach analyzed by this study.

National Geodetic Vertical Datum of 1929 (NGVD29) was used for all models used in this study. The conversion factor to raise NGVD29 to North American Vertical

Datum of 1988 (NAVD88) is 2.84 feet. Datum conversion calculations and benchmark information is provided in Appendix C. The results of the proposed-project HEC-RAS model in both NGVD29 and NAVD88 is provided in Table 4.

Table 4. Proposed Project Models Results in NGVD29 and NAVD88.

Station	Proposed Project HEC-RAS Model BFEs (ft) (NGVD29)	Proposed Project HEC-RAS Model BFEs (ft) (NAVD88)	Difference (ft)
3900	1658.78*	1661.62	2.84
3800	1655.66*	1658.50	2.84
3750	1652.75	1655.59	2.84
3700	1650.90	1653.74	2.84
3620	1647.35*	1650.19	2.84
3580	1646.24*	1649.08	2.84
3500	1641.86*	1644.70	2.84
3480	1641.11	1643.95	2.84
3400	1638.96*	1641.80	2.84
3375	1638.46	1641.30	2.84
3350	1638.45	1641.29	2.84
3325	1638.45	1641.29	2.84
3300	1638.19	1641.03	2.84
3280	1637.68	1640.52	2.84
3270	1634.74	1637.58	2.84
3260	1633.09	1635.93	2.84
3240	1630.85	1633.69	2.84
3220	1629.00	1631.84	2.84
3200	1627.27	1630.11	2.84
3175	1625.63	1628.47	2.84
3150	1624.01	1626.85	2.84
3125	1622.42	1625.26	2.84
3100	1621.47	1624.31	2.84
3080	1621.39	1624.23	2.84
3070	1620.38	1623.22	2.84
3025	1619.85	1622.69	2.84
3000	1619.26	1622.10	2.84
2970	1620.01	1622.85	2.84
2935	1620.11	1622.95	2.84
2900	1618.43	1621.27	2.84
2870	1617.41	1620.25	2.84
2835	1616.50	1619.34	2.84
2800	1615.62	1618.46	2.84
2770	1614.78	1617.62	2.84

2735	1613.94	1616.78	2.84
2700	1613.12	1615.96	2.84
2690	1612.91	1615.75	2.84
2680	1612.58	1615.42	2.84
2670	1612.30	1615.14	2.84
2660	1612.10	1614.94	2.84
2650	1610.22	1613.06	2.84
2590	1611.09	1613.93	2.84
2570	1611.98	1614.82	2.84
2550	1611.31	1614.15	2.84
2540	1610.67	1613.51	2.84
2530	1609.94	1612.78	2.84
2515	1609.21	1612.05	2.84
2510	1608.32	1611.16	2.84
2500	1608.06	1610.90	2.84
2460	1606.99	1609.83	2.84
2440	1605.99	1608.83	2.84
2420	1605.12*	1607.96	2.84
2400	1604.15	1606.99	2.84
2350	1605.36	1608.20	2.84
2330	1605.15	1607.99	2.84
2300	1605.37	1608.21	2.84
2200	1605.41	1608.25	2.84
2120	1605.38	1608.22	2.84
2100	1605.37	1608.21	2.84
2000	1598.84 [2]	1601.68 [2]	2.84
1900	1592.09	1594.93	2.84

[1] The conversion factor to raise NGVD29 to North American Vertical Datum of 1988 (NAVD88) is +2.84 feet.

[2] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.

* Critical depth used where supercritical flows occur in natural channel.

Table 5 on the following page represents the encroached conditions model on the floodway using the limits of the proposed flood plain as the west boundary of the proposed floodway and the east boundary remaining unchanged. This model and table were referenced from *Amendment No. 1 to the Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. which is currently under FEMA review. This proposed project will not affect the regulatory floodway. The encroached conditions model has been included in this report due to the fact that the above mentioned LOMR has not yet been approved.

Table 5. Floodway Model Results in NGVD29 and NAVD88.

Station	Floodway HEC-RAS Model BFEs (ft) (NGVD29) [1]	Floodway HEC-RAS Model BFEs (ft) (NAVD88) [1]	Difference (ft)
2300	1606.32	1609.16	2.84
2200	1606.32	1609.16	2.84
2120	1606.33	1609.17	2.84
2100	1606.27	1609.11	2.84
2000	1598.84 [2]	1601.68 [2]	2.84
1900	1592.05	1594.89	2.84

[1] The conversion factor to raise NGVD29 to North American Vertical Datum of 1988 (NAVD88) is +2.84 feet.

[2] The critical water surface elevation at the upstream end of I-15 culvert is used for section 2000.

5.0 CONCLUSION

Existing Pulsipher Wash improvements, including concrete wash channelization between Birdie Lane and Bertha Howe Ave., Bertha Howe Ave. box culverts, Pioneer Blvd. box culverts and Rough Grading of Parcels 26 and 27 for Specialty Financial between Pioneer Boulevard and I-15 were incorporated into the proposed-project HEC-RAS model. The results of the hydraulic analysis indicate that the 100-year flood will be contained within the existing concrete channel, box culverts and proposed box culverts. Also, the backwater affect and breakout flows at I-15 will remain. Future plans for Pulsipher Wash include a proposed detention basin north of the proposed improvements that will reduce flows and improve conditions for downstream properties.

6.0. REFERENCES

1. Olympus Aerial Surveys, Inc.

2. *City of Mesquite Flood Control Master Plan Update*, by CH2M-HILL, September 1995.

3. *Clark County Regional Flood Control District (CCRFCD), City of Mesquite Flood Control Master Plan*, prepared by Pentacore Engineering, dated September of 2001.

4. *Abbott and Pulsipher Washes FIS Restudy*, completed by G.C, Wallace Inc. in October 1998.

5. *Abbott and Pulsipher Washes FIS Restudy Supplement*, completed by G.C, Wallace Inc. in November 2000.

6. U.S. Army Corp of Engineers' River Analysis System (HEC-RAS) Version 3.1.3, Hydrologic Engineering Center, May 2005.

*7. *Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*, completed by Bulloch Brothers Engineering, Inc. in November 2005.

*The floodway model used for this study was referenced from *Amendment No. 1 to the Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway* which is currently under FEMA review (Case No.: 06-09-B051P). Figures and models were also referenced and revised to reflect proposed-project conditions.

APPENDICES

APPENDIX A

FEMA Forms

1. FEMA 'Overview and Concurrence Form' -- MT-2 Form 1 ..... A1

2. FEMA 'Riverine Hydology & Hydraulics Form' -- MT-2 Form 2 ..... A3

3. FEMA 'Riverine Structures Form' -- MT-2 Form 3 ..... A5

4. Statement of Explanations A16

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour 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, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). 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.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☑ CLOMR: A letter from 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 FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

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	480301 48201C	0005D 0220G	02/08/83 09/28/90
320035	City of Mesquite	NV	32003C	0386E	09/27/02
32003	Clark County, Unincorporated Areas	NV	32003C	0378E	09/27/02

2. Flooding Source: Pulsipher Wash

3. Project Name/Identifier: Proposed Improvements for Pulsipher Wash South of Bertha Howe Ave.

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 ☐ 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 types of flooding and structures (check all that apply)

Types of Flooding:	☑ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☑ Channelization	☐ Levee/Floodwall	☑ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $____

☑ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/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: Travis H. Anderson	Company: Bulloch Brothers Engineering, Inc.	
Mailing Address: 750 West Pioneer Blvd. Mesquite, NV 89027	Daytime Telephone No.: (702) 346-5100	Fax No.: (702) 346-5102
	E-Mail Address:	
Signature of Requester (required): Travis H. Anderson		Date: 3-2-06

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be 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. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: J. Allen Bell, P.E., City Engineer		Telephone No.: (702) 346-5295
Community Name: City of Mesquite	Community Official's Signature (required):	Date:

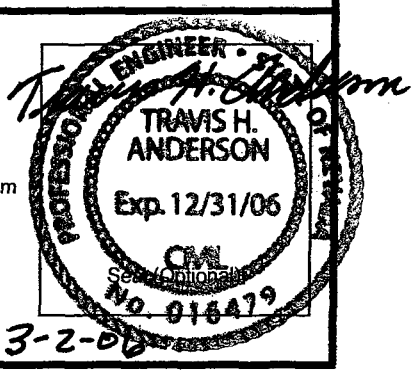
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. 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: Travis H. Anderson	License No.: 16479	Expiration Date: 12/31/06
Company Name: Bulloch Brothers Engineering, Inc.	Telephone No.: (702) 346-5100	Fax No.: (702) 346-5102
Signature: Travis H. Anderson		Date:

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

Form Name and (Number)	Required if ...
☑ Riverine Hydrology and 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



FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 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, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). 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.**

Flooding Source: Pulsipher 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 2) ☐ 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.)	FIS (cfs)	Revised (cfs)
3300	3.09	3474	2450
2900	4.34	3474	3000
2100	4.70	3478	3100

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

☐ Statistical Analysis of Gage Records ☑ Precipitation/Runoff Model Referenced MPU 2001 HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ 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. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

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

Was sediment transport considered? ☐ 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.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Just north of I-15	2100	1605.22	1605.37
Upstream Limit	Approx. 6225' north of I-15	3900	1658.79	1658.78

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☑ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:pulsrev7.out	Floodway File Name:
Corrected Effective Model*	Natural File Name:	Floodway File Name:
Existing or Pre-Project Conditions Model	Natural File Name:pulsrev7.pri	Floodway File Name:
Revised or Post-Project Conditions Model	Natural File Name:CLOMR3.pri	Floodway File Name:
Other - (attach description)	Natural File Name:	Floodway File Name: Floodway.pri (Ref.)

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic 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.).

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,** 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 of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☑ No

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.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

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 added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

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, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). 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.**

Flooding Source: Pulsipher 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 Structure

1. Name of Structure:

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

Location of Structure: Existing Pulsipher Wash Concrete U-Channel from Birdie Lane to Bertha Howe Ave.

Downstream Limit/Cross Section: 3100

Upstream Limit/Cross Section: 3300

2. Name of Structure:

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

Location of Structure: Bertha Howe Ave. Box Culvert

Downstream Limit/Cross Section: 3080

Upstream Limit/Cross Section: 3100

3. Name of Structure:

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

Location of Structure: Proposed Pulsipher Wash 14' x 10' double barrel box culvert including exist. Pioneer Blvd.

Downstream Limit/Cross Section: 2440

Upstream Limit/Cross Section: 3080

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Pulsipher Wash

Name of Structure: Existing Pulsipher Wash Concrete U-channel

1. Accessory Structures

The channelization includes (check one):

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

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry 2450 (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): SEE EXPLANATIONS

4. 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.

C. BRIDGE/CULVERT

Flooding Source: Pulsipher Wash

Name of Structure: Bertha Howe Ave. Box Culvert

1. This revision reflects (check one):

- ☑ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

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

- ☑ Dimensions (height, width, span, radius, length)
- ☑ 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

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.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

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

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -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):

4. 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.

C. BRIDGE/CULVERT

Flooding Source: Pulsipher Wash

Name of Structure: Proposed Pulsipher Wash 14' x 10' double barrel box culvert including exist. Pioneer Blvd.

1. This revision reflects (check one):

- ☑ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

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

- ☑ Dimensions (height, width, span, radius, length)
- ☑ 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

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.

D. DAM

Flooding Source:

Name of Structure:

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

   ☐ Private organization Name of the agency or organization:
3. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).
4. 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.
5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

6. 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

2. Freeboard (continued)

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 landside is:

b. The maximum levee slope floodside 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)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

   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:

   Sta. , depth to

   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:

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.

E. LEVEE/FLOODWALL (CONTINUED)

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.

f. 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.

E. LEVEE/FLOODWALL (CONTINUED)

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.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

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

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.

Explanations

- Bulloch Brothers Engineering, Inc. will submit upon receiving an invoice from FEMA.

Explanation of CHECK-RAS Output Messages (Form 2, Section B-3)

- Manning's n values for channel and right overbank upstream of concrete channel were taken from FIS model. Left overbank for sections 3750 through section 3325 is Falcon Ridge Parkway (Manning's n = 0.016).

- All Manning's n values are typical for existing and proposed conditions analyzed.

- For bridge and culvert analysis, upstream cross sections were taken at the upstream openings and downstream cross sections were taken at the downstream openings. HEC-RAS will not allow the 'distance from upstream XS' plus the 'deck/roadway width' to be greater than the culvert length.

Explanation of Floodway Model (Form 2, Section B-4)

- The encroached conditions floodway model was referenced from *Amendment No. 1 to the Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. which is currently under FEMA review. This proposed project will not affect the regulatory floodway. The encroached conditions model has been included in this report due to the fact that the above mentioned LOMR has not yet been approved.

Explanation of Supercritical Flow (Form 3, Section B-3)

- Supercritical flow currently exists in the concrete U-channel. Flow will also be supercritical within the proposed 14' x 10' double RCB culverts. There is a potential for a hydraulic jump at the junction of the proposed 60" storm drain stubs (3-pipes), transition out of Pioneer Blvd. box culverts and the outlet of the proposed 14' x 10' double RCB culverts. If a hydraulic jump occurs within the proposed box, it would be contained within the concrete box. The proposed rip-rap section and routine maintenance at the outlet of the proposed 14' x 10' double RCB culverts will reduce the potential for hydraulic jump to occur.

Explanation of Sediment Transport (Form 2, Section A-5 & Form 3, Section B-4 & C-4)

- Sediment transport was not considered because its effect on water surface elevations is negligible.

APPENDIX B

Referenced Hydrologic Information

1. "City of Mesquite Flood Control Master Plan Update 2001" completed by Pentacore in September 2001 ..... B1

2. "City of Mesquite Flood Control Master Plan Update" completed by CH2M-Hill in 1995 ..... B11

3. Flow / acre calculations B13

The City of Mesquite
Flood Control Master Plan Update 2001
Volume 1

Prepared for:

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

September 2001



Project Number: 0279.0010

PENTACORE

The data shows that peak discharge estimates decrease, compared with those from the MPU 1995. In general, the decreases are caused by a significant reduction in the rainfall amounts used (Table 1) for the various watersheds. Another reason for the decrease in flows is the application of a series of DARF's in the HEC-1 models in this Update. HEC-1 hydrology modeling results for full-developed conditions, based on the land use plan proposed in the Comprehensive Master Plan, as well as the existing condition are presented in Table 4.

TABLE 4

SUMMARY OF100-YEAR FLOWS

Watershed	Location	Existing Conditions (CFS)		Future Conditions (CFS)	
		MPU 1995	MPU 2001	MPU 1995	MPU 2001
Town Wash	40 (Detention Basin Inflow)	3091	2744	3355	3252
	Detention Basin Outflow	587	571	595	580
	Subbasin T8	548	700	N/A	1020
	50	814	726	N/A	N/A
	Subbasin T9	979	1350	1569	1790
	60 (I-15)	1691	1599	1839	1670
	80 (Virgin River)	2060	1771	2416	1860
Abbott Wash	20	1703	1460	1712	1471
	30	1333	1558	1370	1470
	40	3051	2803	3170	2750
	50 (I-15)	2970	2667	3266	2747
	60 (Virgin River)	2967	2423	3274	2975
Pulsipher Wash	20	2244	1955	2609	2135
	30	3468	2580	4416	2986
	50 (I-15)	3472	2535	4708	3099
	60 (Virgin River)	3166	1828	4338	3215
UnnamedWash	@ I-15	626	600	780	750
West Washes	W1		1011		1169
	W2		79		98
	W3		406		497
	W4		190		214
	W5		236		273
	W6		1502		1624

* Note: Flows from the 1995 MPU were obtained directly from the HEC-1 analysis output files.

REF: 2001 MASTER PLAN UPDATE

FUTURE CONDITION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JAN  1997                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   20MAR01  TIME  08:20:50   *
*                                       *
*****************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                *
                *DIAGRAM
  1             ID        CITY OF MESQUITE MASTER PLAN UPDATE 2000
  2             ID        PENTACORE ENGNEERING  John J. Lee
  3             ID        PULSIPHER WASH HYDROLOGIC ANALYSIS - 100 YEAR EXISTING COND
  4             ID        May 2000
  5             ID        GREEN AMPT LOSS RATE PARAMETERS
  6             ID        BASE MODEL FROM MESQUITE MPU 1995
  7             ID        Revised : 5 DARFs Used
  8             ID                  0.91 @
  9             ID                  0.93 @
 10             ID        Revised : Routing parameters recalculated
 11             ID        Revised : Lag time recalculated
 12             ID        Revised : Removed the storage routing upstream of I-15 from 1995 MPU
 13             IT      2               0     300
 14             IO      5
 15             IN      5               0
 16             JR   PREC     .91     .92     .93     .97       1
                *
```

```
     52          KK    20P4
     53          HC       2
                 *

     54          KK      P6
     55          BA    0.72
     56          LG    0.14     .30     2.5     1.2
     57          UD     .27
                 *

     58          KK   P6-30
     59          RM       5    .442     .15
                 *

     60          KK      P7
     61          BA    0.53
     62          LG    0.15     .33     3.7     .48      20
     63          UD     .24
                 *

     64          KK      30   CNAME
     65          HC       3
                 *

     66          KK   30-50
     67          RM       1    .088     .15
                 *

     68          KK      P8
     69          BA    0.34
     70          LG     .13     .27     3.2     .66    48.5
     71          UD     .14
                 *
1                                    HEC-1 INPUT                                    PAGE  3

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

     72          KK      50   CNAME
     73          KO       0       0       0       0      21
     74          HC       2
                 *

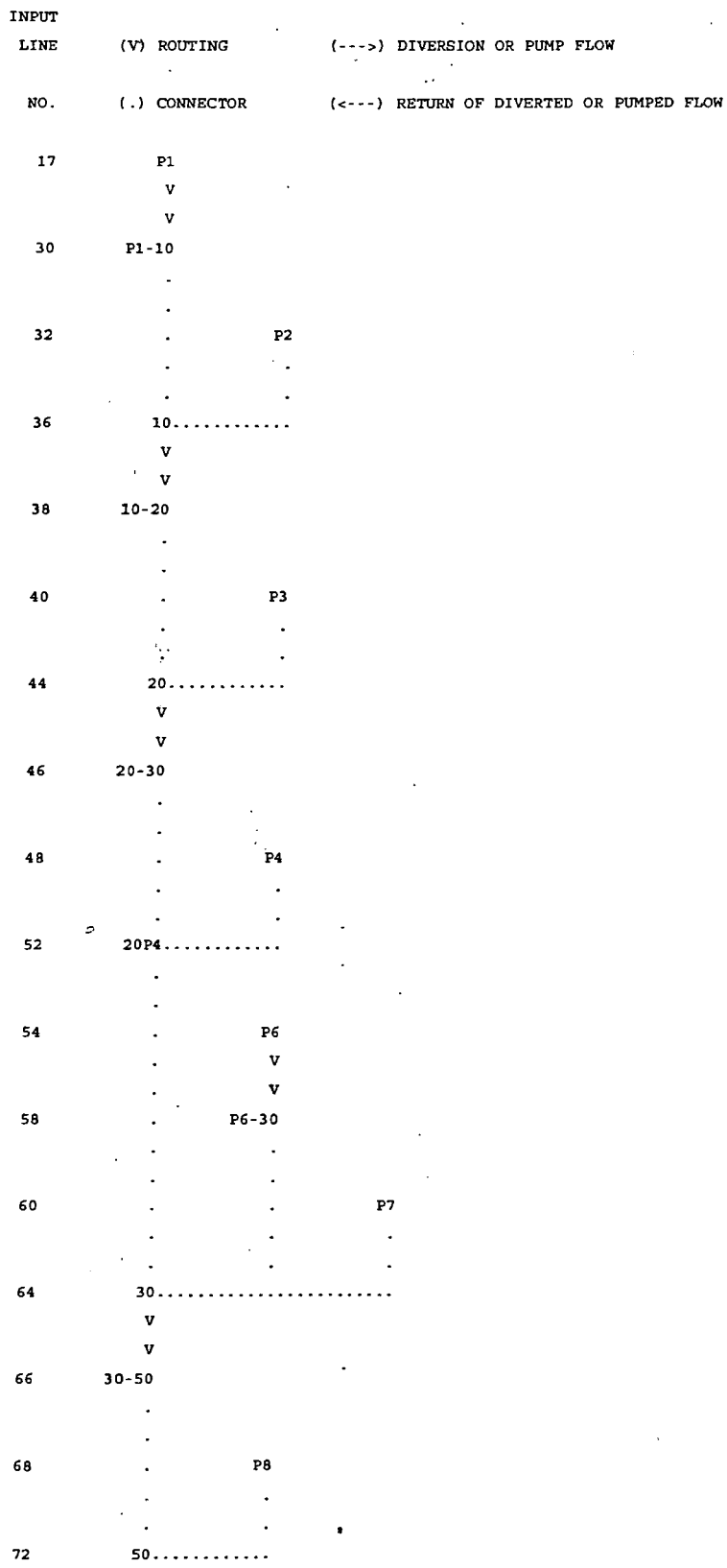
     75          KK   50-60
     76          RK    4400    .018    .035       0    TRAP      15       2
                 *

     77          KK      P9
     78          BA    0.12
     79          LG     .21     .30     2.6    1.09      47
     80          UD     .27
                 *

     81          KK      60
     82          HC       2
                 *
```

83 ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK



```
                V
                V
   75       50-60
                .
                .
   77           .          P9
                .           .
                .           .
   81          60.............

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*                JAN   1997             *
*             VERSION 4.1               *
*                                       *
*  RUN DATE   20MAR01  TIME  08:20:50   *
*                                       *
*****************************************
```

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

CITY OF MESQUITE MASTER PLAN UPDATE 2000
PENTACORE ENGNEERING John J. Lee
PULSIPHER WASH HYDROLOGIC ANALYSIS - 100 YEAR EXISTING COND
May 2000
GREEN AMPT LOSS RATE PARAMETERS
BASE MODEL FROM MESQUITE MPU 1995
Revised : 5 DARFs Used
0.91 @
0.93 @
Revised : Routing parameters recalculated
Revised : Lag time recalculated
Revised : Removed the storage routing upstream of I-15 from 1995 MPU

```
14 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                     NMIN          2  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0958  ENDING TIME
                   ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL      .03 HOURS
                     TOTAL TIME BASE     9.97 HOURS

       ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
```

	PRECIPITATION DEPTH	INCHES
	LENGTH, ELEVATION	FEET
	FLOW	CUBIC FEET PER SECOND
	STORAGE VOLUME	ACRE-FEET
	SURFACE AREA	ACRES
	TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

.91 .92 .93 .97 1.00

*** ***

72 KK 50 CNAME

73 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	.033	TIME INTERVAL IN HOURS

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES

TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION				
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
					.91	.92	.93	.97	1.00
HYDROGRAPH AT									
+	P1	.80	1	FLOW	1033.	1048.	1063.	1122.	1167.
				TIME	3.67	3.67	3.67	3.67	3.67
ROUTED TO									
+	P1-10	.80	1	FLOW	986.	1000.	1015.	1072.	1115.
				TIME	3.73	3.73	3.73	3.73	3.73
HYDROGRAPH AT									
	P2	.54	1	FLOW	996.	1008.	1020.	1068.	1103.
				TIME	3.57	3.57	3.57	3.57	3.57

2 COMBINED AT									
+	10	1.34	1	FLOW	1700.	1724.	1747.	1840.	1909.
				TIME	3.60	3.60	3.60	3.60	3.60
ROUTED TO									
+	10-20	1.34	1	FLOW	1474.	1494.	1515.	1597.	1658.
				TIME	3.87	3.87	3.87	3.87	3.87
HYDROGRAPH AT									
+	P3	.73	1	FLOW	1063.	1078.	1092.	1152.	1196.
				TIME	3.60	3.60	3.60	3.60	3.60
2 COMBINED AT									
+	20	2.07	1	FLOW	2075.	2105.	2135.	2254.	2342.
				TIME	3.73	3.73	3.73	3.73	3.73
ROUTED TO									
+	20-30	2.07	1	FLOW	1959.	1987.	2016.	2129.	2213.
				TIME	3.93	3.93	3.93	3.93	3.93
HYDROGRAPH AT									
+	P4	1.02	1	FLOW	1635.	1659.	1683.	1778.	1849.
				TIME	3.53	3.53	3.53	3.53	3.53
2 COMBINED AT									
+	20P4	3.09	1	FLOW	2389.	2426.	2462.	2607.	2716.
				TIME	3.57	3.57	3.57	3.57	3.57
HYDROGRAPH AT									
+	P6	.72	1	FLOW	363.	375.	386.	434.	469.
				TIME	3.70	3.70	3.70	3.67	3.67
ROUTED TO									
+	P6-30	.72	1	FLOW	255.	264.	272.	306.	331.
				TIME	4.10	4.10	4.10	4.10	4.10
HYDROGRAPH AT									
+	P7	.53	1	FLOW	585.	596.	606.	647.	677.
				TIME	3.63	3.63	3.63	3.63	3.63
3 COMBINED AT									
+	30	4.34	1	FLOW	2940.	2986.	3033.	3219.	3358.
				TIME	3.60	3.60	3.60	3.60	3.60
ROUTED TO									
+	30-50	4.34	1	FLOW	2752.	2797.	2842.	3020.	3155.
				TIME	3.70	3.70	3.70	3.73	3.73
HYDROGRAPH AT									
+	P8	.34	1	FLOW	528.	536.	544.	574.	597.
				TIME	3.57	3.57	3.57	3.57	3.57
2 COMBINED AT									
+	50	4.68	1	FLOW	3099.	3149.	3199.	3398.	3546.
				TIME	3.67	3.67	3.67	3.67	3.67

USED 2450 cfs IN HEC-RAS MODEL (CONSERVATIVE)

USED 3000 cfs IN HEC-RAS MODEL (CONSERVATIVE)

USED 3100 cfs IN HEC-RAS MODEL

ROUTED TO

	50-60	4.68	1	FLOW	3095.	3145.	3190.	3390.	3538.
				TIME	3.70	3.70	3.70	3.70	3.70

HYDROGRAPH AT

+	P9	.12	1	FLOW	121.	123.	126.	134.	140.
				TIME	3.67	3.67	3.67	3.67	3.67

2 COMBINED AT

+	60	4.80	1	FLOW	3215.	3268.	3315.	3523.	3677.
				TIME	3.70	3.70	3.70	3.70	3.70

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

						INTERPOLATED TO COMPUTATION INTERVAL			
ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .91									
50-60	MANE	1.04	3097.50	221.76	1.27	2.00	3094.51	222.00	1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3161E+03 EXCESS= .0000E+00 OUTFLOW= .3163E+03 BASIN STORAGE= .2999E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .92									
50-60	MANE	1.11	3145.99	222.24	1.29	2.00	3145.36	222.00	1.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3212E+03 EXCESS= .0000E+00 OUTFLOW= .3214E+03 BASIN STORAGE= .2415E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .93									
50-60	MANE	1.17	3192.84	221.48	1.31	2.00	3190.22	222.00	1.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3264E+03 EXCESS= .0000E+00 OUTFLOW= .3265E+03 BASIN STORAGE= .2689E-02 PERCENT ERROR= .0

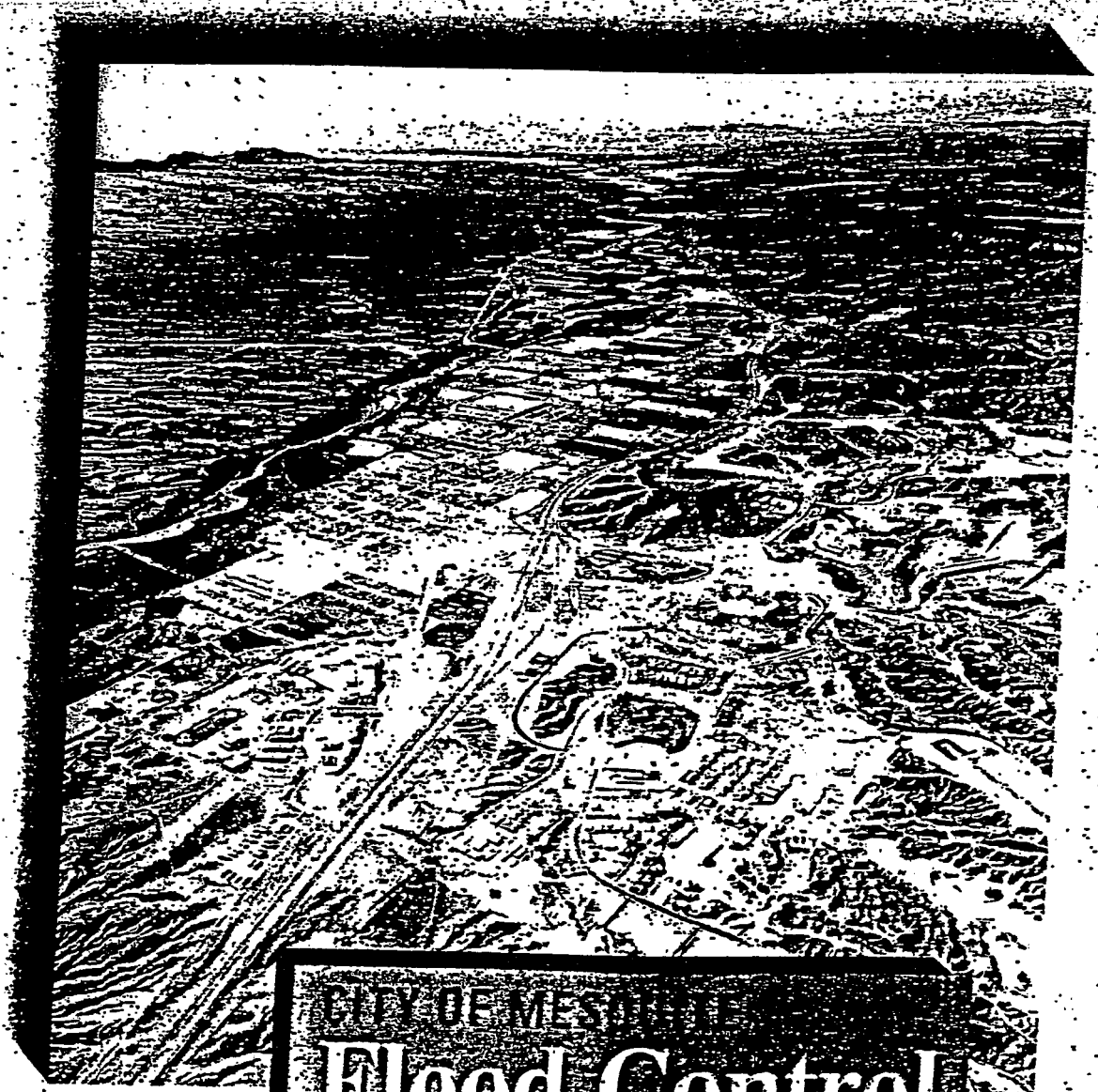
FOR PLAN = 1 RATIO= .97									
50-60	MANE	1.02	3393.56	221.57	1.39	2.00	3390.32	222.00	1.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3471E+03 EXCESS= .0000E+00 OUTFLOW= .3473E+03 BASIN STORAGE= .2604E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= 1.00									
50-60	MANE	1.04	3538.85	221.31	1.45	2.00	3538.48	222.00	1.45

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3627E+03 EXCESS= .0000E+00 OUTFLOW= .3629E+03 BASIN STORAGE= .2611E-02 PERCENT ERROR= -.1

*** NORMAL END OF HEC-1 ***



CITY OF MESQUITE

Flood Control Master Plan Update

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

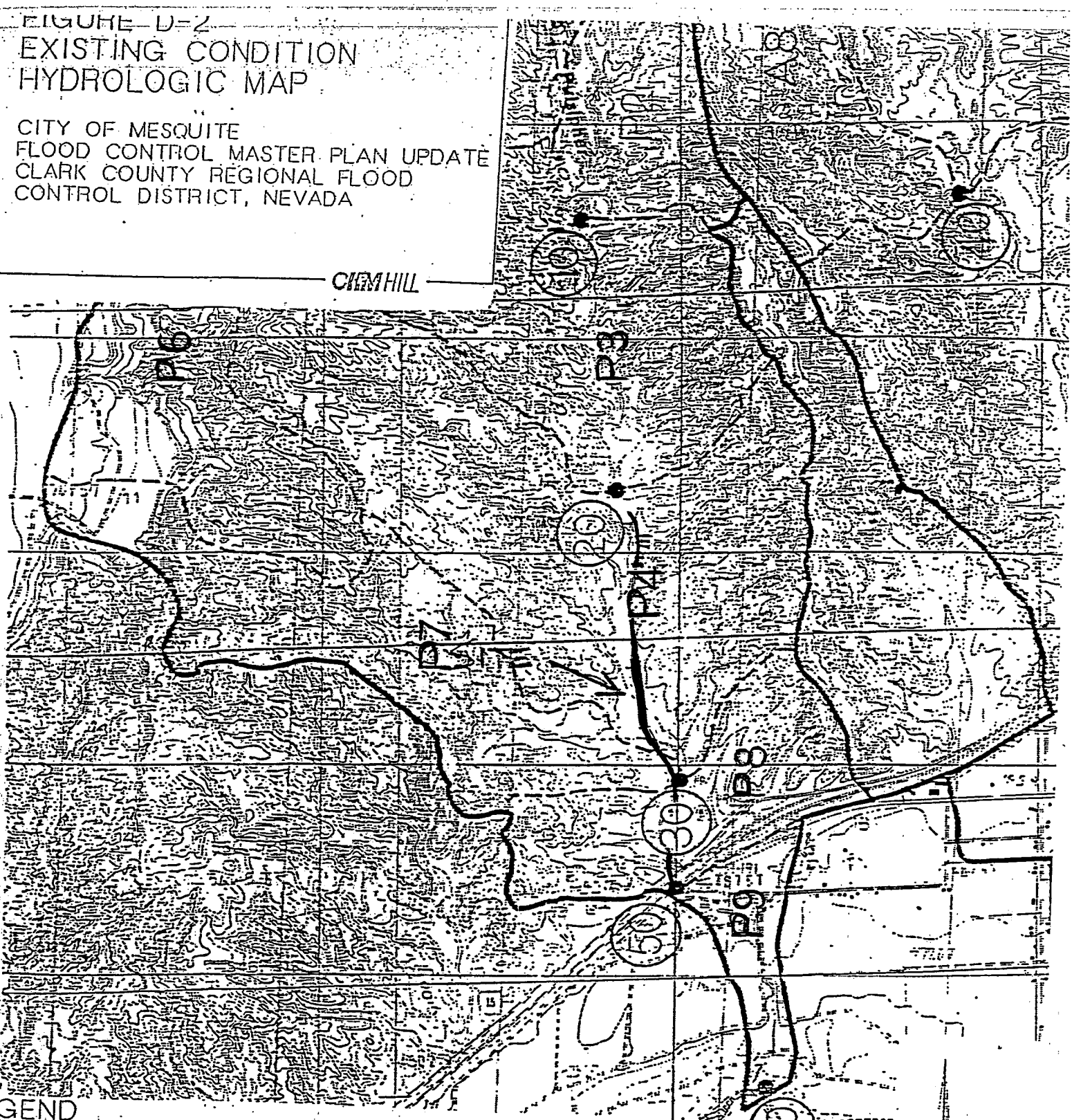
CH2MHILL

SEPTEMBER 1995

FIGURE D-2

EXISTING CONDITION HYDROLOGIC MAP

CITY OF MESQUITE
FLOOD CONTROL MASTER PLAN UPDATE
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT, NEVADA



50 SHEETS
100 SHEETS
200 SHEETS
22-141
22-142
22-144
CAMPAD

FLOW/ACRE CALCULATIONS TO DETERMINE FLOW DIRECTED TO PROPOSED 42" STORM DRAIN STUB. (SEE MAP ON FOLLOWING PAGE FOR SUB-BASIN BOUNDARY DELINIATION)

BASIN P7 (MPU 2001, FUTURE CONDITIONS)

AREA = 0.53 mi^2 = 339.20 ACRES

Q_{100} = 647 cfs

Q_{100}/ACRE = 647 cfs / 339.20 ACRES = 1.91 cfs/AC

SUB-BASIN "A" = 34.93 ACRES

Q_{100} = 34.93 ACRES * 1.91 cfs/ACRE = 66.72 cfs ← "A"

BASIN P8 (MPU 2001, FUTURE CONDITIONS)

AREA = 0.34 mi^2 = 217.60 ACRES

Q_{100} = 574 cfs

Q_{100}/ACRE = 574 cfs / 217.60 ACRES = 2.64 cfs/ACRE

SUB-BASIN "B" = 16.80 ACRES

Q_{100} = 16.8 ACRES * 2.64 cfs/ACRE = 44.35 cfs ← "B"

TOTAL POSSIBLE DESIGN FLOW DIRECTED TO PROPOSED 42" STORM DRAIN = 66.72 cfs + 44.35 cfs

≈ 111 cfs ←

SUB-BASIN "C" = 9.75 ACRES

Q_{100} = 9.75 ACRES * 2.64 cfs/ACRE = 25.74 cfs ← "C"

FOR PRELIMINARY DESIGN ASSUME ALL OF BASIN P6 & P7 FLOW TO PROPOSED (3) 60-INCH STORM DRAIN STUBS.

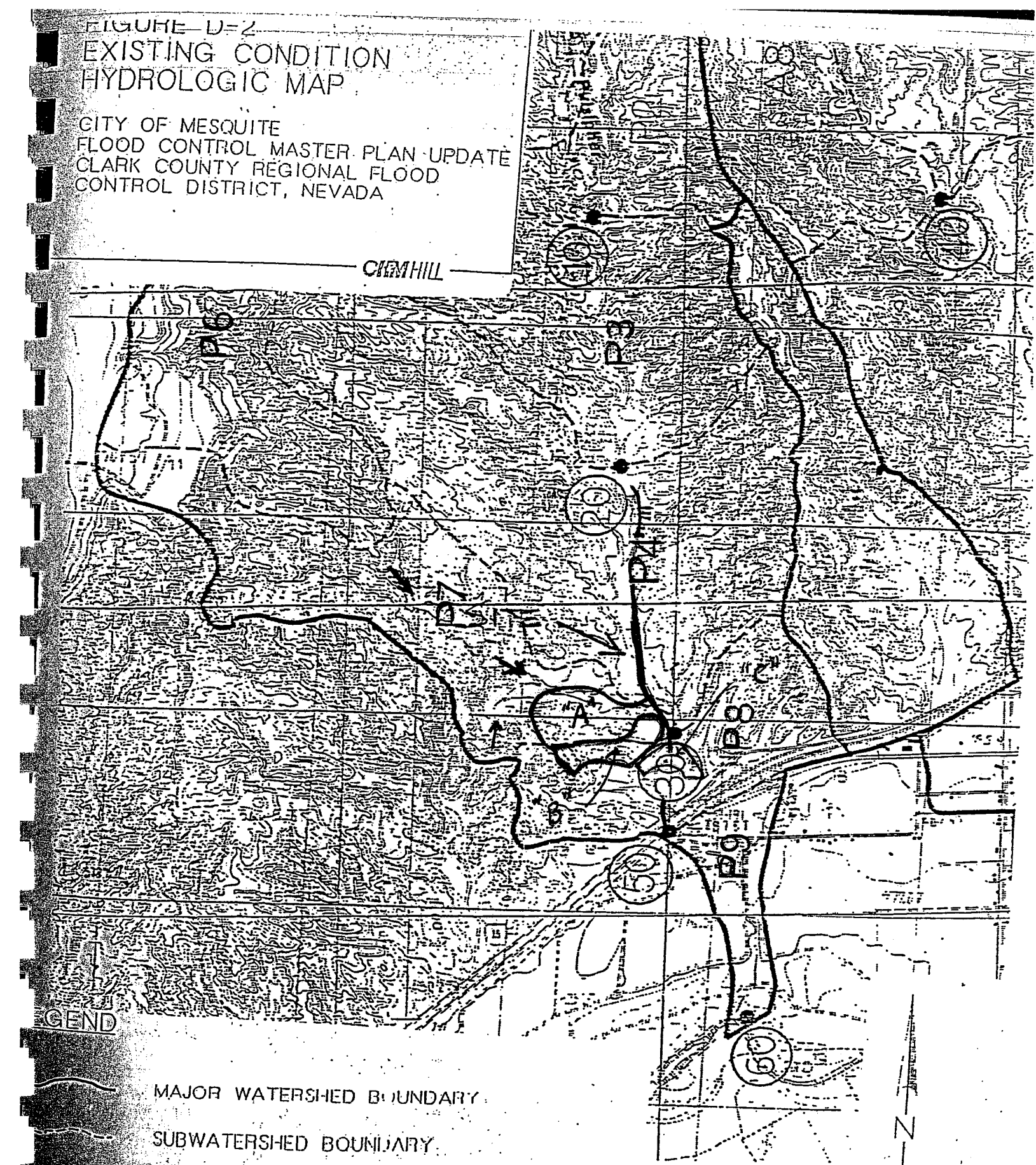
P6-30 (306 cfs) + P7 (647 cfs) = 953 cfs

FIGURE D-2

EXISTING CONDITION HYDROLOGIC MAP

CITY OF MESQUITE
FLOOD CONTROL MASTER PLAN UPDATE
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT, NEVADA

CH2MHILL



LEGEND

MAJOR WATERSHED BOUNDARY

SUBWATERSHED BOUNDARY

T1 SUBWATERSHED NUMBER

10 CONCENTRATION POINT AND NUMBER

1" = 2000'

REFERENCE: 1995 MPU BY CH2M-HILL
CONCENTRATION POINTS WERE ALSO USED IN 2001 MPU BY PENTACORE
SUBJECT SITE LOCATED BETWEEN CP20 & CP50

APPENDIX C

Hydraulic Computations

1. Effective HEC-2 Model, referenced and duplicated from "*Abbott and Pulsipher Washes FIS Restudy Supplement*" completed by G.C Wallace in November 2000 C1

2. Duplicate Effective HEC-RAS Model C22

3. Proposed Project HEC-RAS Model C61

4. Check RAS Output Files C115

5. Referenced Floodway HEC-RAS Model, referenced from *Amendment No. 1 to the Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. which is currently under FEMA review. C132

6. Datum Conversion and Benchmark Information C144

7. Figure 1 FEMA Flood Zone Map ..... Back

8. Figure 2 Annotated FEMA Flood Zone Map ..... Back

9. Figure 3 Post Projects HEC-RAS Cross-Section Exhibit ..... Back

10. Figure 4 Post Projects HEC-RAS Cross-Section Exhibit ..... Back

Effective Model HEC-2 Output File (NGVD 29)

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES           *
 *                                         *
 *  Version   4.6.2;  May 1991             *
 *                                         *
 *  RUN DATE    21SEP05    TIME   16:09:32  *
 *******************************************
```

```
**************************************
*  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
    21SEP05      16:09:32                                                    PAGE    1


                                                                THIS RUN EXECUTED 21SEP05    16:09:32

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

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


 SPLIT FLOW BEING PERFORMED

 SF

 JC
 JP      0       0      40       0       0

 TWSPLIT FLOW AT PULSIPHER/I-15 CULVERT
 WS      9    2000    2100               3
 WC      0    1603      16    1602    38.3    1600      66    1599    92.5    1599
 WC  106.3    1600   113.9    1602   119.9    1604   130.5    1606

 TWSTATION 1400 - SPLIT FLOW OVER RIGHT BANK
 WS      2    1400    1500             2.7
 WC      0    1584     120  1583.8

 TWSTATION 1300 - SPLIT FLOW OVER RIGHT BANK
 WS      2    1300    1400             2.7
 WC      0    1579     190    1584

 TWSTATION 1200 - SPLIT FLOW OVER LEFT BANK
 WS      2    1200    1300             2.7
 WC      0    1576     199    1582

 TWSTATION 1100 - SPLIT FLOW OVER LEFT OVERBANK
 WS      2    1100    1200             2.7
 WC      0    1576     112    1576

 TWSTATION 1000 - SPLIT FLOW OVER LEFT BANK
 WS      2    1000    1100             2.7
 WC      0    1576     102    1576

 TWSTATION 900 - SPLIT FLOW OVER LEFT BANK
 WS      2     900    1000             2.7
 WC      0  1574.5     117    1576

 TWSTATION 800 - SPLIT FLOW OVER LEFT BANK
 WS      2     800     900             2.7
 WC      0  1574.5     102  1574.5
1
    21SEP05      16:09:32                                                    PAGE    2


 TWSTATION 700 - SPLIT FLOW OVER LEFT BANK
 WS      2     700     800             2.7
 WC      0  1573.8     135  1574.5
1
    21SEP05      16:09:32                                                    PAGE    3


 T1      550-035
 T2      Mequite Wash FIS Restudy
 T3      Pulsipher Wash

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                 2                             -1                          3549   1556.95

 JS     **********ASSUMED DISCHARGES FOR SPLIT FLOW**********

                       0         0         0         0         0         0         0         0
              0        0         0         0         0         0         0         0         0
              0      500

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      -1                 -1                                      -1        -6                  15

 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     100                150

 NC     0.03      0.03     0.025       0.1       0.3
 X1      200        15    2929.4   3113.93
 X3       10
 GR     1564   2778.75      1564   2874.16      1562   2912.73      1560    2929.4      1558   2941.08
 GR     1556   2949.85      1554   2963.64      1554   2981.64      1554   3011.17      1554   3066.53
 GR     1556   3081.56      1558   3096.65      1560   3113.93      1560   3148.31      1560   3396.06
```

```
 X1      300         11    2926.48    3035.77     364.63     359.83     352.07
 X3       10
 GR     1566    2682.38       1564    2807.33       1562    2926.48       1560    2954.76       1558    2969.07
 GR     1558    3000.86       1560    3018.26       1562    3035.77       1562    3082.96       1562    3156.53
 GR     1564    3217.12

 NC     0.03        0.03      0.025        0.1         0.3
 X1      400          22    2281.55    2450.74      132.08      158.2     134.41
 X3       10                                                                1566
 GR     1570    2126.23       1572    2143.31       1572    2183.04       1570    2191.36       1562    2217.92
 GR     1560    2238.83       1560    2252.16       1564    2262.45       1566    2281.55       1566    2288.71
 GR     1564    2319.58       1562    2326.53       1560    2333.47       1560    2352.21       1562    2362.78
 GR     1562    2368.59       1562    2429.18       1564    2450.74       1566    2527.34       1566    2620.61
 GR     1566    2621.4        1568    2852.45

 NC     0.015       0.015     0.015        0.3         0.5
 X1       500          11    2332.84    2370.57       75.43       81.76      74.97
 X3        10                                                       1572        1572
 GR     1572    1921.7        1572    2203.22       1572    2332.84       1568.47    2332.84       1564.37    2332.84
 GR   1564.3    2370.57    1568.47    2370.57       1572    2370.57       1572    2514.64       1572    2582.6
 GR     1572    2867.98
1
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 NC     0.015       0.015     0.015        0.3         0.5
 SB      1.25         1.5       2.7         76       37.73       1.34     147.38          0    1565.46    1564.37
 X1       600          12    2596.22    2633.95      122.03     131.14     133.46
 X2                              1    1569.51     1572.66                                2
 X3        10                                                                1572.6      1572.6
 GR     1574    2232.97       1572.6       2260       1572.6    2596.22       1569.56    2596.22       1565.46    2596.22
 GR   1565.4    2633.95       1569.56    2633.95       1572.6    2633.95       1572.6    2866.27       1572.6    2963.4
 GR   1572.6    3102.68       1573.7     3146.68

 NC     0.04        0.04      0.03         0.3         0.5
 X1       700          18    2121.76    2330.75      133.44      79.47      112.64
 X3        10                          2121.76        1578    2330.75        1578       1573.8       1574.9
 GR     1574    1799.95       1572.2       1877       1572.2      1954       1572.2       2031       1573.8    2121.76
 GR     1572    2128.04         1570    2132.18       1569.5    2139.33         1570    2143.07         1572    2144.69
 GR     1574    2297.02       1574.9    2330.75       1574.5    2366.44         1574    2409.4        1572.7    2453.34
 GR   1572.7    2564.87       1572.7    2717.29         1574    2748.19

 NC     0.04        0.04      0.03         0.1         0.3
 X1       800          22    1769.22    1903.89      134.63      139.86     144.94
 X3        10                          1769.22        1578    1903.89        1578       1574.5         1576
 GR     1574    1427.88       1572.5       1510       1572.5      1592       1572.5       1674         1574    1759.85
 GR   1574.5    1769.22         1574    1778.29         1572    1784.62         1570    1788.23       1570.23    1790.02
 GR     1570    1791.12         1572    1797.25         1574    1818.13         1574    1841.16         1574    1867.83
 GR     1576    1903.89         1574    1968.96       1573.2    2017.28       1573.2    2207.8        1573.2    2344.84
 GR     1574    2392.94         1574    2407.17

 NC     0.04        0.04      0.03
 X1       900          21    1575.7    1686.84      102.08      108.33     103.62
 X3        10                1575.7       1578    1686.84        1578       1574.5         1577
 GR     1574    1219.54       1572.9    1309.5       1572.9      1399       1572.9       1489.5         1574    1572.39
 GR   1574.5    1575.7          1574    1579.92         1572    1592.09         1571    1597.2          1572    1604.66
 GR     1574    1606.43         1575    1651.77         1577    1686.84       1575.8    1705.75         1574    1749.48
 GR   1573.7    1798.67       1573.7    1915.16       1573.7    2060.43       1573.7    2160.73         1574    2209.7
 GR     1574    2230.82

 X1      1000          20    1472.42    1568.37      116.93      121.55     118.27
 X3        10                1472.42       1579    1568.37        1579       1576       1577.2
 GR     1574    1096.67       1573.3       1190       1573.3      1283       1573.3       1376         1576    1472.42
 GR     1576    1484.88         1574    1489.57         1572    1494.01       1571.15    1496.75         1572    1501.64
 GR     1574    1503.91         1576    1545.7        1577.2    1568.37       1576.5     1597.74         1576    1625.79
 GR   1575.5    1648.15       1574.3    1710.01       1574.3    1879.49       1574.3     2080.17       1575.3    2121.11

 X1      1100          17    1320.06    1417.67      102.45       103.7      103.7
 X3        10                1320.06       1579    1417.67        1579       1576       1577.4
 GR     1574     924.71       1573.5       1024       1573.5      1124       1573.5       1224         1576    1320.06
 GR     1576    1334.53         1574    1339.91       1571.4    1347.79         1574    1349.58         1576    1393.55
 GR   1577.4    1417.67       1576.5    1447.13         1576    1476.62       1574.7    1519.36       1574.7    1720.11
 GR   1574.7    1929.89       1575.7    1982.94
1
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 X1      1200          22    1178.38    1272.58      111.55      110.23     110.23
 X3        10                          1178.38        1582    1272.58        1581       1576       1577.5
 GR     1588        1000         1586    1003.72       1584    1007.45         1582    1011.19         1580    1030.36
 GR     1578     1045.48         1576    1078.58       1575    1158.89         1576    1178.38         1576    1179.17
 GR     1574      1190.7       1571.62    1204.49       1574    1209.35         1576    1247.96       1577.5    1272.58
 GR   1576.5    1301.79         1576    1333.43     1575.1    1378.11       1575.1    1575.34       1575.1    1770.67
 GR     1576    1817.16       1576.5    1831.23

 NC                           0.025
 X1      1300          27    1014.17    1207.18      198.91      153.42     176.37
 X3        10                                        1207.18        1583       1582         1579
 GR     1588        1000         1586    1004.58       1584    1009.31         1582    1014.17         1582    1065.78
 GR     1582     1072.99         1580    1076.58       1574    1080.99       1572.69    1083.53         1574    1092.54
 GR     1580     1106.55         1580    1121.82       1578    1125.36         1576    1170.24         1576    1178.38
 GR     1578     1183.85         1578     1201.6       1579    1207.18         1578    1236.12         1578    1241.05
 GR     1578     1260.24         1576    1268.87     1575.6    1313.34       1575.6    1502.88       1575.6    1676.59
 GR     1576     1718.52         1577    1735.14

 X1      1400          18       1061    1186.25      122.02      190.42     161.58
 X3        10                                        1186.25        1587       1584         1584
 GR     1600        1000         1600    1027.47       1598    1035.26         1596     1040.7         1590    1046.91
 GR     1588     1052.71         1586     1056.6       1584      1061          1582    1138.25         1580    1142.92
 GR     1578      1145.8         1578    1160.96       1580    1173.97         1582    1180.16         1584    1186.25
 GR     1584     1230.34         1584    1231.21       1584    1307.21

 X1      1500          22    1081.73    1230.57       76.07      119.69     108.07
 X3        10
 GR     1600        1000         1599    1069.96       1583    1081.73         1582    1182.35         1580    1186.84
 GR     1578     1197.97         1578    1201.11       1580    1212.43         1582    1216.13       1583.8    1230.57
 GR     1584      1294.4         1584    1308.23       1584    1356.62         1586    1628.22         1588    1674.02
 GR     1590     1697.27         1592    1726.23       1594    1741.62         1596    1753.42         1598    1763.24
 GR     1598     1801.09         1596    1808.99

 X1      1600          13    1094.37    1243.82      101.17      210.32     196.31
 GR     1602        1000         1600    1064.32     1594.01    1081.14         1584    1094.37         1582    1149.75
 GR   1580.4     1170.49       1580.78    1218.11       1582    1229.76         1584    1243.82         1585    1327.67
 GR     1586     1412.26         1588    1551.37       1590    1677.73

 X1      1650          23    1129.97    1180.64      190.68      185.82     175.57
 X3        10
 GR     1600        1000         1598    1005.05       1596    1011.4          1594    1026.96         1594    1094.89
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GR	1594	1110.32	1592	1122.14	1590	1124.66	1588	1129.97	1586	1134.76
GR	1584	1139.66	1582	1148.86	1582	1161.14	1584	1172.84	1584.7	1180.64
GR	1585	1254.59	1586	1347.77	1588	1480.9	1590	1600.61	1592	1684.68
GR	1594	1697.13	1596	1700.86	1598	1704.54				
NC	0.04	0.04	0.025							
X1	1700	20	1286.61	1350.67	163.66	154.63	161.13			
GR	1602	1000	1604	1037.4	1605.9	1128.6	1605.81	1151.3	1604	1198.85
GR	1602	1246.99	1600	1248.58	1590	1277.69	1588	1282.43	1586	1286.61
GR	1584	1301.89	1582.05	1314.08	1584	1326.15	1586	1341.79	1586.5	1350.67
GR	1586	1360.4	1585.5	1416.24	1586	1475.83	1588	1602.02	1590	1708.11

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NC	0.04	0.04	0.025							
X1	1750	21	1095.43	1152.29	171.49	179.87	169.33			
GR	1610	1000	1608	1023.79	1606	1053.35	1604	1063.55	1602	1070.34
GR	1600	1076.66	1590	1095.43	1588	1097.81	1586	1103.58	1582.1	1112
GR	1582.1	1122.43	1586	1133.65	1587.5	1152.29	1587.1	1211.93	1588	1287.4
GR	1590	1362.75	1592	1371.76	1594	1376.44	1596	1380.58	1598	1384.75
GR	1600	1388.94								
NC	0.04	0.04	0.025	0.1	0.3					
X1	1800	19	1139.62	1221.1	173.79	148.02	170.93			
GR	1608	1000	1606	1021.77	1604	1037.17	1602	1053.97	1600	1078.01
GR	1598	1135.85	1596	1139.62	1590	1145.75	1588	1148.51	1586	1151.34
GR	1582.1	1155.97	1582.1	1164.98	1586	1171.75	1588	1183.17	1590	1191.2
GR	1592	1221.1	1594	1234.56	1596	1243.62	1598	1254.32		
NC	0.015	0.015	0.015	0.3	0.5					
QT	1	3478								
X1	1900	14	1193.33	1205.33	66.92	60.81	58.98			
GR	1606	1000	1604	1017.04	1602	1034.84	1600	1056.24	1598	1118.67
GR	1596	1174.32	1592.19	1193.33	1582.19	1193.33	1582.19	1205.33	1592.19	1205.33
GR	1594	1221.37	1596	1224.34	1598	1232.13	1600	1243.77		
NC	0.015	0.015	0.015	0.3	0.5					
SB		1.5	2.7	114	12		120	0	1588.88	1582.19
X1	2000	9	1044.29	1056.29	320.07	303.13	319.85			
X2			1	1598.88	1603.83					
GR	1602	1000	1600	1026.41	1598.88	1044.29	1588.88	1044.29	1588.88	1056.29
GR	1598.8	1056.29	1600	1080.33	1602	1092.77	1604	1104.82		
NC	0.04	0.04	0.025	0.3	0.5					
X1	2100	17	1093.94	1188.63	58.83	54.83	49.81			
GR	1606	1000	1604	1009.57	1602	1013.54	1600	1020.41	1598	1037.57
GR	1596	1093.94	1594	1118.59	1592	1126.16	1590	1145.6	1590	1151.46
GR	1592	1174.19	1594	1184.61	1596	1188.63	1598	1204.5	1600	1224.72
GR	1602	1240.9	1604	1251.99						
NC	0.04	0.04	0.025	0.1	0.3					
X1	2200	18	142.43	318.37	383.01	273.85	328.57			
X3	10							1598	1598	
GR	1608	0	1608	20.66	1606	28.27	1604	40.91	1603	53.3
GR	1602	71.43	1600	112.67	1598	142.43	1596	210.95	1593	217.68
GR	1598	318.37	1596	562.06	1596	571.04	1596	618.66	1596	624.51
GR	1598	693.73	1600	708.07	1602	779.64				
NC				0.1	0.3					
X1	2300	25	150.15	250.92	320.42	310.65	311.55			
X3	0					453.09	1602			
GR	1608	0	1608	15.33	1606	21.57	1604	27.19	1602	63.6
GR	1600	150.15	1599	164.23	1598	187.99	1596	192.33	1594	198.34
GR	1594	228.2	1596	235.23	1598	238.65	1600	244.41	1600	250.92
GR	1600	277.03	1600	398.64	1602	414.11	1602	452.77	1600	463.12
GR	1600	475.52	1602	492.74	1604	507.6	1606	537.25	1608	543.16

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X1	2330	16	1156	1288	235	222	240			
X3	0									
GR	1608	1000	1606	1008	1604	1028	1602	1122	1601	1156
GR	1600	1203	1598	1205	1596	1209	1596	1238	1598	1243
GR	1600	1247	1601.6	1288	1602	1327	1604	1437	1606	1483
GR	1608	1508								
X1	2350	11	1025	1385	151	123	63			
X3	0									
GR	1608	1000	1606	1010	1604	1025	1603	1087	1603.5	1174
GR	1603.8	1227	1602	1271	1602	1339	1604	1385	1606	1445
GR	1608	1498								
X1	2400	21	555.74	605.96	178	109	71			
GR	1612	93.82	1610	232.8	1608.3	316.57	1608	336.99	1606	384.83
GR	1605.7	394.82	1604	447.58	1602	555.74	1600	564.71	1598	569.83
GR	1598	597.61	1600	601.64	1602	605.96	1604	666.82	1606	687.05
GR	1606	721.82	1605.3	750.29	1606	764.11	1608	799.73	1610	848.51
GR	1612	930.78								
X1	2500	15	173.41	243.04	186.68	182.96	179.72			
GR	1612	41.78	1610	45.58	1608	56.33	1607.4	69.14	1606	97.11
GR	1604	119.54	1604	161.89	1604	173.41	1602	209.67	1602	238.99
GR	1604	243.04	1606	249.45	1608	260.55	1610	291.23	1612	303.53
QT	1	3474								
X1	2600	28	774.94	927.94	320.81	390.78	373.36			
GR	1622	170.68	1620	198.85	1618	205.29	1616	210.56	1618	237.93
GR	1616	243.57	1616	474.86	1616	499.71	1614	504.57	1612	510.3
GR	1612	752.1	1612	762.71	1612	774.94	1610	779.75	1608	784.94
GR	1608	807.9	1608	855.3	1606	872.52	1606	907.23	1608	914.3
GR	1610	919.14	1612	927.94	1613.2	946.75	1614	960.44	1616	971.24
GR	1618	997.96	1620	1011.4	1622	1026.58				
X1	2700	29	605.11	832.94	249.65	237.3	246.94			
GR	1626	35.68	1624	43.5	1622	53.17	1620	65.17	1618	101.3
GR	1618	115.11	1618	141.58	1616	147.23	1616	265.04	1616	364.54
GR	1618	369.57	1618	394.68	1616	400.49	1614	408.58	1614	570.98
GR	1614	582.3	1614	605.11	1612	667.05	1610	699.84	1608	724.01
GR	1608	753.82	1610	771.97	1610.7	781.65	1612	801.7	1614	832.94
GR	1616	894.96	1618	898.43	1620	904.23	1630	923.69		
X1	2800	16	263.07	429.47	262.99	389.6	376.77			
X3	0			263.2	1616					
GR	1616	0	1616	39.55	1616	96.03	1616	111.37	1612	159.52
GR	1614	182.66	1614.7	197.49	1616	263.07	1610	302.64	1612	344.5
GR	1613.6	372.11	1614	379.65	1616	429.47	1620	489.99	1621.6	503.61

GR	1622	507.82								

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X1	2900	30	475.4	801.12	292.71	273.86	292.09			
X3	0			392.8	1620.51					
GR	1630	53.46	1628	61.93	1626	69.99	1624	77.51	1622	93.13
GR	1620	124.83	1618	331.67	1618	366.34	1620	373	1620.5	393.02
GR	1620	475.4	1618	525.34	1618	550.41	1618	631.71	1618	676.78
GR	1618	700.32	1616	722.78	1614	731.76	1612	736.6	1612	763
GR	1614	767.87	1616	772.71	1616.98	781.98	1618	790.94	1620	801.12
GR	1622	816.77	1624	832.8	1626	858.03	1628	874	1630	890.18
X1	3000	23	339.8	443.93	405.73	342.04	349.71			
GR	1630	70.06	1628	82.14	1626	94.71	1624	106.08	1623.2	152.05
GR	1622	224.19	1620	237.42	1620	274.5	1620	298.77	1620	312.51
GR	1620	339.8	1618	361.48	1616	368.38	1614	378.05	1614	399.19
GR	1616	402.54	1618	411.58	1620	443.93	1622	477.92	1624	497.81
GR	1626	542.69	1628	577.88	1628.8	598.92				
X1	3100	21	128.03	404.52	382.96	294.37	302.1			
GR	1640	88.37	1630	113.59	1628	118.26	1626	128.03	1624	297.39
GR	1622	300.14	1620	302.9	1618	305.76	1618	319.74	1618	333.19
GR	1620	337.19	1622	360.91	1624	384.72	1626	404.52	1628	466.46
GR	1630	524.54	1632	559.37	1634	582.77	1636	608.27	1638	629.41
GR	1640	646.16								
X1	3200	14	247.42	403.91	426.92	395.6	390.01			
GR	1639.7	227.47	1630	247.42	1628	253.14	1626	258.7	1624	267.64
GR	1622	275.55	1622	310.81	1624	315.91	1626	321.83	1628	327.9
GR	1630	403.91	1632	489.33	1634	564.85	1636	598.59		
X1	3300	35	36.55	575.86	462.6	416.49	482.8			
GR	1644	0	1642	12.73	1640	25.07	1638	31.27	1636	36.55
GR	1634	43.64	1632	47.01	1630	50.82	1628	55.39	1628	67.9
GR	1630	72.59	1632	76.9	1634	79.06	1636	137.59	1636	212.17
GR	1636	336.67	1634	350.97	1634	363.87	1634	407.22	1632	411.39
GR	1630	414.76	1628	421.9	1628	494.95	1630	503.75	1632	508.15
GR	1632	523.76	1630	526.02	1630	532.3	1632	537.02	1634	540.95
GR	1636	575.86	1638	594.13	1640	601.98	1642	617.87	1644	633.83
X1	3400	18	84.27	600.88	467.16	325.83	402.24			
GR	1650	59.27	1640	84.27	1638	109.44	1636	126.6	1634	131.99
GR	1634	140.44	1636	146.48	1638	193.98	1638	219.41	1638	270.82
GR	1638	278.83	1638	384.4	1640	600.88	1642	643.45	1644	683.24
GR	1646	705.45	1648	714.67	1650	724.58				
X1	3500	12	1139.19	1820.67	445.73	364.17	403.18			
GR	1650	1117.94	1648	1129.92	1646	1139.19	1644	1154.95	1642	1166.11
GR	1640	1198.2	1640	1311.56	1642	1663.86	1644	1780.13	1646	1820.67
GR	1648	1954.48	1650	1976.19						

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X1	3600	21	149.25	618.21	366.01	356.91	358.51			
GR	1660	75.43	1658	80.52	1656	91.22	1654	99.08	1652	110.5
GR	1650	129.6	1648	149.25	1646	271.37	1646	283.71	1646	312.95
GR	1646	327.9	1646	360.07	1646	420.55	1646	607.71	1648	618.21
GR	1650	627.24	1652	634.08	1654	648.02	1656	659.58	1658	673.87
GR	1660	681.36								
X1	3700	23	99.81	528.5	397.89	401.06	409.82			
GR	1660	58.71	1658	62.54	1656	71.6	1654	83.19	1652	99.81
GR	1650	116.08	1648	222.35	1648	252.85	1648	259.17	1648	278.23
GR	1648	293.98	1648	305.86	1648	334.35	1648	360.03	1648	368.2
GR	1648	450.38	1650	484.45	1650.36	490.39	1652	528.5	1654	546.14
GR	1656	553.69	1658	561.37	1660	571.08				
X1	3800	16	42.37	437.01	480	713	666			
GR	1670	24.23	1660	42.37	1658	44.95	1656	48.64	1654	62.46
GR	1654	248.3	1656	288.05	1656	307.66	1656	426.77	1658	437.01
GR	1660	446.89	1662	454.29	1664	464.34	1666	469.29	1668	473.37
GR	1670	483.32								
QT	1	2318								
X1	3900	21	76.48	332.44	468.3	238.03	320.4			
GR	1670	68.89	1660	76.48	1658	109.93	1658	128.97	1658	143.72
GR	1658	147.93	1656	228.75	1656	261.41	1658	286.12	1658.3	289.26
GR	1660	303.73	1662	332.44	1662	354.48	1660	365.24	1658.8	388.81
GR	1660	416.11	1662	428.9	1664	448.42	1666	460.82	1668	489.05
GR	1670	546.72								
X1	4000	11	62.12	249.41	444.57	477.86	465.67			
GR	1670	57.92	1668	60.45	1666	62.12	1664	69.1	1662	80.78
GR	1660	85.35	1660	112.66	1662	121.12	1664	164.38	1666	239.26
GR	1666.3	249.41								
X1	4100	18	201.4	408.03	535	356	497			
GR	1680	148.32	1678	157.13	1676	173.19	1674	188.76	1672	201.4
GR	1670	217.1	1670	223.19	1670	244.9	1668	248.78	1666	254.13
GR	1666	279.97	1668	296.89	1670	368.21	1672	395.34	1674	408.03
GR	1676	416.54	1678	422.71	1680	431.82				
X1	4200	21	72.87	318.01	285	297	402			
GR	1690	0	1688	8.75	1686	20.32	1684	34.98	1682	44.12
GR	1680	52.74	1678	72.87	1676	109.44	1674	148.79	1673.3	163.05
GR	1674	174.44	1674	221.93	1672	228.81	1670	242.3	1670	245.6
GR	1672	268.66	1674	290.23	1676	304.27	1678	311.41	1680	318.01
GR	1690	331.29								
X1	4300	19	168.17	349.29	317.35	407.28	383.62			
GR	1700	89.17	1690	105.7	1680	168.17	1678	195.5	1677.6	203.3
GR	1676	233.39	1676	271.26	1678	296.29	1680	349.29	1682	374.61
GR	1684	413.28	1686	454.41	1688	473.84	1690	495.02	1692	512.03
GR	1694	521.72	1696	534.23	1698	545.99	1700	552.12		

1

X1	4400	20	1152.32	1302.67	432	439	476			
GR	1698	1047.48	1696	1072.5	1694	1113.06	1692	1129.03	1690	1144.19
GR	1688	1152.32	1686	1159.38	1684	1171.95	1682	1198.73	1680	1240.97
GR	1680	1261.36	1682	1265.11	1684	1271.18	1686	1281.25	1688	1302.67
GR	1690	1310.07	1692	1316.26	1694	1322.58	1696	1328.05	1698	1379.32

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 X1     4500       22      91.69      375.6     416.91     575.19     533.38
 GR     1720    75.46       1710      91.69       1700     117.4     1699.3     120.73       1698     126.14
 GR     1696   135.73       1694     144.81       1692     170.97       1690     176.15       1688     181.18
 GR     1686   188.65       1686     207.59       1688     225.29       1690     276.16     1690.6     289.36
 GR     1692   317.67       1694     325.19       1696     332.17       1698     337.97       1700     352.73
 GR     1710    375.6       1712     416.63

 X1     4600       21      134.65     333.42        488        278        442
 GR     1710    16.97       1708      22.09       1706      26.16       1704      32.81       1702      52.97
 GR     1700    69.79       1700      71.45     1701.4     100.97       1700     134.65       1698     178.33
 GR     1696   199.43       1694     245.08       1692     251.89       1692     277.07       1692     285.45
 GR     1692   294.37       1694     299.32       1696     317.63       1698     322.08       1700     333.42
 GR     1710   339.21

 X1     4700       29      373.98      442.2     272.78     275.83     260.86
 X3        0                                               442.2       1700
 GR     1716        0       1714       8.97       1712      18.28       1710      50.93       1708      76.41
 GR     1708    85.71       1710      111.4       1710     149.36       1710     171.04     1710.6     220.24
 GR     1710   255.18       1710     257.77       1710     275.64       1708     298.45       1706     313.76
 GR     1704   334.45       1702     364.57       1700     373.98       1698     382.11       1696     387.57
 GR     1696   418.98       1698     430.84       1700      442.2       1700     475.32       1698     485.47
 GR     1698   491.37       1700     503.73       1710     533.35     1712.7     554.54

 X1     4800       22      199.39     286.05     187.19     241.84     227.74
 GR     1720        0       1720      34.45     1719.1      47.68       1718      67.95       1716      81.26
 GR     1714    99.11       1714     138.55     1714.5     152.91       1714     167.56       1712     188.86
 GR     1710   199.39       1708     204.07       1706     211.95       1704     220.53       1702     222.94
 GR     1700   229.54       1698      234.6       1698     259.35       1700     266.03       1710     286.05
 GR     1720   306.75       1720     307.66

 NC     0.04     0.04      0.025        0.1        0.3
 X1     4900       14      118.6      259.71     374.55     218.45     351.24
 GR     1720   101.08       1710      118.6       1708     126.87       1706     136.18       1704     139.34
 GR     1702   144.61       1702     157.05       1702     171.77       1702     187.75       1704     198.82
 GR     1706   207.55       1708     232.01       1710     259.71       1720     290.56


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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


 *PROF 1

 CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

 CCHV=     .100 CEHV=     .300
 *SECNO 200.000
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1560.00 ELREA=      1560.00

    200.000      1.07   1555.07   1555.07   1556.95   1555.57       .50       .00       .00   1560.00
      668.7        .0     668.7        .0        .0     117.8        .0        .0        .0   1560.00
        .00        .00      5.68       .00       .000      .025      .000      .000   1554.00   2956.30
    .009193         0.        0.        0.         0        17         0       .00    118.24   3074.53


 FLOW DISTRIBUTION FOR SECNO=    200.00          CWSEL=   1555.07

 STA=    2956.    3114.
   PER Q=    100.0
    AREA=    117.8
     VEL=      5.7
   DEPTH=      1.0

 *SECNO 300.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1562.00 ELREA=      1562.00

    300.000      2.01   1560.01   1560.01       .00   1560.76       .76      3.02       .08   1562.00
      668.7        .0     668.7        .0        .0      95.9        .0        .9        .7   1562.00
        .01        .00      6.98       .00       .000      .025      .000      .000   1558.00   2954.63
    .008030       365.      352.      360.         0        14         0       .00     63.71   3018.34


 FLOW DISTRIBUTION FOR SECNO=    300.00          CWSEL=   1560.01

 STA=    2955.    3036.
   PER Q=    100.0
    AREA=     95.9
     VEL=      7.0
   DEPTH=      1.5

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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


 CCHV=     .100 CEHV=     .300
 *SECNO 400.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1566.00 ELREA=      1564.00

    400.000      2.56   1562.56   1562.56       .00   1563.09       .53      1.15       .02   1566.00
      668.7        .0     668.7        .0        .0     115.0        .0       1.2       1.0   1564.00
        .02        .00      5.82       .00       .000      .025      .000      .000   1560.00   2324.58
    .009164       132.      134.      158.         0        11         0       .00    110.67   2435.24


 FLOW DISTRIBUTION FOR SECNO=    400.00          CWSEL=   1562.56

 STA=    2325.    2451.
   PER Q=    100.0
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     AREA=    115.0
      VEL=      5.8
    DEPTH=      1.0

  CCHV=     .300 CEHV=     .500
  *SECNO 500.000

  3301 HV CHANGED MORE THAN HVINS

  7165 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED

  3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1572.00 ELREA=      1572.00

     500.000      2.17   1566.47   1566.47       .00   1567.54      1.07       .36       .27   1572.00
       668.7        .0     668.7        .0        .0      80.6        .0       1.4       1.1   1572.00
         .02        .00      8.30       .00      .000      .015      .000      .000   1564.30   2332.84
      .002945      75.       75.       82.         0        11         0       .00     37.73   2370.57


  FLOW DISTRIBUTION FOR SECNO=    500.00          CWSEL=   1566.47

  STA=    2333.    2371.
    PER Q=    100.0
     AREA=     80.6
      VEL=      8.3
    DEPTH=      2.1

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       SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         EL         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


  CCHV=     .300 CEHV=     .500

  SPECIAL BRIDGE

  5227 DOWNSTREAM ELEV IS    1566.21 , NOT    1566.47 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

  SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
       1.25       1.50       2.70      76.00      37.73       1.34     147.38        .00    1565.46    1564.37

  *SECNO 600.000

  3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.43

  CLASS B LOW FLOW

  3420 BRIDGE W.S.=    1567.10 BRIDGE VELOCITY=       8.39     CALCULATED CHANNEL AREA=        60.

   EGPRS       EGLWC       H3         QWEIR      QLOW       BAREA    TRAPEZOID AREA      ELLC       ELTRD      WEIRLN
         .00   1568.79        .00         0.       669.       147.       147.       1569.51    1572.66          0.


  3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1572.60 ELREA=      1572.60

     600.000      2.70   1568.10       .00        .00   1568.79       .68       1.25       .00   1572.60
       668.7        .0     668.7        .0        .0     100.9        .0       1.6       1.2   1572.60
         .03        .00      6.63       .00      .000      .015      .000      .000   1565.40   2596.22
      .001439     122.      133.      131.         0         0         0       .00     37.73   2633.95


  FLOW DISTRIBUTION FOR SECNO=    600.00          CWSEL=   1568.10

  STA=    2596.    2634.
    PER Q=    100.0
     AREA=    100.9
      VEL=      6.6
    DEPTH=      2.7

  CCHV=     .300 CEHV=     .500
  *SECNO 700.000
  7165 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
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=     2121.8     2330.8  TYPE=       1  TARGET=      208.990
   ELENCL=    1578.00  ELENCR=    1578.00

  3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1573.80 ELREA=      1574.90

     700.000      3.76   1573.26   1573.26       .00   1573.79       .53       .37       .05   1573.80
       668.7        .0     668.7        .0        .0     114.8        .0       1.9       1.4   1578.00
         .03        .00      5.83       .00      .000      .030      .000      .000   1569.50   2123.63
      .014490     133.      113.       79.         0        11         0       .00    117.24   2240.87


  FLOW DISTRIBUTION FOR SECNO=    700.00          CWSEL=   1573.26

  STA=    2124.    2331.
    PER Q=    100.0
     AREA=    114.8
      VEL=      5.8
    DEPTH=      1.0

  CCHV=     .100 CEHV=     .300
  *SECNO 800.000
  3280 CROSS SECTION    800.00 EXTENDED        .78 FEET


  3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.56


  3470 ENCROACHMENT STATIONS=     1769.2     1903.9  TYPE=       1  TARGET=      134.670
```

ELENCL= 1578.00 ELENCR= 1578.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1574.50 ELREA= 1576.00

800.000	4.78	1574.78	1574.40	.00	1575.10	.33	1.29	.02	1574.50
676.1	.0	676.1	.0	.0	147.4	.0	2.3	1.8	1578.00
.04	.00	4.59	.00	.000	.030	.000	.000	1570.00	1769.22
.006077	135.	145.	140.	3	16	0	.00	112.62	1881.84

FLOW DISTRIBUTION FOR SECNO= 800.00 CWSEL= 1574.78

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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

STA= 1769. 1904.
PER Q= 100.0
AREA= 147.4
VEL= 4.6
DEPTH= 1.3

*SECNO 900.000
3280 CROSS SECTION 900.00 EXTENDED 1.36 FEET

3470 ENCROACHMENT STATIONS= 1575.7 1686.8 TYPE= 1 TARGET= 111.140
ELENCL= 1578.00 ELENCR= 1578.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1574.50 ELREA= 1577.00

900.000	4.36	1575.36	1575.28	.00	1575.98	.62	.79	.09	1574.50
798.1	.0	798.1	.0	.0	126.5	.0	2.7	2.1	1578.00
.05	.00	6.31	.00	.000	.030	.000	.000	1571.00	1575.70
.009353	102.	104.	108.	2	10	0	.00	82.44	1658.14

FLOW DISTRIBUTION FOR SECNO= 900.00 CWSEL= 1575.36

STA= 1576. 1687.
PER Q= 100.0
AREA= 126.5
VEL= 6.3
DEPTH= 1.5

*SECNO 1000.000
3280 CROSS SECTION 1000.00 EXTENDED 1.14 FEET

3470 ENCROACHMENT STATIONS= 1472.4 1568.4 TYPE= 1 TARGET= 95.950
ELENCL= 1579.00 ELENCR= 1579.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1576.00 ELREA= 1577.20

1000.000	5.29	1576.44	1576.36	.00	1577.24	.80	1.21	.05	1576.00
966.6	.0	966.6	.0	.0	134.8	.0	3.0	2.3	1579.00
.05	.00	7.17	.00	.000	.030	.000	.000	1571.15	1472.42
.011061	117.	118.	122.	2	11	0	.00	81.68	1554.10

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

FLOW DISTRIBUTION FOR SECNO= 1000.00 CWSEL= 1576.44

STA= 1472. 1568.
PER Q= 100.0
AREA= 134.8
VEL= 7.2
DEPTH= 1.7

*SECNO 1100.000
3280 CROSS SECTION 1100.00 EXTENDED 1.77 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

3470 ENCROACHMENT STATIONS= 1320.1 1417.7 TYPE= 1 TARGET= 97.610
ELENCL= 1579.00 ELENCR= 1579.00

1100.000	6.07	1577.47	1576.93	.00	1578.01	.55	.75	.03	1576.00
1232.5	.0	1232.5	.0	.0	207.5	.0	3.4	2.5	1579.00
.06	.00	5.94	.00	.000	.030	.000	.000	1571.40	1320.06
.005421	102.	104.	104.	3	8	0	.00	97.61	1417.67

FLOW DISTRIBUTION FOR SECNO= 1100.00 CWSEL= 1577.47

STA= 1320. 1418.
PER Q= 100.0
AREA= 207.5
VEL= 5.9
DEPTH= 2.1

*SECNO 1200.000
3280 CROSS SECTION 1200.00 EXTENDED 1.39 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.59

3470 ENCROACHMENT STATIONS= 1178.4 1272.6 TYPE= 1 TARGET= 94.200
ELENCL= 1582.00 ELENCR= 1581.00

1200.000	6.27	1577.89	1577.33	.00	1578.65	.77	.57	.07	1576.00
1889.4	.0	1889.4	.0	.0	268.9	.0	4.0	2.7	1581.00
.06	.00	7.03	.00	.000	.030	.000	.000	1571.62	1178.38
.005067	112.	110.	110.	2	12	0	.00	94.20	1272.58

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

FLOW DISTRIBUTION FOR SECNO= 1200.00 CWSEL= 1577.89

STA= 1178. 1273.
PER Q= 100.0
AREA= 268.9
VEL= 7.0
DEPTH= 2.9

*SECNO 1300.000

3265 DIVIDED FLOW

3280 CROSS SECTION 1300.00 EXTENDED 1.93 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1207.2 TYPE= 1 TARGET= 1207.179

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1582.00 ELREA= 1579.00

1300.000	6.24	1578.93	1578.93	.00	1580.10	1.17	1.11	.12	1582.00
2100.8	.0	2100.8	.0	.0	242.0	.0	5.1	3.2	1583.00
.07	.00	8.68	.00	.000	.025	.000	.000	1572.69	1077.37
.007850	199.	176.	153.	0	5	0	.00	109.71	1206.76

FLOW DISTRIBUTION FOR SECNO= 1300.00 CWSEL= 1578.93

STA= 1077. 1207.
PER Q= 100.0
AREA= 242.0
VEL= 8.7
DEPTH= 2.2

*SECNO 1400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1186.3 TYPE= 1 TARGET= 1186.249

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= 1584.00 ELREA= 1584.00

1400.000	5.68	1583.68	1583.68	.00	1584.79	1.11	1.21	.01	1584.00
2100.8	.0	2100.8	.0	.0	248.0	.0	6.0	3.6	1587.00
.07	.00	8.47	.00	.000	.025	.000	.000	1578.00	1073.49
.007168	122.	162.	190.	0	12	0	.00	111.77	1185.26

FLOW DISTRIBUTION FOR SECNO= 1400.00 CWSEL= 1583.68

STA= 1073. 1186.
PER Q= 100.0
AREA= 248.0
VEL= 8.5
DEPTH= 2.2

*SECNO 1500.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.45

1500.000	6.86	1584.86	1583.66	.00	1585.15	.29	.28	.08	1583.00
2209.1	1.2	2023.5	184.4	1.3	450.5	165.0	7.1	4.2	1583.80
.08	.91	4.49	1.12	.040	.025	.040	.000	1578.00	1080.36
.001321	76.	108.	120.	4	5	0	.00	393.03	1473.39

FLOW DISTRIBUTION FOR SECNO= 1500.00 CWSEL= 1584.86

STA= 1080. 1082. 1231. 1294. 1308. 1357. 1473.
PER Q= .1 91.6 3.6 .7 2.3 1.7
AREA= 1.3 450.5 61.3 11.9 41.6 50.2
VEL= .9 4.5 1.3 1.2 1.2 .8
DEPTH= .9 3.0 1.0 .9 .9 .4

*SECNO 1600.000

1600.000	4.70	1585.10	1583.69	.00	1585.40	.30	.25	.00	1584.00
2209.1	.6	2163.5	45.0	.8	483.7	50.1	9.7	5.7	1584.00
.09	.74	4.47	.90	.040	.025	.040	.000	1580.40	1092.92
.001186	101.	196.	210.	3	11	0	.00	242.66	1335.58

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

FLOW DISTRIBUTION FOR SECNO= 1600.00 CWSEL= 1585.10

STA= 1093. 1094. 1244. 1328. 1336.
PER Q= .0 97.9 2.0 .0

```
     AREA=       .8    483.7     49.8       .4
      VEL=       .7      4.5       .9       .2
    DEPTH=       .5      3.2       .6       .0

 *SECNO 1650.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      1588.00 ELREA=      1584.70

   1650.000      4.66   1586.66   1586.66       .00   1587.48       .81       .36       .15   1588.00
     2209.1        .0    1406.3     802.8        .0     160.5     257.0      11.7       6.8   1584.70
        .10       .00      8.76      3.12      .000      .025      .040      .000   1582.00   1133.17
    .004394       191.      176.      186.         0         5         0       .00    258.69   1391.87


 FLOW DISTRIBUTION FOR SECNO=   1650.00          CWSEL=   1586.66

 STA=    1133.    1181.    1255.    1348.    1392.
   PER Q=      63.7     22.2     13.3       .8
    AREA=     160.5    134.0    108.3     14.6
     VEL=       8.8      3.7      2.7      1.2
   DEPTH=       3.4      1.8      1.2       .3

 *SECNO 1700.000
   1700.000      5.51   1587.56   1587.24       .00   1588.08       .53       .58       .03   1586.00
     2209.1       4.1    1404.7     800.3       2.5     200.5     297.5      13.3       7.7   1586.50
        .11      1.63      7.01      2.69      .040      .025      .040      .000   1582.05   1283.36
    .003070       164.      161.      155.         3         8         0       .00    290.63   1573.98


 FLOW DISTRIBUTION FOR SECNO=   1700.00          CWSEL=   1587.56

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    21SEP05      16:09:32                                                                          PAGE   20

     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


 STA=    1283.    1287.    1351.    1360.    1416.    1476.    1574.
   PER Q=       .2     63.6      1.4     13.9     14.9      6.0
    AREA=      2.5    200.5     12.7    100.8    107.6     76.3
     VEL=      1.6      7.0      2.5      3.1      3.1      1.7
   DEPTH=       .8      3.1      1.3      1.8      1.8       .8

 *SECNO 1750.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   1750.000      6.59   1588.69   1588.69       .00   1589.60       .91       .58       .12   1590.00
     2209.1        .0    1751.8     457.3        .0     206.1     178.0      15.1       8.8   1587.50
        .11       .00      8.50      2.57      .000      .025      .040      .000   1582.10   1096.99
    .003725       171.      169.      180.         0         8         0       .00    216.43   1313.42


 FLOW DISTRIBUTION FOR SECNO=   1750.00          CWSEL=   1588.69

 STA=    1097.    1152.    1212.    1287.    1313.
   PER Q=      79.3     10.6      9.6       .5
    AREA=     206.1     82.9     86.1      9.0
     VEL=       8.5      2.8      2.5      1.1
   DEPTH=       3.7      1.4      1.1       .3

 CCHV=      .100 CEHV=      .300
 *SECNO 1800.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   1800.000      7.80   1589.90   1589.90       .00   1592.04      2.14       .81       .37   1596.00
     2209.1        .0    2209.1        .0        .0     188.1        .0      16.2       9.2   1592.00
        .12       .00     11.74       .00      .000      .025      .000      .000   1582.10   1145.89
    .006502       174.      171.      148.         0        11         0       .00     44.92   1190.80


 FLOW DISTRIBUTION FOR SECNO=   1800.00          CWSEL=   1589.90

 STA=    1146.    1221.
   PER Q=     100.0
    AREA=     188.1
     VEL=      11.7
   DEPTH=       4.2

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    21SEP05      16:09:32                                                                          PAGE   21

     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


 CCHV=      .300 CEHV=      .500
 *SECNO 1900.000

 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   1900.000      9.90   1592.09   1592.09       .00   1597.12      5.03       .36      1.45   1592.19
     2138.1        .0    2138.1        .0        .0     118.8        .0      16.4       9.3   1592.19
        .12       .00     18.00       .00      .000      .015      .000      .000   1582.19   1193.33
    .005698        67.       59.       61.         0        14         0       .00     12.00   1205.33


 FLOW DISTRIBUTION FOR SECNO=   1900.00          CWSEL=   1592.09

 STA=    1193.    1205.
   PER Q=     100.0
    AREA=     118.8
     VEL=      18.0
   DEPTH=       9.9
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 CCHV=     .300 CEHV=     .500

 SPECIAL BRIDGE

 SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .00     1.50      2.70     114.00     12.00      .00     120.00      .00   1588.88   1582.19

 *SECNO 2000.000

 6070,LOW FLOW BY NORMAL BRIDGE

 EGPRS=   1599.481  EGLWC=   1603.810  ELLC=   1598.880  PCWSE=   1592.086  ELTRD=   1603.830

 4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF  1598.880 EGLC=  1603.810 EGC=  1606.367 WSEL=  1605.140

 4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF  1598.880 EGLC=  1603.810 EGC=  1603.810 WSEL=  1598.745

 3370 NORMAL BRIDGE, NRD=   0 MIN ELTRD=  1603.83 MAX ELLC=  1598.88

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   2000.000     10.00   1598.88   1598.88       .00   1603.81      4.93      2.20       .03   1598.88
      2138.1        .0    2138.1        .0        .0     120.0        .1      17.3       9.4   1598.80
         .12       .00     17.82       .09      .000      .015      .015      .000   1588.88   1044.29
     .008468      320.      320.      303.         0        18         0       .00     13.60   1057.89

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    21SEP05      16:09:32                                                                          PAGE   22

     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

 FLOW DISTRIBUTION FOR SECNO=   2000.00          CWSEL=   1598.88

 STA=    1044.    1056.    1058.
   PER Q=   100.0       .0
    AREA=   120.0       .1
     VEL=    17.8       .1
   DEPTH=    10.0       .0

 CCHV=     .300 CEHV=     .500
 *SECNO 2100.000
 3280 CROSS SECTION   2100.00 EXTENDED      1.22 FEET

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO = 22.18

   2100.000     15.22   1605.22   1595.96       .00   1605.28       .06       .01      1.46   1596.00
     3478.0     585.3     2599.9     292.8     611.3    1201.5     349.0      18.6       9.5   1596.00
        .13       .96      2.16       .84       .040      .025      .040      .000   1590.00   1003.74
    .000046       59.       50.       55.          3        14         0       .00    248.25   1251.99

 FLOW DISTRIBUTION FOR SECNO=   2100.00          CWSEL=   1605.22

 STA=    1004.    1010.    1014.    1020.    1038.    1094.    1189.    1205.    1225.    1241.    1252.
   PER Q=       .0       .1       .5      2.6     13.6     74.8      3.8      3.1      1.3       .3
    AREA=      3.5      8.8     29.0    106.7    463.2   1201.5    130.4    125.7     68.2     24.6
     VEL=       .2       .4       .6       .8      1.0      2.2      1.0       .8       .7       .4
   DEPTH=       .6      2.2      4.2      6.2      8.2     12.7      8.2      6.2      4.2      2.2

 CCHV=     .100 CEHV=     .300
 *SECNO 2200.000
 3280 CROSS SECTION   2200.00 EXTENDED      3.28 FEET

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.94

   2200.000     12.28   1605.28   1598.04       .00   1605.29       .01       .01       .00   1598.00
     3478.0     159.8     1475.2     1843.0     441.1    1624.8    3567.2      46.2      13.1   1598.00
        .26       .36       .91       .52       .040      .025      .040      .000   1593.00     32.82
    .000012       383.      329.      274.         2        28         0       .00    746.82    779.64

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    21SEP05      16:09:32                                                                          PAGE   23

     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

 FLOW DISTRIBUTION FOR SECNO=   2200.00          CWSEL=   1605.28

 STA=      33.      142.      318.      562.      619.      694.      780.
   PER Q=      4.6      42.4      30.7       8.6       9.6       4.0
    AREA=    441.1    1624.8    2017.9     525.3     627.5     396.4
     VEL=       .4        .9        .5        .6        .5        .4
   DEPTH=      4.0       9.2       8.3       9.3       8.4       4.6

 CCHV=     .100 CEHV=     .300
 *SECNO 2300.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .36

 3470 ENCROACHMENT STATIONS=         .0     453.1  TYPE=       1  TARGET=      453.089
   2300.000     11.26   1605.26   1600.56       .00   1605.31       .05       .01       .01   1600.00
     3478.0     395.1     1962.7     1120.2     453.0      846.0     1144.2      75.2      17.6   1600.00
        .31       .87      2.32       .98       .040      .025      .040      .000   1594.00     23.65
    .000092       320.      312.      311.         2        11         0       .00    502.60    526.26

 FLOW DISTRIBUTION FOR SECNO=   2300.00          CWSEL=   1605.26

 STA=       24.      150.      251.      277.      399.      453.      508.      526.
   PER Q=     11.4      56.4       4.2      19.8       4.6       3.5       .1
    AREA=    453.0     846.0     137.3     639.5     191.9     163.8      11.7
     VEL=       .9       2.3       1.1       1.1        .8        .7        .3
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 DEPTH=      3.6      8.4      5.3      5.3      3.5      3.0       .6

*SECNO 2330.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .56

  2330.000      9.24   1605.24   1602.20       .00   1605.37       .13       .04       .02   1601.00
    3478.0     426.1    2582.7     469.2     345.1     784.1     397.9      85.7      20.1   1601.60
      .34      1.23      3.29      1.18      .040      .025      .040      .000   1596.00   1015.62
  .000292      235.      240.      222.         3        11         0       .00    449.86   1465.48


 FLOW DISTRIBUTION FOR SECNO=   2330.00          CWSEL=   1605.24

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   21SEP05      16:09:32                                                                          PAGE   24

    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

 STA=    1016.    1028.    1122.    1156.    1288.    1327.    1437.    1465.
   PER Q=      .1       6.6      5.6     74.3      5.6      7.7      .2
    AREA=     7.7     210.4    127.1    784.1    134.1    246.2     17.6
     VEL=      .5       1.1      1.5      3.3      1.4      1.1      .5
   DEPTH=      .6       2.2      3.7      5.9      3.4      2.2      .6

 *SECNO 2350.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .37

   2350.000      3.15   1605.15   1604.46       .00   1605.47       .32       .05       .06   1604.00
     3478.0       5.9    3448.3      23.8       5.0     760.5      20.0      88.0      21.0   1604.00
        .34      1.19      4.53      1.19      .040      .025      .040      .000   1602.00   1016.35
    .002147      151.       63.      123.         4        14         0       .00    403.26   1419.61


 FLOW DISTRIBUTION FOR SECNO=   2350.00          CWSEL=   1605.15

 STA=    1016.    1025.    1385.    1420.
   PER Q=      .2      99.1       .7
    AREA=     5.0     760.5     20.0
     VEL=     1.2       4.5      1.2
   DEPTH=      .6       2.1       .6

 *SECNO 2400.000

 3301 HV CHANGED MORE THAN HVINS

   2400.000      6.90   1604.90   1604.56       .00   1605.83       .93       .17       .19   1602.00
     3478.0     550.8    2620.3     306.9     217.2     297.2     119.3      89.5      21.8   1602.00
        .34      2.54      8.82      2.57      .040      .025      .040      .000   1598.00    419.86
    .002139      178.       71.      109.         3        17         0       .00    256.00    675.86


 FLOW DISTRIBUTION FOR SECNO=   2400.00          CWSEL=   1604.90

 STA=     420.     448.     556.     606.     667.     676.
   PER Q=      .4      15.5      75.3      8.7       .1
    AREA=    12.4     204.8     297.2     115.2      4.0
     VEL=     1.0       2.6       8.8       2.6      1.0
   DEPTH=      .4       1.9       5.9       1.9       .4

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   21SEP05      16:09:32                                                                          PAGE   25

    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 2500.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   2500.000      4.37   1606.37   1606.37       .00   1607.75      1.38       .58       .14   1604.00
     3478.0     710.0    2739.6      28.4     159.4     263.7       9.1      91.8      22.6   1604.00
        .35      4.45     10.39      3.11      .040      .025      .040      .000   1602.00     89.80
    .005228      187.      180.      183.         0        14         0       .00    161.68    251.48


 FLOW DISTRIBUTION FOR SECNO=   2500.00          CWSEL=   1606.37

 STA=      90.      97.     120.     162.     173.     243.     249.     251.
   PER Q=      .0       2.9      13.7      3.7      78.8       .8       .0
    AREA=     1.3      30.6     100.2      27.3     263.7       8.8       .4
     VEL=      .9       3.3       4.8       4.8      10.4       3.2       .9
   DEPTH=      .2       1.4       2.4       2.4       3.8       1.4       .2

 *SECNO 2600.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   2600.000      4.06   1610.06   1610.06       .00   1611.42      1.36      2.19       .00   1612.00
     3474.0        .0    3474.0        .0        .0     371.4        .0      95.1      23.9   1612.00
        .36       .00      9.35       .00      .000      .025      .000      .000   1606.00    779.60
    .006810      321.      373.      391.         0        11         0       .00    139.82    919.42


 FLOW DISTRIBUTION FOR SECNO=   2600.00          CWSEL=   1610.06

 STA=     780.     928.
   PER Q=    100.0
    AREA=    371.4
     VEL=      9.4
   DEPTH=      2.7

 *SECNO 2700.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   2700.000      4.56   1612.56   1612.56       .00   1613.79      1.23      1.69       .01   1614.00
     3474.0        .0    3474.0        .0        .0     390.8        .0      97.3      24.7   1614.00
        .37       .00      8.89       .00      .000      .025      .000      .000   1608.00    649.69
    .006864      250.      247.      237.         0         8         0       .00    160.76    810.45


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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

FLOW DISTRIBUTION FOR SECNO= 2700.00 CWSEL= 1612.56

STA= 650. 833.
PER Q= 100.0
AREA= 390.8
VEL= 8.9
DEPTH= 2.4

*SECNO 2800.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 263.2 507.8 TYPE= 1 TARGET= -263.200
ELENCL= 1616.00 ELENCR= 100000.00

2800.000	5.31	1615.31	1615.31	.00	1616.64	1.33	2.58	.03	1616.00
3474.0	.0	3474.0	.0	.0	375.1	.0	100.6	26.1	1616.00
.38	.00	9.26	.00	.000	.025	.000	.000	1610.00	267.64
.006844	263.	377.	390.	0	11	0	.00	144.58	412.22

FLOW DISTRIBUTION FOR SECNO= 2800.00 CWSEL= 1615.31

STA= 268. 429.
PER Q= 100.0
AREA= 375.1
VEL= 9.3
DEPTH= 2.6

*SECNO 2900.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 392.8 890.2 TYPE= 1 TARGET= -392.800
ELENCL= 1620.51 ELENCR= 100000.00

2900.000	6.57	1618.57	1618.57	.00	1619.51	.94	2.33	.04	1620.00
3474.0	.0	3474.0	.0	.0	446.7	.0	103.3	27.5	1620.00
.39	.00	7.78	.00	.000	.025	.000	.000	1612.00	511.02
.009381	293.	292.	274.	0	11	0	.00	282.84	793.86

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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

FLOW DISTRIBUTION FOR SECNO= 2900.00 CWSEL= 1618.57

STA= 511. 801.
PER Q= 100.0
AREA= 446.7
VEL= 7.8
DEPTH= 1.6

*SECNO 3000.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3000.000	6.69	1620.69	1620.69	.00	1621.93	1.23	2.19	.09	1620.00
3474.0	139.6	3329.4	5.0	72.5	365.9	4.1	107.0	29.6	1620.00
.40	1.93	9.10	1.22	.040	.025	.040	.000	1614.00	232.84
.004467	406.	350.	342.	0	5	0	.00	222.85	455.69

FLOW DISTRIBUTION FOR SECNO= 3000.00 CWSEL= 1620.69

STA=	233.	237.	275.	299.	313.	340.	444.	456.
PER Q=	.1	1.4	.9	.5	1.1	95.8	.1	
AREA=	1.6	25.7	16.8	9.5	18.9	365.9	4.1	
VEL=	1.2	1.9	1.9	1.9	1.9	9.1	1.2	
DEPTH=	.3	.7	.7	.7	.7	3.5	.3	

*SECNO 3100.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3100.000	6.66	1624.66	1624.66	.00	1625.94	1.28	1.66	.01	1626.00
3474.0	.0	3474.0	.0	.0	382.6	.0	109.9	31.0	1626.00
.41	.00	9.08	.00	.000	.025	.000	.000	1618.00	241.79
.006816	383.	302.	294.	0	5	0	.00	149.43	391.22

FLOW DISTRIBUTION FOR SECNO= 3100.00 CWSEL= 1624.66

STA= 242. 405.
PER Q= 100.0
AREA= 382.6
VEL= 9.1
DEPTH= 2.6

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

*SECNO 3200.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3200.000	5.52	1627.52	1627.52	.00	1629.64	2.11	2.49	.25	1630.00
3474.0	.0	3474.0	.0	.0	297.8	.0	112.9	32.0	1630.00
.42	.00	11.67	.00	.000	.025	.000	.000	1622.00	254.47

```
    .005981      427.      390.      396.         0        11         0       .00     71.99    326.45

  FLOW DISTRIBUTION FOR SECNO=   3200.00          CWSEL=   1627.52

  STA=     254.     404.
   PER Q=    100.0
    AREA=    297.8
     VEL=     11.7
   DEPTH=      4.1

  *SECNO 3300.000

  3265 DIVIDED FLOW

  3301 HV CHANGED MORE THAN HVINS

    3300.000      3.38   1631.38   1631.36       .00   1632.76      1.38      3.05       .07   1636.00
      3474.0        .0    3474.0        .0         .0     368.4        .0     116.6      33.1   1636.00
         .43       .00      9.43       .00       .000      .025      .000      .000   1628.00     48.20
      .006678      463.      483.      416.          3        14         0       .00    132.80    535.55

  FLOW DISTRIBUTION FOR SECNO=   3300.00          CWSEL=   1631.38

  STA=      48.     576.
    PER Q=    100.0
     AREA=    368.4
      VEL=      9.4
    DEPTH=      2.8

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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 3400.000

  3301 HV CHANGED MORE THAN HVINS

  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    3400.000      5.11   1639.11   1639.11       .00   1639.82       .72      3.21       .07   1640.00
      3474.0        .0    3474.0        .0         .0     511.1        .0     120.7      35.6   1640.00
         .45       .00      6.80       .00       .000      .025      .000      .000   1634.00     95.51
      .009731      467.      402.      326.          0        17         0       .00    408.71    504.21

  FLOW DISTRIBUTION FOR SECNO=   3400.00          CWSEL=   1639.11

  STA=      96.     601.
    PER Q=    100.0
     AREA=    511.1
      VEL=      6.8
    DEPTH=      1.3

  *SECNO 3500.000

  3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

    3500.000      2.15   1642.15   1641.90       .00   1642.55       .40      2.69       .03   1646.00
      3474.0        .0    3474.0        .0         .0     685.7        .0     126.2      39.8   1646.00
         .47       .00      5.07       .00       .000      .025      .000      .000   1640.00   1165.28
      .004861      446.      403.      364.          5        22         0       .00    507.21   1672.49

  FLOW DISTRIBUTION FOR SECNO=   3500.00          CWSEL=   1642.15

  STA=    1165.    1821.
    PER Q=    100.0
     AREA=    685.7
      VEL=      5.1
    DEPTH=      1.4

  *SECNO 3600.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
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

    3600.000      1.42   1647.42   1647.42       .00   1648.05       .64      2.26       .07   1648.00
      3474.0        .0    3474.0        .0         .0     542.3        .0     131.3      43.7   1648.00
         .49       .00      6.41       .00       .000      .025      .000      .000   1646.00    184.97
      .008531      366.      359.      357.          0        14         0       .00    430.17    615.14

  FLOW DISTRIBUTION FOR SECNO=   3600.00          CWSEL=   1647.42

  STA=     185.     618.
    PER Q=    100.0
     AREA=    542.3
      VEL=      6.4
    DEPTH=      1.3

  *SECNO 3700.000
    3700.000      2.06   1650.06   1649.75       .00   1650.55       .49      2.48       .01   1652.00
      3474.0        .0    3474.0        .0         .0     617.2        .0     136.7      47.5   1652.00
         .51       .00      5.63       .00       .000      .025      .000      .000   1648.00    115.62
      .004530      398.      410.      401.          3        11         0       .00    369.76    485.38

  FLOW DISTRIBUTION FOR SECNO=   3700.00          CWSEL=   1650.06

  STA=     116.     529.
    PER Q=    100.0
     AREA=    617.2
      VEL=      5.6
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   DEPTH=      1.7

  *SECNO 3800.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    3800.000      2.25   1656.25   1656.25       .00   1656.94       .70      4.01       .06   1660.00
      3474.0        .0     3474.0        .0        .0     518.7        .0     145.4      53.2   1658.00
         .54        .00       6.70       .00      .000      .025      .000      .000   1654.00     48.18
       .008386      480.      666.      713.         0         8         0       .00    379.85    428.03


  FLOW DISTRIBUTION FOR SECNO=   3800.00          CWSEL=   1656.25

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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


  STA=      48.      437.
    PER Q=    100.0
     AREA=    518.7
      VEL=      6.7
    DEPTH=      1.4

  *SECNO 3900.000

  3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

    3900.000      2.79   1658.79   1658.78       .00   1659.61       .83      2.63       .04   1660.00
      2318.0        .0     2318.0        .0        .0     317.6        .0     148.5      55.3   1662.00
         .55        .00       7.30       .00      .000      .025      .000      .000   1656.00     96.78
       .007964      468.      320.      238.         2        11         0       .00    196.62    293.40


  FLOW DISTRIBUTION FOR SECNO=   3900.00          CWSEL=   1658.79

  STA=      97.      332.
    PER Q=    100.0
     AREA=    317.6
      VEL=      7.3
    DEPTH=      1.6

  *SECNO 4000.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    4000.000      4.62   1664.62   1664.62       .00   1665.76      1.14      3.52       .09   1666.00
      2318.0        .0     2318.0        .0        .0     270.2        .0     151.6      57.0   1666.30
         .56        .00       8.58       .00      .000      .025      .000      .000   1660.00     66.94
       .007186      445.      466.      478.         0        14         0       .00    120.65    187.58


  FLOW DISTRIBUTION FOR SECNO=   4000.00          CWSEL=   1664.62

  STA=      67.      249.
    PER Q=    100.0
     AREA=    270.2
      VEL=      8.6
    DEPTH=      2.2

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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 4100.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    4100.000      4.34   1670.34   1670.34       .00   1671.28       .94      3.63       .02   1672.00
      2318.0        .0     2318.0        .0        .0     298.3        .0     154.9      58.6   1674.00
         .58        .00       7.77       .00      .000      .025      .000      .000   1666.00    214.41
       .007412      535.      497.      356.         0        12         0       .00    158.44    372.85


  FLOW DISTRIBUTION FOR SECNO=   4100.00          CWSEL=   1670.34

  STA=     214.      408.
    PER Q=    100.0
     AREA=    298.3
      VEL=      7.8
    DEPTH=      1.9

  *SECNO 4200.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    4200.000      4.93   1674.93   1674.93       .00   1675.84       .91      3.00       .00   1678.00
      2318.0        .0     2318.0        .0        .0     302.8        .0     157.7      60.1   1680.00
         .59        .00       7.65       .00      .000      .025      .000      .000   1670.00    130.55
       .007494      285.      402.      297.         0         8         0       .00    166.18    296.74


  FLOW DISTRIBUTION FOR SECNO=   4200.00          CWSEL=   1674.93

  STA=     131.      318.
    PER Q=    100.0
     AREA=    302.8
      VEL=      7.7
    DEPTH=      1.8

  *SECNO 4300.000
  7185 MINIMUM SPECIFIC ENERGY
  3720 CRITICAL DEPTH ASSUMED
    4300.000      3.22   1679.22   1679.22       .00   1680.20       .99      2.86       .02   1680.00
      2318.0        .0     2318.0        .0        .0     290.6        .0     160.3      61.5   1680.00
         .61        .00       7.98       .00      .000      .025      .000      .000   1676.00    178.89
       .007442      317.      384.      407.         0        14         0       .00    149.61    328.50


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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

FLOW DISTRIBUTION FOR SECNO= 4300.00 CWSEL= 1679.22

STA= 179. 349.
PER Q= 100.0
AREA= 290.6
VEL= 8.0
DEPTH= 1.9

*SECNO 4400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4400.000	4.01	1684.01	1684.01	.00	1685.31	1.30	3.41	.09	1688.00
2318.0	.0	2318.0	.0	.0	253.1	.0	163.2	62.8	1688.00
.62	.00	9.16	.00	.000	.025	.000	.000	1680.00	1171.90
.006904	432.	476.	439.	0	11	0	.00	99.31	1271.22

FLOW DISTRIBUTION FOR SECNO= 4400.00 CWSEL= 1684.01

STA= 1172. 1303.
PER Q= 100.0
AREA= 253.1
VEL= 9.2
DEPTH= 2.5

*SECNO 4500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4500.000	4.55	1690.55	1690.55	.00	1691.73	1.18	3.70	.01	1710.00
2318.0	.0	2318.0	.0	.0	266.1	.0	166.4	64.1	1710.00
.64	.00	8.71	.00	.000	.025	.000	.000	1686.00	174.72
.006979	417.	533.	575.	0	8	0	.00	113.57	288.29

FLOW DISTRIBUTION FOR SECNO= 4500.00 CWSEL= 1690.55

STA= 175. 376.
PER Q= 100.0
AREA= 266.1
VEL= 8.7
DEPTH= 2.3

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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 4600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4600.000	3.99	1695.99	1695.99	.00	1697.15	1.16	3.13	.00	1700.00
2318.0	.0	2318.0	.0	.0	267.7	.0	169.1	65.3	1700.00
.65	.00	8.66	.00	.000	.025	.000	.000	1692.00	199.71
.007167	488.	442.	278.	0	15	0	.00	117.81	317.52

FLOW DISTRIBUTION FOR SECNO= 4600.00 CWSEL= 1695.99

STA= 200. 333.
PER Q= 100.0
AREA= 267.7
VEL= 8.7
DEPTH= 2.3

*SECNO 4700.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 442.2 TYPE= 1 TARGET= 442.199

4700.000	4.65	1700.65	1700.65	.00	1701.94	1.30	1.48	.04	1700.00
2318.0	1.2	2241.0	75.8	1.0	241.2	40.4	170.8	66.1	1700.00
.66	1.17	9.29	1.88	.040	.025	.040	.000	1696.00	370.94
.004619	273.	261.	276.	0	11	0	.00	134.71	505.65

FLOW DISTRIBUTION FOR SECNO= 4700.00 CWSEL= 1700.65

STA=	371.	374.	442.	475.	485.	491.	504.	506.
PER Q=	.0	96.7	1.7	.5	.3	.7	.0	
AREA=	1.0	241.2	21.4	6.6	3.8	8.0	.6	
VEL=	1.2	9.3	1.9	1.9	1.9	1.9	1.1	
DEPTH=	.3	3.5	.6	.6	.6	.6	.3	

*SECNO 4800.000

3301 HV CHANGED MORE THAN HVINS

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

4800.000	5.20	1703.20	1703.20	.00	1705.21	2.01	1.21	.21	1710.00
2318.0	.0	2318.0	.0	.0	203.6	.0	172.1	66.6	1710.00
.67	.00	11.39	.00	.000	.025	.000	.000	1698.00	221.50
.006116	187.	228.	242.	0	8	0	.00	50.94	272.43

FLOW DISTRIBUTION FOR SECNO= 4800.00 CWSEL= 1703.20

STA= 221. 286.
PER Q= 100.0

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     AREA=    203.6
      VEL=     11.4
    DEPTH=      4.0

 CCHV=     .100 CEHV=     .300
 *SECNO 4900.000
 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
   4900.000     3.90  1705.90  1705.90      .00  1707.53     1.63     2.21      .04  1710.00
     2318.0       .0   2318.0       .0       .0    226.0       .0    173.8     67.1  1710.00
        .68      .00    10.26      .00      .000     .025     .000     .000  1702.00   136.35
    .006483     375.     351.     218.        0       15        0      .00    70.75   207.09

 FLOW DISTRIBUTION FOR SECNO=   4900.00          CWSEL=   1705.90

 STA=     136.     260.
   PER Q=    100.0
    AREA=    226.0
     VEL=     10.3
   DEPTH=      3.2

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 TWSPLIT FLOW AT PULSIPHER/I-15 CULVERT

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
 1339.89   1339.89       .00  1339.89  1339.89       .00        11  1598.880  1605.219  2000.000  2100.000

 TWSTATION 1400 - SPLIT FLOW OVER RIGHT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  108.35    108.34       .00  1448.23  1448.23       .00        11  1583.677  1584.860  1400.000  1500.000

 TWSTATION 1300 - SPLIT FLOW OVER RIGHT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
     .00       .00       .00  1448.23  1448.23       .00        11  1578.925  1583.677  1300.000  1400.000

 TWSTATION 1200 - SPLIT FLOW OVER LEFT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  211.35    211.68       .16  1659.58  1659.91       .02        11  1577.886  1578.925  1200.000  1300.000

 TWSTATION 1100 - SPLIT FLOW OVER LEFT OVERBANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  656.95    657.48       .08  2316.53  2317.39       .04        11  1577.466  1577.886  1100.000  1200.000

 TWSTATION 1000 - SPLIT FLOW OVER LEFT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  265.90    266.46       .21  2582.43  2583.85       .05        11  1576.445  1577.466  1000.000  1100.000

 TWSTATION 900 - SPLIT FLOW OVER LEFT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  168.48    168.63       .09  2750.91  2752.48       .06        11  1575.360  1576.445   900.000  1000.000

 TWSTATION 800 - SPLIT FLOW OVER LEFT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
  122.00    122.16       .13  2872.92  2874.64       .06        11  1574.778  1575.360   800.000   900.000

1
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 TWSTATION 700 - SPLIT FLOW OVER LEFT BANK

     ASQ      QCOMP     ERRAC     TASQ      TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
    7.34      7.29       .72  2880.26  2881.93       .06        11  1573.263  1574.778   700.000   800.000

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                                                                    THIS RUN EXECUTED 21SEP05    16:09:32

 ************************************
  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

 Pulsipher Wash

 SUMMARY PRINTOUT TABLE  100

       SECNO      EGLWC      ELLC      EGPRS      ELTRD       QPR      QWEIR      CLASS       H3       DEPTH      CWSEL       VCH        EG
 *   600.000   1568.79   1569.51        .00   1572.66    668.74        .00       2.00       .00        2.70    1568.10       6.63   1568.79
 *  2000.000   1603.81   1598.88   1599.48    1603.83   2138.11        .00      59.00       .00       10.00    1598.88      17.82   1603.81

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 Pulsipher Wash

 SUMMARY PRINTOUT TABLE  150
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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
•	200.000	.00	.00	.00	1554.00	668.74	1555.07	1555.07	1555.57	91.93	5.68	117.76	69.75
•	300.000	352.07	.00	.00	1558.00	668.74	1560.01	1560.01	1560.76	80.30	6.98	95.86	74.63
•	400.000	134.41	.00	.00	1560.00	668.74	1562.56	1562.56	1563.09	91.64	5.82	114.97	69.86
•	500.000	74.97	.00	.00	1564.30	668.74	1566.47	1566.47	1567.54	29.45	8.30	80.57	123.22
*	600.000	133.46	1572.66	1569.51	1565.40	668.74	1568.10	.00	1568.79	14.39	6.63	100.89	176.29
*	700.000	112.64	.00	.00	1569.50	668.74	1573.26	1573.26	1573.79	144.90	5.83	114.80	55.55
*	800.000	144.94	.00	.00	1570.00	676.08	1574.78	1574.40	1575.10	60.77	4.59	147.44	86.73
	900.000	103.62	.00	.00	1571.00	798.09	1575.36	1575.28	1575.98	93.53	6.31	126.51	82.52
	1000.000	118.27	.00	.00	1571.15	966.57	1576.44	1576.36	1577.24	110.61	7.17	134.84	91.90
*	1100.000	103.70	.00	.00	1571.40	1232.47	1577.47	1576.93	1578.01	54.21	5.94	207.55	167.39
•	1200.000	110.23	.00	.00	1571.62	1889.42	1577.89	1577.33	1578.65	50.67	7.03	268.92	265.43
*	1300.000	176.37	.00	.00	1572.69	2100.77	1578.93	1578.93	1580.10	78.50	8.68	242.00	237.11
•	1400.000	161.58	.00	.00	1578.00	2100.77	1583.68	1583.68	1584.79	71.68	8.47	248.01	248.14
*	1500.000	108.07	.00	.00	1578.00	2209.12	1584.86	1583.66	1585.15	13.21	4.49	616.70	607.80
	1600.000	196.31	.00	.00	1580.40	2209.12	1585.10	1583.69	1585.40	11.86	4.47	534.65	641.55
•	1650.000	175.57	.00	.00	1582.00	2209.12	1586.66	1586.66	1587.48	43.94	8.76	417.47	333.26
	1700.000	161.13	.00	.00	1582.05	2209.12	1587.56	1587.24	1588.08	30.70	7.01	500.54	398.71
•	1750.000	169.33	.00	.00	1582.10	2209.12	1588.69	1588.69	1589.60	37.25	8.50	384.09	361.95
•	1800.000	170.93	.00	.00	1582.10	2209.12	1589.90	1589.90	1592.04	65.02	11.74	188.10	273.97
*	1900.000	58.98	.00	.00	1582.19	2138.11	1592.09	1592.09	1597.12	56.98	18.00	118.76	283.25
•	2000.000	319.85	1603.83	1598.88	1588.88	2138.11	1598.88	1598.88	1603.81	84.68	17.82	120.06	232.35
•	2100.000	49.81	.00	.00	1590.00	3478.00	1605.22	1595.96	1605.28	.46	2.16	2161.69	5154.45
•	2200.000	328.57	.00	.00	1593.00	3478.00	1605.28	1598.04	1605.29	.12	.91	5633.05	9993.15
*	2300.000	311.55	.00	.00	1594.00	3478.00	1605.26	1600.56	1605.31	.92	2.32	2443.22	3633.66

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	2330.000	240.00	.00	.00	1596.00	3478.00	1605.24	1602.20	1605.37	2.92	3.29	1527.20	2036.33
•	2350.000	63.00	.00	.00	1602.00	3478.00	1605.15	1604.46	1605.47	21.47	4.53	785.48	750.58
	2400.000	71.00	.00	.00	1598.00	3478.00	1604.90	1604.56	1605.83	21.39	8.82	633.59	752.08
•	2500.000	179.72	.00	.00	1602.00	3478.00	1606.37	1606.37	1607.75	52.28	10.39	432.21	481.01
*	2600.000	373.36	.00	.00	1606.00	3474.00	1610.06	1610.06	1611.42	68.10	9.35	371.36	420.97
•	2700.000	246.94	.00	.00	1608.00	3474.00	1612.56	1612.56	1613.79	68.64	8.89	390.77	419.33
•	2800.000	376.77	.00	.00	1610.00	3474.00	1615.31	1615.31	1616.64	68.44	9.26	375.09	419.93
*	2900.000	292.09	.00	.00	1612.00	3474.00	1618.57	1618.57	1619.51	93.81	7.78	446.70	358.68
•	3000.000	349.71	.00	.00	1614.00	3474.00	1620.69	1620.69	1621.93	44.67	9.10	442.41	519.79
•	3100.000	302.10	.00	.00	1618.00	3474.00	1624.66	1624.66	1625.94	68.16	9.08	382.61	420.78
*	3200.000	390.01	.00	.00	1622.00	3474.00	1627.52	1627.52	1629.64	59.81	11.67	297.81	449.22
	3300.000	482.80	.00	.00	1628.00	3474.00	1631.38	1631.36	1632.76	66.78	9.43	368.45	425.12
*	3400.000	402.24	.00	.00	1634.00	3474.00	1639.11	1639.11	1639.82	97.31	6.80	511.14	352.16
•	3500.000	403.18	.00	.00	1640.00	3474.00	1642.15	1641.90	1642.55	48.61	5.07	685.70	498.27
•	3600.000	358.51	.00	.00	1646.00	3474.00	1647.42	1647.42	1648.05	85.31	6.41	542.32	376.11
	3700.000	409.82	.00	.00	1648.00	3474.00	1650.06	1649.75	1650.55	45.30	5.63	617.21	516.18
•	3800.000	666.00	.00	.00	1654.00	3474.00	1656.25	1656.25	1656.94	83.86	6.70	518.75	379.36
*	3900.000	320.40	.00	.00	1656.00	2318.00	1658.79	1658.78	1659.61	79.64	7.30	317.60	259.74
•	4000.000	465.67	.00	.00	1660.00	2318.00	1664.62	1664.62	1665.76	71.86	8.58	270.18	273.44
•	4100.000	497.00	.00	.00	1666.00	2318.00	1670.34	1670.34	1671.28	74.12	7.77	298.33	269.24
•	4200.000	402.00	.00	.00	1670.00	2318.00	1674.93	1674.93	1675.84	74.94	7.65	302.84	267.78
•	4300.000	383.62	.00	.00	1676.00	2318.00	1679.22	1679.22	1680.20	74.42	7.98	290.61	268.69
•	4400.000	476.00	.00	.00	1680.00	2318.00	1684.01	1684.01	1685.31	69.04	9.16	253.12	278.97
*	4500.000	533.38	.00	.00	1686.00	2318.00	1690.55	1690.55	1691.73	69.79	8.71	266.05	277.47
•	4600.000	442.00	.00	.00	1692.00	2318.00	1695.99	1695.99	1697.15	71.67	8.66	267.73	273.80
•	4700.000	260.86	.00	.00	1696.00	2318.00	1700.65	1700.65	1701.94	46.19	9.29	282.59	341.06

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
•	4800.000	227.74	.00	.00	1698.00	2318.00	1703.20	1703.20	1705.21	61.16	11.39	203.56	296.41
•	4900.000	351.24	.00	.00	1702.00	2318.00	1705.90	1705.90	1707.53	64.83	10.26	226.02	287.89

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Pulsipher Wash

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
•	200.000	668.74	1555.07	.00	.00	-1.88	118.24	.00
•	300.000	668.74	1560.01	.00	4.94	.00	63.71	352.07
•	400.000	668.74	1562.56	.00	2.55	.00	110.67	134.41
•	500.000	668.74	1566.47	.00	3.91	.00	37.73	74.97
•	600.000	668.74	1568.10	.00	1.63	.00	37.73	133.46
•	700.000	668.74	1573.26	.00	5.16	.00	117.24	112.64
•	800.000	676.08	1574.78	.00	1.52	.00	112.62	144.94
	900.000	798.09	1575.36	.00	.58	.00	82.44	103.62
	1000.000	966.57	1576.44	.00	1.08	.00	81.68	118.27
•	1100.000	1232.47	1577.47	.00	1.02	.00	97.61	103.70
•	1200.000	1889.42	1577.89	.00	.42	.00	94.20	110.23
•	1300.000	2100.77	1578.93	.00	1.04	.00	109.71	176.37
•	1400.000	2100.77	1583.68	.00	4.75	.00	111.77	161.58
•	1500.000	2209.12	1584.86	.00	1.18	.00	393.03	108.07
	1600.000	2209.12	1585.10	.00	.24	.00	242.66	196.31
•	1650.000	2209.12	1586.66	.00	1.57	.00	258.69	175.57
	1700.000	2209.12	1587.56	.00	.90	.00	290.63	161.13
•	1750.000	2209.12	1588.69	.00	1.13	.00	216.43	169.33
•	1800.000	2209.12	1589.90	.00	1.21	.00	44.92	170.93
•	1900.000	2138.11	1592.09	.00	2.18	.00	12.00	58.98
•	2000.000	2138.11	1598.88	.00	6.79	.00	13.60	319.85
•	2100.000	3478.00	1605.22	.00	6.34	.00	248.25	49.81
•	2200.000	3478.00	1605.28	.00	.06	.00	746.82	328.57
•	2300.000	3478.00	1605.26	.00	-.02	.00	502.60	311.55

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	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
•	2330.000	3478.00	1605.24	.00	-.02	.00	449.86	240.00
•	2350.000	3478.00	1605.15	.00	-.08	.00	403.26	63.00
	2400.000	3478.00	1604.90	.00	-.26	.00	256.00	71.00
•	2500.000	3478.00	1606.37	.00	1.47	.00	161.68	179.72
•	2600.000	3474.00	1610.06	.00	3.70	.00	139.82	373.36
•	2700.000	3474.00	1612.56	.00	2.50	.00	160.76	246.94
•	2800.000	3474.00	1615.31	.00	2.75	.00	144.58	376.77
•	2900.000	3474.00	1618.57	.00	3.27	.00	282.84	292.09
•	3000.000	3474.00	1620.69	.00	2.12	.00	222.85	349.71
•	3100.000	3474.00	1624.66	.00	3.96	.00	149.43	302.10
•	3200.000	3474.00	1627.52	.00	2.87	.00	71.99	390.01
	3300.000	3474.00	1631.38	.00	3.85	.00	132.80	482.80
•	3400.000	3474.00	1639.11	.00	7.73	.00	408.71	402.24
•	3500.000	3474.00	1642.15	.00	3.04	.00	507.21	403.18
•	3600.000	3474.00	1647.42	.00	5.27	.00	430.17	358.51
	3700.000	3474.00	1650.06	.00	2.64	.00	369.76	409.82
•	3800.000	3474.00	1656.25	.00	6.19	.00	379.85	666.00
•	3900.000	2318.00	1658.79	.00	2.54	.00	196.62	320.40
•	4000.000	2318.00	1664.62	.00	5.83	.00	120.65	465.67
•	4100.000	2318.00	1670.34	.00	5.72	.00	158.44	497.00
•	4200.000	2318.00	1674.93	.00	4.58	.00	166.18	402.00
•	4300.000	2318.00	1679.22	.00	4.29	.00	149.61	383.62
•	4400.000	2318.00	1684.01	.00	4.79	.00	99.31	476.00
•	4500.000	2318.00	1690.55	.00	6.54	.00	113.57	533.38
•	4600.000	2318.00	1695.99	.00	5.44	.00	117.81	442.00
•	4700.000	2318.00	1700.65	.00	4.66	.00	134.71	260.86

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SECNO Q CWSEL DIFWSP DIFWSX DIFKWS TOPWID XLCH

•	4800.000	2318.00	1703.20	.00	2.55	.00	50.94	227.74
•	4900.000	2318.00	1705.90	.00	2.70	.00	70.75	351.24

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SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 300.000 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= 500.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 500.000 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= 700.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 700.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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

WARNING SECNO= 1100.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1200.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 1300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 1500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 1650.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1650.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1750.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1750.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1800.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1800.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1900.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1900.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2000.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 2100.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2200.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2300.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO= 2330.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2350.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 2500.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2500.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2600.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2600.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2700.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2700.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2800.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2800.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2900.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2900.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3000.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 3500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 3600.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3600.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 3800.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3800.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 3900.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 4000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4000.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

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 CAUTION SECNO=   4300.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
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 CAUTION SECNO=   4400.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4400.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=   4500.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4500.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=   4600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4600.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=   4700.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4700.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=   4800.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4800.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

 CAUTION SECNO=   4900.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=   4900.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
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MINOR SUBDIVISION MAP APPLICATION
CLARK COUNTY DEVELOPMENT SERVICES DEPARTMENT
FOR SUBMITTAL REQUIREMENTS, PLEASE SEE REVERSE

____Parcel Map Preliminary Review $150	____Parcel Map Extension of Time $100	____Parcel Map Technical Review $200 + $2 per lot	____Certificate of Land Division $350 + $2 per lot	____Reversionary Parcel Map $350	____Exception to Determination $150

DATE FILED _____ APPLICATION NUMBER _____

FEE _____ CHECK #_____

PLANNER INITIALS _____ SEC/TSP/RANGE _____

ZONING _____ LAND USE DESIGNATION _____

PLANS___ ASSESSOR'S MAPS___ TITLE REPORT___ CADD DRAWING____ POINT FILE DISK___

REFERENCE FILES _____

EXTENSION OF TIME APPROVED/DENIED UNTIL_____

_____ _____

PLANNING RIGHT-OF-WAY

EXCEPTION TO DETERMINATION APPROVED/DENIED UNTIL_____

_____ _____

PLANNING RIGHT-OF-WAY

ABOVE FOR OFFICE USE ONLY

PROPERTY OWNER:_____PHONE:_____FAX:_____

APPLICANT:_____

ALL MAIL FOR THIS APPLICATION SHOULD BE MAILED TO:

NAME:_____

ADDRESS:_____CITY:_____STATE:_____ZIP:_____

TELEPHONE:_____FAX:_____E-MAIL:_____

ASSESSOR'S PARCEL NUMBER(S):_____

NEAREST CROSS STREETS:_____

PROPOSED WATER SOURCE:_____ PROPOSED SANITARY SEWER SERVICES_____

NUMBER OF LOTS:_____

MINOR SUBIDIVISION MAP REQUIREMENTS AND PROCEDURES

SUBMITTAL REQUIREMENTS: All submittals shall be legible and suitable for reproduction:
COPIES: Copies of maps must be submitted with each application as required below. All maps must be drawn by a Professional Land Surveyor. **Please note that all maps (except mylar) must be folded to the 9" x 12" standard.**
TITLE REPORT: The required title report must be from a reputable title company, and be dated less than 6 months prior to the time of map submittal, show the names of the parties who may be required to sign the map, list all encumbrances on the property to be subdivided, and also include 1 copy of each document that created the encumbrance or easement on the property. A title report less than two weeks old will be required to submit the minor subdivision map mylar.
ASSESSOR'S MAP: 2 copies of the most recent assessor's maps that clearly indicate the subject parcels. (may be purchased from the Assessor's office or printed off the internet)
CIVIL ENGINEERING TECHNICIAL STUDIES NOTICE: 1 copy of the notices from the Civil Engineering Division indicating conditional acceptance of required technical studies (drainage) is required to schedule a parcel map technical review appointment.
CADD DRAWING: e-mailed to pointdata@co.clark.nv.us with verification @ submittal
POINT FILE DISK: in ascii format with point plot per 30.28 e-mailed to pointdata@co.clark.nv.us with verification @ submittal
FILING FEE: See chart above.
EXCEPTION TO DETERMINATION SUBMITTAL: requires all required documents listed below and all requested on exception checklist.
MYLAR SUBMITTAL: Please contact the Map Team, Planning Section (455-2100) for all required documents or see mylar submittal checklist. Title report dated less than two weeks old is required at this submittal.

Application Type	Application	Copies of Plan	Mylar	Title Report	Preliminary Review Letter	Assessor's Maps	DS Studies	CADD Drawing	Point Disk (CD) File
Parcel Map Preliminary Review	1	6		1*		2			
Parcel Map Extension of Time	1								
Parcel Map Technical Review	1	8	1 (at mylar submittal)	2*	2	2	1 (if required)	1	1
Certificate of Land Division	1	8	1 (at mylar submittal)	2		2		1	1
Reversionary Parcel Map	1	9	1 (at mylar submittal)	2				1	1
Exception to Determination	1	2				2			

* No more than 6 months old

PROCEDURES FOR FILING APPLICATIONS: Please call 455-2100 to schedule an appointment to submit any of the above applications.

The parcel map is approved for one year from the date of the preliminary review letter. This date will be effective until the parcel map is recorded. If not recorded within one year, the parcel map will expire, if an extension of time is not approved. If the application has expired, you may be permitted to submit for an exception to determination (see checklist for requirements). If you are unable to meet the exception submittal requirements, you will need to submit for a new parcel map (preliminary review)

CLARK COUNTY DEVELOPMENT SERVICES, MAP AND DEVELOPMENT REVIEW TEAM
500 S GRAND CENTRAL PARKWAY, PO BOX 551799, LAS VEGAS, NV 89155-1799
(702) 455-2100



FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

NATIONAL FLOOD INSURANCE PROGRAM
ELEVATION CERTIFICATE

PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for the Elevation Certificate is estimated to average 3.5 hours per response. Burden means the time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to the Federal Emergency Management Agency (FEMA). You are not required to respond to the collection of information unless a valid OMB control number is displayed in the upper right corner of the form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: U.S. Department of Homeland Security, Federal Emergency Management Agency, Mitigation Division, 500 C Street SW, Washington DC 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.** To obtain or retain benefits under the National Flood Insurance Program (NFIP), you must respond to this collection of information.

PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in the FEMA Floodplain Management Bulletin about using the Elevation Certificate, available on FEMA's website at www.fema.gov/fima/fpmbul.shtm. Click on "FEMA 467-1 Elevation Certificate Cover and Bulletin."

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expires February 28, 2009

Important: Read the instructions on pages 1-8.

SECTION A - PROPERTY INFORMATION

	For Insurance Company Use:
A1. Building Owner's Name	Policy Number
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.	Company NAIC Number
City / State / ZIP Code	

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____

A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number_____

A8. For a building with a crawl space or enclosure(s), provide:
- a) Square footage of crawl space or enclosure(s) _____ sq ft
- b) No. of permanent flood openings in the crawl space or enclosure(s) walls within 1.0 foot above adjacent grade _____
- c) Total net area of flood openings in A8.b _____ sq in

A9. For a building with an attached garage, provide:
- a) Square footage of attached garage _____ sq ft
- b) No. of permanent flood openings in the attached garage walls within 1.0 foot above adjacent grade _____
- c) Total net area of flood openings in A9.b _____ sq in

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State

B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.
☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other (Describe) _____

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe) _____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No
Designation Date_____ ☐ CBRS ☐ OPA

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.

Benchmark Utilized _____ Vertical Datum_____

Conversion/Comments _____

		Check the measurement used.	
a)	Top of bottom floor (including basement, crawl space, or enclosure floor) _____.__	☐ feet	☐ meters (Puerto Rico only)
b)	Top of the next higher floor _____.__	☐ feet	☐ meters (Puerto Rico only)
c)	Bottom of the lowest horizontal structural member (V Zones only) _____.__	☐ feet	☐ meters (Puerto Rico only)
d)	Attached garage (top of slab) _____.__	☐ feet	☐ meters (Puerto Rico only)
e)	Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments) _____.__	☐ feet	☐ meters (Puerto Rico only)
f)	Lowest adjacent (finished) grade (LAG) _____.__	☐ feet	☐ meters (Puerto Rico only)
g)	Highest adjacent (finished) grade (HAG) _____.__	☐ feet	☐ meters (Puerto Rico only)

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

☐ Check here if comments are provided on back of form.

PLACE SEAL HERE

Certifier's Name _____ License Number _____

Title _____ Company Name _____

Address _____ City _____ State _____ ZIP Code _____

Signature _____ Date _____ Telephone _____

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number
City	State	ZIP Code	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments

Signature Date

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1-E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1-E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
a) Top of bottom floor (including basement, crawl space, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
b) Top of bottom floor (including basement, crawl space, or enclosure) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6-8 with permanent flood openings provided in Section A Items 8 and/or 9 (see page 8 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ . ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____. ____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge.*

Property Owner's or Owner's Authorized Representative's Name

Address City State ZIP Code

Signature Date Telephone

Comments

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8. and G9.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4.-G9.) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: _____. ____ ☐ feet ☐ meters (PR) Datum_____

G9. BFE or (in Zone AO) depth of flooding at the building site: _____. ____ ☐ feet ☐ meters (PR) Datum_____

Local Official's Name Title

Community Name Telephone

Signature Date

Comments

☐ Check here if attachments

Building Photographs

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use: Policy Number
City	State	ZIP Code	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.

Building Photographs

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use: Policy Number
City	State	ZIP Code	Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."

INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

SECTION A – PROPERTY INFORMATION

Items A1.-A4. This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

Item A5. Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

Item A6. If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

Item A7. Select the diagram on pages 7-8 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

Item A8.a Provide the square footage of the crawl space or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawl space or enclosure(s). Examples of elevated buildings constructed with crawl space and enclosure(s) are shown in Diagrams 6-8 on page 8. Diagram 2 or 4 should be used for a building constructed with a crawl space floor that is below the exterior grade on all sides.

Items A8.b-c Enter in Item A8.b the number of permanent flood openings in the crawl space or enclosure(s) walls that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net

area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. If the crawl space or enclosure(s) walls have no permanent openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

Item A9.a Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

Items A9.b-c Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the adjacent grade. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A9.b-c.

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

Item B1. NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's web site at http://www.fema.gov/fema/csb.shtm, or call 1-800-358-9616.

Item B2. County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

Item B3. State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

Items B4.-B5. Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a four-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

Item B6. FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

Item B7. FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

Item B8. Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

Item B9. Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Item B10. Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. An information sheet explaining CBRS areas and OPAs may be obtained on FEMA's web site at http://www.fema.gov/fhm/fmc_cbrs.shtm.

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

Complete Section C if the building is located in any of Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawl spaces to shoot the elevation of the crawl space floor. If access to the crawl space is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawl space to the "next higher floor," and then subtract the crawl space height from the elevation of the "next higher floor." If there is no access to the crawl space, use the exterior grade next to the structure to measure the height of the crawl space to the "next higher floor."
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawl space floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawl space floor to the next higher floor, try to verify this by looking inside the crawl space through any openings or vents.

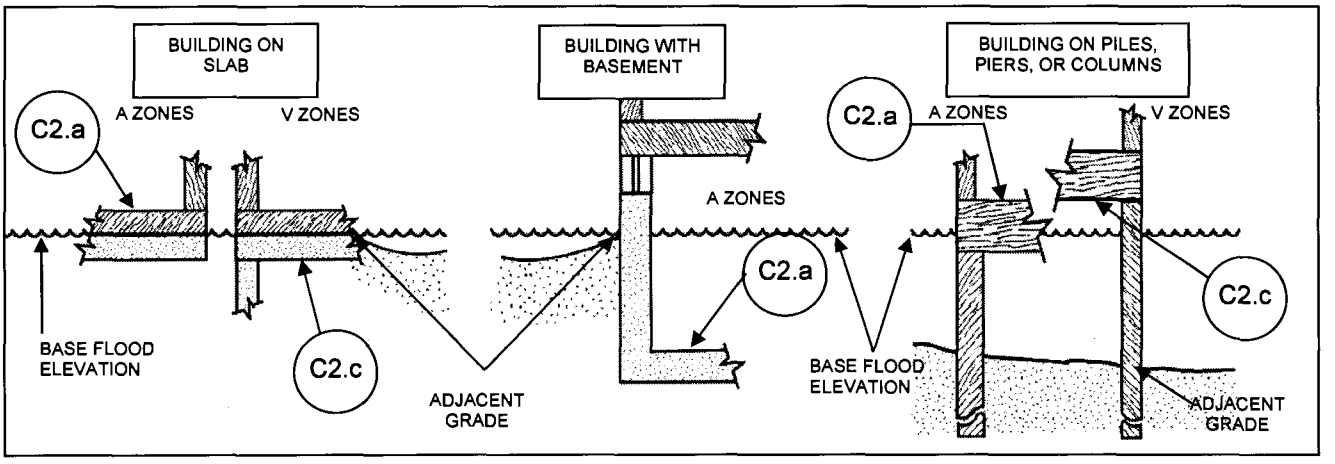
In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

Item C1. Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-g. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Item C2. A field survey is required for Items C2.a-g. Provide the benchmark utilized, the vertical datum for that benchmark, and any datum conversion necessary. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other

unique identifier assigned by the maintainer of the benchmark. Also provide the vertical datum for the benchmark elevation. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. All elevations for the certificate, including the elevations for Items C2.a-g, must be referenced to the datum on which the BFE is based. Show the datum conversion, if applicable, in this section or in the Comments area of Section D. For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items C2.a-d Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7.) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-g. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawl space, Diagram 8, enter the elevation of the top of the crawl space floor in Item C2.a, whether or not the crawl space has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*



Item C2.e Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

Items C2.f-g Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. If the certificate is to be used to support a request for a LOMA or LOMR-F, provide in the Comments area the lowest adjacent grade elevation measured at the deck support or stairs if that elevation is lower than the building's lowest adjacent grade. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable

by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, or other relevant information not specified on the front.

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO & ZONE A (WITHOUT BFE)

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1.- E4. is based on the "natural grade."

Items E1.a and b Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

Item E2. For Building Diagrams 6-8 with permanent flood openings (see page 8), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

Item E3. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E4. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E5. For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner's representative who provided the information on the certificate.

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1.** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2.** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3.** if the information in Items G4.-G9. has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4.-G9. provide a way to document these determinations.

Item G4. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G5. Date Permit Issued. Enter the date the permit was issued for the building.

Item G6. Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

Item G7. New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G8. As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

Item G9. BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

BUILDING DIAGRAMS

The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7., the square footage of crawl space or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-g.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).

DIAGRAM 1

All slab-on-grade single- and multiple-floor buildings (other than split-level) and high-rise buildings, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor is at or above ground level (grade) on at least one side. *

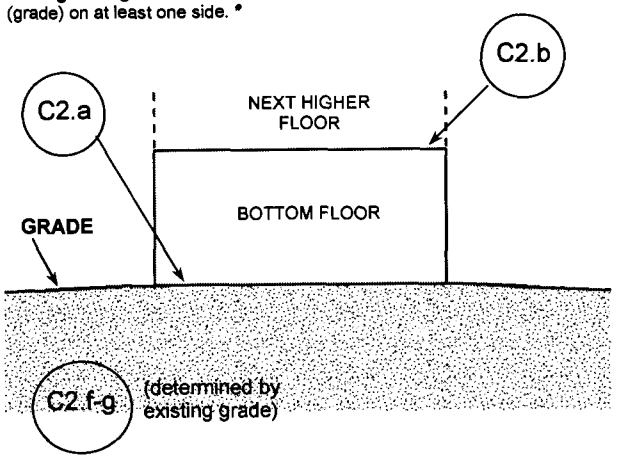


DIAGRAM 2

All single- and multiple-floor buildings with basement (other than split-level) and high-rise buildings with basement, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides. Buildings constructed above crawl spaces that are below grade on all sides should also use this diagram.*

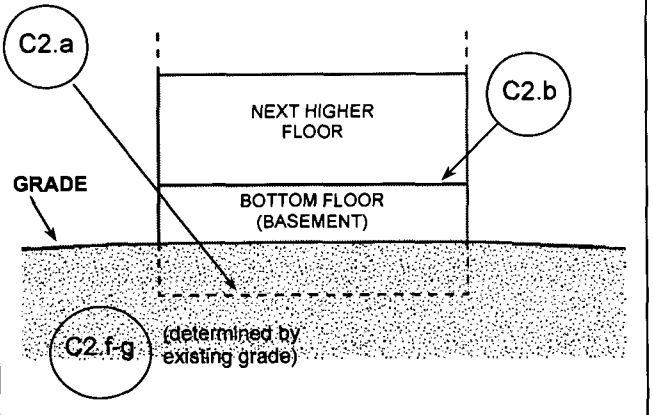


DIAGRAM 3

All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (excluding garage) is at or above ground level (grade) on at least one side .*

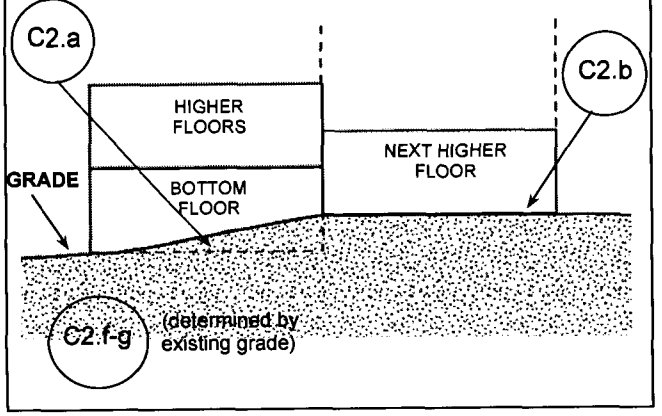
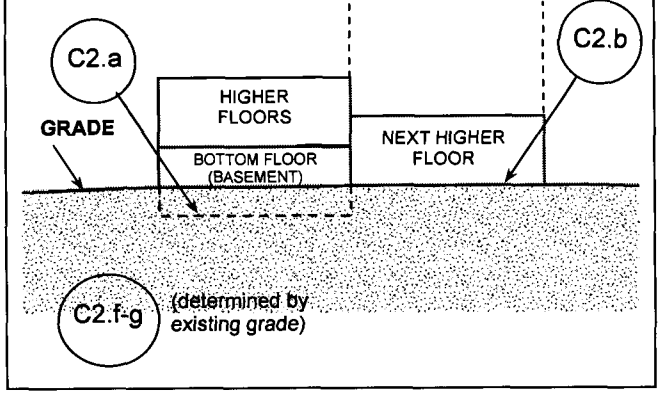


DIAGRAM 4

All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides. Buildings constructed above crawl spaces that are below grade on all sides should also use this diagram. *



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

DIAGRAM 5

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is *open, with no obstruction to flow of flood waters (open lattice work and/or* readily removable insect screening is permissible).

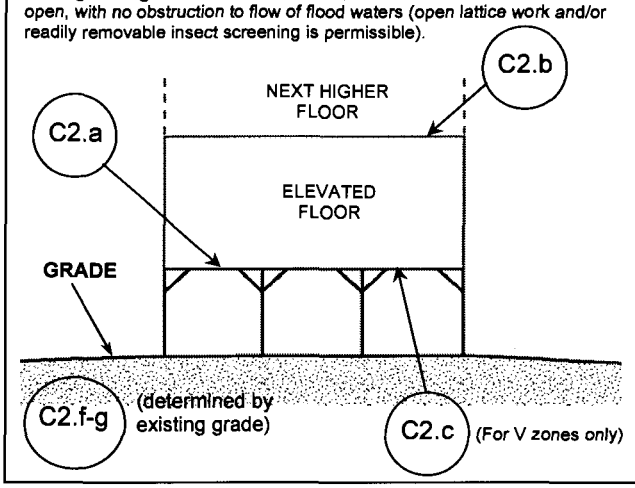


DIAGRAM 6

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

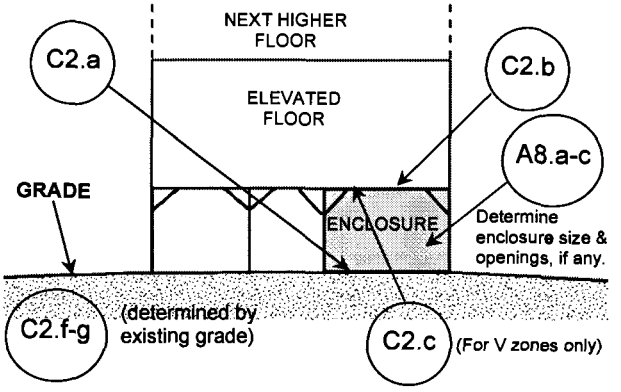


DIAGRAM 7

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

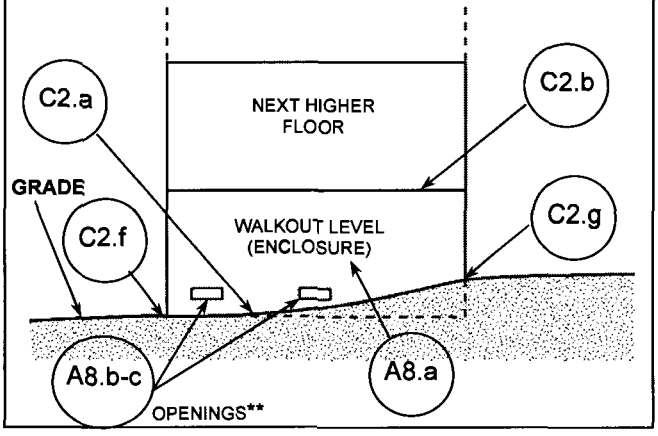
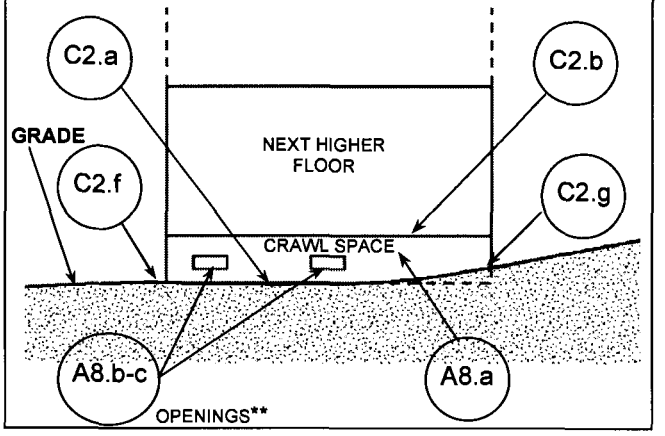


DIAGRAM 8

All buildings elevated on a crawl space with the floor of the crawl space at or above grade on at least one side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawl space is with or without openings** present in the walls of the crawl space. Indicate information about crawl space size and openings in Section A – Property Information.



** An "opening" is defined as a permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawl spaces with a total net area of not less than one square inch for every square foot of area enclosed. Each opening must be on different sides of the enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter. The bottom of the openings must be no higher than one foot above the grade underneath the flood vents. Alternatively, you may submit a certification by a registered professional engineer or architect that the design will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening.

Duplicate Effective Model HEC-RAS Output File (NGVD 29)

Duplicate Effective Model HEC-RAS Output File (NGVD 29)

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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: Effective Pulsrev7
Project File : pulsrev7.prj
Run Date and Time: 11/16/2005 7:30:42 AM

Project in English units

Project Description:
550-035
Mequite Wash FIS Restudy
Pulsipher Wash

****

PLAN DATA

Plan Title: Imported Plan 01
Plan File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.p01

Geometry Title: Imported Geom 01
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.g01

Flow Title : Imported Flow 01
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.f01

Plan Summary Information:
Number of: Cross Sections = 52 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Imported Flow 01
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.f01

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	4900	2318
RIVER-1	Reach-1	3800	3474
RIVER-1	Reach-1	2500	3478
RIVER-1	Reach-1	2000	2138
RIVER-1	Reach-1	1800	2209
RIVER-1	Reach-1	1400	2101
RIVER-1	Reach-1	1200	1889
RIVER-1	Reach-1	1100	1232
RIVER-1	Reach-1	1000	966
RIVER-1	Reach-1	900	798
RIVER-1	Reach-1	800	676
RIVER-1	Reach-1	700	669

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1		Critical

****

GEOMETRY DATA

Geometry Title: Imported Geom 01
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.g01

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4900

INPUT
Description: 4900
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
101.08	1720	118.6	1710	126.87	1708	136.18	1706	139.34	1704
144.61	1702	157.05	1702	171.77	1702	187.75	1702	198.82	1704
207.55	1706	232.01	1708	259.71	1710	290.56	1720		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
101.08	.04	118.6	.025	259.71	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118.6	259.71	374.55	351.24	218.45	.1	.3

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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: Effective Pulsrev7
Project File : pulsrev7.prj
Run Date and Time: 11/16/2005 7:30:42 AM

Project in English units

Project Description:
550-035
Mequite Wash FIS Restudy
Pulsipher Wash

****

PLAN DATA

Plan Title: Imported Plan 01
Plan File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.p01

Geometry Title: Imported Geom 01
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.g01

Flow Title : Imported Flow 01
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.f01

Plan Summary Information:
Number of: Cross Sections = 52 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Imported Flow 01
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.f01

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	4900	2318
RIVER-1	Reach-1	3800	3474
RIVER-1	Reach-1	2500	3478
RIVER-1	Reach-1	2000	2138
RIVER-1	Reach-1	1800	2209
RIVER-1	Reach-1	1400	2101
RIVER-1	Reach-1	1200	1889
RIVER-1	Reach-1	1100	1232
RIVER-1	Reach-1	1000	966
RIVER-1	Reach-1	900	798
RIVER-1	Reach-1	800	676
RIVER-1	Reach-1	700	669

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1		Critical

****

GEOMETRY DATA

Geometry Title: Imported Geom 01
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\pulsrev7.g01

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4900

INPUT
Description: 4900
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
101.08	1720	118.6	1710	126.87	1708	136.18	1706	139.34	1704
144.61	1702	157.05	1702	171.77	1702	187.75	1702	198.82	1704
207.55	1706	232.01	1708	259.71	1710	290.56	1720		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
101.08	.04	118.6	.025	259.71	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118.6	259.71	374.55	351.24	218.45	.1 .3

C23

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.025	
W.S. Elev (ft)	1705.91	Reach Len. (ft)	374.55	351.24	218.45
Crit W.S. (ft)	1705.91	Flow Area (sq ft)		227.16	
E.G. Slope (ft/ft)	*0.006388	Area (sq ft)		227.16	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	70.84	Top Width (ft)		70.84	
Vel Total (ft/s)	10.20	Avg. Vel. (ft/s)		10.20	
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)		3.21	
Conv. Total (cfs)	29001.2	Conv. (cfs)		29001.2	
Length Wtd. (ft)	351.24	Wetted Per. (ft)		72.16	
Min Ch El (ft)	1702.00	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)		12.81	
Frctn Loss (ft)	2.20	Cum Volume (acre-ft)	15.04	122.98	39.67
C & E Loss (ft)	0.04	Cum SA (acres)	5.51	52.10	10.57

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 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: 4800

INPUT
Description: 4800
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720	34.45	1720	47.68	1719.1	67.95	1718	81.26	1716
99.11	1714	138.55	1714	152.91	1714.5	167.56	1714	188.86	1712
199.39	1710	204.07	1708	211.95	1706	220.53	1704	222.94	1702
229.54	1700	234.6	1698	259.35	1698	266.03	1700	286.05	1710
306.75	1720	307.66	1720						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	199.39	.025	286.05	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
199.39	286.05	187.19	227.74	241.84	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.025	
W.S. Elev (ft)	1703.19	Reach Len. (ft)	187.19	227.74	241.84
Crit W.S. (ft)	1703.19	Flow Area (sq ft)		203.20	
E.G. Slope (ft/ft)	*0.006149	Area (sq ft)		203.20	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	50.91	Top Width (ft)		50.91	
Vel Total (ft/s)	11.41	Avg. Vel. (ft/s)		11.41	
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)		3.99	
Conv. Total (cfs)	29559.5	Conv. (cfs)		29559.5	
Length Wtd. (ft)	227.96	Wetted Per. (ft)		53.07	
Min Ch El (ft)	1698.00	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		16.77	
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	15.04	121.24	39.67
C & E Loss (ft)	0.22	Cum SA (acres)	5.51	51.61	10.57

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4700

INPUT
Description: 4700
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716	8.97	1714	19.28	1712	50.93	1710	76.41	1708
85.71	1708	111.4	1710	149.36	1710	171.04	1710	220.24	1710.6
255.18	1710	257.77	1710	275.64	1710	298.45	1708	313.76	1706
334.45	1704	364.57	1702	373.98	1700	382.11	1698	387.57	1696
418.98	1696	430.84	1698	442.2	1700	475.32	1700	485.47	1698
491.37	1698	503.73	1700	533.35	1710	554.54	1712.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	373.98	.025	442.2	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
373.98	442.2	272.78	260.86	275.83	.1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
442.2	554.54	1700

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1701.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1700.64	Reach Len. (ft)	272.78	260.86	275.83
Crit W.S. (ft)	1700.64	Flow Area (sq ft)	0.97	240.91	40.13
E.G. Slope (ft/ft)	*0.004643	Area (sq ft)	0.97	240.91	40.13
Q Total (cfs)	2318.00	Flow (cfs)	1.14	2242.08	74.79
Top Width (ft)	134.67	Top Width (ft)	3.02	68.22	63.43
Vel Total (ft/s)	8.22	Avg. Vel. (ft/s)	1.17	9.31	1.86
Max Chl Dpth (ft)	4.64	Hydr. Depth (ft)	0.32	3.53	0.63
Conv. Total (cfs)	34018.0	Conv. (cfs)	16.7	32903.8	1097.6
Length Wtd. (ft)	261.10	Wetted Per. (ft)	3.09	69.16	63.54
Min Ch El (ft)	1696.00	Shear (lb/sq ft)	0.09	1.01	0.18

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1707.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.62	Wt. n-Val.		0.025	
W.S. Elev (ft)	1705.91	Reach Len. (ft)	374.55	351.24	218.45
Crit W.S. (ft)	1705.91	Flow Area (sq ft)		227.16	
E.G. Slope (ft/ft)	0.006388	Area (sq ft)		227.16	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	70.84	Top Width (ft)		70.84	
Vel Total (ft/s)	10.20	Avg. Vel. (ft/s)		10.20	
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)		3.21	
Conv. Total (cfs)	29001.2	Conv. (cfs)		29001.2	
Length Wtd. (ft)	351.24	Wetted Per. (ft)		72.16	
Min Ch El (ft)	1702.00	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)		12.81	
Frctn Loss (ft)	2.20	Cum Volume (acre-ft)	15.04	122.98	39.67
C & E Loss (ft)	0.04	Cum SA (acres)	5.51	52.10	10.57

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 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: 4800

INPUT
Description: 4800
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1720	34.45	1720	47.68	1719.1	67.95	1718	81.26	1716
99.11	1714	138.55	1714	152.91	1714.5	167.56	1714	188.86	1712
199.39	1710	204.07	1708	211.95	1706	220.53	1704	222.94	1702
229.54	1700	234.6	1698	259.35	1698	266.03	1700	286.05	1710
306.75	1720	307.66	1720						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	199.39	.025	286.05	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
199.39	286.05	187.19	227.74	241.84	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1705.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.02	Wt. n-Val.		0.025	
W.S. Elev (ft)	1703.19	Reach Len. (ft)	187.19	227.74	241.84
Crit W.S. (ft)	1703.19	Flow Area (sq ft)		203.20	
E.G. Slope (ft/ft)	0.006149	Area (sq ft)		203.20	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	50.91	Top Width (ft)		50.91	
Vel Total (ft/s)	11.41	Avg. Vel. (ft/s)		11.41	
Max Chl Dpth (ft)	5.19	Hydr. Depth (ft)		3.99	
Conv. Total (cfs)	29559.5	Conv. (cfs)		29559.5	
Length Wtd. (ft)	227.96	Wetted Per. (ft)		53.07	
Min Ch El (ft)	1698.00	Shear (lb/sq ft)		1.47	
Alpha	1.00	Stream Power (lb/ft s)		16.77	
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	15.04	121.24	39.67
C & E Loss (ft)	0.22	Cum SA (acres)	5.51	51.61	10.57

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4700

INPUT
Description: 4700
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1716	8.97	1714	19.28	1712	50.93	1710	76.41	1708
85.71	1708	111.4	1710	149.36	1710	171.04	1710	220.24	1710.6
255.18	1710	257.77	1710	275.64	1710	298.45	1708	313.76	1706
334.45	1704	364.57	1702	373.98	1700	382.11	1698	387.57	1696
418.98	1696	430.84	1698	442.2	1700	475.32	1700	485.47	1698
491.37	1698	503.73	1700	533.35	1710	554.54	1712.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	373.98	.025	442.2	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
373.98	442.2	272.78	260.86	275.83	.1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
442.2	554.54	1700

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1701.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1700.64	Reach Len. (ft)	272.78	260.86	275.83
Crit W.S. (ft)	1700.64	Flow Area (sq ft)	0.97	240.91	40.13
E.G. Slope (ft/ft)	0.004643	Area (sq ft)	0.97	240.91	40.13
Q Total (cfs)	2318.00	Flow (cfs)	1.14	2242.08	74.79
Top Width (ft)	134.67	Top Width (ft)	3.02	68.22	63.43
Vel Total (ft/s)	8.22	Avg. Vel. (ft/s)	1.17	9.31	1.86
Max Chl Dpth (ft)	4.64	Hydr. Depth (ft)	0.32	3.53	0.63
Conv. Total (cfs)	34018.0	Conv. (cfs)	16.7	32903.8	1097.6
Length Wtd. (ft)	261.10	Wetted Per. (ft)	3.09	69.16	63.54
Min Ch El (ft)	1696.00	Shear (lb/sq ft)	0.09	1.01	0.18

* Alpha	*	1.24	* Stream Power (lb/ft s)	*	0.11	*	9.40	*	0.34	*
* Frctn Loss (ft)	*	1.48	* Cum Volume (acre-ft)	*	15.03	*	120.08	*	39.55	*
* C & E Loss (ft)	*	0.05	* Cum SA (acres)	*	5.50	*	51.30	*	10.39	*

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: 4600

INPUT
Description: 4600
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
16.97	1710	22.09	1708	26.16	1706	32.81	1704	52.97	1702
69.79	1700	71.45	1700	100.97	1701.4	134.65	1700	178.33	1698
199.43	1696	245.08	1694	251.89	1692	277.07	1692	285.45	1692
294.37	1692	299.32	1694	317.63	1696	322.08	1698	333.42	1700
339.21	1710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
16.97	.04	134.65	.025	333.42	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
134.65	333.42	488	442	278 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1697.15	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.15	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1696.00	* Reach Len. (ft)	* 488.00	* 442.00	* 278.00 *
* Crit W.S. (ft)	* 1696.00	* Flow Area (sq ft)	*	* 269.15	* *
* E.G. Slope (ft/ft)	*0.007074	* Area (sq ft)	*	* 269.15	* *
* Q Total (cfs)	* 2318.00	* Flow (cfs)	*	* 2318.00	* *
* Top Width (ft)	* 118.20	* Top Width (ft)	*	* 118.20	* *
* Vel Total (ft/s)	* 8.61	* Avg. Vel. (ft/s)	*	* 8.61	* *
* Max Chl Dpth (ft)	* 4.00	* Hydr. Depth (ft)	*	* 2.28	* *
* Conv. Total (cfs)	* 27559.7	* Conv. (cfs)	*	* 27559.7	* *
* Length Wtd. (ft)	* 442.00	* Wetted Per. (ft)	*	* 119.03	* *
* Min Ch El (ft)	* 1692.00	* Shear (lb/sq ft)	*	* 1.00	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.60	* *
* Frctn Loss (ft)	* 3.11	* Cum Volume (acre-ft)	* 15.03	* 118.56	* 39.43 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 5.49	* 50.74	* 10.19 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4500

INPUT
Description: 4500
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75.46	1720	91.69	1710	117.4	1700	120.73	1699.3	126.14	1698
135.73	1696	144.81	1694	170.97	1692	176.15	1690	181.18	1688
188.65	1686	207.59	1686	225.29	1688	276.16	1690	289.36	1690.6
317.67	1692	325.19	1694	332.17	1696	337.97	1698	352.73	1700
375.6	1710	416.63	1712						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75.46	.04	91.69	.025	375.6	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
91.69	375.6	416.91	533.38	575.19 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1691.73	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.18	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1690.55	* Reach Len. (ft)	* 416.91	* 533.38	* 575.19 *
* Crit W.S. (ft)	* 1690.55	* Flow Area (sq ft)	*	* 265.86	* *
* E.G. Slope (ft/ft)	*0.006994	* Area (sq ft)	*	* 265.86	* *
* Q Total (cfs)	* 2318.00	* Flow (cfs)	*	* 2318.00	* *
* Top Width (ft)	* 113.53	* Top Width (ft)	*	* 113.53	* *
* Vel Total (ft/s)	* 8.72	* Avg. Vel. (ft/s)	*	* 8.72	* *
* Max Chl Dpth (ft)	* 4.55	* Hydr. Depth (ft)	*	* 2.34	* *
* Conv. Total (cfs)	* 27717.5	* Conv. (cfs)	*	* 27717.5	* *
* Length Wtd. (ft)	* 533.38	* Wetted Per. (ft)	*	* 114.44	* *
* Min Ch El (ft)	* 1686.00	* Shear (lb/sq ft)	*	* 1.01	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.84	* *
* Frctn Loss (ft)	* 3.68	* Cum Volume (acre-ft)	* 15.03	* 115.84	* 39.43 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 5.49	* 49.56	* 10.19 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4400

INPUT
Description: 4400
Station Elevation Data num= 20

* Alpha	*	1.24	* Stream Power (lb/ft s)	*	0.11	*	9.40	*	0.34 *
* Frctn Loss (ft)	*	1.48	* Cum Volume (acre-ft)	*	15.03	*	120.08	*	39.55 *
* C & E Loss (ft)	*	0.05	* Cum SA (acres)	*	5.50	*	51.30	*	10.39 *

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: 4600

INPUT
Description: 4600
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
16.97	1710	22.09	1708	26.16	1706	32.81	1704	52.97	1702
69.79	1700	71.45	1700	100.97	1701.4	134.65	1700	178.33	1698
199.43	1696	245.08	1694	251.89	1692	277.07	1692	285.45	1692
294.37	1692	299.32	1694	317.63	1696	322.08	1698	333.42	1700
339.21	1710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
16.97	.04	134.65	.025	333.42	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
134.65	333.42	488	442	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1697.15	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.15	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1696.00	* Reach Len. (ft)	* 488.00	* 442.00	* 278.00 *
* Crit W.S. (ft)	* 1696.00	* Flow Area (sq ft)	*	* 269.15	* *
* E.G. Slope (ft/ft)	*0.007074	* Area (sq ft)	*	* 269.15	* *
* Q Total (cfs)	* 2318.00	* Flow (cfs)	*	* 2318.00	* *
* Top Width (ft)	* 118.20	* Top Width (ft)	*	* 118.20	* *
* Vel Total (ft/s)	* 8.61	* Avg. Vel. (ft/s)	*	* 8.61	* *
* Max Chl Dpth (ft)	* 4.00	* Hydr. Depth (ft)	*	* 2.28	* *
* Conv. Total (cfs)	* 27559.7	* Conv. (cfs)	*	* 27559.7	* *
* Length Wtd. (ft)	* 442.00	* Wetted Per. (ft)	*	* 119.03	* *
* Min Ch El (ft)	* 1692.00	* Shear (lb/sq ft)	*	* 1.00	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.60	* *
* Frctn Loss (ft)	* 3.11	* Cum Volume (acre-ft)	* 15.03	* 118.56	* 39.43 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 5.49	* 50.74	* 10.19 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4500

INPUT
Description: 4500
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75.46	1720	91.69	1710	117.4	1700	120.73	1699.3	126.14	1698
135.73	1696	144.81	1694	170.97	1692	176.15	1690	181.18	1688
188.65	1686	207.59	1686	225.29	1688	276.16	1690	289.36	1690.6
317.67	1692	325.19	1694	332.17	1696	337.97	1698	352.73	1700
375.6	1710	416.63	1712						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75.46	.04	91.69	.025	375.6	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
91.69	375.6	416.91	533.38	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1691.73	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.18	* Wt. n-Val.	*	* 0.025	* *
* W.S. Elev (ft)	* 1690.55	* Reach Len. (ft)	* 416.91	* 533.38	* 575.19 *
* Crit W.S. (ft)	* 1690.55	* Flow Area (sq ft)	*	* 265.86	* *
* E.G. Slope (ft/ft)	*0.006994	* Area (sq ft)	*	* 265.86	* *
* Q Total (cfs)	* 2318.00	* Flow (cfs)	*	* 2318.00	* *
* Top Width (ft)	* 113.53	* Top Width (ft)	*	* 113.53	* *
* Vel Total (ft/s)	* 8.72	* Avg. Vel. (ft/s)	*	* 8.72	* *
* Max Chl Dpth (ft)	* 4.55	* Hydr. Depth (ft)	*	* 2.34	* *
* Conv. Total (cfs)	* 27717.5	* Conv. (cfs)	*	* 27717.5	* *
* Length Wtd. (ft)	* 533.38	* Wetted Per. (ft)	*	* 114.44	* *
* Min Ch El (ft)	* 1686.00	* Shear (lb/sq ft)	*	* 1.01	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.84	* *
* Frctn Loss (ft)	* 3.68	* Cum Volume (acre-ft)	* 15.03	* 115.84	* 39.43 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 5.49	* 49.56	* 10.19 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4400

INPUT
Description: 4400
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1047.48	1698	1072.5	1696	1113.06	1694	1129.03	1692	1144.19	1690
1152.32	1688	1159.38	1686	1171.95	1684	1198.73	1682	1240.97	1680
1261.36	1680	1265.11	1682	1271.18	1684	1281.25	1686	1302.67	1688
1310.07	1690	1316.26	1692	1322.58	1694	1328.05	1696	1379.32	1698

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1047.48	.04	1152.32	.025	1302.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1152.32	1302.67	432	476	439	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1685.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.025	
W.S. Elev (ft)	1684.02	Reach Len. (ft)	432.00	476.00	439.00
Crit W.S. (ft)	1684.02	Flow Area (sq ft)		254.44	
E.G. Slope (ft/ft)	0.006800	Area (sq ft)		254.44	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	99.46	Top Width (ft)		99.46	
Vel Total (ft/s)	9.11	Avg. Vel. (ft/s)		9.11	
Max Chl Dpth (ft)	4.02	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	28109.1	Conv. (cfs)		28109.1	
Length Wtd. (ft)	476.00	Wetted Per. (ft)		100.41	
Min Ch El (ft)	1680.00	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)		9.80	
Frctn Loss (ft)	3.38	Cum Volume (acre-ft)	15.03	112.66	39.43
C & E Loss (ft)	0.09	Cum SA (acres)	5.49	48.26	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4300

INPUT
Description: 4300
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
89.17	1700	105.7	1690	168.17	1680	195.5	1678	203.3	1677.6
233.39	1676	271.26	1676	296.29	1678	349.29	1680	374.61	1682
413.28	1684	454.41	1686	473.84	1688	495.02	1690	512.03	1692
521.72	1694	534.23	1696	545.99	1698	552.12	1700		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
89.17	.04	168.17	.025	349.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
168.17	349.29	317.35	383.62	407.28	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1680.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.		0.025	
W.S. Elev (ft)	1679.22	Reach Len. (ft)	317.35	383.62	407.28
Crit W.S. (ft)	1679.22	Flow Area (sq ft)		290.74	
E.G. Slope (ft/ft)	0.007435	Area (sq ft)		290.74	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	149.64	Top Width (ft)		149.64	
Vel Total (ft/s)	7.97	Avg. Vel. (ft/s)		7.97	
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)		1.94	
Conv. Total (cfs)	26882.7	Conv. (cfs)		26882.7	
Length Wtd. (ft)	383.62	Wetted Per. (ft)		149.84	
Min Ch El (ft)	1676.00	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		7.18	
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	15.03	109.68	39.43
C & E Loss (ft)	0.02	Cum SA (acres)	5.49	46.90	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4200

INPUT
Description: 4200
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1690	8.75	1688	20.32	1686	34.98	1684	44.12	1682
52.74	1680	72.87	1678	109.44	1676	148.79	1674	163.05	1673.3
174.44	1674	221.93	1674	228.81	1672	242.3	1670	245.6	1670
268.66	1672	290.23	1674	304.27	1676	311.41	1678	318.01	1680
331.29	1690								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	72.87	.025	318.01	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72.87	318.01	285	402	297	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1675.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.025	
W.S. Elev (ft)	1674.92	Reach Len. (ft)	285.00	402.00	297.00
Crit W.S. (ft)	1674.92	Flow Area (sq ft)		302.19	
E.G. Slope (ft/ft)	0.007542	Area (sq ft)		302.19	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1047.48	1698	1072.5	1696	1113.06	1694	1129.03	1692	1144.19	1690
1152.32	1688	1159.38	1686	1171.95	1684	1198.73	1682	1240.97	1680
1261.36	1680	1265.11	1682	1271.18	1684	1281.25	1686	1302.67	1688
1310.07	1690	1316.26	1692	1322.58	1694	1328.05	1696	1379.32	1698

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1047.48	.04	1152.32	.025	1302.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1152.32	1302.67	432	476	439 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1685.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.		0.025	
W.S. Elev (ft)	1684.02	Reach Len. (ft)	432.00	476.00	439.00
Crit W.S. (ft)	1684.02	Flow Area (sq ft)		254.44	
E.G. Slope (ft/ft)	0.006800	Area (sq ft)		254.44	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	99.46	Top Width (ft)		99.46	
Vel Total (ft/s)	9.11	Avg. Vel. (ft/s)		9.11	
Max Chl Dpth (ft)	4.02	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	28109.1	Conv. (cfs)		28109.1	
Length Wtd. (ft)	476.00	Wetted Per. (ft)		100.41	
Min Ch El (ft)	1680.00	Shear (lb/sq ft)		1.08	
Alpha	1.00	Stream Power (lb/ft s)		9.80	
Frctn Loss (ft)	3.38	Cum Volume (acre-ft)	15.03	112.66	39.43
C & E Loss (ft)	0.09	Cum SA (acres)	5.49	48.26	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4300

INPUT
Description: 4300
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
89.17	1700	105.7	1690	168.17	1680	195.5	1678	203.3	1677.6
233.39	1676	271.26	1676	296.29	1678	349.29	1680	374.61	1682
413.28	1684	454.41	1686	473.84	1688	495.02	1690	512.03	1692
521.72	1694	534.23	1696	545.99	1698	552.12	1700		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
89.17	.04	168.17	.025	349.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
168.17	349.29	317.35	383.62	407.28 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1680.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.99	Wt. n-Val.		0.025	
W.S. Elev (ft)	1679.22	Reach Len. (ft)	317.35	383.62	407.28
Crit W.S. (ft)	1679.22	Flow Area (sq ft)		290.74	
E.G. Slope (ft/ft)	0.007435	Area (sq ft)		290.74	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	149.64	Top Width (ft)		149.64	
Vel Total (ft/s)	7.97	Avg. Vel. (ft/s)		7.97	
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)		1.94	
Conv. Total (cfs)	26882.7	Conv. (cfs)		26882.7	
Length Wtd. (ft)	383.62	Wetted Per. (ft)		149.84	
Min Ch El (ft)	1676.00	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		7.18	
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	15.03	109.68	39.43
C & E Loss (ft)	0.02	Cum SA (acres)	5.49	46.90	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4200

INPUT
Description: 4200
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1690	8.75	1688	20.32	1686	34.98	1684	44.12	1682
52.74	1680	72.87	1678	109.44	1676	148.79	1674	163.05	1673.3
174.44	1674	221.93	1674	228.81	1672	242.3	1670	245.6	1670
268.66	1672	290.23	1674	304.27	1676	311.41	1678	318.01	1680
331.29	1690								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	72.87	.025	318.01	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72.87	318.01	285	402	297 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1675.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.		0.025	
W.S. Elev (ft)	1674.92	Reach Len. (ft)	285.00	402.00	297.00
Crit W.S. (ft)	1674.92	Flow Area (sq ft)		302.19	
E.G. Slope (ft/ft)	0.007542	Area (sq ft)		302.19	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	

Top Width (ft)	166.08	Top Width (ft)			166.08						
Vel Total (ft/s)	7.67	Avg. Vel. (ft/s)			7.67						
Max Chl Dpth (ft)	4.92	Hydr. Depth (ft)			1.82						
Conv. Total (cfs)	26691.2	Conv. (cfs)			26691.2						
Length Wtd. (ft)	402.00	Wetted Per. (ft)			166.82						
Min Ch El (ft)	1670.00	Shear (lb/sq ft)			0.85						
Alpha	1.00	Stream Power (lb/ft s)			6.54						
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)		15.03	107.07		39.43				
C & E Loss (ft)	0.00	Cum SA (acres)		5.49	45.51		10.19				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4100

INPUT
Description: 4100
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
148.32	1680	157.13	1678	173.19	1676	188.76	1674	201.4	1672
217.1	1670	223.19	1670	244.9	1670	248.78	1668	254.13	1666
279.97	1666	296.89	1668	368.21	1670	395.34	1672	408.03	1674
416.54	1676	422.71	1678	431.82	1680				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
148.32	.04	201.4	.025	408.03	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
201.4	408.03	535	497	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1671.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.		0.025	
W.S. Elev (ft)	1670.33	Reach Len. (ft)	535.00	497.00	356.00
Crit W.S. (ft)	1670.33	Flow Area (sq ft)		296.51	
E.G. Slope (ft/ft)	0.007550	Area (sq ft)		296.51	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	158.19	Top Width (ft)		158.19	
Vel Total (ft/s)	7.82	Avg. Vel. (ft/s)		7.82	
Max Chl Dpth (ft)	4.33	Hydr. Depth (ft)		1.87	
Conv. Total (cfs)	26676.6	Conv. (cfs)		26676.6	
Length Wtd. (ft)	497.00	Wetted Per. (ft)		159.22	
Min Ch El (ft)	1666.00	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)		6.86	
Frctn Loss (ft)	3.62	Cum Volume (acre-ft)	15.03	104.30	39.43
C & E Loss (ft)	0.02	Cum SA (acres)	5.49	44.01	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4000

INPUT
Description: 4000
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57.92	1670	60.45	1668	62.12	1666	69.1	1664	80.78	1662
85.35	1660	112.66	1660	121.12	1662	164.38	1664	239.26	1666
249.41	1666.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57.92	.04	62.12	.025	249.41	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62.12	249.41	444.57	465.67	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1665.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.		0.025	
W.S. Elev (ft)	1664.64	Reach Len. (ft)	444.57	465.67	477.86
Crit W.S. (ft)	1664.64	Flow Area (sq ft)		272.49	
E.G. Slope (ft/ft)	0.007047	Area (sq ft)		272.49	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	121.43	Top Width (ft)		121.43	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	4.64	Hydr. Depth (ft)		2.24	
Conv. Total (cfs)	27613.7	Conv. (cfs)		27613.7	
Length Wtd. (ft)	465.67	Wetted Per. (ft)		122.39	
Min Ch El (ft)	1660.00	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		8.33	
Frctn Loss (ft)	3.46	Cum Volume (acre-ft)	15.03	101.06	39.43
C & E Loss (ft)	0.09	Cum SA (acres)	5.49	42.42	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3900

* Top Width (ft)	*	166.08	* Top Width (ft)	*		*	166.08	*			*
* Vel Total (ft/s)	*	7.67	* Avg. Vel. (ft/s)	*		*	7.67	*			*
* Max Chl Dpth (ft)	*	4.92	* Hydr. Depth (ft)	*		*	1.82	*			*
* Conv. Total (cfs)	*	26691.2	* Conv. (cfs)	*		*	26691.2	*			*
* Length Wtd. (ft)	*	402.00	* Wetted Per. (ft)	*		*	166.82	*			*
* Min Ch El (ft)	*	1670.00	* Shear (lb/sq ft)	*		*	0.85	*			*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	6.54	*			*
* Frctn Loss (ft)	*	3.03	* Cum Volume (acre-ft)	*	15.03	*	107.07	*	39.43		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	5.49	*	45.51	*	10.19		*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4100

INPUT
Description: 4100
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
148.32	1680	157.13	1678	173.19	1676	188.76	1674	201.4	1672
217.1	1670	223.19	1670	244.9	1670	248.78	1668	254.13	1666
279.97	1666	296.89	1668	368.21	1670	395.34	1672	408.03	1674
416.54	1676	422.71	1678	431.82	1680				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
148.32	.04	201.4	.025	408.03	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
201.4	408.03	535	497	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1671.28	* Element	*	Left OB	*	Channel	*	Right OB		*
* Vel Head (ft)	*	0.95	* Wt. n-Val.	*		*	0.025	*			*
* W.S. Elev (ft)	*	1670.33	* Reach Len. (ft)	*	535.00	*	497.00	*	356.00		*
* Crit W.S. (ft)	*	1670.33	* Flow Area (sq ft)	*		*	296.51	*			*
* E.G. Slope (ft/ft)	*	0.007550	* Area (sq ft)	*		*	296.51	*			*
* Q Total (cfs)	*	2318.00	* Flow (cfs)	*		*	2318.00	*			*
* Top Width (ft)	*	158.19	* Top Width (ft)	*		*	158.19	*			*
* Vel Total (ft/s)	*	7.82	* Avg. Vel. (ft/s)	*		*	7.82	*			*
* Max Chl Dpth (ft)	*	4.33	* Hydr. Depth (ft)	*		*	1.87	*			*
* Conv. Total (cfs)	*	26676.6	* Conv. (cfs)	*		*	26676.6	*			*
* Length Wtd. (ft)	*	497.00	* Wetted Per. (ft)	*		*	159.22	*			*
* Min Ch El (ft)	*	1666.00	* Shear (lb/sq ft)	*		*	0.88	*			*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	6.86	*			*
* Frctn Loss (ft)	*	3.62	* Cum Volume (acre-ft)	*	15.03	*	104.30	*	39.43		*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	5.49	*	44.01	*	10.19		*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4000

INPUT
Description: 4000
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57.92	1670	60.45	1668	62.12	1666	69.1	1664	80.78	1662
85.35	1660	112.66	1660	121.12	1662	164.38	1664	239.26	1666
249.41	1666.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57.92	.04	62.12	.025	249.41	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62.12	249.41	444.57	465.67	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1665.76	* Element	*	Left OB	*	Channel	*	Right OB		*
* Vel Head (ft)	*	1.12	* Wt. n-Val.	*		*	0.025	*			*
* W.S. Elev (ft)	*	1664.64	* Reach Len. (ft)	*	444.57	*	465.67	*	477.86		*
* Crit W.S. (ft)	*	1664.64	* Flow Area (sq ft)	*		*	272.49	*			*
* E.G. Slope (ft/ft)	*	0.007047	* Area (sq ft)	*		*	272.49	*			*
* Q Total (cfs)	*	2318.00	* Flow (cfs)	*		*	2318.00	*			*
* Top Width (ft)	*	121.43	* Top Width (ft)	*		*	121.43	*			*
* Vel Total (ft/s)	*	8.51	* Avg. Vel. (ft/s)	*		*	8.51	*			*
* Max Chl Dpth (ft)	*	4.64	* Hydr. Depth (ft)	*		*	2.24	*			*
* Conv. Total (cfs)	*	27613.7	* Conv. (cfs)	*		*	27613.7	*			*
* Length Wtd. (ft)	*	465.67	* Wetted Per. (ft)	*		*	122.39	*			*
* Min Ch El (ft)	*	1660.00	* Shear (lb/sq ft)	*		*	0.98	*			*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	8.33	*			*
* Frctn Loss (ft)	*	3.46	* Cum Volume (acre-ft)	*	15.03	*	101.06	*	39.43		*
* C & E Loss (ft)	*	0.09	* Cum SA (acres)	*	5.49	*	42.42	*	10.19		*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3900

INPUT
Description: 3900
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68.89	1670	76.48	1660	109.93	1658	128.97	1658	143.72	1658
147.93	1658	228.75	1656	261.41	1656	286.12	1658	289.26	1658.3
303.73	1660	332.44	1662	354.48	1662	365.24	1660	388.81	1658.8
416.11	1660	428.9	1662	448.42	1664	460.82	1666	489.05	1668
546.72	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
68.89	.04	76.48	.025	332.44	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76.48	332.44	468.3	320.4	238.03	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.		0.025	
W.S. Elev (ft)	1658.80	Reach Len. (ft)	468.30	320.40	238.03
Crit W.S. (ft)	1658.80	Flow Area (sq ft)		319.23	
E.G. Slope (ft/ft)	0.007841	Area (sq ft)		319.23	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	196.83	Top Width (ft)		196.83	
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)		7.26	
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)		1.62	
Conv. Total (cfs)	26176.9	Conv. (cfs)		26176.9	
Length Wtd. (ft)	320.40	Wetted Per. (ft)		197.01	
Min Ch El (ft)	1656.00	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)		5.76	
Frctn Loss (ft)	2.61	Cum Volume (acre-ft)	15.03	97.90	39.43
C & E Loss (ft)	0.04	Cum SA (acres)	5.49	40.72	10.19

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 conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3800

INPUT
Description: 3800
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
24.23	1670	42.37	1660	44.95	1658	48.64	1656	62.46	1654
248.3	1654	288.05	1656	307.66	1656	426.77	1656	437.01	1658
446.89	1660	454.29	1662	464.34	1664	469.29	1666	473.37	1668
483.32	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
24.23	.04	42.37	.025	437.01	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
42.37	437.01	480	666	713	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1656.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.025	
W.S. Elev (ft)	1656.25	Reach Len. (ft)	480.00	666.00	713.00
Crit W.S. (ft)	1656.25	Flow Area (sq ft)		519.49	
E.G. Slope (ft/ft)	0.008347	Area (sq ft)		519.49	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	379.86	Top Width (ft)		379.86	
Vel Total (ft/s)	6.69	Avg. Vel. (ft/s)		6.69	
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)		1.37	
Conv. Total (cfs)	38023.5	Conv. (cfs)		38023.5	
Length Wtd. (ft)	666.00	Wetted Per. (ft)		380.14	
Min Ch El (ft)	1654.00	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		4.76	
Frctn Loss (ft)	4.00	Cum Volume (acre-ft)	15.03	94.81	39.43
C & E Loss (ft)	0.06	Cum SA (acres)	5.49	38.60	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3700

INPUT
Description: 3700
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58.71	1660	62.54	1658	71.6	1656	83.19	1654	99.81	1652
116.08	1650	222.35	1648	252.85	1648	259.17	1648	278.23	1648
293.98	1648	305.86	1648	334.35	1648	360.03	1648	368.2	1648
450.38	1648	484.45	1650	490.39	1650.36	528.5	1652	546.14	1654
553.69	1656	561.37	1658	571.08	1660				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
58.71	.04	99.81	.025	528.5	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
99.81	528.5	397.89	409.82	401.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

INPUT
Description: 3900
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68.89	1670	76.48	1660	109.93	1658	128.97	1658	143.72	1658
147.93	1658	228.75	1656	261.41	1656	286.12	1658	289.26	1658.3
303.73	1660	332.44	1662	354.48	1662	365.24	1660	388.81	1658.8
416.11	1660	428.9	1662	448.42	1664	460.82	1666	489.05	1668
546.72	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
68.89	.04	76.48	.025	332.44	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76.48	332.44	468.3	320.4	238.03	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.82	Wt. n-Val.		0.025	
W.S. Elev (ft)	1658.80	Reach Len. (ft)	468.30	320.40	238.03
Crit W.S. (ft)	1658.80	Flow Area (sq ft)		319.23	
E.G. Slope (ft/ft)	*0.007841	Area (sq ft)		319.23	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	196.83	Top Width (ft)		196.83	
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)		7.26	
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)		1.62	
Conv. Total (cfs)	26176.9	Conv. (cfs)		26176.9	
Length Wtd. (ft)	320.40	Wetted Per. (ft)		197.01	
Min Ch El (ft)	1656.00	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)		5.76	
Frctn Loss (ft)	2.61	Cum Volume (acre-ft)	15.03	97.90	39.43
C & E Loss (ft)	0.04	Cum SA (acres)	5.49	40.72	10.19

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 conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3800

INPUT
Description: 3800
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
24.23	1670	42.37	1660	44.95	1658	48.64	1656	62.46	1654
248.3	1654	288.05	1656	307.66	1656	426.77	1656	437.01	1658
446.89	1660	454.29	1662	464.34	1664	469.29	1666	473.37	1668
483.32	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
24.23	.04	42.37	.025	437.01	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
42.37	437.01	480	666	713	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1656.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.025	
W.S. Elev (ft)	1656.25	Reach Len. (ft)	480.00	666.00	713.00
Crit W.S. (ft)	1656.25	Flow Area (sq ft)		519.49	
E.G. Slope (ft/ft)	*0.008347	Area (sq ft)		519.49	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	379.86	Top Width (ft)		379.86	
Vel Total (ft/s)	6.69	Avg. Vel. (ft/s)		6.69	
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)		1.37	
Conv. Total (cfs)	38023.5	Conv. (cfs)		38023.5	
Length Wtd. (ft)	666.00	Wetted Per. (ft)		380.14	
Min Ch El (ft)	1654.00	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		4.76	
Frctn Loss (ft)	4.00	Cum Volume (acre-ft)	15.03	94.81	39.43
C & E Loss (ft)	0.06	Cum SA (acres)	5.49	38.60	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3700

INPUT
Description: 3700
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58.71	1660	62.54	1658	71.6	1656	83.19	1654	99.81	1652
116.08	1650	222.35	1648	252.85	1648	259.17	1648	278.23	1648
293.98	1648	305.86	1648	334.35	1648	360.03	1648	368.2	1648
450.38	1648	484.45	1650	490.39	1650.36	528.5	1652	546.14	1654
553.69	1656	561.37	1658	571.08	1660				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
58.71	.04	99.81	.025	528.5	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
99.81	528.5	397.89	409.82	401.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1650.55	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.49	Wt. n-Val.		0.025		
W.S. Elev (ft)	1650.06	Reach Len. (ft)	397.89	409.82	401.06	
Crit W.S. (ft)		Flow Area (sq ft)		617.26		
E.G. Slope (ft/ft)	*0.004529	Area (sq ft)		617.26		
Q Total (cfs)	3474.00	Flow (cfs)		3474.00		
Top Width (ft)	369.76	Top Width (ft)		369.76		
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)		5.63		
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)		1.67		
Conv. Total (cfs)	51620.4	Conv. (cfs)		51620.4		
Length Wtd. (ft)	409.82	Wetted Per. (ft)		369.85		
Min Ch El (ft)	1648.00	Shear (lb/sq ft)		0.47		
Alpha	1.00	Stream Power (lb/ft s)		2.66		
Frctn Loss (ft)	2.48	Cum Volume (acre-ft)	15.03	86.12	39.43	
C & E Loss (ft)	0.01	Cum SA (acres)	5.49	32.86	10.19	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3600

INPUT
Description: 3600
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75.43	1660	80.52	1658	91.22	1656	99.08	1654	110.5	1652
129.6	1650	149.25	1648	271.37	1646	283.71	1646	312.95	1646
327.9	1646	360.07	1646	420.55	1646	607.71	1646	618.21	1648
627.24	1650	634.08	1652	648.02	1654	659.58	1656	673.87	1658
681.36	1660								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75.43	.04	149.25	.025	618.21	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
149.25	618.21	366.01	358.51	356.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.05	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.64	Wt. n-Val.		0.025		
W.S. Elev (ft)	1647.42	Reach Len. (ft)	366.01	358.51	356.91	
Crit W.S. (ft)	1647.42	Flow Area (sq ft)		542.79		
E.G. Slope (ft/ft)	*0.008510	Area (sq ft)		542.79		
Q Total (cfs)	3474.00	Flow (cfs)		3474.00		
Top Width (ft)	430.24	Top Width (ft)		430.24		
Vel Total (ft/s)	6.40	Avg. Vel. (ft/s)		6.40		
Max Chl Dpth (ft)	1.42	Hydr. Depth (ft)		1.26		
Conv. Total (cfs)	37659.4	Conv. (cfs)		37659.4		
Length Wtd. (ft)	358.51	Wetted Per. (ft)		430.39		
Min Ch El (ft)	1646.00	Shear (lb/sq ft)		0.67		
Alpha	1.00	Stream Power (lb/ft s)		4.29		
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)	15.03	80.66	39.43	
C & E Loss (ft)	0.06	Cum SA (acres)	5.49	29.10	10.19	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3500

INPUT
Description: 3500
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1117.94	1650	1129.92	1648	1139.19	1646	1154.95	1644	1166.11	1642
1198.2	1640	1311.56	1640	1663.86	1642	1780.13	1644	1820.67	1646
1954.48	1648	1976.19	1650						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1117.94	.04	1139.19	.025	1820.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1139.19	1820.67	445.73	403.18	364.17	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1642.53	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.43	Wt. n-Val.		0.025		
W.S. Elev (ft)	1642.10	Reach Len. (ft)	445.73	403.18	364.17	
Crit W.S. (ft)	1641.90	Flow Area (sq ft)		662.91		
E.G. Slope (ft/ft)	*0.005400	Area (sq ft)		662.91		
Q Total (cfs)	3474.00	Flow (cfs)		3474.00		
Top Width (ft)	504.34	Top Width (ft)		504.34		
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		5.24		
Max Chl Dpth (ft)	2.10	Hydr. Depth (ft)		1.31		
Conv. Total (cfs)	47274.4	Conv. (cfs)		47274.4		
Length Wtd. (ft)	403.18	Wetted Per. (ft)		504.42		
Min Ch El (ft)	1640.00	Shear (lb/sq ft)		0.44		
Alpha	1.00	Stream Power (lb/ft s)		2.32		
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	15.03	75.70	39.43	
C & E Loss (ft)	0.02	Cum SA (acres)	5.49	25.26	10.19	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3400

INPUT
Description: 3400

E.G. Elev (ft)	1650.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.025	
W.S. Elev (ft)	1650.06	Reach Len. (ft)	397.89	409.82	401.06
Crit W.S. (ft)		Flow Area (sq ft)		617.26	
E.G. Slope (ft/ft)	*0.004529	Area (sq ft)		617.26	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	369.76	Top Width (ft)		369.76	
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)		5.63	
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)		1.67	
Conv. Total (cfs)	51620.4	Conv. (cfs)		51620.4	
Length Wtd. (ft)	409.82	Wetted Per. (ft)		369.85	
Min Ch El (ft)	1648.00	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		2.66	
Frctn Loss (ft)	2.48	Cum Volume (acre-ft)	15.03	86.12	39.43
C & E Loss (ft)	0.01	Cum SA (acres)	5.49	32.86	10.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3600

INPUT
Description: 3600
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75.43	1660	80.52	1658	91.22	1656	99.08	1654	110.5	1652
129.6	1650	149.25	1648	271.37	1646	283.71	1646	312.95	1646
327.9	1646	360.07	1646	420.55	1646	607.71	1646	618.21	1648
627.24	1650	634.08	1652	648.02	1654	659.58	1656	673.87	1658
681.36	1660								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75.43	.04	149.25	.025	618.21	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
149.25 618.21 366.01 358.51 356.91 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.		0.025	
W.S. Elev (ft)	1647.42	Reach Len. (ft)	366.01	358.51	356.91
Crit W.S. (ft)	1647.42	Flow Area (sq ft)		542.79	
E.G. Slope (ft/ft)	*0.008510	Area (sq ft)		542.79	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	430.24	Top Width (ft)		430.24	
Vel Total (ft/s)	6.40	Avg. Vel. (ft/s)		6.40	
Max Chl Dpth (ft)	1.42	Hydr. Depth (ft)		1.26	
Conv. Total (cfs)	37659.4	Conv. (cfs)		37659.4	
Length Wtd. (ft)	358.51	Wetted Per. (ft)		430.39	
Min Ch El (ft)	1646.00	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		4.29	
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)	15.03	80.66	39.43
C & E Loss (ft)	0.06	Cum SA (acres)	5.49	29.10	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3500

INPUT
Description: 3500
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1117.94	1650	1129.92	1648	1139.19	1646	1154.95	1644	1166.11	1642
1198.2	1640	1311.56	1640	1663.86	1642	1780.13	1644	1820.67	1646
1954.48	1648	1976.19	1650						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1117.94	.04	1139.19	.025	1820.67	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1139.19 1820.67 445.73 403.18 364.17 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1642.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.025	
W.S. Elev (ft)	1642.10	Reach Len. (ft)	445.73	403.18	364.17
Crit W.S. (ft)	1641.90	Flow Area (sq ft)		662.91	
E.G. Slope (ft/ft)	*0.005400	Area (sq ft)		662.91	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	504.34	Top Width (ft)		504.34	
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		5.24	
Max Chl Dpth (ft)	2.10	Hydr. Depth (ft)		1.31	
Conv. Total (cfs)	47274.4	Conv. (cfs)		47274.4	
Length Wtd. (ft)	403.18	Wetted Per. (ft)		504.42	
Min Ch El (ft)	1640.00	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)		2.32	
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	15.03	75.70	39.43
C & E Loss (ft)	0.02	Cum SA (acres)	5.49	25.26	10.19

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3400

INPUT
Description: 3400

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
59.27	1650	84.27	1640	109.44	1638	126.6	1636	131.99	1634
140.44	1634	146.48	1636	193.98	1638	219.41	1638	270.82	1638
278.83	1638	384.4	1638	600.88	1640	643.45	1642	683.24	1644
705.45	1646	714.67	1648	724.58	1650				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
59.27	.04	84.27	.025	600.88	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
84.27 600.88 467.16 402.24 325.83 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1639.82	Element	Left OB	Channel / Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.025 /
W.S. Elev (ft)	1639.17	Reach Len. (ft)	467.16	402.24 / 325.83
Crit W.S. (ft)	1639.17	Flow Area (sq ft)		537.48 /
E.G. Slope (ft/ft)	0.008439	Area (sq ft)		537.48 /
Q Total (cfs)	3474.00	Flow (cfs)		3474.00 /
Top Width (ft)	416.42	Top Width (ft)		416.42 /
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46 /
Max Chl Dpth (ft)	5.17	Hydr. Depth (ft)		1.29 /
Conv. Total (cfs)	37816.3	Conv. (cfs)		37816.3 /
Length Wtd. (ft)	402.24	Wetted Per. (ft)		417.31 /
Min Ch El (ft)	1634.00	Shear (lb/sq ft)		0.68 /
Alpha	1.00	Stream Power (lb/ft s)		4.39 /
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	15.03	70.15 / 39.43
C & E Loss (ft)	0.07	Cum SA (acres)	5.49	20.99 / 10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3300

INPUT
Description: 3300
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1644	12.73	1642	25.07	1640	31.27	1638	36.55	1636
43.64	1634	47.01	1632	50.82	1630	55.39	1628	67.9	1628
72.59	1630	76.9	1632	79.06	1634	137.59	1636	212.17	1636
336.67	1636	350.97	1634	363.87	1634	407.22	1634	411.39	1632
414.76	1630	421.9	1628	494.95	1628	503.75	1630	508.15	1632
523.76	1632	526.02	1630	532.3	1630	537.02	1632	540.95	1634
575.86	1636	594.13	1638	601.98	1640	617.87	1642	633.83	1644

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	36.55	.025	575.86	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.55 575.86 462.6 482.8 416.49 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.76	Element	Left OB	Channel / Right OB
Vel Head (ft)	1.39	Wt. n-Val.		0.025 /
W.S. Elev (ft)	1631.36	Reach Len. (ft)	462.60	482.80 / 416.49
Crit W.S. (ft)	1631.36	Flow Area (sq ft)		366.60 /
E.G. Slope (ft/ft)	0.006780	Area (sq ft)		366.60 /
Q Total (cfs)	3474.00	Flow (cfs)		3474.00 /
Top Width (ft)	132.64	Top Width (ft)		132.64 /
Vel Total (ft/s)	9.48	Avg. Vel. (ft/s)		9.48 /
Max Chl Dpth (ft)	3.36	Hydr. Depth (ft)		2.76 /
Conv. Total (cfs)	42190.6	Conv. (cfs)		42190.6 /
Length Wtd. (ft)	482.80	Wetted Per. (ft)		136.06 /
Min Ch El (ft)	1628.00	Shear (lb/sq ft)		1.14 /
Alpha	1.00	Stream Power (lb/ft s)		10.81 /
Frctn Loss (ft)	3.05	Cum Volume (acre-ft)	15.03	65.97 / 39.43
C & E Loss (ft)	0.07	Cum SA (acres)	5.49	18.46 / 10.19

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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: 3200

INPUT
Description: 3200
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
227.47	1639.7	247.42	1630	253.14	1628	258.7	1626	267.64	1624
275.55	1622	310.81	1622	315.91	1624	321.83	1626	327.9	1628
403.91	1630	489.33	1632	564.85	1634	598.59	1636		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
227.47	.04	247.42	.025	403.91	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
247.42 403.91 426.92 390.01 395.6 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.64	Element	Left OB	Channel / Right OB

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
59.27	1650	84.27	1640	109.44	1638	126.6	1636	131.99	1634
140.44	1634	146.48	1636	193.98	1638	219.41	1638	270.82	1638
278.83	1638	384.4	1638	600.88	1640	643.45	1642	683.24	1644
705.45	1646	714.67	1648	724.58	1650				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
59.27	.04	84.27	.025	600.88	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84.27	600.88	467.16	402.24	325.83	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1639.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.025	
W.S. Elev (ft)	1639.17	Reach Len. (ft)	467.16	402.24	325.83
Crit W.S. (ft)	1639.17	Flow Area (sq ft)		537.48	
E.G. Slope (ft/ft)	0.008439	Area (sq ft)		537.48	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	416.42	Top Width (ft)		416.42	
Vel Total (ft/s)	6.46	Avg. Vel. (ft/s)		6.46	
Max Chl Dpth (ft)	5.17	Hydr. Depth (ft)		1.29	
Conv. Total (cfs)	37816.3	Conv. (cfs)		37816.3	
Length Wtd. (ft)	402.24	Wetted Per. (ft)		417.31	
Min Ch El (ft)	1634.00	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)		4.39	
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	15.03	70.15	39.43
C & E Loss (ft)	0.07	Cum SA (acres)	5.49	20.99	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3300

INPUT
Description: 3300
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1644	12.73	1642	25.07	1640	31.27	1638	36.55	1636
43.64	1634	47.01	1632	50.82	1630	55.39	1628	67.9	1628
72.59	1630	76.9	1632	79.06	1634	137.59	1636	212.17	1636
336.67	1636	350.97	1634	363.87	1634	407.22	1634	411.39	1632
414.76	1630	421.9	1628	494.95	1628	503.75	1630	508.15	1632
523.76	1632	526.02	1630	532.3	1630	537.02	1632	540.95	1634
575.86	1636	594.13	1638	601.98	1640	617.87	1642	633.83	1644

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	36.55	.025	575.86	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36.55	575.86	462.6	482.8	416.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.39	Wt. n-Val.		0.025	
W.S. Elev (ft)	1631.36	Reach Len. (ft)	462.60	482.80	416.49
Crit W.S. (ft)	1631.36	Flow Area (sq ft)		366.60	
E.G. Slope (ft/ft)	0.006780	Area (sq ft)		366.60	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	132.64	Top Width (ft)		132.64	
Vel Total (ft/s)	9.48	Avg. Vel. (ft/s)		9.48	
Max Chl Dpth (ft)	3.36	Hydr. Depth (ft)		2.76	
Conv. Total (cfs)	42190.6	Conv. (cfs)		42190.6	
Length Wtd. (ft)	482.80	Wetted Per. (ft)		136.06	
Min Ch El (ft)	1628.00	Shear (lb/sq ft)		1.14	
Alpha	1.00	Stream Power (lb/ft s)		10.81	
Frctn Loss (ft)	3.05	Cum Volume (acre-ft)	15.03	65.97	39.43
C & E Loss (ft)	0.07	Cum SA (acres)	5.49	18.46	10.19

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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: 3200

INPUT
Description: 3200
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
227.47	1639.7	247.42	1630	253.14	1628	258.7	1626	267.64	1624
275.55	1622	310.81	1622	315.91	1624	321.83	1626	327.9	1628
403.91	1630	489.33	1632	564.85	1634	598.59	1636		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
227.47	.04	247.42	.025	403.91	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
247.42	403.91	426.92	390.01	395.6	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1629.64	Element	Left OB	Channel	Right OB

Vel Head (ft)		2.10	Wt. n-Val.			0.025		
W.S. Elev (ft)		1627.54	Reach Len. (ft)		426.92	390.01		395.60
Crit W.S. (ft)		1627.54	Flow Area (sq ft)			299.06		
E.G. Slope (ft/ft)		0.005910	Area (sq ft)			299.06		
Q Total (cfs)		3474.00	Flow (cfs)			3474.00		
Top Width (ft)		72.09	Top Width (ft)			72.09		
Vel Total (ft/s)		11.62	Avg. Vel. (ft/s)			11.62		
Max Chl Dpth (ft)		5.54	Hydr. Depth (ft)			4.15		
Conv. Total (cfs)		45188.2	Conv. (cfs)			45188.2		
Length Wtd. (ft)		390.01	Wetted Per. (ft)			73.78		
Min Ch El (ft)		1622.00	Shear (lb/sq ft)			1.50		
Alpha		1.00	Stream Power (lb/ft s)			17.37		
Frctn Loss (ft)		2.47	Cum Volume (acre-ft)		15.03	62.28		39.43
C & E Loss (ft)		0.24	Cum SA (acres)		5.49	17.33		10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3100

INPUT
Description: 3100
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
88.37	1640	113.59	1630	118.26	1628	128.03	1626	297.39	1624
300.14	1622	302.9	1620	305.76	1618	319.74	1618	333.19	1618
337.19	1620	360.91	1622	384.72	1624	404.52	1626	466.46	1628
524.54	1630	559.37	1632	582.77	1634	608.27	1636	629.41	1638
646.16	1640								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
88.37	.04	128.03	.025	404.52	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
128.03	404.52	382.96	302.1	294.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1624.66	Reach Len. (ft)	382.96	302.10	294.37
Crit W.S. (ft)	1624.66	Flow Area (sq ft)		382.81	
E.G. Slope (ft/ft)	0.006813	Area (sq ft)		382.81	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	149.56	Top Width (ft)		149.56	
Vel Total (ft/s)	9.07	Avg. Vel. (ft/s)		9.07	
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	42087.5	Conv. (cfs)		42087.5	
Length Wtd. (ft)	303.69	Wetted Per. (ft)		152.17	
Min Ch El (ft)	1618.00	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		9.71	
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)	15.03	59.23	39.43
C & E Loss (ft)	0.01	Cum SA (acres)	5.49	16.33	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3000

INPUT
Description: 3000
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70.06	1630	82.14	1628	94.71	1626	106.08	1624	152.05	1623.2
224.19	1622	237.42	1620	274.5	1620	298.77	1620	312.51	1620
339.8	1620	361.48	1618	368.38	1616	378.05	1614	399.19	1614
402.54	1616	411.58	1618	443.93	1620	477.92	1622	497.81	1624
542.69	1626	577.88	1628	598.92	1628.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70.06	.04	339.8	.025	443.93	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
339.8	443.93	405.73	349.71	342.04	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.24	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1620.68	Reach Len. (ft)	405.73	349.71	342.04
Crit W.S. (ft)	1620.68	Flow Area (sq ft)	71.61	365.05	3.98
E.G. Slope (ft/ft)	0.004510	Area (sq ft)	71.61	365.05	3.98
Q Total (cfs)	3474.00	Flow (cfs)	136.72	3332.43	4.85
Top Width (ft)	222.67	Top Width (ft)	106.91	104.13	11.63
Vel Total (ft/s)	7.88	Avg. Vel. (ft/s)	1.91	9.13	1.22
Max Chl Dpth (ft)	6.68	Hydr. Depth (ft)	0.67	3.51	0.34
Conv. Total (cfs)	51731.7	Conv. (cfs)	2035.9	49623.6	72.2
Length Wtd. (ft)	350.81	Wetted Per. (ft)	106.96	105.54	11.65
Min Ch El (ft)	1614.00	Shear (lb/sq ft)	0.19	0.97	0.10
Alpha	1.29	Stream Power (lb/ft s)	0.36	8.89	0.12
Frctn Loss (ft)	2.08	Cum Volume (acre-ft)	14.72	56.64	39.41
C & E Loss (ft)	0.12	Cum SA (acres)	5.02	15.45	10.15

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 energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

Vel Head (ft)	2.10	Wt. n-Val.		0.025			
W.S. Elev (ft)	1627.54	Reach Len. (ft)	426.92	390.01	395.60		
Crit W.S. (ft)	1627.54	Flow Area (sq ft)		299.06			
E.G. Slope (ft/ft)	0.005910	Area (sq ft)		299.06			
Q Total (cfs)	3474.00	Flow (cfs)		3474.00			
Top Width (ft)	72.09	Top Width (ft)		72.09			
Vel Total (ft/s)	11.62	Avg. Vel. (ft/s)		11.62			
Max Chl Dpth (ft)	5.54	Hydr. Depth (ft)		4.15			
Conv. Total (cfs)	45188.2	Conv. (cfs)		45188.2			
Length Wtd. (ft)	390.01	Wetted Per. (ft)		73.78			
Min Ch El (ft)	1622.00	Shear (lb/sq ft)		1.50			
Alpha	1.00	Stream Power (lb/ft s)		17.37			
Frctn Loss (ft)	2.47	Cum Volume (acre-ft)	15.03	62.28	39.43		
C & E Loss (ft)	0.24	Cum SA (acres)	5.49	17.33	10.19		

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3100

INPUT
Description: 3100
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
88.37	1640	113.59	1630	118.26	1628	128.03	1626	297.39	1624
300.14	1622	302.9	1620	305.76	1618	319.74	1618	333.19	1618
337.19	1620	360.91	1622	384.72	1624	404.52	1626	466.46	1628
524.54	1630	559.37	1632	582.77	1634	608.27	1636	629.41	1638
646.16	1640								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
88.37	.04	128.03	.025	404.52	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
128.03	404.52	382.96	302.1	294.37	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1625.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1624.66	Reach Len. (ft)	382.96	302.10	294.37
Crit W.S. (ft)	1624.66	Flow Area (sq ft)		382.81	
E.G. Slope (ft/ft)	0.006813	Area (sq ft)		382.81	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	149.56	Top Width (ft)		149.56	
Vel Total (ft/s)	9.07	Avg. Vel. (ft/s)		9.07	
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	42087.5	Conv. (cfs)		42087.5	
Length Wtd. (ft)	303.69	Wetted Per. (ft)		152.17	
Min Ch El (ft)	1618.00	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		9.71	
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)	15.03	59.23	39.43
C & E Loss (ft)	0.01	Cum SA (acres)	5.49	16.33	10.19

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 3000

INPUT
Description: 3000
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70.06	1630	82.14	1628	94.71	1626	106.08	1624	152.05	1623.2
224.19	1622	237.42	1620	274.5	1620	298.77	1620	312.51	1620
339.8	1620	361.48	1618	368.38	1616	378.05	1614	399.19	1614
402.54	1616	411.58	1618	443.93	1620	477.92	1622	497.81	1624
542.69	1626	577.88	1628	598.92	1628.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70.06	.04	339.8	.025	443.93	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
339.8	443.93	405.73	349.71	342.04	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.24	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1620.68	Reach Len. (ft)	405.73	349.71	342.04
Crit W.S. (ft)	1620.68	Flow Area (sq ft)	71.61	365.05	3.98
E.G. Slope (ft/ft)	0.004510	Area (sq ft)	71.61	365.05	3.98
Q Total (cfs)	3474.00	Flow (cfs)	136.72	3332.43	4.85
Top Width (ft)	222.67	Top Width (ft)	106.91	104.13	11.63
Vel Total (ft/s)	7.88	Avg. Vel. (ft/s)	1.91	9.13	1.22
Max Chl Dpth (ft)	6.68	Hydr. Depth (ft)	0.67	3.51	0.34
Conv. Total (cfs)	51731.7	Conv. (cfs)	2035.9	49623.6	72.2
Length Wtd. (ft)	350.81	Wetted Per. (ft)	106.96	105.54	11.65
Min Ch El (ft)	1614.00	Shear (lb/sq ft)	0.19	0.97	0.10
Alpha	1.29	Stream Power (lb/ft s)	0.36	8.89	0.12
Frctn Loss (ft)	2.08	Cum Volume (acre-ft)	14.72	56.64	39.41
C & E Loss (ft)	0.12	Cum SA (acres)	5.02	15.45	10.15

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 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: 2900

INPUT
Description: 2900
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53.46	1630	61.93	1628	69.99	1626	77.51	1624	93.13	1622
124.83	1620	331.67	1618	366.34	1618	373	1620	393.02	1620.5
475.4	1620	525.34	1618	550.41	1618	631.71	1618	676.78	1618
700.32	1618	722.78	1616	731.76	1614	736.6	1612	763	1612
767.87	1614	772.71	1616	781.98	1616.98	790.94	1618	801.12	1620
816.77	1622	832.8	1624	858.03	1626	874	1628	890.18	1630

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53.46	.04	475.4	.025	801.12	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
475.4	801.12	292.71	292.09 273.86	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
53.46	392.8	1620.51

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1619.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.85	Wt. n-Val.		0.025	
W.S. Elev (ft)	1618.65	Reach Len. (ft)	292.71	292.09	273.86
Crit W.S. (ft)	1618.65	Flow Area (sq ft)		468.40	
E.G. Slope (ft/ft)	0.008097	Area (sq ft)		468.40	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	285.14	Top Width (ft)		285.14	
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)		7.42	
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)		1.64	
Conv. Total (cfs)	38608.0	Conv. (cfs)		38608.0	
Length Wtd. (ft)	292.09	Wetted Per. (ft)		286.82	
Min Ch El (ft)	1612.00	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		6.12	
Frctn Loss (ft)	2.15	Cum Volume (acre-ft)	14.38	53.29	39.40
C & E Loss (ft)	0.05	Cum SA (acres)	4.53	13.89	10.11

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: 2800

INPUT
Description: 2800
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1616	39.55	1616	96.03	1616	111.37	1616	159.52	1612
182.66	1614	197.49	1614.7	263.07	1616	302.64	1610	344.5	1612
372.11	1613.6	379.65	1614	429.47	1616	489.99	1620	503.61	1621.6
507.82	1622								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	263.07	.025	429.47	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
263.07	429.47	262.99	376.77 389.6	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	263.2	1616

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1616.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.31	Wt. n-Val.		0.025	
W.S. Elev (ft)	1615.32	Reach Len. (ft)	262.99	376.77	389.60
Crit W.S. (ft)	1615.32	Flow Area (sq ft)		377.51	
E.G. Slope (ft/ft)	0.006732	Area (sq ft)		377.51	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	145.11	Top Width (ft)		145.11	
Vel Total (ft/s)	9.20	Avg. Vel. (ft/s)		9.20	
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)		2.60	
Conv. Total (cfs)	42340.1	Conv. (cfs)		42340.1	
Length Wtd. (ft)	376.77	Wetted Per. (ft)		145.64	
Min Ch El (ft)	1610.00	Shear (lb/sq ft)		1.09	
Alpha	1.00	Stream Power (lb/ft s)		10.03	
Frctn Loss (ft)	2.57	Cum Volume (acre-ft)	14.38	50.46	39.40
C & E Loss (ft)	0.02	Cum SA (acres)	4.53	12.45	10.11

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 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: 2700

INPUT
Description: 2700

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: 2900

INPUT
Description: 2900
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53.46	1630	61.93	1628	69.99	1626	77.51	1624	93.13	1622
124.83	1620	331.67	1618	366.34	1618	373	1620	393.02	1620.5
475.4	1620	525.34	1618	550.41	1618	631.71	1618	676.78	1618
700.32	1618	722.78	1616	731.76	1614	736.6	1612	763	1612
767.87	1614	772.71	1616	781.98	1616.98	790.94	1618	801.12	1620
816.77	1622	832.8	1624	858.03	1626	874	1628	890.18	1630

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
53.46	.04	475.4	.025	801.12	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
475.4 801.12 292.71 292.09 273.86 .1 .3
Blocked Obstructions num= 1

Sta L	Sta R	Elev
53.46	392.8	1620.51

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1619.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.85	Wt. n-Val.		0.025	
W.S. Elev (ft)	1618.65	Reach Len. (ft)	292.71	292.09	273.86
Crit W.S. (ft)	1618.65	Flow Area (sq ft)		468.40	
E.G. Slope (ft/ft)	0.008097	Area (sq ft)		468.40	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	285.14	Top Width (ft)		285.14	
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)		7.42	
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)		1.64	
Conv. Total (cfs)	38608.0	Conv. (cfs)		38608.0	
Length Wtd. (ft)	292.09	Wetted Per. (ft)		286.82	
Min Ch El (ft)	1612.00	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		6.12	
Frctn Loss (ft)	2.15	Cum Volume (acre-ft)	14.38	53.29	39.40
C & E Loss (ft)	0.05	Cum SA (acres)	4.53	13.89	10.11

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: 2800

INPUT
Description: 2800
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1616	39.55	1616	96.03	1616	111.37	1616	159.52	1612
182.66	1614	197.49	1614.7	263.07	1616	302.64	1610	344.5	1612
372.11	1613.6	379.65	1614	429.47	1616	489.99	1620	503.61	1621.6
507.82	1622								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	263.07	.025	429.47	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
263.07 429.47 262.99 376.77 389.6 .1 .3
Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	263.2	1616

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1616.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.31	Wt. n-Val.		0.025	
W.S. Elev (ft)	1615.32	Reach Len. (ft)	262.99	376.77	389.60
Crit W.S. (ft)	1615.32	Flow Area (sq ft)		377.51	
E.G. Slope (ft/ft)	0.006732	Area (sq ft)		377.51	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	145.11	Top Width (ft)		145.11	
Vel Total (ft/s)	9.20	Avg. Vel. (ft/s)		9.20	
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)		2.60	
Conv. Total (cfs)	42340.1	Conv. (cfs)		42340.1	
Length Wtd. (ft)	376.77	Wetted Per. (ft)		145.64	
Min Ch El (ft)	1610.00	Shear (lb/sq ft)		1.09	
Alpha	1.00	Stream Power (lb/ft s)		10.03	
Frctn Loss (ft)	2.57	Cum Volume (acre-ft)	14.38	50.46	39.40
C & E Loss (ft)	0.02	Cum SA (acres)	4.53	12.45	10.11

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 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: 2700

INPUT
Description: 2700

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.68	1626	43.5	1624	53.17	1622	65.17	1620	101.3	1618
115.11	1618	141.58	1618	147.23	1616	265.04	1616	364.54	1616
369.57	1618	394.68	1618	400.49	1616	408.58	1614	570.98	1614
582.3	1614	605.11	1614	667.05	1612	699.84	1610	724.01	1608
753.82	1608	771.97	1610	781.65	1610.7	801.7	1612	832.94	1614
894.96	1616	898.43	1618	904.23	1620	923.69	1630		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.68	.04	605.11	.025	832.94	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
605.11	832.94	249.65	246.94	237.3	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1613.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1612.56	Reach Len. (ft)	249.65	246.94	237.30
Crit W.S. (ft)	1612.56	Flow Area (sq ft)		389.87	
E.G. Slope (ft/ft)	0.006903	Area (sq ft)		389.87	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	160.50	Top Width (ft)		160.50	
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)		8.91	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		2.43	
Conv. Total (cfs)	41813.5	Conv. (cfs)		41813.5	
Length Wtd. (ft)	246.94	Wetted Per. (ft)		160.85	
Min Ch El (ft)	1608.00	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)		9.31	
Frctn Loss (ft)	1.68	Cum Volume (acre-ft)	14.38	47.14	39.40
C & E Loss (ft)	0.01	Cum SA (acres)	4.53	11.13	10.11

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: 2600

INPUT
Description: 2600
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
170.68	1622	198.85	1620	205.29	1618	210.56	1616	237.93	1618
243.57	1616	474.86	1616	499.71	1616	504.57	1614	510.3	1612
752.1	1612	762.71	1612	774.94	1612	779.75	1610	784.94	1608
807.9	1608	855.3	1608	872.52	1606	907.23	1606	914.3	1608
919.14	1610	927.94	1612	946.75	1613.2	960.44	1614	971.24	1616
997.96	1618	1011.4	1620	1026.58	1622				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
170.68	.04	774.94	.025	927.94	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
774.94	927.94	320.81	373.36	390.78	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1611.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.025	
W.S. Elev (ft)	1610.08	Reach Len. (ft)	320.81	373.36	390.78
Crit W.S. (ft)	1610.08	Flow Area (sq ft)		373.46	
E.G. Slope (ft/ft)	0.006691	Area (sq ft)		373.46	
Q Total (cfs)	3474.00	Flow (cfs)		3474.00	
Top Width (ft)	139.93	Top Width (ft)		139.93	
Vel Total (ft/s)	9.30	Avg. Vel. (ft/s)		9.30	
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		2.67	
Conv. Total (cfs)	42469.5	Conv. (cfs)		42469.5	
Length Wtd. (ft)	368.39	Wetted Per. (ft)		141.11	
Min Ch El (ft)	1606.00	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)		10.28	
Frctn Loss (ft)	2.22	Cum Volume (acre-ft)	14.38	44.97	39.40
C & E Loss (ft)	0.01	Cum SA (acres)	4.53	10.27	10.11

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: 2500

INPUT
Description: 2500
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
41.78	1612	45.58	1610	56.33	1608	69.14	1607.4	97.11	1606
119.54	1604	161.89	1604	173.41	1604	209.67	1602	238.99	1602
243.04	1604	249.45	1606	260.55	1608	291.23	1610	303.53	1612

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
41.78	.04	173.41	.025	243.04	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
173.41	243.04	186.68	179.72	182.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1607.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.45	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1606.35	Reach Len. (ft)	186.68	179.72	182.96

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.68	1626	43.5	1624	53.17	1622	65.17	1620	101.3	1618
115.11	1618	141.58	1618	147.23	1616	265.04	1616	364.54	1616
369.57	1618	394.68	1618	400.49	1616	408.58	1614	570.98	1614
582.3	1614	605.11	1614	667.05	1612	699.84	1610	724.01	1608
753.82	1608	771.97	1610	781.65	1610.7	801.7	1612	832.94	1614
894.96	1616	898.43	1618	904.23	1620	923.69	1630		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.68	.04	605.11	.025	832.94	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
605.11 832.94 249.65 246.94 237.3 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1613.79	Element	Left OB	Channel / Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.025
W.S. Elev (ft)	1612.56	Reach Len. (ft)	249.65	246.94 / 237.30
Crit W.S. (ft)	1612.56	Flow Area (sq ft)		389.87
E.G. Slope (ft/ft)	*0.006903	Area (sq ft)		389.87
Q Total (cfs)	3474.00	Flow (cfs)		3474.00
Top Width (ft)	160.50	Top Width (ft)		160.50
Vel Total (ft/s)	8.91	Avg. Vel. (ft/s)		8.91
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		2.43
Conv. Total (cfs)	41813.5	Conv. (cfs)		41813.5
Length Wtd. (ft)	246.94	Wetted Per. (ft)		160.85
Min Ch El (ft)	1608.00	Shear (lb/sq ft)		1.04
Alpha	1.00	Stream Power (lb/ft s)		9.31
Frctn Loss (ft)	1.68	Cum Volume (acre-ft)	14.38	47.14 / 39.40 / 10.11
C & E Loss (ft)	0.01	Cum SA (acres)	4.53	11.13

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: 2600

INPUT
Description: 2600
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
170.68	1622	198.85	1620	205.29	1618	210.56	1616	237.93	1618
243.57	1616	474.86	1616	499.71	1616	504.57	1614	510.3	1612
752.1	1612	762.71	1612	774.94	1612	779.75	1610	784.94	1608
807.9	1608	855.3	1608	872.52	1606	907.23	1606	914.3	1608
919.14	1610	927.94	1612	946.75	1613.2	960.44	1614	971.24	1616
997.96	1618	1011.4	1620	1026.58	1622				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
170.68	.04	774.94	.025	927.94	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
774.94 927.94 320.81 373.36 390.78 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1611.42	Element	Left OB	Channel / Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.025
W.S. Elev (ft)	1610.08	Reach Len. (ft)	320.81	373.36 / 390.78
Crit W.S. (ft)	1610.08	Flow Area (sq ft)		373.46
E.G. Slope (ft/ft)	*0.006691	Area (sq ft)		373.46
Q Total (cfs)	3474.00	Flow (cfs)		3474.00
Top Width (ft)	139.93	Top Width (ft)		139.93
Vel Total (ft/s)	9.30	Avg. Vel. (ft/s)		9.30
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		2.67
Conv. Total (cfs)	42469.5	Conv. (cfs)		42469.5
Length Wtd. (ft)	368.39	Wetted Per. (ft)		141.11
Min Ch El (ft)	1606.00	Shear (lb/sq ft)		1.11
Alpha	1.00	Stream Power (lb/ft s)		10.28
Frctn Loss (ft)	2.22	Cum Volume (acre-ft)	14.38	44.97 / 39.40 / 10.11
C & E Loss (ft)	0.01	Cum SA (acres)	4.53	10.27

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: 2500

INPUT
Description: 2500
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
41.78	1612	45.58	1610	56.33	1608	69.14	1607.4	97.11	1606
119.54	1604	161.89	1604	173.41	1604	209.67	1602	238.99	1602
243.04	1604	249.45	1606	260.55	1608	291.23	1610	303.53	1612

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
41.78	.04	173.41	.025	243.04	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
173.41 243.04 186.68 179.72 182.96 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1607.81	Element	Left OB	Channel / Right OB
Vel Head (ft)	1.45	Wt. n-Val.	0.040	0.025 / 0.040
W.S. Elev (ft)	1606.35	Reach Len. (ft)	186.68	179.72 / 182.96

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1608	1008	1606	1028	1604	1122	1602	1156	1601
1203	1600	1205	1598	1209	1596	1238	1596	1243	1598
1247	1600	1288	1601.6	1327	1602	1437	1604	1483	1606
1508	1608								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1156	.025	1288	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1156	1288	235	240	222	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.33	Reach Len. (ft)	235.00	240.00	222.00
Crit W.S. (ft)		Flow Area (sq ft)	357.39	795.61	413.43
E.G. Slope (ft/ft)	0.000284	Area (sq ft)	357.39	795.61	413.43
Q Total (cfs)	3478.00	Flow (cfs)	415.35	2611.18	451.47
Top Width (ft)	452.73	Top Width (ft)	141.25	132.00	179.48
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	1.16	3.28	1.09
Max Chl Dpth (ft)	9.33	Hydr. Depth (ft)	2.53	6.03	2.30
Conv. Total (cfs)	206323.2	Conv. (cfs)	24639.6	154901.1	26782.5
Length Wtd. (ft)	235.44	Wetted Per. (ft)	141.35	134.20	179.53
Min Ch El (ft)	1596.00	Shear (lb/sq ft)	0.04	0.11	0.04
Alpha	1.70	Stream Power (lb/ft s)	0.05	0.35	0.04
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	11.87	39.04	38.27
C & E Loss (ft)	0.02	Cum SA (acres)	3.18	8.44	9.46

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: 2300

INPUT
Description: 2300
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1608	15.33	1608	21.57	1606	27.19	1604	63.6	1602
150.15	1600	164.23	1599	187.99	1598	192.33	1596	198.34	1594
228.2	1594	235.23	1596	238.65	1598	244.41	1600	250.92	1600
277.03	1600	398.64	1600	414.11	1602	452.77	1602	463.12	1600
475.52	1600	492.74	1602	507.6	1604	537.25	1606	543.16	1608

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	150.15	.025	250.92	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
150.15	250.92	320.42	311.55	310.65	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
453.09	543.16	1602

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.34	Reach Len. (ft)	320.42	311.55	310.65
Crit W.S. (ft)		Flow Area (sq ft)	463.75	854.51	1167.55
E.G. Slope (ft/ft)	0.000092	Area (sq ft)	463.75	854.51	1167.55
Q Total (cfs)	3478.00	Flow (cfs)	391.85	2000.25	1085.90
Top Width (ft)	504.10	Top Width (ft)	126.73	100.77	276.59
Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	0.84	2.34	0.93
Max Chl Dpth (ft)	11.34	Hydr. Depth (ft)	3.66	8.48	4.22
Conv. Total (cfs)	362504.5	Conv. (cfs)	40841.4	208481.9	113181.2
Length Wtd. (ft)	311.86	Wetted Per. (ft)	127.04	102.75	276.97
Min Ch El (ft)	1594.00	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	1.79	Stream Power (lb/ft s)	0.02	0.11	0.02
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	9.65	34.49	34.24
C & E Loss (ft)	0.01	Cum SA (acres)	2.46	7.80	8.30

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: 2200

INPUT
Description: 2200
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1608	20.66	1608	28.27	1606	40.91	1604	53.3	1603
71.43	1602	112.67	1600	142.43	1598	210.95	1596	217.68	1593
318.37	1598	562.06	1596	571.04	1596	618.66	1596	624.51	1596
693.73	1598	708.07	1600	779.64	1602				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	142.43	.025	318.37	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
142.43	318.37	383.01	328.57	273.85	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	142.43	1598	F
318.37	779.64	1598	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.37	Reach Len. (ft)	383.01	328.57	273.85
Crit W.S. (ft)	1598.01	Flow Area (sq ft)	450.65	1640.05	3607.19
E.G. Slope (ft/ft)	0.000012	Area (sq ft)	450.65	1640.05	3607.19
Q Total (cfs)	3478.00	Flow (cfs)	148.90	1499.50	1829.60
Top Width (ft)	747.37	Top Width (ft)	110.16	175.94	461.27

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1608	1008	1606	1028	1604	1122	1602	1156	1601
1203	1600	1205	1598	1209	1596	1238	1596	1243	1598
1247	1600	1288	1601.6	1327	1602	1437	1604	1483	1606
1508	1608								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1156	.025	1288	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1156	1288	235	240	222	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.33	Reach Len. (ft)	235.00	240.00	222.00
Crit W.S. (ft)		Flow Area (sq ft)	357.39	795.61	413.43
E.G. Slope (ft/ft)	0.000284	Area (sq ft)	357.39	795.61	413.43
Q Total (cfs)	3478.00	Flow (cfs)	415.35	2611.18	451.47
Top Width (ft)	452.73	Top Width (ft)	141.25	132.00	179.48
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	1.16	3.28	1.09
Max Chl Dpth (ft)	9.33	Hydr. Depth (ft)	2.53	6.03	2.30
Conv. Total (cfs)	206323.2	Conv. (cfs)	24639.6	154901.1	26782.5
Length Wtd. (ft)	235.44	Wetted Per. (ft)	141.35	134.20	179.53
Min Ch El (ft)	1596.00	Shear (lb/sq ft)	0.04	0.11	0.04
Alpha	1.70	Stream Power (lb/ft s)	0.05	0.35	0.04
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	11.87	39.04	38.27
C & E Loss (ft)	0.02	Cum SA (acres)	3.18	8.44	9.46

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: 2300

INPUT
Description: 2300
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1608	15.33	1608	21.57	1606	27.19	1604	63.6	1602
150.15	1600	164.23	1599	187.99	1598	192.33	1596	198.34	1594
228.2	1594	235.23	1596	238.65	1598	244.41	1600	250.92	1600
277.03	1600	398.64	1600	414.11	1602	452.77	1602	463.12	1600
475.52	1600	492.74	1602	507.6	1604	537.25	1606	543.16	1608

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	150.15	.025	250.92	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
150.15	250.92	320.42	311.55	310.65	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
453.09	543.16	1602

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.34	Reach Len. (ft)	320.42	311.55	310.65
Crit W.S. (ft)		Flow Area (sq ft)	463.75	854.51	1167.55
E.G. Slope (ft/ft)	0.000092	Area (sq ft)	463.75	854.51	1167.55
Q Total (cfs)	3478.00	Flow (cfs)	391.85	2000.25	1085.90
Top Width (ft)	504.10	Top Width (ft)	126.73	100.77	276.59
Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	0.84	2.34	0.93
Max Chl Dpth (ft)	11.34	Hydr. Depth (ft)	3.66	8.48	4.22
Conv. Total (cfs)	362504.5	Conv. (cfs)	40841.4	208481.9	113181.2
Length Wtd. (ft)	311.86	Wetted Per. (ft)	127.04	102.75	276.97
Min Ch El (ft)	1594.00	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	1.79	Stream Power (lb/ft s)	0.02	0.11	0.02
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	9.65	34.49	34.24
C & E Loss (ft)	0.01	Cum SA (acres)	2.46	7.80	8.30

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: 2200

INPUT
Description: 2200
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1608	20.66	1608	28.27	1606	40.91	1604	53.3	1603
71.43	1602	112.67	1600	142.43	1598	210.95	1596	217.68	1593
318.37	1598	562.06	1596	571.04	1596	618.66	1596	624.51	1596
693.73	1598	708.07	1600	779.64	1602				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	142.43	.025	318.37	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
142.43	318.37	383.01	328.57	273.85	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	142.43	1598	F
318.37	779.64	1598	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.37	Reach Len. (ft)	383.01	328.57	273.85
Crit W.S. (ft)	1598.01	Flow Area (sq ft)	450.65	1640.05	3607.19
E.G. Slope (ft/ft)	0.000012	Area (sq ft)	450.65	1640.05	3607.19
Q Total (cfs)	3478.00	Flow (cfs)	148.90	1499.50	1829.60
Top Width (ft)	747.37	Top Width (ft)	110.16	175.94	461.27

* Vel Total (ft/s)	* 0.61	* Avg. Vel. (ft/s)	* 0.33	* 0.91	* 0.51 *
* Max Chl Dpth (ft)	* 12.37	* Hydr. Depth (ft)	* 4.09	* 9.32	* 7.82 *
* Conv. Total (cfs)	*998439.1	* Conv. (cfs)	* 42745.1	*430466.8	*525227.3 *
* Length Wtd. (ft)	* 317.53	* Wetted Per. (ft)	* 110.45	* 176.73	* 464.84 *
* Min Ch El (ft)	* 1593.00	* Shear (lb/sq ft)	* 0.00	* 0.01	* 0.01 *
* Alpha	* 1.34	* Stream Power (lb/ft s)	* 0.00	* 0.01	* 0.00 *
* Frctn Loss (ft)	* 0.01	* Cum Volume (acre-ft)	* 6.29	* 25.57	* 17.22 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 1.59	* 6.81	* 5.67 *

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 2100

INPUT
Description: 2100
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1606	1009.57	1604	1013.54	1602	1020.41	1600	1037.57	1598
1093.94	1596	1118.59	1594	1126.16	1592	1145.6	1590	1151.46	1590
1174.19	1592	1184.61	1594	1188.63	1596	1204.5	1598	1224.72	1600
1240.9	1602	1251.99	1604						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1093.94	.025	1188.63	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1093.94	1188.63	58.83	49.81	54.83	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1605.36	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.06	* Wt. n-Val.	* 0.040	* 0.025	* 0.040 *
* W.S. Elev (ft)	* 1605.30	* Reach Len. (ft)	* 58.83	* 49.81	* 54.83 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 619.09	* 1209.68	* 354.46 *
* E.G. Slope (ft/ft)	*0.000046	* Area (sq ft)	* 619.09	* 1209.68	* 354.46 *
* Q Total (cfs)	* 3478.00	* Flow (cfs)	* 557.62	* 2644.10	* 276.29 *
* Top Width (ft)	* 248.66	* Top Width (ft)	* 90.61	* 94.69	* 63.36 *
* Vel Total (ft/s)	* 1.59	* Avg. Vel. (ft/s)	* 0.90	* 2.19	* 0.78 *
* Max Chl Dpth (ft)	* 15.30	* Hydr. Depth (ft)	* 6.83	* 12.78	* 5.59 *
* Conv. Total (cfs)	*512546.0	* Conv. (cfs)	* 82174.9	*389655.5	* 40715.6 *
* Length Wtd. (ft)	* 52.65	* Wetted Per. (ft)	* 91.66	* 95.88	* 65.19 *
* Min Ch El (ft)	* 1590.00	* Shear (lb/sq ft)	* 0.02	* 0.04	* 0.02 *
* Alpha	* 1.50	* Stream Power (lb/ft s)	* 0.02	* 0.08	* 0.01 *
* Frctn Loss (ft)	* 0.00	* Cum Volume (acre-ft)	* 1.58	* 14.82	* 4.77 *
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 0.70	* 5.79	* 4.02 *

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 2000

INPUT
Description: 2000
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1026.41	1600	1044.29	1598.88	1044.29	1588.88	1056.29	1588.88
1056.29	1598.8	1080.33	1600	1092.77	1602	1104.82	1604		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1044.29	.015	1056.29	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1044.29	1056.29	320.07	319.85	303.13	.3 .5

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1605.32	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.19	* Wt. n-Val.	* 0.015	* 0.015	* 0.015 *
* W.S. Elev (ft)	* 1605.13	* Reach Len. (ft)	* 0.10	* 0.10	* 0.10 *
* Crit W.S. (ft)	* 1601.35	* Flow Area (sq ft)	* 210.78	* 194.99	* 214.76 *
* E.G. Slope (ft/ft)	*0.000146	* Area (sq ft)	* 210.78	* 194.99	* 214.76 *
* Q Total (cfs)	* 2138.00	* Flow (cfs)	* 680.36	* 779.19	* 678.46 *
* Top Width (ft)	* 104.82	* Top Width (ft)	* 44.29	* 12.00	* 48.53 *
* Vel Total (ft/s)	* 3.45	* Avg. Vel. (ft/s)	* 3.23	* 4.00	* 3.16 *
* Max Chl Dpth (ft)	* 16.25	* Hydr. Depth (ft)	* 4.76	* 16.25	* 4.43 *
* Conv. Total (cfs)	*177116.4	* Conv. (cfs)	* 56362.1	* 64549.4	* 56205.0 *
* Length Wtd. (ft)	* 0.10	* Wetted Per. (ft)	* 47.53	* 31.92	* 50.01 *
* Min Ch El (ft)	* 1588.88	* Shear (lb/sq ft)	* 0.04	* 0.06	* 0.04 *
* Alpha	* 1.04	* Stream Power (lb/ft s)	* 0.13	* 0.22	* 0.12 *
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 1.02	* 14.02	* 4.41 *
* C & E Loss (ft)	*	* Cum SA (acres)	* 0.61	* 5.73	* 3.95 *

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 1950

INPUT
Description: Bridge #2

Distance from Upstream XS = .1
Deck/Roadway Width = 319.65
Weir Coefficient = 2.7
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1000	1603.83	1582.19	1044.29	1603.83	1582.19	1044.29	1603.83	1598.88
1056.29	1603.83	1598.88	1056.29	1603.83	1582.19	1104.82	1603.83	1582.19

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1026.41	1600	1044.29	1598.88	1044.29	1588.88	1056.29	1588.88

Vel Total (ft/s)	0.61	Avg. Vel. (ft/s)	0.33	0.91	0.51
Max Chl Dpth (ft)	12.37	Hydr. Depth (ft)	4.09	9.32	7.82
Conv. Total (cfs)	998439.1	Conv. (cfs)	42745.1	430466.8	525227.3
Length Wtd. (ft)	317.53	Wetted Per. (ft)	110.45	176.73	464.84
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.00	0.01	0.01
Alpha	1.34	Stream Power (lb/ft s)	0.00	0.01	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	6.29	25.57	17.22
C & E Loss (ft)	0.01	Cum SA (acres)	1.59	6.81	5.67

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 2100

INPUT
Description: 2100
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1606	1009.57	1604	1013.54	1602	1020.41	1600	1037.57	1598
1093.94	1596	1118.59	1594	1126.16	1592	1145.6	1590	1151.46	1590
1174.19	1592	1184.61	1594	1188.63	1596	1204.5	1598	1224.72	1600
1240.9	1602	1251.99	1604						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1093.94	.025	1188.63	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1093.94	1188.63	58.83	49.81	54.83	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1605.36	Element			
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1605.30	Reach Len. (ft)	58.83	49.81	54.83
Crit W.S. (ft)		Flow Area (sq ft)	619.09	1209.68	354.46
E.G. Slope (ft/ft)	0.000046	Area (sq ft)	619.09	1209.68	354.46
Q Total (cfs)	3478.00	Flow (cfs)	557.62	2644.10	276.29
Top Width (ft)	248.66	Top Width (ft)	90.61	94.69	63.36
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	0.90	2.19	0.78
Max Chl Dpth (ft)	15.30	Hydr. Depth (ft)	6.83	12.78	5.59
Conv. Total (cfs)	512546.0	Conv. (cfs)	82174.9	389655.5	40715.6
Length Wtd. (ft)	52.65	Wetted Per. (ft)	91.66	95.88	65.19
Min Ch El (ft)	1590.00	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.50	Stream Power (lb/ft s)	0.02	0.08	0.01
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.58	14.82	4.77
C & E Loss (ft)	0.04	Cum SA (acres)	0.70	5.79	4.02

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 2000

INPUT
Description: 2000
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1026.41	1600	1044.29	1598.88	1044.29	1588.88	1056.29	1588.88
1056.29	1598.8	1080.33	1600	1092.77	1602	1104.82	1604		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.015	1044.29	.015	1056.29	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1044.29	1056.29	320.07	319.85	303.13	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1605.32	Element			
Vel Head (ft)	0.19	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1605.13	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1601.35	Flow Area (sq ft)	210.78	194.99	214.76
E.G. Slope (ft/ft)	0.000146	Area (sq ft)	210.78	194.99	214.76
Q Total (cfs)	2138.00	Flow (cfs)	680.36	779.19	678.46
Top Width (ft)	104.82	Top Width (ft)	44.29	12.00	48.53
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)	3.23	4.00	3.16
Max Chl Dpth (ft)	16.25	Hydr. Depth (ft)	4.76	16.25	4.43
Conv. Total (cfs)	177116.4	Conv. (cfs)	56362.1	64549.4	56205.0
Length Wtd. (ft)	0.10	Wetted Per. (ft)	47.53	31.92	50.01
Min Ch El (ft)	1588.88	Shear (lb/sq ft)	0.04	0.06	0.04
Alpha	1.04	Stream Power (lb/ft s)	0.13	0.22	0.12
Frctn Loss (ft)		Cum Volume (acre-ft)	1.02	14.02	4.41
C & E Loss (ft)		Cum SA (acres)	0.61	5.73	3.95

BRIDGE

RIVER: RIVER-1
REACH: Reach-1 RS: 1950

INPUT
Description: Bridge #2

Distance from Upstream XS = .1
Deck/Roadway Width = 319.65
Weir Coefficient = 2.7
Upstream Deck/Roadway Coordinates
num= 6

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
1000	1603.83	1582.19	1044.29	1603.83	1582.19	1044.29	1603.83	1598.88
1056.29	1603.83	1598.88	1056.29	1603.83	1582.19	1104.82	1603.83	1582.19

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1026.41	1600	1044.29	1598.88	1044.29	1588.88	1056.29	1588.88

Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	0.20	12.80	3.78		
C & E Loss (ft)	1.46	Cum SA (acres)	0.12	5.64	3.66		

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: 1800

INPUT
Description: 1800
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1608	1021.77	1606	1037.17	1604	1053.97	1602	1078.01	1600
1135.85	1598	1139.62	1596	1145.75	1590	1148.51	1588	1151.34	1586
1155.97	1582.1	1164.98	1582.1	1171.75	1586	1183.17	1588	1191.2	1590
1221.1	1592	1234.56	1594	1243.62	1596	1254.32	1598		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1139.62	.025	1221.1	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1139.62	1221.1	173.79	170.93	148.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1592.04	Element	Left OB	Channel	Right OB	
Vel Head (ft)	2.11	Wt. n-Val.		0.025		
W.S. Elev (ft)	1589.93	Reach Len. (ft)	173.79	170.93	148.02	
Crit W.S. (ft)	1589.93	Flow Area (sq ft)		189.55		
E.G. Slope (ft/ft)	0.006371	Area (sq ft)		189.55		
Q Total (cfs)	2209.00	Flow (cfs)		2209.00		
Top Width (ft)	45.09	Top Width (ft)		45.09		
Vel Total (ft/s)	11.65	Avg. Vel. (ft/s)		11.65		
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)		4.20		
Conv. Total (cfs)	27675.1	Conv. (cfs)		27675.1		
Length Wtd. (ft)	168.70	Wetted Per. (ft)		49.23		
Min Ch El (ft)	1582.10	Shear (lb/sq ft)		1.53		
Alpha	1.00	Stream Power (lb/ft s)		17.85		
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	0.20	12.60	3.78	
C & E Loss (ft)	0.34	Cum SA (acres)	0.12	5.60	3.66	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: 1750

INPUT
Description: 1750
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1610	1023.79	1608	1053.35	1606	1063.55	1604	1070.34	1602
1076.66	1600	1095.43	1590	1097.81	1588	1103.58	1586	1112	1582.1
1122.43	1582.1	1133.65	1586	1152.29	1587.5	1211.93	1587.1	1287.4	1588
1362.75	1590	1371.76	1592	1376.44	1594	1380.58	1596	1384.75	1598
1388.94	1600								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1095.43	.025	1152.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1095.43	1152.29	171.49	169.33	179.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1589.63	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.96	Wt. n-Val.		0.025	0.040	
W.S. Elev (ft)	1588.67	Reach Len. (ft)	171.49	169.33	179.87	
Crit W.S. (ft)	1588.67	Flow Area (sq ft)		204.95	174.68	
E.G. Slope (ft/ft)	0.003913	Area (sq ft)		204.95	174.68	
Q Total (cfs)	2209.00	Flow (cfs)		1779.30	429.70	
Top Width (ft)	215.63	Top Width (ft)		55.28	160.35	
Vel Total (ft/s)	5.82	Avg. Vel. (ft/s)		8.68	2.46	
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)		3.71	1.09	
Conv. Total (cfs)	35314.9	Conv. (cfs)		28445.4	6869.5	
Length Wtd. (ft)	172.21	Wetted Per. (ft)		57.44	160.36	
Min Ch El (ft)	1582.10	Shear (lb/sq ft)		0.87	0.27	
Alpha	1.83	Stream Power (lb/ft s)		7.57	0.65	
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	0.20	11.82	3.48	
C & E Loss (ft)	0.13	Cum SA (acres)	0.12	5.40	3.39	

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: 1700

INPUT

* Frctn Loss (ft)	*	0.36	* Cum Volume (acre-ft)	*	0.20	*	12.80	*	3.78	*
* C & E Loss (ft)	*	1.46	* Cum SA (acres)	*	0.12	*	5.64	*	3.66	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: 1800

INPUT
Description: 1800
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1608	1021.77	1606	1037.17	1604	1053.97	1602	1078.01	1600
1135.85	1598	1139.62	1596	1145.75	1590	1148.51	1588	1151.34	1586
1155.97	1582.1	1164.98	1582.1	1171.75	1586	1183.17	1588	1191.2	1590
1221.1	1592	1234.56	1594	1243.62	1596	1254.32	1598		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1139.62	.025	1221.1	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1139.62	1221.1	173.79	170.93	148.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1592.04	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	* 2.11	* Wt. n-Val.	*		*	0.025	*		*	
* W.S. Elev (ft)	* 1589.93	* Reach Len. (ft)	*	173.79	*	170.93	*	148.02	*	
* Crit W.S. (ft)	* 1589.93	* Flow Area (sq ft)	*		*	189.55	*		*	
* E.G. Slope (ft/ft)	*0.006371	* Area (sq ft)	*		*	189.55	*		*	
* Q Total (cfs)	* 2209.00	* Flow (cfs)	*		*	2209.00	*		*	
* Top Width (ft)	* 45.09	* Top Width (ft)	*		*	45.09	*		*	
* Vel Total (ft/s)	* 11.65	* Avg. Vel. (ft/s)	*		*	11.65	*		*	
* Max Chl Dpth (ft)	* 7.83	* Hydr. Depth (ft)	*		*	4.20	*		*	
* Conv. Total (cfs)	* 27675.1	* Conv. (cfs)	*		*	27675.1	*		*	
* Length Wtd. (ft)	* 168.70	* Wetted Per. (ft)	*		*	49.23	*		*	
* Min Ch El (ft)	* 1582.10	* Shear (lb/sq ft)	*		*	1.53	*		*	
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	17.85	*		*	
* Frctn Loss (ft)	* 0.83	* Cum Volume (acre-ft)	*	0.20	*	12.60	*	3.78	*	
* C & E Loss (ft)	* 0.34	* Cum SA (acres)	*	0.12	*	5.60	*	3.66	*	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: 1750

INPUT
Description: 1750
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1610	1023.79	1608	1053.35	1606	1063.55	1604	1070.34	1602
1076.66	1600	1095.43	1590	1097.81	1588	1103.58	1586	1112	1582.1
1122.43	1582.1	1133.65	1586	1152.29	1587.5	1211.93	1587.1	1287.4	1588
1362.75	1590	1371.76	1592	1376.44	1594	1380.58	1596	1384.75	1598
1388.94	1600								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1095.43	.025	1152.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1095.43	1152.29	171.49	169.33	179.87	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1589.63	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	* 0.96	* Wt. n-Val.	*		*	0.025	*	0.040	*	
* W.S. Elev (ft)	* 1588.67	* Reach Len. (ft)	*	171.49	*	169.33	*	179.87	*	
* Crit W.S. (ft)	* 1588.67	* Flow Area (sq ft)	*		*	204.95	*	174.68	*	
* E.G. Slope (ft/ft)	*0.003913	* Area (sq ft)	*		*	204.95	*	174.68	*	
* Q Total (cfs)	* 2209.00	* Flow (cfs)	*		*	1779.30	*	429.70	*	
* Top Width (ft)	* 215.63	* Top Width (ft)	*		*	55.28	*	160.35	*	
* Vel Total (ft/s)	* 5.82	* Avg. Vel. (ft/s)	*		*	8.68	*	2.46	*	
* Max Chl Dpth (ft)	* 6.57	* Hydr. Depth (ft)	*		*	3.71	*	1.09	*	
* Conv. Total (cfs)	* 35314.9	* Conv. (cfs)	*		*	28445.4	*	6869.5	*	
* Length Wtd. (ft)	* 172.21	* Wetted Per. (ft)	*		*	57.44	*	160.36	*	
* Min Ch El (ft)	* 1582.10	* Shear (lb/sq ft)	*		*	0.87	*	0.27	*	
* Alpha	* 1.83	* Stream Power (lb/ft s)	*		*	7.57	*	0.65	*	
* Frctn Loss (ft)	* 0.59	* Cum Volume (acre-ft)	*	0.20	*	11.82	*	3.48	*	
* C & E Loss (ft)	* 0.13	* Cum SA (acres)	*	0.12	*	5.40	*	3.39	*	

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: 1700

INPUT

Description: 1700
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1037.4	1604	1128.6	1605.9	1151.3	1605.81	1198.85	1604
1246.99	1602	1248.58	1600	1277.69	1590	1282.43	1588	1286.61	1586
1301.89	1584	1314.08	1582.05	1326.15	1584	1341.79	1586	1350.67	1586.5
1360.4	1586	1416.24	1585.5	1475.83	1586	1602.02	1588	1708.11	1590

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1286.61	.025	1350.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1286.61	1350.67	163.66	161.13 154.63	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1588.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1587.62	Reach Len. (ft)	163.66	161.13	154.63
Crit W.S. (ft)		Flow Area (sq ft)	2.73	204.35	310.92
E.G. Slope (ft/ft)	0.002977	Area (sq ft)	2.73	204.35	310.92
Q Total (cfs)	2209.00	Flow (cfs)	4.48	1427.50	777.02
Top Width (ft)	294.52	Top Width (ft)	3.38	64.06	227.08
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.64	6.99	2.50
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)	0.81	3.19	1.37
Conv. Total (cfs)	40484.8	Conv. (cfs)	82.0	26162.2	14240.6
Length Wtd. (ft)	158.85	Wetted Per. (ft)	3.74	64.64	227.11
Min Ch El (ft)	1582.05	Shear (lb/sq ft)	0.14	0.59	0.25
Alpha	1.86	Stream Power (lb/ft s)	0.22	4.10	0.64
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.19	11.03	2.48
C & E Loss (ft)	0.03	Cum SA (acres)	0.12	5.17	2.59

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1650

INPUT
Description: 1650
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1005.05	1598	1011.4	1596	1026.96	1594	1094.89	1594
1110.32	1594	1122.14	1592	1124.66	1590	1129.97	1588	1134.76	1586
1139.66	1584	1148.86	1582	1161.14	1582	1172.84	1584	1180.64	1584.7
1254.59	1585	1347.77	1586	1480.9	1588	1600.61	1590	1684.68	1592
1697.13	1594	1700.86	1596	1704.54	1598				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1129.97	.025	1180.64	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1129.97	1180.64	190.68	175.57 185.82	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1129.97	1588	F
1180.64	1704.54	1584.7	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1587.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.025	0.040
W.S. Elev (ft)	1586.75	Reach Len. (ft)	190.68	175.57	185.82
Crit W.S. (ft)	1586.75	Flow Area (sq ft)		164.46	274.75
E.G. Slope (ft/ft)	0.004226	Area (sq ft)		164.46	274.75
Q Total (cfs)	2209.00	Flow (cfs)		1431.92	777.09
Top Width (ft)	264.43	Top Width (ft)		47.67	216.76
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		8.71	2.83
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)		3.45	1.27
Conv. Total (cfs)	33979.9	Conv. (cfs)		22026.4	11953.5
Length Wtd. (ft)	177.48	Wetted Per. (ft)		48.62	216.77
Min Ch El (ft)	1582.00	Shear (lb/sq ft)		0.89	0.33
Alpha	2.05	Stream Power (lb/ft s)		7.77	0.95
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	0.19	10.34	1.44
C & E Loss (ft)	0.15	Cum SA (acres)	0.11	4.96	1.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 1600

INPUT
Description: 1600
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1064.32	1600	1081.14	1594.01	1094.37	1584	1149.75	1582
1170.49	1580.4	1218.11	1580.78	1229.76	1582	1243.82	1584	1327.67	1585
1412.26	1586	1551.37	1588	1677.73	1590				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1094.37	.025	1243.82	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1094.37	1243.82	101.17	196.31 210.32	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1585.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1585.10	Reach Len. (ft)	101.17	196.31	210.32

Description: 1700
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1037.4	1604	1128.6	1605.9	1151.3	1605.81	1198.85	1604
1246.99	1602	1248.58	1600	1277.69	1590	1282.43	1588	1286.61	1586
1301.89	1584	1314.08	1582.05	1326.15	1584	1341.79	1586	1350.67	1586.5
1360.4	1586	1416.24	1585.5	1475.83	1586	1602.02	1588	1708.11	1590

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1286.61	.025	1350.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1286.61	1350.67	163.66	161.13	154.63	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1588.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1587.62	Reach Len. (ft)	163.66	161.13	154.63
Crit W.S. (ft)		Flow Area (sq ft)	2.73	204.35	310.92
E.G. Slope (ft/ft)	0.002977	Area (sq ft)	2.73	204.35	310.92
Q Total (cfs)	2209.00	Flow (cfs)	4.48	1427.50	777.02
Top Width (ft)	294.52	Top Width (ft)	3.38	64.06	227.08
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.64	6.99	2.50
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)	0.81	3.19	1.37
Conv. Total (cfs)	40484.8	Conv. (cfs)	82.0	26162.2	14240.6
Length Wtd. (ft)	158.85	Wetted Per. (ft)	3.74	64.64	227.11
Min Ch El (ft)	1582.05	Shear (lb/sq ft)	0.14	0.59	0.25
Alpha	1.86	Stream Power (lb/ft s)	0.22	4.10	0.64
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.19	11.03	2.48
C & E Loss (ft)	0.03	Cum SA (acres)	0.12	5.17	2.59

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1650

INPUT
Description: 1650
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1005.05	1598	1011.4	1596	1026.96	1594	1094.89	1594
1110.32	1594	1122.14	1592	1124.66	1590	1129.97	1588	1134.76	1586
1139.66	1584	1148.86	1582	1161.14	1582	1172.84	1584	1180.64	1584.7
1254.59	1585	1347.77	1586	1480.9	1588	1600.61	1590	1684.68	1592
1697.13	1594	1700.86	1596	1704.54	1598				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1129.97	.025	1180.64	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1129.97	1180.64	190.68	175.57	185.82	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1129.97	1588	F
1180.64	1704.54	1584.7	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1587.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.025	0.040
W.S. Elev (ft)	1586.75	Reach Len. (ft)	190.68	175.57	185.82
Crit W.S. (ft)	1586.75	Flow Area (sq ft)		164.46	274.75
E.G. Slope (ft/ft)	0.004226	Area (sq ft)		164.46	274.75
Q Total (cfs)	2209.00	Flow (cfs)		1431.92	777.09
Top Width (ft)	264.43	Top Width (ft)		47.67	216.76
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		8.71	2.83
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)		3.45	1.27
Conv. Total (cfs)	33979.9	Conv. (cfs)		22026.4	11953.5
Length Wtd. (ft)	177.48	Wetted Per. (ft)		48.62	216.77
Min Ch El (ft)	1582.00	Shear (lb/sq ft)		0.89	0.33
Alpha	2.05	Stream Power (lb/ft s)		7.77	0.95
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	0.19	10.34	1.44
C & E Loss (ft)	0.15	Cum SA (acres)	0.11	4.96	1.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 1600

INPUT
Description: 1600
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1602	1064.32	1600	1081.14	1594.01	1094.37	1584	1149.75	1582
1170.49	1580.4	1218.11	1580.78	1229.76	1582	1243.82	1584	1327.67	1585
1412.26	1586	1551.37	1588	1677.73	1590				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1094.37	.025	1243.82	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1094.37	1243.82	101.17	196.31	210.32	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1585.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1585.10	Reach Len. (ft)	101.17	196.31	210.32

Crit W.S. (ft)		Flow Area (sq ft)	0.80	484.46	50.58
E.G. Slope (ft/ft)	0.001182	Area (sq ft)	0.80	484.46	50.58
Q Total (cfs)	2209.00	Flow (cfs)	0.59	2165.12	43.30
Top Width (ft)	243.07	Top Width (ft)	1.45	149.45	92.17
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)	0.74	4.47	0.86
Max Chl Dpth (ft)	4.70	Hydr. Depth (ft)	0.55	3.24	0.55
Conv. Total (cfs)	64259.8	Conv. (cfs)	17.1	62983.2	1259.5
Length Wtd. (ft)	196.96	Wetted Per. (ft)	1.82	149.75	92.18
Min Ch El (ft)	1580.40	Shear (lb/sq ft)	0.03	0.24	0.04
Alpha	1.15	Stream Power (lb/ft s)	0.02	1.07	0.03
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.18	9.04	0.75
C & E Loss (ft)	0.00	Cum SA (acres)	0.11	4.57	1.14

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1500

INPUT
Description: 1500
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1069.96	1599	1081.73	1583	1182.35	1582	1186.84	1580
1197.97	1578	1201.11	1578	1212.43	1580	1216.13	1582	1230.57	1583.8
1294.4	1584	1308.23	1584	1356.62	1584	1628.22	1586	1674.02	1588
1697.27	1590	1726.23	1592	1741.62	1594	1753.42	1596	1763.24	1598
1801.09	1598	1808.99	1596						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1081.73	.025	1230.57	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1081.73 1230.57 76.07 108.07 119.69 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1081.73	1583	F
1230.57	1808.99	1583.8	F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1585.15	Element	0.040	0.025	0.040
Vel Head (ft)	0.29	Wt. n-Val.	76.07	108.07	119.69
W.S. Elev (ft)	1584.86	Reach Len. (ft)	1.27	450.24	164.61
Crit W.S. (ft)	1583.73	Flow Area (sq ft)	1.27	450.24	164.61
E.G. Slope (ft/ft)	0.001339	Area (sq ft)	1.16	2035.09	172.75
Q Total (cfs)	2209.00	Flow (cfs)	1.37	148.84	242.62
Top Width (ft)	392.83	Top Width (ft)	0.91	4.52	1.05
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)	0.93	3.02	0.68
Max Chl Dpth (ft)	6.86	Hydr. Depth (ft)	31.7	55624.4	4721.6
Conv. Total (cfs)	60377.7	Conv. (cfs)	2.31	150.24	242.62
Length Wtd. (ft)	108.53	Wetted Per. (ft)	0.05	0.25	0.06
Min Ch El (ft)	1578.00	Shear (lb/sq ft)	0.04	1.13	0.06
Alpha	1.47	Stream Power (lb/ft s)	0.18	6.93	0.23
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.10	3.90	0.33
C & E Loss (ft)	0.08	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 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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1400

INPUT
Description: 1400
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1027.47	1600	1035.26	1598	1040.7	1596	1046.91	1590
1052.71	1588	1056.6	1586	1061	1584	1138.25	1582	1142.92	1580
1145.8	1578	1160.96	1578	1173.97	1580	1180.16	1582	1186.25	1584
1230.34	1584	1231.21	1584	1307.21	1584				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1061	.025	1186.25	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1061 1186.25 122.02 161.58 190.42 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1061	1584	F
1186.25	1307.21	1584	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1186.25	1307.21	1587

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1584.79	Element			
Vel Head (ft)	1.12	Wt. n-Val.		0.025	
W.S. Elev (ft)	1583.67	Reach Len. (ft)	122.02	161.58	190.42
Crit W.S. (ft)	1583.67	Flow Area (sq ft)		247.37	
E.G. Slope (ft/ft)	0.007212	Area (sq ft)		247.37	
Q Total (cfs)	2101.00	Flow (cfs)		2101.00	
Top Width (ft)	111.54	Top Width (ft)		111.54	
Vel Total (ft/s)	8.49	Avg. Vel. (ft/s)		8.49	
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)		2.22	
Conv. Total (cfs)	24739.7	Conv. (cfs)		24739.7	
Length Wtd. (ft)	161.58	Wetted Per. (ft)		113.33	
Min Ch El (ft)	1578.00	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		8.35	
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	0.18	6.06	
C & E Loss (ft)	0.01	Cum SA (acres)	0.10	3.57	

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

Crit W.S. (ft)		Flow Area (sq ft)	0.80	484.46	50.58		
E.G. Slope (ft/ft)	0.001182	Area (sq ft)	0.80	484.46	50.58		
Q Total (cfs)	2209.00	Flow (cfs)	0.59	2165.12	43.30		
Top Width (ft)	243.07	Top Width (ft)	1.45	149.45	92.17		
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)	0.74	4.47	0.86		
Max Chl Dpth (ft)	4.70	Hydr. Depth (ft)	0.55	3.24	0.55		
Conv. Total (cfs)	64259.8	Conv. (cfs)	17.1	62983.2	1259.5		
Length Wtd. (ft)	196.96	Wetted Per. (ft)	1.82	149.75	92.18		
Min Ch El (ft)	1580.40	Shear (lb/sq ft)	0.03	0.24	0.04		
Alpha	1.15	Stream Power (lb/ft s)	0.02	1.07	0.03		
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.18	9.04	0.75		
C & E Loss (ft)	0.00	Cum SA (acres)	0.11	4.57	1.14		

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1500

INPUT
Description: 1500
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1069.96	1599	1081.73	1583	1182.35	1582	1186.84	1580
1197.97	1578	1201.11	1578	1212.43	1580	1216.13	1582	1230.57	1583.8
1294.4	1584	1308.23	1584	1356.62	1584	1628.22	1586	1674.02	1588
1697.27	1590	1726.23	1592	1741.62	1594	1753.42	1596	1763.24	1598
1801.09	1598	1808.99	1596						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1081.73	.025	1230.57	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1081.73 1230.57 76.07 108.07 119.69 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1081.73	1583	F
1230.57	1808.99	1583.8	F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1585.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.040	0.025	0.040
W.S. Elev (ft)	1584.86	Reach Len. (ft)	76.07	108.07	119.69
Crit W.S. (ft)	1583.73	Flow Area (sq ft)	1.27	450.24	164.61
E.G. Slope (ft/ft)	0.001339	Area (sq ft)	1.27	450.24	164.61
Q Total (cfs)	2209.00	Flow (cfs)	1.16	2035.09	172.75
Top Width (ft)	392.83	Top Width (ft)	1.37	148.84	242.62
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)	0.91	4.52	1.05
Max Chl Dpth (ft)	6.86	Hydr. Depth (ft)	0.93	3.02	0.68
Conv. Total (cfs)	60377.7	Conv. (cfs)	31.7	55624.4	4721.6
Length Wtd. (ft)	108.53	Wetted Per. (ft)	2.31	150.24	242.62
Min Ch El (ft)	1578.00	Shear (lb/sq ft)	0.05	0.25	0.06
Alpha	1.47	Stream Power (lb/ft s)	0.04	1.13	0.06
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	0.18	6.93	0.23
C & E Loss (ft)	0.08	Cum SA (acres)	0.10	3.90	0.33

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 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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1400

INPUT
Description: 1400
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1600	1027.47	1600	1035.26	1598	1040.7	1596	1046.91	1590
1052.71	1588	1056.6	1586	1061	1584	1138.25	1582	1142.92	1580
1145.8	1578	1160.96	1578	1173.97	1580	1180.16	1582	1186.25	1584
1230.34	1584	1231.21	1584	1307.21	1584				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1061	.025	1186.25	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1061 1186.25 122.02 161.58 190.42 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1061	1584	F
1186.25	1307.21	1584	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1186.25	1307.21	1587

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1584.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.		0.025	
W.S. Elev (ft)	1583.67	Reach Len. (ft)	122.02	161.58	190.42
Crit W.S. (ft)	1583.67	Flow Area (sq ft)		247.37	
E.G. Slope (ft/ft)	0.007212	Area (sq ft)		247.37	
Q Total (cfs)	2101.00	Flow (cfs)		2101.00	
Top Width (ft)	111.54	Top Width (ft)		111.54	
Vel Total (ft/s)	8.49	Avg. Vel. (ft/s)		8.49	
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)		2.22	
Conv. Total (cfs)	24739.7	Conv. (cfs)		24739.7	
Length Wtd. (ft)	161.58	Wetted Per. (ft)		113.33	
Min Ch El (ft)	1578.00	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		8.35	
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	0.18	6.06	
C & E Loss (ft)	0.01	Cum SA (acres)	0.10	3.57	

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, water surface was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1300

INPUT
Description: 1300
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1588	1004.58	1586	1009.31	1584	1014.17	1582	1065.78	1582
1072.99	1582	1076.58	1580	1080.99	1574	1083.53	1572.69	1092.54	1574
1106.55	1580	1121.82	1580	1125.36	1578	1170.24	1576	1178.38	1576
1183.85	1578	1201.6	1578	1207.18	1579	1236.12	1578	1241.05	1578
1260.24	1578	1268.87	1576	1313.34	1575.6	1502.88	1575.6	1676.59	1575.6
1718.52	1576	1735.14	1577						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1014.17	.025	1207.18	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1014.17 1207.18 198.91 176.37 153.42 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1014.17	1582	F
1207.18	1735.14	1579	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1207.18	1735.14	1583

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1580.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.		0.025	
W.S. Elev (ft)	1579.00	Reach Len. (ft)	198.91	176.37	153.42
Crit W.S. (ft)	1579.00	Flow Area (sq ft)		250.51	
E.G. Slope (ft/ft)	0.007070	Area (sq ft)		250.51	
Q Total (cfs)	2101.00	Flow (cfs)		2101.00	
Top Width (ft)	110.50	Top Width (ft)		110.50	
Vel Total (ft/s)	8.39	Avg. Vel. (ft/s)		8.39	
Max Chl Dpth (ft)	6.31	Hydr. Depth (ft)		2.27	
Conv. Total (cfs)	24987.2	Conv. (cfs)		24987.2	
Length Wtd. (ft)	176.37	Wetted Per. (ft)		115.23	
Min Ch El (ft)	1572.69	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		8.05	
Frctn Loss (ft)	1.06	Cum Volume (acre-ft)	0.18	5.14	
C & E Loss (ft)	0.10	Cum SA (acres)	0.10	3.16	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 1200

INPUT
Description: 1200
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1588	1003.72	1586	1007.45	1584	1011.19	1582	1030.36	1580
1045.48	1578	1078.58	1576	1158.89	1575	1178.38	1576	1179.17	1576
1190.7	1574	1204.49	1571.62	1209.35	1574	1247.96	1576	1272.58	1577.5
1301.79	1576.5	1333.43	1576	1378.11	1575.1	1575.34	1575.1	1770.67	1575.1
1817.16	1576	1831.23	1576.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1178.38	.03	1272.58	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1178.38 1272.58 111.55 110.23 110.23 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1178.38	1576	F
1272.58	1831.23	1577.5	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1178.38	1582	1272.58	1831.23	1581

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1578.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.030	
W.S. Elev (ft)	1577.90	Reach Len. (ft)	111.55	110.23	110.23
Crit W.S. (ft)	1577.33	Flow Area (sq ft)		270.27	
E.G. Slope (ft/ft)	0.005116	Area (sq ft)		270.27	
Q Total (cfs)	1889.00	Flow (cfs)		1889.00	
Top Width (ft)	94.20	Top Width (ft)		94.20	
Vel Total (ft/s)	6.99	Avg. Vel. (ft/s)		6.99	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		2.87	
Conv. Total (cfs)	26410.4	Conv. (cfs)		26410.4	
Length Wtd. (ft)	110.23	Wetted Per. (ft)		97.53	
Min Ch El (ft)	1571.62	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)		6.19	
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	0.18	4.09	
C & E Loss (ft)	0.06	Cum SA (acres)	0.10	2.75	

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.

