# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA CONDITIONAL LETTER OF MAP REVISION APPLICATION

April 2007

Prepared For:

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT



Prepared By:

vtn nevada

# FEMA

# CONDITIONAL LETTER OF MAP REVISION APPLICATION

# DUCK CREEK CHANNEL

# LAS VEGAS BLVD. TO

# LOWER DUCK CREEK DETENTION BASIN

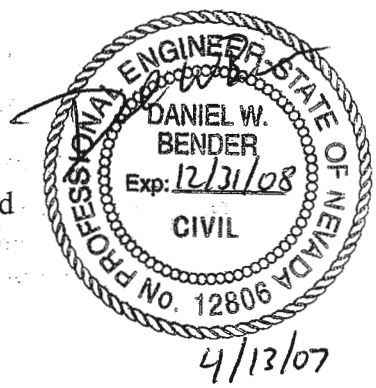
DRAFT

*Prepared for:*

**CLARK COUNTY**
**REGIONAL FLOOD CONTROL DISTRICT**
600 S. GRAND CENTRAL PARKWAY
LAS VEGAS, NEVADA 89106-4511

*Prepared by:*

**VTN Nevada**
2727 S. Rainbow Boulevard
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4/13/07

vtn nevada

April 2007

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Duck Creek Channel – Las Vegas Blvd to Silverado Ranch Blvd Plans
Duck Creek Channel – Silverado Ranch Blvd to LDCDB Plans
Current FEMA Flood Zone Map
CCRFCD MPU Facilities Map

**F. Data CD**

Hydrologic Analysis Letter Report for Duck Creek Channel Improvements CLOMR, Spencer Street to El Dorado Lane, by PBS&J

Electronic Hydrologic and Hydraulic Model Files and Figures

## 1.0 INTRODUCTION

The purpose of this request for Conditional Letter of Map Revision is to show the effects of a proposed channel on the Duck Creek from just downstream of Las Vegas Boulevard to the Lower Duck Creek Detention Basin. Refer to Appendix A, Figure 1, Vicinity Map, for an overall view of the study area.

The flood control facilities in the project vicinity include the proposed Duck Creek Channel between Las Vegas Boulevard and Silverado Ranch Boulevard, the existing channel between Silverado Ranch Boulevard and the existing Lower Duck Creek Detention Basin, and other tributary channels.

This analysis will show that due to the proposed channel improvements, the existing FEMA flood zones will be contained in the proposed channel improvements, and the previous flow split near Silverado Ranch Boulevard no longer exists.

## 2.0 HYDROLOGY

The flow rates for this study were obtained from the Hydrologic Analysis Letter Report for Duck Creek Channel Improvements CLOMR, Spencer Street to El Dorado Lane, by PBS&J, included electronically in Appendix F. This report incorporates the latest developments in the Duck Creek watershed. This report also includes the latest information from housing developments (Mountain's Edge, Arlington Ranch, and South Mountain), and detention basins (Central Duck Creek Detention Basin, Lower Duck Creek Detention Basin, and the Bruner Detention Basin). Based on the information presented in the Duck Creek Channel CLOMR, Spencer Street to Eldorado Lane, the flow rates for the Duck Creek Channel are as shown in Table 1.

**Table 1**

| Reach | HEC-1 Combination Point | Tributary Area ($mi^2$) | 100 Year Flow (cfs) |
|---|---|---|---|
| North Box | DVI153 | 27.27 | 2028 |
| South Box | PT24A | 58.91 | 3135 |
| Confluence | PT25 | 69.76 | 4826 |

## 3.0 HYDRAULICS

### Existing Conditions

Existing conditions are defined by four studies of the area: Green Park Channel/Culvert System CLOMR (Case No. 06-09-B275P, February 2006), I-15/Silverado Ranch Boulevard Interchange CLOMR (Case No. 06-09-B230R, June 2006), Duck Creek/Blue Diamond Washes FIS Restudy (Case No. 03-09-0980X, March 2002) and Grande Pointe LOMR (Case No. 06-09-B036P, October 2006). These are also summarized in Table 2.

**Table 2**

| Reach | Reference Study for Existing Conditions |
|---|---|
| North Box | I-15/Silverado Ranch Boulevard Interchange CLOMR |
| South Box | Green Park Channel/Culvert System CLOMR |
| Confluence to Silverado Ranch Blvd | Duck Creek/Blue Diamond Washes FIS Restudy |
| Silverado Ranch Blvd to LDCDB | Grande Point LOMR |

### Post-Project Conditions – HEC-RAS

The intent of the post-project model is to show that FEMA flood zones are contained in the proposed Duck Creek Channel improvements. This requires the following facilities to be in place:

1. Duck Creek Channel Improvements – Las Vegas Blvd to Silverado Ranch Blvd, currently under design by VTN Nevada
2. Central Duck Creek Detention Basin – Phase I, this is assumed to be complete and operational per the Duck Creek – Spencer to El Dorado CLOMR (see Section 2.0.)

The model is based on the proposed VTN Duck Creek Channel Improvements, supplemented upstream and downstream with information obtained from the studies in Table 2. Upstream of Las Vegas Boulevard, the model uses the same channel geometrics as the existing conditions, based on the Green Park and Silverado Interchange studies. Between Las Vegas Boulevard and Silverado Ranch Boulevard the model is based on the proposed VTN channel improvements. Downstream of Silverado Ranch Boulevard, the model is based on the existing Duck Creek Channel improvements.

## 4.0 RESULTS

The HEC-RAS post-project model results show that the existing improvements in conjunction with the channel improvements designed by VTN are sufficient to contain the 100 Year flood. This is a significant improvement over the current FEMA flood zone. These results are shown on the Post-Project work maps and the Annotated Flood Zone Map, both included in Appendix B. Complete HEC-RAS results are included in Appendix C. Electronic HEC-RAS files are included on the data CD in Appendix F.

## 5.0 CONCLUSION

With the Duck Creek Channel Phase II Improvements, concrete channel lining will be constructed along the "North Box" and "South Box" alignments of Duck Creek from Las Vegas Boulevard to the confluence, and from the confluence downstream to Silverado Ranch Boulevard. Channel improvements already exist from Silverado Ranch Boulevard to the Lower Duck Creek Detention Basin. The hydraulic model of these improvements (post-project model) shows that the 100 Year flood will be contained in the channel and the current FEMA flood zone areas will be contained in the proposed channel improvements.

## 6.0 REFERENCES


1. Clark County Regional Flood Control District, *Hydraulic Criteria and Drainage Design Manual*, August 1999.

2. PBS&J, G.C. Wallace, and Louis Berger Group, *Clark County Regional Flood Control District, Flood Control Master Plan Update of the Las Vegas Valley,* 2002.

3. PBS&J, *I-15/Silverado Ranch Boulevard Interchange CLOMR (Case No. 06-09-B230R)*, June 2006.

4. G.C. Wallace, *Duck Creek/Blue Diamond Washes FIS Restudy (Case No. 03-09-0980X),* March 2002.

5. Stantec, *Green Park Channel/Culvert System CLOMR (Case No. 06-09-B275P)*, February 2006.

6. Integrity Engineers, *Grande Pointe LOMR (Case No. 06-09-B036P, October 2006),* October 2006.

7. PBS&J, *Hydrologic Analysis Letter Report for Duck Creek Channel Improvements CLOMR, Spencer Street to El Dorado Lane*, February 2007.

# APPENDIX A

## FIGURES

**DUCK CREEK VICINITY MAP**
-FIGURE 1.0




# DUCK CREEK CLOMR

## VICINITY MAP

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

FIGURE 1

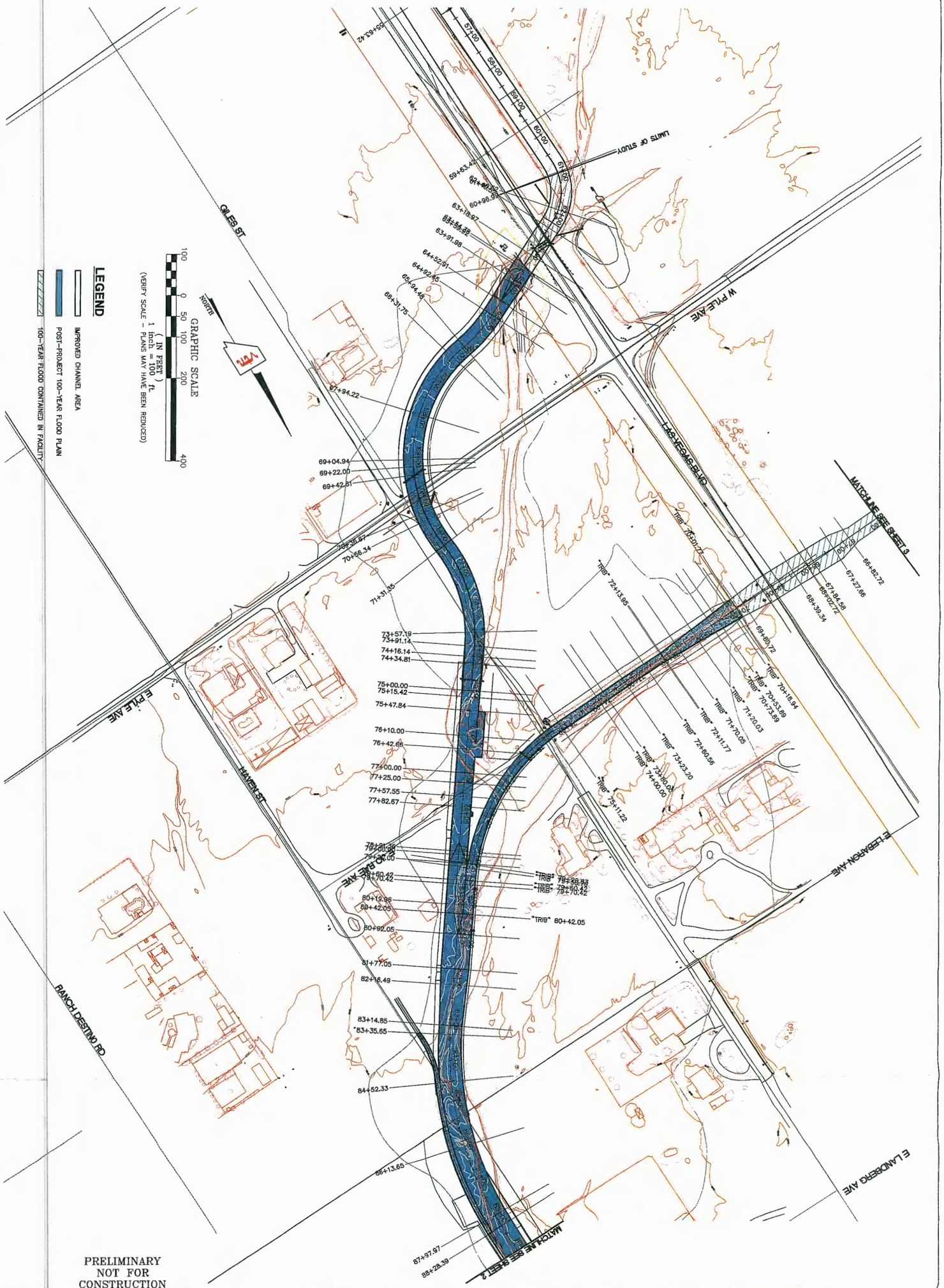
vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
6757 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5140
PHONE (702) 873-7500 FAX (702) 362-2567

# APPENDIX B

## MAPS

# POST-PROJECT WORK MAP

POST-SH1
I:\8011\dwg\6857-LOMR\project work maps.dwg




PRELIMINARY
NOT FOR
CONSTRUCTION

PROFESSIONAL ENGINEER STATE OF NEVADA
DANIEL W. BENDER
No. 12809
CIVIL

TITLE: POST-PROJECT WORK MAP

PROJECT: DUCK CREEK CLOMR

SEAL

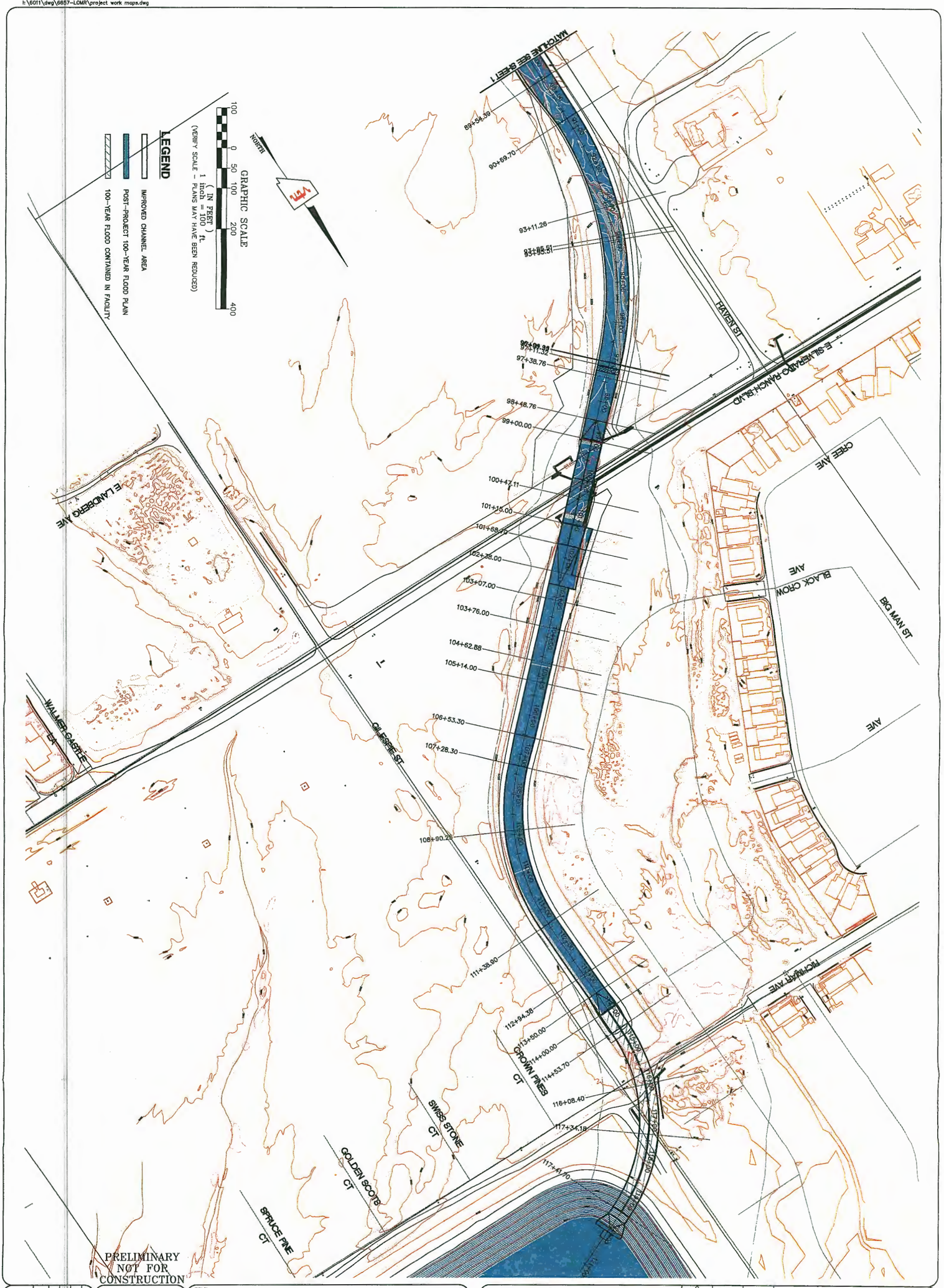
| WO. NO. | DESIGNED BY | DRAWN BY | DATE | SCALE | DRAWING |
|---|---|---|---|---|---|
| 6857 | JJ | JJB | 04/13/07 | HORIZ. 1"=100'<br>VERT. NONE | SHEET 1 OF 3 SHEETS |

| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

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LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597

POST-SH2
I:\6011\dwg\6857-LOMR\project work maps.dwg




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CONSTRUCTION

| | |
|---|---|
| W.O. NO. | 6857 |
| DESIGNED BY | J.J. |
| DRAWN BY | J.B. |
| DATE | 04/13/07 |
| SCALE HORIZ. | 1"=100' |
| VERT. | NONE |
| DRAWING SHEET | 2 OF 3 SHEETS |

PROFESSIONAL ENGINEER STATE OF NEVADA
DANIEL W. BENDER
No. 12809
CIVIL
SEAL

TITLE: POST-PROJECT WORK MAP

PROJECT: DUCK CREEK CLOMR

| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |


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NORTH

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.
(VERIFY SCALE - PLANS MAY HAVE BEEN REDUCED)

**LEGEND**

- IMPROVED CHANNEL AREA
- POST-PROJECT 100-YEAR FLOOD PLAIN
- 100-YEAR FLOOD CONTAINED IN FACILITY

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| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |


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LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597


TITLE: POST-PROJECT WORK MAP

PROJECT: DUCK CREEK CLOMR

SEAL

PROFESSIONAL ENGINEER-STATE OF NEVADA
DANIEL W. BENDER
EXP. 12/31/08
CIVIL
No. 12806

| | |
|---|---|
| WO. NO. | 6657 |
| DESIGNED BY | LL |
| DRAWN BY | JLB |
| DATE | 04/13/07 |
| SCALE HORIZ. | 1"=100' |
| SCALE VERT. | NONE |
| DRAWING | |
| SHEET | 3 OF 3 SHEETS |

POST-SK3
I:\6011\dwg\6657-LOMR\project work maps.dwg

# ANNOTATED FLOOD ZONE MAP




## LEGEND

- 2244 — BASE FLOOD ELEVATION LINE AND VALUE; ELEVATION IN FEET
- ZONE AE FLOOD PLAIN
- AREA TO BE REMOVED FROM FLOOD ZONE

**PANEL 2568 OF 4090**

| | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2568 | E |

**MAP NUMBER: 32003C2568 E**

PROFESSIONAL ENGINEER-STATE OF NEVADA
DANIEL W. BENDER
EXP. 12/31/04
CIVIL
No. 12808

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CONSTRUCTION

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# ANNOTATED FLOOD ZONE MAP
# DUCK CREEK CLOMR

1

# APPENDIX C

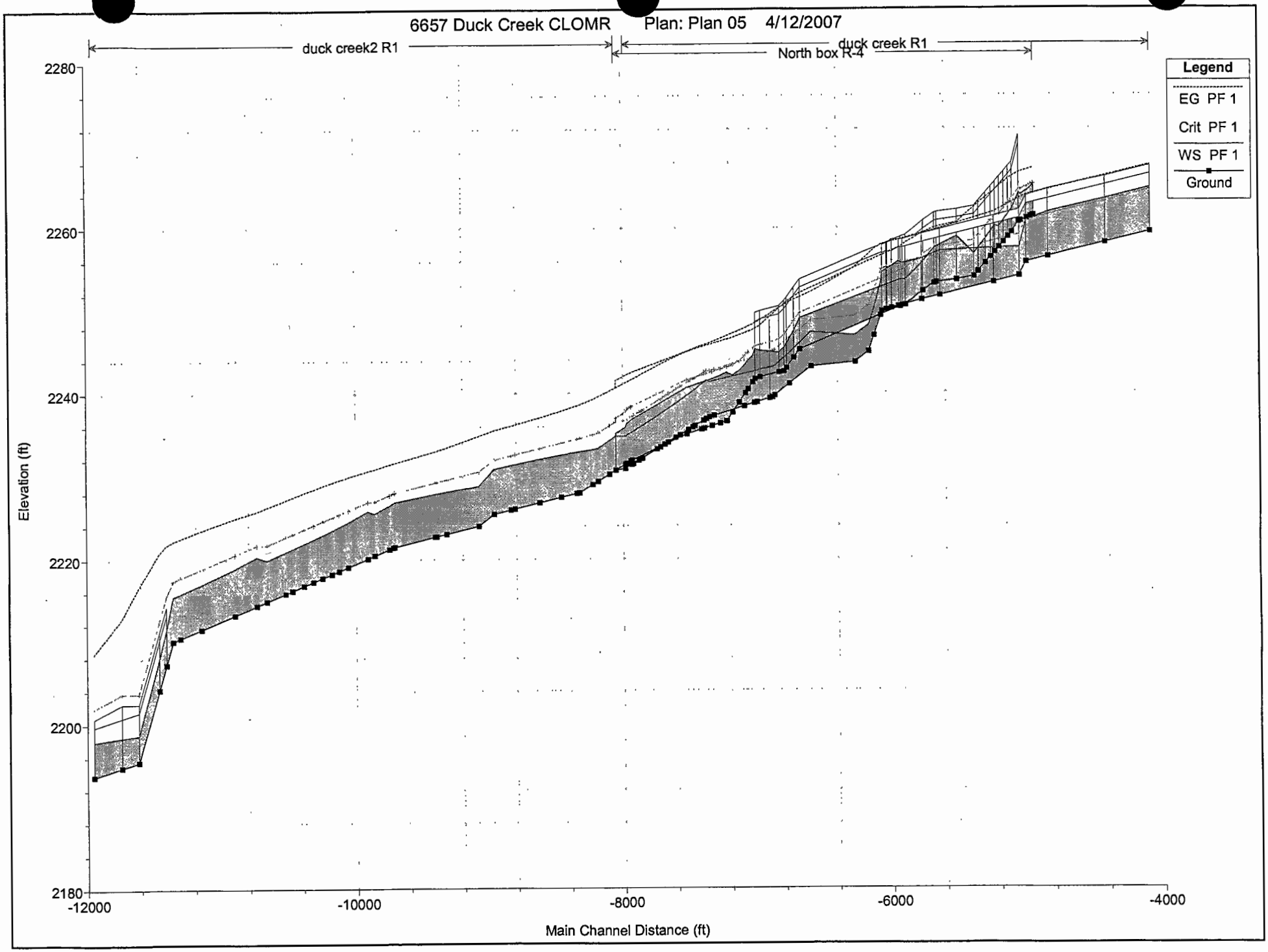
## POST-PROJECT HEC-RAS OUTPUT

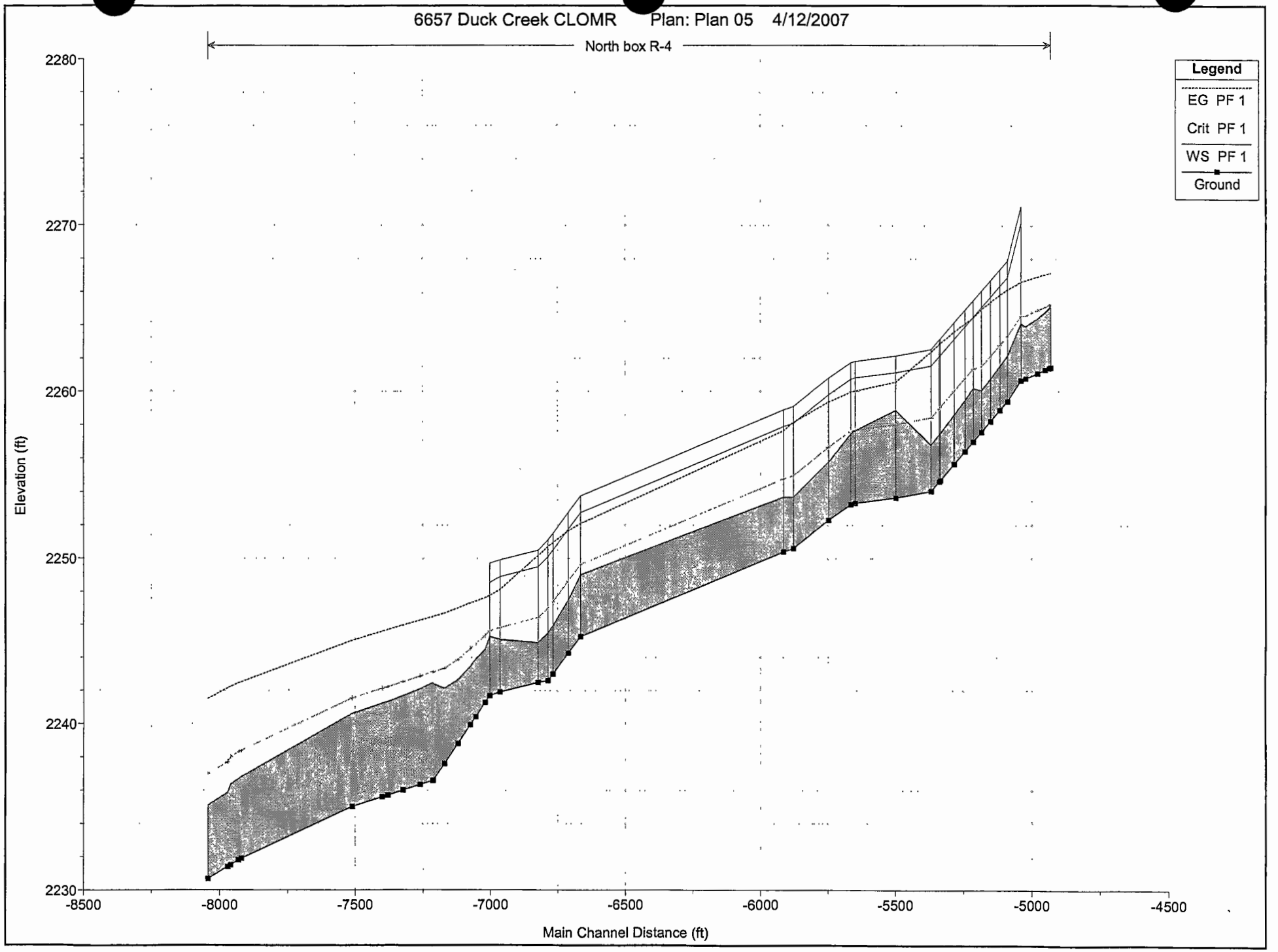
HEC-RAS Plan: Plan 05 Profile: PF 1

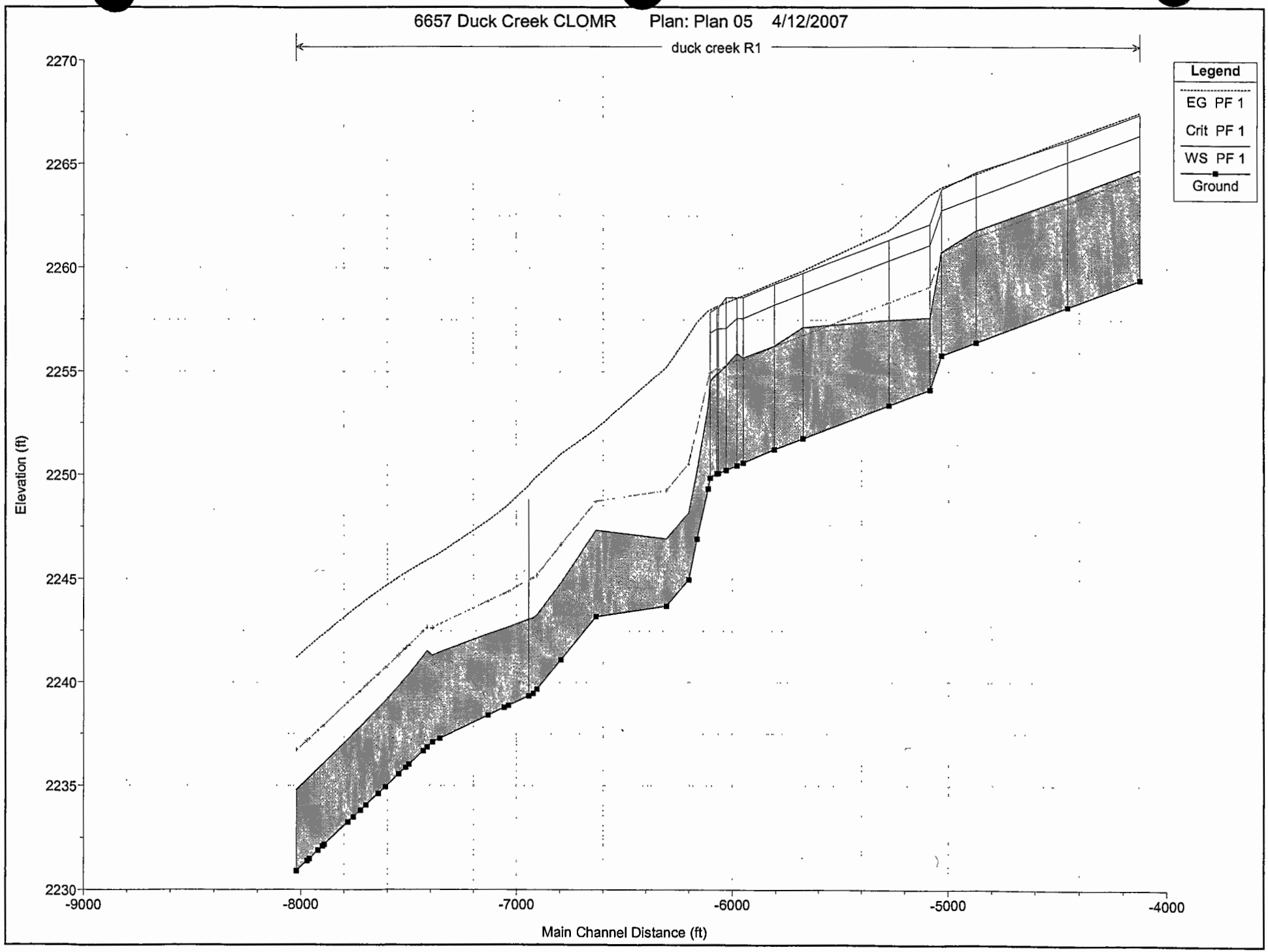
| River | Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # | Hydr Depth | R. Freeboard |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | | (ft) | (ft) |
| North box | R-4 | -4947.21 | PF 1 | 2028 | 2261.44 | 2265.24 | 2265.24 | 2267.16 | 0.002585 | 11.12 | 182.38 | 48.00 | 1.01 | 3.80 | 8.20 |
| North box | R-4 | -4951.89 | PF 1 | 2028 | 2261.41 | 2265.05 | 2265.21 | 2267.14 | 0.002961 | 11.61 | 174.70 | 48.00 | 1.07 | 3.64 | 8.36 |
| North box | R-4 | -4967.12 | PF 1 | 2028 | 2261.30 | 2264.78 | 2265.10 | 2267.07 | 0.003419 | 12.15 | 166.93 | 48.00 | 1.15 | 3.48 | 8.52 |
| North box | R-4 | -4995.19 | PF 1 | 2028 | 2261.09 | 2264.40 | 2264.89 | 2266.93 | 0.004003 | 12.77 | 158.82 | 48.00 | 1.24 | 3.31 | 8.69 |
| North box | R-4 | -5039.61 | PF 1 | 2028 | 2260.77 | 2263.92 | 2264.57 | 2266.71 | 0.004666 | 13.40 | 151.34 | 48.00 | 1.33 | 3.15 | 8.85 |
| North box | R-4 | -5055.91 | PF 1 | 2028 | 2260.66 | 2264.11 | 2264.55 | 2266.62 | 0.004763 | 12.72 | 159.48 | 45.49 | 1.21 | 3.51 | -3.45 |
| North box | R-4 | -5105.91 | PF 1 | 2028 | 2259.40 | 2262.15 | 2263.32 | 2266.14 | 0.009708 | 16.02 | 126.60 | 44.91 | 1.70 | 2.82 | -2.75 |
| North box | R-4 | -5133.42 | PF 1 | 2028 | 2258.88 | 2261.52 | 2262.80 | 2265.83 | 0.010935 | 16.65 | 121.81 | 45.00 | 1.80 | 2.71 | -2.65 |
| North box | R-4 | -5168.74 | PF 1 | 2028 | 2258.20 | 2260.75 | 2262.12 | 2265.39 | 0.012262 | 17.28 | 117.38 | 45.07 | 1.91 | 2.60 | -2.55 |
| North box | R-4 | -5201.46 | PF 1 | 2028 | 2257.58 | 2260.06 | 2261.51 | 2264.95 | 0.013307 | 17.74 | 114.32 | 45.12 | 1.98 | 2.53 | -2.48 |
| North box | R-4 | -5231.46 | PF 1 | 2028 | 2257.00 | 2260.18 | 2261.37 | 2264.43 | 0.009590 | 16.54 | 122.61 | 36.99 | 1.64 | 3.31 | -3.18 |
| North box | R-4 | -5261.86 | PF 1 | 2028 | 2256.42 | 2259.47 | 2260.79 | 2264.07 | 0.010840 | 17.23 | 117.72 | 37.13 | 1.74 | 3.17 | -3.05 |
| North box | R-4 | -5301.48 | PF 1 | 2028 | 2255.66 | 2258.58 | 2260.00 | 2263.58 | 0.012269 | 17.95 | 112.99 | 37.26 | 1.85 | 3.03 | -2.92 |
| North box | R-4 | -5352.52 | PF 1 | 2028 | 2254.69 | 2257.50 | 2259.06 | 2262.89 | 0.013729 | 18.63 | 108.87 | 37.37 | 1.96 | 2.91 | -2.81 |
| North box | R-4 | -5356.13 | PF 1 | 2028 | 2254.62 | 2257.42 | 2258.96 | 2262.83 | 0.013817 | 18.67 | 108.64 | 37.38 | 1.97 | 2.91 | -2.80 |
| North box | R-4 | -5386.13 | PF 1 | 2028 | 2254.05 | 2256.81 | 2258.42 | 2262.39 | 0.014479 | 18.96 | 106.98 | 37.42 | 2.01 | 2.86 | -2.76 |
| North box | R-4 | -5515.90 | PF 1 | 2028 | 2253.65 | 2258.88 | 2258.02 | 2260.56 | 0.002548 | 10.41 | 194.78 | 32.19 | 0.80 | 6.05 | -5.23 |
| North box | R-4 | -5665.69 | PF 1 | 2028 | 2253.33 | 2257.67 | 2257.67 | 2260.02 | 0.004019 | 12.30 | 164.81 | 35.33 | 1.04 | 4.66 | -4.34 |
| North box | R-4 | -5682.16 | PF 1 | 2028 | 2253.24 | 2257.45 | 2257.61 | 2259.94 | 0.004337 | 12.65 | 160.38 | 35.77 | 1.09 | 4.48 | -4.21 |
| North box | R-4 | -5764.87 | PF 1 | 2028 | 2252.31 | 2255.79 | 2256.68 | 2259.36 | 0.007413 | 15.18 | 133.64 | 36.69 | 1.43 | 3.64 | -3.48 |
| North box | R-4 | -5895.57 | PF 1 | 2028 | 2250.60 | 2253.70 | 2254.97 | 2258.14 | 0.010269 | 16.92 | 119.85 | 37.07 | 1.69 | 3.23 | -3.10 |
| North box | R-4 | -5932.72 | PF 1 | 2028 | 2250.40 | 2253.70 | 2254.77 | 2257.65 | 0.008619 | 15.96 | 127.06 | 36.87 | 1.55 | 3.45 | -3.30 |
| North box | R-4 | -6682.72 | PF 1 | 2028 | 2245.25 | 2249.02 | 2249.62 | 2252.09 | 0.005900 | 14.05 | 144.33 | 36.39 | 1.28 | 3.97 | -3.77 |
| North box | R-4 | -6727.66 | PF 1 | 2028 | 2244.26 | 2247.46 | 2248.63 | 2251.64 | 0.009355 | 16.40 | 123.63 | 36.96 | 1.61 | 3.34 | -3.21 |
| North box | R-4 | -6784.58 | PF 1 | 2028 | 2243.00 | 2245.91 | 2247.37 | 2250.94 | 0.012390 | 18.01 | 112.62 | 37.27 | 1.86 | 3.02 | -2.91 |
| North box | R-4 | -6802.72 | PF 1 | 2028 | 2242.60 | 2245.45 | 2246.94 | 2250.69 | 0.013160 | 18.37 | 110.40 | 37.33 | 1.92 | 2.96 | -2.85 |
| North box | R-4 | -6839.34 | PF 1 | 2028 | 2242.49 | 2244.88 | 2246.41 | 2250.16 | 0.015581 | 18.44 | 110.00 | 43.90 | 2.10 | 2.51 | -2.39 |
| North box | R-4 | -6980.72 | PF 1 | 2028 | 2241.91 | 2245.11 | 2245.80 | 2248.12 | 0.006570 | 13.94 | 145.52 | 42.60 | 1.37 | 3.42 | -3.05 |
| North box | R-4 | -7001.77 | PF 1 | 2028 | 2241.70 | 2245.27 | 2245.61 | 2247.76 | 0.004989 | 12.68 | 159.98 | 41.69 | 1.18 | 3.84 | -3.57 |
| North box | R-4 | -7018.94 | PF 1 | 2028 | 2241.28 | 2244.47 | 2245.31 | 2247.60 | 0.005542 | 14.20 | 142.80 | 47.88 | 1.45 | 2.98 | 7.23 |
| North box | R-4 | -7053.89 | PF 1 | 2028 | 2240.43 | 2243.90 | 2244.83 | 2247.41 | 0.005741 | 15.03 | 134.92 | 41.54 | 1.47 | 3.25 | 5.97 |
| North box | R-4 | -7073.89 | PF 1 | 2028 | 2239.95 | 2243.46 | 2244.53 | 2247.29 | 0.006215 | 15.70 | 129.14 | 39.08 | 1.52 | 3.30 | 5.90 |
| North box | R-4 | -7120.03 | PF 1 | 2028 | 2238.83 | 2242.65 | 2243.86 | 2246.99 | 0.006559 | 16.73 | 121.24 | 33.36 | 1.55 | 3.63 | 5.55 |
| North box | R-4 | -7170.05 | PF 1 | 2028 | 2237.61 | 2242.13 | 2243.33 | 2246.68 | 0.005996 | 17.11 | 118.52 | 27.16 | 1.44 | 4.36 | 4.80 |
| North box | R-4 | -7211.77 | PF 1 | 2028 | 2236.60 | 2242.41 | 2243.11 | 2246.47 | 0.004523 | 16.17 | 125.45 | 22.00 | 1.19 | 5.70 | 3.41 |
| North box | R-4 | -7213.95 | PF 1 | 2028 | 2236.59 | 2242.48 | 2243.12 | 2246.46 | 0.004397 | 16.02 | 126.60 | 22.00 | 1.18 | 5.75 | 3.38 |
| North box | R-4 | -7260.56 | PF 1 | 2028 | 2236.35 | 2242.10 | 2242.86 | 2246.25 | 0.004668 | 16.34 | 124.08 | 22.00 | 1.21 | 5.64 | 3.47 |
| North box | R-4 | -7323.20 | PF 1 | 2028 | 2236.02 | 2241.69 | 2242.53 | 2245.96 | 0.004862 | 16.58 | 122.34 | 22.00 | 1.24 | 5.56 | 3.55 |
| North box | R-4 | -7380.00 | PF 1 | 2028 | 2235.72 | 2241.35 | 2242.23 | 2245.68 | 0.004975 | 16.71 | 121.37 | 22.00 | 1.25 | 5.52 | 3.59 |
| North box | R-4 | -7400.00 | PF 1 | 2028 | 2235.62 | 2241.25 | 2242.13 | 2245.58 | 0.004971 | 16.71 | 121.40 | 22.00 | 1.25 | 5.52 | 3.09 |
| North box | R-4 | -7511.22 | PF 1 | 2028 | 2235.04 | 2240.63 | 2241.55 | 2245.03 | 0.005081 | 16.83 | 120.49 | 22.00 | 1.27 | 5.48 | 3.13 |
| North box | R-4 | -7920.83 | PF 1 | 2028 | 2231.90 | 2236.82 | 2238.40 | 2242.53 | 0.007431 | 19.18 | 105.71 | 22.00 | 1.54 | 4.81 | 3.80 |

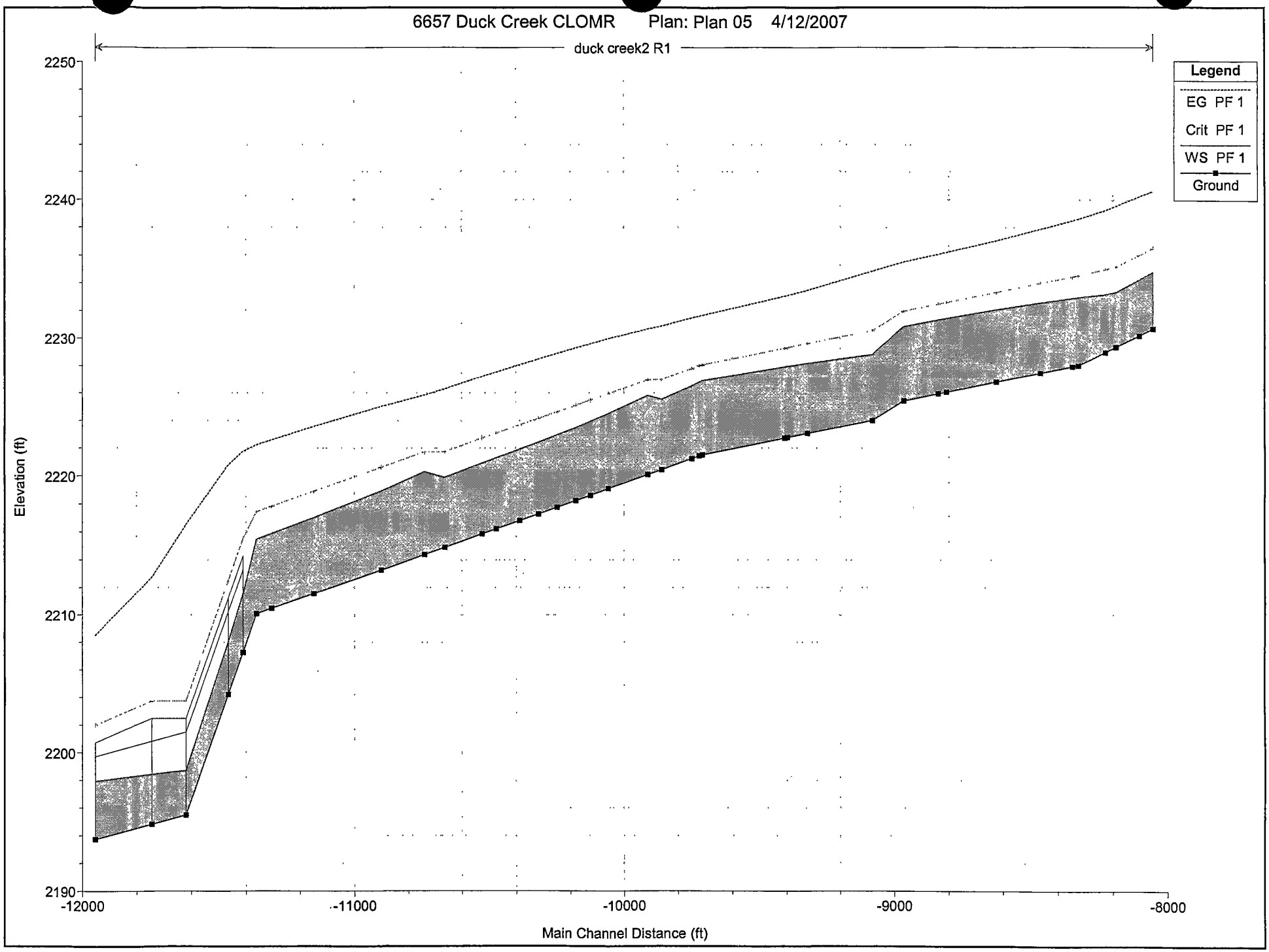
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| North box | R-4 | -7930.76 | PF 1 | 2028 | 2231.80 | 2236.69 | 2238.31 | 2242.46 | 0.007532 | 19.27 | 105.23 | 22.00 | 1.55 | 4.78 | 3.83 |
| North box | R-4 | -7960.42 | PF 1 | 2028 | 2231.50 | 2236.35 | 2238.01 | 2242.23 | 0.007757 | 19.47 | 104.18 | 22.00 | 1.58 | 4.74 | 3.87 |
| North box | R-4 | -7970.42 | PF 1 | 2028 | 2231.40 | 2235.87 | 2237.69 | 2242.15 | 0.008789 | 20.11 | 100.84 | 23.17 | 1.70 | 4.35 | 3.76 |
| North box | R-4 | -8042.05 | PF 1 | 2028 | 2230.68 | 2235.11 | 2236.97 | 2241.51 | 0.009044 | 20.31 | 99.87 | 23.17 | 1.72 | 4.31 | 3.80 |
| duck creek | R1 | -4414.11 | PF 1 | 3135 | 2259.43 | 2264.76 | 2264.50 | 2267.52 | 0.003984 | 13.34 | 234.97 | 36.15 | 1.02 | 6.50 | -5.33 |
| duck creek | R1 | -4743.42 | PF 1 | 3135 | 2258.11 | 2263.41 | 2263.10 | 2266.20 | 0.004029 | 13.40 | 233.91 | 36.25 | 1.03 | 6.45 | -5.30 |
| duck creek | R1 | -5163.42 | PF 1 | 3135 | 2256.43 | 2261.82 | 2261.52 | 2264.54 | 0.003897 | 13.22 | 237.16 | 35.63 | 1.00 | 6.66 | -5.39 |
| duck creek | R1 | -5322.84 | PF 1 | 3135 | 2255.79 | 2260.78 | 2260.78 | 2263.87 | 0.004604 | 14.11 | 222.14 | 37.99 | 1.11 | 5.85 | -4.99 |
| duck creek | R1 | -5375.42 | PF 1 | 3135 | 2254.11 | 2257.61 | 2259.10 | 2263.51 | 0.011474 | 19.49 | 160.86 | 43.83 | 1.84 | 3.67 | -3.50 |
| duck creek | R1 | -5563.42 | PF 1 | 3135 | 2253.36 | 2257.50 | 2258.35 | 2261.81 | 0.007268 | 16.65 | 188.27 | 41.64 | 1.44 | 4.52 | -4.14 |
| duck creek | R1 | -5963.42 | PF 1 | 3135 | 2251.76 | 2257.14 | 2256.75 | 2259.87 | 0.003910 | 13.24 | 236.80 | 35.72 | 1.01 | 6.63 | -5.38 |
| duck creek | R1 | -6096.99 | PF 1 | 3135 | 2251.23 | 2256.23 | 2256.22 | 2259.31 | 0.004569 | 14.07 | 222.79 | 37.90 | 1.11 | 5.88 | -5.00 |
| duck creek | R1 | -6240.52 | PF 1 | 3135 | 2250.58 | 2255.68 | 2255.57 | 2258.66 | 0.004389 | 13.86 | 226.26 | 37.39 | 1.08 | 6.05 | -5.10 |
| duck creek | R1 | -6268.97 | PF 1 | 3135 | 2250.45 | 2255.89 | 2255.55 | 2258.54 | 0.003729 | 13.06 | 240.09 | 36.22 | 0.99 | 6.63 | -5.44 |
| duck creek | R1 | -6318.97 | PF 1 | 3135 | 2250.23 | 2255.29 | 2255.29 | 2258.34 | 0.004563 | 14.01 | 223.81 | 36.87 | 1.10 | 6.07 | -5.06 |
| duck creek | R1 | -6354.38 | PF 1 | 3135 | 2250.08 | 2254.93 | 2255.07 | 2258.17 | 0.004894 | 14.45 | 217.02 | 38.72 | 1.16 | 5.60 | -4.85 |
| duck creek | R1 | -6359.92 | PF 1 | 3135 | 2250.06 | 2254.91 | 2255.15 | 2258.15 | 0.004877 | 14.44 | 217.17 | 38.83 | 1.15 | 5.59 | -4.85 |
| duck creek | R1 | -6391.98 | PF 1 | 3135 | 2249.85 | 2254.53 | 2254.94 | 2257.98 | 0.005303 | 14.90 | 210.40 | 39.77 | 1.21 | 5.29 | -4.68 |
| duck creek | R1 | -6402.45 | PF 1 | 3135 | 2249.34 | 2253.29 | 2254.60 | 2257.93 | 0.006344 | 17.29 | 181.35 | 49.00 | 1.58 | 3.70 | 4.54 |
| duck creek | R1 | -6452.91 | PF 1 | 3135 | 2246.93 | 2250.14 | 2252.19 | 2257.36 | 0.012785 | 21.56 | 145.41 | 49.00 | 2.21 | 2.97 | 5.28 |
| duck creek | R1 | -6492.45 | PF 1 | 3135 | 2244.98 | 2248.17 | 2250.53 | 2256.74 | 0.015399 | 23.50 | 133.42 | 45.00 | 2.40 | 2.96 | 5.26 |
| duck creek | R1 | -6594.48 | PF 1 | 3135 | 2243.70 | 2246.95 | 2249.25 | 2255.20 | 0.014505 | 23.06 | 135.96 | 45.00 | 2.34 | 3.02 | 5.20 |
| duck creek | R1 | -6631.75 | PF 1 | 3135 | 2243.19 | 2247.36 | 2248.74 | 2252.21 | 0.006278 | 17.68 | 177.30 | 45.00 | 1.57 | 3.94 | 4.28 |
| duck creek | R1 | -6794.22 | PF 1 | 3135 | 2241.10 | 2244.82 | 2246.65 | 2250.99 | 0.009158 | 19.94 | 157.23 | 45.00 | 1.88 | 3.49 | 4.73 |
| duck creek | R1 | -6904.94 | PF 1 | 3135 | 2239.68 | 2243.26 | 2245.20 | 2249.91 | 0.010311 | 20.70 | 151.46 | 45.00 | 1.99 | 3.37 | 4.85 |
| duck creek | R1 | -6922.00 | PF 1 | 3135 | 2239.47 | 2243.13 | 2245.06 | 2249.73 | 0.011967 | 20.62 | 152.06 | 44.17 | 1.96 | 3.44 | 4.78 |
| duck creek | R1 | -6942.61 | PF 1 | 3135 | 2239.36 | 2243.07 | 2244.98 | 2249.49 | 0.011909 | 20.33 | 154.22 | 44.17 | 1.92 | 3.49 | 4.73 |
| duck creek | R1 | -7036.67 | PF 1 | 3135 | 2238.88 | 2242.69 | 2244.41 | 2248.56 | 0.008455 | 19.44 | 161.27 | 45.00 | 1.81 | 3.58 | 4.64 |
| duck creek | R1 | -7056.34 | PF 1 | 3135 | 2238.78 | 2242.62 | 2244.31 | 2248.40 | 0.008254 | 19.29 | 162.50 | 45.00 | 1.79 | 3.61 | 4.61 |
| duck creek | R1 | -7131.35 | PF 1 | 3135 | 2238.41 | 2242.35 | 2243.94 | 2247.81 | 0.007545 | 18.75 | 167.21 | 45.00 | 1.71 | 3.72 | 4.51 |
| duck creek | R1 | -7357.19 | PF 1 | 3135 | 2237.28 | 2241.48 | 2242.83 | 2246.25 | 0.006105 | 17.52 | 178.90 | 45.00 | 1.55 | 3.98 | 4.25 |
| duck creek | R1 | -7391.14 | PF 1 | 3135 | 2237.10 | 2241.32 | 2242.63 | 2246.05 | 0.006024 | 17.45 | 179.65 | 45.00 | 1.54 | 3.99 | 4.23 |
| duck creek | R1 | -7416.14 | PF 1 | 3135 | 2236.86 | 2241.53 | 2242.66 | 2245.91 | 0.005035 | 16.81 | 186.51 | 42.00 | 1.41 | 4.44 | 2.78 |
| duck creek | R1 | -7434.81 | PF 1 | 3135 | 2236.67 | 2241.25 | 2242.45 | 2245.81 | 0.005334 | 17.12 | 183.07 | 42.00 | 1.45 | 4.36 | 2.87 |
| duck creek | R1 | -7500.00 | PF 1 | 3135 | 2236.03 | 2240.39 | 2241.79 | 2245.41 | 0.006198 | 17.97 | 174.48 | 42.00 | 1.55 | 4.15 | 3.06 |
| duck creek | R1 | -7515.42 | PF 1 | 3135 | 2235.88 | 2240.21 | 2241.65 | 2245.31 | 0.006357 | 18.11 | 173.07 | 42.00 | 1.57 | 4.12 | 3.09 |
| duck creek | R1 | -7547.84 | PF 1 | 3135 | 2235.56 | 2239.82 | 2241.33 | 2245.09 | 0.006704 | 18.43 | 170.14 | 42.00 | 1.61 | 4.05 | 3.16 |
| duck creek | R1 | -7610.00 | PF 1 | 3135 | 2234.94 | 2239.09 | 2240.70 | 2244.66 | 0.007297 | 18.93 | 165.58 | 42.00 | 1.68 | 3.94 | 3.27 |
| duck creek | R1 | -7642.66 | PF 1 | 3135 | 2234.62 | 2238.73 | 2240.39 | 2244.42 | 0.007542 | 19.13 | 163.84 | 42.00 | 1.71 | 3.90 | 3.31 |
| duck creek | R1 | -7700.00 | PF 1 | 3135 | 2234.06 | 2238.11 | 2239.82 | 2243.97 | 0.007906 | 19.43 | 161.39 | 42.00 | 1.75 | 3.84 | 3.37 |
| duck creek | R1 | -7725.00 | PF 1 | 3135 | 2233.81 | 2237.84 | 2239.58 | 2243.77 | 0.008049 | 19.54 | 160.46 | 42.00 | 1.76 | 3.82 | 4.39 |
| duck creek | R1 | -7757.55 | PF 1 | 3135 | 2233.49 | 2237.50 | 2239.25 | 2243.50 | 0.008211 | 19.66 | 159.44 | 42.00 | 1.78 | 3.80 | 4.41 |
| duck creek | R1 | -7782.67 | PF 1 | 3135 | 2233.24 | 2237.23 | 2239.00 | 2243.29 | 0.008338 | 19.76 | 158.66 | 42.00 | 1.79 | 3.78 | 4.43 |
| duck creek | R1 | -7891.36 | PF 1 | 3135 | 2232.17 | 2236.10 | 2237.93 | 2242.36 | 0.008764 | 20.08 | 156.15 | 42.00 | 1.83 | 3.72 | 4.49 |
| duck creek | R1 | -7900.00 | PF 1 | 3135 | 2232.09 | 2236.02 | 2237.86 | 2242.28 | 0.008778 | 20.09 | 156.07 | 42.00 | 1.84 | 3.72 | 4.49 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| duck creek | R1 | -7920.00 | PF 1 | 3135 | 2231.89 | 2235.80 | 2237.65 | 2242.11 | 0.008866 | 20.15 | 155.58 | 42.00 | 1.85 | 3.70 | 4.51 |
| duck creek | R1 | -7960.42 | PF 1 | 3135 | 2231.49 | 2235.39 | 2237.26 | 2241.75 | 0.008983 | 20.24 | 154.93 | 42.00 | 1.86 | 3.69 | 4.52 |
| duck creek | R1 | -7970.42 | PF 1 | 3135 | 2231.39 | 2235.28 | 2237.17 | 2241.66 | 0.009016 | 20.26 | 154.75 | 42.00 | 1.86 | 3.68 | 4.53 |
| duck creek | R1 | -8019.96 | PF 1 | 3135 | 2230.91 | 2234.79 | 2236.69 | 2241.21 | 0.009106 | 20.32 | 154.25 | 42.00 | 1.87 | 3.67 | 4.54 |
| duck creek2 | R1 | -8042.05 | PF 1 | 4826 | 2230.68 | 2234.79 | 2236.49 | 2240.60 | 0.007408 | 19.35 | 249.35 | 66.00 | 1.75 | 3.78 | 4.55 |
| duck creek2 | R1 | -8092.05 | PF 1 | 4826 | 2230.19 | 2234.25 | 2236.00 | 2240.23 | 0.007742 | 19.62 | 245.94 | 66.00 | 1.79 | 3.73 | 4.60 |
| duck creek2 | R1 | -8177.05 | PF 1 | 4826 | 2229.35 | 2233.34 | 2235.17 | 2239.55 | 0.008229 | 20.00 | 241.29 | 66.00 | 1.84 | 3.66 | 4.67 |
| duck creek2 | R1 | -8216.49 | PF 1 | 4826 | 2228.97 | 2233.20 | 2234.98 | 2239.24 | 0.007448 | 19.73 | 244.60 | 62.56 | 1.76 | 3.91 | 4.41 |
| duck creek2 | R1 | -8314.85 | PF 1 | 4826 | 2228.00 | 2232.96 | 2234.53 | 2238.60 | 0.005775 | 19.06 | 253.20 | 54.00 | 1.55 | 4.69 | 3.58 |
| duck creek2 | R1 | -8335.65 | PF 1 | 4826 | 2227.92 | 2232.91 | 2234.45 | 2238.48 | 0.005670 | 18.95 | 254.68 | 54.00 | 1.54 | 4.72 | 3.55 |
| duck creek2 | R1 | -8452.33 | PF 1 | 4826 | 2227.45 | 2232.56 | 2233.98 | 2237.85 | 0.005218 | 18.45 | 261.54 | 54.00 | 1.48 | 4.84 | 3.43 |
| duck creek2 | R1 | -8613.65 | PF 1 | 4826 | 2226.81 | 2232.07 | 2233.34 | 2237.05 | 0.004753 | 17.91 | 269.46 | 54.00 | 1.41 | 4.99 | 3.28 |
| duck creek2 | R1 | -8797.97 | PF 1 | 4826 | 2226.07 | 2231.44 | 2232.60 | 2236.21 | 0.004434 | 17.52 | 275.52 | 54.00 | 1.37 | 5.10 | 3.17 |
| duck creek2 | R1 | -8828.39 | PF 1 | 4826 | 2225.95 | 2231.34 | 2232.48 | 2236.07 | 0.004391 | 17.46 | 276.38 | 54.00 | 1.36 | 5.12 | 3.15 |
| duck creek2 | R1 | -8954.39 | PF 1 | 4826 | 2225.44 | 2230.87 | 2231.97 | 2235.53 | 0.004282 | 17.32 | 278.62 | 54.00 | 1.34 | 5.16 | 3.11 |
| duck creek2 | R1 | -9069.70 | PF 1 | 4826 | 2224.02 | 2228.82 | 2230.55 | 2234.86 | 0.006425 | 19.72 | 244.74 | 54.00 | 1.63 | 4.53 | 3.74 |
| duck creek2 | R1 | -9330.70 | PF 1 | 4826 | 2223.06 | 2228.17 | 2229.59 | 2233.47 | 0.005231 | 18.47 | 261.33 | 54.00 | 1.48 | 4.84 | 3.43 |
| duck creek2 | R1 | -9404.95 | PF 1 | 4826 | 2222.76 | 2227.93 | 2229.29 | 2233.09 | 0.005017 | 18.22 | 264.83 | 54.00 | 1.45 | 4.90 | 3.37 |
| duck creek2 | R1 | -9414.95 | PF 1 | 4826 | 2222.72 | 2227.90 | 2229.25 | 2233.04 | 0.004989 | 18.19 | 265.31 | 54.00 | 1.45 | 4.91 | 3.36 |
| duck creek2 | R1 | -9722.78 | PF 1 | 4826 | 2221.51 | 2226.90 | 2228.04 | 2231.63 | 0.004380 | 17.45 | 276.62 | 54.00 | 1.36 | 5.12 | 3.15 |
| duck creek2 | R1 | -9724.14 | PF 1 | 4826 | 2221.50 | 2226.89 | 2228.03 | 2231.62 | 0.004394 | 17.46 | 276.33 | 54.00 | 1.36 | 5.12 | 3.15 |
| duck creek2 | R1 | -9734.14 | PF 1 | 4826 | 2221.43 | 2226.78 | 2227.96 | 2231.58 | 0.004483 | 17.58 | 274.56 | 54.00 | 1.37 | 5.08 | 3.19 |
| duck creek2 | R1 | -9761.58 | PF 1 | 4826 | 2221.23 | 2226.51 | 2227.76 | 2231.45 | 0.004695 | 17.84 | 270.53 | 54.00 | 1.40 | 5.01 | 3.26 |
| duck creek2 | R1 | -9871.58 | PF 1 | 4826 | 2220.46 | 2225.55 | 2226.99 | 2230.89 | 0.005293 | 18.54 | 260.35 | 54.00 | 1.49 | 4.82 | 3.45 |
| duck creek2 | R1 | -9922.82 | PF 1 | 4826 | 2220.10 | 2225.82 | 2226.94 | 2230.66 | 0.004239 | 17.64 | 273.52 | 50.00 | 1.33 | 5.47 | 1.78 |
| duck creek2 | R1 | -10032.20 | PF 1 | 4826 | 2219.09 | 2224.50 | 2225.93 | 2229.94 | 0.005097 | 18.73 | 257.73 | 50.00 | 1.45 | 5.15 | 2.10 |
| duck creek2 | R1 | -10100.10 | PF 1 | 4826 | 2218.61 | 2223.95 | 2225.48 | 2229.58 | 0.005376 | 19.06 | 253.27 | 50.00 | 1.49 | 5.07 | 3.20 |
| duck creek2 | R1 | -10153.80 | PF 1 | 4826 | 2218.24 | 2223.48 | 2225.08 | 2229.29 | 0.005631 | 19.34 | 249.59 | 50.00 | 1.53 | 4.99 | 2.26 |
| duck creek2 | R1 | -10223.10 | PF 1 | 4826 | 2217.77 | 2222.96 | 2224.61 | 2228.89 | 0.005811 | 19.53 | 247.07 | 50.00 | 1.55 | 4.94 | 2.31 |
| duck creek2 | R1 | -10292.10 | PF 1 | 4826 | 2217.29 | 2222.43 | 2224.13 | 2228.47 | 0.005989 | 19.72 | 244.69 | 50.00 | 1.57 | 4.89 | 2.36 |
| duck creek2 | R1 | -10361.10 | PF 1 | 4826 | 2216.82 | 2221.93 | 2223.66 | 2228.05 | 0.006119 | 19.86 | 243.01 | 50.00 | 1.59 | 4.86 | 2.39 |
| duck creek2 | R1 | -10477.90 | PF 1 | 4826 | 2216.22 | 2221.29 | 2223.06 | 2227.51 | 0.006271 | 20.02 | 241.10 | 50.00 | 1.61 | 4.82 | 2.43 |
| duck creek2 | R1 | -10529.10 | PF 1 | 4826 | 2215.87 | 2220.92 | 2222.71 | 2227.20 | 0.006352 | 20.10 | 240.11 | 50.00 | 1.62 | 4.80 | 2.45 |
| duck creek2 | R1 | -10668.40 | PF 1 | 4826 | 2214.90 | 2219.91 | 2221.74 | 2226.29 | 0.006523 | 20.27 | 238.07 | 50.00 | 1.64 | 4.76 | 2.49 |
| duck creek2 | R1 | -10743.40 | PF 1 | 4826 | 2214.38 | 2220.32 | 2221.72 | 2225.83 | 0.004753 | 18.84 | 256.14 | 45.00 | 1.39 | 5.69 | 3.56 |
| duck creek2 | R1 | -10906.80 | PF 1 | 4826 | 2213.26 | 2218.93 | 2220.60 | 2225.01 | 0.005519 | 19.78 | 243.96 | 45.00 | 1.50 | 5.42 | 3.83 |
| duck creek2 | R1 | -11154.00 | PF 1 | 4826 | 2211.55 | 2217.03 | 2218.89 | 2223.56 | 0.006161 | 20.50 | 235.38 | 45.00 | 1.58 | 5.23 | 4.02 |
| duck creek2 | R1 | -11311.50 | PF 1 | 4826 | 2210.48 | 2215.90 | 2217.82 | 2222.58 | 0.006389 | 20.75 | 232.62 | 45.00 | 1.61 | 5.17 | 4.08 |
| duck creek2 | R1 | -11367.20 | PF 1 | 4826 | 2210.09 | 2215.49 | 2217.43 | 2222.23 | 0.006482 | 20.84 | 231.54 | 45.00 | 1.62 | 5.15 | 4.10 |
| duck creek2 | R1 | -11417.20 | PF 1 | 4826 | 2207.26 | 2211.54 | 2215.51 | 2221.75 | 0.015618 | 25.65 | 188.17 | 44.00 | 2.19 | 4.28 | 1.72 |
| duck creek2 | R1 | -11470.90 | PF 1 | 4826 | 2204.22 | 2208.05 | 2212.47 | 2220.77 | 0.021663 | 28.62 | 168.64 | 44.00 | 2.58 | 3.83 | 2.17 |
| duck creek2 | R1 | -11625.60 | PF 1 | 4826 | 2195.48 | 2198.72 | 2203.73 | 2216.52 | 0.035993 | 33.86 | 142.55 | 44.00 | 3.31 | 3.24 | 2.76 |
| duck creek2 | R1 | -11745.00 | PF 1 | 4826 | 2194.82 | 2198.44 | 2203.72 | 2212.71 | 0.025767 | 30.32 | 159.19 | 44.00 | 2.81 | 3.62 | 2.38 |
| duck creek2 | R1 | -11952.60 | PF 1 | 4826 | 2193.72 | 2197.93 | 2201.97 | 2208.49 | 0.016413 | 26.08 | 185.06 | 44.00 | 2.24 | 4.21 | 1.79 |


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
duck creek2 R1
duck creek R1
North box R-4
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
2280
2260
2240
2220
2200
2180
Elevation (ft)
-12000
-10000
-8000
-6000
-4000
Main Channel Distance (ft)

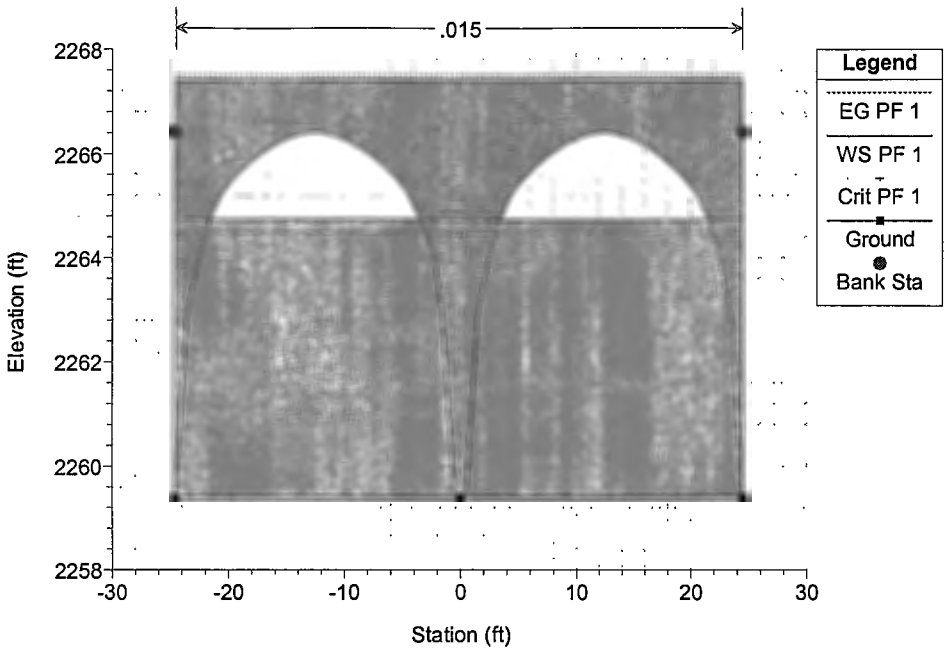

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
North box R-4
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2280
2270
2260
2250
2240
2230
-8500
-8000
-7500
-7000
-6500
-6000
-5500
-5000
-4500
Main Channel Distance (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
duck creek R1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2270
2265
2260
2255
2250
2245
2240
2235
2230
-9000
-8000
-7000
-6000
-5000
-4000
Main Channel Distance (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
duck creek2 R1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
2250
2240
2230
2220
2210
2200
2190
Elevation (ft)
-12000
-11000
-10000
-9000
-8000
Main Channel Distance (ft)

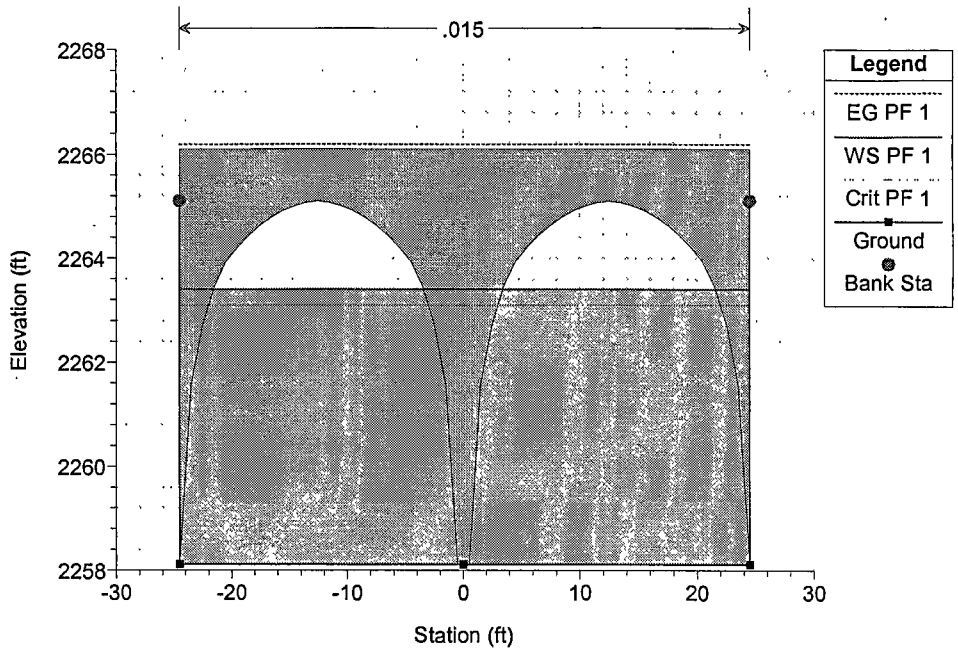
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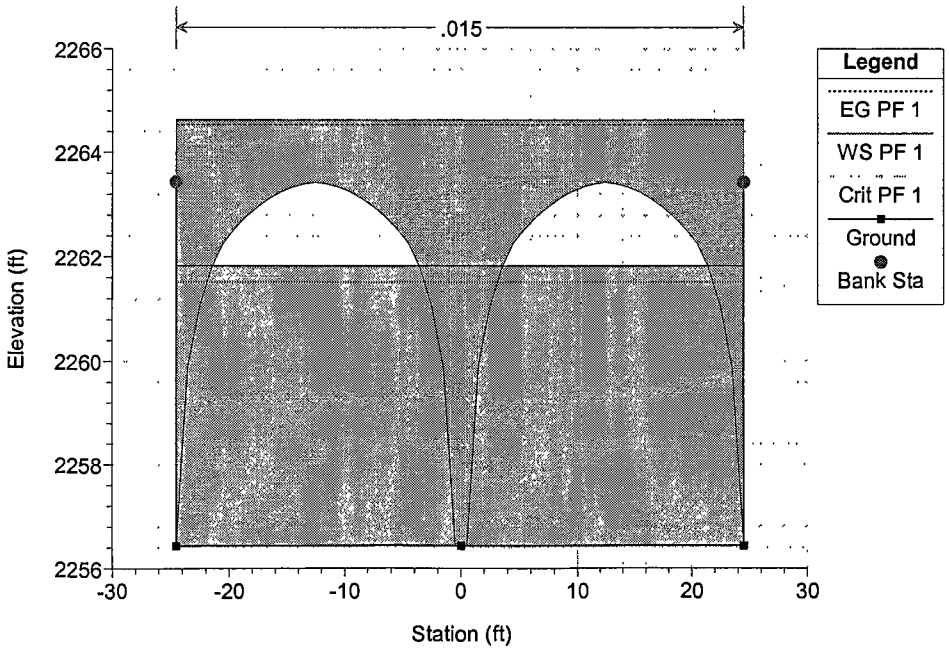

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

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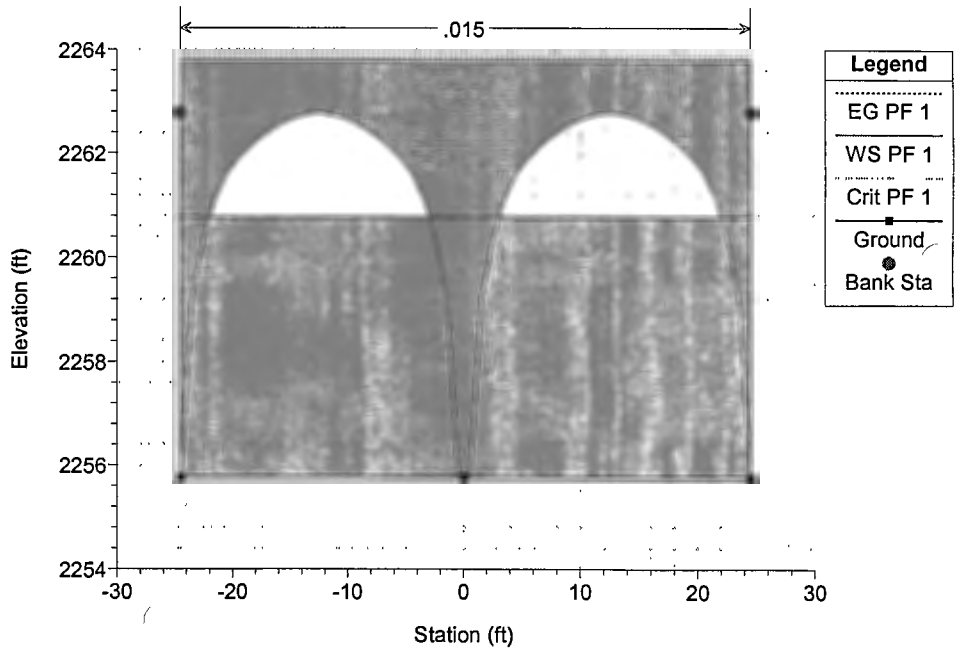

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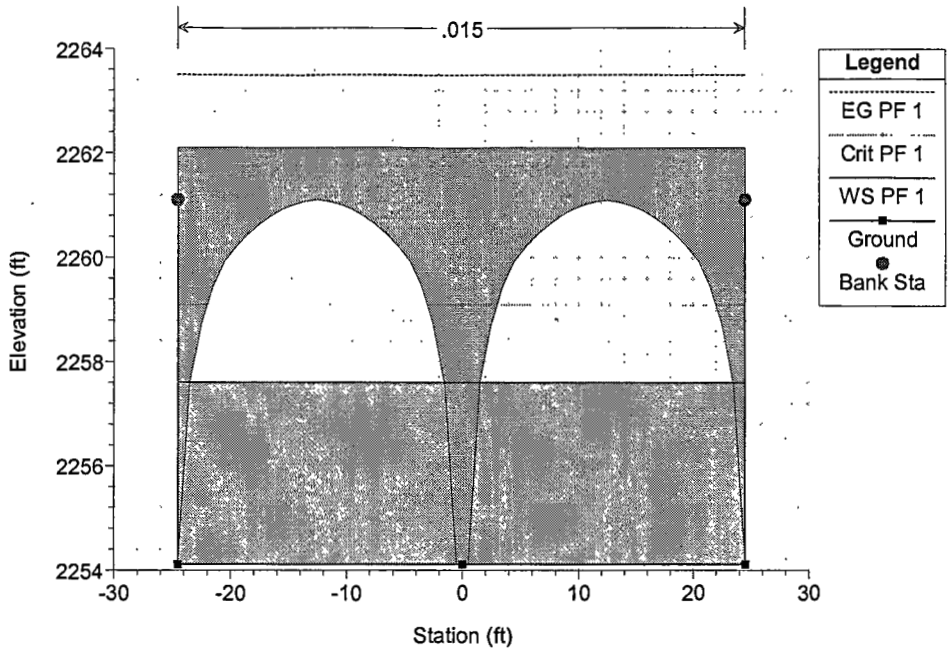

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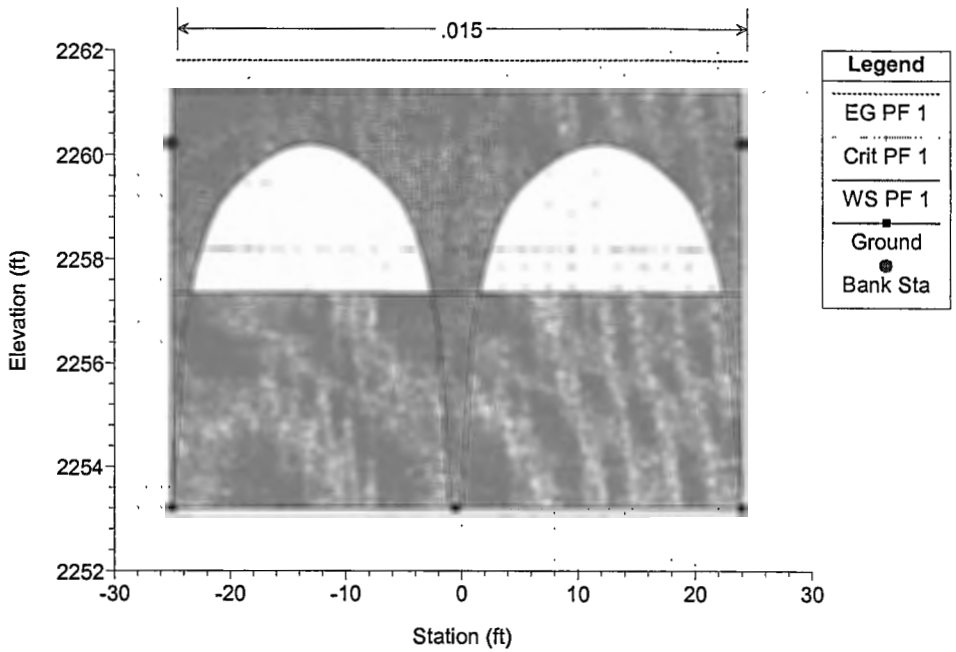
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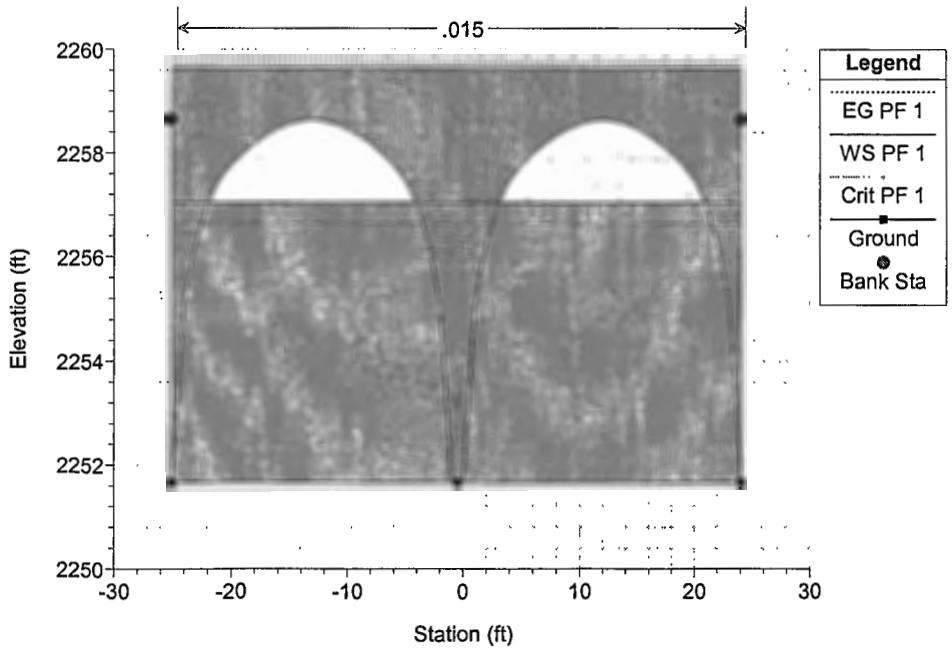

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

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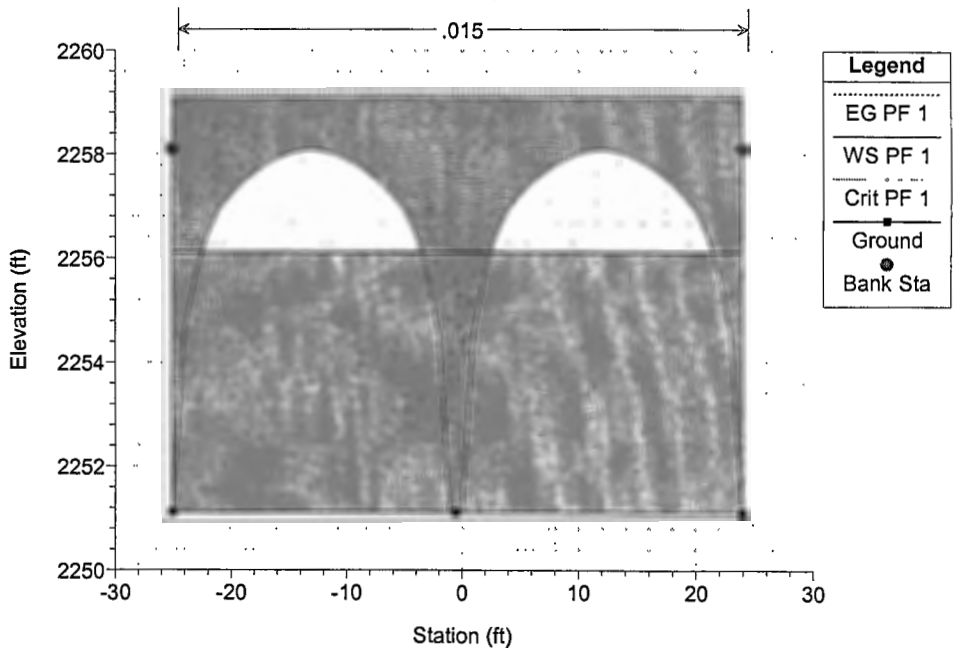

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

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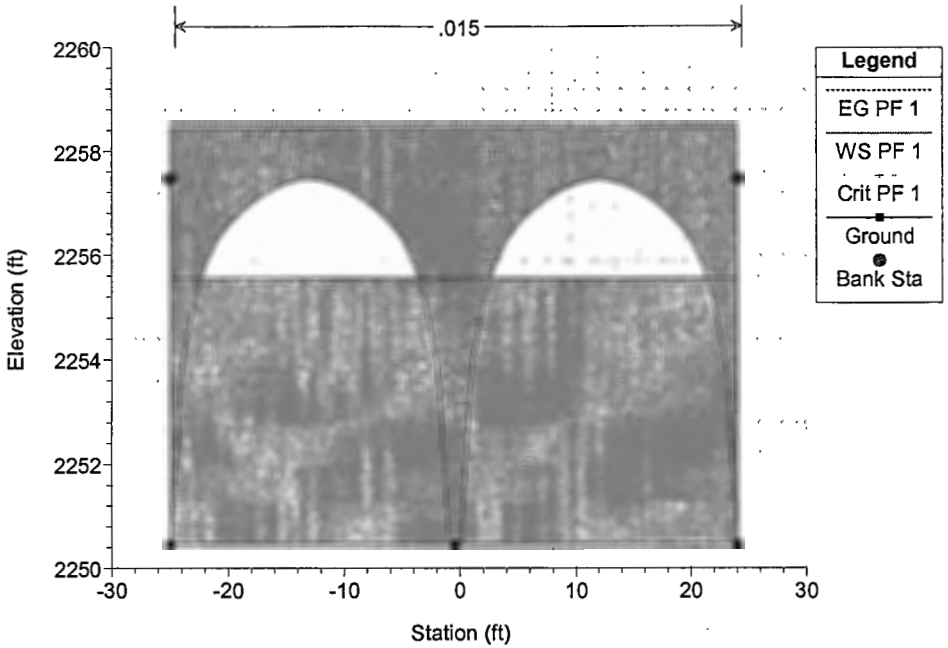