CROSS SECTION

is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1300

INPUT
Description: 1300
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1588	1004.58	1586	1009.31	1584	1014.17	1582	1065.78	1582
1072.99	1582	1076.58	1580	1080.99	1574	1083.53	1572.69	1092.54	1574
1106.55	1580	1121.82	1580	1125.36	1578	1170.24	1576	1178.38	1576
1183.85	1578	1201.6	1578	1207.18	1579	1236.12	1578	1241.05	1578
1260.24	1578	1268.87	1576	1313.34	1575.6	1502.88	1575.6	1676.59	1575.6
1718.52	1576	1735.14	1577						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1014.17	.025	1207.18	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1014.17 1207.18 198.91 176.37 153.42 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1014.17	1582	F
1207.18	1735.14	1579	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1207.18	1735.14	1583

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1580.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.		0.025	
W.S. Elev (ft)	1579.00	Reach Len. (ft)	198.91	176.37	153.42
Crit W.S. (ft)	1579.00	Flow Area (sq ft)		250.51	
E.G. Slope (ft/ft)	0.007070	Area (sq ft)		250.51	
Q Total (cfs)	2101.00	Flow (cfs)		2101.00	
Top Width (ft)	110.50	Top Width (ft)		110.50	
Vel Total (ft/s)	8.39	Avg. Vel. (ft/s)		8.39	
Max Chl Dpth (ft)	6.31	Hydr. Depth (ft)		2.27	
Conv. Total (cfs)	24987.2	Conv. (cfs)		24987.2	
Length Wtd. (ft)	176.37	Wetted Per. (ft)		115.23	
Min Ch El (ft)	1572.69	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		8.05	
Frctn Loss (ft)	1.06	Cum Volume (acre-ft)	0.18	5.14	
C & E Loss (ft)	0.10	Cum SA (acres)	0.10	3.16	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 1200

INPUT
Description: 1200
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1588	1003.72	1586	1007.45	1584	1011.19	1582	1030.36	1580
1045.48	1578	1078.58	1576	1158.89	1575	1178.38	1576	1179.17	1576
1190.7	1574	1204.49	1571.62	1209.35	1574	1247.96	1576	1272.58	1577.5
1301.79	1576.5	1333.43	1576	1378.11	1575.1	1575.34	1575.1	1770.67	1575.1
1817.16	1576	1831.23	1576.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.04	1178.38	.03	1272.58	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1178.38 1272.58 111.55 110.23 110.23 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	1178.38	1576	F
1272.58	1831.23	1577.5	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	1178.38	1582	1272.58	1831.23	1581

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1578.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.030	
W.S. Elev (ft)	1577.90	Reach Len. (ft)	111.55	110.23	110.23
Crit W.S. (ft)	1577.33	Flow Area (sq ft)		270.27	
E.G. Slope (ft/ft)	0.005116	Area (sq ft)		270.27	
Q Total (cfs)	1889.00	Flow (cfs)		1889.00	
Top Width (ft)	94.20	Top Width (ft)		94.20	
Vel Total (ft/s)	6.99	Avg. Vel. (ft/s)		6.99	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		2.87	
Conv. Total (cfs)	26410.4	Conv. (cfs)		26410.4	
Length Wtd. (ft)	110.23	Wetted Per. (ft)		97.53	
Min Ch El (ft)	1571.62	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)		6.19	
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	0.18	4.09	
C & E Loss (ft)	0.06	Cum SA (acres)	0.10	2.75	

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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1100

INPUT
Description: 1100
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
924.71	1574	1024	1573.5	1124	1573.5	1224	1573.5	1320.06	1576
1334.53	1576	1339.91	1574	1347.79	1571.4	1349.58	1574	1393.55	1576
1417.67	1577.4	1447.13	1576.5	1476.62	1576	1519.36	1574.7	1720.11	1574.7
1929.89	1574.7	1982.94	1575.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
924.71	.04	1320.06	.03	1417.67	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1320.06	1417.67	102.45	103.7	103.7 .1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
924.71	1320.06	1576	F
1417.67	1982.94	1577.4	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
924.71	1320.06	1579	1417.67	1982.94	1579

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1578.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.030	
W.S. Elev (ft)	1577.47	Reach Len. (ft)	102.45	103.70	103.70
Crit W.S. (ft)	1576.99	Flow Area (sq ft)		207.99	
E.G. Slope (ft/ft)	0.005486	Area (sq ft)		207.99	
Q Total (cfs)	1232.00	Flow (cfs)		1232.00	
Top Width (ft)	97.61	Top Width (ft)		97.61	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	6.07	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	16633.1	Conv. (cfs)		16633.1	
Length Wtd. (ft)	103.70	Wetted Per. (ft)		101.38	
Min Ch El (ft)	1571.40	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		4.16	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	0.18	3.48	
C & E Loss (ft)	0.02	Cum SA (acres)	0.10	2.50	

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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1000

INPUT
Description: 1000
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1096.67	1574	1190	1573.3	1283	1573.3	1376	1573.3	1472.42	1576
1484.88	1576	1489.57	1574	1494.01	1572	1496.75	1571.15	1501.64	1572
1503.91	1574	1545.7	1576	1568.37	1577.2	1597.74	1576.5	1625.79	1576
1648.15	1575.5	1710.01	1574.3	1879.49	1574.3	2080.17	1574.3	2121.11	1575.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1096.67	.04	1472.42	.03	1568.37	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1472.42	1568.37	116.93	118.27	121.55 .1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1096.67	1472.42	1576	F
1568.37	2121.11	1577.2	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1096.67	1472.42	1579	1568.37	2121.11	1579

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1577.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.		0.030	
W.S. Elev (ft)	1576.45	Reach Len. (ft)	116.93	118.27	121.55
Crit W.S. (ft)	1576.43	Flow Area (sq ft)		135.49	
E.G. Slope (ft/ft)	0.010979	Area (sq ft)		135.49	
Q Total (cfs)	966.00	Flow (cfs)		966.00	
Top Width (ft)	81.83	Top Width (ft)		81.83	
Vel Total (ft/s)	7.13	Avg. Vel. (ft/s)		7.13	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		1.66	
Conv. Total (cfs)	9219.3	Conv. (cfs)		9219.3	
Length Wtd. (ft)	118.27	Wetted Per. (ft)		84.14	
Min Ch El (ft)	1571.15	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)		7.87	
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	0.18	3.07	
C & E Loss (ft)	0.05	Cum SA (acres)	0.10	2.29	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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: 900

INPUT
Description: 900
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1219.54	1574	1309.5	1572.9	1399	1572.9	1489.5	1572.9	1572.39	1574
1575.7	1574.5	1579.92	1574	1592.09	1572	1597.2	1571	1604.66	1572
1606.43	1574	1651.77	1575	1686.84	1577	1705.75	1575.8	1749.48	1574
1798.67	1573.7	1915.16	1573.7	2060.43	1573.7	2160.73	1573.7	2209.7	1574
2230.82	1574								

RIVER: RIVER-1
REACH: Reach-1 RS: 1100

INPUT
Description: 1100
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
924.71	1574	1024	1573.5	1124	1573.5	1224	1573.5	1320.06	1576
1334.53	1576	1339.91	1574	1347.79	1571.4	1349.58	1574	1393.55	1576
1417.67	1577.4	1447.13	1576.5	1476.62	1576	1519.36	1574.7	1720.11	1574.7
1929.89	1574.7	1982.94	1575.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
924.71	.04	1320.06	.03	1417.67	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1320.06 1417.67 102.45 103.7 103.7 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
924.71	1320.06	1576	F
1417.67	1982.94	1577.4	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
924.71	1320.06	1579	1417.67	1982.94	1579

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1578.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.030	
W.S. Elev (ft)	1577.47	Reach Len. (ft)	102.45	103.70	103.70
Crit W.S. (ft)	1576.99	Flow Area (sq ft)		207.99	
E.G. Slope (ft/ft)	0.005486	Area (sq ft)		207.99	
Q Total (cfs)	1232.00	Flow (cfs)		1232.00	
Top Width (ft)	97.61	Top Width (ft)		97.61	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	6.07	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	16633.1	Conv. (cfs)		16633.1	
Length Wtd. (ft)	103.70	Wetted Per. (ft)		101.38	
Min Ch El (ft)	1571.40	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		4.16	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	0.18	3.48	
C & E Loss (ft)	0.02	Cum SA (acres)	0.10	2.50	

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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1000

INPUT
Description: 1000
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1096.67	1574	1190	1573.3	1283	1573.3	1376	1573.3	1472.42	1576
1484.88	1576	1489.57	1574	1494.01	1572	1496.75	1571.15	1501.64	1572
1503.91	1574	1545.7	1576	1568.37	1577.2	1597.74	1576.5	1625.79	1576
1648.15	1575.5	1710.01	1574.3	1879.49	1574.3	2080.17	1574.3	2121.11	1575.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1096.67	.04	1472.42	.03	1568.37	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1472.42 1568.37 116.93 118.27 121.55 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1096.67	1472.42	1576	F
1568.37	2121.11	1577.2	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1096.67	1472.42	1579	1568.37	2121.11	1579

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1577.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.		0.030	
W.S. Elev (ft)	1576.45	Reach Len. (ft)	116.93	118.27	121.55
Crit W.S. (ft)	1576.43	Flow Area (sq ft)		135.49	
E.G. Slope (ft/ft)	0.010979	Area (sq ft)		135.49	
Q Total (cfs)	966.00	Flow (cfs)		966.00	
Top Width (ft)	81.83	Top Width (ft)		81.83	
Vel Total (ft/s)	7.13	Avg. Vel. (ft/s)		7.13	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		1.66	
Conv. Total (cfs)	9219.3	Conv. (cfs)		9219.3	
Length Wtd. (ft)	118.27	Wetted Per. (ft)		84.14	
Min Ch El (ft)	1571.15	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)		7.87	
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	0.18	3.07	
C & E Loss (ft)	0.05	Cum SA (acres)	0.10	2.29	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
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: 900

INPUT
Description: 900
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1219.54	1574	1309.5	1572.9	1399	1572.9	1489.5	1572.9	1572.39	1574
1575.7	1574.5	1579.92	1574	1592.09	1572	1597.2	1571	1604.66	1572
1606.43	1574	1651.77	1575	1686.84	1577	1705.75	1575.8	1749.48	1574
1798.67	1573.7	1915.16	1573.7	2060.43	1573.7	2160.73	1573.7	2209.7	1574
2230.82	1574								

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 1219.54     .04  1575.7     .03 1686.84     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1575.7 1686.84          102.08  103.62  108.33             .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
 1219.54  1575.7  1574.5       F
 1686.84 2230.82    1577       F
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*********************************************
 1219.54  1575.7    1578 1686.84 2230.82    1578

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1575.98  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.61  * Wt. n-Val.            *          *    0.030  *          *
* W.S. Elev (ft)          * 1575.37  * Reach Len. (ft)       *  102.08  *  103.62  *  108.33  *
* Crit W.S. (ft)          * 1575.24  * Flow Area (sq ft)     *          *  127.05  *          *
* E.G. Slope (ft/ft)      *0.009367  * Area (sq ft)          *          *  127.05  *          *
* Q Total (cfs)           *  798.00  * Flow (cfs)            *          *  798.00  *          *
* Top Width (ft)          *   82.56  * Top Width (ft)        *          *   82.56  *          *
* Vel Total (ft/s)        *    6.28  * Avg. Vel. (ft/s)      *          *    6.28  *          *
* Max Chl Dpth (ft)       *    4.37  * Hydr. Depth (ft)      *          *    1.54  *          *
* Conv. Total (cfs)       *  8245.3  * Conv. (cfs)           *          *  8245.3  *          *
* Length Wtd. (ft)        *  103.62  * Wetted Per. (ft)      *          *   84.70  *          *
* Min Ch El (ft)          * 1571.00  * Shear (lb/sq ft)      *          *    0.88  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    5.51  *          *
* Frctn Loss (ft)         *    0.81  * Cum Volume (acre-ft)  *    0.18  *    2.72  *          *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)        *    0.10  *    2.07  *          *
*****************************************************************************************************

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: 800

INPUT
Description: 800
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************************
 1427.88    1574    1510  1572.5    1592  1572.5    1674  1572.5 1759.85    1574
 1769.22  1574.5 1778.29    1574 1784.62    1572 1788.23    1570 1790.02 1570.23
 1791.12    1570 1797.25    1572 1818.13    1574 1841.16    1574 1867.83    1574
 1903.89    1576 1968.96    1574 2017.28  1573.2  2207.8  1573.2 2344.84  1573.2
 2392.94    1574 2407.17    1574

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 1427.88     .04 1769.22     .03 1903.89     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1769.22 1903.89          134.63  144.94  139.86             .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
 1427.88 1769.22  1574.5       F
 1903.89 2407.17    1576       F
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*********************************************
 1427.88 1769.22    1578 1903.89 2407.17    1578

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1575.09  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.34  * Wt. n-Val.            *          *    0.030  *          *
* W.S. Elev (ft)          * 1574.76  * Reach Len. (ft)       *  134.63  *  144.94  *  139.86  *
* Crit W.S. (ft)          * 1574.50  * Flow Area (sq ft)     *          *  145.34  *          *
* E.G. Slope (ft/ft)      *0.006368  * Area (sq ft)          *          *  145.34  *          *
* Q Total (cfs)           *  676.00  * Flow (cfs)            *          *  676.00  *          *
* Top Width (ft)          *  112.28  * Top Width (ft)        *          *  112.28  *          *
* Vel Total (ft/s)        *    4.65  * Avg. Vel. (ft/s)      *          *    4.65  *          *
* Max Chl Dpth (ft)       *    4.76  * Hydr. Depth (ft)      *          *    1.29  *          *
* Conv. Total (cfs)       *  8471.1  * Conv. (cfs)           *          *  8471.1  *          *
* Length Wtd. (ft)        *  144.94  * Wetted Per. (ft)      *          *  113.85  *          *
* Min Ch El (ft)          * 1570.00  * Shear (lb/sq ft)      *          *    0.51  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    2.36  *          *
* Frctn Loss (ft)         *    1.29  * Cum Volume (acre-ft)  *    0.18  *    2.39  *          *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)        *    0.10  *    1.83  *          *
*****************************************************************************************************

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.

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 700

INPUT
Description: 700
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************************
 1799.95    1574    1877  1572.2    1954  1572.2    2031  1572.2 2121.76  1573.8
 2128.04    1572 2132.18    1570 2139.33  1569.5 2143.07    1570 2144.69    1572
 2297.02    1574 2330.75  1574.9 2366.44  1574.5  2409.4    1574 2453.34  1572.7
 2564.87  1572.7 2717.29  1572.7 2748.19    1574

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 1799.95     .04 2121.76     .03 2330.75     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2121.76 2330.75          133.44  112.64   79.47             .3       .5
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
 1799.95 2121.76  1573.8       F
 2330.75 2748.19  1574.9       F
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1219.54	.04	1575.7	.03	1686.84	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1575.7	1686.84	102.08	103.62	108.33	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1219.54	1575.7	1574.5	F
1686.84	2230.82	1577	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1219.54	1575.7	1578	1686.84	2230.82	1578

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1575.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.030	
W.S. Elev (ft)	1575.37	Reach Len. (ft)	102.08	103.62	108.33
Crit W.S. (ft)	1575.24	Flow Area (sq ft)		127.05	
E.G. Slope (ft/ft)	0.009367	Area (sq ft)		127.05	
Q Total (cfs)	798.00	Flow (cfs)		798.00	
Top Width (ft)	82.56	Top Width (ft)		82.56	
Vel Total (ft/s)	6.28	Avg. Vel. (ft/s)		6.28	
Max Chl Dpth (ft)	4.37	Hydr. Depth (ft)		1.54	
Conv. Total (cfs)	8245.3	Conv. (cfs)		8245.3	
Length Wtd. (ft)	103.62	Wetted Per. (ft)		84.70	
Min Ch El (ft)	1571.00	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)		5.51	
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	0.18	2.72	
C & E Loss (ft)	0.08	Cum SA (acres)	0.10	2.07	

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: 800

INPUT
Description: 800
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1427.88	1574	1510	1572.5	1592	1572.5	1674	1572.5	1759.85	1574
1769.22	1574.5	1778.29	1574	1784.62	1572	1788.23	1570	1790.02	1570.23
1791.12	1570	1797.25	1572	1818.13	1574	1841.16	1574	1867.83	1574
1903.89	1576	1968.96	1574	2017.28	1573.2	2207.8	1573.2	2344.84	1573.2
2392.94	1574	2407.17	1574						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1427.88	.04	1769.22	.03	1903.89	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1769.22	1903.89	134.63	144.94	139.86	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1427.88	1769.22	1574.5	F
1903.89	2407.17	1576	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1427.88	1769.22	1578	1903.89	2407.17	1578

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1575.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.030	
W.S. Elev (ft)	1574.76	Reach Len. (ft)	134.63	144.94	139.86
Crit W.S. (ft)	1574.50	Flow Area (sq ft)		145.34	
E.G. Slope (ft/ft)	0.006368	Area (sq ft)		145.34	
Q Total (cfs)	676.00	Flow (cfs)		676.00	
Top Width (ft)	112.28	Top Width (ft)		112.28	
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)		4.65	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		1.29	
Conv. Total (cfs)	8471.1	Conv. (cfs)		8471.1	
Length Wtd. (ft)	144.94	Wetted Per. (ft)		113.85	
Min Ch El (ft)	1570.00	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		2.36	
Frctn Loss (ft)	1.29	Cum Volume (acre-ft)	0.18	2.39	
C & E Loss (ft)	0.02	Cum SA (acres)	0.10	1.83	

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.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 700

INPUT
Description: 700
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1799.95	1574	1877	1572.2	1954	1572.2	2031	1572.2	2121.76	1573.8
2128.04	1572	2132.18	1570	2139.33	1569.5	2143.07	1570	2144.69	1572
2297.02	1574	2330.75	1574.9	2366.44	1574.5	2409.4	1574	2453.34	1572.7
2564.87	1572.7	2717.29	1572.7	2748.19	1574				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1799.95	.04	2121.76	.03	2330.75	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

2121.76	2330.75	133.44	112.64	79.47	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1799.95	2121.76	1573.8	F
2330.75	2748.19	1574.9	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev

```
**********************************************
 1799.95 2121.76    1578 2330.75 2748.19    1578

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1573.79  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.50  * Wt. n-Val.            *          *    0.030 *          *
* W.S. Elev (ft)          * 1573.29  * Reach Len. (ft)       *  133.44  *  112.64 *   79.47  *
* Crit W.S. (ft)          * 1573.29  * Flow Area (sq ft)     *          *  118.49 *          *
* E.G. Slope (ft/ft)      *0.013417  * Area (sq ft)          *          *  118.49 *          *
* Q Total (cfs)           *  669.00  * Flow (cfs)            *          *  669.00 *          *
* Top Width (ft)          *  119.72  * Top Width (ft)        *          *  119.72 *          *
* Vel Total (ft/s)        *    5.65  * Avg. Vel. (ft/s)      *          *    5.65 *          *
* Max Chl Dpth (ft)       *    3.79  * Hydr. Depth (ft)      *          *    0.99 *          *
* Conv. Total (cfs)       *  5775.6  * Conv. (cfs)           *          *  5775.6 *          *
* Length Wtd. (ft)        *  112.64  * Wetted Per. (ft)      *          *  121.37 *          *
* Min Ch El (ft)          * 1569.50  * Shear (lb/sq ft)      *          *    0.82 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    4.62 *          *
* Frctn Loss (ft)         *    0.26  * Cum Volume (acre-ft)  *    0.18  *    1.95 *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)        *    0.10  *    1.45 *          *
*****************************************************************************************************

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 conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
         is not a valid subcritical answer.  The program defaulted to critical depth.
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: 600

INPUT
Description: 600
Station Elevation Data    num=      12
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
**********************************************************************************
 2232.97     1574    2260  1572.6 2596.22  1572.6 2596.22 1569.56 2596.22 1565.46
 2633.95  1565.4 2633.95 1569.56 2633.95  1572.6 2866.27  1572.6  2963.4  1572.6
 3102.68  1572.6 3146.68  1573.7

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 2232.97    .015 2596.22    .015 2633.95    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2596.22 2633.95             122.03  133.46  131.14             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 2232.97 2596.22  1572.6         F
 2633.95 3146.68  1572.6         F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1569.01  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.52  * Wt. n-Val.            *          *    0.015 *          *
* W.S. Elev (ft)          * 1568.49  * Reach Len. (ft)       *    0.10  *    0.10  *    0.10  *
* Crit W.S. (ft)          * 1567.57  * Flow Area (sq ft)     *          *  115.56  *          *
* E.G. Slope (ft/ft)      *0.000939  * Area (sq ft)          *          *  115.56  *          *
* Q Total (cfs)           *  669.00  * Flow (cfs)            *          *  669.00  *          *
* Top Width (ft)          *   37.73  * Top Width (ft)        *          *   37.73  *          *
* Vel Total (ft/s)        *    5.79  * Avg. Vel. (ft/s)      *          *    5.79  *          *
* Max Chl Dpth (ft)       *    3.09  * Hydr. Depth (ft)      *          *    3.06  *          *
* Conv. Total (cfs)       * 21837.5  * Conv. (cfs)           *          * 21837.5  *          *
* Length Wtd. (ft)        *    0.10  * Wetted Per. (ft)      *          *   43.86  *          *
* Min Ch El (ft)          * 1565.40  * Shear (lb/sq ft)      *          *    0.15  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.89  *          *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)  *    0.18  *    1.65  *          *
* C & E Loss (ft)         *          * Cum SA (acres)        *    0.10  *    1.25  *          *
*****************************************************************************************************

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: 550

INPUT
Description: Bridge #1

Distance from Upstream XS =       .1
Deck/Roadway Width        =    133.26
Weir Coefficient          =       2.7
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
 2232.97 1572.66  1564.3 2596.22 1572.66  1564.3 2596.22 1572.66 1569.51
 2633.95 1572.66 1569.51 2633.95 1572.66  1564.3 3146.68 1572.66  1564.3

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
**********************************************************************************
 2232.97     1574    2260  1572.6 2596.22  1572.6 2596.22 1569.56 2596.22 1565.46
 2633.95  1565.4 2633.95 1569.56 2633.95  1572.6 2866.27  1572.6  2963.4  1572.6
 3102.68  1572.6 3146.68  1573.7

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 2232.97    .015 2596.22    .015 2633.95    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
       2596.22 2633.95             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 2232.97 2596.22  1572.6         F
 2633.95 3146.68  1572.6         F

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
```

```
**********************************************
 1799.95 2121.76    1578 2330.75 2748.19    1578

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1573.79  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.50  * Wt. n-Val.            *          *    0.030  *          *
* W.S. Elev (ft)         * 1573.29  * Reach Len. (ft)       *  133.44  *  112.64  *   79.47  *
* Crit W.S. (ft)         * 1573.29  * Flow Area (sq ft)     *          *  118.49  *          *
* E.G. Slope (ft/ft)     *0.013417  * Area (sq ft)          *          *  118.49  *          *
* Q Total (cfs)          *  669.00  * Flow (cfs)            *          *  669.00  *          *
* Top Width (ft)         *  119.72  * Top Width (ft)        *          *  119.72  *          *
* Vel Total (ft/s)       *    5.65  * Avg. Vel. (ft/s)      *          *    5.65  *          *
* Max Chl Dpth (ft)      *    3.79  * Hydr. Depth (ft)      *          *    0.99  *          *
* Conv. Total (cfs)      *  5775.6  * Conv. (cfs)           *          *  5775.6  *          *
* Length Wtd. (ft)       *  112.64  * Wetted Per. (ft)      *          *  121.37  *          *
* Min Ch El (ft)         * 1569.50  * Shear (lb/sq ft)      *          *    0.82  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    4.62  *          *
* Frctn Loss (ft)        *    0.26  * Cum Volume (acre-ft)  *    0.18  *    1.95  *          *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)        *    0.10  *    1.45  *          *
*****************************************************************************************************

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 conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
         is not a valid subcritical answer.  The program defaulted to critical depth.
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: 600

INPUT
Description: 600
Station Elevation Data    num=      12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 2232.97     1574     2260  1572.6 2596.22  1572.6 2596.22 1569.56 2596.22 1565.46
 2633.95  1565.4 2633.95 1569.56 2633.95  1572.6 2866.27  1572.6  2963.4  1572.6
 3102.68  1572.6 3146.68  1573.7

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 2232.97    .015 2596.22    .015 2633.95    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2596.22 2633.95           122.03  133.46  131.14             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 2232.97 2596.22  1572.6         F
 2633.95 3146.68  1572.6         F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1569.01  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.52  * Wt. n-Val.            *          *    0.015  *          *
* W.S. Elev (ft)         * 1568.49  * Reach Len. (ft)       *    0.10  *    0.10  *    0.10  *
* Crit W.S. (ft)         * 1567.57  * Flow Area (sq ft)     *          *  115.56  *          *
* E.G. Slope (ft/ft)     *0.000939  * Area (sq ft)          *          *  115.56  *          *
* Q Total (cfs)          *  669.00  * Flow (cfs)            *          *  669.00  *          *
* Top Width (ft)         *   37.73  * Top Width (ft)        *          *   37.73  *          *
* Vel Total (ft/s)       *    5.79  * Avg. Vel. (ft/s)      *          *    5.79  *          *
* Max Chl Dpth (ft)      *    3.09  * Hydr. Depth (ft)      *          *    3.06  *          *
* Conv. Total (cfs)      * 21837.5  * Conv. (cfs)           *          * 21837.5  *          *
* Length Wtd. (ft)       *    0.10  * Wetted Per. (ft)      *          *   43.86  *          *
* Min Ch El (ft)         * 1565.40  * Shear (lb/sq ft)      *          *    0.15  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    0.89  *          *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *    0.18  *    1.65  *          *
* C & E Loss (ft)        *          * Cum SA (acres)        *    0.10  *    1.25  *          *
*****************************************************************************************************

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: 550

INPUT
Description: Bridge #1

Distance from Upstream XS =       .1
Deck/Roadway Width        =    133.26
Weir Coefficient          =       2.7
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
 2232.97 1572.66  1564.3 2596.22 1572.66  1564.3 2596.22 1572.66 1569.51
 2633.95 1572.66 1569.51 2633.95 1572.66  1564.3 3146.68 1572.66  1564.3

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************************
 2232.97     1574     2260  1572.6 2596.22  1572.6 2596.22 1569.56 2596.22 1565.46
 2633.95  1565.4 2633.95 1569.56 2633.95  1572.6 2866.27  1572.6  2963.4  1572.6
 3102.68  1572.6 3146.68  1573.7

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 2232.97    .015 2596.22    .015 2633.95    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
       2596.22 2633.95             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 2232.97 2596.22  1572.6         F
 2633.95 3146.68  1572.6         F

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
```

```
 2232.97 1572.66  1564.3 2332.84 1572.66  1564.3 2332.84 1572.66 1569.51
 2370.57 1572.66 1569.51 2370.57 1572.66  1564.3 3146.68 1572.66  1564.3

 Downstream Bridge Cross Section Data
 Station Elevation Data    num=      11
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 ***********************************************************************************
   1921.7    1572 2203.22    1572 2332.84    1572 2332.84 1568.47 2332.84 1564.37
  2370.57  1564.3 2370.57 1568.47 2370.57    1572 2514.64    1572  2582.6    1572
  2867.98    1572

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
 ************************************************
   1921.7    .015 2332.84    .015 2370.57    .015

 Bank Sta: Left   Right    Coeff Contr.   Expan.
        2332.84 2370.57            .3       .5
 Ineffective Flow     num=       2
    Sta L   Sta R    Elev  Permanent
   1921.7 2332.84    1572       F
  2370.57 2867.98    1572       F

 Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .95
 Elevation at which weir flow begins         = 1572.66
 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=2615.085    Downstream=2351.705
 Upstream     num=     2
     Width   Elev    Width   Elev
 *********************************
     1.34  1565.4    1.34 1569.51
 Downstream     num=     2
     Width   Elev    Width   Elev
 *********************************
     1.34  1564.3    1.34 1569.51

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Yarnell                KVal =    1.25
 Selected Low Flow Methods = Yarnell

 High Flow Method
        Pressure and Weir flow
            Submerged Inlet Cd          =
            Submerged Inlet + Outlet Cd =.8164966
            Max Low Cord                = 1569.51

 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)          *    1569.01  * Element                *Inside BR US *Inside BR DS *
 * W.S. US. (ft)          *    1568.49  * E.G. Elev (ft)         *    1568.98  *    1567.62  *
 * Q Total (cfs)          *     669.00  * W.S. Elev (ft)         *    1568.37  *    1566.53  *
 * Q Bridge (cfs)         *     669.00  * Crit W.S. (ft)         *    1567.63  *    1566.53  *
 * Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       2.97  *       2.23  *
 * Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *       6.26  *       8.37  *
 * Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     106.94  *      79.91  *
 * Weir Submerg           *             * Froude # Chl           *       0.64  *       1.00  *
 * Weir Max Depth (ft)    *             * Specif Force (cu ft)   *     287.12  *     261.68  *
 * Min El Weir Flow (ft)  *    1572.67  * Hydr Depth (ft)        *       2.94  *       2.20  *
 * Min El Prs (ft)        *    1569.51  * W.P. Total (ft)        *      48.15  *      45.17  *
 * Delta EG (ft)          *       1.47  * Conv. Total (cfs)      *    18035.1  *    11578.8  *
 * Delta WS (ft)          *       2.02  * Top Width (ft)         *      36.39  *      36.39  *
 * BR Open Area (sq ft)   *     148.47  * Frctn Loss (ft)        *             *             *
 * BR Open Vel (ft/s)     *       8.37  * C & E Loss (ft)        *             *             *
 * Coef of Q              *             * Shear Total (lb/sq ft) *       0.19  *       0.37  *
 * Br Sel Method          *   Momentum  * Power Total (lb/ft s)  *       1.19  *       3.09  *
 ***********************************************************************************************

 Warning: The flow regime calculated by the momentum equation shows class B flow.  For the best
          solution, this profile should be run as a mixed flow problem.
 Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
 Warning: The water surface upstream of the bridge computed by the Yarnell method was below critical
          depth.  The Yarnell solution has been disregarded.
 Note:    Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow.
          The Yarnell answer has been disregarded.
 Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
          energy was used.
 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: 500

 INPUT
 Description: 500
 Station Elevation Data    num=      11
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 ***********************************************************************************
   1921.7    1572 2203.22    1572 2332.84    1572 2332.84 1568.47 2332.84 1564.37
  2370.57  1564.3 2370.57 1568.47 2370.57    1572 2514.64    1572  2582.6    1572
  2867.98    1572

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
 ************************************************
   1921.7    .015 2332.84    .015 2370.57    .015

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        2332.84 2370.57            75.43   74.97   81.76             .3       .5
 Ineffective Flow     num=       2
    Sta L   Sta R    Elev  Permanent
   1921.7 2332.84    1572       F
  2370.57 2867.98    1572       F

 CROSS SECTION OUTPUT  Profile #PF 1
 ***********************************************************************************
 * E.G. Elev (ft)         * 1567.54  * Element                *  Left OB *  Channel * Right OB *
```

```
 2232.97 1572.66  1564.3 2332.84 1572.66  1564.3 2332.84 1572.66 1569.51
 2370.57 1572.66 1569.51 2370.57 1572.66  1564.3 3146.68 1572.66  1564.3

Downstream Bridge Cross Section Data
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
  1921.7    1572 2203.22    1572 2332.84    1572 2332.84 1568.47 2332.84 1564.37
 2370.57  1564.3 2370.57 1568.47 2370.57    1572 2514.64    1572  2582.6    1572
 2867.98    1572

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  1921.7    .015 2332.84    .015 2370.57    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
       2332.84 2370.57            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  1921.7 2332.84    1572       F
 2370.57 2867.98    1572       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         = 1572.66
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=2615.085    Downstream=2351.705
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
    1.34  1565.4    1.34 1569.51
Downstream     num=      2
    Width   Elev    Width   Elev
*********************************
    1.34  1564.3    1.34 1569.51

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Yarnell                KVal =    1.25
Selected Low Flow Methods = Yarnell

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.8164966
           Max Low Cord                = 1569.51

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)           *    1569.01 * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)           *    1568.49 * E.G. Elev (ft)         *    1568.98 *    1567.62 *
* Q Total (cfs)           *     669.00 * W.S. Elev (ft)         *    1568.37 *    1566.53 *
* Q Bridge (cfs)          *     669.00 * Crit W.S. (ft)         *    1567.63 *    1566.53 *
* Q Weir (cfs)            *            * Max Chl Dpth (ft)      *       2.97 *       2.23 *
* Weir Sta Lft (ft)       *            * Vel Total (ft/s)       *       6.26 *       8.37 *
* Weir Sta Rgt (ft)       *            * Flow Area (sq ft)      *     106.94 *      79.91 *
* Weir Submerg            *            * Froude # Chl           *       0.64 *       1.00 *
* Weir Max Depth (ft)     *            * Specif Force (cu ft)   *     287.12 *     261.68 *
* Min El Weir Flow (ft)   *    1572.67 * Hydr Depth (ft)        *       2.94 *       2.20 *
* Min El Prs (ft)         *    1569.51 * W.P. Total (ft)        *      48.15 *      45.17 *
* Delta EG (ft)           *       1.47 * Conv. Total (cfs)      *    18035.1 *    11578.8 *
* Delta WS (ft)           *       2.02 * Top Width (ft)         *      36.39 *      36.39 *
* BR Open Area (sq ft)    *     148.47 * Frctn Loss (ft)        *            *            *
* BR Open Vel (ft/s)      *       8.37 * C & E Loss (ft)        *            *            *
* Coef of Q               *            * Shear Total (lb/sq ft) *       0.19 *       0.37 *
* Br Sel Method           *   Momentum * Power Total (lb/ft s)  *       1.19 *       3.09 *
*************************************************************************************************

Warning: The flow regime calculated by the momentum equation shows class B flow.  For the best
         solution, this profile should be run as a mixed flow problem.
Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Warning: The water surface upstream of the bridge computed by the Yarnell method was below critical
         depth.  The Yarnell solution has been disregarded.
Note:    Yarnell answer is not valid if the water surface is above the low chord or if there is weir flow.
         The Yarnell answer has been disregarded.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.
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: 500

INPUT
Description: 500
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
  1921.7    1572 2203.22    1572 2332.84    1572 2332.84 1568.47 2332.84 1564.37
 2370.57  1564.3 2370.57 1568.47 2370.57    1572 2514.64    1572  2582.6    1572
 2867.98    1572

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  1921.7    .015 2332.84    .015 2370.57    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2332.84 2370.57            75.43   74.97   81.76             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  1921.7 2332.84    1572       F
 2370.57 2867.98    1572       F

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)         * 1567.54  * Element                *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	*	1.07	* Wt. n-Val.	*		*	0.015	*		*	
* W.S. Elev (ft)	*	1566.47	* Reach Len. (ft)	*	75.43	*	74.97	*	81.76	*	
* Crit W.S. (ft)	*	1566.47	* Flow Area (sq ft)	*		*	80.55	*		*	
* E.G. Slope (ft/ft)	*	0.002950	* Area (sq ft)	*		*	80.55	*		*	
* Q Total (cfs)	*	669.00	* Flow (cfs)	*		*	669.00	*		*	
* Top Width (ft)	*	37.73	* Top Width (ft)	*		*	37.73	*		*	
* Vel Total (ft/s)	*	8.31	* Avg. Vel. (ft/s)	*		*	8.31	*		*	
* Max Chl Dpth (ft)	*	2.17	* Hydr. Depth (ft)	*		*	2.13	*		*	
* Conv. Total (cfs)	*	12317.7	* Conv. (cfs)	*		*	12317.7	*		*	
* Length Wtd. (ft)	*	74.97	* Wetted Per. (ft)	*		*	42.00	*		*	
* Min Ch El (ft)	*	1564.30	* Shear (lb/sq ft)	*		*	0.35	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	2.93	*		*	
* Frctn Loss (ft)	*	0.36	* Cum Volume (acre-ft)	*	0.18	*	1.36	*		*	
* C & E Loss (ft)	*	0.27	* Cum SA (acres)	*	0.10	*	1.13	*		*	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 400

INPUT
Description: 400
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2126.23	1570	2143.31	1572	2183.04	1572	2191.36	1570	2217.92	1562
2238.83	1560	2252.16	1560	2262.45	1564	2281.55	1566	2288.71	1566
2319.58	1564	2326.53	1562	2333.47	1560	2352.21	1560	2362.78	1562
2368.59	1562	2429.18	1562	2450.74	1564	2527.34	1566	2620.61	1566
2621.4	1566	2852.45	1568						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2126.23	.03	2281.55	.025	2450.74	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2281.55	2450.74	132.08	134.41	158.2	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2126.23	2281.55	1566	F
2450.74	2852.45	1564	F

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1563.09	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.53	* Wt. n-Val.	*	* 0.025	*	*
* W.S. Elev (ft)	* 1562.56	* Reach Len. (ft)	* 132.08	* 134.41	* 158.20	*
* Crit W.S. (ft)	* 1562.56	* Flow Area (sq ft)	*	* 114.36	*	*
* E.G. Slope (ft/ft)	* 0.009326	* Area (sq ft)	* 75.56	* 114.36	*	*
* Q Total (cfs)	* 669.00	* Flow (cfs)	*	* 669.00	*	*
* Top Width (ft)	* 153.25	* Top Width (ft)	* 42.67	* 110.59	*	*
* Vel Total (ft/s)	* 5.85	* Avg. Vel. (ft/s)	*	* 5.85	*	*
* Max Chl Dpth (ft)	* 2.56	* Hydr. Depth (ft)	*	* 1.03	*	*
* Conv. Total (cfs)	* 6927.4	* Conv. (cfs)	*	* 6927.4	*	*
* Length Wtd. (ft)	* 134.41	* Wetted Per. (ft)	*	* 111.16	*	*
* Min Ch El (ft)	* 1560.00	* Shear (lb/sq ft)	*	* 0.60	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 3.50	*	*
* Frctn Loss (ft)	* 1.15	* Cum Volume (acre-ft)	* 0.11	* 1.20	*	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.06	* 1.01	*	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 300

INPUT
Description: 300
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2682.38	1566	2807.33	1564	2926.48	1562	2954.76	1560	2969.07	1558
3000.86	1558	3018.26	1560	3035.77	1562	3082.96	1562	3156.53	1562
3217.12	1564								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2682.38	.03	2926.48	.025	3035.77	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2926.48	3035.77	364.63	352.07	359.83	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2682.38	2926.48	1562	F
3035.77	3217.12	1562	F

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1560.77	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.75	* Wt. n-Val.	*	* 0.025	*	*
* W.S. Elev (ft)	* 1560.02	* Reach Len. (ft)	* 364.63	* 352.07	* 359.83	*
* Crit W.S. (ft)	* 1560.02	* Flow Area (sq ft)	*	* 96.58	*	*
* E.G. Slope (ft/ft)	* 0.007882	* Area (sq ft)	*	* 96.58	*	*
* Q Total (cfs)	* 669.00	* Flow (cfs)	*	* 669.00	*	*
* Top Width (ft)	* 63.96	* Top Width (ft)	*	* 63.96	*	*
* Vel Total (ft/s)	* 6.93	* Avg. Vel. (ft/s)	*	* 6.93	*	*

Vel Head (ft)	1.07	Wt. n-Val.			0.015		
W.S. Elev (ft)	1566.47	Reach Len. (ft)		75.43	74.97	81.76	
Crit W.S. (ft)	1566.47	Flow Area (sq ft)			80.55		
E.G. Slope (ft/ft)	0.002950	Area (sq ft)			80.55		
Q Total (cfs)	669.00	Flow (cfs)			669.00		
Top Width (ft)	37.73	Top Width (ft)			37.73		
Vel Total (ft/s)	8.31	Avg. Vel. (ft/s)			8.31		
Max Chl Dpth (ft)	2.17	Hydr. Depth (ft)			2.13		
Conv. Total (cfs)	12317.7	Conv. (cfs)			12317.7		
Length Wtd. (ft)	74.97	Wetted Per. (ft)			42.00		
Min Ch El (ft)	1564.30	Shear (lb/sq ft)			0.35		
Alpha	1.00	Stream Power (lb/ft s)			2.93		
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)		0.18	1.36		
C & E Loss (ft)	0.27	Cum SA (acres)		0.10	1.13		

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 400

INPUT
Description: 400
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2126.23	1570	2143.31	1572	2183.04	1572	2191.36	1570	2217.92	1562
2238.83	1560	2252.16	1560	2262.45	1564	2281.55	1566	2288.71	1566
2319.58	1564	2326.53	1562	2333.47	1560	2352.21	1560	2362.78	1562
2368.59	1562	2429.18	1562	2450.74	1564	2527.34	1566	2620.61	1566
2621.4	1566	2852.45	1568						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2126.23	.03	2281.55	.025	2450.74	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
2281.55 2450.74 132.08 134.41 158.2 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2126.23	2281.55	1566	F
2450.74	2852.45	1564	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1563.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.		0.025	
W.S. Elev (ft)	1562.56	Reach Len. (ft)	132.08	134.41	158.20
Crit W.S. (ft)	1562.56	Flow Area (sq ft)		114.36	
E.G. Slope (ft/ft)	0.009326	Area (sq ft)	75.56	114.36	
Q Total (cfs)	669.00	Flow (cfs)		669.00	
Top Width (ft)	153.25	Top Width (ft)	42.67	110.59	
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)		5.85	
Max Chl Dpth (ft)	2.56	Hydr. Depth (ft)		1.03	
Conv. Total (cfs)	6927.4	Conv. (cfs)		6927.4	
Length Wtd. (ft)	134.41	Wetted Per. (ft)		111.16	
Min Ch El (ft)	1560.00	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)		3.50	
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	0.11	1.20	
C & E Loss (ft)	0.02	Cum SA (acres)	0.06	1.01	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 300

INPUT
Description: 300
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2682.38	1566	2807.33	1564	2926.48	1562	2954.76	1560	2969.07	1558
3000.86	1558	3018.26	1560	3035.77	1562	3082.96	1562	3156.53	1562
3217.12	1564								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2682.38	.03	2926.48	.025	3035.77	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
2926.48 3035.77 364.63 352.07 359.83 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2682.38	2926.48	1562	F
3035.77	3217.12	1562	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1560.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.025	
W.S. Elev (ft)	1560.02	Reach Len. (ft)	364.63	352.07	359.83
Crit W.S. (ft)	1560.02	Flow Area (sq ft)		96.58	
E.G. Slope (ft/ft)	0.007882	Area (sq ft)		96.58	
Q Total (cfs)	669.00	Flow (cfs)		669.00	
Top Width (ft)	63.96	Top Width (ft)		63.96	
Vel Total (ft/s)	6.93	Avg. Vel. (ft/s)		6.93	

Max Chl Dpth (ft)	2.02	Hydr. Depth (ft)		1.51	
Conv. Total (cfs)	7535.3	Conv. (cfs)		7535.3	
Length Wtd. (ft)	352.07	Wetted Per. (ft)		64.22	
Min Ch El (ft)	1558.00	Shear (lb/sq ft)		0.74	
Alpha	1.00	Stream Power (lb/ft s)		5.13	
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)		0.87	
C & E Loss (ft)	0.08	Cum SA (acres)		0.74	

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, water surface was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 200

INPUT
Description: 200
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2778.75	1564	2874.16	1564	2912.73	1562	2929.4	1560	2941.08	1558
2949.85	1556	2963.64	1554	2981.64	1554	3011.17	1554	3066.53	1554
3081.56	1556	3096.65	1558	3113.93	1560	3148.31	1560	3396.06	1560

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2778.75	.03	2929.4	.025	3113.93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2929.4	3113.93	0	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2778.75	2929.4	1560	F
3113.93	3396.06	1560	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1555.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.025	
W.S. Elev (ft)	1555.08	Reach Len. (ft)			
Crit W.S. (ft)	1555.08	Flow Area (sq ft)		118.97	
E.G. Slope (ft/ft)	0.008907	Area (sq ft)		118.97	
Q Total (cfs)	669.00	Flow (cfs)		669.00	
Top Width (ft)	118.39	Top Width (ft)		118.39	
Vel Total (ft/s)	5.62	Avg. Vel. (ft/s)		5.62	
Max Chl Dpth (ft)	1.08	Hydr. Depth (ft)		1.00	
Conv. Total (cfs)	7088.6	Conv. (cfs)		7088.6	
Length Wtd. (ft)		Wetted Per. (ft)		118.53	
Min Ch El (ft)	1554.00	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		3.14	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	4900	.04	.025	.04
Reach-1	4800	.04	.025	.04
Reach-1	4700	.04	.025	.04
Reach-1	4600	.04	.025	.04
Reach-1	4500	.04	.025	.04
Reach-1	4400	.04	.025	.04
Reach-1	4300	.04	.025	.04
Reach-1	4200	.04	.025	.04
Reach-1	4100	.04	.025	.04
Reach-1	4000	.04	.025	.04
Reach-1	3900	.04	.025	.04
Reach-1	3800	.04	.025	.04
Reach-1	3700	.04	.025	.04
Reach-1	3600	.04	.025	.04
Reach-1	3500	.04	.025	.04
Reach-1	3400	.04	.025	.04
Reach-1	3300	.04	.025	.04
Reach-1	3200	.04	.025	.04
Reach-1	3100	.04	.025	.04
Reach-1	3000	.04	.025	.04
Reach-1	2900	.04	.025	.04
Reach-1	2800	.04	.025	.04
Reach-1	2700	.04	.025	.04
Reach-1	2600	.04	.025	.04
Reach-1	2500	.04	.025	.04
Reach-1	2400	.04	.025	.04
Reach-1	2350	.04	.025	.04
Reach-1	2330	.04	.025	.04
Reach-1	2300	.04	.025	.04
Reach-1	2200	.04	.025	.04
Reach-1	2100	.04	.025	.04
Reach-1	2000	.015	.015	.015
Reach-1	1950	Bridge		
Reach-1	1900	.015	.015	.015
Reach-1	1800	.04	.025	.04
Reach-1	1750	.04	.025	.04
Reach-1	1700	.04	.025	.04
Reach-1	1650	.04	.025	.04
Reach-1	1600	.04	.025	.04
Reach-1	1500	.04	.025	.04
Reach-1	1400	.04	.025	.04
Reach-1	1300	.04	.025	.04
Reach-1	1200	.04	.03	.04
Reach-1	1100	.04	.03	.04
Reach-1	1000	.04	.03	.04
Reach-1	900	.04	.03	.04
Reach-1	800	.04	.03	.04
Reach-1	700	.04	.03	.04
Reach-1	600	.015	.015	.015
Reach-1	550	Bridge		

Max Chl Dpth (ft)	2.02	Hydr. Depth (ft)		1.51			
Conv. Total (cfs)	7535.3	Conv. (cfs)		7535.3			
Length Wtd. (ft)	352.07	Wetted Per. (ft)		64.22			
Min Ch El (ft)	1558.00	Shear (lb/sq ft)		0.74			
Alpha	1.00	Stream Power (lb/ft s)		5.13			
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)		0.87			
C & E Loss (ft)	0.08	Cum SA (acres)		0.74			

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, water surface was used.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 200

INPUT
Description: 200
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2778.75	1564	2874.16	1564	2912.73	1562	2929.4	1560	2941.08	1558
2949.85	1556	2963.64	1554	2981.64	1554	3011.17	1554	3066.53	1554
3081.56	1556	3096.65	1558	3113.93	1560	3148.31	1560	3396.06	1560

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2778.75	.03	2929.4	.025	3113.93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2929.4	3113.93	0	0	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
2778.75	2929.4	1560	F
3113.93	3396.06	1560	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1555.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.025	
W.S. Elev (ft)	1555.08	Reach Len. (ft)			
Crit W.S. (ft)	1555.08	Flow Area (sq ft)		118.97	
E.G. Slope (ft/ft)	0.008907	Area (sq ft)		118.97	
Q Total (cfs)	669.00	Flow (cfs)		669.00	
Top Width (ft)	118.39	Top Width (ft)		118.39	
Vel Total (ft/s)	5.62	Avg. Vel. (ft/s)		5.62	
Max Chl Dpth (ft)	1.08	Hydr. Depth (ft)		1.00	
Conv. Total (cfs)	7088.6	Conv. (cfs)		7088.6	
Length Wtd. (ft)		Wetted Per. (ft)		118.53	
Min Ch El (ft)	1554.00	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		3.14	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	4900	.04	.025	.04
Reach-1	4800	.04	.025	.04
Reach-1	4700	.04	.025	.04
Reach-1	4600	.04	.025	.04
Reach-1	4500	.04	.025	.04
Reach-1	4400	.04	.025	.04
Reach-1	4300	.04	.025	.04
Reach-1	4200	.04	.025	.04
Reach-1	4100	.04	.025	.04
Reach-1	4000	.04	.025	.04
Reach-1	3900	.04	.025	.04
Reach-1	3800	.04	.025	.04
Reach-1	3700	.04	.025	.04
Reach-1	3600	.04	.025	.04
Reach-1	3500	.04	.025	.04
Reach-1	3400	.04	.025	.04
Reach-1	3300	.04	.025	.04
Reach-1	3200	.04	.025	.04
Reach-1	3100	.04	.025	.04
Reach-1	3000	.04	.025	.04
Reach-1	2900	.04	.025	.04
Reach-1	2800	.04	.025	.04
Reach-1	2700	.04	.025	.04
Reach-1	2600	.04	.025	.04
Reach-1	2500	.04	.025	.04
Reach-1	2400	.04	.025	.04
Reach-1	2350	.04	.025	.04
Reach-1	2330	.04	.025	.04
Reach-1	2300	.04	.025	.04
Reach-1	2200	.04	.025	.04
Reach-1	2100	.04	.025	.04
Reach-1	2000	.015	.015	.015
Reach-1	1950	Bridge		
Reach-1	1900	.015	.015	.015
Reach-1	1800	.04	.025	.04
Reach-1	1750	.04	.025	.04
Reach-1	1700	.04	.025	.04
Reach-1	1650	.04	.025	.04
Reach-1	1600	.04	.025	.04
Reach-1	1500	.04	.025	.04
Reach-1	1400	.04	.025	.04
Reach-1	1300	.04	.025	.04
Reach-1	1200	.04	.03	.04
Reach-1	1100	.04	.03	.04
Reach-1	1000	.04	.03	.04
Reach-1	900	.04	.03	.04
Reach-1	800	.04	.03	.04
Reach-1	700	.04	.03	.04
Reach-1	600	.015	.015	.015
Reach-1	550	Bridge		

*Reach-1	*	500	*	.015*	.015*	.015*
*Reach-1	*	400	*	.03*	.025*	.03*
*Reach-1	*	300	*	.03*	.025*	.03*
*Reach-1	*	200	*	.03*	.025*	.03*

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
*Reach-1	4900	374.55*	351.24*	218.45*
*Reach-1	4800	187.19*	227.74*	241.84*
*Reach-1	4700	272.78*	260.86*	275.83*
*Reach-1	4600	488*	442*	278*
*Reach-1	4500	416.91*	533.38*	575.19*
*Reach-1	4400	432*	476*	439*
*Reach-1	4300	317.35*	383.62*	407.28*
*Reach-1	4200	285*	402*	297*
*Reach-1	4100	535*	497*	356*
*Reach-1	4000	444.57*	465.67*	477.86*
*Reach-1	3900	468.3*	320.4*	238.03*
*Reach-1	3800	480*	666*	713*
*Reach-1	3700	397.89*	409.82*	401.06*
*Reach-1	3600	366.01*	358.51*	356.91*
*Reach-1	3500	445.73*	403.18*	364.17*
*Reach-1	3400	467.16*	402.24*	325.83*
*Reach-1	3300	462.6*	482.8*	416.49*
*Reach-1	3200	426.92*	390.01*	395.6*
*Reach-1	3100	382.96*	302.1*	294.37*
*Reach-1	3000	405.73*	349.71*	342.04*
*Reach-1	2900	292.71*	292.09*	273.86*
*Reach-1	2800	262.99*	376.77*	389.6*
*Reach-1	2700	249.65*	246.94*	237.3*
*Reach-1	2600	320.81*	373.36*	390.78*
*Reach-1	2500	186.68*	179.72*	182.96*
*Reach-1	2400	178*	71*	109*
*Reach-1	2350	151*	63*	123*
*Reach-1	2330	235*	240*	222*
*Reach-1	2300	320.42*	311.55*	310.65*
*Reach-1	2200	383.01*	328.57*	273.85*
*Reach-1	2100	58.83*	49.81*	54.83*
*Reach-1	2000	320.07*	319.85*	303.13*
*Reach-1	1950	*Bridge *	*	*
*Reach-1	1900	66.92*	58.98*	60.81*
*Reach-1	1800	173.79*	170.93*	148.02*
*Reach-1	1750	171.49*	169.33*	179.87*
*Reach-1	1700	163.66*	161.13*	154.63*
*Reach-1	1650	190.68*	175.57*	185.82*
*Reach-1	1600	101.17*	196.31*	210.32*
*Reach-1	1500	76.07*	108.07*	119.69*
*Reach-1	1400	122.02*	161.58*	190.42*
*Reach-1	1300	198.91*	176.37*	153.42*
*Reach-1	1200	111.55*	110.23*	110.23*
*Reach-1	1100	102.45*	103.7*	103.7*
*Reach-1	1000	116.93*	118.27*	121.55*
*Reach-1	900	102.08*	103.62*	108.33*
*Reach-1	800	134.63*	144.94*	139.86*
*Reach-1	700	133.44*	112.64*	79.47*
*Reach-1	600	122.03*	133.46*	131.14*
*Reach-1	550	*Bridge *	*	*
*Reach-1	500	75.43*	74.97*	81.76*
*Reach-1	400	132.08*	134.41*	158.2*
*Reach-1	300	364.63*	352.07*	359.83*
*Reach-1	200	0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
*Reach-1	4900	.1*	.3*
*Reach-1	4800	.1*	.3*
*Reach-1	4700	.1*	.3*
*Reach-1	4600	.1*	.3*
*Reach-1	4500	.1*	.3*
*Reach-1	4400	.1*	.3*
*Reach-1	4300	.1*	.3*
*Reach-1	4200	.1*	.3*
*Reach-1	4100	.1*	.3*
*Reach-1	4000	.1*	.3*
*Reach-1	3900	.1*	.3*
*Reach-1	3800	.1*	.3*
*Reach-1	3700	.1*	.3*
*Reach-1	3600	.1*	.3*
*Reach-1	3500	.1*	.3*
*Reach-1	3400	.1*	.3*
*Reach-1	3300	.1*	.3*
*Reach-1	3200	.1*	.3*
*Reach-1	3100	.1*	.3*
*Reach-1	3000	.1*	.3*
*Reach-1	2900	.1*	.3*
*Reach-1	2800	.1*	.3*
*Reach-1	2700	.1*	.3*
*Reach-1	2600	.1*	.3*
*Reach-1	2500	.1*	.3*
*Reach-1	2400	.1*	.3*
*Reach-1	2350	.1*	.3*
*Reach-1	2330	.1*	.3*
*Reach-1	2300	.1*	.3*
*Reach-1	2200	.1*	.3*
*Reach-1	2100	.3*	.5*
*Reach-1	2000	.3*	.5*
*Reach-1	1950	*Bridge *	*
*Reach-1	1900	.3*	.5*
*Reach-1	1800	.1*	.3*
*Reach-1	1750	.1*	.3*
*Reach-1	1700	.1*	.3*
*Reach-1	1650	.1*	.3*
*Reach-1	1600	.1*	.3*
*Reach-1	1500	.1*	.3*
*Reach-1	1400	.1*	.3*
*Reach-1	1300	.1*	.3*
*Reach-1	1200	.1*	.3*
*Reach-1	1100	.1*	.3*
*Reach-1	1000	.1*	.3*
*Reach-1	900	.1*	.3*
*Reach-1	800	.1*	.3*
*Reach-1	700	.3*	.5*

*Reach-1	*	500	*	.015*	.015*	.015*
*Reach-1	*	400	*	.03*	.025*	.03*
*Reach-1	*	300	*	.03*	.025*	.03*
*Reach-1	*	200	*	.03*	.025*	.03*

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
*Reach-1	4900	374.55*	351.24*	218.45*
*Reach-1	4800	187.19*	227.74*	241.84*
*Reach-1	4700	272.78*	260.86*	275.83*
*Reach-1	4600	488*	442*	278*
*Reach-1	4500	416.91*	533.38*	575.19*
*Reach-1	4400	432*	476*	439*
*Reach-1	4300	317.35*	383.62*	407.28*
*Reach-1	4200	285*	402*	297*
*Reach-1	4100	535*	497*	356*
*Reach-1	4000	444.57*	465.67*	477.86*
*Reach-1	3900	468.3*	320.4*	238.03*
*Reach-1	3800	480*	666*	713*
*Reach-1	3700	397.89*	409.82*	401.06*
*Reach-1	3600	366.01*	358.51*	356.91*
*Reach-1	3500	445.73*	403.18*	364.17*
*Reach-1	3400	467.16*	402.24*	325.83*
*Reach-1	3300	462.6*	482.8*	416.49*
*Reach-1	3200	426.92*	390.01*	395.6*
*Reach-1	3100	382.96*	302.1*	294.37*
*Reach-1	3000	405.73*	349.71*	342.04*
*Reach-1	2900	292.71*	292.09*	273.86*
*Reach-1	2800	262.99*	376.77*	389.6*
*Reach-1	2700	249.65*	246.94*	237.3*
*Reach-1	2600	320.81*	373.36*	390.78*
*Reach-1	2500	186.68*	179.72*	182.96*
*Reach-1	2400	178*	71*	109*
*Reach-1	2350	151*	63*	123*
*Reach-1	2330	235*	240*	222*
*Reach-1	2300	320.42*	311.55*	310.65*
*Reach-1	2200	383.01*	328.57*	273.85*
*Reach-1	2100	58.83*	49.81*	54.83*
*Reach-1	2000	320.07*	319.85*	303.13*
*Reach-1	1950	*Bridge	*	*	*
*Reach-1	1900	66.92*	58.98*	60.81*
*Reach-1	1800	173.79*	170.93*	148.02*
*Reach-1	1750	171.49*	169.33*	179.87*
*Reach-1	1700	163.66*	161.13*	154.63*
*Reach-1	1650	190.68*	175.57*	185.82*
*Reach-1	1600	101.17*	196.31*	210.32*
*Reach-1	1500	76.07*	108.07*	119.69*
*Reach-1	1400	122.02*	161.58*	190.42*
*Reach-1	1300	198.91*	176.37*	153.42*
*Reach-1	1200	111.55*	110.23*	110.23*
*Reach-1	1100	102.45*	103.7*	103.7*
*Reach-1	1000	116.93*	118.27*	121.55*
*Reach-1	900	102.08*	103.62*	108.33*
*Reach-1	800	134.63*	144.94*	139.86*
*Reach-1	700	133.44*	112.64*	79.47*
*Reach-1	600	122.03*	133.46*	131.14*
*Reach-1	550	*Bridge	*	*	*
*Reach-1	500	75.43*	74.97*	81.76*
*Reach-1	400	132.08*	134.41*	158.2*
*Reach-1	300	364.63*	352.07*	359.83*
*Reach-1	200	0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
*Reach-1	4900	.1*	.3*
*Reach-1	4800	.1*	.3*
*Reach-1	4700	.1*	.3*
*Reach-1	4600	.1*	.3*
*Reach-1	4500	.1*	.3*
*Reach-1	4400	.1*	.3*
*Reach-1	4300	.1*	.3*
*Reach-1	4200	.1*	.3*
*Reach-1	4100	.1*	.3*
*Reach-1	4000	.1*	.3*
*Reach-1	3900	.1*	.3*
*Reach-1	3800	.1*	.3*
*Reach-1	3700	.1*	.3*
*Reach-1	3600	.1*	.3*
*Reach-1	3500	.1*	.3*
*Reach-1	3400	.1*	.3*
*Reach-1	3300	.1*	.3*
*Reach-1	3200	.1*	.3*
*Reach-1	3100	.1*	.3*
*Reach-1	3000	.1*	.3*
*Reach-1	2900	.1*	.3*
*Reach-1	2800	.1*	.3*
*Reach-1	2700	.1*	.3*
*Reach-1	2600	.1*	.3*
*Reach-1	2500	.1*	.3*
*Reach-1	2400	.1*	.3*
*Reach-1	2350	.1*	.3*
*Reach-1	2330	.1*	.3*
*Reach-1	2300	.1*	.3*
*Reach-1	2200	.1*	.3*
*Reach-1	2100	.3*	.5*
*Reach-1	2000	.3*	.5*
*Reach-1	1950	*Bridge	*	*
*Reach-1	1900	.3*	.5*
*Reach-1	1800	.1*	.3*
*Reach-1	1750	.1*	.3*
*Reach-1	1700	.1*	.3*
*Reach-1	1650	.1*	.3*
*Reach-1	1600	.1*	.3*
*Reach-1	1500	.1*	.3*
*Reach-1	1400	.1*	.3*
*Reach-1	1300	.1*	.3*
*Reach-1	1200	.1*	.3*
*Reach-1	1100	.1*	.3*
*Reach-1	1000	.1*	.3*
*Reach-1	900	.1*	.3*
*Reach-1	800	.1*	.3*
*Reach-1	700	.3*	.5*

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*Reach-1          *    600      *        .3*        .5*
*Reach-1          *    550      *Bridge   *          *
*Reach-1          *    500      *        .3*        .5*
*Reach-1          *    400      *        .1*        .3*
*Reach-1          *    300      *        .1*        .3*
*Reach-1          *    200      *        .1*        .3*
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Profile Output Table - CHECKRAS

Reach	River Sta	Profile	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)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)
Reach-1	4900	PF 1	1.00	70.84	29001.2		136.32		189.16		207.16	1702.00		
Reach-1	4800	PF 1	1.01	50.91	29559.5		221.50		242.72		272.42	1698.00		
Reach-1	4700	PF 1	0.87	134.67	34018.0		370.96		408.09		505.63	1696.00		
Reach-1	4600	PF 1	1.01	118.20	27559.7		199.43		234.04		317.63	1692.00		
Reach-1	4500	PF 1	1.00	113.53	27717.5		174.73		233.65		288.25	1686.00		
Reach-1	4400	PF 1	1.00	99.46	28109.1		1171.82		1227.50		1271.29	1680.00		
Reach-1	4300	PF 1	1.01	149.64	26882.7		178.88		258.73		328.52	1676.00		
Reach-1	4200	PF 1	1.00	166.08	26691.2		130.63		195.44		296.71	1670.00		
Reach-1	4100	PF 1	1.01	158.19	26676.6		214.50		304.72		372.70	1666.00		
Reach-1	4000	PF 1	1.00	121.43	27613.7		66.87		155.77		188.30	1660.00		
Reach-1	3900	PF 1	1.00	196.83	26176.9		96.64		204.46		293.47	1656.00		
Reach-1	3800	PF 1	1.01	379.86	38023.5		48.18		239.69		428.04	1654.00		
Reach-1	3700	PF 1	0.77	369.76	51620.4		115.62		314.16		485.38	1648.00		
Reach-1	3600	PF 1	1.00	430.24	37659.4		184.90		383.73		615.14	1646.00		
Reach-1	3500	PF 1	0.81	504.34	47274.4		1165.53		1479.93		1669.87	1640.00		
Reach-1	3400	PF 1	1.00	416.42	37816.3		94.71		342.58		511.12	1634.00		
Reach-1	3300	PF 1	1.00	132.64	42190.6		48.22		306.21		535.52	1628.00		
Reach-1	3200	PF 1	1.01	72.09	45188.2		254.42		325.67		326.50	1622.00		
Reach-1	3100	PF 1	1.00	149.56	42087.5		241.67		266.28		391.23	1618.00		
Reach-1	3000	PF 1	0.86	222.67	51731.7		232.89		391.87		455.56	1614.00		
Reach-1	2900	PF 1	1.02	285.14	38608.0		509.11		638.26		794.25	1612.00		
Reach-1	2800	PF 1	1.01	145.11	42340.1		267.53		346.27		412.64	1610.00		
Reach-1	2700	PF 1	1.01	160.50	41813.5		649.87		719.03		810.37	1608.00		
Reach-1	2600	PF 1	1.00	139.93	42469.5		779.56		851.44		919.49	1606.00		
Reach-1	2500	PF 1	0.96	161.32	47002.0		90.08		208.23		251.40	1602.00		
Reach-1	2400	PF 1	0.63	259.23	76488.1		417.42		580.85		676.65	1598.00		
Reach-1	2350	PF 1	0.51	407.19	81461.6		1015.56		1205.00		1422.75	1602.00		
Reach-1	2330	PF 1	0.24	452.73	206323.2		1014.75		1222.00		1467.48	1596.00		
Reach-1	2300	PF 1	0.14	504.10	362504.5		23.42		200.54		527.51	1594.00		
Reach-1	2200	PF 1	0.05	747.37	998439.1		32.27		230.40		779.64	1593.00		
Reach-1	2100	PF 1	0.11	248.66	512546.0		1003.33		1141.29		1251.99	1590.00		
Reach-1	2000	PF 1	0.17	104.82	177116.4		1000.00		1050.29		1104.82	1588.88		
Reach-1	1950	BR U PF 1	0.36	104.82			1000.00		1050.29		1104.82	1588.88		
Reach-1	1950	BR D PF 1	5.33	130.73			1104.12		1199.33		1234.85	1582.19		
Reach-1	1900	PF 1	1.01	12.00	28351.9		1193.33		1199.33		1205.33	1582.19		
Reach-1	1800	PF 1	1.00	45.09	27675.1		1145.84		1180.36		1190.93	1582.10		
Reach-1	1750	PF 1	0.79	215.63	35314.9		1097.01		1123.86		1312.64	1582.10		
Reach-1	1700	PF 1	0.69	294.52	40484.8		1283.23		1318.64		1577.75	1582.05		
Reach-1	1650	PF 1	0.83	264.43	33979.9		1132.97		1155.31		1397.40	1582.00		
Reach-1	1600	PF 1	0.44	243.07	64259.8		1092.92		1169.10		1335.99	1580.40		
Reach-1	1500	PF 1	0.46	392.83	60377.7		1080.36		1156.15		1473.19	1578.00		
Reach-1	1400	PF 1	1.01	111.54	24739.7		1073.71		1123.63		1185.25	1578.00		
Reach-1	1300	PF 1	0.98	110.50	24987.2		1077.31		1110.68		1207.18	1572.69		
Reach-1	1200	PF 1	0.73	94.20	26410.4		1178.38		1225.48		1272.58	1571.62		
Reach-1	1100	PF 1	0.72	97.61	16633.1		1320.06		1368.87		1417.67	1571.40		
Reach-1	1000	PF 1	0.98	81.83	9219.3		1472.42		1520.40		1554.25	1571.15		
Reach-1	900	PF 1	0.89	82.56	8245.3		1575.70		1631.27		1658.26	1571.00		
Reach-1	800	PF 1	0.72	112.28	8471.1		1769.22		1836.56		1881.50	1570.00		
Reach-1	700	PF 1	1.00	119.72	5775.6		2123.53		2226.26		2243.24	1569.50		
Reach-1	600	PF 1	0.58	37.73	21837.5		2596.22		2615.09		2633.95	1565.40		
Reach-1	550	BR U PF 1	0.64	36.39	18035.1		2596.22		2615.09		2633.95	1565.40		
Reach-1	550	BR D PF 1	1.00	36.39	11578.8		2332.84		2351.71		2370.57	1564.30		
Reach-1	500	PF 1	1.00	37.73	12317.7		2332.84		2351.71		2370.57	1564.30		
Reach-1	400	PF 1	1.01	110.59	6927.4		2216.07		2366.15		2435.18	1560.00		
Reach-1	300	PF 1	0.99	63.96	7535.3		2954.47		2981.13					

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*Reach-1          *    600      *        .3*       .5*
*Reach-1          *    550      *Bridge   *         *
*Reach-1          *    500      *        .3*       .5*
*Reach-1          *    400      *        .1*       .3*
*Reach-1          *    300      *        .1*       .3*
*Reach-1          *    200      *        .1*       .3*
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Profile Output Table - CHECKRAS

Reach	River Sta	Profile	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)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)
Reach-1	4900	PF 1	1.00	70.84	29001.2		136.32		189.16		207.16	1702.00		
Reach-1	4800	PF 1	1.01	50.91	29559.5		221.50		242.72		272.42	1698.00		
Reach-1	4700	PF 1	0.87	134.67	34018.0		370.96		408.09		505.63	1696.00		
Reach-1	4600	PF 1	1.01	118.20	27559.7		199.43		234.04		317.63	1692.00		
Reach-1	4500	PF 1	1.00	113.53	27717.5		174.73		233.65		288.25	1686.00		
Reach-1	4400	PF 1	1.00	99.46	28109.1		1171.82		1227.50		1271.29	1680.00		
Reach-1	4300	PF 1	1.01	149.64	26882.7		178.88		258.73		328.52	1676.00		
Reach-1	4200	PF 1	1.00	166.08	26691.2		130.63		195.44		296.71	1670.00		
Reach-1	4100	PF 1	1.01	158.19	26676.6		214.50		304.72		372.70	1666.00		
Reach-1	4000	PF 1	1.00	121.43	27613.7		66.87		155.77		188.30	1660.00		
Reach-1	3900	PF 1	1.00	196.83	26176.9		96.64		204.46		293.47	1656.00		
Reach-1	3800	PF 1	1.01	379.86	38023.5		48.18		239.69		428.04	1654.00		
Reach-1	3700	PF 1	0.77	369.76	51620.4		115.62		314.16		485.38	1648.00		
Reach-1	3600	PF 1	1.00	430.24	37659.4		184.90		383.73		615.14	1646.00		
Reach-1	3500	PF 1	0.81	504.34	47274.4		1165.53		1479.93		1669.87	1640.00		
Reach-1	3400	PF 1	1.00	416.42	37816.3		94.71		342.58		511.12	1634.00		
Reach-1	3300	PF 1	1.00	132.64	42190.6		48.22		306.21		535.52	1628.00		
Reach-1	3200	PF 1	1.01	72.09	45188.2		254.42		325.67		326.50	1622.00		
Reach-1	3100	PF 1	1.00	149.56	42087.5		241.67		266.28		391.23	1618.00		
Reach-1	3000	PF 1	0.86	222.67	51731.7		232.89		391.87		455.56	1614.00		
Reach-1	2900	PF 1	1.02	285.14	38608.0		509.11		638.26		794.25	1612.00		
Reach-1	2800	PF 1	1.01	145.11	42340.1		267.53		346.27		412.64	1610.00		
Reach-1	2700	PF 1	1.01	160.50	41813.5		649.87		719.03		810.37	1608.00		
Reach-1	2600	PF 1	1.00	139.93	42469.5		779.56		851.44		919.49	1606.00		
Reach-1	2500	PF 1	0.96	161.32	47002.0		90.08		208.23		251.40	1602.00		
Reach-1	2400	PF 1	0.63	259.23	76488.1		417.42		580.85		676.65	1598.00		
Reach-1	2350	PF 1	0.51	407.19	81461.6		1015.56		1205.00		1422.75	1602.00		
Reach-1	2330	PF 1	0.24	452.73	206323.2		1014.75		1222.00		1467.48	1596.00		
Reach-1	2300	PF 1	0.14	504.10	362504.5		23.42		200.54		527.51	1594.00		
Reach-1	2200	PF 1	0.05	747.37	998439.1		32.27		230.40		779.64	1593.00		
Reach-1	2100	PF 1	0.11	248.66	512546.0		1003.33		1141.29		1251.99	1590.00		
Reach-1	2000	PF 1	0.17	104.82	177116.4		1000.00		1050.29		1104.82	1588.88		
Reach-1	1950	BR U PF 1	0.36	104.82			1000.00		1050.29		1104.82	1588.88		
Reach-1	1950	BR D PF 1	5.33	130.73			1104.12		1199.33		1234.85	1582.19		
Reach-1	1900	PF 1	1.01	12.00	28351.9		1193.33		1199.33		1205.33	1582.19		
Reach-1	1800	PF 1	1.00	45.09	27675.1		1145.84		1180.36		1190.93	1582.10		
Reach-1	1750	PF 1	0.79	215.63	35314.9		1097.01		1123.86		1312.64	1582.10		
Reach-1	1700	PF 1	0.69	294.52	40484.8		1283.23		1318.64		1577.75	1582.05		
Reach-1	1650	PF 1	0.83	264.43	33979.9		1132.97		1155.31		1397.40	1582.00		
Reach-1	1600	PF 1	0.44	243.07	64259.8		1092.92		1169.10		1335.99	1580.40		
Reach-1	1500	PF 1	0.46	392.83	60377.7		1080.36		1156.15		1473.19	1578.00		
Reach-1	1400	PF 1	1.01	111.54	24739.7		1073.71		1123.63		1185.25	1578.00		
Reach-1	1300	PF 1	0.98	110.50	24987.2		1077.31		1110.68		1207.18	1572.69		
Reach-1	1200	PF 1	0.73	94.20	26410.4		1178.38		1225.48		1272.58	1571.62		
Reach-1	1100	PF 1	0.72	97.61	16633.1		1320.06		1368.87		1417.67	1571.40		
Reach-1	1000	PF 1	0.98	81.83	9219.3		1472.42		1520.40		1554.25	1571.15		
Reach-1	900	PF 1	0.89	82.56	8245.3		1575.70		1631.27		1658.26	1571.00		
Reach-1	800	PF 1	0.72	112.28	8471.1		1769.22		1836.56		1881.50	1570.00		
Reach-1	700	PF 1	1.00	119.72	5775.6		2123.53		2226.26		2243.24	1569.50		
Reach-1	600	PF 1	0.58	37.73	21837.5		2596.22		2615.09		2633.95	1565.40		
Reach-1	550	BR U PF 1	0.64	36.39	18035.1		2596.22		2615.09		2633.95	1565.40		
Reach-1	550	BR D PF 1	1.00	36.39	11578.8		2332.84		2351.71		2370.57	1564.30		
Reach-1	500	PF 1	1.00	37.73	12317.7		2332.84		2351.71		2370.57	1564.30		
Reach-1	400	PF 1	1.01	110.59	6927.4		2216.07		2366.15		2435.18	1560.00		
Reach-1	300	PF 1	0.99	63.96	7535.3		2954.47		2981.13					

3018.44	1558.00													
Reach-1	200	PF 1		0.99	118.39	7088.6			2956.23			3021.67		
3074.61	1554.00													

Profile Output Table - Standard Table 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	4900	PF 1	2318.00	1702.00	1705.91	1705.91	1707.53	0.006388	10.20	227.16	70.84	1.00
Reach-1	4800	PF 1	2318.00	1698.00	1703.19	1703.19	1705.21	0.006149	11.41	203.20	50.91	1.01
Reach-1	4700	PF 1	2318.00	1696.00	1700.64	1700.64	1701.95	0.004643	9.31	282.01	134.67	0.87
Reach-1	4600	PF 1	2318.00	1692.00	1696.00	1696.00	1697.15	0.007074	8.61	269.15	118.20	1.01
Reach-1	4500	PF 1	2318.00	1686.00	1690.55	1690.55	1691.73	0.006994	8.72	265.86	113.53	1.00
Reach-1	4400	PF 1	2318.00	1680.00	1684.02	1684.02	1685.31	0.006800	9.11	254.44	99.46	1.00
Reach-1	4300	PF 1	2318.00	1676.00	1679.22	1679.22	1680.20	0.007435	7.97	290.74	149.64	1.01
Reach-1	4200	PF 1	2318.00	1670.00	1674.92	1674.92	1675.84	0.007542	7.67	302.19	166.08	1.00
Reach-1	4100	PF 1	2318.00	1666.00	1670.33	1670.33	1671.28	0.007550	7.82	296.51	158.19	1.01
Reach-1	4000	PF 1	2318.00	1660.00	1664.64	1664.64	1665.76	0.007047	8.51	272.49	121.43	1.00
Reach-1	3900	PF 1	2318.00	1656.00	1658.80	1658.80	1659.61	0.007841	7.26	319.23	196.83	1.00
Reach-1	3800	PF 1	3474.00	1654.00	1656.25	1656.25	1656.94	0.008347	6.69	519.49	379.86	1.01
Reach-1	3700	PF 1	3474.00	1648.00	1650.06		1650.55	0.004529	5.63	617.26	369.76	0.77
Reach-1	3600	PF 1	3474.00	1646.00	1647.42	1647.42	1648.05	0.008510	6.40	542.79	430.24	1.00
Reach-1	3500	PF 1	3474.00	1640.00	1642.10	1641.90	1642.53	0.005400	5.24	662.91	504.34	0.81
Reach-1	3400	PF 1	3474.00	1634.00	1639.17	1639.17	1639.82	0.008439	6.46	537.48	416.42	1.00
Reach-1	3300	PF 1	3474.00	1628.00	1631.36	1631.36	1632.76	0.006780	9.48	366.60	132.64	1.00
Reach-1	3200	PF 1	3474.00	1622.00	1627.54	1627.54	1629.64	0.005910	11.62	299.06	72.09	1.01
Reach-1	3100	PF 1	3474.00	1618.00	1624.66	1624.66	1625.94	0.006813	9.07	382.81	149.56	1.00
Reach-1	3000	PF 1	3474.00	1614.00	1620.68	1620.68	1621.93	0.004510	9.13	440.64	222.67	0.86
Reach-1	2900	PF 1	3474.00	1612.00	1618.65	1618.65	1619.50	0.008097	7.42	468.40	285.14	1.02
Reach-1	2800	PF 1	3474.00	1610.00	1615.32	1615.32	1616.64	0.006732	9.20	377.51	145.11	1.01
Reach-1	2700	PF 1	3474.00	1608.00	1612.56	1612.56	1613.79	0.006903	8.91	389.87	160.50	1.01
Reach-1	2600	PF 1	3474.00	1606.00	1610.08	1610.08	1611.42	0.006691	9.30	373.46	139.93	1.00
Reach-1	2500	PF 1	3478.00	1602.00	1606.35	1606.35	1607.81	0.005476	10.61	429.94	161.32	0.96
Reach-1	2400	PF 1	3478.00	1598.00	1604.97		1605.89	0.002068	8.75	653.81	259.23	0.63
Reach-1	2350	PF 1	3478.00	1602.00	1605.26		1605.55	0.001823	4.31	827.87	407.19	0.51
Reach-1	2330	PF 1	3478.00	1596.00	1605.33		1605.46	0.000284	3.28	1566.43	452.73	0.24
Reach-1	2300	PF 1	3478.00	1594.00	1605.34		1605.40	0.000092	2.34	2485.81	504.10	0.14
Reach-1	2200	PF 1	3478.00	1593.00	1605.37	1598.01	1605.38	0.000012	0.91	5697.89	747.37	0.05
Reach-1	2100	PF 1	3478.00	1590.00	1605.30		1605.36	0.000046	2.19	2183.22	248.66	0.11
Reach-1	2000	PF 1	2138.00	1588.88	1605.13	1601.35	1605.32	0.000146	4.00	620.54	104.82	0.17
Reach-1	1950		Bridge									
Reach-1	1900	PF 1	2138.00	1582.19	1592.10	1592.10	1597.12	0.005687	17.99	118.86	12.00	1.01
Reach-1	1800	PF 1	2209.00	1582.10	1589.93	1589.93	1592.04	0.006371	11.65	189.55	45.09	1.00
Reach-1	1750	PF 1	2209.00	1582.10	1588.67	1588.67	1589.63	0.003913	8.68	379.63	215.63	0.79
Reach-1	1700	PF 1	2209.00	1582.05	1587.62		1588.14	0.002977	6.99	518.00	294.52	0.69
Reach-1	1650	PF 1	2209.00	1582.00	1586.75	1586.75	1587.55	0.004226	8.71	439.21	264.43	0.83
Reach-1	1600	PF 1	2209.00	1580.40	1585.10		1585.40	0.001182	4.47	535.84	243.07	0.44
Reach-1	1500	PF 1	2209.00	1578.00	1584.86	1583.73	1585.15	0.001339	4.52	616.12	392.83	0.46
Reach-1	1400	PF 1	2101.00	1578.00	1583.67	1583.67	1584.79	0.007212	8.49	247.37	111.54	1.01
Reach-1	1300	PF 1	2101.00	1572.69	1579.00	1579.00	1580.10	0.007070	8.39	250.51	110.50	0.98
Reach-1	1200	PF 1	1889.00	1571.62	1577.90	1577.33	1578.66	0.005116	6.99	270.27	94.20	0.73
Reach-1	1100	PF 1	1232.00	1571.40	1577.47	1576.99	1578.02	0.005486	5.92	207.99	97.61	0.72
Reach-1	1000	PF 1	966.00	1571.15	1576.45	1576.43	1577.24	0.010979	7.13	135.49	81.83	0.98
Reach-1	900	PF 1	798.00	1571.00	1575.37	1575.24	1575.98	0.009367	6.28	127.05	82.56	0.89
Reach-1	800	PF 1	676.00	1570.00	1574.76	1574.50	1575.09	0.006368	4.65	145.34	112.28	0.72
Reach-1	700	PF 1	669.00	1569.50	1573.29	1573.29	1573.79	0.013417	5.65	118.49	119.72	1.00
Reach-1	600	PF 1	669.00	1565.40	1568.49	1567.57	1569.01	0.000939	5.79	115.56	37.73	0.58
Reach-1	550		Bridge									
Reach-1	500	PF 1	669.00	1564.30	1566.47	1566.47	1567.54	0.002950	8.31	80.55	37.73	1.00
Reach-1	400	PF 1	669.00	1560.00	1562.56	1562.56	1563.09	0.009326	5.85	114.36	153.25	1.01
Reach-1	300	PF 1	669.00	1558.00	1560.02	1560.02	1560.77	0.007882	6.93	96.58	63.96	0.99
Reach-1	200	PF 1	669.00	1554.00	1555.08	1555.08	1555.57	0.008907	5.62	118.97	118.39	0.99

3018.44	1558.00														
Reach-1	200	PF 1		0.99	118.39	7088.6			2956.23			3021.67			
3074.61	1554.00														

Profile Output Table - Standard Table 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	4900	PF 1	2318.00	1702.00	1705.91	1705.91	1707.53	0.006388	10.20	227.16	70.84	1.00
Reach-1	4800	PF 1	2318.00	1698.00	1703.19	1703.19	1705.21	0.006149	11.41	203.20	50.91	1.01
Reach-1	4700	PF 1	2318.00	1696.00	1700.64	1700.64	1701.95	0.004643	9.31	282.01	134.67	0.87
Reach-1	4600	PF 1	2318.00	1692.00	1696.00	1696.00	1697.15	0.007074	8.61	269.15	118.20	1.01
Reach-1	4500	PF 1	2318.00	1686.00	1690.55	1690.55	1691.73	0.006994	8.72	265.86	113.53	1.00
Reach-1	4400	PF 1	2318.00	1680.00	1684.02	1684.02	1685.31	0.006800	9.11	254.44	99.46	1.00
Reach-1	4300	PF 1	2318.00	1676.00	1679.22	1679.22	1680.20	0.007435	7.97	290.74	149.64	1.01
Reach-1	4200	PF 1	2318.00	1670.00	1674.92	1674.92	1675.84	0.007542	7.67	302.19	166.08	1.00
Reach-1	4100	PF 1	2318.00	1666.00	1670.33	1670.33	1671.28	0.007550	7.82	296.51	158.19	1.01
Reach-1	4000	PF 1	2318.00	1660.00	1664.64	1664.64	1665.76	0.007047	8.51	272.49	121.43	1.00
Reach-1	3900	PF 1	2318.00	1656.00	1658.80	1658.80	1659.61	0.007841	7.26	319.23	196.83	1.00
Reach-1	3800	PF 1	3474.00	1654.00	1656.25	1656.25	1656.94	0.008347	6.69	519.49	379.86	1.01
Reach-1	3700	PF 1	3474.00	1648.00	1650.06		1650.55	0.004529	5.63	617.26	369.76	0.77
Reach-1	3600	PF 1	3474.00	1646.00	1647.42	1647.42	1648.05	0.008510	6.40	542.79	430.24	1.00
Reach-1	3500	PF 1	3474.00	1640.00	1642.10	1641.90	1642.53	0.005400	5.24	662.91	504.34	0.81
Reach-1	3400	PF 1	3474.00	1634.00	1639.17	1639.17	1639.82	0.008439	6.46	537.48	416.42	1.00
Reach-1	3300	PF 1	3474.00	1628.00	1631.36	1631.36	1632.76	0.006780	9.48	366.60	132.64	1.00
Reach-1	3200	PF 1	3474.00	1622.00	1627.54	1627.54	1629.64	0.005910	11.62	299.06	72.09	1.01
Reach-1	3100	PF 1	3474.00	1618.00	1624.66	1624.66	1625.94	0.006813	9.07	382.81	149.56	1.00
Reach-1	3000	PF 1	3474.00	1614.00	1620.68	1620.68	1621.93	0.004510	9.13	440.64	222.67	0.86
Reach-1	2900	PF 1	3474.00	1612.00	1618.65	1618.65	1619.50	0.008097	7.42	468.40	285.14	1.02
Reach-1	2800	PF 1	3474.00	1610.00	1615.32	1615.32	1616.64	0.006732	9.20	377.51	145.11	1.01
Reach-1	2700	PF 1	3474.00	1608.00	1612.56	1612.56	1613.79	0.006903	8.91	389.87	160.50	1.01
Reach-1	2600	PF 1	3474.00	1606.00	1610.08	1610.08	1611.42	0.006691	9.30	373.46	139.93	1.00
Reach-1	2500	PF 1	3478.00	1602.00	1606.35	1606.35	1607.81	0.005476	10.61	429.94	161.32	0.96
Reach-1	2400	PF 1	3478.00	1598.00	1604.97		1605.89	0.002068	8.75	653.81	259.23	0.63
Reach-1	2350	PF 1	3478.00	1602.00	1605.26		1605.55	0.001823	4.31	827.87	407.19	0.51
Reach-1	2330	PF 1	3478.00	1596.00	1605.33		1605.46	0.000284	3.28	1566.43	452.73	0.24
Reach-1	2300	PF 1	3478.00	1594.00	1605.34		1605.40	0.000092	2.34	2485.81	504.10	0.14
Reach-1	2200	PF 1	3478.00	1593.00	1605.37	1598.01	1605.38	0.000012	0.91	5697.89	747.37	0.05
Reach-1	2100	PF 1	3478.00	1590.00	1605.30		1605.36	0.000046	2.19	2183.22	248.66	0.11
Reach-1	2000	PF 1	2138.00	1588.88	1605.13	1601.35	1605.32	0.000146	4.00	620.54	104.82	0.17
Reach-1	1950		Bridge									
Reach-1	1900	PF 1	2138.00	1582.19	1592.10	1592.10	1597.12	0.005687	17.99	118.86	12.00	1.01
Reach-1	1800	PF 1	2209.00	1582.10	1589.93	1589.93	1592.04	0.006371	11.65	189.55	45.09	1.00
Reach-1	1750	PF 1	2209.00	1582.10	1588.67	1588.67	1589.63	0.003913	8.68	379.63	215.63	0.79
Reach-1	1700	PF 1	2209.00	1582.05	1587.62		1588.14	0.002977	6.99	518.00	294.52	0.69
Reach-1	1650	PF 1	2209.00	1582.00	1586.75	1586.75	1587.55	0.004226	8.71	439.21	264.43	0.83
Reach-1	1600	PF 1	2209.00	1580.40	1585.10		1585.40	0.001182	4.47	535.84	243.07	0.44
Reach-1	1500	PF 1	2209.00	1578.00	1584.86	1583.73	1585.15	0.001339	4.52	616.12	392.83	0.46
Reach-1	1400	PF 1	2101.00	1578.00	1583.67	1583.67	1584.79	0.007212	8.49	247.37	111.54	1.01
Reach-1	1300	PF 1	2101.00	1572.69	1579.00	1579.00	1580.10	0.007070	8.39	250.51	110.50	0.98
Reach-1	1200	PF 1	1889.00	1571.62	1577.90	1577.33	1578.66	0.005116	6.99	270.27	94.20	0.73
Reach-1	1100	PF 1	1232.00	1571.40	1577.47	1576.99	1578.02	0.005486	5.92	207.99	97.61	0.72
Reach-1	1000	PF 1	966.00	1571.15	1576.45	1576.43	1577.24	0.010979	7.13	135.49	81.83	0.98
Reach-1	900	PF 1	798.00	1571.00	1575.37	1575.24	1575.98	0.009367	6.28	127.05	82.56	0.89
Reach-1	800	PF 1	676.00	1570.00	1574.76	1574.50	1575.09	0.006368	4.65	145.34	112.28	0.72
Reach-1	700	PF 1	669.00	1569.50	1573.29	1573.29	1573.79	0.013417	5.65	118.49	119.72	1.00
Reach-1	600	PF 1	669.00	1565.40	1568.49	1567.57	1569.01	0.000939	5.79	115.56	37.73	0.58
Reach-1	550		Bridge									
Reach-1	500	PF 1	669.00	1564.30	1566.47	1566.47	1567.54	0.002950	8.31	80.55	37.73	1.00
Reach-1	400	PF 1	669.00	1560.00	1562.56	1562.56	1563.09	0.009326	5.85	114.36	153.25	1.01
Reach-1	300	PF 1	669.00	1558.00	1560.02	1560.02	1560.77	0.007882	6.93	96.58	63.96	0.99
Reach-1	200	PF 1	669.00	1554.00	1555.08	1555.08	1555.57	0.008907	5.62	118.97	118.39	0.99

HEC-RAS Plan: Imported Pla 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	4900	PF 1	2318.00	1702.00	1705.91	1705.91	1707.53	0.006388	10.20	227.16	70.84	1.00
Reach-1	4800	PF 1	2318.00	1698.00	1703.19	1703.19	1705.21	0.006149	11.41	203.20	50.91	1.01
Reach-1	4700	PF 1	2318.00	1696.00	1700.64	1700.64	1701.95	0.004643	9.31	282.01	134.67	0.87
Reach-1	4600	PF 1	2318.00	1692.00	1696.00	1696.00	1697.15	0.007074	8.61	269.15	118.20	1.01
Reach-1	4500	PF 1	2318.00	1686.00	1690.55	1690.55	1691.73	0.006994	8.72	265.86	113.53	1.00
Reach-1	4400	PF 1	2318.00	1680.00	1684.02	1684.02	1685.31	0.006800	9.11	254.44	99.46	1.00
Reach-1	4300	PF 1	2318.00	1676.00	1679.22	1679.22	1680.20	0.007435	7.97	290.74	149.64	1.01
Reach-1	4200	PF 1	2318.00	1670.00	1674.92	1674.92	1675.84	0.007542	7.67	302.19	166.08	1.00
Reach-1	4100	PF 1	2318.00	1666.00	1670.33	1670.33	1671.28	0.007550	7.82	296.51	158.19	1.01
Reach-1	4000	PF 1	2318.00	1660.00	1664.64	1664.64	1665.76	0.007047	8.51	272.49	121.43	1.00
Reach-1	3900	PF 1	2318.00	1656.00	1658.80	1658.80	1659.61	0.007841	7.26	319.23	196.83	1.00
Reach-1	3800	PF 1	3474.00	1654.00	1656.25	1656.25	1656.94	0.008347	6.69	519.49	379.86	1.01
Reach-1	3700	PF 1	3474.00	1648.00	1650.06		1650.55	0.004529	5.63	617.26	369.76	0.77
Reach-1	3600	PF 1	3474.00	1646.00	1647.42	1647.42	1648.05	0.008510	6.40	542.79	430.24	1.00
Reach-1	3500	PF 1	3474.00	1640.00	1642.10	1641.90	1642.53	0.005400	5.24	662.91	504.34	0.81
Reach-1	3400	PF 1	3474.00	1634.00	1639.17	1639.17	1639.82	0.008439	6.46	537.48	416.42	1.00
Reach-1	3300	PF 1	3474.00	1628.00	1631.36	1631.36	1632.76	0.006780	9.48	366.60	132.64	1.00
Reach-1	3200	PF 1	3474.00	1622.00	1627.54	1627.54	1629.64	0.005910	11.62	299.06	72.09	1.01
Reach-1	3100	PF 1	3474.00	1618.00	1624.66	1624.66	1625.94	0.006813	9.07	382.81	149.56	1.00
Reach-1	3000	PF 1	3474.00	1614.00	1620.68	1620.68	1621.93	0.004510	9.13	440.64	222.67	0.86
Reach-1	2900	PF 1	3474.00	1612.00	1618.65	1618.65	1619.50	0.008097	7.42	468.40	285.14	1.02
Reach-1	2800	PF 1	3474.00	1610.00	1615.32	1615.32	1616.64	0.006732	9.20	377.51	145.11	1.01
Reach-1	2700	PF 1	3474.00	1608.00	1612.56	1612.56	1613.79	0.006903	8.91	389.87	160.50	1.01
Reach-1	2600	PF 1	3474.00	1606.00	1610.08	1610.08	1611.42	0.006691	9.30	373.46	139.93	1.00
Reach-1	2500	PF 1	3478.00	1602.00	1606.35	1606.35	1607.81	0.005476	10.61	429.94	161.32	0.96
Reach-1	2400	PF 1	3478.00	1598.00	1604.97		1605.89	0.002068	8.75	653.81	259.23	0.63
Reach-1	2350	PF 1	3478.00	1602.00	1605.26		1605.55	0.001823	4.31	827.87	407.19	0.51
Reach-1	2330	PF 1	3478.00	1596.00	1605.33		1605.46	0.000284	3.28	1566.43	452.73	0.24
Reach-1	2300	PF 1	3478.00	1594.00	1605.34		1605.40	0.000092	2.34	2485.81	504.10	0.14
Reach-1	2200	PF 1	3478.00	1593.00	1605.37	1598.01	1605.38	0.000012	0.91	5697.89	747.37	0.05
Reach-1	2100	PF 1	3478.00	1590.00	1605.30		1605.36	0.000046	2.19	2183.22	248.66	0.11
Reach-1	2000	PF 1	2138.00	1588.88	1605.13	1601.35	1605.32	0.000146	4.00	620.54	104.82	0.17
Reach-1	1950		Bridge									
Reach-1	1900	PF 1	2138.00	1582.19	1592.10	1592.10	1597.12	0.005687	17.99	118.86	12.00	1.01
Reach-1	1800	PF 1	2209.00	1582.10	1589.93	1589.93	1592.04	0.006371	11.65	189.55	45.09	1.00
Reach-1	1750	PF 1	2209.00	1582.10	1588.67	1588.67	1589.63	0.003913	8.68	379.63	215.63	0.79
Reach-1	1700	PF 1	2209.00	1582.05	1587.62		1588.14	0.002977	6.99	518.00	294.52	0.69
Reach-1	1650	PF 1	2209.00	1582.00	1586.75	1586.75	1587.55	0.004226	8.71	439.21	264.43	0.83

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

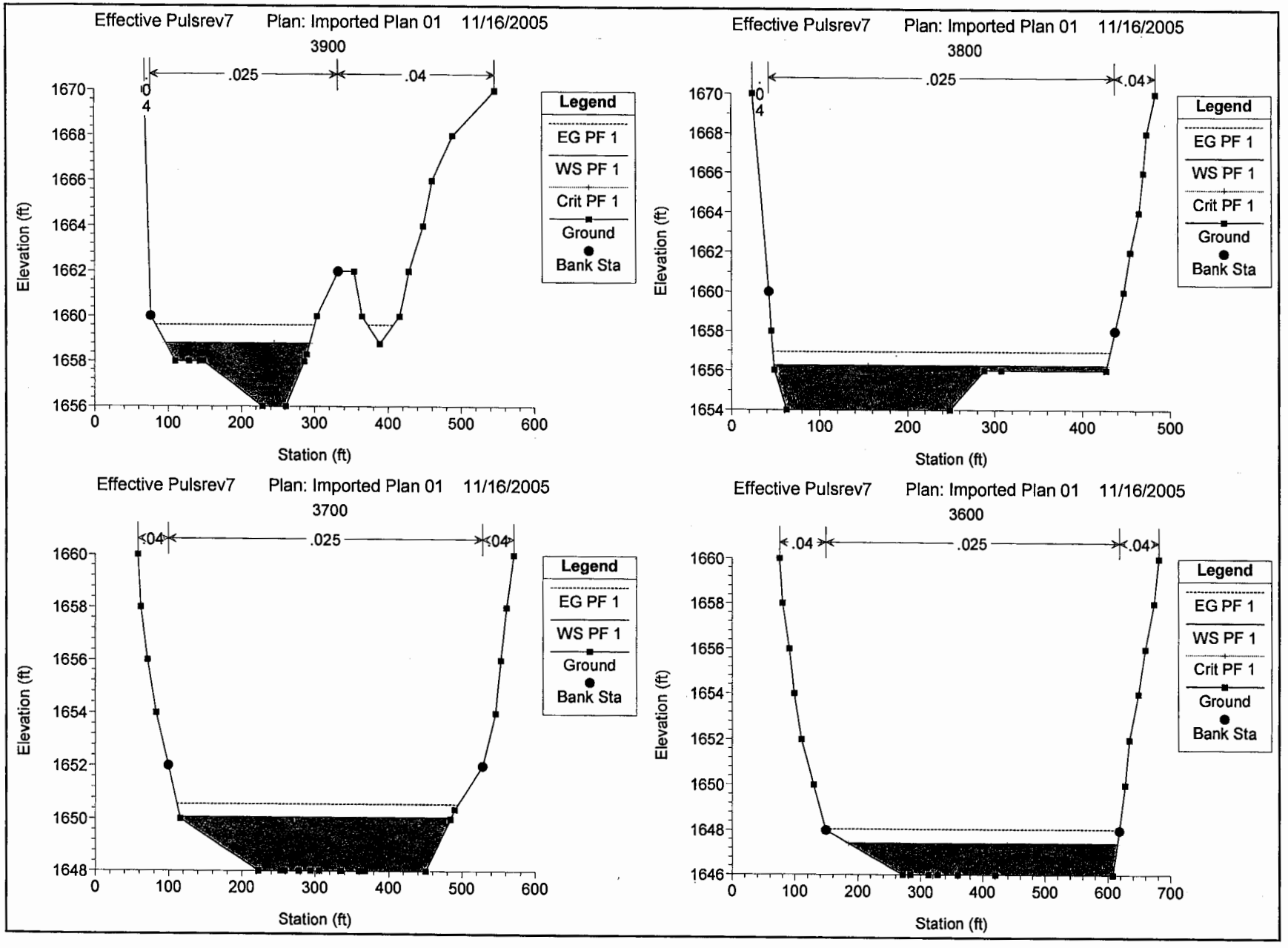
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4900	PF 1	2318.00	1702.00	1705.91	1705.91	1707.53	0.006388	10.20	227.16	70.84	1.00
Reach-1	4800	PF 1	2318.00	1698.00	1703.19	1703.19	1705.21	0.006149	11.41	203.20	50.91	1.01
Reach-1	4700	PF 1	2318.00	1696.00	1700.64	1700.64	1701.95	0.004643	9.31	282.01	134.67	0.87
Reach-1	4600	PF 1	2318.00	1692.00	1696.00	1696.00	1697.15	0.007074	8.61	269.15	118.20	1.01
Reach-1	4500	PF 1	2318.00	1686.00	1690.55	1690.55	1691.73	0.006994	8.72	265.86	113.53	1.00
Reach-1	4400	PF 1	2318.00	1680.00	1684.02	1684.02	1685.31	0.006800	9.11	254.44	99.46	1.00
Reach-1	4300	PF 1	2318.00	1676.00	1679.22	1679.22	1680.20	0.007435	7.97	290.74	149.64	1.01
Reach-1	4200	PF 1	2318.00	1670.00	1674.92	1674.92	1675.84	0.007542	7.67	302.19	166.08	1.00
Reach-1	4100	PF 1	2318.00	1666.00	1670.33	1670.33	1671.28	0.007550	7.82	296.51	158.19	1.01
Reach-1	4000	PF 1	2318.00	1660.00	1664.64	1664.64	1665.76	0.007047	8.51	272.49	121.43	1.00
Reach-1	3900	PF 1	2318.00	1656.00	1658.80	1658.80	1659.61	0.007841	7.26	319.23	196.83	1.00
Reach-1	3800	PF 1	3474.00	1654.00	1656.25	1656.25	1656.94	0.008347	6.69	519.49	379.86	1.01
Reach-1	3700	PF 1	3474.00	1648.00	1650.06		1650.55	0.004529	5.63	617.26	369.76	0.77
Reach-1	3600	PF 1	3474.00	1646.00	1647.42	1647.42	1648.05	0.008510	6.40	542.79	430.24	1.00
Reach-1	3500	PF 1	3474.00	1640.00	1642.10	1641.90	1642.53	0.005400	5.24	662.91	504.34	0.81
Reach-1	3400	PF 1	3474.00	1634.00	1639.17	1639.17	1639.82	0.008439	6.46	537.48	416.42	1.00
Reach-1	3300	PF 1	3474.00	1628.00	1631.36	1631.36	1632.76	0.006780	9.48	366.60	132.64	1.00
Reach-1	3200	PF 1	3474.00	1622.00	1627.54	1627.54	1629.64	0.005910	11.62	299.06	72.09	1.01
Reach-1	3100	PF 1	3474.00	1618.00	1624.66	1624.66	1625.94	0.006813	9.07	382.81	149.56	1.00
Reach-1	3000	PF 1	3474.00	1614.00	1620.68	1620.68	1621.93	0.004510	9.13	440.64	222.67	0.86
Reach-1	2900	PF 1	3474.00	1612.00	1618.65	1618.65	1619.50	0.008097	7.42	468.40	285.14	1.02
Reach-1	2800	PF 1	3474.00	1610.00	1615.32	1615.32	1616.64	0.006732	9.20	377.51	145.11	1.01
Reach-1	2700	PF 1	3474.00	1608.00	1612.56	1612.56	1613.79	0.006903	8.91	389.87	160.50	1.01
Reach-1	2600	PF 1	3474.00	1606.00	1610.08	1610.08	1611.42	0.006691	9.30	373.46	139.93	1.00
Reach-1	2500	PF 1	3478.00	1602.00	1606.35	1606.35	1607.81	0.005476	10.61	429.94	161.32	0.96
Reach-1	2400	PF 1	3478.00	1598.00	1604.97		1605.89	0.002068	8.75	653.81	259.23	0.63
Reach-1	2350	PF 1	3478.00	1602.00	1605.26		1605.55	0.001823	4.31	827.87	407.19	0.51
Reach-1	2330	PF 1	3478.00	1596.00	1605.33		1605.46	0.000284	3.28	1566.43	452.73	0.24
Reach-1	2300	PF 1	3478.00	1594.00	1605.34		1605.40	0.000092	2.34	2485.81	504.10	0.14
Reach-1	2200	PF 1	3478.00	1593.00	1605.37	1598.01	1605.38	0.000012	0.91	5697.89	747.37	0.05
Reach-1	2100	PF 1	3478.00	1590.00	1605.30		1605.36	0.000046	2.19	2183.22	248.66	0.11
Reach-1	2000	PF 1	2138.00	1588.88	1605.13	1601.35	1605.32	0.000146	4.00	620.54	104.82	0.17
Reach-1	1950		Bridge									
Reach-1	1900	PF 1	2138.00	1582.19	1592.10	1592.10	1597.12	0.005687	17.99	118.86	12.00	1.01
Reach-1	1800	PF 1	2209.00	1582.10	1589.93	1589.93	1592.04	0.006371	11.65	189.55	45.09	1.00
Reach-1	1750	PF 1	2209.00	1582.10	1588.67	1588.67	1589.63	0.003913	8.68	379.63	215.63	0.79
Reach-1	1700	PF 1	2209.00	1582.05	1587.62		1588.14	0.002977	6.99	518.00	294.52	0.69
Reach-1	1650	PF 1	2209.00	1582.00	1586.75	1586.75	1587.55	0.004226	8.71	439.21	264.43	0.83

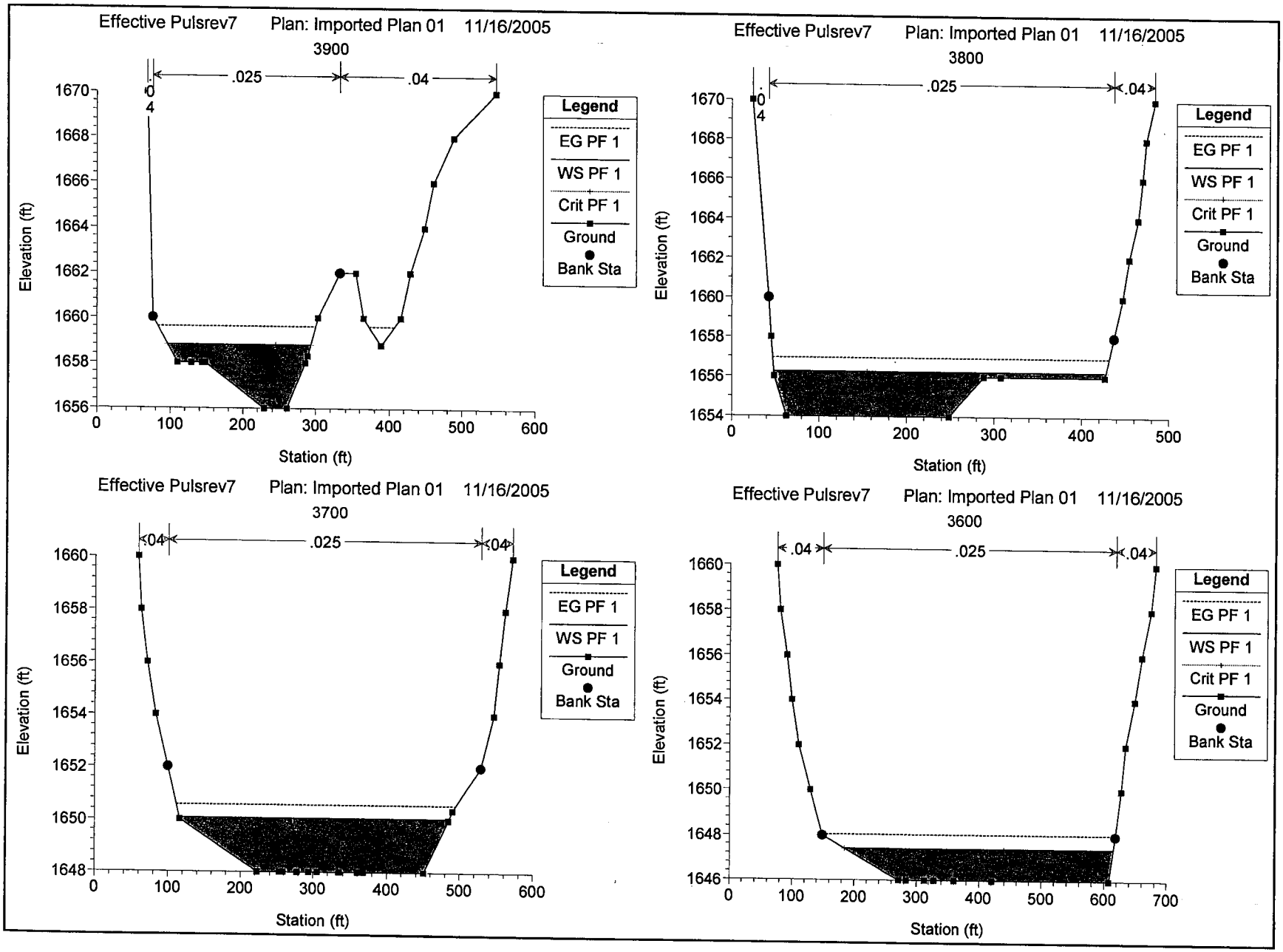
HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

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	1600	PF 1	2209.00	1580.40	1585.10		1585.40	0.001182	4.47	535.84	243.07	0.44
Reach-1	1500	PF 1	2209.00	1578.00	1584.86	1583.73	1585.15	0.001339	4.52	616.12	392.83	0.46
Reach-1	1400	PF 1	2101.00	1578.00	1583.67	1583.67	1584.79	0.007212	8.49	247.37	111.54	1.01
Reach-1	1300	PF 1	2101.00	1572.69	1579.00	1579.00	1580.10	0.007070	8.39	250.51	110.50	0.98
Reach-1	1200	PF 1	1889.00	1571.62	1577.90	1577.33	1578.66	0.005116	6.99	270.27	94.20	0.73
Reach-1	1100	PF 1	1232.00	1571.40	1577.47	1576.99	1578.02	0.005486	5.92	207.99	97.61	0.72
Reach-1	1000	PF 1	966.00	1571.15	1576.45	1576.43	1577.24	0.010979	7.13	135.49	81.83	0.98
Reach-1	900	PF 1	798.00	1571.00	1575.37	1575.24	1575.98	0.009367	6.28	127.05	82.56	0.89
Reach-1	800	PF 1	676.00	1570.00	1574.76	1574.50	1575.09	0.006368	4.65	145.34	112.28	0.72
Reach-1	700	PF 1	669.00	1569.50	1573.29	1573.29	1573.79	0.013417	5.65	118.49	119.72	1.00
Reach-1	600	PF 1	669.00	1565.40	1568.49	1567.57	1569.01	0.000939	5.79	115.56	37.73	0.58
Reach-1	550		Bridge									
Reach-1	500	PF 1	669.00	1564.30	1566.47	1566.47	1567.54	0.002950	8.31	80.55	37.73	1.00
Reach-1	400	PF 1	669.00	1560.00	1562.56	1562.56	1563.09	0.009326	5.85	114.36	153.25	1.01
Reach-1	300	PF 1	669.00	1558.00	1560.02	1560.02	1560.77	0.007882	6.93	96.58	63.96	0.99
Reach-1	200	PF 1	669.00	1554.00	1555.08	1555.08	1555.57	0.008907	5.62	118.97	118.39	0.99

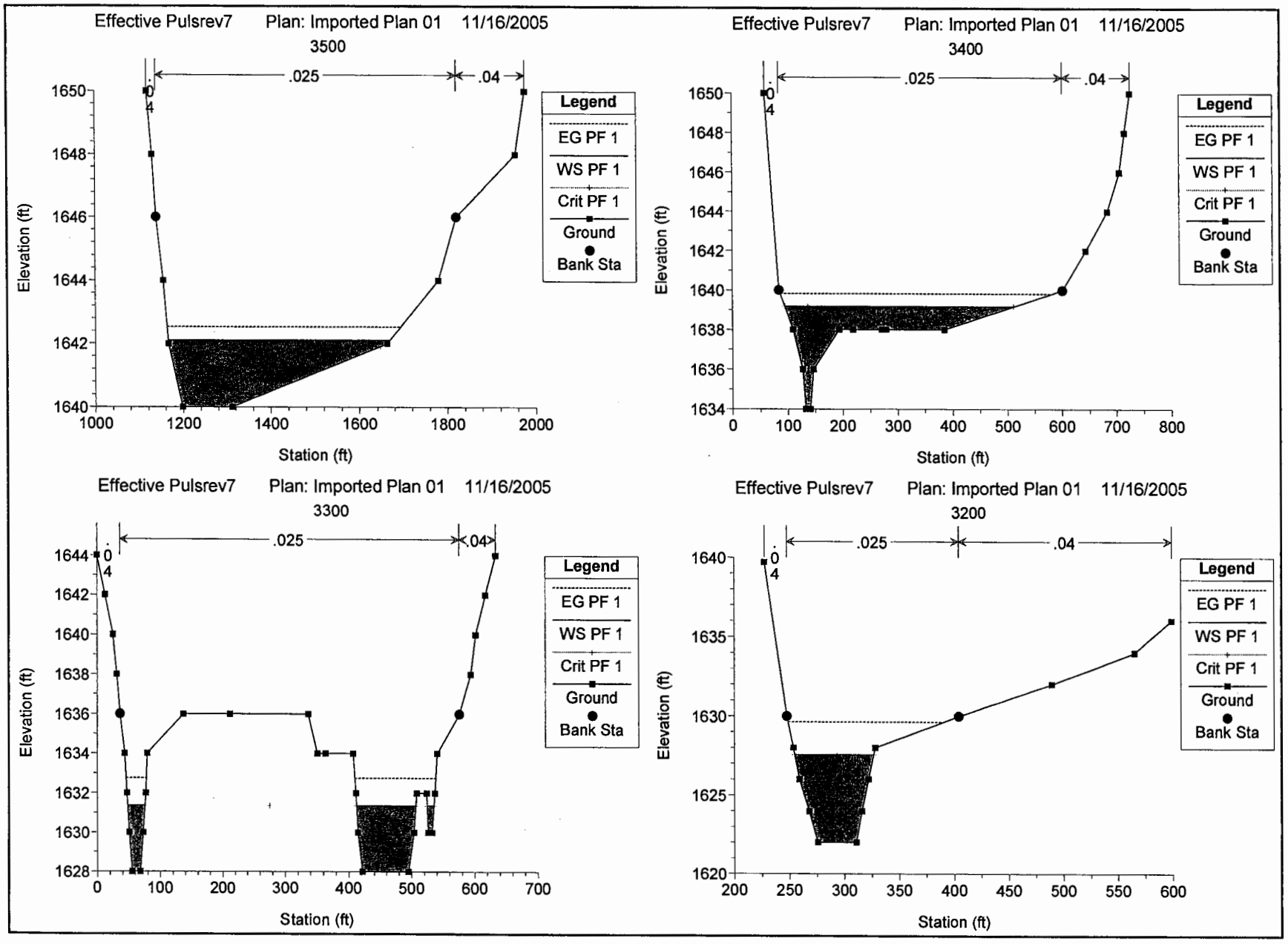
HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

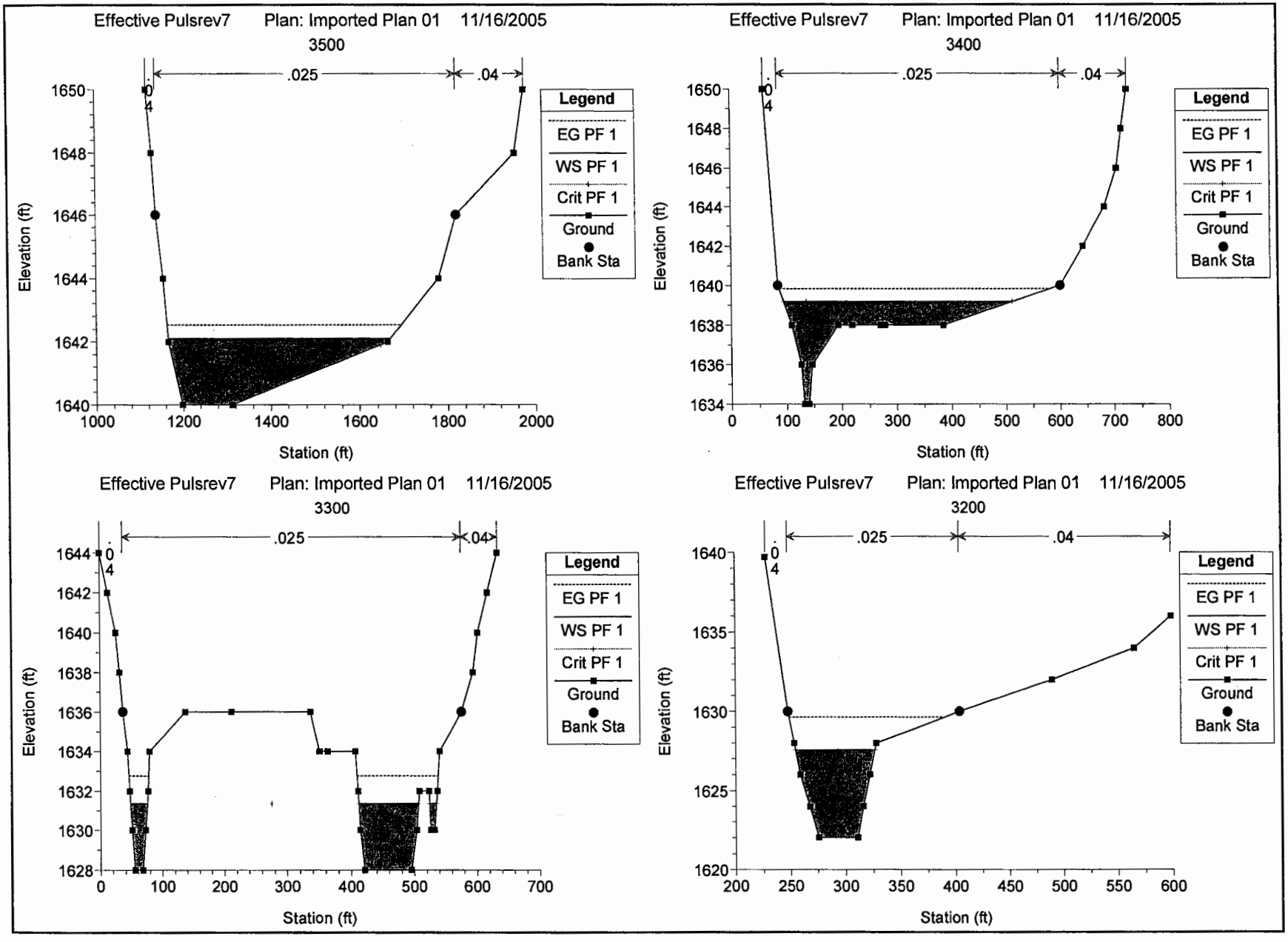
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	1600	PF 1	2209.00	1580.40	1585.10		1585.40	0.001182	4.47	535.84	243.07	0.44
Reach-1	1500	PF 1	2209.00	1578.00	1584.86	1583.73	1585.15	0.001339	4.52	616.12	392.83	0.46
Reach-1	1400	PF 1	2101.00	1578.00	1583.67	1583.67	1584.79	0.007212	8.49	247.37	111.54	1.01
Reach-1	1300	PF 1	2101.00	1572.69	1579.00	1579.00	1580.10	0.007070	8.39	250.51	110.50	0.98
Reach-1	1200	PF 1	1889.00	1571.62	1577.90	1577.33	1578.66	0.005116	6.99	270.27	94.20	0.73
Reach-1	1100	PF 1	1232.00	1571.40	1577.47	1576.99	1578.02	0.005486	5.92	207.99	97.61	0.72
Reach-1	1000	PF 1	966.00	1571.15	1576.45	1576.43	1577.24	0.010979	7.13	135.49	81.83	0.98
Reach-1	900	PF 1	798.00	1571.00	1575.37	1575.24	1575.98	0.009367	6.28	127.05	82.56	0.89
Reach-1	800	PF 1	676.00	1570.00	1574.76	1574.50	1575.09	0.006368	4.65	145.34	112.28	0.72
Reach-1	700	PF 1	669.00	1569.50	1573.29	1573.29	1573.79	0.013417	5.65	118.49	119.72	1.00
Reach-1	600	PF 1	669.00	1565.40	1568.49	1567.57	1569.01	0.000939	5.79	115.56	37.73	0.58
Reach-1	550		Bridge									
Reach-1	500	PF 1	669.00	1564.30	1566.47	1566.47	1567.54	0.002950	8.31	80.55	37.73	1.00
Reach-1	400	PF 1	669.00	1560.00	1562.56	1562.56	1563.09	0.009326	5.85	114.36	153.25	1.01
Reach-1	300	PF 1	669.00	1558.00	1560.02	1560.02	1560.77	0.007882	6.93	96.58	63.96	0.99
Reach-1	200	PF 1	669.00	1554.00	1555.08	1555.08	1555.57	0.008907	5.62	118.97	118.39	0.99


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3900
.025
.04
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3800
.025
.04
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3700
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

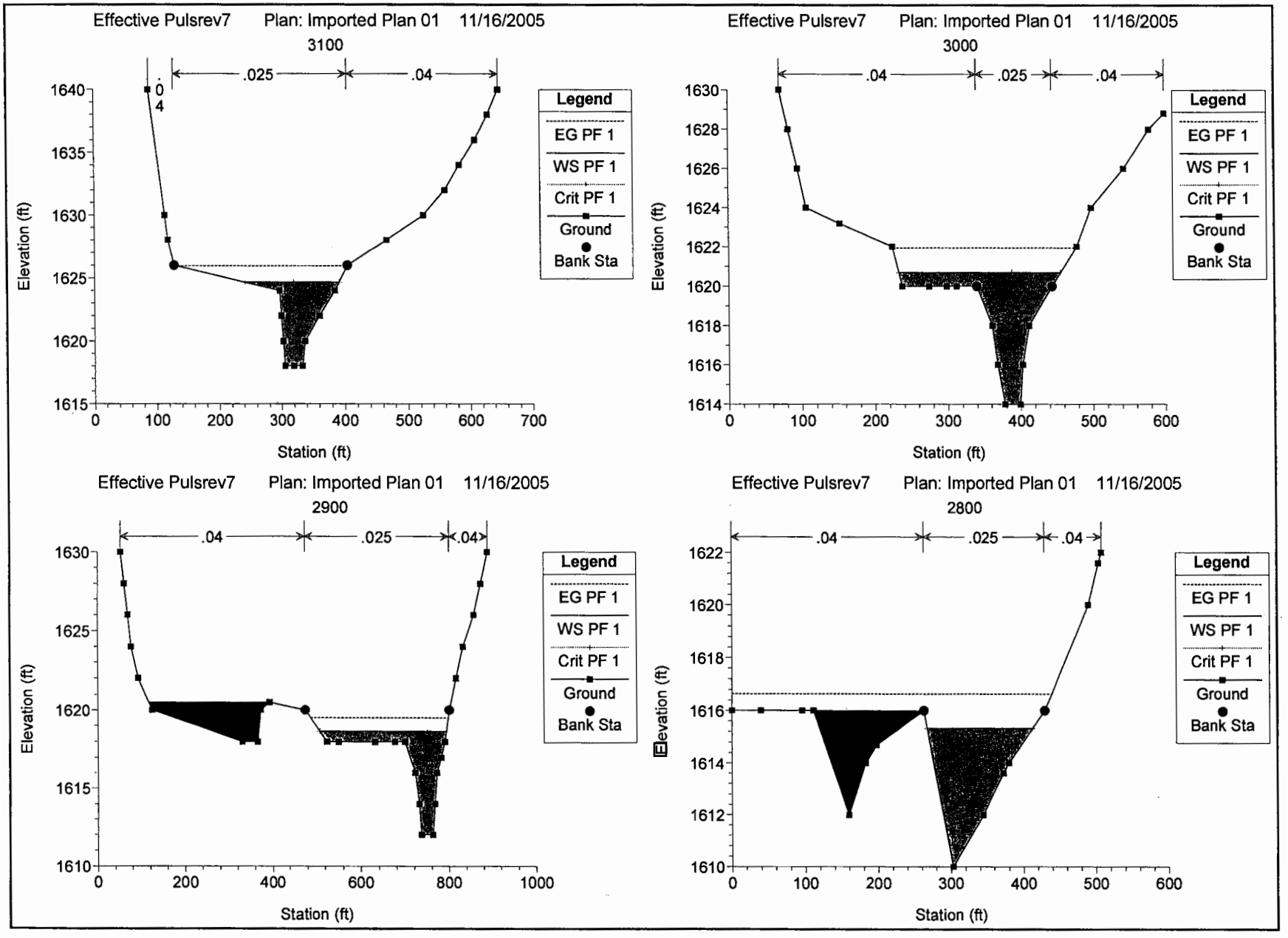

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3800
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3700
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
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.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

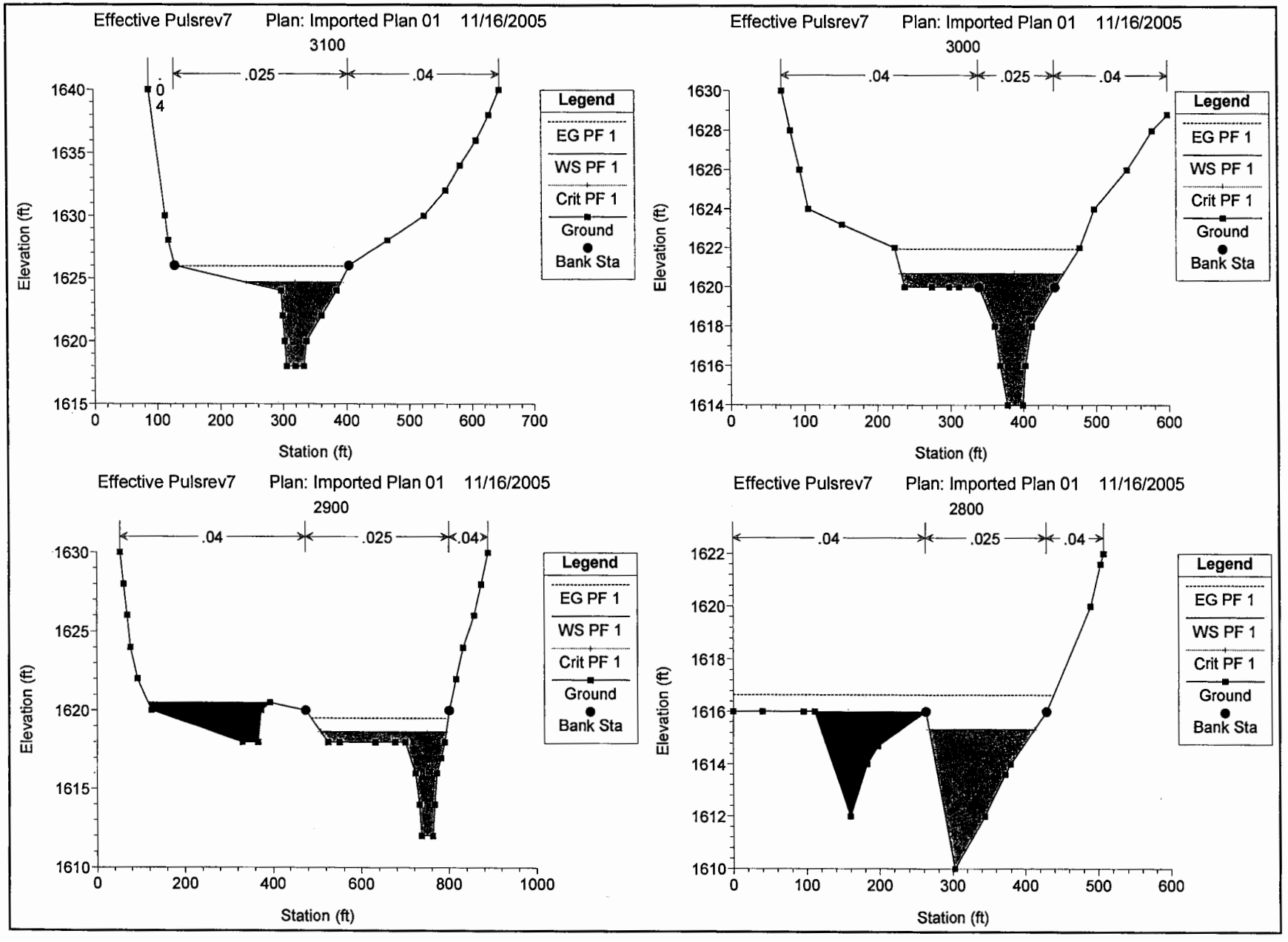
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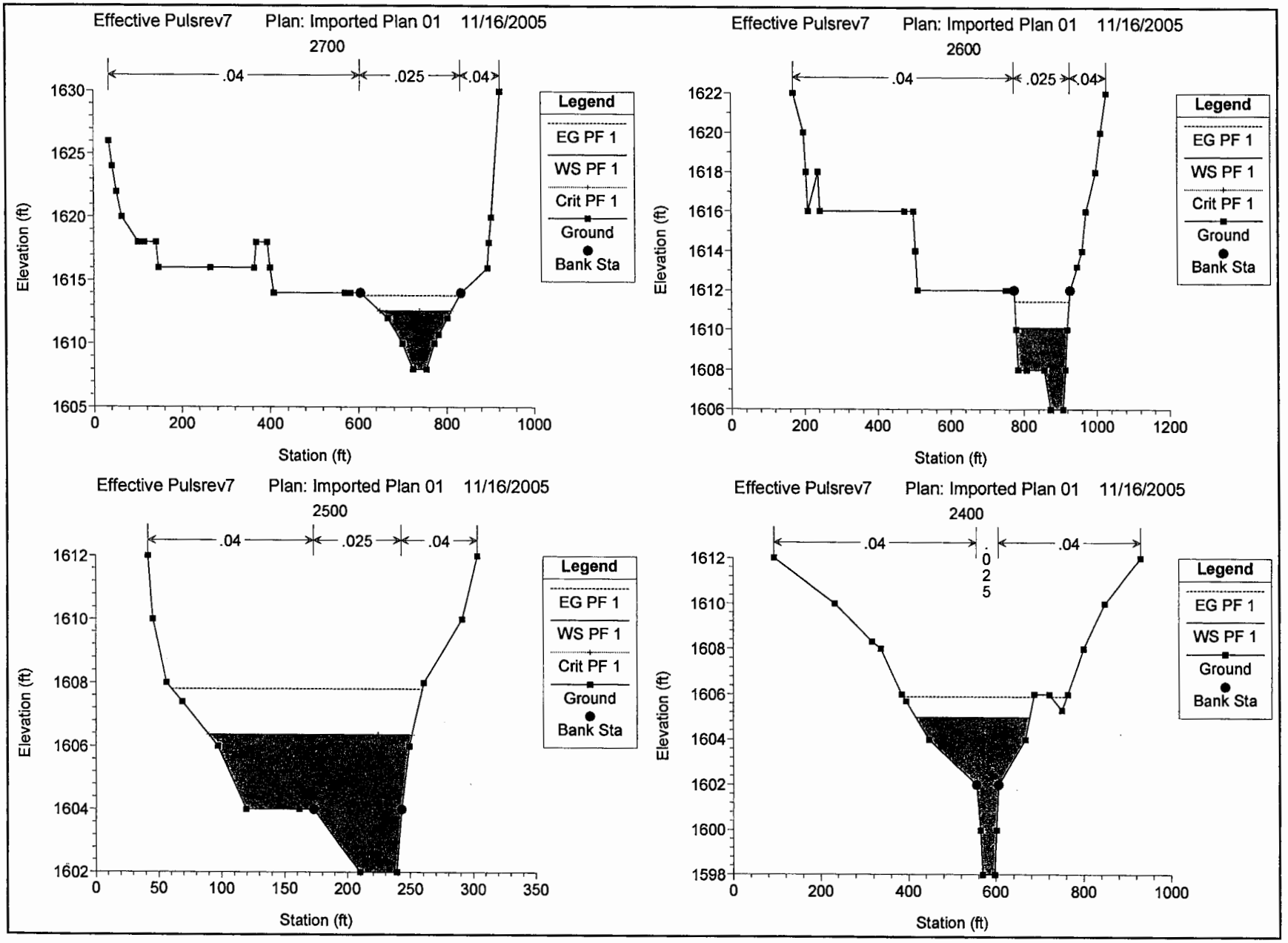

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
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.025
.04
.0
4
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3400
.025
.04
.0
4
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3300
.025
.04
.0
4
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3200
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4
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

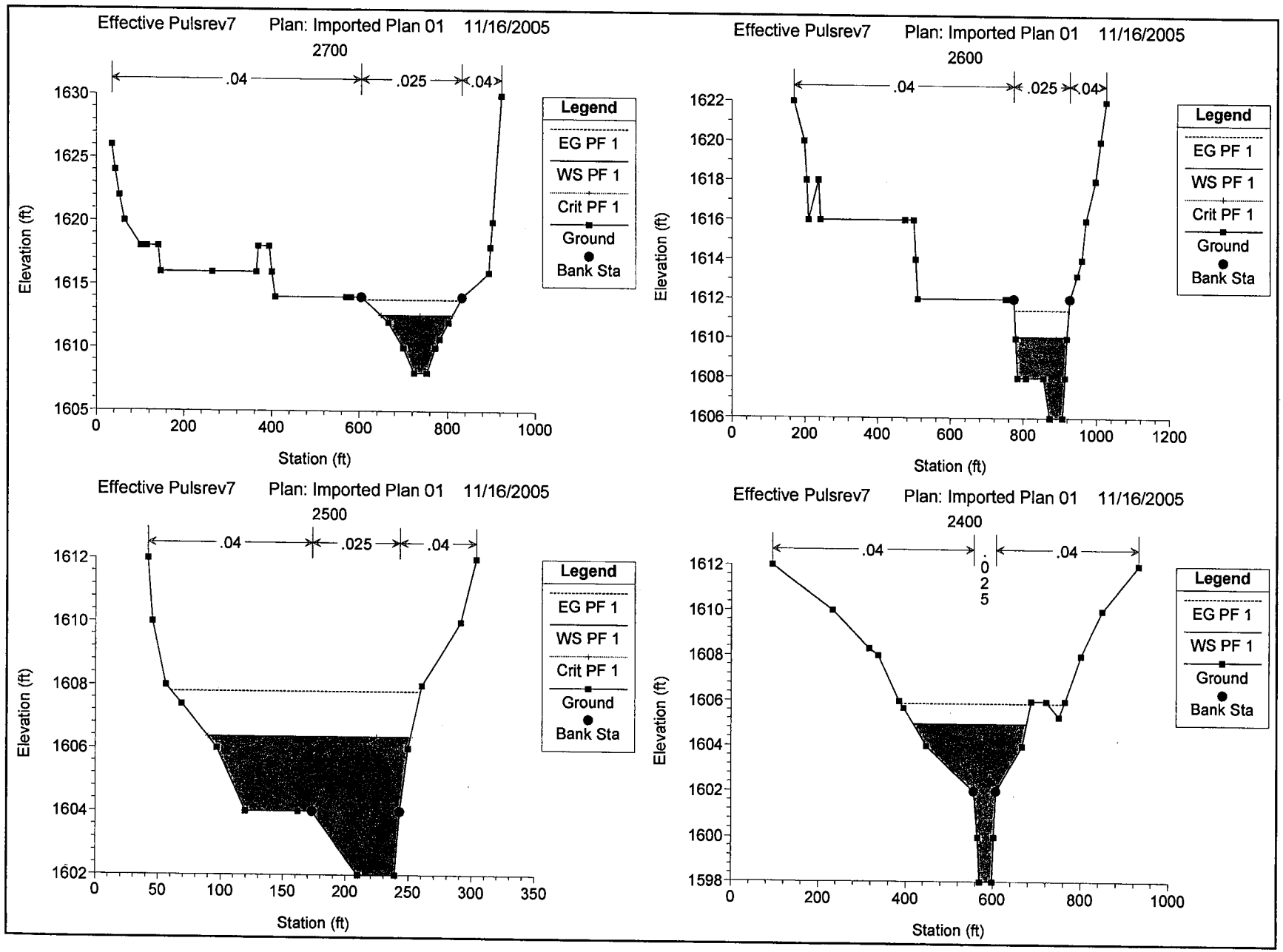

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3500
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.04
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4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1650
1648
1646
1644
1642
1640
1000
1200
1400
1600
1800
2000
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3400
.025
.04
0
4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1650
1648
1646
1644
1642
1640
1638
1636
1634
0
100
200
300
400
500
600
700
800
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3300
.025
.04
0
4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1644
1642
1640
1638
1636
1634
1632
1630
1628
0
100
200
300
400
500
600
700
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3200
.025
.04
0
4
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
1640
1635
1630
1625
1620
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250
300
350
400
450
500
550
600

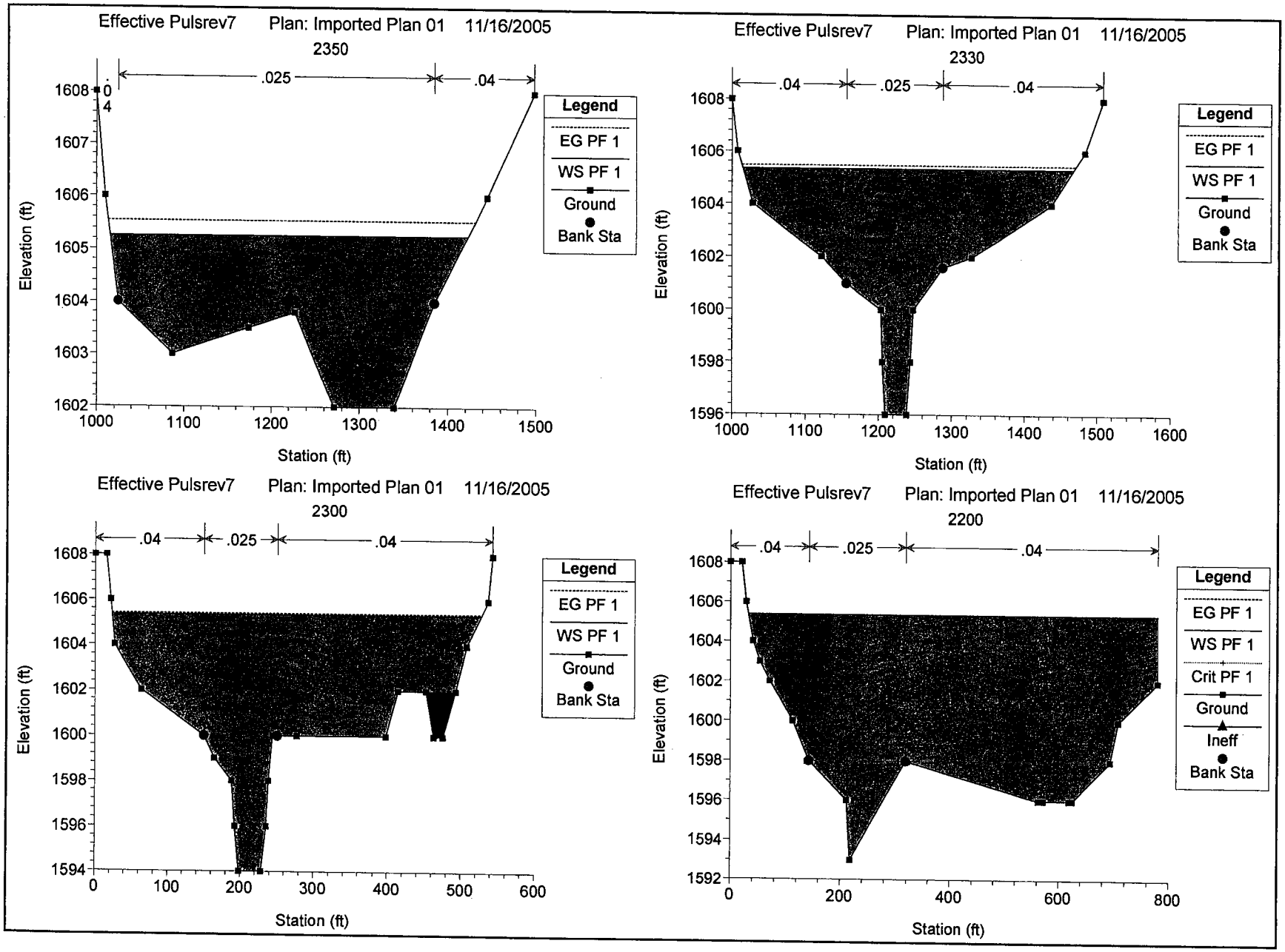
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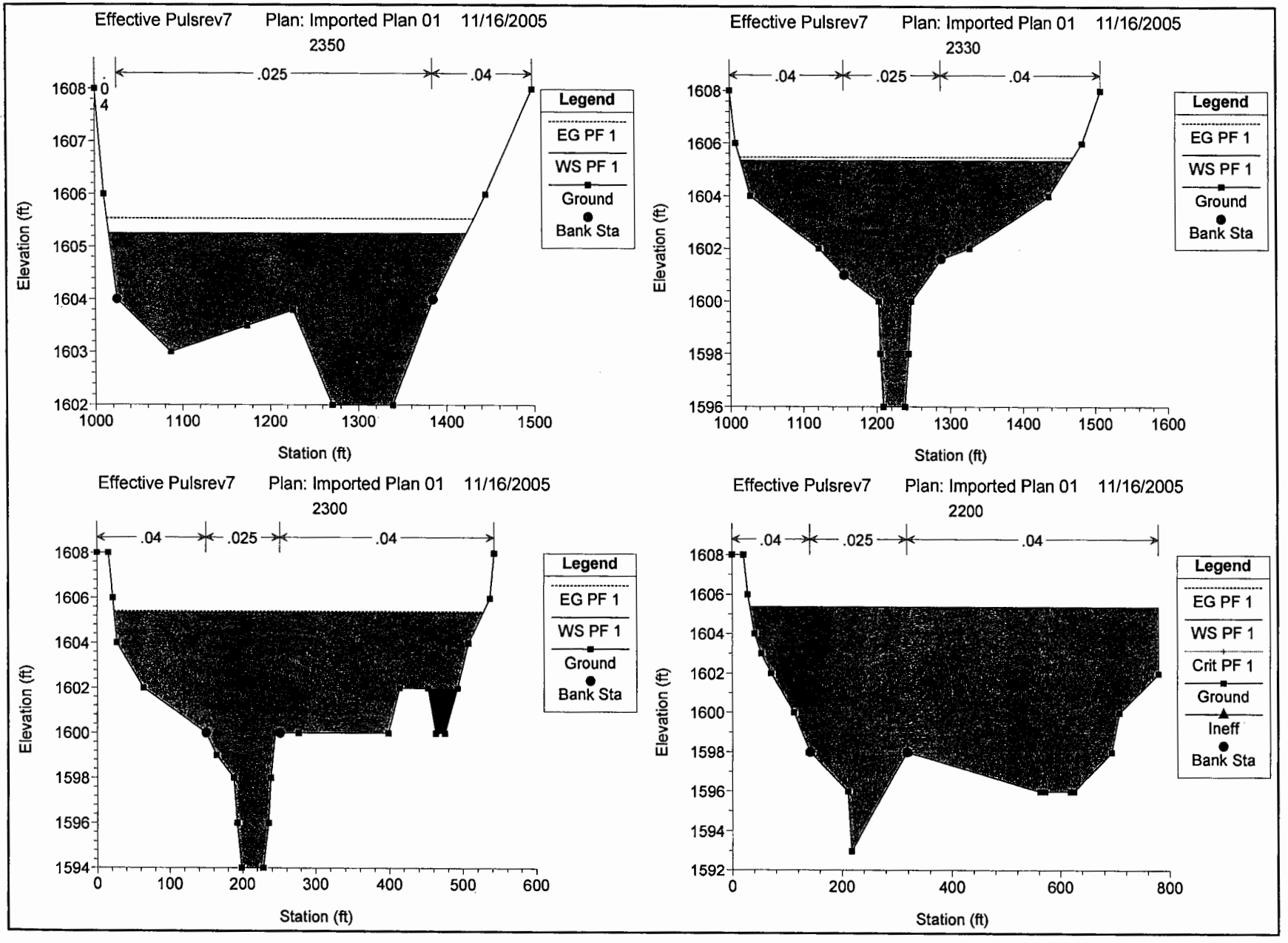

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3100
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3000
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2900
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2800
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

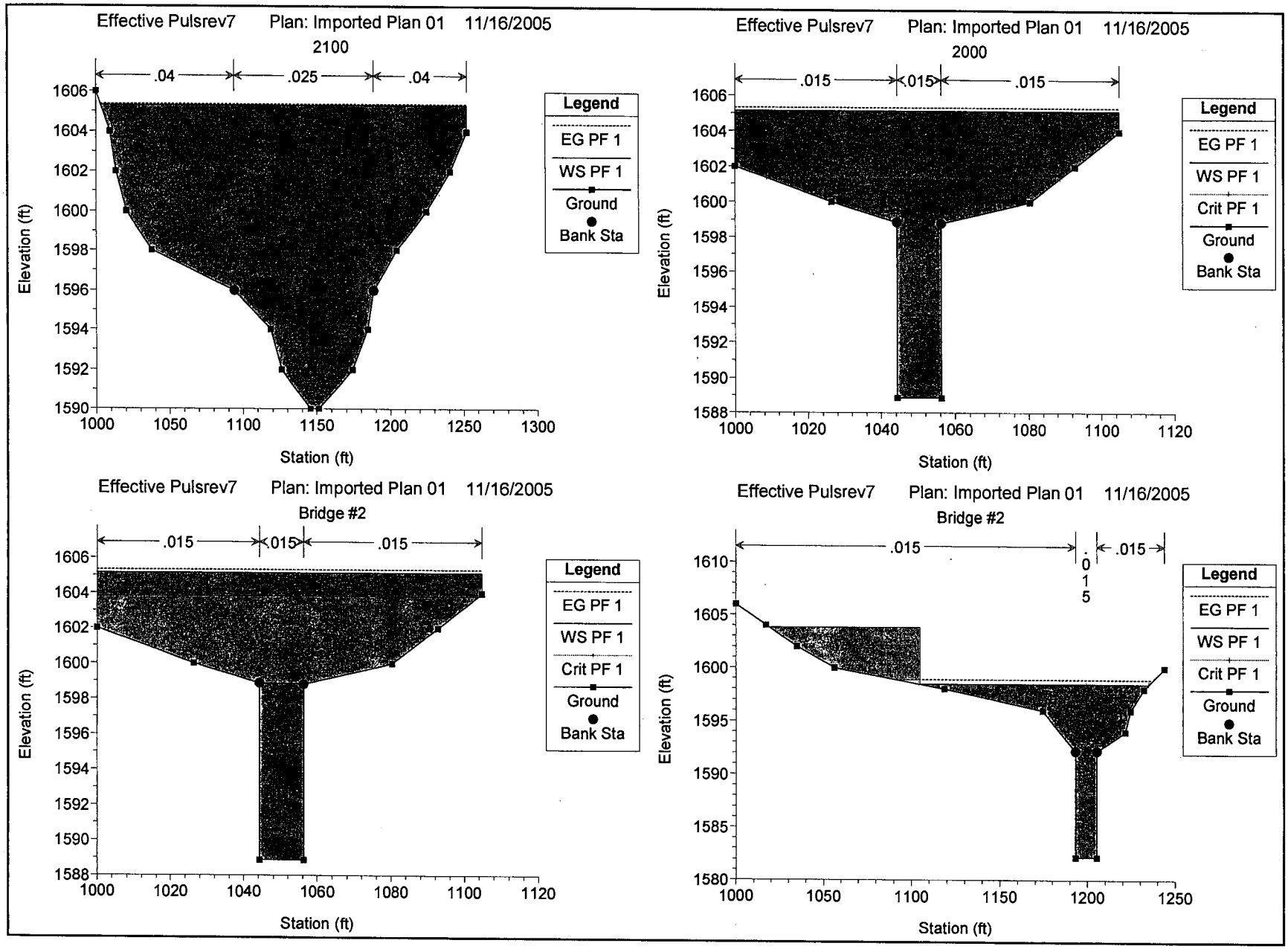

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3100
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
3000
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2900
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2800
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

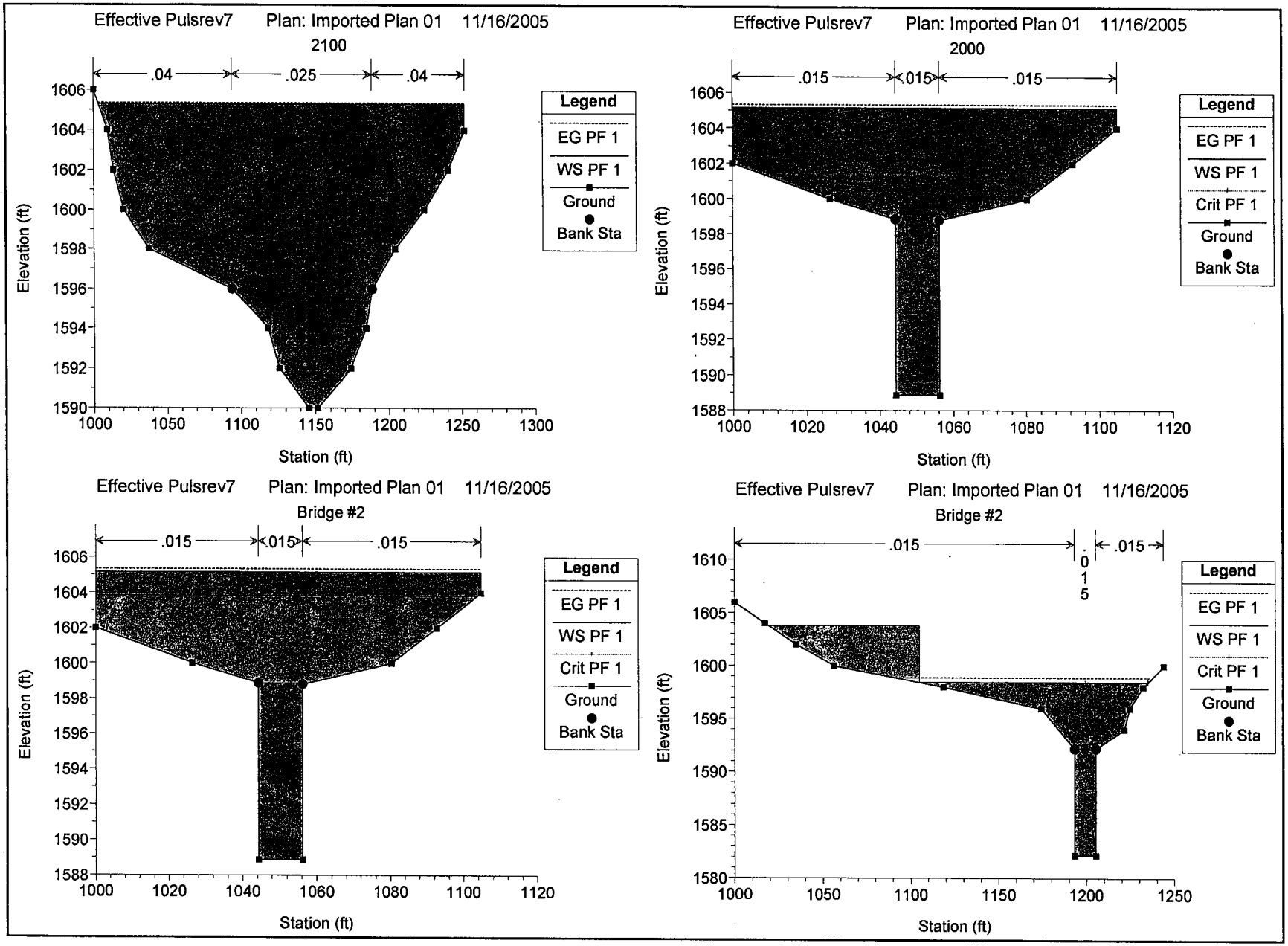

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2700
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2600
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2500
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2400

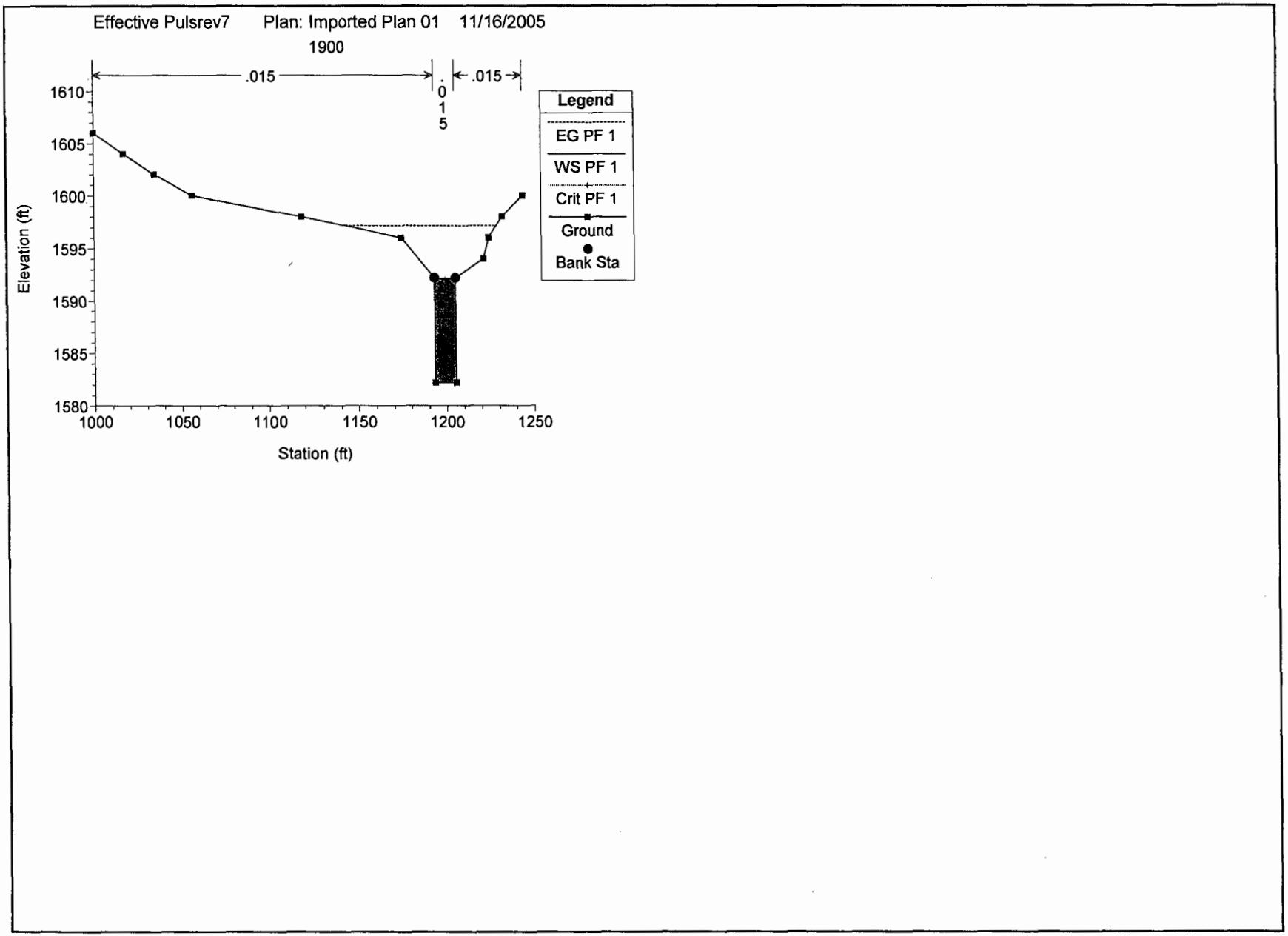

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2700
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2600
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2500
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2400
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta

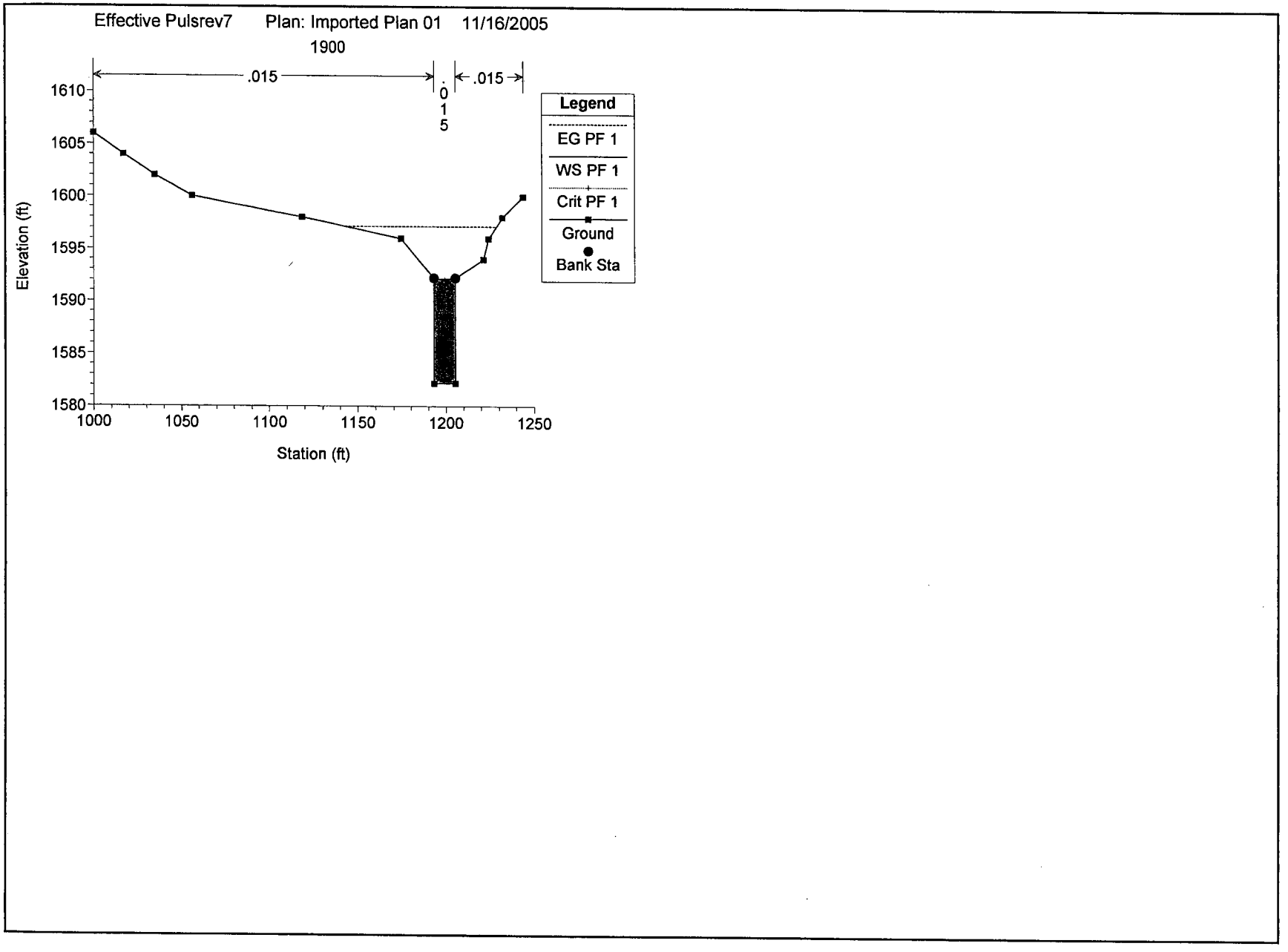

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2350
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2330
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2300
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2200
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2350
.04
.025
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2330
.04
.025
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2300
.04
.025
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2200
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

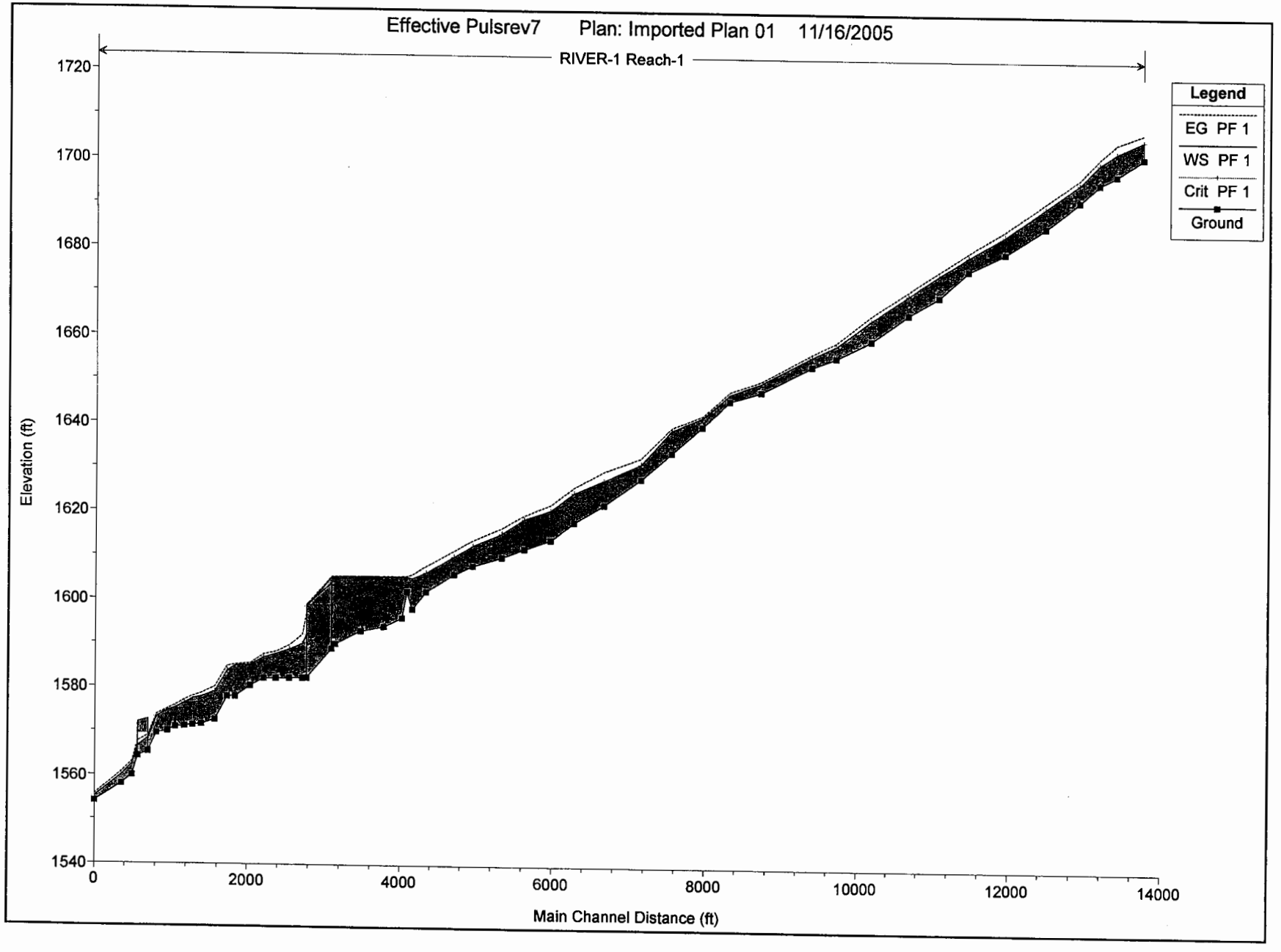

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2100
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2000
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
Bridge #2
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
Bridge #2
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

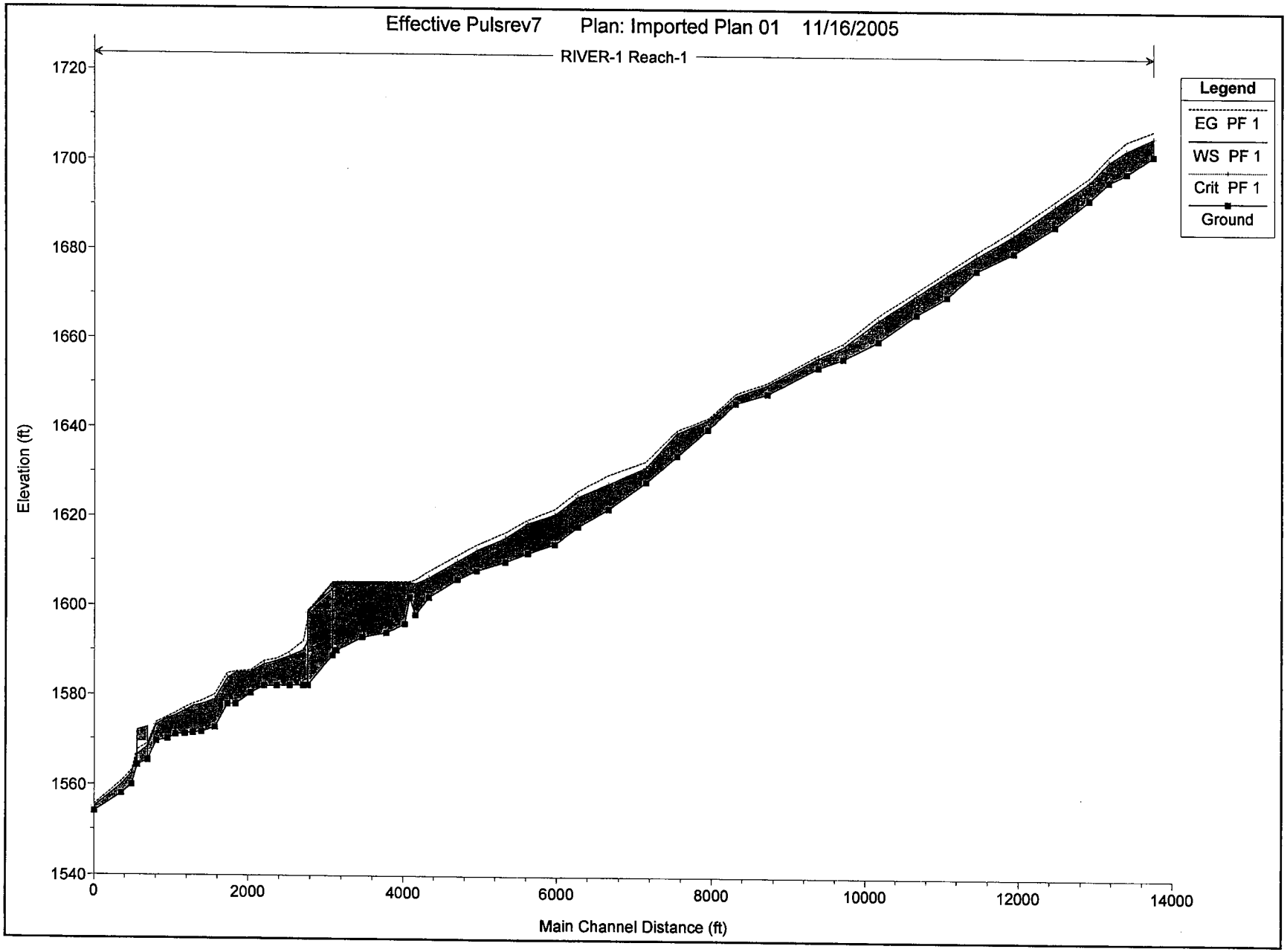

Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2100
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
2000
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
Bridge #2
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
Bridge #2
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
1900
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1610
1605
1600
1595
1590
1585
1580
1000
1050
1100
1150
1200
1250
Station (ft)


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
1900
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1610
1605
1600
1595
1590
1585
1580
1000
1050
1100
1150
1200
1250
Station (ft)

C56


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1720
1700
1680
1660
1640
1620
1600
1580
1560
1540
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)


Effective Pulsrev7 Plan: Imported Plan 01 11/16/2005
RIVER-1 Reach-1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
1720
1700
1680
1660
1640
1620
1600
1580
1560
1540
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)

Proposed Project Model HEC-RAS Output File (NGVD 29)

Proposed Project Model HEC-RAS Output File (NGVD 29)

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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
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PROJECT DATA
Project Title: Proposed 14x10 box culverts
Project File : CLOMR3.prj
Run Date and Time: 2/24/2006 11:18:51 AM

Project in English units

Project Description:
Proposed Pulsipher Wash improvements adjacent to Falcon Ridge Parkway south of Bertha Howe Avenue. Upsteam existing channel from Sta: 15+48.39 to 22+39.15 is a concrete U channel with a 24.67' bottom and 8' in height. Includes two culverts (12' x 8') under Bertha Howe Avenue. Ties into proposed double 14x10 box culverts betweeen Bertha Howe Ave and Pioneer Blvd. Box culverts (5 - 12' x 10'). Proposed transition from proposed 2-14x10's to three of Pioneer Blvd. 12x10's back to proposed double 14x10 box culverts from Pioneer Blvd. to approximately 430' downstream of Pioneer Blvd.

PLAN DATA

Plan Title: Plan 23
Plan File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.p23

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10

Flow Title : Flow 03
Flow File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03

Plan Summary Information:
Number of: Cross Sections = 61 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 3 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Flow 03
Flow File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03

Flow Data (cfs)

River	Reach	RS	PF 1
Pulsipher Wash	Falcon Ridge	3900	2318
Pulsipher Wash	Falcon Ridge	3300	2450
Pulsipher Wash	Falcon Ridge	2935	3000
Pulsipher Wash	Falcon Ridge	2500	3100
Pulsipher Wash	Falcon Ridge	2100	2138

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Pulsipher Wash	Falcon Ridge	PF 1	Critical	Critical

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Pulsipher Wash	Falcon Ridge	2970	PF 1	Known WS	1620.01
Pulsipher Wash	Falcon Ridge	2590	PF 1	Known WS	1611.09

GEOMETRY DATA

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3900

INPUT
Description: Section: 3900 (Match existing cross section 3900 from effective model)
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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
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PROJECT DATA
Project Title: Proposed 14x10 box culverts
Project File : CLOMR3.prj
Run Date and Time: 2/24/2006 11:18:51 AM

Project in English units

Project Description:
Proposed Pulsipher Wash improvements adjacent to Falcon Ridge Parkway south of Bertha Howe Avenue. Upsteam existing channel from Sta: 15+48.39 to 22+39.15 is a concrete U channel with a 24.67' bottom and 8' in height. Includes two culverts (12' x 8') under Bertha Howe Avenue. Ties into proposed double 14x10 box culverts betweeen Bertha Howe Ave and Pioneer Blvd. Box culverts (5 - 12' x 10'). Proposed transition from proposed 2-14x10's to three of Pioneer Blvd. 12x10's back to proposed double 14x10 box culverts from Pioneer Blvd. to approximately 430' downstream of Pioneer Blvd.

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PLAN DATA

Plan Title: Plan 23
Plan File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.p23

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10

Flow Title : Flow 03
Flow File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03

Plan Summary Information:
Number of: Cross Sections = 61 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 3 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

****

FLOW DATA

Flow Title: Flow 03
Flow File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03

Flow Data (cfs)

River	Reach	RS	PF 1
Pulsipher Wash	Falcon Ridge	3900	2318
Pulsipher Wash	Falcon Ridge	3300	2450
Pulsipher Wash	Falcon Ridge	2935	3000
Pulsipher Wash	Falcon Ridge	2500	3100
Pulsipher Wash	Falcon Ridge	2100	2138

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Pulsipher Wash	Falcon Ridge	PF 1	Critical	Critical

Changes in WS and EG

River	Reach	RS	Profile	Type	Value
Pulsipher Wash	Falcon Ridge	2970	PF 1	Known WS	1620.01
Pulsipher Wash	Falcon Ridge	2590	PF 1	Known WS	1611.09

****

GEOMETRY DATA

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : c:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3900

INPUT
Description: Section: 3900 (Match existing cross section 3900 from effective model)
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

****

C62

-250	1670	-192.33	1668	-164.1	1666	-151.7	1664	-132.18	1662
-119.39	1660	-92.09	1658.8	-68.52	1660	-57.76	1662	-35.72	1662
-7.01	1660	7.46	1658.3	10.61	1658	35.32	1656	67.98	1656
148.8	1658	153.01	1658	167.76	1658	186.8	1658	220.25	1660
227.84	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-250	.04	-35.72	.025	220.25	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.72	220.25	238.03	320.4	468.3	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.		0.025	
W.S. Elev (ft)	1658.78	Reach Len. (ft)	238.03	320.40	468.30
Crit W.S. (ft)	1658.78	Flow Area (sq ft)		317.01	
E.G. Slope (ft/ft)	0.008011	Area (sq ft)		317.01	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	196.56	Top Width (ft)		196.56	
Vel Total (ft/s)	7.31	Avg. Vel. (ft/s)		7.31	
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)		1.61	
Conv. Total (cfs)	25897.6	Conv. (cfs)		25897.6	
Length Wtd. (ft)	320.40	Wetted Per. (ft)		196.73	
Min Ch El (ft)	1656.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		5.89	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.71	45.91	6.78
C & E Loss (ft)		Cum SA (acres)	5.72	16.57	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3800

INPUT
Description: Section: 43 (Existing cross section 3800 from effective model)
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-260.99	1670	-215.04	1668	-210.96	1666	-206.01	1664	-195.96	1662
-188.56	1660	-178.68	1658	-168.44	1656	-49.33	1656	-29.72	1656
-22.32	1654	163.52	1654	177.34	1656	181.03	1658	183.61	1660
201.75	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-260.99	.04	-178.68	.025	183.61	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-178.68	183.61	421.12	355.77	288.45	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1656.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.03	Wt. n-Val.		0.025	
W.S. Elev (ft)	1655.47	Reach Len. (ft)	421.12	355.77	288.45
Crit W.S. (ft)	1655.66	Flow Area (sq ft)		284.32	
E.G. Slope (ft/ft)	0.011905	Area (sq ft)		284.32	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	201.42	Top Width (ft)		201.42	
Vel Total (ft/s)	8.15	Avg. Vel. (ft/s)		8.15	
Max Chl Dpth (ft)	1.47	Hydr. Depth (ft)		1.41	
Conv. Total (cfs)	21244.3	Conv. (cfs)		21244.3	
Length Wtd. (ft)	355.77	Wetted Per. (ft)		201.72	
Min Ch El (ft)	1654.00	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		8.54	
Frctn Loss (ft)	3.10	Cum Volume (acre-ft)	32.71	43.70	6.78
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	15.11	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3750

INPUT
Description: Section: 3750
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-204.93	1657	-194.93	1653.44	-144.93	1654.25	-94.93	1653.44	-89.93	1653.54
-56.23	1652	29.67	1650	35.24	1648.81	50	1648.25	67.21	1648.85
69.86	1650	78.18	1652	86.94	1654	91.55	1656	96.91	1658

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-204.93	.016	-89.93	.025	96.91	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-89.93	96.91	240	221	221	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.025	
W.S. Elev (ft)	1652.75	Reach Len. (ft)	240.00	221.00	221.00
Crit W.S. (ft)	1652.46	Flow Area (sq ft)		333.47	
E.G. Slope (ft/ft)	0.004912	Area (sq ft)		333.47	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	153.97	Top Width (ft)		153.97	
Vel Total (ft/s)	6.95	Avg. Vel. (ft/s)		6.95	
Max Chl Dpth (ft)	4.49	Hydr. Depth (ft)		2.17	
Conv. Total (cfs)	33072.7	Conv. (cfs)		33072.7	
Length Wtd. (ft)	221.00	Wetted Per. (ft)		154.72	
Min Ch El (ft)	1648.25	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)		4.59	
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	32.71	41.18	6.78
C & E Loss (ft)	0.05	Cum SA (acres)	5.72	13.66	1.73

-250	1670	-192.33	1668	-164.1	1666	-151.7	1664	-132.18	1662
-119.39	1660	-92.09	1658.8	-68.52	1660	-57.76	1662	-35.72	1662
-7.01	1660	7.46	1658.3	10.61	1658	35.32	1656	67.98	1656
148.8	1658	153.01	1658	167.76	1658	186.8	1658	220.25	1660
227.84	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-250	.04	-35.72	.025	220.25	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-35.72	220.25	238.03	320.4	468.3	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1659.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.		0.025	
W.S. Elev (ft)	1658.78	Reach Len. (ft)	238.03	320.40	468.30
Crit W.S. (ft)	1658.78	Flow Area (sq ft)		317.01	
E.G. Slope (ft/ft)	0.008011	Area (sq ft)		317.01	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	196.56	Top Width (ft)		196.56	
Vel Total (ft/s)	7.31	Avg. Vel. (ft/s)		7.31	
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)		1.61	
Conv. Total (cfs)	25897.6	Conv. (cfs)		25897.6	
Length Wtd. (ft)	320.40	Wetted Per. (ft)		196.73	
Min Ch El (ft)	1656.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		5.89	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.71	45.91	6.78
C & E Loss (ft)		Cum SA (acres)	5.72	16.57	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3800

INPUT
Description: Section: 43 (Existing cross section 3800 from effective model)
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-260.99	1670	-215.04	1668	-210.96	1666	-206.01	1664	-195.96	1662
-188.56	1660	-178.68	1658	-168.44	1656	-49.33	1656	-29.72	1656
-22.32	1654	163.52	1654	177.34	1656	181.03	1658	183.61	1660
201.75	1670								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-260.99	.04	-178.68	.025	183.61	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-178.68	183.61	421.12	355.77	288.45	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1656.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.03	Wt. n-Val.		0.025	
W.S. Elev (ft)	1655.47	Reach Len. (ft)	421.12	355.77	288.45
Crit W.S. (ft)	1655.66	Flow Area (sq ft)		284.32	
E.G. Slope (ft/ft)	0.011905	Area (sq ft)		284.32	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	201.42	Top Width (ft)		201.42	
Vel Total (ft/s)	8.15	Avg. Vel. (ft/s)		8.15	
Max Chl Dpth (ft)	1.47	Hydr. Depth (ft)		1.41	
Conv. Total (cfs)	21244.3	Conv. (cfs)		21244.3	
Length Wtd. (ft)	355.77	Wetted Per. (ft)		201.72	
Min Ch El (ft)	1654.00	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		8.54	
Frctn Loss (ft)	3.10	Cum Volume (acre-ft)	32.71	43.70	6.78
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	15.11	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3750

INPUT
Description: Section: 3750
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-204.93	1657	-194.93	1653.44	-144.93	1654.25	-94.93	1653.44	-89.93	1653.54
-56.23	1652	29.67	1650	35.24	1648.81	50	1648.25	67.21	1648.85
69.86	1650	78.18	1652	86.94	1654	91.55	1656	96.91	1658

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-204.93	.016	-89.93	.025	96.91	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-89.93	96.91	240	221	221	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.025	
W.S. Elev (ft)	1652.75	Reach Len. (ft)	240.00	221.00	221.00
Crit W.S. (ft)	1652.46	Flow Area (sq ft)		333.47	
E.G. Slope (ft/ft)	0.004912	Area (sq ft)		333.47	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	153.97	Top Width (ft)		153.97	
Vel Total (ft/s)	6.95	Avg. Vel. (ft/s)		6.95	
Max Chl Dpth (ft)	4.49	Hydr. Depth (ft)		2.17	
Conv. Total (cfs)	33072.7	Conv. (cfs)		33072.7	
Length Wtd. (ft)	221.00	Wetted Per. (ft)		154.72	
Min Ch El (ft)	1648.25	Shear (lb/sq ft)		0.66	
Alpha	1.00	Stream Power (lb/ft s)		4.59	
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	32.71	41.18	6.78
C & E Loss (ft)	0.05	Cum SA (acres)	5.72	13.66	1.73

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: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3700

INPUT
Description: Section: 3700 (Appoximate location of cross section 3700 from effective model)
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-123.78	1655	-113.78	1651.46	-63.78	1652.27	-13.78	1651.46	-8.78	1651.56
.44	1652.1	5.13	1652	22.5	1650	41.64	1648	50	1646.87
77.46	1646.88	89.37	1648	105.38	1650	126.38	1652	144.97	1654
216.57	1656	223.14	1658	234.09	1660				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-123.78	.016	.44	.025	234.09	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
.44	234.09	282	284	355	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1650.90	Reach Len. (ft)	282.00	284.00	355.00
Crit W.S. (ft)	1650.90	Flow Area (sq ft)		255.57	
E.G. Slope (ft/ft)	0.006723	Area (sq ft)		255.57	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	100.21	Top Width (ft)		100.21	
Vel Total (ft/s)	9.07	Avg. Vel. (ft/s)		9.07	
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)		2.55	
Conv. Total (cfs)	28270.2	Conv. (cfs)		28270.2	
Length Wtd. (ft)	284.00	Wetted Per. (ft)		100.66	
Min Ch El (ft)	1646.87	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		9.67	
Frctn Loss (ft)	2.05	Cum Volume (acre-ft)	32.71	39.69	6.78
C & E Loss (ft)	0.11	Cum SA (acres)	5.72	13.02	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3620

INPUT
Description: Section: 3620
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-120.79	1653	-110.79	1648.98	-60.79	1649.79	-10.79	1648.98	-5.79	1649.08
7.9	1649.01	43.21	1644	45.66	1643.73	50	1643.5	83.23	1643.32
91.12	1646.06	110.97	1645.9	118.71	1646	228.85	1648	324.25	1648
341.14	1650								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-120.79	.016	-5.79	.025	341.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.79	341.14	151	149	106	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1646.61	Reach Len. (ft)	151.00	149.00	106.00
Crit W.S. (ft)	1647.35	Flow Area (sq ft)		193.46	
E.G. Slope (ft/ft)	0.023515	Area (sq ft)		193.46	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	127.68	Top Width (ft)		127.68	
Vel Total (ft/s)	11.98	Avg. Vel. (ft/s)		11.98	
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	15116.2	Conv. (cfs)		15116.2	
Length Wtd. (ft)	149.00	Wetted Per. (ft)		128.35	
Min Ch El (ft)	1643.32	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		26.51	
Frctn Loss (ft)	3.24	Cum Volume (acre-ft)	32.71	38.22	6.78
C & E Loss (ft)	0.10	Cum SA (acres)	5.72	12.27	1.73

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: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3580

INPUT
Description: Section: 3580
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3700

INPUT
Description: Section: 3700 (Appoximate location of cross section 3700 from effective model)
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-123.78	1655	-113.78	1651.46	-63.78	1652.27	-13.78	1651.46	-8.78	1651.56
.44	1652.1	5.13	1652	22.5	1650	41.64	1648	50	1646.87
77.46	1646.88	89.37	1648	105.38	1650	126.38	1652	144.97	1654
216.57	1656	223.14	1658	234.09	1660				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-123.78	.016	.44	.025	234.09	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
.44	234.09	282	284	355	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1652.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1650.90	Reach Len. (ft)	282.00	284.00	355.00
Crit W.S. (ft)	1650.90	Flow Area (sq ft)		255.57	
E.G. Slope (ft/ft)	*0.006723	Area (sq ft)		255.57	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	100.21	Top Width (ft)		100.21	
Vel Total (ft/s)	9.07	Avg. Vel. (ft/s)		9.07	
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)		2.55	
Conv. Total (cfs)	28270.2	Conv. (cfs)		28270.2	
Length Wtd. (ft)	284.00	Wetted Per. (ft)		100.66	
Min Ch El (ft)	1646.87	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		9.67	
Frctn Loss (ft)	2.05	Cum Volume (acre-ft)	32.71	39.69	6.78
C & E Loss (ft)	0.11	Cum SA (acres)	5.72	13.02	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3620

INPUT
Description: Section: 3620
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-120.79	1653	-110.79	1648.98	-60.79	1649.79	-10.79	1648.98	-5.79	1649.08
7.9	1649.01	43.21	1644	45.66	1643.73	50	1643.5	83.23	1643.32
91.12	1646.06	110.97	1645.9	118.71	1646	228.85	1648	324.25	1648
341.14	1650								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-120.79	.016	-5.79	.025	341.14	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-5.79	341.14	151	149	106	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1648.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1646.61	Reach Len. (ft)	151.00	149.00	106.00
Crit W.S. (ft)	1647.35	Flow Area (sq ft)		193.46	
E.G. Slope (ft/ft)	*0.023515	Area (sq ft)		193.46	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	127.68	Top Width (ft)		127.68	
Vel Total (ft/s)	11.98	Avg. Vel. (ft/s)		11.98	
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	15116.2	Conv. (cfs)		15116.2	
Length Wtd. (ft)	149.00	Wetted Per. (ft)		128.35	
Min Ch El (ft)	1643.32	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		26.51	
Frctn Loss (ft)	3.24	Cum Volume (acre-ft)	32.71	38.22	6.78
C & E Loss (ft)	0.10	Cum SA (acres)	5.72	12.27	1.73

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: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3580

INPUT
Description: Section: 3580
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 -119.71  1651.5 -109.71 1647.65  -59.71 1648.46   -9.71 1647.65   -4.71 1647.75
    3.89 1648.87   34.73 1641.67   66.07 1641.59   84.69 1644.92  200.92    1646
  314.16    1646  320.54    1648  326.39    1650  332.19    1650

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 -119.71    .016    3.89    .025  326.39     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3.89  326.39              288     297     315             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1646.87  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.64  * Wt. n-Val.             *          *    0.025  *          *
* W.S. Elev (ft)          * 1646.24  * Reach Len. (ft)        *  288.00  *  297.00  *  315.00  *
* Crit W.S. (ft)          * 1646.24  * Flow Area (sq ft)      *          *  361.98  *          *
* E.G. Slope (ft/ft)      *0.009061  * Area (sq ft)           *          *  361.98  *          *
* Q Total (cfs)           * 2318.00  * Flow (cfs)             *          * 2318.00  *          *
* Top Width (ft)          *  299.75  * Top Width (ft)         *          *  299.75  *          *
* Vel Total (ft/s)        *    6.40  * Avg. Vel. (ft/s)       *          *    6.40  *          *
* Max Chl Dpth (ft)       *    4.65  * Hydr. Depth (ft)       *          *    1.21  *          *
* Conv. Total (cfs)       * 24351.0  * Conv. (cfs)           *          * 24351.0  *          *
* Length Wtd. (ft)        *  297.00  * Wetted Per. (ft)       *          *  300.62  *          *
* Min Ch El (ft)          * 1641.59  * Shear (lb/sq ft)      *          *    0.68  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    4.36  *          *
* Frctn Loss (ft)         *    2.59  * Cum Volume (acre-ft)   *   32.71  *   37.27  *    6.78  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    5.72  *   11.54  *    1.73  *
*************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3500

INPUT
Description: Section: 3500 (Appoximate location of cross section 3500 from
             effective model)
Station Elevation Data    num=      16
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 -137.38    1649 -127.38 1645.27  -77.38 1646.08  -27.38 1645.27  -22.38 1645.37
  -15.42 1645.95    27.2    1642   39.86    1640   53.43 1638.87   74.09    1640
   80.06 1641.93   98.07    1642  180.21    1642  368.72    1640  416.34    1640
  450.57    1646

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 -137.38    .016  -15.42    .025  450.57     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -15.42  450.57              109     113     108             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1642.76  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.32  * Wt. n-Val.             *          *    0.025  *          *
* W.S. Elev (ft)          * 1641.44  * Reach Len. (ft)        *  109.00  *  113.00  *  108.00  *
* Crit W.S. (ft)          * 1641.86  * Flow Area (sq ft)      *          *  251.42  *          *
* E.G. Slope (ft/ft)      *0.022651  * Area (sq ft)           *          *  251.42  *          *
* Q Total (cfs)           * 2318.00  * Flow (cfs)             *          * 2318.00  *          *
* Top Width (ft)          *  239.73  * Top Width (ft)         *          *  239.73  *          *
* Vel Total (ft/s)        *    9.22  * Avg. Vel. (ft/s)       *          *    9.22  *          *
* Max Chl Dpth (ft)       *    2.57  * Hydr. Depth (ft)       *          *    1.05  *          *
* Conv. Total (cfs)       * 15401.7  * Conv. (cfs)           *          * 15401.7  *          *
* Length Wtd. (ft)        *  113.00  * Wetted Per. (ft)       *          *  240.28  *          *
* Min Ch El (ft)          * 1638.87  * Shear (lb/sq ft)      *          *    1.48  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *   13.64  *          *
* Frctn Loss (ft)         *    4.04  * Cum Volume (acre-ft)   *   32.71  *   35.18  *    6.78  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)         *    5.72  *    9.70  *    1.73  *
*************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3480

INPUT
Description: Section: 3480
Station Elevation Data    num=      18
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 -154.37    1648 -144.37 1644.7  -94.37 1645.51  -44.37  1644.7  -39.37  1644.8
  -33.37 1644.95  -10.43    1642   18.69    1640   48.39 1638.25   71.31    1640
  116.55 1640.86     119  1639.6   142.4 1639.86  148.64 1641.06  342.47    1640
  394.05  1639.3  443.84    1640   468.1    1646

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 -154.37    .016  -39.37    .025   468.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -39.37  468.1               249     239     282             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1641.53  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.42  * Wt. n-Val.             *          *    0.025  *          *
* W.S. Elev (ft)          * 1641.11  * Reach Len. (ft)        *  249.00  *  239.00  *  282.00  *
```

-119.71	1651.5	-109.71	1647.65	-59.71	1648.46	-9.71	1647.65	-4.71	1647.75
3.89	1648.87	34.73	1641.67	66.07	1641.59	84.69	1644.92	200.92	1646
314.16	1646	320.54	1648	326.39	1650	332.19	1650		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-119.71	.016	3.89	.025	326.39	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
3.89	326.39	288	297	315	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1646.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.		0.025	
W.S. Elev (ft)	1646.24	Reach Len. (ft)	288.00	297.00	315.00
Crit W.S. (ft)	1646.24	Flow Area (sq ft)		361.98	
E.G. Slope (ft/ft)	*0.009061	Area (sq ft)		361.98	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	299.75	Top Width (ft)		299.75	
Vel Total (ft/s)	6.40	Avg. Vel. (ft/s)		6.40	
Max Chl Dpth (ft)	4.65	Hydr. Depth (ft)		1.21	
Conv. Total (cfs)	24351.0	Conv. (cfs)		24351.0	
Length Wtd. (ft)	297.00	Wetted Per. (ft)		300.62	
Min Ch El (ft)	1641.59	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)		4.36	
Frctn Loss (ft)	2.59	Cum Volume (acre-ft)	32.71	37.27	6.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.72	11.54	1.73

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3500

INPUT
Description: Section: 3500 (Appoximate location of cross section 3500 from effective model)
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-137.38	1649	-127.38	1645.27	-77.38	1646.08	-27.38	1645.27	-22.38	1645.37
-15.42	1645.95	27.2	1642	39.86	1640	53.43	1638.87	74.09	1640
80.06	1641.93	98.07	1642	180.21	1642	368.72	1640	416.34	1640
450.57	1646								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-137.38	.016	-15.42	.025	450.57	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-15.42	450.57	109	113	108	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1642.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.		0.025	
W.S. Elev (ft)	1641.44	Reach Len. (ft)	109.00	113.00	108.00
Crit W.S. (ft)	1641.86	Flow Area (sq ft)		251.42	
E.G. Slope (ft/ft)	*0.022651	Area (sq ft)		251.42	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	239.73	Top Width (ft)		239.73	
Vel Total (ft/s)	9.22	Avg. Vel. (ft/s)		9.22	
Max Chl Dpth (ft)	2.57	Hydr. Depth (ft)		1.05	
Conv. Total (cfs)	15401.7	Conv. (cfs)		15401.7	
Length Wtd. (ft)	113.00	Wetted Per. (ft)		240.28	
Min Ch El (ft)	1638.87	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)		13.64	
Frctn Loss (ft)	4.04	Cum Volume (acre-ft)	32.71	35.18	6.78
C & E Loss (ft)	0.07	Cum SA (acres)	5.72	9.70	1.73

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3480

INPUT
Description: Section: 3480
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-154.37	1648	-144.37	1644.7	-94.37	1645.51	-44.37	1644.7	-39.37	1644.8
-33.37	1644.95	-10.43	1642	18.69	1640	48.39	1638.25	71.31	1640
116.55	1640.86	119	1639.6	142.4	1639.86	148.64	1641.06	342.47	1640
394.05	1639.3	443.84	1640	468.1	1646				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-154.37	.016	-39.37	.025	468.1	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-39.37	468.1	249	239	282	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1641.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.025	
W.S. Elev (ft)	1641.11	Reach Len. (ft)	249.00	239.00	282.00

Crit W.S. (ft)	1641.05	Flow Area (sq ft)		446.02					
E.G. Slope (ft/ft)	0.007658	Area (sq ft)		446.02					
Q Total (cfs)	2318.00	Flow (cfs)		2318.00					
Top Width (ft)	445.82	Top Width (ft)		445.82					
Vel Total (ft/s)	5.20	Avg. Vel. (ft/s)		5.20					
Max Chl Dpth (ft)	2.86	Hydr. Depth (ft)		1.00					
Conv. Total (cfs)	26489.1	Conv. (cfs)		26489.1					
Length Wtd. (ft)	239.00	Wetted Per. (ft)		446.55					
Min Ch El (ft)	1638.25	Shear (lb/sq ft)		0.48					
Alpha	1.00	Stream Power (lb/ft s)		2.48					
Frctn Loss (ft)	1.99	Cum Volume (acre-ft)	32.71	34.28	6.78				
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	8.81	1.73				

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3400

INPUT
Description: Section: 3400 (Appoximate location of cross section 3400 from effective model)
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-140.42	1646	-130.42	1641.92	-80.42	1642.83	-30.42	1641.92	-25.42	1642.02
-19.42	1642.08	5.51	1640	37.49	1638.5	59.46	1638	60.54	1636
78.62	1636	88.91	1638	125.03	1638	140.54	1637	148.5	1638
192.74	1638	194.15	1636	198.36	1636	199.47	1638	285.58	1638.81
289.66	1636.63	300.18	1635.9	301.01	1638.17	336.12	1637.25	358.86	1638
375.15	1640	402.94	1650						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-140.42	.016	-19.42	.025	375.15	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.42	375.15	118	116	388	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1639.53	Element			
Vel Head (ft)	0.57	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.96	Reach Len. (ft)	118.00	116.00	388.00
Crit W.S. (ft)	1638.96	Flow Area (sq ft)		382.51	
E.G. Slope (ft/ft)	0.009055	Area (sq ft)		382.51	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	338.93	Top Width (ft)		338.93	
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)		6.06	
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)		1.13	
Conv. Total (cfs)	24359.4	Conv. (cfs)		24359.4	
Length Wtd. (ft)	116.00	Wetted Per. (ft)		344.89	
Min Ch El (ft)	1635.90	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		3.80	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	32.71	32.00	6.78
C & E Loss (ft)	0.16	Cum SA (acres)	5.72	6.66	1.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3375

INPUT
Description: Section: 3375; 300' +/- Upstream of existing U channel.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-132.28	1645	-122.28	1640.83	-72.28	1641.64	-22.28	1640.83	-17.28	1640.93
-1.55	1640.29	10.16	1638	35.68	1637.55	55.26	1638	67.89	1638.23
78.39	1638	144.57	1636	146.03	1634	158.44	1634	163.57	1636
216.48	1636	219	1634	232.51	1634	233.22	1636	243.59	1636
247.04	1634	258.46	1634	260.46	1636	262.46	1638	313.39	1638
317.86	1635.21	331.8	1636	332.22	1638.33	519.22	1636	559.19	1634
614.39	1634	633.19	1636	672.22	1638	680.29	1640		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-132.28	.016	-17.28	.025	680.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-17.28	680.29	73	85	303	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1638.51	Element			
Vel Head (ft)	0.05	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.46	Reach Len. (ft)	73.00	85.00	303.00
Crit W.S. (ft)	1636.37	Flow Area (sq ft)		1336.37	
E.G. Slope (ft/ft)	0.000343	Area (sq ft)		1336.37	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	666.28	Top Width (ft)		666.28	
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)		1.73	
Max Chl Dpth (ft)	4.46	Hydr. Depth (ft)		2.01	
Conv. Total (cfs)	125221.6	Conv. (cfs)		125221.6	
Length Wtd. (ft)	85.00	Wetted Per. (ft)		675.12	
Min Ch El (ft)	1634.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	32.71	29.71	6.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.72	5.32	1.73

Crit W.S. (ft)	1641.05	Flow Area (sq ft)		446.02	
E.G. Slope (ft/ft)	0.007658	Area (sq ft)		446.02	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	445.82	Top Width (ft)		445.82	
Vel Total (ft/s)	5.20	Avg. Vel. (ft/s)		5.20	
Max Chl Dpth (ft)	2.86	Hydr. Depth (ft)		1.00	
Conv. Total (cfs)	26489.1	Conv. (cfs)		26489.1	
Length Wtd. (ft)	239.00	Wetted Per. (ft)		446.55	
Min Ch El (ft)	1638.25	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		2.48	
Frctn Loss (ft)	1.99	Cum Volume (acre-ft)	32.71	34.28	6.78
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	8.81	1.73

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3400

INPUT
Description: Section: 3400 (Appoximate location of cross section 3400 from effective model)
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-140.42	1646	-130.42	1641.92	-80.42	1642.83	-30.42	1641.92	-25.42	1642.02
-19.42	1642.08	5.51	1640	37.49	1638.5	59.46	1638	60.54	1636
78.62	1636	88.91	1638	125.03	1638	140.54	1637	148.5	1638
192.74	1638	194.15	1636	198.36	1636	199.47	1638	285.58	1638.81
289.66	1636.63	300.18	1635.9	301.01	1638.17	336.12	1637.25	358.86	1638
375.25	1640	402.94	1650						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-140.42	.016	-19.42	.025	375.15	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.42	375.15	118	116	388	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1639.53	Element		0.025	
Vel Head (ft)	0.57	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.96	Reach Len. (ft)	118.00	116.00	388.00
Crit W.S. (ft)	1638.96	Flow Area (sq ft)		382.51	
E.G. Slope (ft/ft)	0.009055	Area (sq ft)		382.51	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	338.93	Top Width (ft)		338.93	
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)		6.06	
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)		1.13	
Conv. Total (cfs)	24359.4	Conv. (cfs)		24359.4	
Length Wtd. (ft)	116.00	Wetted Per. (ft)		344.89	
Min Ch El (ft)	1635.90	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		3.80	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	32.71	32.00	6.78
C & E Loss (ft)	0.16	Cum SA (acres)	5.72	6.66	1.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3375

INPUT
Description: Section: 3375; 300' +/- Upstream of existing U channel.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-132.28	1645	-122.28	1640.83	-72.28	1641.64	-22.28	1640.83	-17.28	1640.93
-1.55	1640.29	10.16	1638	35.68	1637.55	55.26	1638	67.89	1638.23
78.39	1638	144.57	1636	146.03	1634	158.44	1634	163.57	1636
216.48	1636	219	1634	232.51	1634	233.22	1636	243.59	1636
247.04	1634	258.46	1634	260.46	1636	262.46	1638	313.39	1638
317.86	1635.21	331.8	1636	332.22	1638.33	519.22	1636	559.19	1634
614.39	1634	633.19	1636	672.22	1638	680.29	1640		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-132.28	.016	-17.28	.025	680.29	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-17.28	680.29	73	85	303	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1638.51	Element		0.025	
Vel Head (ft)	0.05	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.46	Reach Len. (ft)	73.00	85.00	303.00
Crit W.S. (ft)	1636.37	Flow Area (sq ft)		1336.37	
E.G. Slope (ft/ft)	0.000343	Area (sq ft)		1336.37	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	666.28	Top Width (ft)		666.28	
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)		1.73	
Max Chl Dpth (ft)	4.46	Hydr. Depth (ft)		2.01	
Conv. Total (cfs)	125221.6	Conv. (cfs)		125221.6	
Length Wtd. (ft)	85.00	Wetted Per. (ft)		675.12	
Min Ch El (ft)	1634.00	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.07	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	32.71	29.71	6.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.72	5.32	1.73

****

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3350

INPUT
Description: Section: 3350; 200' +/- Upstream of existing U channel.
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.21	1644	-117.21	1640.2	-67.21	1641.01	-17.21	1640.2	-12.21	1640.3
-1.83	1640.35	2.58	1640	12.9	1638	23.46	1636	50	1634.5
63.1	1636	79.67	1637.3	118.31	1636	124.15	1634	139.18	1634
142.46	1636	177.91	1636	180.91	1634	190.05	1632	225.18	1632
227.68	1634	231.25	1636	384.9	1636	388.43	1634	391.6	1632
396.68	1630	432.01	1632	435.49	1634	443.22	1636	445.86	1638
478.56	1639								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.21	.016	-1.83	.025	478.56	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-1.83 478.56 101 104 110 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1638.49	Element		0.025	
Vel Head (ft)	0.04	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	101.00	104.00	110.00
Crit W.S. (ft)		Flow Area (sq ft)		1500.10	
E.G. Slope (ft/ft)	0.000138	Area (sq ft)		1500.10	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	450.03	Top Width (ft)		450.03	
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)		1.55	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		3.33	
Conv. Total (cfs)	197097.6	Conv. (cfs)		197097.6	
Length Wtd. (ft)	104.00	Wetted Per. (ft)		456.41	
Min Ch El (ft)	1630.00	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.71	26.95	6.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.72	4.23	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3325

INPUT
Description: Section: 3325; 100' +/- Upstream of existing U channel.
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.45	1643	-117.45	1639.31	-67.45	1640.12	-17.45	1639.31	-12.45	1639.41
-6.02	1639.5	1.95	1638	17.75	1636	32.49	1634	43.56	1632
54.5	1631.01	96	1630	101.75	1630	110.64	1632	117.8	1636
164.54	1636	170.34	1634	171.71	1632	179.75	1630	191.7	1630
197.44	1632	199.28	1636	229.11	1636	238.7	1634	243.13	1632
250.76	1630	258.29	1629.5	274.39	1629.5	281.15	1630	290.37	1635.9
322.08	1636	332.15	1638.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.45	.016	-6.02	.025	332.15	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-6.02 332.15 133 117 132 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1638.48	Element		0.025	
Vel Head (ft)	0.03	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	133.00	117.00	132.00
Crit W.S. (ft)		Flow Area (sq ft)		1636.07	
E.G. Slope (ft/ft)	0.000070	Area (sq ft)		1636.07	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	331.72	Top Width (ft)		331.72	
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)		1.42	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	276606.1	Conv. (cfs)		276606.1	
Length Wtd. (ft)	120.87	Wetted Per. (ft)		341.03	
Min Ch El (ft)	1629.50	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.71	23.20	6.78
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	3.30	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3300

INPUT
Description: Section: 3300 (Station 22+74.15) End of transition section; End of alignment. Grade break; begin 1.52% slope to upstream end of culverts at Bertha Howe Ave.. (Appoximate location of cross section 3300 from effective model)
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10.48	1638.45	-5.14	1638	7.18	1636	28.26	1634	31.67	1632
36.49	1630	37.67	1629.65	37.67	1628.65	50	1628.41	62.33	1628.65
62.33	1629.65	77.44	1630	92.66	1632	112.97	1634	122.88	1636
129.24	1638	138.38	1638.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-10.48	.022	37.67	.015	62.33	.022

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3350

INPUT
Description: Section: 3350; 200' +/- Upstream of existing U channel.
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.21	1644	-117.21	1640.2	-67.21	1641.01	-17.21	1640.2	-12.21	1640.3
-1.83	1640.35	2.58	1640	12.9	1638	23.46	1636	50	1634.5
63.1	1636	79.67	1637.3	118.31	1636	124.15	1634	139.18	1634
142.46	1636	177.91	1636	180.91	1634	190.05	1632	225.18	1632
227.68	1634	231.25	1636	384.9	1636	388.43	1634	391.6	1632
396.68	1630	432.01	1632	435.49	1634	443.22	1636	445.86	1638
478.56	1639								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.21	.016	-1.83	.025	478.56	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-1.83	478.56	101	104	110	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1638.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	101.00	104.00	110.00
Crit W.S. (ft)		Flow Area (sq ft)		1500.10	
E.G. Slope (ft/ft)	0.000138	Area (sq ft)		1500.10	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	450.03	Top Width (ft)		450.03	
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)		1.55	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		3.33	
Conv. Total (cfs)	197097.6	Conv. (cfs)		197097.6	
Length Wtd. (ft)	104.00	Wetted Per. (ft)		456.41	
Min Ch El (ft)	1630.00	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.04	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.71	26.95	6.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.72	4.23	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3325

INPUT
Description: Section: 3325; 100' +/- Upstream of existing U channel.
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-127.45	1643	-117.45	1639.31	-67.45	1640.12	-17.45	1639.31	-12.45	1639.41
-6.02	1639.5	1.95	1638	17.75	1636	32.49	1634	43.56	1632
54.5	1631.01	96	1630	101.75	1630	110.64	1632	117.8	1636
164.54	1636	170.34	1634	171.71	1632	179.75	1630	191.7	1630
197.44	1632	199.28	1636	229.11	1636	238.7	1634	243.13	1632
250.76	1630	258.29	1629.5	274.39	1629.5	281.15	1630	290.37	1635.9
322.08	1636	332.15	1638.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-127.45	.016	-6.02	.025	332.15	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-6.02	332.15	133	117	132	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1638.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.025	
W.S. Elev (ft)	1638.45	Reach Len. (ft)	133.00	117.00	132.00
Crit W.S. (ft)		Flow Area (sq ft)		1636.07	
E.G. Slope (ft/ft)	0.000070	Area (sq ft)		1636.07	
Q Total (cfs)	2318.00	Flow (cfs)		2318.00	
Top Width (ft)	331.72	Top Width (ft)		331.72	
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)		1.42	
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	276606.1	Conv. (cfs)		276606.1	
Length Wtd. (ft)	120.87	Wetted Per. (ft)		341.03	
Min Ch El (ft)	1629.50	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	32.71	23.20	6.78
C & E Loss (ft)	0.02	Cum SA (acres)	5.72	3.30	1.73

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3300

INPUT
Description: Section: 3300 (Station 22+74.15) End of transition section; End of alignment. Grade break; begin 1.52% slope to upstream end of culverts at Bertha Howe Ave.. (Appoximate location of cross section 3300 from effective model)
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10.48	1638.45	-5.14	1638	7.18	1636	28.26	1634	31.67	1632
36.49	1630	37.67	1629.65	37.67	1628.65	50	1628.41	62.33	1628.65
62.33	1629.65	77.44	1630	92.66	1632	112.97	1634	122.88	1636
129.24	1638	138.38	1638.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-10.48	.022	37.67	.015	62.33	.022

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33              20      20      20           .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)       * 1638.44  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)        *    0.26  * Wt. n-Val.           *    0.022 *    0.015 *    0.022 *
* W.S. Elev (ft)       * 1638.19  * Reach Len. (ft)      *    20.00 *    20.00 *    20.00 *
* Crit W.S. (ft)       *          * Flow Area (sq ft)    *   144.17 *   238.12 *   380.48 *
* E.G. Slope (ft/ft)   *0.000149  * Area (sq ft)         *   144.17 *   238.12 *   380.48 *
* Q Total (cfs)        * 2450.00  * Flow (cfs)           *   253.24 *  1237.86 *   958.90 *
* Top Width (ft)       *  139.99  * Top Width (ft)       *    45.02 *    24.66 *    70.31 *
* Vel Total (ft/s)     *    3.21  * Avg. Vel. (ft/s)     *     1.76 *     5.20 *     2.52 *
* Max Chl Dpth (ft)    *    9.78  * Hydr. Depth (ft)     *     3.20 *     9.66 *     5.41 *
* Conv. Total (cfs)    *200956.6  * Conv. (cfs)          * 20771.6  *101532.9  * 78652.1  *
* Length Wtd. (ft)     *   20.00  * Wetted Per. (ft)     *    46.28 *    26.66 *    71.06 *
* Min Ch El (ft)       * 1628.41  * Shear (lb/sq ft)     *     0.03 *     0.08 *     0.05 *
* Alpha                *    1.60  * Stream Power (lb/ft s) *   0.05 *     0.43 *     0.13 *
* Frctn Loss (ft)      *    0.00  * Cum Volume (acre-ft) *    32.49 *    20.69 *     6.20 *
* C & E Loss (ft)      *    0.05  * Cum SA (acres)       *     5.65 *     2.82 *     1.62 *
*****************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3280

INPUT
Description: Section: 3280 (Station: 22+54.15) Concrete transition section.
             Transition from existing channel to 24.67' x 8' existing U
             channel.
Station Elevation Data    num=      13
   Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  -10.51 1638.27   -8.1    1638   10.05    1636   33.56    1634   37.67 1633.35
   37.67 1628.35     50  1628.1   62.33 1628.35   62.33 1633.35   94.13    1634
  102.46    1636  109.01    1638  117.51 1638.25

Manning's n Values        num=       3
    Sta   n Val      Sta   n Val      Sta   n Val
*************************************************
  -10.51    .025    37.67    .015    62.33    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33              15      15      15           .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)       * 1638.39  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)        *    0.71  * Wt. n-Val.           *    0.025 *    0.015 *    0.025 *
* W.S. Elev (ft)       * 1637.68  * Reach Len. (ft)      *    15.00 *    15.00 *    15.00 *
* Crit W.S. (ft)       * 1635.61  * Flow Area (sq ft)    *    92.24 *   233.14 *   154.27 *
* E.G. Slope (ft/ft)   *0.000479  * Area (sq ft)         *    92.24 *   233.14 *   154.27 *
* Q Total (cfs)        * 2450.00  * Flow (cfs)           *   199.39 *  1801.62 *   448.99 *
* Top Width (ft)       *  113.15  * Top Width (ft)       *    42.86 *    24.66 *    45.63 *
* Vel Total (ft/s)     *    5.11  * Avg. Vel. (ft/s)     *     2.16 *     7.73 *     2.91 *
* Max Chl Dpth (ft)    *    9.58  * Hydr. Depth (ft)     *     2.15 *     9.45 *     3.38 *
* Conv. Total (cfs)    *111906.1  * Conv. (cfs)          *   9107.3 *  82290.6 *  20508.2 *
* Length Wtd. (ft)     *   15.00  * Wetted Per. (ft)     *    43.09 *    34.67 *    46.12 *
* Min Ch El (ft)       * 1628.10  * Shear (lb/sq ft)     *     0.06 *     0.20 *     0.10 *
* Alpha                *    1.76  * Stream Power (lb/ft s) *   0.14 *     1.56 *     0.29 *
* Frctn Loss (ft)      *    0.01  * Cum Volume (acre-ft) *    32.43 *    20.58 *     6.08 *
* C & E Loss (ft)      *    0.27  * Cum SA (acres)       *     5.63 *     2.81 *     1.59 *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3270

INPUT
Description: Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line;
             Begin 24.67' x 8' existing concrete U channel.
Station Elevation Data    num=       5
   Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
   37.67 1636.12   37.67 1628.12      50 1627.87   62.33 1628.12   62.33 1636.12

Manning's n Values        num=       3
    Sta   n Val      Sta   n Val      Sta   n Val
*************************************************
   37.67    .015    37.67    .015    62.33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33             39.15   39.15   39.15          .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)       * 1638.11  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)        *    3.37  * Wt. n-Val.           *          *    0.015 *          *
* W.S. Elev (ft)       * 1634.74  * Reach Len. (ft)      *   39.15  *   39.15  *   39.15  *
* Crit W.S. (ft)       * 1634.74  * Flow Area (sq ft)    *          *   166.23 *          *
* E.G. Slope (ft/ft)   *0.003083  * Area (sq ft)         *          *   166.23 *          *
* Q Total (cfs)        * 2450.00  * Flow (cfs)           *          * 2450.00 *          *
* Top Width (ft)       *   24.66  * Top Width (ft)       *          *   24.66  *          *
* Vel Total (ft/s)     *   14.74  * Avg. Vel. (ft/s)     *          *   14.74  *          *
* Max Chl Dpth (ft)    *    6.87  * Hydr. Depth (ft)     *          *    6.74  *          *
* Conv. Total (cfs)    * 44125.8  * Conv. (cfs)          *          * 44125.8  *          *
* Length Wtd. (ft)     *   39.15  * Wetted Per. (ft)     *          *   37.90  *          *
* Min Ch El (ft)       * 1627.87  * Shear (lb/sq ft)     *          *    0.84  *          *
* Alpha                *    1.00  * Stream Power (lb/ft s) *         *   12.44  *          *
* Frctn Loss (ft)      *    0.12  * Cum Volume (acre-ft) *    32.42 *   20.51  *    6.05  *
* C & E Loss (ft)      *    0.00  * Cum SA (acres)       *     5.62 *    2.80  *    1.59  *
*****************************************************************************************************

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.
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33              20      20      20           .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)        * 1638.44  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.26  * Wt. n-Val.           *   0.022  *   0.015  *   0.022  *
* W.S. Elev (ft)        * 1638.19  * Reach Len. (ft)      *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)    *  144.17  *  238.12  *  380.48  *
* E.G. Slope (ft/ft)    *0.000149  * Area (sq ft)         *  144.17  *  238.12  *  380.48  *
* Q Total (cfs)         * 2450.00  * Flow (cfs)           *  253.24  * 1237.86  *  958.90  *
* Top Width (ft)        *  139.99  * Top Width (ft)       *   45.02  *   24.66  *   70.31  *
* Vel Total (ft/s)      *    3.21  * Avg. Vel. (ft/s)     *    1.76  *    5.20  *    2.52  *
* Max Chl Dpth (ft)     *    9.78  * Hydr. Depth (ft)     *    3.20  *    9.66  *    5.41  *
* Conv. Total (cfs)     *200956.6  * Conv. (cfs)          * 20771.6  *101532.9  * 78652.1  *
* Length Wtd. (ft)      *   20.00  * Wetted Per. (ft)     *   46.28  *   26.66  *   71.06  *
* Min Ch El (ft)        * 1628.41  * Shear (lb/sq ft)     *    0.03  *    0.08  *    0.05  *
* Alpha                 *    1.60  * Stream Power (lb/ft s) *  0.05  *    0.43  *    0.13  *
* Frctn Loss (ft)       *    0.00  * Cum Volume (acre-ft)  *   32.49  *   20.69  *    6.20  *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)        *    5.65  *    2.82  *    1.62  *
*****************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3280

INPUT
Description: Section: 3280 (Station: 22+54.15) Concrete transition section.
             Transition from existing channel to 24.67' x 8' existing U
             channel.
Station Elevation Data    num=      13
   Sta    Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
  -10.51 1638.27   -8.1     1638   10.05     1636   33.56     1634   37.67 1633.35
   37.67 1628.35     50   1628.1   62.33 1628.35   62.33 1633.35   94.13     1634
  102.46    1636  109.01     1638  117.51 1638.25

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*************************************************
  -10.51    .025    37.67    .015    62.33    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33              15      15      15           .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)        * 1638.39  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.71  * Wt. n-Val.           *   0.025  *   0.015  *   0.025  *
* W.S. Elev (ft)        * 1637.68  * Reach Len. (ft)      *   15.00  *   15.00  *   15.00  *
* Crit W.S. (ft)        * 1635.61  * Flow Area (sq ft)    *   92.24  *  233.14  *  154.27  *
* E.G. Slope (ft/ft)    *0.000479  * Area (sq ft)         *   92.24  *  233.14  *  154.27  *
* Q Total (cfs)         * 2450.00  * Flow (cfs)           *  199.39  * 1801.62  *  448.99  *
* Top Width (ft)        *  113.15  * Top Width (ft)       *   42.86  *   24.66  *   45.63  *
* Vel Total (ft/s)      *    5.11  * Avg. Vel. (ft/s)     *    2.16  *    7.73  *    2.91  *
* Max Chl Dpth (ft)     *    9.58  * Hydr. Depth (ft)     *    2.15  *    9.45  *    3.38  *
* Conv. Total (cfs)     *111906.1  * Conv. (cfs)          *  9107.3  * 82290.6  * 20508.2  *
* Length Wtd. (ft)      *   15.00  * Wetted Per. (ft)     *   43.09  *   34.67  *   46.12  *
* Min Ch El (ft)        * 1628.10  * Shear (lb/sq ft)     *    0.06  *    0.20  *    0.10  *
* Alpha                 *    1.76  * Stream Power (lb/ft s) *  0.14  *    1.56  *    0.29  *
* Frctn Loss (ft)       *    0.01  * Cum Volume (acre-ft)  *   32.43  *   20.58  *    6.08  *
* C & E Loss (ft)       *    0.27  * Cum SA (acres)        *    5.63  *    2.81  *    1.59  *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3270

INPUT
Description: Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line;
             Begin 24.67' x 8' existing concrete U channel.
Station Elevation Data    num=       5
   Sta    Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
   37.67 1636.12   37.67 1628.12      50 1627.87   62.33 1628.12   62.33 1636.12

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*************************************************
   37.67    .015    37.67    .015    62.33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67  62.33              39.15   39.15   39.15        .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)        * 1638.11  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.37  * Wt. n-Val.           *          *   0.015  *          *
* W.S. Elev (ft)        * 1634.74  * Reach Len. (ft)      *   39.15  *   39.15  *   39.15  *
* Crit W.S. (ft)        * 1634.74  * Flow Area (sq ft)    *          *  166.23  *          *
* E.G. Slope (ft/ft)    *0.003083  * Area (sq ft)         *          *  166.23  *          *
* Q Total (cfs)         * 2450.00  * Flow (cfs)           *          * 2450.00  *          *
* Top Width (ft)        *   24.66  * Top Width (ft)       *          *   24.66  *          *
* Vel Total (ft/s)      *   14.74  * Avg. Vel. (ft/s)     *          *   14.74  *          *
* Max Chl Dpth (ft)     *    6.87  * Hydr. Depth (ft)     *          *    6.74  *          *
* Conv. Total (cfs)     * 44125.8  * Conv. (cfs)          *          * 44125.8  *          *
* Length Wtd. (ft)      *   39.15  * Wetted Per. (ft)     *          *   37.90  *          *
* Min Ch El (ft)        * 1627.87  * Shear (lb/sq ft)     *          *    0.84  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   12.44  *          *
* Frctn Loss (ft)       *    0.12  * Cum Volume (acre-ft)  *   32.42  *   20.51  *    6.05  *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)        *    5.62  *    2.80  *    1.59  *
*****************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3260

INPUT
Description: Section: 3260 (Station: 22+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1635.52	37.67	1627.52	50	1627.27	62.33	1627.52	62.33	1635.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1637.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.73	Wt. n-Val.		0.015	
W.S. Elev (ft)	1633.09	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1634.14	Flow Area (sq ft)		140.39	
E.G. Slope (ft/ft)	0.005019	Area (sq ft)		140.39	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	17.45	Avg. Vel. (ft/s)		17.45	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	34581.9	Conv. (cfs)		34581.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		35.80	
Min Ch El (ft)	1627.27	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		21.44	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	32.42	20.37	6.05
C & E Loss (ft)	0.14	Cum SA (acres)	5.62	2.78	1.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3240

INPUT
Description: Section: 3240 (Station 21+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1634.01	37.67	1626.01	50	1625.76	62.33	1626.01	62.33	1634.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1637.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1630.85	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1632.63	Flow Area (sq ft)		122.53	
E.G. Slope (ft/ft)	0.007477	Area (sq ft)		122.53	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	20.00	Avg. Vel. (ft/s)		20.00	
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	28334.5	Conv. (cfs)		28334.5	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		34.35	
Min Ch El (ft)	1625.76	Shear (lb/sq ft)		1.66	
Alpha	1.00	Stream Power (lb/ft s)		33.29	
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	32.42	20.07	6.05
C & E Loss (ft)	0.15	Cum SA (acres)	5.62	2.72	1.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3220

INPUT
Description: Section: 3220 (Station: 20+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1632.49	37.67	1624.49	50	1624.24	62.33	1624.49	62.33	1632.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1636.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.14	Wt. n-Val.		0.015	
W.S. Elev (ft)	1629.00	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1631.11	Flow Area (sq ft)		114.23	
E.G. Slope (ft/ft)	0.009200	Area (sq ft)		114.23	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	21.45	Avg. Vel. (ft/s)		21.45	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	25543.3	Conv. (cfs)		25543.3	

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3260

INPUT
Description: Section: 3260 (Station: 22+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1635.52	37.67	1627.52	50	1627.27	62.33	1627.52	62.33	1635.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1637.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.73	Wt. n-Val.		0.015	
W.S. Elev (ft)	1633.09	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1634.14	Flow Area (sq ft)		140.39	
E.G. Slope (ft/ft)	0.005019	Area (sq ft)		140.39	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	17.45	Avg. Vel. (ft/s)		17.45	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	34581.9	Conv. (cfs)		34581.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		35.80	
Min Ch El (ft)	1627.27	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		21.44	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	32.42	20.37	6.05
C & E Loss (ft)	0.14	Cum SA (acres)	5.62	2.78	1.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3240

INPUT
Description: Section: 3240 (Station 21+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1634.01	37.67	1626.01	50	1625.76	62.33	1626.01	62.33	1634.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1637.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	1630.85	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1632.63	Flow Area (sq ft)		122.53	
E.G. Slope (ft/ft)	0.007477	Area (sq ft)		122.53	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	20.00	Avg. Vel. (ft/s)		20.00	
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	28334.5	Conv. (cfs)		28334.5	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		34.35	
Min Ch El (ft)	1625.76	Shear (lb/sq ft)		1.66	
Alpha	1.00	Stream Power (lb/ft s)		33.29	
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	32.42	20.07	6.05
C & E Loss (ft)	0.15	Cum SA (acres)	5.62	2.72	1.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3220

INPUT
Description: Section: 3220 (Station: 20+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1632.49	37.67	1624.49	50	1624.24	62.33	1624.49	62.33	1632.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1636.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.14	Wt. n-Val.		0.015	
W.S. Elev (ft)	1629.00	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1631.11	Flow Area (sq ft)		114.23	
E.G. Slope (ft/ft)	0.009200	Area (sq ft)		114.23	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	24.66	Top Width (ft)		24.66	
Vel Total (ft/s)	21.45	Avg. Vel. (ft/s)		21.45	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	25543.3	Conv. (cfs)		25543.3	

Length Wtd. (ft)	100.00	Wetted Per. (ft)			33.68		
Min Ch El (ft)	1624.24	Shear (lb/sq ft)			1.95		
Alpha	1.00	Stream Power (lb/ft s)			41.78		
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)		32.42		19.80		6.05	
C & E Loss (ft)	0.09	Cum SA (acres)		5.62		2.67		1.59	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3200

INPUT
Description: Section: 3200 (Station 19+00); Existing concrete U channel.
(Appoximate location of cross section 3200 from effective model)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1630.97	37.67	1622.97	50	1622.72	62.33	1622.97	62.33	1630.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	103	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1635.09	Element		Left OB		Channel		Right OB	
Vel Head (ft)	7.82	Wt. n-Val.				0.015			
W.S. Elev (ft)	1627.27	Reach Len. (ft)		97.00		100.00		103.00	
Crit W.S. (ft)	1629.59	Flow Area (sq ft)				109.20			
E.G. Slope (ft/ft)	0.010518	Area (sq ft)				109.20			
Q Total (cfs)	2450.00	Flow (cfs)				2450.00			
Top Width (ft)	24.66	Top Width (ft)				24.66			
Vel Total (ft/s)	22.44	Avg. Vel. (ft/s)				22.44			
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)				4.43			
Conv. Total (cfs)	23889.6	Conv. (cfs)				23889.6			
Length Wtd. (ft)	100.00	Wetted Per. (ft)				33.27			
Min Ch El (ft)	1622.72	Shear (lb/sq ft)				2.16			
Alpha	1.00	Stream Power (lb/ft s)				48.35			
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)		32.42		19.54		6.05	
C & E Loss (ft)	0.07	Cum SA (acres)		5.62		2.61		1.59	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: Pulsipher Wash
REACH: Falcon Ridge RS: 3175

INPUT
Description: Section: 3175 (Station 18+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1629.46	37.67	1621.46	50	1621.21	62.33	1621.46	62.33	1629.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	96	100	102	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1633.94	Element		Left OB		Channel		Right OB	
Vel Head (ft)	8.31	Wt. n-Val.				0.015			
W.S. Elev (ft)	1625.63	Reach Len. (ft)		96.00		100.00		102.00	
Crit W.S. (ft)	1628.08	Flow Area (sq ft)				105.89			
E.G. Slope (ft/ft)	0.011529	Area (sq ft)				105.89			
Q Total (cfs)	2450.00	Flow (cfs)				2450.00			
Top Width (ft)	24.66	Top Width (ft)				24.66			
Vel Total (ft/s)	23.14	Avg. Vel. (ft/s)				23.14			
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)				4.29			
Conv. Total (cfs)	22817.4	Conv. (cfs)				22817.4			
Length Wtd. (ft)	100.00	Wetted Per. (ft)				33.00			
Min Ch El (ft)	1621.21	Shear (lb/sq ft)				2.31			
Alpha	1.00	Stream Power (lb/ft s)				53.43			
Frctn Loss (ft)	1.10	Cum Volume (acre-ft)		32.42		19.29		6.05	
C & E Loss (ft)	0.05	Cum SA (acres)		5.62		2.55		1.59	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3150

INPUT
Description: Section: 3150 (Station 17+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1627.94	37.67	1619.94	50	1619.69	62.33	1619.94	62.33	1627.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	102	.1	.3

* Length Wtd. (ft)	*	100.00	* Wetted Per. (ft)	*		*	33.68	*		*	
* Min Ch El (ft)	*	1624.24	* Shear (lb/sq ft)	*		*	1.95	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	41.78	*		*	
* Frctn Loss (ft)	*	0.83	* Cum Volume (acre-ft)	*	32.42	*	19.80	*	6.05	*	
* C & E Loss (ft)	*	0.09	* Cum SA (acres)	*	5.62	*	2.67	*	1.59	*	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3200

INPUT
Description: Section: 3200 (Station 19+00); Existing concrete U channel.
(Appoximate location of cross section 3200 from effective model)
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1630.97	37.67	1622.97	50	1622.72	62.33	1622.97	62.33	1630.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	103	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1635.09	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	*	7.82	* Wt. n-Val.	*		*	0.015	*		*	
* W.S. Elev (ft)	*	1627.27	* Reach Len. (ft)	*	97.00	*	100.00	*	103.00	*	
* Crit W.S. (ft)	*	1629.59	* Flow Area (sq ft)	*		*	109.20	*		*	
* E.G. Slope (ft/ft)	*	0.010518	* Area (sq ft)	*		*	109.20	*		*	
* Q Total (cfs)	*	2450.00	* Flow (cfs)	*		*	2450.00	*		*	
* Top Width (ft)	*	24.66	* Top Width (ft)	*		*	24.66	*		*	
* Vel Total (ft/s)	*	22.44	* Avg. Vel. (ft/s)	*		*	22.44	*		*	
* Max Chl Dpth (ft)	*	4.55	* Hydr. Depth (ft)	*		*	4.43	*		*	
* Conv. Total (cfs)	*	23889.6	* Conv. (cfs)	*		*	23889.6	*		*	
* Length Wtd. (ft)	*	100.00	* Wetted Per. (ft)	*		*	33.27	*		*	
* Min Ch El (ft)	*	1622.72	* Shear (lb/sq ft)	*		*	2.16	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	48.35	*		*	
* Frctn Loss (ft)	*	0.98	* Cum Volume (acre-ft)	*	32.42	*	19.54	*	6.05	*	
* C & E Loss (ft)	*	0.07	* Cum SA (acres)	*	5.62	*	2.61	*	1.59	*	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The 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: Pulsipher Wash
REACH: Falcon Ridge RS: 3175

INPUT
Description: Section: 3175 (Station 18+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1629.46	37.67	1621.46	50	1621.21	62.33	1621.46	62.33	1629.46

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	96	100	102	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1633.94	* Element	*	Left OB	*	Channel	*	Right OB	*	
* Vel Head (ft)	*	8.31	* Wt. n-Val.	*		*	0.015	*		*	
* W.S. Elev (ft)	*	1625.63	* Reach Len. (ft)	*	96.00	*	100.00	*	102.00	*	
* Crit W.S. (ft)	*	1628.08	* Flow Area (sq ft)	*		*	105.89	*		*	
* E.G. Slope (ft/ft)	*	0.011529	* Area (sq ft)	*		*	105.89	*		*	
* Q Total (cfs)	*	2450.00	* Flow (cfs)	*		*	2450.00	*		*	
* Top Width (ft)	*	24.66	* Top Width (ft)	*		*	24.66	*		*	
* Vel Total (ft/s)	*	23.14	* Avg. Vel. (ft/s)	*		*	23.14	*		*	
* Max Chl Dpth (ft)	*	4.42	* Hydr. Depth (ft)	*		*	4.29	*		*	
* Conv. Total (cfs)	*	22817.4	* Conv. (cfs)	*		*	22817.4	*		*	
* Length Wtd. (ft)	*	100.00	* Wetted Per. (ft)	*		*	33.00	*		*	
* Min Ch El (ft)	*	1621.21	* Shear (lb/sq ft)	*		*	2.31	*		*	
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	53.43	*		*	
* Frctn Loss (ft)	*	1.10	* Cum Volume (acre-ft)	*	32.42	*	19.29	*	6.05	*	
* C & E Loss (ft)	*	0.08	* Cum SA (acres)	*	5.62	*	2.55	*	1.59	*	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3150

INPUT
Description: Section: 3150 (Station 17+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1627.94	37.67	1619.94	50	1619.69	62.33	1619.94	62.33	1627.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	97	100	102	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.71	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.70	Wt. n-Val.		0.015		
W.S. Elev (ft)	1624.01	Reach Len. (ft)	97.00	100.00	102.00	
Crit W.S. (ft)	1626.56	Flow Area (sq ft)		103.51		
E.G. Slope (ft/ft)	0.012338	Area (sq ft)		103.51		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	23.67	Avg. Vel. (ft/s)		23.67		
Max Chl Dpth (ft)	4.32	Hydr. Depth (ft)		4.20		
Conv. Total (cfs)	22056.7	Conv. (cfs)		22056.7		
Length Wtd. (ft)	100.00	Wetted Per. (ft)		32.81		
Min Ch El (ft)	1619.69	Shear (lb/sq ft)		2.43		
Alpha	1.00	Stream Power (lb/ft s)		57.52		
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	32.42	19.05	6.05	
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	2.50	1.59	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3125

INPUT
Description: Section: 3125 (Station 16+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1626.42	37.67	1618.42	50	1618.17	62.33	1618.42	62.33	1626.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	50 51.61	54	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1631.42	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.99	Wt. n-Val.		0.015		
W.S. Elev (ft)	1622.42	Reach Len. (ft)	50.00	51.61	54.00	
Crit W.S. (ft)	1625.04	Flow Area (sq ft)		101.81		
E.G. Slope (ft/ft)	0.012965	Area (sq ft)		101.81		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	24.06	Avg. Vel. (ft/s)		24.06		
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)		4.13		
Conv. Total (cfs)	21517.3	Conv. (cfs)		21517.3		
Length Wtd. (ft)	51.61	Wetted Per. (ft)		32.67		
Min Ch El (ft)	1618.17	Shear (lb/sq ft)		2.52		
Alpha	1.00	Stream Power (lb/ft s)		60.69		
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	32.42	18.82	6.05	
C & E Loss (ft)	0.03	Cum SA (acres)	5.62	2.44	1.59	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3100

INPUT
Description: Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha Howe Ave. (2 - 12 x 8's); Grade Break s=0.8%; End of existing concrete U channel. (Appoximate location of cross section 3100 from effective model)
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1625.39	37.67	1617.39	62.33	1617.39	62.33	1625.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	127.02 127.02	127.02	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.67	Element	Left OB	Channel	Right OB	
Vel Head (ft)	9.20	Wt. n-Val.		0.015		
W.S. Elev (ft)	1621.47	Reach Len. (ft)	0.01	0.01	0.01	
Crit W.S. (ft)	1624.11	Flow Area (sq ft)		100.67		
E.G. Slope (ft/ft)	0.013547	Area (sq ft)		100.67		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	24.34	Avg. Vel. (ft/s)		24.34		
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		4.08		
Conv. Total (cfs)	21049.6	Conv. (cfs)		21049.6		
Length Wtd. (ft)	0.01	Wetted Per. (ft)		32.82		
Min Ch El (ft)	1617.39	Shear (lb/sq ft)		2.59		
Alpha	1.00	Stream Power (lb/ft s)		63.13		
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	32.42	18.70	6.05	
C & E Loss (ft)	0.06	Cum SA (acres)	5.62	2.41	1.59	

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3090

INPUT
Description: Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled with pier hulking (1' of debris on each side of pier).
Distance from Upstream XS = .01
Deck/Roadway Width = 127
Weir Coefficient = 2.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1632.71	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.70	Wt. n-Val.		0.015		
W.S. Elev (ft)	1624.01	Reach Len. (ft)	97.00	100.00	102.00	
Crit W.S. (ft)	1626.56	Flow Area (sq ft)		103.51		
E.G. Slope (ft/ft)	*0.012338	Area (sq ft)		103.51		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	23.67	Avg. Vel. (ft/s)		23.67		
Max Chl Dpth (ft)	4.32	Hydr. Depth (ft)		4.20		
Conv. Total (cfs)	22056.7	Conv. (cfs)		22056.7		
Length Wtd. (ft)	100.00	Wetted Per. (ft)		32.81		
Min Ch El (ft)	1619.69	Shear (lb/sq ft)		2.43		
Alpha	1.00	Stream Power (lb/ft s)		57.52		
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	32.42	19.05	6.05	
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	2.50	1.59	

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: Pulsipher Wash
REACH: Falcon Ridge RS: 3125

INPUT
Description: Section: 3125 (Station 16+00); Existing concrete U channel
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1626.42	37.67	1618.42	50	1618.17	62.33	1618.42	62.33	1626.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	50 51.61	54	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1631.42	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.99	Wt. n-Val.		0.015		
W.S. Elev (ft)	1622.42	Reach Len. (ft)	50.00	51.61	54.00	
Crit W.S. (ft)	1625.04	Flow Area (sq ft)		101.81		
E.G. Slope (ft/ft)	*0.012965	Area (sq ft)		101.81		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	24.06	Avg. Vel. (ft/s)		24.06		
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)		4.13		
Conv. Total (cfs)	21517.3	Conv. (cfs)		21517.3		
Length Wtd. (ft)	51.61	Wetted Per. (ft)		32.67		
Min Ch El (ft)	1618.17	Shear (lb/sq ft)		2.52		
Alpha	1.00	Stream Power (lb/ft s)		60.69		
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	32.42	18.82	6.05	
C & E Loss (ft)	0.03	Cum SA (acres)	5.62	2.44	1.59	

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: Pulsipher Wasb
REACH: Falcon Ridge RS: 3100

INPUT
Description: Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha Howe Ave. (2 - 12 x 8's); Grade Break s=0.8%; End of existing concrete U channel. (Appoximate location of cross section 3100 from effective model)
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37.67	1625.39	37.67	1617.39	62.33	1617.39	62.33	1625.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37.67	.015	37.67	.015	62.33	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37.67	62.33	127.02 127.02	127.02	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1630.67	Element	Left OB	Channel	Right OB	
Vel Head (ft)	9.20	Wt. n-Val.		0.015		
W.S. Elev (ft)	1621.47	Reach Len. (ft)	0.01	0.01	0.01	
Crit W.S. (ft)	1624.11	Flow Area (sq ft)		100.67		
E.G. Slope (ft/ft)	*0.013547	Area (sq ft)		100.67		
Q Total (cfs)	2450.00	Flow (cfs)		2450.00		
Top Width (ft)	24.66	Top Width (ft)		24.66		
Vel Total (ft/s)	24.34	Avg. Vel. (ft/s)		24.34		
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		4.08		
Conv. Total (cfs)	21049.6	Conv. (cfs)		21049.6		
Length Wtd. (ft)	0.01	Wetted Per. (ft)		32.82		
Min Ch El (ft)	1617.39	Shear (lb/sq ft)		2.59		
Alpha	1.00	Stream Power (lb/ft s)		63.13		
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	32.42	18.70	6.05	
C & E Loss (ft)	0.06	Cum SA (acres)	5.62	2.41	1.59	

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3090

INPUT
Description: Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled with pier bulking (1' of debris on each side of pier).
Distance from Upstream XS = .01
Deck/Roadway Width = 127
Weir Coefficient = 2.6

```
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
**************************************************
   37.67    1631 1625.39    62.34    1631 1625.39

Upstream Bridge Cross Section Data
Station Elevation Data     num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
**********************************************************************************
   37.67 1625.39   37.67 1617.39   49.67 1617.39   49.67 1625.39   50.33 1625.39
   50.33 1617.39   62.33 1617.39   62.33 1625.39

Manning's n Values         num=       1
     Sta   n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          37.67   62.33            .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
**************************************************
   37.67    1631 1624.37    62.33    1631 1624.37

Downstream Bridge Cross Section Data
Station Elevation Data     num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
**********************************************************************************
   37.67 1624.37   37.67 1616.37   49.67 1616.37   49.67 1624.37   50.33 1624.37
   50.33 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values         num=       1
     Sta   n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          37.67   62.33            .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         =    1631
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=      50    Downstream=      50
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .67 1617.08     .67 1627.08
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .67  1616.4     .67  1626.4
Debris Width  =     2.67
Debris Height =       10

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1
**********************************************************************************************
* E.G. US. (ft)           *    1630.67  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)           *    1621.47  * E.G. Elev (ft)        *    1630.46  *    1627.82  *
* Q Total (cfs)           *    2450.00  * W.S. Elev (ft)        *    1621.69  *    1621.39  *
* Q Bridge (cfs)          *    2450.00  * Crit W.S. (ft)        *    1624.27  *    1623.25  *
* Q Weir (cfs)            *             * Max Chl Dpth (ft)     *       4.30  *       5.02  *
* Weir Sta Lft (ft)       *             * Vel Total (ft/s)      *      23.78  *      20.34  *
* Weir Sta Rgt (ft)       *             * Flow Area (sq ft)     *     103.04  *     120.44  *
* Weir Submerg            *             * Froude # Chl          *       2.02  *       1.60  *
* Weir Max Depth (ft)     *             * Specif Force (cu ft)  *    2030.37  *    1850.13  *
* Min El Weir Flow (ft)   *    1631.01  * Hydr Depth (ft)       *       4.30  *       5.02  *
* Min El Prs (ft)         *    1625.39  * W.P. Total (ft)       *      36.88  *      39.08  *
* Delta EG (ft)           *       2.85  * Conv. Total (cfs)     *   20251.0   *   25265.2   *
* Delta WS (ft)           *       0.08  * Top Width (ft)        *      23.99  *      23.99  *
* BR Open Area (sq ft)    *     191.92  * Frctn Loss (ft)       *       0.00  *       1.47  *
* BR Open Vel (ft/s)      *      23.78  * C & E Loss (ft)       *       0.21  *       1.18  *
* Coef of Q               *             * Shear Total (lb/sq ft) *       2.55  *       1.81  *
* Br Sel Method           *Energy only  * Power Total (lb/ft s)  *      60.71  *      36.80  *
**********************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3080

INPUT
Description: Section: 3080 (Station: 14+21.37); Outlet of culverts under Bertha
             Howe Ave. (2 - 12 x 8's)  Begin proposed box culverts. Begin
             transition from 2 - 12x8's to 2 -14x10's.
Station Elevation Data     num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
```

```
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   37.67    1631 1625.39   62.34    1631 1625.39

Upstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
   37.67 1625.39   37.67 1617.39   49.67 1617.39   49.67 1625.39   50.33 1625.39
   50.33 1617.39   62.33 1617.39   62.33 1625.39

Manning's n Values         num=       1
     Sta   n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          37.67   62.33             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   37.67    1631 1624.37   62.33    1631 1624.37

Downstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
   37.67 1624.37   37.67 1616.37   49.67 1616.37   49.67 1624.37   50.33 1624.37
   50.33 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values         num=       1
     Sta   n Val
***************
   37.67    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          37.67   62.33             .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         =    1631
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=      50    Downstream=      50
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .67 1617.08      .67 1627.08
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
     .67  1616.4      .67  1626.4
Debris Width  =     2.67
Debris Height =       10

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
          inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1
*********************************************************************************************
* E.G. US. (ft)          *    1630.67  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1621.47  * E.G. Elev (ft)        *    1630.46  *    1627.82  *
* Q Total (cfs)          *    2450.00  * W.S. Elev (ft)        *    1621.69  *    1621.39  *
* Q Bridge (cfs)         *    2450.00  * Crit W.S. (ft)        *    1624.27  *    1623.25  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       4.30  *       5.02  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      23.78  *      20.34  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     103.04  *     120.44  *
* Weir Submerg           *             * Froude # Chl           *       2.02  *       1.60  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    2030.37  *    1850.13  *
* Min El Weir Flow (ft)  *    1631.01  * Hydr Depth (ft)        *       4.30  *       5.02  *
* Min El Prs (ft)        *    1625.39  * W.P. Total (ft)        *      36.88  *      39.08  *
* Delta EG (ft)          *       2.85  * Conv. Total (cfs)      *    20251.0  *    25265.2  *
* Delta WS (ft)          *       0.08  * Top Width (ft)         *      23.99  *      23.99  *
* BR Open Area (sq ft)   *     191.92  * Frctn Loss (ft)        *       0.00  *       1.47  *
* BR Open Vel (ft/s)     *      23.78  * C & E Loss (ft)        *       0.21  *       1.18  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       2.55  *       1.81  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      60.71  *      36.80  *
*********************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3080

INPUT
Description: Section: 3080 (Station: 14+21.37); Outlet of culverts under Bertha
             Howe Ave. (2 - 12 x 8's)  Begin proposed box culverts. Begin
             transition from 2 - 12x8's to 2 -14x10's.
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*****************************************************************************
   37.67 1624.37   37.67 1616.37   49.67 1616.37   49.67 1624.37   50.34 1624.37
   50.34 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values        num=      3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
   37.67    .015   37.67    .015   62.33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
          37.67   62.33               10      10      10              .3       .5
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
*********************************************
   37.67 1625.37 1624.37   62.33 1625.37 1624.37

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1627.82  * Element                * Left OB *  Channel * Right OB *
* Vel Head (ft)          *    6.43  * Wt. n-Val.             *         *    0.015 *          *
* W.S. Elev (ft)         * 1621.39  * Reach Len. (ft)        *   10.00  *   10.00  *   10.00  *
* Crit W.S. (ft)         * 1623.25  * Flow Area (sq ft)      *          *  120.44  *          *
* E.G. Slope (ft/ft)     *0.011037  * Area (sq ft)           *          *  120.44  *          *
* Q Total (cfs)          * 2450.00  * Flow (cfs)             *          * 2450.00  *          *
* Top Width (ft)         *   23.99  * Top Width (ft)         *          *   23.99  *          *
* Vel Total (ft/s)       *   20.34  * Avg. Vel. (ft/s)       *          *   20.34  *          *
* Max Chl Dpth (ft)      *    5.02  * Hydr. Depth (ft)       *          *    5.02  *          *
* Conv. Total (cfs)      * 23320.8  * Conv. (cfs)           *          * 23320.8  *          *
* Length Wtd. (ft)       *   10.00  * Wetted Per. (ft)       *          *   44.07  *          *
* Min Ch El (ft)         * 1616.37  * Shear (lb/sq ft)      *          *    1.88  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *   38.30  *          *
* Frctn Loss (ft)        *    0.00  * Cum Volume (acre-ft)   *   32.42  *   18.70  *    6.05  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    5.62  *    2.41  *    1.59  *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3070

INPUT
Description: Section: 3070 (Station 14+11.37); Proposed box culverts. End
             transition from 2 - 12x8's to 2- 14x10's.
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************************
   35.67 1626.29   35.67 1616.29   49.67 1616.29   49.67 1626.29   50.34 1626.29
   50.34 1616.29   64.34 1616.29   64.34 1626.29

Manning's n Values        num=      3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
   35.67    .015   35.67    .015   64.34    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
          35.67   64.34              109.78  111.35  113.02              .1       .3
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
*********************************************
   35.67 1627.29 1626.29   64.34 1627.29 1626.29

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1627.49  * Element                * Left OB *  Channel * Right OB *
* Vel Head (ft)          *    7.11  * Wt. n-Val.             *         *    0.015 *          *
* W.S. Elev (ft)         * 1620.38  * Reach Len. (ft)        *  109.78  *  111.35  *  113.02  *
* Crit W.S. (ft)         * 1622.50  * Flow Area (sq ft)      *          *  114.50  *          *
* E.G. Slope (ft/ft)     *0.013176  * Area (sq ft)           *          *  114.50  *          *
* Q Total (cfs)          * 2450.00  * Flow (cfs)             *          * 2450.00  *          *
* Top Width (ft)         *   28.00  * Top Width (ft)         *          *   28.00  *          *
* Vel Total (ft/s)       *   21.40  * Avg. Vel. (ft/s)       *          *   21.40  *          *
* Max Chl Dpth (ft)      *    4.09  * Hydr. Depth (ft)       *          *    4.09  *          *
* Conv. Total (cfs)      * 21344.3  * Conv. (cfs)           *          * 21344.3  *          *
* Length Wtd. (ft)       *  111.35  * Wetted Per. (ft)       *          *   44.36  *          *
* Min Ch El (ft)         * 1616.29  * Shear (lb/sq ft)      *          *    2.12  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *   45.43  *          *
* Frctn Loss (ft)        *    0.12  * Cum Volume (acre-ft)   *   32.42  *   18.67  *    6.05  *
* C & E Loss (ft)        *    0.21  * Cum SA (acres)         *    5.62  *    2.40  *    1.59  *
*****************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3025

INPUT
Description: Section: 3025 (Station 13+00); Proposed box culverts.
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************************
   35.67  1625.4   35.67  1615.4   49.67  1615.4   49.67  1625.4   50.34  1625.4
   50.34  1615.4   64.34  1615.4   64.34  1625.4

Manning's n Values        num=      3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
   35.67    .015   35.67    .015   64.34    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
          35.67   64.34               99.3     100  100.68              .1       .3
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
*********************************************
   35.67  1626.4  1625.4   64.34  1626.4  1625.4

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1625.86  * Element                *  Left OB *  Channel * Right OB *
```

```
**********************************************************************************
   37.67 1624.37   37.67 1616.37   49.67 1616.37   49.67 1624.37   50.34 1624.37
   50.34 1616.37   62.33 1616.37   62.33 1624.37

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val     Sta   n Val
**************************************************
   37.67    .015   37.67    .015   62.33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          37.67   62.33              10      10      10             .3       .5
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   37.67 1625.37 1624.37   62.33 1625.37 1624.37

CROSS SECTION OUTPUT  Profile #PF 1
**********************************************************************************************************
* E.G. Elev (ft)          * 1627.82  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    6.43  * Wt. n-Val.            *          *    0.015 *          *
* W.S. Elev (ft)          * 1621.39  * Reach Len. (ft)       *   10.00  *   10.00  *   10.00  *
* Crit W.S. (ft)          * 1623.25  * Flow Area (sq ft)     *          *  120.44  *          *
* E.G. Slope (ft/ft)      *0.011037  * Area (sq ft)          *          *  120.44  *          *
* Q Total (cfs)           * 2450.00  * Flow (cfs)           *          * 2450.00  *          *
* Top Width (ft)          *   23.99  * Top Width (ft)       *          *   23.99  *          *
* Vel Total (ft/s)        *   20.34  * Avg. Vel. (ft/s)     *          *   20.34  *          *
* Max Chl Dpth (ft)       *    5.02  * Hydr. Depth (ft)     *          *    5.02  *          *
* Conv. Total (cfs)       * 23320.8  * Conv. (cfs)          *          * 23320.8  *          *
* Length Wtd. (ft)        *   10.00  * Wetted Per. (ft)     *          *   44.07  *          *
* Min Ch El (ft)          * 1616.37  * Shear (lb/sq ft)     *          *    1.88  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *   38.30  *          *
* Frctn Loss (ft)         *    0.00  * Cum Volume (acre-ft)  *   32.42  *   18.70  *    6.05  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)        *    5.62  *    2.41  *    1.59  *
**********************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION


RIVER: Pulsipher Wash
REACH: Falcon Ridge       RS: 3070

INPUT
Description: Section: 3070 (Station 14+11.37); Proposed box culverts. End
             transition from 2 - 12x8's to 2- 14x10's.
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************
   35.67 1626.29   35.67 1616.29   49.67 1616.29   49.67 1626.29   50.34 1626.29
   50.34 1616.29   64.34 1616.29   64.34 1626.29

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val     Sta   n Val
**************************************************
   35.67    .015   35.67    .015   64.34    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          35.67   64.34             109.78  111.35  113.02             .1       .3
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   35.67 1627.29 1626.29   64.34 1627.29 1626.29

CROSS SECTION OUTPUT  Profile #PF 1
**********************************************************************************************************
* E.G. Elev (ft)          * 1627.49  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    7.11  * Wt. n-Val.            *          *    0.015 *          *
* W.S. Elev (ft)          * 1620.38  * Reach Len. (ft)       *  109.78  *  111.35  *  113.02  *
* Crit W.S. (ft)          * 1622.50  * Flow Area (sq ft)     *          *  114.50  *          *
* E.G. Slope (ft/ft)      *0.013176  * Area (sq ft)          *          *  114.50  *          *
* Q Total (cfs)           * 2450.00  * Flow (cfs)           *          * 2450.00  *          *
* Top Width (ft)          *   28.00  * Top Width (ft)       *          *   28.00  *          *
* Vel Total (ft/s)        *   21.40  * Avg. Vel. (ft/s)     *          *   21.40  *          *
* Max Chl Dpth (ft)       *    4.09  * Hydr. Depth (ft)     *          *    4.09  *          *
* Conv. Total (cfs)       * 21344.3  * Conv. (cfs)          *          * 21344.3  *          *
* Length Wtd. (ft)        *  111.35  * Wetted Per. (ft)     *          *   44.36  *          *
* Min Ch El (ft)          * 1616.29  * Shear (lb/sq ft)     *          *    2.12  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *   45.43  *          *
* Frctn Loss (ft)         *    0.12  * Cum Volume (acre-ft)  *   32.42  *   18.67  *    6.05  *
* C & E Loss (ft)         *    0.21  * Cum SA (acres)        *    5.62  *    2.40  *    1.59  *
**********************************************************************************************************

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: Pulsipher Wash
REACH: Falcon Ridge       RS: 3025

INPUT
Description: Section: 3025 (Station 13+00); Proposed box culverts.
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
**********************************************************************************
   35.67  1625.4   35.67  1615.4   49.67  1615.4   49.67  1625.4   50.34  1625.4
   50.34  1615.4   64.34  1615.4   64.34  1625.4

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val     Sta   n Val
**************************************************
   35.67    .015   35.67    .015   64.34    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          35.67   64.34              99.3     100  100.68             .1       .3
Cross Section Lid
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
   35.67  1626.4  1625.4   64.34  1626.4  1625.4

CROSS SECTION OUTPUT  Profile #PF 1
**********************************************************************************************
* E.G. Elev (ft)          * 1625.86  * Element               *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	6.02	Wt. n-Val.			0.015			
W.S. Elev (ft)	1619.85	Reach Len. (ft)		99.30	100.00		100.68	
Crit W.S. (ft)	1621.61	Flow Area (sq ft)			124.45			
E.G. Slope (ft/ft)	0.010410	Area (sq ft)			124.45			
Q Total (cfs)	2450.00	Flow (cfs)			2450.00			
Top Width (ft)	28.00	Top Width (ft)			28.00			
Vel Total (ft/s)	19.69	Avg. Vel. (ft/s)			19.69			
Max Chl Dpth (ft)	4.44	Hydr. Depth (ft)			4.44			
Conv. Total (cfs)	24012.9	Conv. (cfs)			24012.9			
Length Wtd. (ft)	100.00	Wetted Per. (ft)			45.78			
Min Ch El (ft)	1615.40	Shear (lb/sq ft)			1.77			
Alpha	1.00	Stream Power (lb/ft s)			34.78			
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)		32.42	18.37		6.05	
C & E Loss (ft)	0.33	Cum SA (acres)		5.62	2.33		1.59	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3000

INPUT
Description: Section: 3000 (Station 12+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1624.6	35.67	1614.6	49.67	1614.6	49.67	1624.6	50.34	1624.6
50.34	1614.6	64.34	1614.6	64.34	1624.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	99.3	100 100.68	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1625.6	1624.6	64.34 1625.6	1624.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1624.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1619.26	Reach Len. (ft)	99.30	100.00	100.68
Crit W.S. (ft)	1620.81	Flow Area (sq ft)		130.58	
E.G. Slope (ft/ft)	0.009094	Area (sq ft)		130.58	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.76	Avg. Vel. (ft/s)		18.76	
Max Chl Dpth (ft)	4.66	Hydr. Depth (ft)		4.66	
Conv. Total (cfs)	25691.4	Conv. (cfs)		25691.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		46.65	
Min Ch El (ft)	1614.60	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		29.81	
Frctn Loss (ft)	0.97	Cum Volume (acre-ft)	32.42	18.07	6.05
C & E Loss (ft)	0.17	Cum SA (acres)	5.62	2.27	1.59

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2970

INPUT
Description: Section: 2970 (Station: 11+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1623.8	35.67	1613.8	49.67	1613.8	49.67	1623.8	50.34	1623.8
50.34	1613.8	64.34	1613.8	64.34	1623.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	99.3	100 100.68	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1624.8	1623.8	64.34 1624.8	1623.8

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.01	Reach Len. (ft)	99.30	100.00	100.68
Crit W.S. (ft)	1620.01	Flow Area (sq ft)		173.88	
E.G. Slope (ft/ft)	0.004133	Area (sq ft)		173.88	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	14.09	Avg. Vel. (ft/s)		14.09	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	38107.3	Conv. (cfs)		38107.3	
Length Wtd. (ft)		Wetted Per. (ft)		52.84	
Min Ch El (ft)	1613.80	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)		11.97	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.42	17.72	6.05
C & E Loss (ft)		Cum SA (acres)	5.62	2.20	1.59

Vel Head (ft)	6.02	Wt. n-Val.			0.015			
W.S. Elev (ft)	1619.85	Reach Len. (ft)		99.30	100.00		100.68	
Crit W.S. (ft)	1621.61	Flow Area (sq ft)			124.45			
E.G. Slope (ft/ft)	0.010410	Area (sq ft)			124.45			
Q Total (cfs)	2450.00	Flow (cfs)			2450.00			
Top Width (ft)	28.00	Top Width (ft)			28.00			
Vel Total (ft/s)	19.69	Avg. Vel. (ft/s)			19.69			
Max Chl Dpth (ft)	4.44	Hydr. Depth (ft)			4.44			
Conv. Total (cfs)	24012.9	Conv. (cfs)			24012.9			
Length Wtd. (ft)	100.00	Wetted Per. (ft)			45.78			
Min Ch El (ft)	1615.40	Shear (lb/sq ft)			1.77			
Alpha	1.00	Stream Power (lb/ft s)			34.78			
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)		32.42	18.37		6.05	
C & E Loss (ft)	0.33	Cum SA (acres)		5.62	2.33		1.59	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 3000

INPUT
Description: Section: 3000 (Station 12+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1624.6	35.67	1614.6	49.67	1614.6	49.67	1624.6	50.34	1624.6
50.34	1614.6	64.34	1614.6	64.34	1624.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	99.3	100 100.68	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1625.6	1624.6	64.34 1625.6	1624.6

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1624.73	Element		0.015	
Vel Head (ft)	5.47	Wt. n-Val.			
W.S. Elev (ft)	1619.26	Reach Len. (ft)	99.30	100.00	100.68
Crit W.S. (ft)	1620.81	Flow Area (sq ft)		130.58	
E.G. Slope (ft/ft)	0.009094	Area (sq ft)		130.58	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.76	Avg. Vel. (ft/s)		18.76	
Max Chl Dpth (ft)	4.66	Hydr. Depth (ft)		4.66	
Conv. Total (cfs)	25691.4	Conv. (cfs)		25691.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		46.65	
Min Ch El (ft)	1614.60	Shear (lb/sq ft)		1.59	
Alpha	1.00	Stream Power (lb/ft s)		29.81	
Frctn Loss (ft)	0.97	Cum Volume (acre-ft)	32.42	18.07	6.05
C & E Loss (ft)	0.17	Cum SA (acres)	5.62	2.27	1.59

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2970

INPUT
Description: Section: 2970 (Station: 11+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1623.8	35.67	1613.8	49.67	1613.8	49.67	1623.8	50.34	1623.8
50.34	1613.8	64.34	1613.8	64.34	1623.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	99.3	100 100.68	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1624.8	1623.8	64.34 1624.8	1623.8

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1623.09	Element		0.015	
Vel Head (ft)	3.08	Wt. n-Val.			
W.S. Elev (ft)	1620.01	Reach Len. (ft)	99.30	100.00	100.68
Crit W.S. (ft)	1620.01	Flow Area (sq ft)		173.88	
E.G. Slope (ft/ft)	0.004133	Area (sq ft)		173.88	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	14.09	Avg. Vel. (ft/s)		14.09	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	38107.3	Conv. (cfs)		38107.3	
Length Wtd. (ft)		Wetted Per. (ft)		52.84	
Min Ch El (ft)	1613.80	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)		11.97	
Frctn Loss (ft)		Cum Volume (acre-ft)	32.42	17.72	6.05
C & E Loss (ft)		Cum SA (acres)	5.62	2.20	1.59

Warning: Divided flow computed for this cross-section.
Warning: During the standard step calculations, the final energy answer that was computed is less than the downstream energy. This is not physically possible. Please check your data.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
Note: The user has entered a known water surface elevation at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2935

INPUT
Description: Section: 2935 (Station: 10+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1623	35.67	1613	49.67	1613	49.67	1623	50.34	1623
50.34	1613	64.34	1613	64.34	1623				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1624	1623	64.34	1624	1623

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.53	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.11	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1620.11	Flow Area (sq ft)		199.00	
E.G. Slope (ft/ft)	0.004314	Area (sq ft)		199.00	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	15.08	Avg. Vel. (ft/s)		15.08	
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		7.11	
Conv. Total (cfs)	45673.3	Conv. (cfs)		45673.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		56.43	
Min Ch El (ft)	1613.00	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		14.32	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	32.42	17.30	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	2.14	1.59

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: 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: Pulsipher Wash
REACH: Falcon Ridge RS: 2900

INPUT
Description: Section: 2900 (Station: 9+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1622.2	35.67	1612.2	49.67	1612.2	49.67	1622.2	50.34	1622.2
50.34	1612.2	64.34	1612.2	64.34	1622.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1623.2	1622.2	64.34	1623.2	1622.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.43	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1619.31	Flow Area (sq ft)		174.48	
E.G. Slope (ft/ft)	0.006140	Area (sq ft)		174.48	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	17.19	Avg. Vel. (ft/s)		17.19	
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	38285.7	Conv. (cfs)		38285.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		52.93	
Min Ch El (ft)	1612.20	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)		21.73	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	32.42	16.87	6.05
C & E Loss (ft)	0.11	Cum SA (acres)	5.62	2.08	1.59

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.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2870

INPUT
Description: Section: 2870 (Station: 8+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

Warning: Divided flow computed for this cross-section.
Warning: During the standard step calculations, the final energy answer that was computed is less than the downstream energy. This is not physically possible. Please check your data.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
Note: The user has entered a known water surface elevation at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2935

INPUT
Description: Section: 2935 (Station: 10+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1623	35.67	1613	49.67	1613	49.67	1623	50.34	1623
50.34	1613	64.34	1613	64.34	1623				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1624	1623	64.34	1624	1623

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.53	Wt. n-Val.		0.015	
W.S. Elev (ft)	1620.11	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1620.11	Flow Area (sq ft)		199.00	
E.G. Slope (ft/ft)	0.004314	Area (sq ft)		199.00	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	15.08	Avg. Vel. (ft/s)		15.08	
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		7.11	
Conv. Total (cfs)	45673.3	Conv. (cfs)		45673.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		56.43	
Min Ch El (ft)	1613.00	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		14.32	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	32.42	17.30	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	2.14	1.59

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: 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: Pulsipher Wash
REACH: Falcon Ridge RS: 2900

INPUT
Description: Section: 2900 (Station: 9+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1622.2	35.67	1612.2	49.67	1612.2	49.67	1622.2	50.34	1622.2
50.34	1612.2	64.34	1612.2	64.34	1622.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1623.2	1622.2	64.34	1623.2	1622.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1623.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.59	Wt. n-Val.		0.015	
W.S. Elev (ft)	1618.43	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1619.31	Flow Area (sq ft)		174.48	
E.G. Slope (ft/ft)	0.006140	Area (sq ft)		174.48	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	17.19	Avg. Vel. (ft/s)		17.19	
Max Chl Dpth (ft)	6.23	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	38285.7	Conv. (cfs)		38285.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		52.93	
Min Ch El (ft)	1612.20	Shear (lb/sq ft)		1.26	
Alpha	1.00	Stream Power (lb/ft s)		21.73	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	32.42	16.87	6.05
C & E Loss (ft)	0.11	Cum SA (acres)	5.62	2.08	1.59

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.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2870

INPUT
Description: Section: 2870 (Station: 8+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

35.67	1621.4	35.67	1611.4	49.67	1611.4	49.67	1621.4	50.34	1621.4
50.34	1611.4	64.34	1611.4	64.34	1621.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1622.4 1621.4	64.34	1622.4 1621.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1617.41	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1618.49	Flow Area (sq ft)		168.39	
E.G. Slope (ft/ft)	*0.006761	Area (sq ft)		168.39	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	17.82	Avg. Vel. (ft/s)		17.82	
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)		6.01	
Conv. Total (cfs)	36486.3	Conv. (cfs)		36486.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		52.06	
Min Ch El (ft)	1611.40	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)		24.32	
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	32.42	16.47	6.05
C & E Loss (ft)	0.03	Cum SA (acres)	5.62	2.01	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2835

INPUT
Description: Section: 2835 (Station: 7+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1620.6	35.67	1610.6	49.67	1610.6	49.67	1620.6	50.34	1620.6
50.34	1610.6	64.34	1610.6	64.34	1620.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1621.6 1620.6	64.34	1621.6 1620.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.50	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1617.69	Flow Area (sq ft)		165.21	
E.G. Slope (ft/ft)	*0.007121	Area (sq ft)		165.21	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.16	Avg. Vel. (ft/s)		18.16	
Max Chl Dpth (ft)	5.90	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	35551.7	Conv. (cfs)		35551.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		51.60	
Min Ch El (ft)	1610.60	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		25.84	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	32.42	16.09	6.05
C & E Loss (ft)	0.02	Cum SA (acres)	5.62	1.95	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2800

INPUT
Description: Section: 2800 (Station: 6+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1619.8	35.67	1609.8	49.67	1609.8	49.67	1619.8	50.34	1619.8
50.34	1609.8	64.34	1609.8	64.34	1619.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1620.8 1619.8	64.34	1620.8 1619.8

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1620.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.26	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.62	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1616.91	Flow Area (sq ft)		163.01	
E.G. Slope (ft/ft)	*0.007386	Area (sq ft)		163.01	

35.67	1621.4	35.67	1611.4	49.67	1611.4	49.67	1621.4	50.34	1621.4
50.34	1611.4	64.34	1611.4	64.34	1621.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1622.4 1621.4	64.34	1622.4 1621.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1622.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	1617.41	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1618.49	Flow Area (sq ft)		168.39	
E.G. Slope (ft/ft)	*0.006761	Area (sq ft)		168.39	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	17.82	Avg. Vel. (ft/s)		17.82	
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)		6.01	
Conv. Total (cfs)	36486.3	Conv. (cfs)		36486.3	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		52.06	
Min Ch El (ft)	1611.40	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)		24.32	
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	32.42	16.47	6.05
C & E Loss (ft)	0.03	Cum SA (acres)	5.62	2.01	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2835

INPUT
Description: Section: 2835 (Station: 7+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1620.6	35.67	1610.6	49.67	1610.6	49.67	1620.6	50.34	1620.6
50.34	1610.6	64.34	1610.6	64.34	1620.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1621.6 1620.6	64.34	1621.6 1620.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1621.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.12	Wt. n-Val.		0.015	
W.S. Elev (ft)	1616.50	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1617.69	Flow Area (sq ft)		165.21	
E.G. Slope (ft/ft)	*0.007121	Area (sq ft)		165.21	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.16	Avg. Vel. (ft/s)		18.16	
Max Chl Dpth (ft)	5.90	Hydr. Depth (ft)		5.90	
Conv. Total (cfs)	35551.7	Conv. (cfs)		35551.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		51.60	
Min Ch El (ft)	1610.60	Shear (lb/sq ft)		1.42	
Alpha	1.00	Stream Power (lb/ft s)		25.84	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	32.42	16.09	6.05
C & E Loss (ft)	0.02	Cum SA (acres)	5.62	1.95	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2800

INPUT
Description: Section: 2800 (Station: 6+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1619.8	35.67	1609.8	49.67	1609.8	49.67	1619.8	50.34	1619.8
50.34	1609.8	64.34	1609.8	64.34	1619.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1620.8 1619.8	64.34	1620.8 1619.8

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1620.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.26	Wt. n-Val.		0.015	
W.S. Elev (ft)	1615.62	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1616.91	Flow Area (sq ft)		163.01	
E.G. Slope (ft/ft)	*0.007386	Area (sq ft)		163.01	

Q Total (cfs)	3000.00	Flow (cfs)			3000.00						
Top Width (ft)	28.00	Top Width (ft)			28.00						
Vel Total (ft/s)	18.40	Avg. Vel. (ft/s)			18.40						
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)			5.82						
Conv. Total (cfs)	34906.7	Conv. (cfs)			34906.7						
Length Wtd. (ft)	100.00	Wetted Per. (ft)			51.29						
Min Ch El (ft)	1609.80	Shear (lb/sq ft)			1.47						
Alpha	1.00	Stream Power (lb/ft s)			26.97						
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)		32.42	15.71		6.05				
C & E Loss (ft)	0.01	Cum SA (acres)		5.62	1.88		1.59				

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2770

INPUT
Description: Section: 2770 (Station: 5+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1619	35.67	1609	49.67	1609	49.67	1619	50.34	1619
50.34	1609	64.34	1609	64.34	1619				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1620	1619	64.34	1620	1619

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1620.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.78	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1616.11	Flow Area (sq ft)		161.74	
E.G. Slope (ft/ft)	0.007545	Area (sq ft)		161.74	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.55	Avg. Vel. (ft/s)		18.55	
Max Chl Dpth (ft)	5.78	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	34537.7	Conv. (cfs)		34537.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		51.11	
Min Ch El (ft)	1609.00	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)		27.65	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	32.42	15.34	6.05
C & E Loss (ft)	0.01	Cum SA (acres)	5.62	1.82	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2735

INPUT
Description: Section: 2735 (Station: 4+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1618.2	35.67	1608.2	49.67	1608.2	49.67	1618.2	50.34	1618.2
50.34	1608.2	64.34	1608.2	64.34	1618.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1619.2	1618.2	64.34	1619.2	1618.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1619.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.41	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.94	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1615.31	Flow Area (sq ft)		160.74	
E.G. Slope (ft/ft)	0.007674	Area (sq ft)		160.74	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.66	Avg. Vel. (ft/s)		18.66	
Max Chl Dpth (ft)	5.74	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	34246.9	Conv. (cfs)		34246.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		50.96	
Min Ch El (ft)	1608.20	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		28.20	
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	32.42	14.97	6.05
C & E Loss (ft)	0.01	Cum SA (acres)	5.62	1.75	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2700

INPUT
Description: Section: 2700 (Station: 3+00); Proposed box culverts. Approximate location of cross section 2700 from effective model)
Station Elevation Data num= 8

Q Total (cfs)	3000.00	Flow (cfs)			3000.00				
Top Width (ft)	28.00	Top Width (ft)			28.00				
Vel Total (ft/s)	18.40	Avg. Vel. (ft/s)			18.40				
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)			5.82				
Conv. Total (cfs)	34906.7	Conv. (cfs)			34906.7				
Length Wtd. (ft)	100.00	Wetted Per. (ft)			51.29				
Min Ch El (ft)	1609.80	Shear (lb/sq ft)			1.47				
Alpha	1.00	Stream Power (lb/ft s)			26.97				
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)		32.42	15.71		6.05		
C & E Loss (ft)	0.01	Cum SA (acres)		5.62	1.88		1.59		

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2770

INPUT
Description: Section: 2770 (Station: 5+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1619	35.67	1609	49.67	1609	49.67	1619	50.34	1619
50.34	1609	64.34	1609	64.34	1619				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1620 1619	64.34	1620 1619

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1620.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.34	Wt. n-Val.		0.015	
W.S. Elev (ft)	1614.78	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1616.11	Flow Area (sq ft)		161.74	
E.G. Slope (ft/ft)	0.007545	Area (sq ft)		161.74	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.55	Avg. Vel. (ft/s)		18.55	
Max Chl Dpth (ft)	5.78	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	34537.7	Conv. (cfs)		34537.7	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		51.11	
Min Ch El (ft)	1609.00	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)		27.65	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	32.42	15.34	6.05
C & E Loss (ft)	0.01	Cum SA (acres)	5.62	1.82	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2735

INPUT
Description: Section: 2735 (Station: 4+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1618.2	35.67	1608.2	49.67	1608.2	49.67	1618.2	50.34	1618.2
50.34	1608.2	64.34	1608.2	64.34	1618.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	100	100	100 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1619.2 1618.2	64.34	1619.2 1618.2

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1619.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.41	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.94	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	1615.31	Flow Area (sq ft)		160.74	
E.G. Slope (ft/ft)	0.007674	Area (sq ft)		160.74	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.66	Avg. Vel. (ft/s)		18.66	
Max Chl Dpth (ft)	5.74	Hydr. Depth (ft)		5.74	
Conv. Total (cfs)	34246.9	Conv. (cfs)		34246.9	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		50.96	
Min Ch El (ft)	1608.20	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		28.20	
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	32.42	14.97	6.05
C & E Loss (ft)	0.01	Cum SA (acres)	5.62	1.75	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2700

INPUT
Description: Section: 2700 (Station: 3+00); Proposed box culverts. Approximate location of cross section 2700 from effective model)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1617.4	35.67	1607.4	49.67	1607.4	49.67	1617.4	50.34	1617.4
50.34	1607.4	64.34	1607.4	64.34	1617.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	23.22	23.22	23.22 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1618.4	1617.4	64.34 1618.4 1617.4

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.57	Element		0.015	
Vel Head (ft)	5.46	Wt. n-Val.		23.22	23.22
W.S. Elev (ft)	1613.12	Reach Len. (ft)	23.22	23.22	23.22
Crit W.S. (ft)	1614.49	Flow Area (sq ft)		160.04	
E.G. Slope (ft/ft)	0.007766	Area (sq ft)		160.04	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.75	Avg. Vel. (ft/s)		18.75	
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)		5.72	
Conv. Total (cfs)	34042.1	Conv. (cfs)		34042.1	
Length Wtd. (ft)	23.22	Wetted Per. (ft)		50.86	
Min Ch El (ft)	1607.40	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		28.60	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	32.42	14.60	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.69	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2690

INPUT
Description: Section: 2690 (Station: 2+76.79); Proposed box culvert
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1617.21	35.67	1607.21	49.67	1607.21	49.67	1617.21	50.34	1617.21
50.34	1607.21	64.34	1607.21	64.34	1617.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	44.31	43.13	41.96 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1618.21	1617.21	64.34 1618.21 1617.21

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.39	Element		0.015	
Vel Head (ft)	5.48	Wt. n-Val.		43.13	41.96
W.S. Elev (ft)	1612.91	Reach Len. (ft)	44.31	159.68	
Crit W.S. (ft)	1614.32	Flow Area (sq ft)		159.68	
E.G. Slope (ft/ft)	0.007814	Area (sq ft)		3000.00	
Q Total (cfs)	3000.00	Flow (cfs)		28.00	
Top Width (ft)	28.00	Top Width (ft)		18.79	
Vel Total (ft/s)	18.79	Avg. Vel. (ft/s)		5.70	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		33937.7	
Conv. Total (cfs)	33937.7	Conv. (cfs)		50.81	
Length Wtd. (ft)	43.13	Wetted Per. (ft)		1.53	
Min Ch El (ft)	1607.21	Shear (lb/sq ft)		28.80	
Alpha	1.00	Stream Power (lb/ft s)		14.52	6.05
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	32.42	1.67	1.59
C & E Loss (ft)	0.00	Cum SA (acres)	5.62		

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2680

INPUT
Description: Section: 2680 (Station: 2+33.64); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.87	35.67	1606.87	49.67	1606.87	49.67	1616.87	50.34	1616.87
50.34	1606.87	64.34	1606.87	64.34	1616.87				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	34.34	33.63	32.93 .1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1617.87	1616.87	64.34 1617.87 1616.87

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1618.05	Element		0.015	
Vel Head (ft)	5.47	Wt. n-Val.		33.63	32.93
W.S. Elev (ft)	1612.58	Reach Len. (ft)	34.34	159.79	
Crit W.S. (ft)	1613.96	Flow Area (sq ft)			

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1617.4	35.67	1607.4	49.67	1607.4	49.67	1617.4	50.34	1617.4
50.34	1607.4	64.34	1607.4	64.34	1617.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	23.22	23.22	23.22	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1618.4	1617.4	64.34	1618.4	1617.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1618.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	1613.12	Reach Len. (ft)	23.22	23.22	23.22
Crit W.S. (ft)	1614.49	Flow Area (sq ft)		160.04	
E.G. Slope (ft/ft)	0.007766	Area (sq ft)		160.04	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.75	Avg. Vel. (ft/s)		18.75	
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)		5.72	
Conv. Total (cfs)	34042.1	Conv. (cfs)		34042.1	
Length Wtd. (ft)	23.22	Wetted Per. (ft)		50.86	
Min Ch El (ft)	1607.40	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		28.60	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	32.42	14.60	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.69	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2690

INPUT
Description: Section: 2690 (Station: 2+76.79); Proposed box culvert
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1617.21	35.67	1607.21	49.67	1607.21	49.67	1617.21	50.34	1617.21
50.34	1607.21	64.34	1607.21	64.34	1617.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	44.31	43.13	41.96	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1618.21	1617.21	64.34	1618.21	1617.21

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1618.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.48	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.91	Reach Len. (ft)	44.31	43.13	41.96
Crit W.S. (ft)	1614.32	Flow Area (sq ft)		159.68	
E.G. Slope (ft/ft)	0.007814	Area (sq ft)		159.68	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.79	Avg. Vel. (ft/s)		18.79	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	33937.7	Conv. (cfs)		33937.7	
Length Wtd. (ft)	43.13	Wetted Per. (ft)		50.81	
Min Ch El (ft)	1607.21	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		28.80	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	32.42	14.52	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.67	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2680

INPUT
Description: Section: 2680 (Station: 2+33.64); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.87	35.67	1606.87	49.67	1606.87	49.67	1616.87	50.34	1616.87
50.34	1606.87	64.34	1606.87	64.34	1616.87				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	34.34	33.63	32.93	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1617.87	1616.87	64.34	1617.87	1616.87

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1618.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.58	Reach Len. (ft)	34.34	33.63	32.93
Crit W.S. (ft)	1613.96	Flow Area (sq ft)		159.79	

E.G. Slope (ft/ft)	0.007799	Area (sq ft)			159.79				
Q Total (cfs)	3000.00	Flow (cfs)			3000.00				
Top Width (ft)	28.00	Top Width (ft)			28.00				
Vel Total (ft/s)	18.77	Avg. Vel. (ft/s)			18.77				
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)			5.71				
Conv. Total (cfs)	33970.5	Conv. (cfs)			33970.5				
Length Wtd. (ft)	33.63	Wetted Per. (ft)			50.83				
Min Ch El (ft)	1606.87	Shear (lb/sq ft)			1.53				
Alpha	1.00	Stream Power (lb/ft s)			28.74				
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)		32.42	14.36		6.05		
C & E Loss (ft)	0.00	Cum SA (acres)		5.62	1.65		1.59		

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2670

INPUT
Description: Section: 2670 (Station 2+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.6	35.67	1606.6	49.67	1606.6	49.67	1616.6	50.34	1616.6
50.34	1606.6	64.34	1606.6	64.34	1616.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	25	25	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1617.6	1616.6	64.34	1617.6	1616.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.49	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.30	Reach Len. (ft)	25.00	25.00	25.00
Crit W.S. (ft)	1613.69	Flow Area (sq ft)		159.58	
E.G. Slope (ft/ft)	0.007828	Area (sq ft)		159.58	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.80	Avg. Vel. (ft/s)		18.80	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	33907.9	Conv. (cfs)		33907.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		50.80	
Min Ch El (ft)	1606.60	Shear (lb/sq ft)		1.54	
Alpha	1.00	Stream Power (lb/ft s)		28.86	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	32.42	14.24	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.63	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2660

INPUT
Description: Section: 2660 (Station 1+75.00); Begin transition to Pioneer box culverts (3 - 12x10's used)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.4	35.67	1606.4	49.67	1606.4	49.67	1616.4	50.34	1616.4
50.34	1606.4	64.34	1606.4	64.34	1616.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	10.9	10	10.9	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1617.4	1616.4	64.34	1617.4	1616.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.48	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.10	Reach Len. (ft)	10.90	10.00	10.90
Crit W.S. (ft)	1613.49	Flow Area (sq ft)		159.71	
E.G. Slope (ft/ft)	0.007810	Area (sq ft)		159.71	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.78	Avg. Vel. (ft/s)		18.78	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	33945.7	Conv. (cfs)		33945.7	
Length Wtd. (ft)	10.00	Wetted Per. (ft)		50.82	
Min Ch El (ft)	1606.40	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		28.79	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	32.42	14.14	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.61	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2650

INPUT
Description: Section: 2650 (Station: 1+65); End Transition; Inlet of existing

E.G. Slope (ft/ft)	0.007799	Area (sq ft)			159.79				
Q Total (cfs)	3000.00	Flow (cfs)			3000.00				
Top Width (ft)	28.00	Top Width (ft)			28.00				
Vel Total (ft/s)	18.77	Avg. Vel. (ft/s)			18.77				
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)			5.71				
Conv. Total (cfs)	33970.5	Conv. (cfs)			33970.5				
Length Wtd. (ft)	33.63	Wetted Per. (ft)			50.83				
Min Ch El (ft)	1606.87	Shear (lb/sq ft)			1.53				
Alpha	1.00	Stream Power (lb/ft s)			28.74				
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)		32.42	14.36		6.05		
C & E Loss (ft)	0.00	Cum SA (acres)		5.62	1.65		1.59		

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2670

INPUT
Description: Section: 2670 (Station 2+00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.6	35.67	1606.6	49.67	1606.6	49.67	1616.6	50.34	1616.6
50.34	1606.6	64.34	1606.6	64.34	1616.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	25	25	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1617.6	1616.6	64.34 1617.6	1616.6

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.49	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.30	Reach Len. (ft)	25.00	25.00	25.00
Crit W.S. (ft)	1613.69	Flow Area (sq ft)		159.58	
E.G. Slope (ft/ft)	0.007828	Area (sq ft)		159.58	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.80	Avg. Vel. (ft/s)		18.80	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	33907.9	Conv. (cfs)		33907.9	
Length Wtd. (ft)	25.00	Wetted Per. (ft)		50.80	
Min Ch El (ft)	1606.60	Shear (lb/sq ft)		1.54	
Alpha	1.00	Stream Power (lb/ft s)		28.86	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	32.42	14.24	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.63	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2660

INPUT
Description: Section: 2660 (Station 1+75.00); Begin transition to Pioneer box culverts (3 - 12x10's used)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1616.4	35.67	1606.4	49.67	1606.4	49.67	1616.4	50.34	1616.4
50.34	1606.4	64.34	1606.4	64.34	1616.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	10.9	10	10.9	.1	.3

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1617.4	1616.4	64.34 1617.4	1616.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.48	Wt. n-Val.		0.015	
W.S. Elev (ft)	1612.10	Reach Len. (ft)	10.90	10.00	10.90
Crit W.S. (ft)	1613.49	Flow Area (sq ft)		159.71	
E.G. Slope (ft/ft)	0.007810	Area (sq ft)		159.71	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.78	Avg. Vel. (ft/s)		18.78	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		5.70	
Conv. Total (cfs)	33945.7	Conv. (cfs)		33945.7	
Length Wtd. (ft)	10.00	Wetted Per. (ft)		50.82	
Min Ch El (ft)	1606.40	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		28.79	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	32.42	14.14	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.61	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2650

INPUT
Description: Section: 2650 (Station: 1+65); End Transition; Inlet of existing

Pioneer Blvd. culverts (3 - 12 x 10's used)

Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1616.32	31.33	1606.32	43.33	1606.32	43.33	1616.32	44	1616.32
44	1606.32	56	1606.32	56	1616.32	56.67	1616.32	56.67	1606.32
68.67	1606.32	68.67	1616.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31.33	68.67	165	165	.3	.5

Cross Section Lid

num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33 1617.32	1616.32	68.67 1617.32	1616.32

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1617.31	Element		0.015	
Vel Head (ft)	7.09	Wt. n-Val.		0.10	0.10
W.S. Elev (ft)	1610.22	Reach Len. (ft)	0.10	140.37	
Crit W.S. (ft)	1612.29	Flow Area (sq ft)		140.37	
E.G. Slope (ft/ft)	+0.014785	Area (sq ft)		3000.00	
Q Total (cfs)	3000.00	Flow (cfs)		36.00	
Top Width (ft)	36.00	Top Width (ft)		21.37	
Vel Total (ft/s)	21.37	Avg. Vel. (ft/s)		3.90	
Max Chl Dpth (ft)	3.90	Hydr. Depth (ft)		24672.6	
Conv. Total (cfs)	24672.6	Conv. (cfs)		59.40	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		2.18	
Min Ch El (ft)	1606.32	Shear (lb/sq ft)		46.62	
Alpha	1.00	Stream Power (lb/ft s)		14.11	6.05
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	32.42	1.60	1.59
C & E Loss (ft)	0.16	Cum SA (acres)	5.62		

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.

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2620

INPUT
Description: Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled with pier bulking (1' of debris on each side of pier).
Distance from Upstream XS = .1
Deck/Roadway Width = 164
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33 1619	1616.32	68.67 1619	1616.32

Upstream Bridge Cross Section Data
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1616.32	31.33	1606.32	43.33	1606.32	43.33	1616.32	44	1616.32
44	1606.32	56	1606.32	56	1616.32	56.67	1616.32	56.67	1606.32
68.67	1606.32	68.67	1616.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
31.33	68.67	.3	.5

Downstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33 1619	1615	68.67 1619	1615

Downstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1615	31.33	1605	43.33	1605	43.33	1615	44	1615
44	1605	49.67	1605	49.67	1615	50.34	1615	50.34	1605
56	1605	56	1615	56.67	1615	56.67	1605	68.67	1605
68.67	1615								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
31.33	68.67	.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 = 1619
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= 43.66 Downstream= 43.66
Upstream num= 2

Width	Elev	Width	Elev
.67	1606.32	.67	1616.32

Downstream num= 2

Width	Elev	Width	Elev

Pioneer Blvd. culverts (3 - 12 x 10's used)

Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1616.32	31.33	1606.32	43.33	1606.32	43.33	1616.32	44	1616.32
44	1606.32	56	1606.32	56	1616.32	56.67	1616.32	56.67	1606.32
68.67	1606.32	68.67	1616.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31.33	68.67	165	165	.3	.5

Cross Section Lid num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33	1617.32 1616.32	68.67	1617.32 1616.32

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1617.31	Element	Left OB	Channel	Right OB	
Vel Head (ft)	7.09	Wt. n-Val.		0.015		
W.S. Elev (ft)	1610.22	Reach Len. (ft)	0.10	0.10	0.10	
Crit W.S. (ft)	1612.29	Flow Area (sq ft)		140.37		
E.G. Slope (ft/ft)	0.014785	Area (sq ft)		140.37		
Q Total (cfs)	3000.00	Flow (cfs)		3000.00		
Top Width (ft)	36.00	Top Width (ft)		36.00		
Vel Total (ft/s)	21.37	Avg. Vel. (ft/s)		21.37		
Max Chl Dpth (ft)	3.90	Hydr. Depth (ft)		3.90		
Conv. Total (cfs)	24672.6	Conv. (cfs)		24672.6		
Length Wtd. (ft)	0.10	Wetted Per. (ft)		59.40		
Min Ch El (ft)	1606.32	Shear (lb/sq ft)		2.18		
Alpha	1.00	Stream Power (lb/ft s)		46.62		
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	32.42	14.11	6.05	
C & E Loss (ft)	0.16	Cum SA (acres)	5.62	1.60	1.59	

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.

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2620

INPUT
Description: Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled with pier bulking (1' of debris on each side of pier).
Distance from Upstream XS = .1
Deck/Roadway Width = 164
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33	1619 1616.32	68.67	1619 1616.32

Upstream Bridge Cross Section Data
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1616.32	31.33	1606.32	43.33	1606.32	43.33	1616.32	44	1616.32
44	1606.32	56	1606.32	56	1616.32	56.67	1616.32	56.67	1606.32
68.67	1606.32	68.67	1616.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
31.33	68.67	.3	.5

Downstream Deck/Roadway Coordinates num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
31.33	1619 1615	68.67	1619 1615

Downstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31.33	1615	31.33	1605	43.33	1605	43.33	1615	44	1615
44	1605	49.67	1605	49.67	1615	50.34	1615	50.34	1605
56	1605	56	1615	56.67	1615	56.67	1605	68.67	1605
68.67	1615								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31.33	.015	31.33	.015	68.67	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
31.33	68.67	.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 = 1619
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= 43.66 Downstream= 43.66
Upstream num= 2

Width	Elev	Width	Elev
.67	1606.32	.67	1616.32

Downstream num= 2

Width	Elev	Width	Elev

```
     .67    1605     .67    1615
 Debris Width  =     2.67
 Debris Height =       10

 Pier Data
 Pier Station     Upstream=   56.33    Downstream=   56.33
 Upstream     num=        2
    Width   Elev    Width   Elev
 *********************************
     .67 1606.32     .67 1616.32
 Downstream     num=        2
    Width   Elev    Width   Elev
 *********************************
     .67    1605     .67    1615
 Debris Width  =     2.67
 Debris Height =       10

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum              Cd   =       2
 Selected Low Flow Methods = Highest Energy Answer

 High Flow Method
        Pressure and Weir flow
            Submerged Inlet Cd          =
            Submerged Inlet + Outlet Cd =      .8
            Max Low Cord                =

 Additional Bridge Parameters
        Add Friction component to Momentum
        Do not add Weight component to Momentum
        Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
        Criteria to check for pressure flow = Upstream energy grade line

 BRIDGE OUTPUT  Profile #PF 1
 ************************************************************************************************
 * E.G. US. (ft)          *    1617.31  * Element               *Inside BR US *Inside BR DS *
 * W.S. US. (ft)          *    1610.22  * E.G. Elev (ft)        *    1617.31  *    1614.11  *
 * Q Total (cfs)          *    3000.00  * W.S. Elev (ft)        *    1610.22  *    1611.19  *
 * Q Bridge (cfs)         *    3000.00  * Crit W.S. (ft)        *    1612.31  *    1611.09  *
 * Q Weir (cfs)           *             * Max Chl Dpth (ft)     *       3.90  *       6.19  *
 * Weir Sta Lft (ft)      *             * Vel Total (ft/s)      *      21.37  *      13.73  *
 * Weir Sta Rgt (ft)      *             * Flow Area (sq ft)     *     140.40  *     218.57  *
 * Weir Submerg           *             * Froude # Chl          *       1.91  *       0.97  *
 * Weir Max Depth (ft)    *             * Specif Force (cu ft)  *    2264.65  *    1955.07  *
 * Min El Weir Flow (ft)  *    1619.01  * Hydr Depth (ft)       *       3.90  *       6.19  *
 * Min El Prs (ft)        *    1616.32  * W.P. Total (ft)       *      59.40  *      84.83  *
 * Delta EG (ft)          *    1617.31  * Conv. Total (cfs)     *    24679.1  *    40695.0  *
 * Delta WS (ft)          *      -0.87  * Top Width (ft)        *      35.99  *      35.32  *
 * BR Open Area (sq ft)   *     353.20  * Frctn Loss (ft)       *       0.00  *             *
 * BR Open Vel (ft/s)     *      21.37  * C & E Loss (ft)       *       0.00  *             *
 * Coef of Q              *             * Shear Total (lb/sq ft) *      2.18  *       0.87  *
 * Br Sel Method          *Energy only  * Power Total (lb/ft s)  *     46.60  *      12.00  *
 ************************************************************************************************

 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: Pulsipher Wash
 REACH: Falcon Ridge       RS: 2590

 INPUT
 Description: Section: 2590 (Station: 0+00); Outlet of existing Pioneer Blvd.
              culverts; Begin transition from 3-12x10's to 2-14x10's.
 Station Elevation Data     num=       16
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 ***************************************************************************************
    31.33     1615    31.33     1605    43.33     1605    43.33     1615       44     1615
       44     1605    49.67     1605    49.67     1615    50.34     1615    50.34     1605
       56     1605       56     1615    56.67     1615    56.67     1605    68.67     1605
    68.67     1615

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
 ***********************************************
    31.33     .015    31.33     .015    68.67     .015

 Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
           31.33    68.67              10.96       10   10.84              .3       .5
 Cross Section Lid
     num=        2
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 ***********************************************
    31.33     1616     1615    68.67     1616     1615

 CROSS SECTION OUTPUT  Profile #PF 1
 ************************************************************************************************
 * E.G. Elev (ft)         * 1614.11  * Element               *  Left OB  *  Channel  * Right OB *
 * Vel Head (ft)          *     3.02 * Wt. n-Val.            *           *    0.015  *           *
 * W.S. Elev (ft)         * 1611.09  * Reach Len. (ft)       *   10.96    *   10.00  *   10.84    *
 * Crit W.S. (ft)         * 1611.09  * Flow Area (sq ft)     *            *  215.16  *           *
 * E.G. Slope (ft/ft)     *0.005657  * Area (sq ft)          *            *  215.16  *           *
 * Q Total (cfs)          * 3000.00  * Flow (cfs)           *            * 3000.00  *           *
 * Top Width (ft)         *   35.33  * Top Width (ft)        *            *   35.33  *           *
 * Vel Total (ft/s)       *   13.94  * Avg. Vel. (ft/s)      *            *   13.94  *           *
 * Max Chl Dpth (ft)      *    6.09  * Hydr. Depth (ft)      *            *    6.09  *           *
 * Conv. Total (cfs)      * 39885.1  * Conv. (cfs)          *            * 39885.1  *           *
 * Length Wtd. (ft)       *          * Wetted Per. (ft)      *            *   84.05  *           *
 * Min Ch El (ft)         * 1605.00  * Shear (lb/sq ft)      *            *    0.90  *           *
 * Alpha                  *    1.00  * Stream Power (lb/ft s) *           *   12.61  *           *
 * Frctn Loss (ft)        *    0.01  * Cum Volume (acre-ft)  *   32.42    *   14.11  *    6.05   *
 * C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    5.62    *    1.60  *    1.59   *
 ************************************************************************************************

 Warning: Divided flow computed for this cross-section.