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

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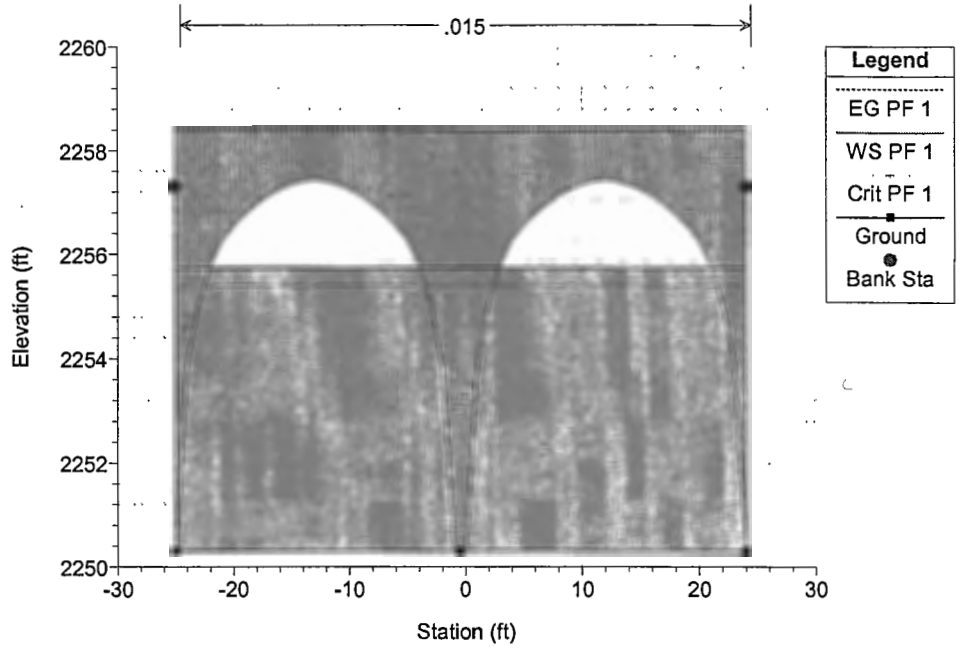
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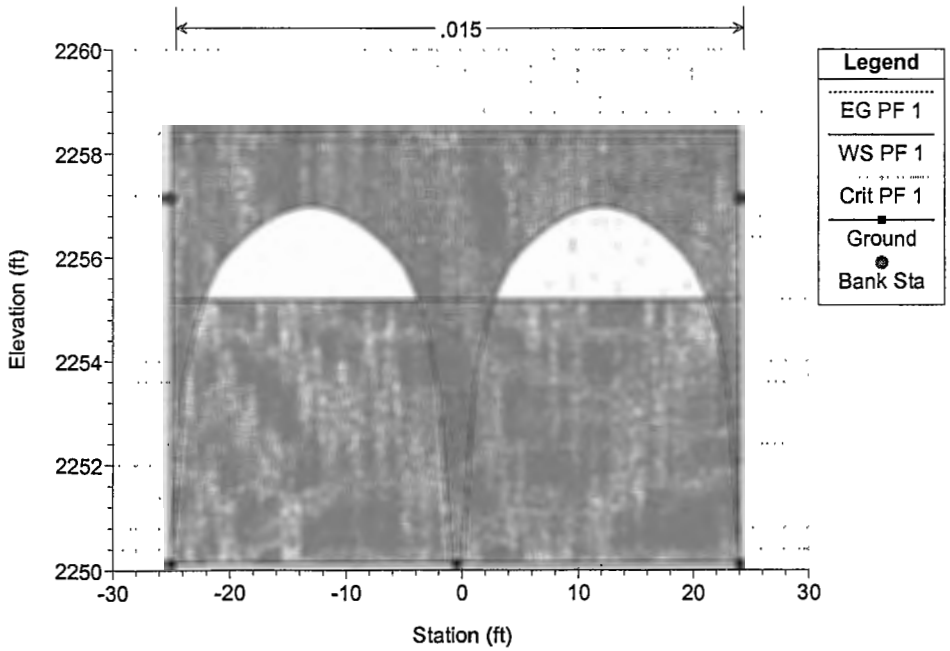

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6268.97



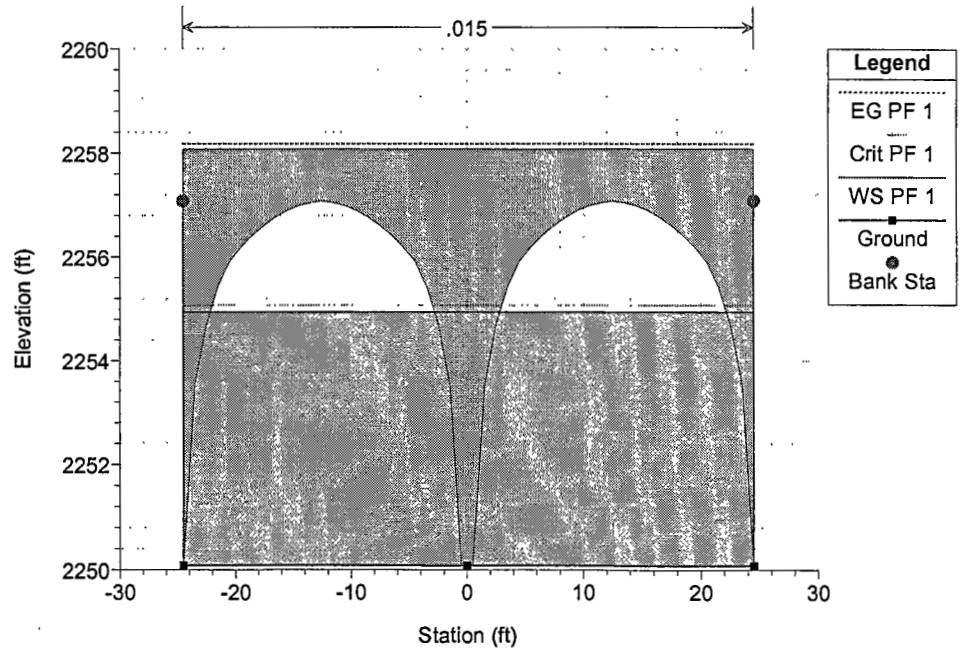

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6318.97



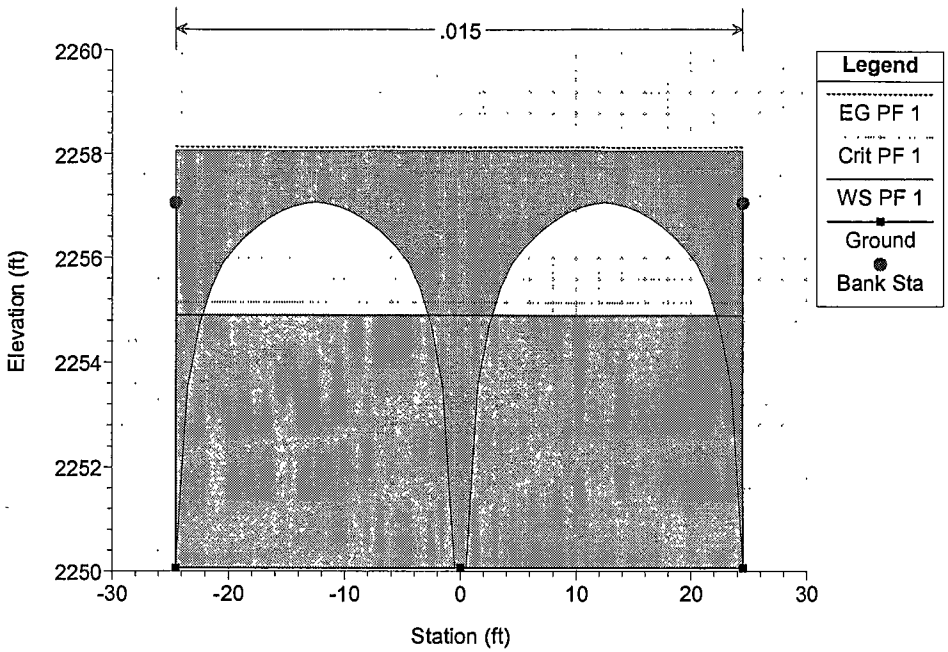

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6354.38



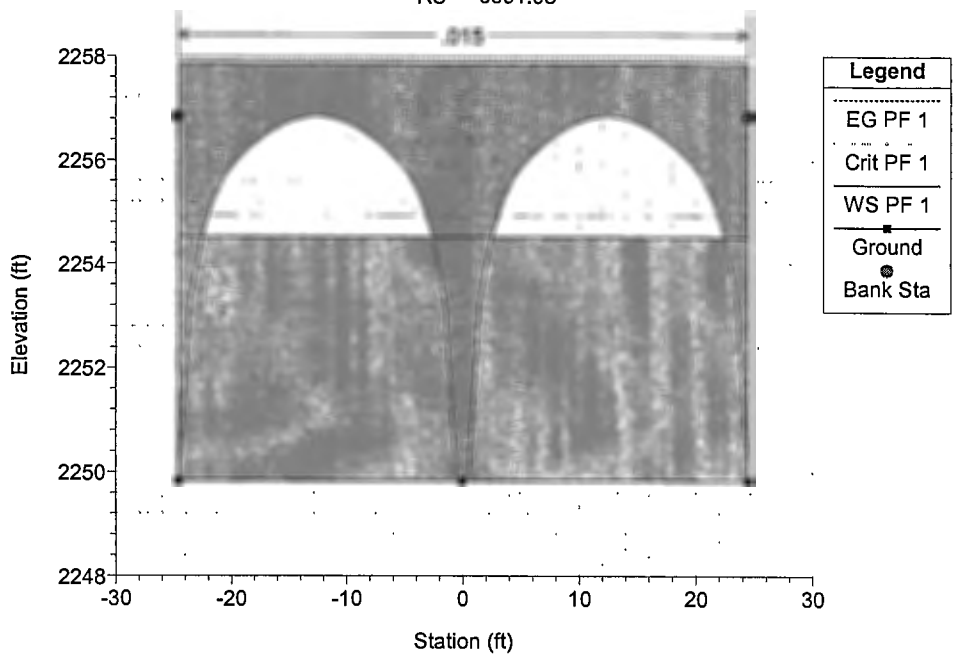
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6359.92



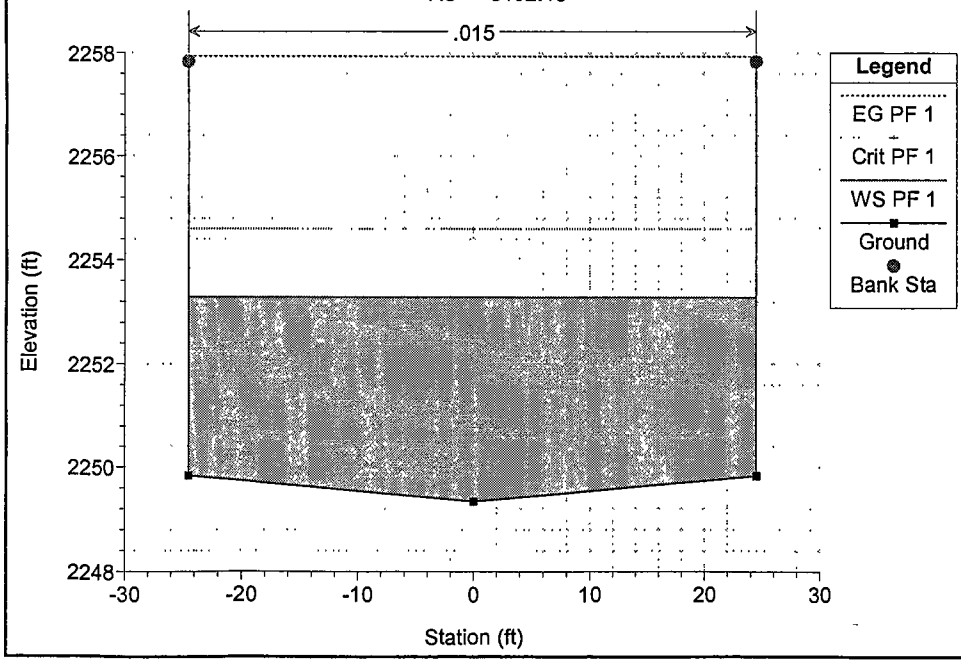

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6391.98



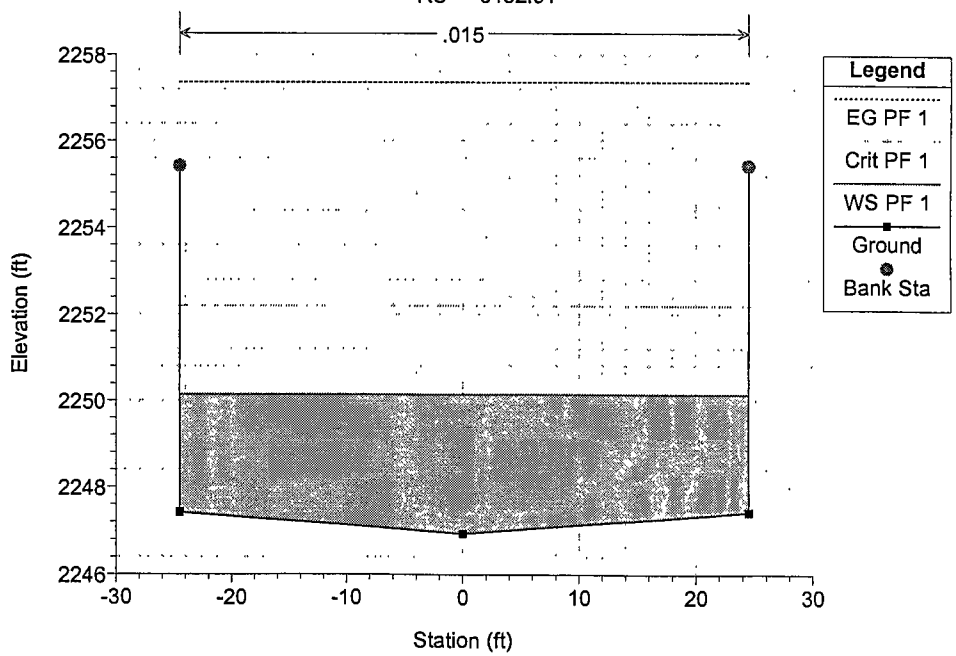

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6402.45



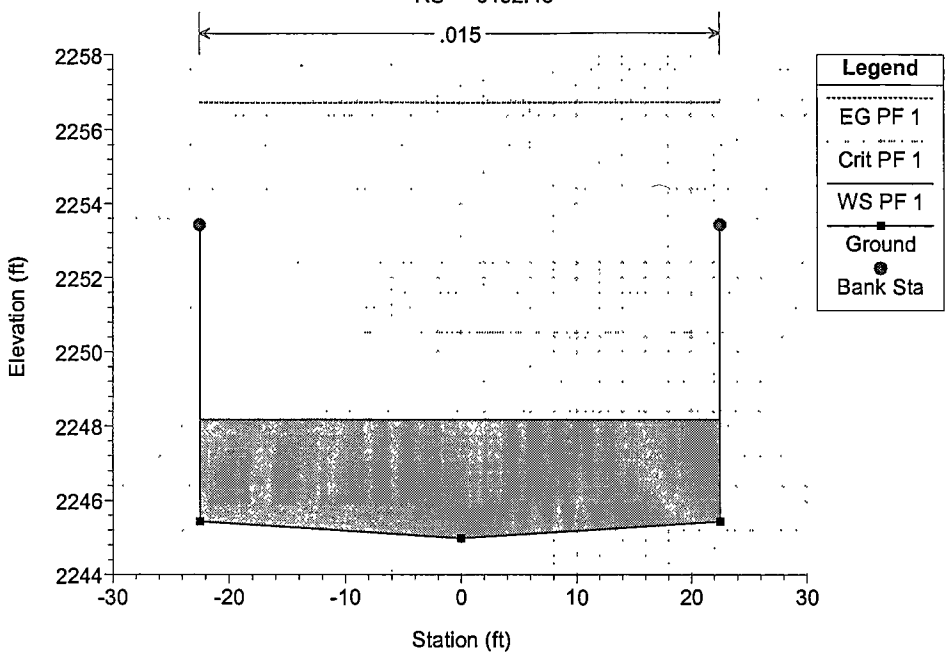

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6452.91



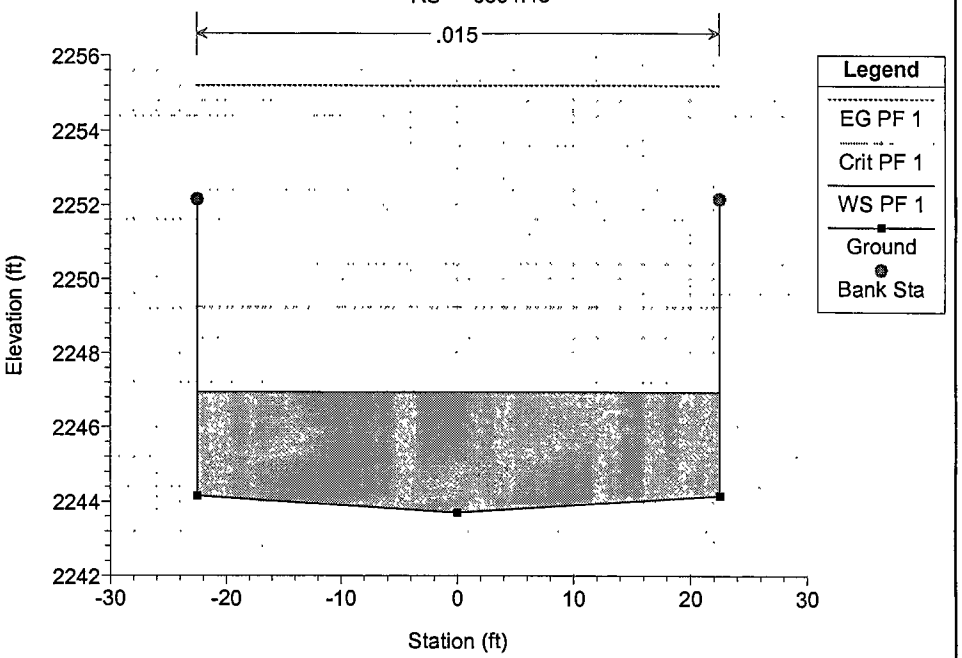
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6492.45



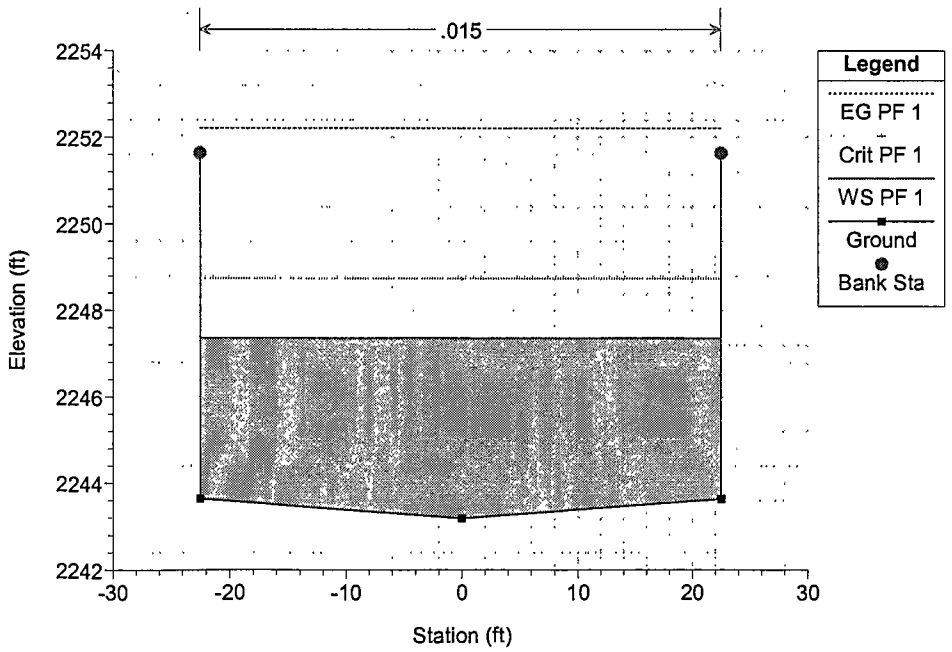

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6594.48



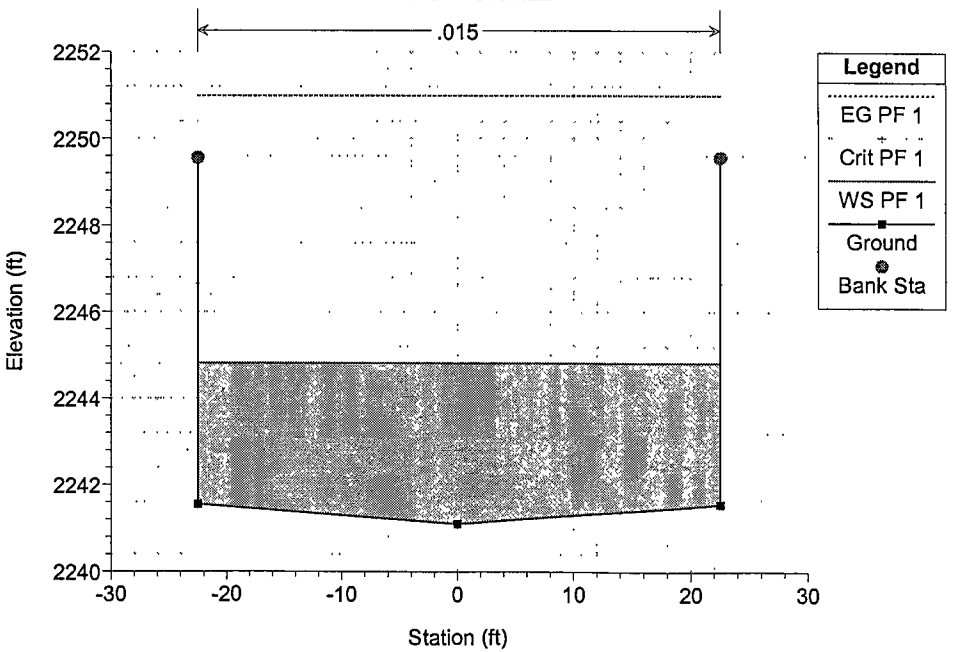

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6631.75



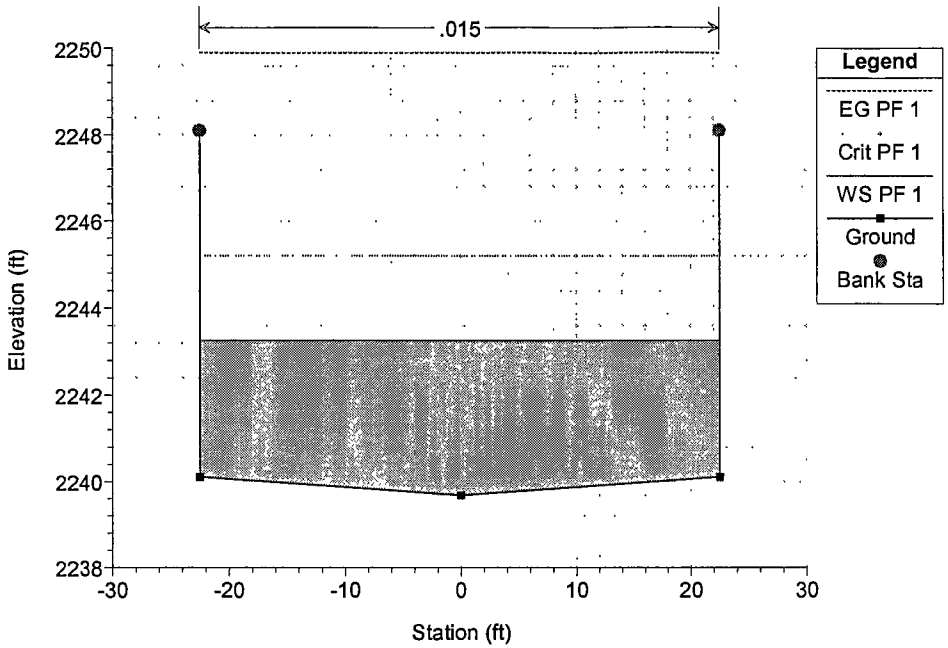

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6794.22



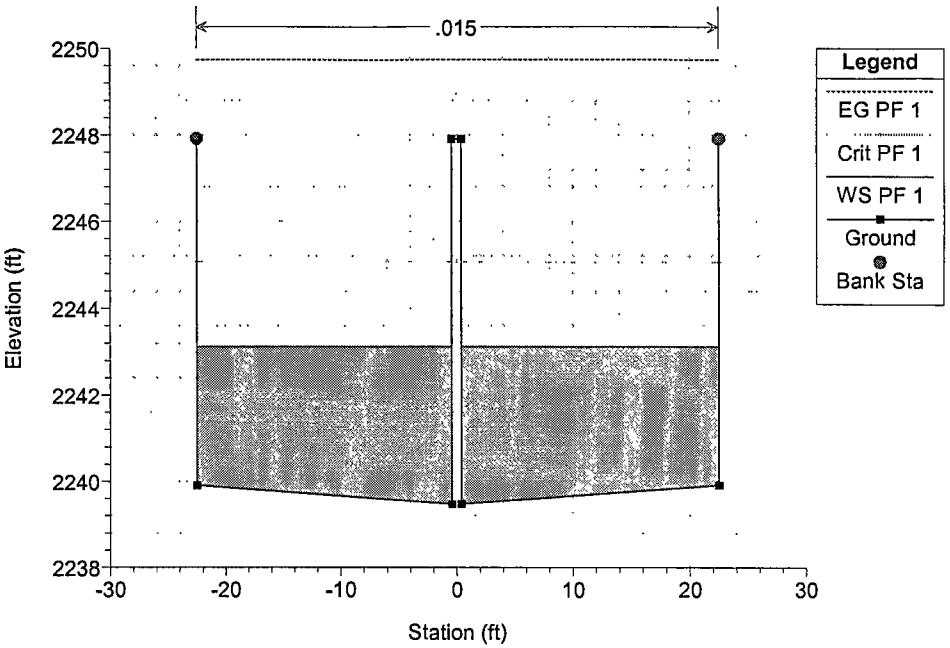
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6904.94



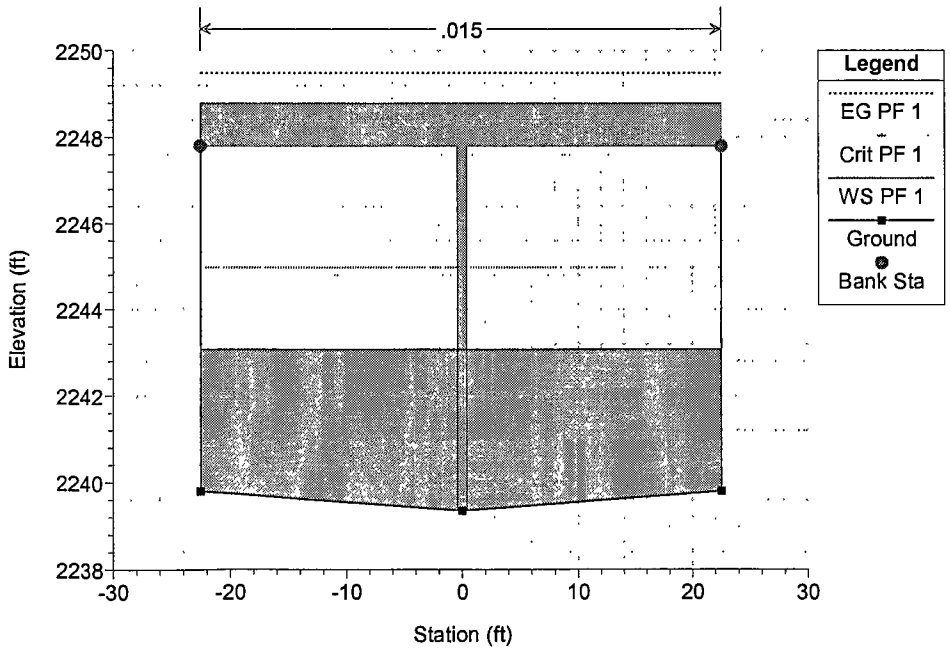

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6922



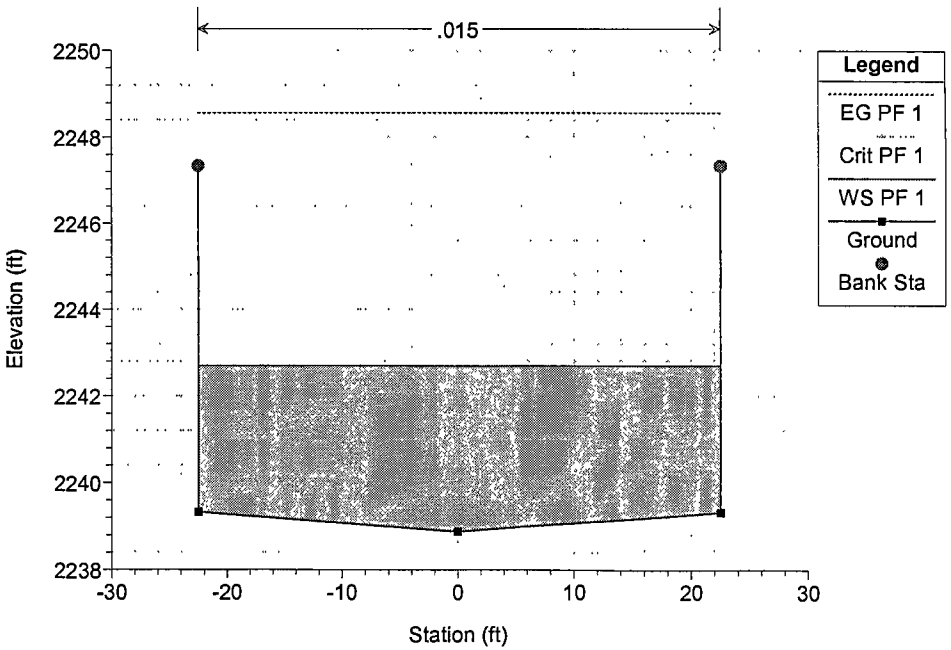

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6942.61



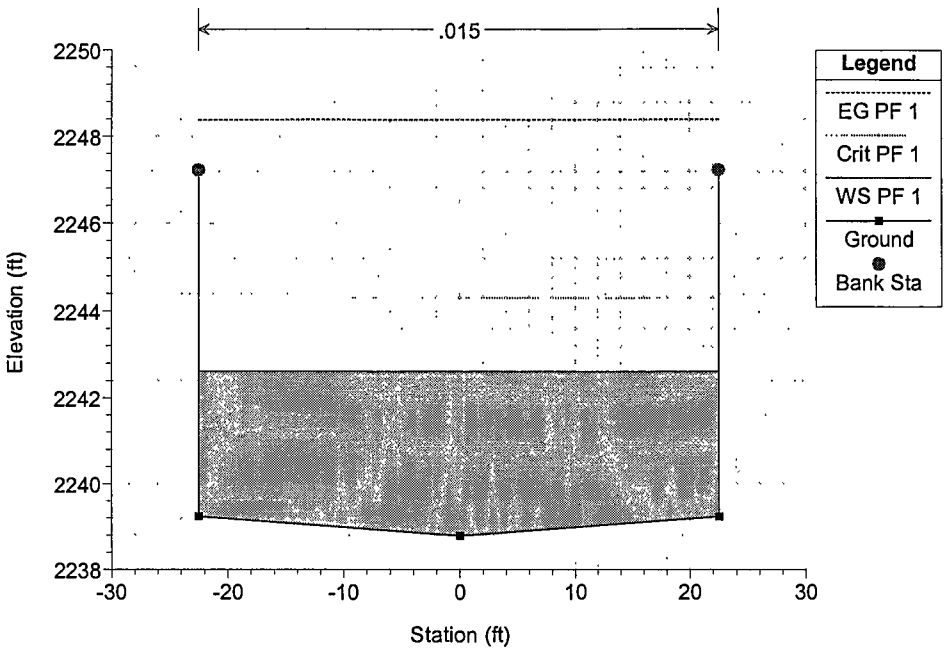

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7036.67



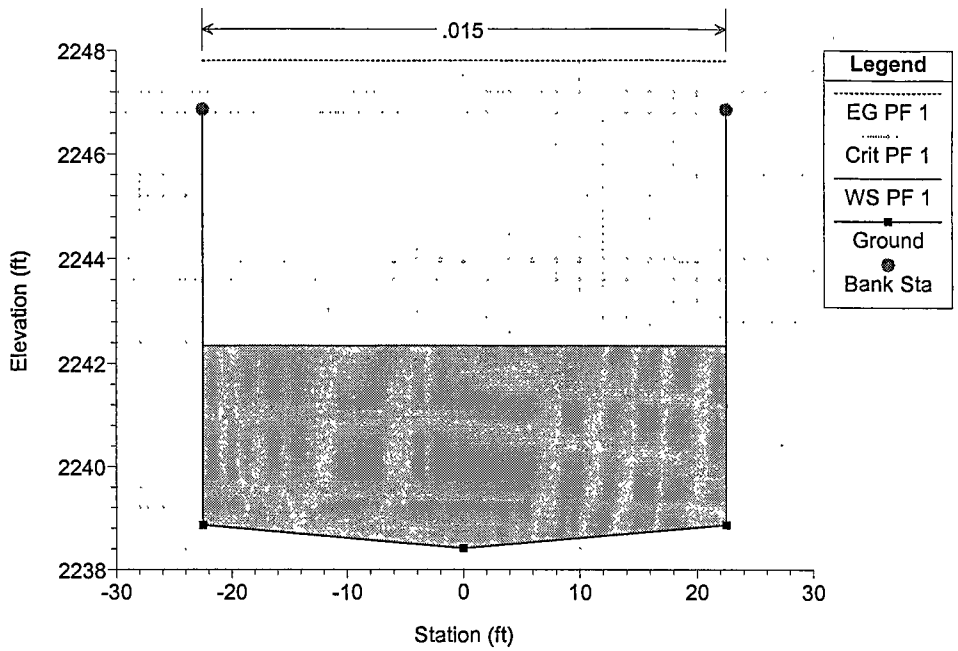
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7056.34



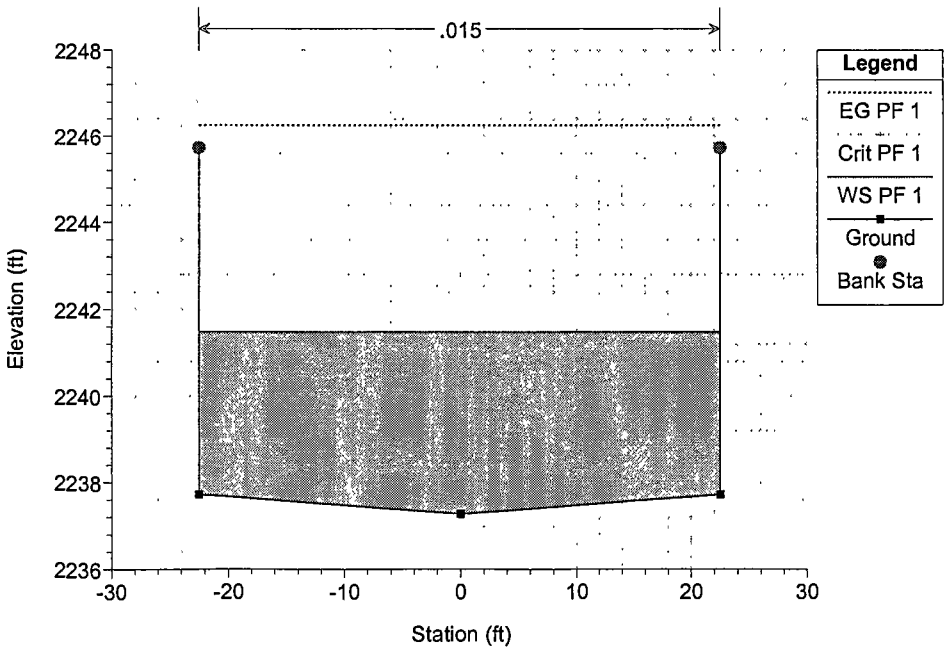

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7131.35



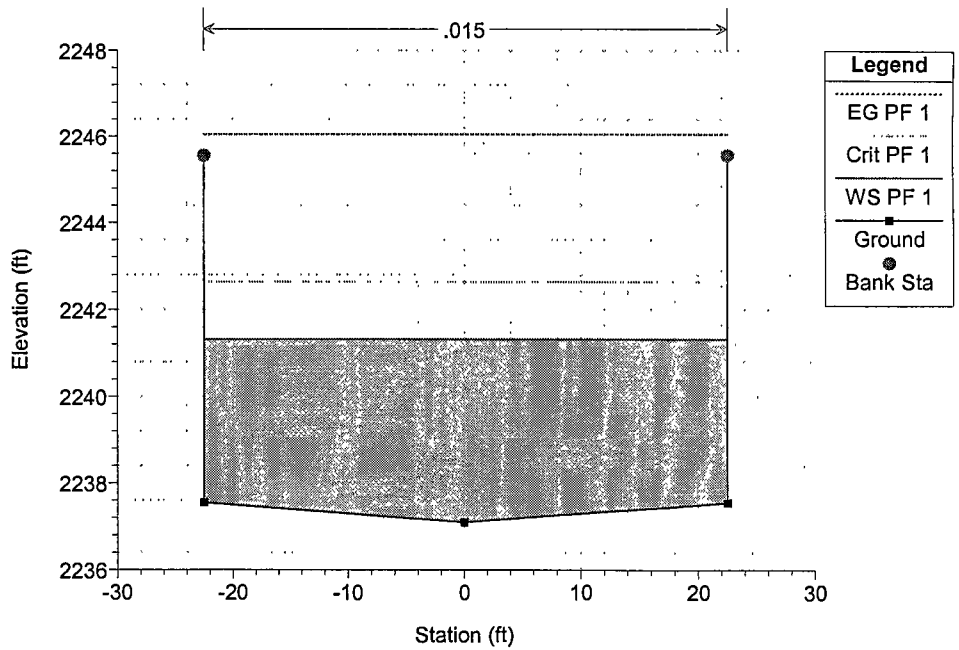

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7357.19



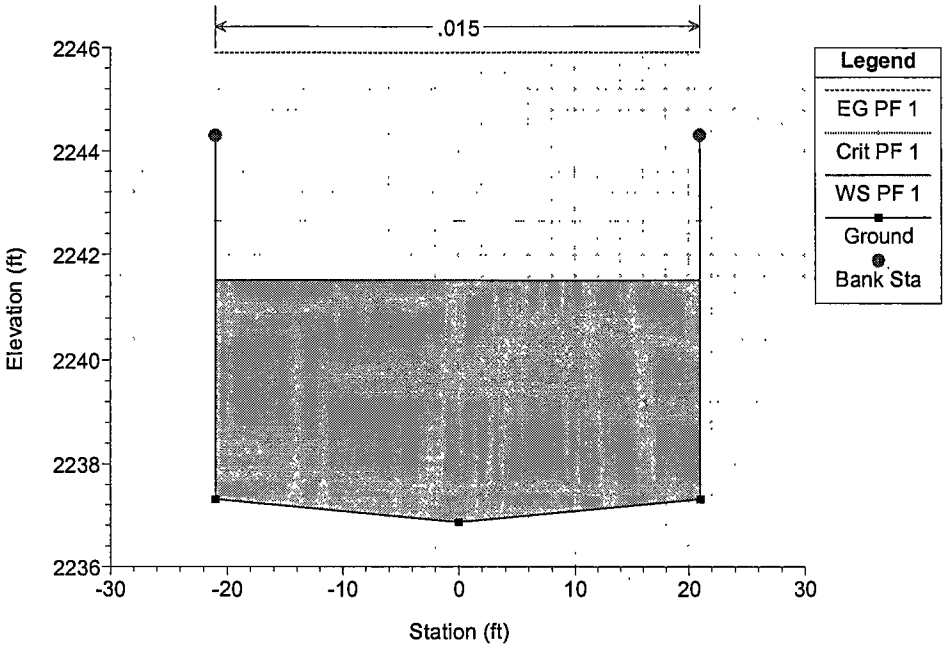

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7391.14



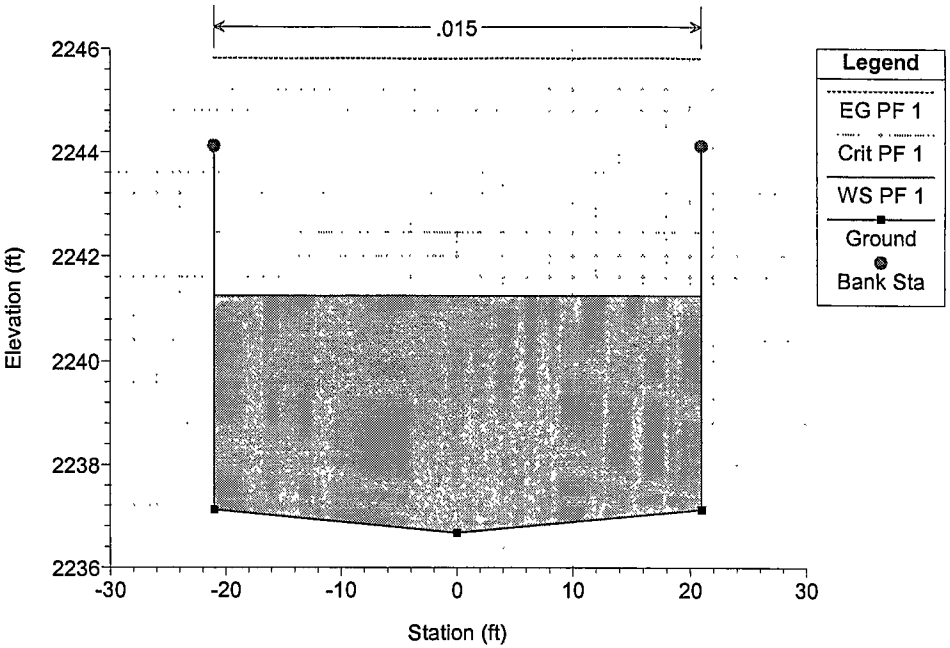
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7416.14



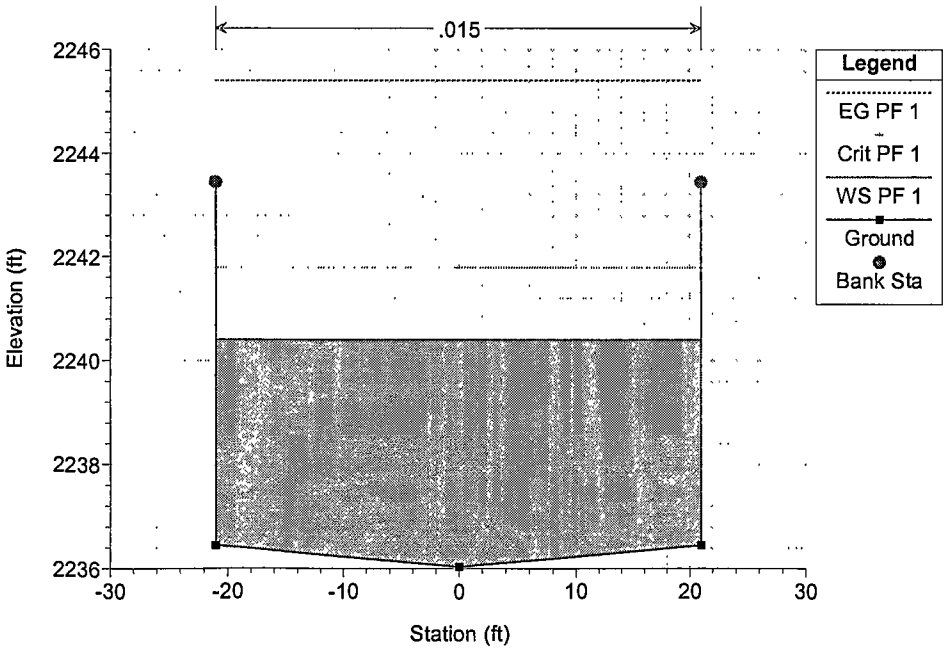

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7434.81



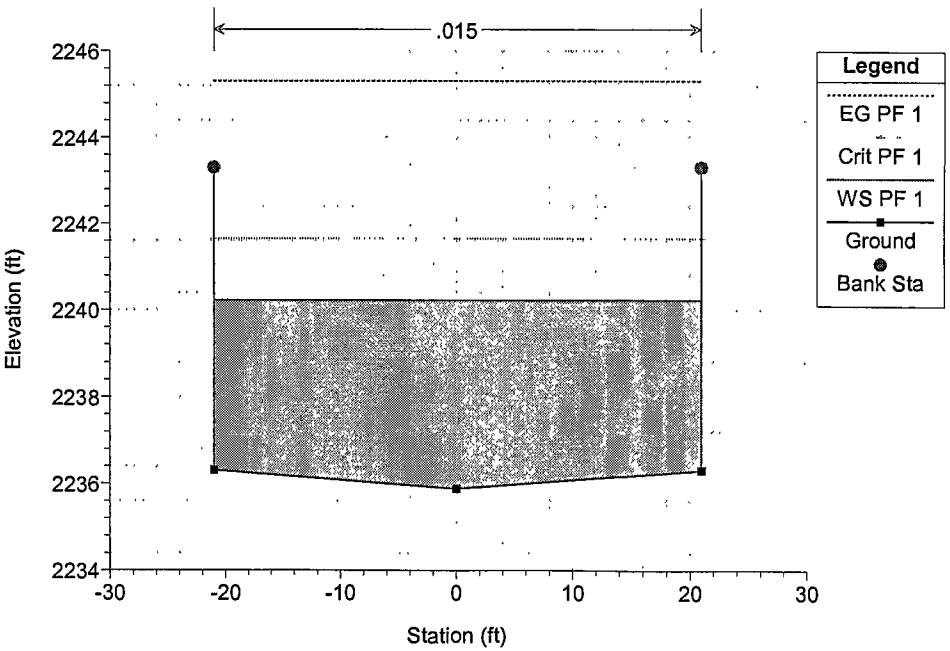

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7500



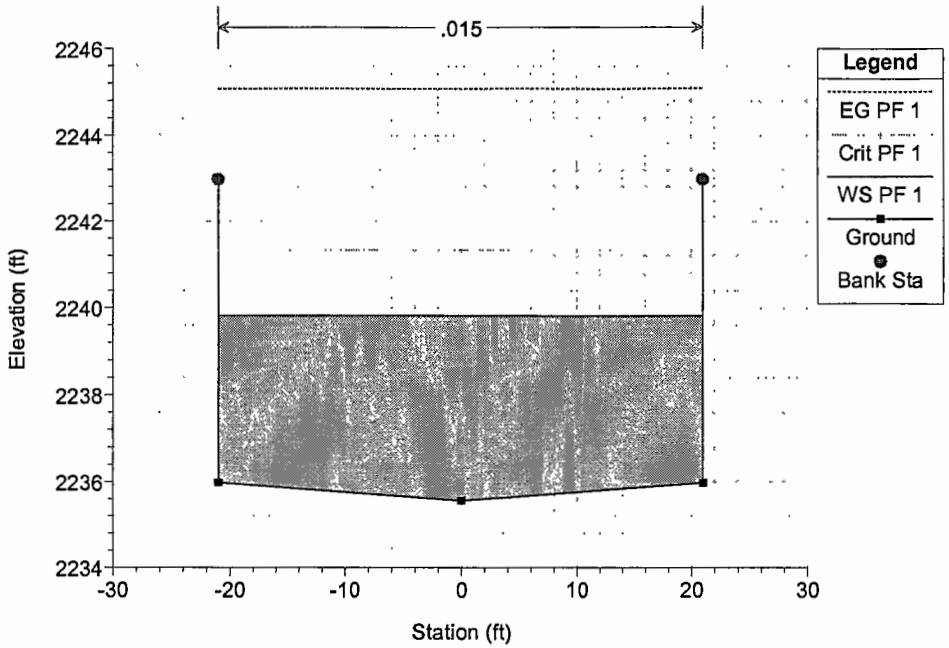

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7515.42



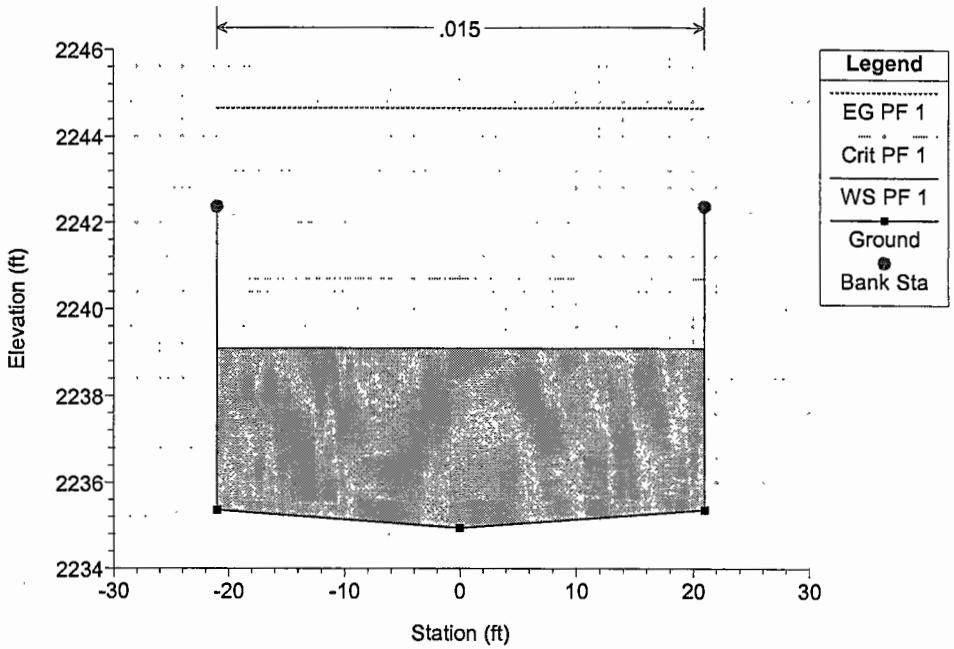
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7547.84



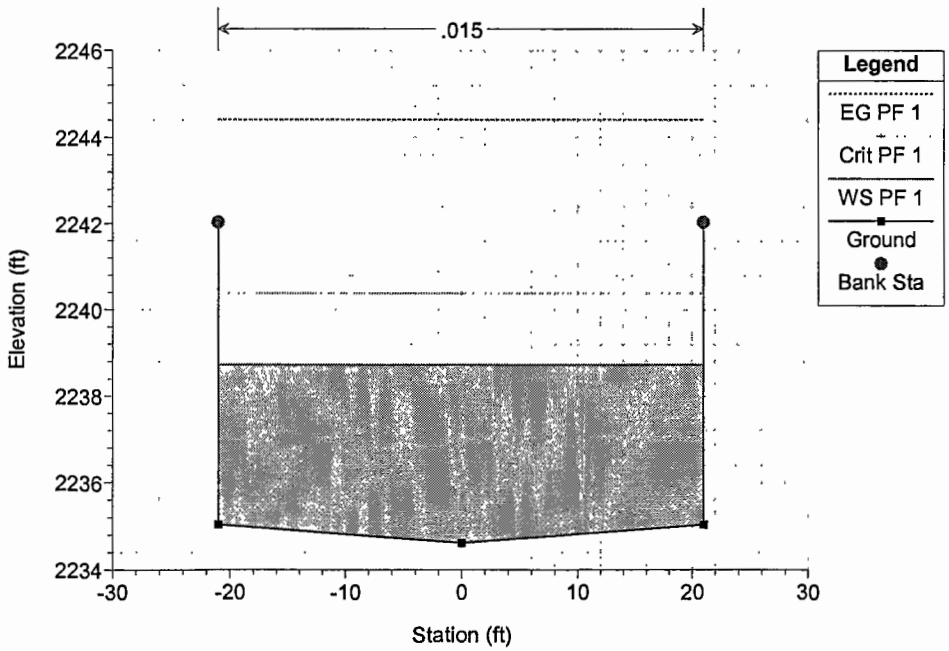

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7610



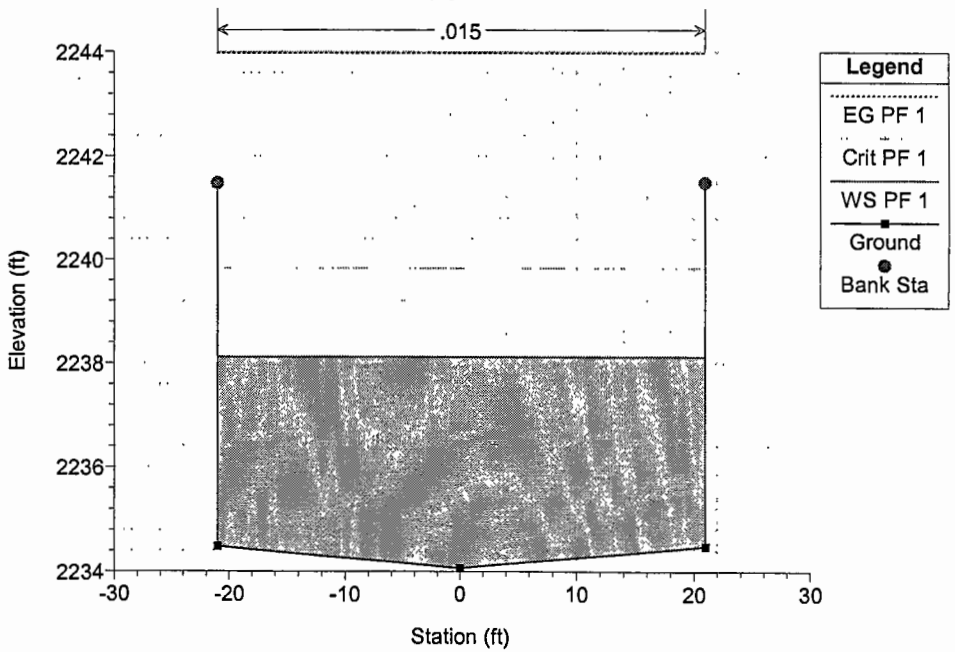

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7642.66



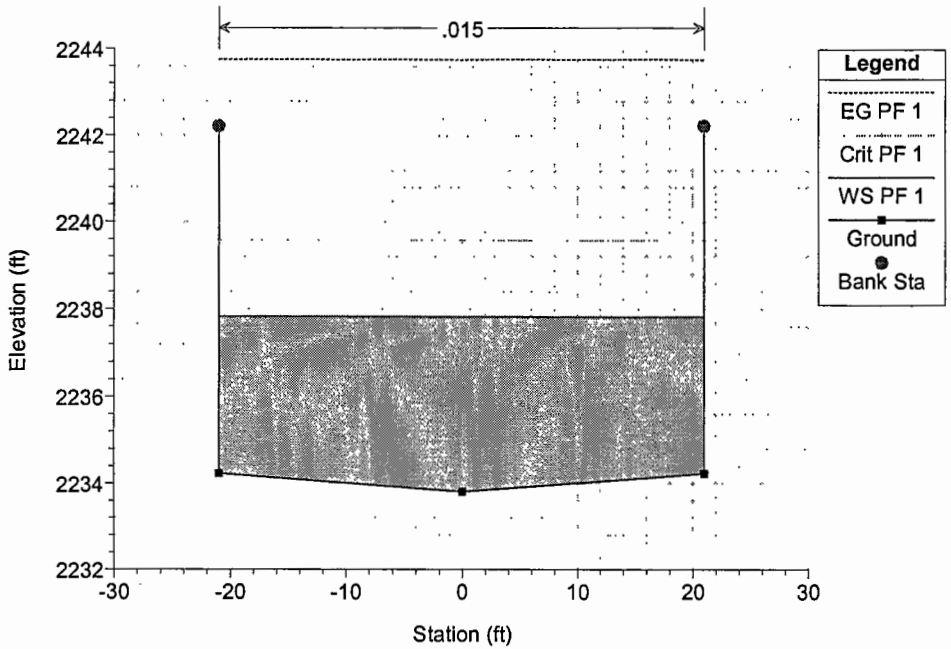

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7700



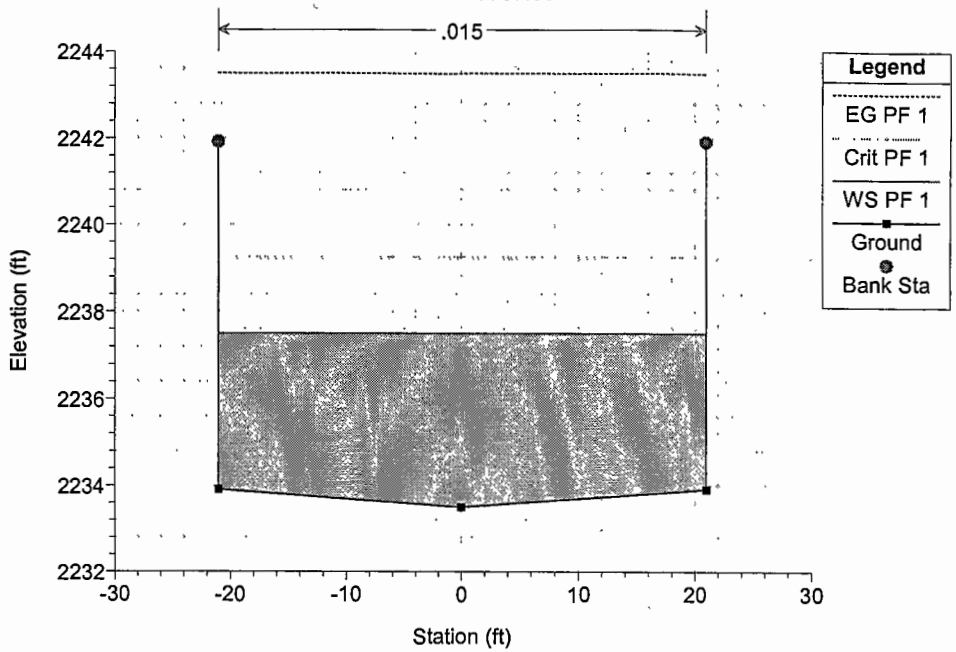
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7725



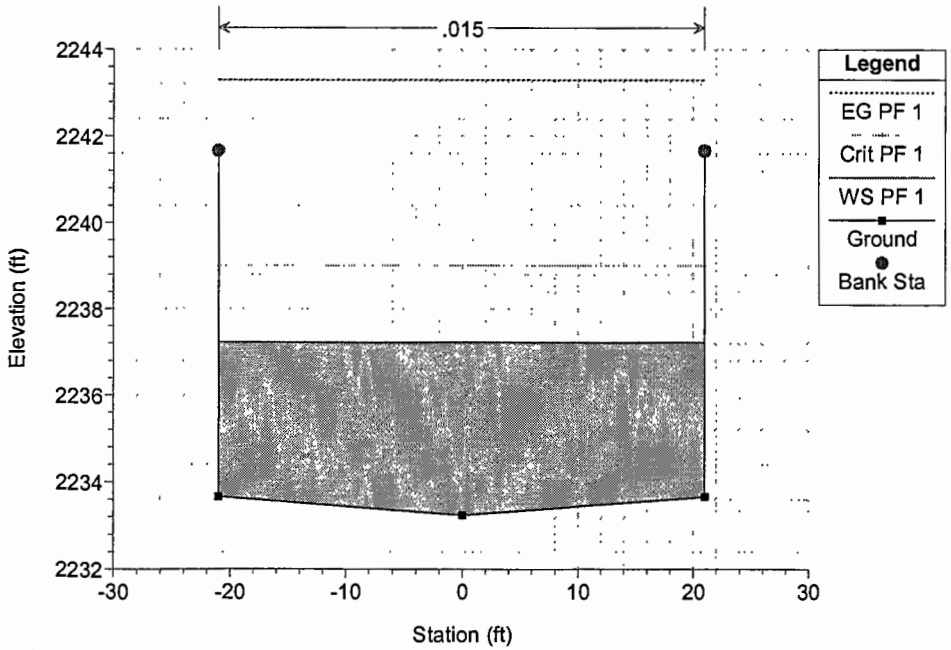

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7757.55



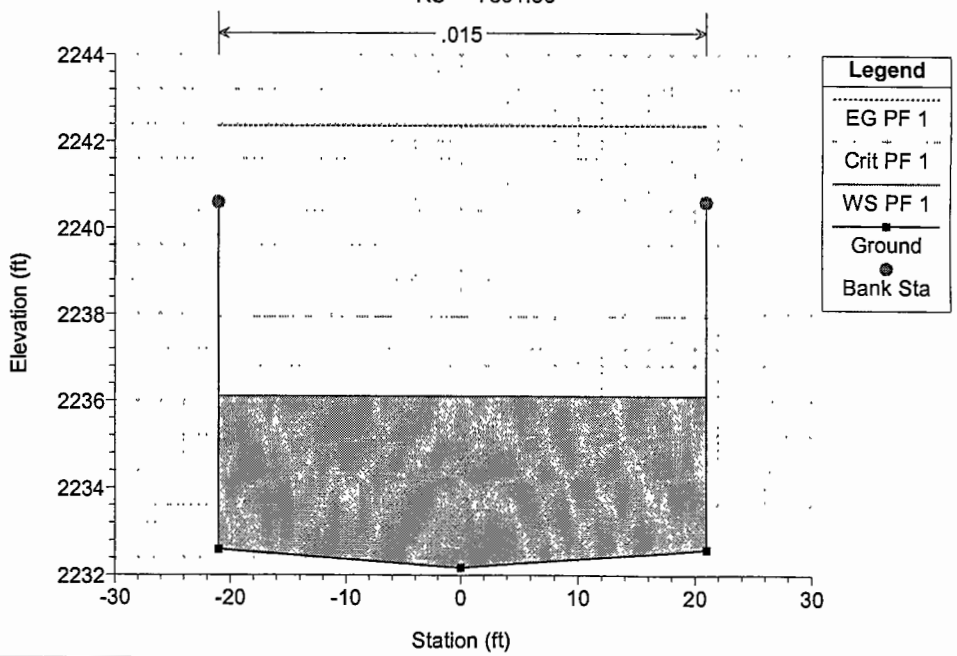

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7782.67



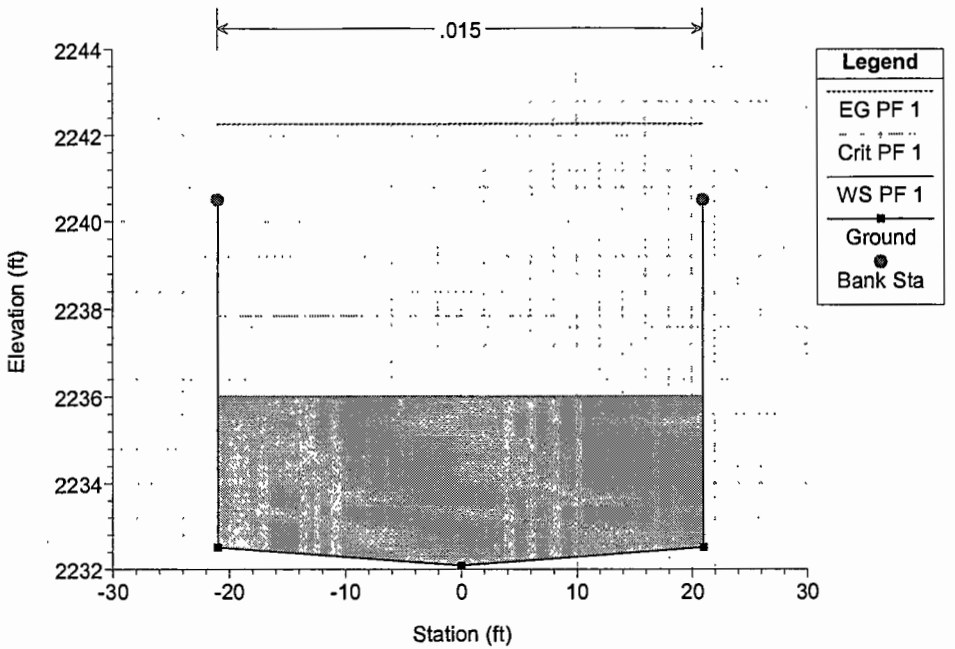

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7891.36



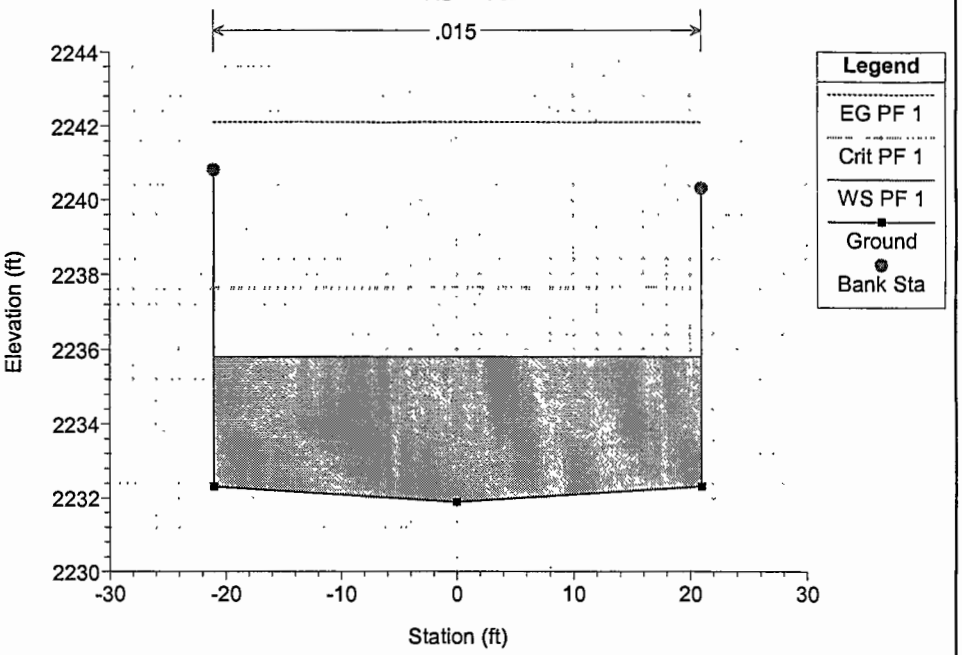
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7900



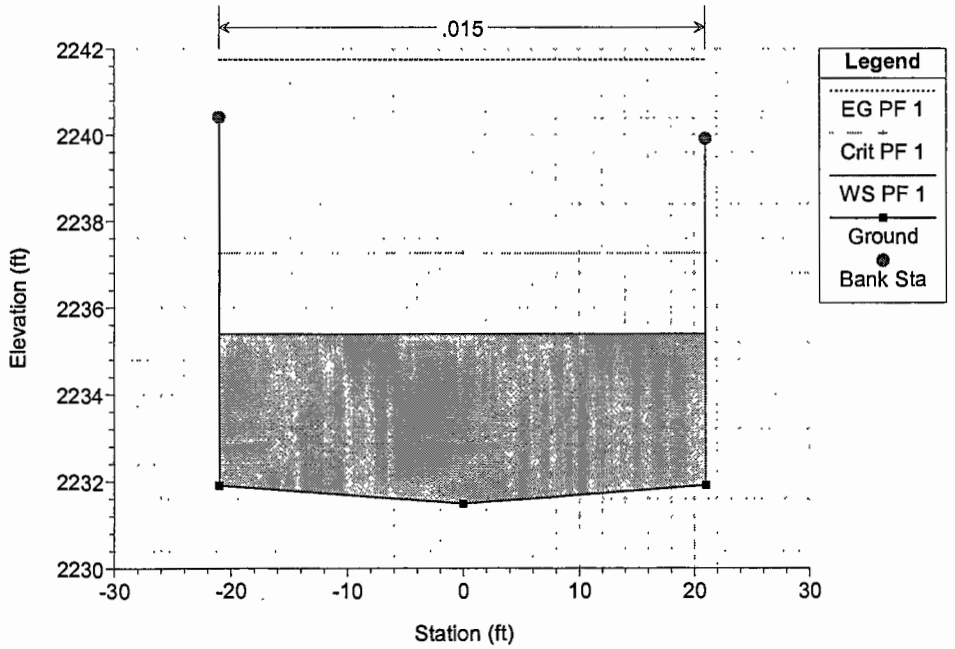

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7920



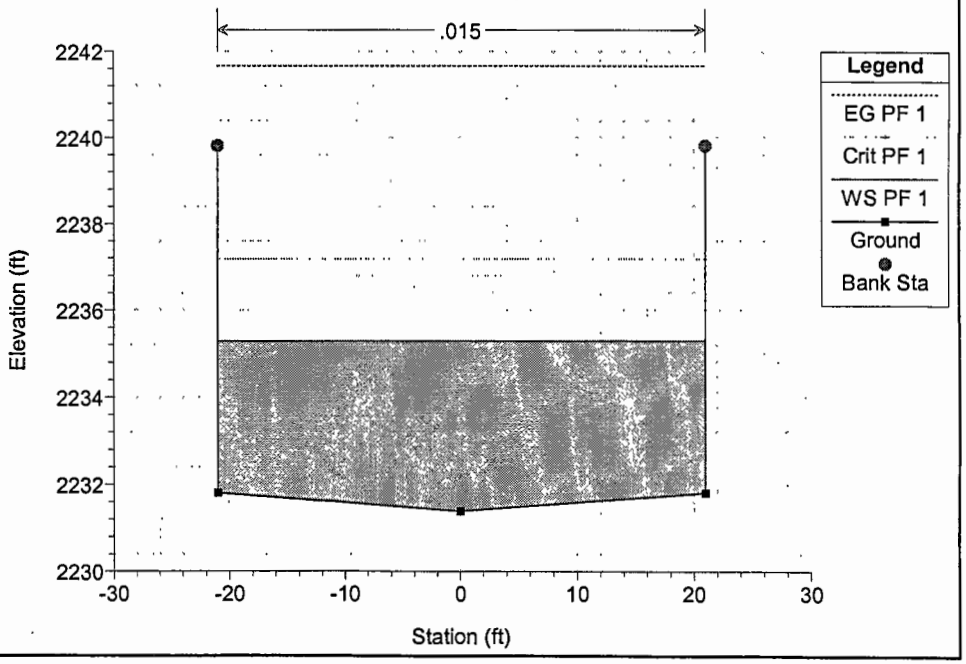

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7960.42



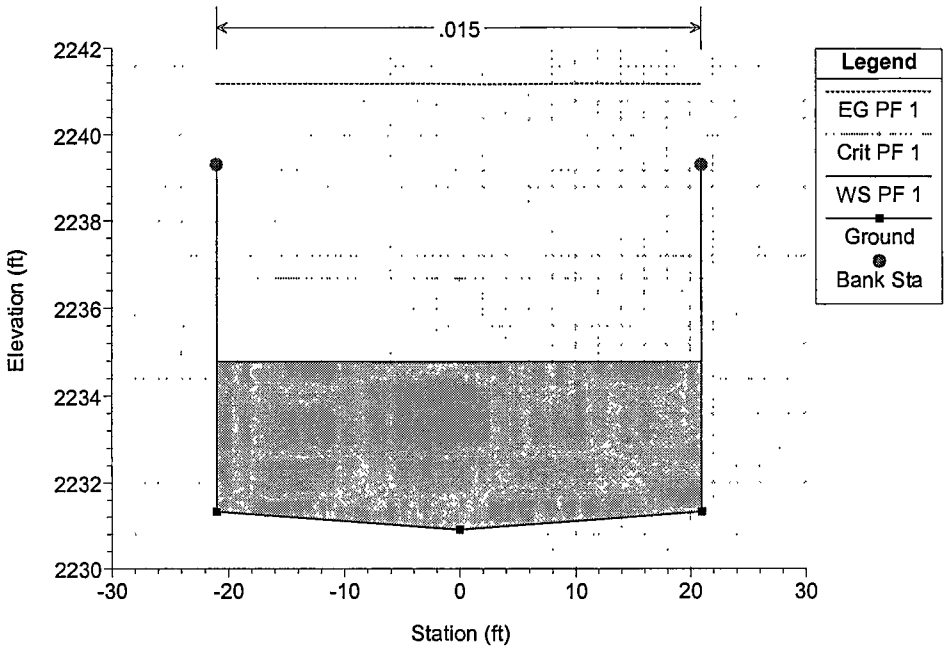

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7970.42



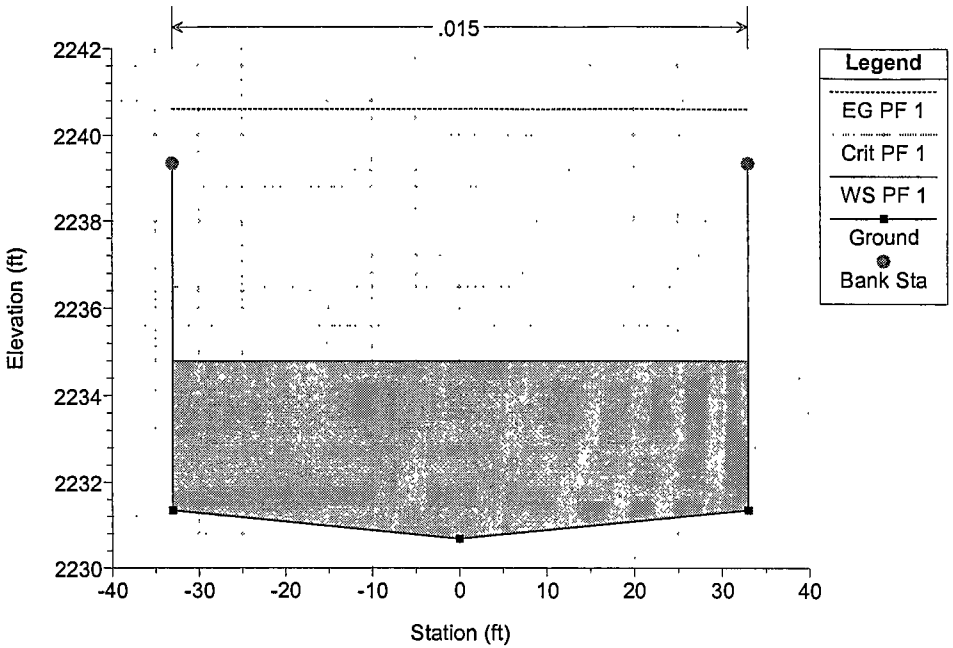
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8019.96



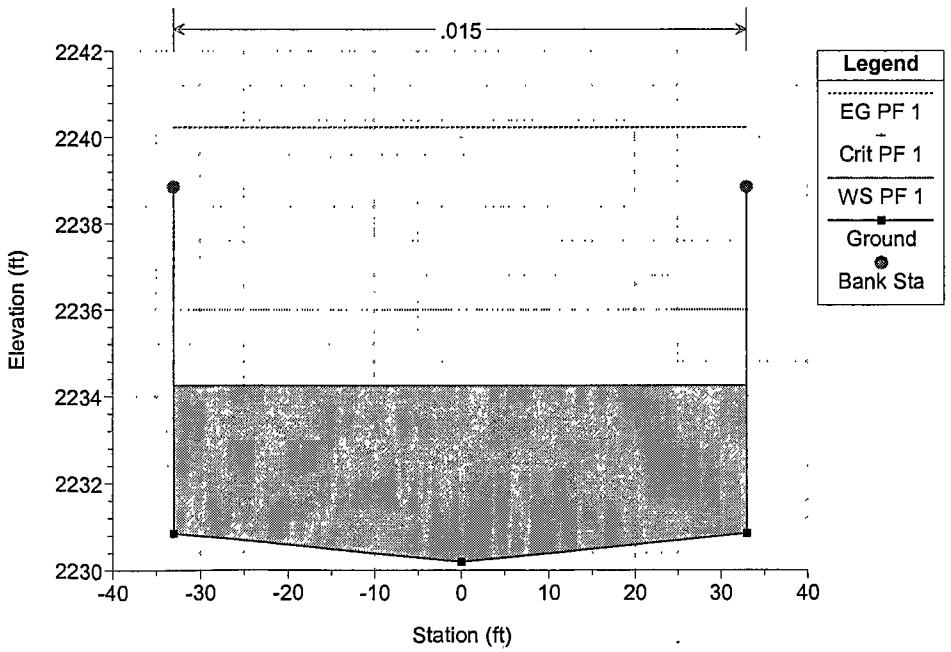

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8042.05



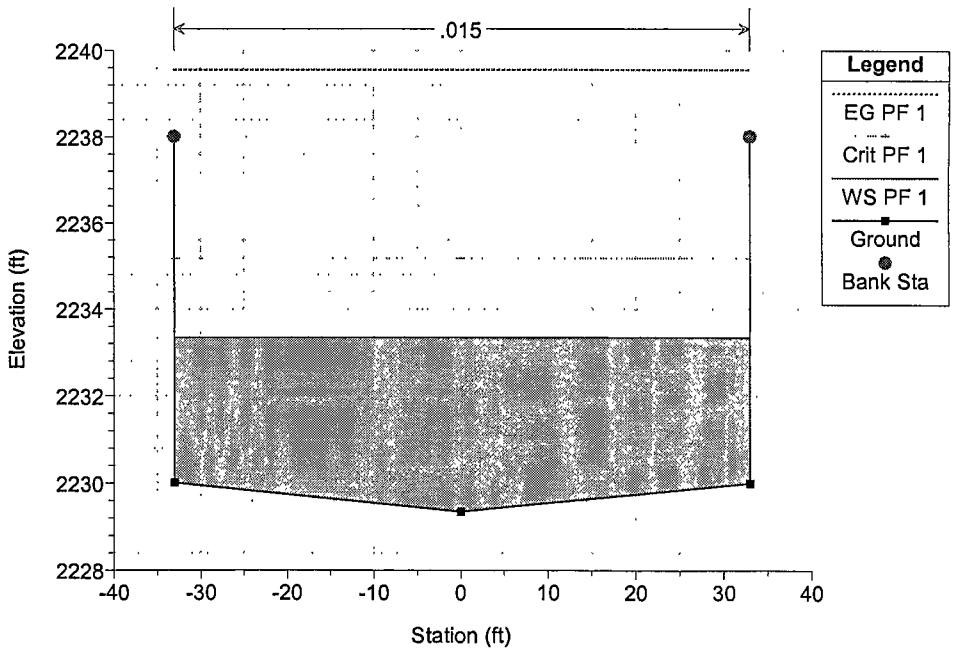

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

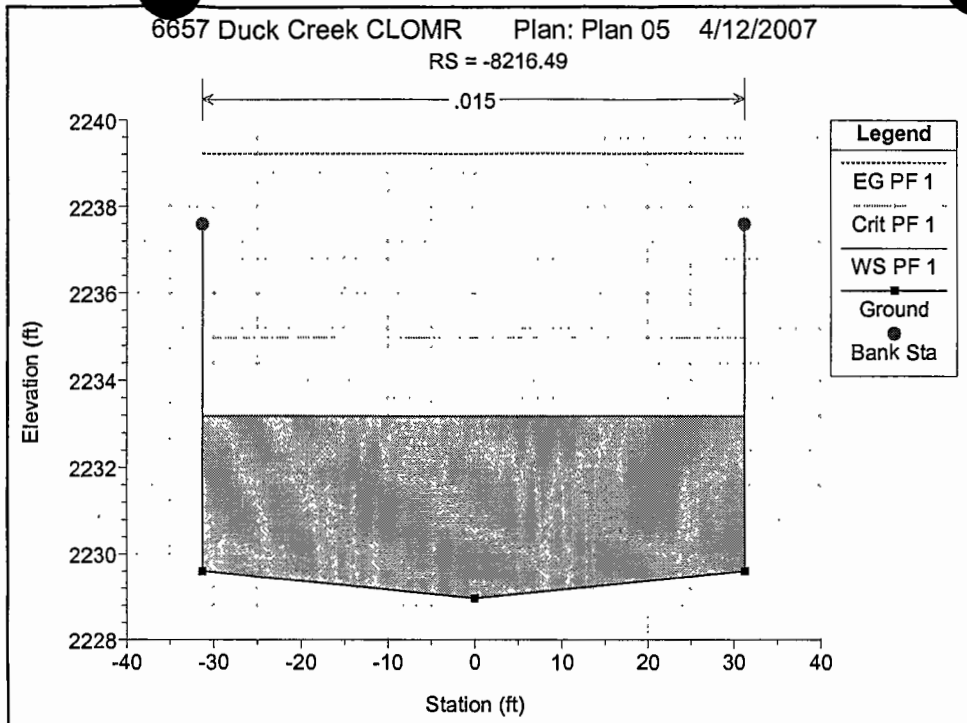
RS = -8092.05

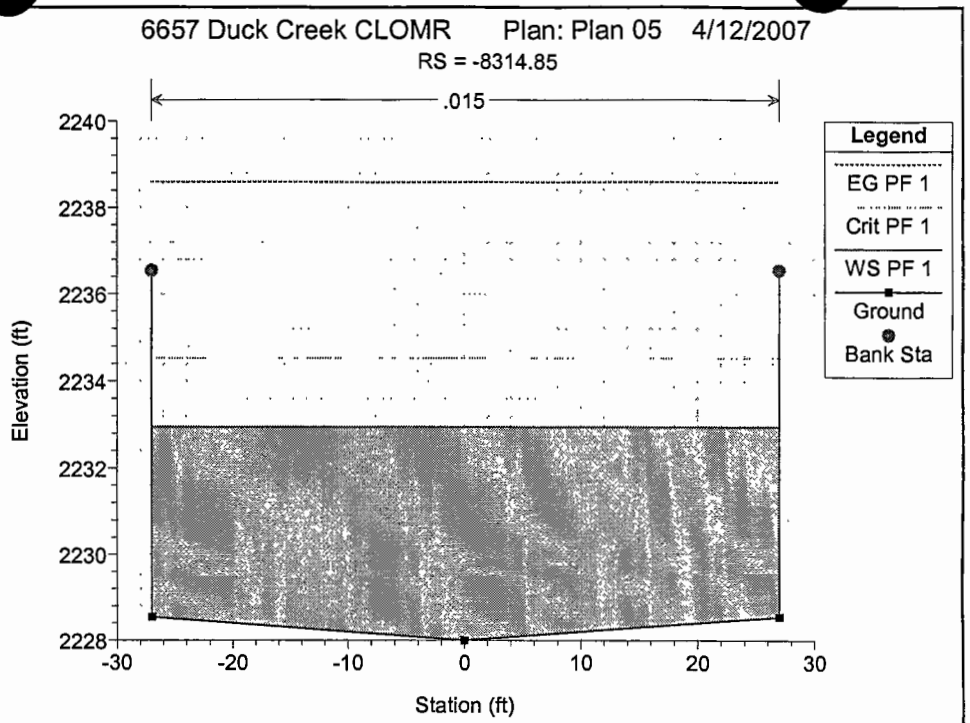


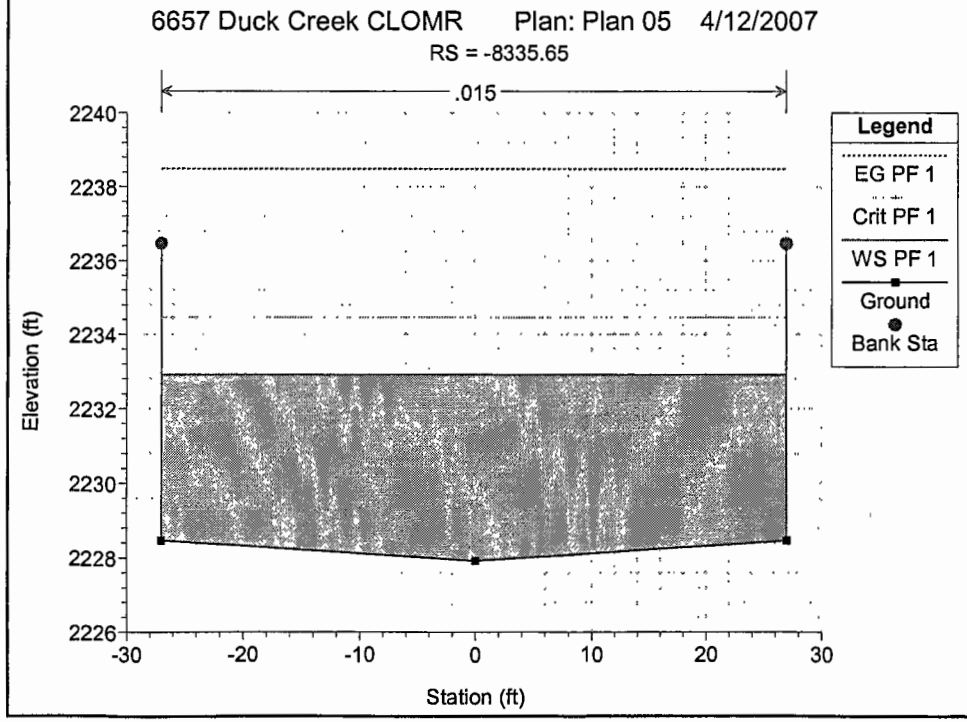

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

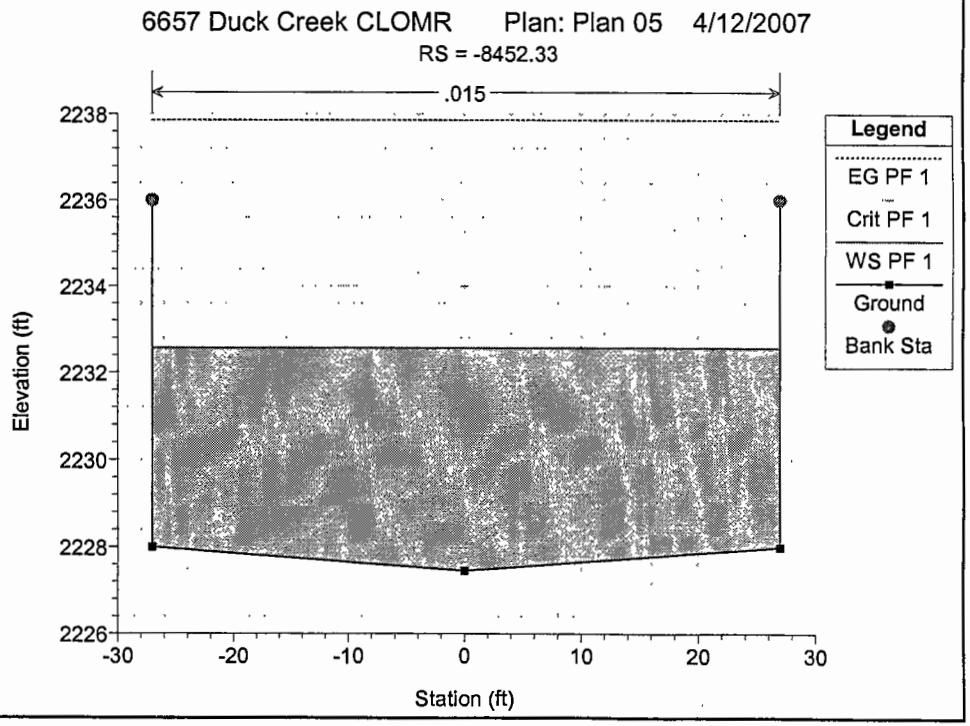
RS = -8177.05




6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -8216.49
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