 CROSS SECTION
```

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2570

INPUT
Description: Section: 2570 (Station: -0+10.00); End transition from Pioneer Blvd box culverts (3 - 12x10's to 2 - 14x10's).
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1614.89	35.67	1604.89	49.67	1604.89	49.67	1614.89
50.34	1604.89	64.34	1604.89	64.34	1614.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	19.35	18.3	17.25	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1615.89	1614.89	64.34	1615.89	1614.89

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1615.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.55	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.98	Reach Len. (ft)	19.35	18.30	17.25
Crit W.S. (ft)	1611.98	Flow Area (sq ft)		198.55	
E.G. Slope (ft/ft)	*0.004341	Area (sq ft)		198.55	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	15.11	Avg. Vel. (ft/s)		15.11	
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)		7.09	
Conv. Total (cfs)	45534.5	Conv. (cfs)		45534.5	
Length Wtd. (ft)	18.30	Wetted Per. (ft)		56.36	
Min Ch El (ft)	1604.89	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		14.42	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	32.42	14.06	6.05
C & E Loss (ft)	0.00	Cum SA (acres)	5.62	1.59	1.59

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: Divided flow computed for this cross-section.
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: Pulsipher Wash
REACH: Falcon Ridge RS: 2550

INPUT
Description: Section: 2550 (Station: -0+28.30); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1614.7	35.67	1604.7	49.67	1604.7	49.67	1614.7	50.34	1614.7
50.34	1604.7	64.34	1604.7	64.34	1614.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	29.95	28.9	27.86	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1615.7	1614.7	64.34	1615.7	1614.7

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1615.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1611.31	Reach Len. (ft)	29.95	28.90	27.86
Crit W.S. (ft)	1611.81	Flow Area (sq ft)		185.16	
E.G. Slope (ft/ft)	*0.005232	Area (sq ft)		185.16	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	16.20	Avg. Vel. (ft/s)		16.20	
Max Chl Dpth (ft)	6.61	Hydr. Depth (ft)		6.61	
Conv. Total (cfs)	41476.7	Conv. (cfs)		41476.7	
Length Wtd. (ft)	28.90	Wetted Per. (ft)		54.45	
Min Ch El (ft)	1604.70	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)		17.99	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	32.42	13.98	6.05
C & E Loss (ft)	0.05	Cum SA (acres)	5.62	1.58	1.59

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 croas sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2540

INPUT
Description: Section: 2540 (Station: -0+57.21); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1614.39	35.67	1604.39	49.67	1604.39	49.67	1614.39	50.34	1614.39
50.34	1604.39	64.34	1604.39	64.34	1614.39				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	44.32	42.76	41.21	.1	.3

Cross Section Lid
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
35.67	1615.39	1614.39	64.34	1615.39	1614.39

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1615.19	Element	Left OB	Channel	Right OB	
Vel Head (ft)	4.52	Wt. n-Val.		0.015		
W.S. Elev (ft)	1610.67	Reach Len. (ft)	44.32	42.76	41.21	
Crit W.S. (ft)	1611.48	Flow Area (sq ft)		175.88		
E.G. Slope (ft/ft)	0.006009	Area (sq ft)		175.88		
Q Total (cfs)	3000.00	Flow (cfs)		3000.00		
Top Width (ft)	28.00	Top Width (ft)		28.00		
Vel Total (ft/s)	17.06	Avg. Vel. (ft/s)		17.06		
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		6.28		
Conv. Total (cfs)	38702.1	Conv. (cfs)		38702.1		
Length Wtd. (ft)	42.76	Wetted Per. (ft)		53.13		
Min Ch El (ft)	1604.39	Shear (lb/sq ft)		1.24		
Alpha	1.00	Stream Power (lb/ft s)		21.18		
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	32.42	13.86	6.05	
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	1.56	1.59	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2530

INPUT
Description: Section: 2530 (Station: -1+00.00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1613.93	35.67	1603.93	49.67	1603.93	49.67	1613.93	50.34	1613.93
50.34	1603.93	64.34	1603.93	64.34	1613.93				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	51.78	49.97	48.15	.1	.3

Cross Section Lid
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
35.67	1614.93	1613.93	64.34	1614.93	1613.93

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1614.87	Element	Left OB	Channel	Right OB	
Vel Head (ft)	4.93	Wt. n-Val.		0.015		
W.S. Elev (ft)	1609.94	Reach Len. (ft)	51.78	49.97	48.15	
Crit W.S. (ft)	1611.02	Flow Area (sq ft)		168.38		
E.G. Slope (ft/ft)	0.006762	Area (sq ft)		168.38		
Q Total (cfs)	3000.00	Flow (cfs)		3000.00		
Top Width (ft)	28.00	Top Width (ft)		28.00		
Vel Total (ft/s)	17.82	Avg. Vel. (ft/s)		17.82		
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)		6.01		
Conv. Total (cfs)	36481.2	Conv. (cfs)		36481.2		
Length Wtd. (ft)	49.97	Wetted Per. (ft)		52.05		
Min Ch El (ft)	1603.93	Shear (lb/sq ft)		1.37		
Alpha	1.00	Stream Power (lb/ft s)		24.33		
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	32.42	13.69	6.05	
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	1.54	1.59	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2515

INPUT
Description: Section: 2515 (Station: -1+50.00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1613.4	35.67	1603.4	49.67	1603.4	49.67	1613.4	50.34	1613.4
50.34	1603.4	64.34	1603.4	64.34	1613.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	67.85	65.47	63.09	.1	.3

Cross Section Lid
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
35.67	1614.4	1613.4	64.34	1614.4	1613.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1614.49	Element	Left OB	Channel	Right OB	
Vel Head (ft)	5.27	Wt. n-Val.		0.015		
W.S. Elev (ft)	1609.21	Reach Len. (ft)	67.85	65.47	63.09	
Crit W.S. (ft)	1610.49	Flow Area (sq ft)		162.79		
E.G. Slope (ft/ft)	0.007413	Area (sq ft)		162.79		
Q Total (cfs)	3000.00	Flow (cfs)		3000.00		
Top Width (ft)	28.00	Top Width (ft)		28.00		
Vel Total (ft/s)	18.43	Avg. Vel. (ft/s)		18.43		
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		5.81		
Conv. Total (cfs)	34844.8	Conv. (cfs)		34844.8		
Length Wtd. (ft)	65.47	Wetted Per. (ft)		51.26		
Min Ch El (ft)	1603.40	Shear (lb/sq ft)		1.47		
Alpha	1.00	Stream Power (lb/ft s)		27.09		
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	32.42	13.50	6.05	

C & E Loss (ft)	0.03	Cum SA (acres)	5.62	1.50	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2510

INPUT
Description: Section: 2510 (Station: -2+15.55); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1612.69	35.67	1602.69	49.67	1602.69	49.67	1612.69	50.34	1612.69
50.34	1602.69	64.34	1602.69	64.34	1612.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	52.93	52.93	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1613.69	1612.69	64.34 1613.69	1612.69

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1613.95	Element			
Vel Head (ft)	5.63	Wt. n-Val.		0.015	
W.S. Elev (ft)	1608.32	Reach Len. (ft)	52.93	52.93	52.93
Crit W.S. (ft)	1609.80	Flow Area (sq ft)		157.51	
E.G. Slope (ft/ft)	*0.008113	Area (sq ft)		157.51	
Q Total (cfs)	3000.00	Flow (cfs)		3000.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	19.05	Avg. Vel. (ft/s)		19.05	
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)		5.63	
Conv. Total (cfs)	33307.1	Conv. (cfs)		33307.1	
Length Wtd. (ft)	52.93	Wetted Per. (ft)		50.50	
Min Ch El (ft)	1602.69	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		30.09	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	32.42	13.26	6.05
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	1.46	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2500

INPUT
Description: Section: 2500 (Station: -2+68.48); Proposed box culverts.
(Existing cross section 2500 from effective model)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1612.13	35.67	1602.13	49.67	1602.13	49.67	1612.13	50.34	1612.13
50.34	1602.13	64.34	1602.13	64.34	1612.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	81.52	81.52	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67 1613.13	1612.13	64.34 1613.13	1612.13

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1613.47	Element			
Vel Head (ft)	5.41	Wt. n-Val.		0.015	
W.S. Elev (ft)	1608.06	Reach Len. (ft)	81.52	81.52	81.52
Crit W.S. (ft)	1609.38	Flow Area (sq ft)		166.14	
E.G. Slope (ft/ft)	*0.007488	Area (sq ft)		166.14	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	18.66	Avg. Vel. (ft/s)		18.66	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		5.93	
Conv. Total (cfs)	35825.3	Conv. (cfs)		35825.3	
Length Wtd. (ft)	81.52	Wetted Per. (ft)		51.73	
Min Ch El (ft)	1602.13	Shear (lb/sq ft)		1.50	
Alpha	1.00	Stream Power (lb/ft s)		28.01	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	32.42	13.07	6.05
C & E Loss (ft)	0.07	Cum SA (acres)	5.62	1.43	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2460

INPUT
Description: Section: 2460 (Station: -3+50.00); Proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1611.26	35.67	1601.26	49.67	1601.26	49.67	1611.26	50.34	1611.26
50.34	1601.26	64.34	1601.26	64.34	1611.26				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	79.58	79.58	.1	.3

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1612.26	1611.26	64.34	1612.26	1611.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1612.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.81	Wt. n-Val.		0.015	
W.S. Elev (ft)	1606.99	Reach Len. (ft)	79.58	79.58	79.58
Crit W.S. (ft)	1608.51	Flow Area (sq ft)		160.31	
E.G. Slope (ft/ft)	0.008254	Area (sq ft)		160.31	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	19.34	Avg. Vel. (ft/s)		19.34	
Max Chl Dpth (ft)	5.73	Hydr. Depth (ft)		5.73	
Conv. Total (cfs)	34120.6	Conv. (cfs)		34120.6	
Length Wtd. (ft)	79.58	Wetted Per. (ft)		50.90	
Min Ch El (ft)	1601.26	Shear (lb/sq ft)		1.62	
Alpha	1.00	Stream Power (lb/ft s)		31.38	
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	32.42	12.76	6.05
C & E Loss (ft)	0.04	Cum SA (acres)	5.62	1.38	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2440

INPUT
Description: Section: 2440 (Station: -4+29.58); Outlet of proposed box culverts.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.67	1610.4	35.67	1600.4	49.67	1600.4	49.67	1610.4	50.34	1610.4
50.34	1600.4	64.34	1600.4	64.34	1610.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.67	.015	35.67	.015	64.34	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.67	64.34	11.5	8.13	11.5	.3	.5

Cross Section Lid
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
35.67	1611.4	1610.4	64.34	1611.4	1610.4

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1612.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	1605.99	Reach Len. (ft)	11.50	8.13	11.50
Crit W.S. (ft)	1607.65	Flow Area (sq ft)		156.48	
E.G. Slope (ft/ft)	0.008819	Area (sq ft)		156.48	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	28.00	Top Width (ft)		28.00	
Vel Total (ft/s)	19.81	Avg. Vel. (ft/s)		19.81	
Max Chl Dpth (ft)	5.59	Hydr. Depth (ft)		5.59	
Conv. Total (cfs)	33010.3	Conv. (cfs)		33010.3	
Length Wtd. (ft)	8.13	Wetted Per. (ft)		50.35	
Min Ch El (ft)	1600.40	Shear (lb/sq ft)		1.71	
Alpha	1.00	Stream Power (lb/ft s)		33.90	
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	32.42	12.47	6.05
C & E Loss (ft)	0.03	Cum SA (acres)	5.62	1.32	1.59

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2420

INPUT
Description: Section: 2420 (Station: -4+37.71); Proposed rip-rap; Edge of proposed wing walls.
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27.54	1610.4	27.54	1601.4	35.67	1599.51	64.34	1599.51	72.47	1601.4
72.47	1610.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
27.54	.025	27.54	.03	72.47	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
27.54	72.47	14.69	13.46	14.69	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1611.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.42	Wt. n-Val.		0.030	
W.S. Elev (ft)	1602.82	Reach Len. (ft)	14.69	13.46	14.69
Crit W.S. (ft)	1605.12	Flow Area (sq ft)		133.14	
E.G. Slope (ft/ft)	0.057014	Area (sq ft)		133.14	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	44.93	Top Width (ft)		44.93	
Vel Total (ft/s)	23.28	Avg. Vel. (ft/s)		23.28	
Max Chl Dpth (ft)	3.31	Hydr. Depth (ft)		2.96	
Conv. Total (cfs)	12982.9	Conv. (cfs)		12982.9	
Length Wtd. (ft)	13.46	Wetted Per. (ft)		48.19	
Min Ch El (ft)	1599.51	Shear (lb/sq ft)		9.83	
Alpha	1.00	Stream Power (lb/ft s)		228.95	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	32.42	12.44	6.05
C & E Loss (ft)	0.70	Cum SA (acres)	5.62	1.32	1.59

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2400

INPUT
Description: Section: 2400 (Sta: -4+51.17); South of Pioneer Blvd. existing channel with proposed rough grading. Proposed rip-rap. (Existing cross section 2400 from effective model)

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-27.25	1614	2.75	1604	18.74	1602	31.64	1600	37.67	1598
58.81	1598	83.88	1605.15	86.62	1606	116.41	1615.81		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-27.25	.04	18.74	.03	83.88	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
18.74	83.88	74.34	72.39	74.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1610.38	Element	Left OB	Channel	Right OB	
Vel Head (ft)	8.61	Wt. n-Val.		0.030		
W.S. Elev (ft)	1601.77	Reach Len. (ft)	74.34	72.39	74.08	
Crit W.S. (ft)	1604.15	Flow Area (sq ft)		131.65		
E.G. Slope (ft/ft)	0.066908	Area (sq ft)		131.65		
Q Total (cfs)	3100.00	Flow (cfs)		3100.00		
Top Width (ft)	51.85	Top Width (ft)		51.85		
Vel Total (ft/s)	23.55	Avg. Vel. (ft/s)		23.55		
Max Chl Dpth (ft)	3.77	Hydr. Depth (ft)		2.54		
Conv. Total (cfs)	11984.5	Conv. (cfs)		11984.5		
Length Wtd. (ft)	72.78	Wetted Per. (ft)		52.84		
Min Ch El (ft)	1598.00	Shear (lb/sq ft)		10.41		
Alpha	1.00	Stream Power (lb/ft s)		245.08		
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	32.42	12.40	6.05	
C & E Loss (ft)	0.02	Cum SA (acres)	5.62	1.30	1.59	

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2350

INPUT
Description: Section: 2350 (Sta: -5+23.57); South of Pioneer Blvd. existing channel. Approximate end of proposed rip-rap. (Existing cross section 2350 from effective model)

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-178.07	1614	-153.69	1606	-128.06	1604	-46.6	1602	-22.53	1602
25.19	1602	38.98	1598	42.11	1597.24	61.02	1597.76	61.49	1598
68.32	1600	83.6	1604.6	111.69	1614	114.09	1615.15		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-178.07	.04	25.19	.03	83.6	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25.19	83.6	63.58	63.83	63.66	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.72	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.36	Wt. n-Val.	0.040	0.030	0.025	
W.S. Elev (ft)	1605.36	Reach Len. (ft)	63.58	63.83	63.66	
Crit W.S. (ft)	1603.85	Flow Area (sq ft)	445.29	340.48	0.86	
E.G. Slope (ft/ft)	0.001331	Area (sq ft)	445.29	340.48	0.86	
Q Total (cfs)	3100.00	Flow (cfs)	1143.52	1955.53	0.95	
Top Width (ft)	231.36	Top Width (ft)	170.68	58.41	2.27	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)	2.57	5.74	1.10	
Max Chl Dpth (ft)	8.12	Hydr. Depth (ft)	2.61	5.83	0.38	
Conv. Total (cfs)	84958.6	Conv. (cfs)	31339.3	53593.3	26.0	
Length Wtd. (ft)	63.74	Wetted Per. (ft)	170.75	60.10	2.39	
Min Ch El (ft)	1597.24	Shear (lb/sq ft)	0.22	0.47	0.03	
Alpha	1.50	Stream Power (lb/ft s)	0.56	2.70	0.03	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	32.04	12.01	6.05	
C & E Loss (ft)	0.01	Cum SA (acres)	5.47	1.21	1.58	

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2330

INPUT
Description: Section: 2330 (Sta: -6+06.38); South of Pioneer Blvd. existing channel. (Existing cross section 2330 from effective model)

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-232.34	1610	-213.57	1608	-202.51	1606	-170.02	1604	21.93	1602
41.1	1596.83	60.96	1596.94	84.75	1604.16	116.81	1615.73		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-232.34	.04	21.93	.025	60.96	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
21.93	60.96	244.91	239.77	234.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.040	0.025	0.030

C86

W.S. Elev (ft)	1605.15	Reach Len. (ft)	244.91	239.77	234.33		
Crit W.S. (ft)		Flow Area (sq ft)	423.77	274.15	110.83		
E.G. Slope (ft/ft)	0.001001	Area (sq ft)	423.77	274.15	110.83		
Q Total (cfs)	3100.00	Flow (cfs)	793.72	1869.31	436.96		
Top Width (ft)	276.23	Top Width (ft)	210.66	39.03	26.54		
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)	1.87	6.82	3.94		
Max Chl Dpth (ft)	8.32	Hydr. Depth (ft)	2.01	7.02	4.18		
Conv. Total (cfs)	97964.7	Conv. (cfs)	25082.9	59073.1	13808.7		
Length Wtd. (ft)	241.13	Wetted Per. (ft)	210.70	39.72	27.78		
Min Ch El (ft)	1596.83	Shear (lb/sq ft)	0.13	0.43	0.25		
Alpha	2.12	Stream Power (lb/ft s)	0.24	2.94	0.98		
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	31.40	11.56	5.97		
C & E Loss (ft)	0.12	Cum SA (acres)	5.20	1.14	1.56		

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2300

INPUT
Description: Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing channel. (Existing cross section 2300 from effective model)

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-279.66	1608	-273.24	1606	-243.69	1604	-228.95	1602	-211.85	1600
-199.32	1600	-189.03	1602	-163.66	1602	-112.79	1600	12.87	1598.85
31.05	1596	39.89	1595.82	63.64	1595.82	86.88	1603.39	121.14	1615.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-279.66	.04	12.87	.025	63.64	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
12.87	63.64	134.71	313.73	323.04	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)		Flow Area (sq ft)	1290.73	454.90	139.53
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	1290.73	454.90	139.53
Q Total (cfs)	3100.00	Flow (cfs)	1539.99	1340.00	220.01
Top Width (ft)	356.42	Top Width (ft)	276.81	50.77	28.84
Vel Total (ft/s)	1.64	Avg. Vel. (ft/s)	1.19	2.95	1.58
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	4.66	8.96	4.84
Conv. Total (cfs)	269046.0	Conv. (cfs)	133654.3	116296.9	19094.8
Length Wtd. (ft)	198.06	Wetted Per. (ft)	277.34	50.99	30.38
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.04	0.07	0.04
Alpha	1.71	Stream Power (lb/ft s)	0.05	0.22	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	26.58	9.55	5.30
C & E Loss (ft)	0.02	Cum SA (acres)	3.83	0.89	1.41

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2200

INPUT
Description: Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing channel. (Existing cross section 2200 from effective model)

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-529.7	1606	-504.93	1602	-433.36	1600	-422.03	1598	-411.07	1596
-393.06	1596	-382.49	1598	-358.9	1598	-351.33	1596	-339.14	1596
-324.81	1598	-311.83	1596	-284.98	1596	-17.67	1598	19.38	1598
32.13	1594	33.2	1593.65	51.03	1593	71.7	1598.5	111.8	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-529.7	.04	19.38	.025	51.03	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.38	51.03	230.85	258.71	280.12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.41	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	4131.47	347.76	261.33
E.G. Slope (ft/ft)	0.000018	Area (sq ft)	4131.47	347.76	261.33
Q Total (cfs)	3100.00	Flow (cfs)	2487.36	423.95	188.69
Top Width (ft)	615.60	Top Width (ft)	545.41	31.65	38.54
Vel Total (ft/s)	0.65	Avg. Vel. (ft/s)	0.60	1.22	0.72
Max Chl Dpth (ft)	12.41	Hydr. Depth (ft)	7.57	10.99	6.78
Conv. Total (cfs)	736500.3	Conv. (cfs)	590949.4	100722.0	44828.8
Length Wtd. (ft)	242.41	Wetted Per. (ft)	546.81	32.33	40.55
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.23	Stream Power (lb/ft s)	0.01	0.01	0.01
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	18.20	6.66	3.81
C & E Loss (ft)	0.00	Cum SA (acres)	2.55	0.60	1.16

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2120

INPUT
Description: Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing channel. End of bank protection (rip-rap) west sided of channel.

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

-219.24	1608	-197.58	1606	-180.07	1604	-146.34	1598	-109.19	1596
-99.41	1594	-92.4	1594	-41.72	1596	23.32	1595.11	27.27	1594
36.27	1592	42.09	1590.38	64.49	1591	80.92	1594.43	84.7	1596
112.56	1606								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.24	.04	23.32	.025	64.49	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.32	64.49	73	68.06	68.56	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.38	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1813.39	565.75	368.99
E.G. Slope (ft/ft)	*0.000033	Area (sq ft)	1813.39	565.75	368.99
Q Total (cfs)	3100.00	Flow (cfs)	1596.88	1097.70	405.42
Top Width (ft)	302.96	Top Width (ft)	215.46	41.17	46.34
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.88	1.94	1.10
Max Chl Dpth (ft)	15.00	Hydr. Depth (ft)	8.42	13.74	7.96
Conv. Total (cfs)	*539571.4	Conv. (cfs)	*277946.1	*191060.3	70565.1
Length Wtd. (ft)	69.60	Wetted Per. (ft)	216.37	41.77	48.64
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.49	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.45	3.95	1.79
C & E Loss (ft)	0.00	Cum SA (acres)	0.54	0.38	0.89

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2100

INPUT
Description: Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing channel. (Existing cross section 2100 from effective model)

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-81.41	1606	-56.47	1604	-45.38	1602	-37.37	1600	-26.85	1598
-14.73	1596	27.52	1594	32.71	1592	38.34	1590	50	1589.6
61.03	1590	79.71	1600	95.92	1606				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-81.41	.04	-81.41	.025	95.92	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81.41	95.92	68.04	62.28	67.59	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.025	
W.S. Elev (ft)	1605.37	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1410.45	
E.G. Slope (ft/ft)	*0.000040	Area (sq ft)		1410.45	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	167.76	Top Width (ft)		167.76	
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)		1.52	
Max Chl Dpth (ft)	15.77	Hydr. Depth (ft)		8.41	
Conv. Total (cfs)	*339803.5	Conv. (cfs)		*339803.5	
Length Wtd. (ft)	64.04	Wetted Per. (ft)		172.84	
Min Ch El (ft)	1589.60	Shear (lb/sq ft)		0.02	
Alpha	1.00	Stream Power (lb/ft s)		0.03	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.93	2.41	1.50
C & E Loss (ft)	0.05	Cum SA (acres)	0.36	0.22	0.86

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2000

INPUT
Description: Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of I-15 box culvert. (Existing cross section 2000 from effective model)

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	303.13	319.85	320.07	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1605.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1605.17	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1601.38	Flow Area (sq ft)	215.53	195.42	212.36
E.G. Slope (ft/ft)	*0.000144	Area (sq ft)	215.53	195.42	212.36
Q Total (cfs)	2138.00	Flow (cfs)	677.95	775.84	684.21
Top Width (ft)	104.82	Top Width (ft)	48.53	12.00	44.29
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)	3.15	3.97	3.22
Max Chl Dpth (ft)	16.29	Hydr. Depth (ft)	4.44	16.29	4.79
Conv. Total (cfs)	*178233.2	Conv. (cfs)	56516.8	64677.6	57038.8
Length Wtd. (ft)	0.10	Wetted Per. (ft)	50.05	32.00	47.57
Min Ch El (ft)	1588.88	Shear (lb/sq ft)	0.04	0.05	0.04
Alpha	1.04	Stream Power (lb/ft s)	0.12	0.22	0.13

* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	*	0.76 *	1.26 *	1.33 *
* C & E Loss (ft)	*	* Cum SA (acres)	*	0.32 *	0.09 *	0.82 *

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1950

INPUT
Description: Section: 1950; Existing I-15 culvert (12' x 10')
Distance from Upstream XS = .1
Deck/Roadway Width = 319.65
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
-4.53	1603.83	1582.19	44	1603.83	1582.19	44	1603.83	1598.88
56	1603.83	1598.88	56	1603.83	1582.19	100.29	1603.83	1582.19

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left Right Coeff Contr. Expan.
44 56 .3 .5

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-4.53	1603.83	1598.88	1104.82	1603.83	1598.88

Downstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left Right Coeff Contr. Expan.
44 56 .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 = 1603.83
Energy head used in apillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd =.8164966
Max Low Cord = 1598.88

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)	* 1605.35	* Element	*Inside BR US	*Inside BR DS	*
* W.S. US. (ft)	* 1605.17	* E.G. Elev (ft)	* 1605.35	* 1604.64	*
* Q Total (cfs)	* 2138.00	* W.S. Elev (ft)	* 1605.17	* 1604.37	*
* Q Bridge (cfs)	* 1624.24	* Crit W.S. (ft)	* 1598.84	* 1594.60	*
* Q Weir (cfs)	* 513.76	* Max Chl Dpth (ft)	* 16.29	* 22.18	*
* Weir Sta Lft (ft)	* -4.53	* Vel Total (ft/s)	* 8.23	* 3.28	*
* Weir Sta Rgt (ft)	* 100.29	* Flow Area (sq ft)	* 259.86	* 652.15	*
* Weir Submerg	* 0.00	* Froude # Chl	* 0.36	* 0.19	*
* Weir Max Depth (ft)	* 1.52	* Specif Force (cu ft)	* 2016.42	* 5524.01	*
* Min El Weir Flow (ft)	* 1603.84	* Hydr Depth (ft)	* 2.48	* 2.84	*
* Min El Prs (ft)	* 1598.88	* W.P. Total (ft)	* 151.33	* 544.03	*
* Delta EG (ft)	* 8.23	* Conv. Total (cfs)	*	*	*
* Delta WS (ft)	* 13.08	* Top Width (ft)	* 104.82	* 229.89	*
* BR Open Area (sq ft)	* 120.00	* Frctn Loss (ft)	*	*	*
* BR Open Vel (ft/s)	* 13.54	* C & E Loss (ft)	*	*	*
* Coef of Q	*	* Shear Total (lb/sq ft)	*	*	*
* Br Sel Method	* Press/Weir	* Power Total (lb/ft s)	*	*	*

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used for pressure flow.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1900

INPUT
Description: Section: 1900; South I-15. Outlet of existing box culvert at I-15. (12x10) (Match existing cross section 1900 from effective model)

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	60.81	58.98	66.92	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1597.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.09	Reach Len. (ft)			
Crit W.S. (ft)	1592.09	Flow Area (sq ft)		118.76	
E.G. Slope (ft/ft)	0.005698	Area (sq ft)		118.76	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		9.90	
Conv. Total (cfs)	28323.5	Conv. (cfs)		28323.5	
Length Wtd. (ft)		Wetted Per. (ft)		31.79	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)		23.92	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Pulsipher Wash

Reach	River Sta.	n1	n2	n3
Falcon Ridge	3900	.04	.025	.04
Falcon Ridge	3800	.04	.025	.04
Falcon Ridge	3750	.016	.025	.04
Falcon Ridge	3700	.016	.025	.04
Falcon Ridge	3620	.016	.025	.04
Falcon Ridge	3580	.016	.025	.04
Falcon Ridge	3500	.016	.025	.04
Falcon Ridge	3480	.016	.025	.04
Falcon Ridge	3400	.016	.025	.04
Falcon Ridge	3375	.016	.025	.04
Falcon Ridge	3350	.016	.025	.04
Falcon Ridge	3325	.016	.025	.03
Falcon Ridge	3300	.022	.015	.022
Falcon Ridge	3280	.025	.015	.025
Falcon Ridge	3270	.015	.015	.015
Falcon Ridge	3260	.015	.015	.015
Falcon Ridge	3240	.015	.015	.015
Falcon Ridge	3220	.015	.015	.015
Falcon Ridge	3200	.015	.015	.015
Falcon Ridge	3175	.015	.015	.015
Falcon Ridge	3150	.015	.015	.015
Falcon Ridge	3125	.015	.015	.015
Falcon Ridge	3100	.015	.015	.015
Falcon Ridge	3090	Bridge		
Falcon Ridge	3080	.015	.015	.015
Falcon Ridge	3070	.015	.015	.015
Falcon Ridge	3025	.015	.015	.015
Falcon Ridge	3000	.015	.015	.015
Falcon Ridge	2970	.015	.015	.015
Falcon Ridge	2935	.015	.015	.015
Falcon Ridge	2900	.015	.015	.015
Falcon Ridge	2870	.015	.015	.015
Falcon Ridge	2835	.015	.015	.015
Falcon Ridge	2800	.015	.015	.015
Falcon Ridge	2770	.015	.015	.015
Falcon Ridge	2735	.015	.015	.015
Falcon Ridge	2700	.015	.015	.015
Falcon Ridge	2690	.015	.015	.015
Falcon Ridge	2680	.015	.015	.015
Falcon Ridge	2670	.015	.015	.015
Falcon Ridge	2660	.015	.015	.015
Falcon Ridge	2650	.015	.015	.015
Falcon Ridge	2620	Bridge		
Falcon Ridge	2590	.015	.015	.015
Falcon Ridge	2570	.015	.015	.015
Falcon Ridge	2550	.015	.015	.015
Falcon Ridge	2540	.015	.015	.015
Falcon Ridge	2530	.015	.015	.015
Falcon Ridge	2515	.015	.015	.015
Falcon Ridge	2510	.015	.015	.015
Falcon Ridge	2500	.015	.015	.015
Falcon Ridge	2460	.015	.015	.015
Falcon Ridge	2440	.015	.015	.015
Falcon Ridge	2420	.025	.03	.025
Falcon Ridge	2400	.04	.03	.025
Falcon Ridge	2350	.04	.03	.025
Falcon Ridge	2330	.04	.025	.03
Falcon Ridge	2300	.04	.025	.03
Falcon Ridge	2200	.04	.025	.03
Falcon Ridge	2120	.04	.025	.03
Falcon Ridge	2100	.04	.025	.03
Falcon Ridge	2000	.015	.015	.015
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Pulsipher Wash

Reach	River Sta.	Left	Channel	Right
Falcon Ridge	3900	238.03	320.4	468.3
Falcon Ridge	3800	421.12	355.77	288.45
Falcon Ridge	3750	240	221	221
Falcon Ridge	3700	282	284	355
Falcon Ridge	3620	151	149	106
Falcon Ridge	3580	288	297	315
Falcon Ridge	3500	109	113	108
Falcon Ridge	3480	249	239	282
Falcon Ridge	3400	118	116	388
Falcon Ridge	3375	73	85	303
Falcon Ridge	3350	101	104	110
Falcon Ridge	3325	133	117	132
Falcon Ridge	3300	20	20	20
Falcon Ridge	3280	15	15	15
Falcon Ridge	3270	39.15	39.15	39.15
Falcon Ridge	3260	100	100	100
Falcon Ridge	3240	100	100	100
Falcon Ridge	3220	100	100	100
Falcon Ridge	3200	97	100	103
Falcon Ridge	3175	96	100	102
Falcon Ridge	3150	97	100	102
Falcon Ridge	3125	50	51.61	54
Falcon Ridge	3100	127.02	127.02	127.02
Falcon Ridge	3090	Bridge		
Falcon Ridge	3080	10	10	10
Falcon Ridge	3070	109.78	111.35	113.02
Falcon Ridge	3025	99.3	100	100.68
Falcon Ridge	3000	99.3	100	100.68
Falcon Ridge	2970	99.3	100	100.68
Falcon Ridge	2935	100	100	100
Falcon Ridge	2900	100	100	100
Falcon Ridge	2870	100	100	100
Falcon Ridge	2835	100	100	100
Falcon Ridge	2800	100	100	100
Falcon Ridge	2770	100	100	100
Falcon Ridge	2735	100	100	100
Falcon Ridge	2700	23.22	23.22	23.22
Falcon Ridge	2690	44.31	43.13	41.96
Falcon Ridge	2680	34.34	33.63	32.93
Falcon Ridge	2670	25	25	25
Falcon Ridge	2660	10.9	10	10.9
Falcon Ridge	2650	165	165	165
Falcon Ridge	2620	Bridge		
Falcon Ridge	2590	10.96	10	10.84
Falcon Ridge	2570	19.35	18.3	17.25
Falcon Ridge	2550	29.95	28.9	27.86
Falcon Ridge	2540	44.32	42.76	41.21
Falcon Ridge	2530	51.78	49.97	48.15
Falcon Ridge	2515	67.85	65.47	63.09
Falcon Ridge	2510	52.93	52.93	52.93
Falcon Ridge	2500	81.52	81.52	81.52
Falcon Ridge	2460	79.58	79.58	79.58
Falcon Ridge	2440	11.5	8.13	11.5
Falcon Ridge	2420	14.69	13.46	14.69
Falcon Ridge	2400	74.34	72.39	74.08
Falcon Ridge	2350	63.58	63.83	63.66
Falcon Ridge	2330	244.91	239.77	234.33
Falcon Ridge	2300	134.71	313.73	323.04
Falcon Ridge	2200	230.85	258.71	280.12
Falcon Ridge	2120	73	68.06	68.56
Falcon Ridge	2100	68.04	62.28	67.59
Falcon Ridge	2000	303.13	319.85	320.07
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	60.81	58.98	66.92

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Pulsipher Wash

Reach	River Sta.	Contr.	Expan.
Falcon Ridge	3900	.1	.3
Falcon Ridge	3800	.1	.3
Falcon Ridge	3750	.1	.3
Falcon Ridge	3700	.1	.3
Falcon Ridge	3620	.1	.3
Falcon Ridge	3580	.1	.3
Falcon Ridge	3500	.1	.3
Falcon Ridge	3480	.1	.3
Falcon Ridge	3400	.1	.3
Falcon Ridge	3375	.1	.3
Falcon Ridge	3350	.1	.3
Falcon Ridge	3325	.1	.3
Falcon Ridge	3300	.1	.3
Falcon Ridge	3280	.1	.3
Falcon Ridge	3270	.1	.3
Falcon Ridge	3260	.1	.3
Falcon Ridge	3240	.1	.3
Falcon Ridge	3220	.1	.3
Falcon Ridge	3200	.1	.3
Falcon Ridge	3175	.1	.3
Falcon Ridge	3150	.1	.3
Falcon Ridge	3125	.3	.5
Falcon Ridge	3100	.3	.5
Falcon Ridge	3090	Bridge	
Falcon Ridge	3080	.3	.5
Falcon Ridge	3070	.1	.3
Falcon Ridge	3025	.1	.3
Falcon Ridge	3000	.1	.3
Falcon Ridge	2970	.1	.3
Falcon Ridge	2935	.1	.3
Falcon Ridge	2900	.1	.3
Falcon Ridge	2870	.1	.3
Falcon Ridge	2835	.1	.3
Falcon Ridge	2800	.1	.3
Falcon Ridge	2770	.1	.3
Falcon Ridge	2735	.1	.3
Falcon Ridge	2700	.1	.3
Falcon Ridge	2690	.1	.3
Falcon Ridge	2680	.1	.3
Falcon Ridge	2670	.1	.3
Falcon Ridge	2660	.1	.3
Falcon Ridge	2650	.3	.5

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*Falcon Ridge     *    2620    *Bridge   *          *
*Falcon Ridge     *    2590    *         .3*        .5*
*Falcon Ridge     *    2570    *         .1*        .3*
*Falcon Ridge     *    2550    *         .1*        .3*
*Falcon Ridge     *    2540    *         .1*        .3*
*Falcon Ridge     *    2530    *         .1*        .3*
*Falcon Ridge     *    2515    *         .1*        .3*
*Falcon Ridge     *    2510    *         .1*        .3*
*Falcon Ridge     *    2500    *         .1*        .3*
*Falcon Ridge     *    2460    *         .1*        .3*
*Falcon Ridge     *    2440    *         .3*        .5*
*Falcon Ridge     *    2420    *         .1*        .3*
*Falcon Ridge     *    2400    *         .1*        .3*
*Falcon Ridge     *    2350    *         .1*        .3*
*Falcon Ridge     *    2330    *         .1*        .3*
*Falcon Ridge     *    2300    *         .1*        .3*
*Falcon Ridge     *    2200    *         .1*        .3*
*Falcon Ridge     *    2120    *         .1*        .3*
*Falcon Ridge     *    2100    *         .3*        .5*
*Falcon Ridge     *    2000    *         .3*        .5*
*Falcon Ridge     *    1950    *Bridge   *          *
*Falcon Ridge     *    1900    *         .3*        .5*
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Profile Output Table - Standard Table 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
Falcon Ridge	3900	PF 1	2318.00	1656.00	1658.78	1658.78	1659.61	0.008011	7.31	317.01	196.56	1.01
Falcon Ridge	3800	PF 1	2318.00	1654.00	1655.47	1655.66	1656.50	0.011905	8.15	284.32	201.42	1.21
Falcon Ridge	3750	PF 1	2318.00	1648.25	1652.75	1652.46	1653.50	0.004912	6.95	333.47	153.97	0.83
Falcon Ridge	3700	PF 1	2318.00	1646.87	1650.90	1650.90	1652.18	0.006723	9.07	255.57	100.21	1.00
Falcon Ridge	3620	PF 1	2318.00	1643.32	1646.61	1647.35	1648.84	0.023515	11.98	193.46	127.68	1.72
Falcon Ridge	3580	PF 1	2318.00	1641.59	1646.24	1646.24	1646.87	0.009061	6.40	361.98	299.75	1.03
Falcon Ridge	3500	PF 1	2318.00	1638.87	1641.44	1641.86	1642.76	0.022651	9.22	251.42	239.73	1.59
Falcon Ridge	3480	PF 1	2318.00	1638.25	1641.11	1641.05	1641.53	0.007658	5.20	446.02	445.82	0.92
Falcon Ridge	3400	PF 1	2318.00	1635.90	1638.96	1638.96	1639.53	0.009055	6.06	382.51	338.93	1.01
Falcon Ridge	3375	PF 1	2318.00	1634.00	1638.46	1636.37	1638.51	0.000343	1.73	1336.37	666.28	0.22
Falcon Ridge	3350	PF 1	2318.00	1630.00	1638.45		1638.49	0.000138	1.55	1500.10	450.03	0.15
Falcon Ridge	3325	PF 1	2318.00	1629.50	1638.45		1638.48	0.000070	1.42	1636.07	331.72	0.11
Falcon Ridge	3300	PF 1	2450.00	1628.41	1638.19		1638.44	0.000149	5.20	762.77	139.99	0.29
Falcon Ridge	3280	PF 1	2450.00	1628.10	1637.68	1635.61	1638.39	0.000479	7.73	479.66	113.15	0.44
Falcon Ridge	3270	PF 1	2450.00	1627.87	1634.74	1634.74	1638.11	0.003083	14.74	166.23	24.66	1.00
Falcon Ridge	3260	PF 1	2450.00	1627.27	1633.09	1634.14	1637.82	0.005019	17.45	140.39	24.66	1.29
Falcon Ridge	3240	PF 1	2450.00	1625.76	1630.85	1632.63	1637.06	0.007477	20.00	122.53	24.66	1.58
Falcon Ridge	3220	PF 1	2450.00	1624.24	1629.00	1631.11	1636.14	0.009200	21.45	114.23	24.66	1.76
Falcon Ridge	3200	PF 1	2450.00	1622.72	1627.27	1629.59	1635.09	0.010518	22.44	109.20	24.66	1.88
Falcon Ridge	3175	PF 1	2450.00	1621.21	1625.63	1628.08	1633.94	0.011529	23.14	105.89	24.66	1.97
Falcon Ridge	3150	PF 1	2450.00	1619.69	1624.01	1626.56	1632.71	0.012338	23.67	103.51	24.66	2.04
Falcon Ridge	3125	PF 1	2450.00	1618.17	1622.42	1625.04	1631.42	0.012965	24.06	101.81	24.66	2.09
Falcon Ridge	3100	PF 1	2450.00	1617.39	1621.47	1624.11	1630.67	0.013547	24.34	100.67	24.66	2.12
Falcon Ridge	3090		Bridge									
Falcon Ridge	3080	PF 1	2450.00	1616.37	1621.39	1623.25	1627.82	0.011037	20.34	120.44	23.99	1.60
Falcon Ridge	3070	PF 1	2450.00	1616.29	1620.38	1622.50	1627.49	0.013176	21.40	114.50	28.00	1.86
Falcon Ridge	3025	PF 1	2450.00	1615.40	1619.85	1621.61	1625.86	0.010410	19.69	124.45	28.00	1.65
Falcon Ridge	3000	PF 1	2450.00	1614.60	1619.26	1620.81	1624.73	0.009094	18.76	130.58	28.00	1.53
Falcon Ridge	2970	PF 1	2450.00	1613.80	1620.01	1620.01	1623.09	0.004133	14.09	173.88	28.00	1.00
Falcon Ridge	2935	PF 1	3000.00	1613.00	1620.11	1620.11	1623.64	0.004314	15.08	199.00	28.00	1.00
Falcon Ridge	2900	PF 1	3000.00	1612.20	1618.43	1619.31	1623.02	0.006140	17.19	174.48	28.00	1.21
Falcon Ridge	2870	PF 1	3000.00	1611.40	1617.41	1618.49	1622.34	0.006761	17.82	168.39	28.00	1.28
Falcon Ridge	2835	PF 1	3000.00	1610.60	1616.50	1617.69	1621.62	0.007121	18.16	165.21	28.00	1.32
Falcon Ridge	2800	PF 1	3000.00	1609.80	1615.62	1616.91	1620.88	0.007386	18.40	163.01	28.00	1.34
Falcon Ridge	2770	PF 1	3000.00	1609.00	1614.78	1616.11	1620.12	0.007545	18.55	161.74	28.00	1.36
Falcon Ridge	2735	PF 1	3000.00	1608.20	1613.94	1615.31	1619.35	0.007674	18.66	160.74	28.00	1.37
Falcon Ridge	2700	PF 1	3000.00	1607.40	1613.12	1614.49	1618.57	0.007766	18.75	160.04	28.00	1.38
Falcon Ridge	2690	PF 1	3000.00	1607.21	1612.91	1614.32	1618.39	0.007814	18.79	159.68	28.00	1.39
Falcon Ridge	2680	PF 1	3000.00	1606.87	1612.58	1613.96	1618.05	0.007799	18.77	159.79	28.00	1.38
Falcon Ridge	2670	PF 1	3000.00	1606.60	1612.30	1613.69	1617.79	0.007828	18.80	159.58	28.00	1.39
Falcon Ridge	2660	PF 1	3000.00	1606.40	1612.10	1613.49	1617.58	0.007810	18.78	159.71	28.00	1.39
Falcon Ridge	2650	PF 1	3000.00	1606.32	1610.22	1612.29	1617.31	0.014785	21.37	140.37	36.00	1.91
Falcon Ridge	2620		Bridge									
Falcon Ridge	2590	PF 1	3000.00	1605.00	1611.09	1611.09	1614.11	0.005657	13.94	215.16	35.33	

Falcon Ridge	2570	PF 1	3000.00	1604.89	1611.98	1611.98	1615.53	0.004341	15.11	198.55	28.00
Falcon Ridge	2550	PF 1	3000.00	1604.70	1611.31	1611.81	1615.39	0.005232	16.20	185.16	28.00
Falcon Ridge	2540	PF 1	3000.00	1604.39	1610.67	1611.48	1615.19	0.006009	17.06	175.88	28.00
Falcon Ridge	2530	PF 1	3000.00	1603.93	1609.94	1611.02	1614.87	0.006762	17.82	168.38	28.00
Falcon Ridge	2515	PF 1	3000.00	1603.40	1609.21	1610.49	1614.49	0.007413	18.43	162.79	28.00
Falcon Ridge	2510	PF 1	3000.00	1602.69	1608.32	1609.80	1613.95	0.008113	19.05	157.51	28.00
Falcon Ridge	2500	PF 1	3100.00	1602.13	1608.06	1609.38	1613.47	0.007488	18.66	166.14	28.00
Falcon Ridge	2460	PF 1	3100.00	1601.26	1606.99	1608.51	1612.79	0.008254	19.34	160.31	28.00
Falcon Ridge	2440	PF 1	3100.00	1600.40	1605.99	1607.65	1612.08	0.008819	19.81	156.48	28.00
Falcon Ridge	2420	PF 1	3100.00	1599.51	1602.82	1605.12	1611.23	0.057014	23.28	133.14	44.93
Falcon Ridge	2400	PF 1	3100.00	1598.00	1601.77	1604.15	1610.38	0.066908	23.55	131.65	51.85
Falcon Ridge	2350	PF 1	3100.00	1597.24	1605.36	1603.85	1605.72	0.001331	5.74	786.63	231.36
Falcon Ridge	2330	PF 1	3100.00	1596.83	1605.15		1605.64	0.001001	6.82	808.76	276.23
Falcon Ridge	2300	PF 1	3100.00	1595.82	1605.37		1605.44	0.000133	2.95	1885.16	356.42
Falcon Ridge	2200	PF 1	3100.00	1593.00	1605.41		1605.42	0.000018	1.22	4740.57	615.60
Falcon Ridge	2120	PF 1	3100.00	1590.38	1605.38		1605.41	0.000033	1.94	2748.13	302.96
Falcon Ridge	2100	PF 1	2138.00	1589.60	1605.37		1605.41	0.000040	1.52	1410.45	167.76
Falcon Ridge	2000	PF 1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82
Falcon Ridge	1950		Bridge								
Falcon Ridge	1900	PF 1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00

Profile Output Table - CHECKRAS

Reach	River Sta	Profile	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)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)
Falcon Ridge	3900	PF 1	1.01	196.56	25897.6		3.35		92.27	
199.90	1656.00									
Falcon Ridge	3800	PF 1	1.21	201.42	21244.3		-27.75		2.47	
173.67	1654.00									
Falcon Ridge	3750	PF 1	0.83	153.97	33072.7		-72.53		3.49	
81.44	1648.25									
Falcon Ridge	3700	PF 1	1.00	100.21	28270.2		14.66		117.27	
114.86	1646.87									
Falcon Ridge	3620	PF 1	1.72	127.68	15116.2		24.79		167.68	
152.47	1643.32									
Falcon Ridge	3580	PF 1	1.03	299.75	24351.0		15.17		165.14	
314.92	1641.59									
Falcon Ridge	3500	PF 1	1.59	239.73	15401.7		30.72		217.58	
424.57	1638.87									
Falcon Ridge	3480	PF 1	0.92	445.82	26489.1		2.51		214.37	
448.33	1638.25									
Falcon Ridge	3400	PF 1	1.01	338.93	24359.4		27.73		177.87	
366.66	1635.90									
Falcon Ridge	3375	PF 1	0.22	666.28	125221.6		7.80		331.51	
674.08	1634.00									
Falcon Ridge	3350	PF 1	0.15	450.03	197097.6		10.57		238.37	
460.61	1630.00									
Falcon Ridge	3325	PF 1	0.11	331.72	276606.1		-0.41		163.07	
331.30	1629.50									
Falcon Ridge	3300	PF 1	0.29	139.99	200956.6		-7.35		50.00	
132.64	1628.41									
Falcon Ridge	3280	PF 1	0.44	113.15	111906.1		-5.19		50.00	
107.96	1628.10									
Falcon Ridge	3270	PF 1	1.00	24.66	44125.8		37.67		50.00	
62.33	1627.87									
Falcon Ridge	3260	PF 1	1.29	24.66	34581.9		37.67		50.00	
62.33	1627.27									
Falcon Ridge	3240	PF 1	1.58	24.66	28334.5		37.67		50.00	
62.33	1625.76									
Falcon Ridge	3220	PF 1	1.76	24.66	25543.3		37.67		50.00	
62.33	1624.24									
Falcon Ridge	3200	PF 1	1.88	24.66	23889.6		37.67		50.00	
62.33	1622.72									
Falcon Ridge	3175	PF 1	1.97	24.66	22817.4		37.67		50.00	
62.33	1621.21									
Falcon Ridge	3150	PF 1	2.04	24.66	22056.7		37.67		50.00	
62.33	1619.69									
Falcon Ridge	3125	PF 1	2.09	24.66	21517.3		37.67		50.00	
62.33	1618.17									
Falcon Ridge	3100	PF 1	2.12	24.66	21049.6		37.67		50.00	
62.33	1617.39									
Falcon Ridge	3090 BR U	PF 1	2.02	23.99	20251.0		37.67		50.00	
62.33	1617.39									
Falcon Ridge	3090 BR D	PF 1	1.60	23.99	25265.2		37.67		50.00	
62.33	1616.37									
Falcon Ridge	3080	PF 1	1.60	23.99	23320.8		37.67		50.00	
62.33	1616.37									
Falcon Ridge	3070	PF 1	1.86	28.00	21344.3		35.67		50.01	
64.34	1616.29									
Falcon Ridge	3025	PF 1	1.65	28.00	24012.9		35.67		50.01	
64.34	1615.40									
Falcon Ridge	3000	PF 1	1.53	28.00	25691.4		35.67		50.01	
64.34	1614.60									
Falcon Ridge	2970	PF 1	1.00	28.00	38107.3		35.67		50.01	
64.34	1613.80									
Falcon Ridge	2935	PF 1	1.00	28.00	45673.3		35.67		50.01	
64.34	1613.00									
Falcon Ridge	2900	PF 1	1.21	28.00	38285.7		35.67		50.01	
64.34	1612.20									
Falcon Ridge	2870	PF 1	1.28	28.00	36486.3		35.67		50.01	
64.34	1611.40									
Falcon Ridge	2835	PF 1	1.32	28.00	35551.7		35.67		50.01	

	64.34	1610.60							
Falcon Ridge	2800	PF 1	1.34	28.00	34906.7		35.67		50.01
	64.34	1609.80							
Falcon Ridge	2770	PF 1	1.36	28.00	34537.7		35.67		50.01
	64.34	1609.00							
Falcon Ridge	2735	PF 1	1.37	28.00	34246.9		35.67		50.01
	64.34	1608.20							
Falcon Ridge	2700	PF 1	1.38	28.00	34042.1		35.67		50.01
	64.34	1607.40							
Falcon Ridge	2690	PF 1	1.39	28.00	33937.7		35.67		50.01
	64.34	1607.21							
Falcon Ridge	2680	PF 1	1.38	28.00	33970.5		35.67		50.01
	64.34	1606.87							
Falcon Ridge	2670	PF 1	1.39	28.00	33907.9		35.67		50.01
	64.34	1606.60							
Falcon Ridge	2660	PF 1	1.39	28.00	33945.7		35.67		50.01
	64.34	1606.40							
Falcon Ridge	2650	PF 1	1.91	36.00	24672.6		31.33		50.00
	68.67	1606.32							
Falcon Ridge	2620 BR U	PF 1	1.91	35.99	24679.1		31.33		50.00
	68.67	1606.32							
Falcon Ridge	2620 BR D	PF 1	0.97	35.32	40695.0		31.33		50.00
	68.67	1605.00							
Falcon Ridge	2590	PF 1	1.00	35.33	39885.1		31.33		50.00
	68.67	1605.00							
Falcon Ridge	2570	PF 1	1.00	28.00	45534.5		35.67		50.01
	64.34	1604.89							
Falcon Ridge	2550	PF 1	1.11	28.00	41476.7		35.67		50.01
	64.34	1604.70							
Falcon Ridge	2540	PF 1	1.20	28.00	38702.1		35.67		50.01
	64.34	1604.39							
Falcon Ridge	2530	PF 1	1.28	28.00	36481.2		35.67		50.01
	64.34	1603.93							
Falcon Ridge	2515	PF 1	1.35	28.00	34844.8		35.67		50.01
	64.34	1603.40							
Falcon Ridge	2510	PF 1	1.42	28.00	33307.1		35.67		50.01
	64.34	1602.69							
Falcon Ridge	2500	PF 1	1.35	28.00	35825.3		35.67		50.01
	64.34	1602.13							
Falcon Ridge	2460	PF 1	1.42	28.00	34120.6		35.67		50.01
	64.34	1601.26							
Falcon Ridge	2440	PF 1	1.48	28.00	33010.3		35.67		50.01
	64.34	1600.40							
Falcon Ridge	2420	PF 1	2.38	44.93	12982.9		27.54		50.01
	72.47	1599.51							
Falcon Ridge	2400	PF 1	2.60	51.85	11984.5		20.20		51.31
	72.04	1598.00							
Falcon Ridge	2350	PF 1	0.42	231.36	84958.6		-145.49		54.40
	85.87	1597.24							
Falcon Ridge	2330	PF 1	0.45	276.23	97964.7		-188.73		41.45
	87.50	1596.83							
Falcon Ridge	2300	PF 1	0.17	356.42	269046.0		-263.94		38.26
	92.48	1595.82							
Falcon Ridge	2200	PF 1	0.06	615.60	736500.3		-526.03		35.21
	89.57	1593.00							
Falcon Ridge	2120	PF 1	0.09	302.96	539571.4		-192.14		43.91
	110.83	1590.38							
Falcon Ridge	2100	PF 1	0.09	167.76	339803.5		-73.54		7.25
	94.21	1589.60							
Falcon Ridge	2000	PF 1	0.17	104.82	178233.2		-4.53		50.00
	100.29	1588.88							
Falcon Ridge	1950 BR U	PF 1	0.36	104.82			-4.53		50.00
	100.29	1588.88							
Falcon Ridge	1950 BR D	PF 1	0.19	229.89			5.56		50.00
	235.45	1582.19							
Falcon Ridge	1900	PF 1	1.01	12.00	28323.5		44.00		50.00
	56.00	1582.19							

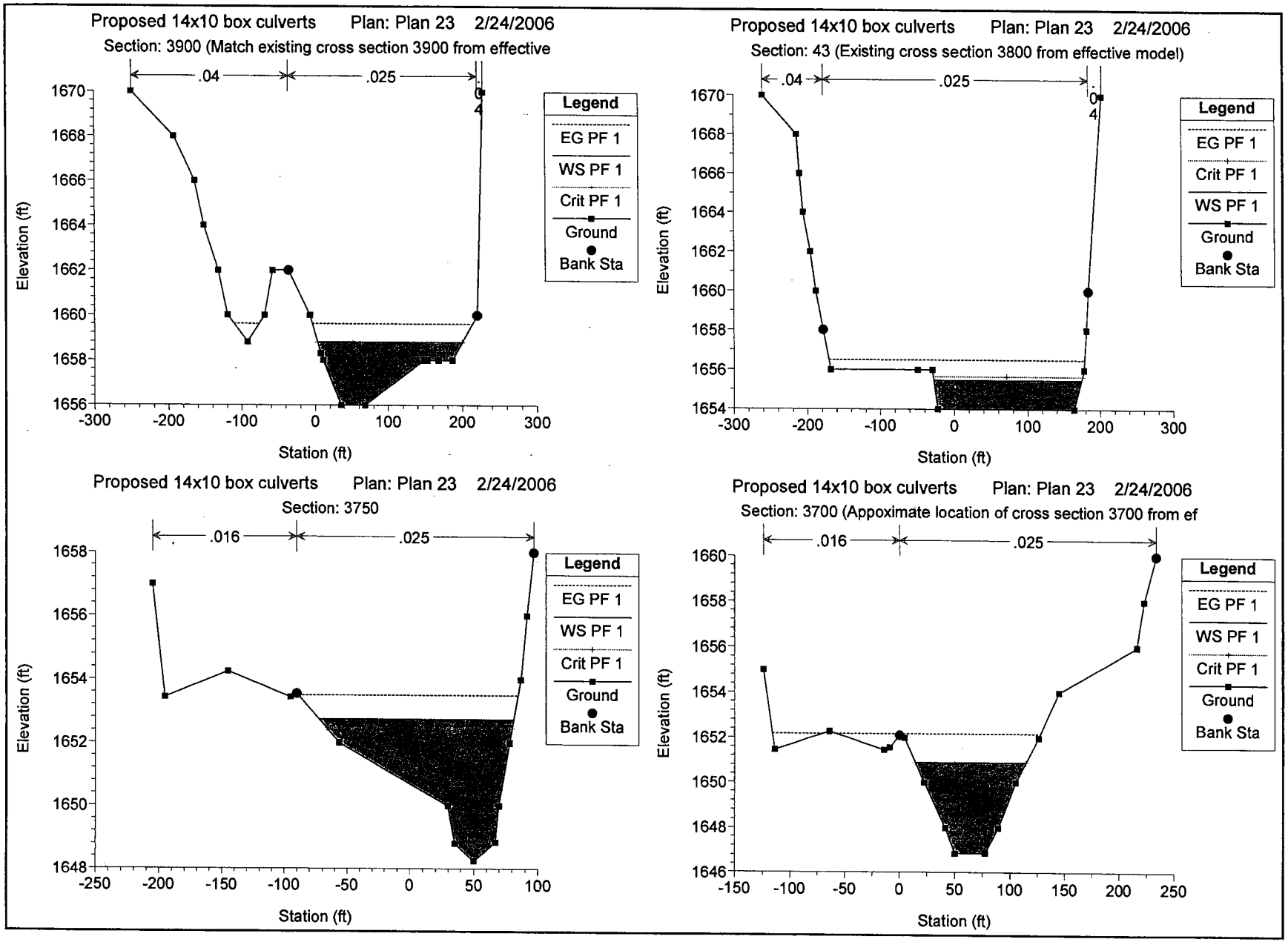
HEC-RAS Plan: Plan 23 River: Pulsipher Wash Reach: Falcon Ridge Profile: PF 1

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)	
Falcon Ridge	3900	PF 1	2318.00	1656.00	1658.78	1658.78	1659.61	0.008011	7.31	317.01	196.56	1.01
Falcon Ridge	3800	PF 1	2318.00	1654.00	1655.47	1655.66	1656.50	0.011905	8.15	284.32	201.42	1.21
Falcon Ridge	3750	PF 1	2318.00	1648.25	1652.75	1652.46	1653.50	0.004912	6.95	333.47	153.97	0.83
Falcon Ridge	3700	PF 1	2318.00	1646.87	1650.90	1650.90	1652.18	0.006723	9.07	255.57	100.21	1.00
Falcon Ridge	3620	PF 1	2318.00	1643.32	1646.61	1647.35	1648.84	0.023515	11.98	193.46	127.68	1.72
Falcon Ridge	3580	PF 1	2318.00	1641.59	1646.24	1646.24	1646.87	0.009061	6.40	361.98	299.75	1.03
Falcon Ridge	3500	PF 1	2318.00	1638.87	1641.44	1641.86	1642.76	0.022651	9.22	251.42	239.73	1.59
Falcon Ridge	3480	PF 1	2318.00	1638.25	1641.11	1641.05	1641.53	0.007658	5.20	446.02	445.82	0.92
Falcon Ridge	3400	PF 1	2318.00	1635.90	1638.96	1638.96	1639.53	0.009055	6.06	382.51	338.93	1.01
Falcon Ridge	3375	PF 1	2318.00	1634.00	1638.46	1636.37	1638.51	0.000343	1.73	1336.37	666.28	0.22
Falcon Ridge	3350	PF 1	2318.00	1630.00	1638.45		1638.49	0.000138	1.55	1500.10	450.03	0.15
Falcon Ridge	3325	PF 1	2318.00	1629.50	1638.45		1638.48	0.000070	1.42	1636.07	331.72	0.11
Falcon Ridge	3300	PF 1	2450.00	1628.41	1638.19		1638.44	0.000149	5.20	762.77	139.99	0.29
Falcon Ridge	3280	PF 1	2450.00	1628.10	1637.68	1635.61	1638.39	0.000479	7.73	479.66	113.15	0.44
Falcon Ridge	3270	PF 1	2450.00	1627.87	1634.74	1634.74	1638.11	0.003083	14.74	166.23	24.66	1.00
Falcon Ridge	3260	PF 1	2450.00	1627.27	1633.09	1634.14	1637.82	0.005019	17.45	140.39	24.66	1.29
Falcon Ridge	3240	PF 1	2450.00	1625.76	1630.85	1632.63	1637.06	0.007477	20.00	122.53	24.66	1.58
Falcon Ridge	3220	PF 1	2450.00	1624.24	1629.00	1631.11	1636.14	0.009200	21.45	114.23	24.66	1.76
Falcon Ridge	3200	PF 1	2450.00	1622.72	1627.27	1629.59	1635.09	0.010518	22.44	109.20	24.66	1.88
Falcon Ridge	3175	PF 1	2450.00	1621.21	1625.63	1628.08	1633.94	0.011529	23.14	105.89	24.66	1.97
Falcon Ridge	3150	PF 1	2450.00	1619.69	1624.01	1626.56	1632.71	0.012338	23.67	103.51	24.66	2.04
Falcon Ridge	3125	PF 1	2450.00	1618.17	1622.42	1625.04	1631.42	0.012965	24.06	101.81	24.66	2.09
Falcon Ridge	3100	PF 1	2450.00	1617.39	1621.47	1624.11	1630.67	0.013547	24.34	100.67	24.66	2.12
Falcon Ridge	3090		Bridge									
Falcon Ridge	3080	PF 1	2450.00	1616.37	1621.39	1623.25	1627.82	0.011037	20.34	120.44	23.99	1.60
Falcon Ridge	3070	PF 1	2450.00	1616.29	1620.38	1622.50	1627.49	0.013176	21.40	114.50	28.00	1.86
Falcon Ridge	3025	PF 1	2450.00	1615.40	1619.85	1621.61	1625.86	0.010410	19.69	124.45	28.00	1.65
Falcon Ridge	3000	PF 1	2450.00	1614.60	1619.26	1620.81	1624.73	0.009094	18.76	130.58	28.00	1.53
Falcon Ridge	2970	PF 1	2450.00	1613.80	1620.01	1620.01	1623.09	0.004133	14.09	173.88	28.00	1.00
Falcon Ridge	2935	PF 1	3000.00	1613.00	1620.11	1620.11	1623.64	0.004314	15.08	199.00	28.00	1.00
Falcon Ridge	2900	PF 1	3000.00	1612.20	1618.43	1619.31	1623.02	0.006140	17.19	174.48	28.00	1.21
Falcon Ridge	2870	PF 1	3000.00	1611.40	1617.41	1618.49	1622.34	0.006761	17.82	168.39	28.00	1.28
Falcon Ridge	2835	PF 1	3000.00	1610.60	1616.50	1617.69	1621.62	0.007121	18.16	165.21	28.00	1.32
Falcon Ridge	2800	PF 1	3000.00	1609.80	1615.62	1616.91	1620.88	0.007386	18.40	163.01	28.00	1.34
Falcon Ridge	2770	PF 1	3000.00	1609.00	1614.78	1616.11	1620.12	0.007545	18.55	161.74	28.00	1.36
Falcon Ridge	2735	PF 1	3000.00	1608.20	1613.94	1615.31	1619.35	0.007674	18.66	160.74	28.00	1.37
Falcon Ridge	2700	PF 1	3000.00	1607.40	1613.12	1614.49	1618.57	0.007766	18.75	160.04	28.00	1.38
Falcon Ridge	2690	PF 1	3000.00	1607.21	1612.91	1614.32	1618.39	0.007814	18.79	159.68	28.00	1.39
Falcon Ridge	2680	PF 1	3000.00	1606.87	1612.58	1613.96	1618.05	0.007799	18.77	159.79	28.00	1.38
Falcon Ridge	2670	PF 1	3000.00	1606.60	1612.30	1613.69	1617.79	0.007828	18.80	159.58	28.00	1.39

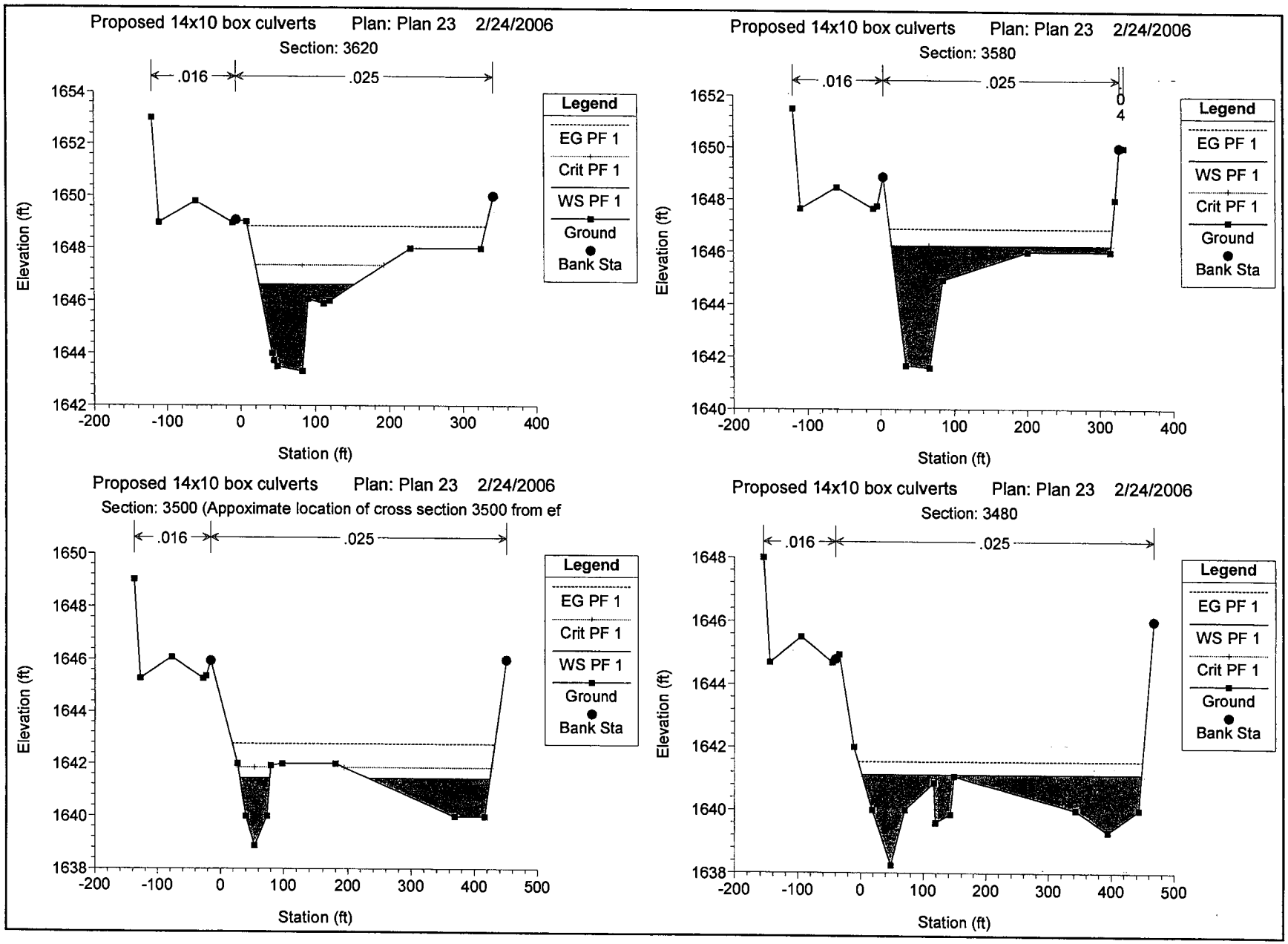
HEC-RAS Plan: Plan 23 River: Pulsipher Wash Reach: Falcon Ridge Profile: PF 1 (Continued)

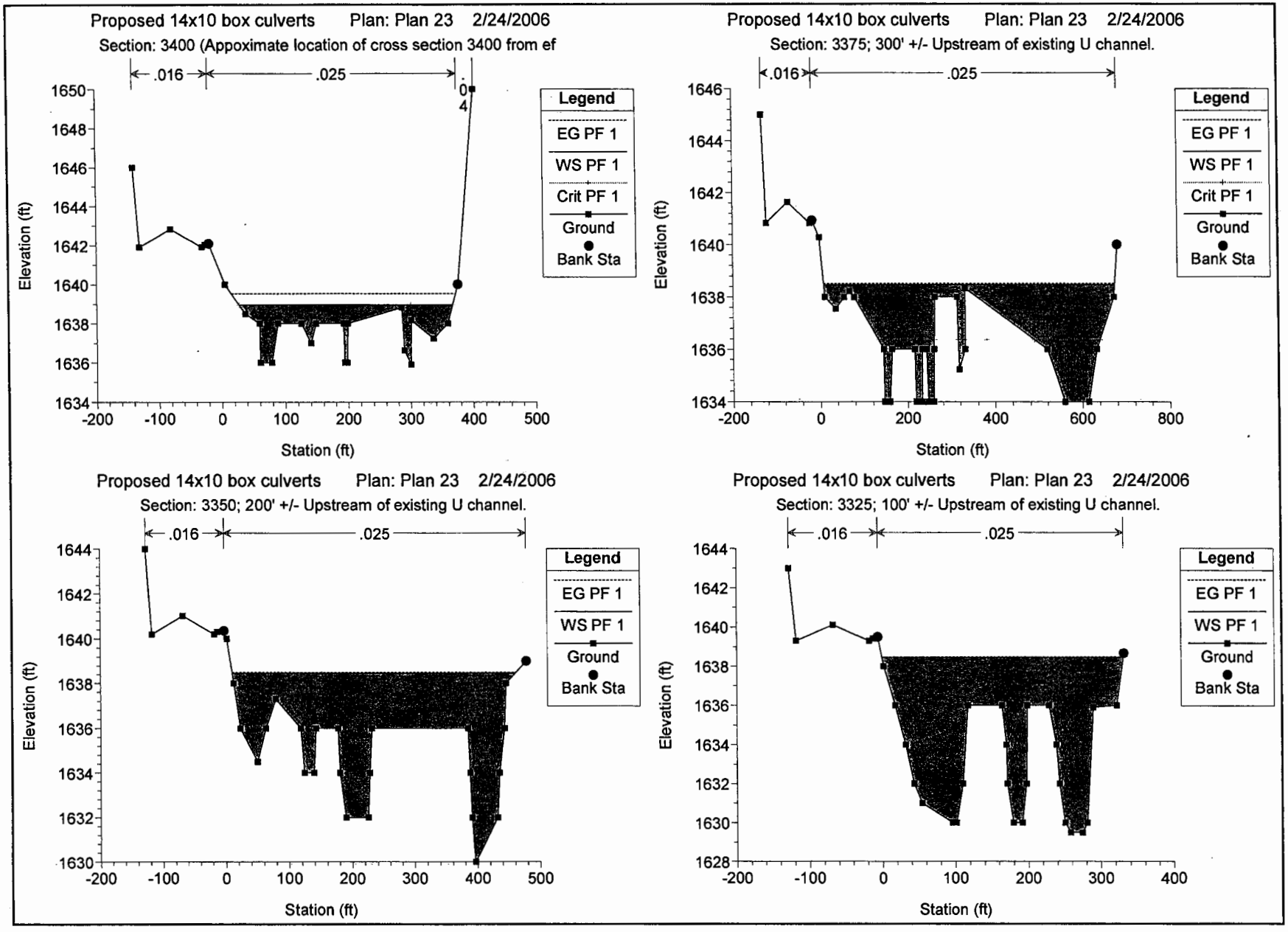
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Falcon Ridge	2660	PF 1	3000.00	1606.40	1612.10	1613.49	1617.58	0.007810	18.78	159.71	28.00	1.39
Falcon Ridge	2650	PF 1	3000.00	1606.32	1610.22	1612.29	1617.31	0.014785	21.37	140.37	36.00	1.91
Falcon Ridge	2620		Bridge									
Falcon Ridge	2590	PF 1	3000.00	1605.00	1611.09	1611.09	1614.11	0.005657	13.94	215.16	35.33	1.00
Falcon Ridge	2570	PF 1	3000.00	1604.89	1611.98	1611.98	1615.53	0.004341	15.11	198.55	28.00	1.00
Falcon Ridge	2550	PF 1	3000.00	1604.70	1611.31	1611.81	1615.39	0.005232	16.20	185.16	28.00	1.11
Falcon Ridge	2540	PF 1	3000.00	1604.39	1610.67	1611.48	1615.19	0.006009	17.06	175.88	28.00	1.20
Falcon Ridge	2530	PF 1	3000.00	1603.93	1609.94	1611.02	1614.87	0.006762	17.82	168.38	28.00	1.28
Falcon Ridge	2515	PF 1	3000.00	1603.40	1609.21	1610.49	1614.49	0.007413	18.43	162.79	28.00	1.35
Falcon Ridge	2510	PF 1	3000.00	1602.69	1608.32	1609.80	1613.95	0.008113	19.05	157.51	28.00	1.42
Falcon Ridge	2500	PF 1	3100.00	1602.13	1608.06	1609.38	1613.47	0.007488	18.66	166.14	28.00	1.35
Falcon Ridge	2460	PF 1	3100.00	1601.26	1606.99	1608.51	1612.79	0.008254	19.34	160.31	28.00	1.42
Falcon Ridge	2440	PF 1	3100.00	1600.40	1605.99	1607.65	1612.08	0.008819	19.81	156.48	28.00	1.48
Falcon Ridge	2420	PF 1	3100.00	1599.51	1602.82	1605.12	1611.23	0.057014	23.28	133.14	44.93	2.38
Falcon Ridge	2400	PF 1	3100.00	1598.00	1601.77	1604.15	1610.38	0.066908	23.55	131.65	51.85	2.60
Falcon Ridge	2350	PF 1	3100.00	1597.24	1605.36	1603.85	1605.72	0.001331	5.74	786.63	231.36	0.42
Falcon Ridge	2330	PF 1	3100.00	1596.83	1605.15		1605.64	0.001001	6.82	808.76	276.23	0.45
Falcon Ridge	2300	PF 1	3100.00	1595.82	1605.37		1605.44	0.000133	2.95	1885.16	356.42	0.17
Falcon Ridge	2200	PF 1	3100.00	1593.00	1605.41		1605.42	0.000018	1.22	4740.57	615.60	0.06
Falcon Ridge	2120	PF 1	3100.00	1590.38	1605.38		1605.41	0.000033	1.94	2748.13	302.96	0.09
Falcon Ridge	2100	PF 1	2138.00	1589.60	1605.37		1605.41	0.000040	1.52	1410.45	167.76	0.09
Falcon Ridge	2000	PF 1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF 1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01

C94

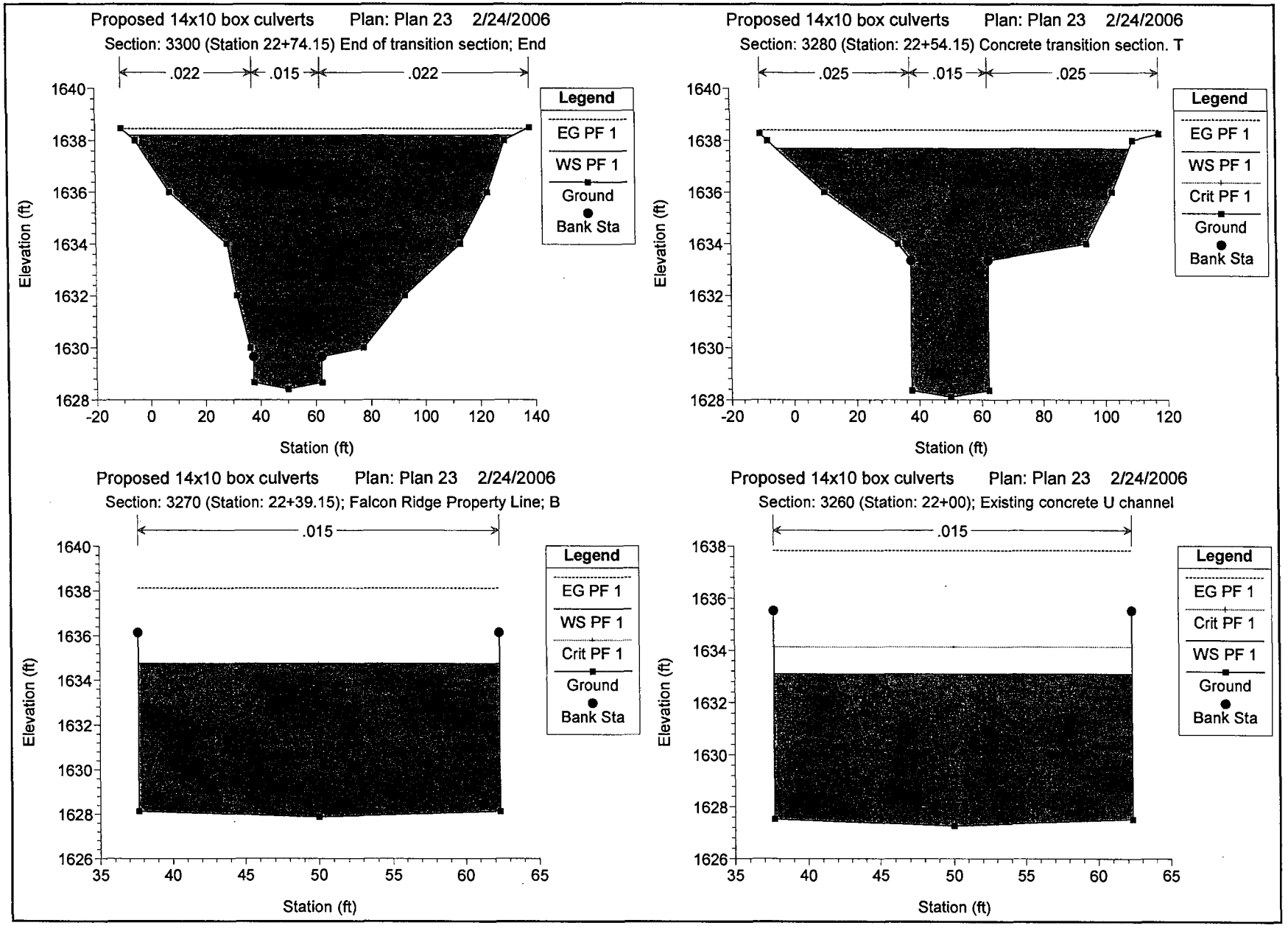

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3900 (Match existing cross section 3900 from effective
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 43 (Existing cross section 3800 from effective model)
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3750
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3700 (Appoximate location of cross section 3700 from ef
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

C91

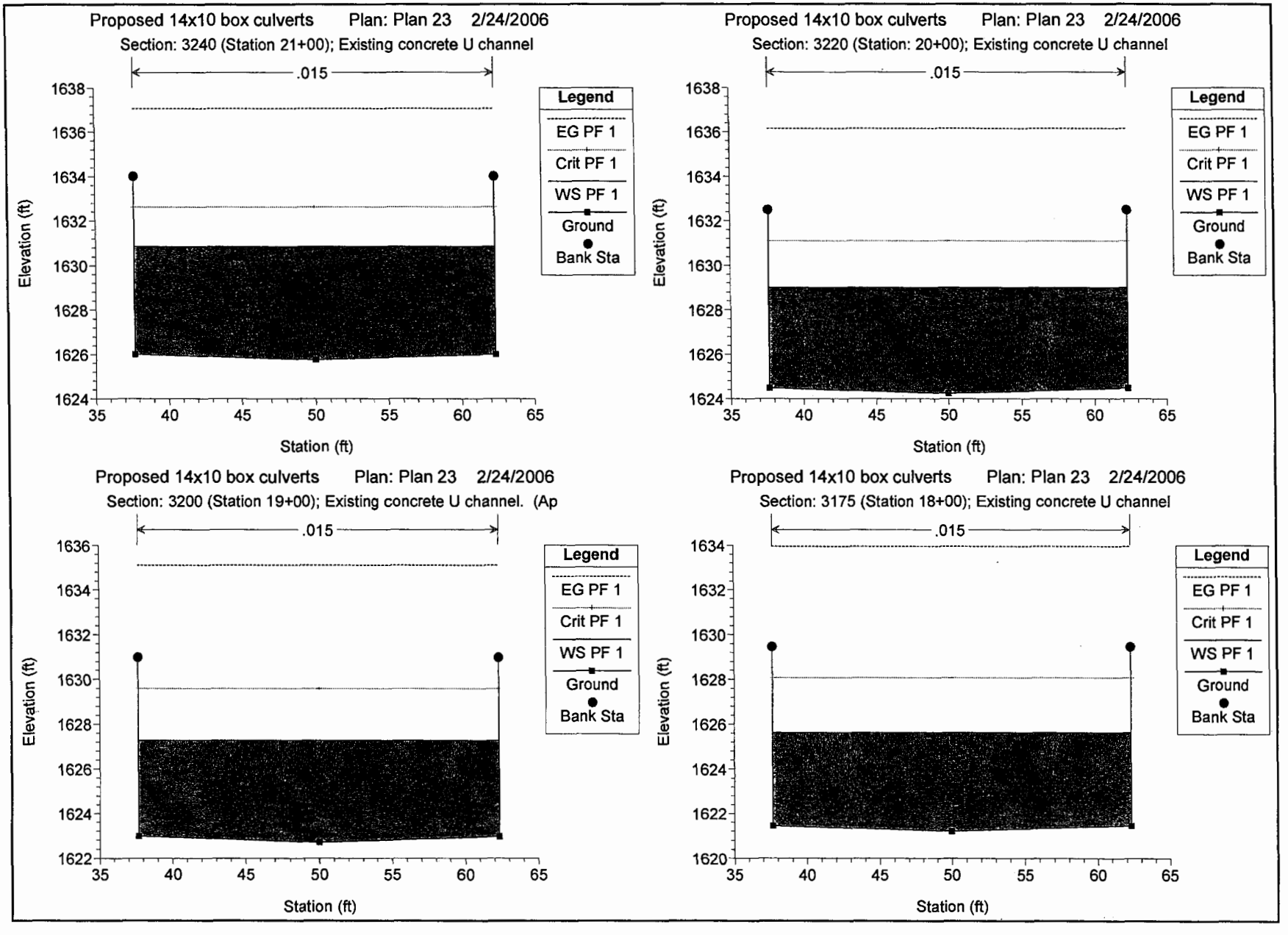

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3620
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3580
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3500 (Appoximate location of cross section 3500 from ef
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3480
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

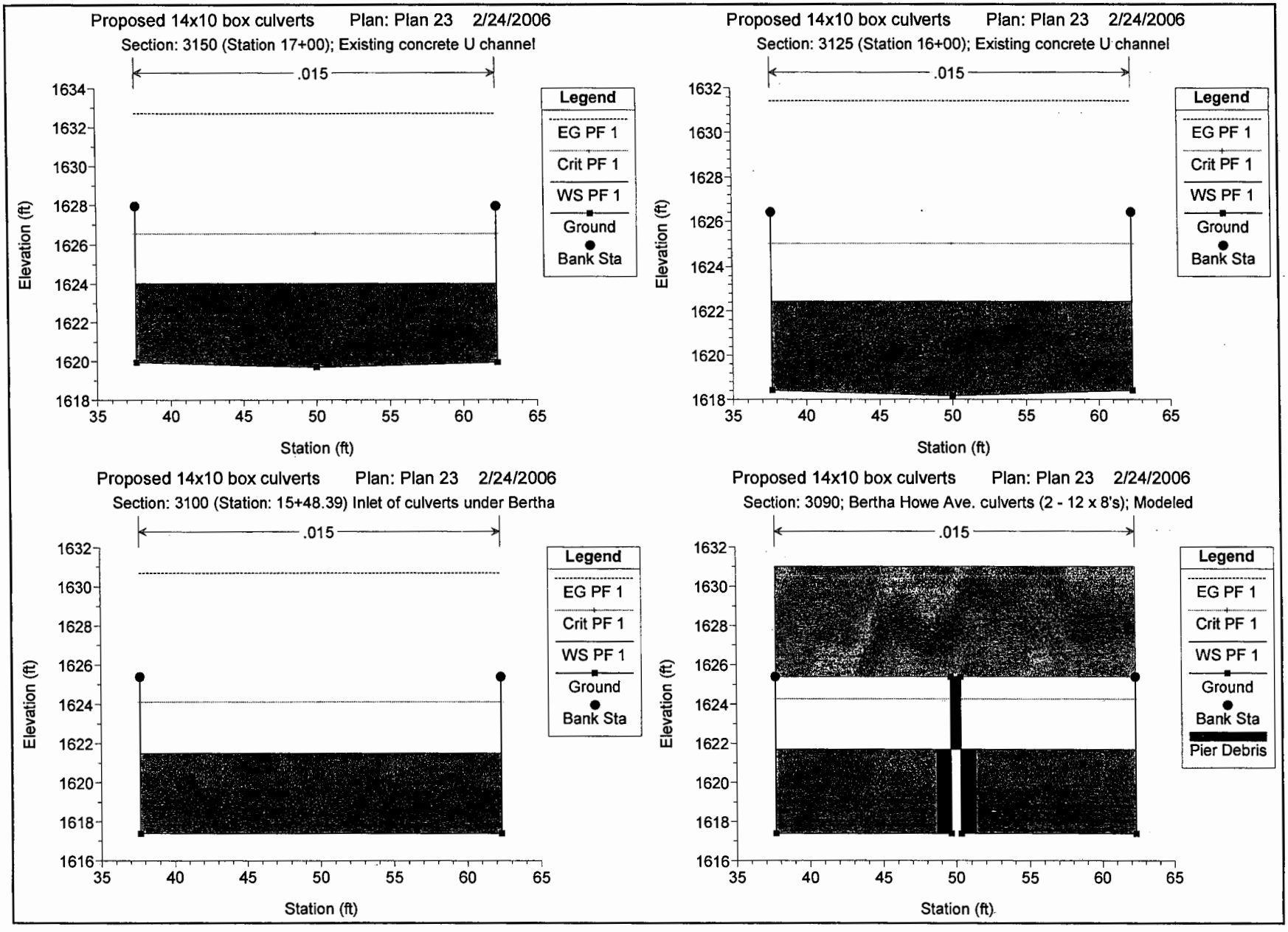

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3400 (Appoximate location of cross section 3400 from ef
.016
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3375; 300' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3350; 200' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3325; 100' +/- Upstream of existing U channel.
.016
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

C94

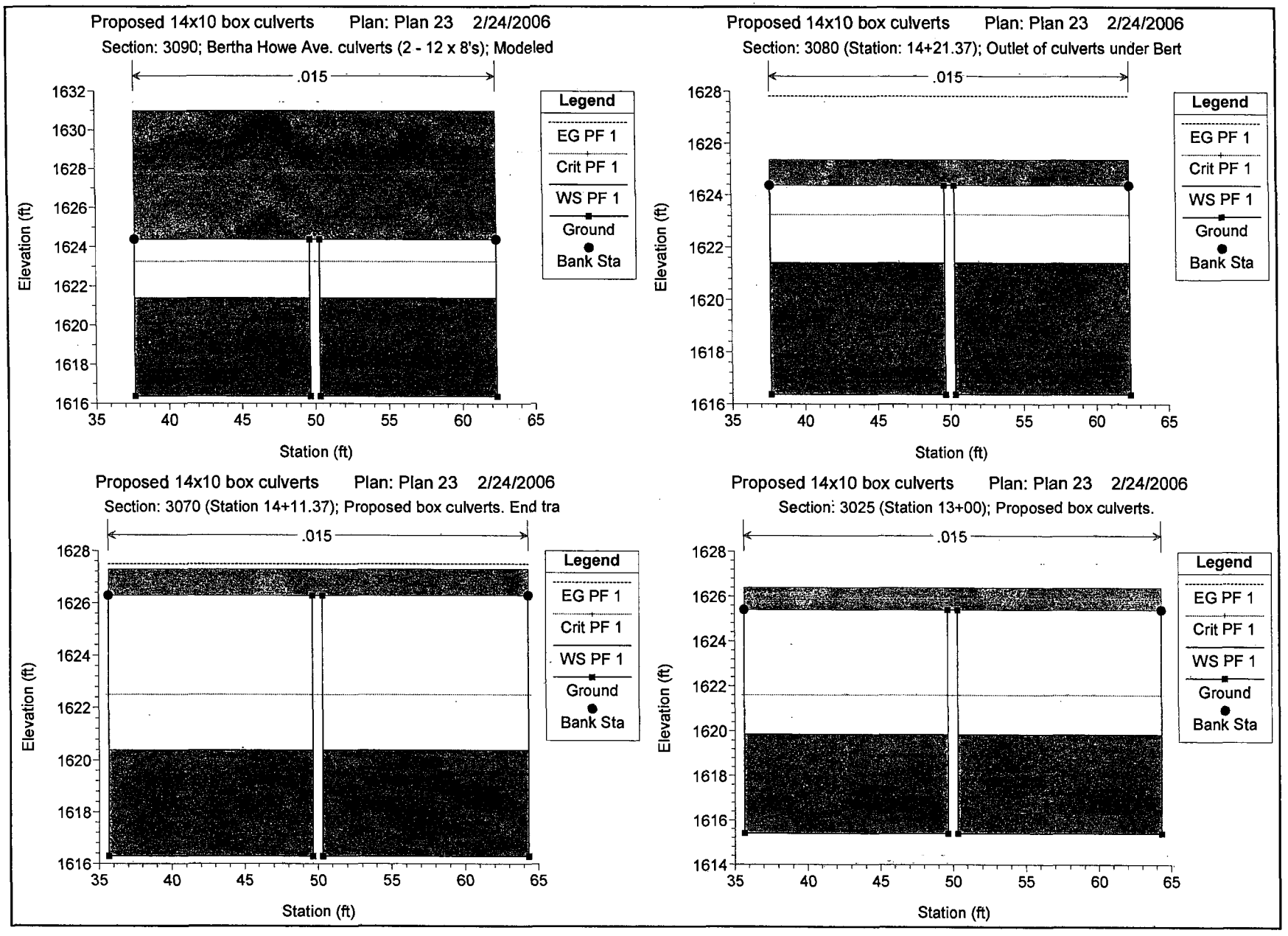

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3300 (Station 22+74.15) End of transition section; End
.022
.015
.022
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3280 (Station: 22+54.15) Concrete transition section. T
.025
.015
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line; B
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3260 (Station: 22+00); Existing concrete U channel
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

C106

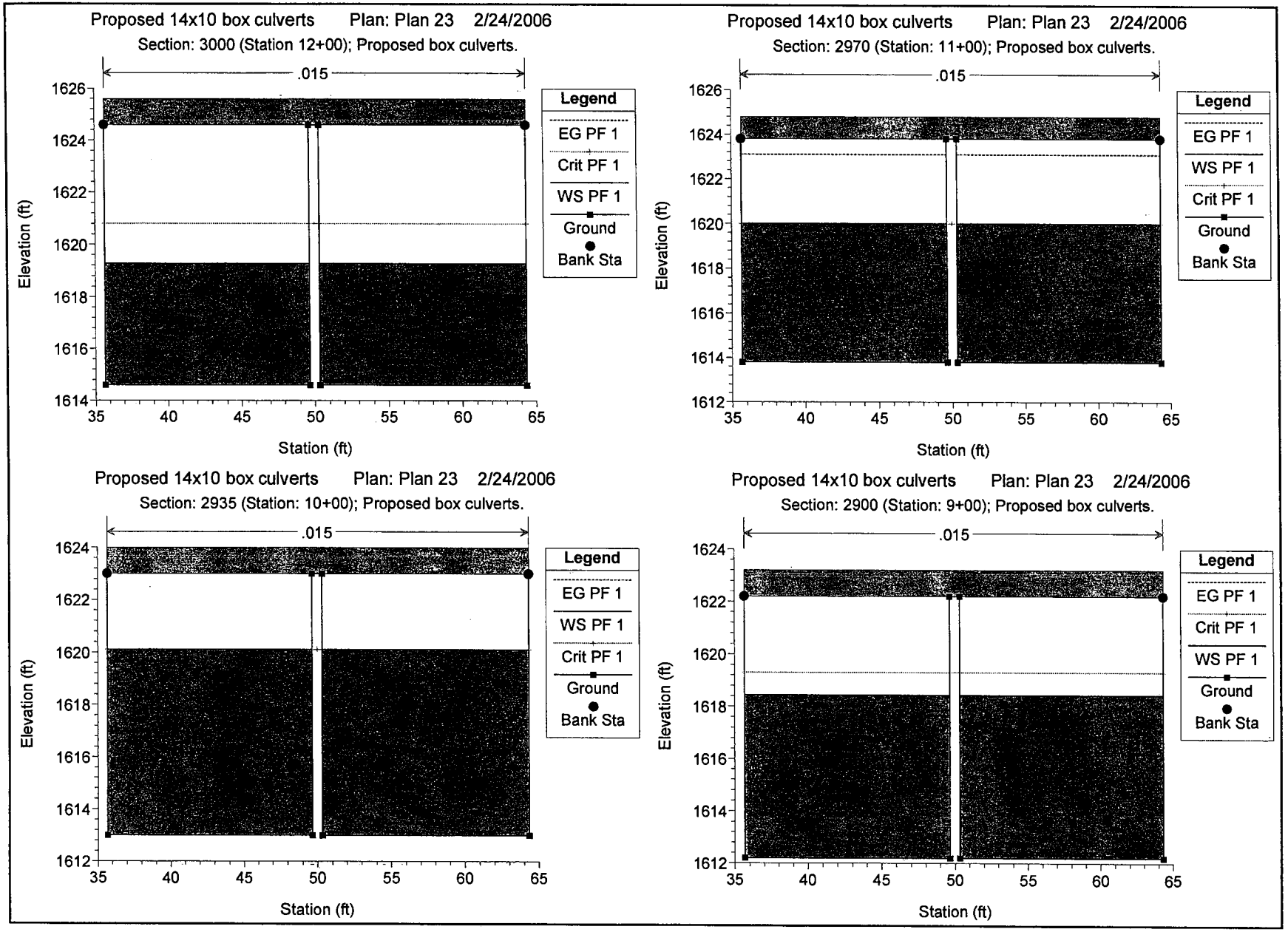

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3240 (Station 21+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3220 (Station: 20+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3200 (Station 19+00); Existing concrete U channel. (Ap
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3175 (Station 18+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3150 (Station 17+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3125 (Station 16+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Pier Debris

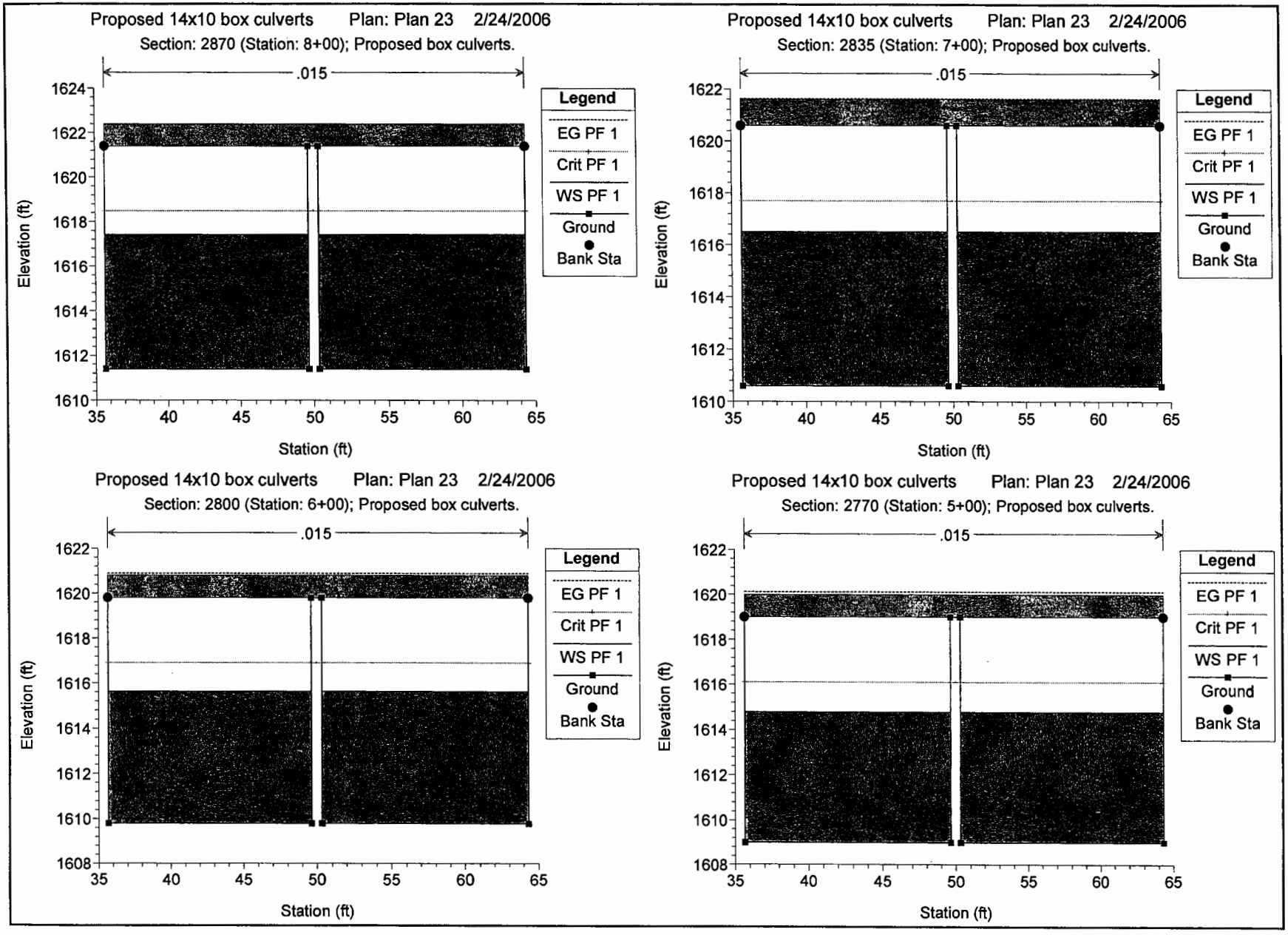
C102


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3080 (Station: 14+21.37); Outlet of culverts under Bert
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3070 (Station 14+11.37); Proposed box culverts. End tra
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3025 (Station 13+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

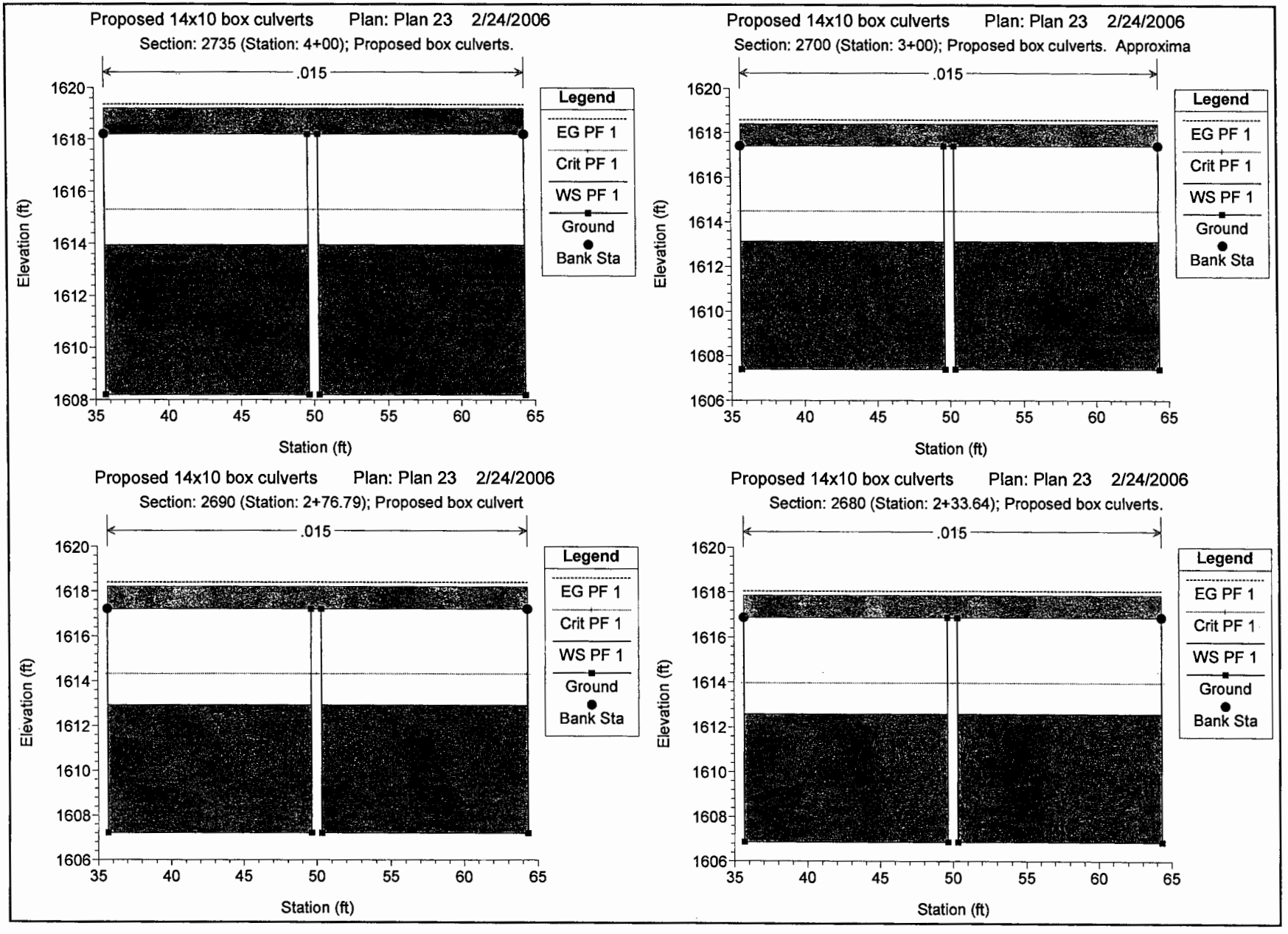
4013


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3000 (Station 12+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2970 (Station: 11+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2935 (Station: 10+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2900 (Station: 9+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

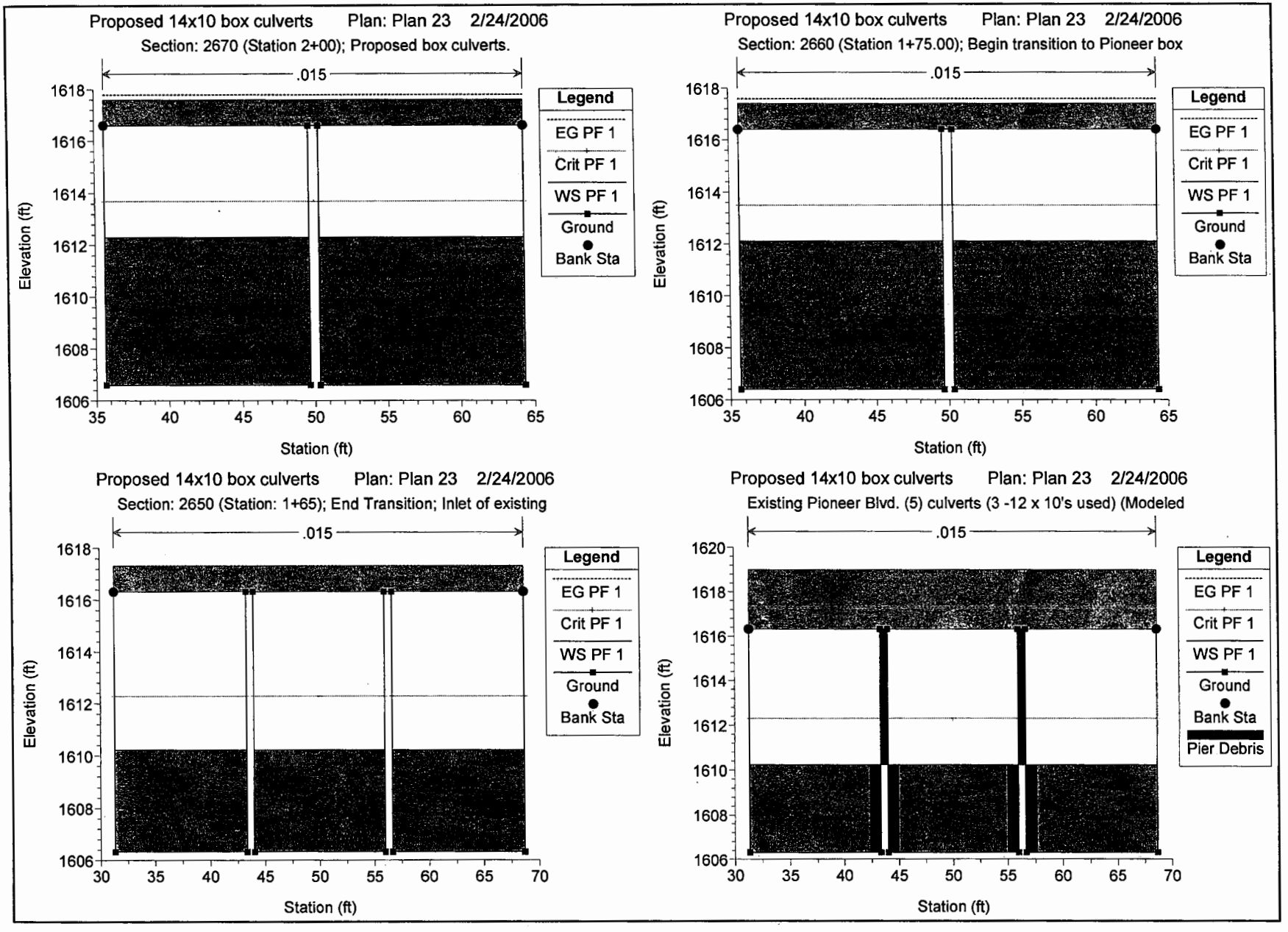
C104


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2870 (Station: 8+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2835 (Station: 7+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2800 (Station: 6+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2770 (Station: 5+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

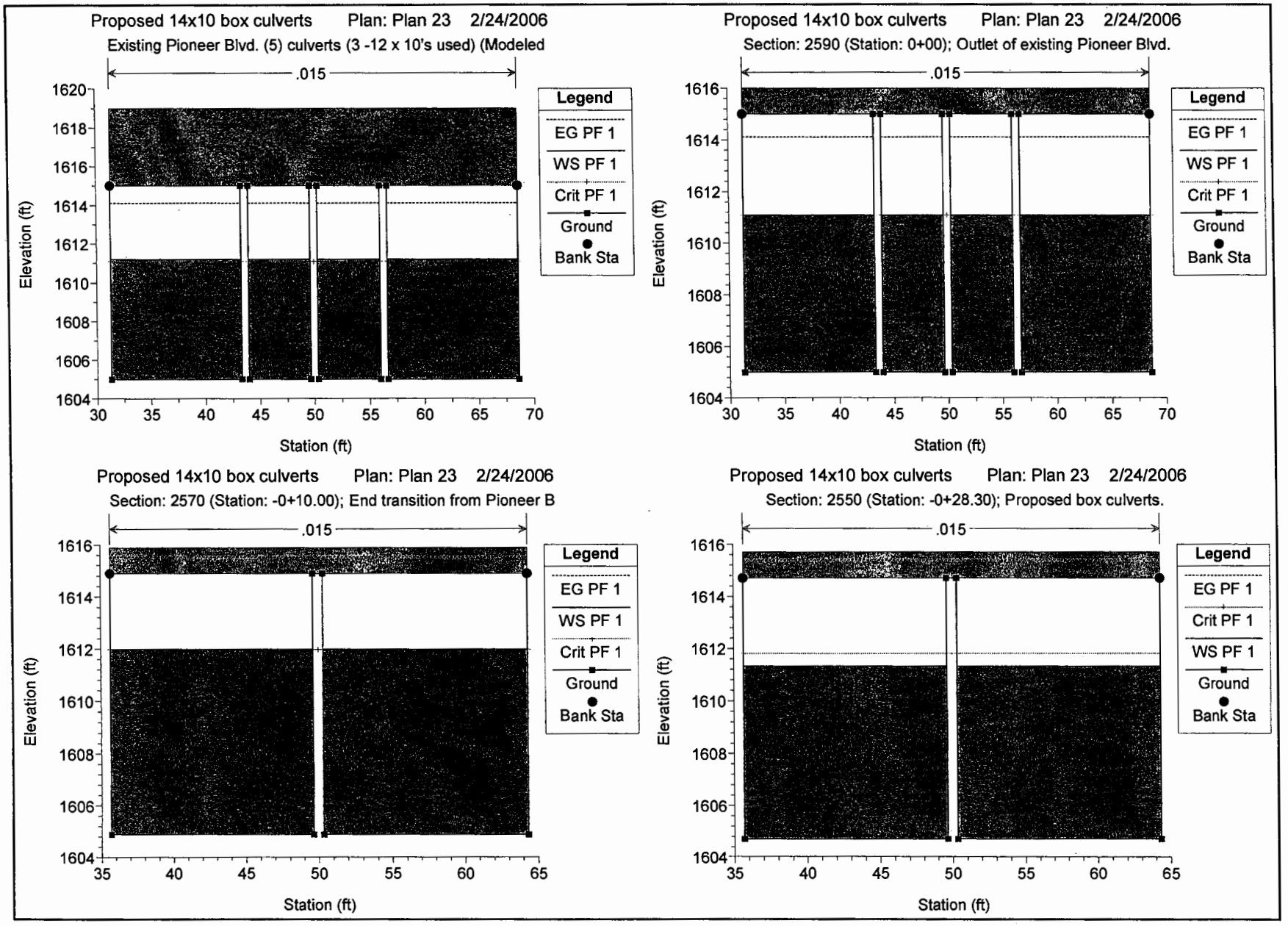
C105


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2735 (Station: 4+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2700 (Station: 3+00); Proposed box culverts. Approxima
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2690 (Station: 2+76.79); Proposed box culvert
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2680 (Station: 2+33.64); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

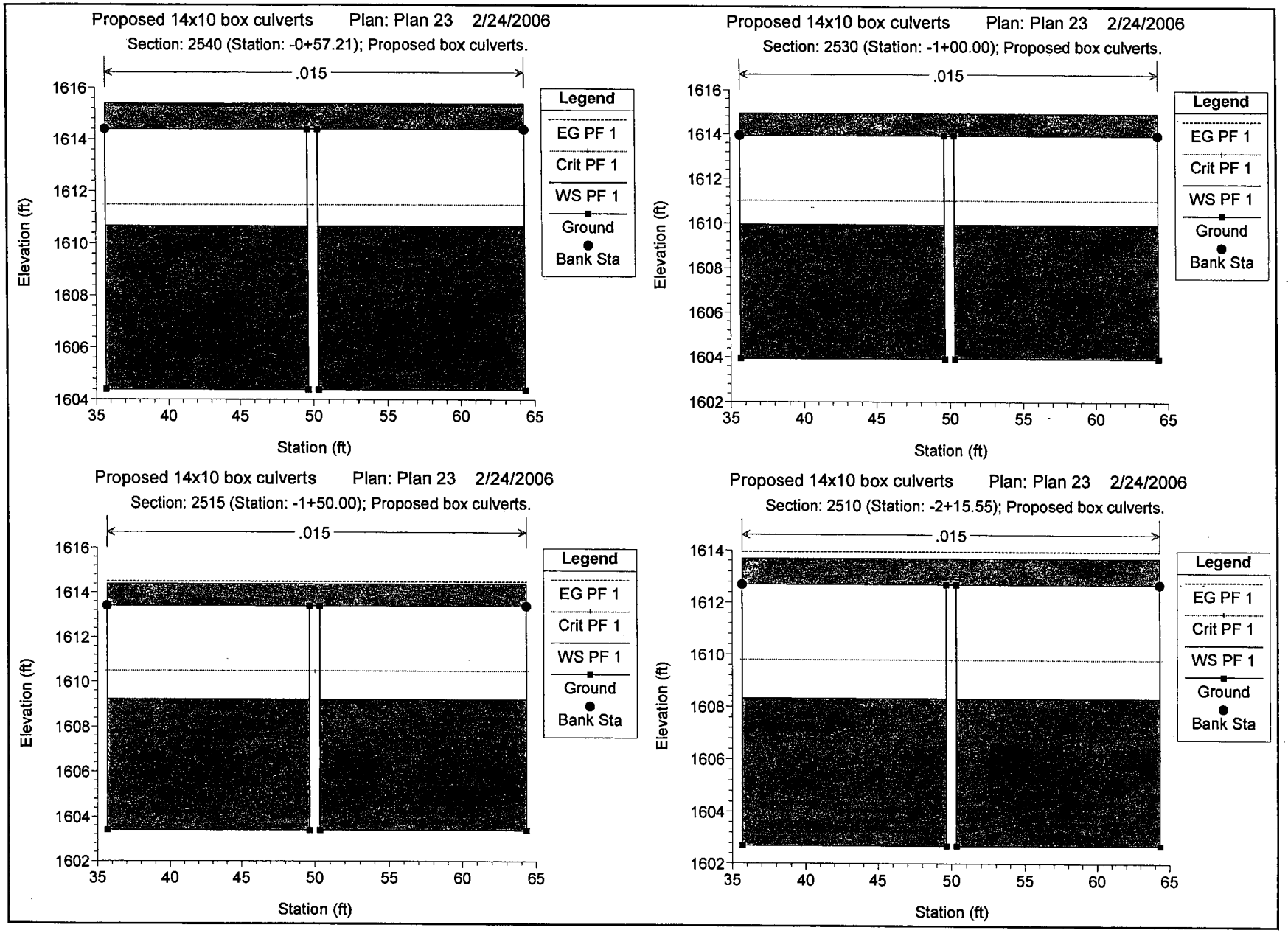
C10\6


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2670 (Station 2+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2660 (Station 1+75.00); Begin transition to Pioneer box
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2650 (Station: 1+65); End Transition; Inlet of existing
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Pier Debris

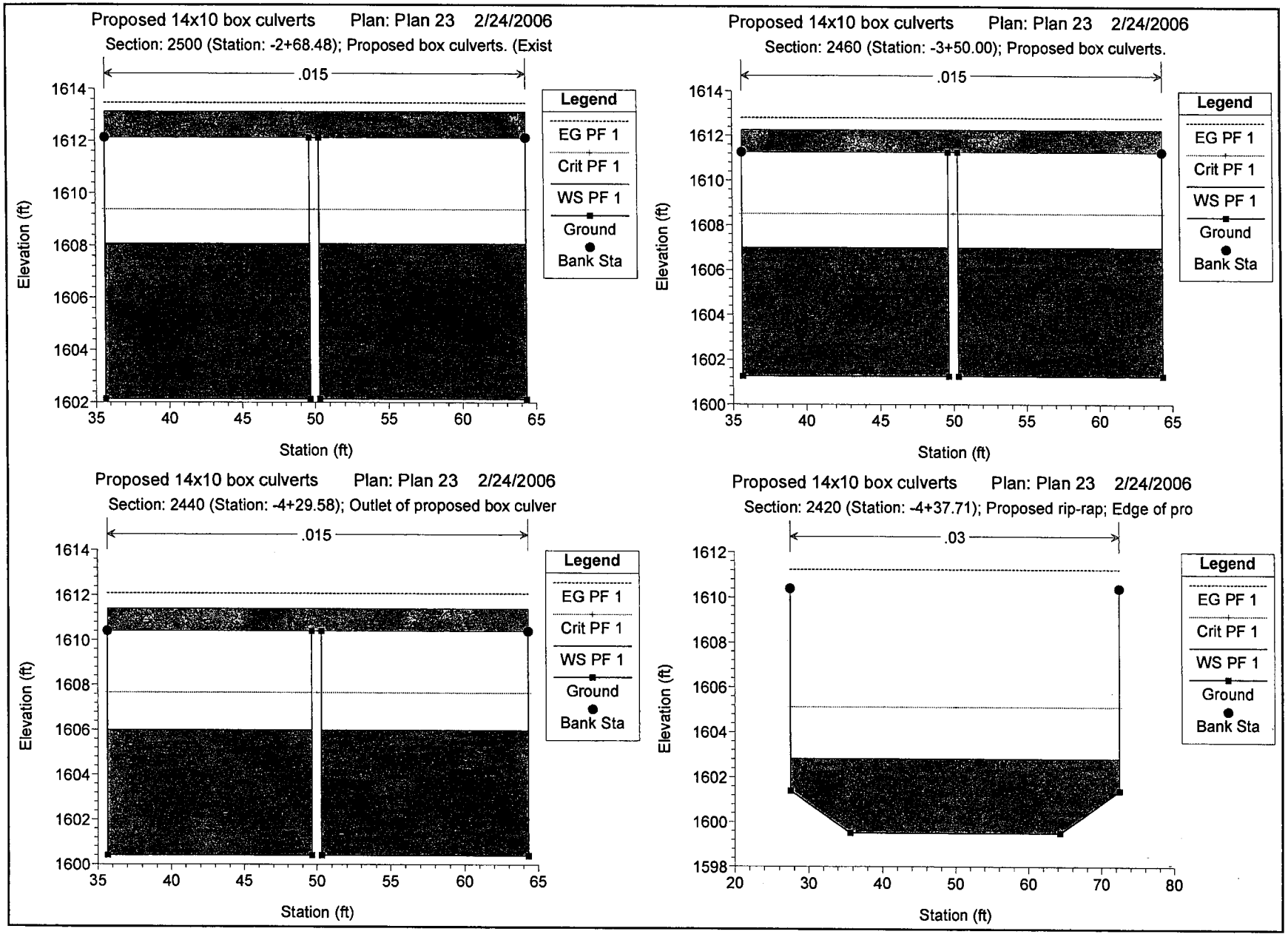
C107

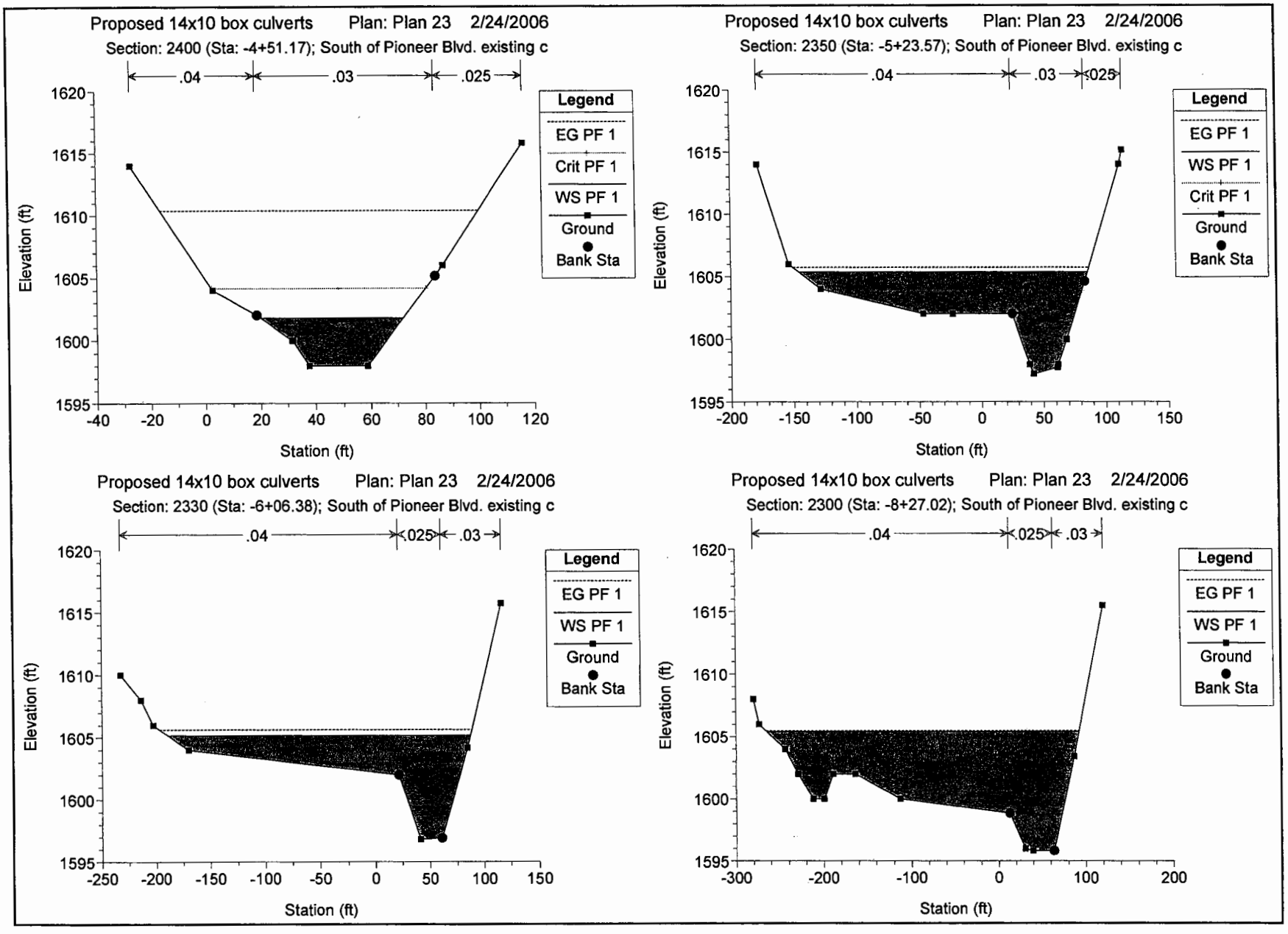

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2590 (Station: 0+00); Outlet of existing Pioneer Blvd.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2570 (Station: -0+10.00); End transition from Pioneer B
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2550 (Station: -0+28.30); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

C108

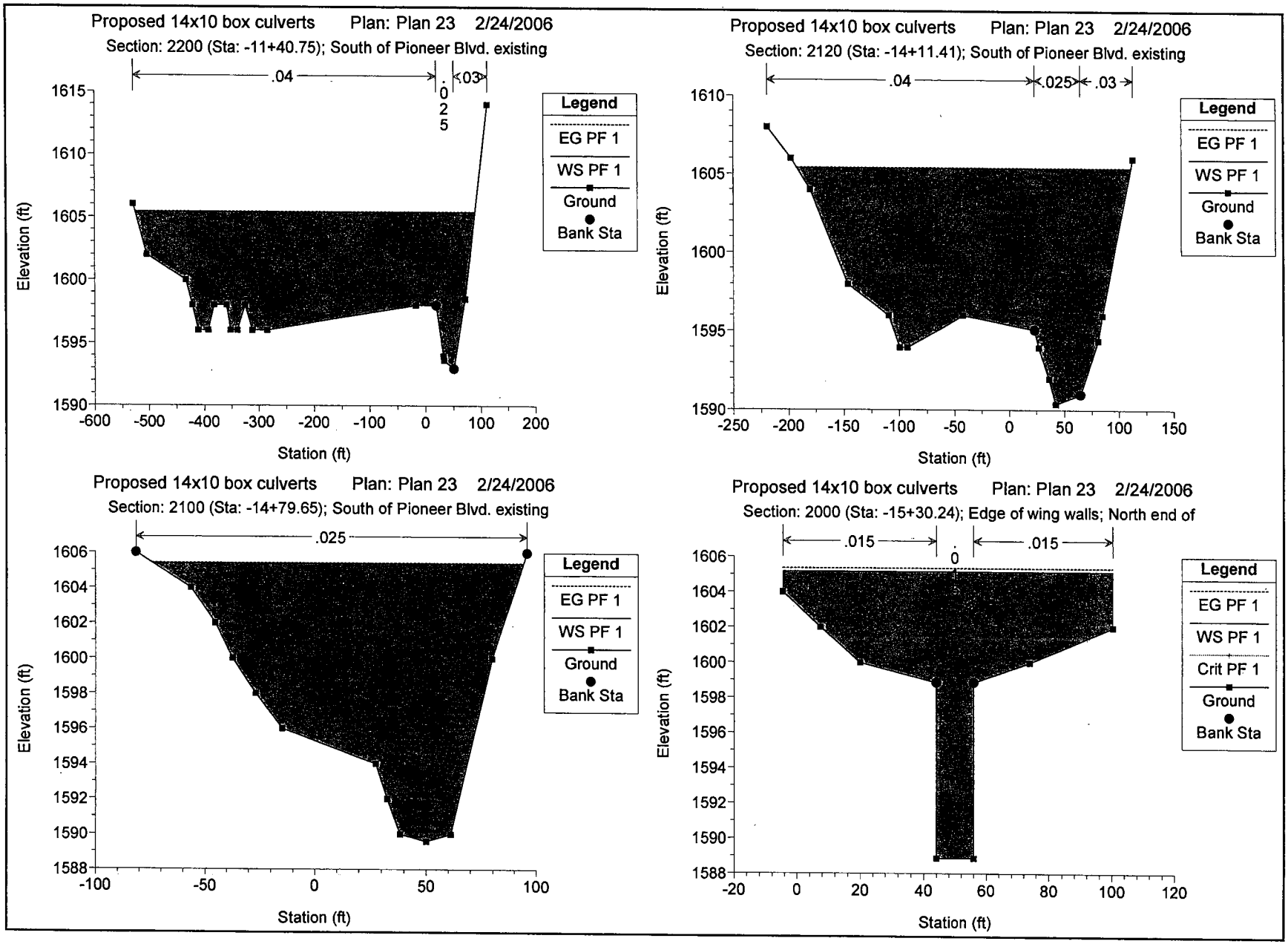

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2540 (Station: -0+57.21); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2530 (Station: -1+00.00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2515 (Station: -1+50.00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2510 (Station: -2+15.55); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

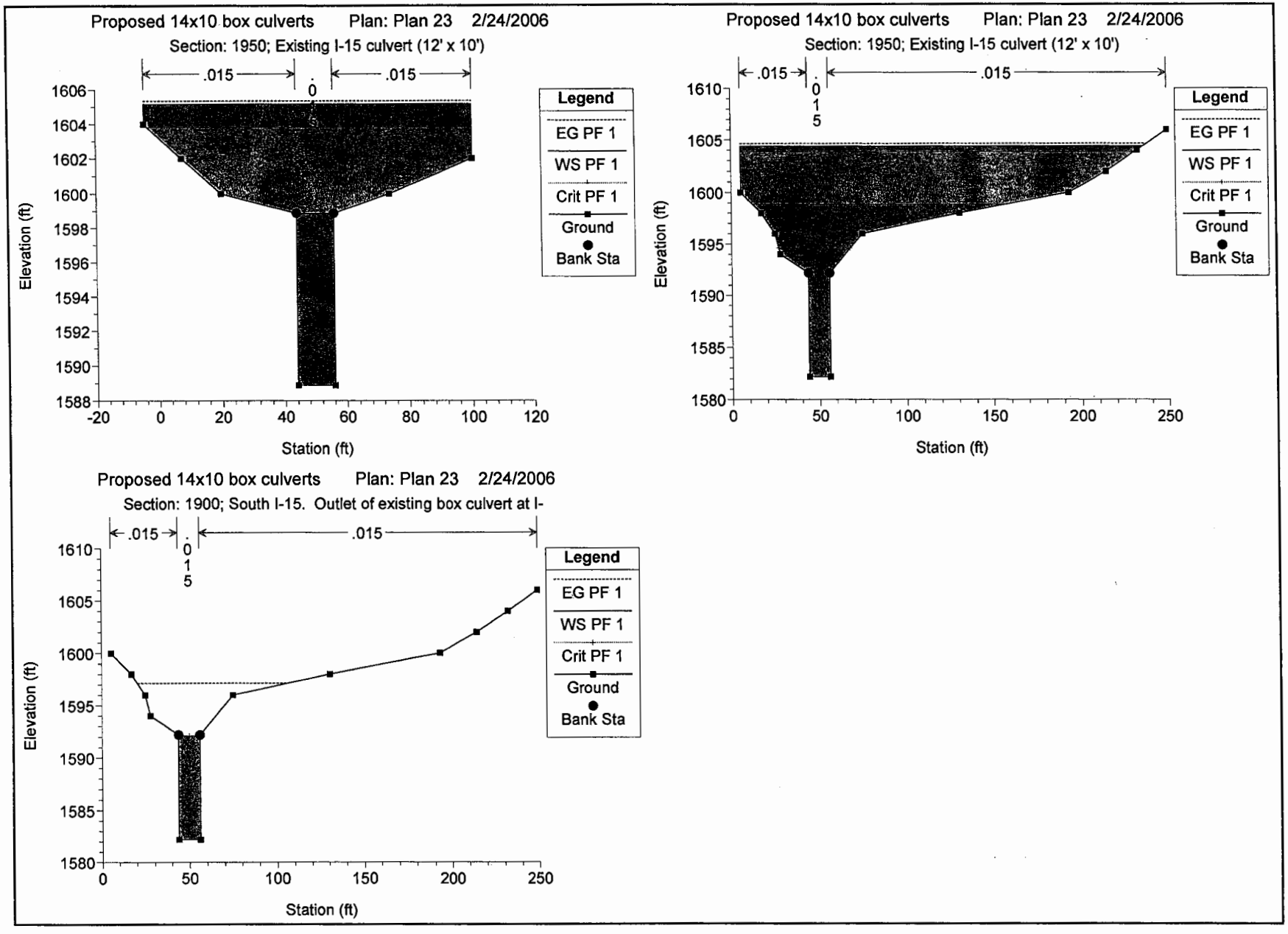
C104


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2500 (Station: -2+68.48); Proposed box culverts. (Exist
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2460 (Station: -3+50.00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2440 (Station: -4+29.58); Outlet of proposed box culver
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2420 (Station: -4+37.71); Proposed rip-rap; Edge of pro
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

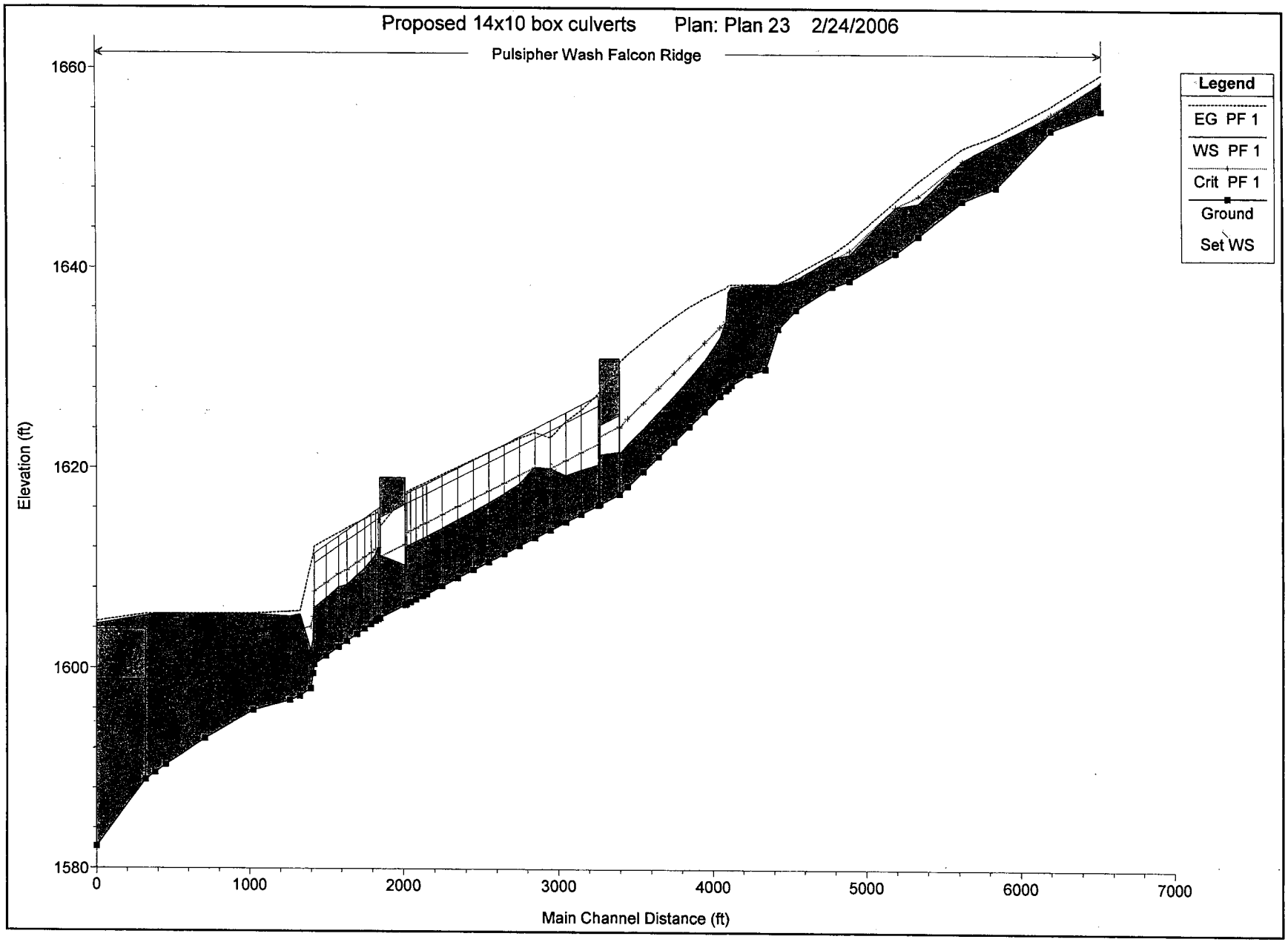

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2400 (Sta: -4+51.17); South of Pioneer Blvd. existing c
.04
.03
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2350 (Sta: -5+23.57); South of Pioneer Blvd. existing c
.04
.03
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2330 (Sta: -6+06.38); South of Pioneer Blvd. existing c
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing c
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

C111


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of
.015
.015
0
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.0
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1900; South I-15. Outlet of existing box culvert at I-
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

C117


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Pulsipher Wash Falcon Ridge
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Set WS
Elevation (ft)
1660
1640
1620
1600
1580
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)

C.11.4

Check-Ras Output Files (NGVD 29)

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.prj
Plan File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.p23
Geometry File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10
Flow File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03
Report File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.nt
Selected profiles: PF 1
Date: 2/24/2006
Time: 11:20:33 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
Pulsipher Wash,Falcon Ridge						
3900		0.04	0.025	0.04	0.1	0.3
3800		0.04	0.025	0.04	0.1	0.3
3750		0.016	0.025	0.04	0.1	0.3
3700		0.016	0.025	0.04	0.1	0.3
3620		0.016	0.025	0.04	0.1	0.3
3580		0.016	0.025	0.04	0.1	0.3
3500		0.016	0.025	0.04	0.1	0.3
3480		0.016	0.025	0.04	0.1	0.3
3400		0.016	0.025	0.04	0.1	0.3
3375		0.016	0.025	0.04	0.1	0.3
3350		0.016	0.025	0.04	0.1	0.3
3325		0.016	0.025	0.03	0.1	0.3
3300		0.022	0.015	0.022	0.1	0.3
3280		0.025	0.015	0.025	0.1	0.3
3270		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3260		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3240		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3220		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3200		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3175		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3150		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3125		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
3100		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
3090	Bridge-Up	-----	0.015	-----	0.3	0.5
3090	Bridge-Dn	-----	0.015	-----	0.3	0.5
3080		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
3070		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3025		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
3000		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2970		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2935		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2900		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2870		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2835		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2800		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2770		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2735		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2700		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2690		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2680		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2670		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2660		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2650		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
2620	Bridge-Up	-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
2620	Bridge-Dn	-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
2590		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
2570		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2550		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2540		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2530		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2515		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2510		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2500		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2460		-----	0.015	0.015	0.1	0.3
		-----	0.015	-----		
2440		-----	0.015	0.015	0.3	0.5
		-----	0.015	-----		
2420		-----	0.025	0.025	0.1	0.3
		-----	0.03	-----		
2400		0.04	0.03	0.025	0.1	0.3
2350		0.04	0.03	0.025	0.1	0.3
2330		0.04	0.025	0.03	0.1	0.3
2300		0.04	0.025	0.03	0.1	0.3
2200		0.04	0.025	0.03	0.1	0.3
2120		0.04	0.025	0.03	0.1	0.3
2100		-----	0.025	0.03	0.3	0.5
		-----	0.04	-----		

2000		0.015	0.015	0.015	0.3	0.5
1950	Bridge-Up	0.015	0.015	0.015	0.3	0.5
1950	Bridge-Dn	0.015	0.015	0.015	0.3	0.5
1900		0.015	0.015	0.015	0.3	0.5

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.015	0.04
Right Overbank n Value:	0.015	0.04
Channel n Value:	0.015	0.04
Contraction Coefficient:	0.1	0.3
Expansion Coefficient:	0.3	0.5

ROUGHNESS COEFFICIENT CHECK

RS: 3900
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 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: 3750
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: 3750
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 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: 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: 3620
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: 3620
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: 3580
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: 3580
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: 3500
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: 3500
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: 3480
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: 3480
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: 3400
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: 3400
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: 3375
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: 3375
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: 3350

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: 3350
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: 3325
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: 3325
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: 3325
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: 3300
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: 3300
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: 3300
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: 3280
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: 3280
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: 3280
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: 3270
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: 3270
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: 3260
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: 3260
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: 3240
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: 3240
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: 3220
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: 3220
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: 3200
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: 3200
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: 3175
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: 3175
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: 3150
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: 3150
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: 3125
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: 3125
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
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
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: 3090
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: 3090
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: 3080
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: 3080
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: 3070
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: 3070
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: 3025
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: 3025
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
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
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: 2970
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: 2970
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: 2935
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: 2935
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: 2900
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: 2900
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: 2870
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: 2870
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: 2835
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: 2835
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: 2800
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: 2800
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: 2770
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: 2770
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: 2735
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: 2735
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: 2700
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: 2700
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: 2690
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: 2690
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: 2680
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: 2680
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: 2670
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: 2670
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: 2660
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: 2660
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: 2650
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: 2650
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: 2620
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: 2620
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: 2620
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: 2620
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: 2590
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: 2590
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: 2570
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: 2570
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: 2550
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: 2550
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: 2540
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: 2540
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: 2530
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: 2530
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: 2515
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: 2515
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: 2510
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: 2510
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: 2500
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: 2500
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: 2460
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: 2460
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: 2440
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: 2440
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: 2420
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: 2400
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: 2350
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: 2330
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: 2330
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: 2300
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: 2300
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: 2200
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: 2200
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: 2120
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: 2120
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: 2100
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: 2000
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: 2000
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: 2000
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: 2000
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: 1950
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: 1950
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: 1950
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: 1950
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: 1950
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: 1950
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: 1950
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: 1950
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.

TRANSITION LOSS COEFFICIENT CHECK

RS: 2660
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: 2440
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: 3090
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: 3090
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: 2620
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: 2620
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: 2000
NT RS 01 This is Section 3.
Channel n value of 0.015 is less than the channel n value of 0.025
at Section 4.

RS: 1950
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: 1950
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: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.prj
Plan File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.p23
Geometry File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10
Flow File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03
Report File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.xs
Selected profiles: PF 1
Date: 2/24/2006
Time: 10:11:39 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
Pulsipher Wash,Falcon Ridge						
3900	238.03	320.4	468.3	196.56	2318	C
3800	421.12	355.77	288.45	201.42	2318	
3750	240	221	221	153.97	2318	
3700	282	284	355	100.21	2318	C
3620	151	149	106	127.68	2318	
3580	288	297	315	299.75	2318	C
3500	109	113	108	239.73	2318	D
3480	249	239	282	445.82	2318	
3400	118	116	388	338.93	2318	C
3375	73	85	303	666.28	2318	
3350	101	104	110	450.03	2318	
3325	133	117	132	331.72	2318	
3300	20	20	20	139.99	2450	
3280	15	15	15	113.15	2450	
3270	39.15	39.15	39.15	24.66	2450	C
3260	100	100	100	24.66	2450	
3240	100	100	100	24.66	2450	
3220	100	100	100	24.66	2450	
3200	97	100	103	24.66	2450	
3175	96	100	102	24.66	2450	
3150	97	100	102	24.66	2450	
3125	50	51.61	54	24.66	2450	
3100	127.02	127.02	127.02	24.66	2450	
3090	Bridge #1-Up					
3090	Bridge #1-Dn					
3080	10	10	10	23.99	2450	D
3070	109.78	111.35	113.02	28	2450	D
3025	99.3	100	100.68	28	2450	D
3000	99.3	100	100.68	28	2450	D
2970	99.3	100	100.68	28	2450	D,C
2935	100	100	100	28	3000	D,C
2900	100	100	100	28	3000	D
2870	100	100	100	28	3000	D
2835	100	100	100	28	3000	D
2800	100	100	100	28	3000	D
2770	100	100	100	28	3000	D
2735	100	100	100	28	3000	D
2700	23.22	23.22	23.22	28	3000	D
2690	44.31	43.13	41.96	28	3000	D
2680	34.34	33.63	32.93	28	3000	D
2670	25	25	25	28	3000	D
2660	10.9	10	10.9	28	3000	D
2650	165	165	165	36	3000	D
2620	Bridge #1-Up					
2620	Bridge #1-Dn					
2590	10.96	10	10.84	35.33	3000	D,C
2570	19.35	18.3	17.25	28	3000	D,C
2550	29.95	28.9	27.86	28	3000	D
2540	44.32	42.76	41.21	28	3000	D
2530	51.78	49.97	48.15	28	3000	D
2515	67.85	65.47	63.09	28	3000	D
2510	52.93	52.93	52.93	28	3000	D
2500	81.52	81.52	81.52	28	3100	D
2460	79.58	79.58	79.58	28	3100	D
2440	11.5	8.13	11.5	28	3100	D
2420	14.69	13.46	14.69	44.93	3100	
2400	74.34	72.39	74.08	51.85	3100	
2350	63.58	63.83	63.66	231.36	3100	
2330	244.91	239.77	234.33	276.23	3100	
2300	134.71	313.73	323.04	356.42	3100	
2200	230.85	258.71	280.12	615.6	3100	
2120	73	68.06	68.56	302.96	3100	
2100	68.04	62.28	67.59	167.76	2138	
2000	303.13	319.85	320.07	104.82	2138	E
1950	Bridge #1-Up					
1950	Bridge #1-Dn					
1900	60.81	58.98	66.92	12	2138	C

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

SPACING CHECK

INEFFECTIVE FLOW CHECK

DISCHARGE CHECK

RS: 2100
XS DC 01 Discharge decreases in the downstream direction.

LOCATION CHECK

RS: 3750
XS LC 01 Lenchl Up/TopwdthAct Dn = 2.21
MaxChlDpth Up/MaxChlDpth Dn = 1.11
TopwdthAct Up/TopwdthAct Dn = 1.54
This cross section is located too far upstream from the

critical depth cross section.

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is Pulsipher Wash,Falcon Ridge
Critical is specified as the downstream boundary
for profile PF 1

XS BC 02 The name of the stream is Pulsipher Wash,Falcon Ridge
Critical is specified as the upstream boundary
for profile PF 1

XS BC 03 Maximum number of iterations is 0
It should not be less than 20.

XS FR 02 The profile is computed as mixed flow regime.

LATERAL WEIRS CHECK

---END---

CHECK-RAS Program: Structure Check

Project File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.prj
Plan File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.p23
Geometry File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.g10
Flow File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.f03
Report File: C:\HEC\RAS3.1.3\Pulsipher Wash\KENNEDY COMMERCIAL\CLOMR3.br
Selected profiles: PF 1
Date: 2/24/2006
Time: 11:20:43 AM

RS	MaxLoChord	MnTpRd	EGEL	WSEL	MinChEl	Structure
Pulsipher Wash,Falcon Ridge						
3900			1659.61	1658.78	1656	
3800			1656.5	1655.47	1654	
3750			1653.5	1652.75	1648.25	
3700			1652.18	1650.9	1646.87	
3620			1648.84	1646.61	1643.32	
3580			1646.87	1646.24	1641.59	
3500			1642.76	1641.44	1638.87	
3480			1641.53	1641.11	1638.25	
3400			1639.53	1638.96	1635.9	
3375			1638.51	1638.46	1634	
3350			1638.49	1638.45	1630	
3325			1638.48	1638.45	1629.5	
3300			1638.44	1638.19	1628.41	
3280			1638.39	1637.68	1628.1	
3270			1638.11	1634.74	1627.87	
3260			1637.82	1633.09	1627.27	
3240			1637.06	1630.85	1625.76	
3220			1636.14	1629	1624.24	
3200			1635.09	1627.27	1622.72	
3175			1633.94	1625.63	1621.21	
3150			1632.71	1624.01	1619.69	
3125			1631.42	1622.42	1618.17	
3100			1630.67	1621.47	1617.39	
3090	1625.39	1631	1630.46	1621.69	1617.39	Bridge #1-Up
3090	1624.37	1631	1627.82	1621.39	1616.37	Bridge #1-Dn
3080			1627.82	1621.39	1616.37	Lid
3070			1627.49	1620.38	1616.29	Lid
3025			1625.86	1619.85	1615.4	Lid
3000			1624.73	1619.26	1614.6	Lid
2970			1623.09	1620.01	1613.8	Lid
2935			1623.64	1620.11	1613	Lid
2900			1623.02	1618.43	1612.2	Lid
2870			1622.34	1617.41	1611.4	Lid
2835			1621.62	1616.5	1610.6	Lid
2800			1620.88	1615.62	1609.8	Lid
2770			1620.12	1614.78	1609	Lid
2735			1619.35	1613.94	1608.2	Lid
2700			1618.57	1613.12	1607.4	Lid
2690			1618.39	1612.91	1607.21	Lid
2680			1618.05	1612.58	1606.87	Lid
2670			1617.79	1612.3	1606.6	Lid
2660			1617.58	1612.1	1606.4	Lid
2650			1617.31	1610.22	1606.32	Lid
2620	1616.32	1619	1617.31	1610.22	1606.32	Bridge #1-Up
2620	1615	1619	1614.11	1611.19	1605	Bridge #1-Dn
2590			1614.11	1611.09	1605	Lid
2570			1615.53	1611.98	1604.89	Lid
2550			1615.39	1611.31	1604.7	Lid
2540			1615.19	1610.67	1604.39	Lid
2530			1614.87	1609.94	1603.93	Lid
2515			1614.49	1609.21	1603.4	Lid
2510			1613.95	1608.32	1602.69	Lid
2500			1613.47	1608.06	1602.13	Lid
2460			1612.79	1606.99	1601.26	Lid
2440			1612.08	1605.99	1600.4	Lid
2420			1611.23	1602.82	1599.51	
2400			1610.38	1601.77	1598	
2350			1605.72	1605.36	1597.24	
2330			1605.64	1605.15	1596.83	
2300			1605.44	1605.37	1595.82	
2200			1605.42	1605.41	1593	
2120			1605.41	1605.38	1590.38	
2100			1605.41	1605.37	1589.6	
2000			1605.35	1605.17	1588.88	
1950	1598.88	1603.83	1605.35	1605.17	1588.88	Bridge #1-Up
1950	1598.88	1603.83	1604.64	1604.37	1582.19	Bridge #1-Dn
1900			1597.12	1592.09	1582.19	

River Station: 3025
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions, such as pipe crossing, or the type of flow through the lid sections and the main stream is in supercritical flow.

River Station: 3000
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions, such as pipe crossing, or the type of flow through the lid sections and the main stream is in supercritical flow.

River Station: 2970
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions, such as pipe crossing, or the type of flow through the lid sections and the main stream is in supercritical flow.

River Station: 2935
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions, such as pipe crossing, or the type of flow through the lid sections and the main stream is in supercritical flow.

River Station: 2900
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions, such as pipe crossing, or the type of flow through the lid sections and the main stream is in supercritical flow.

River Station: 2870

ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2835
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2800
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2770
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2735
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2700
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2690
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2680
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2670
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2550
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2540
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2530
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2515
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2510
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2500
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2460
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

River Station: 2440
ST GD 08 'Cross Section Lid' option is used for this section.
Instead, Bridge or Culvert option should be used.
Cross section Lid option may be used to model small obstructions,
such as pipe crossing, or the type of flow through the lid sections
and the main stream is in supercritical flow.

RIVER/REACH: Pulsipher Wash, Falcon Ridge
RIVER STATION: 3090
TYPE OF STRUCTURE: Bridge

Description:	Section: 3090; Bertha Howe Ave. culverts (2 - 12
Distance from Upstream XS:	0.01
Deck/Roadway Width:	127
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	1631
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	3125	51.61	1622.42		1631.42	24.66	
3	3100	127.02	1621.47		1630.67	24.66	
	3090	127.00	1621.69		1630.46	23.99	Bridge #1-Up
	3090	0.01	1621.39		1627.82	23.99	Bridge #1-Dn
2	3080	10.00	1621.39		1627.82	23.99	
1	3070	111.35	1620.38		1627.49	28	

Ineffective Flow, Section 3 Sta L	Sta R	Elev	Ineffective Flow, Section 2 Sta L	Sta R	Elev

BRIDGE:
Bridge Name: Bridge #1
LowFlowMethod: Highest Energy Answer
Momentum Cd: 2
HighFlowMethod: Energy Only
SluiceGate Cd: 0 Submerged Cd: 0

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: 1625.39 MinTopRd: 1631.01 MinElPrs: 1625.39

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Bridge							U
							D

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Bridge #1	49.67	62.33	1631.00	1631.00	1631.00	1625.39	U
	49.67	62.33	1631.00	1631.00	1631.00	1624.37	D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Bridge #1	2450	2450	0	Energy only	Sluicegate Pressure Flow

GEOMETRIC CHECK

RS: 3090
ST GD 03 The end station of 62.34 from upstream road/weir data
is greater than the end station of 62.33 from upstream internal
section/section 3.
The high chord elevation of 1631 for the end road/weir station is
greater than the ground elevation of 1625.39 for the end ground station.
The EGEL at section 3 of 1630.67 is greater than the ground elevation.
The road/weir data should be included in the ground data

RS: 3070
ST GD 08 'Cross Section Lid' option is used for this section.
Cross section lid data must be removed from this section,
unless the structure is modeled as culverts in series.

RS: 3080
ST GD 08 'Cross Section Lid' option is used for this section.
Cross section lid data must be removed from this section,
unless the structure is modeled as culverts in series.

TYPE OF FLOW CHECK

RS: 3090 This is Bridge #1
BR PF 01 Type of flow is sluicegate pressure flow because,
1. EGEL 3 of 1630.67 is equal to or less than MinTopRd of 1631.01.
2. EGEL 3 of 1630.67 is equal to or greater than MxLoCdU of 1625.39.
3. WSEL 2 of 1621.39 is less than MxLoCdD of 1624.37.

DISTANCE CHECK

RS: 3090 This is Bridge #1
ST DT 01 'Distance from Upstream XS' of 0.01 is less than the height of the
bridge opening of 8.00
Section 3 should be placed at the foot of the road embankment or
wing walls.
Distances at Sections 4 & 3, and 'Distance from Upstream XS' should
be adjusted.

RS: 3090 This is Bridge #1
ST DT 02 The channel distance of 9.996643E-03 at Downstream Internal Section is less than
the height of the bridge opening of 9.02
Section 2 should be placed at the foot of the road embankment or
wing walls.
Distances at Sections 4, 3 & 2 should be adjusted.

INEFFECTIVE FLOW CHECK

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RS:       3100 This is Section 3
ST GD 06  Pressure flow occurs at Bridge
          The velocity head at Section 3 is more than 0.5 foot and more than
          the velocity head at Section 4.
          Section 3 should be recoded to represent the natural valley
          cross section.


-------------------------------------------------------------------------------
RIVER/REACH:       Pulsipher Wash, Falcon Ridge
RIVER STATION:     2620
TYPE OF STRUCTURE: Bridge
-------------------------------------------------------------------------------
Description:                                      Existing Pioneer Blvd. (5) culverts (3 -12 x 10's
Distance from Upstream XS:                         0.1
Deck/Roadway Width:                                164
Weir Coefficient:                                  2.6
Maximum allowable submergence for weir flow:       0.95
Elevation at which weir flow begins:               1619
Weir crest shape:                                 Broad Crested
-------------------------------------------------------------------------------


Sec  River    Length   WSEL      Surch.    EGEL      TopWidth
     Station  Channel                                Actual
-------------------------------------------------------------------------------
 4   2660      10.00   1612.1               1617.58   28
 3   2650     165.00   1610.22              1617.31   36
     2620     164.00   1610.22              1617.31   35.99    Bridge #1-Up
     2620       0.90   1611.19              1614.11   35.32    Bridge #1-Dn
 2   2590      10.00   1611.09              1614.11   35.33
 1   2570      18.30   1611.98              1615.53   28
-------------------------------------------------------------------------------

        Ineffective Flow, Section 3             Ineffective Flow, Section 2
        Sta L     Sta R     Elev                Sta L     Sta R     Elev
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------


BRIDGE:
Bridge Name:    Bridge #1
LowFlowMethod:  Highest Energy Answer
Momentum Cd:    2
HighFlowMethod: Pressure and Weir flow
SluiceGate Cd: 0        Submerged Cd:   0.8

-------------------------------------------------------------------------------
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:   1616.32  MinTopRd:  1619.01       MinElPrs:       1616.32

Opening Type      StagStaL    StagStaR  EncStaL   EncStaR   LIfSta5   RIfStaS
-------------------------------------------------------------------------------
Bridge                                                                    U
                                                                          D

                  LAbutSt     RAbutSt   LMnTpRd   RMnTpRd   MnTpRd    MxLoCd
-------------------------------------------------------------------------------
Bridge #1         43.33       68.67     1619.00   1619.00   1619.00   1616.32 U
                  43.33       68.67     1619.00   1619.00   1619.00   1615.00 D

Name          Q Total.  Q Struc   Q Weir    Selected Method     Flow Type
-------------------------------------------------------------------------------
Bridge #1     3000      3000      0         Energy only         Sluicegate Pressure Flow
-------------------------------------------------------------------------------

GEOMETRIC CHECK
---------------

RS:       2570
ST GD 08  'Cross Section Lid' option is used for this section.
          Cross section lid data must be removed from this section,
          unless the structure is modeled as culverts in series.

RS:       2590
ST GD 08  'Cross Section Lid' option is used for this section.
          Cross section lid data must be removed from this section,
          unless the structure is modeled as culverts in series.

RS:       2650
ST GD 08  'Cross Section Lid' option is used for this section.
          Cross section lid data must be removed from this section,
          unless the structure is modeled as culverts in series.

RS:       2660
ST GD 08  'Cross Section Lid' option is used for this section.
          Cross section lid data must be removed from this section,
          unless the structure is modeled as culverts in series.

TYPE OF FLOW CHECK
------------------

RS:       2620 This is Bridge #1
BR PF 01  Type of flow is sluicegate pressure flow because,
          1. EGEL 3 of 1617.31 is equal to or less than MinTopRd of 1619.01.
          2. EGEL 3 of 1617.31 is equal to or greater than MxLoCdU of 1616.32.
          3. WSEL 2 of 1611.09 is less than MxLoCdD of 1615.00.

DISTANCE CHECK
--------------

RS:       2620 This is Bridge #1
ST DT 01  'Distance from Upstream XS' of 0.10 is less than the height of the
          bridge opening of  10.00
          Section 3 should be placed at the foot of the road embankment or
          wing walls.
          Distances at Sections 4 & 3, and 'Distance from Upstream XS' should
```

be adjusted.

RS: 2620 This is Bridge #1
ST DT 02 The channel distance of 0.9 at Downstream Internal Section is less than the height of the bridge opening of 11.32
Section 2 should be placed at the foot of the road embankment or wing walls.
Distances at Sections 4, 3 & 2 should be adjusted.

INEFFECTIVE FLOW CHECK

RS: 2650 This is Section 3
ST GD 06 Pressure flow occurs at Bridge
The velocity head at Section 3 is more than 0.5 foot and more than the velocity head at Section 4.
Section 3 should be recoded to represent the natural valley cross section.

RIVER/REACH: Pulsipher Wash, Falcon Ridge
RIVER STATION: 1950
TYPE OF STRUCTURE: Bridge

Description:	Section: 1950; Existing I-15 culvert (12' x 10')
Distance from Upstream XS:	0.1
Deck/Roadway Width:	319.65
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	1603.83
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	2100	62.28	1605.37		1605.41	167.76	
3	2000	319.85	1605.17		1605.35	104.82	
	1950	319.65	1605.17		1605.35	104.82	Bridge #1-Up
	1950	0.10	1604.37		1604.64	229.89	Bridge #1-Dn
2	1900	58.98	1592.09		1597.12	12	

Ineffective Flow, Section 3			Ineffective Flow, Section 2		
Sta L	Sta R	Elev	Sta L	Sta R	Elev

BRIDGE:
Bridge Name: Bridge #1
LowFlowMethod: Higheat Energy Answer
Momentum Cd: 0
HighFlowMethod: Pressure and Weir flow
SluiceGate Cd: 0 Submerged Cd: 0.8164966

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations uae critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

---

MaxLowChord: 1598.88 MinTopRd: 1603.84 MinElPrs: 1598.88

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Bridge							U
							D

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Bridge #1	44.00	56.00	1603.83	1603.83	1603.83	1598.88	U
	12.08	158.13	1603.83	1603.83	1603.83	1598.88	D

Name	Q Total	Q Struc	Q Weir	Selected Method	Flow Type
Bridge #1	2138	1624.24	513.76	Press/Weir	Sluicegate Pressure and Weir Flow

GEOMETRIC CHECK

RS: 1950
ST GD 03 The starting station of -4.53 from downstream road/weir data is less than the starting station of 5.56 from downstream internal section.
The high chord elevation of 1603.83 for the starting road/weir station is greater than the ground elevation of 1600 for the starting ground station.
The EGEL at section 3 of 1605.35 is greater than the ground elevation.
The road/weir data should be included in the ground data

TYPE OF FLOW CHECK

RS: 1950 This is Bridge #1
BR PW 01 Type of sluicegate pressure and weir flow because,
1. EGEL 3 of 1605.35 is greater than MinTopRd of 1603.84.
2. EGEL 3 of 1605.35 is equal to or greater than MxLoCdU of 1598.88.
3. WSEL 2 of 1592.09 is less than MxLoCdD of 1598.88.

DISTANCE CHECK

RS: 1950 This is Bridge #1
ST DT 01 'Distance from Upstream XS' of 0.10 is less than the height of the bridge opening of 10.00
Section 3 should be placed at the foot of the road embankment or wing walls.
Distances at Sections 4 & 3, and 'Distance from Upstream XS' should

be adjusted.

RS: 1950 This is Bridge #1
ST DT 02 The channel distance of 0.1000122 at Downstream Internal Section is less than the height of the bridge opening of 16.69
Section 2 should be placed at the foot of the road embankment or wing walls.
Distances at Sections 4, 3 & 2 should be adjusted.

INEFFECTIVE FLOW CHECK

RS: 1900 This is section 2
ST GD 05 Weir flow occurs at Bridge
The velocity head at Section 2 is more than 0.5 foot and more than the velocity head at Section 1.
Section 2 should be recoded to represent the natural valley cross section.

RS: 1900 This is section 2
ST GD 07 Weir flow occurs at the structure.
Critical depth occurs at Section 2.
However, critical depth does not occur at Section 1.
Section 2 should be recoded to represent the natural valley cross section.

---END

Floodway Model HEC-RAS Output File (NGVD 29)

Referenced from *Amendment No. 1 to the Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway*. which is currently under FEMA review.

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp 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: Floodway Model
Project File : Floodway.prj
Run Date and Time: 1/30/2006 3:11:06 PM

Project in English units

Project Description:
Pulsipher Wash adjacent to Falcon Ridge Parkway. Revised floodway run along Pulsipher Wash from I-15 to limit of existing floodway. Limits of the revised floodplain used as the south boundary of the floodway with the north boundary remaining unchanged.

****

PLAN DATA

Plan Title: Plan 21
Plan File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.p21

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.g10

Flow Title : Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.f01

Plan Summary Information:
Number of: Cross Sections = 6 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Pulsipher Wash Reach = Falcon Ridge

RS	Profile	Method	Value1	Value2
2300	PF 2	1	-102.41	91.35
2200	PF 2	1	-124.26	88.75
2120	PF 2	1	-109.9	109.8
2100	PF 2	1	-22.5	93.49
2000	PF 2	1	31.02	76.4

****

FLOW DATA

Flow Title: Imported Flow 03
Flow File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.f01

Flow Data (cfs)

River	Reach	RS	PF#1	PF 2
Pulsipher Wash	Falcon Ridge	2300	3100	3100
Pulsipher Wash	Falcon Ridge	2000	2138	2138

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Pulsipher Wash	Falcon Ridge	PF#1	Critical	Critical
Pulsipher Wash	Falcon Ridge	PF 2	Critical	Critical

****

GEOMETRY DATA

Geometry Title: Adjacent to Falcon Ridge Pkwy.
Geometry File : C:\HEC\RAS3.1.3\Pulsipher Wash\1ST FEMA REVIEW\Floodway.g10

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2300

INPUT
Description: Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing channel. (Existing cross section 2300 from effective model)
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

****

-279.66	1608	-273.24	1606	-243.69	1604	-228.95	1602	-211.85	1600
-199.32	1600	-189.03	1602	-163.66	1602	-112.79	1600	12.87	1598.85
31.05	1596	39.89	1595.82	63.64	1595.82	86.88	1603.39	121.14	1615.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-279.66	.04	12.87	.025	63.64	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
12.87	63.64	134.71	313.73 323.04	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)	1601.01	Flow Area (sq ft)	1289.34	454.65	139.39
E.G. Slope (ft/ft)	0.000133	Area (sq ft)	1289.34	454.65	139.39
Q Total (cfs)	3100.00	Flow (cfs)	1539.51	1340.49	219.99
Top Width (ft)	356.33	Top Width (ft)	276.73	50.77	28.83
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.19	2.95	1.58
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	4.66	8.95	4.84
Conv. Total (cfs)	268695.9	Conv. (cfs)	133439.1	116188.7	19068.2
Length Wtd. (ft)	198.07	Wetted Per. (ft)	277.27	50.99	30.37
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.04	0.07	0.04
Alpha	1.71	Stream Power (lb/ft s)	0.05	0.22	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	26.57	9.54	5.30
C & E Loss (ft)	0.02	Cum SA (acres)	3.82	0.89	1.41

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.32	Reach Len. (ft)	134.71	313.73	323.04
Crit W.S. (ft)	1600.93	Flow Area (sq ft)	800.03	502.98	165.55
E.G. Slope (ft/ft)	0.000135	Area (sq ft)	800.03	502.98	165.55
Q Total (cfs)	3100.00	Flow (cfs)	1210.45	1595.81	293.74
Top Width (ft)	193.76	Top Width (ft)	115.28	50.77	27.71
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.51	3.17	1.77
Max Chl Dpth (ft)	10.50	Hydr. Depth (ft)	6.94	9.91	5.97
Conv. Total (cfs)	267099.5	Conv. (cfs)	104293.7	137497.1	25308.7
Length Wtd. (ft)	233.21	Wetted Per. (ft)	121.70	50.99	30.53
Min Ch El (ft)	1595.82	Shear (lb/sq ft)	0.06	0.08	0.05
Alpha	1.43	Stream Power (lb/ft s)	0.08	0.26	0.08
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	12.27	9.99	5.64
C & E Loss (ft)	0.01	Cum SA (acres)	1.44	0.82	1.29

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 2200

INPUT
Description: Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing channel. (Existing cross section 2200 from effective model)

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-529.7	1606	-504.93	1602	-433.36	1600	-422.03	1598	-411.07	1596
-393.06	1596	-382.49	1598	-358.9	1598	-351.33	1596	-339.14	1596
-324.81	1598	-311.83	1596	-284.98	1596	-17.67	1598	19.38	1598
32.13	1594	33.2	1593.65	51.03	1593	71.7	1598.5	111.8	1614

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-529.7	.04	19.38	.025	51.03	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.38	51.03	230.85	258.71 280.12	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.40	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	4128.81	347.61	261.15
E.G. Slope (ft/ft)	0.000018	Area (sq ft)	4128.81	347.61	261.15
Q Total (cfs)	3100.00	Flow (cfs)	2487.25	424.06	188.69
Top Width (ft)	615.56	Top Width (ft)	545.38	31.65	38.53
Vel Total (ft/s)	0.65	Avg. Vel. (ft/s)	0.60	1.22	0.72
Max Chl Dpth (ft)	12.40	Hydr. Depth (ft)	7.57	10.98	6.78
Conv. Total (cfs)	735769.2	Conv. (cfs)	590336.8	100647.4	44785.0
Length Wtd. (ft)	242.41	Wetted Per. (ft)	546.78	32.33	40.53
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.23	Stream Power (lb/ft s)	0.01	0.01	0.01
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	18.19	6.65	3.81
C & E Loss (ft)	0.00	Cum SA (acres)	2.55	0.59	1.16

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.32	Reach Len. (ft)	230.85	258.71	280.12
Crit W.S. (ft)		Flow Area (sq ft)	1238.23	376.79	295.80
E.G. Slope (ft/ft)	0.000076	Area (sq ft)	1238.23	376.79	295.80
Q Total (cfs)	3100.00	Flow (cfs)	1618.43	1003.82	477.75
Top Width (ft)	213.01	Top Width (ft)	143.64	31.65	37.72
Vel Total (ft/s)	1.62	Avg. Vel. (ft/s)	1.31	2.66	1.62
Max Chl Dpth (ft)	13.32	Hydr. Depth (ft)	8.62	11.90	7.84
Conv. Total (cfs)	355513.2	Conv. (cfs)	185603.9	115119.8	54789.5
Length Wtd. (ft)	248.22	Wetted Per. (ft)	152.76	32.33	40.90
Min Ch El (ft)	1593.00	Shear (lb/sq ft)	0.04	0.06	0.03
Alpha	1.36	Stream Power (lb/ft s)	0.05	0.15	0.06
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	9.12	6.83	3.93
C & E Loss (ft)	0.01	Cum SA (acres)	1.04	0.52	1.05

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2120

INPUT
Description: Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing channel. End of bank protection (rip-rap) west sided of channel.

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-219.24	1608	-197.58	1606	-180.07	1604	-146.34	1598	-109.19	1596
-99.41	1594	-92.4	1594	-41.72	1596	23.32	1595.11	27.27	1594
36.27	1592	42.09	1590.38	64.49	1591	80.92	1594.43	84.7	1596
112.56	1606								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.24	.04	23.32	.025	64.49	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.32	64.49	73	68.06	68.56	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1605.37	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1812.34	565.55	368.77
E.G. Slope (ft/ft)	*0.000033	Area (sq ft)	1812.34	565.55	368.77
Q Total (cfs)	3100.00	Flow (cfs)	1596.75	1097.87	405.39
Top Width (ft)	302.91	Top Width (ft)	215.41	41.17	46.32
Vel Total (ft/s)	1.13	Avg. Vel. (ft/s)	0.88	1.94	1.10
Max Chl Dpth (ft)	14.99	Hydr. Depth (ft)	8.41	13.74	7.96
Conv. Total (cfs)	*539168.4	Conv. (cfs)	*277714.3	*190947.2	70506.9
Length Wtd. (ft)	69.36	Wetted Per. (ft)	216.32	41.77	48.62
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.49	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.45	3.94	1.79
C & E Loss (ft)	0.00	Cum SA (acres)	0.54	0.38	0.89

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.025	0.030
W.S. Elev (ft)	1606.33	Reach Len. (ft)	73.00	68.06	68.56
Crit W.S. (ft)		Flow Area (sq ft)	1479.45	604.90	411.88
E.G. Slope (ft/ft)	*0.000031	Area (sq ft)	1479.45	604.90	411.88
Q Total (cfs)	3100.00	Flow (cfs)	1444.27	1186.41	469.32
Top Width (ft)	219.70	Top Width (ft)	133.22	41.17	45.31
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)	0.98	1.96	1.14
Max Chl Dpth (ft)	15.95	Hydr. Depth (ft)	11.11	14.69	9.09
Conv. Total (cfs)	*558116.0	Conv. (cfs)	*260023.0	*213597.3	84495.6
Length Wtd. (ft)	69.25	Wetted Per. (ft)	143.76	41.77	48.87
Min Ch El (ft)	1590.38	Shear (lb/sq ft)	0.02	0.03	0.02
Alpha	1.37	Stream Power (lb/ft s)	0.02	0.05	0.02
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.92	3.91	1.66
C & E Loss (ft)	0.01	Cum SA (acres)	0.31	0.30	0.78

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2100

INPUT
Description: Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing channel. (Existing cross section 2100 from effective model)

Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-81.41	1606	-56.47	1604	-45.38	1602	-37.37	1600	-26.85	1598
-14.73	1596	27.52	1594	32.71	1592	38.34	1590	50	1589.6
61.03	1590	79.71	1600	95.92	1606				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-81.41	.04	-81.41	.025	95.92	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-81.41	95.92	68.04	62.28	67.59	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1605.32	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1402.05	
E.G. Slope (ft/ft)	*0.000084	Area (sq ft)		1402.05	
Q Total (cfs)	3100.00	Flow (cfs)		3100.00	
Top Width (ft)	166.99	Top Width (ft)		166.99	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)		2.21	
Max Chl Dpth (ft)	15.72	Hydr. Depth (ft)		8.40	
Conv. Total (cfs)	*337444.2	Conv. (cfs)		*337444.2	
Length Wtd. (ft)	63.72	Wetted Per. (ft)		172.06	
Min Ch El (ft)	1589.60	Shear (lb/sq ft)		0.04	
Alpha	1.00	Stream Power (lb/ft s)		0.09	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.93	2.40	1.50
C & E Loss (ft)	0.03	Cum SA (acres)	0.36	0.22	0.86

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 OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.025	
W.S. Elev (ft)	1606.27	Reach Len. (ft)	68.04	62.28	67.59
Crit W.S. (ft)		Flow Area (sq ft)		1341.40	
E.G. Slope (ft/ft)	*0.000068	Area (sq ft)		1341.40	

Q Total (cfs)	3100.00	Flow (cfs)			3100.00						
Top Width (ft)	115.99	Top Width (ft)			115.99						
Vel Total (ft/s)	2.31	Avg. Vel. (ft/s)			2.31						
Max Chl Dpth (ft)	16.67	Hydr. Depth (ft)			11.56						
Conv. Total (cfs)	377006.2	Conv. (cfs)			377006.2						
Length Wtd. (ft)	63.32	Wetted Per. (ft)			130.45						
Min Ch El (ft)	1589.60	Shear (lb/sq ft)			0.04						
Alpha	1.00	Stream Power (lb/ft s)			0.10						
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		0.68	2.39		1.33				
C & E Loss (ft)	0.10	Cum SA (acres)		0.20	0.18		0.75				

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: Pulsipher Wash
REACH: Falcon Ridge RS: 2000

INPUT
Description: Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of I-15 box culvert. (Existing cross section 2000 from effective model)

Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
44	56	303.13	319.85	320.07	.3	.5

CROSS SECTION OUTPUT Profile #PF#1

E.G. Elev (ft)	1605.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1605.17	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1601.38	Flow Area (sq ft)	215.53	195.42	212.36
E.G. Slope (ft/ft)	0.000144	Area (sq ft)	215.53	195.42	212.36
Q Total (cfs)	2138.00	Flow (cfs)	677.95	775.84	684.21
Top Width (ft)	104.82	Top Width (ft)	48.53	12.00	44.29
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)	3.15	3.97	3.22
Max Chl Dpth (ft)	16.29	Hydr. Depth (ft)	4.44	16.29	4.79
Conv. Total (cfs)	178233.2	Conv. (cfs)	56516.8	64677.6	57038.8
Length Wtd. (ft)	0.10	Wetted Per. (ft)	50.05	32.00	47.57
Min Ch El (ft)	1588.88	Shear (lb/sq ft)	0.04	0.05	0.04
Alpha	1.04	Stream Power (lb/ft s)	0.12	0.22	0.13
Frctn Loss (ft)		Cum Volume (acre-ft)	0.76	1.26	1.33
C & E Loss (ft)		Cum SA (acres)	0.32	0.09	0.82

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	1606.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.015	0.015	0.015
W.S. Elev (ft)	1605.83	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	1601.10	Flow Area (sq ft)	86.27	203.39	128.68
E.G. Slope (ft/ft)	0.000274	Area (sq ft)	86.27	203.39	128.68
Q Total (cfs)	2138.00	Flow (cfs)	383.15	1143.66	611.20
Top Width (ft)	45.38	Top Width (ft)	12.98	12.00	20.40
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)	4.44	5.62	4.75
Max Chl Dpth (ft)	16.95	Hydr. Depth (ft)	6.65	16.95	6.31
Conv. Total (cfs)	129238.3	Conv. (cfs)	23160.6	69131.9	36945.9
Length Wtd. (ft)	0.10	Wetted Per. (ft)	19.34	32.00	26.08
Min Ch El (ft)	1588.88	Shear (lb/sq ft)	0.08	0.11	0.08
Alpha	1.03	Stream Power (lb/ft s)	0.34	0.61	0.40
Frctn Loss (ft)		Cum Volume (acre-ft)	0.61	1.29	1.23
C & E Loss (ft)		Cum SA (acres)	0.19	0.09	0.73

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

BRIDGE

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1950

INPUT
Description: Section: 1950; Existing I-15 culvert (12' x 10')
Distance from Upstream XS = .1
Deck/Roadway Width = 319.65
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
-4.53 1603.83	1582.19	44 1603.83	1582.19	44 1603.83	1598.88
56 1603.83	1598.88	56 1603.83	1582.19	100.29 1603.83	1582.19

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-4.53	1604	7.52	1602	19.96	1600	44	1598.88	44	1588.88
56	1588.88	56	1598.88	73.88	1600	100.29	1602		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-4.53	.015	44	.015	56	.015

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
44	56	.3	.5

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
-4.53 1603.83	1598.88	1104.82 1603.83	1598.88

Downstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
44	56	.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 = 1603.83
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
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd =.8164966
Max Low Cord = 1598.88

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)	1605.35	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1605.17	E.G. Elev (ft)	1605.35	1604.64
Q Total (cfs)	2138.00	W.S. Elev (ft)	1605.17	1604.37
Q Bridge (cfs)	1624.24	Crit W.S. (ft)	1598.84	1594.60
Q Weir (cfs)	513.76	Max Chl Dpth (ft)	16.29	22.18
Weir Sta Lft (ft)	-4.53	Vel Total (ft/s)	8.23	3.28
Weir Sta Rgt (ft)	100.29	Flow Area (sq ft)	259.86	652.15
Weir Submerg	0.00	Froude # Chl	0.36	0.19
Weir Max Depth (ft)	1.52	Specif Force (cu ft)	2016.42	5524.01
Min El Weir Flow (ft)	1603.84	Hydr Depth (ft)	2.48	2.84
Min El Prs (ft)	1598.88	W.P. Total (ft)	151.33	544.03
Delta EG (ft)	8.23	Conv. Total (cfs)		
Delta WS (ft)	13.08	Top Width (ft)	104.82	229.89
BR Open Area (sq ft)	120.00	Frctn Loss (ft)		
BR Open Vel (ft/s)	13.54	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)		

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used for pressure flow.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE OUTPUT Profile #PF 2

E.G. US. (ft)	1606.25	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1605.83	E.G. Elev (ft)	1606.25	1604.57
Q Total (cfs)	2138.00	W.S. Elev (ft)	1605.83	1604.32
Q Bridge (cfs)	1693.71	Crit W.S. (ft)	1598.84	1594.60
Q Weir (cfs)	444.30	Max Chl Dpth (ft)	16.95	22.13
Weir Sta Lft (ft)	31.02	Vel Total (ft/s)	10.15	3.34
Weir Sta Rgt (ft)	76.40	Flow Area (sq ft)	210.72	641.05
Weir Submerg	0.00	Froude # Chl	0.43	0.16
Weir Max Depth (ft)	2.42	Specif Force (cu ft)	2206.09	5498.22
Min El Weir Flow (ft)	1603.84	Hydr Depth (ft)	4.64	2.79
Min El Prs (ft)	1598.88	W.P. Total (ft)	93.38	543.56
Delta EG (ft)	9.13	Conv. Total (cfs)		
Delta WS (ft)	13.78	Top Width (ft)	45.38	229.47
BR Open Area (sq ft)	120.00	Frctn Loss (ft)		
BR Open Vel (ft/s)	14.11	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)		
Br Sel Method	Press/Weir	Power Total (lb/ft s)		

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used for pressure flow.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Pulsipher Wash
REACH: Falcon Ridge RS: 1900

INPUT
Description: Section: 1900; South I-15. Outlet of existing box culvert at I-15. (12x10) (Match existing cross section 1900 from effective model)
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.56	1600	17.2	1598	24.99	1596	27.96	1594	44	1592.19
44	1582.19	56	1582.19	56	1592.19	75.01	1596	130.66	1598
193.09	1600	214.49	1602	232.29	1604	249.33	1606		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.56	.015	44	.015	56	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
44	56	60.81	58.98	66.92	.1	.3

CROSS SECTION OUTPUT Profile #PF#1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1597.12	Element			
Vel Head (ft)	5.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.09	Reach Len. (ft)			
Crit W.S. (ft)	1592.09	Flow Area (sq ft)		118.76	
E.G. Slope (ft/ft)	0.005698	Area (sq ft)		118.76	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.00	Avg. Vel. (ft/s)		18.00	
Max Chl Dpth (ft)	9.90	Hydr. Depth (ft)		9.90	
Conv. Total (cfs)	28323.5	Conv. (cfs)		28323.5	
Length Wtd. (ft)		Wetted Per. (ft)		31.79	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.33	
Alpha	1.00	Stream Power (lb/ft s)		23.92	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	1597.12	Element			
Vel Head (ft)	5.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	1592.05	Reach Len. (ft)			
Crit W.S. (ft)	1592.05	Flow Area (sq ft)		118.26	
E.G. Slope (ft/ft)	0.005759	Area (sq ft)		118.26	
Q Total (cfs)	2138.00	Flow (cfs)		2138.00	
Top Width (ft)	12.00	Top Width (ft)		12.00	
Vel Total (ft/s)	18.08	Avg. Vel. (ft/s)		18.08	
Max Chl Dpth (ft)	9.85	Hydr. Depth (ft)		9.85	
Conv. Total (cfs)	28173.1	Conv. (cfs)		28173.1	
Length Wtd. (ft)		Wetted Per. (ft)		31.71	
Min Ch El (ft)	1582.19	Shear (lb/sq ft)		1.34	
Alpha	1.00	Stream Power (lb/ft s)		24.24	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Pulsipher Wash

Reach	River Sta.	n1	n2	n3
Falcon Ridge	2300	.04	.025	.03
Falcon Ridge	2200	.04	.025	.03
Falcon Ridge	2120	.04	.025	.03
Falcon Ridge	2100	.04	.025	.03
Falcon Ridge	2000	.015	.015	.015
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Pulsipher Wash

Reach	River Sta.	Left	Channel	Right
Falcon Ridge	2300	134.71	313.73	323.04
Falcon Ridge	2200	230.85	258.71	280.12
Falcon Ridge	2120	73	68.06	68.56
Falcon Ridge	2100	68.04	62.28	67.59
Falcon Ridge	2000	303.13	319.85	320.07
Falcon Ridge	1950	Bridge		
Falcon Ridge	1900	60.81	58.98	66.92

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Pulsipher Wash

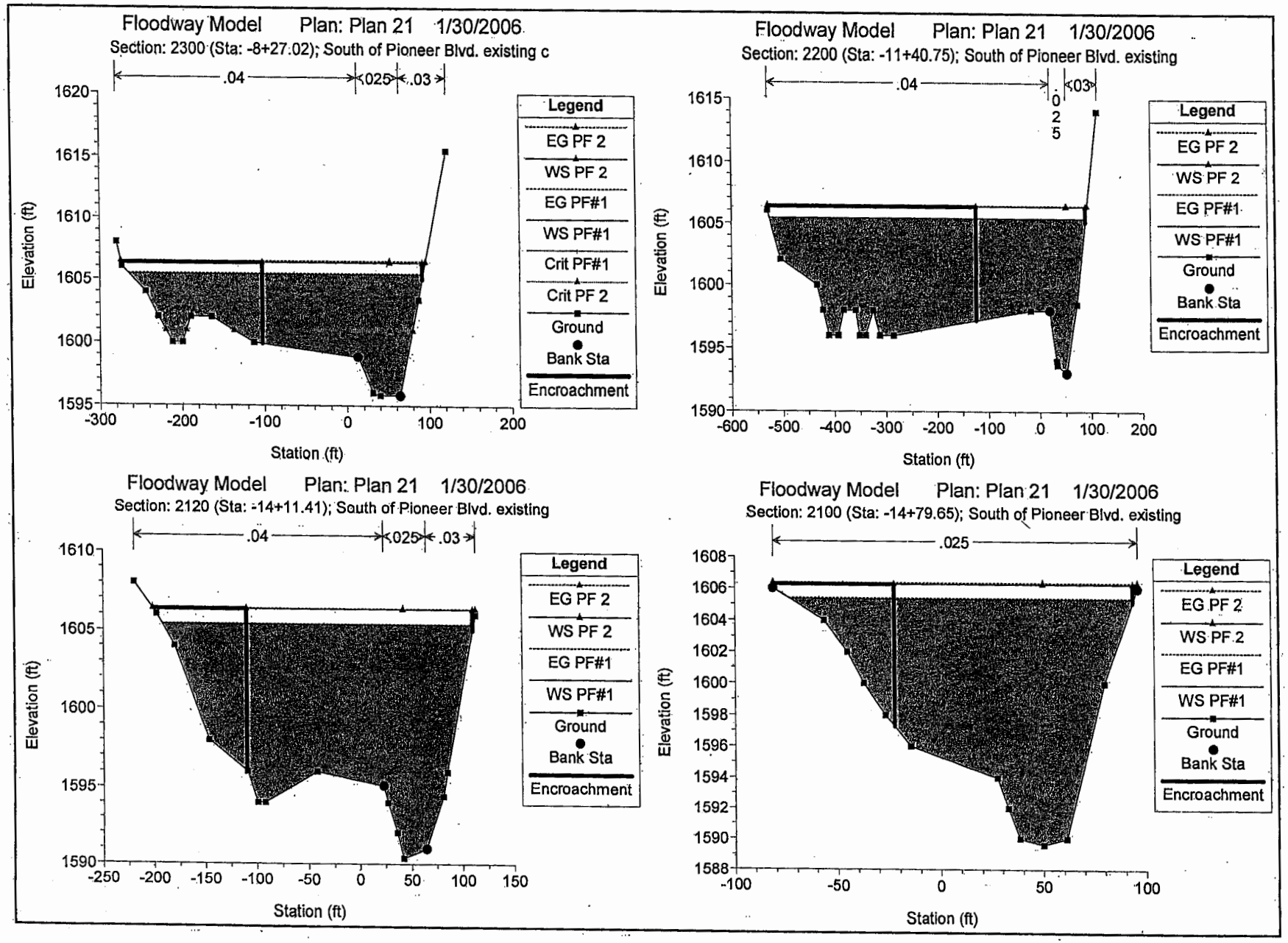
Reach	River Sta.	Contr.	Expan.
Falcon Ridge	2300	.1	.3
Falcon Ridge	2200	.1	.3
Falcon Ridge	2120	.1	.3
Falcon Ridge	2100	.3	.5
Falcon Ridge	2000	.3	.5
Falcon Ridge	1950	Bridge	
Falcon Ridge	1900	.3	.5

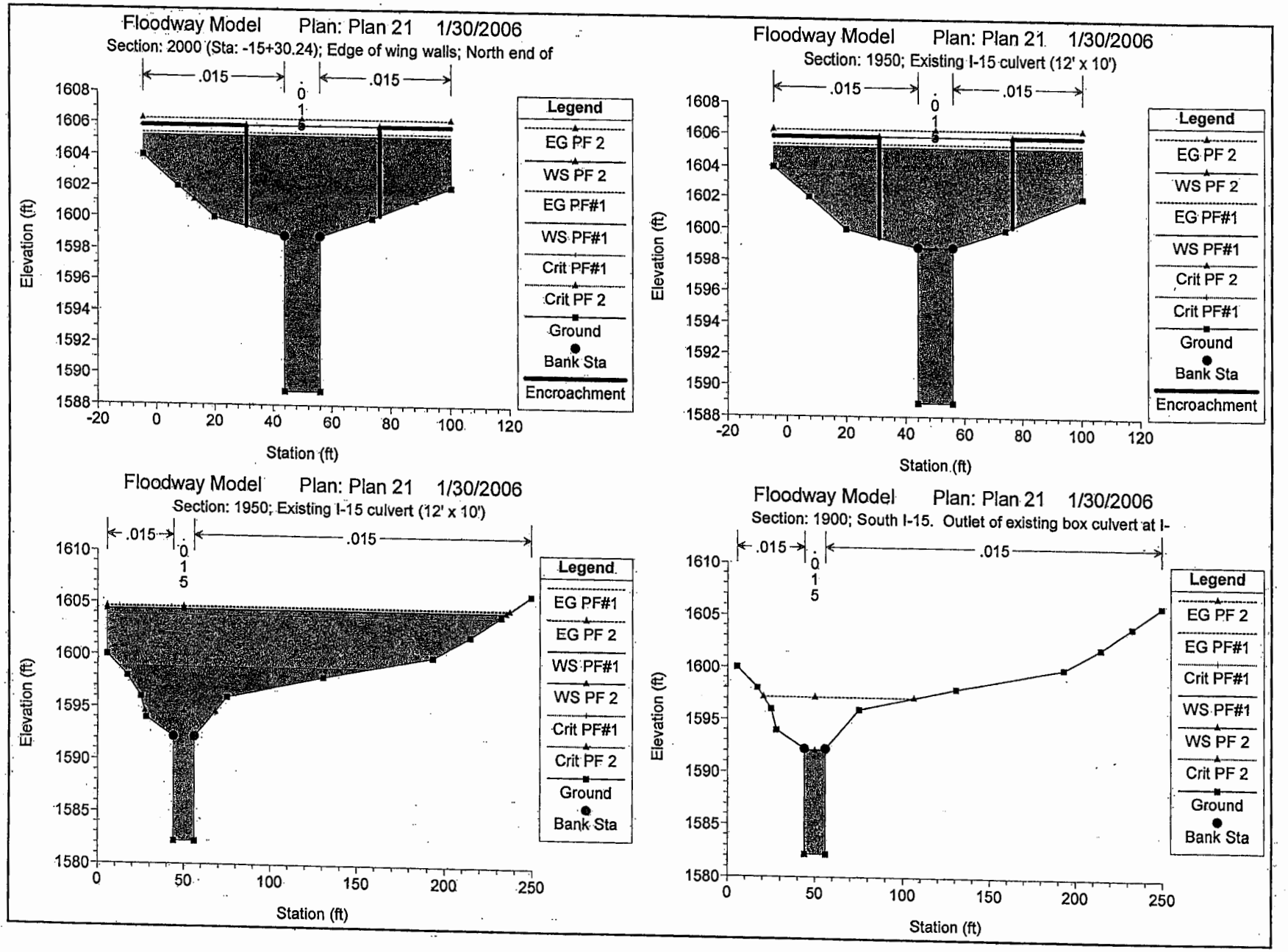
Profile Output Table - Standard Table 1

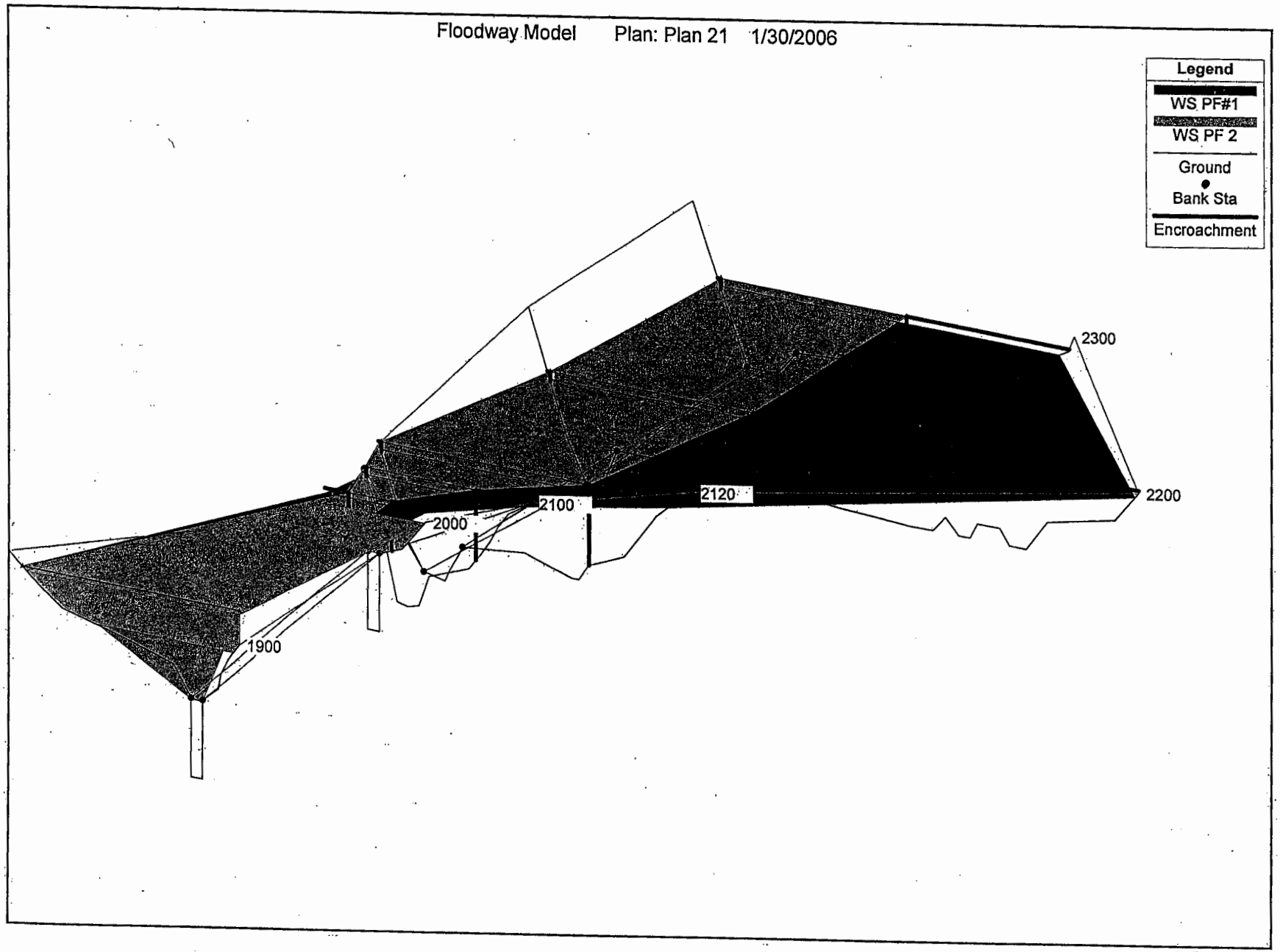
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37	1601.01	1605.44	0.000133	2.95	1883.38	356.33	0.17
Falcon Ridge	2300	PF 2	3100.00	1595.82	1606.32	1600.93	1606.42	0.000135	3.17	1468.56	193.76	0.18
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56	0.06
Falcon Ridge	2200	PF 2	3100.00	1593.00	1606.32		1606.38	0.000076	2.66	1910.82	213.01	0.14
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91	0.09
Falcon Ridge	2120	PF 2	3100.00	1590.38	1606.33		1606.36	0.000031	1.96	2496.23	219.70	0.09
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99	0.13
Falcon Ridge	2100	PF 2	3100.00	1589.60	1606.27		1606.35	0.000068	2.31	1341.40	115.99	0.12
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	2000	PF 2	2138.00	1588.88	1605.83	1601.10	1606.25	0.000274	5.62	418.34	45.38	0.24
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01
Falcon Ridge	1900	PF 2	2138.00	1582.19	1592.05	1592.05	1597.12	0.005759	18.08	118.26	12.00	1.01

HEC-RAS Plan: Plan 21 River: Pulsipher Wash Reach: Falcon Ridge

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
Falcon Ridge	2300	PF#1	3100.00	1595.82	1605.37	1601.01	1605.44	0.000133	2.95	1883.38	356.33	0.17
Falcon Ridge	2300	PF 2	3100.00	1595.82	1606.32	1600.93	1606.42	0.000135	3.17	1468.56	193.76	0.18
Falcon Ridge	2200	PF#1	3100.00	1593.00	1605.40		1605.41	0.000018	1.22	4737.57	615.56	0.06
Falcon Ridge	2200	PF 2	3100.00	1593.00	1606.32		1606.38	0.000076	2.66	1910.82	213.01	0.14
Falcon Ridge	2120	PF#1	3100.00	1590.38	1605.37		1605.40	0.000033	1.94	2746.66	302.91	0.09
Falcon Ridge	2120	PF 2	3100.00	1590.38	1606.33		1606.36	0.000031	1.96	2496.23	219.70	0.09
Falcon Ridge	2100	PF#1	3100.00	1589.60	1605.32		1605.40	0.000084	2.21	1402.05	166.99	0.13
Falcon Ridge	2100	PF 2	3100.00	1589.60	1606.27		1606.35	0.000068	2.31	1341.40	115.99	0.12
Falcon Ridge	2000	PF#1	2138.00	1588.88	1605.17	1601.38	1605.35	0.000144	3.97	623.31	104.82	0.17
Falcon Ridge	2000	PF 2	2138.00	1588.88	1605.83	1601.10	1606.25	0.000274	5.62	418.34	45.38	0.24
Falcon Ridge	1950		Bridge									
Falcon Ridge	1900	PF#1	2138.00	1582.19	1592.09	1592.09	1597.12	0.005698	18.00	118.76	12.00	1.01
Falcon Ridge	1900	PF 2	2138.00	1582.19	1592.05	1592.05	1597.12	0.005759	18.08	118.26	12.00	1.01


Floodway Model Plan: Plan 21 1/30/2006
Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing c
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Crit PF#1
Crit PF 2
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing
.04
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing
.025
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Ground
Bank Sta
Encroachment


Floodway Model Plan: Plan 21 1/30/2006
Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of
.015
.015
.01
5
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF#1
WS PF#1
Crit PF#1
Crit PF 2
Ground
Bank Sta
Encroachment
Floodway Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
Floodway Model Plan: Plan 21 1/30/2006
Section: 1950; Existing I-15 culvert (12' x 10')
Floodway Model Plan: Plan 21 1/30/2006
Section: 1900; South I-15. Outlet of existing box culvert at I-


Floodway Model Plan: Plan 21 1/30/2006
Legend
WS PF#1
WS PF 2
Ground
Bank Sta
Encroachment
2300
2200
2120
2100
2000
1900

Datum Conversion and Benchmark Information

ACRN=GR1365 ********** BENCH MARK DESCRIPTION **********
DESIGNATION--Z 405
QUAD--0361141[illegible] QSN--
MONUMENT BY--NGS
RECOVERY BY--
STAMPING--Z 405 1982

STATE--NV COUNTY--CLARK
LATITUDE= 364815N LONGITUDE= 1140410W
YR--1982 MARK TYPE--FLANGE-ENCASED ROD
DATE-- CONDITION--

***** MARK MADE BY/FOR--NGS
***** SPECIFIC SETTING--STAINLESS STEEL ROD
IN MESQUITE, IN THE EAST PLANTER BOX AT THE EAST ENTRANCE TO THE CHURCH OF LATTER DAY SAINTS, 17.2 METERS (56.5 FT) NORTH OF THE BOULEVARD CENTERLINE, 20.2 METERS (66.5 FT) SOUTHEAST OF THE SOUTHEAST CORNER OF THE EAST WING OF THE CHURCH, 9.6 METERS (31.5 FT) NORTHWEST OF THE NORTHWEST CORNER OF A CONCRETE BRIDGE OVER A DRY WASH, 2.7 METERS (9 FT) NORTH OF A POWER LINE T JUNCTION POLE, 0.6 METER (2 FT) EAST OF THE EAST CURB OF A DRIVEWAY.

LAT-N364815. LON-W1140410. SOURCE/ORDER/DATUM-S 4 27 ADJID-
ELEVATION- 487.2197 SOURCE/ORDER/DATUM-A 88 ADJID-0000002 1598.49
ELEVATION- 486.3414 SOURCE/ORDER/DATUM-F 29 ADJID-L24739 1595.61

USE THIS ELEV. (BBE BM ELEV.= 1595.65) 29 Matches BBE INFO 486.3659(M) 1595.69
1598.49 88
2.84 DIFF
NAVD 88
NGVD 29

ACRN=GR1368 ********** BENCH MARK DESCRIPTION **********
DESIGNATION--C 406
QUAD--0361141[illegible] QSN--
MONUMENT BY--NGS
RECOVERY BY--
STAMPING--C 406 19[illegible]

STATE--NV COUNTY--CLARK
LATITUDE= 364648N LONGITUDE= 1140624W
YR--1982 MARK TYPE--FLANGE-ENCASED ROD
DATE-- CONDITION--

***** MARK MADE BY/FOR--NGS
***** SPECIFIC SETTING--STAINLESS STEEL ROD
2.1 KM (1.3 MI) NORTHEAST ALONG STATE HIGHWAY 170 FROM THE JUNCTION OF MAIN STREET IN BUNKERVILLE, 1.6 KM (1.0 MI) SOUTHWEST OF THE SOUTH END OF THE BRIDGE OVER THE VIRGIN RIVER, 0.9 METER (3 FT) SOUTHWEST OF THE NORTHWEST POLE FOR A POWER LINE SPUR CROSSING THE HIGHWAY, 19.2 METERS (63 FT) NORTHWEST OF THE HIGHWAY CENTERLINE, 92.9 METERS (305 FT) SOUTHWEST OF MILEPOST 10, 51.8 METERS (170 FT) NORTHEAST OF THE NORTHWEST END OF A 36 INCH CORRUGATED METAL PIPE CULVERT.

LAT-N364648. LON-W1140624. SOURCE/ORDER/DATUM-S 4 27 ADJID
ELEVATION- 477.7853 SOURCE/ORDER/DATUM-A 88 ADJID-0000025 1567.53
ELEVATION- 476.9084 SOURCE/ORDER/DATUM-F 29 ADJID-L24739 1564.66

GR0140 Superseded values are not recommended for survey control.
GR0140 NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
GR0140 See file dsdata.txt to determine how the superseded data were derived.
GR0140
GR0140 MARKER: DD = SURVEY DISK
GR0140 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
GR0140 STAMPING: SEE TEXT
GR0140 STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
GR0140+STABILITY: SURFACE MOTION
GR0140

GR0140	HISTORY	- Date	Condition	Report By
GR0140	HISTORY	- 1957	MONUMENTED	NVDH
GR0140	HISTORY	- 1957	GOOD	NGS
GR0140	HISTORY	- 1979	MARK NOT FOUND	USGS

GR0140
GR0140 STATION DESCRIPTION
GR0140
GR0140'DESCRIBED BY NATIONAL GEODETIC SURVEY 1957
GR0140'7.8 MI W FROM MESQUITE.
GR0140'7.8 MILES WEST ALONG U.S. HIGHWAY 91 FROM THE POST OFFICE IN MESQUITE,
GR0140'150 FEET EAST OF A T ROAD SOUTH, 50 FEET SOUTH OF THE CENTER LINE OF
GR0140'THE HIGHWAY 2.8 FEET NORTH OF A ROUND BLACK AND WHITE IRON REFERENCE
GR0140'POST, SET IN A CONCRETE POST FLUSH WITH THE GROUND. STAMPED DIST 50 FT
GR0140'STA F 233 + 74.48 POT ANGLE 90 O Z 136 1957 ELEV 1588.60.
GR0140
GR0140 STATION RECOVERY (1979)
GR0140
GR0140'RECOVERY NOTE BY US GEOLOGICAL SURVEY 1979
GR0140'MARK NOT FOUND.
1 National Geodetic Survey, Retrieval Date = JULY 10, 2002
GR1365 **********
GR1365 DESIGNATION - Z 405
GR1365 PID - GR1365
GR1365 STATE/COUNTY- NV/CLARK
GR1365 USGS QUAD - MESQUITE (1985)
GR1365
GR1365 *CURRENT SURVEY CONTROL
GR1365

GR1365*	NAD 83(1986)-	36 48 14.	(N)	114 04 12.	(W)	SCALED
GR1365*	NAVD 88 -	487.220	(meters)	1598.49	(feet)	ADJUSTED

GR1365

GR1365	GEOID HEIGHT-	-26.43	(meters)			GEOID99
GR1365	DYNAMIC HT -	486.735	(meters)	1596.90	(feet)	COMP
GR1365	MODELED GRAV-	979,624.4	(mgal)			NAVD 88
GR1365	OBS GRAVITY -	979,624.2	(mgal)			GRAV_OBS

GR1365
GR1365 VERT ORDER - FIRST CLASS II
GR1365
GR1365.The horizontal coordinates were scaled from a topographic map and have
GR1365.an estimated accuracy of +/- 6 seconds.
GR1365
GR1365.The orthometric height was determined by differential leveling
GR1365.and adjusted by the National Geodetic Survey in June 1991.
GR1365
GR1365.The geoid height was determined by GEOID99.
GR1365
GR1365.The dynamic height is computed by dividing the NAVD 88
GR1365.geopotential number by the normal gravity value computed on the
GR1365.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
GR1365.degrees latitude (g = 980.6199 gals.).

GR1365
GR1365.The modeled gravity was interpolated from observed gravity values.
GR1365.The observed gravity was obtained from relative gravimeter ties
GR1365.to the IGSN71 gravity network.
GR1365
GR1365;   North   East   Units Estimated Accuracy
GR1365;SPC NV E   - 8,228,940.   335,040.   MT (+/- 180 meters Scaled)
GR1365
GR1365   SUPERSEDED SURVEY CONTROL
GR1365
GR1365.No superseded survey control is available for this station.
GR1365
GR1365_MARKER: I = METAL ROD
GR1365_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
GR1365_STAMPING: Z 405 1982
GR1365_MARK LOGO: NGS
GR1365_PROJECTION: FLUSH
GR1365_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
GR1365_ROD/PIPE-DEPTH: 12.2 meters
GR1365
GR1365 HISTORY   - Date   Condition   Report By
GR1365 HISTORY   - 1982   MONUMENTED   NGS
GR1365 HISTORY   - 19941017 MARK NOT FOUND USPSQD
GR1365 HISTORY   - 19951007 GOOD   USPSQD
GR1365
GR1365   STATION DESCRIPTION
GR1365
GR1365'DESCRIBED BY NATIONAL GEODETIC SURVEY 1982
GR1365'IN MESQUITE.
GR1365'IN MESQUITE, IN THE EAST PLANTER BOX AT THE EAST ENTRANCE TO THE
GR1365'CHURCH OF LATTER DAY SAINTS, 17.2 METERS (56.5 FT) NORTH OF THE
GR1365'BOULEVARD CENTERLINE, 20.2 METERS (66.5 FT) SOUTHEAST OF THE SOUTHEAST
GR1365'CORNER OF THE EAST WING OF THE CHURCH, 9.6 METERS (31.5 FT) NORTHWEST
GR1365'OF THE NORTHWEST CORNER OF A CONCRETE BRIDGE OVER A DRY WASH, 2.7
GR1365'METERS (9 FT) NORTH OF A POWER LINE T JUNCTION POLE, 0.6 METER (2 FT)
GR1365'EAST OF THE EAST CURB OF A DRIVEWAY.
GR1365'THE MARK IS 0.05 M BELOW THE DRIVEWAY CURB.
GR1365
GR1365   STATION RECOVERY (1994)
GR1365
GR1365'RECOVERY NOTE BY US POWER SQUADRON 1994
GR1365'MARK NOT FOUND.
GR1365
GR1365   STATION RECOVERY (1995)
GR1365
GR1365'RECOVERY NOTE BY US POWER SQUADRON 1995
GR1365'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:03:19

- This listing contains control for which complete digital -
- data sheets where not provided. The complete data sheets were -
- not provided for the reason listed below. The reason below is -
- associated with a horizontal control Nonpub code shown under -
- the heading 'H' and/or a vertical control Nonpub code shown under -
- the heading 'v' -

APPENDIX D

Referenced Improvement Plans & As-Built Plans

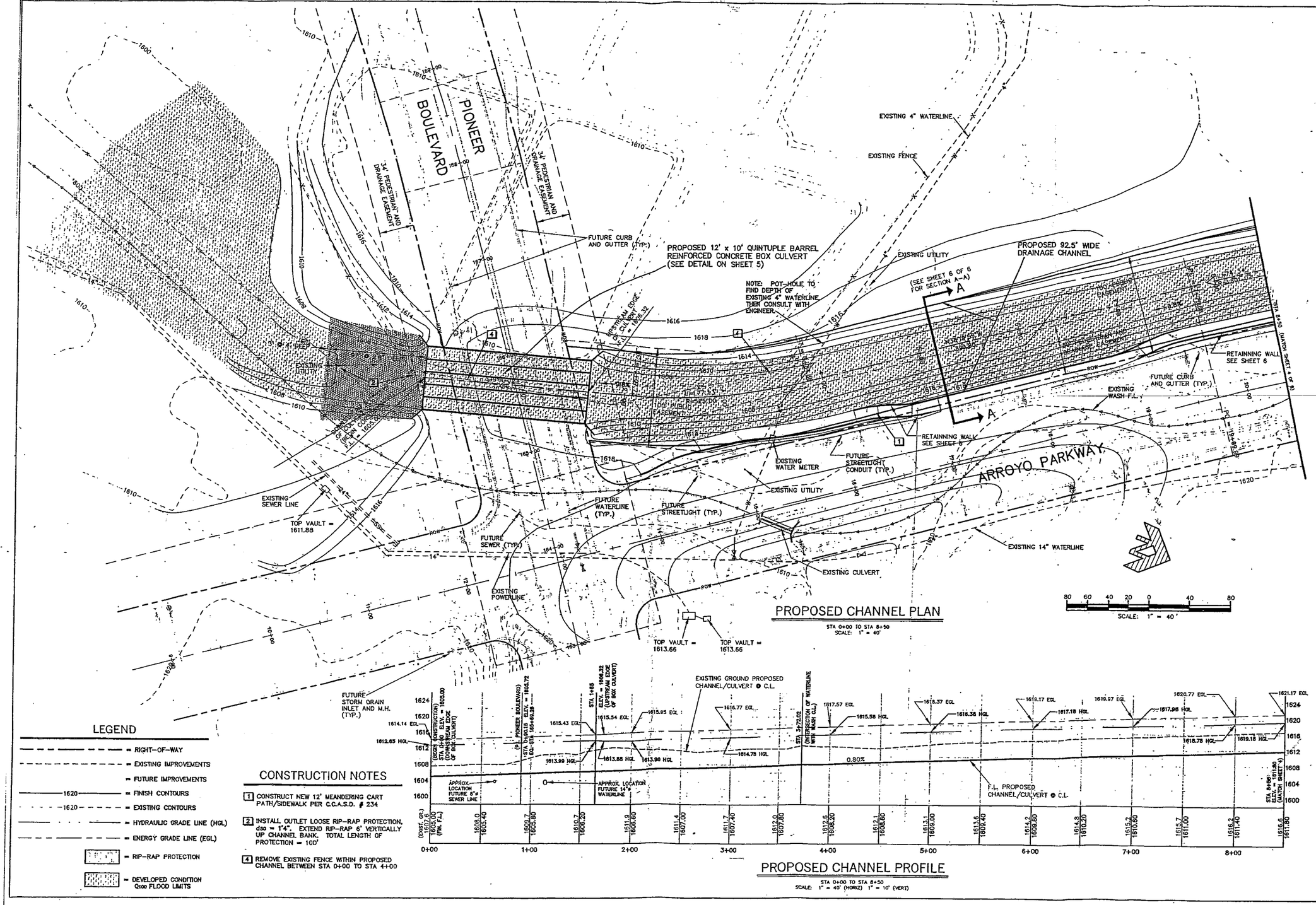
Note:
Pulsipher Wash Improvement Project was referenced for Pioneer Blvd. box culvert only, grass lined channel was not built.

1. Referenced Improvement Plans, Pulsipher Wash Improvement Project D1

2. Referenced Improvement Plans, Pulsipher Wash Improvements D4

3. Referenced As-Built Plans, Falcon Ridge Phase I D8

4. Copy of as-built certification letter referenced from the *Final Report for Request for LOMR, Pulsipher Wash Adjacent to Falcon Ridge Parkway* D13



LEGEND

- = RIGHT-OF-WAY
- = EXISTING IMPROVEMENTS
- = FUTURE IMPROVEMENTS
- 1620 = FINISH CONTOURS
- 1620 = EXISTING CONTOURS
- = HYDRAULIC GRADE LINE (HGL)
- = ENERGY GRADE LINE (EGL)
- = RIP-RAP PROTECTION
- = DEVELOPED CONDITION Q100 FLOOD LIMITS

CONSTRUCTION NOTES

1. CONSTRUCT NEW 12' MEANDERING CART PATH/SIDEWALK PER C.C.A.S.D. # 234
2. INSTALL OUTLET LOOSE RIP-RAP PROTECTION, d_{50} = 1'4". EXTEND RIP-RAP 6' VERTICALLY UP CHANNEL BANK. TOTAL LENGTH OF PROTECTION = 100'
4. REMOVE EXISTING FENCE WITHIN PROPOSED CHANNEL BETWEEN STA 0+00 TO STA 4+00

NO	DESCRIPTION	DATE	BY
	REVISIONS		

BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS-LAND SURVEYORS-LAND PLANNERS

P.O. BOX 1405
CEDAR CITY, UTAH 84720
(435) 586-9592

91 WEST 1470 SOUTH, STE 102
ST. GEORGE, UTAH 84770
(435) 628-4700

561 W MESQUITE BLVD, STE 4
MESQUITE, NEVADA 89027
(702) 346-5101

CHANNEL/CULVERT PLAN & PROFILE STA 0+00 TO 8+50

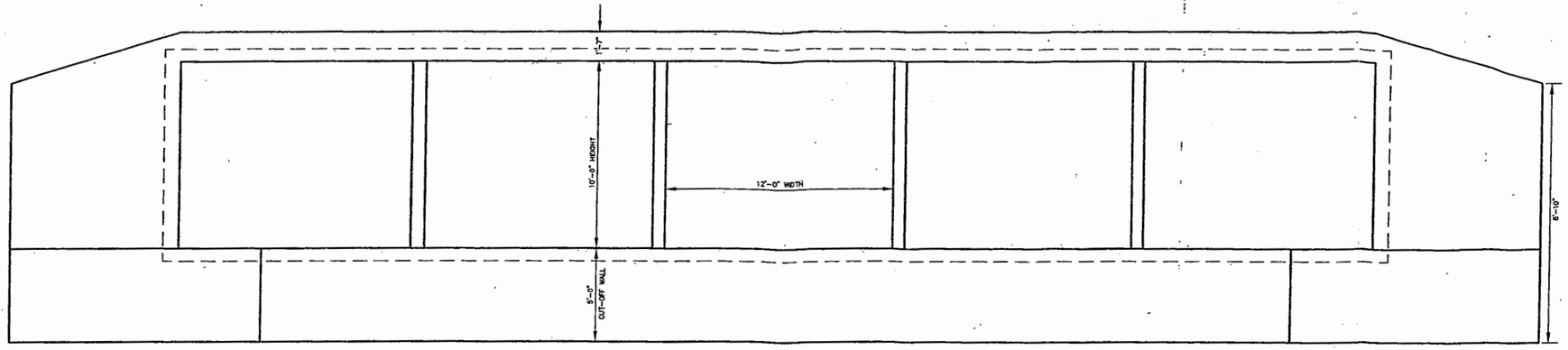
FOR

PULSIPHER WASH IMPROVEMENT PROJECT

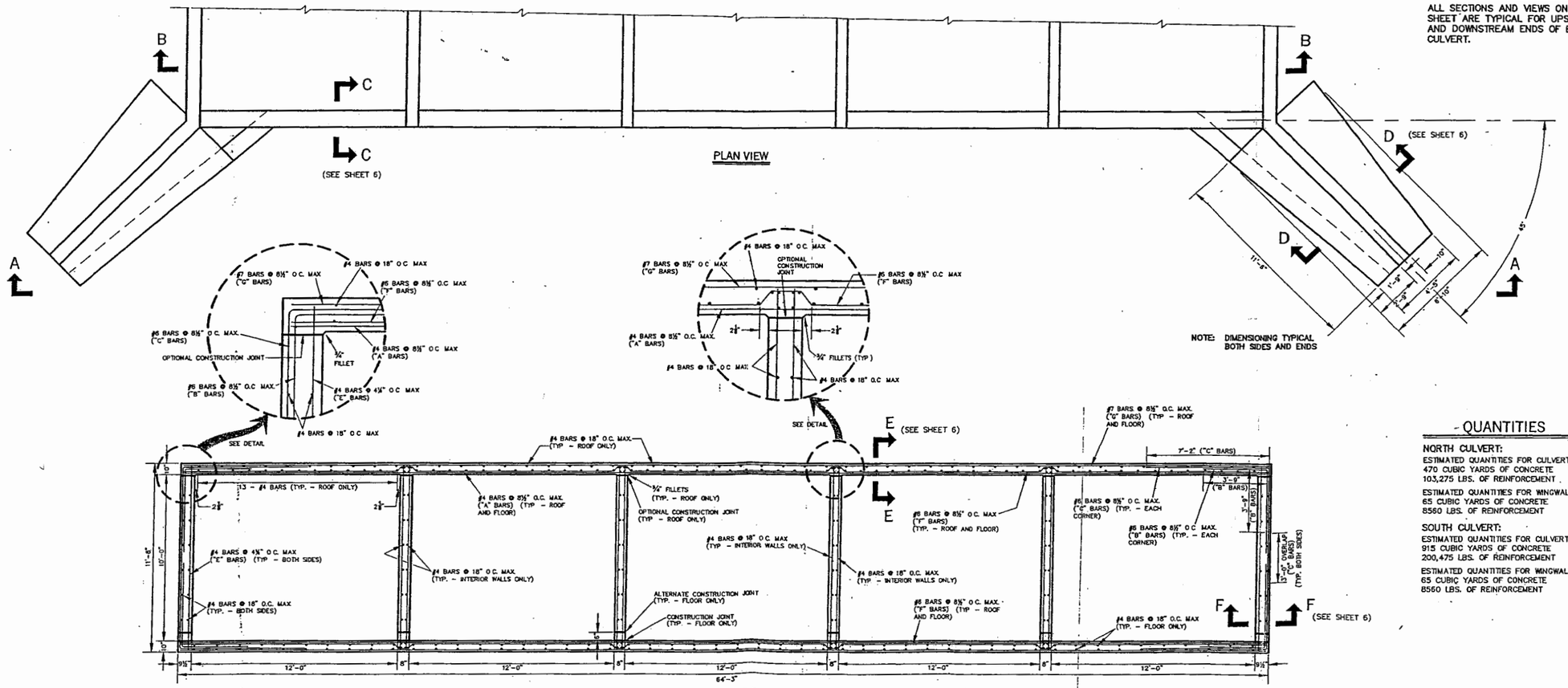
MESQUITE, NEVADA

SCALE	DRAWN BY	CHECKED BY
AS SHOWN	CAS	
FILE NAME	DATED 7-11-2000	SHEET NO. 3 OF 6

01



SECTION A-A



SECTION B-B

NOTE

ALL SECTIONS AND VIEWS ON THIS SHEET ARE TYPICAL FOR UPSTREAM AND DOWNSTREAM ENDS OF EACH CULVERT.

NOTE: DIMENSIONING TYPICAL BOTH SIDES AND ENDS

QUANTITIES

NORTH CULVERT:

ESTIMATED QUANTITIES FOR CULVERT:
470 CUBIC YARDS OF CONCRETE
103,275 LBS. OF REINFORCEMENT

ESTIMATED QUANTITIES FOR WINGWALLS:
65 CUBIC YARDS OF CONCRETE
8560 LBS. OF REINFORCEMENT

SOUTH CULVERT:

ESTIMATED QUANTITIES FOR CULVERT:
915 CUBIC YARDS OF CONCRETE
200,475 LBS. OF REINFORCEMENT

ESTIMATED QUANTITIES FOR WINGWALLS:
65 CUBIC YARDS OF CONCRETE
8560 LBS. OF REINFORCEMENT

QUINTUPLE BARREL 12' x 10' REINFORCED CONCRETE CULVERT DETAILS

REFERENCE: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION – RCP CULVERTS/TYPE I HEADWALLS – B-20.1.5(502)

NO	DESCRIPTION	DATE	BY
	REVISIONS		

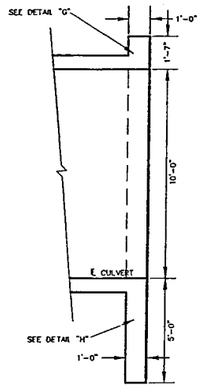
BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS—LAND SURVEYORS—LAND PLANNERS
P.O. BOX 1405, CEDAR CITY, UTAH 84720, (435) 586-9592
91 WEST 1470 SOUTH, STE 102, ST. GEORGE, UTAH 84770, (435) 628-4700
561 W MESQUITE BLVD, STE 4, MESQUITE, NEVADA 89027, (702) 345-5101

DETAIL SHEET
QUINTUPLE BARREL R.C.B. CULVERT
FOR
PULSIPHER WASH
IMPROVEMENT PROJECT
WASHINGTON COUNTY, UTAH

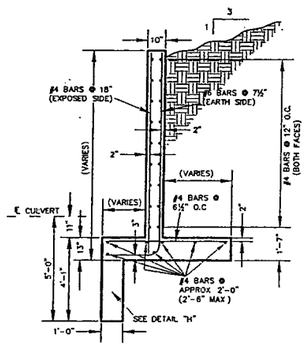
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DATED: 6-28-2000
SHEET NO.:

7/11/00

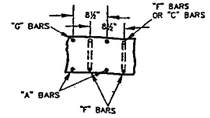
D2



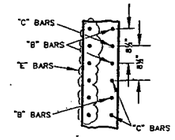
SECTION C-C
(FROM SHEET 5)



SECTION D-D
(FROM SHEET 5)



SECTION E-E
(FROM SHEET 5)



SECTION F-F
(FROM SHEET 5)

R.C.B. CULVERT - GENERAL NOTES

1– DESIGN SPECIFICATION: AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1977" AND "INTERIM SPECIFICATIONS" THROUGH 1980.

2– CONSTRUCTION SPECIFICATIONS: CURRENT EDITION STATE OF NEVADA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND SPECIAL PROVISIONS THERETO.

3– LOADING: LIVE LOAD: STANDARD HS20–44 OR ALTERNATE FHWA MILITARY LOADING. IMPACT FOR TOP SLAB IS 30 FT. OF COVER, NO IMPACT OVER 3 FT. IMPACT NOT INCLUDED FOR INVERT; SURCHARGE NOT INCLUDED FOR WALLS. EQUIVALENT FLUID PRESSURE FOR TWO CONDITIONS: A) 140 LBS/CUFT VERTICAL, 42 LBS/CUFT HORIZONTAL AND B) 140 LBS/CUFT VERTICAL AND HORIZONTAL. LOAD FACTORS: 2.5(L+I).

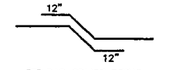
4– CONCRETE: CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,250 PSI. MAXIMUM ALLOWABLE SHEAR $V_C = 3.5\sqrt{f'_C}$ PSI TAKEN AT A DISTANCE D FROM THE FACE OF THE SUPPORTING MEMBER.

5– REINFORCING STEEL: REINFORCING STEEL SHALL BE AASHTO M 31 (ASTM A615) GRADE 60. MAIN REINFORCEMENT IS TO BE PLACED IN THE TRANSVERSE DIRECTION. STAGGER ALL LAP SPLICES. HOOKS MAY BE ROTATED OR TILTED AS NECESSARY TO PROVIDE PROPER CLEARANCE. REINFORCEMENT SHALL HAVE A 2–1/2" INCH CLEARANCE ON BOTTOM OF INVERT AND A 2 INCH CLEARANCE ON REMAINDER OF CULVERT AND ITS APPURTENANCES UNLESS OTHERWISE NOTED IN THE CONTRACT PLANS. REINFORCING STEEL IN THE TOP SLAB SHALL HAVE AN EPOXY COATING WHEN THERE IS 6 INCHES OR LESS OF COVER ON THE RCB (CLARK COUNTY EXCLUDED). REINFORCEMENT STEEL SHALL CONFORM TO SPECIFICATIONS IN SECTION 1907 OF THE 1997 UNIFORM BUILDING CODE FOR MINIMUM BEND DIAMETERS, SURFACE CONDITIONS, PLATING, ETC.

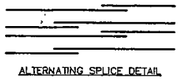
6– FOUNDATION PRESSURE: EXISTING GROUND SHOULD BE CAPABLE OF SUPPORTING 1.1 TONS/FT² FOR BOX CULVERT. CONSULT WITH AUTHORIZED GEOTECHNICAL ENGINEER FOR AVAILABLE BEARING PRESSURE AT THE PROPOSED LOCATION OF THE RCB CULVERT.

7– SPLICING: WHEN THE ADDITION OF CELLS CAUSES THE LENGTHS OF THE "A", "F" AND "G" BARS TO EXCEED 60 FEET THE BARS WILL REQUIRE SPLICING. SPLICES FOR THE "A" BARS SHALL BE CENTERED ABOUT THE CENTER LINE OF THE INTERIOR WALLS. SPLICES FOR THE "G" BARS SHALL BE CENTERED ABOUT THE CENTER OF THE CELLS. SPLICES FOR THE "F" BARS SHALL BE DONE AT THE 45° LEG AND CONFORM TO THE SPLICE DETAIL SHOWN. SPLICE LOCATIONS SHALL BE ALTERNATED FROM BAR TO BAR. SEE DETAIL SHOWN. SPLICE LENGTHS FOR THE "A" AND "G" BARS SHALL BE AS FOLLOWS:

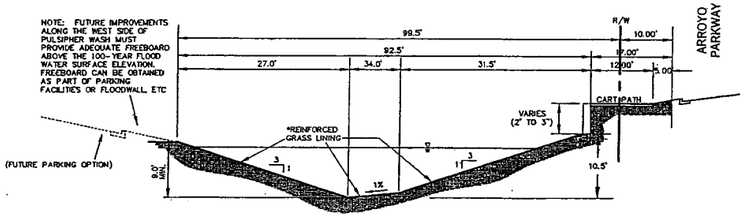
NO. 4 BARS – 16 INCHES
NO. 6 BARS – 24 INCHES
NO. 7 BARS – 31 INCHES
NO. 8 BARS – 40 INCHES



"F" BAR SPLICE DETAIL

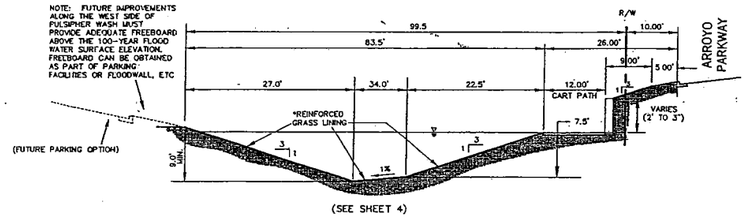


ALTERNATING SPLICE DETAIL

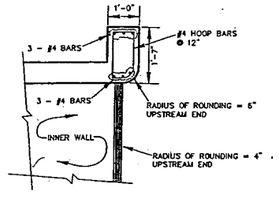


SECTION A-A
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(SEE SHEET 3)

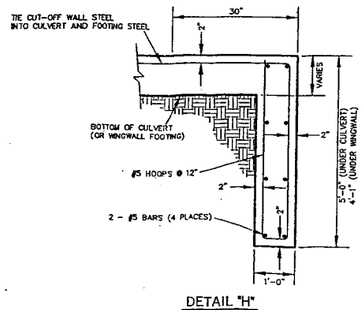
*NOTE: GRASS LINING TO BE REINFORCED WITH ENKAMAT 7010 OR APPROVED EQUAL. REINFORCING MATERIAL TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ALSO, GRASS SEED TO BE PLACED USING PRE SEEDED CS2 EROSION CONTROL BLANKETS (MADE BY BON TERRA AMERICA, INC.) OR APPROVED EQUAL.



(SEE SHEET 4)



DETAIL "G"



DETAIL "H"

NO	REVISIONS DESCRIPTION	DATE	BY

BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS–LAND SURVEYORS–
LAND PLANNERS
561 W MESQUITE BLVD, STE 4
MESQUITE, NEVADA 89027
(702) 346-3101
91 WEST 1470 SOUTH, STE 102
ST. GEORGE, UTAH 84770
(435) 628-4700
P.O. BOX 1405
CEDAR CITY, UTAH 84720
(435) 586-9592

DETAIL SHEET
QUINTUPLE BARREL R.C.B. CULVERT
FOR
PULSIPHER WASH
IMPROVEMENT PROJECT
MESQUITE, NEVADA

CIVIL — 7/1/00

SCALE: NO SCALE	DRAWN BY: GSAS	CHECKED BY:
FILE NAME:	DATE: 7-7-2000	SHEET NO: 6 OF 6

D3

CONSTRUCTION NOTES

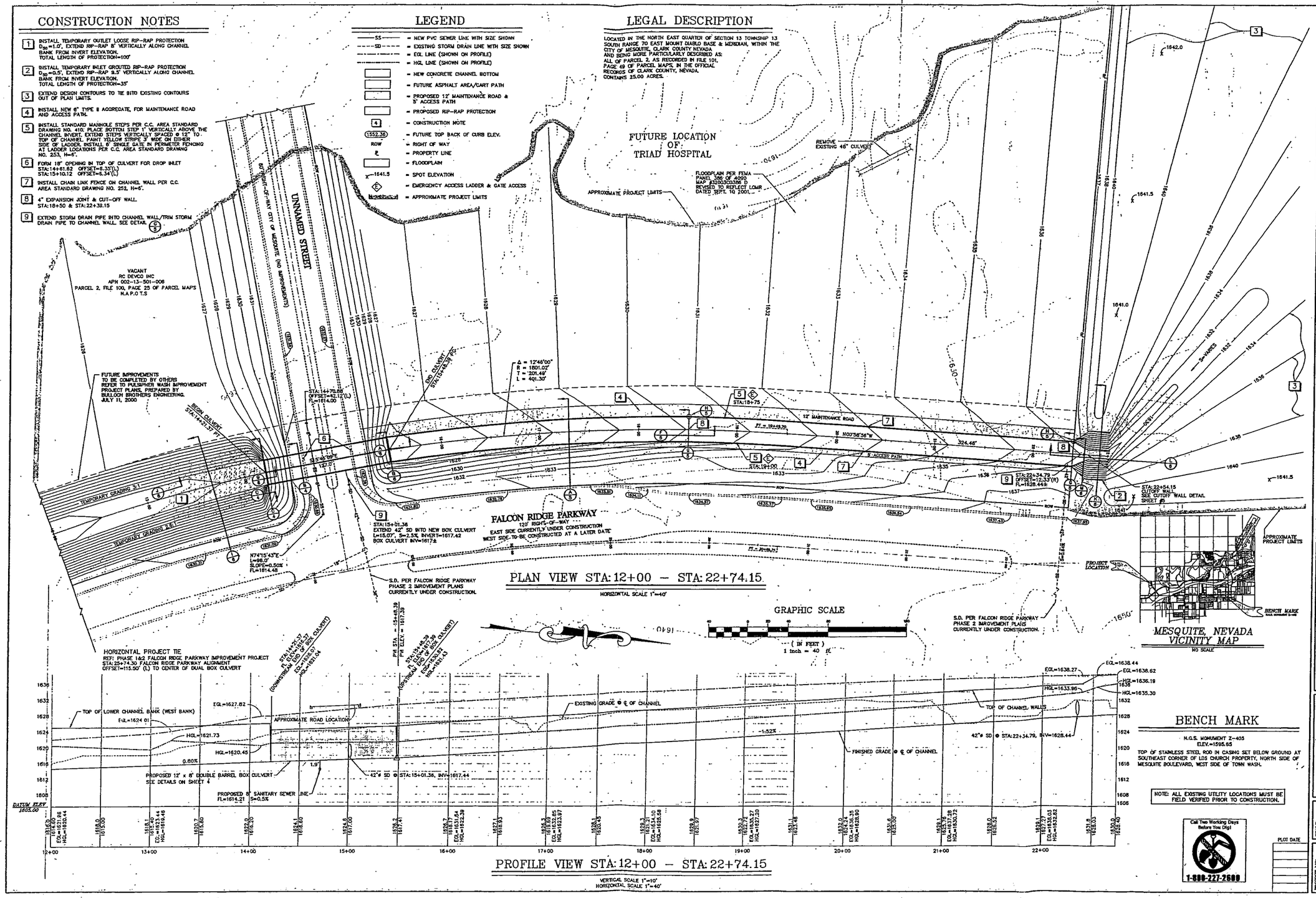
1. INSTALL TEMPORARY OUTLET LOOSE RIP-RAP PROTECTION D_{50}=1.0', EXTEND RIP-RAP 8' VERTICALLY ALONG CHANNEL BANK FROM INVERT ELEVATION. TOTAL LENGTH OF PROTECTION=100'
2. INSTALL TEMPORARY INLET GROUTED RIP-RAP PROTECTION D_{50}=0.5', EXTEND RIP-RAP 9.5' VERTICALLY ALONG CHANNEL BANK FROM INVERT ELEVATION. TOTAL LENGTH OF PROTECTION=35'
3. EXTEND DESIGN CONTOURS TO TIE INTO EXISTING CONTOURS OUT OF PLAN LIMITS.
4. INSTALL NEW 6" TYPE II AGGREGATE, FOR MAINTENANCE ROAD AND ACCESS PATH.
5. INSTALL STANDARD MANHOLE STEPS PER C.C. AREA STANDARD DRAWING NO. 410. PLACE BOTTOM STEP 1' VERTICALLY ABOVE THE CHANNEL INVERT. EXTEND STEPS VERTICALLY SPACED @ 12" TO TOP OF CHANNEL. PAINT YELLOW STRIPE 3" WIDE ON EITHER SIDE OF LADDER. INSTALL 6' SINGLE GATE IN PERIMETER FENCING AT LADDER LOCATIONS PER C.C. AREA STANDARD DRAWING NO. 253, H=6'.
6. FORM 18" OPENING IN TOP OF CULVERT FOR DROP INLET STA:14+61.62 OFFSET=8.33'(L) STA:15+10.12 OFFSET=8.34'(L)
7. INSTALL CHAIN LINK FENCE ON CHANNEL WALL PER C.C. AREA STANDARD DRAWING NO. 252, H=6'.
8. 4" EXPANSION JOINT & CUT-OFF WALL. STA:18+50 & STA:22+32.15
9. EXTEND STORM DRAIN PIPE INTO CHANNEL WALL/TRIM STORM DRAIN PIPE TO CHANNEL WALL. SEE DETAIL 6/S

LEGEND

- SS = NEW PVC SEWER LINE WITH SIZE SHOWN
- SD = EXISTING STORM DRAIN LINE WITH SIZE SHOWN
- EGL LINE (SHOWN ON PROFILE)
- HGL LINE (SHOWN ON PROFILE)
- = NEW CONCRETE CHANNEL BOTTOM
- = FUTURE ASPHALT AREA/CART PATH
- = PROPOSED 12' MAINTENANCE ROAD & 8' ACCESS PATH
- = PROPOSED RIP-RAP PROTECTION
- 4 = CONSTRUCTION NOTE
- (1552.36) = FUTURE TOP BACK OF CURB ELEV.
- ROW = RIGHT OF WAY
- ℄ = PROPERTY LINE
- = FLOODPLAIN
- 1641.5 = SPOT ELEVATION
- E = EMERGENCY ACCESS LADDER & GATE ACCESS
- = APPROXIMATE PROJECT LIMITS

LEGAL DESCRIPTION

LOCATED IN THE NORTH EAST QUARTER OF SECTION 13 TOWNSHIP 13 SOUTH RANGE 70 EAST MOUNT DIABLO BASE & MERIDIAN, WITHIN THE CITY OF MESQUITE, CLARK COUNTY NEVADA. AND BEING MORE PARTICULARLY DESCRIBED AS: ALL OF PARCEL 2, AS RECORDED IN FILE 101, PAGE 49 OF PARCEL MAPS, IN THE OFFICIAL RECORDS OF CLARK COUNTY, NEVADA. CONTAINS 25.00 ACRES.



PLAN VIEW STA:12+00 – STA:22+74.15

HORIZONTAL SCALE 1"=40'

GRAPHIC SCALE

(IN FEET) 1 inch = 40 ft

HORIZONTAL PROJECT TIE
REF: PHASE 1&2 FALCON RIDGE PARKWAY IMPROVEMENT PROJECT
STA:25+74.30 FALCON RIDGE PARKWAY ALIGNMENT
OFFSET=115.50' (L) TO CENTER OF DUAL BOX CULVERT

PROFILE VIEW STA:12+00 – STA:22+74.15

VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=40'

BENCH MARK

N.G.S. MONUMENT Z-405
ELEV.=1595.65
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

Call Two Working Days Before You Dig!
1-800-227-2600

NO	REVISIONS DESCRIPTION	DATE	BY

BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS–LAND SURVEYORS–LAND PLANNERS
P.O. BOX 3174 CEDAR CITY, UTAH 84720 (435) 586-9592
160 WEST 1650 SOUTH, UNIT 5 ST. GEORGE, UTAH 84770 (435) 628-4700
561 V MESQUITE BLVD. STE 4 MESQUITE, NEVADA 89027 (702) 346-5101

PLAN AND PROFILE STA:12+00 - STA:22+74.15
FOR
PULSIPHER WASH IMPROVEMENTS
CITY OF MESQUITE
MESQUITE, NEVADA

REGISTERED PROFESSIONAL ENGINEER — BRENT BULLOCH — CIVIL — STATE OF NEVADA — 10/15/02

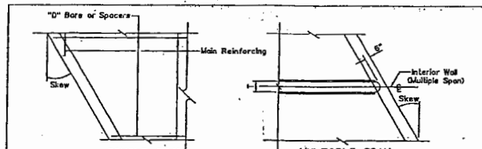
DATE 10/15/02
EDP# 13-151.1

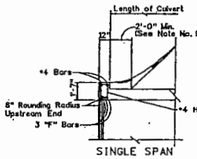
SCALE	DRAWN BY	CHECKED BY
1"=40'	E.M.	GB
PROJECT NO 1306-10-2	DATE SEPT. 2002	SHEET NO 1 OF 6

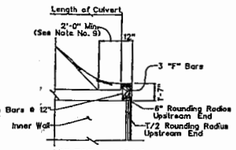
PLOT DATE

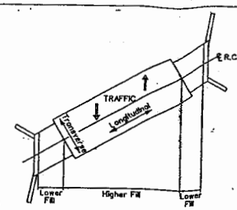
13-06-10-2

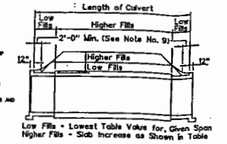
D4











GENERAL NOTES :

a. DESIGN SPECIFICATIONS : AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1983, EXCEPT AS NOTED BELOW.

b. CONSTRUCTION SPECIFICATIONS: STATE OF NEVADA DEPARTMENT OF HIGHWAYS "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," CURRENT EDITION, AND SPECIAL PROVISIONS THERETO.

c. LOADING: LIVE LOAD: STANDARD HS20-44 OR ALTERNATE FHWA MILITARY LOADING.
IMPACT: FOR TOP SLAB OF 2'0" UP TO 2 FT. COVER, NO IMPACT ABOVE 2 FT. COVER. NO IMPACT FOR WINGS, NO SURCHARGE FOR WALLS.
EARTH LOAD: EQUIVALENT FLUID PRESSURE FOR TWO CONDITIONS,
1) 140 LBS./CU. FT. VERTICAL, 45 LBS./CU. FT. HORIZONTAL.
2) 110 LBS./CU. FT. VERTICAL, 340 LBS./CU. FT. HORIZONTAL.
LOAD FACTORS: 1.30 - 1.5E - 2.5 E.H.

d. CONCRETE: THE CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,250 PSI MINIMUM ALLOWABLE SHEAR, $v_c = 2.0\sqrt{f'_c}$ PSI, FOR SPANS AT A DISTANCE "d" FROM THE SUPPORTING MEMBER.

e. REINFORCING STEEL: ALL REINFORCING STEEL, TO BE ASTM A615 GRADE 60, MIN. REINFORCEMENT: IS TO BE PLACED IN THE TRANSVERSE DIRECTION, STAGGER SPLICES NOT SHOWN, HOOKS MAY BE OMITTED ON TILTED, AS NECESSARY, FOR CLEARANCE. REINFORCEMENT SHALL HAVE A 2-1/2 INCH CLEARANCE ON BOTTOM OF BOTTOM SLAB AND 2 INCH CLEARANCE ON UNDERSIDE OF STRUCTURE AND ITS APPURTENANCES UNLESS OTHERWISE NOTED ON THE PLANS.

f. FOUNDATION PRESSURE: THE RCB CULVERTS ARE DESIGNED TO THE FOLLOWING SOIL BEARING PRESSURES:

COVER HEIGHTS	10 FT. OR LESS	20 FT.
RCB HEIGHT	TONS/SQ.FT.	
6 FT.	4.0	4.0
8 FT.	4.0	4.0
10 FT.	4.0	4.0
12 FT.	4.0	4.0
14 FT.	4.0	3.0

g. SPECIAL DESIGN CULVERTS WITH CONDITIONS, LOADING, OR SIZES DIFFERING FROM THOSE GIVEN ON THESE RCB CULVERT SHEETS MAY REQUIRE A SPECIAL DESIGN.

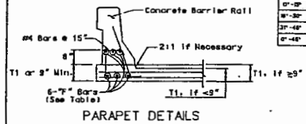
h. RECTANGULAR BOX CULVERTS ARE SHOWN ON PLANS AS SPAN TIMES HEIGHT TIMES LENGTH OF 1 FT. = 1 MF BOX.

i. ADDITIONAL LENGTH: LENGTH OF CULVERT SHALL BE INCREASED AS FOLLOWS: ADD 3.0 FT. TO EACH END WHEN COVER AT SHOULDER IS 0.0 TO 5.0 FEET, AND AN ADDITIONAL 1.0 FT. TO EACH END FOR EACH SUCCESSIVE 5.0 FT. OF COVER OR PORTION THEREOF.

j. HEADWALLS: ALL RCB CULVERTS SHALL HAVE TYPE I HEADWALLS UNLESS OTHERWISE NOTED ON THE PLANS.

k. QUANTITIES: QUANTITIES DO NOT INCLUDE "K" BARS, HOR. SPLICES IN BARS, HOR. TEMPERATURE BARS FOR EXPOSED TOP SLAB, NOR CONCRETE OR REINFORCEMENT FOR PARAPETS OR WING LEDGES.

l. THREE OR MORE CELLS: FOR CULVERTS WITH MORE THAN TWO CELLS, USE DIMENSIONS AND REINFORCEMENT FOR THE "DOUBLE BOX CULVERTS" AND ADJUST THE QUANTITIES ACCORDINGLY.

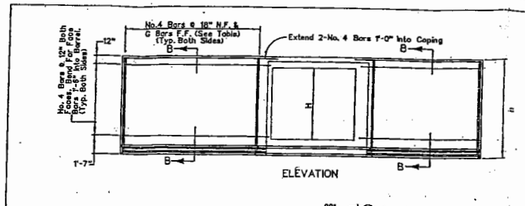


COPING REINFORCING INCLUDED IN THE HEADWALL QUANTITIES

SKEW ANGLE	SPAN	5	6	7	8	10	12	14
0°-15°	"F" BAR NO.	4	5	5	6	7	8	8
16°-30°		4	5	5	6	7	8	8
31°-45°	BAR NO.	5	6	6	7	8	8	8
0°-45°	#4 HOOPS	5	6	6	7	8	8	8

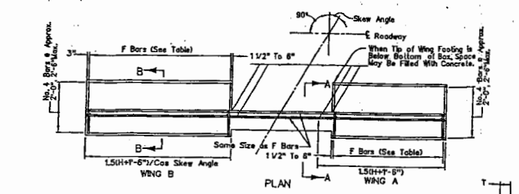
SKEWED PARAPETS

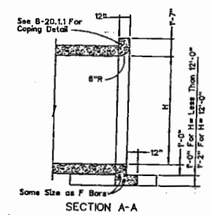
SPAN	5	6	7	8	10	12	14
0°-45°	5" CTRS.						

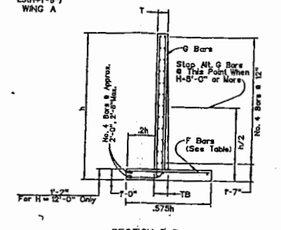


H = HEIGHT IN "F" INCHES	G BARS SIZE NO.	G BARS SPACE IN.	F BARS SIZE NO.	F BARS SPACE IN.
5	4	12	4	12
6	4	12	4	12
7	4	12	4	12
8	4	12	4	12
9	4	12	4	12
10	4	12	4	12
11	4	12	4	12
12	4	12	4	12
13	4	6	4	12
14	4	6	4	12
15	4	6	4	12
16	4	6	4	12
17	4	6	4	12
18	4	6	4	12
19	4	6	4	12
20	4	6	4	12
21	4	6	5	12
22	4	6	5	12
23	4	6	5	12
24	4	6	5	12
25	4	6	5	12
26	4	6	5	12
27	4	6	5	12
28	4	6	5	12
29	4	6	5	12
30	4	6	5	12
31	4	6	5	12
32	4	6	5	12
33	4	6	5	12
34	4	6	5	12
35	4	6	5	12
36	4	6	5	12
37	4	6	5	12
38	4	6	5	12
39	4	6	5	12
40	4	6	5	12
41	4	6	5	12
42	4	6	5	12

TABLE







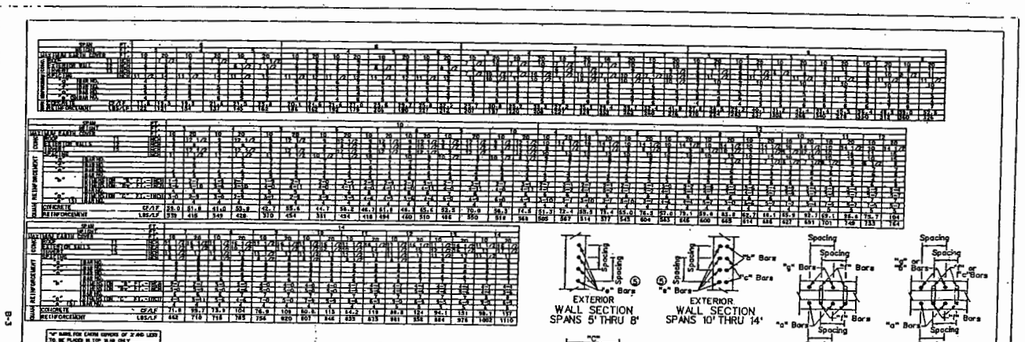
NOTES:
1. FOR GENERAL NOTES SEE SHEET B-20.1.1
2. FOR QUANTITIES SEE SHEET B-20.1.4.1

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
RCB CULVERTS
TYPE II HEADWALLS
B-20.1.4 (502) (505)
CHIEF BRIDGE DESIGN ENGR.
SHEET 1 OF 2

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
R.C.B., CULVERTS,
GENERAL NOTES
B-20.1.1 (502) (505)
CHIEF BRIDGE DESIGN ENGR.

NDOT CULVERT GENERAL
NOT TO SCALE
A 4

NDOT CULVERT WINGWALL
NOT TO SCALE
NOTE: ADD 3" TO OVERALL HEIGHT SEE DETAILS D 6, G 6
C 4



NOTES:
1. FOR BOXES WITH SPAN OR HEIGHT LESS THAN ANY OF THOSE SHOWN IN TABLE, USE NEXT GREATER SIZE BOX. CONCRETE DIMENSIONS AND REINFORCEMENT, MAKE NECESSARY CHANGES IN BAR LENGTHS AND QUANTITIES.
2. FOR BOXES WITH SPAN OR HEIGHT OR COVER GREATER THAN THOSE SHOWN IN TABLES, A SPECIAL DESIGN IS REQUIRED.
3. QUANTITIES ARE APPROXIMATE AND FOR DESIGN PURPOSES ONLY.
4. IT IS PERMISSIBLE TO ELIMINATE THE 180° HOOKS ON EVERY OTHER "e" BAR.
5. "e" BARS ARE AT HALF SPACING.
6. PROVIDE PAVING NOTCH WHEN TOP IS EXPOSED AND WHERE P.C.C. PAVEMENT OR APPROACH SLAB IS USED. ADJUST THE QUANTITIES.
7. WHEN TOP IS EXPOSED, THE TOP SLAB CONCRETE SHALL BE "A1", f'_c=3500 PSI+ OR "A", f'_c=4000 PSI+ AS DETERMINED BY THE ENGINEER. IF "A1" CONCRETE IS TO BE USED, THE TOP SLAB REINFORCING STEEL SHALL HAVE AN EPOXY COATING.

NOTE: THIS PLAN SHEET MAY BE USED FOR MULTIPLE CELL CULVERTS BY MAKING NECESSARY ADJUSTMENTS.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
DOUBLE
RCB CULVERTS
B-20.1.3 (502)
CHIEF BRIDGE DESIGN ENGR.

STEEL NDOT CULVERT
NOT TO SCALE
NOTE: REVISE INTERIOR WALL TO 4" FROM INSIDE OF FACE TO CENTERLINE
B 4

① - QUANTITIES SHOWN ARE FOR TWO HEADWALLS AT THE INLET AND OUTLET

CUBIC YARDS OF CONCRETE AND POUNDS OF REINFORCING FOR TWO TYPE II HEADWALLS ①

SPAN	HEIGHT	SINGLE BOX 0°SKEW CONC.	SINGLE BOX 0°SKEW REINF.	SINGLE BOX 15°SKEW CONC.	SINGLE BOX 15°SKEW REINF.	SINGLE BOX 30°SKEW CONC.	SINGLE BOX 30°SKEW REINF.	SINGLE BOX 45°SKEW CONC.	SINGLE BOX 45°SKEW REINF.	DOUBLE BOX 0°SKEW CONC.	DOUBLE BOX 0°SKEW REINF.	DOUBLE BOX 15°SKEW CONC.	DOUBLE BOX 15°SKEW REINF.	DOUBLE BOX 30°SKEW CONC.	DOUBLE BOX 30°SKEW REINF.	DOUBLE BOX 45°SKEW CONC.	DOUBLE BOX 45°SKEW REINF.	TRIPLE BOX 0°SKEW CONC.	TRIPLE BOX 0°SKEW REINF.	TRIPLE BOX 15°SKEW CONC.	TRIPLE BOX 15°SKEW REINF.	TRIPLE BOX 30°SKEW CONC.	TRIPLE BOX 30°SKEW REINF.	TRIPLE BOX 45°SKEW CONC.	TRIPLE BOX 45°SKEW REINF.	SPAN
5	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	5
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	
6	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	6
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	
7	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	7
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	
8	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	8
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	
10	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	10
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	
12	5	8.4	888	10.2	947	11.4	1,013	13.4	1,093	16.8	1,777	20.4	1,895	22.8	2,026	26.8	2,186	25.2	2,666	30.6	2,842	34.2	3,039	40.2	3,279	12
	6	9.1	1,183	11.1	1,262	12.4	1,350	14.6	1,457	18.2	2,369	22.2	2,526	24.8	2,701	29.2	2,914	27.3	3,554	33.3	3,789	37.2	4,051	43.8	4,371	
	7	9.8	1,478	12.0	1,577	13.4	1,688	15.8	1,821	19.7	2,961	24.0	3,157	26.8	3,376	31.5	3,642	29.5	4,442	36.0	4,736	40.2	5,064	47.3	5,463	

QUANTITIES FOR ADDITIONAL CELLS

CONCRETE FOR TWO TYPE II HEADWALLS FOR EACH ADDITIONAL CELL (CU YARDS) (ADD THIS QUANTITY TO THE QUANTITY FOR A DOUBLE BOX)

FOR HEIGHT NO LESS THAN 12'0"
$[0.56ft^3(SPAN(ft)+0.67(ft))/COS\ SKEW\ ANGLE$

FOR HEIGHT NO EQUAL TO OR GREATER THAN 12'0"
$[0.23ft^3(SPAN(ft)+0.67(ft))/COS\ SKEW\ ANGLE$

REINFORCING FOR TWO TYPE II HEADWALLS FOR EACH ADDITIONAL CELL (POUNDS) (ADD THIS QUANTITY TO THE QUANTITY FOR A DOUBLE BOX)

FOR HEIGHT NO LESS THAN OR EQUAL TO 7'0"
$[16.59lb/(ft(SPAN(ft)+0.67(ft))/COS\ SKEW\ ANGLE$

FOR HEIGHT NO EQUAL TO 8'0" OR 9'0"
$[24.03lb/(ft(SPAN(ft)+0.67(ft))/COS\ SKEW\ ANGLE$

FOR HEIGHT NO EQUAL TO OR GREATER THAN 10'0"
$[42.72lb/(ft(SPAN(ft)+0.67(ft))/COS\ SKEW\ ANGLE$

ANGLE	COS ℄
0°	1.0000
15°	0.9659
30°	0.8660
45°	0.7071

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
RCB CULVERTS
TYPE II HEADWALLS
B-20.1.4.1 (502) (505)
CHIEF BRIDGE DESIGN ENGR.
SHEET 2 OF 2

NO	DESCRIPTION	DATE	BY
	REVISIONS		

BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS—LAND SURVEYORS—
LAND PLANNERS
163 WEST 1600 SOUTH, UNIT 5 | 561 V MESQUITE BLVD, STE 4
ST. GEORGE, UTAH 84770 | MESQUITE, NEVADA 89027
(435) 986-4700 | (702) 346-4700

P.O. BOX 3174
CEDAR CITY, UTAH 84720
(435) 586-0900

DETAIL SHEET
FOR
PULSIPHER WASH IMPROVEMENTS
CITY OF MESQUITE

DATE
EXP: 12/31/12

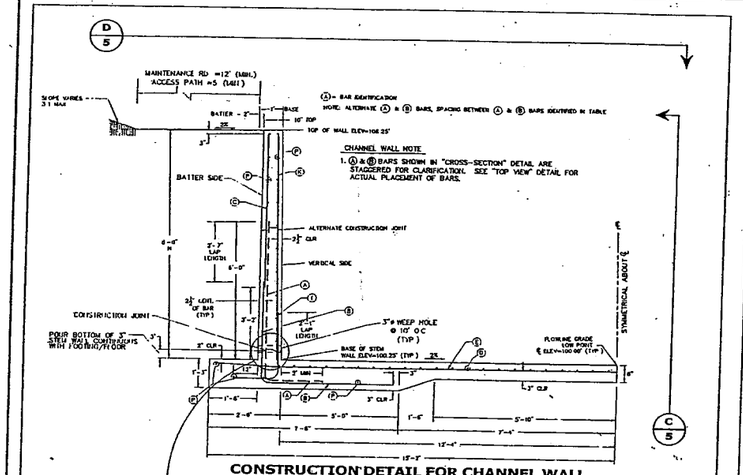
SCALE	DRAWN BY	CHECKED BY
NO SCALE	E.M.	