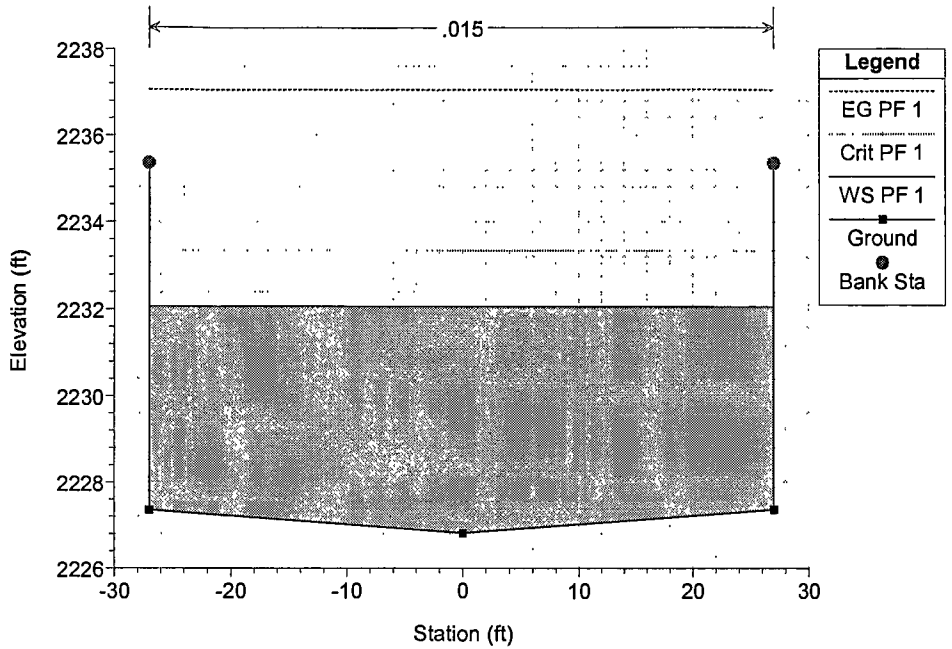

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -8314.85
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -8335.65
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -8452.33
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

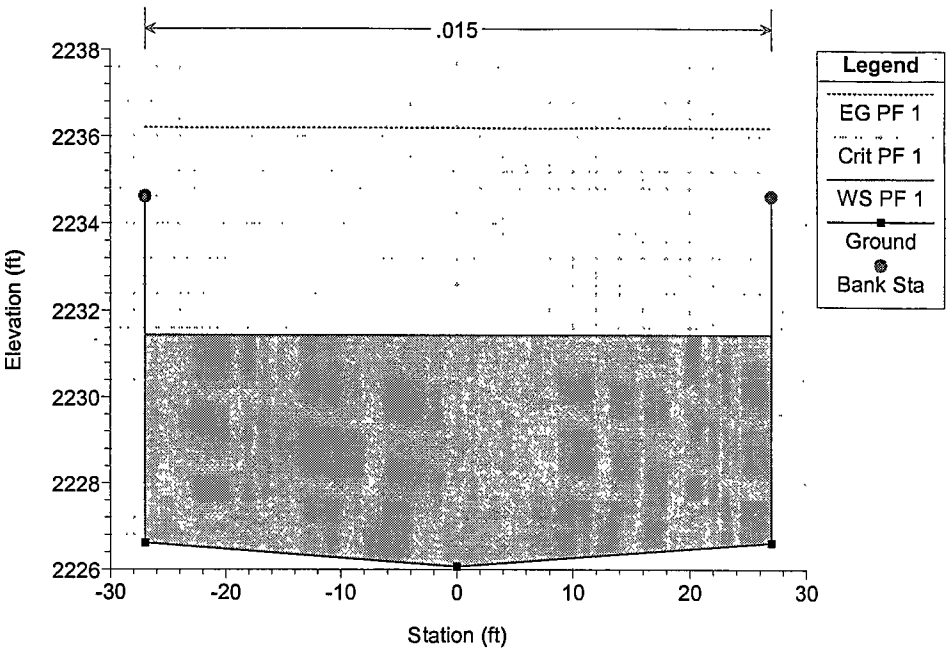
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8613.65



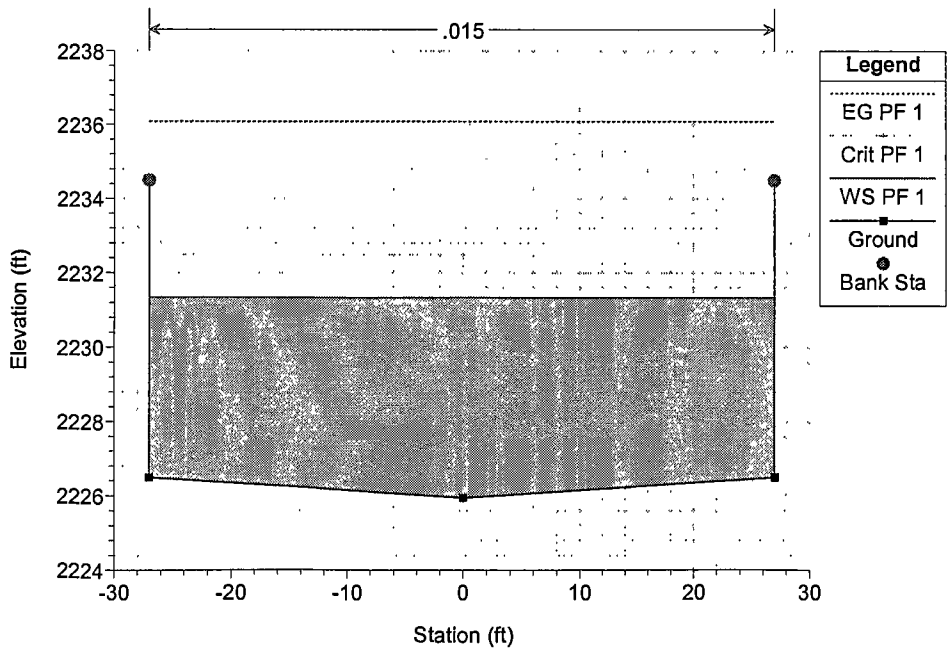

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8797.97



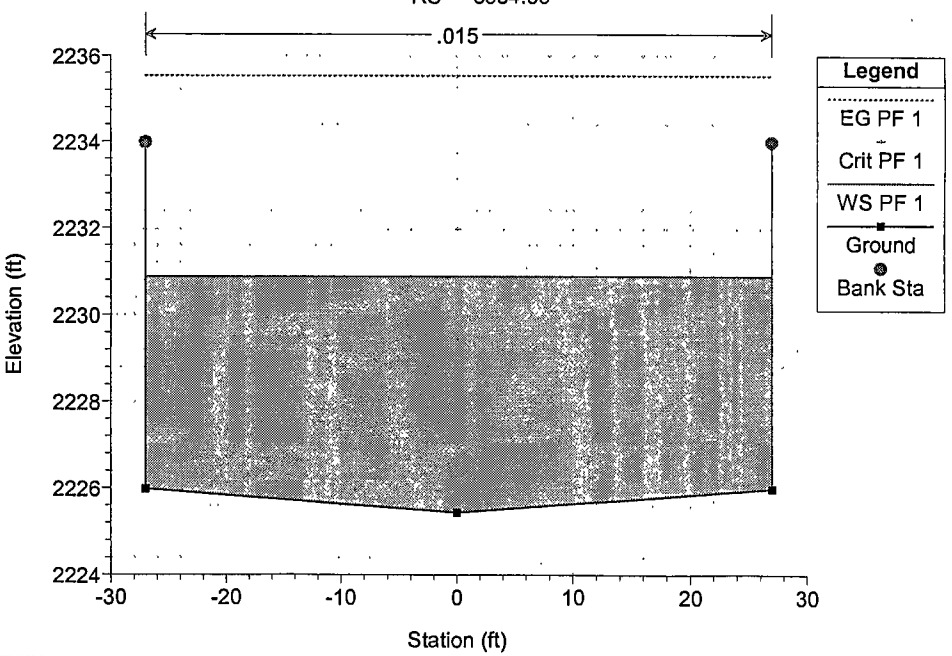

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8828.39



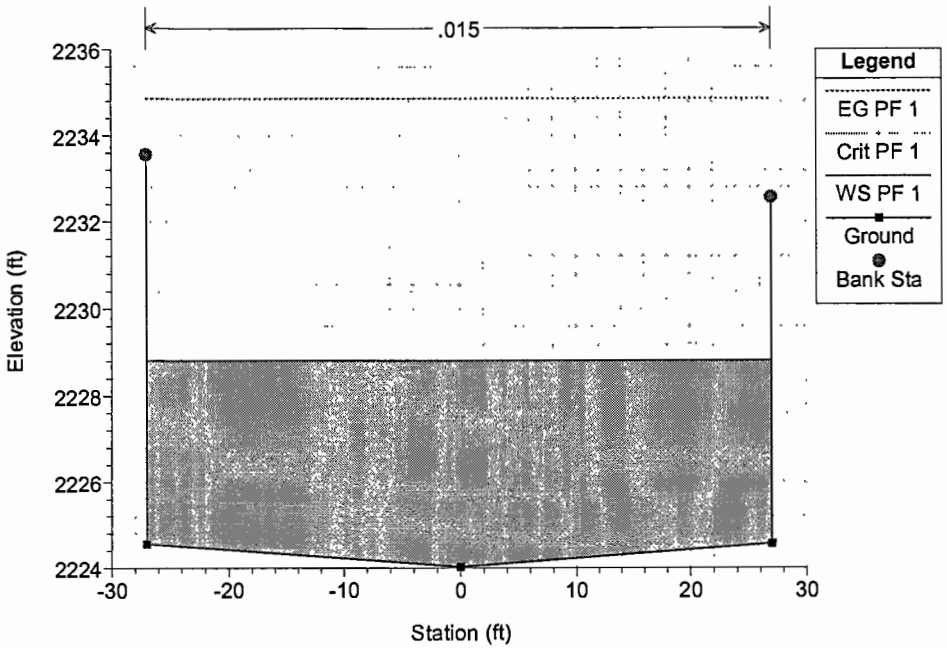

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8954.39



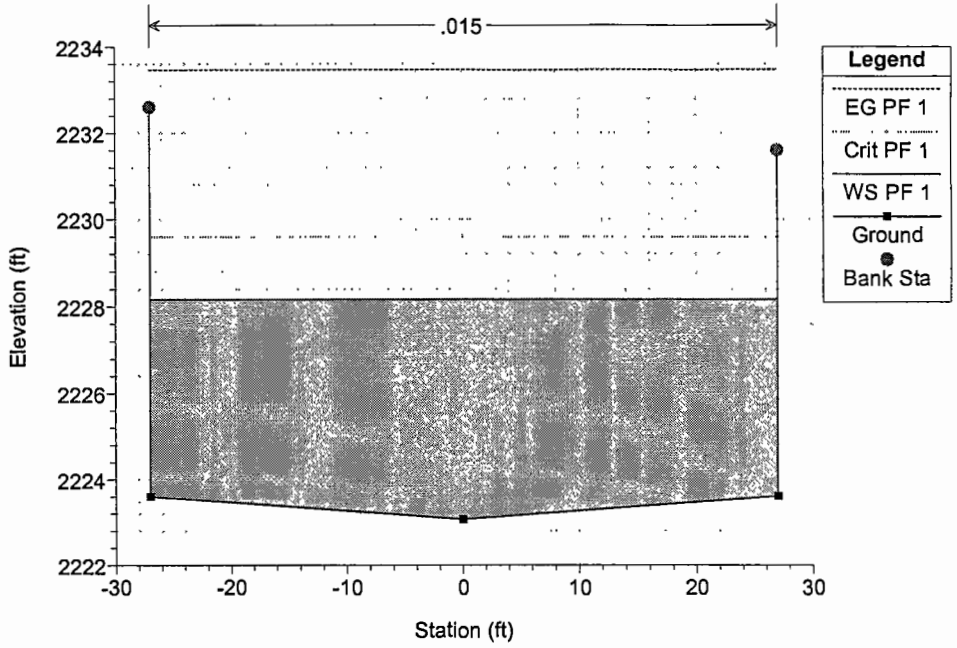
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -9069.7



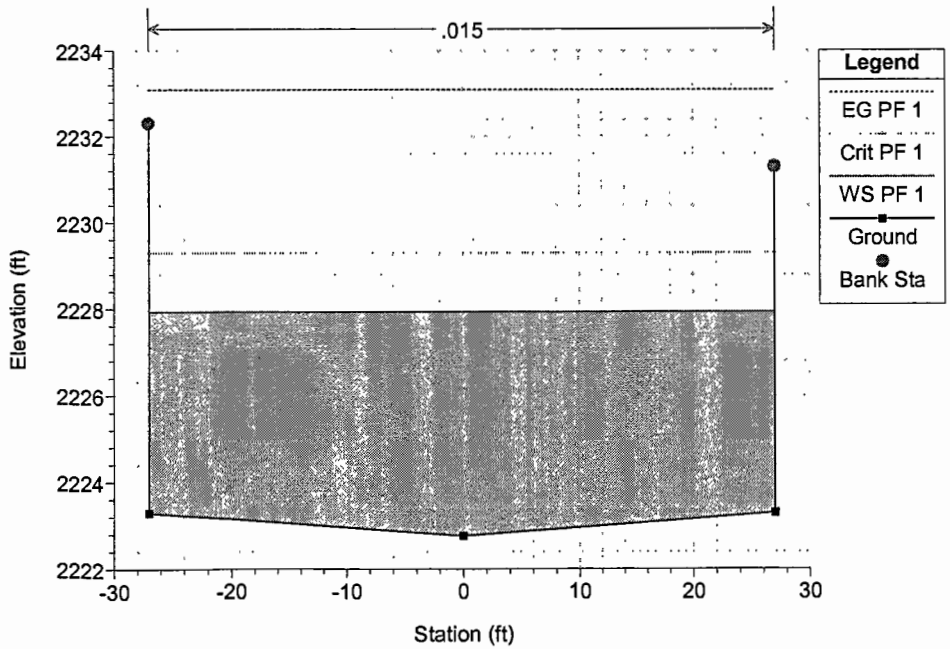

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -9330.7



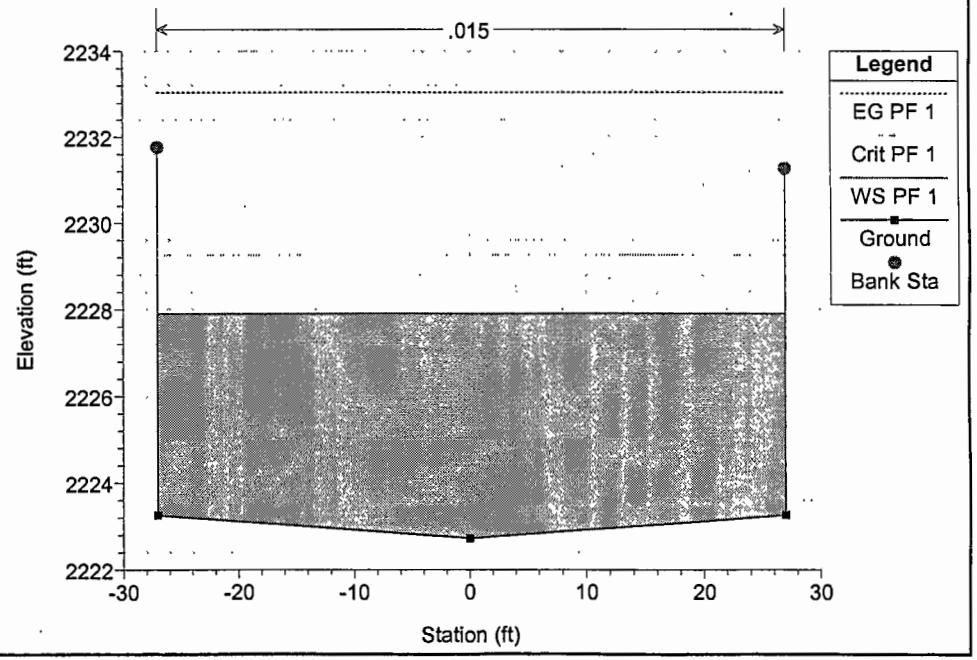

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

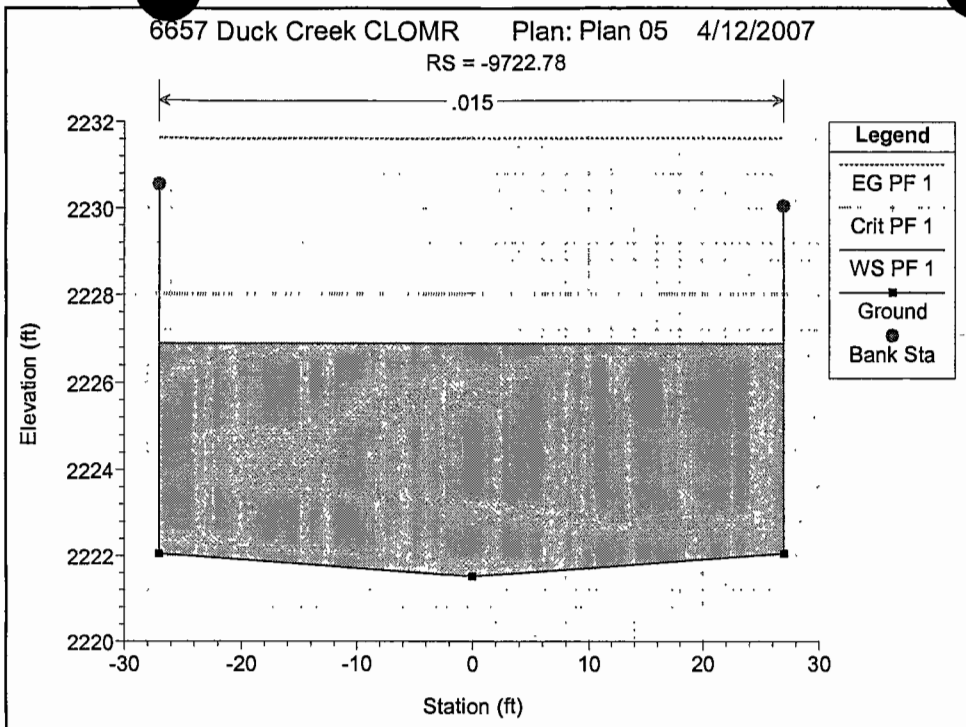
RS = -9404.95

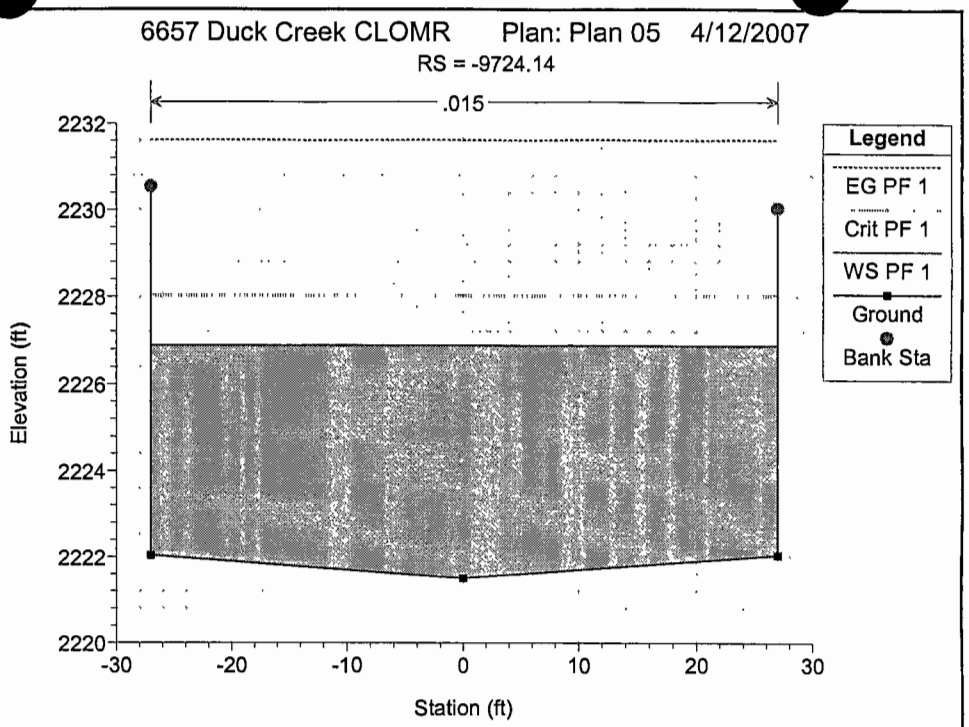


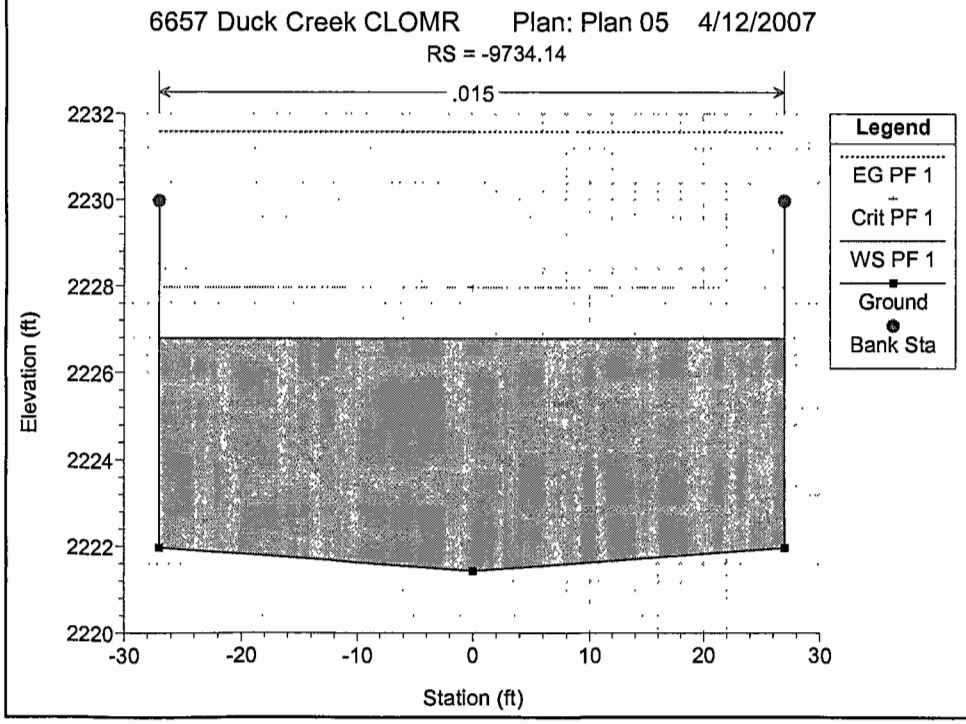

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

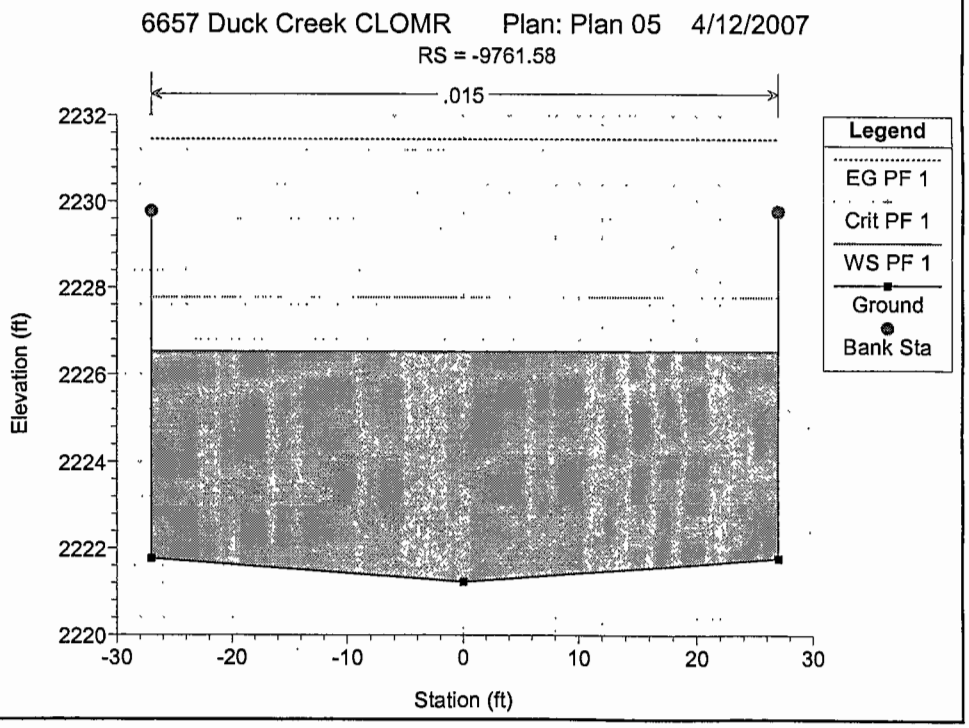
RS = -9414.95




6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -9722.78
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

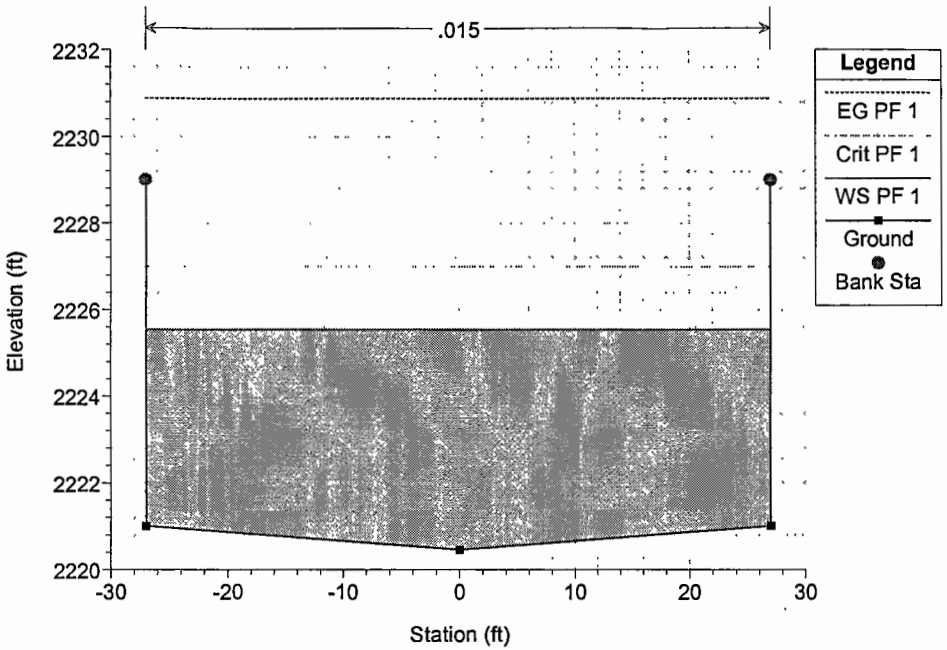

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -9724.14
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -9734.14
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -9761.58
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

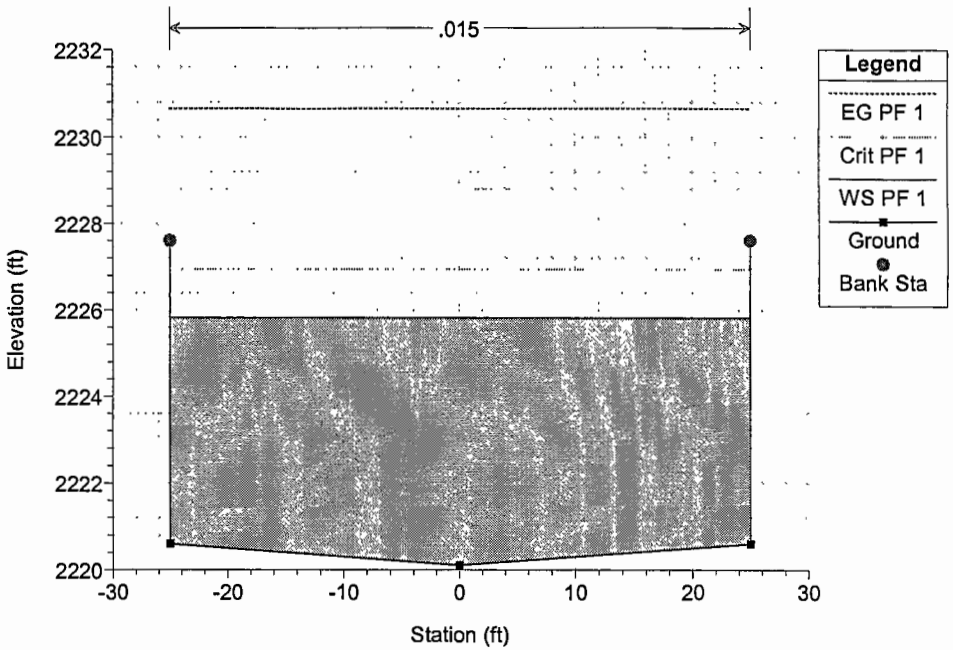
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -9871.58



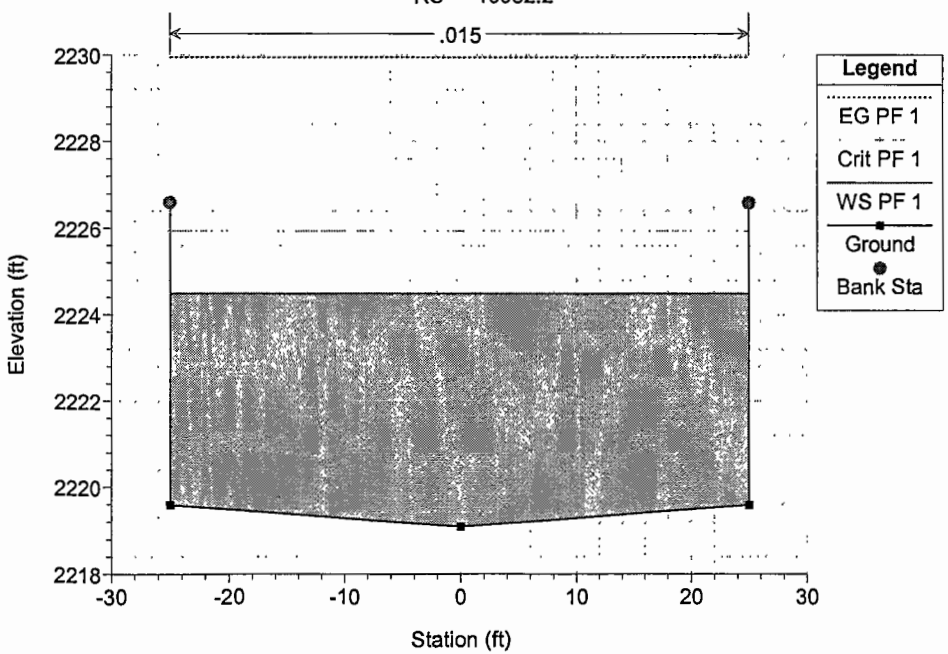

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -9922.82



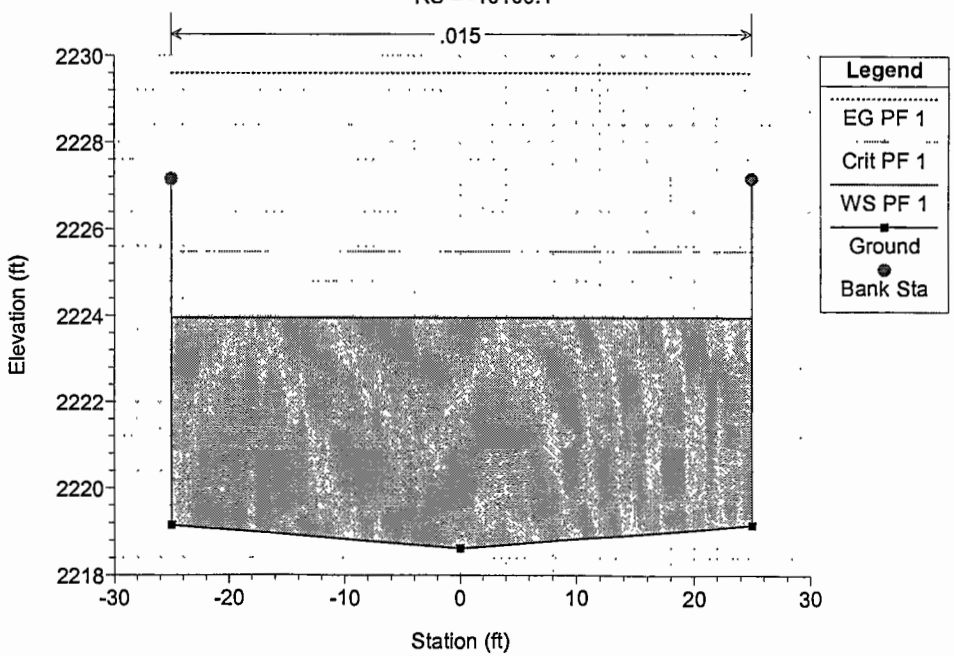

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10032.2



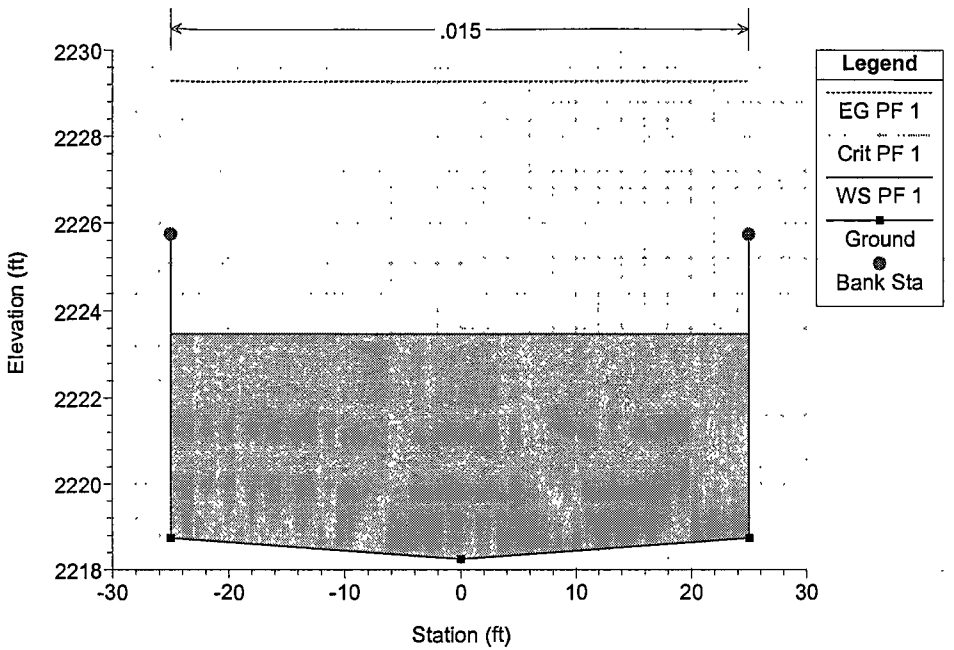

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10100.1



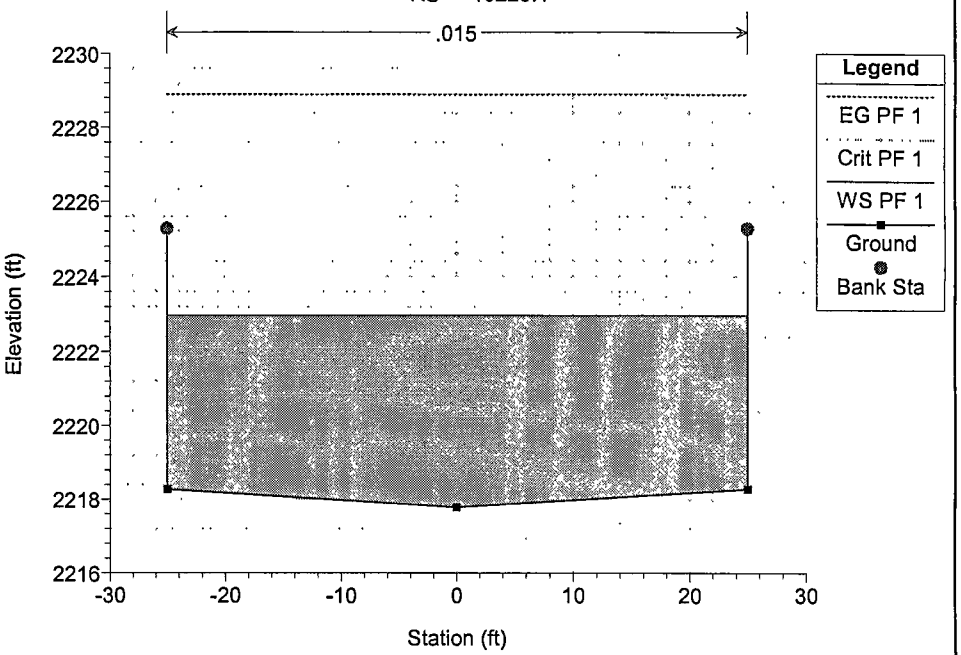
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10153.8



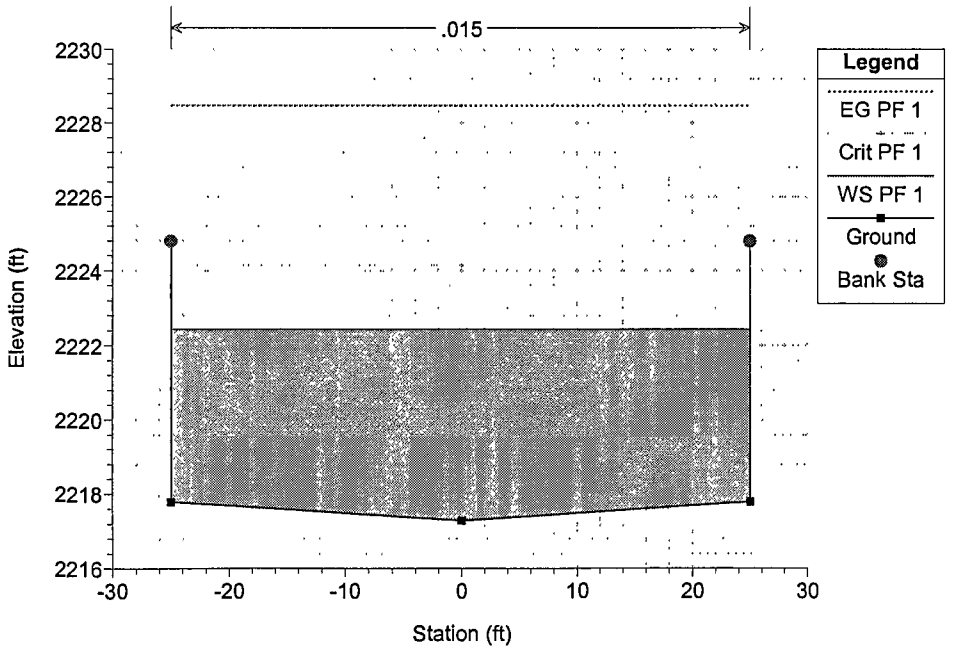

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10223.1



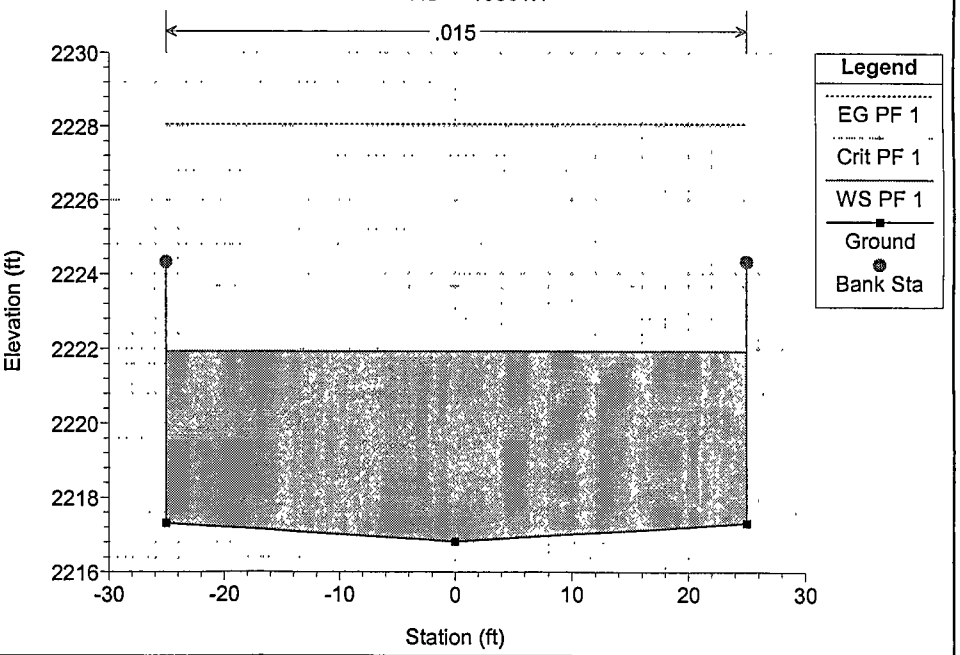

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10292.1



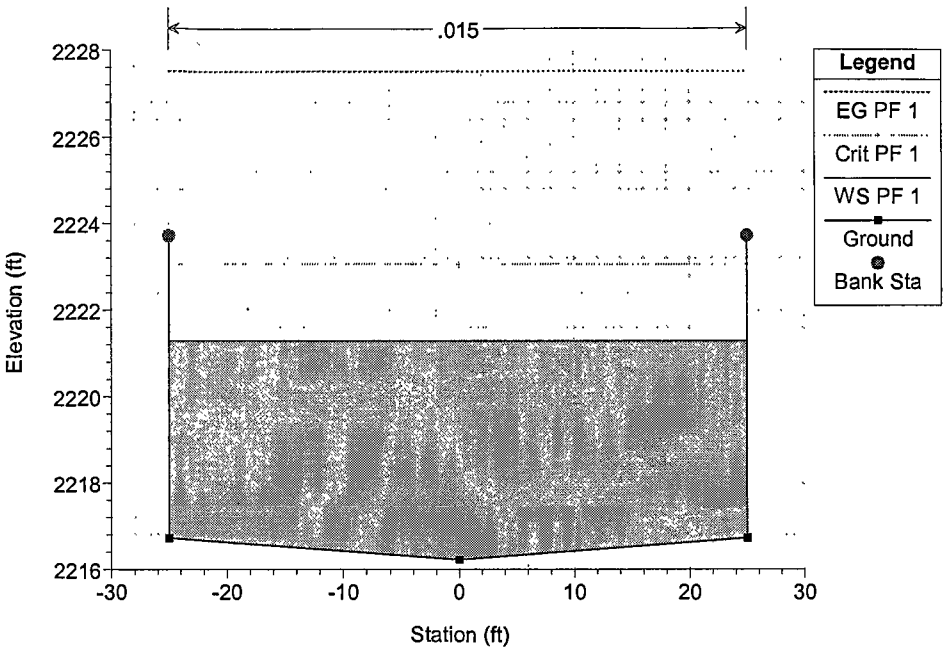

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10361.1



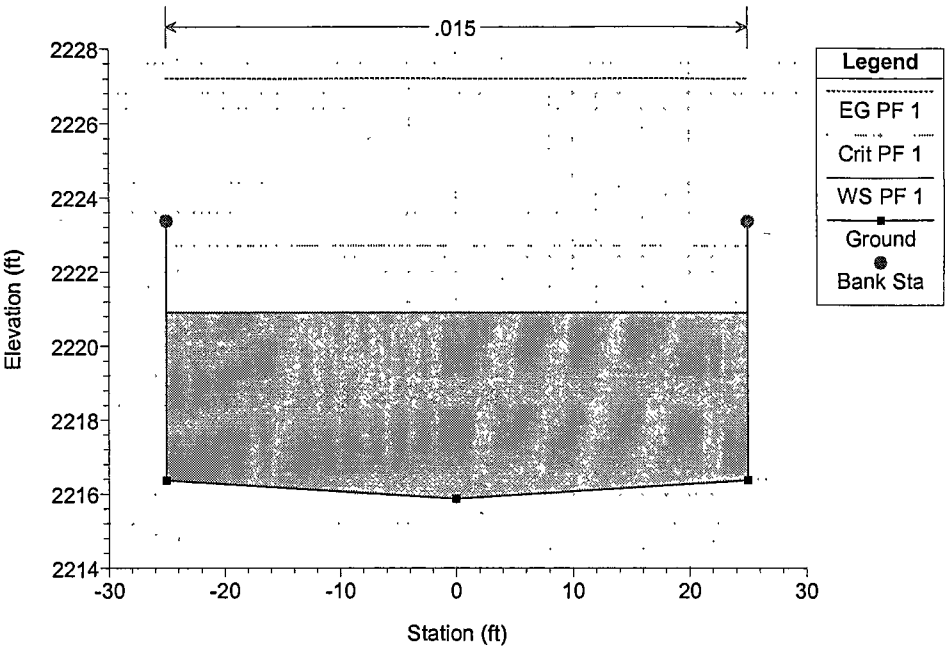
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10477.9



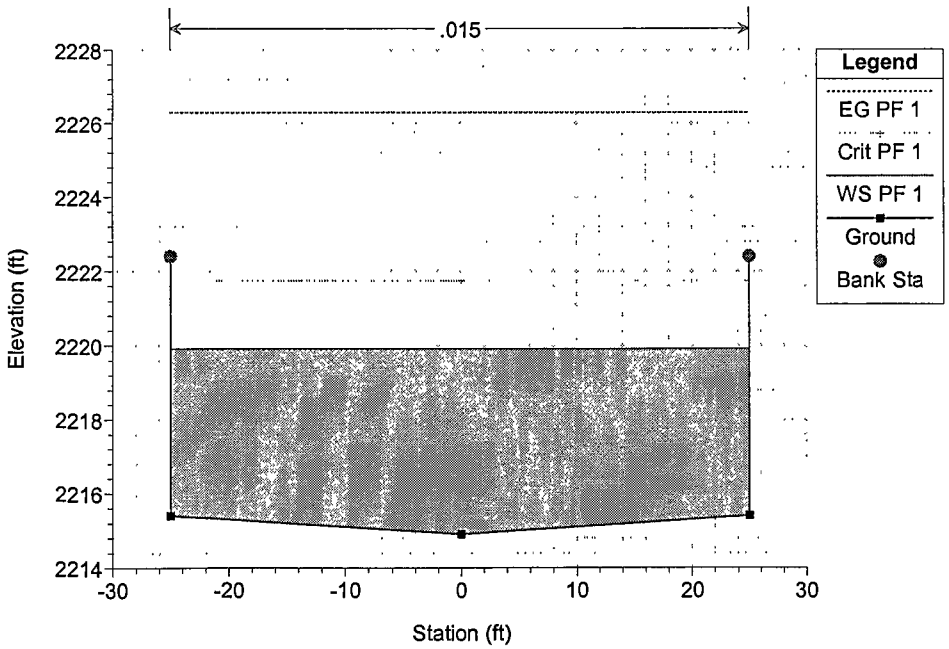

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10529.1



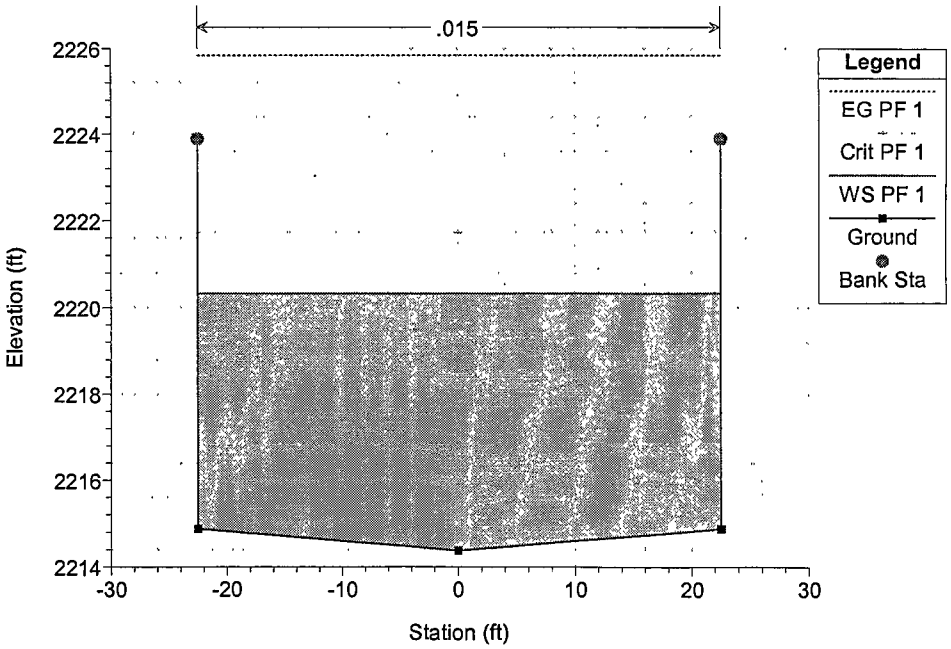

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10668.4



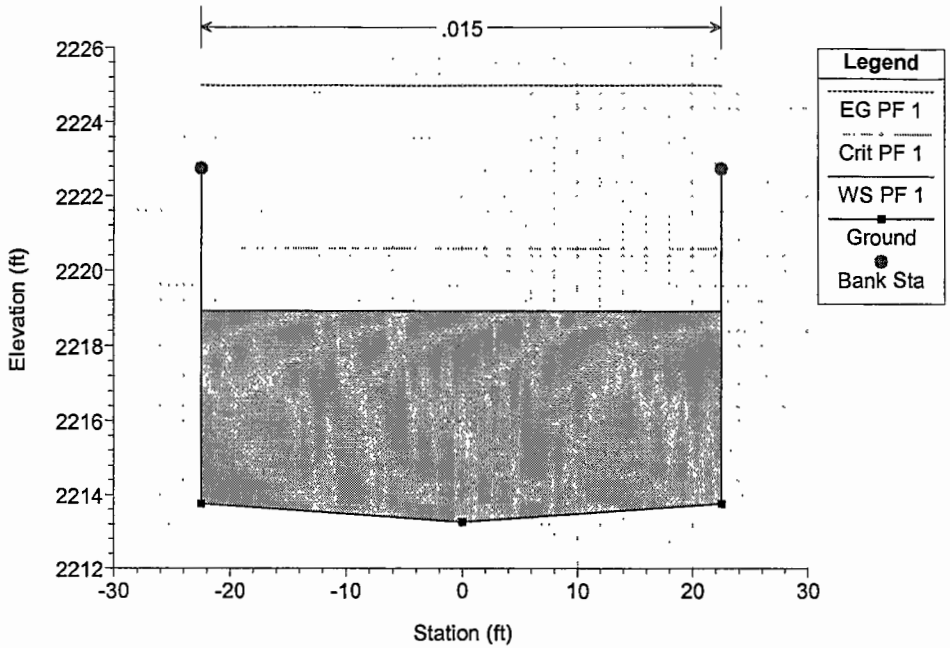

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10743.4



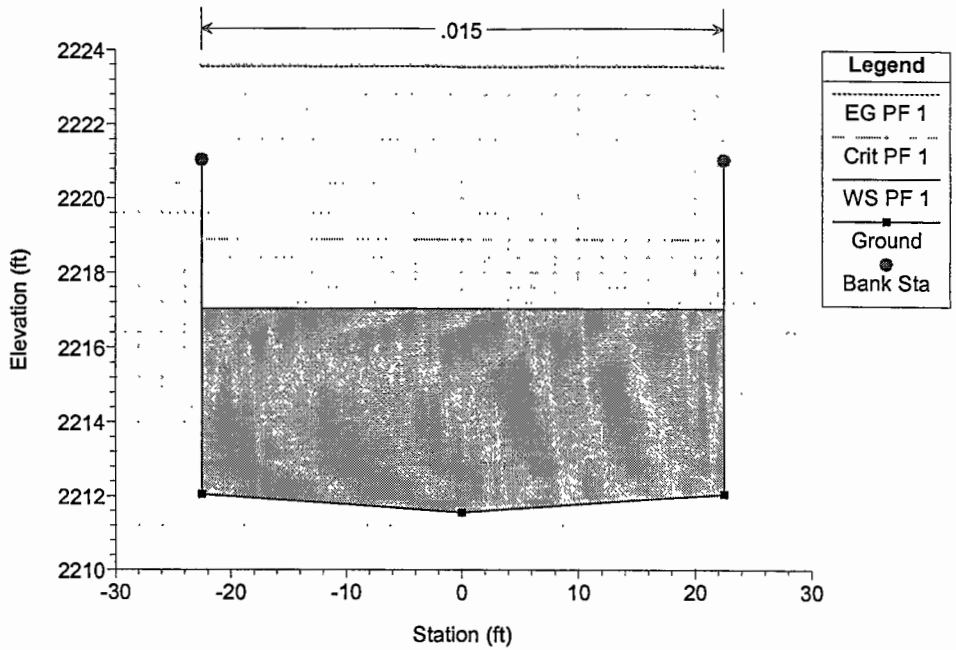
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -10906.8



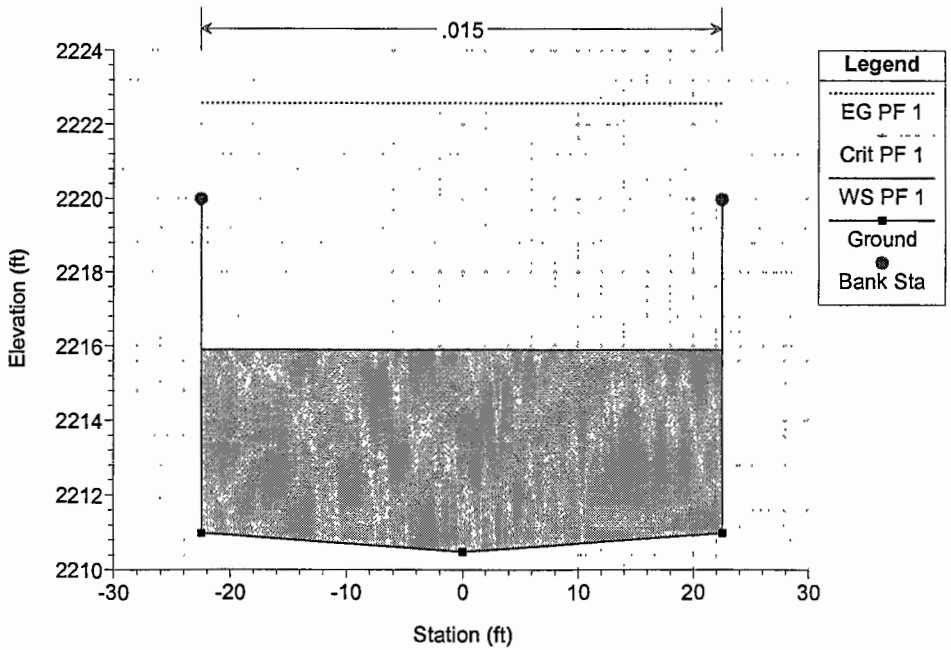

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -11154



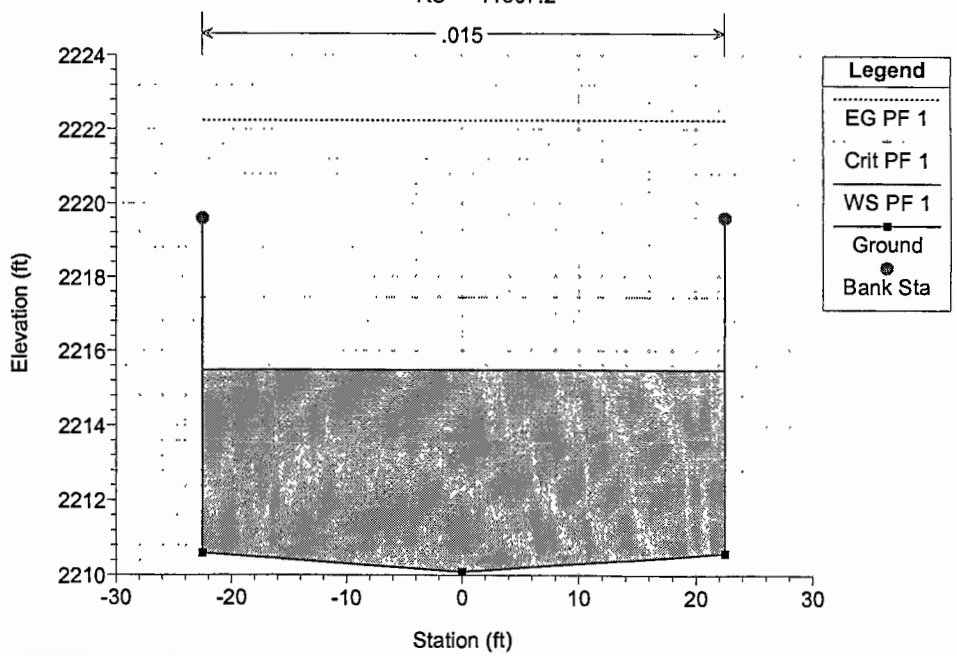

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -11311.5



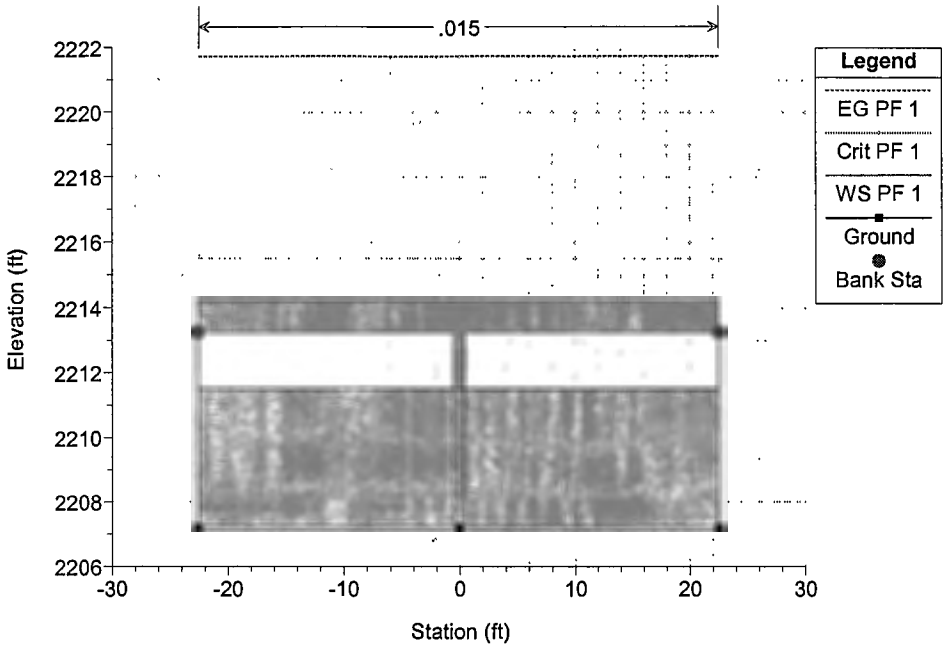

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -11367.2



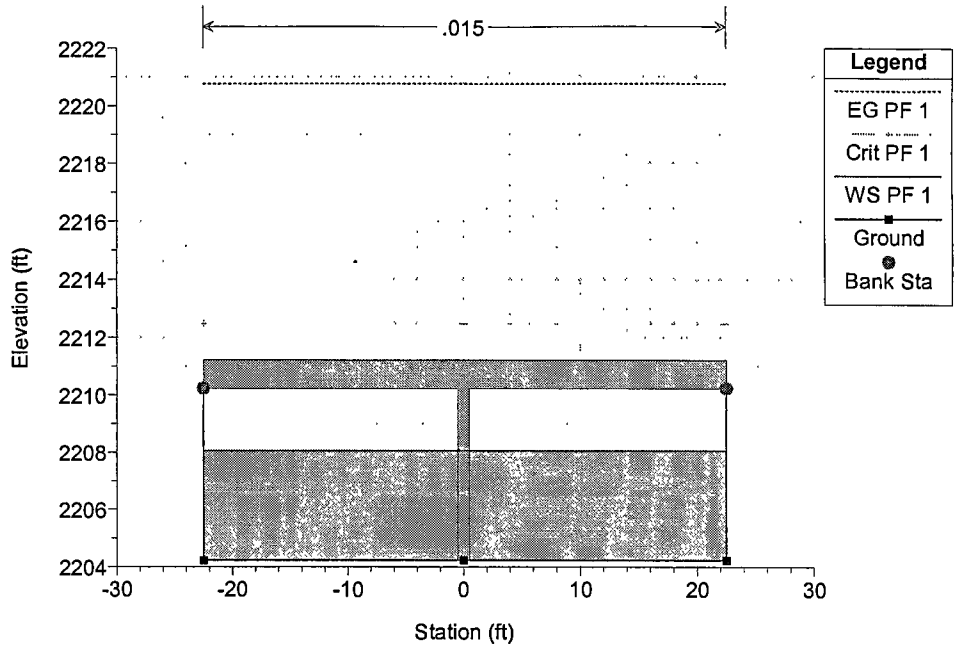
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -11417.2



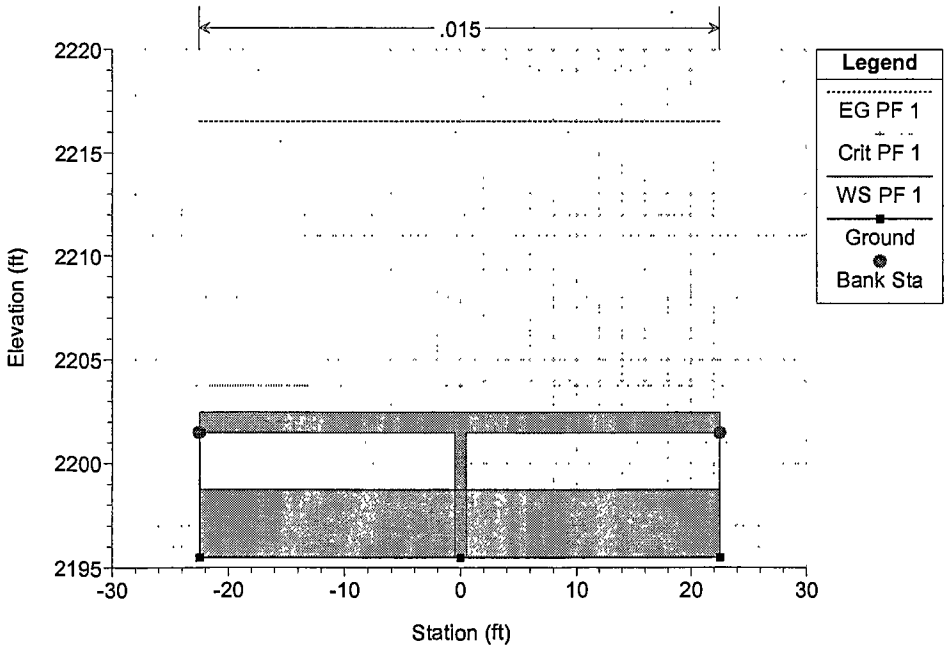

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -11470.9



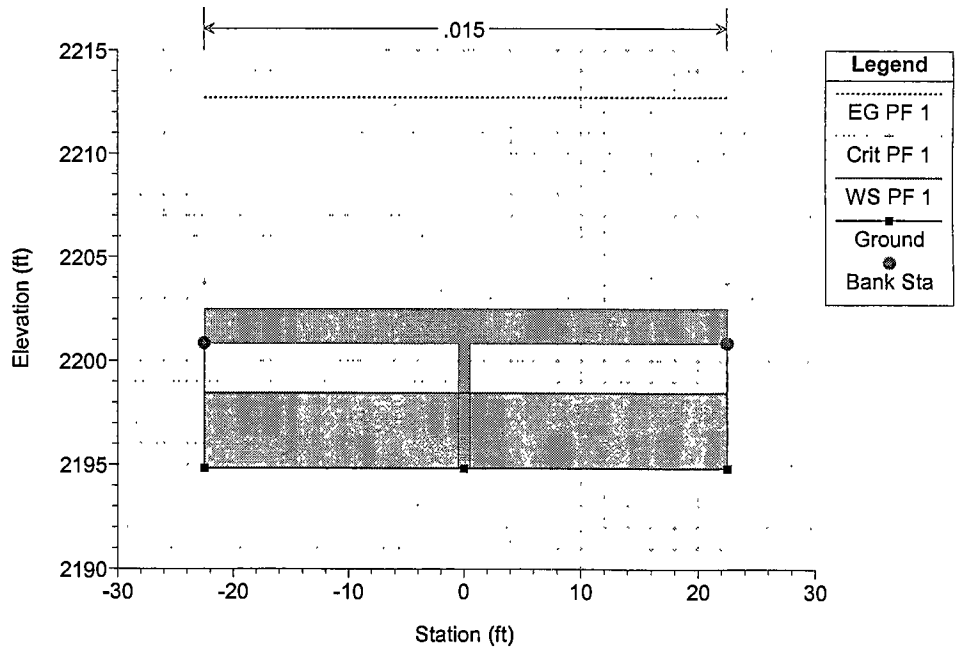

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

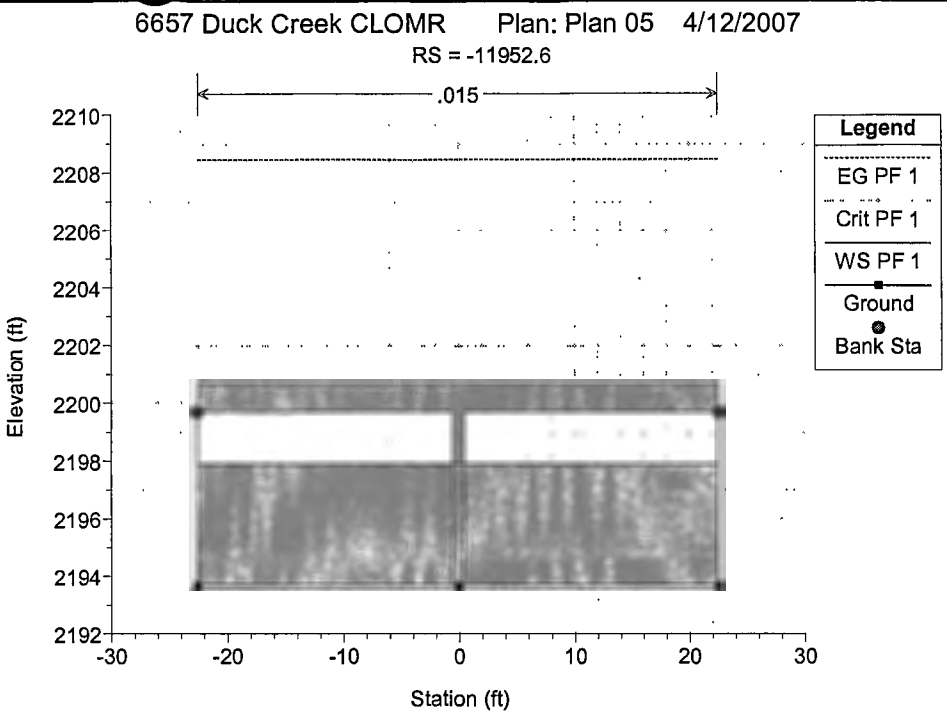
RS = -11625.6

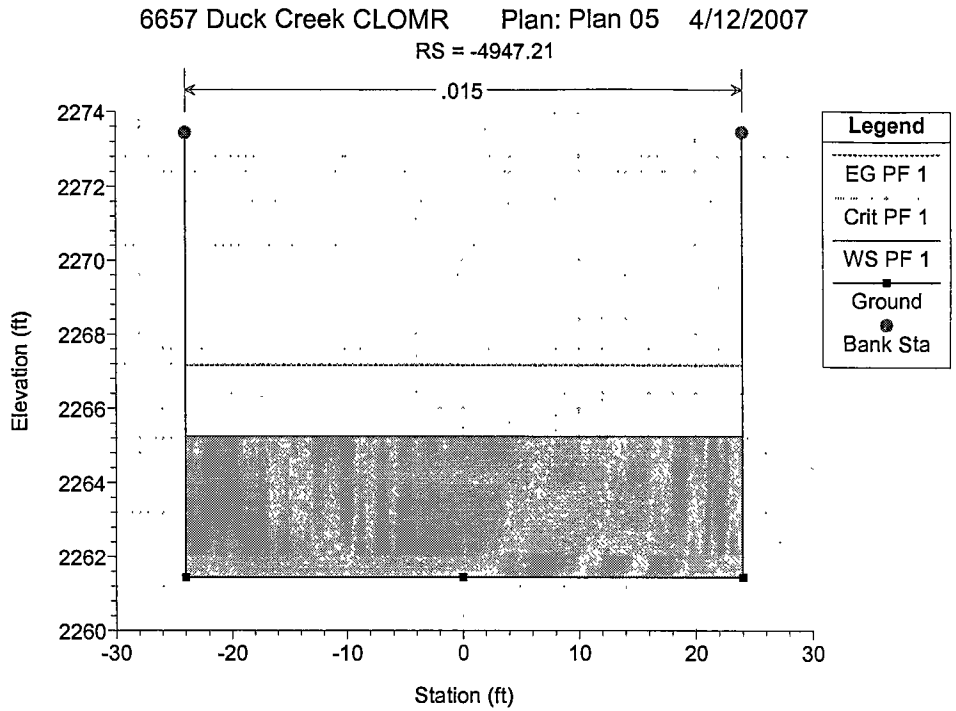


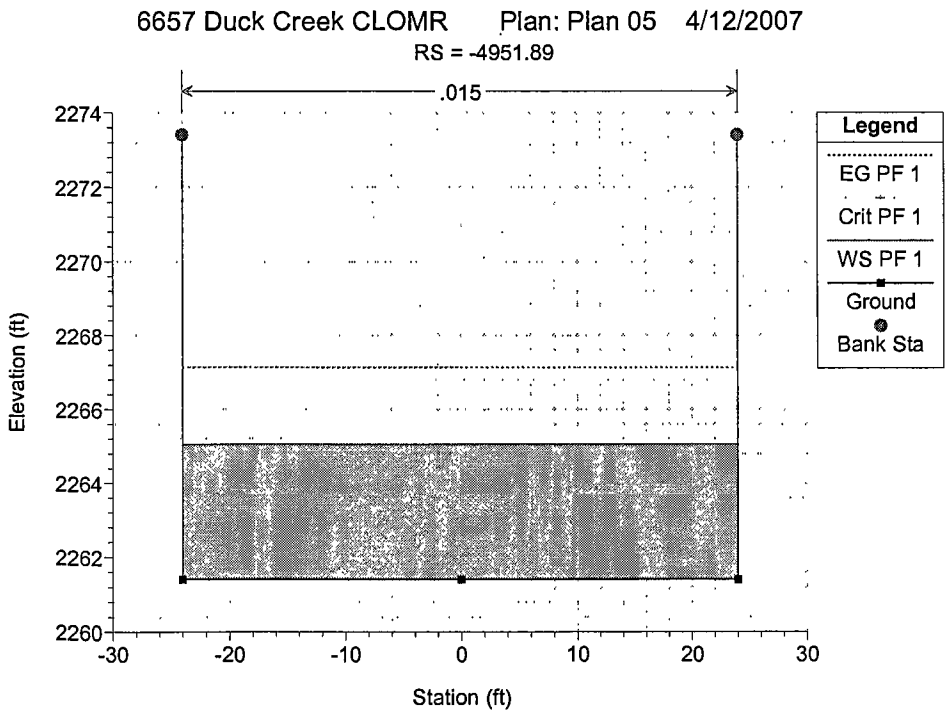

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

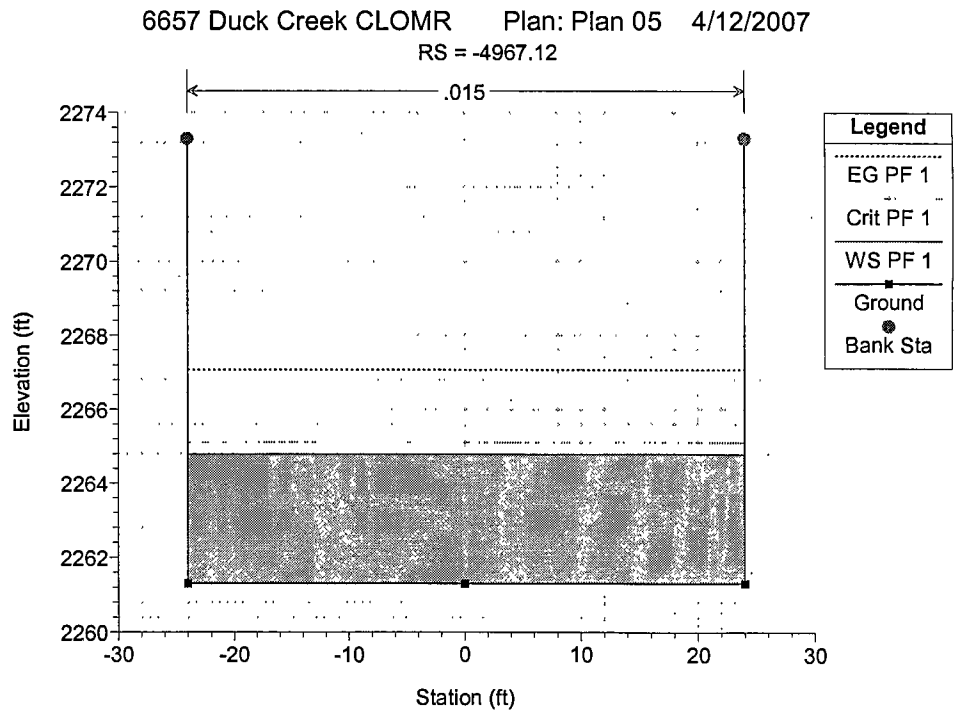
RS = -11745

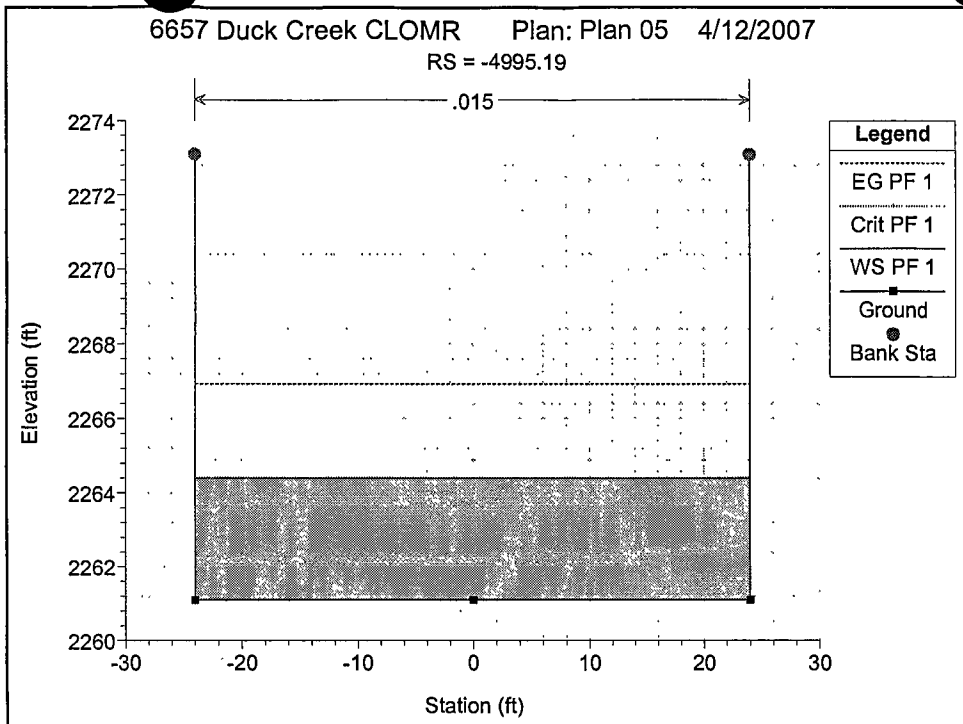


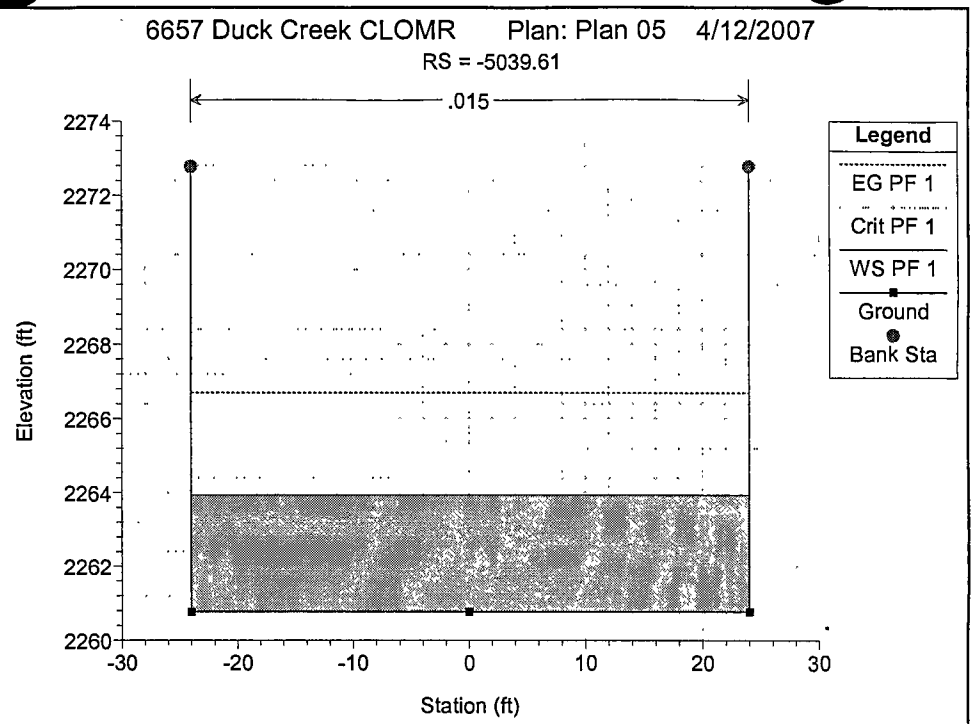

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -11952.6
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

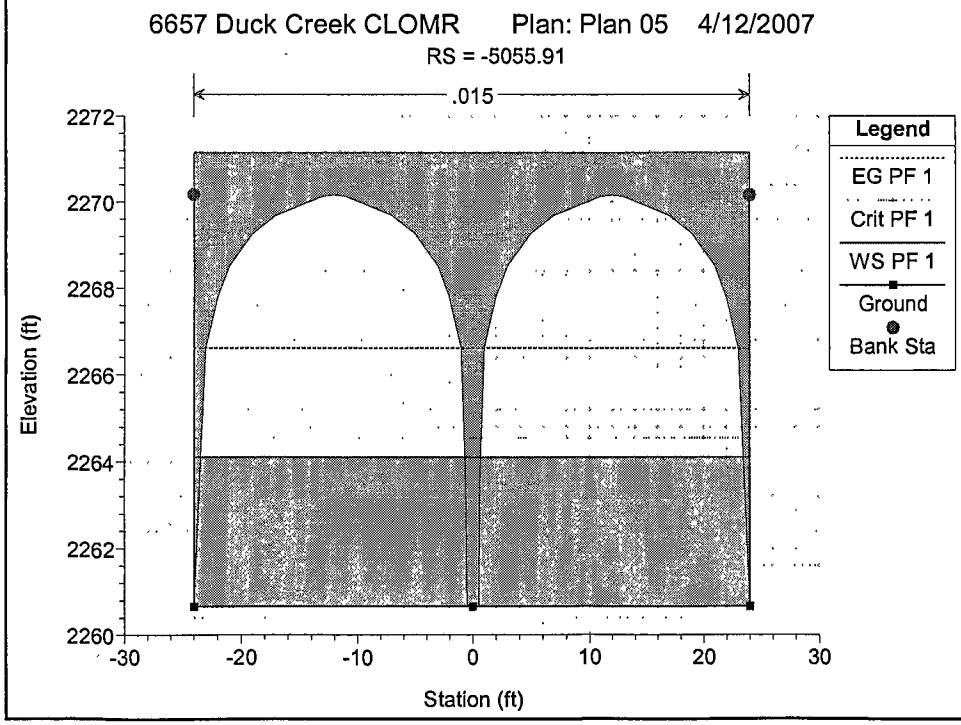

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -4947.21
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

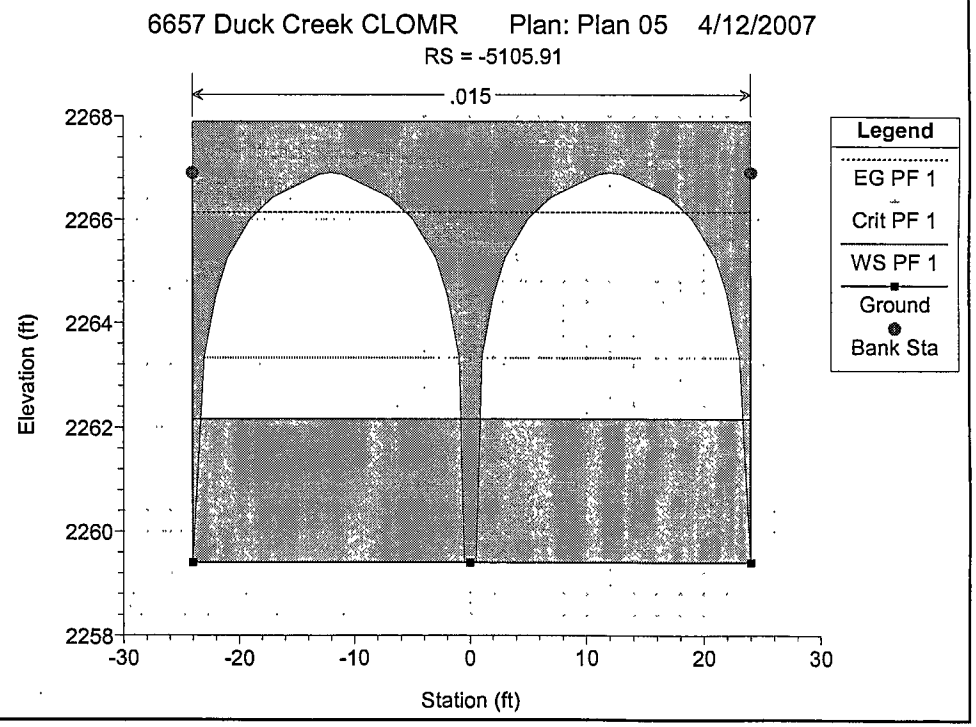

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -4951.89
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -4967.12
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -4995.19
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

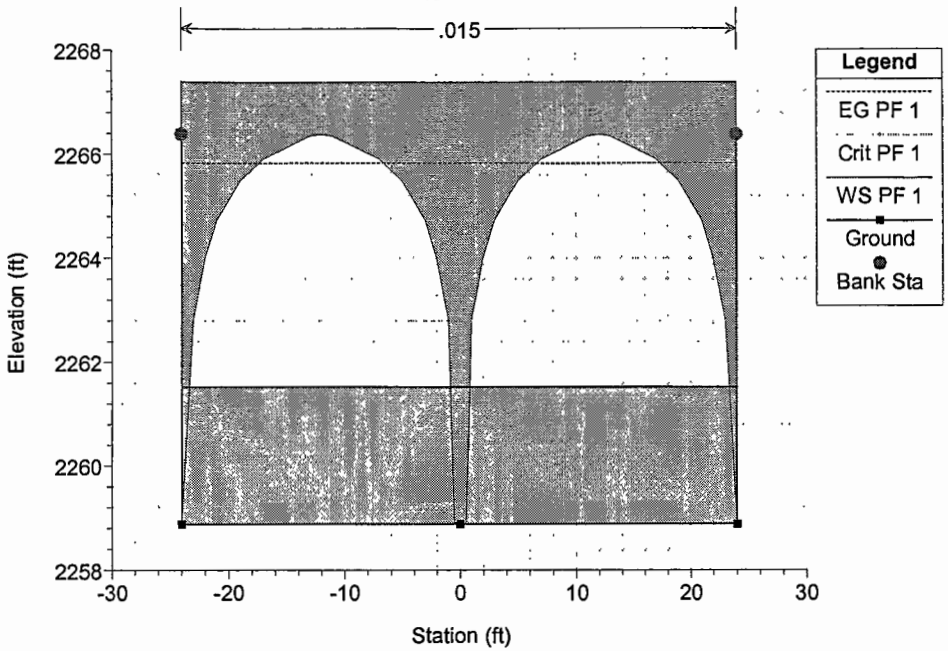

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -5039.61
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -5055.91
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007
RS = -5105.91
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

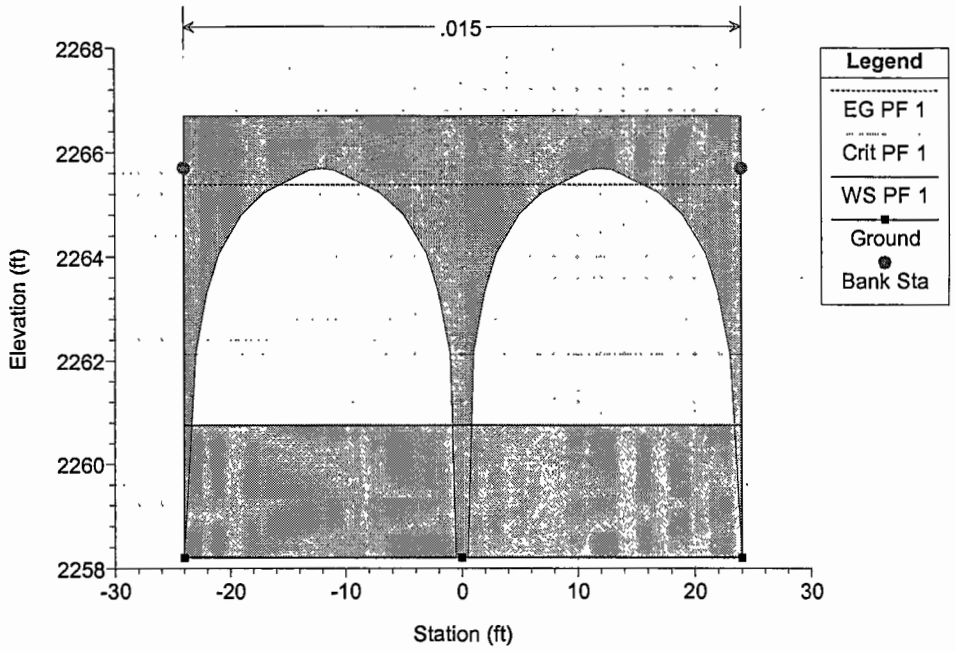
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5133.42



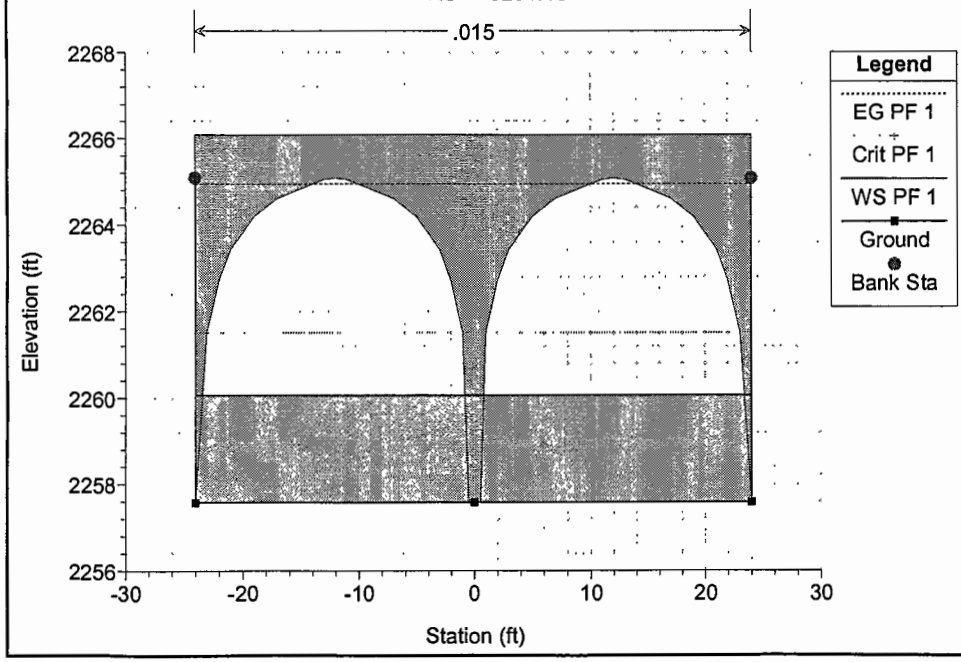

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5168.74



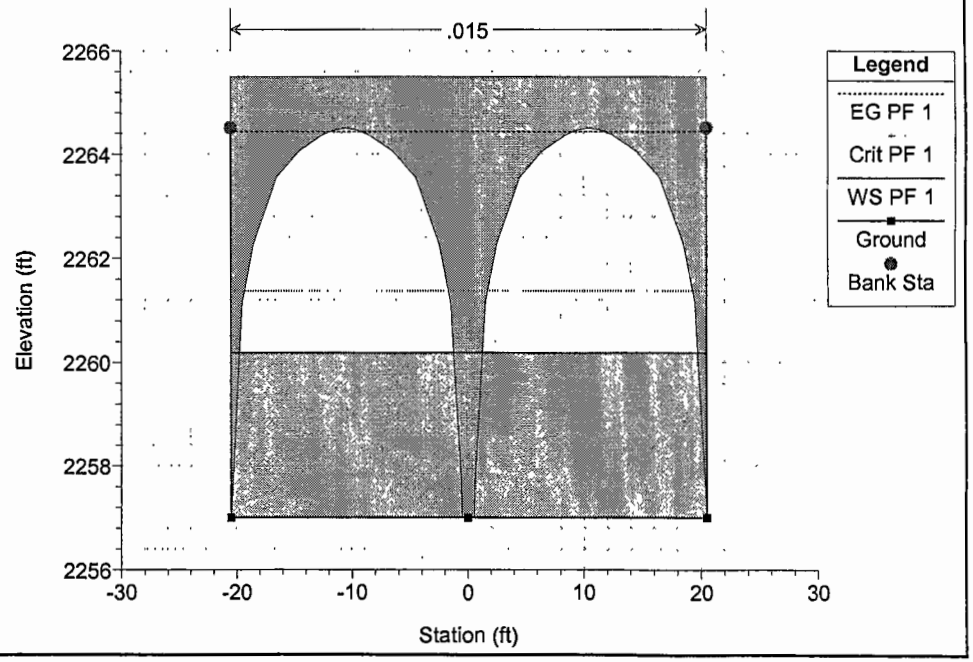

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5201.46



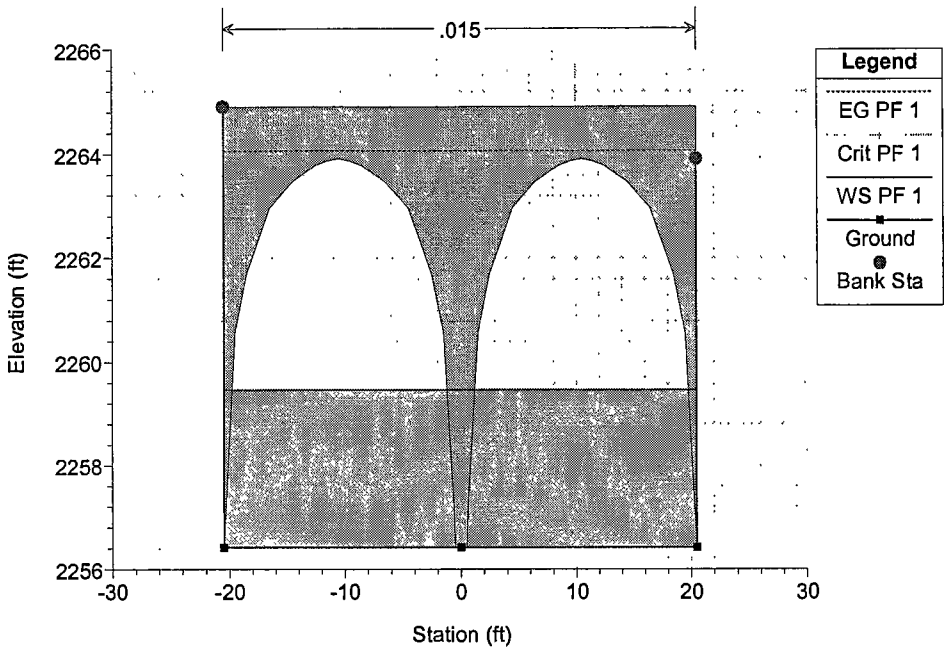

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5231.46



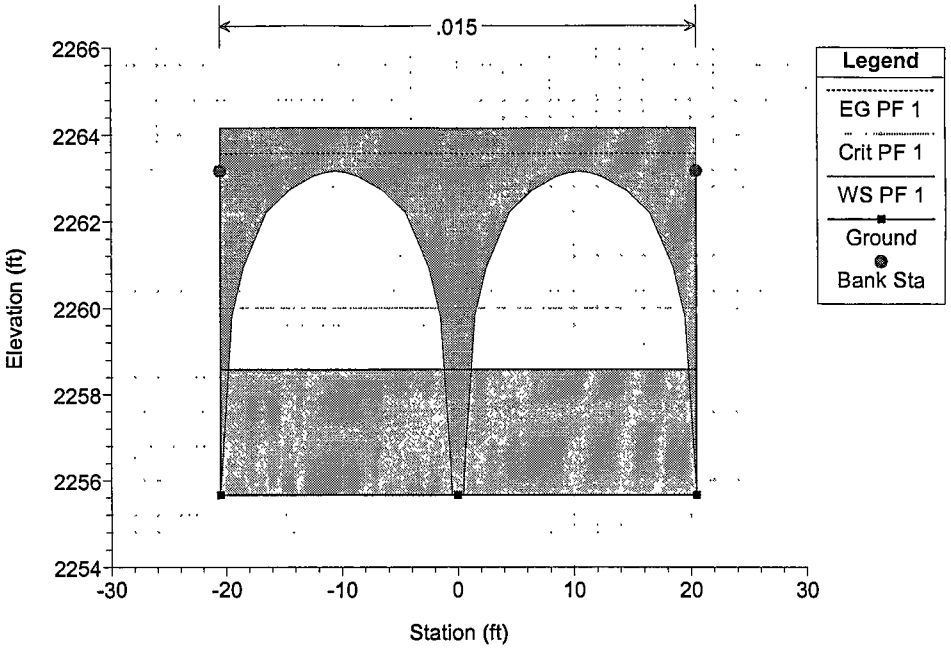
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5261.86



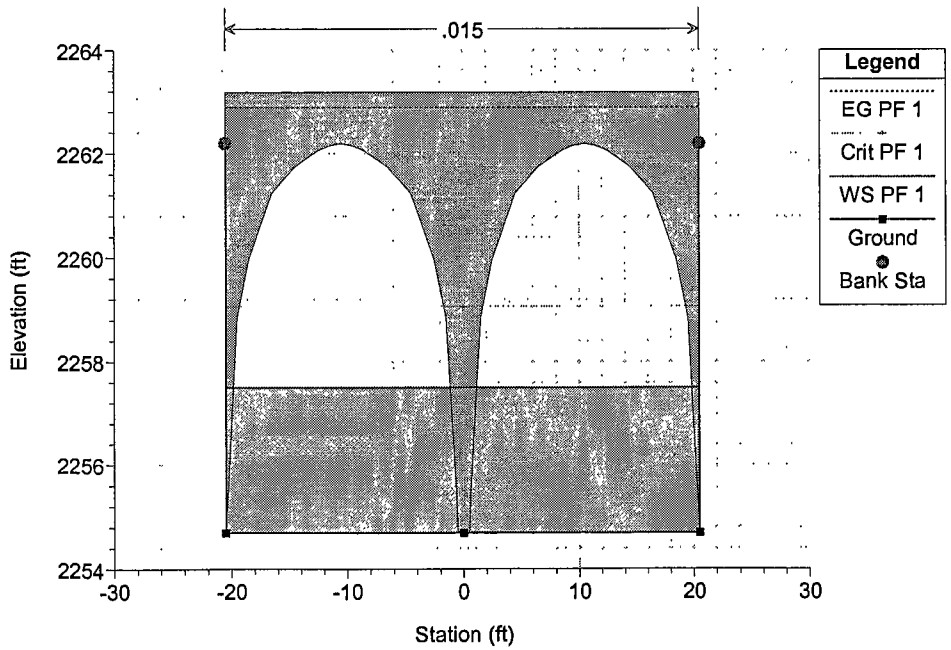

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5301.48



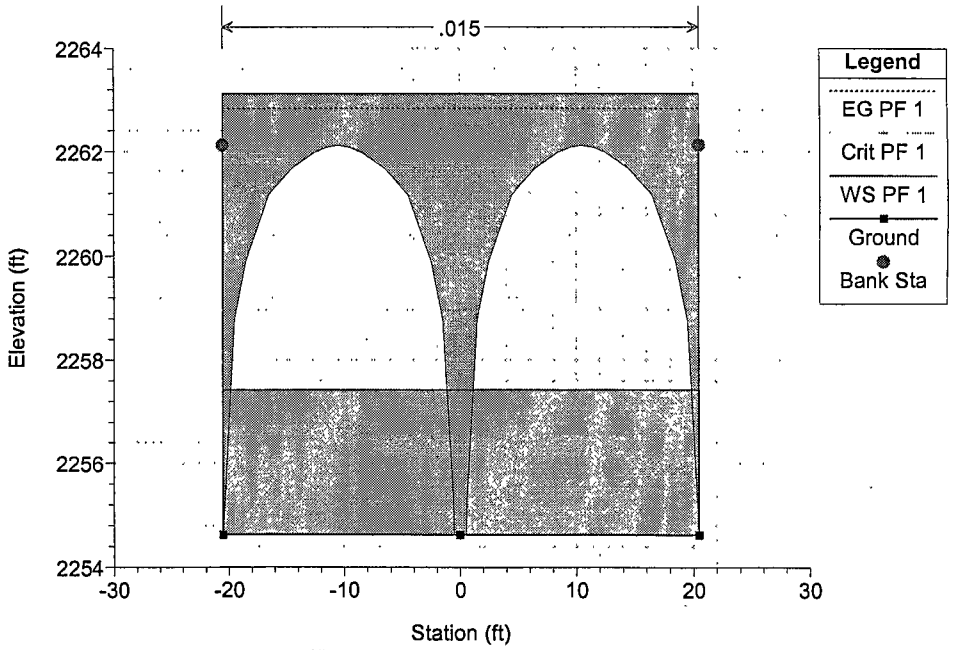

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5352.52



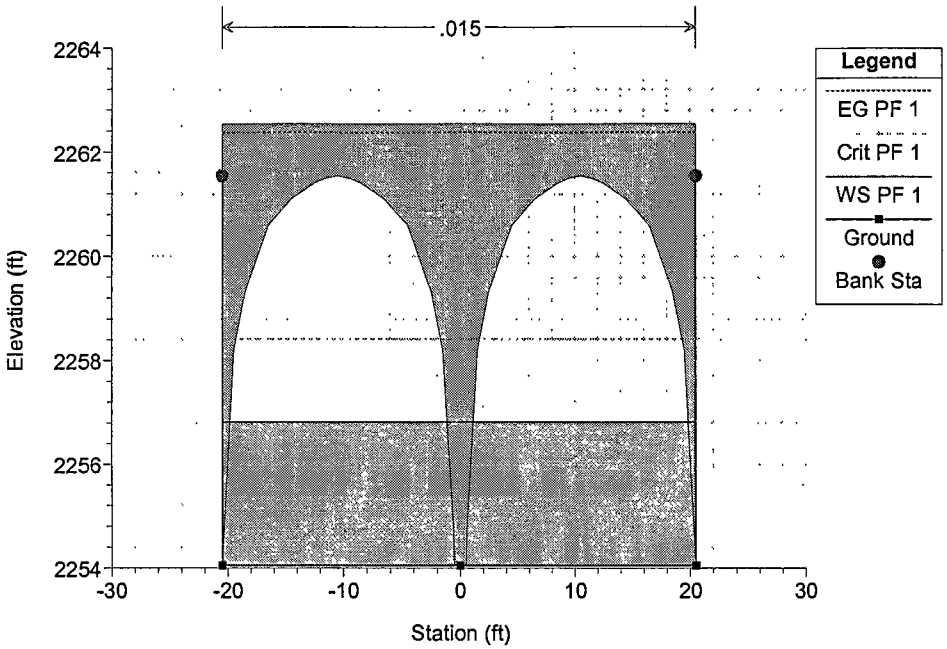

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5356.13



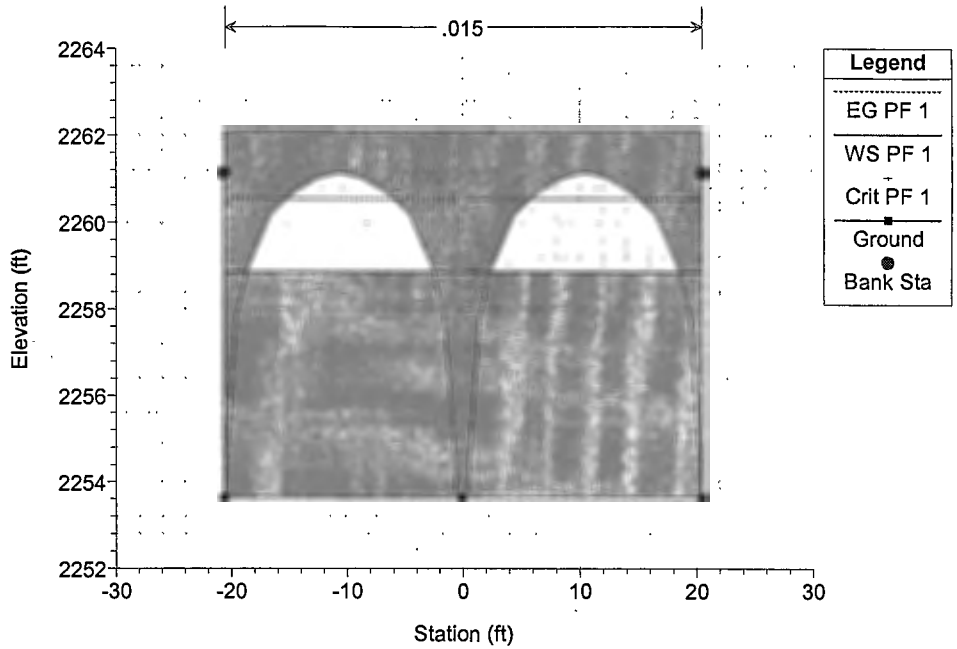
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5386.13



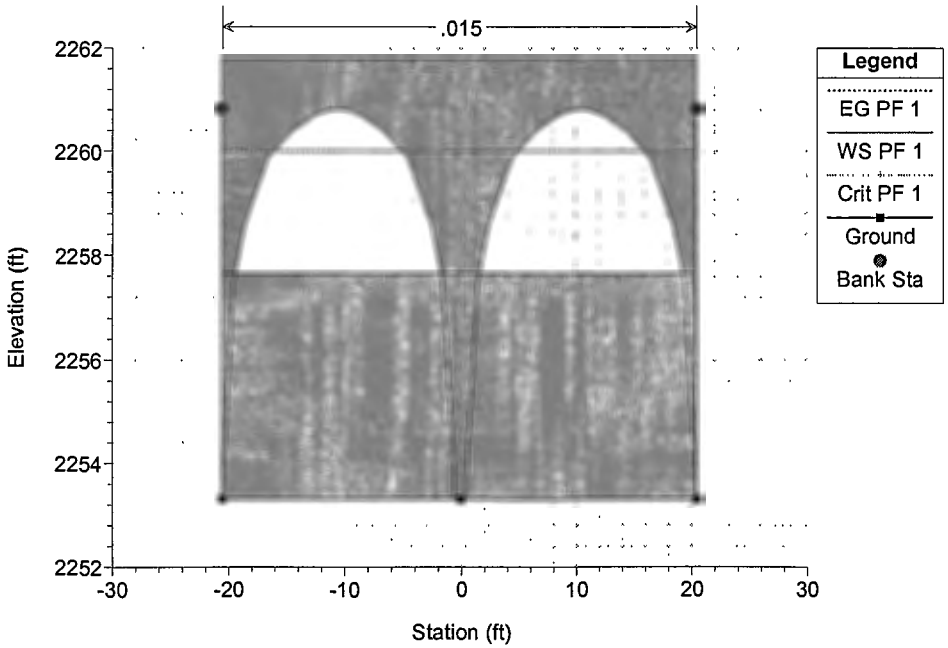

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5515.9



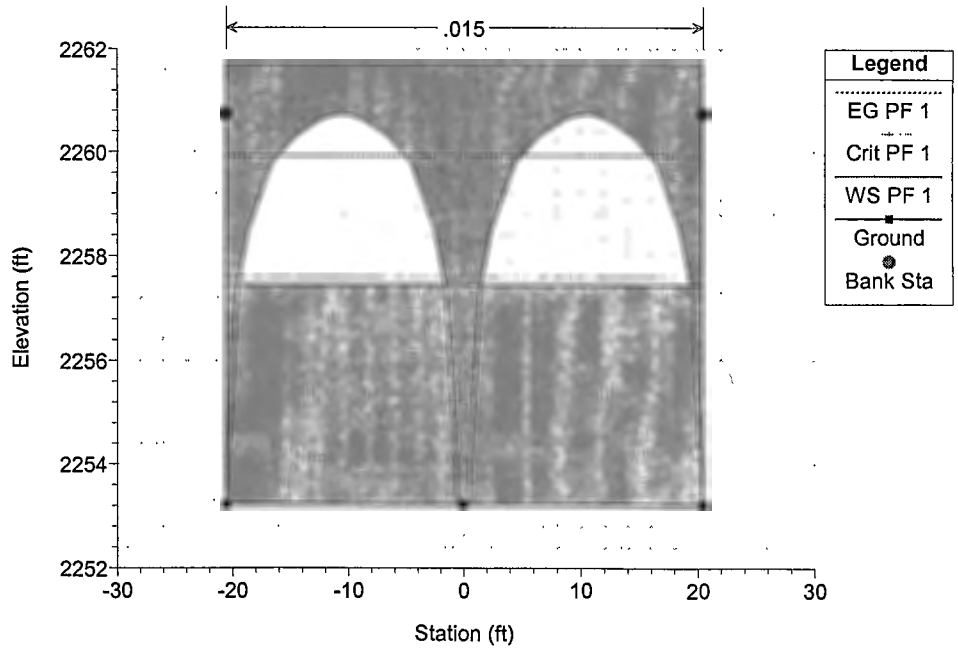

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5665.69



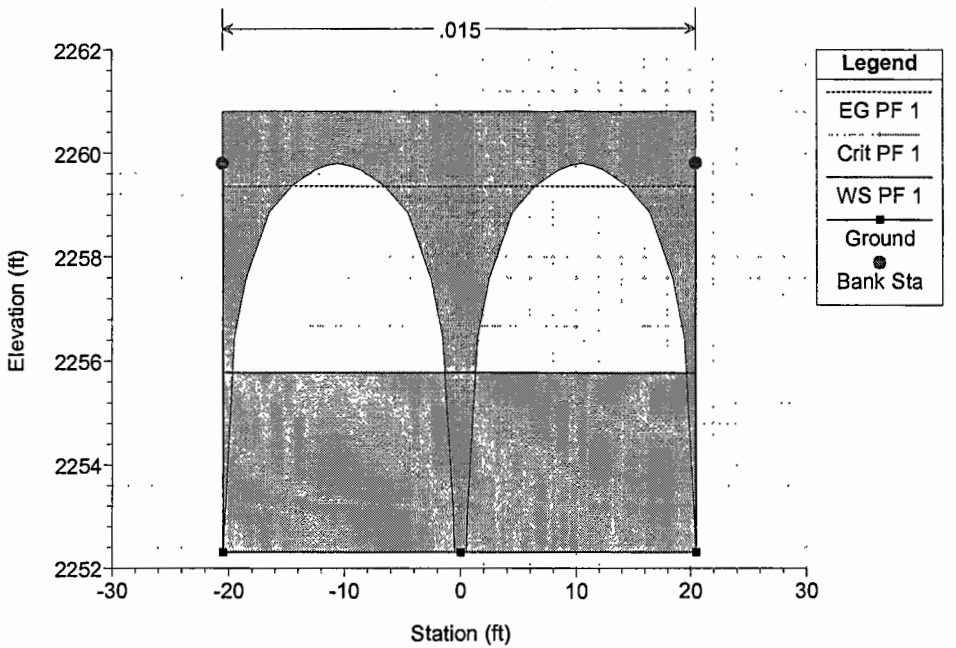

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5682.16



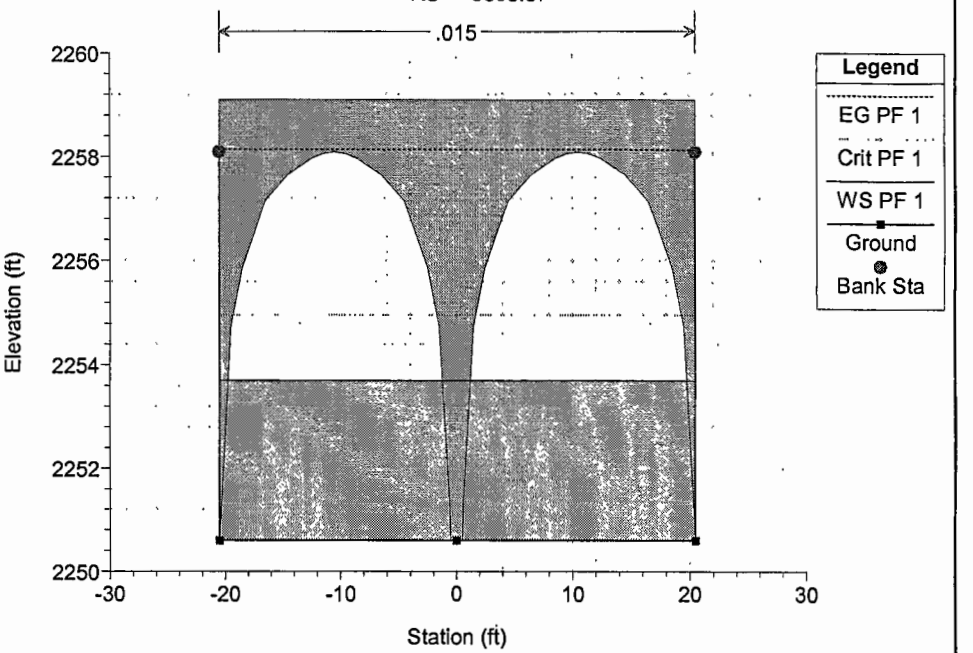
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5764.87



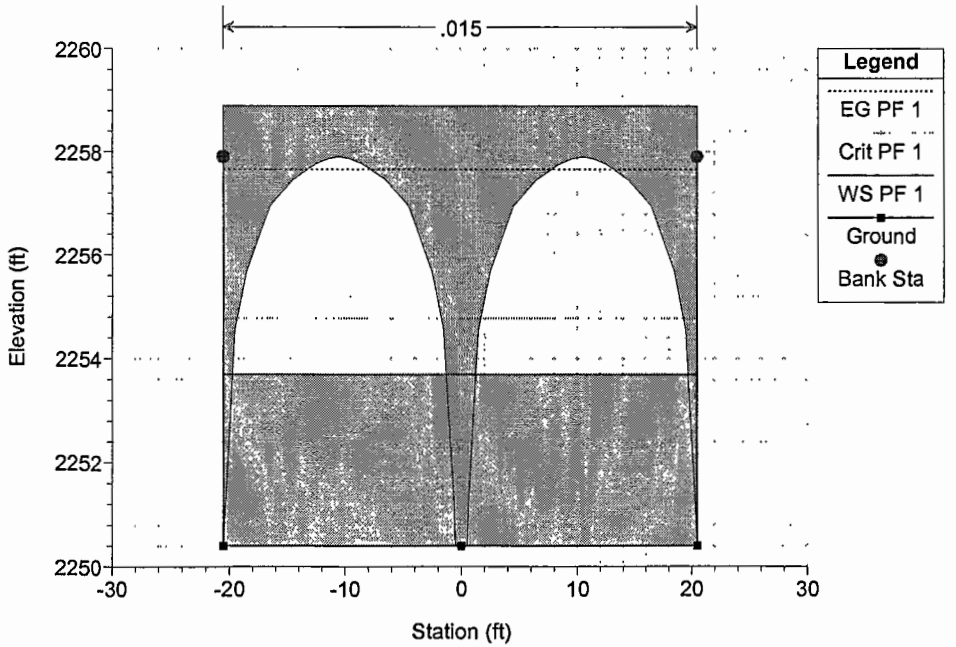

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5895.57



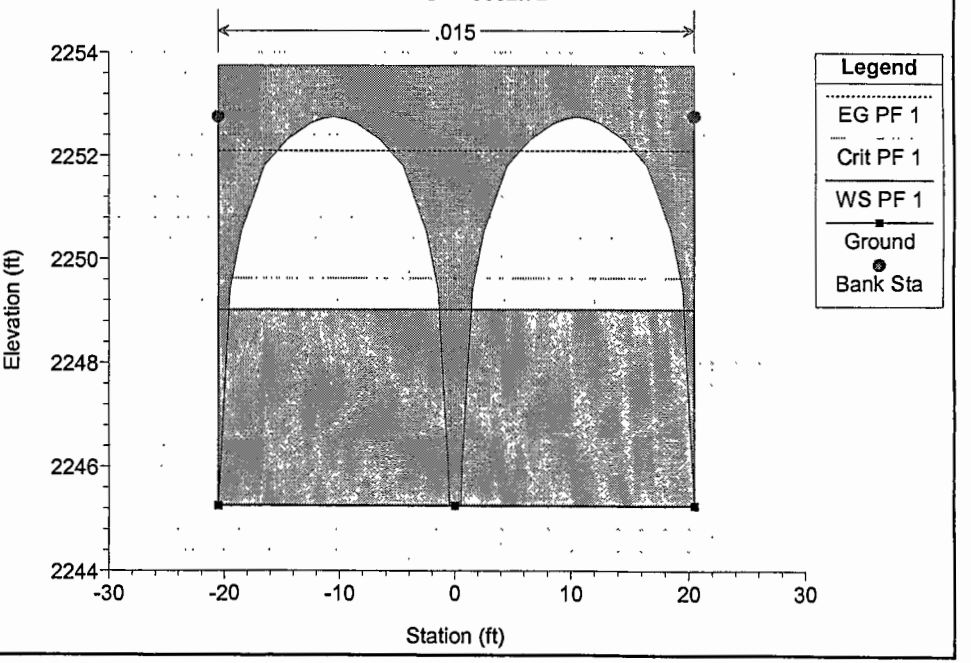

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -5932.72



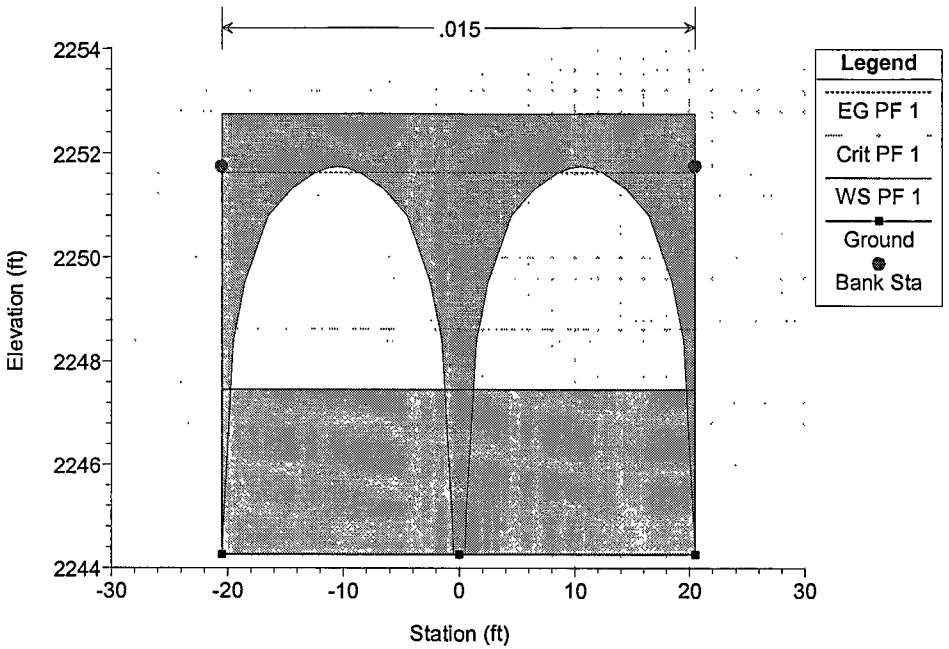

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6682.72



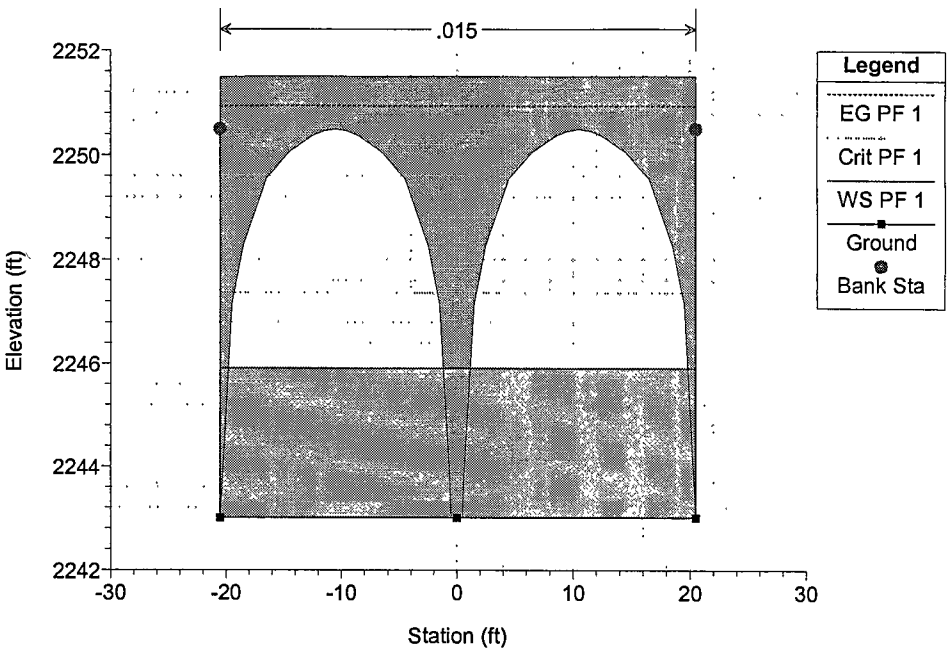
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6727.66



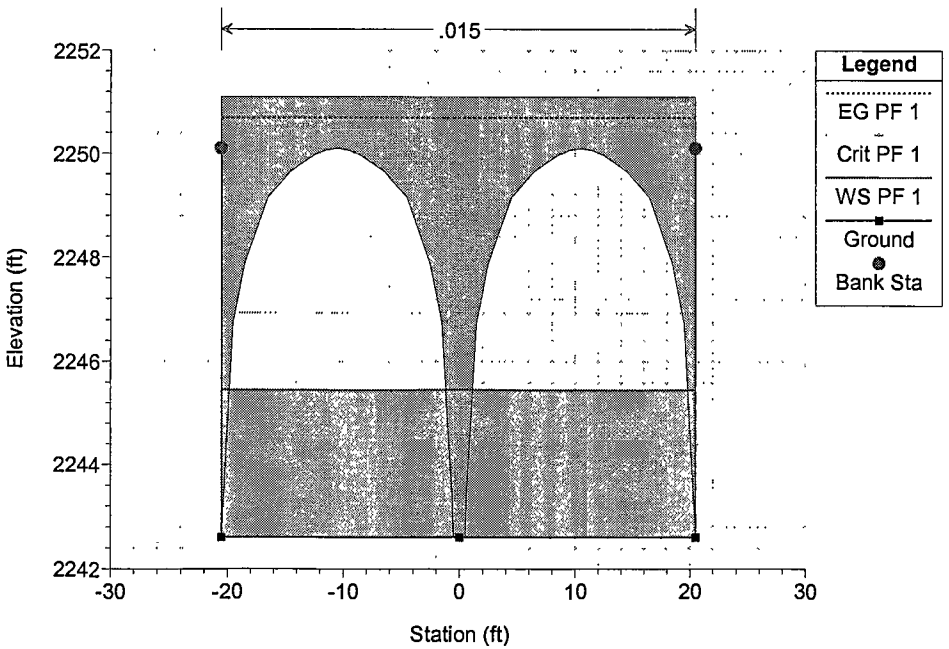

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6784.58



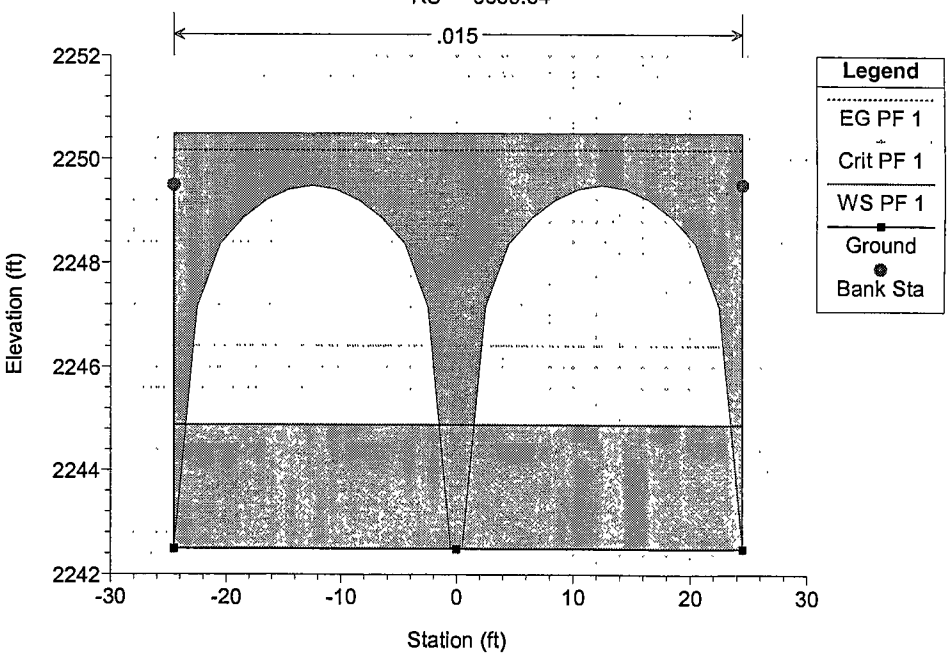

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6802.72



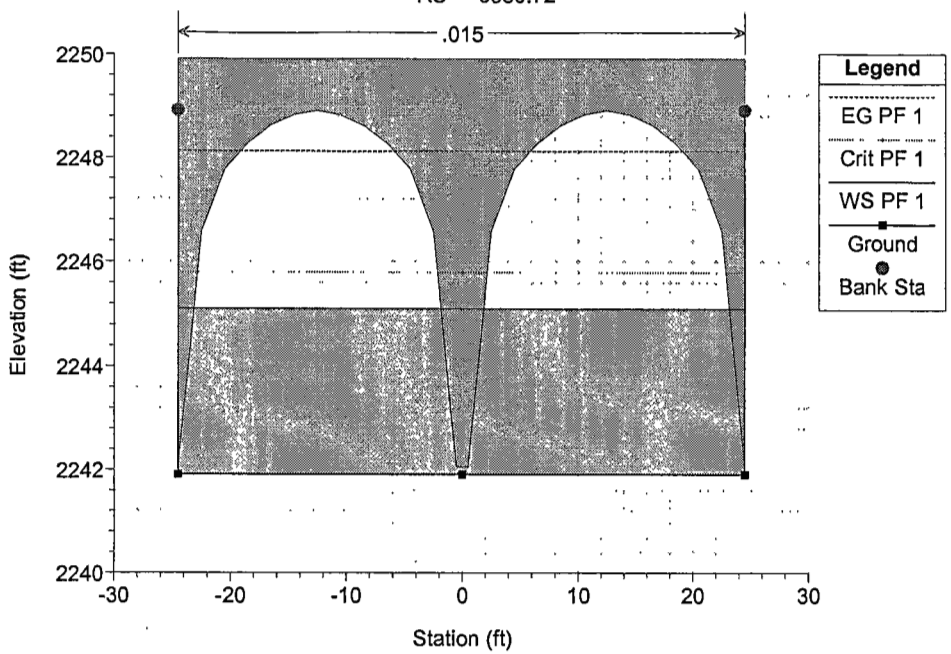

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6839.34



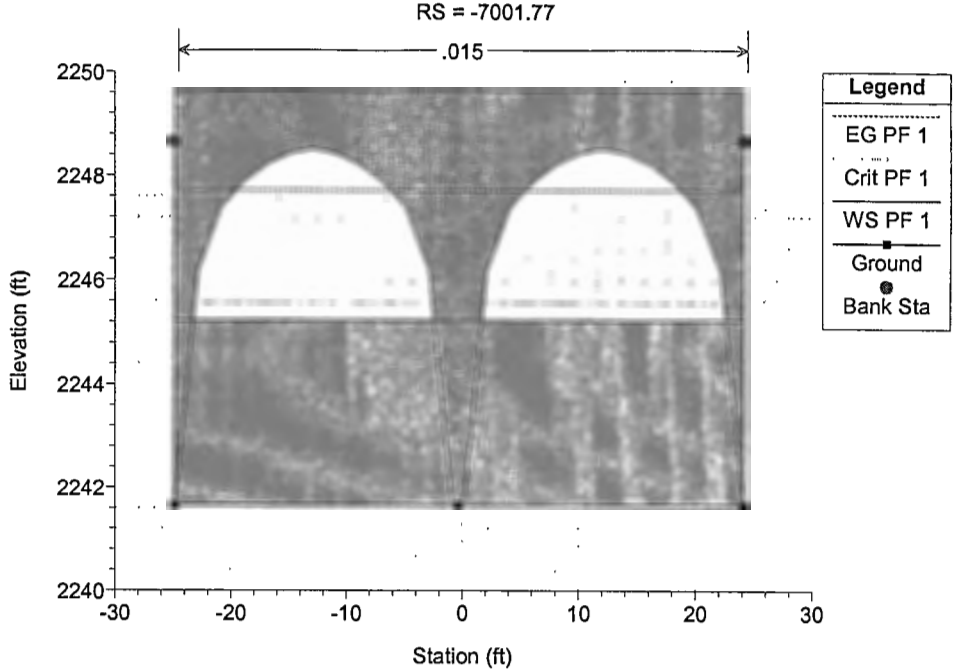
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -6980.72



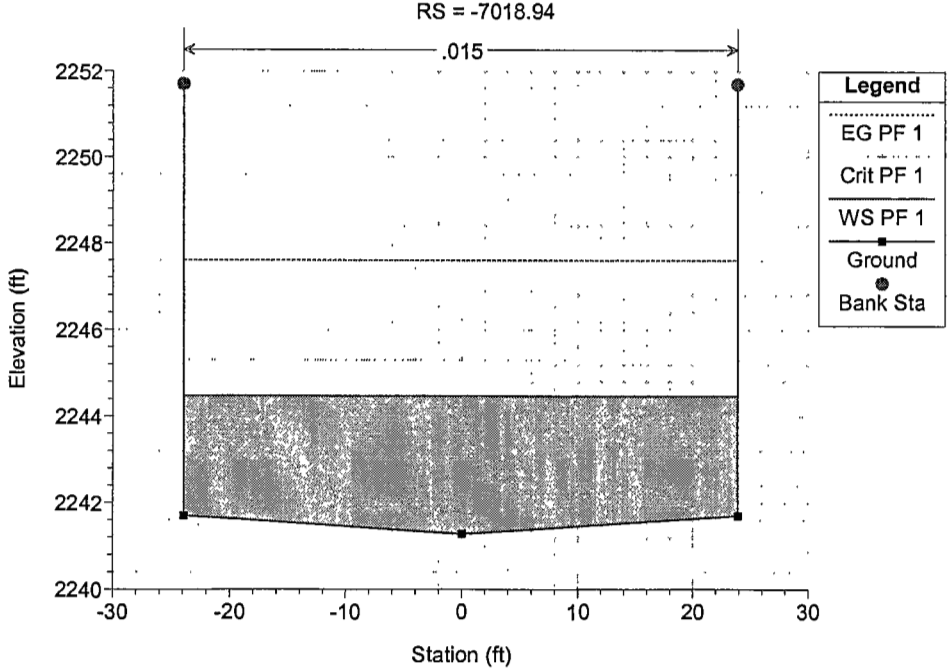

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7001.77



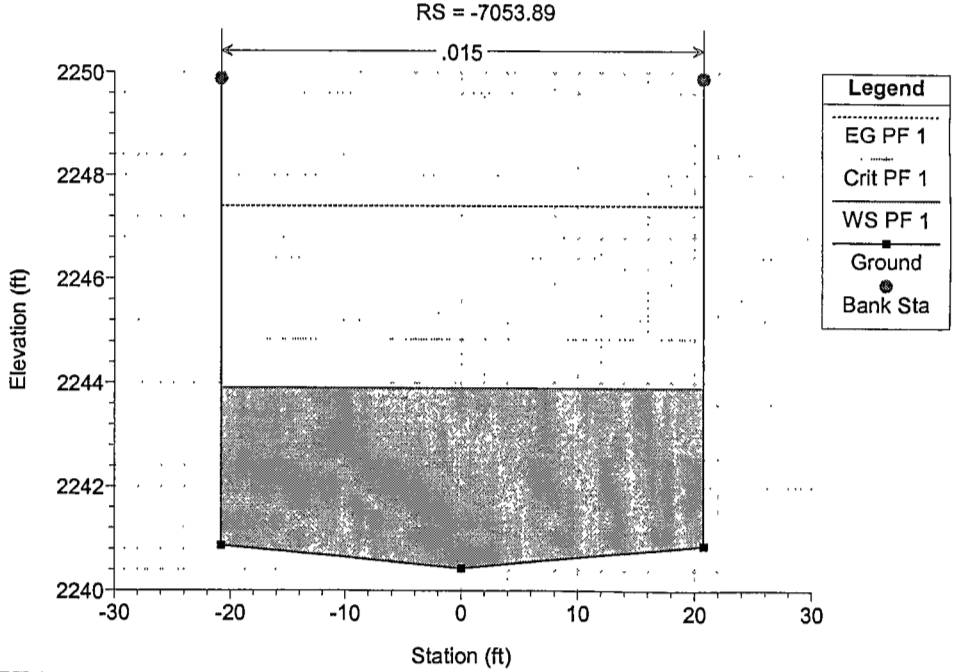

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7018.94



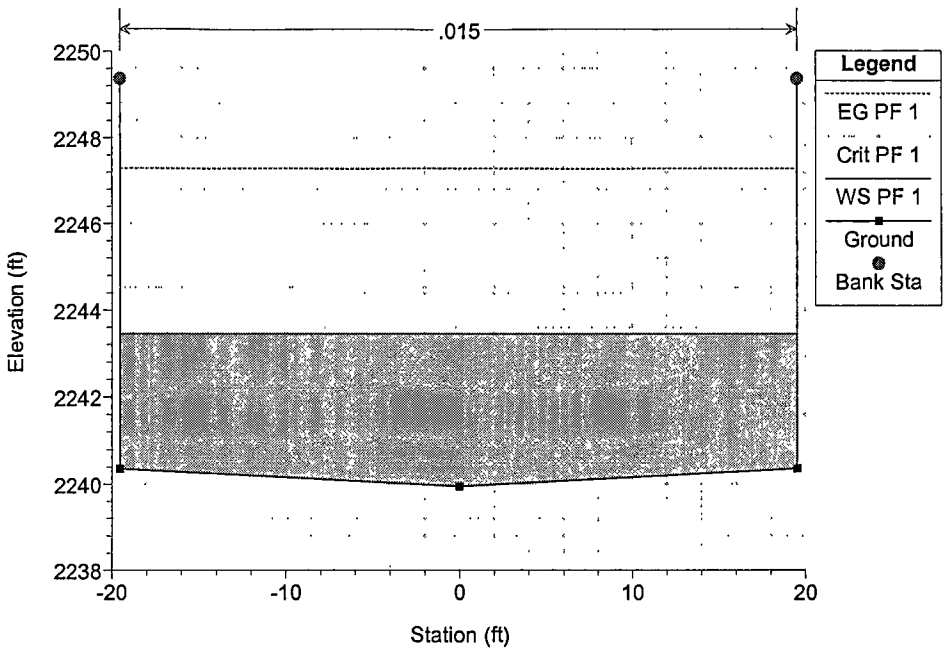

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7053.89



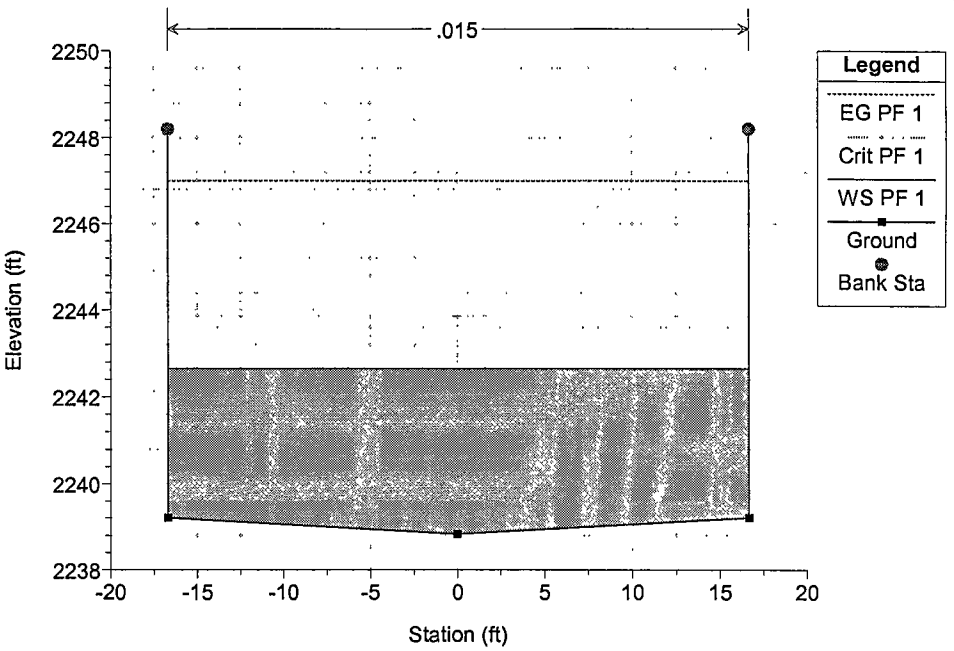
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7073.89



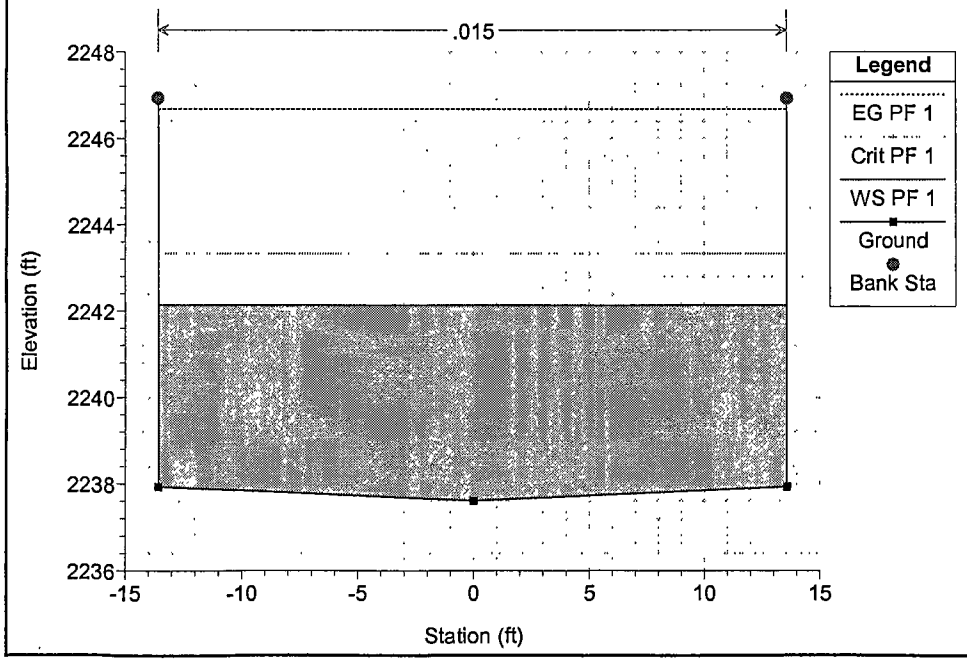

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7120.03



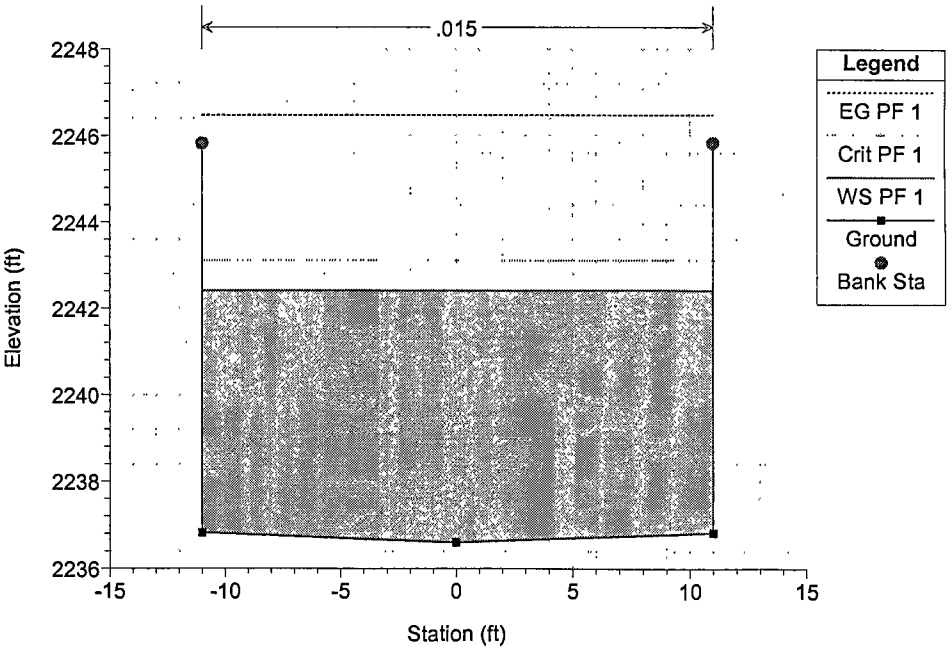

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7170.05



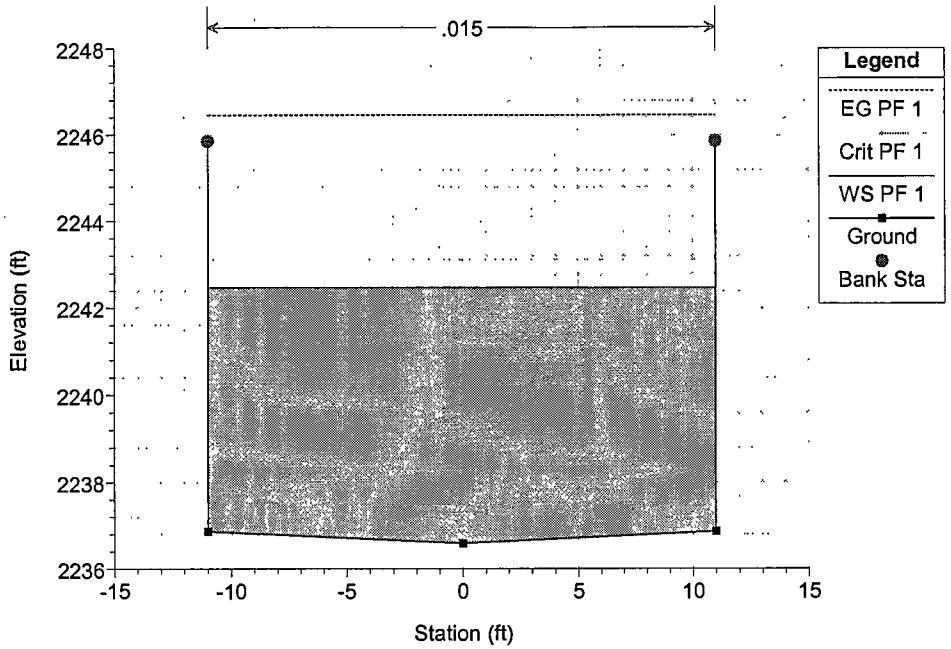

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7211.77



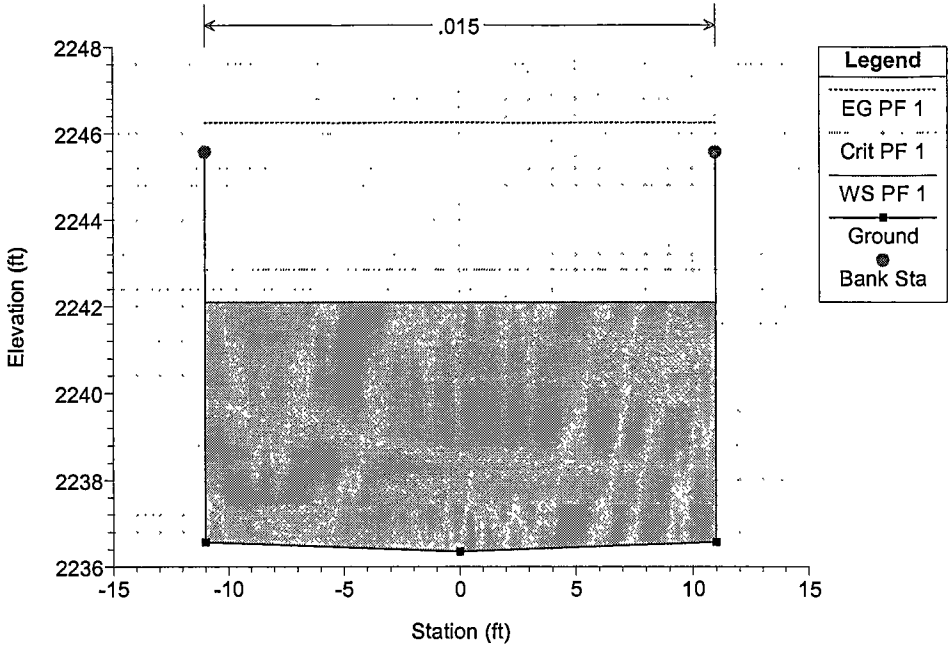
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7213.95



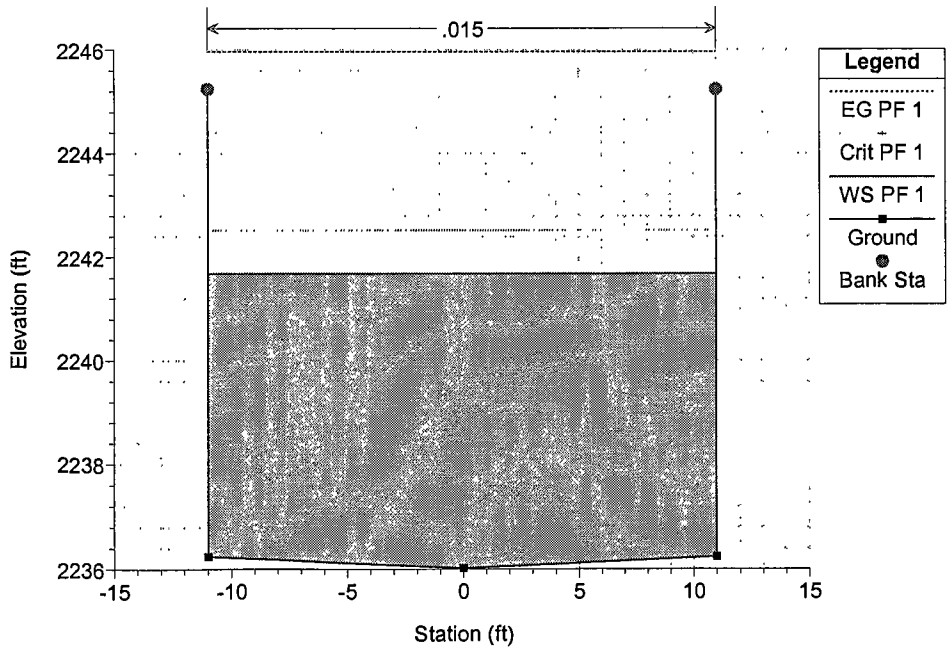

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7260.56



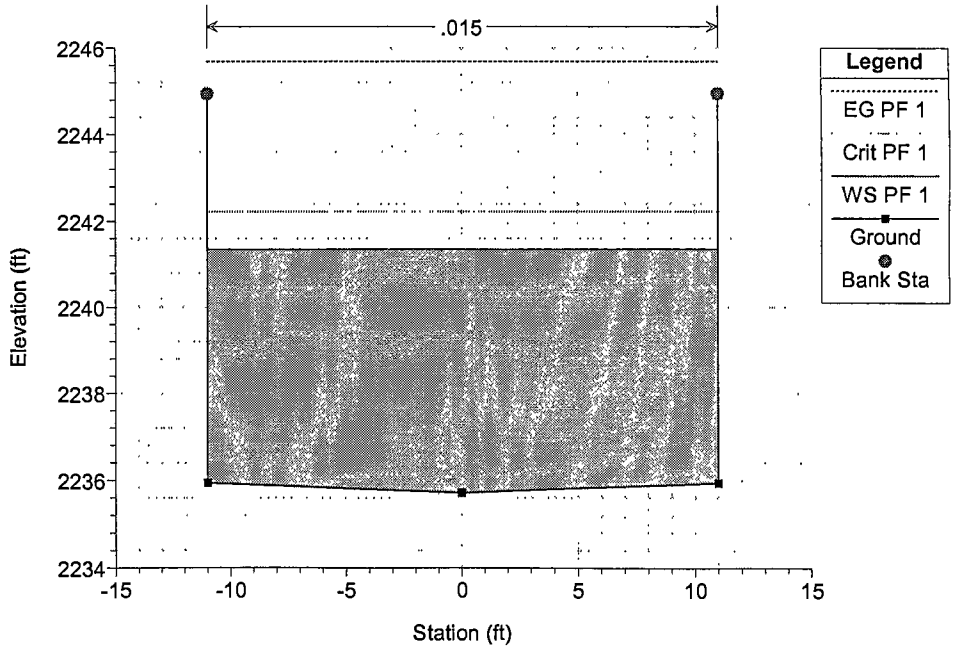

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7323.20



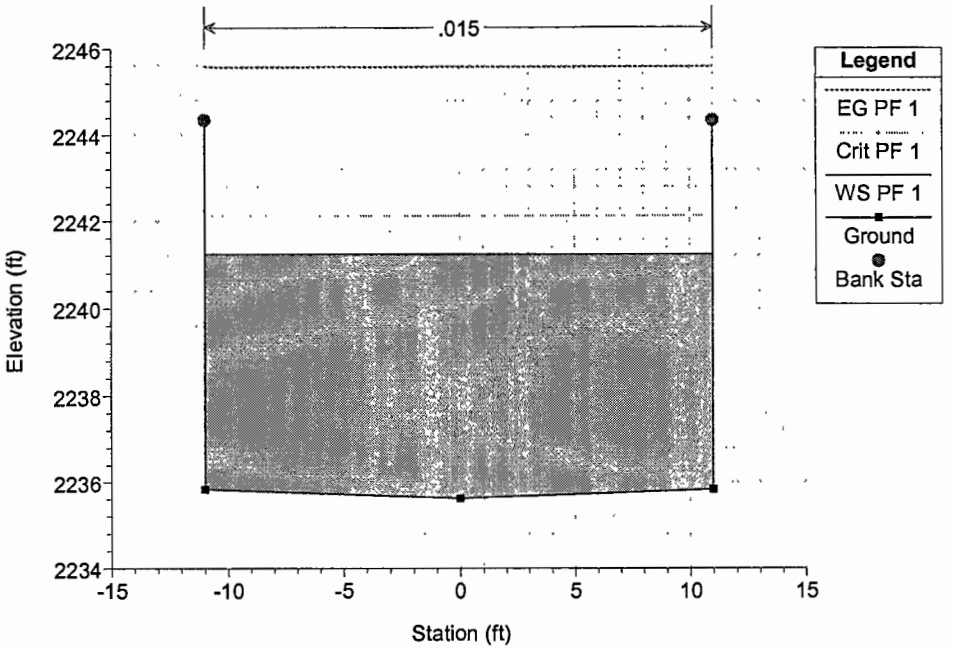

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7380



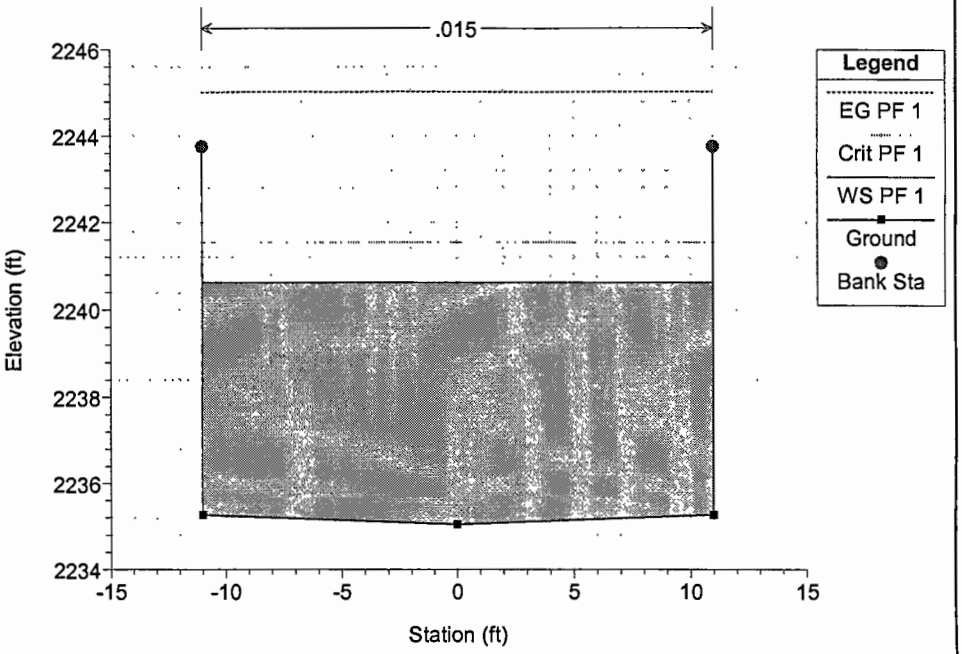
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7400



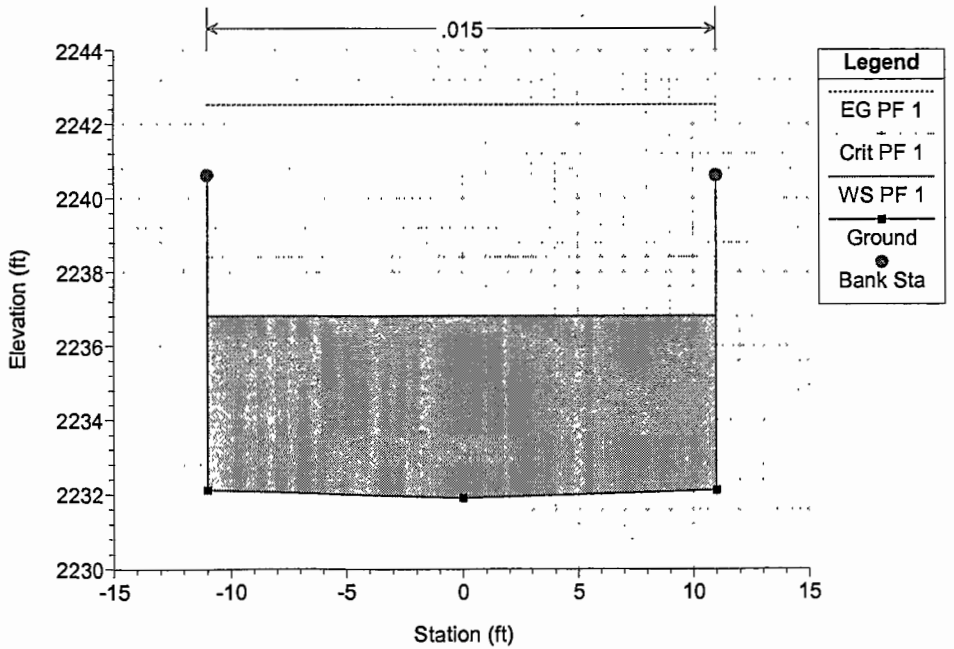

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7511.22



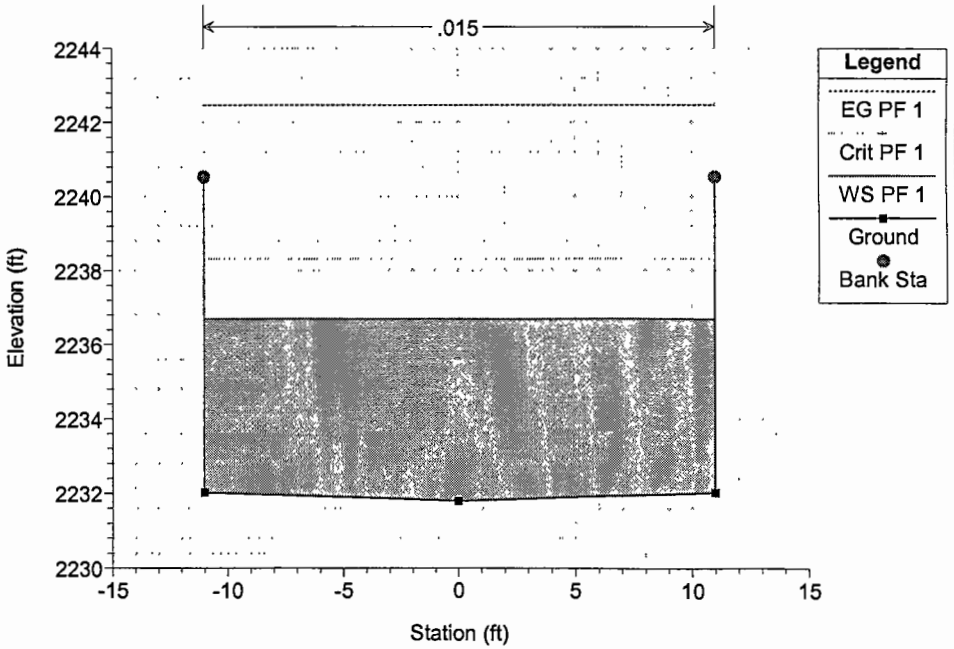

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7920.83



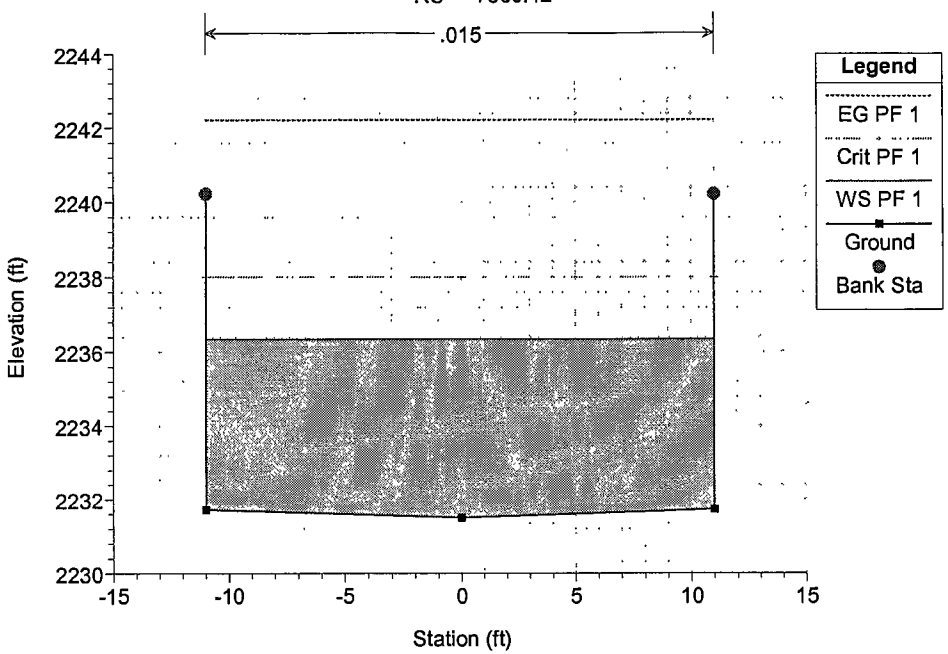

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7930.76



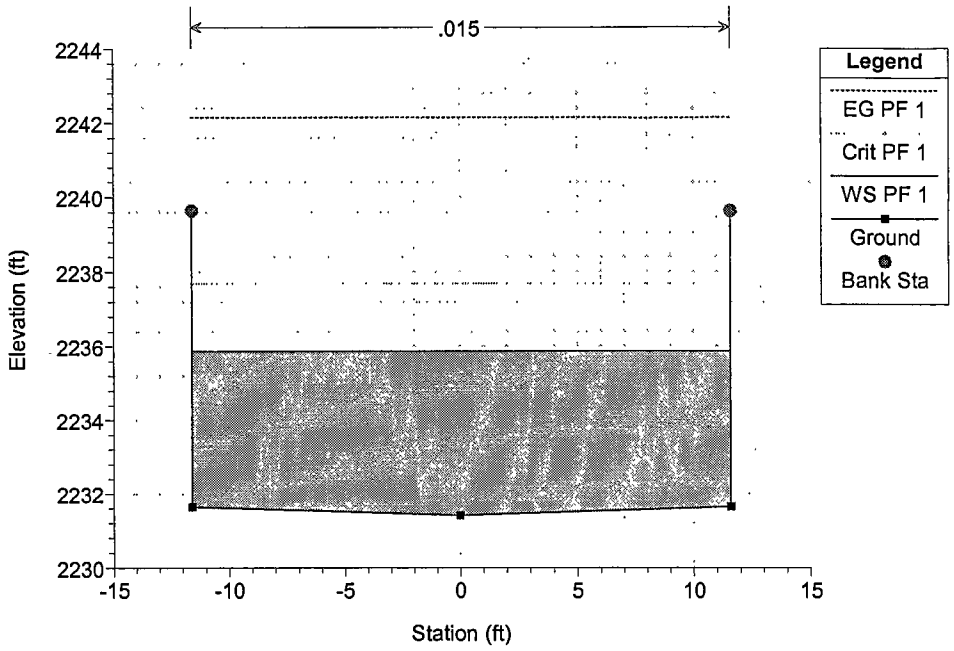
6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7960.42