PROJECT NO	DATED	SHEET NO
1306-10-2	SEPT. 2002	

COMPAQ

12,006-10-2

DS



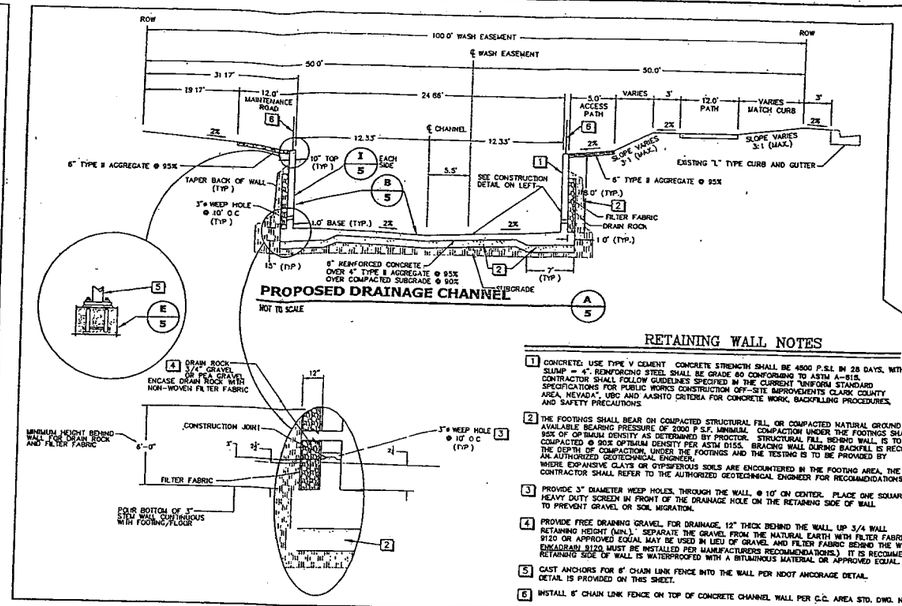
CHANNEL WALL NOTE

1. Ⓐ & Ⓑ BARS SHOWN IN "CROSS-SECTION" DETAIL ARE STAGGERED FOR CLARIFICATION. SEE "TOP VIEW" DETAIL FOR ACTUAL PLACEMENT OF BARS.

CONSTRUCTION DETAIL FOR CHANNEL WALL GEOMETRY AND STEEL CROSS-SECTION VIEW
NOT TO SCALE — B/6

REINFORCEMENT TABLE FOR CHANNEL WALL

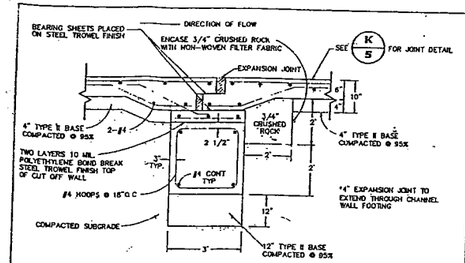
HEIGHT (H)=8'					
REBAR ID	BAR #	SPACING INCHES EAST SIDE	SPACING INCHES WEST SIDE	MINIMUM LAP FT-IN	MINIMUM LENGTH FT-IN
(A)	#5	11"	8"	3'-2"	10'-0"
(B)	#5	11"	8"	3'-2"	10'-0"
(C)	#5	11"	12"	2'-7"	6'-7"
(D)	#5	9.5"	9.5"	2'-7"	CONTINUOUS
(E)	#5	12"	12"	2'-7"	CONTINUOUS
(G)	#4	12"	12"	2'-1"	7'-10"
(I)	#4	12"	12"	2'-1"	CONTINUOUS
(T)	#4	12"	12"	2'-1"	5'-0"



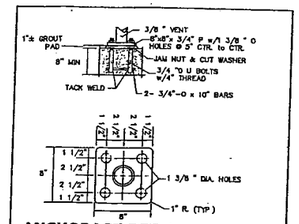
PROPOSED DRAINAGE CHANNEL
NOT TO SCALE — A/5

RETAINING WALL NOTES

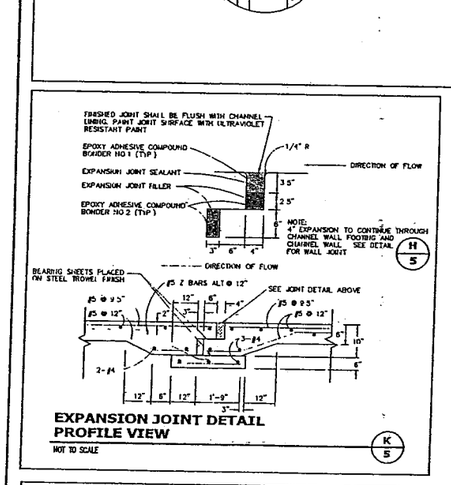
1. CONCRETE: USE TYPE V CEMENT. CONCRETE STRENGTH SHALL BE 4500 P.S.I. IN 28 DAYS, WITH SLUMP = 4". REINFORCING STEEL SHALL BE GRADE 60 CONFORMING TO ASTM A-615. CONTRACTOR SHALL FOLLOW GUIDELINES SPECIFIED IN THE CURRENT "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA", UBC AND AASHTO CRITERIA FOR CONCRETE WORK, BACKFILLING PROCEDURES, AND SAFETY PRECAUTIONS.
2. THE FOOTINGS SHALL BEAR ON COMPACTED STRUCTURAL FILL OR COMPACTED NATURAL GROUND WITH AVAILABLE BEARING PRESSURE OF 2000 P.S.F. MINIMUM. COMPACTION UNDER THE FOOTINGS SHALL BE 95% OF OPTIMUM DENSITY AS DETERMINED BY PROCTOR. STRUCTURAL FILL BEHIND WALL IS TO BE COMPACTED @ 95% OF MAXIMUM DENSITY PER ASTM D1557. BRACING WALL DURING BACKFILL IS RECOMMENDED. THE DEPTH OF COMPACTION, UNDER THE FOOTINGS AND THE TESTING IS TO BE PROVIDED BY AN AUTHORIZED GEOTECHNICAL ENGINEER. WHERE EXPANSIVE CLAYS OR OTHERWISE UNSUITABLE SOILS ARE ENCOUNTERED IN THE FOOTING AREA, THE CONTRACTOR SHALL REFER TO THE AUTHORIZED GEOTECHNICAL ENGINEER FOR RECOMMENDATIONS.
3. PROVIDE 3" DIAMETER WEEP HOLES, THROUGH THE WALL, @ 10' ON CENTER. PLACE ONE SQUARE FOOT OF HEAVY DUTY SCREEN IN FRONT OF THE DRAINAGE HOLE ON THE RETAINING SIDE OF WALL TO PREVENT GRAVEL OR SOIL MIGRATION.
4. PROVIDE FREE DRAINING GRAVEL, FOR DRAINAGE, 12" THICK BEHIND THE WALL UP 3/4 WALL RETAINING HEIGHT (MIN.). SEPARATE THE GRAVEL FROM THE NATURAL EARTH WITH FILTER FABRIC. ENKADRAIN 9120 OR APPROVED EQUAL MAY BE USED IN LIEU OF GRAVEL AND FILTER FABRIC BEHIND THE WALL. ENKADRAIN 9120 MUST BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.) IT IS RECOMMENDED THAT RETAINING SIDE OF WALL IS WATERPROOFED WITH A BITUMINOUS MATERIAL OR APPROVED EQUAL.
5. CAST ANCHORS FOR 8' CHAIN LINK FENCE INTO THE WALL PER NDOT ANCORAGE DETAIL.
6. INSTALL 8' CHAIN LINK FENCE ON TOP OF CONCRETE CHANNEL WALL PER C.C. AREA STD. DWG. NO. 252, H=8'.



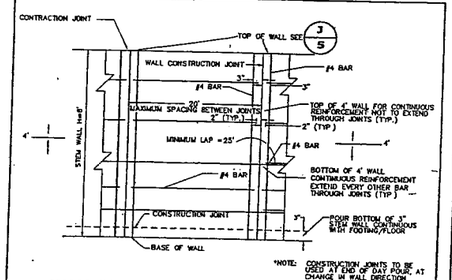
CUTOFF WALL DETAIL UNDER EXPANSION JOINT PROFILE VIEW
NOT TO SCALE — F/5



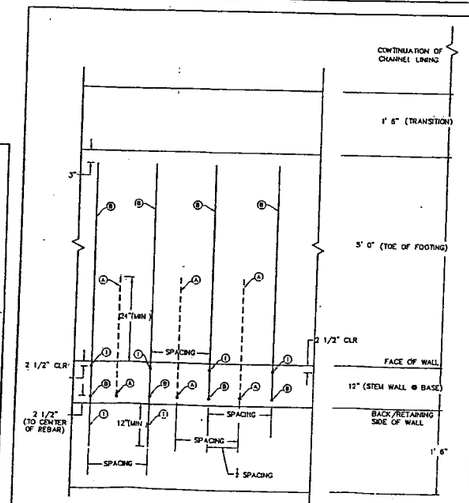
ANCHORAGE DETAIL PROFILE VIEW AND BASE PLATE DETAIL
NOT TO SCALE — E/5



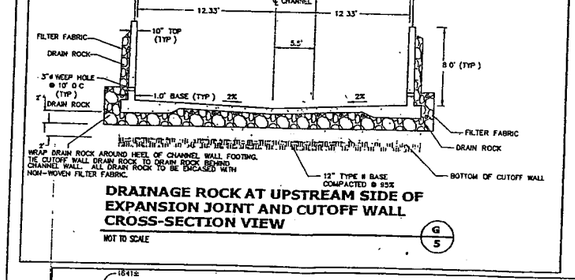
EXPANSION JOINT DETAIL PROFILE VIEW
NOT TO SCALE — K/5



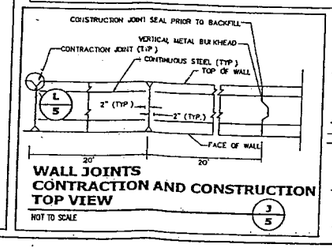
WALL JOINTS CONTRACTION AND CONSTRUCTION
NOT TO SCALE — I/5



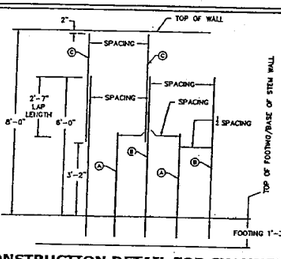
CONSTRUCTION DETAIL FOR CHANNEL WALL VERTICAL STEEL DETAIL TOP VIEW
NOT TO SCALE — D/5



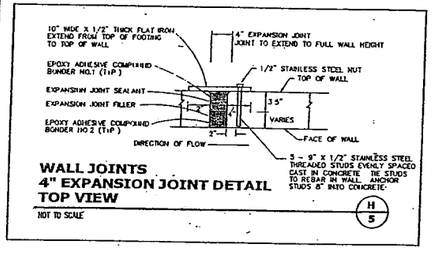
DRAINAGE ROCK AT UPSTREAM SIDE OF EXPANSION JOINT AND CUTOFF WALL CROSS-SECTION VIEW
NOT TO SCALE — G/5



WALL JOINTS CONTRACTION AND CONSTRUCTION TOP VIEW
NOT TO SCALE — J/5

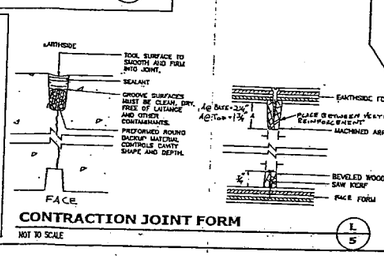


CONSTRUCTION DETAIL FOR CHANNEL WALL VERTICAL STEEL DETAIL PROFILE VIEW
NOT TO SCALE — C/5

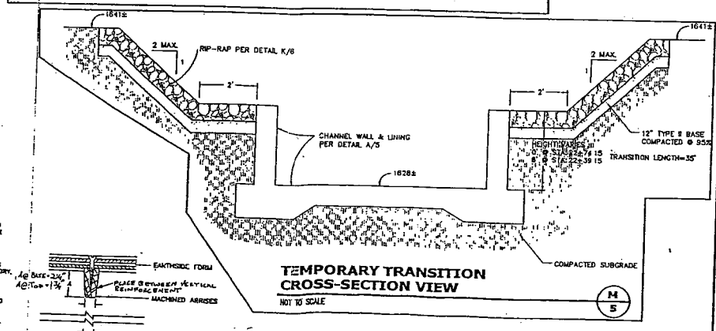


WALL JOINTS 4" EXPANSION JOINT DETAIL TOP VIEW
NOT TO SCALE — H/5

WALL JOINTS CONTRACTION AND CONSTRUCTION TOP VIEW
NOT TO SCALE — J/5



CONTRACTION JOINT FORM
NOT TO SCALE — L/5



TEMPORARY TRANSITION CROSS-SECTION VIEW
NOT TO SCALE — M/5

NO	DESCRIPTION	DATE	BY
	REVISIONS		

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MESQUITE, NEVADA 89027
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DETAIL SHEET FOR PULSIPHER WASH IMPROVEMENTS CITY OF MESQUITE

LINCOLN COUNTY, NEVADA

PROFESSIONAL ENGINEER — GREG BULLOCH — CIVIL — No. 7610 — STATE OF NEVADA

DATE: 10/24/02
EXP: 12/31/03

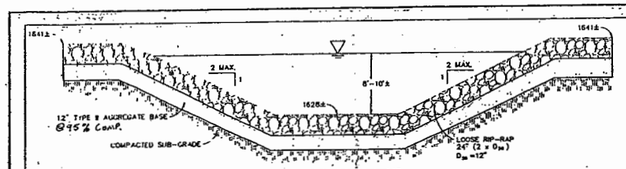
SCALE	DRAWN BY	CHECKED BY
NO SCALE	E.M.	GB

PROJECT NO	DATE	SHEET NO
1206-W-2	SEPT. 2002	6 OF 6

PLOT DATE

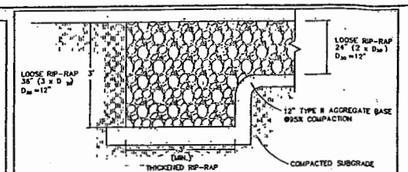
1206-W-2

D6



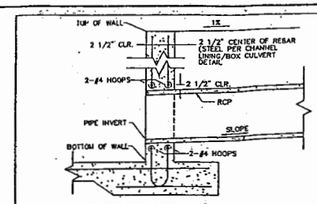
TEMPORARY RIP-RAP (NORTH) CROSS-SECTION VIEW K/6

NOT TO SCALE



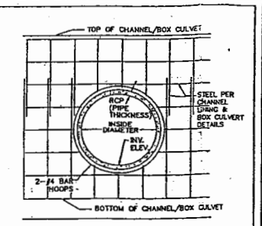
TEMPORARY RIP-RAP (SOUTH) END OF RIP-RAP J/6

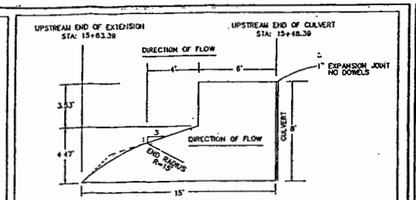
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PIPE THROUGH WALL DETAIL AND CROSS-SECTION VIEW PROFILE VIEW H/6

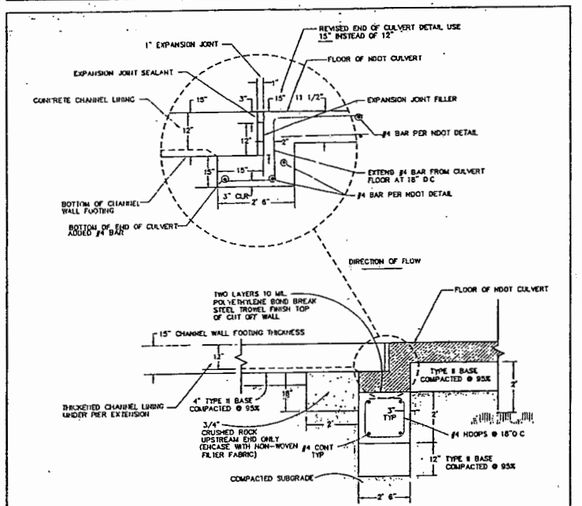
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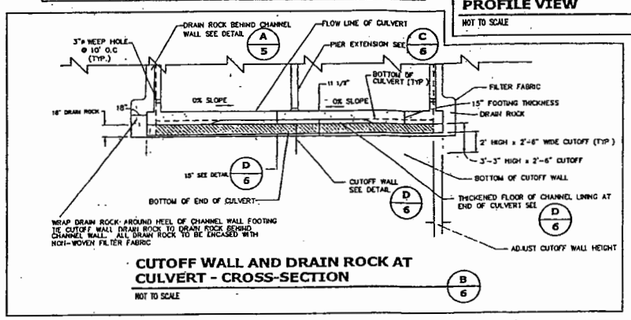
GEOMETRY BRIDGE PIER EXTENSION PROFILE VIEW N/6

NOT TO SCALE



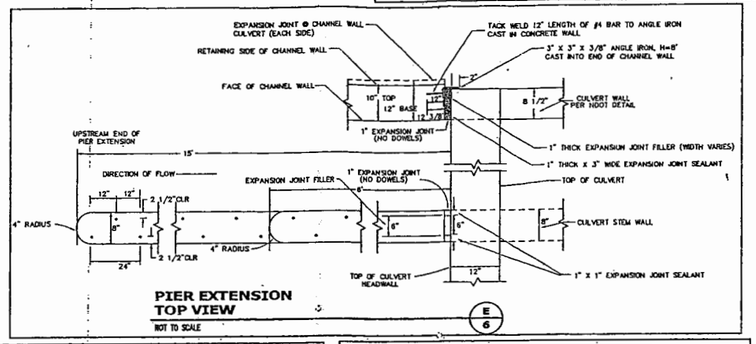
CUTOFF WALL DETAIL UNDER CULVERT (NORTH) D/6

NOT TO SCALE



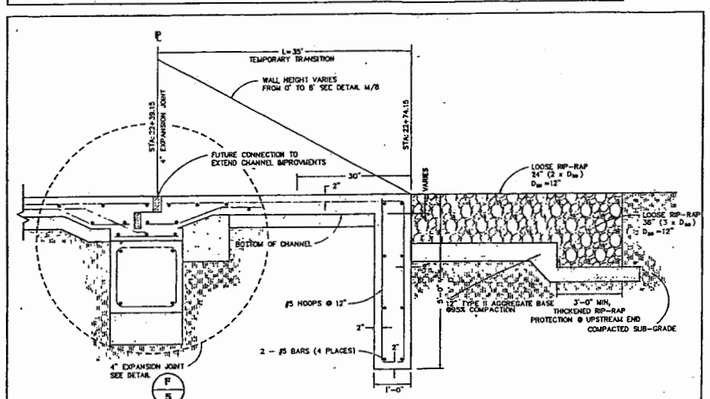
CUTOFF WALL AND DRAIN ROCK AT CULVERT - CROSS-SECTION B/6

NOT TO SCALE



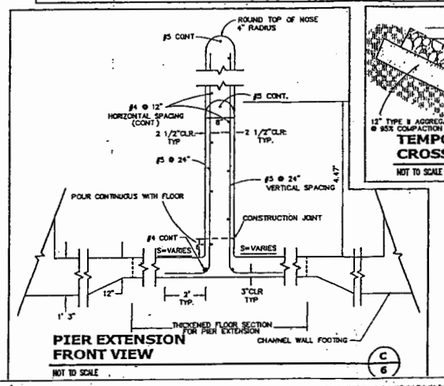
PIER EXTENSION TOP VIEW E/6

NOT TO SCALE



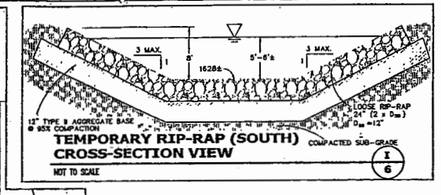
END OF CHANNEL CUTOFF WALL L/6

NOT TO SCALE



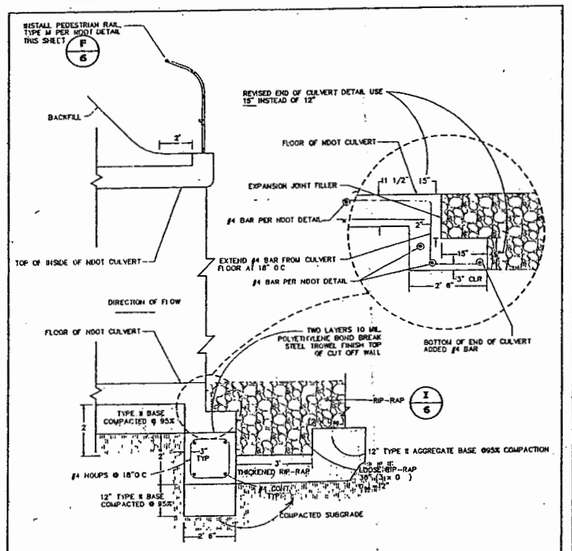
PIER EXTENSION FRONT VIEW C/6

NOT TO SCALE



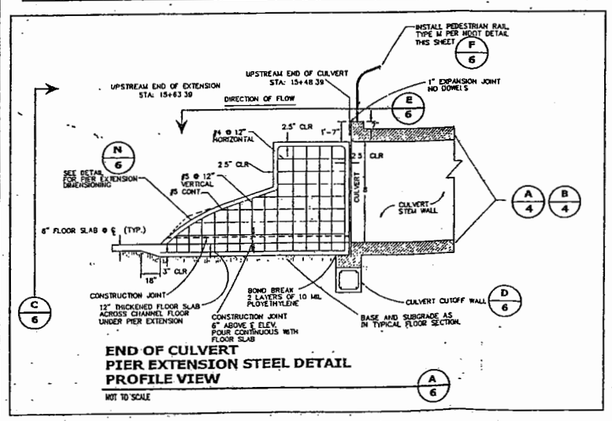
TEMPORARY RIP-RAP (SOUTH) CROSS-SECTION VIEW I/6

NOT TO SCALE



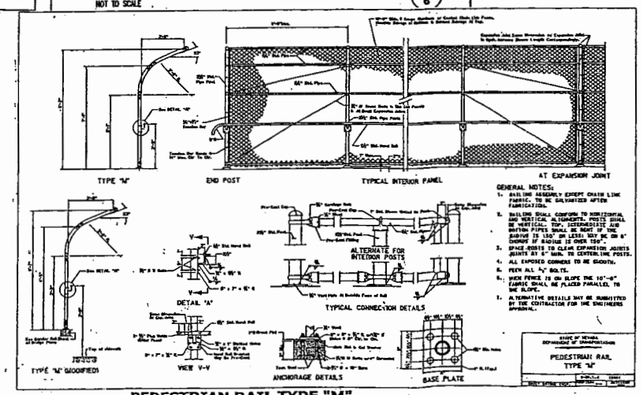
CUTOFF WALL DETAIL UNDER CULVERT (SOUTH) G/6

NOT TO SCALE



END OF CULVERT PIER EXTENSION STEEL DETAIL PROFILE VIEW A/6

NOT TO SCALE



PEDESTRIAN RAIL TYPE "M" NDOT DETAIL F/6

NOT TO SCALE

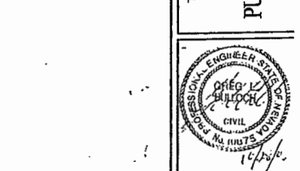
NO	DESCRIPTION	DATE	BY
	REVISIONS		

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DETAIL SHEET FOR PULSIPHER WASH IMPROVEMENTS CITY OF MESQUITE

CLARK COUNTY, NEVADA



DATE: 12/3/02
EXP: 12/31/03

SCALE	DRAWN BY	CHECKED BY
NO SCALE	E.M.	

PROJECT NO.	DATE	SHEET NO.
1306-07-2	SEPT. 2002	

PLOT DATE

COMPAQ

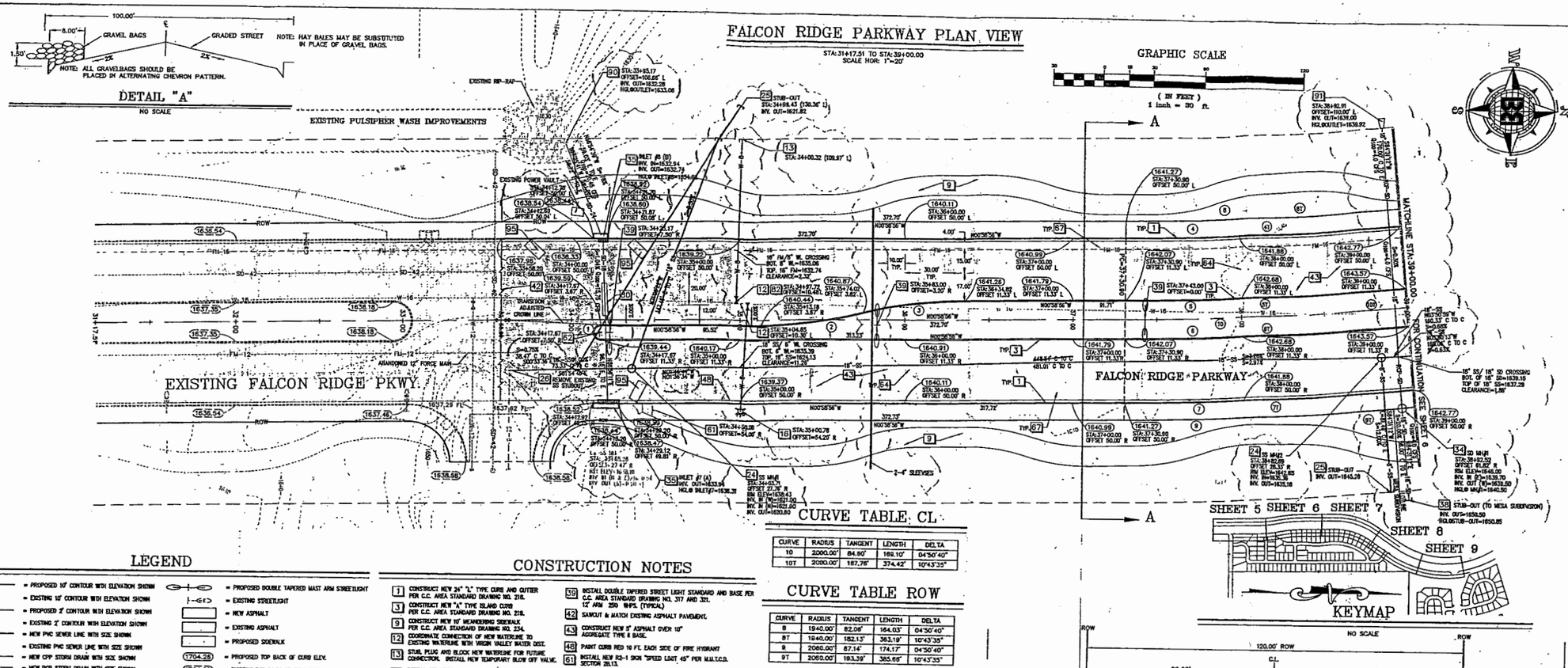
12-4-02

07

FALCON RIDGE PARKWAY PLAN VIEW

STA:31+17.51 TO STA:39+00.00
SCALE HOR: 1"=20'

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft.



DETAIL "A"

NO SCALE

LEGEND

1510	= PROPOSED 10' CONTOUR WITH ELEVATION SHOWN
1510	= EXISTING 10' CONTOUR WITH ELEVATION SHOWN
1508	= PROPOSED 2' CONTOUR WITH ELEVATION SHOWN
1508	= EXISTING 2' CONTOUR WITH ELEVATION SHOWN
SS	= NEW PVC SEWER LINE WITH SIZE SHOWN
SS	= EXISTING PVC SEWER LINE WITH SIZE SHOWN
SD	= NEW CPP STORM DRAIN WITH SIZE SHOWN
RCP—SD—	= NEW RCP STORM DRAIN WITH SIZE SHOWN
SD	= EXISTING CPP STORM DRAIN WITH SIZE SHOWN
W	= NEW PVC WATER LINE WITH SIZE SHOWN
W	= EXISTING PVC WATER LINE WITH SIZE SHOWN
	= EXISTING REUSE FORCE MAIN WITH SIZE SHOWN
	= NEW MANHOLE
	= EXISTING MANHOLE
	= NEW GATE VALVE
	= EXISTING GATE VALVE
	= NEW FIRE HYDRANT
	= EXISTING FIRE HYDRANT
HC	= HANDICAP RAMP
HGL	= HYDRAULIC GRADE LINE
Q_{100}	= 100-YEAR STORM EVENT FLOW IN (CFS)
	= GRAVEL BAGS OR HAY BALES TEMPORARY SEDIMENT CONTROL DEVICES SEE DETAIL "A" ON THIS SHEET
	= AS-BUILT
	= PROPOSED DOUBLE TAPERED MAST ARM STREETLIGHT
	= EXISTING STREETLIGHT
	= NEW ASPHALT
	= EXISTING ASPHALT
	= PROPOSED SIDEWALK
1704.28	= PROPOSED TOP BACK OF CURB ELEV.
1704.28	= EXISTING TOP BACK OF CURB ELEV.
16	= CONSTRUCTION NOTE
1703.76	= SPOT ELEVATION
ROW	= RIGHT OF WAY
TBC	= TOP BACK OF CURB
℄	= PROPERTY LINE
℄	= CENTER LINE
	= PROPOSED SAWCUT LINE
	= PROPOSED SIGN
RCP	= REINFORCED CONCRETE PIPE
CPP	= CORRUGATED PLASTIC PIPE

CONSTRUCTION NOTES

1. CONSTRUCT NEW 24" "L" TYPE CURB AND GUTTER PER C.C. AREA STANDARD DRAWING NO. 216.
3. CONSTRUCT NEW "A" TYPE ISLAND CURB PER C.C. AREA STANDARD DRAWING NO. 219.
9. CONSTRUCT NEW 10' MEANDERING SIDEWALK PER C.C. AREA STANDARD DRAWING NO. 234.
12. COORDINATE CONNECTION OF NEW WATERLINE TO EXISTING WATERLINE WITH VIRGIN VALLEY WATER DIST.
13. STUB, PLUG AND BLOCK NEW WATERLINE FOR FUTURE CONNECTION. INSTALL NEW TEMPORARY BLOW OFF VALVE.
16. INSTALL NEW FIRE HYDRANT AND GATE VALVE V.V.W.D. AREA STANDARD DRAWING NO. 8.0. (TYPICAL)
24. INSTALL NEW 60" STANDARD ECCENTRIC SEWER MANHOLE PER C.C. SANITATION DISTRICT "DESIGN & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", STANDARD DRAWING NO. SD-1
25. STUB-OUT NEW SANITARY SEWER LINE FOR FUTURE CONNECTION AT INVERT ELEVATION INDICATED.
26. CONNECT NEW SEWER LINE TO EXISTING MANHOLE.
34. INSTALL NEW 60" STORM DRAIN MANHOLE PER C.C. AREA STANDARD DRAWING NO. 404.
35. CONSTRUCT NEW MODIFIED TYPE "C" DROP INLET PER C.C. AREA STANDARD DRAWING NO. 413. (A): L=15.00' WITH 4 GRATES; D=4.00' (B): L=8.00' WITH 2 GRATES; D=4.00'
38. STUB-OUT NEW STORM DRAIN FOR FUTURE CONNECTION AT INVERT ELEVATION INDICATED.
39. INSTALL DOUBLE TAPERED STREET LIGHT STANDARD AND BASE PER C.C. AREA STANDARD DRAWING NO. 317 AND 321.
42. SAWCUT & MATCH EXISTING ASPHALT PAVEMENT.
43. CONSTRUCT NEW 3" ASPHALT OVER 10" AGGREGATE TYPE II BASE.
48. PAINT CURB RED 10 FT. EACH SIDE OF FIRE HYDRANT
61. INSTALL NEW R2-1 SIGN "SPEED LIMIT 45" PER M.U.T.C.D. SECTION 2B.13.
62. INSTALL NEW R4-7 SIGN PER M.U.T.C.D. SECTION 2B.33.
64. PAINT 4" WIDE WHITE DASHED (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
67. PAINT 4" WIDE WHITE SOLID (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
80. CONCRETE ENCASE STORM DRAIN LINE 10' ON BOTH SIDES OF WATER MAIN CROSSING AS DESCRIBED IN V.V.W.D. STANDARD DRAWING NO. 5.0.
82. INSTALL NEW 16" X 6" FE TEE, AND ONE 6" FE X MJ GATE VALVE.
90. OUTLET STORM DRAIN INTO EXISTING PULSIPHER WASH IMPROVEMENTS. REMOVE AND REPLACE RIP-RAP FOR OUTLET PROTECTION.
91. PROVIDE LOOSE RIP-RAP FOR OUTLET PROTECTION ACCORDING TO D_{50}=6"; L=4.00', W=4.00', DEPTH=12".
95. USE BMP'S "BEST MANAGEMENT PRACTICES" TO PREVENT STORMWATER POLLUTION INTO PULSIPHER WASH. THIS INCLUDES PLACING GRAVEL BAGS OR HAY BALES AS A TEMPORARY SEDIMENT CONTROL DEVICES ACCORDING TO DETAIL "A" AS SHOWN ON THIS PLAN. THE GRAVEL BAGS OR HAY BALES SHALL BE IN PLACE DURING ROADWAY GRADING AND CONSTRUCTION.

CURVE TABLE CL

CURVE	RADIUS	TANGENT	LENGTH	DELTA
10	2000.00'	84.90'	169.10'	04°50'40"
10T	2080.00'	187.76'	374.42'	10°43'35"

CURVE TABLE ROW

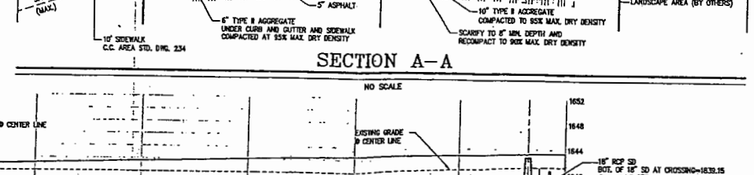
CURVE	RADIUS	TANGENT	LENGTH	DELTA
8	1940.00'	82.08'	164.03'	04°50'40"
8T	1840.00'	182.13'	363.19'	10°43'35"
9	2060.00'	87.14'	174.17'	04°50'40"
9T	2060.00'	193.39'	385.68'	10°43'35"

CURVE TABLE TBC

CURVE	RADIUS	TANGENT	LENGTH	DELTA
1	3.83'	INFINITE	12.03'	180°00'00"
2	250.00'	30.88'	61.45'	14°05'02"
3	250.00'	30.88'	61.42'	14°04'34"
4	1950.00'	82.49'	164.87'	04°50'40"
4T	1950.00'	106.92'	213.62'	06°16'36"
5	1988.67'	84.12'	168.14'	04°50'40"
5T	1988.67'	109.04'	217.85'	06°16'36"
6	2011.33'	85.08'	170.06'	04°50'40"
6T	2011.33'	110.28'	220.34'	06°16'36"
7	2050.00'	86.72'	173.33'	04°50'40"
7T	2050.00'	112.40'	224.57'	06°16'36"

SECTION A–A

NO SCALE

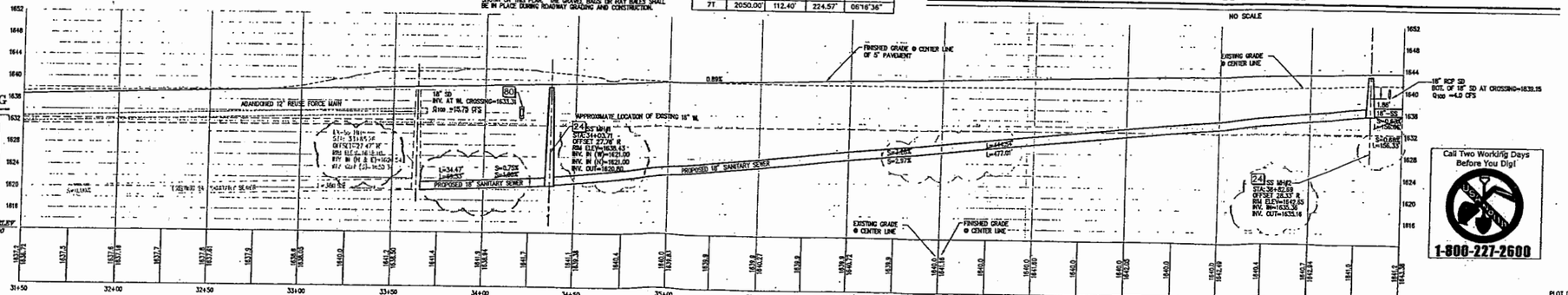


AS-BUILT MANHOLE NOTHRING & EASTING

#	NORTHING	EASTING
EX-SS	49283.1210	38104.5310
SS-1	49321.5910	38104.1550
SS-2	49802.4120	38090.6450

FALCON RIDGE PARKWAY PROFILE VIEW

STA:31+50.00 TO STA:39+00.00
SCALE HOR: 1"=50', SCALE VER: 1"=10'



NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

Call Two Working Days Before You Dig!
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AS-BUILT INFORMATION UPDATED 8-4-05

H:\1288-04-(RFMS PUD)\1288-04-02-(PHASE I-FALCON RIDGE PARKWAY)\WORKING PLANS\AS-BUILT(S) PHP 1 31+00 TO 39+00-AS-BUILT(8-4-05).dwg 8/5/2005 7:55:02 AM Richard Bartlett

NO	DESCRIPTION	DATE	BY
1	REVISE 12" TO 18" STORM DRAIN	06/03/04	LH

THESE PLANS ARE THE PROPERTY OF BULLOCH BROTHERS ENGINEERING INC. AND ARE NOT TO BE USED IN WHOLE OR IN PART FOR ANY PROJECT OTHER THAN THE ONE FOR WHICH THEY WERE PREPARED WITHOUT THE EXPRESS WRITTEN CONSENT OF BULLOCH BROTHERS ENGINEERING INC.

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750 WEST PIONEER BOULEVARD
MESQUITE, NEVADA 89027
(702) 346-6100

PLAN AND PROFILE SHEET 1
STA: 31+17.51 TO STA: 39+00.00
FOR
FALCON RIDGE PHASE I
RFMS
MESQUITE, NEVADA

SCALE	DRAWN BY	CHECKED BY
1"=20'	A.J.N.	G.B.

PROJECT NO	DATED	SHEET NO
1288-4-02	JAN 2004	5 OF 9

PLOT DATE

D8

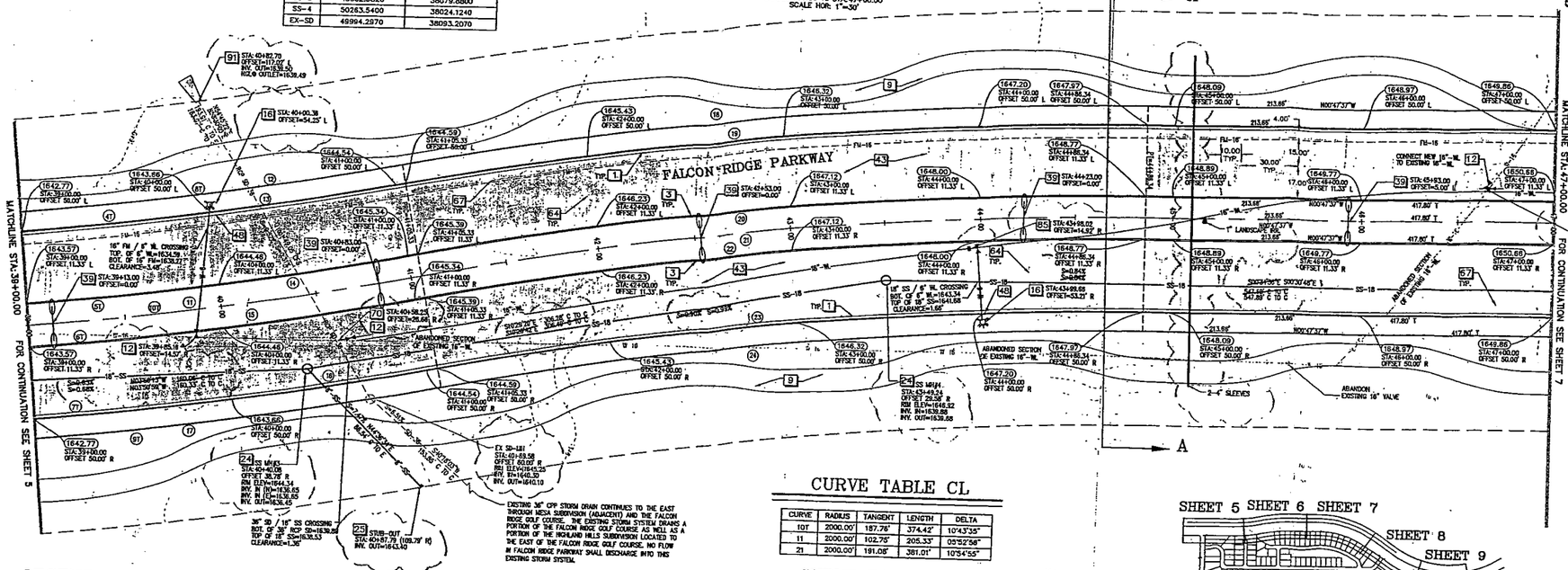
NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

AS-BUILT MANHOLE NOTHRING & EASTING

#	NORTHING	EASTING
SS-3	49962.3820	38079.8800
SS-4	50263.5400	38024.1240
EX-SD	49994.2970	38093.2070

FALCON RIDGE PARKWAY PLAN VIEW

STA: 39+00.00 TO STA: 47+00.00
SCALE HOR: 1"=30'



GRAPHIC SCALE
(IN FEET)
1 inch = 50 ft.

LEGEND

- 1310 — = PROPOSED 10' CONTOUR WITH ELEVATION SHOWN
- = EXISTING 10' CONTOUR WITH ELEVATION SHOWN
- 1308 — = PROPOSED 2' CONTOUR WITH ELEVATION SHOWN
- = EXISTING 2' CONTOUR WITH ELEVATION SHOWN
- SS — = NEW PVC SEWER LINE WITH SIZE SHOWN
- SD — = NEW CPP STORM DRAIN WITH SIZE SHOWN
- = EXISTING STORM DRAIN WITH SIZE SHOWN
- W — = NEW PVC WATER LINE WITH SIZE SHOWN
- = EXISTING PVC WATER LINE WITH SIZE SHOWN
- = EXISTING REUSE FORCE MAIN WITH SIZE SHOWN
- = NEW MANHOLE
- = NEW GATE VALVE
- = NEW FIRE HYDRANT
- HC = HANDICAP RAMP
- Q100 = 100-YEAR STORM EVENT FLOW IN (CFS)
- = NEW 16" WJ TO FE WATERLINE ADAPTER
- = AS-BUILT
- = PROPOSED DOUBLE TAPERED MAST ARM STREETLIGHT
- = NEW ASPHALT
- = PROPOSED SIDEWALK
- 1704.26 = PROPOSED TOP BACK OF CURB ELEV.
- 1704.26 = EXISTING TOP BACK OF CURB ELEV.
- 16 = CONSTRUCTION NOTE
- 1703.76 = SPOT ELEVATION
- ROW = RIGHT OF WAY
- TBC = TOP BACK OF CURB
- ℄ = PROPERTY LINE
- ℄ = CENTER LINE
- RCP = REINFORCED CONCRETE PIPE
- CPP = CORRUGATED PLASTIC PIPE
- HGL = HYDRAULIC GRADE LINE

CONSTRUCTION NOTES

1. CONSTRUCT NEW 24" "L" TYPE CURB AND GUTTER PER C.C. AREA STANDARD DRAWING NO. 218.
3. CONSTRUCT NEW "A" TYPE ISLAND CURB PER C.C. AREA STANDARD DRAWING NO. 219.
9. CONSTRUCT NEW 10' MEANDERING SIDEWALK PER C.C. AREA STANDARD DRAWING NO. 234.
12. COORDINATE CONNECTION OF NEW WATERLINE TO EXISTING WATERLINE WITH VIRGIN VALLEY WATER DIST.
16. INSTALL NEW FIRE HYDRANT AND GATE VALVE V.V.W.D. AREA STANDARD DRAWING NO. 6.6. (TYPICAL)
24. INSTALL NEW 60" STANDARD ECCENTRIC SEWER MANHOLE PER C.C. SANITATION DISTRICT "ACTION & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", STANDARD DRAWING NO. SD-1
25. STUB-OUT NEW SANITARY SEWER LINE FOR FUTURE CONNECTION AT INVERT ELEVATION INDICATED.
39. INSTALL DOUBLE TAPERED STREET LIGHT STANDARD AND BASE PER C.C. AREA STANDARD DWG. NO. 317 AND 321. 12' ARM 250 WHPS. (TYPICAL)
43. CONSTRUCT NEW 5" ASPHALT OVER 10" AGGREGATE TYPE II BASE.
48. PAINT CURB RED 10 FT. EACH SIDE OF FIRE HYDRANT
64. PAINT 4" WIDE WHITE DASHED (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
67. PAINT 4" WIDE WHITE SOLID (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
70. INSTALL NEW 16" 11.25° BEND AND NEW 16" BUTTERFLY VALVE. ABANDON EXISTING 16" WATERLINE FROM STA:40+67.48 (28.30' R) TO STA: 40+64.54 (16.00' L) AS SHOWN ON THE PLANS.
71. INSTALL NEW 16" BVE AND 16" 11.25° BEND. INSTALL NEW 16" BUTTERFLY VALVE ON EXISTING WATERLINE AND ON PROPOSED WATERLINE WHERE SHOWN. FIELD VERIFY DEPTH OF EXISTING 16" WATERLINE AND ADD ANY FITTINGS NECESSARY TO TIE THE EXISTING 16" WATERLINE TO THE PROPOSED 16" WATERLINE WHILE MAINTAINING A 42" DEPTH OF COVER OVER THE PROPOSED 16" WATERLINE.
85. INSTALL NEW 16" X 6" MJ X FE TEE, AND ONE 6" FE X MJ GATE VALVE AND ONE 16" FE X MJ ADAPTER.
91. PROVIDE LOOSE RIP-RAP FOR OUTLET PROTECTION ACCORDING TO D_{50}=6"; L=14.00', W=7.00', DEPTH=18".

CURVE TABLE CL

CURVE	RADIUS	TANGENT	LENGTH	DELTA
10T	2000.00'	187.76'	374.42'	10°43'35"
11	2000.00'	102.75'	205.33'	05°52'56"
21	2000.00'	191.08'	381.01'	10°54'55"

CURVE TABLE ROW

CURVE	RADIUS	TANGENT	LENGTH	DELTA
8T	1940.00'	182.13'	363.19'	10°43'35"
9T	2060.00'	193.39'	385.66'	10°43'35"
12	1940.00'	99.67'	199.17'	05°52'56"
17	2060.00'	105.84'	211.48'	05°52'56"
18	2060.00'	196.82'	392.44'	10°54'55"
24	1940.00'	185.35'	369.58'	10°54'55"

CURVE TABLE TBC

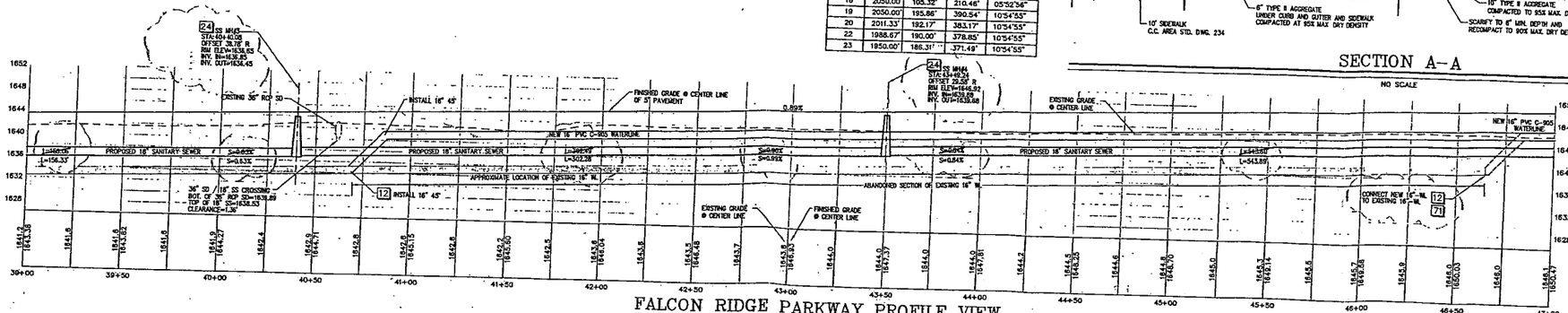
CURVE	RADIUS	TANGENT	LENGTH	DELTA
4T	1950.00'	106.92'	213.62'	06°16'36"
5T	1988.67'	109.04'	217.85'	06°16'36"
6T	2011.33'	110.28'	220.34'	06°16'36"
7T	2050.00'	112.40'	224.57'	06°16'36"
13	1950.00'	100.18'	200.19'	05°52'56"
14	1988.67'	102.17'	204.16'	05°52'56"
15	2011.33'	103.34'	206.49'	05°52'56"
16	2050.00'	105.32'	210.46'	05°52'56"
19	2050.00'	195.86'	390.54'	10°54'55"
20	2011.33'	192.17'	383.17'	10°54'55"
22	1988.67'	190.00'	378.85'	10°54'55"
23	1950.00'	186.31'	371.49'	10°54'55"

SHEET 5 SHEET 6 SHEET 7 SHEET 8 SHEET 9

KEYMAP

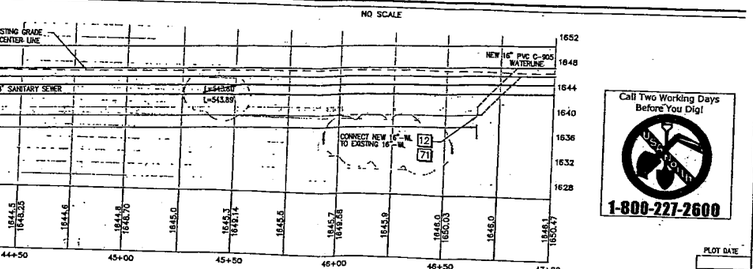
FALCON RIDGE PARKWAY PROFILE VIEW

STA:39+00.00 TO STA:47+00.00
SCALE HOR: 1"=30', SCALE VER: 1"=10'



SECTION A-A

NO SCALE



AS-BUILT INFORMATION UPDATED 8-4-05

Call Two Working Days Before You Dig!
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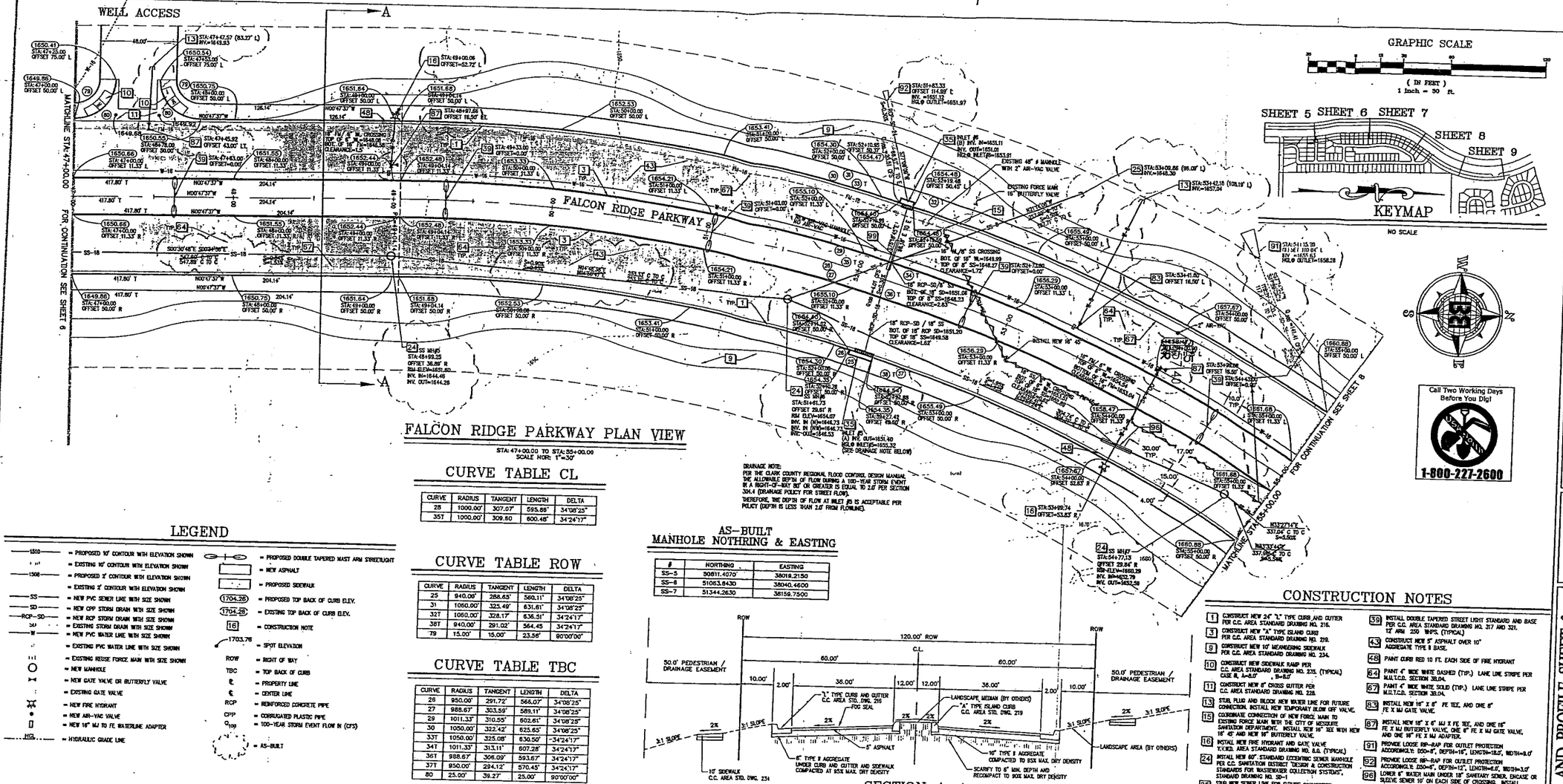
REVISIONS		
NO	DESCRIPTION	DATE

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750 WEST PIONEER BOULEVARD, MESQUITE, NEVADA 89027 (702) 346-5100

PLAN AND PROFILE SHEET 2
STA: 39+00.00 TO 47+00.00
FOR
FALCON RIDGE PHASE I
RFMS
MESQUITE, NEVADA

SCALE	DRAWN BY	CHECKED BY
1"=30'	AJN/AJC	CJB
PROJECT NO	DATE	SHEET NO
1288-4-02	JAN 2004	6 OF 9

PLOT DATE



FALCON RIDGE PARKWAY PLAN VIEW

STA: 47+00.00 TO STA: 55+00.00
SCALE HOR: 1"=50'

LEGEND

- 1510 — = PROPOSED 10' CONTOUR WITH ELEVATION SHOWN
- = EXISTING 10' CONTOUR WITH ELEVATION SHOWN
- 1508 — = PROPOSED 2' CONTOUR WITH ELEVATION SHOWN
- = EXISTING 2' CONTOUR WITH ELEVATION SHOWN
- SS — = NEW PVC SEWER LINE WITH SIZE SHOWN
- SD — = NEW CPP STORM DRAIN WITH SIZE SHOWN
- RCP-SD — = NEW RCP STORM DRAIN WITH SIZE SHOWN
- = EXISTING STORM DRAIN WITH SIZE SHOWN
- W — = NEW PVC WATER LINE WITH SIZE SHOWN
- = EXISTING PVC WATER LINE WITH SIZE SHOWN
- = EXISTING RECLAIM FORCE MAIN WITH SIZE SHOWN
- = NEW MANHOLE
- = NEW GATE VALVE OR BUTTERFLY VALVE
- = EXISTING GATE VALVE
- = NEW FIRE HYDRANT
- = NEW AIR-VAC VALVE
- = NEW 16" MJ TO FE WATERLINE ADAPTER
- HGL — = HYDRAULIC GRADE LINE
- = PROPOSED DOUBLE TAPERED MAST ARM STREETLIGHT
- = NEW ASPHALT
- = PROPOSED SIDEWALK
- (1704.26) = PROPOSED TOP BACK OF CURB ELEV.
- [1704.28] = EXISTING TOP BACK OF CURB ELEV.
- [16] = CONSTRUCTION NOTE
- 1703.76 = SPOT ELEVATION
- ROW = RIGHT OF WAY
- TBC = TOP BACK OF CURB
- ℄ = PROPERTY LINE
- ℄ = CENTER LINE
- RCP = REINFORCED CONCRETE PIPE
- CPP = CORRUGATED PLASTIC PIPE
- Q_{100} = 100-YEAR STORM EVENT FLOW IN (CFS)
- = AS-BUILT

CURVE TABLE CL

CURVE	RADIUS	TANGENT	LENGTH	DELTA
28	1000.00'	307.07'	595.88'	34°08'25"
35T	1000.00'	309.60	600.48'	34°24'17"

CURVE TABLE ROW

CURVE	RADIUS	TANGENT	LENGTH	DELTA
25	940.00'	288.63'	560.11'	34°08'25"
31	1060.00'	325.49'	631.61'	34°08'25"
32T	1060.00'	328.17'	636.51'	34°24'17"
38T	940.00'	291.02'	564.45	34°24'17"
79	15.00'	15.00'	23.56'	90°00'00"

CURVE TABLE TBC

CURVE	RADIUS	TANGENT	LENGTH	DELTA
26	950.00'	291.72'	566.07'	34°08'25"
27	988.67'	303.59'	589.11'	34°08'25"
29	1011.33'	310.55'	602.61'	34°08'25"
30	1050.00'	322.42'	625.65'	34°08'25"
33T	1050.00'	325.08'	630.50'	34°24'17"
34T	1011.33'	313.11'	607.28'	34°24'17"
36T	988.67'	306.09'	593.67'	34°24'17"
37T	950.00'	294.12'	570.45'	34°24'17"
80	25.00'	39.27'	25.00'	90°00'00"

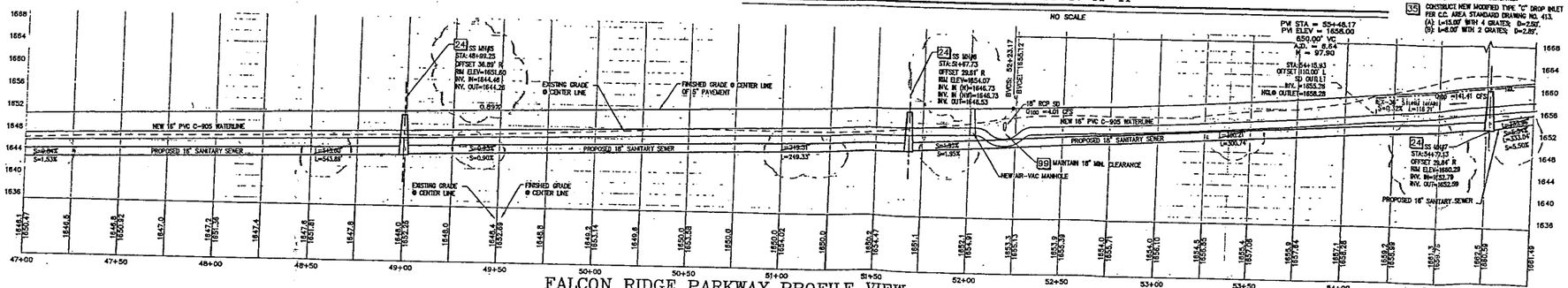
AS-BUILT MANHOLE NOTHRING & EASTING

#	NORTHING	EASTING
SS-5	50811.4070'	38018.2150
SS-6	51063.8430	38040.4600
SS-7	51344.2630	38159.7500

DRAINAGE NOTE:
PER THE CLARK COUNTY REGIONAL FLOOD CONTROL DESIGN MANUAL THE ALLOWABLE DEPTH OF FLOW DURING A 100-YEAR STORM EVENT IN A RIGHT-OF-WAY 80' OR GREATER IS EQUAL TO 2.0' PER SECTION 304.4 (DRAINAGE POLICY FOR STREET FLOW).
THEREFORE, THE DEPTH OF FLOW AT INLET (5) IS ACCEPTABLE PER POLICY (DEPTH IS LESS THAN 2.0' FROM FLOWLINE).

SECTION A-A

NO SCALE



FALCON RIDGE PARKWAY PROFILE VIEW

STA: 47+00.00 TO STA: 55+00.00
SCALE HOR: 1"=50', SCALE VER: 1"=10'

NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTES

1. CONSTRUCT NEW 24" "L" TYPE CURB AND GUTTER PER C.C. AREA STANDARD DRAWING NO. 216.
3. CONSTRUCT NEW "A" TYPE ISLAND CURB PER C.C. AREA STANDARD DRAWING NO. 219.
9. CONSTRUCT NEW 10' MEANDERING SIDEWALK PER C.C. AREA STANDARD DRAWING NO. 234.
10. CONSTRUCT NEW SIDEWALK RAMP PER C.C. AREA STANDARD DRAWING NO. 235, (TYPICAL) CASE III, A=8.0' B=8.0'
11. CONSTRUCT NEW 6" CROSS GUTTER PER C.C. AREA STANDARD DRAWING NO. 228.
13. STUB, PLUG AND BLOCK NEW WATER LINE FOR FUTURE CONNECTION. INSTALL NEW TEMPORARY BLOW OFF VALVE.
15. COORDINATE CONNECTION OF NEW FORCE MAIN TO EXISTING FORCE MAIN WITH THE CITY OF MESQUITE SANITATION DEPARTMENT. INSTALL NEW 16" TEE WITH NEW 16" 45° AND NEW 16" BUTTERFLY VALVE.
16. INSTALL NEW FIRE HYDRANT AND GATE VALVE V.V.W.D. AREA STANDARD DRAWING NO. 8.0. (TYPICAL)
24. INSTALL NEW 60" STANDARD ECCENTRIC SEWER MANHOLE PER C.C. SANITATION DISTRICT "SEWER & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", STANDARD DRAWING NO. SD-1.
25. STUB NEW SEWER LINE FOR FUTURE CONNECTION AT INVERT ELEVATION INDICATED.
35. CONSTRUCT NEW MODIFIED TYPE "C" DROP INLET PER C.C. AREA STANDARD DRAWING NO. 413.
(A): L=15.00' WITH 4 GRATES D=2.00'.
(B): L=8.00' WITH 2 GRATES D=2.89'.
39. INSTALL DOUBLE TAPERED STREET LIGHT STANDARD AND BASE PER C.C. AREA STANDARD DRAWING NO. 317 AND 321. 12' ARM 250 WATTS. (TYPICAL)
43. CONSTRUCT NEW 5" ASPHALT OVER 10" AGGREGATE TYPE II BASE.
48. PAINT CURB RED 10 FT. EACH SIDE OF FIRE HYDRANT
64. PAINT 4" WIDE WHITE DASHED (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
67. PAINT 4" WIDE WHITE SOLID (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
83. INSTALL NEW 16" X 8" FE TEE, AND ONE 8" FE X MJ GATE VALVE.
87. INSTALL NEW 16" X 6" MJ X FE TEE, AND ONE 16" FE X MJ BUTTERFLY VALVE, ONE 6" FE X MJ GATE VALVE, AND ONE 16" FE X MJ ADAPTER.
91. PROVIDE LOOSE RIP-RAP FOR OUTLET PROTECTION ACCORDING TO D50=6", DEPTH=18", LENGTH=18.0', WIDTH=8.0'
92. PROVIDE LOOSE RIP-RAP FOR OUTLET PROTECTION ACCORDING TO D50=6", DEPTH=12", LENGTH=6.0', WIDTH=3.0'
96. LOWER 8" WATER MAIN UNDER 18" SANITARY SEWER, ENCASE OR SLEEVE SEWER 10' ON EACH SIDE OF CROSSING. INSTALL NEW AIR/VAC - AIR RELEASE VALVE. CONSTRUCT PER V.V.W.D. DESIGN AND STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION DRAWING NUMBERS 5.0, 5.1, AND 8.0. MAINTAIN 18" MIN. VERTICAL CLEARANCE.
99. LOWER 16" WATER MAIN UNDER 18" RCP SD CULVERT, ENCASE OR SLEEVE CULVERT 10' ON EACH SIDE OF CROSSING. INSTALL NEW AIR/VAC - AIR RELEASE VALVE. CONSTRUCT PER V.V.W.D. DESIGN AND STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION DRAWING NUMBERS 5.0, 5.1, AND 8.0. MAINTAIN 18" MIN. VERTICAL CLEARANCE.

AS-BUILT INFORMATION UPDATED 8-4-05

NO	DESCRIPTION	DATE	BY

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MESQUITE, NEVADA 89027
(702) 346-0100

PLAN AND PROFILE SHEET 3
STA: 47+00.00 TO 55+00.00
FOR
FALCON RIDGE PHASE I
RFMS
MESQUITE, NEVADA

PLOT DATE	SCALE	DRAWN BY	CHECKED BY
	1"=50'	AJN/JGC	GB
PROJECT NO	DATE	SHEET NO	
1288-4-02	JAN 2004	7 OF 9	

N:\1288-04-(RFMS PUD)\1288-04-02-(PHASE I-FALCON RIDGE PARKWAY)\WORKING PLANS\AS-BUILT\(7) PHP 3-47+00 TO 55+00-AS-BUILT(8-4-05).dwg 8/5/2005 10:09:21 AM Richard Bartlett

D10

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

SHEET 5 SHEET 6 SHEET 7
SHEET 8
SHEET 9

KEYMAP

NO SCALE

CONSTRUCTION NOTES

1 CONSTRUCT NEW 24" "L" TYPE CURB AND GUTTER PER C.C. AREA STANDARD DRAWING NO. 216.
3 CONSTRUCT NEW "A" TYPE ISLAND CURB PER C.C. AREA STANDARD DRAWING NO. 218.
9 CONSTRUCT NEW 10' MEANDERING SIDEWALK PER C.C. AREA STANDARD DRAWING NO. 234.
10 CONSTRUCT NEW SIDEWALK RAMP PER C.C. AREA STANDARD DRAWING NO. 235. (TYPICAL) CASE 1A: (A) A=1.5' ; B=21.5' ; (D) A=15.0', B=4.5' (C) A=4.5' ; (D) A=4.5' ; B=4.5'.
11 CONSTRUCT NEW 6" CROSS GUTTER PER C.C. AREA STANDARD DRAWING NO. 228.
13 STUB, PLUG AND BLOCK NEW WATER LINE FOR FUTURE CONNECTION. INSTALL NEW TEMPORARY BLOW OFF VALVE.
16 INSTALL NEW FIRE HYDRANT AND GATE VALVE W.V.W.D. AREA STANDARD DRAWING NO. 8.0. (TYPICAL)
24 INSTALL NEW 60" STANDARD ECCENTRIC SEWER MANHOLE PER C.C. SANITATION DISTRICT "DESIGN & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", STANDARD DRAWING NO. SD-1
25 STUB NEW SEWER LINE FOR FUTURE CONNECTION AT INVERT ELEVATION INDICATED.
34 INSTALL NEW 60" STORM DRAIN MANHOLE PER C.C. AREA STANDARD DRAWING NO. 404.
39 INSTALL DOUBLE TAPERED STREET LIGHT STANDARD AND BASE PER C.C. AREA STANDARD DRAWING NO. 317 AND 321. 12' ARM 250 WATTS. (TYPICAL)
43 CONSTRUCT NEW 5" ASPHALT OVER 10" AGGREGATE TYPE II BASE COURSE.
48 PAINT CURB RED 10 FT. EACH SIDE OF FIRE HYDRANT
61 INSTALL NEW R2-1 SIGN "SPEED LIMIT 45" PER M.U.T.C.D. SECTION 2B.13.
62 INSTALL NEW R4-7 SIGN PER M.U.T.C.D. SECTION 2B.33.
64 PAINT 4" WIDE WHITE DASHED (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
67 PAINT 4" WIDE WHITE SOLID (TYP.) LANE LINE STRIPE PER M.U.T.C.D. SECTION 3B.04.
84 INSTALL NEW 36" X 6" MJ X PE TEE, AND ONE 6" PE X MJ GATE VALVE AND ONE 16" PE X MJ ADAPTER.
86 INSTALL NEW 36" X 6" PE TEE, AND TWO 16" BUTTERFLY VALVES AND ONE 16" PE X MJ ADAPTER AND ONE 6" PE X MJ GATE VALVE.
97 INSTALL NEW 16" X 16" PE TEE, AND ONE 16" PE X MJ GATE VALVE AND ONE 16" PE X MJ ADAPTER.
98 LOWER 6" WATER MAIN UNDER 24" SANITARY SEWER MAIN, ENCASE SLEEVE SEWER 10' ON EACH SIDE OF CROSSING. INSTALL NEW AIR/VAC – AIR RELEASE VALVE, CONSTRUCT PER V.V.W.D. DESIGN AND STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION DRAWING NUMBERS S.G. 5.1, AND 8.0.

LEGEND

- 1510 — PROPOSED 10' CONTOUR WITH ELEVATION SHOWN
- 1510 — EXISTING 10' CONTOUR WITH ELEVATION SHOWN
- 1508 — PROPOSED 2' CONTOUR WITH ELEVATION SHOWN
- 1508 — EXISTING 2' CONTOUR WITH ELEVATION SHOWN
- SS — NEW PVC SEWER LINE WITH SIZE SHOWN
- SD — NEW CPP STORM DRAIN WITH SIZE SHOWN
- SD — EXISTING CPP STORM DRAIN WITH SIZE SHOWN
- W — NEW PVC WATER LINE WITH SIZE SHOWN
- NEW MANHOLE
- NEW GATE VALVE
- NEW FIRE HYDRANT
- HC — HANDICAP RAMP
- NEW 16" MJ TO PE WATERLINE ADAPTER
- NEW AIR-VAC VALVE
- Q_{100} — 100-YEAR STORM EVENT FLOW IN (CFS)
- PROPOSED DOUBLE TAPERED MAST ARM STREETLIGHT
- NEW ASPHALT
- PROPOSED SIDEWALK
- 1704.26 — PROPOSED TOP BACK OF CURB ELEV.
- 1704.26 — EXISTING TOP BACK OF CURB ELEV.
- 16 — CONSTRUCTION NOTE
- 1703.76 — SPOT ELEVATION
- ROW — RIGHT OF WAY
- TBC — TOP BACK OF CURB
- ℄ — PROPERTY LINE
- ℄ — CENTER LINE
- GB — GRADE BREAK
- PROPOSED SIGN
- CPP — CORRUGATED PLASTIC PIPE
- RCP — REINFORCED CONCRETE PIPE
- HGL — HYDRAULIC GRADE LINE

FALCON RIDGE PARKWAY PLAN VIEW

STA:55+00.00 TO STA:63+00.00
SCALE HOR: 1"=30'

Call Two Working Days Before You Dig!
1-800-227-2600

SECTION A–A

NO SCALE

FALCON RIDGE PARKWAY PROFILE VIEW

STA:55+00.00 TO STA:63+00.00
SCALE HOR: 1"=30', SCALE VER: 1"=10'

AS–BUILT MANHOLE NOTHRING & EASTING

#	NORTHING	EASTING
SS–8	51623.4840	38345.5480
SS–9	51806.8860	38466.3030
SS–9A	52003.2250	38552.7060
EXSD–2	51404.7420	38114.4500
EXSD–3	51657.4510	38283.5210
SD–2	51936.5650	38459.3810

CURVE TABLE CL

CURVE	RADIUS	TANGENT	LENGTH	DELTA
42	1000.00'	2.31'	4.62'	00°15'52"
54	1304.96'	192.07'	381.41'	16°44'46"
60T	1304.96'	528.22'	1003.82'	44°04'25"

CURVE TABLE ROW

CURVE	RADIUS	TANGENT	LENGTH	DELTA
39	1060.00'	2.45'	4.89'	00°15'52"
45	940.00'	2.17'	4.34'	00°15'52"
58	1244.96'	183.24'	363.87'	16°44'46"
58	1364.96'	200.90'	398.94'	16°44'46"
62T	1244.96'	399.43'	773.03'	35°34'36"
71T	1364.96'	450.59'	870.43'	36°32'14"

CURVE TABLE TBC

CURVE	RADIUS	TANGENT	LENGTH	DELTA
40	1050.00'	2.42'	4.85'	00°15'52"
41	1011.33'	2.33'	4.67'	00°15'52"
43	988.67'	2.28'	4.56'	00°15'52"
44	950.00'	2.19'	4.38'	00°15'52"
46	11.33'	INFINITE	35.60'	180°00'00"
47	25.00'	25.00'	39.27'	90°00'00"
48	25.00'	25.00'	39.27'	90°00'00"
49	3.83'	INFINITE	12.04'	180°00'00"
50	1308.63'	14.74'	29.47'	01°17'25"
51	250.67'	37.58'	74.81'	17°03'10"
52	249.33'	25.33'	50.48'	11°36'00"
53	1316.30'	193.74'	384.72'	16°44'46"
55	1254.96'	184.71'	366.79'	16°44'46"
57	1354.96'	140.11'	279.23'	11°48'27"
59	1293.63'	113.21'	225.84'	10°00'09"
65T	1254.96'	402.64'	779.24'	35°34'36"
66T	1293.63'	330.16'	646.51'	28°38'04"
68T	1316.30'	193.80'	384.84'	16°45'05"
70T	1354.98'	253.95'	502.08'	21°11'23"
90	25.00'	24.77'	39.04'	89°28'53"
91	20.00'	19.08'	30.47'	87°17'27"

AS–BUILT INFORMATION UPDATED 8–4–05

NO	DESCRIPTION	DATE	BY
1.	RELOCATE DRIVEWAY, ADD SEWER MANHOLE AND WATER AND SEWER STUBS	09/30/04	JH
2.	REVISE CURB TABLE PER C.C. FOR REVISIONS MADE AT HARDY WAY INTERSECTION.	11/31/04	JH

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CIVIL ENGINEERS–LAND SURVEYORS
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CEDAR CITY, UTAH 84721
(435) 586–9598
750 WEST PIONEER BOULEVARD
MESQUITE, NEVADA 89027
(702) 346–5100

PLAN AND PROFILE SHEET
STA: 55+00.00 TO 63+00.00
FOR
FALCON RIDGE PHASE I
RFMS
MESQUITE, NEVADA

SCALED: 1"=50'
DRAWN BY: ALTA/BLC
CHECKED BY: GLB
PROJECT NO: 1288-4-02
DATED: JAN 2004
SHEET NO: 8 OF 9

PLOT DATE

N:\1288-04-RFMS PUD\1288-04-02-(PHASE I-FALCON RIDGE PARKWAY)\WORKING PLANS\AS-BUILT\(8) PRF 4 55+00 TO 63+00-AS-BUILT(8-4-05).dwg 8/8/2005 7:22:37 AM Richard Bartlett

D11

APPENDIX E

Data CD

BULLOCH BROTHERS ENGINEERING
ENGINEERS ★ SURVEYORS ★ LAND PLANNERS
Established in 1972

Mr. Mike Godesky
Project Engineer, Region IX
Federal Emergency Management Agency
Mitigation Division
500 C Street S.W.
Washington, D.C. 20472

Date: Nov. 1, 2005

Regarding: **Request for Letter of Map Revision Pulsipher Wash Adjacent to Falcon Ridge Parkway**

Dear Mr. Godesky:

This letter is written to certify "as-built" conditions for the above mention request for LOMR. The structures included in the referenced improvement plans and as-built plans, including the concrete channel, Falcon Ridge Parkway, Pioneer Boulevard quintuple barrel box culvert and double barrel box culvert at Bertha Howe Ave. (Bertha Howe Ave. is shown as Unnamed Street on referenced plans) were all constructed in substantial accordance with the improvement plans sealed by the design engineer. The grass lined channel shown as part of the referenced Pulsipher Wash Improvement Project was not built. An earthen channel currently exists between Pioneer Blvd. and Bertha Howe Ave.. The flood control facilities are currently functioning.

Should there be any questions or need additional information, please call us at (702) 346-5100.

Sincerely,

Greg L. Bulloch, P.E.
Bulloch Brothers Engineering, Inc

PROFESSIONAL ENGINEER STATE OF NEVADA
GREG L. BULLOCH
Exp. 12/31/06
CIVIL
No. 10875

11/1/05

CONCURRENCE BY CITY OF MESQUITE PUBLIC WORKS:

Signature — 11-7-05 Date

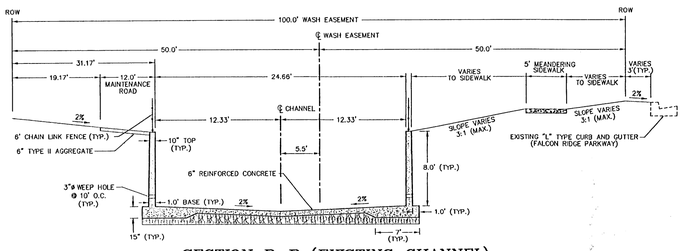
Bill Tanner, Director of Public Works

Cedar City
P.O. Box 3174
Cedar City, UT 84721-3174
435.586.9592
435.586.4995 Fax

Pleasant Grove
1909 W. State Street, Suite 200
Pleasant Grove, UT 84062
801.763.8467
801.763.8472 Fax

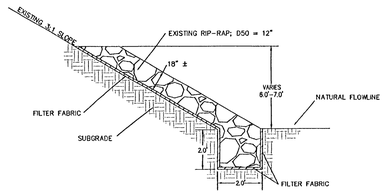
Mesquite
750 W. Pioneer Blvd.
Mesquite, NV 89027
702.346.5100
702.346.5102 Fax

FIGURE 3
PULSIPHER WASH HEC-RAS CROSS-SECTION EXHIBIT



SECTION B–B (EXISTING CHANNEL)

NO SCALE



SECTION C–C

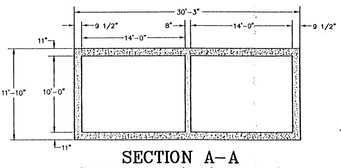
NO SCALE



GRAPHIC SCALE

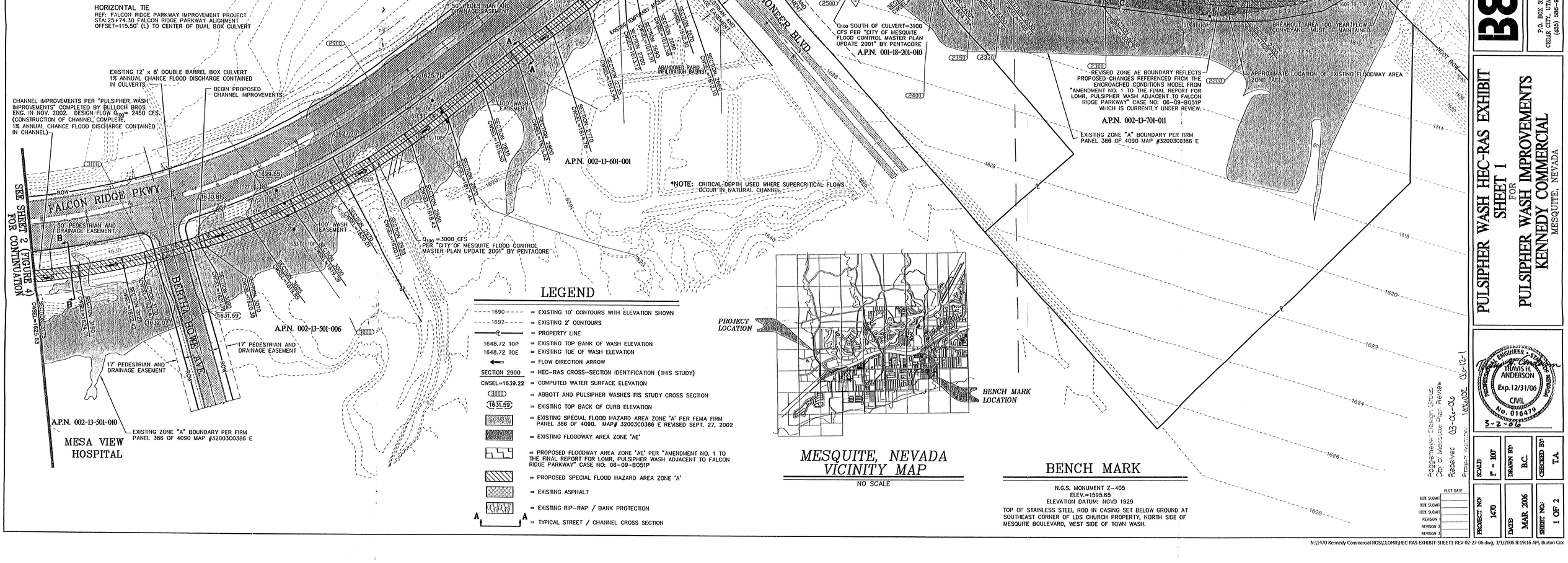
100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.



SECTION A–A
(PROPOSED DOUBLE 14' X 10' BOX CULVERT)

NO SCALE



LEGEND

1690	= EXISTING 10' CONTOURS WITH ELEVATION SHOWN
1692	= EXISTING 2' CONTOURS
	= PROPERTY LINE
1648.72 TOP	= EXISTING TOP BANK OF WASH ELEVATION
1648.72 TOE	= EXISTING TOE OF WASH ELEVATION
	= FLOW DIRECTION ARROW
SECTION 2900	= HEC-RAS CROSS-SECTION IDENTIFICATION (THIS STUDY)
CWSEL=1639.22	= COMPUTED WATER SURFACE ELEVATION
(3000)	= ABBOTT AND PULSIPHER WASHES FIS STUDY CROSS SECTION
1631.59	= EXISTING TOP BACK OF CURB ELEVATION
	= EXISTING SPECIAL FLOOD HAZARD AREA ZONE 'A' PER FEMA FIRM PANEL 386 OF 4090. MAP# 32003C0386 E REVISED SEPT. 27, 2002
	= EXISTING FLOODWAY AREA ZONE 'AE'
	= PROPOSED FLOODWAY AREA ZONE 'AE' PER "AMENDMENT NO. 1 TO THE FINAL REPORT FOR LOMR, PULSIPHER WASH ADJACENT TO FALCON RIDGE PARKWAY" CASE NO: 06-09-B051P
	= PROPOSED SPECIAL FLOOD HAZARD AREA ZONE 'A'
	= EXISTING ASPHALT
	= EXISTING RIP-RAP / BANK PROTECTION
A A	= TYPICAL STREET / CHANNEL CROSS SECTION

MESQUITE, NEVADA VICINITY MAP

NO SCALE

BENCH MARK

N.G.S. MONUMENT Z-405
ELEV.=1595.85
ELEVATION DATUM: NGVD 1929
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

NO	DESCRIPTION	DATE	BY	APPROVED

REVISIONS

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3-9-06
Project Number 06-12-1
Reviewed by

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1909 WEST STATE ST., SUITE 200, PLEASANT GROVE, UTAH 84062, (801) 785-8497
750 WEST PIONEER BLVD., MESQUITE, NEVADA 89027, (702) 346-5100

PULSIPHER WASH HEC-RAS EXHIBIT
SHEET 1
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-03-06
Project Number 1470002 03-12-1

SCALE	DRAWN BY:	CHECKED BY:
1" = 100'	B.C.	T.A.

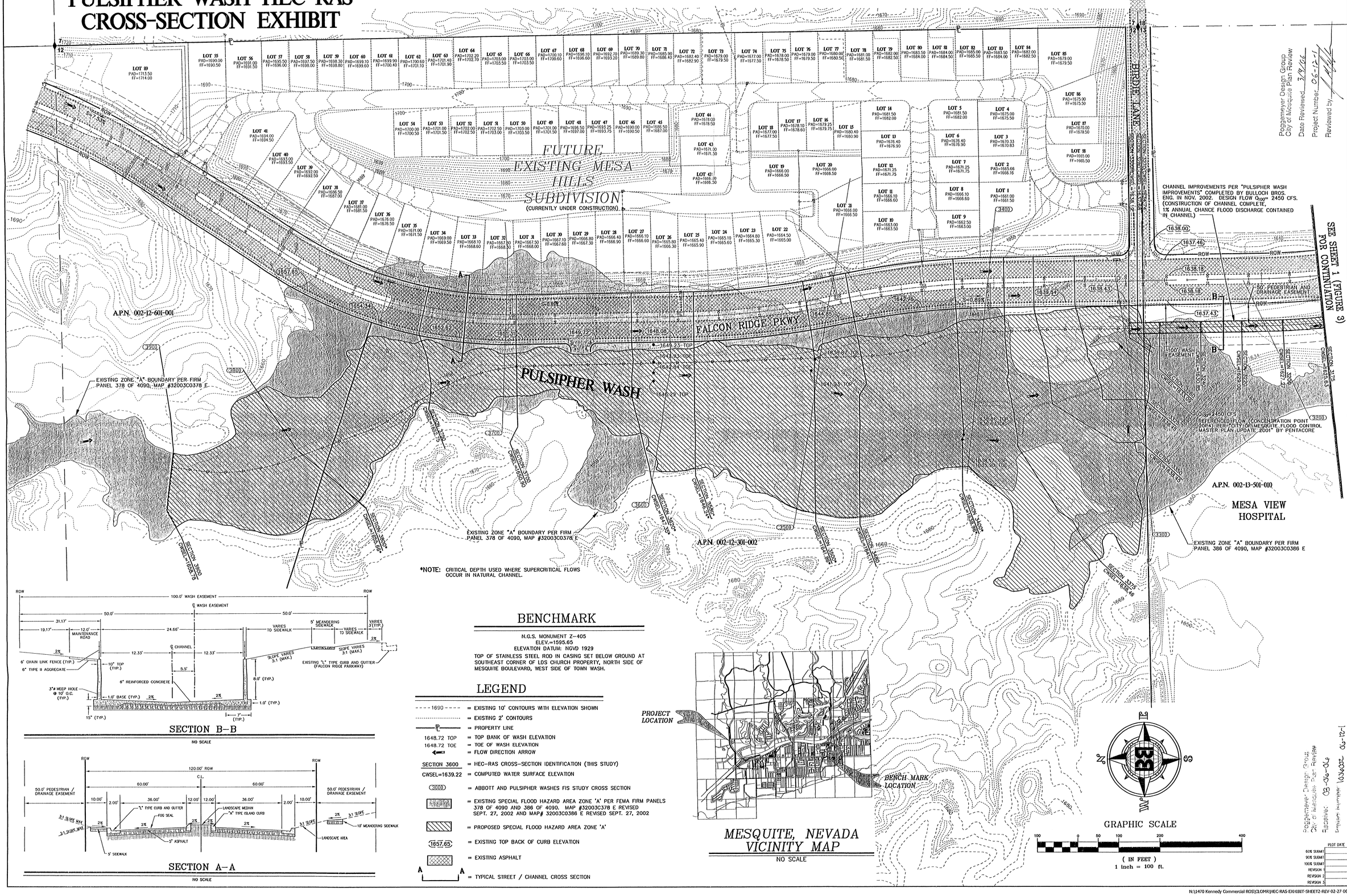
PROJECT NO:	DATE:	SHEET NO:
1470	MAR. 2006	1 OF 2

PLOT DATE
60% SUBMIT
90% SUBMIT
100% SUBMIT
REVISION 1
REVISION 2
REVISION 3

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FIGURE 4
PULSIPHER WASH HEC-RAS CROSS-SECTION EXHIBIT

FALCON RIDGE AREA



*NOTE: CRITICAL DEPTH USED WHERE SUPERCRITICAL FLOWS OCCUR IN NATURAL CHANNEL.

SECTION B–B

NO SCALE

SECTION A–A

NO SCALE

BENCHMARK

N.G.S. MONUMENT Z-405
ELEV.=1595.65
ELEVATION DATUM: NGVD 1929
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

LEGEND

- ----1690---- = EXISTING 10' CONTOURS WITH ELEVATION SHOWN
- ---------- = EXISTING 2' CONTOURS
- —℄— = PROPERTY LINE
- 1648.72 TOP = TOP BANK OF WASH ELEVATION
- 1648.72 TOE = TOE OF WASH ELEVATION
- = FLOW DIRECTION ARROW
- SECTION 3600 = HEC-RAS CROSS-SECTION IDENTIFICATION (THIS STUDY)
- CWSEL=1639.22 = COMPUTED WATER SURFACE ELEVATION
- (3000) = ABBOTT AND PULSIPHER WASHES FIS STUDY CROSS SECTION
- = EXISTING SPECIAL FLOOD HAZARD AREA ZONE 'A' PER FEMA FIRM PANELS 378 OF 4090 AND 386 OF 4090, MAP #32003C378 E REVISED SEPT. 27, 2002 AND MAP# 32003C0386 E REVISED SEPT. 27, 2002
- = PROPOSED SPECIAL FLOOD HAZARD AREA ZONE 'A'
- (1657.65) = EXISTING TOP BACK OF CURB ELEVATION
- = EXISTING ASPHALT
- A A = TYPICAL STREET / CHANNEL CROSS SECTION

MESQUITE, NEVADA VICINITY MAP

NO SCALE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS			
NO	DESCRIPTION	DATE	BY / APPROVED

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3/8/06
Project Number 06-121
Reviewed by

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(702) 346-5100

PULSIPHER WASH HEC-RAS EXHIBIT
SHEET 2
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

Poggemeyer Design Group
Plan Review Update Per Review
Received 03-06-06
Engineer Number Unsure 06-121

SCALE	DRAWN BY:	CHECKED BY:
1" = 100'	B.C.	T.A.

PROJECT NO:	DATE:	SHEET NO:
1470	MAR 2006	2 OF 2

PLOT DATE
60% SUBMIT
90% SUBMIT
100% SUBMIT
REVISION 1
REVISION 2
REVISION 3

N:\1470 Kennedy Commercial ROS\LOMR\HEC-RAS-EXHIBIT-SHEET2-REV-02-27 06.dwg, 3/1/2006 8:19:37 AM, Burton Cox

CITY OF M

ZONE A

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

N
W E
S

ZONE X

12

7

CORPORATE LIMITS

ZONE X

Wash

ZONE A

Pulsipher

R70E R71E

R70E R71E

12

7

ROAD

DUMP

Pulsipher

Wash

ZONE X

13

LIMIT OF DETAILED STUDY

ZONE A

1608

ZONE AE

D

1608

D

1600

C

1596

1595

1594

1595
1593

C

1589

ZONE AE

1588

1587

C

B

AREA SHOWN ON THIS PANEL IS LOCATED WITHIN 13 SOUTH, RANGE 70 EAST, AND TOWNSHIP 13 SOUTH, AST.

Poggemeyer Design Group
City of Mesquite Plan Review

Date Reviewed 3/9/06

Project Number 06-12-1

Reviewed by

CITY OF MESQUITE
320035

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 06-12-1

REVISION 3
REVISION 2
REVISION 1
UPDATE 2001
UPDATE 2005
PLOT DATE

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0378 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 378 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESQUITE, CITY OF	320035	0378	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	0378	E

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
32003C0378 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0386 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 386 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESQUITE, CITY OF	320035	0386	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	0386	E

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
32003C0386 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

PROJECT NO:	1470
SCALE:	1" = 300'
DATE:	MAR 2006
DRAWN BY:	H.W.
SHEET NO:	1 OF 1
CHECKED BY:	T.A.

F.E.M.A. FLOOD ZONE MAP
FIGURE 1
FROM
FIRM MAP NOS.
32003C0386E & 32003C0387E
MESQUITE, NEVADA

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PLEASANT GROVE, UTAH 84062
(801) 763-8467

750 WEST PIONEER BLVD.
MESQUITE, NEVADA 89027
(702) 346-5100

REVISIONS

NO	DESCRIPTION	DATE	BY	APPROVED

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N:\1470 Kennedy Commercial ROS\CLOMR\FIGURE-1-Firm Map-coord..dwg, 3/1/2006 8:07:10 AM, Burton Cox

CITY OF M

ZONE A

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

N
W E
S

ZONE X

HARDY WAY

HARDY WAY

12

7

CORPORATE LIMITS

UPSTREAM LIMIT
OF STUDY

Wash

FALCON RIDGE PARKWAY

FALCON NEST COURT

ZONE X

ZONE A

WOODS COURT

LONG IRON LANE

HIGHLAND VIEW COURT

WEDGE WAY

Pulsipher

SANDTRAP COURT

R70E R71E

PROPOSED ZONE A

R70E R71E

HIGHLAND HILLS DRIVE

CALAIS DRIVE

12

7

CALAIS CIRCLE

BIRDIE LANE

PROPOSED ZONE A CONTAINED
IN EXISTING CHANNEL

Pulsipher Wash

FALCON RIDGE PARKWAY

ROAD

DUMP

TRIBUTARIES AND DUMP ROAD
ARE NO LONGER CURRENT

BERTHA HOWE AVENUE

ZONE X

PROPOSED ZONE A CONTAINED
IN EXISTING BERTH HOWE CULVERT

PIONEER BOULEVARD

PROPOSED PULSIPHER WASH
CHANNEL IMPROVEMENTS

PROPOSED ZONE A CONTAINED
IN EXISTING PIONEER BLVD. CULVERT

13

WEST PIONEER BOULEVARD

LIMIT OF
DETAILED STUDY

ZONE A

ZONE AE

AREA SHOWN ON THIS PANEL IS LOCATED WITHIN
13 SOUTH, RANGE 70 EAST, AND TOWNSHIP 13 SOUTH,
AST.

REVISED ZONE AE BOUNDARY REFLECTS PROPOSED CHANGES REFERENCED FROM THE ENCROACHED CONDITIONS MODEL FROM "AMENDMENT NO. 1 TO THE FINAL REPORT FOR LOMR, PULSIPHER WASH ADJACENT TO FALCON RIDGE PARKWAY" CASE NO: 06-09-B051P, WHICH IS CURRENTLY UNDER REVIEW.

Poggemeyer Design Group
City of Mesquite Plan Review

Date Reviewed 3/9/06

Project Number 06-12-1

Reviewed by

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 1050502
06-12-1

CITY OF MESQUITE
320035

DOWNSTREAM LIMIT OF
STUDY, I-15 BOX CULVERT

ZONE AE

1608 1600 1596 1595 1594 1595 1593 1589 1588 1587

D C B

REVISION 3 | REVISION 2 | REVISION 1 | 100% SUBMIT | 90% SUBMIT | 60% SUBMIT | PLOT DATE

NFIP
PANEL 0378 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 378 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESQUITE, CITY OF	320035	0378	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	0378	E

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
32003C0378 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NFIP
PANEL 0386 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 386 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MESQUITE, CITY OF	320035	0386	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	0386	E

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
32003C0386 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

PROJECT NO:	1470
SCALE:	1" = 300'
DATE:	MAR 2006
DRAWN BY:	H.W.
SHEET NO:	1 OF 1
CHECKED BY:	T.A.

ANNOTATED FLOOD ZONE MAP
FIGURE 2
FROM
FIRM MAP NOS.
32003C0386E & 32003C0387E
MESQUITE, NEVADA

BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS–LAND SURVEYORS–LAND PLANNERS
– www.bullochbrothers.com –

P.O. BOX 3174
CEDAR CITY, UTAH 84720
(435) 586-9592

1909 WEST STATE ST., SUITE 200
PLEASANT GROVE, UTAH 84062
(801) 763-8467

750 WEST PIONEER BLVD.
MESQUITE, NEVADA 89027
(702) 346-5100

REVISIONS

NO	DESCRIPTION	DATE	BY	APPROVED

THE INFORMATION CONTAINED ON THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY. THE INDIVIDUAL RECEIVING THIS DRAWING ASSUMES ALL RESPONSIBILITY FOR VERIFYING THE ACCURACY, SUITABILITY & USEABILITY OF THIS INFORMATION FOR THE PURPOSES INTENDED. ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION. DRAWING COPYRIGHTED 2006, BY BULLOCH BROTHERS ENGINEERING, INC. UNAUTHORIZED DUPLICATION PROHIBITED.

N:\1470 Kennedy Commercial ROS\CLOMR\FIGURE-2-Annotated Firm Map-coord-REV-01-26-06..dwg, 3/1/2006 8:18:27 AM, Burton Cox

BULLOCH BROTHERS ENGINEERING
ENGINEERS ★ SURVEYORS ★ LAND PLANNERS
Established in 1972

MESQUITE BUILDING & PLANNING
RECEIVED
5/9/06 CL

City of Mesquite
10 East Mesquite Boulevard
Mesquite, Nevada 89027

Date: May 1, 2006

Attention: Allen Bell, P.E., Bill Tanner, Catherine Lorbeer, City of Mesquite
Michael B. Holloway, P.E., Dennis Stransky, P.E., Poggemeyer Design Group

Regarding: Review comments by Poggemeyer for "**Request for Conditional Letter of Map Revision Proposed Pulsipher Wash Channel Improvements South of Bertha Howe Avenue**": **PDG #10060002, 06-12-1 (JMC).**

We have reviewed the memorandum from Poggemeyer dated March 10, 2006 with regards to the study. The following are responses to the comments related to this review.

Comments:

1. **Comment:** The FEMA Overview and Concurrence Form, the Riverine Structures Form and the FEMA Riverine Hydrology and Hydraulics Form are all expired. The engineer must use the current valid forms for the submittal.

   Response: A complete revised copy of MT-2 forms is included in Appendix E of Amendment No. 1.

2. **Comment:** FEMA has not approved the reference study, therefore it can not be used as reference.

   Response: City comment. (City and RFCD have approved, therefore it should be treated as best available data. If referenced study is not approved, this study may require revision.)

3. **Comment:** The Fire Notes on the plans are not correct based on the memo received from Allen Bell and the City of Mesquite dated November 21, 2005.

   Response: The Fire Notes do not apply to this project and therefore have not been updated. An updated Note Sheet will be submitted with the actual improvement plans for the project.

4. **Comment:** There are cross sections for the HEC-RAS analyses that have flow overtopping the banks. The engineer must review and revise.

Cedar City
P.O. Box 3174
Cedar City, UT 84721-3174
435.586.9592
435.586.4995 Fax

Pleasant Grove
1909 W. State Street, Suite 200
Pleasant Grove, UT 84062
801.763.8467
801.763.8472 Fax

Mesquite
750 W. Pioneer Blvd.
Mesquite, NV 89027
702.346.5100
702.346.5102 Fax

Bullhead City
Bullhead City, AZ 86442
801.318.9101

Response: The existing channel does in fact have flows overtopping the banks. The banks and the overbank areas are modeled with different Manning's "n" values.

5. **Comment:** The proposed 14'x10' box culvert appears to have flows overtopping it according to the proposed conditions HEC-RAS analysis. The engineer must review and revise as needed.

Response: Review of the HEC-RAS analysis has shown that there are no flows overtopping the proposed 14'x10' box culvert. The profiles have been plotted in color with the water surface, inside top of box and freeboard called out. (See Profiles, Amendment No. 1, Appendix E, Pages E19-E35)

6. **Additional Comments**

a.) **Comment:** See attached (1 page); Titled Pulsipher Wash-Environmental Considerations (Staff Research by DJV) March 21, 2006. Does Benchmark referenced on Sheet 1 and 3 still exist.

Response: Attached has been reviewed. Benchmark does still exist.

We believe that the items listed in the Request for Conditional Letter of Map Revision Proposed Pulsipher Wash Channel Improvements South of Bertha Howe Avenue have been thoroughly addressed. If you have any questions please call us at (702) 346-5100.

Sincerely,

Lance Henrie, E.I.
Bulloch Brothers Engineering, Inc.

Reviewed by:

Travis H. Anderson, P.E.
Bulloch Brothers Engineering, Inc

PROFESSIONAL ENGINEER • STATE OF NEVADA
TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 016479
5-1-06

CONCURRENCE AND APPROVAL BY THE CITY OF MESQUITE:

Signature — Date: 2 May '06
Allen Bell, P.E., City Engineer

Signature — Date: 5-2 06
Bill Tanner, Director of Public Works

Catherine Lorbeer — Date: 5/5/06
Signature
Catherine Lorbeer, AICP, Planning and Redevelopment Manager

COMMENTS:_____

_____

_____

_____

AMENDMENT NO. 1 TO THE REQUEST FOR CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR PROPOSED PULSIPHER WASH CHANNEL IMPROVEMENTS SOUTH OF BERTHA HOWE AVENUE

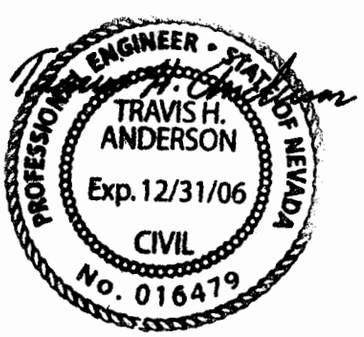
LOCATED IN: MESQUITE, CLARK COUNTY, NEVADA

Submitted to:

FEMA Map Coordination Contractor
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304-6425

Submitted by:

Bulloch Brothers Engineering, Inc.
750 West Pioneer Boulevard
Mesquite, Nevada 89027



5-1-06

May 2006

APPENDIX E

1. Review comments and response letter E1
2. Revised FEMA 'Overview and Concurrence Form' -- MT-2 Form 1 ..... E4
3. Revised FEMA 'Riverine Hydology & Hydraulics Form' -- MT-2 Form 2 ..... E6
4. Revised FEMA 'Riverine Structures Form' -- MT-2 Form 3 ..... E8
5. HEC-RAS Profiles E19

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: August 31, 2007

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour 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, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

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 Parts 60 & 65 of the NFIP Regulations.)

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	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
320035	City of Mesquite	NV	32003C	0386E	09/27/02
32003	Clark County, Unincorporated Areas	NV	32003C	0378E	09/27/02

2. Flooding Source: Pulsipher Wash

3. Project Name/Identifier: Proposed Improvements for Pulsipher Wash South of Bertha Howe Ave.

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 ☐ 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 types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☒ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included?	☐ Yes	Fee amount: $____
	☒ No, Attach Explanation	

Please see the DHS-FEMA Web site at http://www.fema.gov/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: Travis H. Anderson, P.E.	Company: Bulloch Brothers Engineering, Inc.	
Mailing Address: 750 West Pioneer Blvd. Mesquite, NV 89027	Daytime Telephone No.: (702) 346-5100	Fax No.: (702) 346-5102
	E-Mail Address:	
Signature of Requester (required): Travis H. Anderson		Date: 4-27-06

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be 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. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: J. Allen Bell, P.E., City Engineer		Telephone No.: (702) 346-5295
Community Name: City of Mesquite	Community Official's Signature (required):	Date: 2 May '06

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. 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: Travis H. Anderson, P.E.	License No.: 16479	Expiration Date: 12/31/06
Company Name: Bulloch Brothers Engineering, Inc.	Telephone No.: (702) 346-5100	Fax No.: (702) 346-5102
Signature: Travis H. Anderson		Date: 4-27-06

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

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and 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: August 31, 2007

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 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, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Pulsipher 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 2) ☐ 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.)	FIS (cfs)	Revised (cfs)
3300	3.09	3474	2450
2900	4.34	3474	3000
2100	4.70	3478	3100

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model Referenced MPU 2001 HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ 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. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by DHS-FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

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

Was sediment transport considered? ☐ 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.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	Just north of I-15	2100	1605.22	1605.37
Upstream Limit	Approx. 6225' north of I-15	3900	1658.79	1658.78

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

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. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted ☐ Diskette Submitted

	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name: pulsrev7.out	Plan Name:	File Name:	Plan Name	NGVD29
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name: pulsrev7.prj	Plan Name: Imported Plan 01			NGVD29
Revised or Post-Project Conditions Model	File Name: CLOMR3.prj	Plan Name: Plan 23			NGVD29
Other - (attach description)			File Name: Floodway.prj (Ref.)	Plan Name: Plan 21	NGVD29

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by DHS-FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic 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.).

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,** 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 of revision.

☒ Annotated FIRM and/or FBFM Included ☐ Digital Mapping (GIS/CADD) Data Submitted (Recommended)

D. COMMON REGULATORY REQUIREMENTS*

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

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.
- The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

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/CLOMR 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 added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

If Yes, please submit documentation from the community to show that they have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the 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.

5. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☐ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: August 31, 2007

PAPERWORK REDUCTION ACT

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, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: Pulsipher 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 Structure

1. Name of Structure: Pulsipher Wash Concrete U-Channel

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

Location of Structure: Existing Pulsipher Wash Concrete U-Channel form Birdie Lane to Bertha Howe Ave.

Downstream Limit/Cross Section: 3100

Upstream Limit/Cross Section: 3300

2. Name of Structure: Bertha Howe Ave. Box Culvert

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

Location of Structure: Bertha Howe Ave.

Downstream Limit/Cross Section: 3080

Upstream Limit/Cross Section: 3100

3. Name of Structure: Proposed Pulsipher Wash Improvements South of Bertha Howe Ave. including Pioneer Blvd.

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

Location of Structure: South of Bertha Howe Ave.

Downstream Limit/Cross Section: 2440

Upstream Limit/Cross Section: 3080

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Pulsipher Wash

Name of Structure: Existing Pulsipher Wash Concrete U-Channel

1. Accessory Structures

The channelization includes (check one):

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

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry 2450 (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): See Explanations

4. 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.

C. BRIDGE/CULVERT

Flooding Source: Pulsipher Wash

Name of Structure: Bertha Howe Ave. Box Culvert

1. This revision reflects (check one):

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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

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

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

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.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

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

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -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):

4. 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.

C. BRIDGE/CULVERT

Flooding Source: Pulsipher Wash

Name of Structure: Proposed Pulsipher Wash 14'x10' double barrel box culvert including exist. Pioneer Blvd.

1. This revision reflects (check one):

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

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

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

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

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.

D. DAM

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:

3. The Dam was permitted as (check one) ☐ Federal Dam ☐ State Dam ☐ Local Government Dam ☐ None

   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 _____

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

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

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 or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	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

2. Freeboard (continued)

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 landside is:

b. The maximum levee slope floodside 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)

4. Embankment Protection (continued)

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:

Sta. , depth to

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:

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.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ 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. 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.

f. 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.

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.

E. LEVEE/FLOODWALL (CONTINUED)

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.

11. Maintenance Plan

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
    If No, please attach supporting documentation.

12. Operations and Maintenance Plan

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

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)

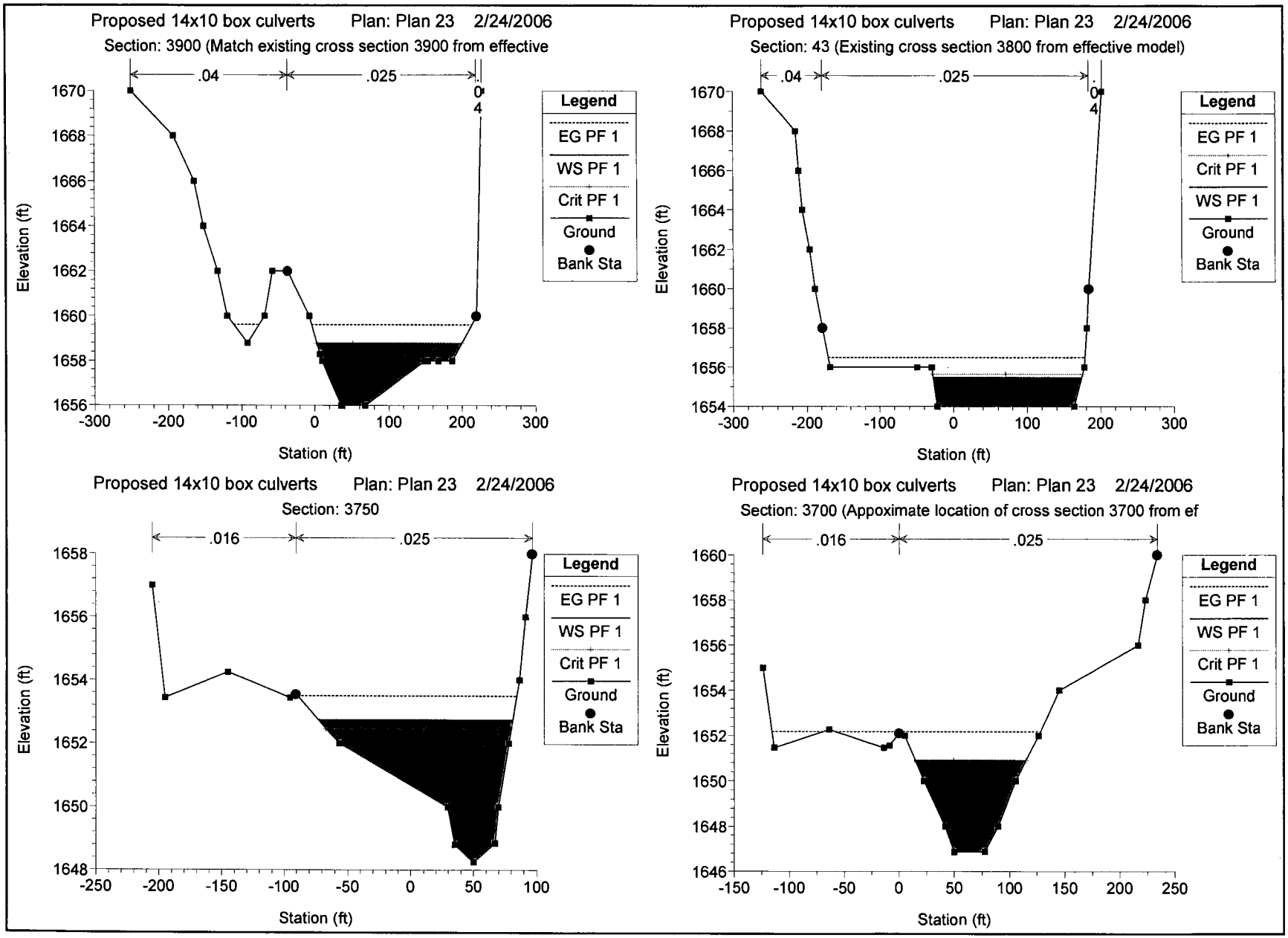
Method used to estimate sediment transport:

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

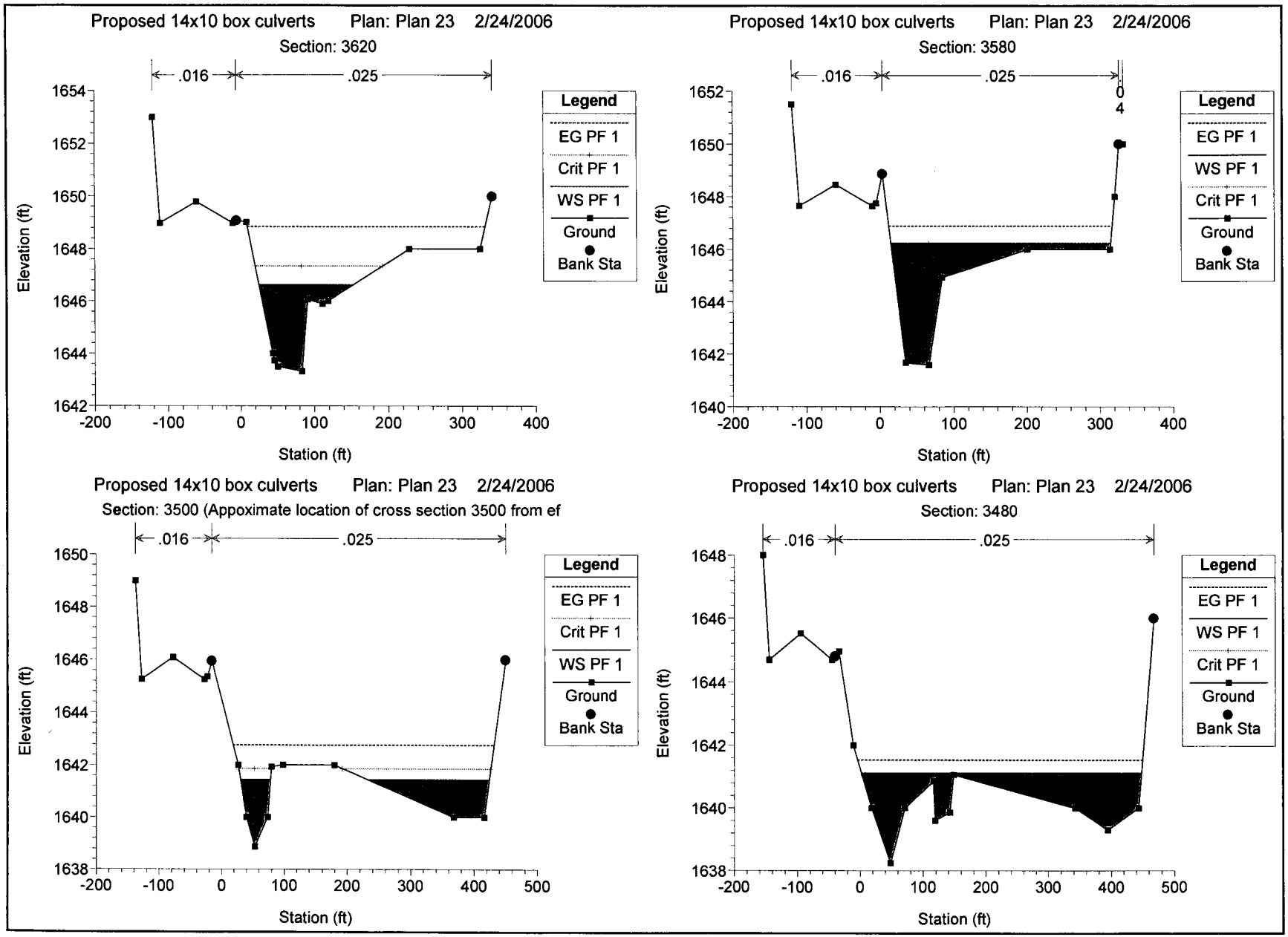
Method used to estimate scour and/or deposition:

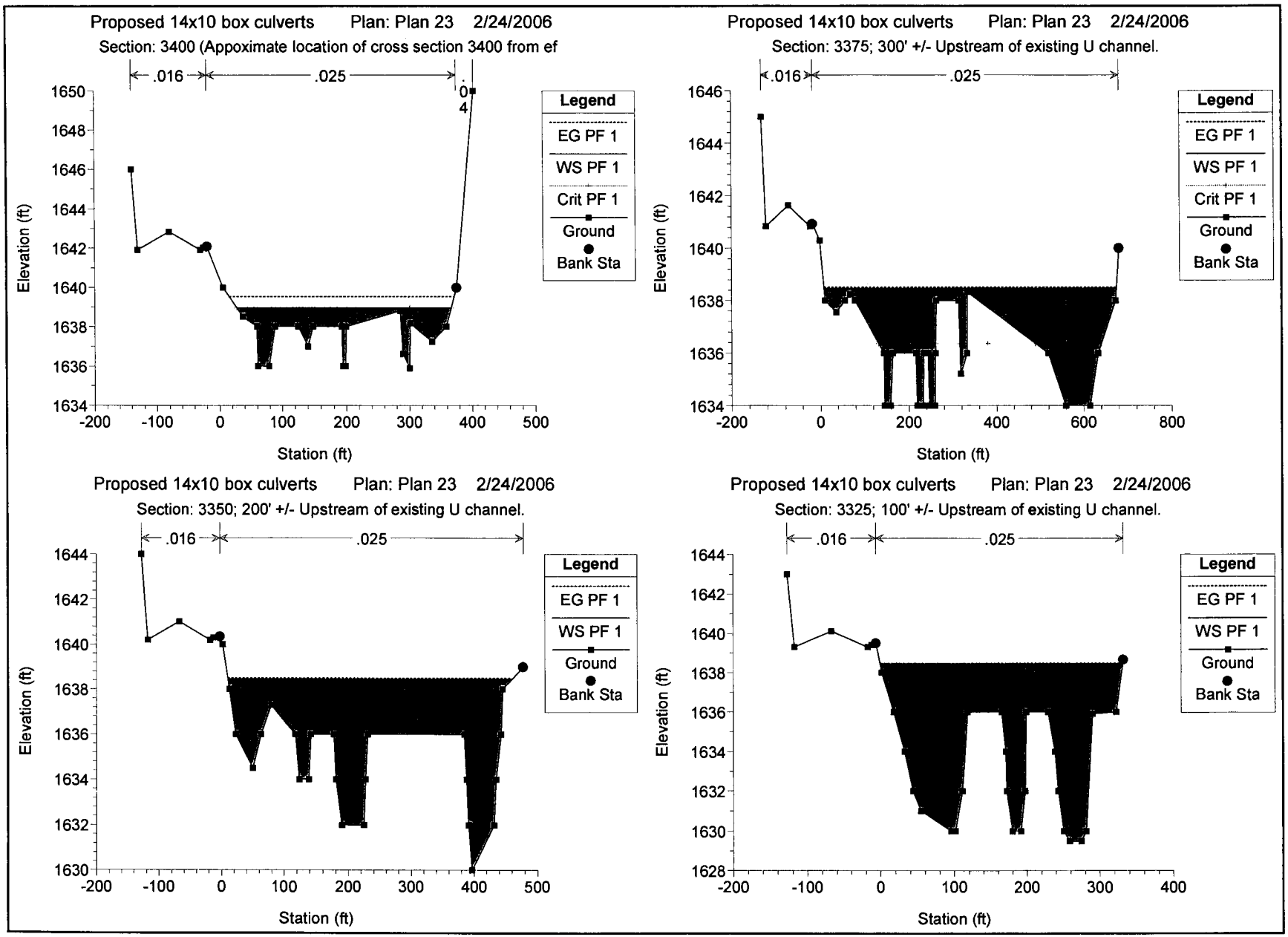
Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

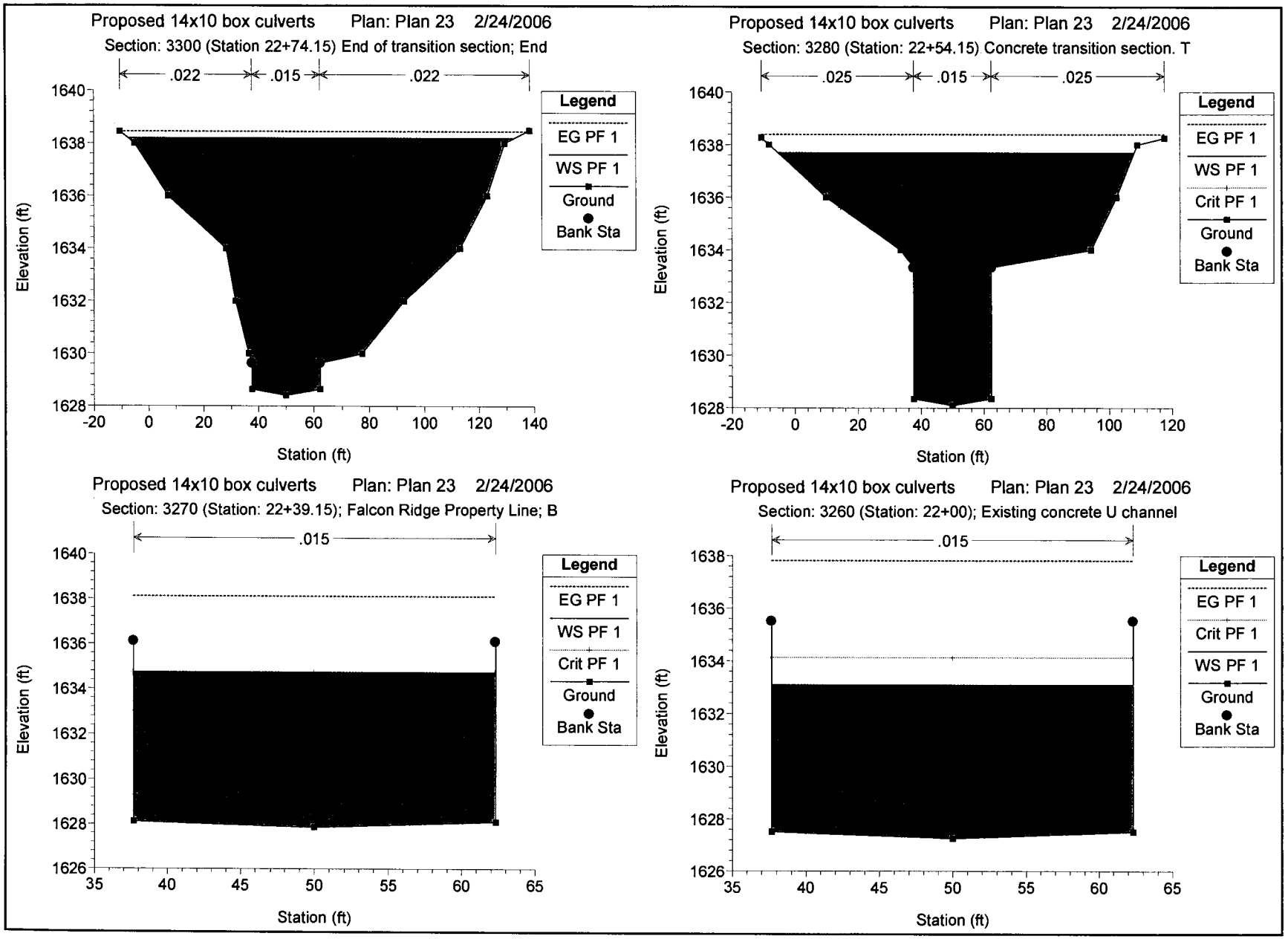
If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3900 (Match existing cross section 3900 from effective
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 43 (Existing cross section 3800 from effective model)
.04
.025
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3750
.016
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3700 (Appoximate location of cross section 3700 from ef
.016
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

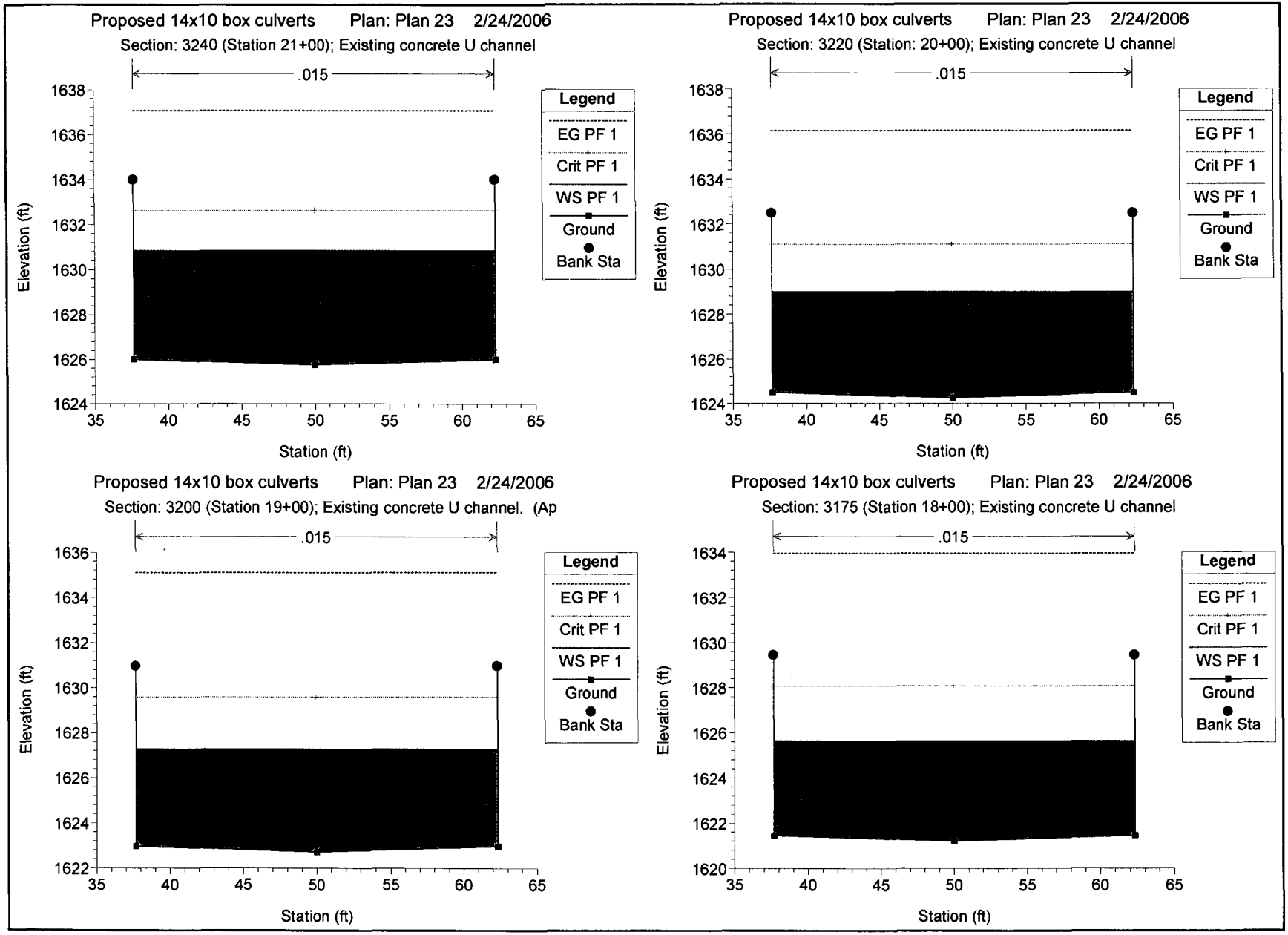
E19

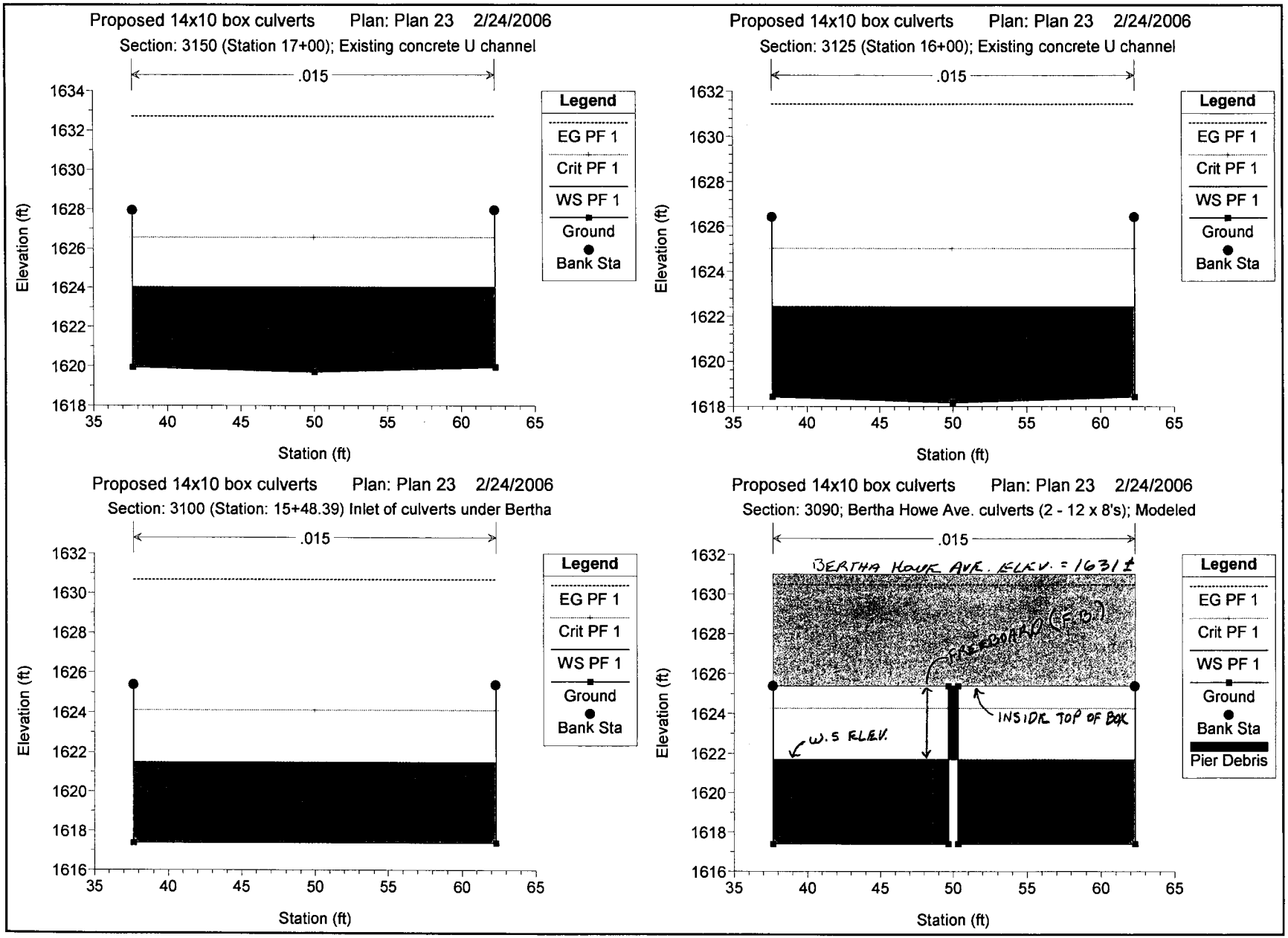

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3620
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3580
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3500 (Appoximate location of cross section 3500 from ef
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3480
.016
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3400 (Appoximate location of cross section 3400 from ef
.016
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3375; 300' +/- Upstream of existing U channel.
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3350; 200' +/- Upstream of existing U channel.
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3325; 100' +/- Upstream of existing U channel.

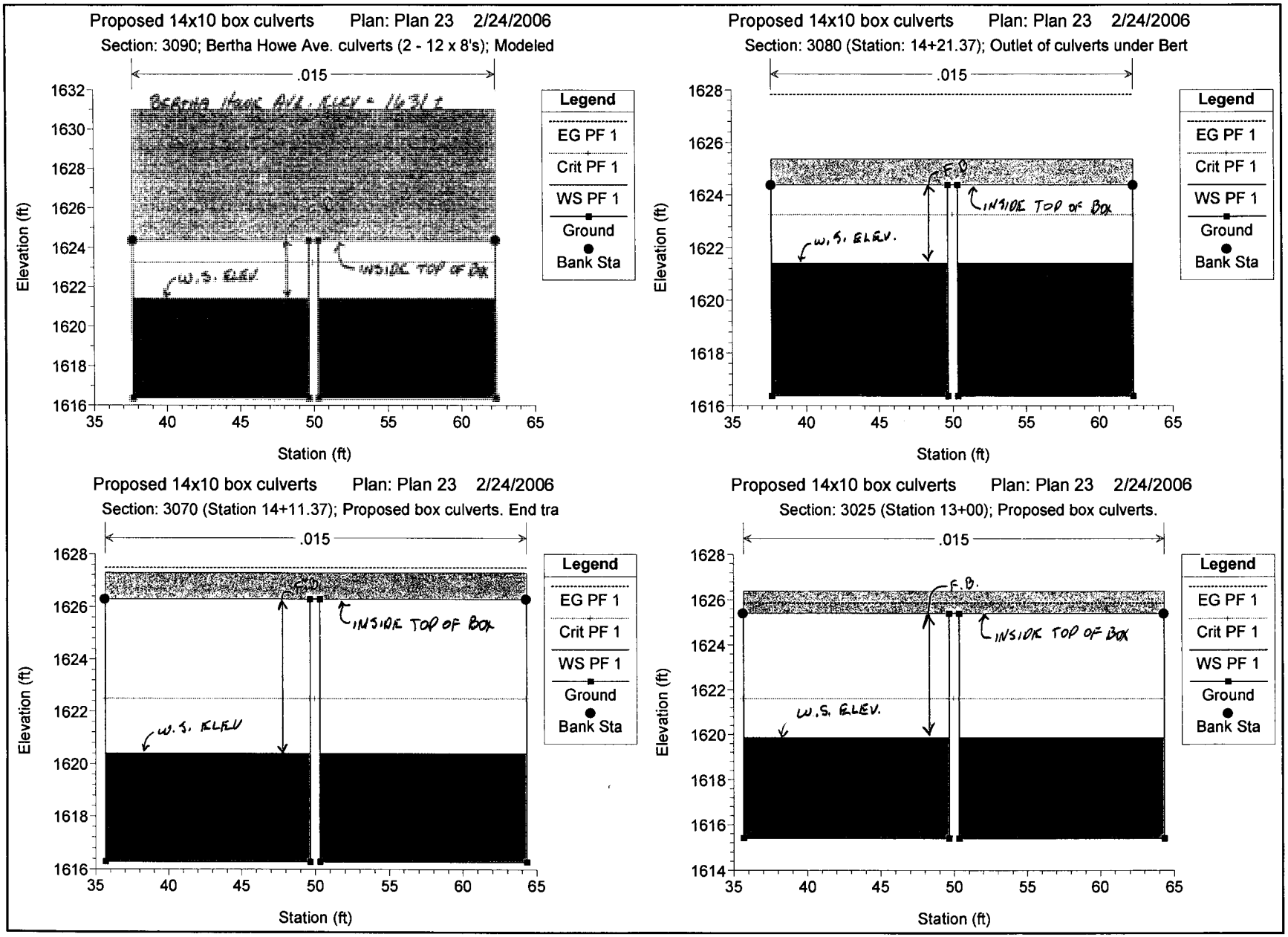

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3300 (Station 22+74.15) End of transition section; End
.022
.015
.022
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3280 (Station: 22+54.15) Concrete transition section. T
.025
.015
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3270 (Station: 22+39.15); Falcon Ridge Property Line; B
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3260 (Station: 22+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

E 12


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3240 (Station 21+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3220 (Station: 20+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3200 (Station 19+00); Existing concrete U channel. (Ap
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3175 (Station 18+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

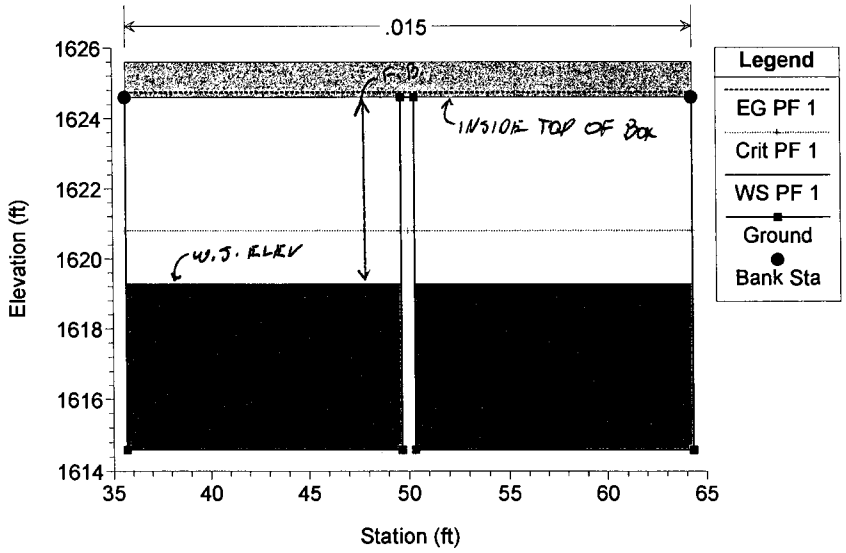

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3150 (Station 17+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3125 (Station 16+00); Existing concrete U channel
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3100 (Station: 15+48.39) Inlet of culverts under Bertha
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
BERTHA HOWE AVE. ELEV. = 1631±
FREEBOARD (F.B.)
INSIDE TOP OF BOX
W.S ELEV.
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Pier Debris

224


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3090; Bertha Howe Ave. culverts (2 - 12 x 8's); Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
W.S. ELEV
INSIDE TOP OF BOX
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3080 (Station: 14+21.37); Outlet of culverts under Bert
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3070 (Station 14+11.37); Proposed box culverts. End tra
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
F.B.
INSIDE TOP OF BOX
W.S. ELEV
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 3025 (Station 13+00); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
F.B.
INSIDE TOP OF BOX
W.S. ELEV.