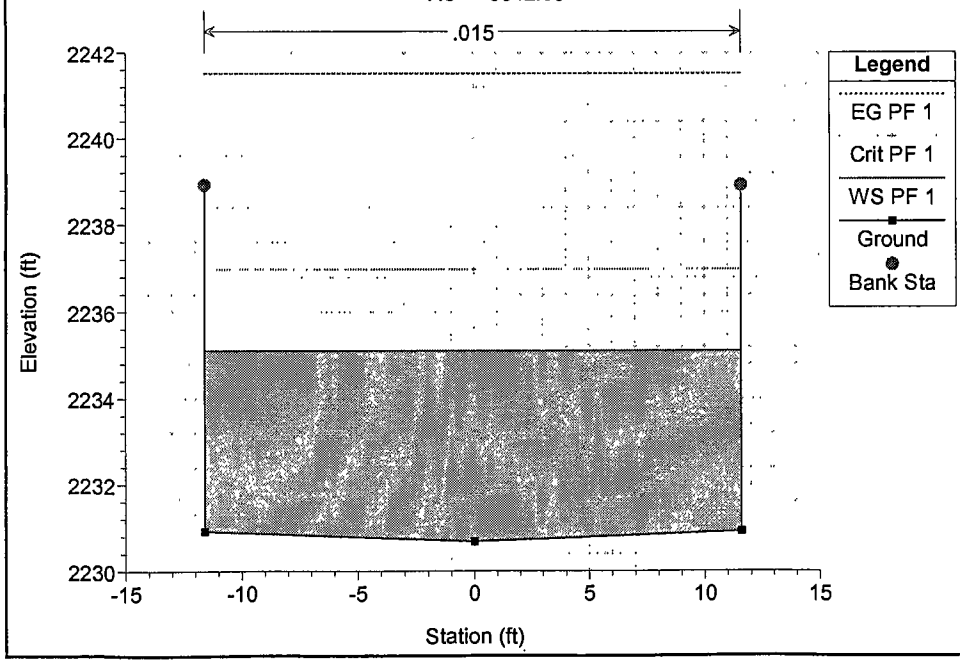

6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -7970.42




6657 Duck Creek CLOMR Plan: Plan 05 4/12/2007

RS = -8042.05



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: 6657 Duck Creek CLOMR
Project File : channel2.prj
Run Date and Time: 4/12/2007 3:36:34 PM

Project in English units

PLAN DATA

Plan Title: Plan 05
Plan File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\April Submittal\post-project\channel2.p05

Geometry Title: 6657duckcreek2
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\April Submittal\post-project\channel2.g02

Flow Title : Updated Flow Data
Flow File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\April Submittal\post-project\channel2.f05

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections | = 131 | Multiple Openings | = | 0 |
| | Culverts | = 0 | Inline Structures | = | 0 |
| | Bridges | = 0 | 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: Updated Flow Data
Flow File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\April Submittal\post-project\channel2.f05

Flow Data (cfs)

| River | Reach | RS | PF 1 |
|---|---|---|---|
| duck creek | R1 | -4414.11 | 3135 |
| duck creek2 | R1 | -8042.05 | 4826 |
| North box | R-4 | -4947.21 | 2028 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| duck creek | R1 | PF 1 | Normal S = 0.004 | |
| duck creek2 | R1 | PF 1 | | Normal S = 0.024 |
| North box | R-4 | PF 1 | Critical | |

GEOMETRY DATA

Geometry Title: 6657duckcreek2
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\April Submittal\post-project\channel2.g02

Reach Connection Table

| River | Reach | Upstream Boundary | Downstream Boundary |
|---|---|---|---|
| duck creek | R1 | | J1 |
| duck creek2 | R1 | J1 | |
| North box | R-4 | | J1 |

JUNCTION INFORMATION

Name: J1
Description:
Energy computation Method

| Length across Junction River | Reach | | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|---|
| duck creek | R1 | to duck creek2 | R1 | | 71.63 | |
| North box | R-4 | to duck creek2 | R1 | | 0 | |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -4414.11

```
INPUT
Description: existing channel r10
Station Elevation Data    num=       5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
   -24.5 2266.43   -24.5 2259.43        0 2259.43    24.5 2259.43    24.5
2266.43

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5           329.31  329.31  329.31              0        0
Cross Section Lid
    num=      50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2267.43 2259.43   -23.5 2267.43 2262.88   -22.5 2267.43 2264.05
   -21.5 2267.43 2264.78   -20.5 2267.43 2265.26   -19.5 2267.43 2265.54
   -18.5 2267.43 2265.77   -17.5 2267.43 2265.96   -16.5 2267.43 2266.12
   -15.5 2267.43 2266.25   -14.5 2267.43 2266.34   -13.5 2267.43  2266.4
   -12.5 2267.43 2266.43   -11.5 2267.43  2266.4   -10.5 2267.43 2266.34
    -9.5 2267.43 2266.25    -8.5 2267.43 2266.12    -7.5 2267.43 2265.96
    -6.5 2267.43 2265.77    -5.5 2267.43 2265.54    -4.5 2267.43 2265.26
    -3.5 2267.43 2264.78    -2.2 2267.43 2264.05    -1.5 2267.43 2262.88
     -.5 2267.43 2259.43      .5 2267.43 2259.43     1.5 2267.43 2262.88
     2.5 2267.43 2264.05     3.5 2267.43 2264.78     4.5 2267.43 2265.26
     5.5 2267.43 2265.54     6.5 2267.43 2265.77     7.5 2267.43 2265.96
     8.5 2267.43 2266.12     9.5 2267.43 2266.25    10.5 2267.43 2266.34
    11.5 2267.43  2266.4    12.5 2267.43 2266.43    13.5 2267.43  2266.4
    14.5 2267.43 2266.34    15.5 2267.43 2266.25    16.5 2267.43 2266.12
    17.5 2267.43 2265.96    18.5 2267.43 2265.77    19.5 2267.43 2265.54
    20.5 2267.43 2265.26    21.5 2267.43 2264.78    22.5 2267.43 2264.05
    23.5 2267.43 2262.88    24.5 2267.43 2259.43

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -4743.42

INPUT
Description: existing channel r9
Station Elevation Data    num=       5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
   -24.5 2265.11   -24.5 2258.11        0 2258.11    24.5 2258.11    24.5
2265.11

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5             420     420     420              0        0
```

Cross Section Lid
num= 50

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2266.11 | 2258.11 | -23.5 | 2266.11 | 2261.56 | -22.5 | 2266.11 | 2262.73 |
| -21.5 | 2266.11 | 2263.46 | -20.5 | 2266.11 | 2263.94 | -19.5 | 2266.11 | 2264.22 |
| -18.5 | 2266.11 | 2264.45 | -17.5 | 2266.11 | 2264.64 | -16.5 | 2266.11 | 2264.8 |
| -15.5 | 2266.11 | 2264.93 | -14.5 | 2266.11 | 2265.02 | -13.5 | 2266.11 | 2265.08 |
| -12.5 | 2266.11 | 2265.11 | -11.5 | 2266.11 | 2265.08 | -10.5 | 2266.11 | 2265.02 |
| -9.5 | 2266.11 | 2264.93 | -8.5 | 2266.11 | 2264.8 | -7.5 | 2266.11 | 2264.64 |
| -6.5 | 2266.11 | 2264.45 | -5.5 | 2266.11 | 2264.22 | -4.5 | 2266.11 | 2263.94 |
| -3.5 | 2266.11 | 2263.46 | -2.5 | 2266.11 | 2262.73 | -1.5 | 2266.11 | 2261.56 |
| -.5 | 2266.11 | 2258.11 | .5 | 2266.11 | 2258.11 | 1.5 | 2266.11 | 2261.56 |
| 2.5 | 2266.11 | 2262.73 | 3.5 | 2266.11 | 2263.46 | 4.5 | 2266.11 | 2263.94 |
| 5.5 | 2266.11 | 2264.22 | 6.5 | 2266.11 | 2264.45 | 7.5 | 2266.11 | 2264.64 |
| 8.5 | 2266.11 | 2264.8 | 9.5 | 2266.11 | 2264.93 | 10.5 | 2266.11 | 2265.02 |
| 11.5 | 2266.11 | 2265.08 | 12.5 | 2266.11 | 2265.11 | 13.5 | 2266.11 | 2265.08 |
| 14.5 | 2266.11 | 2265.02 | 15.5 | 2266.11 | 2264.93 | 16.5 | 2266.11 | 2264.8 |
| 17.5 | 2266.11 | 2264.64 | 18.5 | 2266.11 | 2264.45 | 19.5 | 2266.11 | 2264.22 |
| 20.5 | 2266.11 | 2263.94 | 21.5 | 2266.11 | 2263.46 | 22.5 | 2266.11 | 2262.73 |
| 23.5 | 2266.11 | 2261.56 | 24.5 | 2266.11 | 2258.11 | | | |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -5163.42

INPUT
Description: existing channel r8
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2263.43 | -24.5 | 2256.43 | 0 | 2256.43 | 24.5 | 2256.43 | 24.5 | 2263.43 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 159.42 | 159.42 | 159.42 | 0 | 0 |

Cross Section Lid
num= 50

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2264.63 | 2256.43 | -23.5 | 2264.63 | 2259.88 | -22.5 | 2264.63 | 2261.05 |
| -21.5 | 2264.63 | 2261.78 | -20.5 | 2264.63 | 2262.26 | -19.5 | 2264.63 | 2262.54 |
| -18.5 | 2264.63 | 2262.77 | -17.5 | 2264.63 | 2262.96 | -16.5 | 2264.63 | 2263.12 |
| -15.5 | 2264.63 | 2263.25 | -14.5 | 2264.63 | 2263.34 | -13.5 | 2264.63 | 2263.4 |
| -12.5 | 2264.63 | 2263.43 | -11.5 | 2264.63 | 2263.4 | -10.5 | 2264.63 | 2263.34 |
| -9.5 | 2264.63 | 2263.25 | -8.5 | 2264.63 | 2263.12 | -7.5 | 2264.63 | 2262.96 |
| -6.5 | 2264.63 | 2262.77 | -5.5 | 2264.63 | 2262.54 | -4.5 | 2264.63 | 2262.26 |
| -3.5 | 2264.63 | 2261.78 | -2.5 | 2264.63 | 2261.05 | -1.5 | 2264.63 | 2259.88 |
| -.5 | 2264.63 | 2256.43 | .5 | 2264.63 | 2256.43 | 1.5 | 2264.63 | 2259.88 |
| 2.5 | 2264.63 | 2261.05 | 3.5 | 2264.63 | 2261.78 | 4.5 | 2264.63 | 2262.26 |
| 5.5 | 2264.63 | 2262.54 | 6.5 | 2264.63 | 2262.77 | 7.5 | 2264.63 | 2262.96 |
| 8.5 | 2264.63 | 2263.12 | 9.5 | 2264.63 | 2263.25 | 10.5 | 2264.63 | 2263.34 |
| 11.5 | 2264.63 | 2263.4 | 12.5 | 2264.63 | 2263.43 | 13.5 | 2264.63 | 2263.4 |
| 14.5 | 2264.63 | 2263.34 | 15.5 | 2264.63 | 2263.25 | 16.5 | 2264.63 | 2263.12 |
| 17.5 | 2264.63 | 2262.96 | 18.5 | 2264.63 | 2262.77 | 19.5 | 2264.63 | 2262.54 |
| 20.5 | 2264.63 | 2262.26 | 21.5 | 2264.63 | 2261.78 | 22.5 | 2264.63 | 2261.05 |
| 23.5 | 2264.63 | 2259.88 | 24.5 | 2264.63 | 2256.43 | | | |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -5322.84

INPUT
Description: existing channel r7
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2262.79 | -24.5 | 2255.79 | 0 | 2255.79 | 24.5 | 2255.79 | 24.5 | 2262.79 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. | |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 52.58 | 52.58 | 52.58 | 0 | 0 |

Cross Section Lid
num= 50

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2263.79 | 2255.79 | -23.5 | 2263.79 | 2259.24 | -22.5 | 2263.79 | 2260.41 |
| -21.5 | 2263.79 | 2261.14 | -20.5 | 2263.79 | 2261.62 | -19.5 | 2263.79 | 2261.9 |
| -18.5 | 2263.79 | 2262.13 | -17.5 | 2263.79 | 2262.32 | -16.5 | 2263.79 | 2262.48 |
| -15.5 | 2263.79 | 2262.61 | -14.5 | 2263.79 | 2262.7 | -13.5 | 2263.79 | 2262.76 |
| -12.5 | 2263.79 | 2262.79 | -11.5 | 2263.79 | 2262.76 | -10.5 | 2263.79 | 2262.7 |
| -9.5 | 2263.79 | 2262.61 | -8.5 | 2263.79 | 2262.48 | -7.5 | 2263.79 | 2262.32 |
| -6.5 | 2263.79 | 2262.13 | -5.5 | 2263.79 | 2261.9 | -4.5 | 2263.79 | 2261.62 |
| -3.5 | 2263.79 | 2261.14 | -2.5 | 2263.79 | 2260.41 | -1.5 | 2263.79 | 2259.24 |
| -.5 | 2263.79 | 2255.79 | .5 | 2263.79 | 2255.79 | 1.5 | 2263.79 | 2259.24 |
| 2.5 | 2263.79 | 2260.41 | 3.5 | 2263.79 | 2261.14 | 4.5 | 2263.79 | 2261.62 |
| 5.5 | 2263.79 | 2261.9 | 6.5 | 2263.79 | 2262.13 | 7.5 | 2263.79 | 2262.32 |
| 8.5 | 2263.79 | 2262.48 | 9.5 | 2263.79 | 2262.61 | 10.5 | 2263.79 | 2262.7 |
| 11.5 | 2263.79 | 2262.76 | 12.5 | 2263.79 | 2262.79 | 13.5 | 2263.79 | 2262.76 |
| 14.5 | 2263.79 | 2262.7 | 15.5 | 2263.79 | 2262.61 | 16.5 | 2263.79 | 2262.48 |
| 17.5 | 2263.79 | 2262.32 | 18.5 | 2263.79 | 2262.13 | 19.5 | 2263.79 | 2261.9 |
| 20.5 | 2263.79 | 2261.62 | 21.5 | 2263.79 | 2261.14 | 22.5 | 2263.79 | 2260.41 |
| 23.5 | 2263.79 | 2259.24 | 24.5 | 2263.79 | 2255.79 | | | |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -5375.42

INPUT
Description: existing channel r6
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2261.11 | -24.5 | 2254.11 | 0 | 2254.11 | 24.5 | 2254.11 | 24.5 | 2261.11 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5              188     188     188              0         0
Cross Section Lid
    num=       50
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2262.11 2254.11   -23.5 2262.11 2257.56   -22.5 2262.11 2258.73
   -21.5 2262.11 2259.46   -20.5 2262.11 2259.94   -19.5 2262.11 2260.22
   -18.5 2262.11 2260.45   -17.5 2262.11 2260.64   -16.5 2262.11  2260.8
   -15.5 2262.11 2260.93   -14.5 2262.11 2261.02   -13.5 2262.11 2261.08
   -12.5 2262.11 2261.11   -11.5 2262.11 2261.08   -10.5 2262.11 2261.02
    -9.5 2262.11 2260.93    -8.5 2262.11  2260.8    -7.5 2262.11 2260.64
    -6.5 2262.11 2260.45    -5.5 2262.11 2260.22    -4.5 2262.11 2259.94
    -3.5 2262.11 2259.46    -2.5 2262.11 2258.73    -1.5 2262.11 2257.56
     -.5 2262.11 2254.11      .5 2262.11 2254.11     1.5 2262.11 2257.56
     2.5 2262.11 2258.73     3.5 2262.11 2259.46     4.5 2262.11 2259.94
     5.5 2262.11 2260.22     6.5 2262.11 2260.45     7.5 2262.11 2260.64
     8.5 2262.11  2260.8     9.5 2262.11 2260.93    10.5 2262.11 2261.02
    11.5 2262.11 2261.08    12.5 2262.11 2261.11    13.5 2262.11 2261.08
    14.5 2262.11 2261.02    15.5 2262.11 2260.93    16.5 2262.11  2260.8
    17.5 2262.11 2260.64    18.5 2262.11 2260.45    19.5 2262.11 2260.22
    20.5 2262.11 2259.94    21.5 2262.11 2259.46    22.5 2262.11 2258.73
    23.5 2262.11 2257.56    24.5 2262.11 2254.11

CROSS SECTION


RIVER: duck creek
REACH: R1                   RS: -5563.42

INPUT
Description: existing channel r5
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2260.36   -24.5 2253.36       0 2253.36    24.5 2253.36    24.5
2260.36

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5              400     400     400              0         0
Cross Section Lid
    num=       50
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2261.36 2253.36   -23.5 2261.36 2256.81   -22.5 2261.36 2257.98
   -21.5 2261.36 2258.71   -20.5 2261.36 2259.19   -19.5 2261.36 2259.47
   -18.5 2261.36  2259.7   -17.5 2261.36 2259.89   -16.5 2261.36 2260.05
   -15.5 2261.36 2260.18   -14.5 2261.36 2260.27   -13.5 2261.36 2260.33
   -12.5 2261.36 2260.36   -11.5 2261.36 2260.33   -10.5 2261.36 2260.27
    -9.5 2261.36 2260.18    -8.5 2261.36 2260.05    -7.5 2261.36 2259.89
    -6.5 2261.36  2259.7    -5.5 2261.36 2259.47    -4.5 2261.36 2259.19
    -3.5 2261.36 2258.71    -2.5 2261.36 2257.98    -1.5 2261.36 2256.81
     -.5 2261.36 2253.36      .5 2261.36 2253.36     1.5 2261.36 2256.81
     2.5 2261.36 2257.98     3.5 2261.36 2258.71     4.5 2261.36 2259.19
     5.5 2261.36 2259.47     6.5 2261.36  2259.7     7.5 2261.36 2259.89
     8.5 2261.36 2260.05     9.5 2261.36 2260.18    10.5 2261.36 2260.27
    11.5 2261.36 2260.33    12.5 2261.36 2260.36    13.5 2261.36 2260.33
    14.5 2261.36 2260.27    15.5 2261.36 2260.18    16.5 2261.36 2260.05
```

```
    17.5 2261.36 2259.89    18.5 2261.36  2259.7    19.5 2261.36 2259.47
    20.5 2261.36 2259.19    21.5 2261.36 2258.71    22.5 2261.36 2257.98
    23.5 2261.36 2256.81    24.5 2261.36 2253.36

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -5963.42

INPUT
Description: existing channel r4
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2258.76   -24.5 2251.76       0 2251.76    24.5 2251.76    24.5
2258.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5           133.57  133.57  133.57              0        0
Cross Section Lid
    num=      50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2259.76 2251.76   -23.5 2259.76 2255.21   -22.5 2259.76 2256.38
   -21.5 2259.76 2257.11   -20.5 2259.76 2257.59   -19.5 2259.76 2257.87
   -18.5 2259.76  2258.1   -17.5 2259.76 2258.29   -16.5 2259.76 2258.45
   -15.5 2259.76 2258.58   -14.5 2259.76 2258.67   -13.5 2259.76 2258.73
   -12.5 2259.76 2258.76   -11.5 2259.76 2258.73   -10.5 2259.76 2258.67
    -9.5 2259.76 2258.58    -8.5 2259.76 2258.45    -7.5 2259.76 2258.29
    -6.5 2259.76  2258.1    -5.5 2259.76 2257.87    -4.5 2259.76 2257.59
    -3.5 2259.76 2257.11    -2.5 2259.76 2256.38    -1.5 2259.76 2255.21
     -.5 2259.76 2251.76      .5 2259.76 2251.76     1.5 2259.76 2255.21
     2.5 2259.76 2256.38     3.5 2259.76 2257.11     4.5 2259.76 2257.59
     5.5 2259.76 2257.87     6.5 2259.76  2258.1     7.5 2259.76 2258.29
     8.5 2259.76 2258.45     9.5 2259.76 2258.58    10.5 2259.76 2258.67
    11.5 2259.76 2258.73    12.5 2259.76 2258.76    13.5 2259.76 2258.73
    14.5 2259.76 2258.67    15.5 2259.76 2258.58    16.5 2259.76 2258.45
    17.5 2259.76 2258.29    18.5 2259.76  2258.1    19.5 2259.76 2257.87
    20.5 2259.76 2257.59    21.5 2259.76 2257.11    22.5 2259.76 2256.38
    23.5 2259.76 2255.21    24.5 2259.76 2251.76

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -6096.99

INPUT
Description: existing channel r3
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2258.23   -24.5 2251.23       0 2251.23    24.5 2251.23    24.5
2258.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
   -24.5     .015    -24.5     .015     24.5     .015

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.
Expan.
         -24.5     24.5           143.53  143.53  143.53               0         0
Cross Section Lid
    num=       50
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
   -24.5 2259.23 2251.23    -23.5 2259.23 2254.68    -22.5 2259.23 2255.85
   -21.5 2259.23 2256.58    -20.5 2259.23 2257.06    -19.5 2259.23 2257.34
   -18.5 2259.23 2257.57    -17.5 2259.23 2257.76    -16.5 2259.23 2257.92
   -15.5 2259.23 2258.05    -14.5 2259.23 2258.14    -13.5 2259.23  2258.2
   -12.5 2259.23 2258.23    -11.5 2259.23  2258.2    -10.5 2259.23 2258.14
    -9.5 2259.23 2258.05     -8.5 2259.23 2257.92     -7.5 2259.23 2257.76
    -6.5 2259.23 2257.57     -5.5 2259.23 2257.34     -4.5 2259.23 2257.06
    -3.5 2259.23 2256.58     -2.5 2259.23 2255.85     -1.5 2259.23 2254.68
     -.5 2259.23 2251.23       .5 2259.23 2251.23      1.5 2259.23 2254.68
     2.5 2259.23 2255.85      3.5 2259.23 2256.58      4.5 2259.23 2257.06
     5.5 2259.23 2257.34      6.5 2259.23 2257.57      7.5 2259.23 2257.76
     8.5 2259.23 2257.92      9.5 2259.23 2258.05     10.5 2259.23 2258.14
    11.5 2259.23  2258.2     12.5 2259.23 2258.23     13.5 2259.23  2258.2
    14.5 2259.23 2258.14     15.5 2259.23 2258.05     16.5 2259.23 2257.92
    17.5 2259.23 2257.76     18.5 2259.23 2257.57     19.5 2259.23 2257.34
    20.5 2259.23 2257.06     21.5 2259.23 2256.58     22.5 2259.23 2255.85
    23.5 2259.23 2254.68     24.5 2259.23 2251.23

CROSS SECTION


RIVER: duck creek
REACH: R1                   RS: -6240.52

INPUT
Description: existing channel r2
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -24.5 2257.58    -24.5 2250.58        0 2250.58     24.5 2250.58     24.5
2257.58

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -24.5     .015    -24.5     .015     24.5     .015

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.
Expan.
         -24.5     24.5            28.45   28.45   28.45               0         0
Cross Section Lid
    num=       50
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
   -24.5 2258.58 2250.58    -23.5 2258.58 2254.03    -22.5 2258.58  2255.2
   -21.5 2258.58 2255.93    -20.5 2258.58 2256.41    -19.5 2258.58 2256.69
   -18.5 2258.58 2256.92    -17.5 2258.58 2257.11    -16.5 2258.58 2257.27
   -15.5 2258.58  2257.4    -14.5 2258.58 2257.49    -13.5 2258.58 2257.55
   -12.5 2258.58 2257.58    -11.5 2258.58 2257.55    -10.5 2258.58 2257.49
    -9.5 2258.58  2257.4     -8.5 2258.58 2257.27     -7.5 2258.58 2257.11
    -6.5 2258.58 2256.92     -5.5 2258.58 2256.69     -4.5 2258.58 2256.41
    -3.5 2258.58 2255.93     -2.5 2258.58  2255.2     -1.5 2258.58 2254.03
     -.5 2258.58 2250.58       .5 2258.58 2250.58      1.5 2258.58 2254.03
     2.5 2258.58  2255.2      3.5 2258.58 2255.93      4.5 2258.58 2256.41
     5.5 2258.58 2256.69      6.5 2258.58 2256.92      7.5 2258.58 2257.11
     8.5 2258.58 2257.27      9.5 2258.58  2257.4     10.5 2258.58 2257.49
```

```
    11.5 2258.58 2257.55    12.5 2258.58 2257.58    13.5 2258.58 2257.55
    14.5 2258.58 2257.49    15.5 2258.58  2257.4    16.5 2258.58 2257.27
    17.5 2258.58 2257.11    18.5 2258.58 2256.92    19.5 2258.58 2256.69
    20.5 2258.58 2256.41    21.5 2258.58 2255.93    22.5 2258.58  2255.2
    23.5 2258.58 2254.03    24.5 2258.58 2250.58

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -6268.97

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2257.45   -24.5 2250.45       0 2250.45    24.5 2250.45    24.5
2257.45

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5              50      50      50              0        0
Cross Section Lid
    num=       50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2258.58 2250.45   -23.5 2258.58 2254.03   -22.5 2258.58  2255.2
   -21.5 2258.58 2255.93   -20.5 2258.58 2256.41   -19.5 2258.58 2256.69
   -18.5 2258.58 2256.92   -17.5 2258.58 2257.11   -16.5 2258.58 2257.27
   -15.5 2258.58  2257.4   -14.5 2258.58 2257.49   -13.5 2258.58 2257.55
   -12.5 2258.58 2257.58   -11.5 2258.58 2257.55   -10.5 2258.58 2257.49
    -9.5 2258.58  2257.4    -8.5 2258.58 2257.27    -7.5 2258.58 2257.11
    -6.5 2258.58 2256.92    -5.5 2258.58 2256.69    -4.5 2258.58 2256.41
    -3.5 2258.58 2255.93    -2.5 2258.58  2255.2    -1.5 2258.58 2254.03
     -.5 2258.58 2250.45      .5 2258.58 2250.45     1.5 2258.58 2254.03
     2.5 2258.58  2255.2     3.5 2258.58 2255.93     4.5 2258.58 2256.41
     5.5 2258.58 2256.69     6.5 2258.58 2256.92     7.5 2258.58 2257.11
     8.5 2258.58 2257.27     9.5 2258.58  2257.4    10.5 2258.58 2257.49
    11.5 2258.58 2257.55    12.5 2258.58 2257.58    13.5 2258.58 2257.55
    14.5 2258.58 2257.49    15.5 2258.58  2257.4    16.5 2258.58 2257.27
    17.5 2258.58 2257.11    18.5 2258.58 2256.92    19.5 2258.58 2256.69
    20.5 2258.58 2256.41    21.5 2258.58 2255.93    22.5 2258.58  2255.2
    23.5 2258.58 2254.03    24.5 2258.58 2250.45

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -6318.97

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2257.23   -24.5 2250.23       0 2250.23    24.5 2250.23    24.5
2257.23
```

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 35.41 | 35.41 | 35.41 | 0 | 0 |

Cross Section Lid

num= 50

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2258.58 | 2250.23 | -23.5 | 2258.58 | 2253.55 | -22.5 | 2258.58 | 2254.72 |
| -21.5 | 2258.58 | 2255.45 | -20.5 | 2258.58 | 2255.93 | -19.5 | 2258.58 | 2256.21 |
| -18.5 | 2258.58 | 2256.44 | -17.5 | 2258.58 | 2256.63 | -16.5 | 2258.58 | 2256.79 |
| -15.5 | 2258.58 | 2256.92 | -14.5 | 2258.58 | 2257.01 | -13.5 | 2258.58 | 2257.07 |
| -12.5 | 2258.58 | 2257.1 | -11.5 | 2258.58 | 2257.07 | -10.5 | 2258.58 | 2257.01 |
| -9.5 | 2258.58 | 2256.92 | -8.5 | 2258.58 | 2256.79 | -7.5 | 2258.58 | 2256.63 |
| -6.5 | 2258.58 | 2256.44 | -5.5 | 2258.58 | 2256.21 | -4.5 | 2258.58 | 2255.93 |
| -3.5 | 2258.58 | 2255.45 | -2.5 | 2258.58 | 2254.72 | -1.5 | 2258.58 | 2253.55 |
| -.5 | 2258.58 | 2250.23 | .5 | 2258.58 | 2250.23 | 1.5 | 2258.58 | 2253.55 |
| 2.5 | 2258.58 | 2254.72 | 3.5 | 2258.58 | 2255.45 | 4.5 | 2258.58 | 2255.93 |
| 5.5 | 2258.58 | 2256.21 | 6.5 | 2258.58 | 2256.44 | 7.5 | 2258.58 | 2256.63 |
| 8.5 | 2258.58 | 2256.79 | 9.5 | 2258.58 | 2256.92 | 10.5 | 2258.58 | 2257.01 |
| 11.5 | 2258.58 | 2257.07 | 12.5 | 2258.58 | 2257.1 | 13.5 | 2258.58 | 2257.07 |
| 14.5 | 2258.58 | 2257.01 | 15.5 | 2258.58 | 2256.92 | 16.5 | 2258.58 | 2256.79 |
| 17.5 | 2258.58 | 2256.63 | 18.5 | 2258.58 | 2256.44 | 19.5 | 2258.58 | 2256.21 |
| 20.5 | 2258.58 | 2255.93 | 21.5 | 2258.58 | 2255.45 | 22.5 | 2258.58 | 2254.72 |
| 23.5 | 2258.58 | 2253.55 | 24.5 | 2258.58 | 2250.23 | | | |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -6354.38

INPUT
Description: existing channel r
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2257.08 | -24.5 | 2250.08 | 0 | 2250.08 | 24.5 | 2250.08 | 24.5 | 2257.08 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 5.54 | 5.54 | 5.54 | 0 | 0 |

Cross Section Lid

num= 50

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2258.08 | 2250.08 | -23.5 | 2258.08 | 2253.53 | -22.5 | 2258.08 | 2254.7 |
| -21.5 | 2258.08 | 2255.43 | -20.5 | 2258.08 | 2255.91 | -19.5 | 2258.08 | 2256.19 |
| -18.5 | 2258.08 | 2256.42 | -17.5 | 2258.08 | 2256.61 | -16.5 | 2258.08 | 2256.77 |
| -15.5 | 2258.08 | 2256.9 | -14.5 | 2258.08 | 2256.99 | -13.5 | 2258.08 | 2257.05 |
| -12.5 | 2258.08 | 2257.08 | -11.5 | 2258.08 | 2257.05 | -10.5 | 2258.08 | 2256.99 |
| -9.5 | 2258.08 | 2256.9 | -8.5 | 2258.08 | 2256.77 | -7.5 | 2258.08 | 2256.61 |
| -6.5 | 2258.08 | 2256.42 | -5.5 | 2258.08 | 2256.19 | -4.5 | 2258.08 | 2255.91 |
| -3.5 | 2258.08 | 2255.43 | -2.5 | 2258.08 | 2254.7 | -1.5 | 2258.08 | 2253.53 |
| -.5 | 2258.08 | 2250.08 | .5 | 2258.08 | 2250.08 | 1.5 | 2258.08 | 2253.53 |
| 2.5 | 2258.08 | 2254.7 | 3.5 | 2258.08 | 2255.43 | 4.5 | 2258.08 | 2255.91 |

```
     5.5 2258.08 2256.19     6.5 2258.08 2256.42     7.5 2258.08 2256.61
     8.5 2258.08 2256.77     9.5 2258.08  2256.9    10.5 2258.08 2256.99
    11.5 2258.08 2257.05    12.5 2258.08 2257.08    13.5 2258.08 2257.05
    14.5 2258.08 2256.99    15.5 2258.08  2256.9    16.5 2258.08 2256.77
    17.5 2258.08 2256.61    18.5 2258.08 2256.42    19.5 2258.08 2256.19
    20.5 2258.08 2255.91    21.5 2258.08 2255.43    22.5 2258.08  2254.7
    23.5 2258.08 2253.53    24.5 2258.08 2250.08

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -6359.92

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -24.5 2257.06   -24.5 2250.06       0 2250.06    24.5 2250.06    24.5
2257.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -24.5    24.5            32.06   32.06   32.06              0        0
Cross Section Lid
    num=      50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2258.08 2250.06   -23.5 2258.08 2253.53   -22.5 2258.08  2254.7
   -21.5 2258.08 2255.43   -20.5 2258.08 2255.91   -19.5 2258.08 2256.19
   -18.5 2258.08 2256.42   -17.5 2258.08 2256.61   -16.5 2258.08 2256.77
   -15.5 2258.08  2256.9   -14.5 2258.08 2256.99   -13.5 2258.08 2257.05
   -12.5 2258.08 2257.08   -11.5 2258.08 2257.05   -10.5 2258.08 2256.99
    -9.5 2258.08  2256.9    -8.5 2258.08 2256.77    -7.5 2258.08 2256.61
    -6.5 2258.08 2256.42    -5.5 2258.08 2256.19    -4.5 2258.08 2255.91
    -3.5 2258.08 2255.43    -2.5 2258.08  2254.7    -1.5 2258.08 2253.53
     -.5 2258.08 2250.06      .5 2258.08 2250.06     1.5 2258.08 2253.53
     2.5 2258.08  2254.7     3.5 2258.08 2255.43     4.5 2258.08 2255.91
     5.5 2258.08 2256.19     6.5 2258.08 2256.42     7.5 2258.08 2256.61
     8.5 2258.08 2256.77     9.5 2258.08  2256.9    10.5 2258.08 2256.99
    11.5 2258.08 2257.05    12.5 2258.08 2257.08    13.5 2258.08 2257.05
    14.5 2258.08 2256.99    15.5 2258.08  2256.9    16.5 2258.08 2256.77
    17.5 2258.08 2256.61    18.5 2258.08 2256.42    19.5 2258.08 2256.19
    20.5 2258.08 2255.91    21.5 2258.08 2255.43    22.5 2258.08  2254.7
    23.5 2258.08 2253.53    24.5 2258.08 2250.06

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -6391.98
```

```
INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -24.5 2256.85    -24.5 2249.85        0 2249.85     24.5 2249.85     24.5
2256.85

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015    -24.5    .015     24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -24.5    24.5            10.47   10.47   10.47              0         0
Cross Section Lid
    num=      50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5 2257.87 2249.85   -23.5 2257.87 2253.32   -22.5 2257.87 2254.49
   -21.5 2257.87 2255.22   -20.5 2257.87  2255.7   -19.5 2257.87 2255.98
   -18.5 2257.87 2256.21   -17.5 2257.87  2256.4   -16.5 2257.87 2256.56
   -15.5 2257.87 2256.69   -14.5 2257.87 2256.78   -13.5 2257.87 2256.84
   -12.5 2257.87 2256.87   -11.5 2257.87 2256.84   -10.5 2257.87 2256.78
    -9.5 2257.87 2256.69    -8.5 2257.87 2256.56    -7.5 2257.87  2256.4
    -6.5 2257.87 2256.21    -5.5 2257.87 2255.98    -4.5 2257.87  2255.7
    -3.5 2257.87 2255.22    -2.5 2257.87 2254.49    -1.5 2257.87 2253.32
     -.5 2257.87 2249.85      .5 2257.87 2249.85     1.5 2257.87 2253.32
     2.5 2257.87 2254.49     3.5 2257.87 2255.22     4.5 2257.87  2255.7
     5.5 2257.87 2255.98     6.5 2257.87 2256.21     7.5 2257.87  2256.4
     8.5 2257.87 2256.56     9.5 2257.87 2256.69    10.5 2257.87 2256.78
    11.5 2257.87 2256.84    12.5 2257.87 2256.87    13.5 2257.87 2256.84
    14.5 2257.87 2256.78    15.5 2257.87 2256.69    16.5 2257.87 2256.56
    17.5 2257.87  2256.4    18.5 2257.87 2256.21    19.5 2257.87 2255.98
    20.5 2257.87  2255.7    21.5 2257.87 2255.22    22.5 2257.87 2254.49
    23.5 2257.87 2253.32    24.5 2257.87 2249.85

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -6402.45

INPUT
Description: r2
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -24.5 2257.83    -24.5 2249.83        0 2249.34     24.5 2249.83     24.5
2257.83

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015    -24.5    .015     24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -24.5    24.5            50.46   50.46   50.46              .05       .05
```

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -6452.91

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2255.42 | -24.5 | 2247.42 | 0 | 2246.93 | 24.5 | 2247.42 | 24.5 | 2255.42 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. | |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 39.54 | 39.54 | 39.54 | .05 .05 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -6492.45

INPUT
Description: r3
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2253.43 | -22.5 | 2245.43 | 0 | 2244.98 | 22.5 | 2245.43 | 22.5 | 2253.43 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. | |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 108.876 | 102.03 | 95.724 | .05 .05 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -6594.48

INPUT
Description: r4
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2252.15 | -22.5 | 2244.15 | 0 | 2243.7 | 22.5 | 2244.15 | 22.5 | 2252.15 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5          306.465  327.52348.5749              0        0

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -6631.75

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2251.64   -22.5 2243.64       0 2243.19    22.5 2243.64    22.5
2251.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5          152.03  162.47  172.91              0        0

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -6794.22

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2249.55   -22.5 2241.55       0  2241.1    22.5 2241.55    22.5
2249.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           103.6  110.72  117.84              0        0

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -6904.94

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2248.11   -22.5 2240.11       0 2239.68    22.5 2240.11    22.5
2248.11
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5            15.96   17.06   18.16              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -6922

INPUT
Description: r4a
Station Elevation Data      num=        8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2247.91   -22.5 2239.91  -.41672239.468  -.4167 2247.91   .4167
2247.91
   .41672239.468    22.5 2239.91    22.5 2247.91

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           19.285   20.61  21.935              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -6942.61

INPUT
Description: r4b
Station Elevation Data      num=        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5  2247.8   -22.5  2239.8        0 2239.35    22.5  2239.8    22.5
2247.8

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           88.013   94.06 100.107              0         0
Cross Section Lid
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -22.5  2248.8  2247.8  -.4167  2248.8  2247.8  -.4167  2248.8 2239.35
   .4167  2248.8 2239.35   .4167  2248.8  2247.8    22.5  2248.8  2247.8
```

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7036.67

INPUT
Description: r4c
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2247.33 | -22.5 | 2239.33 | 0 | 2238.88 | 22.5 | 2239.33 | 22.5 | 2247.33 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 18.41 | 19.67 | 20.93 | 0 | 0 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7056.34

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2247.23 | -22.5 | 2239.23 | 0 | 2238.78 | 22.5 | 2239.23 | 22.5 | 2247.23 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 70.18 | 75.01 | 79.84 | 0 | 0 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7131.35

INPUT
Description: r5
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2246.86 | -22.5 | 2238.86 | 0 | 2238.41 | 22.5 | 2238.86 | 22.5 | 2246.86 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           240.23  225.84  211.21            .05      .05

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -7357.19

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2245.73   -22.5 2237.73       0 2237.28    22.5 2237.73    22.5
2245.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           36.12   33.95   31.75            .05      .05

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -7391.14

INPUT
Description: r6
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2245.55   -22.5 2237.55       0  2237.1    22.5 2237.55    22.5
2245.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5             25      25      25            .05        0

CROSS SECTION


RIVER: duck creek
REACH: R1                RS: -7416.14

INPUT
Description: r7
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -21 2244.31      -21 2237.31       0 2236.86      21 2237.31      21
2244.31
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21            18.67   18.67   18.67             .05         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7434.81

INPUT
Description: interpolated
Station Elevation Data     num=        5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
     -21 2244.12      -21 2237.12        0 2236.67       21 2237.12       21
2244.12

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21            65.19   65.19   65.19             .05         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7500

INPUT
Description: r8
Station Elevation Data     num=        5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
     -21 2243.45      -21 2236.45        0 2236.03       21 2236.45       21
2243.45

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21            15.42   15.42   15.42               0       .05

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7515.42
```

```
INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -21  2243.3     -21  2236.3       0 2235.88      21  2236.3      21
2243.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -21    .015     -21    .015      21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -21      21            32.42   32.42   32.42              0      .05

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -7547.84

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -21 2242.98     -21 2235.98       0 2235.56      21 2235.98      21
2242.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -21    .015     -21    .015      21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -21      21            62.16   62.16   62.16              0      .05

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -7610

INPUT
Description: r9
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -21 2242.36     -21 2235.36       0 2234.94      21 2235.36      21
2242.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -21    .015     -21    .015      21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -21      21            32.66   32.66   32.66              0      .05
```

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7642.66

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -21 | 2242.04 | -21 | 2235.04 | 0 | 2234.62 | 21 | 2235.04 | 21 | 2242.04 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -21 | .015 | -21 | .015 | 21 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -21 | 21 | 57.34 | 57.34 | 57.34 | 0 .05 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7700

INPUT
Description: r10
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -21 | 2241.48 | -21 | 2234.48 | 0 | 2234.06 | 21 | 2234.48 | 21 | 2241.48 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -21 | .015 | -21 | .015 | 21 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -21 | 21 | 25 | 25 | 25 | 0 .05 |

CROSS SECTION

RIVER: duck creek
REACH: R1 RS: -7725

INPUT
Description: r11
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -21 | 2242.23 | -21 | 2234.23 | 0 | 2233.81 | 21 | 2234.23 | 21 | 2242.23 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -21 | .015 | -21 | .015 | 21 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -21      21            32.55   32.55   32.55              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -7757.55

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2241.91      -21 2233.91        0 2233.49       21 2233.91       21
2241.91

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -21      21            25.12   25.12   25.12              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -7782.67

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2241.66      -21 2233.66        0 2233.24       21 2233.66       21
2241.66

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -21      21           108.69  108.69  108.69              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                 RS: -7891.36

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2240.59      -21 2232.59        0 2232.17       21 2232.59       21
2240.59
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21              8.64    8.64    8.64               0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7900

INPUT
Description: r11a
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2240.51       -21 2232.51         0 2232.09       21 2232.51       21
2240.51

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21                20      20      20               0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7920

INPUT
Description: r12
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2240.81       -21 2232.31         0 2231.89       21 2232.31       21
2240.31

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21      21             40.42   40.42   40.42               0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7960.42

INPUT
Description: r13
Station Elevation Data     num=        5
```

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2240.41      -21 2231.91        0 2231.49       21 2231.91       21
2239.91

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21       21               10       10       10              0         0

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -7970.42

INPUT
Description: r14
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2239.81      -21 2231.81        0 2231.39       21 2231.81       21
2239.81

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21       21            49.54   49.54   49.54              0       .05

CROSS SECTION


RIVER: duck creek
REACH: R1                  RS: -8019.96

INPUT
Description: interpolated
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -21 2239.33      -21 2231.33        0 2230.91       21 2231.33       21
2239.33

Manning's n Values         num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -21    .015      -21    .015       21    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -21       21            22.09   22.09   22.09              0       .05

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -8042.05
```

```
INPUT
Description: r15
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -33 2239.34     -33 2231.34       0 2230.68      33 2231.34      33
2239.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -33    .015     -33    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -33      33               50      50      50              0      .05

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -8092.05

INPUT
Description: r16
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -33 2238.85     -33 2230.85       0 2230.19      33 2230.85      33
2238.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -33    .015     -33    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -33      33               85      85      85              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -8177.05

INPUT
Description: r17
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -33 2238.01     -33 2230.01       0 2229.35      33 2230.01      33
2238.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -33    .015     -33    .015      33    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -33      33            39.44   39.44   39.44            .05        0
```

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -8216.49

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -31.28 | 2237.6 | -31.28 | 2229.6 | 0 | 2228.97 | 31.28 | 2229.6 | 31.28 | 2237.6 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -31.28 | .015 | -31.28 | .015 | 31.28 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -31.28 | 31.28 | 98.36 | 98.36 | 98.36 | .05 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -8314.85

INPUT
Description: r18
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -27 | 2236.54 | -27 | 2228.54 | 0 | 2228 | 27 | 2228.54 | 27 | 2236.54 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -27 | .015 | -27 | .015 | 27 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -27 | 27 | 20.1 | 20.8 | 20.5 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -8335.65

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -27 | 2236.46 | -27 | 2228.46 | 0 | 2227.92 | 27 | 2228.46 | 27 | 2236.46 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -27 | .015 | -27 | .015 | 27 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27           112.74  116.68  120.62              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -8452.33

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -27 2235.99      -27 2227.99        0 2227.45       27 2227.99       27
2235.99

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27           155.87  161.32  166.77              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -8613.65

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -27 2235.35      -27 2227.35        0 2226.81       27 2227.35       27
2235.35

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27           178.09  184.32  190.55              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -8797.97

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -27 2234.61      -27 2226.61        0 2226.07       27 2226.61       27
2234.61
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -27      27           29.12   30.42   31.19              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -8828.39

INPUT
Description: r19
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27 2234.49     -27 2226.49       0 2225.95      27 2226.49      27
2234.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -27      27             126     126     126              0      .05

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -8954.39

INPUT
Description: r20
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27 2233.98     -27 2225.98       0 2225.44      27 2225.98      27
2233.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -27      27          115.31  115.31  115.31            .05        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9069.7
```

```
INPUT
Description: r21
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27 2233.56     -27 2224.56       0 2224.02      27 2224.56      27
2232.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27           249.71  241.56  233.41              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9330.7

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27  2232.6     -27  2223.6       0 2223.06      27  2223.6      27
2231.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27            76.76   74.25   71.74              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9404.95

INPUT
Description: r22
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27  2232.3     -27  2223.3       0 2222.76      27  2223.3      27
2231.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -27    .015     -27    .015      27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27            10.34      10    9.66              0        0
```

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -9414.95

INPUT
Description: r23
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -27 | 2231.76 | -27 | 2223.26 | 0 | 2222.72 | 27 | 2223.26 | 27 | 2231.26 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -27 | .015 | -27 | .015 | 27 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -27 | 27 | 314.72 | 304.45 | 294.18 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -9722.78

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -27 | 2230.55 | -27 | 2222.05 | 0 | 2221.51 | 27 | 2222.05 | 27 | 2230.05 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -27 | .015 | -27 | .015 | 27 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -27 | 27 | 1.41 | 1.36 | 1.31 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -9724.14

INPUT
Description: r24
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -27 | 2230.54 | -27 | 2222.04 | 0 | 2221.5 | 27 | 2222.04 | 27 | 2230.04 |

```
Manning's n Values        num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27            10.34      10    9.66              0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9734.14

INPUT
Description: r25
Station Elevation Data    num=        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27 2229.97     -27 2221.97       0 2221.43      27 2221.97      27
2229.97

Manning's n Values        num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27            27.44   27.44   27.44             0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9761.58

INPUT
Description: r26
Station Elevation Data    num=        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27 2229.77     -27 2221.77       0 2221.23      27 2221.77      27
2229.77

Manning's n Values        num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -27      27             110     110     110            .05         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9871.58
```

```
INPUT
Description: r27
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -27    2229     -27    2221       0 2220.46      27    2221      27
2229

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -27    .015      -27    .015       27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -27      27           51.24   51.24   51.24            .05        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -9922.82

INPUT
Description: r28
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -25  2227.6     -25  2220.6       0  2220.1      25  2220.6      25
2227.6

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25           147.1   147.1   147.1            .05        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -10032.2

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -25 2226.59     -25 2219.59       0 2219.09      25 2219.59      25
2226.59

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25            67.9    67.9    67.9             0        0
```

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -10100.1

INPUT
Description: r29
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -25 | 2227.15 | -25 | 2219.15 | 0 | 2218.61 | 25 | 2219.15 | 25 | 2227.15 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -25 | .015 | -25 | .015 | 25 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -25 | 25 | 53.75 | 53.75 | 53.75 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -10153.8

INPUT
Description: r30
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -25 | 2225.74 | -25 | 2218.74 | 0 | 2218.24 | 25 | 2218.74 | 25 | 2225.74 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -25 | .015 | -25 | .015 | 25 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -25 | 25 | 69.3 | 69.3 | 69.3 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -10223.1

INPUT
Description: r31
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -25 | 2225.27 | -25 | 2218.27 | 0 | 2217.77 | 25 | 2218.27 | 25 | 2225.27 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -25 | .015 | -25 | .015 | 25 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25               69       69       69             0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                RS: -10292.1

INPUT
Description: r32
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -25 2224.79     -25 2217.79       0 2217.29      25 2217.79      25
2224.79

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25               69       69       69             0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                RS: -10361.1

INPUT
Description: r33
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -25 2224.32     -25 2217.32       0 2216.82      25 2217.32      25
2224.32

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25             86.8     86.8     86.8             0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                RS: -10477.9

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -25 2223.72     -25 2216.72       0 2216.22      25 2216.72      25
2223.72
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25             51.2    51.2    51.2              0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -10529.1

INPUT
Description: r34
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -25 2223.37       -25 2216.37         0 2215.87       25 2216.37       25
2223.37

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25           139.34  139.34  139.34              0         0

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -10668.4

INPUT
Description: r35
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -25  2222.4       -25  2215.4         0  2214.9       25  2215.4       25
2222.4

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .015      -25    .015       25    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -25      25               75      75      75              0       .05

CROSS SECTION


RIVER: duck creek2
REACH: R1                  RS: -10743.4
```

```
INPUT
Description: r36
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2223.88   -22.5 2214.88       0 2214.38    22.5 2214.88    22.5
2223.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           161.9   161.9   161.9              0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -10906.8

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2222.76   -22.5 2213.76       0 2213.26    22.5 2213.76    22.5
2222.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           248.73  248.73  248.73             0        0

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -11154

INPUT
Description: r37
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2221.05   -22.5 2212.05       0 2211.55    22.5 2212.05    22.5
2221.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           155.4   155.4   155.4              0        0
```

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -11311.5

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2219.98 | -22.5 | 2210.98 | 0 | 2210.48 | 22.5 | 2210.98 | 22.5 | 2219.98 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 55.61 | 55.61 | 55.61 | 0 | 0 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -11367.2

INPUT
Description: r39
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2219.59 | -22.5 | 2210.59 | 0 | 2210.09 | 22.5 | 2210.59 | 22.5 | 2219.59 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 50 | 50 | 50 | 0 | .05 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -11417.2

INPUT
Description: r40
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2213.26 | -22.5 | 2207.26 | 0 | 2207.26 | 22.5 | 2207.26 | 22.5 | 2213.26 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5            53.72   53.72   53.72              0        0
Cross Section Lid
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -22.5 2214.26 2213.26     -.5 2214.26 2213.26     -.5 2214.26 2207.26
      .5 2214.26 2207.26      .5 2214.26 2213.26    22.5 2214.26 2213.26

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -11470.9

INPUT
Description: r41
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2210.22   -22.5 2204.22       0 2204.22    22.5 2204.22    22.5
2210.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5           154.76  154.76  154.76              0        0
Cross Section Lid
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -22.5 2211.22 2210.22     -.5 2211.22 2210.22     -.5 2211.22 2204.22
      .5 2211.22 2204.22      .5 2211.22 2210.22    22.5 2211.22 2210.22

CROSS SECTION


RIVER: duck creek2
REACH: R1                 RS: -11625.6

INPUT
Description: r42
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -22.5 2201.48   -22.5 2195.48       0 2195.48    22.5 2195.48    22.5
2201.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -22.5    .015   -22.5    .015    22.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -22.5    22.5            125.7   125.7   125.7              0        0
Cross Section Lid
    num=        6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -22.5 2202.48 2201.48     -.5 2202.48 2201.48     -.5 2202.48 2195.48
      .5 2202.48 2195.48      .5 2202.48 2201.48    22.5 2202.48 2201.48
```

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -11745

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2200.82 | -22.5 | 2194.82 | 0 | 2194.82 | 22.5 | 2194.82 | 22.5 | 2200.82 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.5 | 22.5 | 207.6 | 207.6 | 207.6 | 0 | 0 |

Cross Section Lid
num= 6

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -22.5 | 2202.48 | 2200.82 | -.5 | 2202.48 | 2200.82 | -.5 | 2202.48 | 2194.82 |
| .5 | 2202.48 | 2194.82 | .5 | 2202.48 | 2200.82 | 22.5 | 2202.48 | 2200.82 |

CROSS SECTION

RIVER: duck creek2
REACH: R1 RS: -11952.6

INPUT
Description: r43
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -22.5 | 2199.72 | -22.5 | 2193.72 | 0 | 2193.72 | 22.5 | 2193.72 | 22.5 | 2199.72 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -22.5 | .015 | -22.5 | .015 | 22.5 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -22.5 | 22.5 | 0 | 0 |

Cross Section Lid
num= 6

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -22.5 | 2200.72 | 2199.72 | -.5 | 2200.72 | 2199.72 | -.5 | 2200.72 | 2193.72 |
| .5 | 2200.72 | 2193.72 | .5 | 2200.72 | 2199.72 | 22.5 | 2200.72 | 2199.72 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -4947.21

```
INPUT
Description: c29
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -24 2273.44      -24 2261.44        0 2261.44       24 2261.44       24
2273.44

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -24    .015      -24    .015       24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -24      24            4.686   4.686   4.686             .1       .3

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -4951.89

INPUT
Description: c28
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -242273.406      -242261.406        02261.406       242261.406
242273.406

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -24    .015      -24    .015       24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -24      24           15.227  15.227  15.227             .1       .3

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -4967.12

INPUT
Description: c27
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -242273.297      -242261.297        02261.297       242261.297
242273.297

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -24    .015      -24    .015       24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           -24      24           28.067  28.067  28.067             .1       .3
```

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -4995.19

INPUT
Description: c26
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24 | 2273.09 | -24 | 2261.09 | 0 | 2261.09 | 24 | 2261.09 | 24 | 2273.09 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24 | .015 | -24 | .015 | 24 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24 | 24 | 44.424 | 44.424 | 44.424 | .1 .3 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -5039.61

INPUT
Description: c25
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24 | 2272.77 | -24 | 2260.77 | 0 | 2260.77 | 24 | 2260.77 | 24 | 2272.77 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24 | .015 | -24 | .015 | 24 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24 | 24 | 16.296 | 16.296 | 16.296 | .1 .3 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -5055.91

INPUT
Description: c24
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24 | 2270.16 | -24 | 2260.66 | 0 | 2260.66 | 24 | 2260.66 | 24 | 2270.16 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24 | .015 | -24 | .015 | 24 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -24      24            57.97      50   41.98             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -24 2271.16 2260.66     -23 2271.16 2266.61     -22 2271.16 2267.78
     -21 2271.16 2268.52     -19 2271.16 2269.27     -17 2271.16 2269.69
     -13 2271.16 2270.13     -12 2271.16 2270.16     -11 2271.16 2270.13
      -7 2271.16 2269.69      -5 2271.16 2269.27      -3 2271.16 2268.52
      -2 2271.16 2267.78      -1 2271.16 2266.61     -.6 2271.16 2263.51
     -.5 2271.16 2260.67      .5 2271.16 2260.67      .6 2271.16 2263.51
       1 2271.16 2266.61       2 2271.16 2267.78       3 2271.16 2268.52
       5 2271.16 2269.27       7 2271.16 2269.69      11 2271.16 2270.13
      12 2271.16 2270.16      13 2271.16 2270.13      17 2271.16 2269.69
      19 2271.16 2269.27      21 2271.16 2268.52      22 2271.16 2267.78
      23 2271.16 2266.61      24 2271.16 2260.66

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5105.91

INPUT
Description: c23
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -24  2266.9     -24  2259.4       0  2259.4      24  2259.4      24
2266.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -24    .015     -24    .015      24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -24      24             31.9  27.516    23.1             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -24  2267.9  2259.4     -23  2267.9 2263.35     -22  2267.9 2264.52
     -21  2267.9 2265.26     -19  2267.9 2266.01     -17  2267.9 2266.43
     -13  2267.9 2266.87     -12  2267.9  2266.9     -11  2267.9 2266.87
      -7  2267.9 2266.43      -5  2267.9 2266.01      -3  2267.9 2265.26
      -2  2267.9 2264.52      -1  2267.9 2263.35     -.6  2267.9 2260.25
     -.5  2267.9 2259.41      .5  2267.9 2259.41      .6  2267.9 2260.25
       1  2267.9 2263.35       2  2267.9 2264.52       3  2267.9 2265.26
       5  2267.9 2266.01       7  2267.9 2266.43      11  2267.9 2266.87
      12  2267.9  2266.9      13  2267.9 2266.87      17  2267.9 2266.43
      19  2267.9 2266.01      21  2267.9 2265.26      22  2267.9 2264.52
      23  2267.9 2263.35      24  2267.9  2259.4

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5133.42
```

```
INPUT
Description: c22
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -242266.376      -242258.876        02258.876       242258.876
242266.376

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -24     .015      -24     .015       24     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -24       24            40.95  35.323   29.66             .1       .3
Cross Section Lid
    num=       32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -242267.3762258.876     -232267.3762262.826     -222267.3762263.996
     -212267.3762264.736     -192267.3762265.486     -172267.3762265.906
     -132267.3762266.346     -122267.3762266.376     -112267.3762266.346
      -72267.3762265.906      -52267.3762265.486      -32267.3762264.736
      -22267.3762263.996      -12267.3762262.826     -.62267.3762259.726
     -.52267.3762258.886      .52267.3762258.886      .62267.3762259.726
       12267.3762262.826       22267.3762263.996       32267.3762264.736
       52267.3762265.486       72267.3762265.906      112267.3762266.346
      122267.3762266.376      132267.3762266.346      172267.3762265.906
      192267.3762265.486      212267.3762264.736      222267.3762263.996
      232267.3762262.826      242267.3762258.876

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5168.74

INPUT
Description: c21
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -242265.703      -242258.203        02258.203       242258.203
242265.703

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -24     .015      -24     .015       24     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -24       24            37.93  32.711   27.46             .1       .3
Cross Section Lid
    num=       32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -242266.7032258.203     -232266.7032262.153     -222266.7032263.323
     -212266.7032264.063     -192266.7032264.813     -172266.7032265.233
     -132266.7032265.673     -122266.7032265.703     -112266.7032265.673
      -72266.7032265.233      -52266.7032264.813      -32266.7032264.063
      -22266.7032263.323      -12266.7032262.153     -.62266.7032259.053
     -.52266.7032258.213      .52266.7032258.213      .62266.7032259.053
       12266.7032262.153       22266.7032263.323       32266.7032264.063
       52266.7032264.813       72266.7032265.233      112266.7032265.673
```

```
      122266.7032265.703      132266.7032265.673      172266.7032265.233
      192266.7032264.813      212266.7032264.063      222266.7032263.323
      232266.7032262.153      242266.7032258.203

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5201.46

INPUT
Description: c20
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -24 2265.08     -24 2257.58       0 2257.58      24 2257.58      24
2265.08

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -24    .015      -24    .015       24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -24      24               30      30      30             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -24 2266.08 2257.58     -23 2266.08 2261.53     -22 2266.08  2262.7
     -21 2266.08 2263.44     -19 2266.08 2264.19     -17 2266.08 2264.61
     -13 2266.08 2265.05     -12 2266.08 2265.08     -11 2266.08 2265.05
      -7 2266.08 2264.61      -5 2266.08 2264.19      -3 2266.08 2263.44
      -2 2266.08  2262.7      -1 2266.08 2261.53     -.6 2266.08 2258.43
     -.5 2266.082257.592       .5 2266.08 2257.59      .6 2266.08 2258.43
       1 2266.08 2261.53        2 2266.08  2262.7       3 2266.08 2263.44
       5 2266.08 2264.19        7 2266.08 2264.61      11 2266.08 2265.05
      12 2266.08 2265.08       13 2266.08 2265.05      17 2266.08 2264.61
      19 2266.08 2264.19       21 2266.08 2263.44      22 2266.08  2262.7
      23 2266.08 2261.53       24 2266.08 2257.58

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5231.46

INPUT
Description: c19
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5  2264.5   -20.5    2257       0    2257    20.5    2257    20.5
2264.5

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015    -20.5    .015     20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5           30.406  30.406  30.406             .1       .3
```

```
Cross Section Lid
    num=       32
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
   -20.5  2265.5    2257    -19.5  2265.5 2261.15    -18.5  2265.5 2262.28
   -16.5  2265.5 2263.55    -14.5  2265.5 2264.06    -12.5  2265.5 2264.37
   -11.5  2265.5 2264.46    -10.5  2265.5  2264.5     -9.5  2265.5 2264.46
    -8.5  2265.5 2264.37     -6.5  2265.5 2264.06     -4.5  2265.5 2263.55
    -2.5  2265.5 2262.28     -1.5  2265.5 2261.15      -.6  2265.5 2257.81
     -.5  2265.5    2257       .5  2265.5    2257       .6  2265.5 2257.81
     1.5  2265.5 2261.15      2.5  2265.5 2262.28      4.5  2265.5 2263.55
     6.5  2265.5 2264.06      8.5  2265.5 2264.37      9.5  2265.5 2264.46
    10.5  2265.5  2264.5     11.5  2265.5 2264.46     12.5  2265.5 2264.37
    14.5  2265.5 2264.06     16.5  2265.5 2263.55     18.5  2265.5 2262.28
    19.5  2265.5 2261.15     20.5  2265.5    2257

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5261.86

INPUT
Description: c18
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.5 2264.92    -20.5 2256.42        0 2256.42     20.5 2256.42     20.5
2263.92

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -20.5     .015    -20.5     .015     20.5     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -20.5    20.5           39.621  39.621  39.621              .1       .3
Cross Section Lid
    num=       32
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
   -20.5 2264.92 2256.42    -19.5 2264.92 2260.57    -18.5 2264.92  2261.7
   -16.5 2264.92 2262.97    -14.5 2264.92 2263.48    -12.5 2264.92 2263.79
   -11.5 2264.92 2263.88    -10.5 2264.92 2263.92     -9.5 2264.92 2263.88
    -8.5 2264.92 2263.79     -6.5 2264.92 2263.48     -4.5 2264.92 2262.97
    -2.5 2264.92  2261.7     -1.5 2264.92 2260.57      -.6 2264.92 2257.23
     -.5 2264.92 2256.42       .5 2264.92 2256.42       .6 2264.92 2257.23
     1.5 2264.92 2260.57      2.5 2264.92  2261.7      4.5 2264.92 2262.97
     6.5 2264.92 2263.48      8.5 2264.92 2263.79      9.5 2264.92 2263.88
    10.5 2264.92 2263.92     11.5 2264.92 2263.88     12.5 2264.92 2263.79
    14.5 2264.92 2263.48     16.5 2264.92 2262.97     18.5 2264.92  2261.7
    19.5 2264.92 2260.57     20.5 2264.92 2256.42

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5301.48
```

```
INPUT
Description: c17
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.52263.163   -20.52255.663        02255.663    20.52255.663
20.52263.163

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -20.5    20.5            51.04   51.04   51.04              .1        .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.52264.1632255.663   -19.52264.1632259.813   -18.52264.1632260.943
   -16.52264.1632262.213   -14.52264.1632262.723   -12.52264.1632263.033
   -11.52264.1632263.123   -10.52264.1632263.163    -9.52264.1632263.123
    -8.52264.1632263.033    -6.52264.1632262.723    -4.52264.1632262.213
    -2.52264.1632260.943    -1.52264.1632259.813     -.62264.1632256.473
     -.52264.1632255.663      .52264.1632255.663      .62264.1632256.473
     1.52264.1632259.813     2.52264.1632260.943     4.52264.1632262.213
     6.52264.1632262.723     8.52264.1632263.033     9.52264.1632263.123
    10.52264.1632263.163    11.52264.1632263.123    12.52264.1632263.033
    14.52264.1632262.723    16.52264.1632262.213    18.52264.1632260.943
    19.52264.1632259.813    20.52264.1632255.663

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5352.52

INPUT
Description: c16
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.52262.189   -20.52254.689        02254.689    20.52254.689
20.52262.189

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -20.5    20.5            3.603   3.603   3.603              .1        .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.52263.1892254.689   -19.52263.1892258.839   -18.52263.1892259.969
   -16.52263.1892261.239   -14.52263.1892261.749   -12.52263.1892262.059
   -11.52263.1892262.149   -10.52263.1892262.189    -9.52263.1892262.149
    -8.52263.1892262.059    -6.52263.1892261.749    -4.52263.1892261.239
    -2.52263.1892259.969    -1.52263.1892258.839     -.62263.1892255.499
     -.52263.1892254.689      .52263.1892254.689      .62263.1892255.499
     1.52263.1892258.839     2.52263.1892259.969     4.52263.1892261.239
     6.52263.1892261.749     8.52263.1892262.059     9.52263.1892262.149
```

```
    10.52263.1892262.189    11.52263.1892262.149    12.52263.1892262.059
    14.52263.1892261.749    16.52263.1892261.239    18.52263.1892259.969
    19.52263.1892258.839    20.52263.1892254.689

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5356.13

INPUT
Description: c15
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5 2262.12   -20.5 2254.62       0 2254.62    20.5 2254.62    20.5
2262.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5           26.57      30    33.4             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2263.12 2254.62   -19.5 2263.12 2258.77   -18.5 2263.12  2259.9
   -16.5 2263.12 2261.17   -14.5 2263.12 2261.68   -12.5 2263.12 2261.99
   -11.5 2263.12 2262.08   -10.5 2263.12 2262.12    -9.5 2263.12 2262.08
    -8.5 2263.12 2261.99    -6.5 2263.12 2261.68    -4.5 2263.12 2261.17
    -2.5 2263.12  2259.9    -1.5 2263.12 2258.77     -.6 2263.12 2255.43
     -.5 2263.12 2254.62      .5 2263.12 2254.62      .6 2263.12 2255.43
     1.5 2263.12 2258.77     2.5 2263.12  2259.9     4.5 2263.12 2261.17
     6.5 2263.12 2261.68     8.5 2263.12 2261.99     9.5 2263.12 2262.08
    10.5 2263.12 2262.12    11.5 2263.12 2262.08    12.5 2263.12 2261.99
    14.5 2263.12 2261.68    16.5 2263.12 2261.17    18.5 2263.12  2259.9
    19.5 2263.12 2258.77    20.5 2263.12 2254.62

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5386.13

INPUT
Description: c14
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5 2261.55   -20.5 2254.05       0 2254.05    20.5 2254.05    20.5
2261.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5          114.93  129.77  144.48             .1       .3
```

```
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2262.55 2254.05   -19.5 2262.55  2258.2   -18.5 2262.55 2259.33
   -16.5 2262.55  2260.6   -14.5 2262.55 2261.11   -12.5 2262.55 2261.42
   -11.5 2262.55 2261.51   -10.5 2262.55 2261.55    -9.5 2262.55 2261.51
    -8.5 2262.55 2261.42    -6.5 2262.55 2261.11    -4.5 2262.55  2260.6
    -2.5 2262.55 2259.33    -1.5 2262.55  2258.2     -.6 2262.55 2254.86
     -.5 2262.55 2254.05      .5 2262.55 2254.05      .6 2262.55 2254.86
     1.5 2262.55  2258.2     2.5 2262.55 2259.33     4.5 2262.55  2260.6
     6.5 2262.55 2261.11     8.5 2262.55 2261.42     9.5 2262.55 2261.51
    10.5 2262.55 2261.55    11.5 2262.55 2261.51    12.5 2262.55 2261.42
    14.5 2262.55 2261.11    16.5 2262.55  2260.6    18.5 2262.55 2259.33
    19.5 2262.55  2258.2    20.5 2262.55 2254.05

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5515.9

INPUT
Description: c13
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5 2261.15   -20.5 2253.65       0 2253.65    20.5 2253.65    20.5
2261.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5          149.799 149.799 149.799             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2262.15 2253.65   -19.5 2262.15  2257.8   -18.5 2262.15 2258.93
   -16.5 2262.15  2260.2   -14.5 2262.15 2260.71   -12.5 2262.15 2261.02
   -11.5 2262.15 2261.11   -10.5 2262.15 2261.15    -9.5 2262.15 2261.11
    -8.5 2262.15 2261.02    -6.5 2262.15 2260.71    -4.5 2262.15  2260.2
    -2.5 2262.15 2258.93    -1.5 2262.15  2257.8     -.6 2262.15 2254.46
     -.5 2262.15 2253.65      .5 2262.15 2253.65      .6 2262.15 2254.46
     1.5 2262.15  2257.8     2.5 2262.15 2258.93     4.5 2262.15  2260.2
     6.5 2262.15 2260.71     8.5 2262.15 2261.02     9.5 2262.15 2261.11
    10.5 2262.15 2261.15    11.5 2262.15 2261.11    12.5 2262.15 2261.02
    14.5 2262.15 2260.71    16.5 2262.15  2260.2    18.5 2262.15 2258.93
    19.5 2262.15  2257.8    20.5 2262.15 2253.65

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5665.69
```

```
INPUT
Description: c12
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.5 2260.83    -20.5 2253.33        0 2253.33     20.5 2253.33     20.5
2260.83

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015    -20.5    .015     20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -20.5    20.5           16.461  16.461  16.461             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2261.83 2253.33   -19.5 2261.83 2257.48   -18.5 2261.83 2258.61
   -16.5 2261.83 2259.88   -14.5 2261.83 2260.39   -12.5 2261.83  2260.7
   -11.5 2261.83 2260.79   -10.5 2261.83 2260.83    -9.5 2261.83 2260.79
    -8.5 2261.83  2260.7    -6.5 2261.83 2260.39    -4.5 2261.83 2259.88
    -2.5 2261.83 2258.61    -1.5 2261.83 2257.48     -.6 2261.83 2254.14
     -.5 2261.83 2253.33      .5 2261.83 2253.33      .6 2261.83 2254.14
     1.5 2261.83 2257.48     2.5 2261.83 2258.61     4.5 2261.83 2259.88
     6.5 2261.83 2260.39     8.5 2261.83  2260.7     9.5 2261.83 2260.79
    10.5 2261.83 2260.83    11.5 2261.83 2260.79    12.5 2261.83  2260.7
    14.5 2261.83 2260.39    16.5 2261.83 2259.88    18.5 2261.83 2258.61
    19.5 2261.83 2257.48    20.5 2261.83 2253.33

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5682.16

INPUT
Description: c11
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.5 2260.74    -20.5 2253.24        0 2253.24     20.5 2253.24     20.5
2260.74

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015    -20.5    .015     20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -20.5    20.5           82.71   82.71   82.71             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2261.74 2253.24   -19.5 2261.74 2257.39   -18.5 2261.74 2258.52
   -16.5 2261.74 2259.79   -14.5 2261.74  2260.3   -12.5 2261.74 2260.61
   -11.5 2261.74  2260.7   -10.5 2261.74 2260.74    -9.5 2261.74  2260.7
    -8.5 2261.74 2260.61    -6.5 2261.74  2260.3    -4.5 2261.74 2259.79
    -2.5 2261.74 2258.52    -1.5 2261.74 2257.39     -.6 2261.74 2254.05
     -.5 2261.74 2253.24      .5 2261.74 2253.24      .6 2261.74 2254.05
     1.5 2261.74 2257.39     2.5 2261.74 2258.52     4.5 2261.74 2259.79
```

```
     6.5 2261.74  2260.3     8.5 2261.74 2260.61     9.5 2261.74  2260.7
    10.5 2261.74 2260.74    11.5 2261.74  2260.7    12.5 2261.74 2260.61
    14.5 2261.74  2260.3    16.5 2261.74 2259.79    18.5 2261.74 2258.52
    19.5 2261.74 2257.39    20.5 2261.74 2253.24

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5764.87

INPUT
Description: c10
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5 2259.81   -20.5 2252.31       0 2252.31    20.5 2252.31    20.5
2259.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5          130.704 130.704 130.704             .1       .3
Cross Section Lid
    num=      32
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2260.81 2252.31   -19.5 2260.81 2256.46   -18.5 2260.81 2257.59
   -16.5 2260.81 2258.86   -14.5 2260.81 2259.37   -12.5 2260.81 2259.68
   -11.5 2260.81 2259.77   -10.5 2260.81 2259.81    -9.5 2260.81 2259.77
    -8.5 2260.81 2259.68    -6.5 2260.81 2259.37    -4.5 2260.81 2258.86
    -2.5 2260.81 2257.59    -1.5 2260.81 2256.46     -.6 2260.81 2253.12
     -.5 2260.81 2252.31      .5 2260.81 2252.31      .6 2260.81 2253.12
     1.5 2260.81 2256.46     2.5 2260.81 2257.59     4.5 2260.81 2258.86
     6.5 2260.81 2259.37     8.5 2260.81 2259.68     9.5 2260.81 2259.77
    10.5 2260.81 2259.81    11.5 2260.81 2259.77    12.5 2260.81 2259.68
    14.5 2260.81 2259.37    16.5 2260.81 2258.86    18.5 2260.81 2257.59
    19.5 2260.81 2256.46    20.5 2260.81 2252.31

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -5895.57

INPUT
Description: c9
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.52258.095   -20.52250.595       02250.595    20.52250.595
20.52258.095

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5          37.146  37.146  37.146             .1       .3
```

Cross Section Lid
num= 32

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -20.52259.0952250.595 | | | -19.52259.0952254.745 | | | -18.52259.0952255.875 | | |
| -16.52259.0952257.145 | | | -14.52259.0952257.655 | | | -12.52259.0952257.965 | | |
| -11.52259.0952258.055 | | | -10.52259.0952258.095 | | | -9.52259.0952258.055 | | |
| -8.52259.0952257.965 | | | -6.52259.0952257.655 | | | -4.52259.0952257.145 | | |
| -2.52259.0952255.875 | | | -1.52259.0952254.745 | | | -.62259.0952251.405 | | |
| -.52259.0952250.595 | | | .52259.0952250.595 | | | .62259.0952251.405 | | |
| 1.52259.0952254.745 | | | 2.52259.0952255.875 | | | 4.52259.0952257.145 | | |
| 6.52259.0952257.655 | | | 8.52259.0952257.965 | | | 9.52259.0952258.055 | | |
| 10.52259.0952258.095 | | | 11.52259.0952258.055 | | | 12.52259.0952257.965 | | |
| 14.52259.0952257.655 | | | 16.52259.0952257.145 | | | 18.52259.0952255.875 | | |
| 19.52259.0952254.745 | | | 20.52259.0952250.595 | | | | | |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -5932.72

INPUT
Description: c8
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20.5 | 2257.9 | -20.5 | 2250.4 | 0 | 2250.4 | 20.5 | 2250.4 | 20.5 | 2257.9 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20.5 | .015 | -20.5 | .015 | 20.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. | |
|---|---|---|---|---|---|
| -20.5 | 20.5 | 750 | 750 | 750 | .1 .3 |

Cross Section Lid
num= 32

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -20.5 | 2258.9 | 2250.4 | -19.5 | 2258.9 | 2254.55 | -18.5 | 2258.9 | 2255.68 |
| -16.5 | 2258.9 | 2256.95 | -14.5 | 2258.9 | 2257.46 | -12.5 | 2258.9 | 2257.77 |
| -11.5 | 2258.9 | 2257.86 | -10.5 | 2258.9 | 2257.9 | -9.5 | 2258.9 | 2257.86 |
| -8.5 | 2258.9 | 2257.77 | -6.5 | 2258.9 | 2257.46 | -4.5 | 2258.9 | 2256.95 |
| -2.5 | 2258.9 | 2255.68 | -1.5 | 2258.9 | 2254.55 | -.6 | 2258.9 | 2251.21 |
| -.5 | 2258.9 | 2250.4 | .5 | 2258.9 | 2250.4 | .6 | 2258.9 | 2251.21 |
| 1.5 | 2258.9 | 2254.55 | 2.5 | 2258.9 | 2255.68 | 4.5 | 2258.9 | 2256.95 |
| 6.5 | 2258.9 | 2257.46 | 8.5 | 2258.9 | 2257.77 | 9.5 | 2258.9 | 2257.86 |
| 10.5 | 2258.9 | 2257.9 | 11.5 | 2258.9 | 2257.86 | 12.5 | 2258.9 | 2257.77 |
| 14.5 | 2258.9 | 2257.46 | 16.5 | 2258.9 | 2256.95 | 18.5 | 2258.9 | 2255.68 |
| 19.5 | 2258.9 | 2254.55 | 20.5 | 2258.9 | 2250.4 | | | |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -6682.72

```
INPUT
Description: c7
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.5 2252.75   -20.5 2245.25        0 2245.25     20.5 2245.25     20.5
2252.75

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5            44.94   44.94   44.94             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5 2253.75 2245.25   -19.5 2253.75  2249.4   -18.5 2253.75 2250.53
   -16.5 2253.75  2251.8   -14.5 2253.75 2252.31   -12.5 2253.75 2252.62
   -11.5 2253.75 2252.71   -10.5 2253.75 2252.75    -9.5 2253.75 2252.71
    -8.5 2253.75 2252.62    -6.5 2253.75 2252.31    -4.5 2253.75  2251.8
    -2.5 2253.75 2250.53    -1.5 2253.75  2249.4     -.6 2253.75 2246.06
     -.5 2253.75 2245.25      .5 2253.75 2245.25      .6 2253.75 2246.06
     1.5 2253.75  2249.4     2.5 2253.75 2250.53     4.5 2253.75  2251.8
     6.5 2253.75 2252.31     8.5 2253.75 2252.62     9.5 2253.75 2252.71
    10.5 2253.75 2252.75    11.5 2253.75 2252.71    12.5 2253.75 2252.62
    14.5 2253.75 2252.31    16.5 2253.75  2251.8    18.5 2253.75 2250.53
    19.5 2253.75  2249.4    20.5 2253.75 2245.25

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -6727.66

INPUT
Description: c6
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -20.52251.758   -20.52244.258        02244.258     20.52244.258
20.52251.758

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5           56.926  56.926  56.926             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.52252.7582244.258   -19.52252.7582248.408   -18.52252.7582249.538
   -16.52252.7582250.808   -14.52252.7582251.318   -12.52252.7582251.628
   -11.52252.7582251.718   -10.52252.7582251.758    -9.52252.7582251.718
    -8.52252.7582251.628    -6.52252.7582251.318    -4.52252.7582250.808
    -2.52252.7582249.538    -1.52252.7582248.408     -.62252.7582245.068
     -.52252.7582244.258      .52252.7582244.258      .62252.7582245.068
     1.52252.7582248.408     2.52252.7582249.538     4.52252.7582250.808
     6.52252.7582251.318     8.52252.7582251.628     9.52252.7582251.718
```

```
    10.52252.7582251.758    11.52252.7582251.718    12.52252.7582251.628
    14.52252.7582251.318    16.52252.7582250.808    18.52252.7582249.538
    19.52252.7582248.408    20.52252.7582244.258

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -6784.58

INPUT
Description: c5
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5  2250.5   -20.5    2243       0    2243    20.5    2243    20.5
2250.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5           18.134  18.134  18.134             .1       .3
Cross Section Lid
    num=      32
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -20.5  2251.5    2243   -19.5  2251.5 2247.15   -18.5  2251.5 2248.28
   -16.5  2251.5 2249.55   -14.5  2251.5 2250.06   -12.5  2251.5 2250.37
   -11.5  2251.5 2250.46   -10.5  2251.5  2250.5    -9.5  2251.5 2250.46
    -8.5  2251.5 2250.37    -6.5  2251.5 2250.06    -4.5  2251.5 2249.55
    -2.5  2251.5 2248.28    -1.5  2251.5 2247.15     -.6  2251.5 2243.81
     -.5  2251.5    2243      .5  2251.5    2243      .6  2251.5 2243.81
     1.5  2251.5 2247.15     2.5  2251.5 2248.28     4.5  2251.5 2249.55
     6.5  2251.5 2250.06     8.5  2251.5 2250.37     9.5  2251.5 2250.46
    10.5  2251.5  2250.5    11.5  2251.5 2250.46    12.5  2251.5 2250.37
    14.5  2251.5 2250.06    16.5  2251.5 2249.55    18.5  2251.5 2248.28
    19.5  2251.5 2247.15    20.5  2251.5    2243

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -6802.72

INPUT
Description: c4
c4
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
   -20.5  2250.1   -20.5  2242.6       0  2242.6    20.5  2242.6    20.5
2250.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -20.5    .015   -20.5    .015    20.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
         -20.5    20.5           36.62   36.62   36.62             .1       .3
```

Cross Section Lid
num= 32

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -20.5 | 2251.1 | 2242.6 | -19.5 | 2251.1 | 2246.75 | -18.5 | 2251.1 | 2247.88 |
| -16.5 | 2251.1 | 2249.15 | -14.5 | 2251.1 | 2249.66 | -12.5 | 2251.1 | 2249.97 |
| -11.5 | 2251.1 | 2250.06 | -10.5 | 2251.1 | 2250.1 | -9.5 | 2251.1 | 2250.06 |
| -8.5 | 2251.1 | 2249.97 | -6.5 | 2251.1 | 2249.66 | -4.5 | 2251.1 | 2249.15 |
| -2.5 | 2251.1 | 2247.88 | -1.5 | 2251.1 | 2246.75 | -.6 | 2251.1 | 2243.41 |
| -.5 | 2251.1 | 2242.6 | .5 | 2251.1 | 2242.6 | .6 | 2251.1 | 2243.41 |
| 1.5 | 2251.1 | 2246.75 | 2.5 | 2251.1 | 2247.88 | 4.5 | 2251.1 | 2249.15 |
| 6.5 | 2251.1 | 2249.66 | 8.5 | 2251.1 | 2249.97 | 9.5 | 2251.1 | 2250.06 |
| 10.5 | 2251.1 | 2250.1 | 11.5 | 2251.1 | 2250.06 | 12.5 | 2251.1 | 2249.97 |
| 14.5 | 2251.1 | 2249.66 | 16.5 | 2251.1 | 2249.15 | 18.5 | 2251.1 | 2247.88 |
| 19.5 | 2251.1 | 2246.75 | 20.5 | 2251.1 | 2242.6 | | | |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -6839.34

INPUT
Description: c3
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.5 | 2249.49 | -24.5 | 2242.49 | 0 | 2242.49 | 24.5 | 2242.49 | 24.5 | 2249.49 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24.5 | .015 | -24.5 | .015 | 24.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24.5 | 24.5 | 141.386 | 141.386 141.386 | .1 | .3 |

Cross Section Lid
num= 26

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -24.5 | 2250.49 | 2242.49 | -22.5 | 2250.492 | 247.162 | -20.5 | 2250.492 | 248.361 |
| -18.5 | 2250.492 | 248.862 | -16.5 | 2250.492 | 249.203 | -14.5 | 2250.492 | 249.411 |
| -12.5 | 2250.492 | 249.487 | -10.5 | 2250.492 | 249.411 | -8.5 | 2250.492 | 249.203 |
| -6.5 | 2250.492 | 248.862 | -4.5 | 2250.492 | 248.361 | -2.5 | 2250.492 | 247.162 |
| -.5 | 2250.49 | 2242.49 | .5 | 2250.49 | 2242.49 | 2.5 | 2250.492 | 247.162 |
| 4.5 | 2250.492 | 248.361 | 6.5 | 2250.492 | 248.862 | 8.5 | 2250.492 | 249.203 |
| 10.5 | 2250.492 | 249.411 | 12.5 | 2250.492 | 249.487 | 14.5 | 2250.492 | 249.411 |
| 16.5 | 2250.492 | 249.203 | 18.5 | 2250.492 | 248.862 | 20.5 | 2250.492 | 248.361 |
| 22.5 | 2250.492 | 247.162 | 24.5 | 2250.49 | 2242.49 | | | |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -6980.72

INPUT
Description: c2
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24.52 | 248.907 | -24.52 | 241.907 | 0 | 2241.907 | 24.52 | 241.907 | 24.52 | 248.907 |

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -24.5    24.5          38.214  38.214  38.214              .1        .3
Cross Section Lid
    num=       26
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.52249.9072242.057   -22.52249.9072246.579   -20.52249.9072247.778
   -18.52249.9072248.279   -16.52249.907 2248.62   -14.52249.9072248.828
   -12.52249.9072248.904   -10.52249.9072248.828    -8.52249.907 2248.62
    -6.52249.9072248.279    -4.52249.9072247.778    -2.52249.9072246.579
     -.52249.9072242.057      .52249.9072242.057     2.52249.9072246.579
     4.52249.9072247.778     6.52249.9072248.279     8.52249.907 2248.62
    10.52249.9072248.828    12.52249.9072248.904    14.52249.9072248.828
    16.52249.907 2248.62    18.52249.9072248.279    20.52249.9072247.778
    22.52249.9072246.579    24.52249.9072242.057

CROSS SECTION


RIVER: North box
REACH: R-4                  RS: -7001.77

INPUT
Description: c1
Station Elevation Data      num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
   -24.5   2248.7    -24.5   2241.7        0   2241.7     24.5   2241.7     24.5
2248.7

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -24.5    .015   -24.5    .015    24.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
         -24.5    24.5           17.17   17.17   17.17              .1        .3
Cross Section Lid
    num=       26
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -24.5  2249.7  2241.7   -22.5  2249.7 2246.22   -20.5  2249.7 2247.42
   -18.5  2249.7 2247.92   -16.5  2249.7 2248.26   -14.5  2249.7 2248.47
   -12.5  2249.7 2248.55   -10.5  2249.7 2248.47    -8.5  2249.7 2248.26
    -6.5  2249.7 2247.92    -4.5  2249.7 2247.42    -2.5  2249.7 2246.22
     -.5  2249.7  2241.7      .5  2249.7  2241.7     2.5  2249.7 2246.22
     4.5  2249.7 2247.42     6.5  2249.7 2247.92     8.5  2249.7 2248.26
    10.5  2249.7 2248.47    12.5  2249.7 2248.55    14.5  2249.7 2248.47
    16.5  2249.7 2248.26    18.5  2249.7 2247.92    20.5  2249.7 2247.42
    22.5  2249.7 2246.22    24.5  2249.7  2241.7
```

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -7018.94

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -23.94 | 2251.7 | -23.94 | 2241.7 | 0 | 2241.28 | 23.94 | 2241.7 | 23.94 | 2251.7 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -23.94 | .015 | -23.94 | .015 | 23.94 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -23.94 | 23.94 | 34.95 | 34.95 | 34.95 | 0 | 0 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -7053.89

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20.77 | 2249.87 | -20.77 | 2240.87 | 0 | 2240.43 | 20.77 | 2240.87 | 20.77 | 2249.87 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20.77 | .015 | -20.77 | .015 | 20.77 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20.77 | 20.77 | 20 | 20 | 20 | 0 | 0 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -7073.89

INPUT
Description: interpolated
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -19.54 | 2249.36 | -19.54 | 2240.36 | 0 | 2239.95 | 19.54 | 2240.36 | 19.54 | 2249.36 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -19.54 | .015 | -19.54 | .015 | 19.54 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
        -19.54   19.54             46.14   46.14   46.14               0         0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7120.03

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
  -16.68  2248.2  -16.68  2239.2       0 2238.83   16.68  2239.2   16.68
2248.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -16.68    .015  -16.68    .015   16.68    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
        -16.68   16.68             50.02   50.02   50.02               0         0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7170.05

INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
  -13.58 2246.93  -13.58 2237.93       0 2237.61   13.58 2237.93   13.58
2246.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -13.58    .015  -13.58    .015   13.58    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
        -13.58   13.58             41.72   41.72   41.72               0         0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7211.77

INPUT
Description: 2
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta
Elev
     -11 2245.82      -11 2236.82       0  2236.6      11 2236.82      11
2245.82
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -11       11             2.18    2.18    2.18              0         0

CROSS SECTION


RIVER: North box
REACH: R-4                 RS: -7213.95

INPUT
Description: interpolated
Station Elevation Data     num=        5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
     -11 2245.86      -11 2236.86        0 2236.59       11 2236.86       11
2245.86

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -11       11            46.61   46.61   46.61              0         0

CROSS SECTION


RIVER: North box
REACH: R-4                 RS: -7260.56

INPUT
Description: interpolated
Station Elevation Data     num=        5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta
Elev
     -11 2245.57      -11 2236.57        0 2236.35       11 2236.57       11
2245.57

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
           -11       11            62.64   62.64   62.64              0         0

CROSS SECTION


RIVER: North box
REACH: R-4                 RS: -7323.20
```

```
INPUT
Description: interpolated
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -11 2245.24      -11 2236.24        0 2236.02       11 2236.24       11
2245.24

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
          -11       11             56.8    56.8    56.8              0         0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7380

INPUT
Description: 3
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -11 2244.94      -11 2235.94        0 2235.72       11 2235.94       11
2244.94

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
          -11       11               20      20      20              0         0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7400

INPUT
Description: 4
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -11 2244.34      -11 2235.84        0 2235.62       11 2235.84       11
2244.34

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -11    .015      -11    .015       11    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
          -11       11           111.22  111.22  111.22              0         0
```

CROSS SECTION .

RIVER: North box
REACH: R-4 RS: -7511.22

INPUT
Description: 5
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -11 | 2243.76 | -11 | 2235.26 | 0 | 2235.04 | 11 | 2235.26 | 11 | 2243.76 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -11 | .015 | -11 | .015 | 11 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. |
|---|---|---|---|---|
| -11 | 11 | 400.6 409.61 418.62 | | 0 0 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -7920.83

INPUT
Description: 6
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -11 | 2240.62 | -11 | 2232.12 | 0 | 2231.9 | 11 | 2232.12 | 11 | 2240.62 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -11 | .015 | -11 | .015 | 11 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. Expan. |
|---|---|---|---|---|
| -11 | 11 | 9.71 9.93 10.15 | | 0 0 |

CROSS SECTION

RIVER: North box
REACH: R-4 RS: -7930.76

INPUT
Description: 6a
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -11 | 2240.52 | -11 | 2232.02 | 0 | 2231.8 | 11 | 2232.02 | 11 | 2240.52 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -11 | .015 | -11 | .015 | 11 | .015 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -11      11           29.007   29.66  30.313              0        0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7960.42

INPUT
Description: 7
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
     -11 2240.22      -11 2231.72        0  2231.5       11 2231.72       11
2240.22

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -11     .015      -11     .015       11     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          -11      11             9.78      10   10.22              0        0

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -7970.42

INPUT
Description: 8
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
 -11.5832239.632 -11.5832231.632        0  2231.4  11.5832231.632
11.5832239.632

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 -11.583     .015 -11.583     .015   11.583     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
       -11.583  11.583           71.63   71.63   71.63              0      .05

CROSS SECTION


RIVER: North box
REACH: R-4                RS: -8042.05

INPUT
Description: 9
Station Elevation Data    num=       5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta
Elev
 -11.5832238.912 -11.5832230.912        0 2230.68  11.5832230.912
11.5832238.912
```

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -11.583 | .015 | -11.583 | .015 | 11.583 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -11.583 | 11.583 | 0 | .05 |

SUMMARY OF MANNING'S N VALUES

River:duck creek

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| R1 | -4414.11 | .015 | .015 | .015 |
| R1 | -4743.42 | .015 | .015 | .015 |
| R1 | -5163.42 | .015 | .015 | .015 |
| R1 | -5322.84 | .015 | .015 | .015 |
| R1 | -5375.42 | .015 | .015 | .015 |
| R1 | -5563.42 | .015 | .015 | .015 |
| R1 | -5963.42 | .015 | .015 | .015 |
| R1 | -6096.99 | .015 | .015 | .015 |
| R1 | -6240.52 | .015 | .015 | .015 |
| R1 | -6268.97 | .015 | .015 | .015 |
| R1 | -6318.97 | .015 | .015 | .015 |
| R1 | -6354.38 | .015 | .015 | .015 |
| R1 | -6359.92 | .015 | .015 | .015 |
| R1 | -6391.98 | .015 | .015 | .015 |
| R1 | -6402.45 | .015 | .015 | .015 |
| R1 | -6452.91 | .015 | .015 | .015 |
| R1 | -6492.45 | .015 | .015 | .015 |
| R1 | -6594.48 | .015 | .015 | .015 |
| R1 | -6631.75 | .015 | .015 | .015 |
| R1 | -6794.22 | .015 | .015 | .015 |
| R1 | -6904.94 | .015 | .015 | .015 |
| R1 | -6922 | .015 | .015 | .015 |
| R1 | -6942.61 | .015 | .015 | .015 |
| R1 | -7036.67 | .015 | .015 | .015 |
| R1 | -7056.34 | .015 | .015 | .015 |
| R1 | -7131.35 | .015 | .015 | .015 |
| R1 | -7357.19 | .015 | .015 | .015 |
| R1 | -7391.14 | .015 | .015 | .015 |
| R1 | -7416.14 | .015 | .015 | .015 |
| R1 | -7434.81 | .015 | .015 | .015 |
| R1 | -7500 | .015 | .015 | .015 |
| R1 | -7515.42 | .015 | .015 | .015 |
| R1 | -7547.84 | .015 | .015 | .015 |
| R1 | -7610 | .015 | .015 | .015 |
| R1 | -7642.66 | .015 | .015 | .015 |
| R1 | -7700 | .015 | .015 | .015 |
| R1 | -7725 | .015 | .015 | .015 |
| R1 | -7757.55 | .015 | .015 | .015 |
| R1 | -7782.67 | .015 | .015 | .015 |
| R1 | -7891.36 | .015 | .015 | .015 |
| R1 | -7900 | .015 | .015 | .015 |
| R1 | -7920 | .015 | .015 | .015 |
| R1 | -7960.42 | .015 | .015 | .015 |
| R1 | -7970.42 | .015 | .015 | .015 |
| R1 | -8019.96 | .015 | .015 | .015 |

River:duck creek2

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| R1 | -8042.05 | .015 | .015 | .015 |
| R1 | -8092.05 | .015 | .015 | .015 |
| R1 | -8177.05 | .015 | .015 | .015 |
| R1 | -8216.49 | .015 | .015 | .015 |
| R1 | -8314.85 | .015 | .015 | .015 |
| R1 | -8335.65 | .015 | .015 | .015 |
| R1 | -8452.33 | .015 | .015 | .015 |
| R1 | -8613.65 | .015 | .015 | .015 |
| R1 | -8797.97 | .015 | .015 | .015 |
| R1 | -8828.39 | .015 | .015 | .015 |
| R1 | -8954.39 | .015 | .015 | .015 |
| R1 | -9069.7 | .015 | .015 | .015 |
| R1 | -9330.7 | .015 | .015 | .015 |
| R1 | -9404.95 | .015 | .015 | .015 |
| R1 | -9414.95 | .015 | .015 | .015 |
| R1 | -9722.78 | .015 | .015 | .015 |
| R1 | -9724.14 | .015 | .015 | .015 |
| R1 | -9734.14 | .015 | .015 | .015 |
| R1 | -9761.58 | .015 | .015 | .015 |
| R1 | -9871.58 | .015 | .015 | .015 |
| R1 | -9922.82 | .015 | .015 | .015 |
| R1 | -10032.2 | .015 | .015 | .015 |
| R1 | -10100.1 | .015 | .015 | .015 |
| R1 | -10153.8 | .015 | .015 | .015 |
| R1 | -10223.1 | .015 | .015 | .015 |
| R1 | -10292.1 | .015 | .015 | .015 |
| R1 | -10361.1 | .015 | .015 | .015 |
| R1 | -10477.9 | .015 | .015 | .015 |
| R1 | -10529.1 | .015 | .015 | .015 |
| R1 | -10668.4 | .015 | .015 | .015 |
| R1 | -10743.4 | .015 | .015 | .015 |
| R1 | -10906.8 | .015 | .015 | .015 |
| R1 | -11154 | .015 | .015 | .015 |
| R1 | -11311.5 | .015 | .015 | .015 |
| R1 | -11367.2 | .015 | .015 | .015 |
| R1 | -11417.2 | .015 | .015 | .015 |
| R1 | -11470.9 | .015 | .015 | .015 |
| R1 | -11625.6 | .015 | .015 | .015 |
| R1 | -11745 | .015 | .015 | .015 |
| R1 | -11952.6 | .015 | .015 | .015 |

River:North box

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| R-4 | -4947.21 | .015 | .015 | .015 |
| R-4 | -4951.89 | .015 | .015 | .015 |
| R-4 | -4967.12 | .015 | .015 | .015 |
| R-4 | -4995.19 | .015 | .015 | .015 |
| R-4 | -5039.61 | .015 | .015 | .015 |
| R-4 | -5055.91 | .015 | .015 | .015 |
| R-4 | -5105.91 | .015 | .015 | .015 |
| R-4 | -5133.42 | .015 | .015 | .015 |
| R-4 | -5168.74 | .015 | .015 | .015 |
| R-4 | -5201.46 | .015 | .015 | .015 |
| R-4 | -5231.46 | .015 | .015 | .015 |
| R-4 | -5261.86 | .015 | .015 | .015 |

| | | | | |
|---|---|---|---|---|
| R-4 | -5301.48 | .015 | .015 | .015 |
| R-4 | -5352.52 | .015 | .015 | .015 |
| R-4 | -5356.13 | .015 | .015 | .015 |
| R-4 | -5386.13 | .015 | .015 | .015 |
| R-4 | -5515.9 | .015 | .015 | .015 |
| R-4 | -5665.69 | .015 | .015 | .015 |
| R-4 | -5682.16 | .015 | .015 | .015 |
| R-4 | -5764.87 | .015 | .015 | .015 |
| R-4 | -5895.57 | .015 | .015 | .015 |
| R-4 | -5932.72 | .015 | .015 | .015 |
| R-4 | -6682.72 | .015 | .015 | .015 |
| R-4 | -6727.66 | .015 | .015 | .015 |
| R-4 | -6784.58 | .015 | .015 | .015 |
| R-4 | -6802.72 | .015 | .015 | .015 |
| R-4 | -6839.34 | .015 | .015 | .015 |
| R-4 | -6980.72 | .015 | .015 | .015 |
| R-4 | -7001.77 | .015 | .015 | .015 |
| R-4 | -7018.94 | .015 | .015 | .015 |
| R-4 | -7053.89 | .015 | .015 | .015 |
| R-4 | -7073.89 | .015 | .015 | .015 |
| R-4 | -7120.03 | .015 | .015 | .015 |
| R-4 | -7170.05 | .015 | .015 | .015 |
| R-4 | -7211.77 | .015 | .015 | .015 |
| R-4 | -7213.95 | .015 | .015 | .015 |
| R-4 | -7260.56 | .015 | .015 | .015 |
| R-4 | -7323.20 | .015 | .015 | .015 |
| R-4 | -7380 | .015 | .015 | .015 |
| R-4 | -7400 | .015 | .015 | .015 |
| R-4 | -7511.22 | .015 | .015 | .015 |
| R-4 | -7920.83 | .015 | .015 | .015 |
| R-4 | -7930.76 | .015 | .015 | .015 |
| R-4 | -7960.42 | .015 | .015 | .015 |
| R-4 | -7970.42 | .015 | .015 | .015 |
| R-4 | -8042.05 | .015 | .015 | .015 |

SUMMARY OF REACH LENGTHS

River: duck creek

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| R1 | -4414.11 | 329.31 | 329.31 | 329.31 |
| R1 | -4743.42 | 420 | 420 | 420 |
| R1 | -5163.42 | 159.42 | 159.42 | 159.42 |
| R1 | -5322.84 | 52.58 | 52.58 | 52.58 |
| R1 | -5375.42 | 188 | 188 | 188 |
| R1 | -5563.42 | 400 | 400 | 400 |
| R1 | -5963.42 | 133.57 | 133.57 | 133.57 |
| R1 | -6096.99 | 143.53 | 143.53 | 143.53 |
| R1 | -6240.52 | 28.45 | 28.45 | 28.45 |
| R1 | -6268.97 | 50 | 50 | 50 |
| R1 | -6318.97 | 35.41 | 35.41 | 35.41 |
| R1 | -6354.38 | 5.54 | 5.54 | 5.54 |
| R1 | -6359.92 | 32.06 | 32.06 | 32.06 |
| R1 | -6391.98 | 10.47 | 10.47 | 10.47 |
| R1 | -6402.45 | 50.46 | 50.46 | 50.46 |
| R1 | -6452.91 | 39.54 | 39.54 | 39.54 |
| R1 | -6492.45 | 108.876 | 102.03 | 95.724 |
| R1 | -6594.48 | 306.465 | 327.52 | 348.5749 |

| | | | | |
|---|---|---|---|---|
| R1 | -6631.75 | 152.03 | 162.47 | 172.91 |
| R1 | -6794.22 | 103.6 | 110.72 | 117.84 |
| R1 | -6904.94 | 15.96 | 17.06 | 18.16 |
| R1 | -6922 | 19.285 | 20.61 | 21.935 |
| R1 | -6942.61 | 88.013 | 94.06 | 100.107 |
| R1 | -7036.67 | 18.41 | 19.67 | 20.93 |
| R1 | -7056.34 | 70.18 | 75.01 | 79.84 |
| R1 | -7131.35 | 240.23 | 225.84 | 211.21 |
| R1 | -7357.19 | 36.12 | 33.95 | 31.75 |
| R1 | -7391.14 | 25 | 25 | 25 |
| R1 | -7416.14 | 18.67 | 18.67 | 18.67 |
| R1 | -7434.81 | 65.19 | 65.19 | 65.19 |
| R1 | -7500 | 15.42 | 15.42 | 15.42 |
| R1 | -7515.42 | 32.42 | 32.42 | 32.42 |
| R1 | -7547.84 | 62.16 | 62.16 | 62.16 |
| R1 | -7610 | 32.66 | 32.66 | 32.66 |
| R1 | -7642.66 | 57.34 | 57.34 | 57.34 |
| R1 | -7700 | 25 | 25 | 25 |
| R1 | -7725 | 32.55 | 32.55 | 32.55 |
| R1 | -7757.55 | 25.12 | 25.12 | 25.12 |
| R1 | -7782.67 | 108.69 | 108.69 | 108.69 |
| R1 | -7891.36 | 8.64 | 8.64 | 8.64 |
| R1 | -7900 | 20 | 20 | 20 |
| R1 | -7920 | 40.42 | 40.42 | 40.42 |
| R1 | -7960.42 | 10 | 10 | 10 |
| R1 | -7970.42 | 49.54 | 49.54 | 49.54 |
| R1 | -8019.96 | 22.09 | 22.09 | 22.09 |

River: duck creek2

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| R1 | -8042.05 | 50 | 50 | 50 |
| R1 | -8092.05 | 85 | 85 | 85 |
| R1 | -8177.05 | 39.44 | 39.44 | 39.44 |
| R1 | -8216.49 | 98.36 | 98.36 | 98.36 |
| R1 | -8314.85 | 20.1 | 20.8 | 20.5 |
| R1 | -8335.65 | 112.74 | 116.68 | 120.62 |
| R1 | -8452.33 | 155.87 | 161.32 | 166.77 |
| R1 | -8613.65 | 178.09 | 184.32 | 190.55 |
| R1 | -8797.97 | 29.12 | 30.42 | 31.19 |
| R1 | -8828.39 | 126 | 126 | 126 |
| R1 | -8954.39 | 115.31 | 115.31 | 115.31 |
| R1 | -9069.7 | 249.71 | 241.56 | 233.41 |
| R1 | -9330.7 | 76.76 | 74.25 | 71.74 |
| R1 | -9404.95 | 10.34 | 10 | 9.66 |
| R1 | -9414.95 | 314.72 | 304.45 | 294.18 |
| R1 | -9722.78 | 1.41 | 1.36 | 1.31 |
| R1 | -9724.14 | 10.34 | 10 | 9.66 |
| R1 | -9734.14 | 27.44 | 27.44 | 27.44 |
| R1 | -9761.58 | 110 | 110 | 110 |
| R1 | -9871.58 | 51.24 | 51.24 | 51.24 |
| R1 | -9922.82 | 147.1 | 147.1 | 147.1 |
| R1 | -10032.2 | 67.9 | 67.9 | 67.9 |
| R1 | -10100.1 | 53.75 | 53.75 | 53.75 |
| R1 | -10153.8 | 69.3 | 69.3 | 69.3 |
| R1 | -10223.1 | 69 | 69 | 69 |
| R1 | -10292.1 | 69 | 69 | 69 |
| R1 | -10361.1 | 86.8 | 86.8 | 86.8 |
| R1 | -10477.9 | 51.2 | 51.2 | 51.2 |
| R1 | -10529.1 | 139.34 | 139.34 | 139.34 |

| | | | | |
|---|---|---|---|---|
| R1 | -10668.4 | 75 | 75 | 75 |
| R1 | -10743.4 | 161.9 | 161.9 | 161.9 |
| R1 | -10906.8 | 248.73 | 248.73 | 248.73 |
| R1 | -11154 | 155.4 | 155.4 | 155.4 |
| R1 | -11311.5 | 55.61 | 55.61 | 55.61 |
| R1 | -11367.2 | 50 | 50 | 50 |
| R1 | -11417.2 | 53.72 | 53.72 | 53.72 |
| R1 | -11470.9 | 154.76 | 154.76 | 154.76 |
| R1 | -11625.6 | 125.7 | 125.7 | 125.7 |
| R1 | -11745 | 207.6 | 207.6 | 207.6 |
| R1 | -11952.6 | | | |

River: North box

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| R-4 | -4947.21 | 4.686 | 4.686 | 4.686 |
| R-4 | -4951.89 | 15.227 | 15.227 | 15.227 |
| R-4 | -4967.12 | 28.067 | 28.067 | 28.067 |
| R-4 | -4995.19 | 44.424 | 44.424 | 44.424 |
| R-4 | -5039.61 | 16.296 | 16.296 | 16.296 |
| R-4 | -5055.91 | 57.97 | 50 | 41.98 |
| R-4 | -5105.91 | 31.9 | 27.516 | 23.1 |
| R-4 | -5133.42 | 40.95 | 35.323 | 29.66 |
| R-4 | -5168.74 | 37.93 | 32.711 | 27.46 |
| R-4 | -5201.46 | 30 | 30 | 30 |
| R-4 | -5231.46 | 30.406 | 30.406 | 30.406 |
| R-4 | -5261.86 | 39.621 | 39.621 | 39.621 |
| R-4 | -5301.48 | 51.04 | 51.04 | 51.04 |
| R-4 | -5352.52 | 3.603 | 3.603 | 3.603 |
| R-4 | -5356.13 | 26.57 | 30 | 33.4 |
| R-4 | -5386.13 | 114.93 | 129.77 | 144.48 |
| R-4 | -5515.9 | 149.799 | 149.799 | 149.799 |
| R-4 | -5665.69 | 16.461 | 16.461 | 16.461 |
| R-4 | -5682.16 | 82.71 | 82.71 | 82.71 |
| R-4 | -5764.87 | 130.704 | 130.704 | 130.704 |
| R-4 | -5895.57 | 37.146 | 37.146 | 37.146 |
| R-4 | -5932.72 | 750 | 750 | 750 |
| R-4 | -6682.72 | 44.94 | 44.94 | 44.94 |
| R-4 | -6727.66 | 56.926 | 56.926 | 56.926 |
| R-4 | -6784.58 | 18.134 | 18.134 | 18.134 |
| R-4 | -6802.72 | 36.62 | 36.62 | 36.62 |
| R-4 | -6839.34 | 141.386 | 141.386 | 141.386 |
| R-4 | -6980.72 | 38.214 | 38.214 | 38.214 |
| R-4 | -7001.77 | 17.17 | 17.17 | 17.17 |
| R-4 | -7018.94 | 34.95 | 34.95 | 34.95 |
| R-4 | -7053.89 | 20 | 20 | 20 |
| R-4 | -7073.89 | 46.14 | 46.14 | 46.14 |
| R-4 | -7120.03 | 50.02 | 50.02 | 50.02 |
| R-4 | -7170.05 | 41.72 | 41.72 | 41.72 |
| R-4 | -7211.77 | 2.18 | 2.18 | 2.18 |
| R-4 | -7213.95 | 46.61 | 46.61 | 46.61 |
| R-4 | -7260.56 | 62.64 | 62.64 | 62.64 |
| R-4 | -7323.20 | 56.8 | 56.8 | 56.8 |
| R-4 | -7380 | 20 | 20 | 20 |
| R-4 | -7400 | 111.22 | 111.22 | 111.22 |
| R-4 | -7511.22 | 400.6 | 409.61 | 418.62 |
| R-4 | -7920.83 | 9.71 | 9.93 | 10.15 |
| R-4 | -7930.76 | 29.007 | 29.66 | 30.313 |
| R-4 | -7960.42 | 9.78 | 10 | 10.22 |
| R-4 | -7970.42 | 71.63 | 71.63 | 71.63 |
| R-4 | -8042.05 | | | |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: duck creek

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| R1 | -4414.11 | 0 | 0 |
| R1 | -4743.42 | 0 | 0 |
| R1 | -5163.42 | 0 | 0 |
| R1 | -5322.84 | 0 | 0 |
| R1 | -5375.42 | 0 | 0 |
| R1 | -5563.42 | 0 | 0 |
| R1 | -5963.42 | 0 | 0 |
| R1 | -6096.99 | 0 | 0 |
| R1 | -6240.52 | 0 | 0 |
| R1 | -6268.97 | 0 | 0 |
| R1 | -6318.97 | 0 | 0 |
| R1 | -6354.38 | 0 | 0 |
| R1 | -6359.92 | 0 | 0 |
| R1 | -6391.98 | 0 | 0 |
| R1 | -6402.45 | .05 | .05 |
| R1 | -6452.91 | .05 | .05 |
| R1 | -6492.45 | .05 | .05 |
| R1 | -6594.48 | 0 | 0 |
| R1 | -6631.75 | 0 | 0 |
| R1 | -6794.22 | 0 | 0 |
| R1 | -6904.94 | 0 | 0 |
| R1 | -6922 | 0 | 0 |
| R1 | -6942.61 | 0 | 0 |
| R1 | -7036.67 | 0 | 0 |
| R1 | -7056.34 | 0 | 0 |
| R1 | -7131.35 | .05 | .05 |
| R1 | -7357.19 | .05 | .05 |
| R1 | -7391.14 | .05 | 0 |
| R1 | -7416.14 | .05 | 0 |
| R1 | -7434.81 | .05 | 0 |
| R1 | -7500 | 0 | .05 |
| R1 | -7515.42 | 0 | .05 |
| R1 | -7547.84 | 0 | .05 |
| R1 | -7610 | 0 | .05 |
| R1 | -7642.66 | 0 | .05 |
| R1 | -7700 | 0 | .05 |
| R1 | -7725 | 0 | 0 |
| R1 | -7757.55 | 0 | 0 |
| R1 | -7782.67 | 0 | 0 |
| R1 | -7891.36 | 0 | 0 |
| R1 | -7900 | 0 | 0 |
| R1 | -7920 | 0 | 0 |
| R1 | -7960.42 | 0 | 0 |
| R1 | -7970.42 | 0 | .05 |
| R1 | -8019.96 | 0 | .05 |

River: duck creek2

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| R1 | -8042.05 | 0 | .05 |
| R1 | -8092.05 | 0 | 0 |
| R1 | -8177.05 | .05 | 0 |
| R1 | -8216.49 | .05 | 0 |
| R1 | -8314.85 | 0 | 0 |
| R1 | -8335.65 | 0 | 0 |
| R1 | -8452.33 | 0 | 0 |
| R1 | -8613.65 | 0 | 0 |
| R1 | -8797.97 | 0 | 0 |
| R1 | -8828.39 | 0 | .05 |
| R1 | -8954.39 | .05 | 0 |
| R1 | -9069.7 | 0 | 0 |
| R1 | -9330.7 | 0 | 0 |
| R1 | -9404.95 | 0 | 0 |
| R1 | -9414.95 | 0 | 0 |
| R1 | -9722.78 | 0 | 0 |
| R1 | -9724.14 | 0 | 0 |
| R1 | -9734.14 | 0 | 0 |
| R1 | -9761.58 | .05 | 0 |
| R1 | -9871.58 | .05 | 0 |
| R1 | -9922.82 | .05 | 0 |
| R1 | -10032.2 | 0 | 0 |
| R1 | -10100.1 | 0 | 0 |
| R1 | -10153.8 | 0 | 0 |
| R1 | -10223.1 | 0 | 0 |
| R1 | -10292.1 | 0 | 0 |
| R1 | -10361.1 | 0 | 0 |
| R1 | -10477.9 | 0 | 0 |
| R1 | -10529.1 | 0 | 0 |
| R1 | -10668.4 | 0 | .05 |
| R1 | -10743.4 | 0 | 0 |
| R1 | -10906.8 | 0 | 0 |
| R1 | -11154 | 0 | 0 |
| R1 | -11311.5 | 0 | 0 |
| R1 | -11367.2 | 0 | .05 |
| R1 | -11417.2 | 0 | 0 |
| R1 | -11470.9 | 0 | 0 |
| R1 | -11625.6 | 0 | 0 |
| R1 | -11745 | 0 | 0 |
| R1 | -11952.6 | 0 | 0 |

River: North box

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| R-4 | -4947.21 | .1 | .3 |
| R-4 | -4951.89 | .1 | .3 |
| R-4 | -4967.12 | .1 | .3 |
| R-4 | -4995.19 | .1 | .3 |
| R-4 | -5039.61 | .1 | .3 |
| R-4 | -5055.91 | .1 | .3 |
| R-4 | -5105.91 | .1 | .3 |
| R-4 | -5133.42 | .1 | .3 |
| R-4 | -5168.74 | .1 | .3 |
| R-4 | -5201.46 | .1 | .3 |
| R-4 | -5231.46 | .1 | .3 |

| | | | |
|---|---|---|---|
| R-4 | -5261.86 | .1 | .3 |
| R-4 | -5301.48 | .1 | .3 |
| R-4 | -5352.52 | .1 | .3 |
| R-4 | -5356.13 | .1 | .3 |
| R-4 | -5386.13 | .1 | .3 |
| R-4 | -5515.9 | .1 | .3 |
| R-4 | -5665.69 | .1 | .3 |
| R-4 | -5682.16 | .1 | .3 |
| R-4 | -5764.87 | .1 | .3 |
| R-4 | -5895.57 | .1 | .3 |
| R-4 | -5932.72 | .1 | .3 |
| R-4 | -6682.72 | .1 | .3 |
| R-4 | -6727.66 | .1 | .3 |
| R-4 | -6784.58 | .1 | .3 |
| R-4 | -6802.72 | .1 | .3 |
| R-4 | -6839.34 | .1 | .3 |
| R-4 | -6980.72 | .1 | .3 |
| R-4 | -7001.77 | .1 | .3 |
| R-4 | -7018.94 | 0 | 0 |
| R-4 | -7053.89 | 0 | 0 |
| R-4 | -7073.89 | 0 | 0 |
| R-4 | -7120.03 | 0 | 0 |
| R-4 | -7170.05 | 0 | 0 |
| R-4 | -7211.77 | 0 | 0 |
| R-4 | -7213.95 | 0 | 0 |
| R-4 | -7260.56 | 0 | 0 |
| R-4 | -7323.20 | 0 | 0 |
| R-4 | -7380 | 0 | 0 |
| R-4 | -7400 | 0 | 0 |
| R-4 | -7511.22 | 0 | 0 |
| R-4 | -7920.83 | 0 | 0 |
| R-4 | -7930.76 | 0 | 0 |
| R-4 | -7960.42 | 0 | 0 |
| R-4 | -7970.42 | 0 | .05 |
| R-4 | -8042.05 | 0 | .05 |

# APPENDIX D

## FEMA FORMS

# FEMA
# OVERVIEW & CONCURRENCE FORM
MT-2 FORM 1

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 | City of Katy | TX | 480301 | 0005D | 02/08/83 |
| 480287 | Harris County | TX | 48201C | 0220G | 09/28/90 |
| 320003 | Clark County | NV | 320003 | 2568 | 08/13/03 |
| | | | | | |

2. Flooding Source: Duck Creek and Duck Creek Tributary

3. Project Name/Identifier: Duck Creek Channel

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

5. Basis for Request and Type of Revision:

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

☒ Physical Change ☒ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ 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: Daniel Bender, P.E. | Company: VTN Nevada | |
| Mailing Address:<br>2727 South Rainbow Boulevard<br>Las Vegas, Nevada<br>89146 | Daytime Telephone No.:<br>702-247-4020 | Fax No.:<br>702-247-4262 |
| | E-Mail Address: danb@vtnnv.com | |
| Signature of Requester (required): | | Date: 4/23/07 |

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: Layne Weber, P.E., Principal Engineer | | Telephone No.:<br>(702) 455-4856 |
| Community Name: Clark County | Community Official's Signature (required):<br>W Layne Weber | Date:<br>25 Apr 07 |

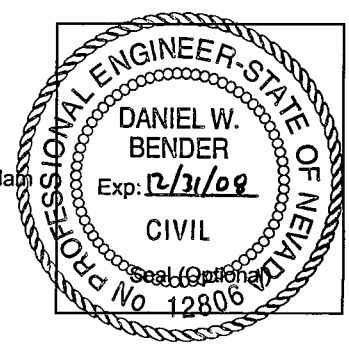
### CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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: Daniel Bender, P.E. | License No.: 12806 | Expiration Date:<br>12/31/2008 |
| Company Name: VTN Nevada | Telephone No.: 702-247-4020 | Fax No.:<br>702-247-4262 |
| Signature:<br>Dan Bender | | Date: 4/23/07 |

**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 |



# FEMA
# RIVERINE HYDROLOGY & HYDRAULICS FORM
MT-2 FORM 2

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: Duck Creek
**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) |
|---|---|---|---|

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

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model [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 | Lower Duck Detention Basin | 121+00 | 2189 | 2189 |
| Upstream Limit | South Box | 69+04.94 | 2252.61 | 2243.26 |
| | North Box | 70+01.77 | 2248.18 | 2245.27 |

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: | Floodway File Name: |
| Corrected Effective Model* | Natural File Name: | Floodway File Name: |
| Existing or Pre-Project Conditions Model | Natural File Name: dc_trbutary.prj | Floodway File Name: |
| Revised or Post-Project Conditions Model | Natural File Name: channel2.prj | Floodway File Name: |
| Other - (attach description) | Natural File Name: | Floodway File Name: |

*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.

# FEMA
# RIVERINE STRUCTURES FORM
MT-2 FORM 3

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: Duck Creek
**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: 49'x8' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 64+50

Upstream Limit/Cross Section: 63+91.98

**2. Name of Structure: 45'x8' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 69+42.61

Upstream Limit/Cross Section: 64+50

**3. Name of Structure: 45'x8' RCB**

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

Location of Structure: Pyle Ave.

Downstream Limit/Cross Section: 70+36.67

Upstream Limit/Cross Section: 69+42.61

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

## B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: 49'x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 3135 (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: Duck Creek

Name of Structure: 45'x8' RCB

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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Duck Creek
**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: 45'x8' Rect. Channel**

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

   Location of Structure: Duck Creek

   Downstream Limit/Cross Section: 70+36.67

   Upstream Limit/Cross Section: 74+16.14

2. **Name of Structure: 42'x7' Rect. Channel**

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

   Location of Structure: Duck Creek

   Downstream Limit/Cross Section: 77+25

   Upstream Limit/Cross Section: 74+16.14

3. **Name of Structure: 42'x8' Rect. Channel**

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

   Location of Structure: Duck Creek

   Downstream Limit/Cross Section: 80+42.05

   Upstream Limit/Cross Section: 77+25

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

## B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: 45'x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 3135 (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:

Name of Structure:

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):
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Duck Creek and Duck Creek Tribute
**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: 66'x8' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 83+14.85

Upstream Limit/Cross Section: 80+42.05

**2. Name of Structure: 54'x8' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 99+00

Upstream Limit/Cross Section: 83+14.85

**3. Name of Structure: 50'x7' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 107+28.3

Upstream Limit/Cross Section: 99+00

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

## B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: 42'x7' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 3135 (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: Duck Creek and Duck Creek Tribute

Name of Structure: 45'x6' RCB

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.

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: Duck Creek
**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: 45'x9' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 114+00

Upstream Limit/Cross Section: 107+28.3

**2. Name of Structure: 45'x6' RCB**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 121+00

Upstream Limit/Cross Section: 114+00

**3. Name of Structure: 48'x7' Rect. Channel**

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

Location of Structure: Duck Creek Tribute

Downstream Limit/Cross Section: 72+11.77

Upstream Limit/Cross Section: 70+01.77

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

## B. CHANNELIZATION

Flooding Source: Duck Creek

Name of Structure: 42'x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 3135 (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:

Name of Structure:

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):
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.

FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

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

## PAPERWORK REDUCTION ACT

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Flooding Source: Duck Creek
**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: 22'x9' Rect. Channel**

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

Location of Structure: Duck Creek Tribute

Downstream Limit/Cross Section: 74+00

Upstream Limit/Cross Section: 72+11.77

**2. Name of Structure: 22'x8.5' Rect. Channel**

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

Location of Structure: Duck Creek

Downstream Limit/Cross Section: 79+70.42

Upstream Limit/Cross Section: 74+00

**3. Name of Structure: 23'-2"x8' Rect. Channel**

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

Location of Structure: Duck Creek Tribute

Downstream Limit/Cross Section: 80+42.05

Upstream Limit/Cross Section: 79+70.42

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

## B. CHANNELIZATION

Flooding Source: Duck Creek and Duck Creek Tribute

Name of Structure: 66'x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 4826 (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:

Name of Structure:

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):
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: Duck Creek and Duck Creek Tribute

Name of Structure: 54'x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 4826 (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:

Name of Structure:

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):
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: Duck Creek and Duck Creek Tribute

Name of Structure: 50'x7' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 4826 (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:

Name of Structure:

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):
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: Duck Creek Tribute

Name of Structure: 22'x9' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 2028 (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:

Name of Structure:

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):
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: Duck Creek Tribute

Name of Structure: 22'x8.5' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 2028 (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:

Name of Structure:

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):
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: Duck Creek Tribute

Name of Structure: 23'-2"x8' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 2028 (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:

Name of Structure:

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):
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: Duck Creek and Duck Creek Tribute

Name of Structure: 45'x9' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 4826 (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:

Name of Structure:

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):
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: Duck Creek Tribute

Name of Structure: 48'x7' Rect. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe): Rect. Channel
- ☐ 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 2028 (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:

Name of Structure:

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):
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.

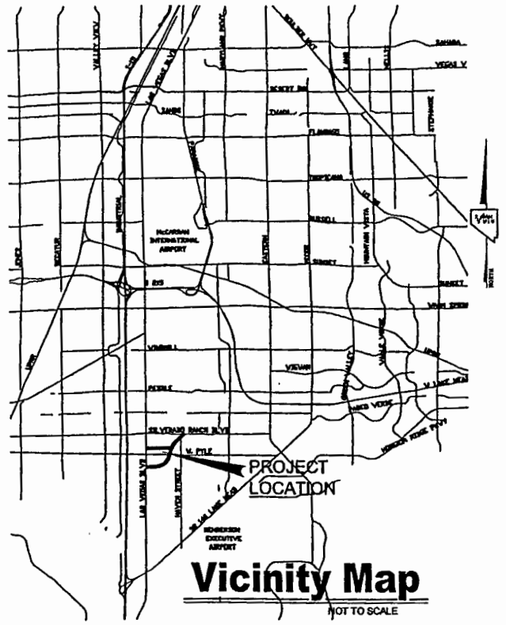
# APPENDIX E

## REFERENCE MATERIAL

# FOR REFERENCE ONLY

## DUCK CREEK CHANNEL PLANS – LAS VEGAS BLVD TO SILVERADO RANCH BLVD PLANS

# DEPARTMENT OF PUBLIC WORKS




**Vicinity Map**

NOT TO SCALE

"Progress as Promised"

# 2005
# IMPROVEMENT PLANS FOR
# DUCK CREEK CHANNEL
# PHASE II
## LAS VEGAS BOULEVARD
## TO
## SILVERADO RANCH BOULEVARD

FUNDED BY
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

SEE SHEET No. I-02
FOR DRAWING INDEX

**County Manager**

Thom Reilly

**Director of Public Works**

Approved:

Denis Cederburg, PE

**Clark County Regional Flood Control District**

Approved:

Gale Wm. Fraser II, P.E.
General Manager / Chief Engineer

**County Commissioners**

Rory Reid, Chair
Myrna Williams, Vice-Chair
Tom Collins
Yvonne Atkinson Gates
Chip Maxfield
Lynette Boggs McDonald
Bruce L. Woodbury

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9171

vtn nevada
• CONSULTING ENGINEERS
• PLANNERS
• LAND SURVEYORS
2727 S. RAINBOW BLVD
LAS VEGAS, NEVADA 89146
PHONE (702) 873-7550
FAX (702) 362-2597

| AGENCY | PLANS REVIEWED BY | DATE |
|---|---|---|
| SPRINT TELEPHONE NEVADA | | |
| LAS VEGAS VALLEY WATER DISTRICT | | |
| SOUTHWEST GAS CORPORATION | | |
| NEVADA POWER COMPANY (TRANSMISSION) | | |
| NEVADA POWER COMPANY (DISTRIBUTION) | | |
| CLARK COUNTY WATER RECLAMATION DISTRICT | | |
| COX COMMUNICATIONS, LAS VEGAS, INC | | |
| | | |
| | | |

| DEPARTMENT OF PUBLIC WORKS | BY | DATE |
|---|---|---|
| DESIGN ENGINEERING DIVISION | | |
| CONSTRUCTION MANAGEMENT DIVISION | | |
| MAINTENANCE MANAGEMENT DIVISION | | |
| TRAFFIC MANAGEMENT DIVISION | | |
| COUNTY SURVEYOR'S OFFICE | | |
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| REVISIONS | | |
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DESIGN ENGINEERING DIVISION

COVER SHEET

L-1796

BID No.:

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITIONS OF "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS" CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, 1986, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA. VOLUMES I AND II", EXCEPT AS OTHERWISE SPECIFIED BY THE CONTRACT DRAWINGS AND/OR SPECIAL PROVISIONS.
2. ALL UTILITY COMPANIES SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 48 (FORTY-EIGHT) HOURS PRIOR TO COMMENCEMENT OF CONTRUCTION.
3. LOCATIONS OF EXISTING & PROPOSED UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM INFORMATION RECEIVED FROM THE APPLICABLE UTILITY CO'S. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOWN, OR FOR UTILITIES OR STRUCTURES NOT SHOWN AT ACTUAL LOCATIONS ON THE DRAWINGS. THE PLANS DO NOT SHOW ALL SEWER LATERALS, SEWER FORCE MAINS, AND WATER SERVICE LATERALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS OF LATERALS OR MAINS DAMAGED DUE TO CONSTRUCTION OPERATIONS. LATERALS IN CONFLICT WITH PROPOSED IMPROVEMENTS SHALL BE RELOCATED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR TO VERIFY THE EXACT LOCATION OF UTILITIES PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR'S RESPONSIBILITIES REGARDING UTILITIES SHALL BE AS REQUIRED UNDER SECTION 107.17 OF THE UNIFORM STANDARD SPECIFICATIONS AND AS PROVIDED IN THE SPECIFICATIONS.
4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS, WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO THE SATISFACTION OF THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
5. ALL BARRICADING AND TEMPORARY TRAFFIC CONTROL DEVICES OR METHODS USED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH "NEVADA WORK ZONE TRAFFIC CONTROL HAND BOOK," DATED 1986 AND "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," 1988 EDITION, THE NEVADA DEPARTMENT OF TRANSPORTATION REGULATIONS, THE NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK AND THE CLARK COUNTY "TRAFFIC CONTROL PLAN FOR HIGHWAY WORK ZONE." EXCEPT AS REQUIRED BY THE ENGINEER.
6. PROTECTION AND REPLACEMENT OF SURVEY MONUMENTS OR PROPERTY STAKES NOT DELINEATED ON THE CONTRACT DRAWINGS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
7. A SOILS REPORT HAS BEEN PREPARED BY TERRACON AND IS AVAILABLE FOR REVIEW AT THE OFFICE OF VTN NEVADA, OR THE CLARK COUNTY DEPARTMENT OF PUBLIC WORKS. SOILS REPORT WAS PREPARED FOR THE SOLE PURPOSE OF ASSISTING IN THE DESIGN PROCESS AND AS SUCH SHALL NOT BE CONSIDERED AS PART OF THIS CONTRACT.
8. THE OWNING UTILITY COMPANY SHALL BE RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ALL POWER POLES, TELEPHONE POLES, JOINTLY OWNED POWER POLES AND RELATIVE APPURTENANCES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE CONTRACT DRAWINGS.
9. REMOVAL OR RELOCATION OF POWER POLES, TELEPHONE POLES, JOINTLY-OWNED POLES, AND APPURTENANCES WHICH INTERFERE WITH IMPROVEMENTS REQUIRED TO BE CONSTRUCTED UNDER THIS CONTRACT, SHALL BE THE RESPONSIBILITY TO THE RESPECTIVE UTILITY COMPANY, EXCEPT AS OTHERWISE SPECIFIED BY CONTRACT DRAWING AND/OR SPECIAL PROVISIONS.
10. THE SPRINT CENTRAL TELEPHONE COMPANY SHALL BE RESPONSIBLE FOR THE ADJUSTMENT OF TELEPHONE MANHOLES AND UNDERGROUND TELEPHONE LINES THAT INTERFERE WITH THE REQUIRED IMPROVEMENTS AS SHOWN ON THE CONTRACT DRAWINGS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ALL WATER SERVICES, METERS, AND FIRE HYDRANTS WHICH INTERFERE WITH IMPROVEMENTS SHOWN ON THE CONTRACT DRAWINGS. WATER DISTRIBUTION FACILITIES SHALL BE IN ACCORDANCE WITH THE "UNIFORM DESIGN AND CONSTRUCTION STANDARDS (UDS) FOR WATER DISTRIBUTION SYSTEMS" AND APPLICABLE NORTH LAS VEGAS ADDENDA, EXCEPT AS OTHERWISE SPECIFIED BY THE CONTRACT DRAWINGS AND/OR SPECIAL PROVISIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL EXISTING SANITARY, WATER AND STORM SEWER MANHOLES TO THE FINAL FINISH GRADES IN ACCORDANCE WITH SECTION 609 OF THE "STANDARD SPECIFICATIONS".
13. CONTRACTOR TO NOTIFY PROPERTY OWNERS 24 (TWENTY-FOUR) HOURS PRIOR TO INTERRUPTION OF WATER SERVICE.
14. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE OWNER.
15. CURB AND GUTTER WITH A GRADE OF 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.
16. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL & VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION & EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS & EGRESS TO OFFSITE PROPERTIES. EXTENT OF TRANSITIONS TO BE DETERMINED BY THE CONSTRUCTION MANAGER.
17. TYPE V CEMENT SHALL BE USED IN ALL OFFSITE CONCRETE WORK. CONCRETE TO BE 4500 PSI MINIMUM @ 28 DAYS. MIX DESIGN TO BE APPROVED BY THE ENGINEER PRIOR TO USE ON THE PROJECT, UNLESS OTHERWISE NOTED.
18. PERMITS ARE REQUIRED FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY. CONTRACTOR SHALL SECURE ALL PERMITS & INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
19. EXPANSION JOINTS ARE REQUIRED AT THE MAXIMUM OF 300 FEET FOR EXTRUDED TYPE CURB.
20. THE CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE PLANS AND WHAT EXISTS IN THE FIELD, CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY.
21. EXACT LOCATION OF ALL SAWCUT LINES MAY BE DETERMINED IN THE FIELD BY THE CLARK COUNTY INSPECTOR IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATION.
22. ALL VALVES AND MANHOLES WITHIN THE NEW ASPHALT PAVEMENT LIMITS WILL BE VERTICALLY ADJUSTED AND CONSTRUCTED WITH CONCRETE COLLARS IN ACCORDANCE WITH THE LATEST EDITION OF THE UNIFORM STANDARD DRAWINGS (DWG #317 AND DWG #408, RESPECTIVELY). WATER VALVES SHALL BE ACCESSIBLE AT ALL TIMES.

## SNWA CONSTRUCTION NOTES:

CONTRACTOR SHALL FIELD LOCATE AND PROTECT ALL SNWA/SNWS APPURTENANCES INCLUDING, BUT NOT LIMITED TO AV/AR, ACCESS MANWAYS AND CATHODIC PROTECTION SYSTEMS. ALL ABOVE GROUND STRUCTURES AND AT GRADE STRUCTURES MUST BE ADJUSTED TO NEW GRADE AT CONTRACTOR'S EXPENSE. CATHODIC PROTECTION TEST STATIONS, RECTIFIERS, AND AV/AR'S MUST BE RELOCATED TO THE SIDEWALK PER SNWA STANDARDS AND AT THE CONTRACTOR'S EXPENSE. CONTRACTOR TO NOTIFY SOUTHERN NEVADA WATER AUTHORITY, DEVELOPMENT PLAN REVIEW, AT (702) 862-3444 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY.

SOUTHERN NEVADA WATER AUTHORITY — DATE

SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

## LAS VEGAS VALLEY WATER DISTRICT STANDARD NOTES:

LVVWD PROJECT #152154

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2003 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS).
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENTS, CLARK COUNTY, AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.19 OF THE 2003 EDITION OF THE UDACS.
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION. OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT 1-800-227-2600.

APPROVED

LAS VEGAS VALLEY WATER DISTRICT — DATE

## GENERAL LEGEND

- EXISTING CURB & GUTTER
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- CATV — EXISTING CABLE TELEVISION LINE(S)
- 4" G — EXISTING GAS LINE (SIZE VARIES)
- 12" SS — EXISTING SEWER LINE (SIZE VARIES)
- 8" W — EXISTING WATER LINE (SIZE VARIES)
- TEL — EXISTING TELEPHONE CABLE/CONDUIT(S)
- 18" SD — EXISTING STORM DRAIN (SIZE VARIES)
- UGE — EXISTING UNDERGROUND ELECTRIC LINE(S)
- EXISTING FENCE LINE
- EXISTING RIP RAP
- EXISTING VALVE
- EXISTING MANHOLE OR POWER POLE
- (2220.25) EXISTING ELEVATION
- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY GRADING EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED CONCRETE CHANNEL BOTTOM (PROFILE)
- PROPOSED MAINTENANCE ROAD

## DRAWING INDEX:


| | |
|---|---|
| I-01 | COVER SHEET |
| I-02 | GENERAL NOTES, ABBREVIATIONS, LEGEND & DRAWING INDEX |
| SC-01 thru SC-02 | SURVEY CONTROL PLAN |
| T-01 | TYPICAL EXCAVATION SECTIONS |
| R-01 thru R-02 | REMOVAL PLAN |
| P-01 thru P-07 | CHANNEL PLAN & PROFILE |
| G-01 thru G-04 | CHANNEL GRADING PLAN |
| F-01 thru F-03 | FENCE, GATE & SIGN PLAN |
| F-04 | CHAIN LINK FENCE & SIGN DETAILS |
| F-05 | POST AND CABLE RAILING DETAILS |
| F-06 | ACCESS LADDER DETAILS |
| D-01 | FLOOD CONTROL MONITORING STATION DETAILS |
| D-02 | MISCELLANEOUS DETAILS |
| S1 thru S7 | STRUCTURAL PLANS AND SECTIONS |
| SD1 thru SD7 | STRUCTURAL DETAILS & NOTES |


## ABBREVIATIONS

| | | | |
|---|---|---|---|
| & | AND | NPC | NEVADA POWER COMPANY |
| @ | AT | NRS | NEVADA REVISED STATUTES/NON-RISING STEM |
| AC | ASPHALTIC CONCRETE | NW | NORTHWEST |
| ALT | ALTERNATE | OC | ON CENTER |
| ANG. | ANGLE | OD | OUTSIDE DIAMETER |
| APN | ASSESSORS PARCEL NUMBER | OH | OVERHEAD |
| APPROX | APPROXIMATE | PG | PROFILE GRADE |
| ASSY | ASSEMBLY | P/R | PATENT RESERVATION |
| ASTM | AMERICAN SOCIETY OF TESTING MATERIALS | PC | POINT OF CURVATURE |
| BC | BOLT CIRCLE | PCC | POINT OF COMPOUND CURVE |
| BFV | BUTTERFLY VALVE | PE | PLAIN END/POLYETHYLENE PIPE |
| BK | BOOK | PG | PROFILE GRADE |
| BLK | BLOCK | PKWY | PARKWAY |
| BLM | BUREAU OF LAND MANAGEMENT | PLS | PROFESSIONAL LAND SURVEYOR |
| CCSD | CLARK COUNTY SANITATION DISTRICT | PO | PUSH ON |
| CFS | CUBIC FEET PER SECOND | PROP | PROPOSED |
| CHAN | CHANNEL | PPCBR | PORTABLE PRECAST CONCRETE BARRIER RAIL |
| CI | CUBIC INCH | PSI | POUNDS PER SQUARE INCH |
| CL OR ℄ | CENTER LINE | PT | POINT OF TANGENCY |
| CLR | CLEAR | PVC | POLYVINYL CHLORIDE |
| CLF | CHAIN LINK FENCE | R/W | RIGHT-OF-WAY |
| COMB | COMBINATION | R | RADIUS |
| CONC | CONCRETE | RCB | REINFORCED CONCRETE BOX |
| CONST | CONSTRUCT | RCC | ROLLER COMPACTED CONCRETE |
| D OR Δ | DELTA | RCP | REINFORCED CONCRETE PIPE |
| DI | DUCTILE IRON | RD | ROAD |
| DIA | DIAMETER | RECT | RECTANGULAR |
| DL | DAYLIGHT LINE | REQD | REQUIRED |
| DWG | DRAWING | RFCD | REGIONAL FLOOD CONTROL DISTRICT |
| DWGS | DRAWINGS | RJ | RIGID JOINT |
| E | EAST | RP | RADIUS POINT |
| EG | EXISTING GROUND | RT | RIGHT |
| EL OR ELEV | ELEVATION | S | SOUTH OR SLOPE |
| ELEC | ELECTRICAL | S/W | SIDEWALK |
| EP | EDGE OF PAVEMENT | SCH | SCHEDULE |
| ESMT | EASEMENT | SD | STORM DRAIN |
| ETC | ETCETERA | SDMH | STORM DRAIN MANHOLE |
| EX OR EXIST | EXISTING | SEC | SECTION |
| FG | FINISH GRADE | SHT | SHEET |
| FL | FLOW LINE | SNWA | SOUTHERN NEVADA WATER AUTHORITY |
| FLG | FLANGE | SPECS | SPECIFICATIONS |
| FO | FIBER OPTICS | SQ | SQUARE |
| FT | FEET | SS | SANITARY SEWER/STAINLESS STEEL |
| FUT | FUTURE | SSMH | SANITARY SEWER MANHOLE |
| GALV | GALVANIZED | ST | STREET |
| H or HORIZ | HORIZONTAL | STA | STATION |
| HD | HEAD | STD | STANDARD |
| HGL | HYDRAULIC GRADE LINE | STL | STEEL |
| INST | INSTRUMENT | STRUCT | STRUCTURE |
| INV | INVERT | SWG | SOUTHWEST GAS COMPANY |
| L | LENGTH | T | TANGENT |
| LF | LINEAL FEET | T.C.E. | TEMPORARY CONSTRUCTION EASEMENT |
| LG | LONG | TEL | TELEPHONE |
| LT | LEFT | TEMP | TEMPORARY |
| MAINT | MAINTENANCE | THK | THICK |
| MAX | MAXIMUM | THR | THRUST |
| MECH | MECHANICAL | TOW | TOP OF WALL |
| MIN | MINIMUM | TRANS | TRANSITION |
| MJ | MECHANICAL JOINT | TRAP | TRAPEZOIDAL |
| MLC | MORTAR LINED AND COATED | TYP | TYPICAL |
| MLCP | MORTAR LINED AND COATED PIPE | UG | UNDERGROUND |
| MOD | MODIFIED | U.N.O. | UNLESS NOTED OTHERWISE |
| N | NORTH | V or VERT | V or VERTICAL |
| NDOT | NEVADA DEPARTMENT OF TRANSPORTATION | VAR | VARIES |
| | | VICT | VICINITY |
| NTS | NOT TO SCALE | W | WEST |
| NC | NATIONAL COARSE THREAD | W/ | WITH |

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06







DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

I:\6011\DWG\DESIGN\6011-GEN-NOTES.DWG (TAB=I-02)

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

GENERAL NOTES, ABBREVIATIONS, LEGEND & DRAWING INDEX

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

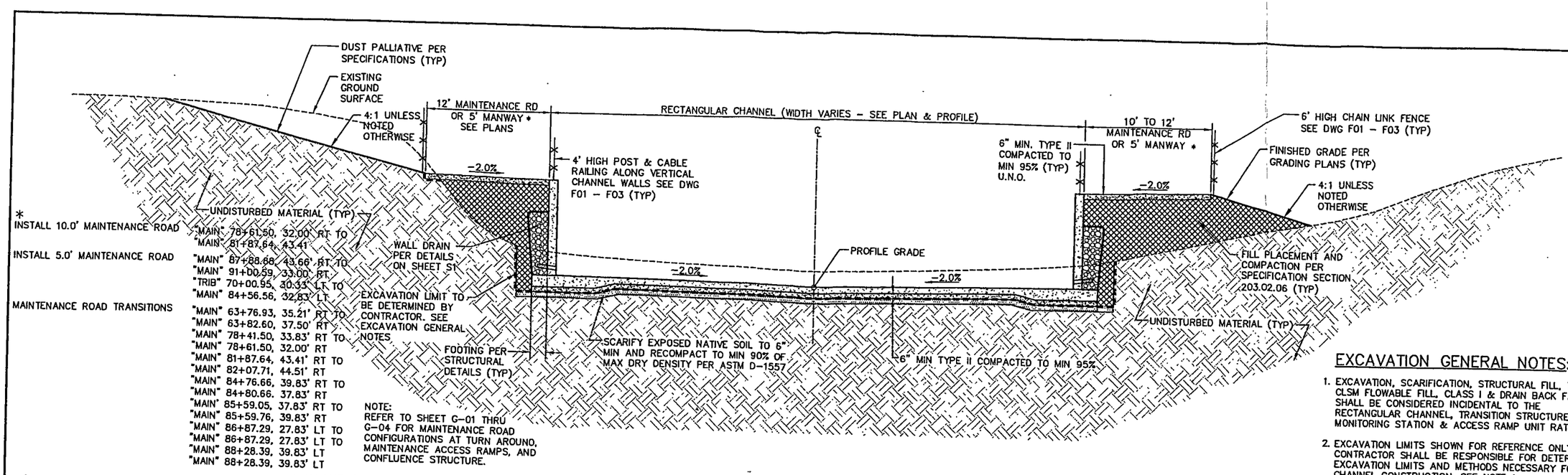
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|---|---|
| DESIGNED BY: | JG |
| DRAWN BY: | DRF, BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

VTN nevada — CIVIL ENGINEERING ENGINEERS • PLANNERS • LAND SURVEYORS

| | |
|---|---|
| SCALE | |
| HORIZ: | NONE |
| VERT: | NONE |
| FIELD BOOK | NONE |

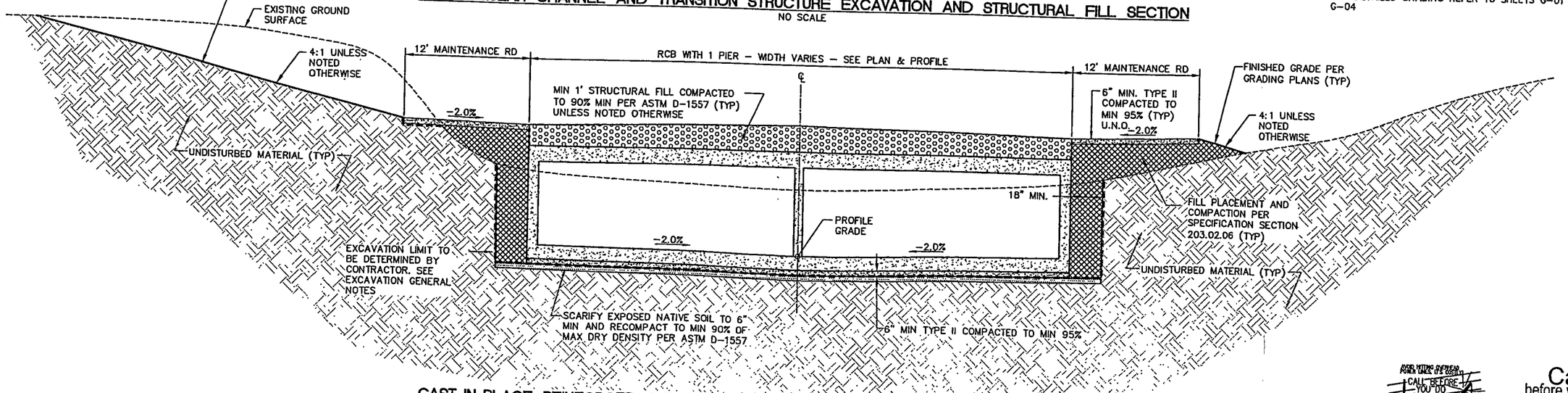
SHEET No I-02

L-1796




## RECTANGULAR CHANNEL AND TRANSITION STRUCTURE EXCAVATION AND STRUCTURAL FILL SECTION

NO SCALE




## CAST-IN-PLACE REINFORCED CONCRETE BOX (RCB) EXCAVATION AND STRUCTURAL FILL SECTION

NO SCALE

## EXCAVATION GENERAL NOTES:

1. EXCAVATION, SCARIFICATION, STRUCTURAL FILL, TYPE II, CLSM FLOWABLE FILL, CLASS I & DRAIN BACK FILL SHALL BE CONSIDERED INCIDENTAL TO THE RECTANGULAR CHANNEL, TRANSITION STRUCTURE, RCB MONITORING STATION & ACCESS RAMP UNIT RATES.
2. EXCAVATION LIMITS SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXCAVATION LIMITS AND METHODS NECESSARY FOR CHANNEL CONSTRUCTION. SEE NOTE 1.
3. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06




Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7541
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7311
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-6811

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## TYPICAL EXCAVATION SECTIONS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9171

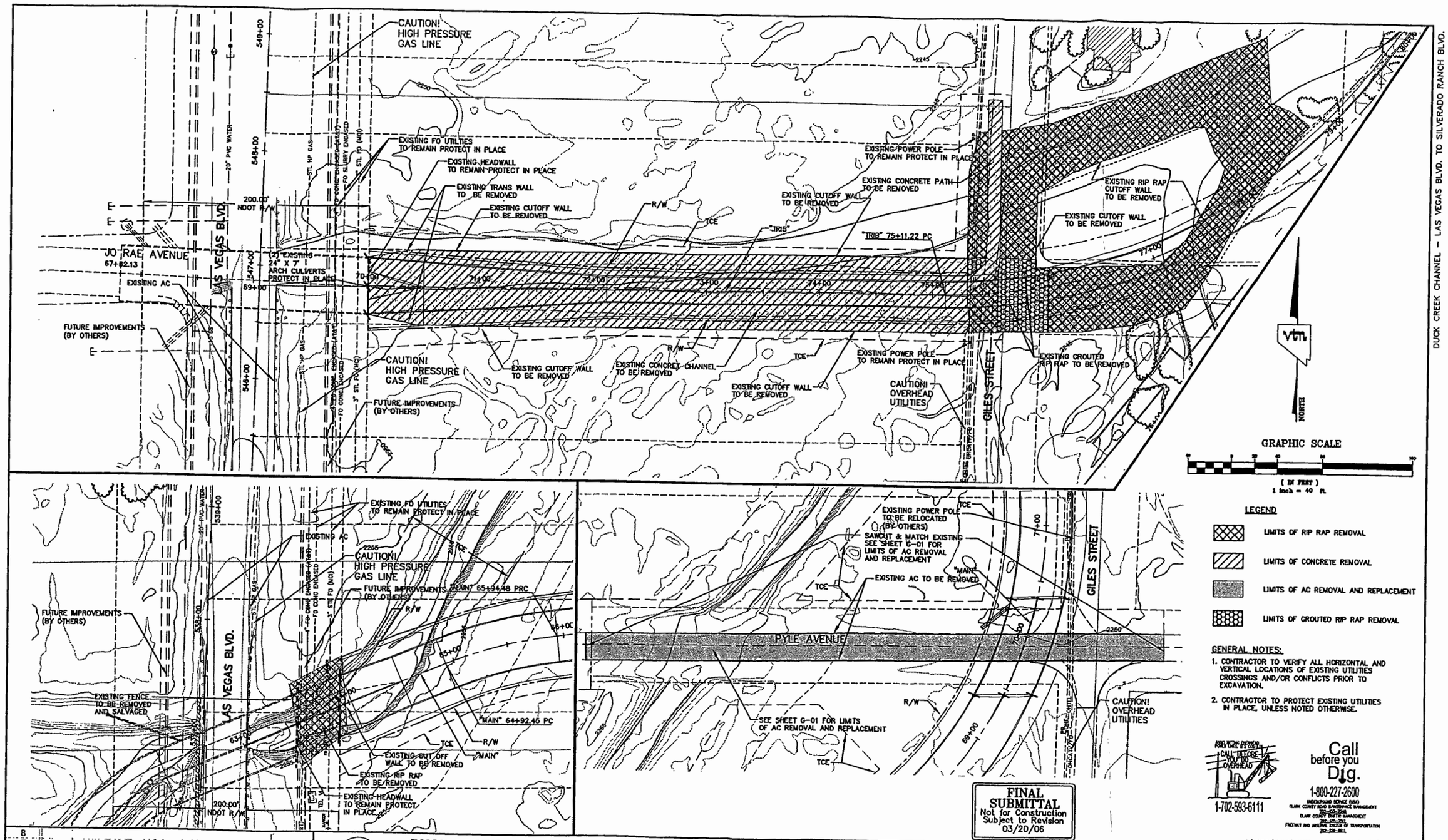
VTN nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 822-7566 FAX (702) 362-2567

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

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SCALE
HORIZ: NONE
VERT: NONE
FIELD BOOK NONE

SHEET No
**T-01**
L-1796




DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES CROSSINGS AND/OR CONFLICTS PRIOR TO EXCAVATION.
2. CONTRACTOR TO PROTECT EXISTING UTILITIES IN PLACE, UNLESS NOTED OTHERWISE.

CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-2540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7541
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-3511

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

| REV No. | DATE | DESCRIPTION | APPROVED |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## REMOVAL PLAN

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

| | |
|---|---|
| DESIGNED BY: | JNC |
| DRAWN BY: | BAH |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

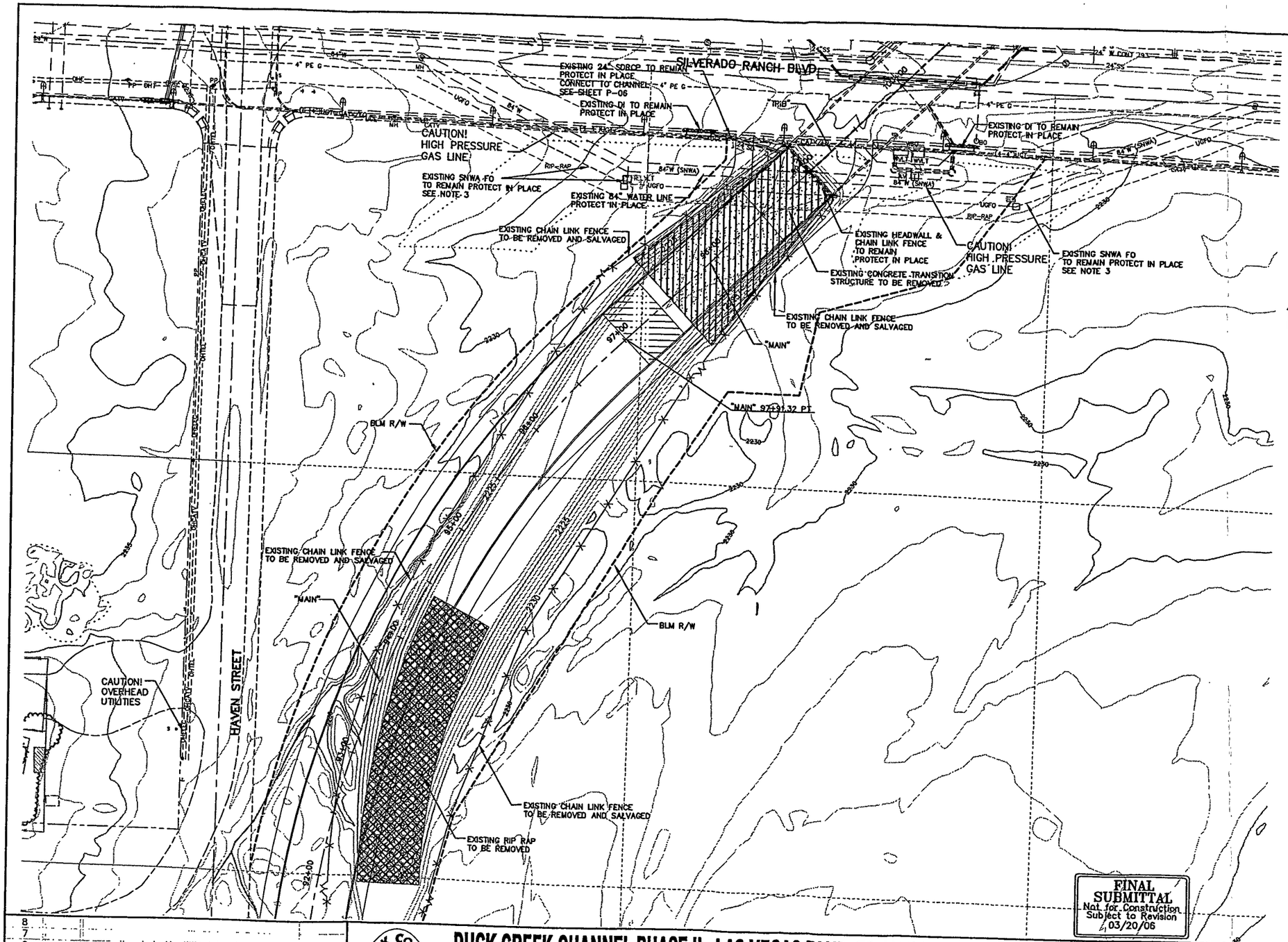
VTN nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2317 SOUTH JONES BOULEVARD LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7540 FAX (702) 363-3067

SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No.
R-01

L-1796

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DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

GENERAL NOTES:

1. CONTRACTOR TO VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES CROSSINGS AND/OR CONFLICTS PRIOR TO EXCAVATION.
2. CONTRACTOR TO PROTECT EXISTING UTILITIES IN PLACE, UNLESS NOTED OTHERWISE.
3. SNWA FIBER OPTIC CONDUIT RUNS ALONG THE SOUTH SIDE OF THE SNWA WATER PIPE LINE.

CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600

SOUTHERN NEVADA WATER AUTHORITY DATE

SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

SEE SHEET I-02 FOR SNWA CONSTRUCTION NOTES.

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

| REV No | DATE | DESCRIPTION | APPROVED |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## REMOVAL PLAN

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

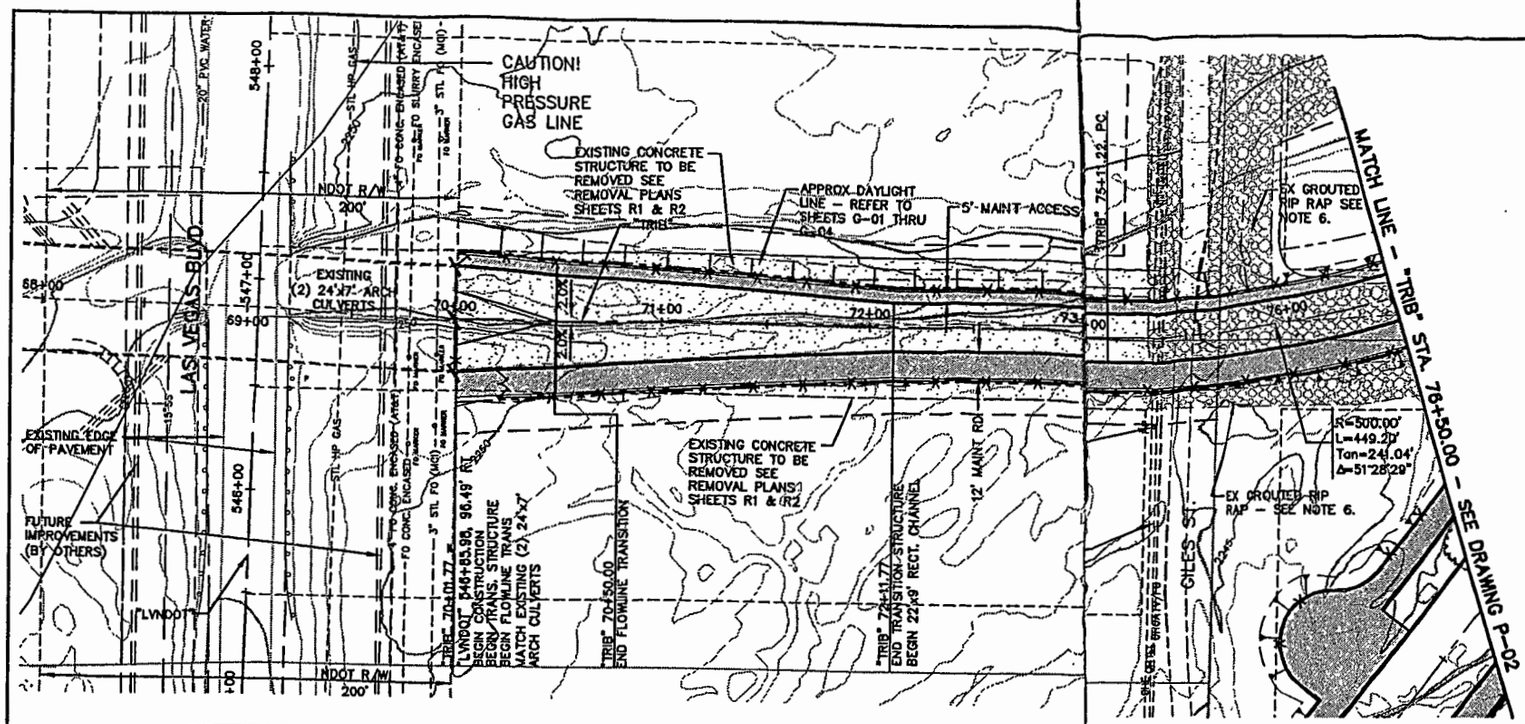
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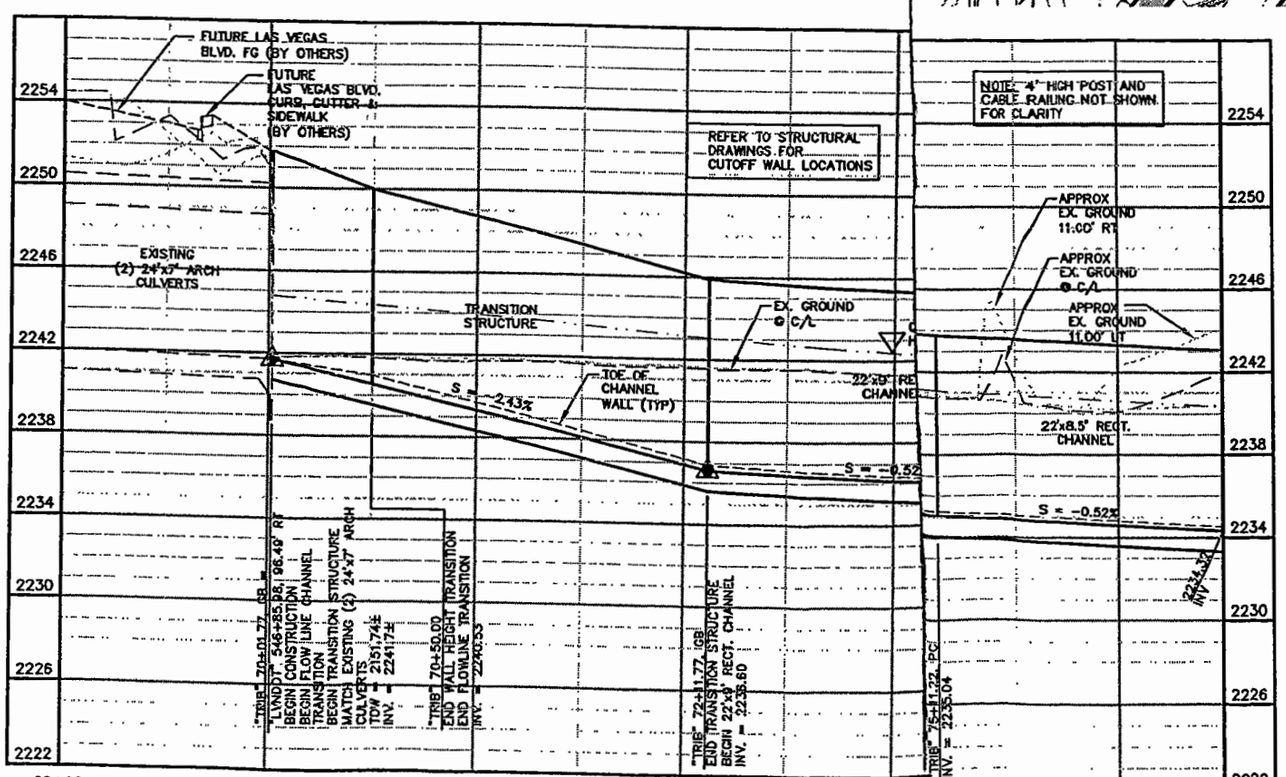
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| DESIGNED BY: | JNG |
| DRAWN BY: | BAH |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

vtn nevada
5727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89118-2140
PHONE (702) 895-7566 FAX (702) 361-3367

SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No
R-02
L-1796










GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED SINGLE SWING GATE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
4. FOR FENCE, GATE & SIGN PLAN REFER TO SHEETS F-01 THRU F-03.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. FOR LIMITS OF REMOVAL REFER TO SHEETS R1 & R2.
7. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04.
8. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.




Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7501
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-5601

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHA VERADO RANCH BLVD.

CHAN

"TRIB" STA. 7 76+50.00

CLARK COUNTY, NE PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5140
PHONE (702) 873-7866 FAX (702) 363-3067

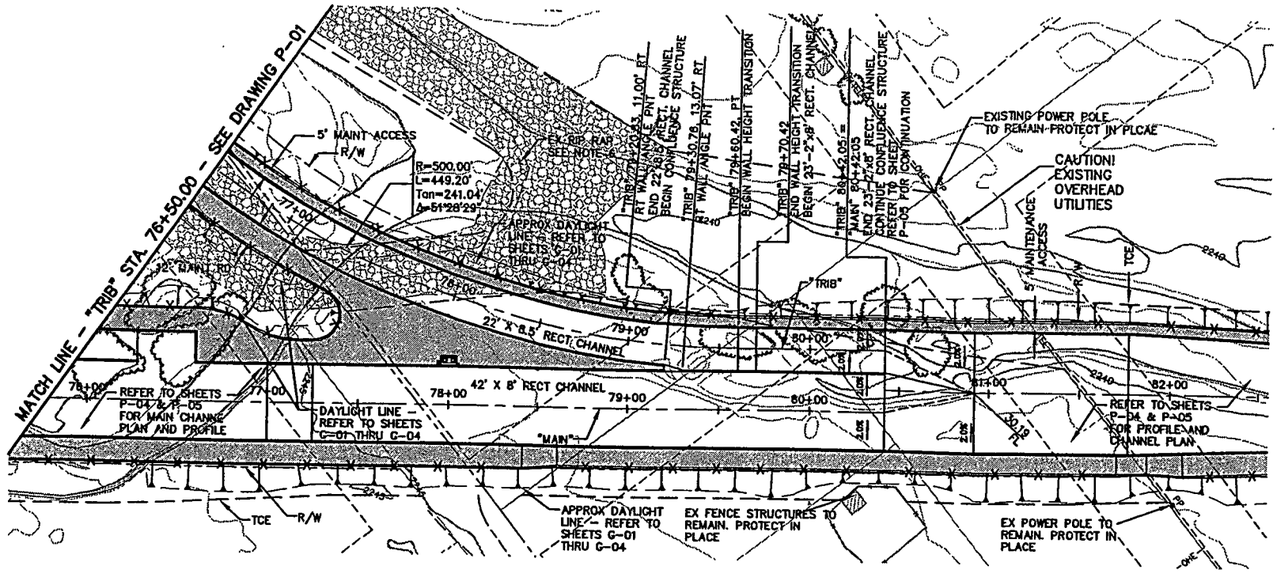
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| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

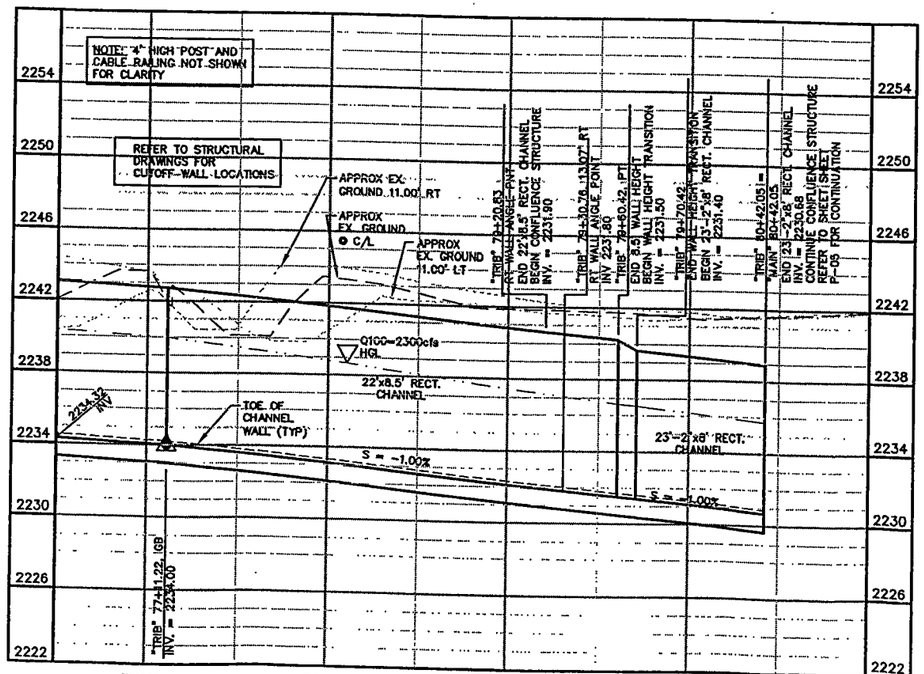
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| SCALE | |
| HORIZ. | 1" = 40' |
| VERT: | 1" = 4' |
| FIELD BOOK | NONE |

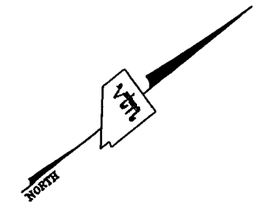
SHEET No **P-01**

L-1796

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GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
4. FOR FENCE, GATE & SIGN PLAN REFER TO SHEETS F-01 THRU F-03.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. FOR LIMITS OF REMOVAL REFER TO SHEETS R1 & R2.
7. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04.
8. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.