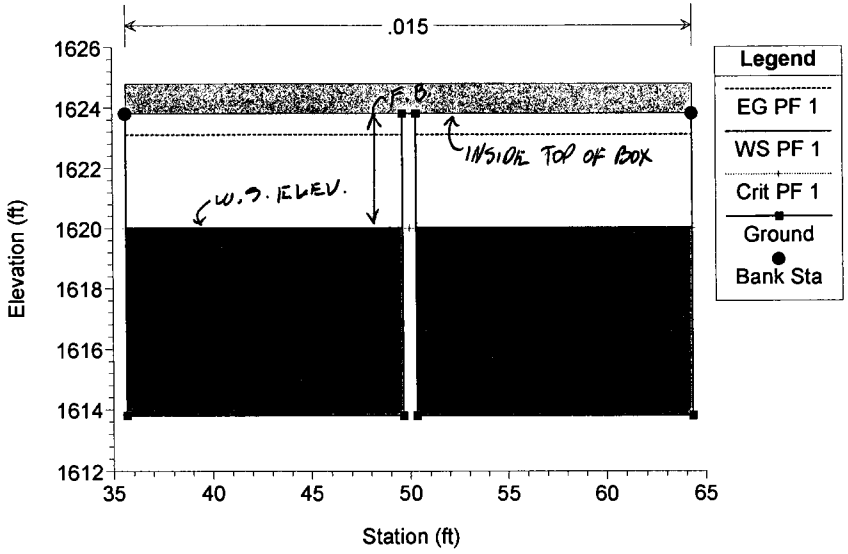
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006

Section: 3000 (Station 12+00); Proposed box culverts.



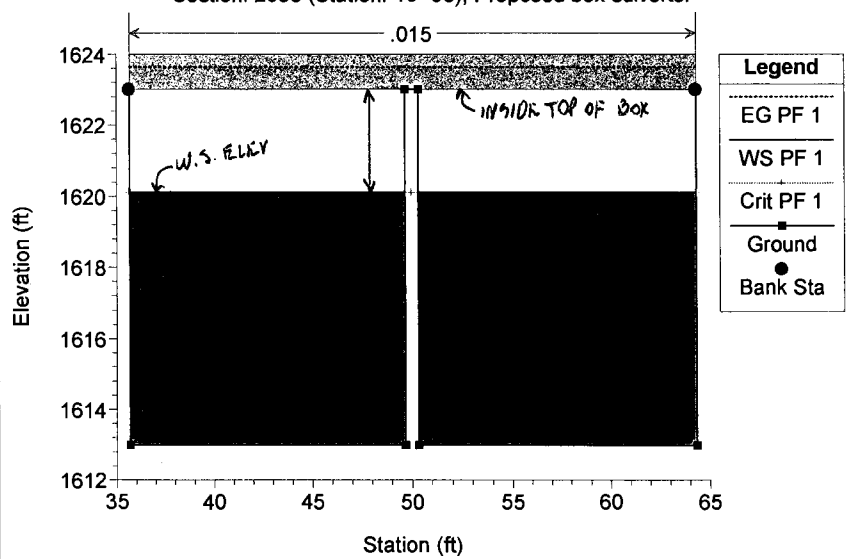
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006

Section: 2970 (Station: 11+00); Proposed box culverts.



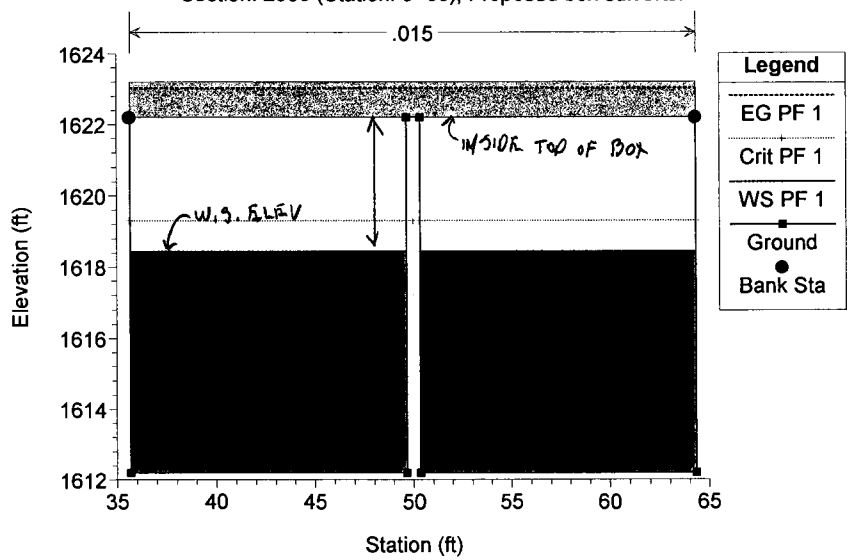
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006

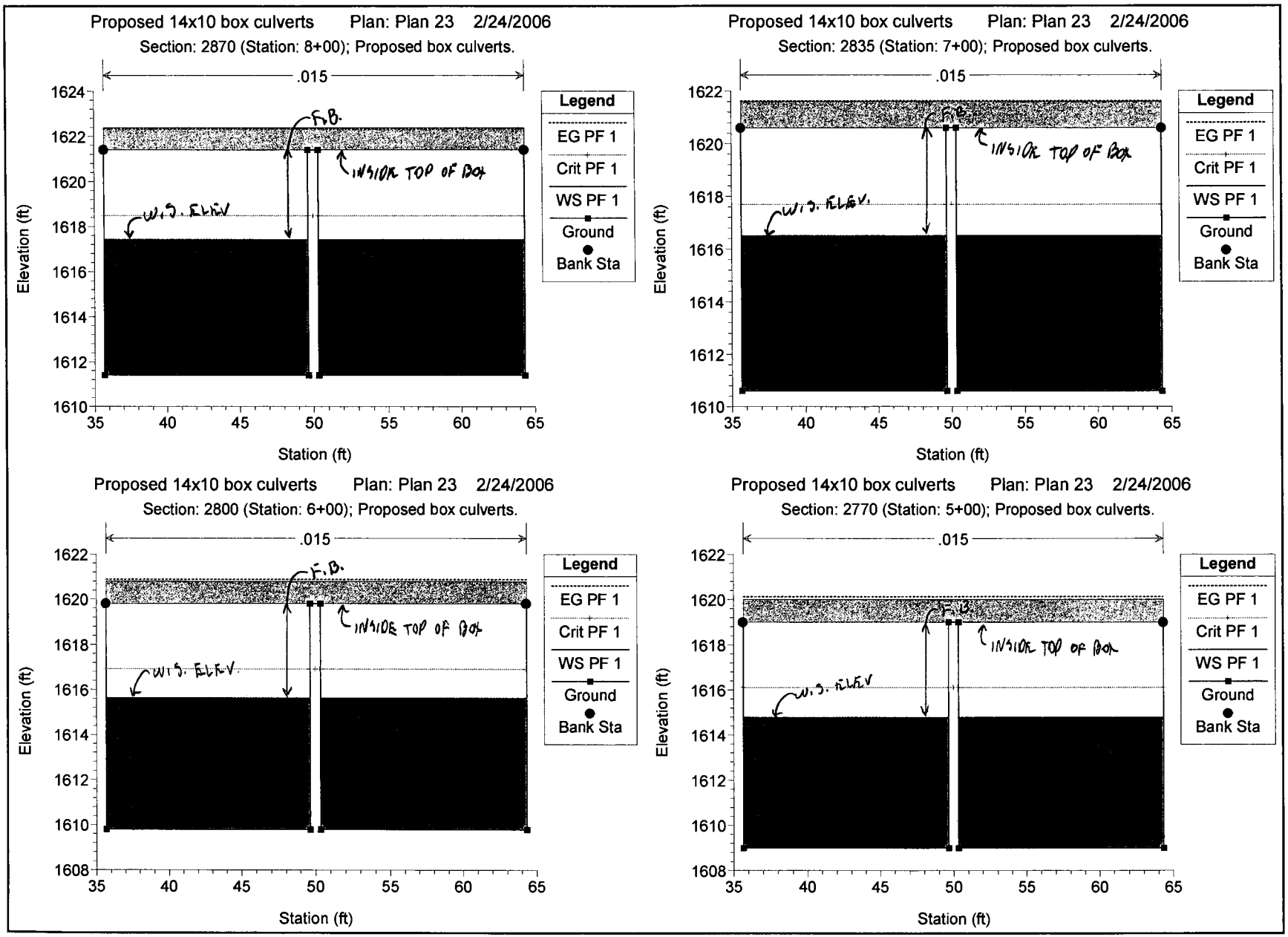
Section: 2935 (Station: 10+00); Proposed box culverts.

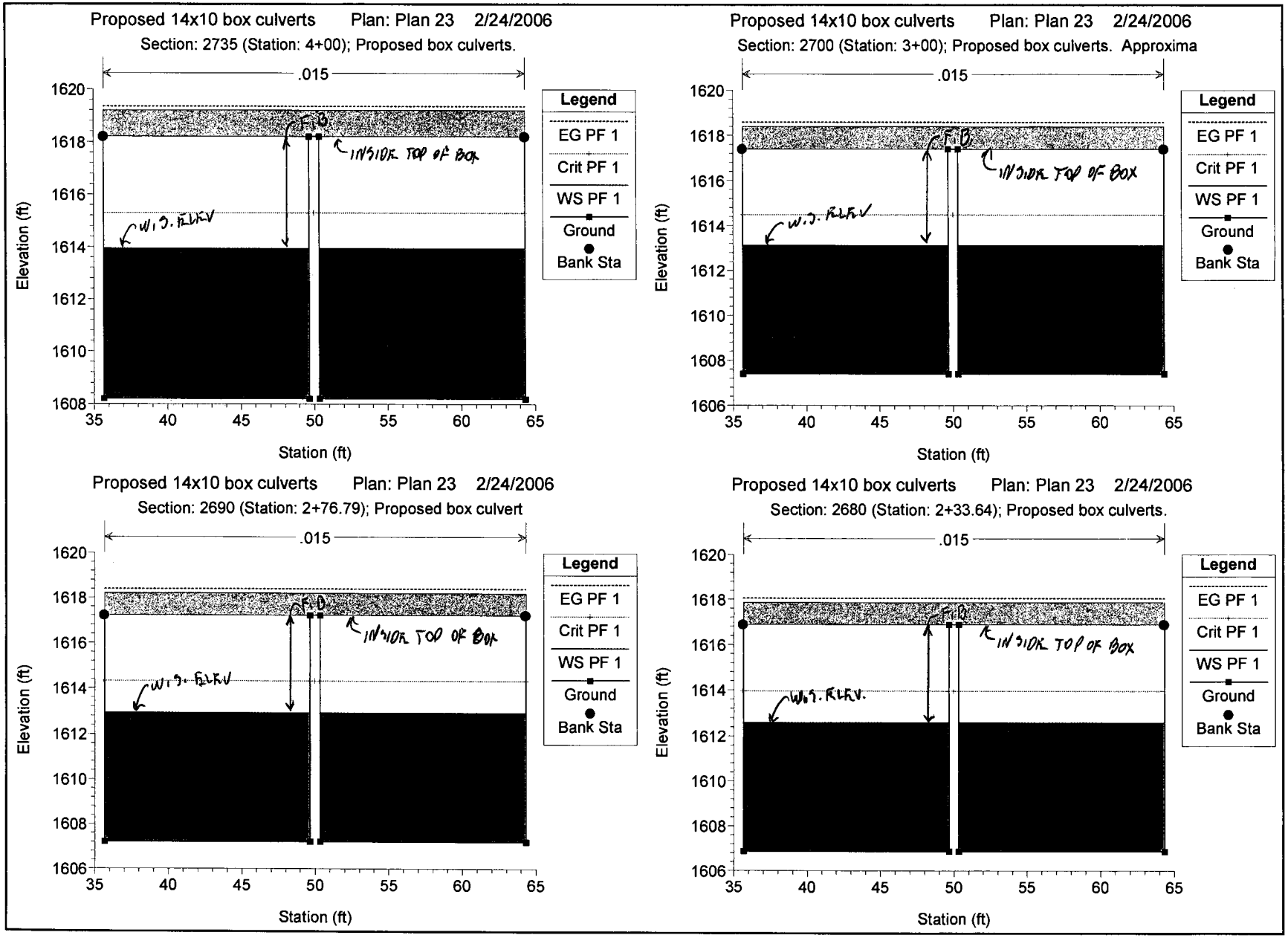


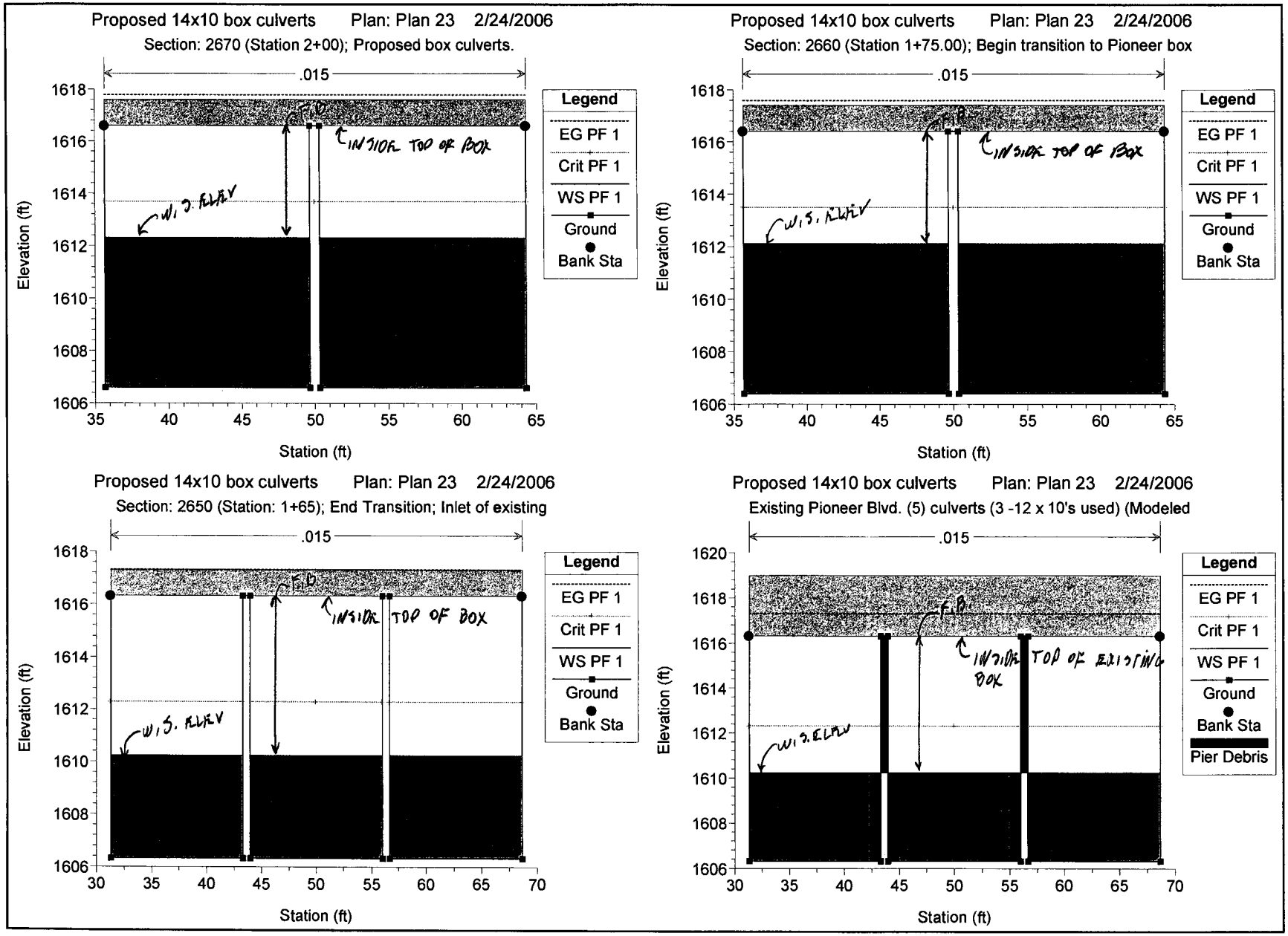
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006

Section: 2900 (Station: 9+00); Proposed box culverts.

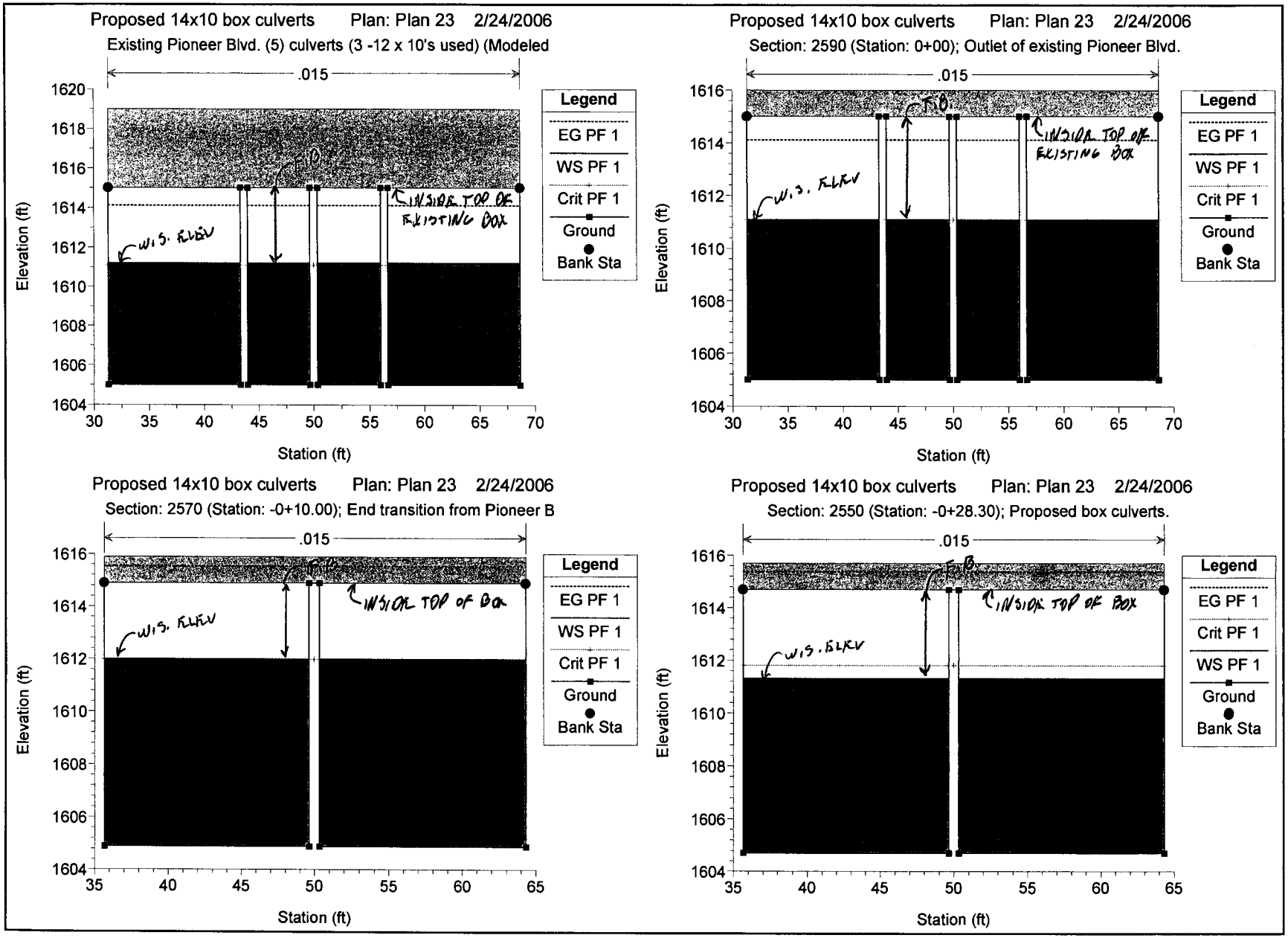


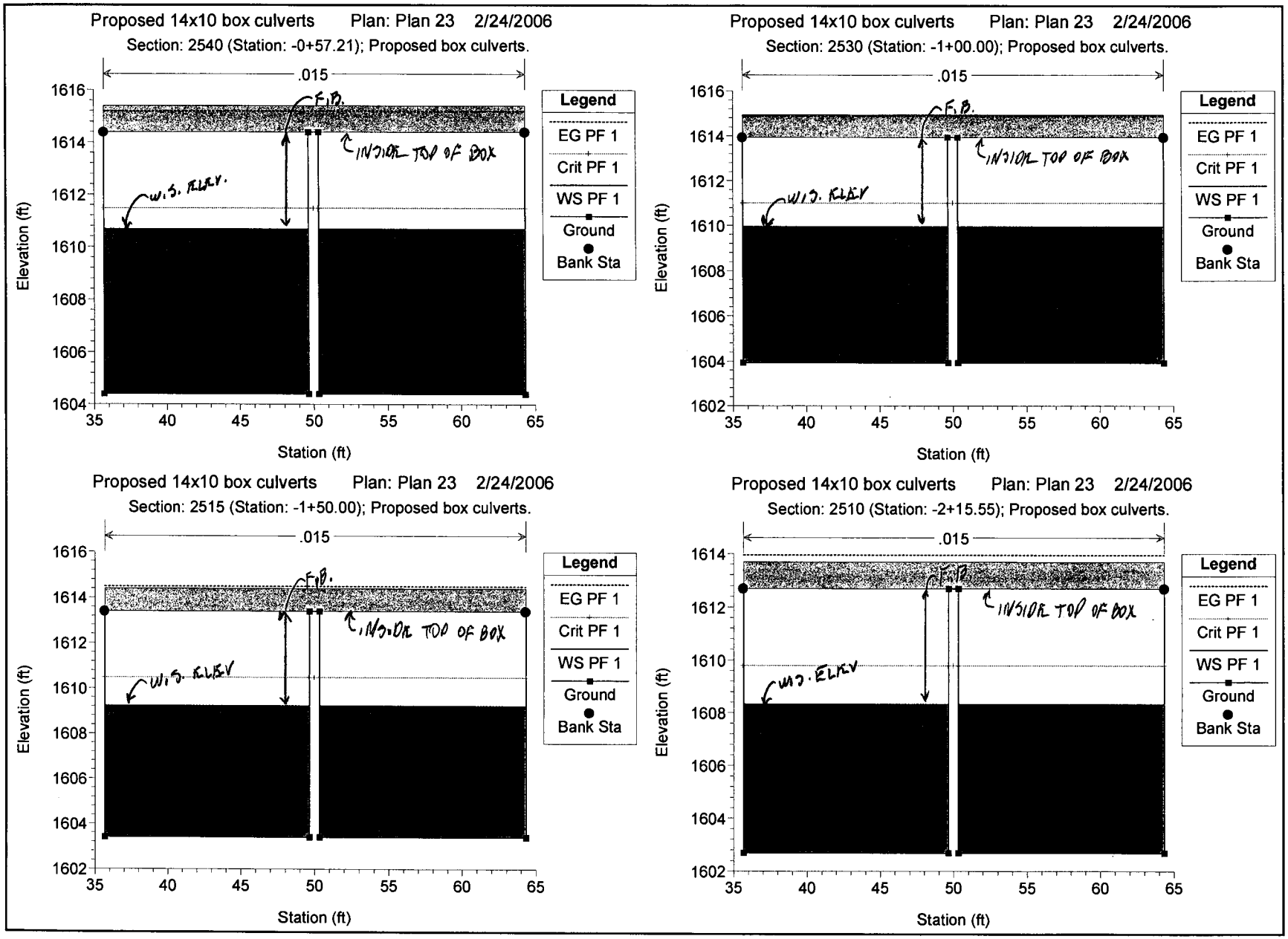

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2870 (Station: 8+00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2835 (Station: 7+00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2800 (Station: 6+00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2770 (Station: 5+00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

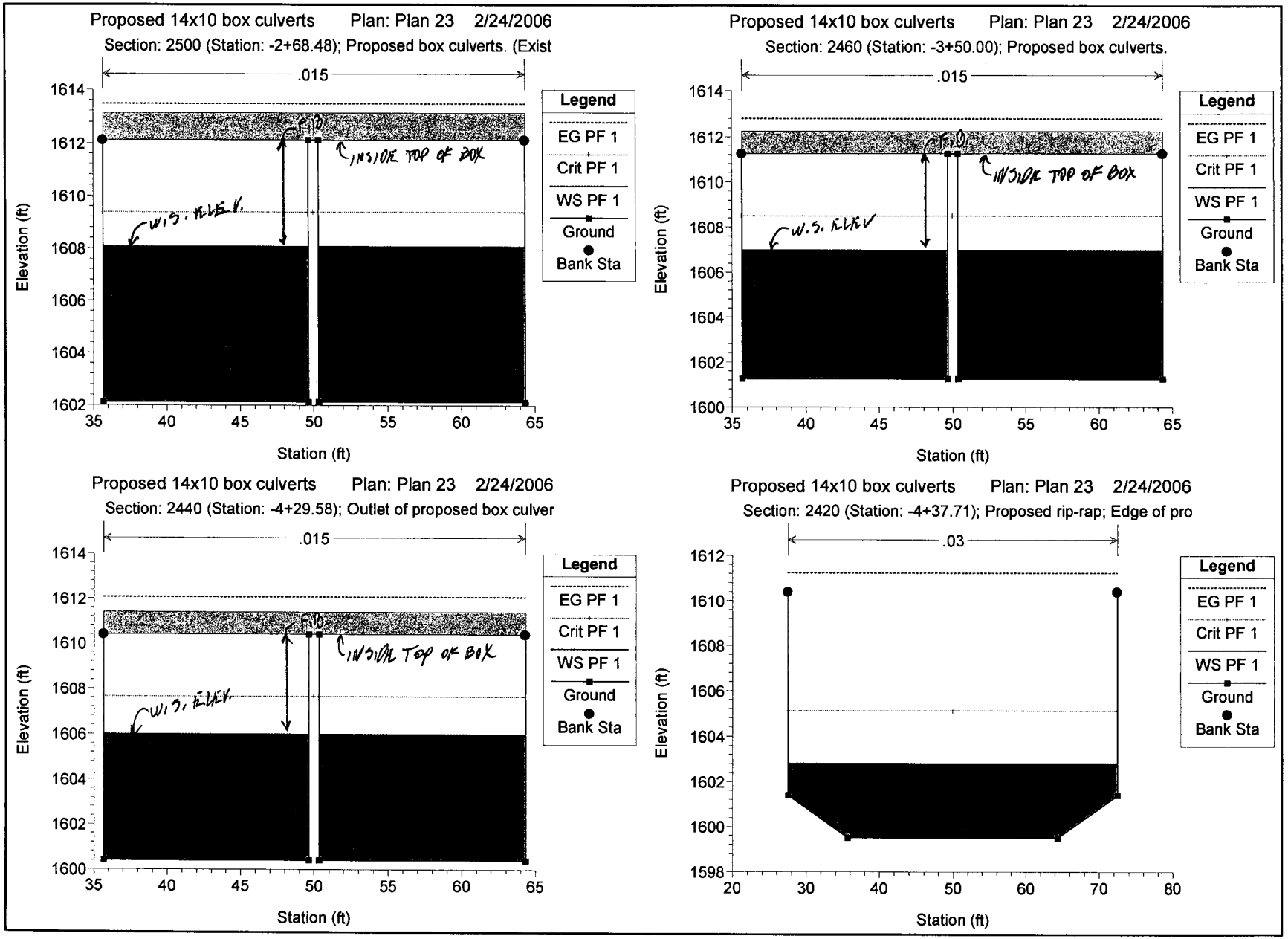

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2735 (Station: 4+00); Proposed box culverts.
.015
F.B
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2700 (Station: 3+00); Proposed box culverts. Approxima
.015
F.B
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2690 (Station: 2+76.79); Proposed box culvert
.015
F.B
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2680 (Station: 2+33.64); Proposed box culverts.
.015
F.B
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

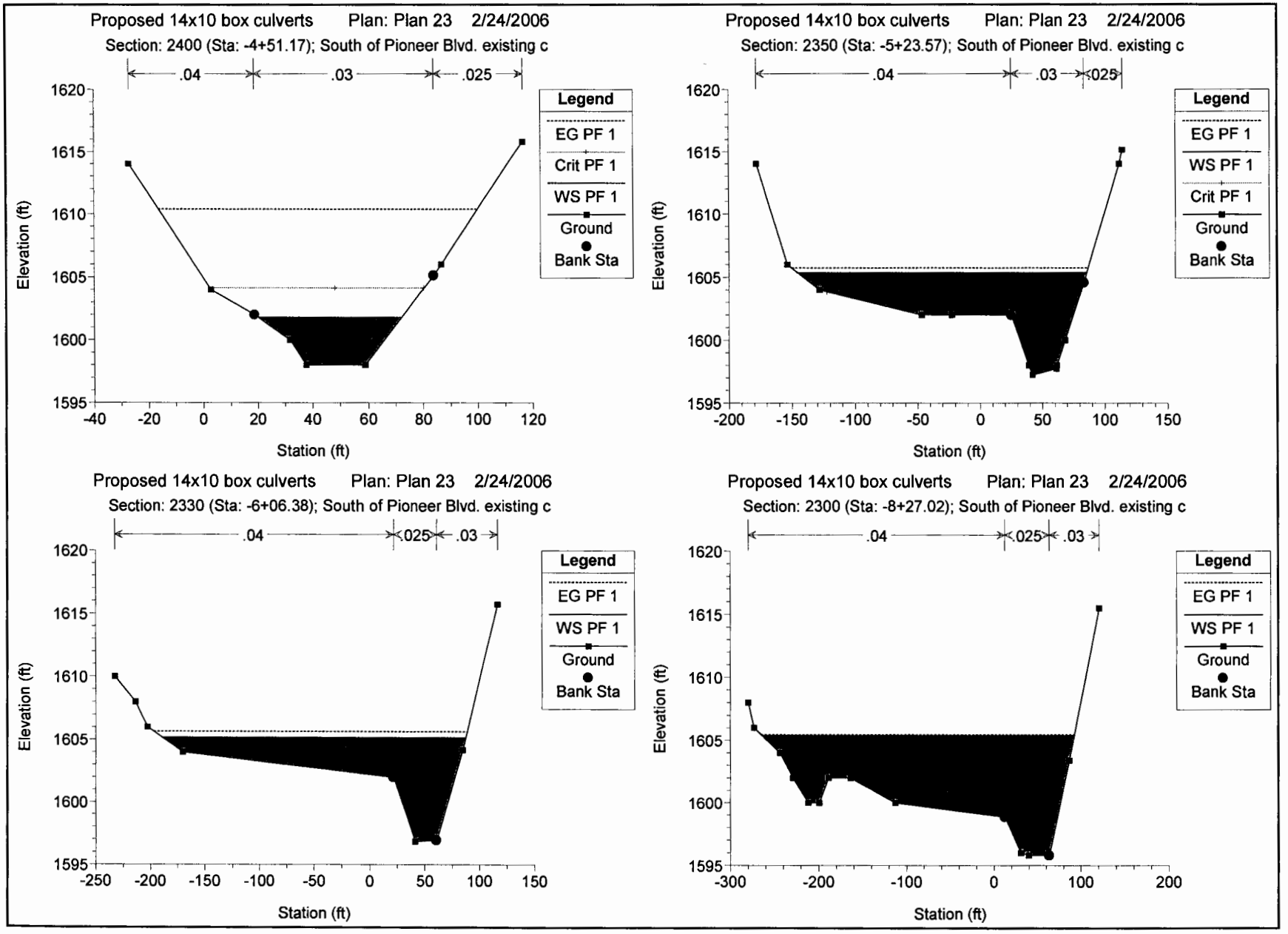

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2670 (Station 2+00); Proposed box culverts.
.015
INSIDE TOP OF BOX
W.S. ELEV
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2660 (Station 1+75.00); Begin transition to Pioneer box
.015
INSIDE TOP OF BOX
W.S. ELEV
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2650 (Station: 1+65); End Transition; Inlet of existing
.015
INSIDE TOP OF BOX
W.S. ELEV
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled
.015
INSIDE TOP OF EXISTING BOX
W.S. ELEV
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Pier Debris

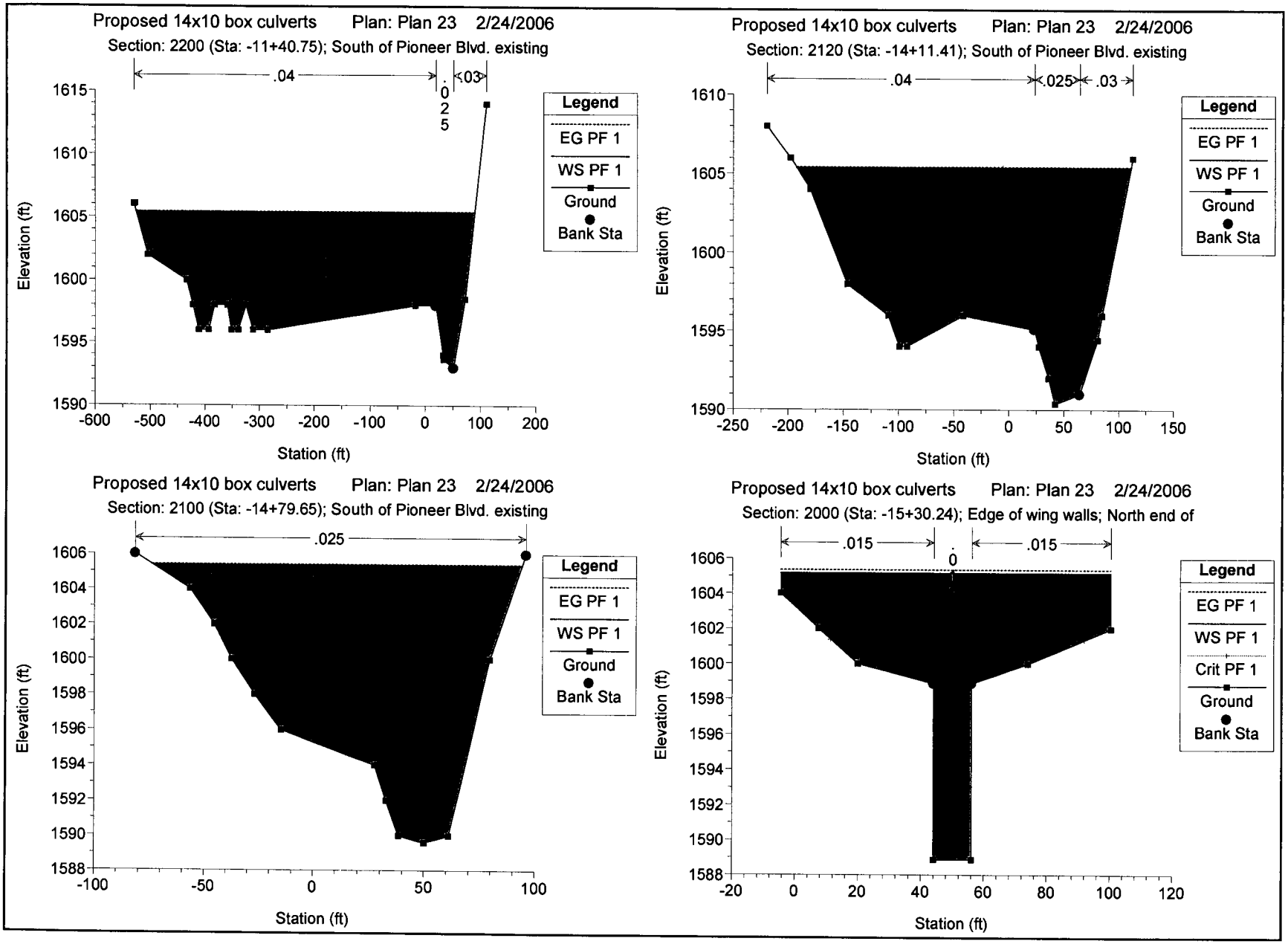
E-26

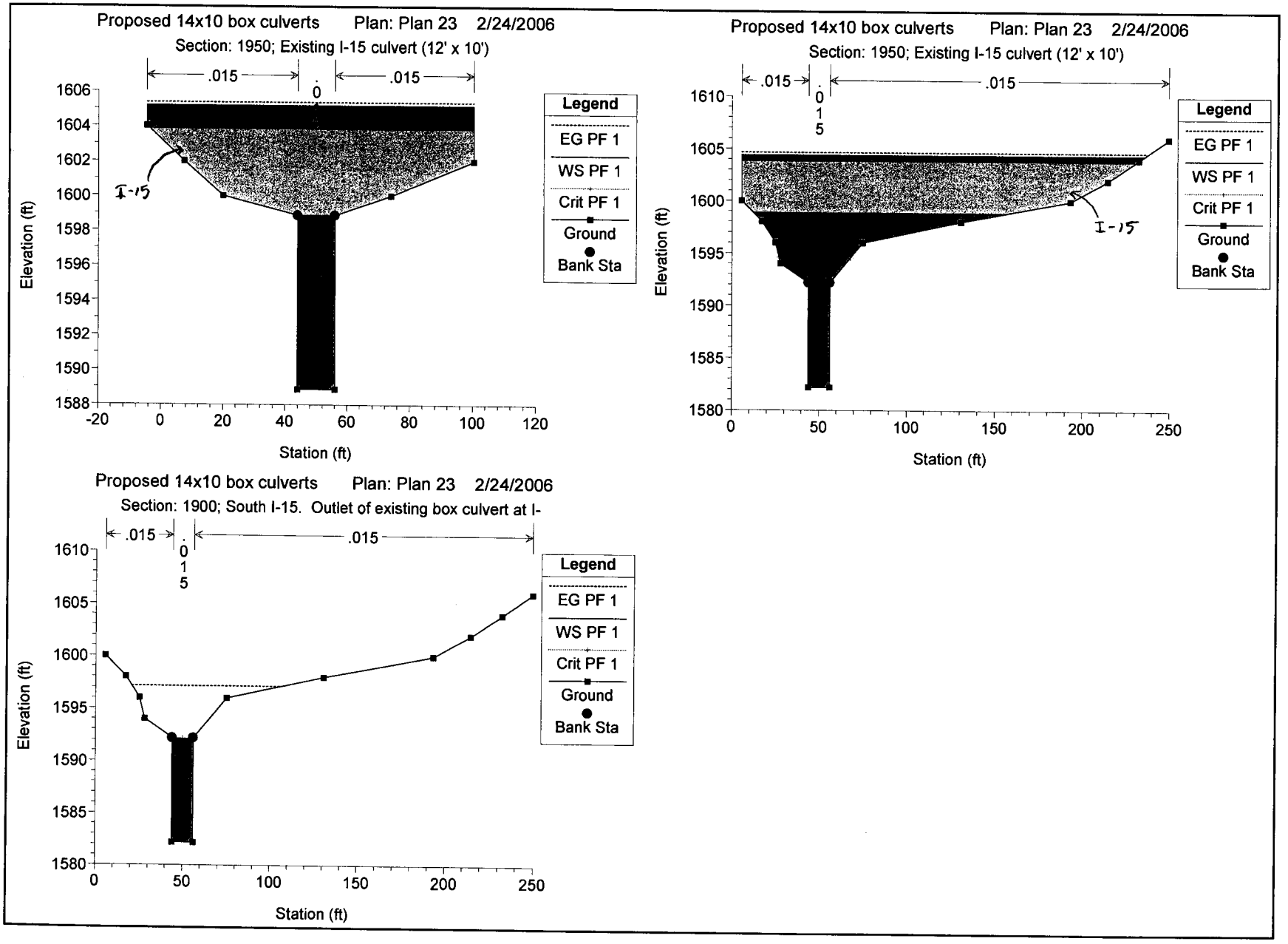

Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Existing Pioneer Blvd. (5) culverts (3 -12 x 10's used) (Modeled
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
W.S. ELEV
INSIDE TOP OF EXISTING BOX
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2590 (Station: 0+00); Outlet of existing Pioneer Blvd.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
W.S. ELEV
INSIDE TOP OF EXISTING BOX
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2570 (Station: -0+10.00); End transition from Pioneer B
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
W.S. ELEV
INSIDE TOP OF BOX
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2550 (Station: -0+28.30); Proposed box culverts.
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
W.S. ELEV
INSIDE TOP OF BOX


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2540 (Station: -0+57.21); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2530 (Station: -1+00.00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2515 (Station: -1+50.00); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2510 (Station: -2+15.55); Proposed box culverts.
.015
F.B.
INSIDE TOP OF BOX
W.S. ELEV
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2500 (Station: -2+68.48); Proposed box culverts. (Exist
.015
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2460 (Station: -3+50.00); Proposed box culverts.
.015
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2440 (Station: -4+29.58); Outlet of proposed box culver
.015
INSIDE TOP OF BOX
W.S. ELEV.
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2420 (Station: -4+37.71); Proposed rip-rap; Edge of pro
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2400 (Sta: -4+51.17); South of Pioneer Blvd. existing c
.04
.03
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2350 (Sta: -5+23.57); South of Pioneer Blvd. existing c
.04
.03
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2330 (Sta: -6+06.38); South of Pioneer Blvd. existing c
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2300 (Sta: -8+27.02); South of Pioneer Blvd. existing c
.04
.025
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2200 (Sta: -11+40.75); South of Pioneer Blvd. existing
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2120 (Sta: -14+11.41); South of Pioneer Blvd. existing
.04
.025
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2100 (Sta: -14+79.65); South of Pioneer Blvd. existing
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 2000 (Sta: -15+30.24); Edge of wing walls; North end of
.015
.015
0
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.0
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
I-15
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1950; Existing I-15 culvert (12' x 10')
.015
.015
.0
1
5
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
I-15
Elevation (ft)
Station (ft)
Proposed 14x10 box culverts Plan: Plan 23 2/24/2006
Section: 1900; South I-15. Outlet of existing box culvert at I-
.015
.015
.0
1
5
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

E 25

MESQUITE BUILDING & PLANNING
RECEIVED
3/22/06 ca

MEMORANDUM

POGGEMEYER
DESIGN GROUP
ENGINEERS + PLANNERS + SURVEYORS
LANDSCAPE ARCHITECTS

RECEIVED
CITY OF MESQUITE
Date: 3-13-06

To: Michael B. Holloway, P.E.

From: Jason M. Calhoun, P.E. JMC

Office: Las Vegas

Date: March 10, 2006

Subject: City of Mesquite Public Works Plan Review Contract
Request for Conditional Letter of Map Revision
Proposed Pulsipher Wash Channel Improvements
South of Bertha Howe Avenue
Dated: March 2, 2006
Prepared by: Bulloch Brothers Engineering, Inc.
PDG #10060002, 06-12-1 (JMC)

This letter provides comments on the above referenced study dated March 2, 2006. The City of Mesquite and Poggemeyer Design Group, Inc. reviewed this study and based on the documents submitted, we have the following comments:

1) The FEMA Overview and Concurrence Form, The Riverine Structures Form, and the FEMA Riverine Hydrology and Hydraulics Form are all expired. The engineer must use the current valid forms for the submittal.

2) FMEA has not approved the reference study therefore it can not be used as reference. City & Reco may approved extension, it should be treated as best available data. If reference study is not approved, this study may require revisions.

3) The Fire Notes on the plans are not correct based on the memo received from Allen Bell and the City of Mesquite dates November 21, 2005.

4) There are cross sections for the HEC-RAS analyses that have flow overtopping the banks. The engineer must review and revise.

5) The proposed 14 X 10 box culvert appears to have flows overtopping it according to the proposed conditions HEC-RAS analysis. The engineer must review and revise as needed.

Note: Reference Guidelines and Specifications for Flood Hazard Mapping Partners at www.fema.gov/fmh/dl_cgs.shtm.

Poggemeyer Design Group, Inc.
1200 Financial Blvd. Ste 101
Reno, Nevada 89502
(775) 857-3330
FAX (775) 857-2089
email: civileng@poggemeyer.reno.nv.us

Please let me know if you have any questions concerning these comments.

CONCURRENCE BY CITY OF MESQUITE:

City Engineer _____ Date 14 Mar '06

Planning & Zoning _____ Date 3/22/06

Public Works _____ Date March 17, 2006

COMMENTS:

SEE ATTACHED (1 page); TITLED PULSIPHER WASH – ENVIRONMENTAL CONSIDERATIONS (STAFF RESEARCH BY PJV) MARCH 21, 2006. Dave Uncapher 346-2835
DOES BENCHMARK REFERENCED ON SHEET 1 AND 3 STILL EXIST? D.U.

Pulsipher Wash – Environmental Considerations
(Staff Research – by DJV)
March 21, 2006

Environmental Planning

1. This project is in an area of on-going development – there are no specific environmental issues to address beyond the standard conditions, except for proposed modifications to Pulsipher Wash.
2. Obtain all necessary permits prior to ground disturbance or grading (i.e., Clark County Dust Control permit for sites over 0.25 acres, and Stormwater Discharge permit for construction sites over 1 acre in area, as applicable).
3. Utilize Best Management Practices (BMPs) in grading and construction (i.e., stormwater and erosion control, and pollution prevention measures; no fuel storage areas adjacent to wash).
4. Prior to mass grading, demarcate or fence all natural conservation areas or wet lands to prevent disturbance of these areas by and earth-moving or construction equipment (install or incorporate silt fencing as an engineering control for soil erosion and run-off, when appropriate).
5. For projects adjacent to main wash? (Pulsipher Wash); Install or incorporate silt fencing or other erosion control measures for soil erosion and run-off, when appropriate.

I do recommend that any design changes or considerations within the 1986 Land Act area, be brought to the attention of the USFWS biologist or representative, to obtain feedback on any proposed action that will affect the wash.

According to Section 9-13-5, *Agreement by City of Mesquite is to assist the USFWS in protecting endangered species in and around the Virgin River subject to the availability of Federal or other funding.* The City of Mesquite will carry out its legal responsibilities under Section 10 of the Endangered Species Act and will, accordingly, assist the USFWS in the recovery of the Virgin River Species in and around the Virgin River, subject to the availability of adequate federal or other non-City funding to accomplish such assistance. The clause "in and around the Virgin River" would be defined to include any portion of Pulsipher Wash, as Pulsipher Wash is one of the three main ephemeral washes, which are legally defined as draining to Waters of the United States, therefore, indirectly is considered waters of the U.S. As such an Army Corps 404 permit may be warranted for disturbance or modifications made to Pulsipher Wash that is not part of the upper Pulsipher Wash detention basin project. (I would at least recommend a site visit by the local U.S. Army Corps of Engineers regulatory representative.)

The other consideration concerning changes and/or modifications to Pulsipher Wash, is that Pulsipher Wash is part of the City and regional flood control network. Thus, all erosion control features and other considerations regarding flood control, must meet Clark County Regional Flood Control District standards (i.e., the Hydrological Criteria and Drainage Design Manual). The City has adopted and is required to adhere to these standards through Title 8 – "Flood Control" of the City Code.

COVER SHEET AND INDEX
PULSIPHER WASH CHANNEL IMPROVEMENTS
FOR
KENNEDY COMMERCIAL

3230 SOUTH BUFFALO, SUITE 105
LAS VEGAS, NV 89117
(702) 792-8777



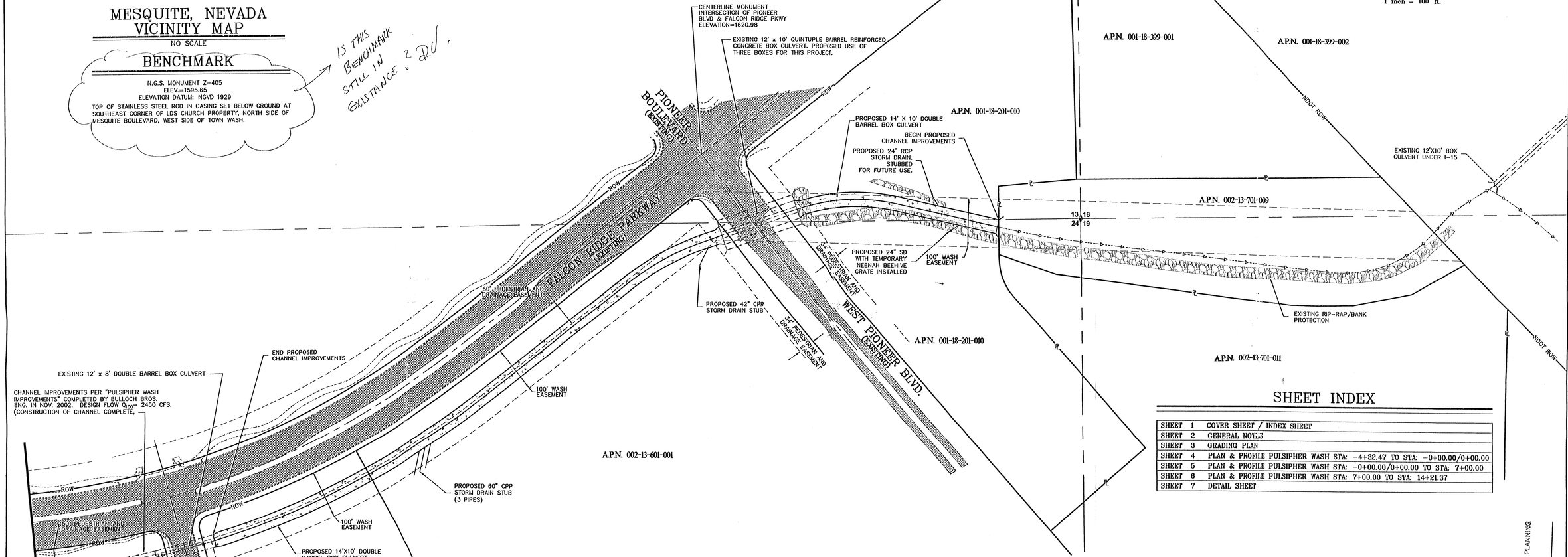
MESQUITE, NEVADA
VICINITY MAP

NO SCALE

BENCHMARK

N.G.S. MONUMENT Z-405
ELEV.=1595.65
ELEVATION DATUM: NGVD 1929
TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

IS THIS BENCHMARK STILL IN EXISTANCE ? RJ.



P-9

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed: 3-16-06
Project Number: 06-12-1
Reviewed by:

SHEET INDEX

SHEET	1	COVER SHEET / INDEX SHEET
SHEET	2	GENERAL NOTES
SHEET	3	GRADING PLAN
SHEET	4	PLAN & PROFILE PULSIPHER WASH STA: -4+32.47 TO STA: -0+00.00/0+00.00
SHEET	5	PLAN & PROFILE PULSIPHER WASH STA: -0+00.00/0+00.00 TO STA: 7+00.00
SHEET	6	PLAN & PROFILE PULSIPHER WASH STA: 7+00.00 TO STA: 14+21.37
SHEET	7	DETAIL SHEET

DEVIATION OF STANDARDS

NONE

PRIOR TO ANY CONSTRUCTION, UTILITY OR OTHERWISE, A PERMIT MUST BE OBTAINED FROM THE PUBLIC WORKS DEPARTMENT

Call Two Working Days Before You Dig!
BLUE STAKE, INC.
1-800-227-2600

THIS COVER SHEET IS FOR EXHIBIT PURPOSES ONLY AND IS NOT INTENDED FOR ANY DESIGN, MEASUREMENT OR OWNERSHIP DEFINITION. THE ATTACHED PLAN SET IS FOR DESIGN AND TO BE USED FOR CONSTRUCTION.

NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

APPROVAL BY THE CITY OF MESQUITE

J. ALLEN BELL P.E. CITY ENGINEER	DATE:
BILL TANNER DIRECTOR OF PUBLIC WORKS	DATE:
KURT O. SAWYER DIRECTOR OF BUILDING	DATE:
DEREK L. HUGHES CITY OF MESQUITE FIRE DEPARTMENT	DATE:
CATHERINE LORBEER, AICP PLANNING AND REDEVELOPMENT MANAGER	DATE:

APPROVAL BY THE UTILITY COMPANIES

MICHAEL WINTERS VIRGIN VALLEY WATER DISTRICT	DATE:
LOUIS COLE OVERTON POWER DIST. No.5	DATE:
HAROLD OSTER RIO VIRGIN TELEPHONE CO.	DATE:
SLADE ZAUGHT VIRGIN VALLEY DISPOSAL INC.	DATE:

MESQUITE BUILDING & PLANNING
RECEIVED
3/2/06

ADDITIONAL NOTES REQUIRED BY CITY

1. THE PLANS HEREIN REPRESENT THE ENTIRE PROJECT TO BE COMPLETED IN A SINGLE PHASE.
2. CERTIFICATE OF COMPLETION OR CERTIFICATE OF OCCUPANCY(S) WILL NOT BE APPROVED PRIOR TO COMPLETION OF ALL WORK SHOWN HEREIN.
3. ALL WORK CONTEMPLATED BY THESE PLANS MUST BE COMPLETED WITHIN ONE YEAR OF THE DATE OF LAST APPROVAL BY THE CITY.
4. SHOULD THE WORK NOT BE COMPLETED, THE PLANS MUST BE RESUBMITTED FOR REVIEW AND RE-APPROVAL.

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-02-06
Project Number 1470-0602 06-12-1

PLOT DATE
60% SUBMIT
90% SUBMIT 03-01-06
100% SUBMIT
REVISION 1
REVISION 2
REVISION 3

REVISIONS

NO	DESCRIPTION	DATE	BY	APPROVED

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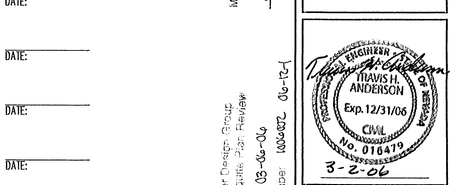
BULLOCH BROTHERS ENGINEERING INC.
CIVIL ENGINEERS-LAND SURVEYORS-LAND PLANNERS
- www.bullochbrothers.com -

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MESQUITE, NEVADA 89027
(702) 346-5100

COVER SHEET/INDEX
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA



SCALE:	DRAWN BY:	CHECKED BY:
1" = 100'	B.C.	T.A.

PROJECT NO:	DATE:	SHEET NO:
1470	MAR 2006	1 OF 7

N:\1470 Kennedy Commercial ROS\CLOMR\01-COVER-SHEET-INDEX.dwg, 3/1/2006 7:48:42 AM, Burton Cox

CITY OF MESQUITE GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN STRICT CONFORMANCE TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", 1986 (AS REVISED), AND THE LATEST REVISION OF THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, OFF SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", (C.C.A.S.D.), AND THE NEVADA DEPARTMENT OF TRANSPORTATION STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION.

2. ALL DIMENSIONS ARE TO THE BACK-OF-CURB UNLESS OTHERWISE NOTED.

3. THE EXACT LOCATIONS OF SAW CUT LINES MAY BE DETERMINED IN THE FIELD BY THE CITY OF MESQUITE.

4. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK-1985" AND TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-CURRENT EDITION".

5. CURB AND GUTTER, WITH A GRADE LESS THAN FOUR-TENTHS OF ONE PERCENT, SHALL BE CONSTRUCTED BY FORMING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.

6. ALL CEMENT SHALL BE TYPE V.

7. THE TBC SHALL BE 0.50' HIGHER THAN FINISH GRADE UNLESS OTHERWISE NOTED.

8. ALL WORK DONE WITHIN THE PUBLIC RIGHT-OF-WAY AND OUTSIDE OF THE PROJECT BOUNDARIES WILL REQUIRE A SEPARATE ENCROACHMENT PERMIT ISSUED BY THE CITY OF MESQUITE. TRENCH AND PAVEMENT REPLACEMENT CONDITIONS WILL BE IN CONFORMANCE WITH THE PERMIT.

9. ALL EXISTING CONSTRUCTION, TO BE MET BY NEW CONSTRUCTION, SHALL BE FIELD VERIFIED FOR VERTICAL AND HORIZONTAL LOCATIONS BEFORE THE START OF DEPENDENT NEW CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY OF EXISTING CONDITIONS FROM THOSE SHOWN ON THE PLANS BEFORE THE START OF THE NEW CONSTRUCTION SO THAT ANY CHANGES WHICH MAY BE REQUIRED CAN BE MADE.

10. ANY ERRORS OR DISCREPANCIES IN THE PLANS SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION. ERRORS OR DISCREPANCIES DISCOVERED AFTER THE COMMENCEMENT OF CONSTRUCTION, SHALL ALSO BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER. IT IS THE CONTRACTORS RESPONSIBILITY TO REPORT SUCH ERRORS OR DISCREPANCIES UPON DISCOVERY. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO RESOLVE SUCH ERRORS OR DISCREPANCIES WITH THE CONCURRENCE OF HIS CLIENT AND WITH THE APPROVAL OF THE CITY ENGINEER.

11. ALL CLEARING AND GRADING WORK SHALL BE IN STRICT CONFORMANCE WITH THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL INVESTIGATIONS PREPARED BY "AGEC, INC.", PROJECT NO. 2052674, "GEOTECHNICAL INVESTIGATION, MIKE KENNEDY PARCELS, MESQUITE, NEVADA", DATED FEBRUARY 13, 2006.

12. THE CONTRACTOR(S) SHALL REVIEW THE ABOVE MENTIONED GEOTECHNICAL INVESTIGATIONS PRIOR TO STARTING THE WORK.

13. ALL WORK, WITHIN THE PUBLIC RIGHT-OF-WAY AND EASEMENTS, SHALL BE WARRANTED BY THE CONTRACTOR(S) FOR ONE YEAR FROM DATE OF FINAL APPROVAL.

14. CALL 1-800-227-2600 AT LEAST TWO WORKING DAYS BEFORE YOU DIG. THE CONTRACTOR IS TO NOTIFY UNDERGROUND SERVICE ALERT. EXISTING UTILITIES ARE SHOWN ON PLANS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. THE ENGINEER BEARS NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR SHOWN INCORRECTLY.

15. DIMENSIONS SHOWN TAKE PRECEDENCE OVER SCALING.

16. ALL ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON NGVD 1929, NGS MONUMENT Z-405, ELEVATION 1595.65, AT THE TOP OF THE STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT THE SOUTHEAST CORNER OF LDS CHURCH PROPERTY, ON THE NORTH SIDE OF MESQUITE BOULEVARD, THE WEST SIDE OF TOWN WASH.

17. SIDEWALK EXPANSION JOINTS SHOWN ON UNIFORM STANDARD DRAWING #234 SHALL BE MODIFIED TO CONFORM WITH SPECIFICATIONS MANDATED BY THE CITY OF MESQUITE IN A LETTER DATED JULY 30, 1997: SIDEWALK EXPANSION JOINTS SHALL BE CONSTRUCTED AT 15' INTERVALS WHEN USING THE STANDARD 1/2" FELT MATERIAL; OR, AS AN ALTERNATIVE, SIDEWALK JOINTS MAY BE CONSTRUCTED AT 30' INTERVALS WHEN AN APPROVED ELASTOMERIC SEALANT MATERIAL IS USED.

18. THE CONTRACTOR SHALL COORDINATE A PRE-CONSTRUCTION MEETING INVOLVING THE POWER COMPANY, THE TELEPHONE COMPANY(S), AND THE CABLE COMPANY(S), WHILE ALSO INVITING THE PUBLIC WORKS DEPARTMENT FROM THE CITY OF MESQUITE, TO DETERMINE UTILITY LINES, JUNCTION BOXES AND TRANSFORMER LOCATIONS, AND EASEMENTS.

REV. 09-06-02
REV. 12-02-04
REV. 07-07-05
REV. 08-18-05

CITY OF MESQUITE SANITATION NOTES

1. ALL SANITARY SEWER CONSTRUCTION SHALL REQUIRE A CONSTRUCTION PERMIT TO BE ISSUED BY THE CITY OF MESQUITE SANITATION DEPARTMENT TO THE GENERAL CONTRACTOR FOR THE PROJECT. THIS WILL REQUIRE A COPY OF THE IMPROVEMENT PLANS SIGNED BY ALL UTILITIES, COPY OF CONTRACTORS CLASS A LICENSE AND A DATE WHEN CONSTRUCTION WILL START. THE GENERAL CONTRACTOR WILL ALSO BE REQUIRED TO HAVE A COPY OF THE LATEST EDITION OF THE "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS FOR SOUTHERN NEVADA", ON THE PROJECT AT ALL TIMES. THE MESQUITE SANITATION DEPARTMENT CAN BE NOTIFIED AT 10 E. MESQUITE BLVD., OR BY CALLING 1-702-346-2849 OR 1-702-346-5295.

2. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS FOR SOUTHERN NEVADA" AS ADOPTED BY THE CLARK COUNTY SANITATION DISTRICT, AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", AS AMENDED. IN ALL CASES, THE DISTRICT'S CRITERIA SHALL SUPERSEDE THE UNIFORM STANDARD SPECIFICATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.

3. THE "STANDARD DRAWINGS" AS SPECIFIED IN THE LATEST EDITION OF THE "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS FOR SOUTHERN NEVADA" AS ADOPTED BY THE CLARK COUNTY SANITATION DISTRICT SHALL APPLY TO ALL CONSTRUCTION.

4. SEWER MAINS ONLY, ARE TO BE LAID IN THE SEWER TRENCHES.

5. ALL HOUSE LATERALS ARE TO BE LAID AT NOT LESS THAN MINIMUM SLOPES SHOWN IN THE STANDARDS.

6. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY OF MESQUITE SANITATION DEPARTMENT. ALL NEW SEWER LINE CONSTRUCTION WILL BE PLUGGED AT THE MAIN LINE TIE-IN AND THERE WILL BE NO SEWER LINE USAGE UNTIL ALL SEWER LINES WITHIN THE PROJECT ARE ACCEPTED BY THE SANITATION DEPARTMENT.

7. ALL SOIL TESTING SHALL BE IN ACCORDANCE WITH SECTION 3.11 OF THE STANDARDS.

8. ALL EXFILTRATION, INFILTRATION AND AIR TESTING OF LINES SHALL BE IN ACCORDANCE WITH THE STANDARDS.

9. CUT SHEETS MUST BE SUBMITTED TO THE CITY SANITATION DEPARTMENT BEFORE CONSTRUCTION WILL BE PERMITTED TO START.

10. THE LOCATION OF THE SEWER SERVICE LATERAL, WHERE IT PASSES UNDER THE CURB, SHALL BE INDICATED BY INSCRIBING AN "S" IN THE TOP OF THE CURB OR BY INSERTION OF A BRASS TAG MARKED "S" IN THE TOP OF THE CURB.

11. THE MESQUITE SANITATION DEPARTMENT SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF THE PROJECT COMPLETION WALK THROUGH, AND WILL BE PROVIDED WITH A SET OF "AS-BUILTS". "AS-BUILTS", AS A MINIMUM, SHALL INCLUDE DISTANCE BETWEEN MANHOLES, LATERAL LOCATION AT THE THE PROPERTY LINE, ALIGNMENT CHANGES AND EXISTING UTILITIES THAT CROSS THE SEWER LINES. THE ENGINEER WILL PROVIDE RECORD DRAWINGS, MYLARS OF GOOD QUALITY, TO THE DEPARTMENT REFLECTING THE CERTIFIED "AS-BUILTS" SUPPLIED BY THE CONTRACTOR. ONCE ALL THESE CONDITIONS ARE SATISFIED, AND THE PUNCH LIST IS COMPLETED TO THE DEPARTMENTS APPROVAL, THE COMPLETION DATE WILL BE ESTABLISHED AND THE WARRANTY WILL BE IN EFFECT FOR ONE YEAR FROM THAT DATE.

CITY OF MESQUITE STREET LIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS, EXCEPT AS NOTED ON THE STREET LIGHTING PLANS, SHALL CONFORM TO THE "CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS" AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA".

2. ALL LIGHT POLES ARE TO BE GALVANIZED.

3. A NEW SERVICE POINT IS REQUIRED.

4. STREETLIGHT CONDUIT SHALL CONFORM TO CLARK COUNTY STANDARD SPECIFICATION (SECTION 623) AND SHALL BE SCHEDULE 40 PVC OF THE SIZE 1 1/4 INCH. UNDERGROUND CONDUIT SHALL BE INSTALLED TYPICALLY 3 FEET BEHIND THE BACK-OF-CURB IN LINE WITH THE CENTER OF THE LIGHTING POLE FOUNDATIONS, WHERE FEASIBLE. DEVIATION FROM THIS ALIGNMENT SHALL BE PERMITTED UPON THE ENGINEERS APPROVAL. PLACEMENT OF THE CONDUIT WITHIN THE PAVEMENT AREA OF THE STREET WILL BE PERMITTED TO AVOID CONFLICTS BEHIND THE SIDEWALK AREA. THE CONDUIT SHALL BE BURIED A MINIMUM OF 24 INCHES BELOW FINISHED GRADE SURFACE. CONDUIT SHALL ALSO INCLUDE THE FURNISHING AND INSTALLATION OF ALL ELECTRICAL WIRE AS REQUIRED FOR THE OPERATION OF THE NEW STREETLIGHTS. THE CONTRACTOR SHALL PROVIDE FINAL "AS-BUILT" LOCATIONS OF ALL CONDUIT.

5. PULLBOXES SHALL BE A NO. 3 1/2 PULLBOX AND INSTALLED PER CLARK COUNTY STANDARD SPECIFICATIONS (SECTION 623) AND CLARK COUNTY UNIFORM STANDARD DRAWINGS. THE MAXIMUM DISTANCE ALLOWED BETWEEN PULLBOXES AND POLES IS 300 FEET. THE MAXIMUM BEND SHALL NOT EXCEED 270° IN ANY ONE RUN. PULLBOXES SHALL ALSO BE LOCATED AT BOTH SIDES OF STREET CROSSINGS. THE CONTRACTOR SHALL PROVIDE FINAL "AS-BUILT" LOCATIONS OF ALL PULLBOXES.

6. ELECTRICAL SERVICE POINTS AND METER BASES: THE STREET LIGHTING SYSTEM INCLUDES THE CONNECTION TO SERVICE POINTS LOCATED BY OVERTON POWER. THE CONTRACTOR SHALL COORDINATE CONNECTION AND SERVICE POINT LOCATIONS WITH OVERTON POWER. THE SERVICE SOURCE WILL BE 120/240 VOLT, SINGLE PHASE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIAL AND EQUIPMENT NECESSARY FOR CONNECTION TO THESE SERVICE POINTS. THE CONTRACTOR SHALL PROVIDE FINAL "AS-BUILT" LOCATIONS OF ALL ELECTRICAL SERVICE POINTS AND METER BASES.

REV. 04-15-99

VIRGIN VALLEY WATER DISTRICT NOTES

1. THE LOCATION OF THE WATER SERVICE LATERAL, WHERE IT PASSES UNDER THE CURB, SHALL BE INDICATED BY INSCRIBING A "W" IN THE TOP OF THE CURB OR BY INSERTION OF A BRASS TAG MARKED "W" IN THE TOP OF THE CURB. SERVICES SHALL BE SHOWN ON "AS-BUILT" PLANS.

2. DISTRIBUTION WATER MAINS SHALL BE INSTALLED WITH A MINIMUM 42" COVER BELOW FINISHED GRADE, EXCEPT WHERE INDICATED OTHERWISE ON THE PLANS, WITH SPECIFIC PROPOSED COVER SHOWN AND APPROVED BY THE VIRGIN VALLEY WATER DISTRICT.

3. INTERRUPTION OF EXISTING WATER SERVICE, WHILE MAKING CONNECTIONS TO EXISTING WATER MAINS, SHALL NOT BE ALLOWED WITHOUT SPECIAL APPROVAL OF THE VIRGIN VALLEY WATER DISTRICT. A MINIMUM OF 48 HOURS NOTICE TO THE DISTRICT SHALL BE REQUIRED BEFORE MAKING CONNECTIONS. CONNECTION TO THE EXISTING SYSTEM SHALL BE DONE DURING THE TIME OF LEAST INCONVENIENCE TO CUSTOMERS OF EXISTING SYSTEM. INTERRUPTIONS OF SERVICE SHALL BE LIMITED TO LESS THAN FOUR (4) HOURS PER 24 HOUR PERIOD. THE CONTRACTOR SHALL NOTIFY ALL CUSTOMERS WHO WILL BE AFFECTED BY SERVICE INTERRUPTION AT LEAST 24 HOURS PRIOR TO THE INTERRUPTION OF SERVICE.

4. TEMPORARY CONSTRUCTION WATER MAY BE OBTAINED FROM AN EXISTING FIRE HYDRANT BY MAKING APPLICATION AT THE OFFICE OF THE VIRGIN VALLEY WATER DISTRICT. UNAUTHORIZED CONNECTIONS TO THE DISTRICT'S WATER SYSTEM IS A VIOLATION AND SUBJECT TO LEGAL ACTION.

5. THE CONTRACTOR SHALL NOTIFY THE VIRGIN VALLEY WATER DISTRICT (1-702-346-5731), AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATING FOR EXISTING WATER FACILITIES SO THAT APPROPRIATE WATER SYSTEMS CAN BE MARKED IN THE FIELD.

6. THE LOCATION AND ELEVATION OF EXISTING WATER FACILITIES SHALL BE CONFIRMED BY FIELD MEASUREMENT AND EXCAVATION EXPLORATION BY THE CONTRACTOR.

7. THE EXISTENCE AND LOCATION OF WATER FACILITIES SHOWN ON THE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. TO THE BEST OF THE DESIGN ENGINEER'S KNOWLEDGE, THE EXISTING WATER FACILITIES ARE AS SHOWN ON THE PLANS. THE VIRGIN VALLEY WATER DISTRICT SHALL NOT BE HELD RESPONSIBLE FOR ANY ERROR IN THE LOCATION AND ELEVATION OF THE EXISTING WATER FACILITIES.

8. NO REVISIONS SHALL BE MADE TO THE WATER SYSTEM SHOWN ON THESE PLANS WITHOUT THE APPROVAL OF THE VIRGIN VALLEY WATER DISTRICT. MAJOR DESIGN REVISIONS MUST BE SUBMITTED IN DUPLICATE BY THE DESIGN ENGINEER TO THE VIRGIN VALLEY WATER DISTRICT GENERAL MANAGER OR DISTRICT ENGINEER FOR APPROVAL NO LATER THAN 14 DAYS PRIOR TO COMMENCING CONSTRUCTION.

9. THE VIRGIN VALLEY WATER DISTRICT INSPECTOR SHALL BE NOTIFIED A MINIMUM OF 24 HOURS PRIOR TO ANY REQUIRED INSPECTION. CALL 1-702-346-5731 WEEKDAYS BETWEEN 8:00 A.M. AND 4:30 P.M. OR 1-702-682-1957 WEEKDAYS BETWEEN 7:00 AM AND 3:30 PM.

10. PIPE DEFLECTIONS FOR SHORT RADIUS CURVES AND ANGLE POINTS SHALL NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS AND SHALL NORMALLY BE ACCOMPLISHED BY MEANS OF STANDARD FITTINGS, THE LOCATIONS OF WHICH SHALL BE DETAILED ON THE PLANS.

11. ALL NEW WATER LINES SHALL BE TESTED AND DISINFECTED, PER VIRGIN VALLEY WATER DISTRICT STANDARD SPECIFICATIONS, SECTION IX, PRIOR TO BEING PLACED IN SERVICE. ARRANGEMENT FOR A TOTAL COLIFORM BACTERIA TEST SHALL BE MADE WITH THE VIRGIN VALLEY WATER DISTRICT 24 HOURS IN ADVANCE OF THE NEW SYSTEM BEING READY FOR TESTING. ANY COSTS ASSOCIATED WITH THE BACTERIA ANALYSIS SHALL BE BILLED TO THE DEVELOPER. AT NO TIME SHALL A LINE THAT HAS NOT BEEN TESTED AND FOUND FREE OF CONTAMINATION BE CONNECTED TO THE DISTRICT'S WATER SYSTEM.

12. APPROVED BACK FLOW PREVENTION DEVICES SHALL BE INSTALLED FOR ALL IRRIGATION AND PRIVATE FIRE SERVICES.

13. IT IS THE INTENT OF THESE SPECIFICATIONS AND IMPROVEMENT PLANS THAT THE WORK PERFORMED UNDER THE CONTRACT SHALL RESULT IN A COMPLETE OPERATING WATER SYSTEM IN SATISFACTORY WORKING CONDITION WITH RESPECT TO THE FUNCTIONAL PURPOSES OF THE INSTALLATION. IF THERE ARE ANY QUESTIONS REGARDING THE STATED OR IMPLIED MEANING OF THESE PLANS, THE CONTRACTOR IS DIRECTED TO CONTACT THE DESIGN ENGINEER IMMEDIATELY.

14. ALL WATER SYSTEM CONSTRUCTION SHALL CONFORM TO THE VIRGIN VALLEY WATER DISTRICT "DESIGN STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION".

15. EACH LIVING UNIT SHALL BE PROVIDED WITH A PRESSURE REGULATOR, CLASS 150 (MINIMUM).

16. A CONSTRUCTION PERMIT SHALL BE ISSUED BY THE VIRGIN VALLEY WATER DISTRICT PRIOR TO COMMENCING CONSTRUCTION. ISSUING OF THIS PERMIT SHALL BE CONDITIONED ON THE FOLLOWING:
a. PROVIDE A SET OF APPROVED CONSTRUCTION PLANS.
b. PROVIDE A COPY OF THE PERFORMANCE BOND SUBMITTED TO THE CITY OF MESQUITE.
c. PAY ALL FEES DUE TO THE VIRGIN VALLEY WATER DISTRICT.

17. THE VIRGIN VALLEY WATER DISTRICT SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF SCHEDULING THE FINAL INSPECTION. THE COMPLETION DATE OF THE PROJECT AND THE START OF THE WARRANTY PERIOD SHALL BE DETERMINED BY SATISFYING THE CONDITIONS OF THE FINAL "PUNCH LIST" AND THE SUBMITTAL OF THE "AS-BUILT" DRAWINGS BY THE ENGINEER OF RECORD.

18. WATER METERS MUST BE PURCHASED THROUGH THE VIRGIN VALLEY WATER DISTRICT. INSTALLATION OF WATER METERS MUST BE DONE BY OR AUTHORIZED BY THE WATER DISTRICT AND WILL REQUIRE 24 HOUR NOTICE PRIOR TO INSTALLATION.

19. CONSTRUCTION OF THIS PROJECT SHALL NOT COMMENCE UNTIL TWO (2) SETS OF APPROVED CONSTRUCTION PLANS HAVE BEEN RECEIVED BY THE VIRGIN VALLEY WATER DISTRICT.

REV. 06-01-02
REV. 08-03-04

ADDITIONAL WATER NOTES REQUIRED BY CLARK COUNTY HEALTH DISTRICT

1. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS"(UDACS) EXCEPT FOR PROJECTS SERVICED BY THE "VIRGIN VALLEY WATER DISTRICT".

2. WATERLINES SHALL BE FLUSHED, TESTED AND DISINFECTED PER "VIRGIN VALLEY WATER DISTRICT DESIGN STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION", SECTION IX, PRIOR TO BEING PLACED IN SERVICE. A WATER SAMPLE STATION IS REQUIRED FOR NEW SUBDIVISIONS PER "VIRGIN VALLEY WATER DISTRICT DESIGN STANDARDS AND SPECIFICATIONS FOR WATER WORKS CONSTRUCTION", SECTION VIII.B.10.

REV. 12-19-01

CITY OF MESQUITE FIRE NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CITY OF MESQUITE ORDINANCE #211, NFPA #24, 2002 EDITION AND THE INTERNATIONAL FIRE CODE, 2003 EDITION.

2. ON ANY BUILDING CONSTRUCTION SITE, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE COMBUSTIBLE MATERIALS ARE DELIVERED TO THE SITE AND CONSTRUCTION COMMENCES. SAID FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER WITH REQUIRED WATER SUPPLY.

3. IF DURING CONSTRUCTION IT BECOMES NECESSARY TO CLOSE ANY CONTROL VALVE OR PLAN A HYDRANT OUT OF SERVICE, THE CITY OF MESQUITE FIRE DEPARTMENT MUST BE CONTACTED.

4. THE PAINTING OF CURBS AND/OR STRIPING OF ASPHALT AREAS AND PROTECTION OF HYDRANT FROM PHYSICAL INJURY, SHALL BE PER CITY OF MESQUITE FIRE DEPARTMENT FIRE HYDRANT INSTALLATION/SPECIFICATIONS HANDOUT.

5. NO FIRE HYDRANT SHALL BE LOCATED WITHIN 25 FEET OF ANY STRUCTURE, OR WITHIN 6 FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION. FOR WALL, FENCE AND PLANT LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS CENTER SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES.

6. AT ALL TIMES DURING CONSTRUCTION, SUITABLE EMERGENCY VEHICLE ACCESS ROADS MUST BE MAINTAINED. ROADWAYS MUST BE SMOOTH, COMPACTED AND CAPABLE OF SUPPORTING THE IMPOSED LOADS OF ALL EMERGENCY VEHICLES.

7. PRIOR TO ACCEPTANCE OF ANY PRIVATE FIRE SERVICE MAIN, A SATISFACTORY HYDROSTATIC TEST, WITH PIPING JOINTS UNCOVERED, MUST BE CONDUCTED. APPROVED PLANS AND A CONTRACTOR'S MATERIALS AND TEST CERTIFICATE MUST BE PROVIDED AT THE TIME OF INSPECTION.

8. BLUE REFLECTIVE MARKERS INSTALLED PER IFC AMENDMENT, SECTION C-107, MUST BE PROVIDED BEFORE FINAL HYDRANT ACCEPTANCE CAN BE OBTAINED.

9. THE CURB IS TO BE PAINTED RED, TEN FEET EACH WAY FROM FIRE HYDRANTS.

REV. 10-13-98
REV. 09-21-05
REV. 11-09-05

CITY OF MESQUITE TRAFFIC NOTES

1. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS IMMEDIATELY AFTER THE FIRST GRADING WORK IS ACCOMPLISHED.

2. ALL CONSTRUCTION SIGNING, BARRICADING AND TRAFFIC DELINEATION SHALL CONFORM TO THE "NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK-1985" AND TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES-2000."

3. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY ENGINEER.

4. THE DEVELOPER SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL PERMANENT SIGNS SHOWN ON THE PLANS. STREET NAME SIGNS AND ALL SIGN POST INSTALLATIONS SHALL CONFORM IN THEIR ENTIRETY TO CITY OF MESQUITE/CLARK COUNTY STANDARDS.

5. IF A PROPOSED STREETLIGHT STANDARD IS FIELD LOCATED TO WITHIN FIVE (5) FEET OF ANY SIGN SHOWN HEREON TO BE MOUNTED ON A SIGN POST, THE POST MOUNTING MAY BE CHANGED TO THE STREETLIGHT STANDARD, WITH THE APPROVAL OF THE CITY ENGINEER.

6. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC INTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HEREUNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

7. PRIOR TO CONSTRUCTION OF THE STREET SIGN, THE CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PUBLIC WORKS DEPARTMENT OF THE CITY OF MESQUITE.

REV. 05-03-02

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3/9/06
Project Number 06-12
Reviewed by

NO	DESCRIPTION	DATE	BY	APPROVED

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GENERAL NOTES
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 016479
3-2-06

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 1470001 06-12-1

SCALE: NONE	DRAWN BY: B.C.	CHECKED BY: T.A.
PROJECT NO: 1470	DATE: MAR 2006	SHEET NO: 2 OF 7

PLOT DATE
60% SUBMIT
90% SUBMIT 03-01-06
100% SUBMIT
REVISION
REVISION 2
REVISION 3

ROUGH GRADING PLAN
PULSIPHER WASH CHANNEL IMPROVEMENTS
FOR
KENNEDY COMMERCIAL

3230 SOUTH BUFFALO, SUITE 105
LAS VEGAS, NV 89117
(702) 792-8777

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3/9/06
Project Number 06-12
Reviewed by

REVISIONS

NO	DESCRIPTION	DATE	BY	APPROVED
1	REVISED PER CITY OF MESQUITE COMMENTS, ADDED SEC. B-B, ADDED NOTE, ADDED SEC. C-C, ADDED DISCLAIMER, ADDED BENCH MARK, ADDED LEGEND, ADDED QUANTITIES, ADDED VICINITY MAP, ADDED CONSTRUCTION NOTE	03-06-06	LJS	

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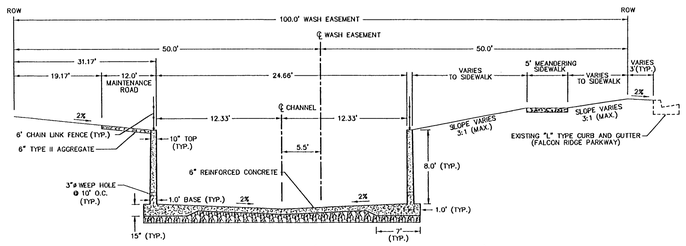
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SECTION A–A
(PROPOSED DOUBLE 14' X 10' BOX CULVERT)
NO SCALE

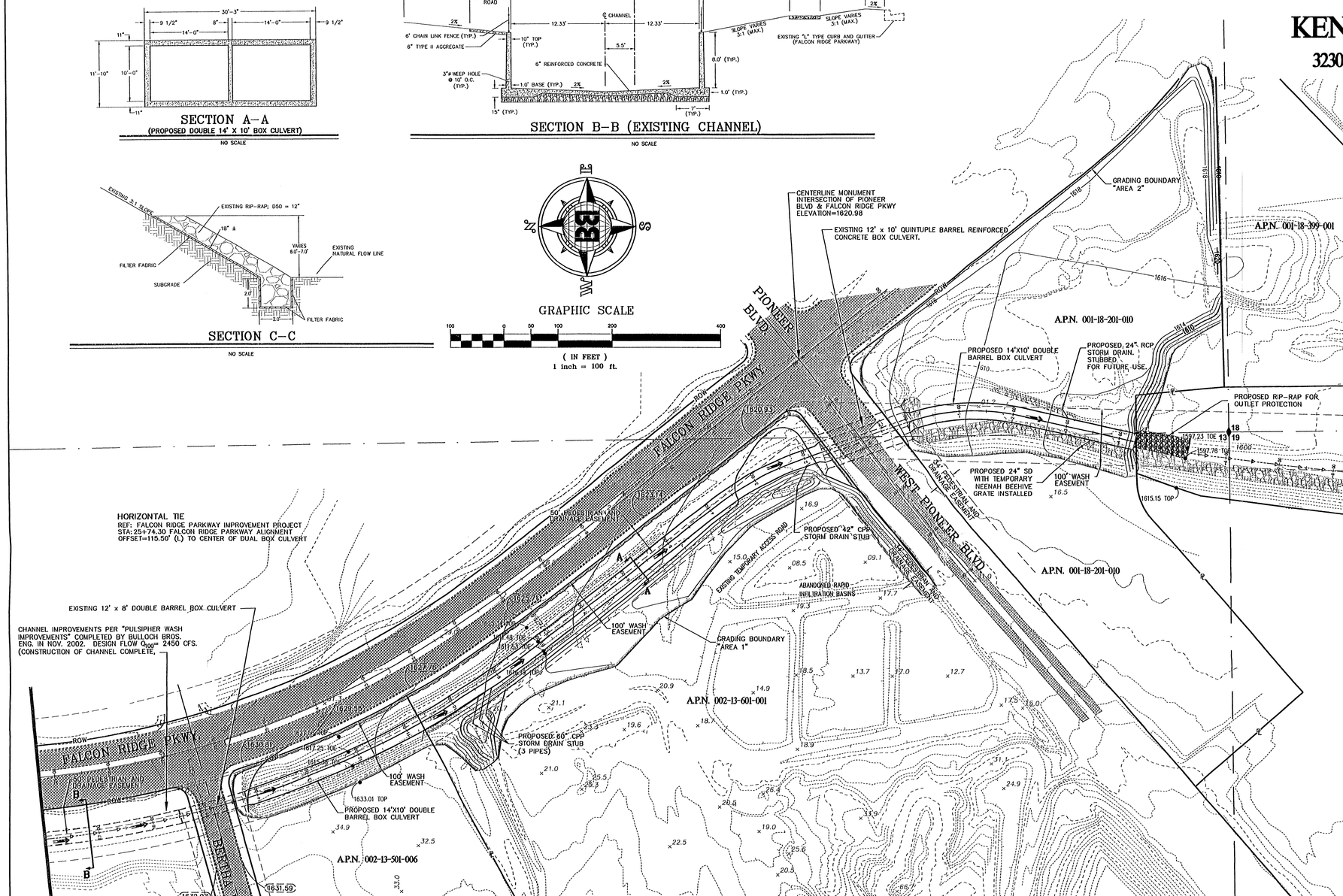
SECTION B–B (EXISTING CHANNEL)
NO SCALE



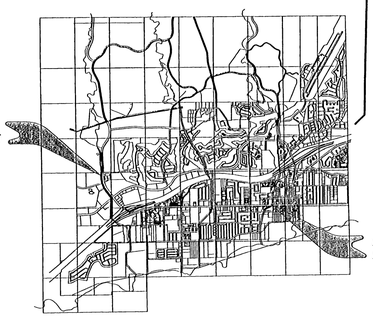
SECTION C–C
NO SCALE

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

HORIZONTAL TIE
REF: FALCON RIDGE PARKWAY IMPROVEMENT PROJECT
STA: 251+74.30 FALCON RIDGE PARKWAY ALIGNMENT
OFFSET=115.50' (L) TO CENTER OF DUAL BOX CULVERT



PROJECT LOCATION



MESQUITE, NEVADA VICINITY MAP
NO SCALE

BENCHMARK

N.G.S. MONUMENT Z–405
ELEV.=1595.65
ELEVATION DATUM: NGVD 1929

TOP OF STAINLESS STEEL ROD IN CASING SET BELOW GROUND AT SOUTHEAST CORNER OF LDS CHURCH PROPERTY, NORTH SIDE OF MESQUITE BOULEVARD, WEST SIDE OF TOWN WASH.

LEGEND

1610	= EXISTING 10' CONTOURS WITH ELEVATION SHOWN
	= EXISTING 2' CONTOURS
1620	= PROPOSED 10' CONTOURS WITH ELEVATION SHOWN
1618	= PROPOSED 2' CONTOURS WITH ELEVATION SHOWN
℄	= PROPERTY LINE
1648.72 TOP	= EXISTING TOP BANK OF WASH ELEVATION
1648.72 TOE	= EXISTING TOE OF WASH ELEVATION
	= FLOW DIRECTION ARROW
1623.74	= EXISTING TOP BACK OF CURB ELEVATION
	= EXISTING ASPHALT
	= EXISTING RIP-RAP / BANK PROTECTION
	= PROPOSED RIP-RAP / BANK PROTECTION
A A	= TYPICAL STREET / CHANNEL CROSS SECTION

"AREA 1" GRADING QUANTITIES
NORTH OF WEST PIONEER BLVD.

1,063 C.Y. (CUT)
11,983 C.Y. (FILL)
10,920 (NET FILL)
4.00 ACRES DISTURBED

NOTE:
ABOVE QUANTITIES DO NOT ACCOUNT FOR SHRINKAGE, SUBSIDENCE, OVER–EXCAVATION, OR OTHER REQUIREMENTS THAT MAY BE REQUIRED BY THE GEOTECHNICAL REPORT. THE CONTRACTOR SHALL VERIFY THEIR OWN QUANTITIES.

THE QUANTITIES WERE CALCULATED USING ROUGH GRADING CONTOURS AS EXISTING CONTOURS FROM THE OVERALL GRADING PLAN FOR HIGHLAND VISTAS P.U.D. AREA.

"AREA 2" GRADING QUANTITIES
SOUTH OF WEST PIONEER BLVD.

494 C.Y. (CUT)
42,961 C.Y. (FILL)
42,467 (NET FILL)
6.20 ACRES DISTURBED

NOTE:
ABOVE QUANTITIES DO NOT ACCOUNT FOR SHRINKAGE, SUBSIDENCE, OVER–EXCAVATION, OR OTHER REQUIREMENTS THAT MAY BE REQUIRED BY THE GEOTECHNICAL REPORT. THE CONTRACTOR SHALL VERIFY THEIR OWN QUANTITIES.

THE QUANTITIES WERE CALCULATED USING ROUGH GRADING CONTOURS AS EXISTING CONTOURS FROM THE OVERALL GRADING PLAN FOR HIGHLAND VISTAS P.U.D. AREA.

Call Two Working Days Before You Dig!
DIGALERT
1-800-227-2600

NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

DISCLAIMER:
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TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 010479
3-2-06

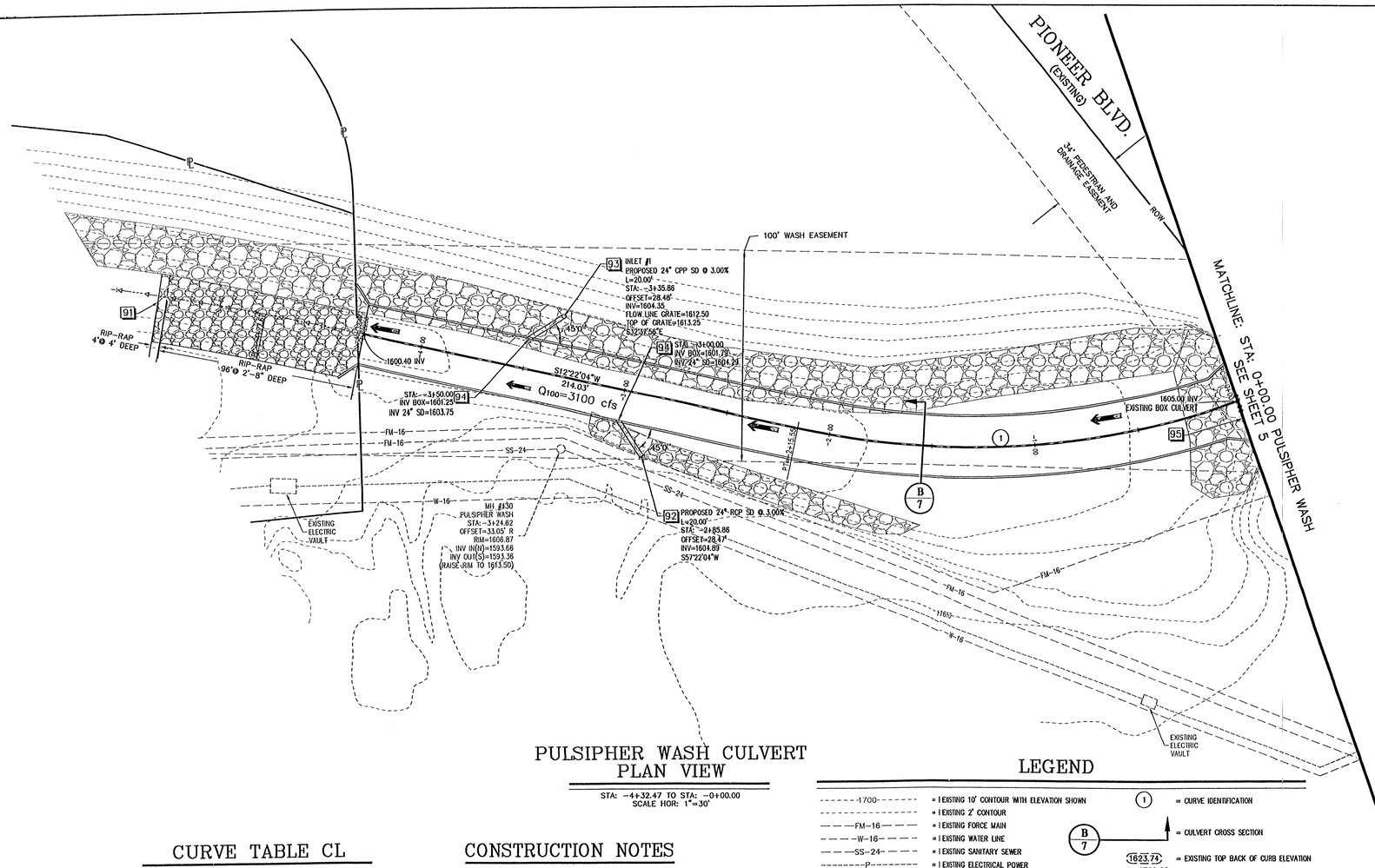
Poggemeyer Design Group
City of Mesquite Plan Review
Reviewed 03-06-06
Project Number 1470.002 06-12

PLOT DATE
60% SUBMIT
90% SUBMIT 03-01-06
100% SUBMIT
REVISION 1
REVISION 2
REVISION 3

SCALE: 1" = 100'	DRAWN BY: LJS/B.C.	CHECKED BY: T.A.
PROJECT NO: 1470	DATE: MAR 2006	SHEET NO: 3 OF 7

ROUGH GRADING PLAN
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

N:\1470 Kennedy Commercial ROS\CLOMR\03-GRADING-PLAN.dwg, 3/1/2006 7:49:25 AM, Burton Cox



PULSIPHER WASH CULVERT
PLAN VIEW

STA: -4+32.47 TO STA: -0+00.00
SCALE HOR: 1"=30'

LEGEND

-1700-	= EXISTING 10' CONTOUR WITH ELEVATION SHOWN
	= EXISTING 2' CONTOUR
-FM-16-	= EXISTING FORCE MAIN
-W-16-	= EXISTING WATER LINE
-SS-24-	= EXISTING SANITARY SEWER
-P-	= EXISTING ELECTRICAL POWER
	= CULVERT CENTERLINE
	= HYDRAULIC GRADE LINE (HGL)
	= ENERGY GRADE LINE (EGL)
PL	= PROPERTY LINE
	= APPROXIMATE LOCATION OF EXISTING RIP-RAP
	= PROPOSED RIP-RAP
(1)	= CURVE IDENTIFICATION
B/7	= CULVERT CROSS SECTION
1623.74	= EXISTING TOP BACK OF CURB ELEVATION
1769.00	= EXISTING WASH SPOT ELEVATION
16	= CONSTRUCTION NOTE

CURVE TABLE CL

CURVE	RADIUS	LENGTH	TANGENT	DELTA
1	395.01'	215.55'	110.53'	31°15'53"

CONSTRUCTION NOTES

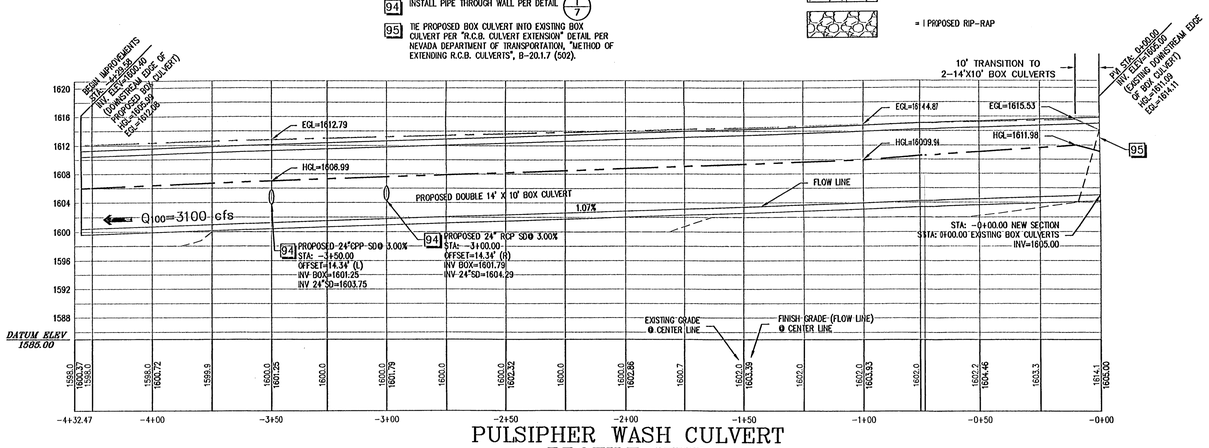
91 INSTALL LOOSE RIP-RAP FOR OUTLET PROTECTION, d50=1'-4". TIE INTO EXISTING RIP-RAP ALONG WEST BANK OF WASH. TOTAL LENGTH OF PROTECTION=100'. CAP NEW PIPE PER "PIPE CAP DETAIL" THIS SHEET.

92 INSTALL TEMPORARY NEENAH GRATE R-2560-E2 OR APPROVED EQUIVALENT PER C.C. AREA STANDARD DRAWING NO. 416.

93 INSTALL PIPE THROUGH WALL PER DETAIL 1/7

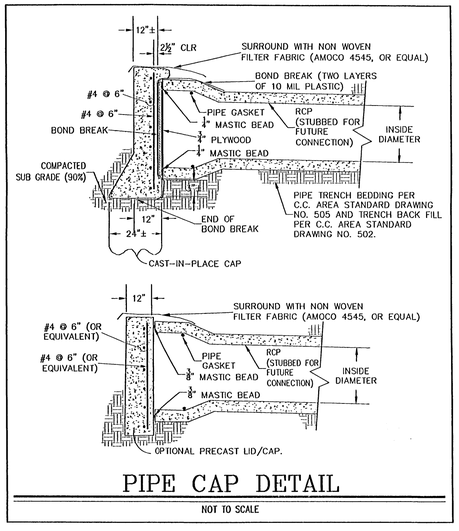
94 TIE PROPOSED BOX CULVERT INTO EXISTING BOX CULVERT PER "R.C.B. CULVERT EXTENSION" DETAIL PER NEVADA DEPARTMENT OF TRANSPORTATION, "METHOD OF EXTENDING R.C.B. CULVERTS", B-20.1.7 (502).

95



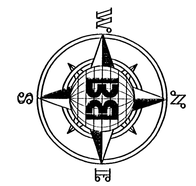
PULSIPHER WASH CULVERT
PROFILE VIEW

STA: -4+32.47 TO STA: -0+00.00
SCALE HOR: 1"=30', SCALE VER: 1"=10'



PIPE CAP DETAIL

NOT TO SCALE



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

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Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed: 3-9-06
Project Number: 06-01
Reviewed by:

REVISIONS			
NO	DESCRIPTION	DATE	BY APPROVED
	PER REVISION COMMENTS FROM CITY OF MESQUITE DATED 2/28/06	3/1/06	
	ADDED NOTE TO CONSTRUCTION NOTES, CURVE TABLE, & REVISED AREA TO DISTURBED	3/1/06	

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P.O. BOX 3174
CEDAR CITY, UTAH 84720
(435) 590-6592

PLAN AND PROFILE
STA: -4+32.47 TO STA: -0+00.00/0+00.00
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

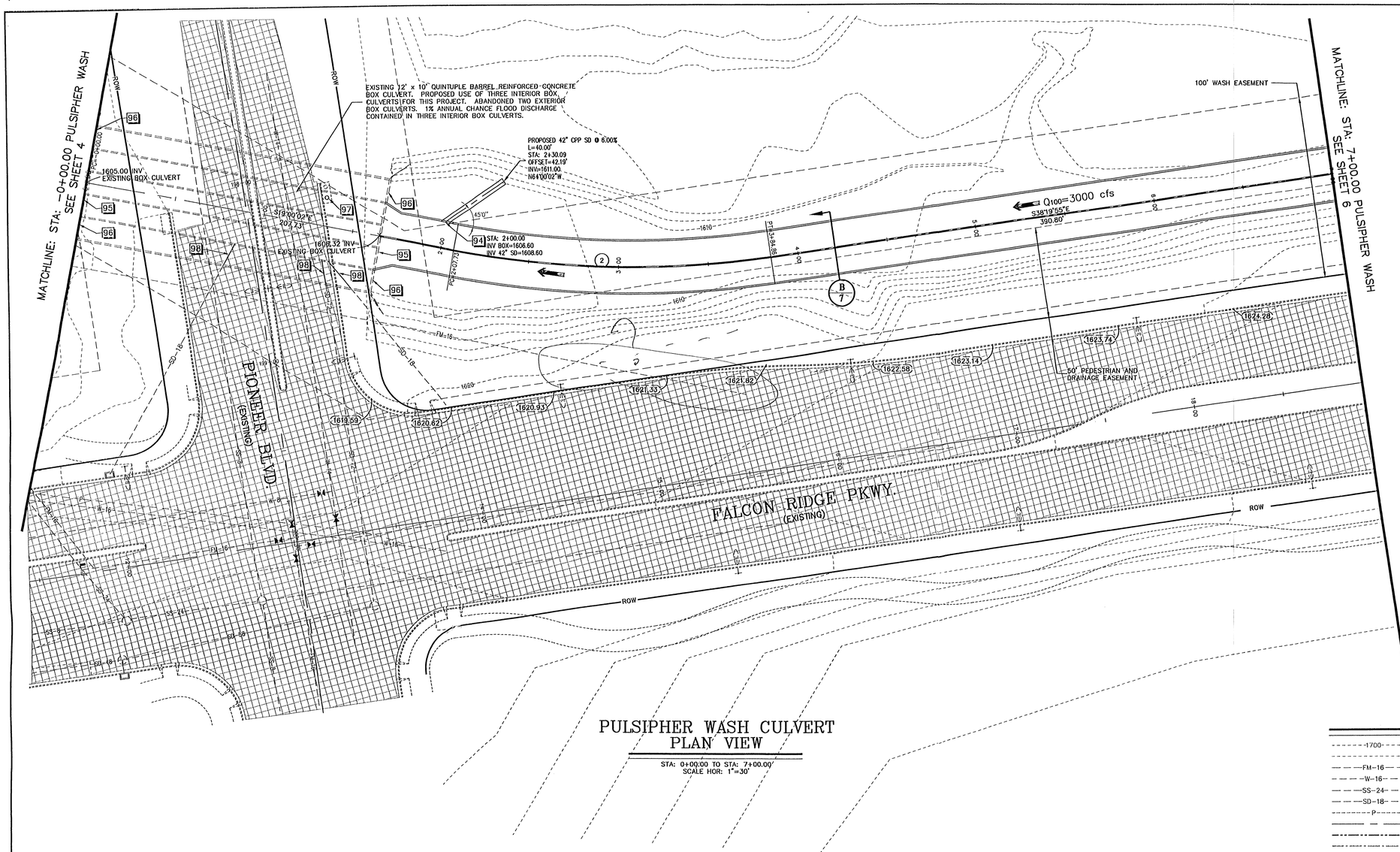
REGISTERED PROFESSIONAL ENGINEER
TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 018479
STATE OF NEVADA
3-2-06

Poggemeyer Design Group
City of Mesquite Plan Review
Received: 03-30-06
Project Number: 1606062 06-12-1

SCALE: 1" = 30'	DRAWN BY: B.C.	CHECKED BY: T.A.
PROJECT NO: 1470	DATE: MAR 2006	SHEET NO: 4 OF 7

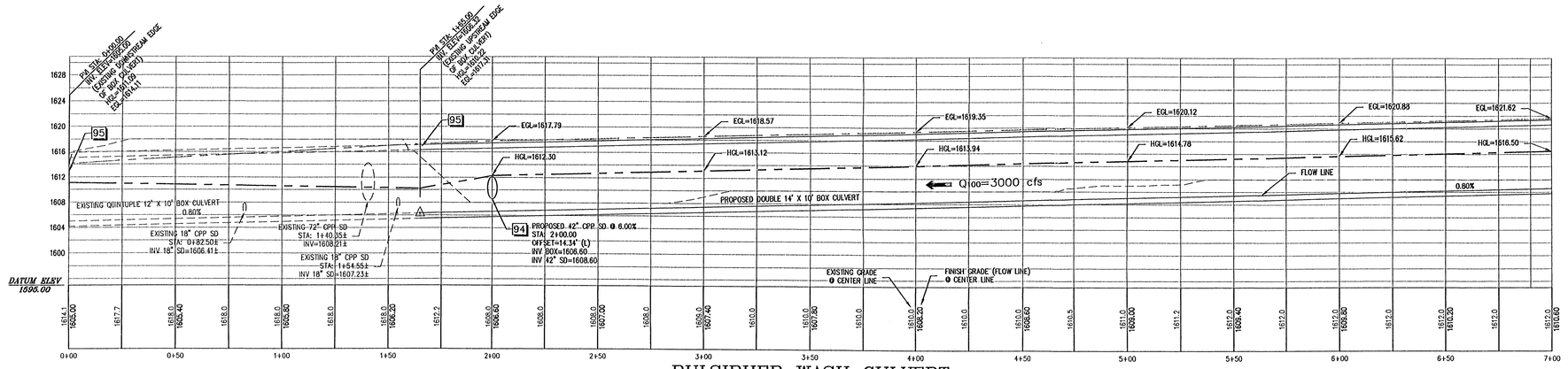
PLOT DATE	
60% SUBMIT	
90% SUBMIT	03-01-06
100% SUBMIT	
REVISION 1	
REVISION 2	
REVISION 3	

N:\1470 Kennedy Commercial ROS\CLOMR\04-PLAN-PROFILE-1.dwg, 3/1/2006 10:30:39 AM, Burton Cox



PULSIPHER WASH CULVERT
PLAN VIEW

STA: 0+00.00 TO STA: 7+00.00
SCALE HOR: 1"=30'



PULSIPHER WASH CULVERT
PROFILE VIEW

STA: 0+00.00 TO STA: 7+00.00
SCALE HOR: 1"=30', SCALE VER: 1"=10'

LEGEND

-1700-	= EXISTING 10' CONTOUR WITH ELEVATION SHOWN
	= EXISTING 2' CONTOUR
FM-16	= EXISTING FORCE MAIN
W-16	= EXISTING WATER LINE
SS-24	= EXISTING SANITARY SEWER
SD-18	= EXISTING STORM DRAIN
P	= EXISTING ELECTRICAL POWER
	= CULVERT CENTERLINE
	= HYDRAULIC GRADE LINE (HGL)
	= ENERGY GRADE LINE (EGL)
1	= CURVE IDENTIFICATION
B/7	= CULVERT CROSS SECTION
1623.74	= EXISTING TOP BACK OF CURB ELEVATION
1769.00	= EXISTING WASH SPOT ELEVATION
16	= CONSTRUCTION NOTE

CONSTRUCTION NOTES

94 INSTALL PIPE THROUGH WALL PER DETAIL 1/7

95 TIE PROPOSED BOX CULVERT INTO EXISTING BOX CULVERT PER "R.C.B. CULVERT EXTENSION" DETAIL PER NEVADA DEPARTMENT OF TRANSPORTATION, "METHOD OF EXTENDING R.C.B. CULVERTS", B-20.1.7 (502).

96 PLUG UNUSED EXISTING BOX CULVERT PER "METHOD OF PLUGGING R.C.B." DETAIL PER NEVADA DEPARTMENT OF TRANSPORTATION, "METHOD OF EXTENDING R.C.B. CULVERTS", B-20.1.7 (502).

97 CORE DRILL 18" OPENING IN EXISTING BOX FOR DROP INLET. CAP AND PLUG EXISTING DROP INLET OPENING WITH CONCRETE.

98 EXTEND STORM DRAIN PIPE TO INTERIOR CHANNEL WALL. CUT OPENING THROUGH THE CHANNEL WALL AND INSTALL PIPE THROUGH WALL PER DETAIL 1/7

CURVE TABLE CL

CURVE	RADIUS	LENGTH	TANGENT	DELTA
2	525.00'	177.13'	89.42'	19°19'52"

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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Progamemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3-9-06
Project Number 05-04
Reviewed by

NO	DESCRIPTION	DATE	BY	APPROVED

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750 WEST PIONEER BLVD.
MESQUITE, NEVADA 89027
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PLAN AND PROFILE
STA: -0+00.00/0+00.00 TO STA : 7+00.00
FOR
PULSIPHER WASH IMPROVEMENTS
KENNEDY COMMERCIAL
MESQUITE, NEVADA

PROFESSIONAL ENGINEER
TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 016479
STATE OF NEVADA
3-1-06

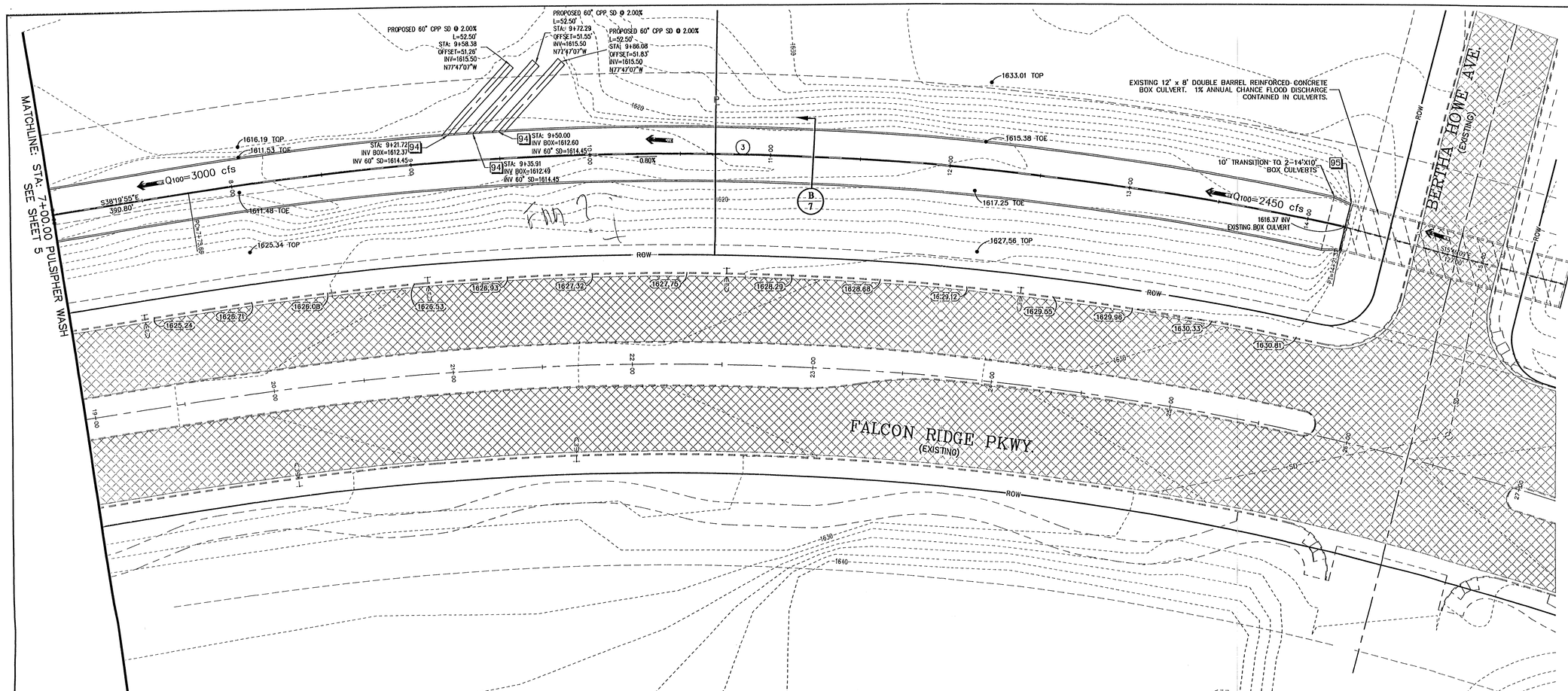
Progamemeyer Design Group
City of Mesquite Plan Review
Reviewed 05-04-06
Project Number 1005502 05-104

SCALE:	1" = 30'
DRAWN BY:	B.C.
CHECKED BY:	T.A.
PROJECT NO:	1470
DATE:	MAR 2006
SHEET NO:	5 OF 7

PLOT DATE

60% SUBMIT	
90% SUBMIT	03-01-06
100% SUBMIT	
REVISION 1	
REVISION 2	
REVISION 3	

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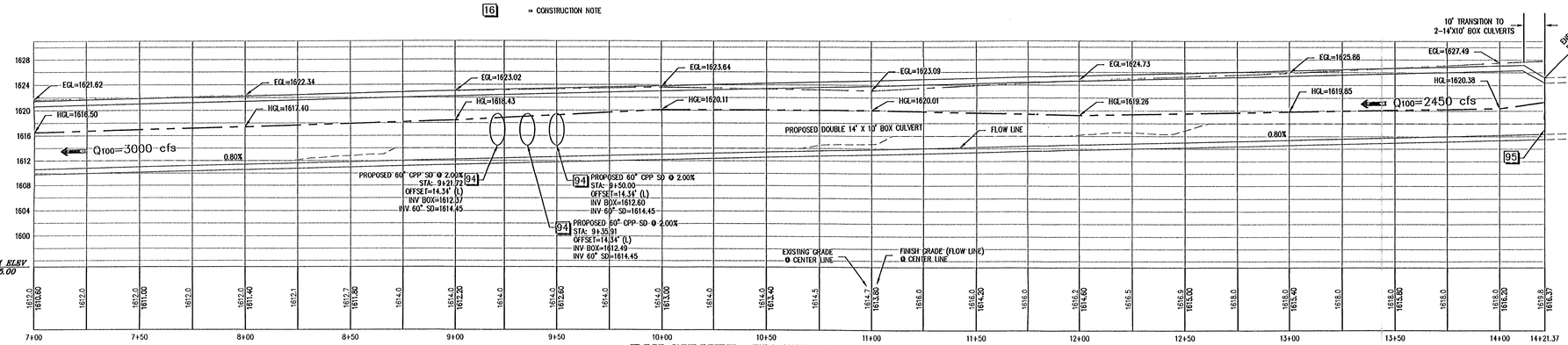
PULSIPHER WASH CULVERT PLAN VIEW

STA: 7+00.00 TO STA: 14+21.37
SCALE HOR: 1"=30'

LEGEND

- -1700- = EXISTING 10' CONTOUR WITH ELEVATION SHOWN
- = EXISTING 2' CONTOUR
- SD-24 = EXISTING STORM DRAIN
- = CULVERT CENTERLINE
- = HYDRAULIC GRADE LINE (HGL)
- = ENERGY GRADE LINE (EGL)
- (1) = CURVE IDENTIFICATION
- B/7 = CULVERT CROSS SECTION
- 1623.74 = EXISTING TOP BACK OF CURB ELEVATION
- X 1769.00 = EXISTING WASH SPOT ELEVATION
- 16 = CONSTRUCTION NOTE

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PULSIPHER WASH CULVERT PROFILE VIEW

STA: 7+00.00 TO STA: 14+21.37
SCALE HOR: 1"=30', SCALE VER: 1"=10'

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

CONSTRUCTION NOTES

94 INSTALL PIPE THROUGH WALL PER DETAIL (1/7)

95 TIE PROPOSED BOX CULVERT INTO EXISTING BOX CULVERT PER "R.C.B. CULVERT EXTENSION" DETAIL PER NEVADA DEPARTMENT OF TRANSPORTATION, "METHOD OF EXTENDING R.C.B. CULVERTS", D-20.1.7 (502).

CURVE TABLE CL

CURVE	RADIUS	LENGTH	TANGENT	DELTA
3	1801.02'	645.71'	326.36'	20°32'31"

Poggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 1470.007 04-12-1

PLOT DATE
60% SUBMIT
90% SUBMIT 03-01-06
100% SUBMIT
REVISION 1
REVISION 2
REVISION 3

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NOTE: ALL EXISTING UTILITY LOCATIONS MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

REVISIONS			
NO	DESCRIPTION	DATE	BY APPROVED

Poggemeyer Design Group
City of Mesquite Plan Review
Date Reviewed 3-6-06
Project Number 04-12-1
Reviewed by

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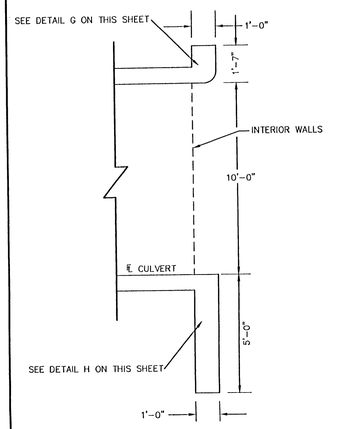
PLAN AND PROFILE STA: 7+00.00 TO STA: 14+21.37 FOR PULSIPHER WASH IMPROVEMENTS KENNEDY COMMERCIAL

MESQUITE, NEVADA

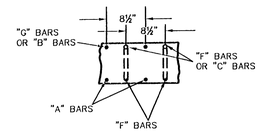
REGISTERED PROFESSIONAL ENGINEER
TRAVIS H. ANDERSON
Exp. 12/31/06
CIVIL
No. 016479
3-2-06

SCALE	DRAWN BY:	CHECKED BY:
1" = 30'	B.C.	T.A.
PROJECT NO: 1470	DATE: MAR 2006	SHEET NO: 6 OF 7

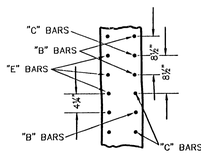
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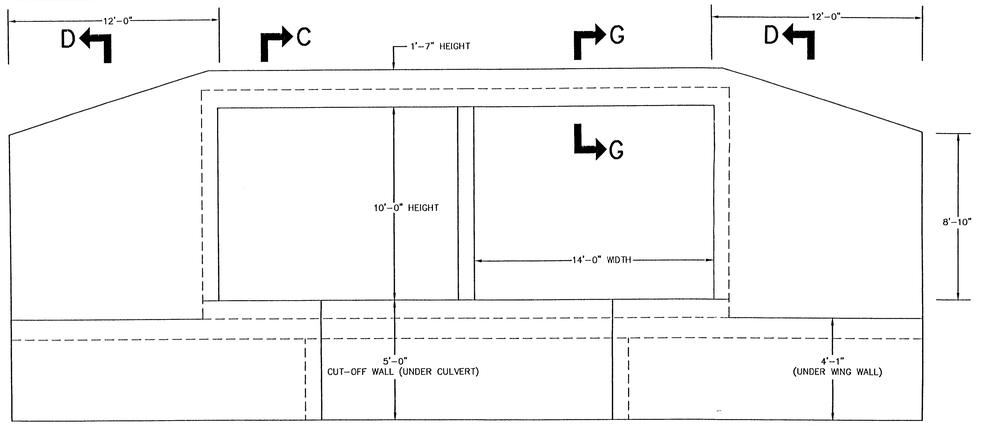
SECTION C–C



SECTION E–E ROOF SECTION

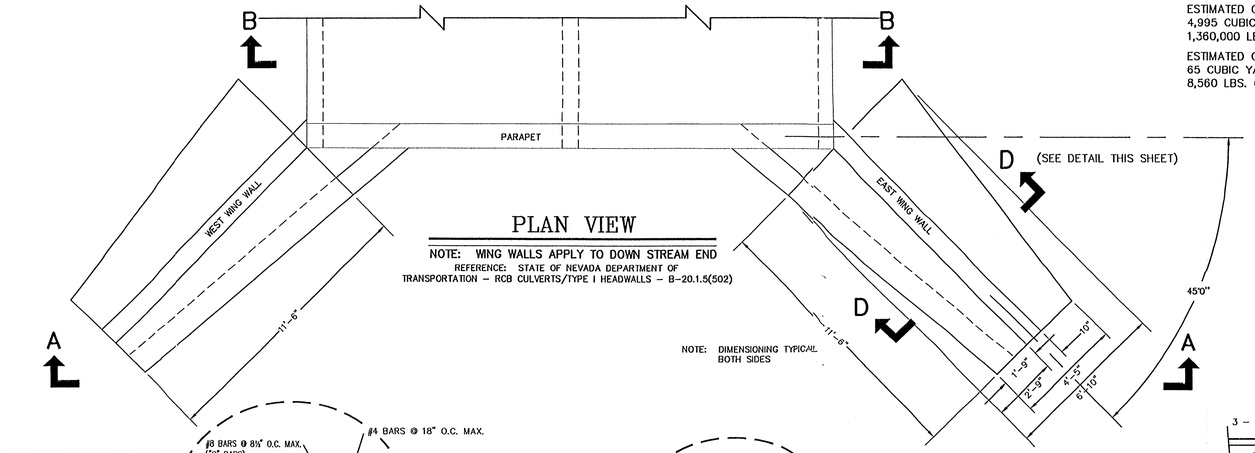


SECTION F–F EXTERIOR WALL SECTION



SECTION A–A

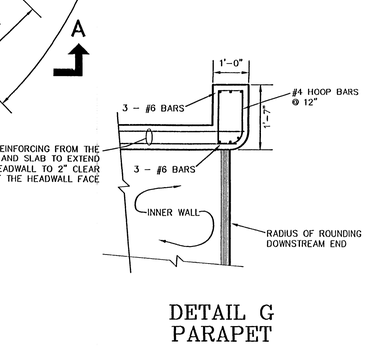
NOTE: WING WALLS APPLY TO DOWN STREAM END



PLAN VIEW

NOTE: WING WALLS APPLY TO DOWN STREAM END

REFERENCE: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION – RCB CULVERTS/TYPE I HEADWALLS – B–20.1.5(502)



DETAIL "H" DOWN STREAM CUTOFF WALL

CULVERT QUANTITIES

ESTIMATED QUANTITIES FOR CULVERT:
4,995 CUBIC YARDS OF CONCRETE
1,360,000 LBS. OF REINFORCEMENT

ESTIMATED QUANTITIES FOR WING WALLS:
65 CUBIC YARDS OF CONCRETE
8,560 LBS. OF REINFORCEMENT

R.C.B. CULVERT GENERAL NOTES

1– DESIGN SPECIFICATION: AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1977" AND "INTERIM SPECIFICATIONS" THROUGH 1980.

2– CONSTRUCTION SPECIFICATIONS: CURRENT EDITION STATE OF NEVADA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AND SPECIAL PROVISIONS THERETO.

3– LOADING: LIVE LOAD: STANDARD HS20–44 OR ALTERNATE FHWA MILITARY LOADING. IMPACT FOR TOP SLAB IS 30 FT. OF COVER, NO IMPACT OVER 3 FT. IMPACT NOT INCLUDED FOR INVERT; SURCHARGE NOT INCLUDED FOR WALLS.
EQUIVALENT FLUID PRESSURE FOR TWO CONDITIONS: A) 140 LBS/CU FT VERTICAL, 42 LBS/CU FT HORIZONTAL AND B) 140 LBS/CU FT VERTICAL AND HORIZONTAL. LOAD FACTORS: 2.5(L+I).

4– CONCRETE: CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI. MAXIMUM ALLOWABLE SHEAR $VC = 3.5\sqrt{F'C}$ PSI TAKEN AT A DISTANCE D FROM THE FACE OF THE SUPPORTING MEMBER.

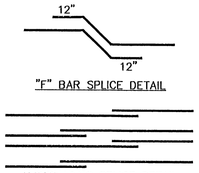
5– REINFORCING STEEL: REINFORCING STEEL SHALL BE AASHTO M 31 (ASTM A615) GRADE 60. MAIN REINFORCEMENT IS TO BE PLACED IN THE TRANSVERSE DIRECTION. STAGGER ALL LAP SPLICES. HOOKS MAY BE ROTATED OR TILTED AS NECESSARY TO PROVIDE PROPER CLEARANCE. REINFORCEMENT SHALL HAVE A 2–1/2" INCH CLEARANCE ON BOTTOM OF INVERT AND A 2 INCH CLEARANCE ON REMAINDER OF CULVERT AND ITS APPURTENANCES UNLESS OTHERWISE NOTED IN THE CONTRACT PLANS. REINFORCING STEEL IN THE TOP SLAB SHALL HAVE AN EPOXY COATING WHEN THERE IS 6 INCHES OR LESS OF COVER ON THE RCB (CLARK COUNTY EXCLUDED). REINFORCEMENT STEEL SHALL CONFORM TO SPECIFICATIONS IN SECTION 1907 OF THE 1997 UNIFORM BUILDING CODE FOR MINIMUM BEND DIAMETERS, SURFACE CONDITIONS, PLATING, ETC.

6– FOUNDATION PRESSURE: EXISTING GROUND SHOULD BE CAPABLE OF SUPPORTING 1.2 TONS/FT^2 FOR BOX CULVERT. CONSULT WITH AUTHORIZED GEOTECHNICAL ENGINEER FOR AVAILABLE BEARING PRESSURE AT THE PROPOSED LOCATION OF THE RCB CULVERT.
A. EXCAVATE TO AN ELEVATION CORRESPONDING TO TWO(2) FEET BELOW PAD ELEVATION. THE EXCAVATION SHALL EXTEND A MINIMUM OF THREE(3) FEET BEYOND THE PROPOSED CULVERT BOUNDARY.
B. FILL PAD TO WITHIN 12 INCHES OF FINAL PAD GRADE USING THE EXCAVATED ON–SITE SANDY SOIL PLACED IN MOISTURE AND DENSITY (95% MODIFIED PROCTOR) CONTROLLED LIFTS.
C. FILL TO FINAL PAD GRADE USING TYPE II BASE, PLACED IN MOISTURE DENSITY (95% MODIFIED PROCTOR) CONTROLLED LIFTS.

7– SPLICING: WHEN THE ADDITION OF CELLS CAUSES THE LENGTHS OF THE "A", "F" AND "G" BARS TO EXCEED 60 FEET THE BARS WILL REQUIRE SPLICING. SPLICES FOR THE "A" BARS SHALL BE CENTERED ABOUT THE CENTER LINE OF THE INTERIOR WALLS. SPLICES FOR THE "G" BARS SHALL BE CENTERED ABOUT THE CENTER OF THE CELLS. SPLICES FOR THE "F" BARS SHALL BE DONE AT THE 45° LEG AND CONFORM TO THE SPLICE DETAIL SHOWN. SPLICE LOCATIONS SHALL BE ALTERNATED FROM BAR TO BAR. SEE DETAIL SHOWN. SPLICE LENGTHS FOR THE "A" AND "G" BARS SHALL BE AS FOLLOWS:

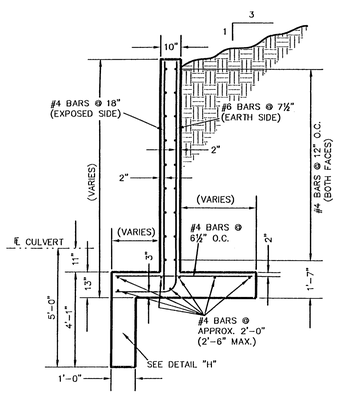
NO. 4 BARS – 16 INCHES
NO. 6 BARS – 24 INCHES
NO. 7 BARS – 31 INCHES
NO. 8 BARS – 40 INCHES

DETAIL G PARAPET

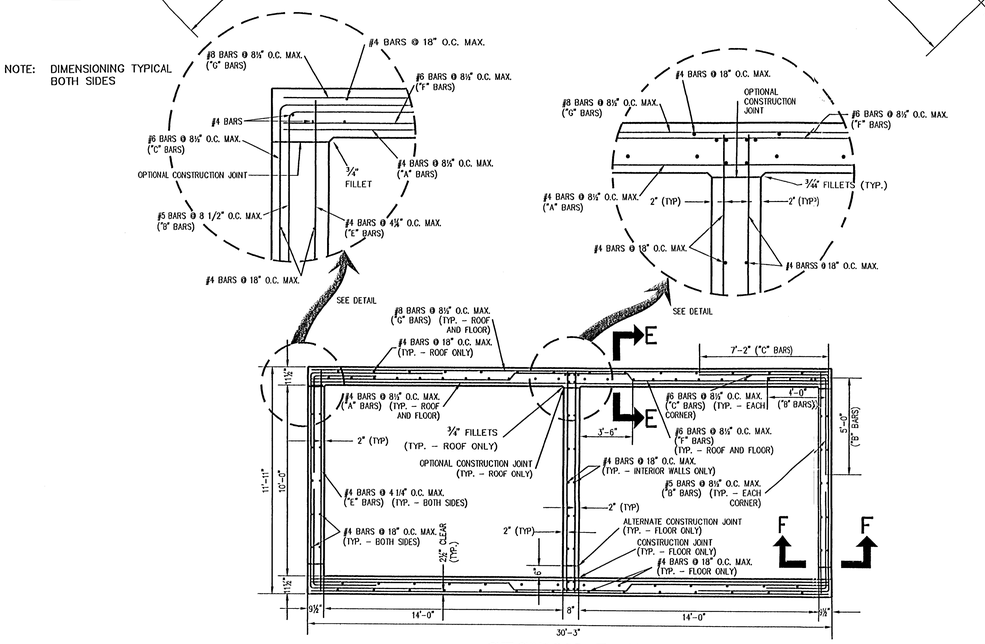


"F" BAR SPLICE DETAIL

ALTERNATING SPLICE DETAIL



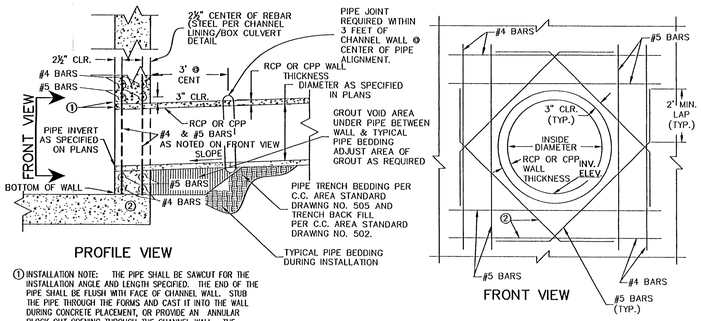
SECTION D–D WING WALL CROSS–SECTION VIEW



SECTION B–B

DOUBLE BARREL 14' X 10' REINFORCED CONCRETE CULVERT DETAILS

REFERENCE: STATE OF NEVADA DEPARTMENT OF TRANSPORTATION – RCB CULVERTS – B–20.1.3(502), B–20.1.1(502)(505)



① INSTALLATION NOTE: THE PIPE SHALL BE SAWCUT FOR THE INSTALLATION ANGLE AND LENGTH SPECIFIED. THE END OF THE PIPE SHALL BE FLUSH WITH FACE OF CHANNEL WALL. STUB THE PIPE THROUGH THE FORMS AND CAST IT INTO THE WALL DURING CONCRETE PLACEMENT, OR PROVIDE AN ANNULAR BLOCK OUT OPENING THROUGH THE CHANNEL WALL. THE ANNULAR SPACE SHALL BE FILLED SOLID WITH NONSHRINK GROUT.

② ALL THE REINFORCEMENT SHOWN, IS IN ADDITION TO NORMAL WALL REINFORCEMENT (FOR BOTH CHANNEL FACE, AND EARTH SIDE REINFORCEMENT MATS). THE ADDITIONAL REINFORCEMENT SHALL BE TIED TO THE NORMAL WALL REINFORCEMENT (BOTH FACES).

DETAIL I PIPE THROUGH WALL DETAIL FRONT AND PROFILE VIEW

Reviewed by: Daggemeyer Design Group
City of Mesquite Plan Review
Received 03-06-06
Project Number 1030907 06-121

REVISIONS

NO	DESCRIPTION	DATE	BY	APPROVED
	City Comments Plan Review	3-2-06		

Date Reviewed 06-121
Project Number
Reviewed by

THE SUBMITTED DRAWINGS, SPECIFICATIONS, AND REPORTS, ARE INCOMPLETE, AND ARE SUBJECT TO REVIEW AND COMMENT BY THE CITY OF MESQUITE. AS SUCH, THESE DRAWINGS, SPECIFICATIONS, AND REPORTS SHALL NOT BE CONSTRUED TO BE APPROVED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

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P.O. BOX 5174 CEDAR CITY, UT 84720 (435) 586-4562

DETAIL SHEET DOUBLE BARREL R.C.B CULVERT FOR PULSIPHER WASH IMPROVEMENT KENNEDY COMMERCIAL

MESQUITE, NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA TRAVIS H. ANDERSON Exp. 12/31/06 CIVIL No. 016479 3-2-06

SCALE: NO SCALE	DRAWN BY: B.C.	CHECKED BY: T.A.
PROJECT NO: 1470	DATE: MAR 2006	SHEET NO: 7 OF 7

PLOT DATE

60% SUBMIT	
90% SUBMIT	03-01-06
100% SUBMIT	
REVISION 1	
REVISION 2	
REVISION 3	