AVOID WORKING OVERHEAD POWER LINES. IT'S GOOD LAW!
CALL BEFORE YOU DO OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7511
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-228-5811

**FINAL SUBMITTAL**
Not for Construction
Subject to Revision
03/20/06

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE

"TRIB" STA. 76+50.00 TO "TRIB" STA. 80+42.05

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

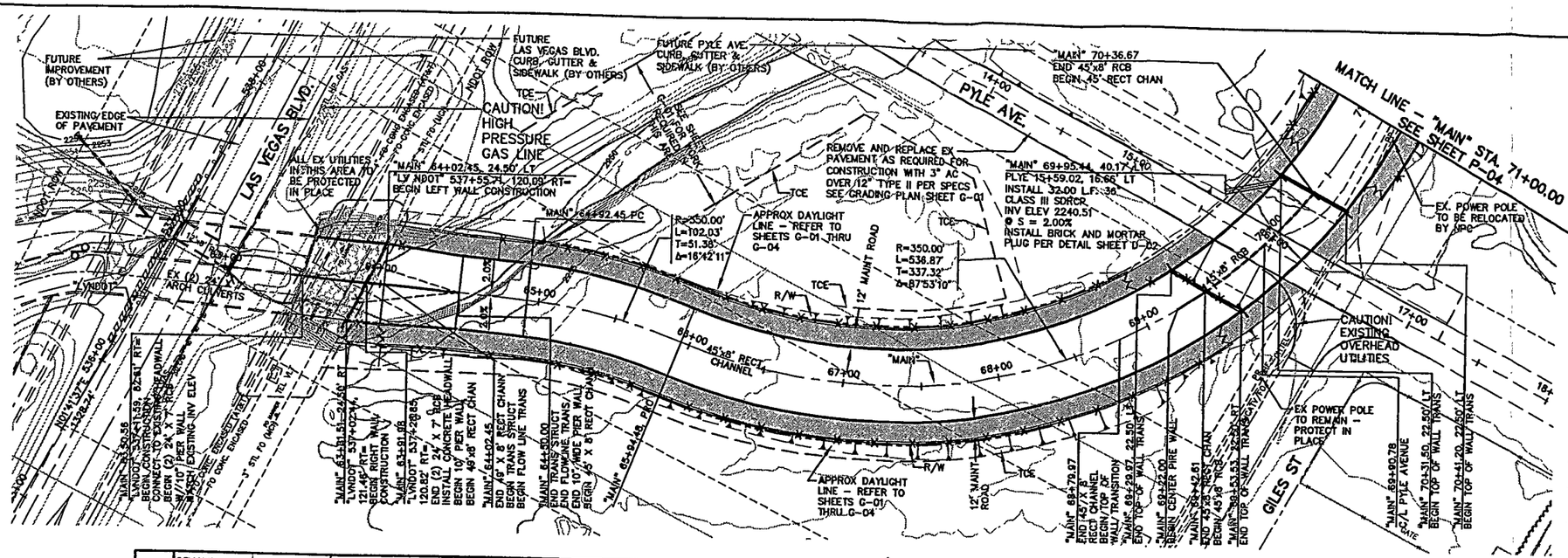
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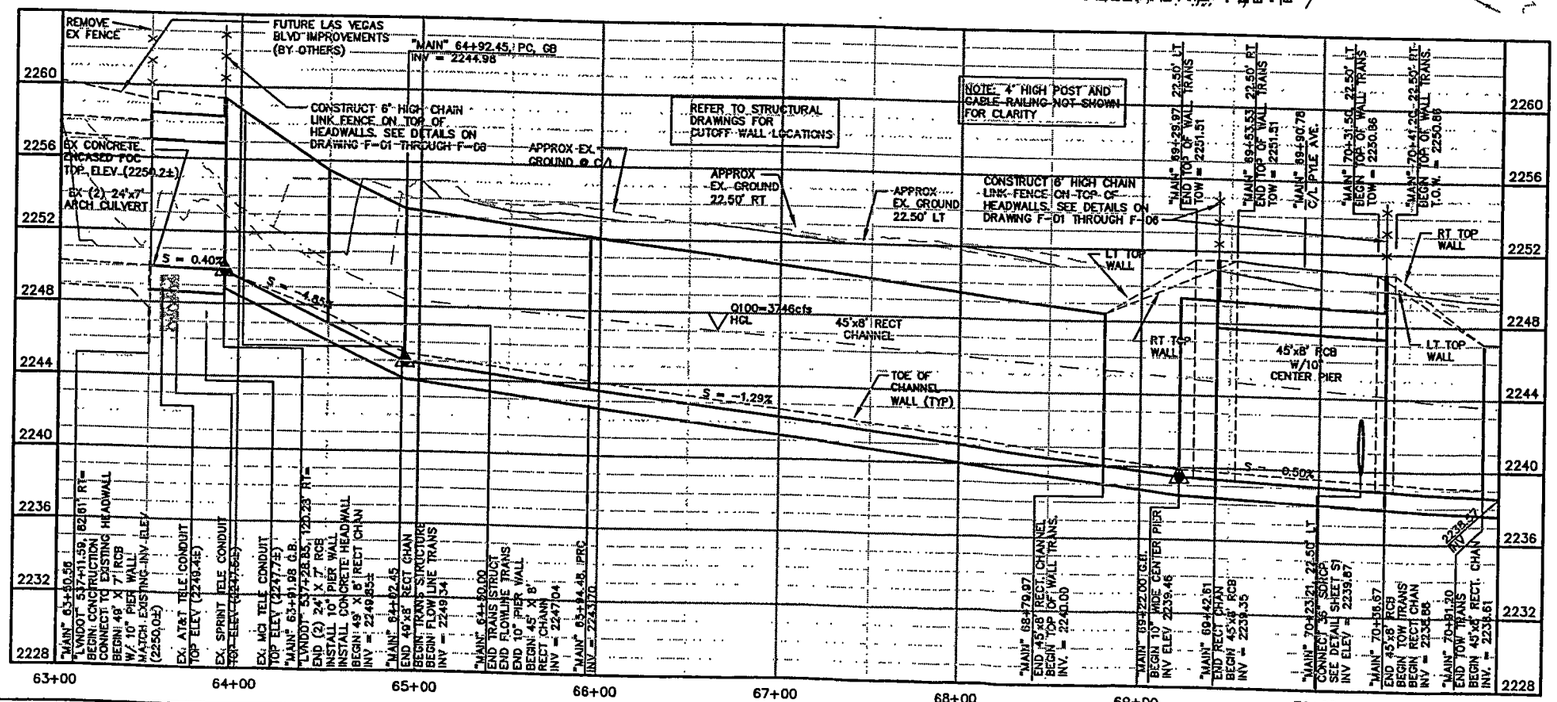
VTN nevada
CONSULTING ENGINEERS
PLANNERS
LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5145
PHONE (702) 228-7564 FAX (702) 363-3267

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK NONE

SHEET No
**P-02**
L-1796

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.




NOTES:

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
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6. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04.
7. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.

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Subject to Revision
03/20/06

CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-2648
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7511
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-222-5811

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE

"MAIN" STA. 63+00.00 TO "MAIN" STA. 71+00.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

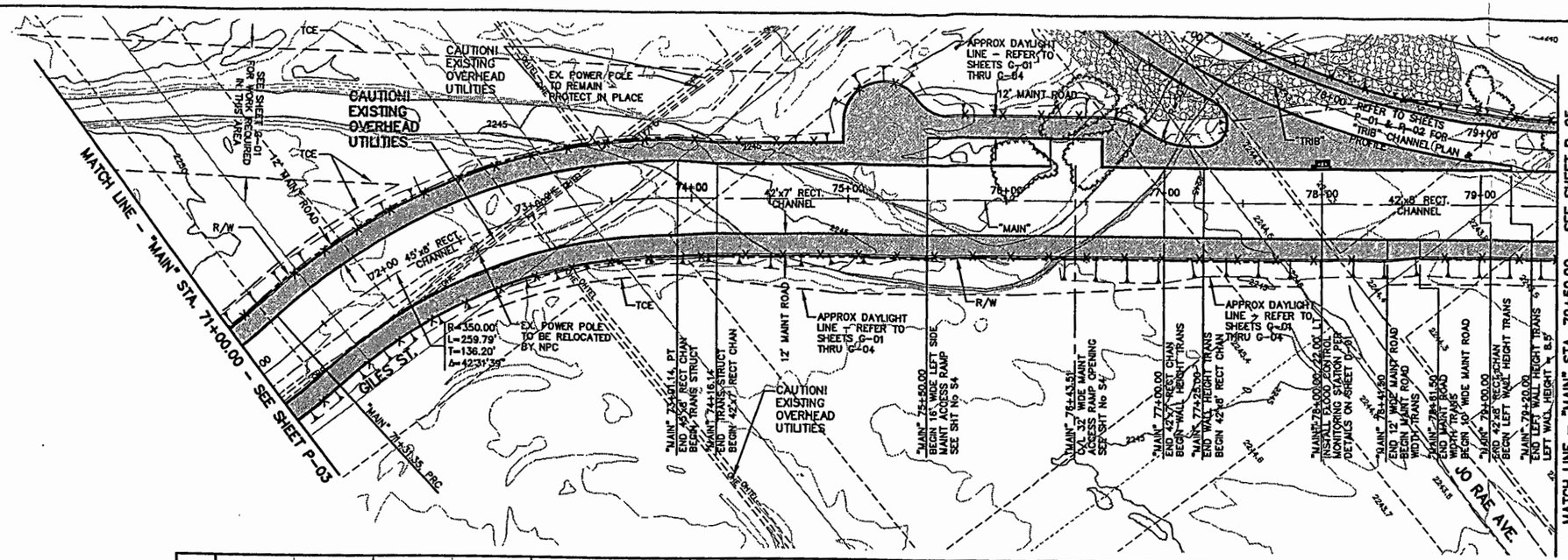
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| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 3/30/06 |

vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
5371 SOUTH VALLEY VIEW BOULEVARD, LAS VEGAS, NEVADA 89118-1240
Phone: (702) 871-7586 Fax: (702) 361-1947

| | |
|---|---|
| SCALE | |
| HORIZ: | 1" = 40' |
| VERT. | 1" = 4' |
| FIELD BOOK | NONE |

SHEET No
P-03
L-1796

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.




VICINITY MAP

NORTH

GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
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7. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.

CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7040
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7511
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-228-8811

**FINAL SUBMITTAL**
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03/20/06

| REV No | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE

"MAIN" STA. 71+00.00 TO "MAIN" STA. 79+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
DP. 06/30/07
CIVIL
No. 9177

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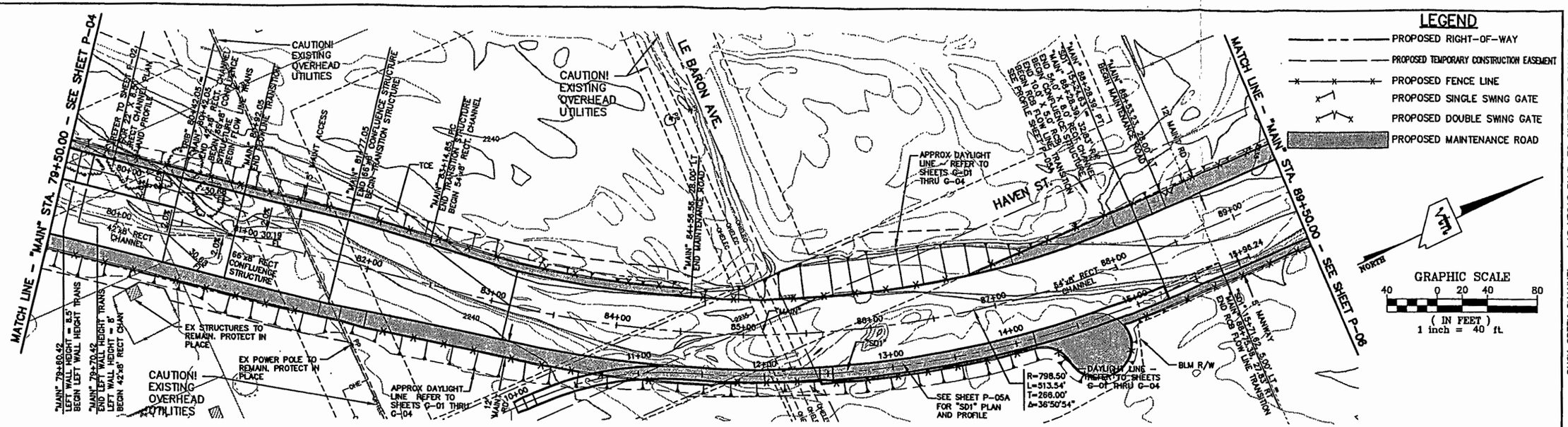
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| CHECKED BY: | KDG |
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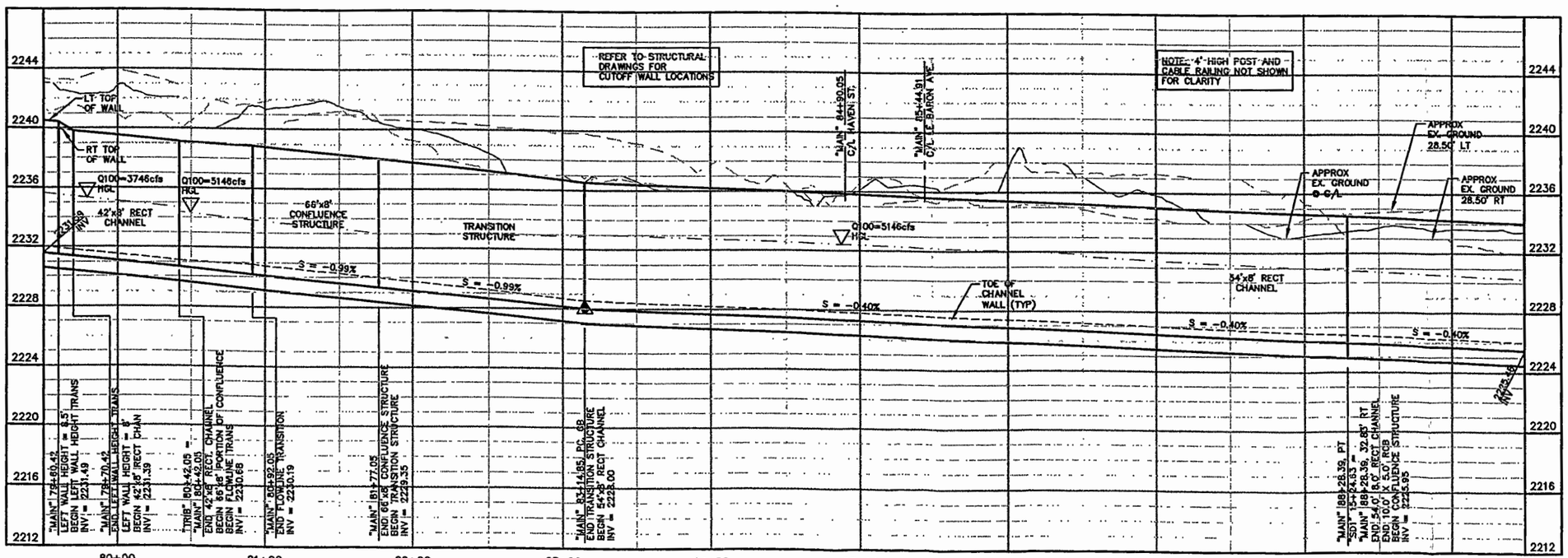
vtn nevada — 5717 SOUTH RAINBOW BOULEVARD, LAS VEGAS, NEVADA 89118-2507 PHONE (702) 575-7906 FAX (702) 263-3267

| | |
|---|---|
| SCALE | |
| HORIZ: | 1" = 40' |
| VERT: | 1" = 4' |
| FIELD BOOK | NONE |

SHEET No **P-04**

L-1796




**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
4. FOR FENCE, GATE & SIGN PLAN REFER TO SHEETS F-01 THRU F-03.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04.
7. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.

AVOID VISITING OVERHEAD POWER LINES. IT'S CLOSE-LY CALL BEFORE YOU DO OVERHEAD
1-702-593-6111

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7548
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7411
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-3511

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE
## "MAIN" STA. 79+50.00 TO "MAIN" STA. 89+50.00
## CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
#9,9177

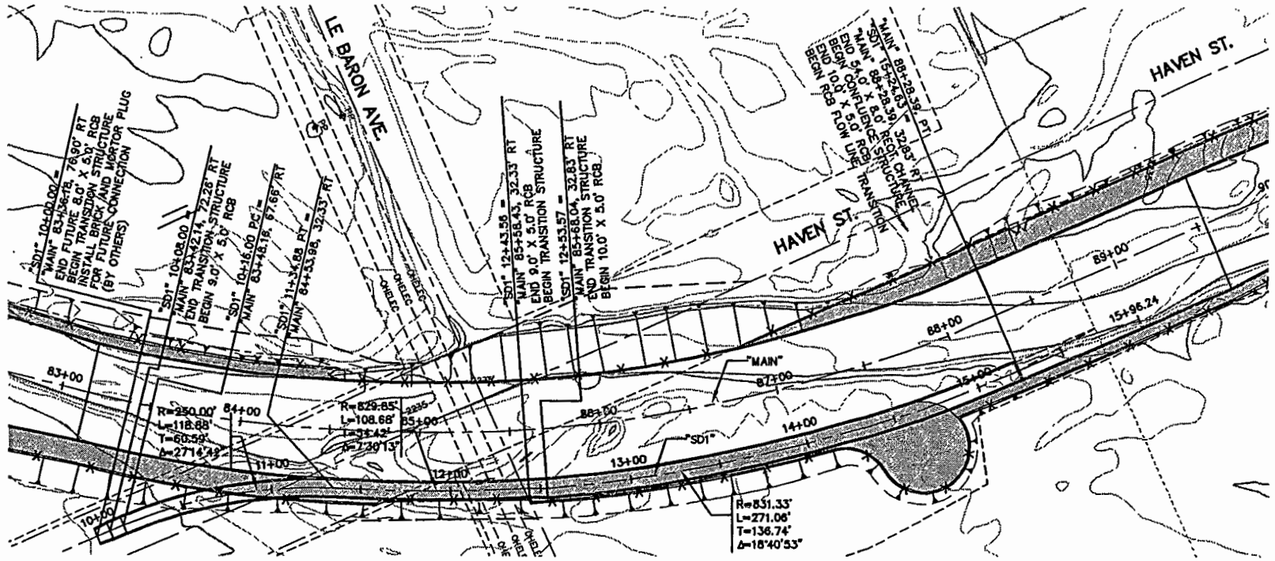
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| DESIGNED BY: | JNC |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

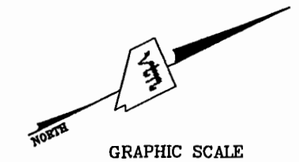
VTN nevada — CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS

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| SCALE | |
| HORIZ: | 1" = 40' |
| VERT: | 1" = 4' |
| FIELD BOOK | NONE |

SHEET No **P-05**

L-1796




## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTURCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED SINGLE SWING GATE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
4. FOR FENCE, GATE & SIGN PLAN REFER TO SHEETS F-01 THRU F-03.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. FOR DETAILED GRADING REFER TO SHEETS G-01 THRU G-04.
7. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY!
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CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7539
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-1401

**FINAL SUBMITTAL**
Not for Construction
Subject to Revision
03/20/06

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PROFILE

"SD1" 10+00.00 TO "SD1" 15+24.63

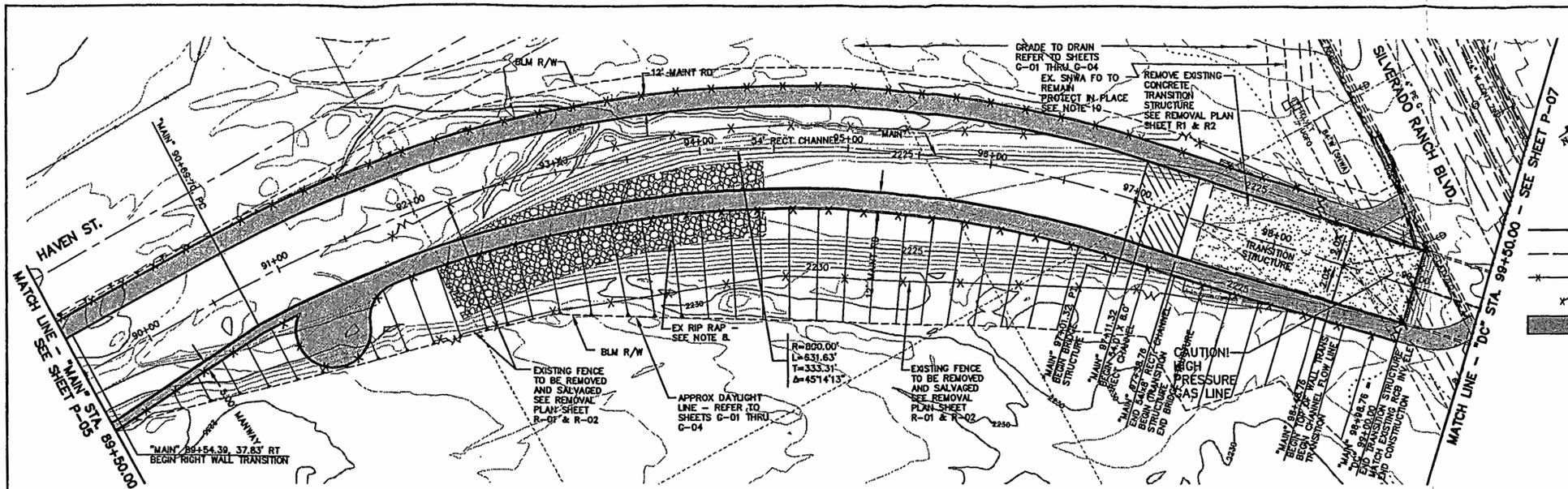
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

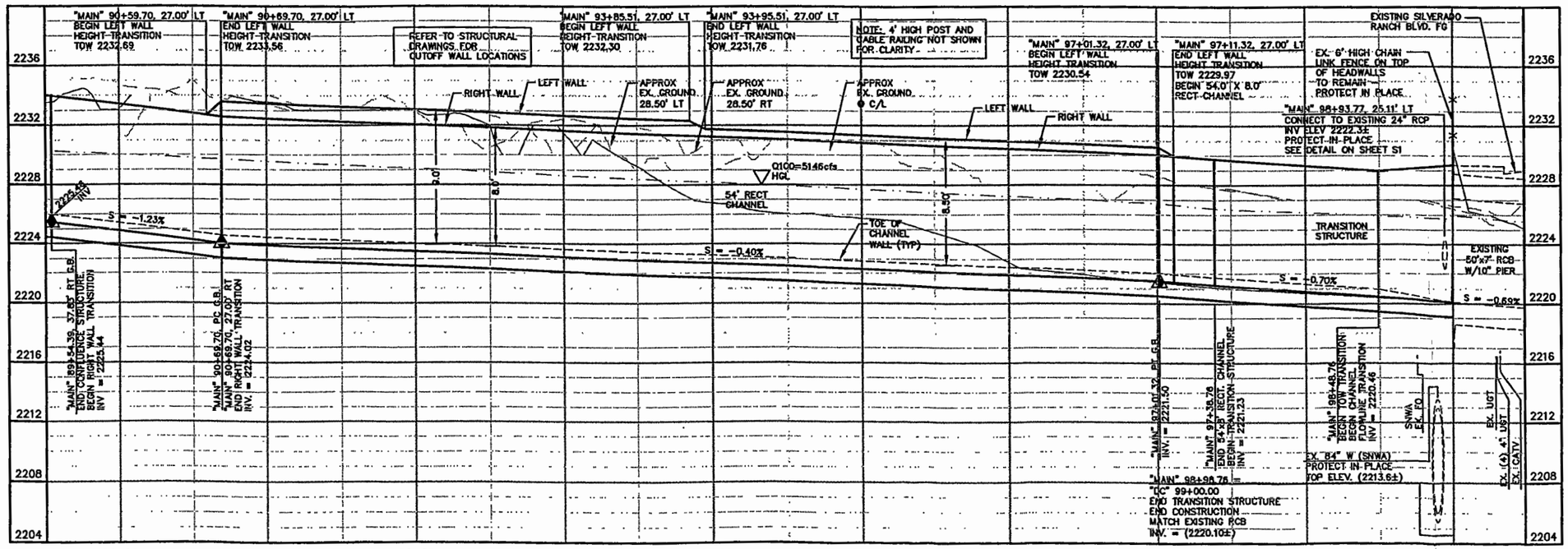
PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

VTN nevada
CONSULTING ENGINEERS & MANAGERS
LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5149
PHONE: (702) 873-7866 FAX: (702) 363-3947

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |
| SCALE | |
| HORIZ: | AS-SHOWN |
| VERT. | AS-SHOWN |
| FIELD BOOK | NONE |
| SHEET No | P-05A |

L-1796




**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & SD1 THRU SD7.
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO SHEET T-01.
4. FOR FENCE GATE & SIGN PLAN REFER TO SHEETS F-01 THRU F-03.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. ANY STORM DRAIN OR SEWER THAT CROSSES OVER SNWA WATER PIPELINE SHALL HAVE WATERTIGHT JOINTS WITH A MINIMUM LENGTH OF 10 FEET FROM EACH SIDE OF THE WATER PIPELINE.
7. SEE SNWA CONSTRUCTION NOTES ON SHEET I-02.
8. SEE REMOVAL PLAN SHEET R-2
9. FOR CHANNEL LADDER LOCATIONS & DETAILS REFER TO SHEET F-06.
10. SNWA FIBER OPTIC CONDUIT RUN ALONG THE SOUTH SIDE OF THE SNWA PIPE LINE.

SOUTHERN NEVADA WATER AUTHORITY — DATE

SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

SEE SHEET I-02 FOR SNWA CONSTRUCTION NOTES.

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Subject to Revision
03/20/06

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CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7261
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-6811

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE

"MAIN" STA. 89+50.00 TO "MAIN" STA. 99+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

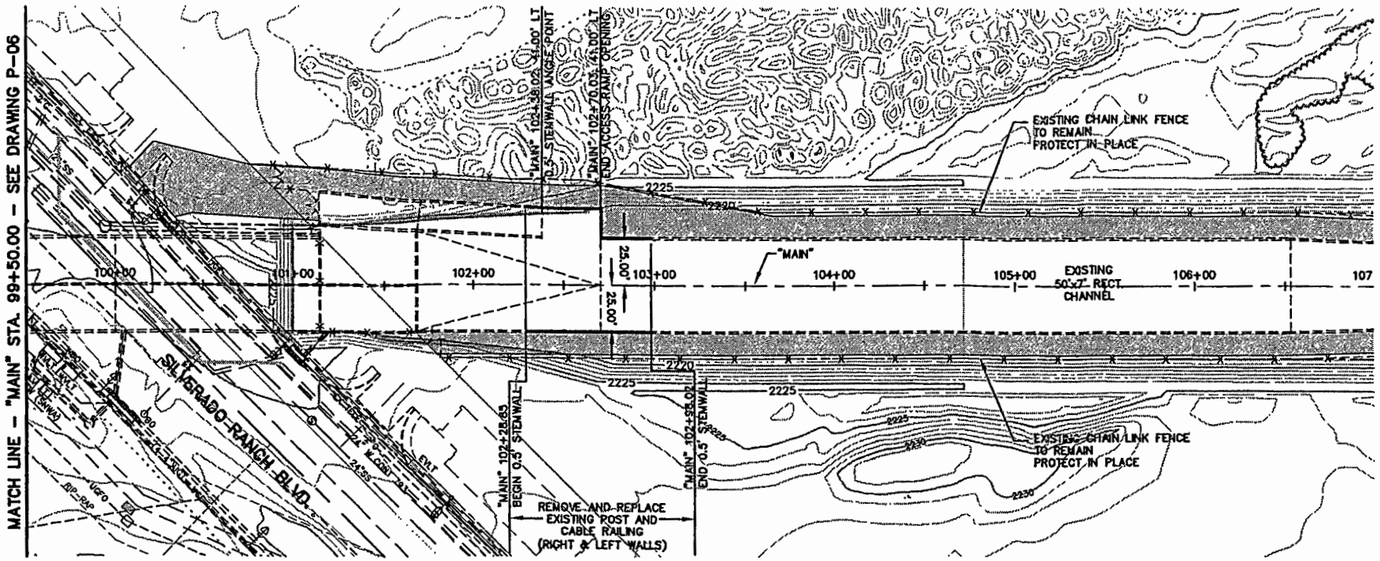
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| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

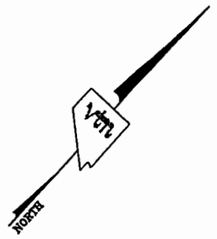
VTN nevada — CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2317 SOUTH JONES BOULEVARD LAS VEGAS, NEVADA 89146-5418 PHONE (702) 873-7866 FAX (702) 873-8941

| | |
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| SCALE | |
| HORIZ: | 1" = 40' |
| VERT: | 1" = 4' |
| FIELD BOOK | NONE |

SHEET No **P-06**

L-1796



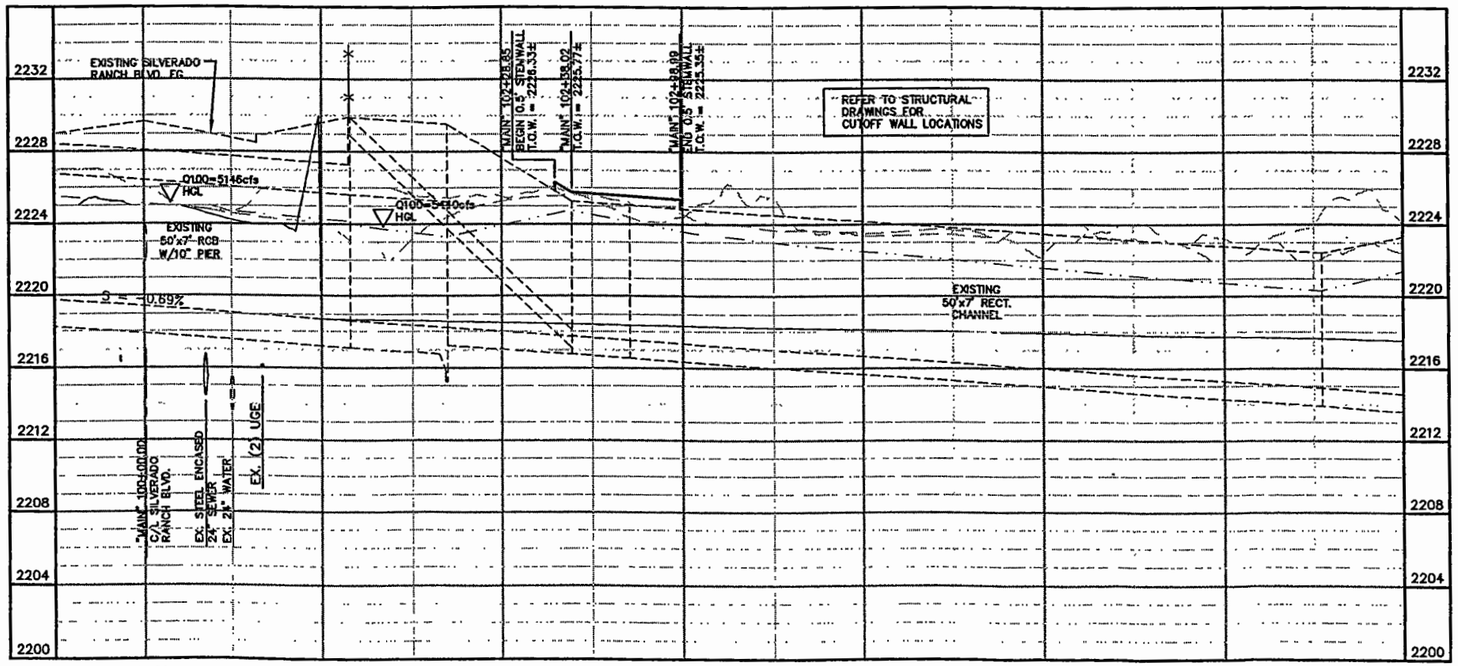




GRAPHIC SCALE

40 0 20 40 80

( IN FEET )

1 inch = 40 ft.




**NOTES:**

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION, CUTOFF WALL LOCATIONS, EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO SHEETS S1 THRU S7 & S01 THRU SD7.
3. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.

SOUTHERN NEVADA WATER AUTHORITY DATE

SNWA APPROVAL IS VALID FOR ONE (1) YEAR FROM THE SIGNATURE DATE. IF CONSTRUCTION WITHIN THE EASEMENT OR RESTRICTED PIPE SAFETY ZONE IS NOT COMPLETE, PLANS MUST BE RESUBMITTED TO SNWA FOR APPROVAL.

SEE SHEET I-02 FOR SNWA CONSTRUCTION NOTES.




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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-3601

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL PLAN AND PROFILE

"MAIN" STA. 99+50.00 TO "MAIN" STA. 109+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

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| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE | 03/30/06 |

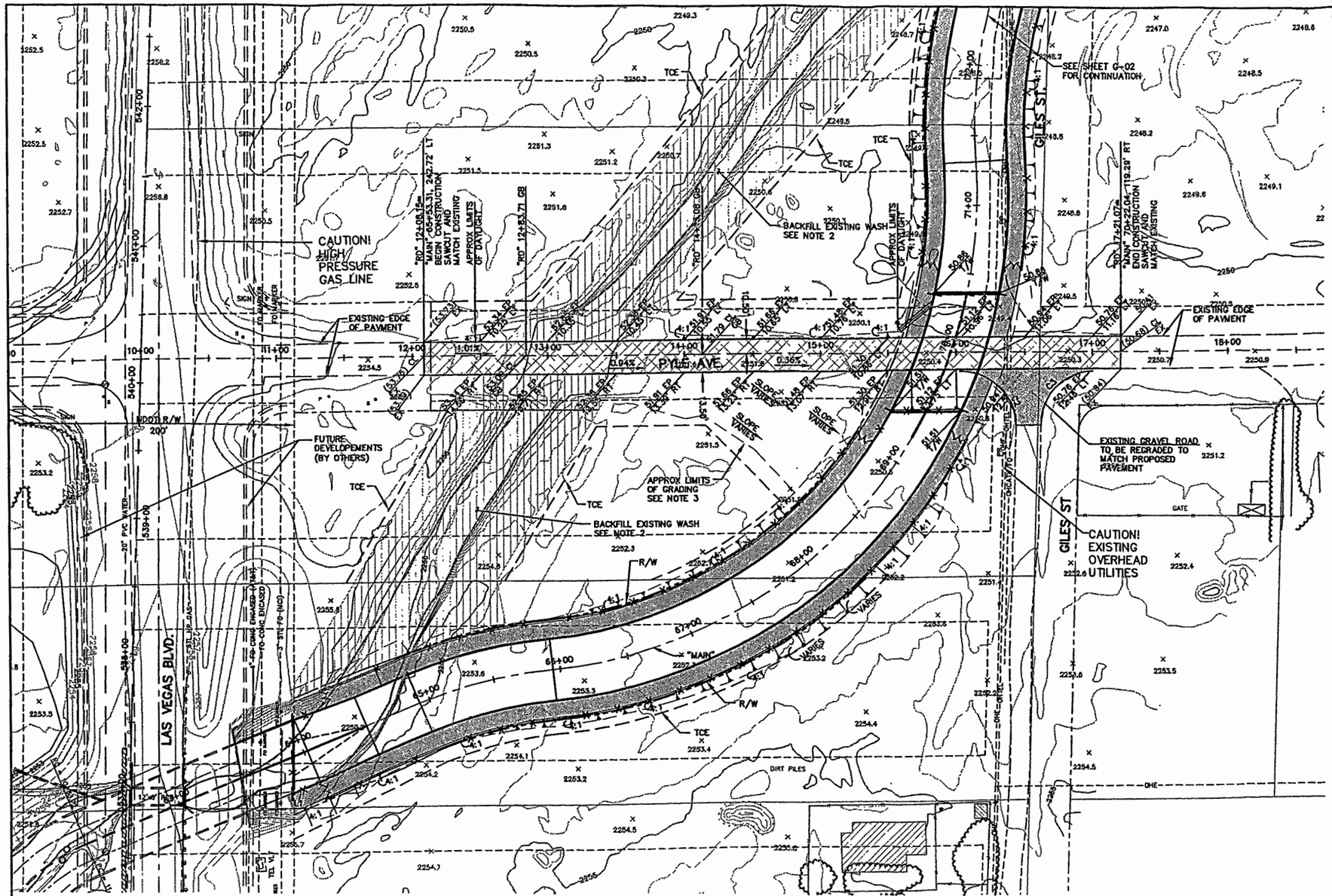
vtn nevada
2727 SOUTH Rainbow BOULEVARD LAS VEGAS, NEVADA 89146-5146 PHONE (702) 870-7666 FAX (702) 870-3967

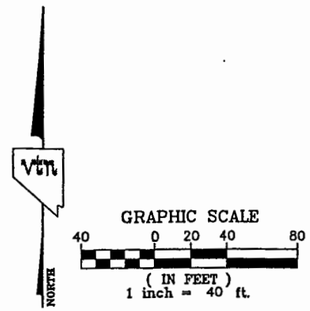
| SCALE | |
|---|---|
| HORIZ: | 1" = 40' |
| VERT: | 1" = 4' |
| FIELD BOOK | NONE |

SHEET No **P-07**

L-1796

DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.




## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD
- NEW AC PAVEMENT 3" AC OVER 4" TYPE II
- GRAVEL ROAD 4" TYPE II
- FILL AREA SEE NOTE 2

**NOTES:**

1. FOR CHANNEL PLAN AND PROFILE REFER TO SHEETS P-01 THRU P-07
2. FILL EXISTING WASH W/SELECT BACKFILL PER CLARK COUNTY STANDARD SPECIFICATION. PLACE FILL SIMMILAR TO STRUCTURAL FILL IN SECTION 203.02.06 OF THE SPECIAL PROVISIONS. CONTRACTOR SHALL FILL THE EXISTING WASH WITHIN THE DESIGNATED TEMPORARY CONSTRUCTION EASEMENT SO AS TO ELIMINATE A DEFINED FLOW PATH. GRADING SHALL TIE INTO EXISTING GROUND IN SUCH A WAY NOT TO CREATE ANY LOW POINTS OR DEFINED FLOW PATH, UNLESS OTHERWISE NOTED IN THESE PLANS.
3. GRADE TO DRAIN TOWARDS CHANNEL 3.0% MAX SLOPE.

DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.


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CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7241
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-729-6411


**CURVE TABLE**

| CURVE | LENGTH | RADIUS | TANGENT | DELTA | START NORTHING | START EASTING | END NORTHING | END EASTING |
|---|---|---|---|---|---|---|---|---|
| C2 | 63.52 | 39.79 | 40.82 | 91°27'52" | 26709032.4514 | 778415.4643 | 26708992.8628 | 778456.4537 |
| C3 | 61.50 | 39.71 | 38.85 | 88°44'53" | 26709033.4818 | 778512.9758 | 26708993.3070 | 778474.6330 |

**LINE TABLE**

| LINE | LENGTH | BEARING | START NORTHING | START EASTING | END NORTHING | END EASTING |
|---|---|---|---|---|---|---|
| L1 | 6.11 | N89°05'02"E | 26708708.8879 | 777924.9045 | 26708708.9856 | 777931.0172 |

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03/20/06

| REV No | DATE | DESCRIPTION | APPROVED |
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# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL GRADING PLAN

"MAIN" STA 63+00.00 TO "MAIN" STA 72+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

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7327 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89118-3232 PHONE (702) 932-7888 FAX (702) 361-3867

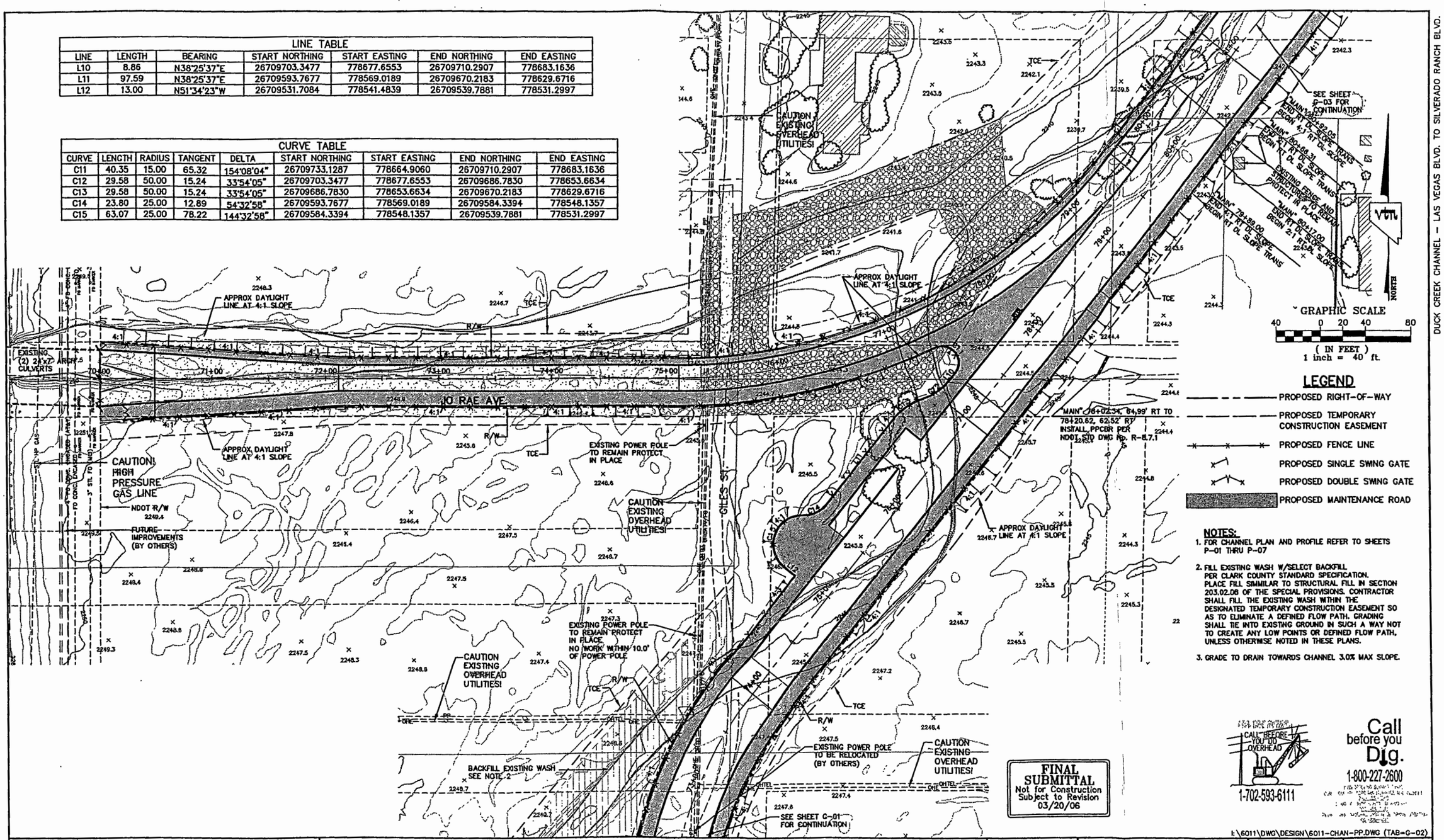
SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No
**G-01**
L-1796

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| LINE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| LINE | LENGTH | BEARING | START NORTHING | START EASTING | END NORTHING | END EASTING |
| L10 | 8.86 | N38°25'37"E | 26709703.3477 | 778677.6553 | 26709710.2907 | 778683.1636 |
| L11 | 97.59 | N38°25'37"E | 26709593.7677 | 778569.0189 | 26709670.2183 | 778629.6716 |
| L12 | 13.00 | N51°34'23"W | 26709531.7084 | 778541.4839 | 26709539.7881 | 778531.2997 |

| CURVE TABLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CURVE | LENGTH | RADIUS | TANGENT | DELTA | START NORTHING | START EASTING | END NORTHING | END EASTING |
| C11 | 40.35 | 15.00 | 65.32 | 154°08'04" | 26709733.1287 | 778664.9060 | 26709710.2907 | 778683.1636 |
| C12 | 29.58 | 50.00 | 15.24 | 33°54'05" | 26709703.3477 | 778677.6553 | 26709686.7830 | 778653.6634 |
| C13 | 29.58 | 50.00 | 15.24 | 33°54'05" | 26709686.7830 | 778653.6634 | 26709670.2183 | 778629.6716 |
| C14 | 23.80 | 25.00 | 12.89 | 54°32'58" | 26709593.7677 | 778569.0189 | 26709584.3394 | 778548.1357 |
| C15 | 63.07 | 25.00 | 78.22 | 144°32'58" | 26709584.3394 | 778548.1357 | 26709539.7881 | 778531.2997 |




## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED SINGLE SWING GATE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. FOR CHANNEL PLAN AND PROFILE REFER TO SHEETS P-01 THRU P-07
2. FILL EXISTING WASH W/SELECT BACKFILL PER CLARK COUNTY STANDARD SPECIFICATION. PLACE FILL SIMMILAR TO STRUCTURAL FILL IN SECTION 203.02.08 OF THE SPECIAL PROVISIONS. CONTRACTOR SHALL FILL THE EXISTING WASH WITHIN THE DESIGNATED TEMPORARY CONSTRUCTION EASEMENT SO AS TO ELIMINATE A DEFINED FLOW PATH. GRADING SHALL TIE INTO EXISTING GROUND IN SUCH A WAY NOT TO CREATE ANY LOW POINTS OR DEFINED FLOW PATH, UNLESS OTHERWISE NOTED IN THESE PLANS.
3. GRADE TO DRAIN TOWARDS CHANNEL 3.0% MAX SLOPE.

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DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL GRADING PLAN

"MAIN" STA. 72+50.00 TO "MAIN" STA. 81+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

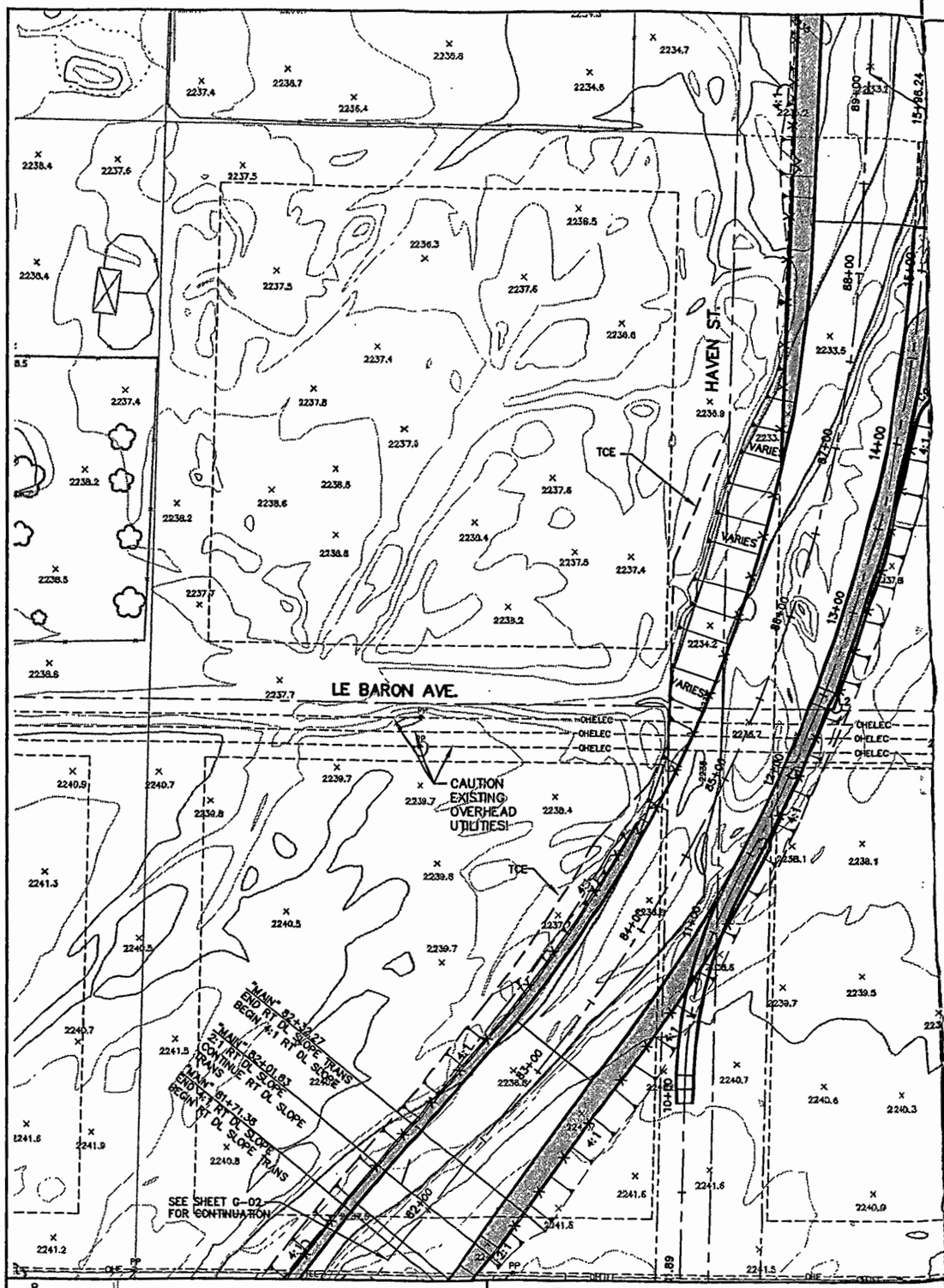
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| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

vtn nevada
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2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5146 PHONE (702) 873-7999 FAX (702) 873-9947

| | |
|---|---|
| SCALE | |
| HORIZ: | 1" = 40' |
| VERT: | |
| FIELD BOOK | NONE |

SHEET No
**G-02**

L-1796




DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

NORTH

GRAPHIC SCALE

40 0 20 40 80

( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. FOR CHANNEL PLAN AND PROFILE REFER TO SHEETS P-01 THRU P-07
2. FILL EXISTING WASH W/SELECT BACKFILL PER CLARK COUNTY STANDARD SPECIFICATION. PLACE FILL SIMMILAR TO STRUCTURAL FILL IN SECTION 203.02.06 OF THE SPECIAL PROVISIONS. CONTRACTOR SHALL FILL THE EXISTING WASH WITHIN THE DESIGNATED TEMPORARY CONSTRUCTION EASEMENT SO AS TO ELIMINATE A DEFINED FLOW PATH. GRADING SHALL TIE INTO EXISTING GROUND IN SUCH A WAY NOT TO CREATE ANY LOW POINTS OR DEFINED FLOW PATH, UNLESS OTHERWISE NOTED IN THESE PLANS.
3. GRADE TO DRAIN TOWARDS CHANNEL 3.0% MAX SLOPE.

| LINE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| LINE | LENGTH | BEARING | START NORTHING | START EASTING | END NORTHING | END EASTING |
| L2 | 2.31 | S89°28'01"E | 26710356.3639 | 779223.5719 | 26710356.3440 | 779224.7049 |
| L3 | 4.65 | N01°11'57"E | 26710276.5730 | 779189.4627 | 26710281.2220 | 779189.5600 |

| CURVE TABLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CURVE | LENGTH | RADIUS | TANGENT | DELTA | START NORTHING | START EASTING | END NORTHING | END EASTING |
| C1 | 82.1 | 1002.33 | 41.07 | 4°41'34" | 26710281.2220 | 779189.5600 | 26710356.3639 | 779222.5719 |
| C9 | 32.1 | 24.60 | 18.81 | 74°49'13" | 26710520.9186 | 779268.8674 | 26710541.1243 | 779290.8928 |
| C10 | 82.4 | 25.00 | 319.83 | 188°56'21" | 26710541.1243 | 779290.8928 | 26710589.9718 | 779280.9563 |




1-702-593-6111

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CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7231
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-8411

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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHA

CHA

"MAIN" STA. 8

CLARK COUNTY, NE

VERADO RANCH BLVD.

89+50.00

PUBLIC WORKS

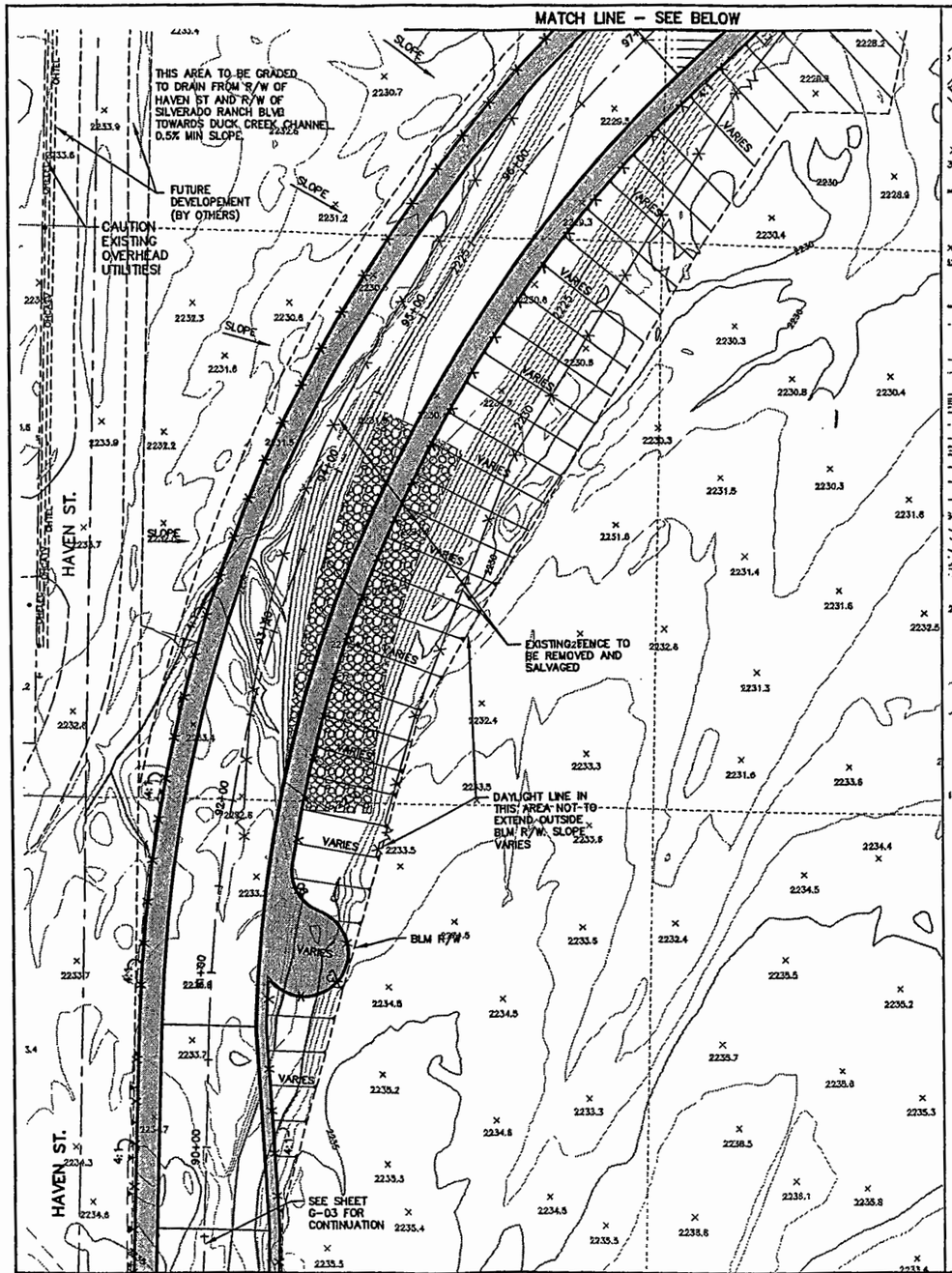
PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9171

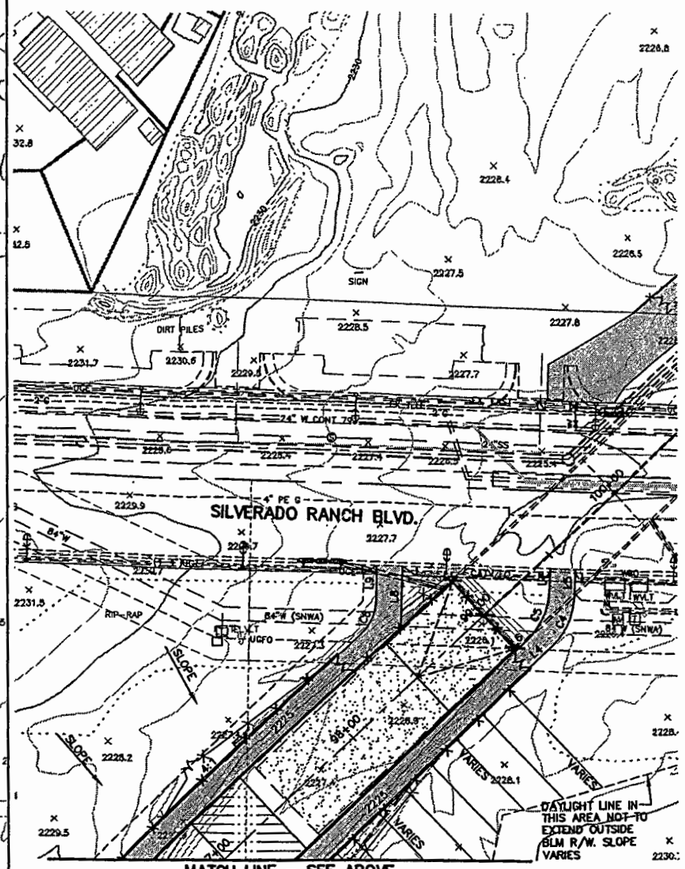
VTN nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7566 FAX (702) 873-2547

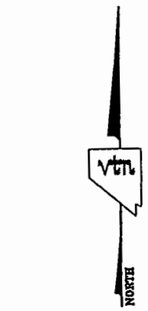
| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No
**G-03**
L-1796




GRAPHIC SCALE

40 0 20 40 80

( IN FEET )

1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. FOR CHANNEL PLAN AND PROFILE REFER TO SHEETS P-01 THRU P-07
2. FILL EXISTING WASH W/SELECT BACKFILL PER CLARK COUNTY STANDARD SPECIFICATION. PLACE FILL SIMMILAR TO STRUCTURAL FILL IN SECTION 203.02.06 OF THE SPECIAL PROVISIONS. CONTRACTOR SHALL FILL THE EXISTING WASH WITHIN THE DESIGNATED TEMPORARY CONSTRUCTION EASEMENT SO AS TO ELIMINATE A DEFINED FLOW PATH. GRADING SHALL TIE INTO EXISTING GROUND IN SUCH A WAY NOT TO CREATE ANY LOW POINTS OR DEFINED FLOW PATH, UNLESS OTHERWISE NOTED IN THESE PLANS.
3. GRADE TO DRAIN TOWARDS CHANNEL 3.0% MAX SLOPE.

DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

| LINE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| LINE | LENGTH | BEARING | START NORTHING | START EASTING | END NORTHING | END EASTING |
| L4 | 15.77 | S46°48'55"W | 26711553.7211 | 779680.0623 | 26711542.9313 | 779668.5661 |
| L5 | 14.90 | S01°48'55"W | 26711596.5143 | 779693.1402 | 26711581.6201 | 779692.6681 |
| L6 | 8.42 | S46°05'57"W | 26711557.6265 | 779666.5305 | 26711551.7866 | 779660.4620 |
| L7 | 11.78 | S01°48'55"W | 26711596.9578 | 779679.1472 | 26711585.1810 | 779678.7740 |
| L8 | 33.75 | S01°48'55"W | 26711597.5391 | 779597.6757 | 26711563.8108 | 779596.6067 |
| L9 | 20.10 | S01°48'55"W | 26711597.9826 | 779583.6828 | 26711577.8943 | 779583.0461 |

| CURVE TABLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CURVE | LENGTH | RADIUS | TANGENT | DELTA | START NORTHING | START EASTING | END NORTHING | END EASTING |
| C4 | 31.42 | 40.00 | 16.57 | 45°00'00" | 26711553.7211 | 779680.0623 | 26711581.6201 | 779692.6681 |
| C5 | 30.92 | 40.00 | 16.28 | 44°17'02" | 26711557.6265 | 779666.5305 | 26711585.1810 | 779678.7740 |
| C6 | 19.95 | 25.00 | 10.54 | 45°42'58" | 26711560.2451 | 779574.9382 | 26711577.8943 | 779583.0461 |
| C7 | 94.68 | 25.00 | 74.76 | 216°58'57" | 26710902.6708 | 779280.5095 | 26710939.7001 | 779310.1297 |
| C8 | 33.61 | 24.61 | 20.01 | 78°14'57" | 26710939.7001 | 779310.1297 | 26710966.5450 | 779294.5186 |

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03/20/06

ASSN. WIRE ABREAST ASSN. LAKE, INC. 1-800-227-2600
CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7240
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7511
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-4411

E:\6011\DWG\DESIGN\6011-CHAN-PP.DWG (TAB=G-04)

| REV No | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 8 | | | |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## CHANNEL GRADING PLAN

"MAIN" STA. 89+50.00 TO "MAIN" STA. 99+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

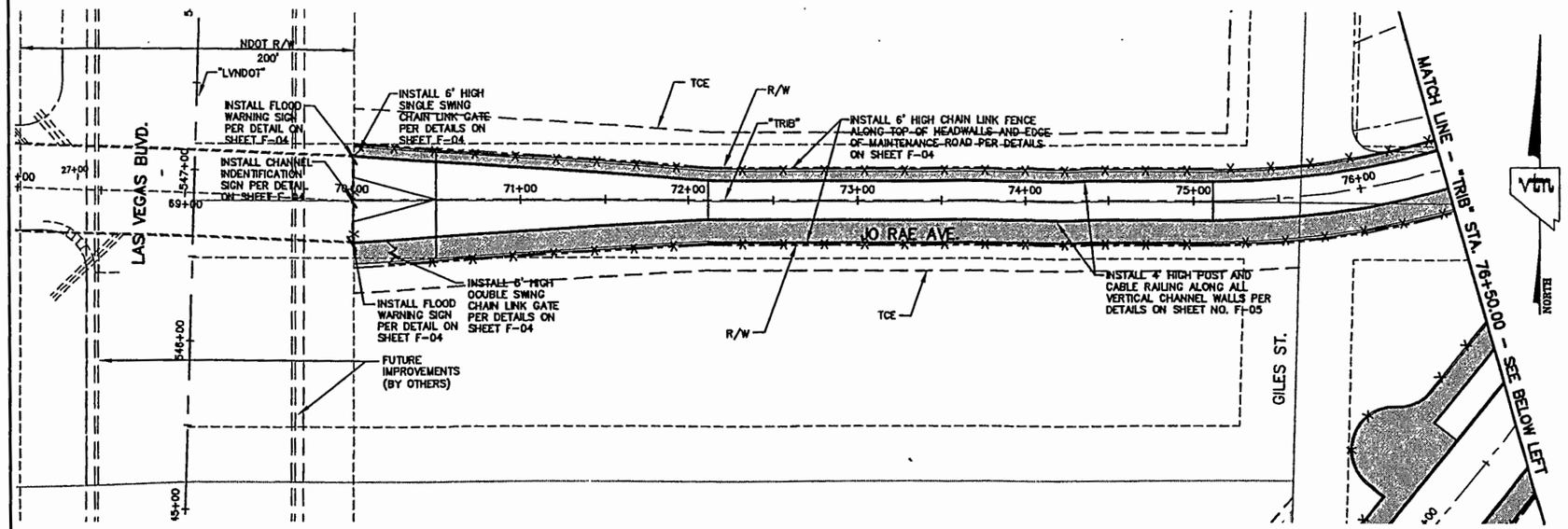
PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

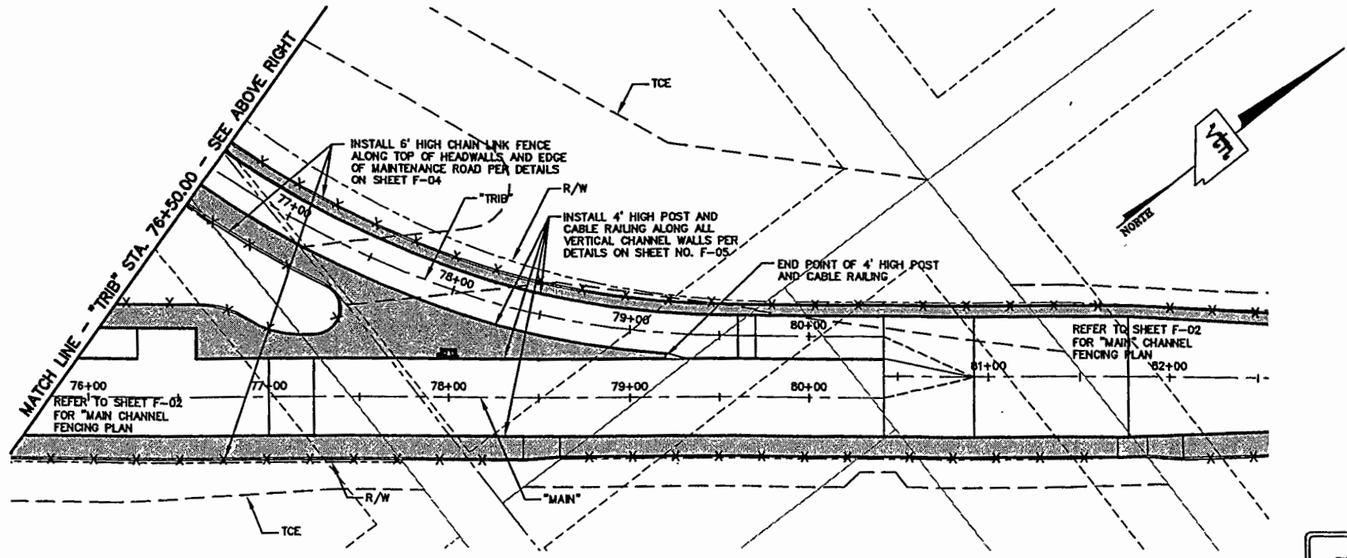
VTN nevada
5727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89118-2148
PHONE (702) 896-7566 FAX (702) 365-3647

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

SCALE
HORIZ: 1" = 40'
VERT: 1" = 4'
FIELD BOOK NONE

SHEET No
G-04
L-1796




GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED FENCE LINE
- PROPOSED SINGLE SWING GATE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

**NOTES:**

1. INSTALL CHANNEL LADDER STEPS AND ACCESS OPENINGS PER DETAILS ON SHEET F-06.
2. CHAIN LINK FENCE LOCATED 1.0' OFF MAINTENANCE ROAD UNLESS OTHERWISE NOTED.

DUCK CREEK CHANNEL – LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

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Not for Construction
Subject to Revision
03/20/06

CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7511
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-3811

I:\6011\DWG\DESIGN\6011-CHAN-PP.DWG (TAB=F-01)

| REV No | DATE | DESCRIPTION | APPROVED |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## FENCE, GATE & SIGN PLAN

"TRIB" STA. 70+01.77 TO "TRIB" STA. 80+42.05

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

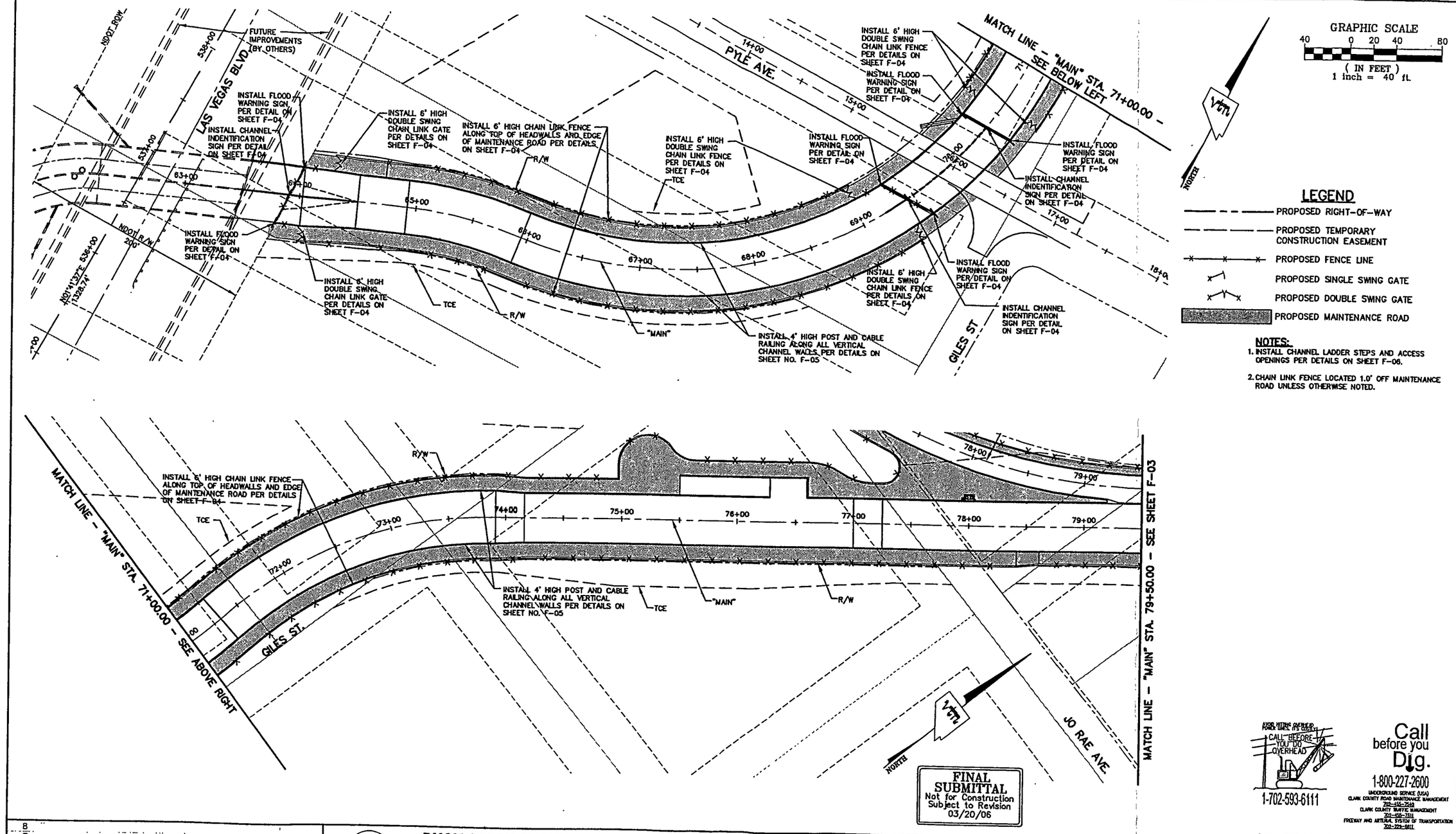
PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 870-7540 FAX (702) 870-8067

| | |
|---|---|
| SCALE | |
| HORIZ: | 1" = 40' |
| VERT: | |
| FIELD BOOK | NONE |

SHEET No
**F-01**
L-1796




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03/20/06

ALWAYS NOTIFY CALL BEFORE YOU DIG OVERHEAD
1-702-593-6111

Call before you Dig.
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UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-7250
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-7011
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-6811

I:\6011\DWG\DESIGN\6011-CHAN-PP.DWG (TAB=F-02)

| REV No | DATE | DESCRIPTION | APPROVED |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## FENCE, GATE & SIGN PLAN

"MAIN" STA. 63+00.00 TO "MAIN" STA. 79+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

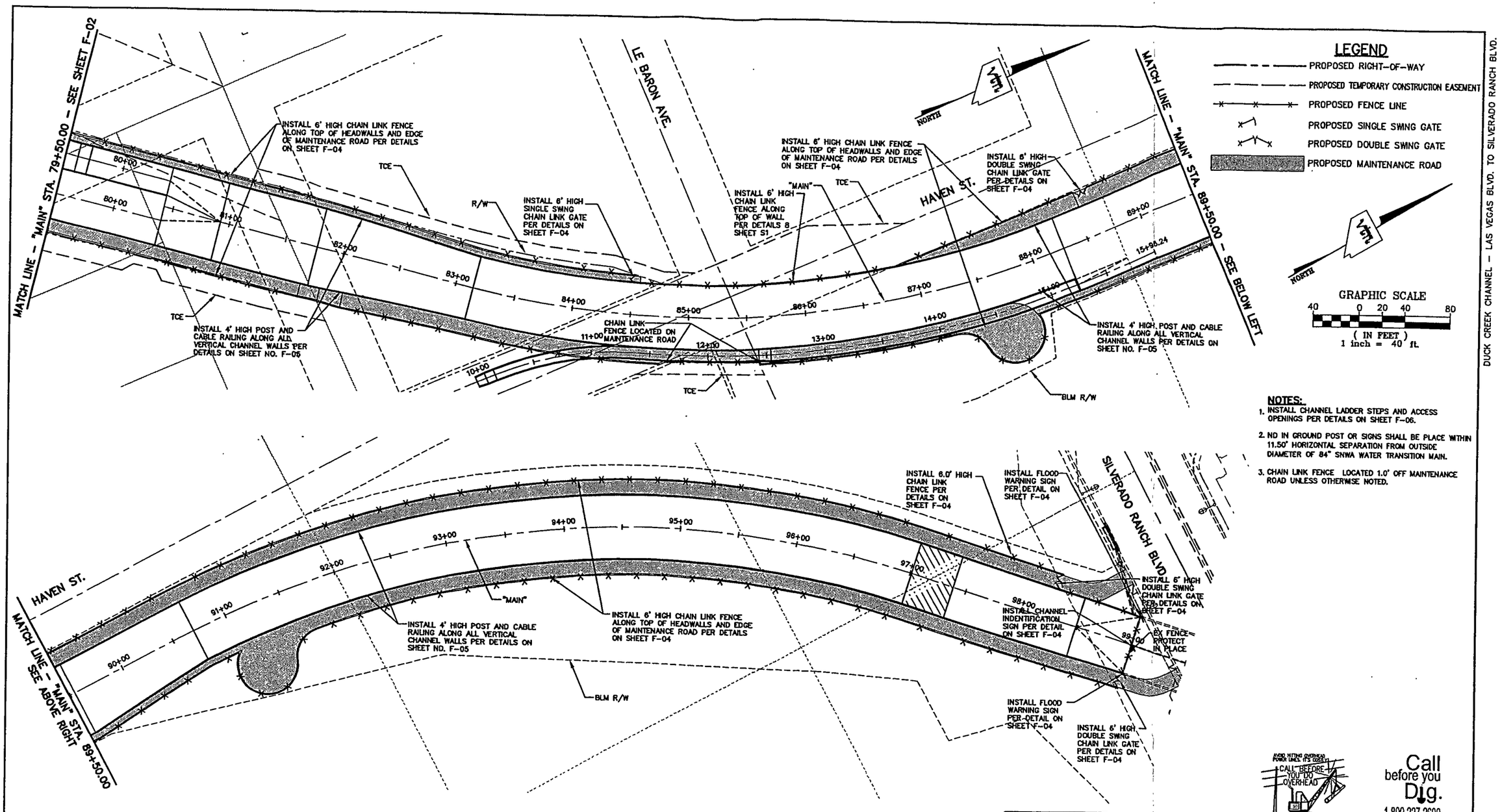
PROFESSIONAL ENGINEER - STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

vtn CONSULTING ENGINEERS PLANNERS LAND SURVEYORS nevada
3727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89103-4122
PHONE (702) 873-7564 FAX (702) 243-3947

SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No
F-02
L-1796




**NOTES:**

1. INSTALL CHANNEL LADDER STEPS AND ACCESS OPENINGS PER DETAILS ON SHEET F-06.
2. NO IN GROUND POST OR SIGNS SHALL BE PLACE WITHIN 11.50' HORIZONTAL SEPARATION FROM OUTSIDE DIAMETER OF 84" SNWA WATER TRANSITION MAIN.
3. CHAIN LINK FENCE LOCATED 1.0' OFF MAINTENANCE ROAD UNLESS OTHERWISE NOTED.

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY!
CALL BEFORE YOU DO OVERHEAD
1-702-593-6111

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)
CLARK COUNTY ROAD MAINTENANCE MANAGEMENT 702-455-2540
CLARK COUNTY TRAFFIC MANAGEMENT 702-455-2311
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION 702-229-3411

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03/20/06

| REV No | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 8 | | | |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## FENCE, GATE & SIGN PLAN

"MAIN" STA. 79+50.00 TO "MAIN" STA. 99+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

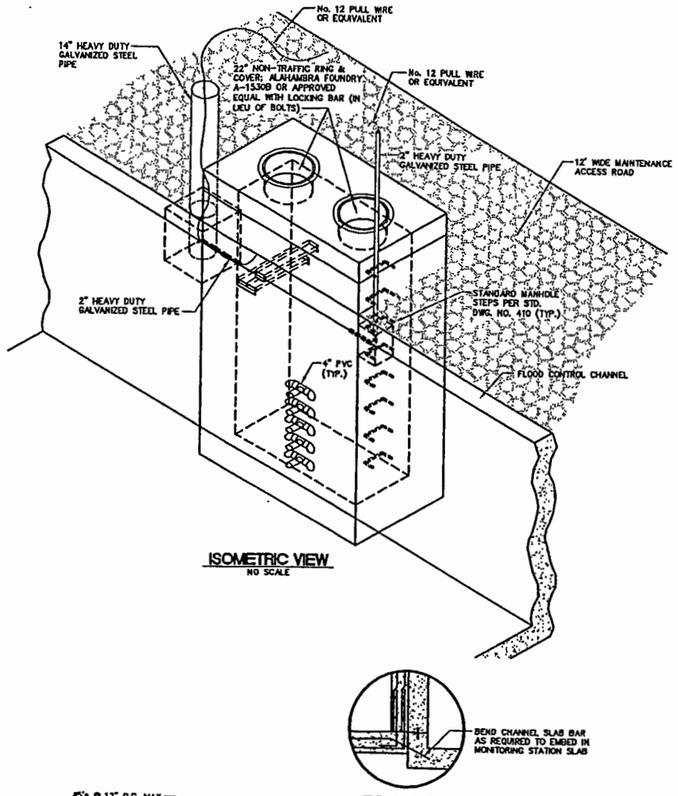
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| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

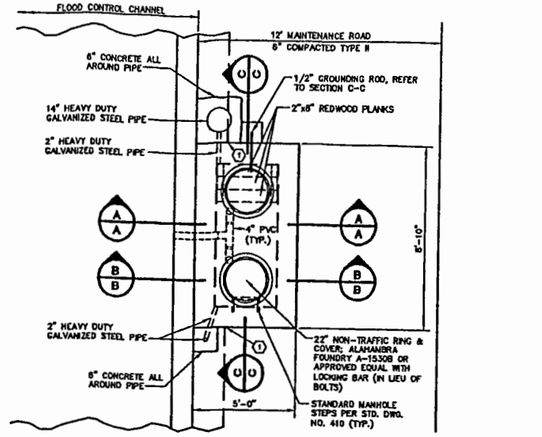
vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH Rainbow BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 873-7866 FAX (702) 362-2847

SCALE
HORIZ: 1" = 40'
VERT:
FIELD BOOK NONE

SHEET No
**F-03**
L-1796

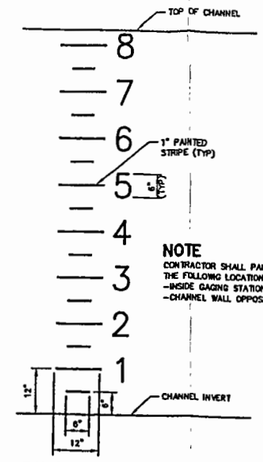



ISOMETRIC VIEW
NO SCALE



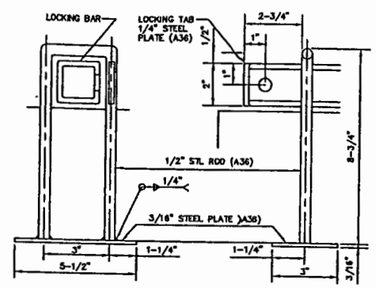

"MAIN" 78+00.00 PLAN
SCALE: 3/8" = 1'-0"

CONSTRUCTION NOTE:
① END FOOTING EXTENSION AT MONITORING STATION WALL (TYP.)

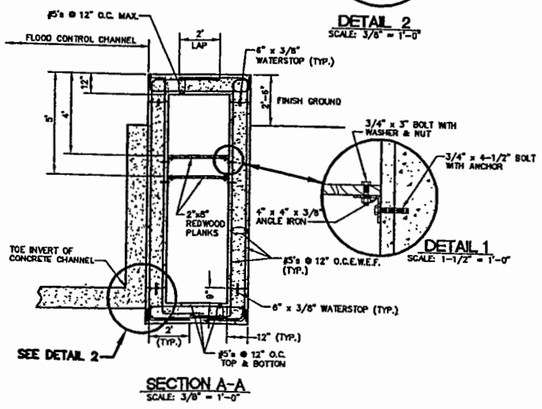



NOTE
CONTRACTOR SHALL PAINT STAFF GAGE IN THE FOLLOWING LOCATIONS:
-INSIDE GAGING STATION VAULT
-CHANNEL WALL OPPOSITE GAGING STATION

PAINTED STAFF GAGE DETAIL
NO SCALE




LOCKING BAR GUIDE
NO SCALE

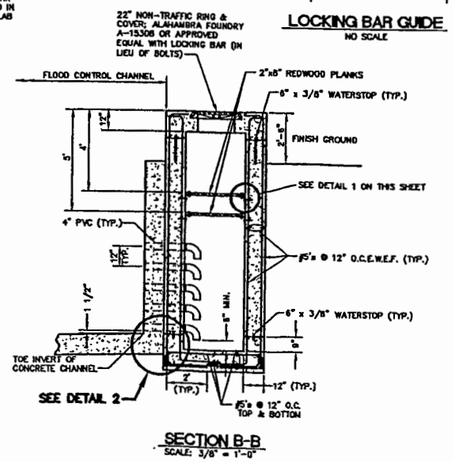



SECTION A-A
SCALE: 3/8" = 1'-0"

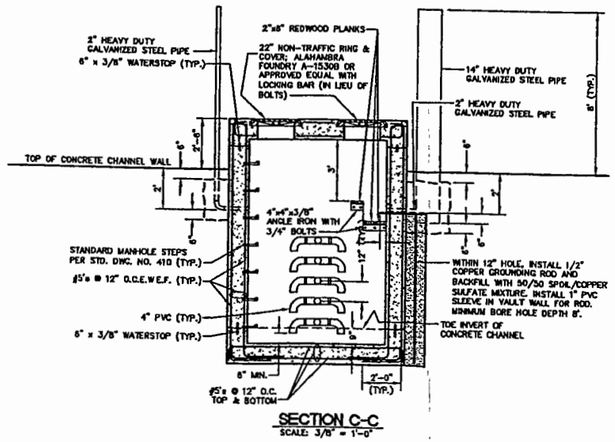



DETAIL 2
SCALE: 3/8" = 1'-0"

DETAIL 1
SCALE: 1-1/2" = 1'-0"




SECTION B-B
SCALE: 3/8" = 1'-0"




SECTION C-C
SCALE: 3/8" = 1'-0"

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Not for Construction
Subject to Revision
03/20/06

DUCK CREEK CHANNEL - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

| REV No | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 8 | | | |
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| 1 | | | |

CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

## FLOOD CONTROL MONITORING STATION DETAILS AT "MAIN" STA: 78+00.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

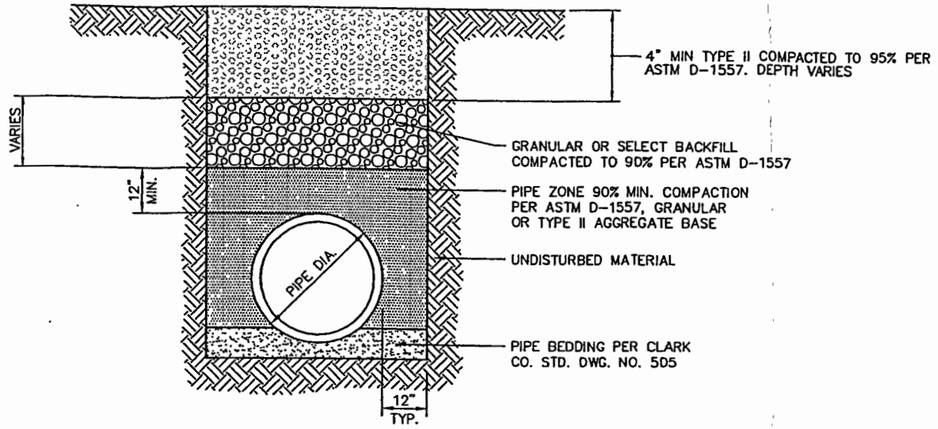
I:\6011\DWG\DESIGN\DETAILS\6011-DET-D-01.DWG (TAB=D-01)

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE: | 03/30/06 |

VTN nevada
ENGINEERING CHANGES • PLANNING • LAND SURVEYING
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5940
PHONE (702) 873-7866 FAX (702) 873-8347

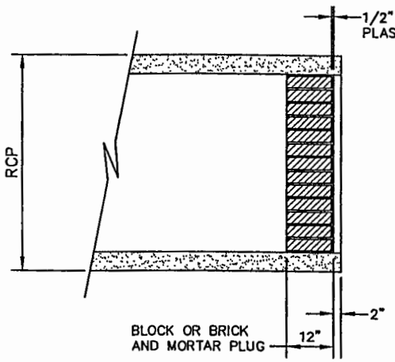
| | |
|---|---|
| SCALE | |
| HORIZ: | AS NOTED |
| VERT: | AS NOTED |
| FIELD BOOK | NONE |

SHEET No
D-01
L-1796



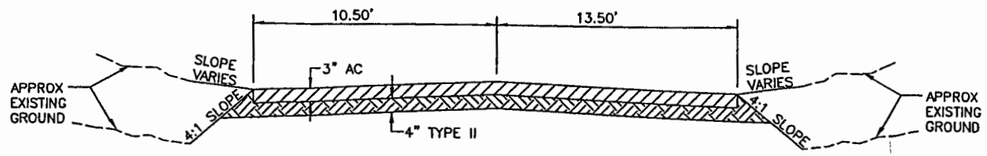

## TYPICAL RCP TRENCH DETAIL

NO SCALE




## BRICK AND MORTAR RCB / RCP PLUG

N.T.S.




## PYLE AVENUE TYPICAL SECTION

NO SCALE

FINAL SUBMITTAL
Not for Construction
Subject to Revision
03/20/06

I:\6011\DWG\DESIGN\DETAILS\6011-DET-D-01.DWG (TAB=D-02)

| REV No | DATE | DESCRIPTION | APPROVED |
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CLARK COUNTY NEVADA

# DUCK CREEK CHANNEL PHASE II - LAS VEGAS BLVD. TO SILVERADO RANCH BLVD.

MISCELLANEOUS DETAILS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER-STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/07
CIVIL
No. 9177

vtn nevada
CONSULTING ENGINEERS PLANNERS LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148
PHONE (702) 932-7566 FAX (702) 365-3647

| | |
|---|---|
| DESIGNED BY: | JNG |
| DRAWN BY: | BKP |
| CHECKED BY: | KDG |
| DATE. | 03/30/06 |

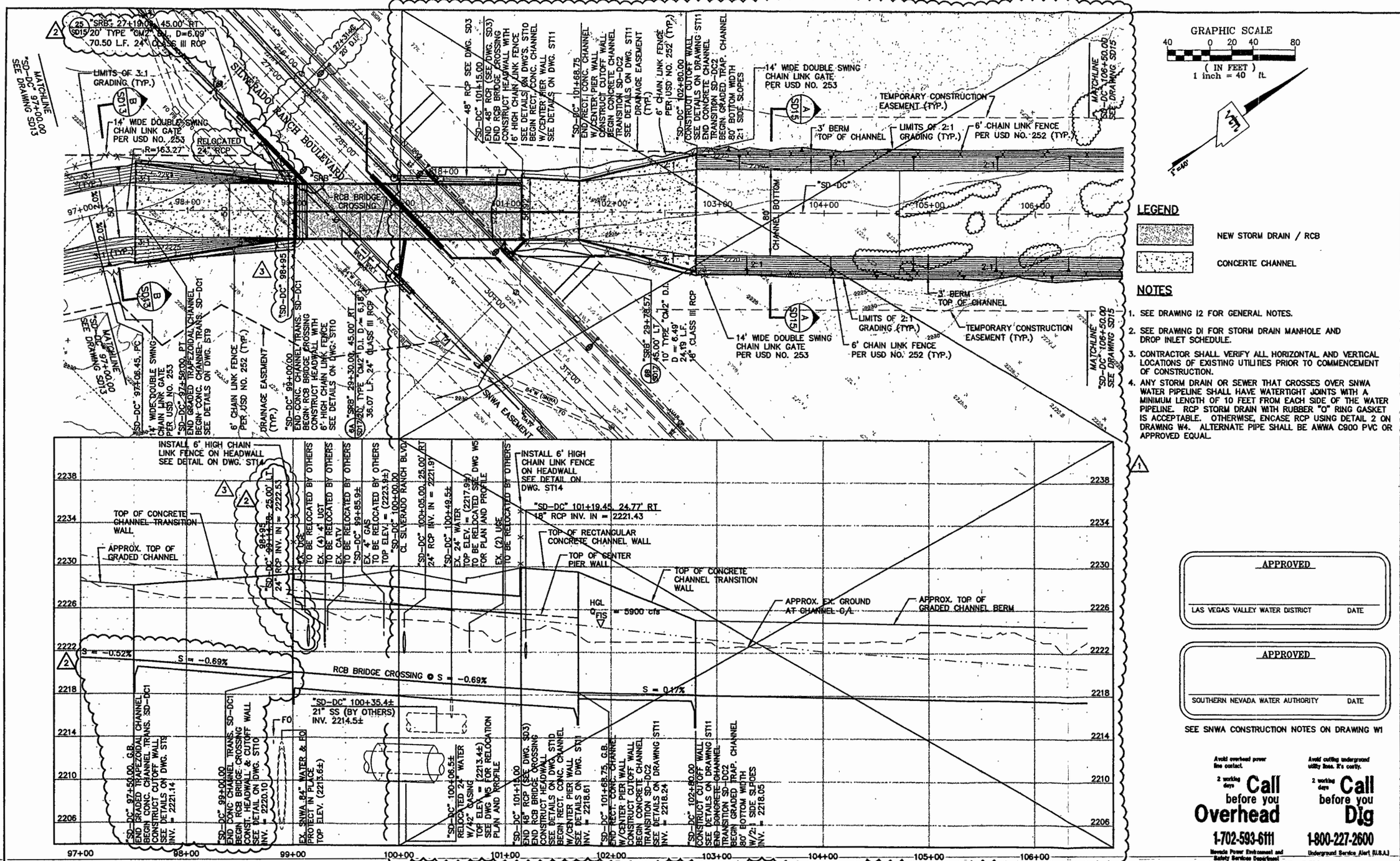
| | |
|---|---|
| SCALE | |
| HORIZ. | AS NOTED |
| VERT. | AS NOTED |
| FIELD BOOK | NONE |

SHEET No **D-02**

L-1796

# FOR REFERENCE ONLY

## DUCK CREEK CHANNEL PLANS – SILVERADO RANCH BLVD TO LDCDB PLANS




GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

## LEGEND

- NEW STORM DRAIN / RCB
- CONCERTE CHANNEL

## NOTES

1. SEE DRAWING I2 FOR GENERAL NOTES.
2. SEE DRAWING DI FOR STORM DRAIN MANHOLE AND DROP INLET SCHEDULE.
3. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ANY STORM DRAIN OR SEWER THAT CROSSES OVER SNWA WATER PIPELINE SHALL HAVE WATERTIGHT JOINTS WITH A MINIMUM LENGTH OF 10 FEET FROM EACH SIDE OF THE WATER PIPELINE. RCP STORM DRAIN WITH RUBBER "O" RING GASKET IS ACCEPTABLE. OTHERWISE, ENCASE RCP USING DETAIL 2 ON DRAWING W4. ALTERNATE PIPE SHALL BE AWWA C900 PVC OR APPROVED EQUAL.

APPROVED
LAS VEGAS VALLEY WATER DISTRICT DATE

APPROVED
SOUTHERN NEVADA WATER AUTHORITY DATE

SEE SNWA CONSTRUCTION NOTES ON DRAWING W1

Avoid overhead power line contact. 2 working days **Call before you Overhead** 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly. 2 working days **Call before you Dig** 1-800-227-2600 Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | 8-8-03 | DELETED INTERIM CHANNEL | KDG |
| 2 | 9/9/03 | ADDED DROP INLET, REVISED CHANNEL SLOPE & G.B. | KDG |
| 3 | 12/2005 | RECORD DRAWING INFORMATION AS PROVIDED BY SOUTHERN NEVADA PAVING | |

CLARK COUNTY NEVADA

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.
## DUCK CREEK CHANNEL PLAN AND PROFILE
## "SD-DC" 97+00.00 TO "SD-DC" 106+50.00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH CLARK COUNTY PUBLIC WORKS. THE DOCUMENTS WERE SEALED ON 04/30/03 BY KEN D. GILBRETH UNDER LICENSE NO. 9177

| | | | |
|---|---|---|---|
| PROJECT No: | 5846 | DRAWN BY: | TMM |
| DESIGNED BY: | LM | CHECKED BY: | KDG |
| APPROVED BY | KDG | | |

vtn nevada — CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 S. RAINBOW BLVD. LAS VEGAS, NEVADA 89102 PHONE (702) 873-7550 FAX (702) 362-2597

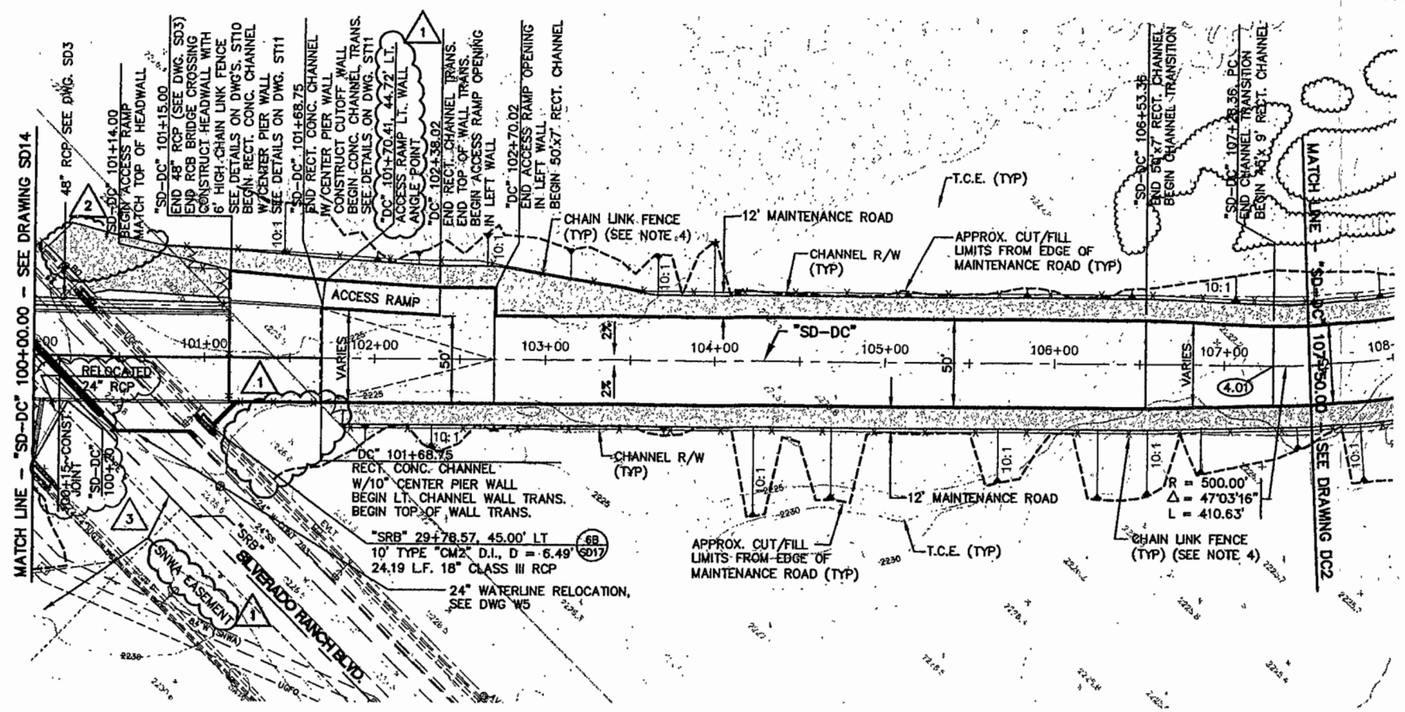
SCALE
HORIZ: 1"=40'
VERT: 1"=4'
FIELD BOOK

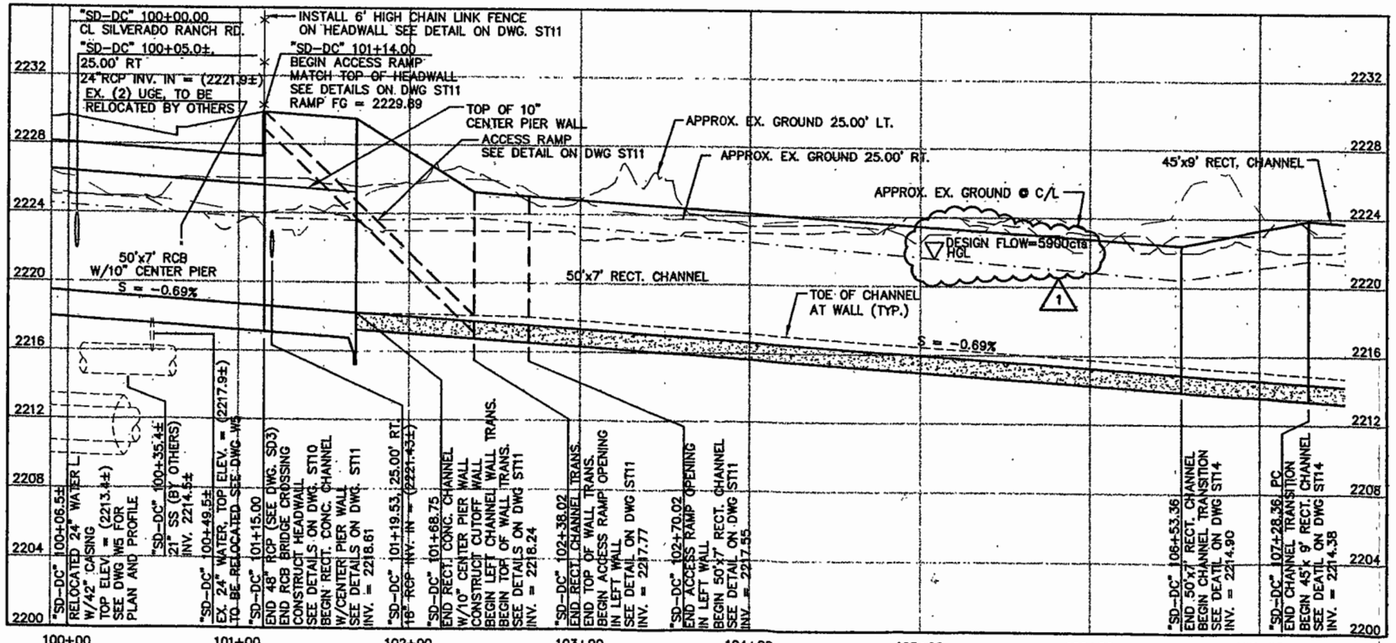
L-1704
DRAWING NO. SD14
SHT. OF

I:\CAD\PUBWRK\5846\5846-SD-DC-ALT1.DWG

SILVERADO RANCH BLVD. IMPROVEMENTS - LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR - DECEMBER 2005




GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

NORTH

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY GRADING EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

### CHANNEL CENTERLINE CONTROL POINT DATA

| POINT NO. | NORTHING | EASTING | DESCRIPTION |
|---|---|---|---|
| (4.01) | 26712137.29 | 780246.32 | PC |

## NOTES

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION & EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO DRAWINGS ST1 – ST18.
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO DRAWINGS X1 – X3.
4. FOR FENCING, GATING AND SIGNAGE PLAN REFER TO DRAWINGS F1 – F2.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.

APPROVED

LAS VEGAS VALLEY WATER DISTRICT DATE

Avoid overhead power line contact.
2 working days **Call before you Overhead** 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly.
2 working days **Call before you Dig** 1-800-227-2600 Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 3 | 6/25/03 | CHANGED HGL, MAINTENANCE RD, STA. SPELLING | KDG |
| 2 | 9/8/03 | REVISED MAINTENANCE RD. | KDG |
| 1 | 12/2005 | RECORD DRAWING INFORMATION AS PROVIDED BY SOUTHERN NEVADA PAVING | |

CLARK COUNTY NEVADA

# SILVERADO RANCH BLVD. – LAS VEGAS BLVD TO EASTERN AVE.
## DUCK CREEK CHANNEL PLAN & PROFILE
## "SD-DC" 100+00.00 to "SD-DC" 107+50.00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH CLARK COUNTY PUBLIC WORKS THE DOCUMENTS WERE SEALED ON 06/19/03 BY KEN D. GILBRETH UNDER LICENSE NO. 9177

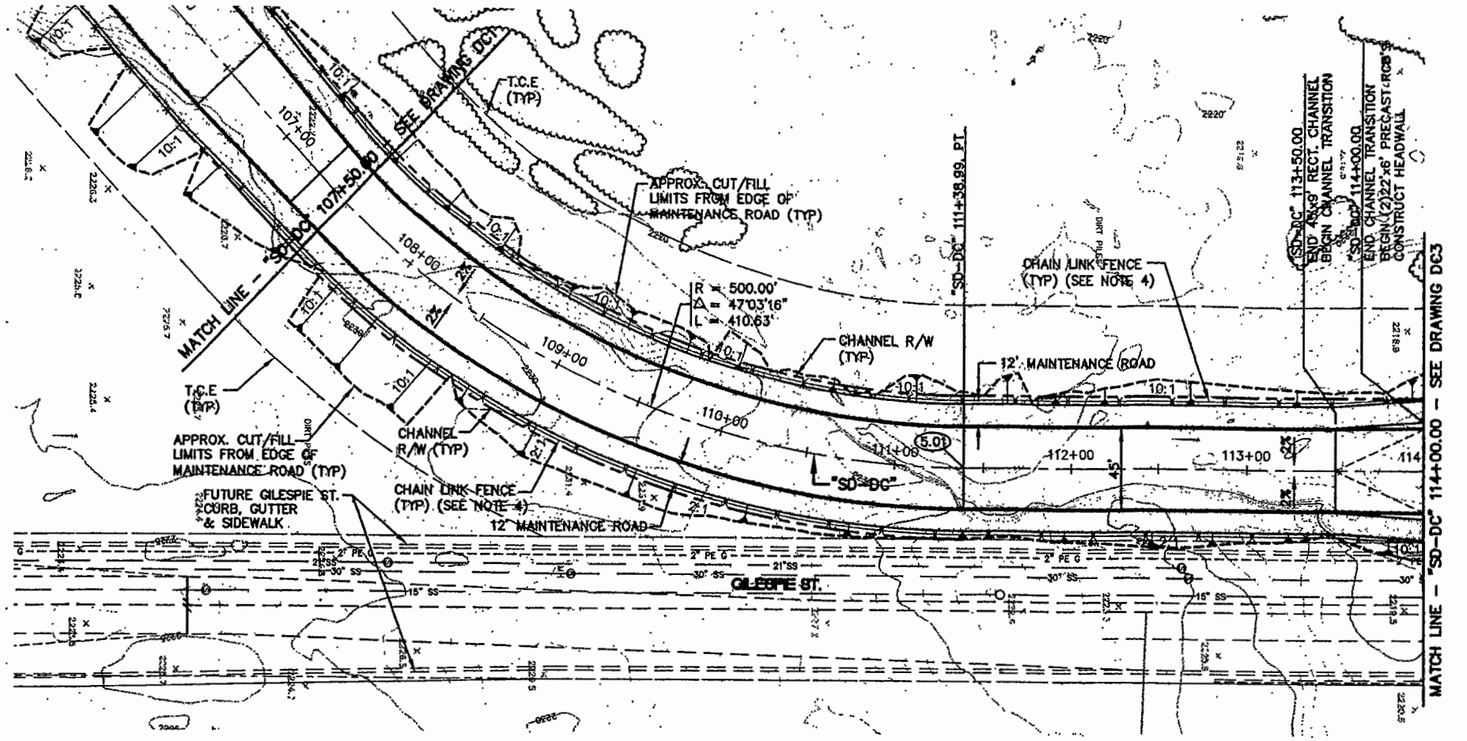

vtn nevada
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2727 S. RAINBOW BLVD. LAS VEGAS, NEVADA 89102 PHONE (702) 873-7550 FAX (702) 362-2597

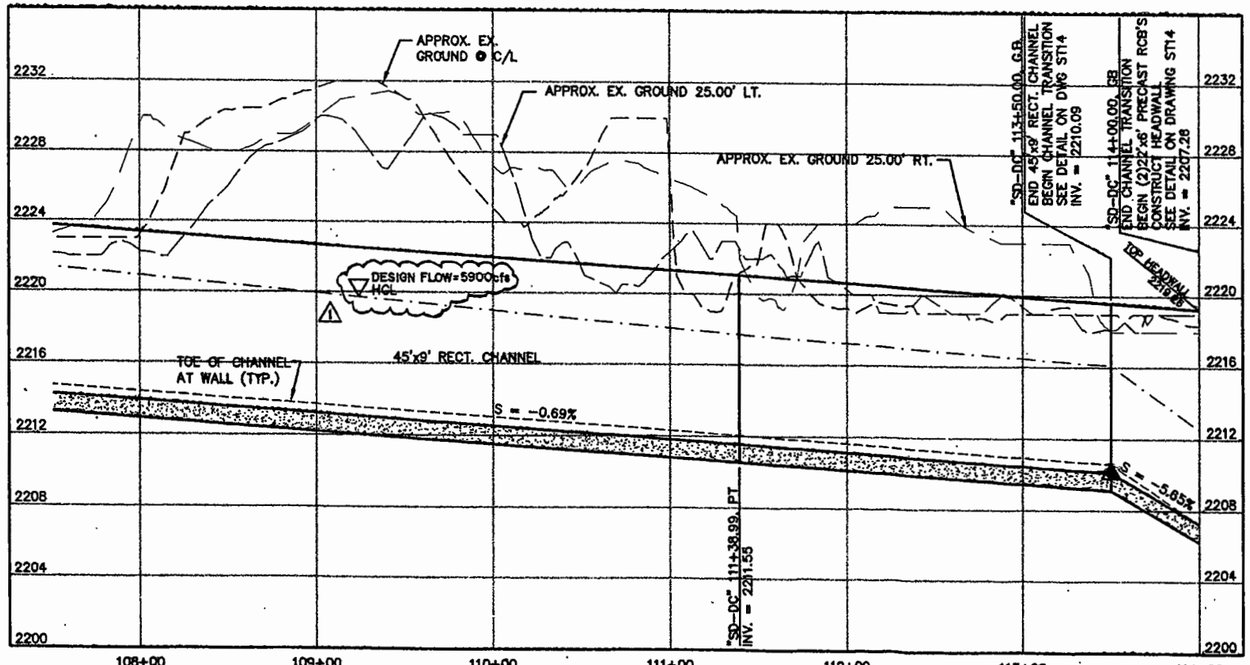

| | |
|---|---|
| PROJECT No: | 5846 |
| DESIGNED BY: | JNG |
| APPROVED BY | KDG |
| DRAWN BY: | TMM |
| CHECKED BY: | JNG |
| SCALE | |
| HORIZ: 1"=40' | |
| VERT: 1"=4' | |
| FIELD BOOK | |
| | L-1704 |
| DRAWING NO. | DC1 |
| SHT. | OF |

SILVERADO RANCH BLVD. IMPROVEMENTS – LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR – DECEMBER 2005

I:\6011\DWG\DESIGN\6011-5846-PP.DWG (VIEWS = "E" & "PRF-E")




GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

NORTH

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY GRADING EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD

### CHANNEL CENTERLINE CONTROL POINT DATA

| POINT NO. | NORTHING | EASTING | DESCRIPTION |
|---|---|---|---|
| (5.01) | 2671250.96 | 780404.14 | PT |

## NOTES

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION & EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO DRAWINGS ST1 – ST18.
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO DRAWINGS X1 – X3.
4. FOR FENCING, GATING AND SIGNAGE PLAN REFER TO DRAWINGS F1 – F2.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.


Avoid overhead power line contact.
2 working days Call before you Overhead
1-702-593-6111
Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly.
2 working days Call before you Dig
1-800-227-2600
Underground Service Alert (U.S.A.)


| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 1 | 6.25.03 | CHANGED HGL & SPELLING | KDG |

CLARK COUNTY NEVADA

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.
## DUCK CREEK CHANNEL PLAN & PROFILE
## "SD-DC" 107+50.00 to "SD-DC" 114+00.00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER STATE OF NEVADA
KEN D. GILBRETH
EXP. 06/30/05
CIVIL
No. 9177

| | | | |
|---|---|---|---|
| PROJECT No: | 5846 | DRAWN BY: | TMM |
| DESIGNED BY: | JNG | CHECKED BY: | JNG |
| APPROVED BY | KDG | | |

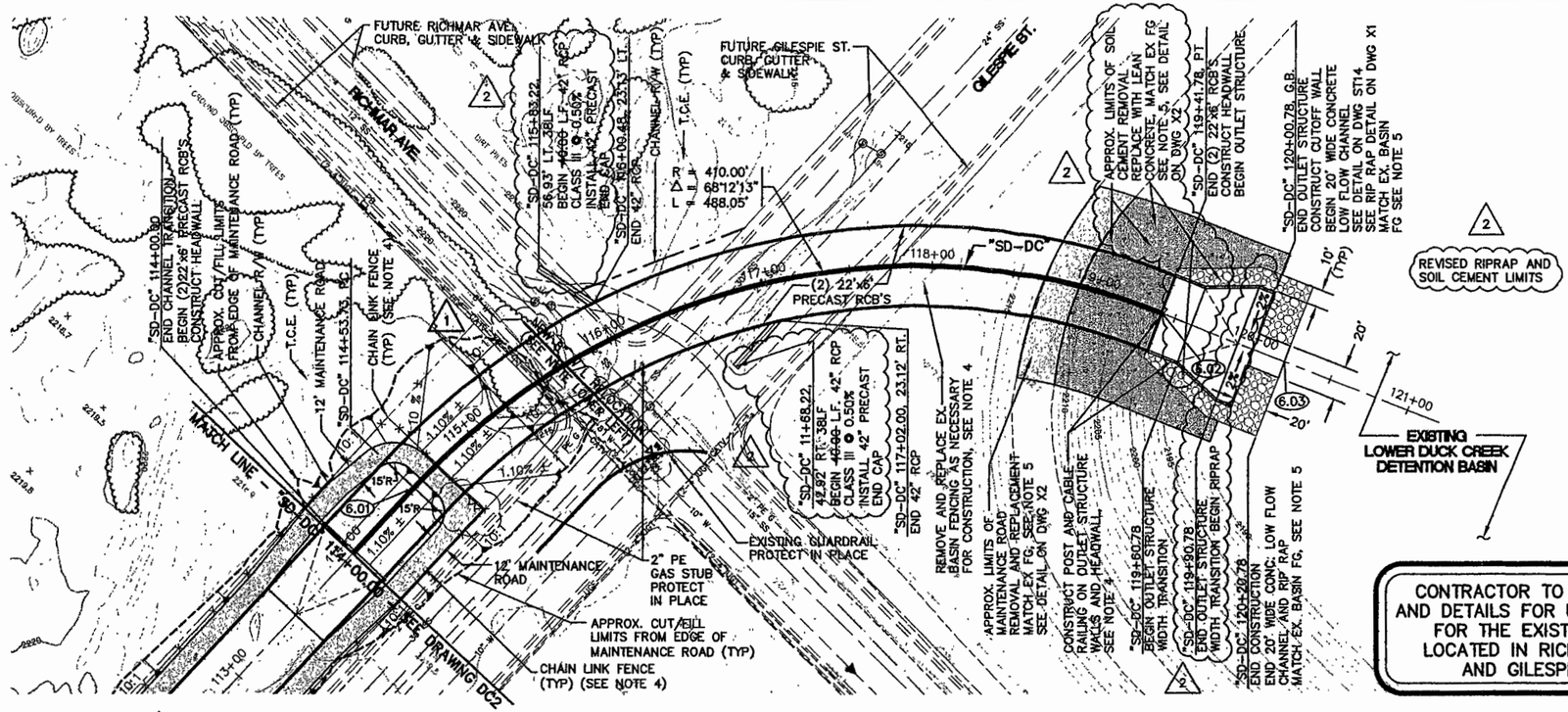
VTN nevada
• CONSULTING ENGINEERS
• PLANNERS
• LAND SURVEYORS
2727 S. RAINBOW BLVD.
LAS VEGAS, NEVADA 89102
PHONE (702) 873-7550
FAX (702) 362-2597

| | |
|---|---|
| SCALE | |
| HORIZ: 1"=40' | L-1704 |
| VERT: 1"=4' | DRAWING NO. |
| FIELD BOOK | DC2 |
| | SHT. 112 OF 157 |

SILVERADO RANCH BLVD. IMPROVEMENTS – LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR – DECEMBER 2005

I:\6011\DWG\DESIGN\6011-5846-PP.DWG (VIEWS = "F" & "PRF-F")




GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

NORTH

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED TEMPORARY GRADING EASEMENT
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED MAINTENANCE ROAD
- PROPOSED LEAN CONCRETE
- PROPOSED RIPRAP

CONTRACTOR TO SUBMIT PLANS AND DETAILS FOR UTILITIY SUPPORT FOR THE EXISTING UTILITIES LOCATED IN RICHMAR AVENUE AND GILESPIE STREET

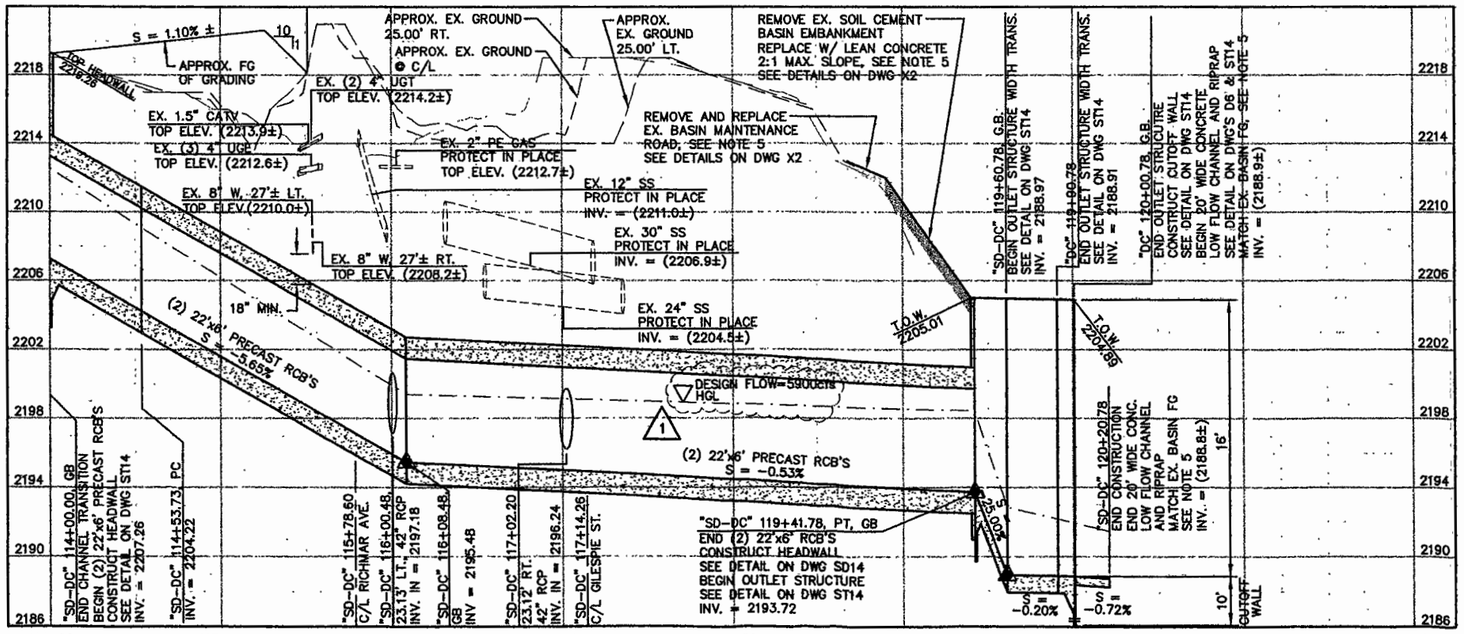
### CHANNEL CENTERLINE CONTROL POINT DATA

| POINT NO. | NORTHING | EASTING | DESCRIPTION |
|---|---|---|---|
| 6.01 | 26712818.89 | 780402.82 | PC |
| 6.02 | 26713200.46 | 780658.99 | PT |
| 6.03 | 26713230.09 | 780732.22 | MATCH EX. |

## NOTES

1. CONTRACTOR SHALL VERIFY ALL HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. FOR CHANNEL CONSTRUCTION & EXPANSION JOINTS, WALL DRAIN AND STRUCTURAL DETAILS REFER TO DRAWINGS ST1 – ST18.
3. FOR TYPICAL EXCAVATION CROSS SECTIONS REFER TO DRAWINGS X1 – X3.
4. FOR FENCING, GATING AND SIGNAGE PLAN REFER TO DRAWINGS F1 – F2.
5. CONTRACTOR SHALL VERIFY EXISTING INVERTS AND EXISTING FINISH GRADE OF MATCH POINTS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO SUBMIT PLANS AND DETAILS TO THE CLARK COUNTY RECLAMATION DISTRICT FOR REVIEW AND APPROVAL FOR SUPPORT OF THE EXISTING 12", 24" AND 30" SS IN RICHMAR AND GILLESPIE PRIOR TO CONSTRUCTION OF THE RCB'S.

NOTE:
FOR NEW 8" WATER LINE RELOCATION SEE DWG W6




Avoid overhead power line contact.
2 working days **Call before you Overhead** 1-702-593-6111
Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly.
2 working days **Call before you Dig** 1-800-227-2600
Underground Service Alert (USA)

APPROVED

LAS VEGAS VALLEY WATER DISTRICT DATE

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| 2 | 12/2005 | RECORD DRAWING INFORMATION AS PROVIDED BY SOUTHERN NEVADA PAVING | |
| 1 | 6.25.03 | CHANGED GATE LOCATION, HGL, ADDED NEW 8" WATER LINE RELOCATION & FIXED SPELLING | |

CLARK COUNTY NEVADA

# SILVERADO RANCH BLVD. – LAS VEGAS BLVD TO EASTERN AVE.
## DUCK CREEK CHANNEL PLAN & PROFILE
## "SD-DC" 114+00.00 to "SD-DC" 122+20.78
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

ORIGINAL CONSTRUCTION DRAWINGS ARE ON FILE WITH CLARK COUNTY PUBLIC WORKS
THE DOCUMENTS WERE SEALED ON: 06/05/03
BY KEN D. GILBRETH UNDER LICENSE NO. 9177

vtn nevada
• CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 S. RAINBOW BLVD. LAS VEGAS, NEVADA 89102
PHONE (702) 873-7550 FAX (702) 362-2567

PROJECT No: 5846 DRAWN BY: TMM
DESIGNED BY: JNG CHECKED BY: JNG
APPROVED BY: KDG
FIELD BOOK

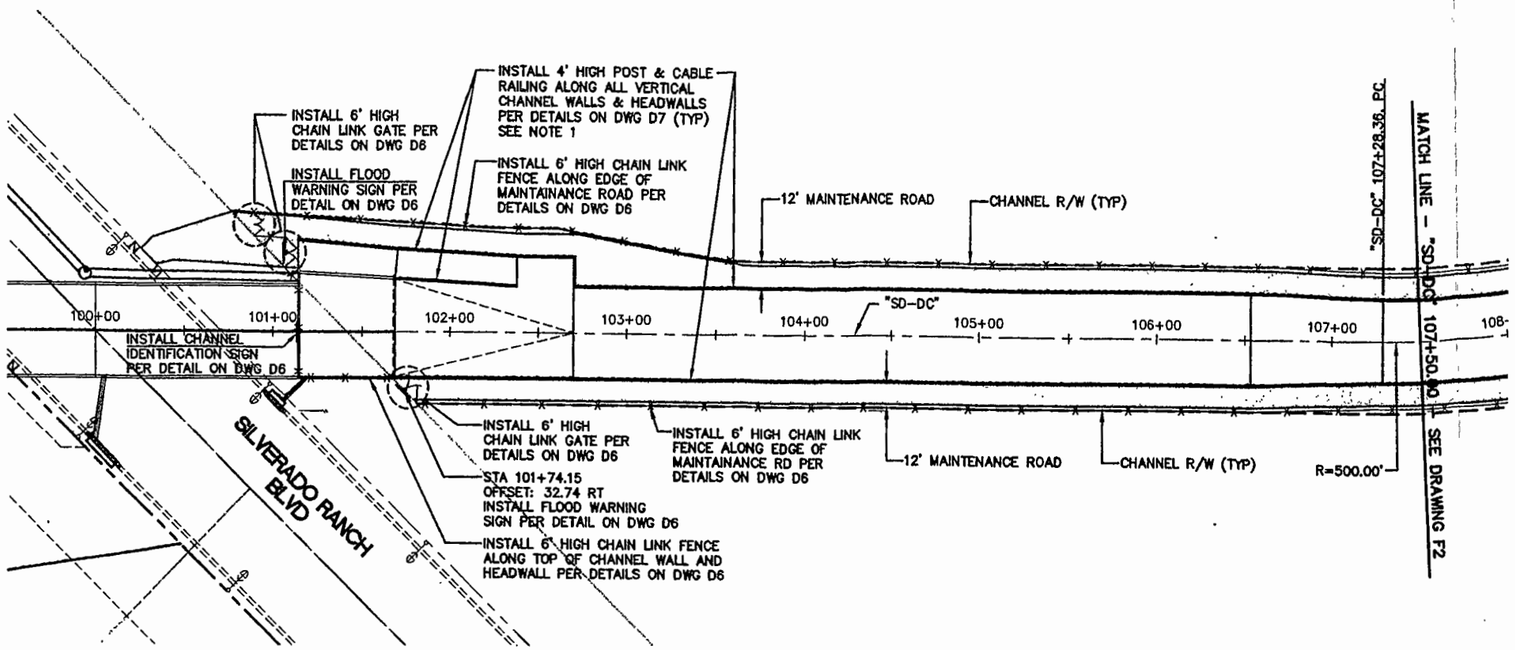
SCALE
HORIZ: 1"=40'
VERT: 1"=4'

L-1704
DRAWING NO. DC3
SHT. OF

SILVERADO RANCH BLVD. IMPROVEMENTS – LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR – DECEMBER 2005

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NORTH

GRAPHIC SCALE

40 0 20 40 80

( IN FEET )

1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED RIPRAP
- PROPOSED MAINTENANCE ROAD

## NOTE:

1. INSTALL CHANNEL LADDER STEPS & ACCESS OPENINGS PER DETAILS & SCHEDULE ON DWG D8.

SILVERADO RANCH BLVD. IMPROVEMENTS - LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR - DECEMBER, 2005

I:\CAD\PUBWRK\5846\6011-5846-FENCE.DWG (VIEWS = "D" & "E")

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|
| | | | |

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.

## FENCE, GATE & SIGN PLAN

## "SD-DC" 100+00.00 to "SD-DC" 107+50.00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

KEN D. GILBRETH EXP 06/30/06 CIVIL No. 9177 STATE OF NEVADA PROFESSIONAL ENGINEER 12-24-03

PROJECT No: 5846 DRAWN BY: DRF
DESIGNED BY: TMM CHECKED BY: JNG
APPROVED BY: KDG

VTN nevada
- CONSULTING ENGINEERS
- PLANNERS
- LAND SURVEYORS

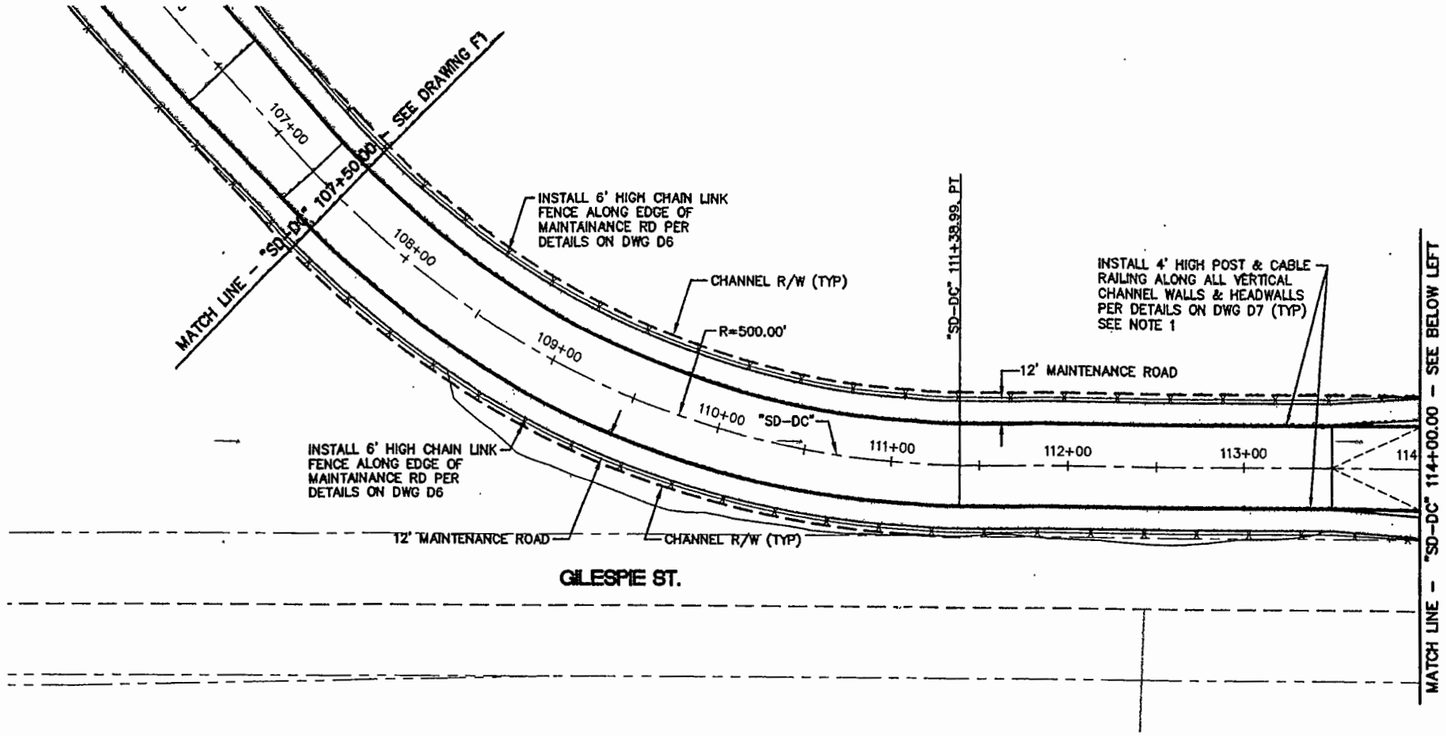
2727 S. RAINBOW BLVD. LAS VEGAS, NEVADA 89102 PHONE (702) 873-7550 FAX (702) 362-2587

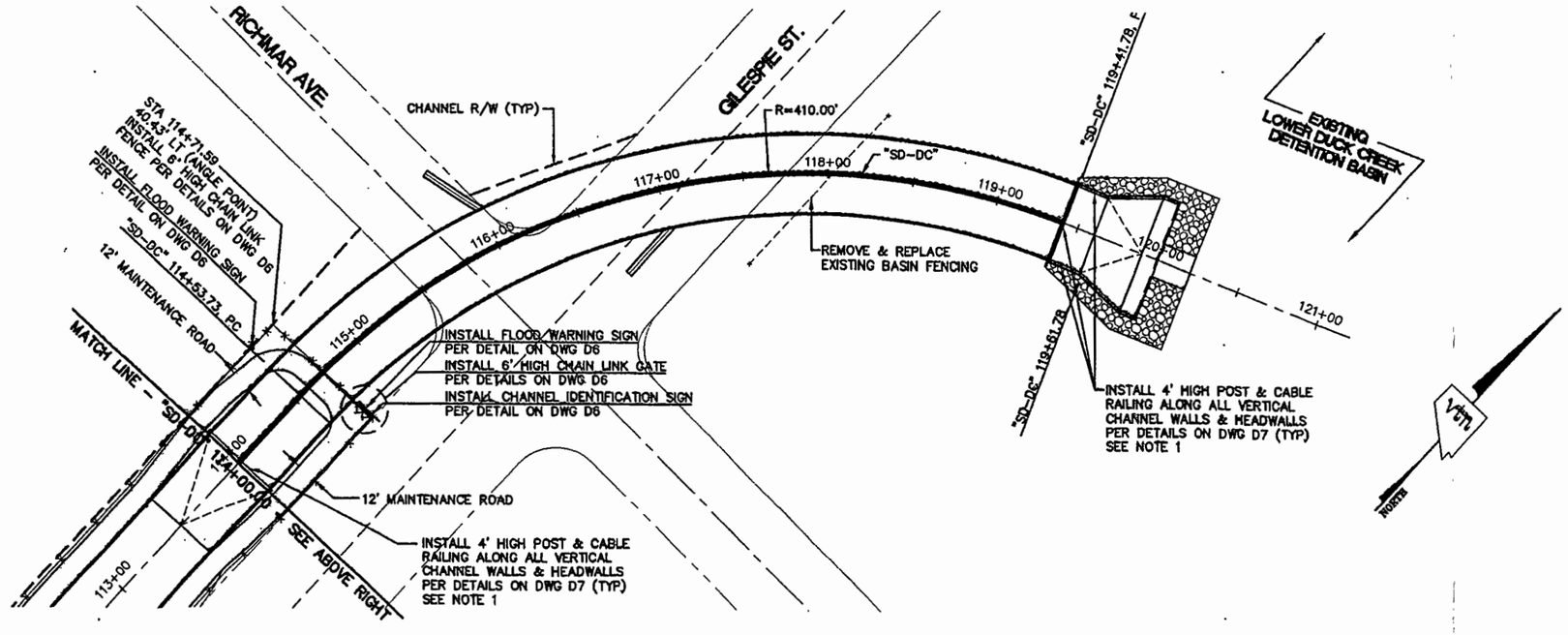
SCALE
HORIZ: 1"=40'
VERT:
FIELD BOOK

L-1704
DRAWING NO. F1
SHT. 114 OF 157

Avoid overhead power line contact. 2 working days Call before you Overhead 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly. 2 working days Call before you Dig 1-800-227-2600 Underground Service Alert (U.S.A.)




NORTH

GRAPHIC SCALE
40 0 20 40 80
( IN FEET )
1 inch = 40 ft.

## LEGEND

- PROPOSED RIGHT-OF-WAY
- PROPOSED FENCE LINE
- PROPOSED DOUBLE SWING GATE
- PROPOSED RIPRAP
- PROPOSED MAINTENANCE ROAD

**NOTE:**

1. INSTALL CHANNEL LADDER STEPS & ACCESS OPENINGS PER DETAILS & SCHEDULE ON DWG D8.

SILVERADO RANCH BLVD. IMPROVEMENTS — LAS VEGAS BLVD TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR - DECEMBER 2005

Avoid overhead power line contact. 2 working days **Call before you Overhead** 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly. 2 working days **Call before you Dig** 1-800-227-2600 Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.

## FENCE, GATE & SIGN PLAN

## "SD-DC" 107+50.00 to "SD-DC" 122+00.00

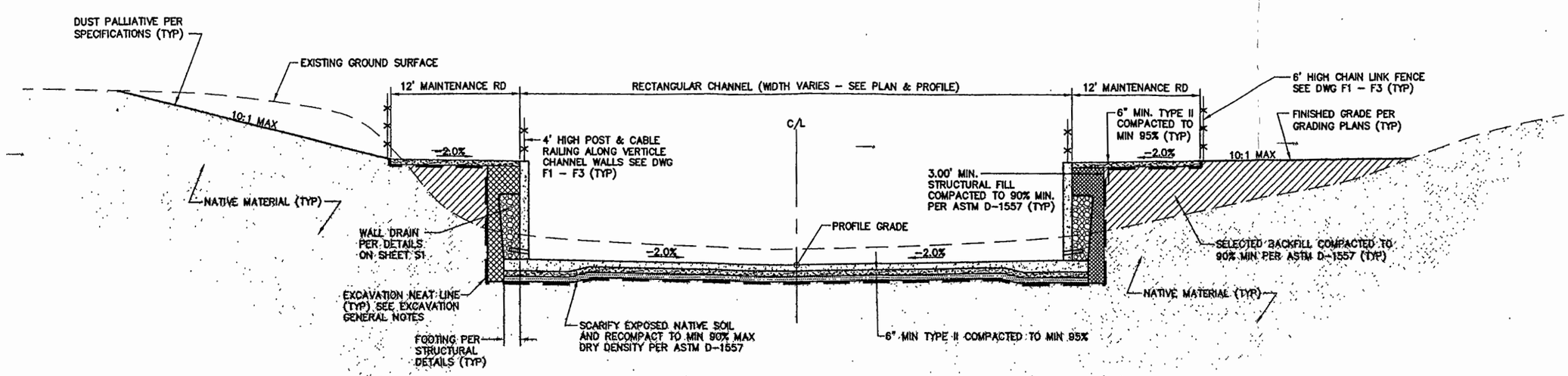
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

KEN D. GILBRETH EXP 06/30/06 CIVIL No. 9177 STATE OF NEVADA

| | | | |
|---|---|---|---|
| PROJECT No: 5846 | DRAWN BY: DRF | SCALE | L-1704 |
| DESIGNED BY: TMM | CHECKED BY: JNG | HORIZ: 1"=40' | |
| APPROVED BY: KDG | | VERT: | DRAWING NO. F2 |
| | | FIELD BOOK | SHT. 115 OF 157 |

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## STA 101+15.00 TO STA 114+00.00
## RECTANGULAR CHANNEL AND TRANSITION STRUCTURE EXCAVATION AND STRUCTURAL FILL SECTION
NO SCALE

### EXCAVATION GENERAL NOTE:

1. EXCAVATION, STRUCTURAL FILL, TYPE II, CLSM FLOWABLE FILL, CLASS I & DRAIN BACK FILL SHALL BE CONSIDERED INCIDENTAL TO THE RECTANGULAR CHANNEL, TRANSITION STRUCTURE, RCB & ACCESS RAMP BID ITEM.

Avoid overhead power line contact. 2 working days Call before you Overhead 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly. 2 working days Call before you Dig 1-800-227-2600 Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.

TYPICAL EXCAVATION SECTION

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

KEN D. GILBRETH EXP: 06/30/09 CIVIL No. 9177 STATE OF NEVADA 6-24-08

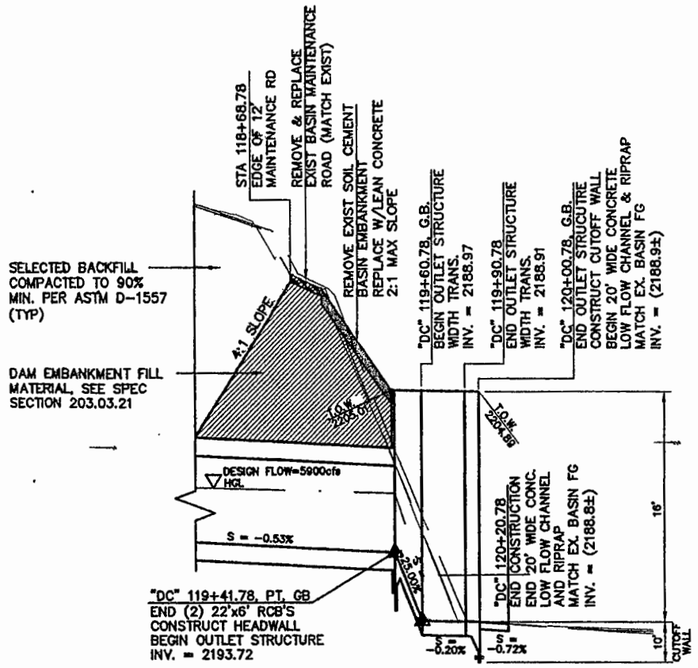
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|---|---|---|---|
| PROJECT No: 5846 | DRAWN BY: DRF | SCALE | L-1704 |
| DESIGNED BY: DWB | CHECKED BY: JNG | HORIZ: | |
| APPROVED BY: KDG | | VERT: | DRAWING NO. X1 |
| | | FIELD BOOK | |

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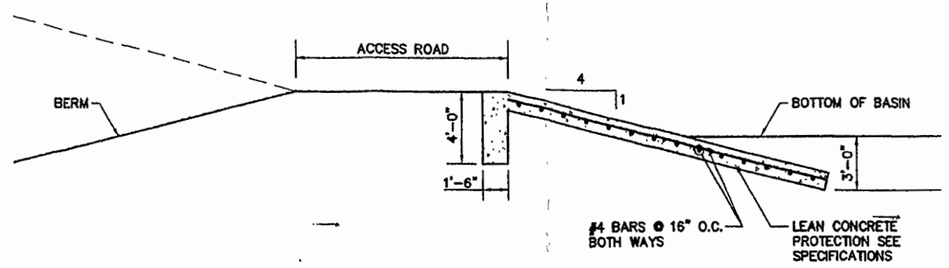
SHT. 116 OF 157

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR – DECEMBER 2005

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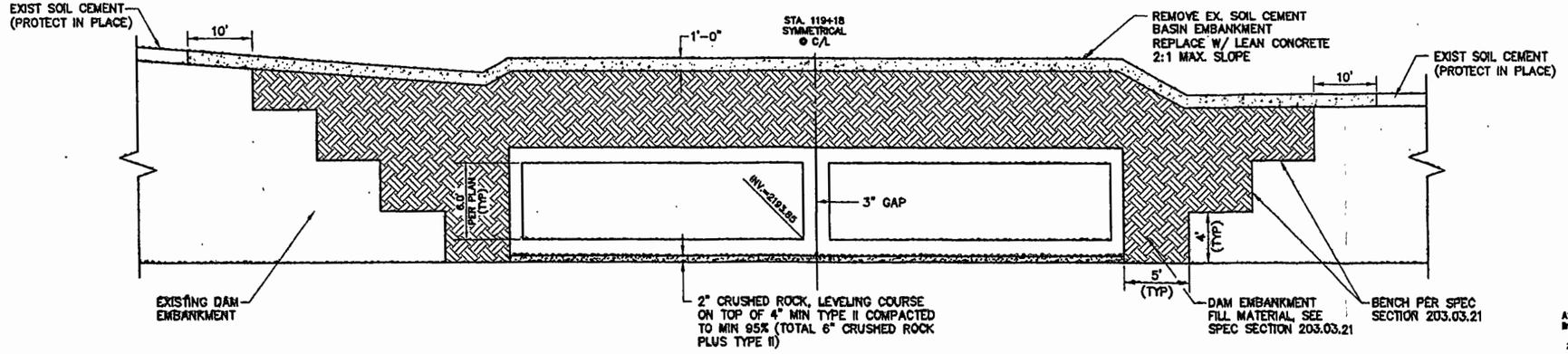



LONGITUDINAL-SECTION AT DAM EMBANKMENT
PRECAST REINFORCED CONCRETE BOX (RCB) SECTION
NO SCALE




NOTE:

PRECAST BOXES SHALL BE CAST WITH LIFTING LUGS OR ANCHORS (LOCATED BY MFR.) LIFTING LUGS OR ANCHORS SHALL BE STARCON SC-52 ANCHORS OR EQUAL.




STA 118+90.08 TO STA 119+41.78
CROSS-SECTION AT DAM EMBANKMENT
PRECAST REINFORCED CONCRETE BOX (RCB) SECTION
NO SCALE

Avoid overhead power line contact. 2 working days **Call before you Overhead** 1-702-593-6111 Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly. 2 working days **Call before you Dig** 1-800-227-2600 Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.

## TYPICAL EXCAVATION SECTIONS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

KEN D. GILBRETH EXP 06/30/09 CIVIL #9177 5-24-05

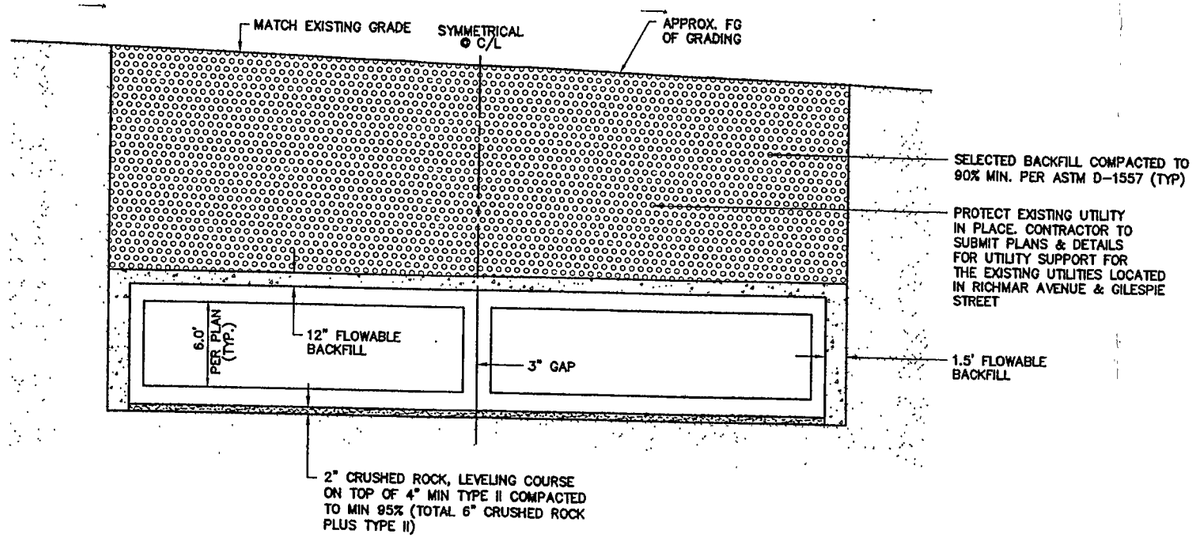
| | | | |
|---|---|---|---|
| PROJECT No: 5846 | DRAWN BY: DRF | SCALE | L-1704 |
| DESIGNED BY: DWB | CHECKED BY: JNG | HORIZ: | |
| APPROVED BY: KDG | | VERT: | DRAWING NO. X2 |
| | | FIELD BOOK | SHT. 117 OF 157 |

VTN nevada • CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 S. RAINBOW BLVD. LAS VEGAS, NEVADA 89102 PHONE (702) 873-7550 FAX (702) 362-2597

L:\CAD\PUBWRK\5846\5846-X2-TYP-XSEC.DWG

SILVERADO RANCH BLVD. IMPROVEMENTS - LAS VEGAS BLVD. TO EASTERN AVENUE

RECORD DRAWINGS INFORMATION SUPPLIED BY CONTRACTOR - DECEMBER 2005




**STA 114+00.00 TO STA 118+90.08**
**PRECAST REINFORCED CONCRETE BOX (RCB) SECTION**
NO SCALE

## EXCAVATION GENERAL NOTE:

1. EXCAVATION, STRUCTURAL FILL, TYPE II, CLSM FLOWABLE FILL, CLASS I & DRAIN BACK FILL SHALL BE CONSIDERED INCIDENTAL TO THE RECTANGULAR CHANNEL, TRANSITION STRUCTURE, RCB & ACCESS RAMP BID ITEM.
2. TRENCH SHORING WILL BE NECESSARY TO PROTECT EXISTING UTILITIES AND TO KEEP EXCAVATION LIMITS WITHIN THE PROJECT RIGHT-OF-WAY. TRENCH SHORING METHODS ARE THE CONTRACTORS RESPONSIBILITY. THE CONTRACTOR SHALL FOLLOW O.S.H.A. SAFETY REGULATION (29CFR, PART 1926, SUB PART P, EXCAVATION)

Avoid overhead power line contact.
2 working days **Call before you Overhead**
1-702-593-6111
Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly.
2 working days **Call before you Dig**
1-800-227-2600
Underground Service Alert (U.S.A.)

| REV. NO. | DATE | DESCRIPTION | APPROVED |
|---|---|---|---|

CLARK COUNTY NEVADA

# SILVERADO RANCH BLVD. - LAS VEGAS BLVD TO EASTERN AVE.

## TYPICAL EXCAVATION SECTIONS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

KEN D. GILBRETH EXP 09/30/03 CIVIL No. 9171 STATE OF NEVADA 6-24-03

| | | | |
|---|---|---|---|
| PROJECT No: 5846 | DRAWN BY: DRF | SCALE | L-1704 |
| DESIGNED BY: DWB | CHECKED BY: JNG | HORIZ: | DRAWING NO. X3 |
| APPROVED BY: KDG | | VERT: | |
| | | FIELD BOOK | SHT. 118 OF 157 |

vtn nevada
• CONSULTING ENGINEERS
• PLANNERS
• LAND SURVEYORS
2727 S. RAINBOW BLVD.
LAS VEGAS, NEVADA 89102
PHONE (702) 873-7550
FAX (702) 362-2597

I:\CAD\PUBWRK\5846\5846-X3-TYP-XSEC.DWG

# FOR REFERENCE ONLY

## CURRENT FEMA FLOOD ZONE MAP

# NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations (BFEs)** shown on this map apply only landward of 0.0° North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be converted to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3181

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

**Base map** information shown on this FIRM was provided in digital format by Clark County Regional Flood Control District. This information was converted using Orthophotography, dated 1998 or newer, and GBF/DIME data. Segments were digitized off of the orthophotography based on center of pavement.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the FEMA Map Service Center at the following phone numbers and internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

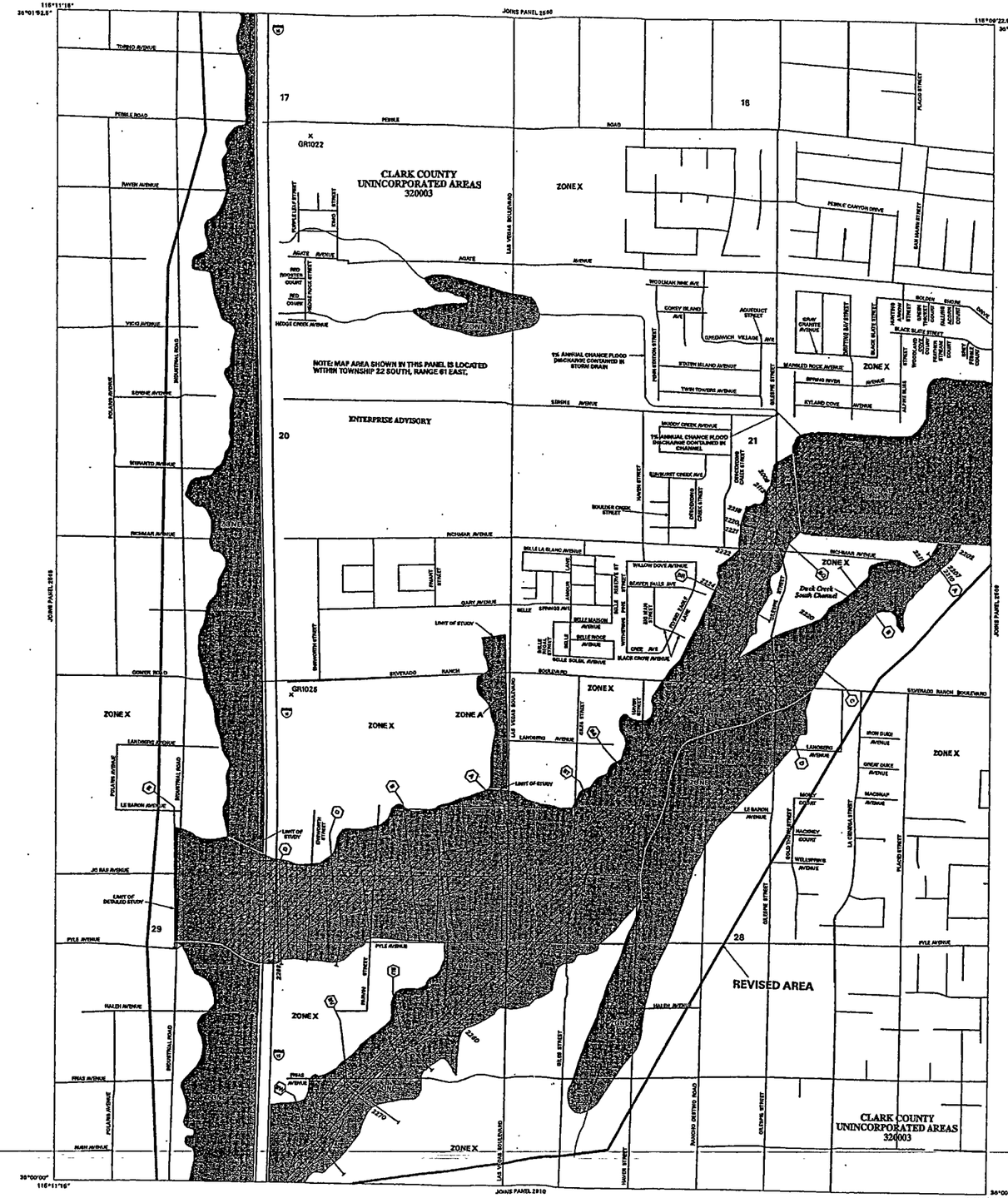
If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

This Digital Flood Insurance Rate Map (DFIRM) was produced through a unique partnership between Clark County and the Federal Emergency Management Agency (FEMA). Clark County has developed a long-term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the Clark County commitment to share and maintain floodplain layers within their Geographic Information System Management Office (GISMO).

This DFIRM reflects several innovative features. These include:
- Southern Nevada GIS – Cooperation among local governmental agencies throughout Clark County. The foundation of cooperation is the GIS Interlocal Agreements formed between fourteen regional participants. In part, the agreements specify that the Clark County GIS Management Office (GISMO) will be responsible for maintaining a GIS data warehouse and associated Southern Nevada GIS Metadata.
- The GISMO's responsibilities go beyond maintaining the GIS data warehouse. GISMO also maintains the Street Centerline Database used by 911 dispatch services. The centerline database serves as the base map for this DFIRM.

DIGITAL DATA AVAILABILITY: http://www.co.clark.nv.us/cosh/gismo/gismo.htm




## LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A — No base flood elevations determined.
- ZONE AE — Base flood elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
- ZONE A99 — Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A) — (A) — Cross Section Line
- (23) — (23) — Transect Line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000m — 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT — 6000-foot grid ticks
- DX5510× — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- e M1.5 — River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 16, 1999

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

September 27, 2002: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to incorporate previously issued Letters of Map Revision, to add roads and road names, to incorporate previously issued letters of map revision, to incorporate previously issued letters of map amendment, and to change floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2568E

# FIRM
## FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA
AND INCORPORATED AREAS

**PANEL 2568 OF 4090**

SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2568 | E |

AUG 13 2003

Notice to Users: 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
32003C2568E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

# FOR REFERENCE ONLY

# CCRFCD MPU FACILITIES MAP

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

# 2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

## LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- Dike
- Natural Wash
- ID-Mile Separator

N
W E
S

0 1,000 2,000 3,000 4,000 5,000
Feet

SCALE: 1 inch = 3000 feet

US95 I-15 I-215

| | | | | |
|---|---|---|---|---|
| 1 | 2 | | | |
| 3 | 4 | 5 | 6 | |
| 7 | 8 | 9 | 10 | |
| 11 | 12 | 13 | 14 | |
| 15 | 16 | 17 | 18 | |
| 19 | 20 | 21 | 22 | |
| 23 | 24 | 25 | 26 | |
| 27 | 28 | 29 | | |

FLOOD CONTROL FACILITIES
FIGURE F-20

PBS&J

G.C. WALLACE, INC.

| ID / River Mile | Status | Facility Description | Length (ft.) | Flow (cfs) | HEC-1 Node | HEC-1 Model | Tributary Area (sq.mi.) | Channel Slope (%) |
|---|---|---|---|---|---|---|---|---|
| BD01 | | BLUE DIAMOND CHANNEL 01 | | | | | | |
| 0000 | E | Natural Wash | 805 | 632 | CDLD415 | DUCK3 | 2.04 | |
| 0000 | P1 | Gablon Chnl 15'W 5.5'D 2:1 SS | 805 | 632 | CDLD415 | DUCK3 | 2.04 | 0.50 |
| 0010 | E | 3: 10' X 5' RCBC @ Las Vegas Blvd | 50 | 632 | CDLD415 | DUCK3 | 2.04 | 1.60 |
| 0012 | E | Natural Wash | 2400 | 632 | CDLD415 | DUCK3 | 2.04 | |
| 0012 | P1 | Conc Chnl 15'W 4.0'D 2:1 SS | 2400 | 632 | CDLD415 | DUCK3 | 2.04 | 1.30 |
| 0060 | E | 3: 12' X 4' RCBC @ I-15 | 180 | 631 | CDLD070 | DUCK3 | 1.88 | 1.30 |
| 0061 | E | Natural Wash | 890 | 631 | CDLD070 | DUCK3 | 1.88 | |
| 0061 | P1 | Conc Chnl 15'W 4.0'D 2:1 SS | 890 | 631 | CDLD070 | DUCK3 | 1.88 | 1.20 |
| 0072 | P1 | 2: 6' X 6' RCBC @ Industrial | 60 | 631 | CDLD070 | DUCK3 | 1.88 | 1.80 |
| BD02 | | BLUE DIAMOND CHANNEL 02 | | | | | | |
| 0000 | E | 3: 8' X 8' RCB | 290 | 1767 | CDLD185 | DUCK3 | 4.36 | 1.10 |
| 0008 | E | 3: 96" CIPCP | 1160 | 1767 | CDLD185 | DUCK3 | 4.36 | 1.10 |
| 0026 | E | 2: 78" CIPCP | 1440 | 784 | CDLD180 | DUCK3 | 2.61 | 1.10 |
| 0059 | E | 2: 10' X 6' RCBC @ Las Vegas Blvd | 80 | 784 | CDLD180 | DUCK3 | 2.61 | 1.10 |
| 0060 | E | Conc Chnl 20'W 5'D 2:1 SS | 375 | 784 | CDLD180 | DUCK3 | 2.61 | 1.10 |
| 0065 | E | 2: 10' X 6' RCBC @ Serene Ave | 50 | 784 | CDLD180 | DUCK3 | 2.61 | 0.40 |
| 0066 | E | Conc Chnl 20'W 5'D 2:1 SS | 1630 | 784 | CDLD180 | DUCK3 | 2.61 | 0.45 |
| 0097 | E | 2: 10' X 6' RCBC | 70 | 784 | CDLD180 | DUCK3 | 2.61 | 0.61 |
| 0098 | E | Conc Chnl 20'W 5'D 2:1 SS | 600 | 784 | CDLD180 | DUCK3 | 2.61 | 0.87 |
| 0109 | E | 2: 10' X 6' RCBC | 150 | 784 | CDLD180 | DUCK3 | 2.61 | 8.09 |
| 0111 | E | Gablon Chnl 25'W 5'D 2:1 SS | 40 | 688 | CDLD130 | DUCK3 | 2.37 | 4.34 |
| 0122 | E | 2: 12' X 4' RCBC @ I-15 | 190 | 688 | CDLD130 | DUCK3 | 2.37 | 0.86 |
| 0123 | E | Natural Wash | 700 | 688 | CDLD130 | DUCK3 | 2.37 | |
| 0123 | P1 | Conc Chnl 20'W 3.5'D 2:1 SS | 700 | 688 | CDLD130 | DUCK3 | 2.37 | 1.30 |
| 0148 | P1 | 2: 10' X 5' RCBC @ Industrial | 60 | 688 | CDLD130 | DUCK3 | 2.37 | 1.00 |
| 0150 | E | Natural Wash | 630 | 688 | CDLD130 | DUCK3 | 2.37 | |
| 0150 | P1 | Conc Chnl 20'W 3.5'D 2:1 SS | 630 | 688 | CDLD130 | DUCK3 | 2.37 | 1.30 |
| BD03 | | BLUE DIAMOND CHANNEL 03 | | | | | | |
| 0000 | E | 2: 84" CIPCP | 1070 | 1158 | CDLD185N | DUCK3 | 1.75 | 1.20 |
| 0020 | E | 2: 96" CIPCP | 880 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.60 |
| 0037 | E | Gablon Chnl 20'W 8'D 2:1 SS | 250 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.47 |
| 0049 | E | 3: 12' X 7' RCBC @ Las Vegas Blvd | 100 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.90 |
| 0051 | E | 3: 10' X 5' RCB | 1200 | 1158 | CDLD185N | DUCK3 | 1.75 | 1.20 |
| 0068 | E | Conc Chnl 60'W 6'D 2:1 SS | 265 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.70 |
| 0075 | E | 3: 10' X 5' RCBC @ W Agate Ave | 50 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.60 |
| 0076 | E | Natural Wash | 420 | 1158 | CDLD185N | DUCK3 | 1.75 | |
| 0076 | P1 | Gablon Chnl 25'W 6'D 2:1 SS | 420 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.80 |
| 0081 | E | 2: 109" CMP | 700 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.60 |
| 0089 | P1 | Gablon Chnl 25'W 6'D 2:1 SS | 200 | 1158 | CDLD185N | DUCK3 | 1.75 | 0.60 |
| 0091 | E | 3: 12' X 5' RCBC @ I-15 | 190 | 1158 | CDLD185N | DUCK3 | 1.75 | 1.20 |
| BDBF | | BLUE DIAMOND-BUFFALO BRANCH | | | | | | |
| 0000 | E | Conc Chnl 10'W 10'D 0:1 SS | 310 | 1613 | CTBD11S | FLAM3SC | 2.06 | 2.00 |
| 0005 | E | 10' X 10' RCB | 480 | 1613 | CTBD11S | FLAM3SC | 2.06 | 2.00 |
| 0010 | P1 | Conc Chnl 10'W 9'D 0:1 SS | 3190 | 1343 | CTBD10 | FLAM3SC | 1.68 | 0.96 |
| 0076 | P1 | Conc Chnl 10'W 7.5'D 0:1 SS | 2660 | 1002 | CTBD9 | FLAM3SC | 1.29 | 0.96 |
| 0125 | P1 | 90" RCP | 1330 | 556 | CTBD8 | FLAM3SC | 0.78 | 0.80 |
| BDJO | | BLUE DIAMOND-JONES BRANCH | | | | | | |
| 0000 | E | 12' X 7' RCB | 320 | 768 | CTBD19S | FLAM3SC | 1.72 | 0.94 |
| 0005 | P1 | Conc Chnl 12'W 5.5'D 0:1 SS | 2690 | 768 | CTBD19S | FLAM3SC | 1.72 | 0.94 |
| BDMO | | BLUE DIAMOND CHANNEL MOHAWK | | | | | | |
| 0000 | E | Conc Chnl 10'W 6'D 0:1 SS | 570 | 343 | CTBD20BS | FLAM3SC | 0.73 | 0.70 |
| 0010 | E | 2: 6' X 6' RCB | 410 | 343 | CTBD20BS | FLAM3SC | 0.73 | 0.70 |
| BDRB | | BLUE DIAMOND-RAINBOW BRANCH | | | | | | |
| 0000 | E | 10' X 9' RCB | 350 | 875 | CTBD15S | FLAM3SC | 1.77 | 1.09 |
| 0005 | P2 | 10' X 6' RCB | 3430 | 875 | CTBD15S | FLAM3SC | 1.77 | 1.09 |
| 0074 | P2 | 60" RCP | 2560 | 191 | CTBD13 | FLAM3SC | 1.01 | 0.75 |
| 0122 | P2 | 54" RCP | 300 | 36 | TBD12 | FLAM3SC | 0.51 | 0.60 |

| ID / River Mile | Status | Facility Description | Length (ft.) | Flow (cfs) | HEC-1 Node | HEC-1 Model | Tributary Area (sq.mi.) | Channel Slope (%) ** |
|---|---|---|---|---|---|---|---|---|
| BDWA | | BLUE DIAMOND WASH | | | | | | |
| 0112 | E | Natural Wash | 1310 | 1073 | CBUB310 | DUCK3 | 2.12 | |
| 0112 | P1 | 10' X 5' RCB | 1310 | 1073 | CBUB310 | DUCK3 | 2.12 | 3.00 |
| 0137 | E | 24", 36", and 54" CMP @ Placid | 50 | 1073 | CBUB310 | DUCK3 | 2.12 | 1.40 |
| 0137 | P1 | Replace with 10' X 8' RCB | 50 | 1073 | CBUB310 | DUCK3 | 2.12 | 1.40 |
| 0138 | E | Natural Wash | 1880 | 881 | CBUB300 | DUCK3 | 1.64 | |
| 0138 | P1 | 10' X 5' RCB | 1880 | 881 | CBUB300 | DUCK3 | 1.64 | 2.50 |
| 0174 | E | 48" CMP @ Rancho Destino | 50 | 881 | CBUB300 | DUCK3 | 1.64 | 1.20 |
| 0174 | P1 | Replace with 10' X 8' RCB | 50 | 881 | CBUB300 | DUCK3 | 1.64 | 1.20 |
| 0175 | E | Natural Wash | 630 | 881 | CBUB300 | DUCK3 | 1.64 | |
| 0175 | P1 | 9' X 5' RCB | 630 | 881 | CBUB300 | DUCK3 | 1.64 | 3.00 |
| 0186 | E | 3: 15' X 5' RCBC @ Haven St | 50 | 881 | CBUB300 | DUCK3 | 1.64 | 1.00 |
| 0187 | E | Conc Chnl 15'W 8'D 1:1 SS | 585 | 881 | CBUB300 | DUCK3 | 1.64 | 0.86 |
| 0198 | E | Single Span Bridge 45'W 10'D @ Giles | 45 | 881 | CBUB300 | DUCK3 | 1.64 | 1.50 |
| 0199 | E | Conc Chnl 15'W 8'D 1:1 SS | 320 | 881 | CBUB300 | DUCK3 | 1.64 | 1.56 |
| 0204 | E | Single Span Bridge 15.5'W 7'D | 45 | 881 | CBUB300 | DUCK3 | 1.64 | 1.60 |
| 0205 | E | Conc Chnl 15'W 8'D 1:1 SS | 350 | 881 | CBUB300 | DUCK3 | 1.64 | 1.56 |
| 0211 | E | 48" CMP @ Las Vegas Blvd | 140 | 578 | CBUB290 | DUCK3 | 1.16 | 1.70 |
| 0212 | E | 5' X 5' RCBC @ Las Vegas Blvd | 140 | 578 | CBUB290 | DUCK3 | 1.16 | 1.70 |
| 0213 | E | Natural Wash | 2510 | 578 | CBUB290 | DUCK3 | 1.16 | |
| 0213 | P1 | 7' X 5' RCB | 2510 | 578 | CBUB290 | DUCK3 | 1.16 | 2.00 |
| 0261 | E | 12' X 5' RCBC @ I-15 | 200 | 314 | CBUB280 | DUCK3 | 0.83 | 1.30 |
| BDWS | | BLUE DIAMOND-WARM SPRINGS BRANCH | | | | | | |
| 0000 | P1 | 84" RCP | 2410 | 428 | TBD5 | FLAM3SC | 0.49 | 0.80 |
| DCBD | | DUCK CREEK / BLUE DIAMOND | | | | | | |
| 0083 | E | Natural Wash | 4750 | 1892 | CBUB350 | DUCK4 | 10.85 | |
| 0083 | P1 | Conc Chnl 20'W 5.5'D 2:1 SS | 4750 | 1892 | CBUB350 | DUCK4 | 10.85 | 1.10 |
| 0176 | E | 3: 10' X 8' RCBC @ Las Vegas Blvd | 80 | 1747 | CBUB340 | DUCK4 | 10.35 | 0.70 |
| 0177 | E | Natural Wash | 1550 | 1747 | CBUB340 | DUCK4 | 10.35 | |
| 0177 | P1 | Conc Chnl 25'W 5'D 2:1 SS | 1550 | 1747 | CBUB340 | DUCK4 | 10.35 | 1.07 |
| 0206 | E | 2: 60" CMP | 1160 | 1747 | CBUB340 | DUCK4 | 10.35 | 1.20 |
| 0206 | P1 | Replace with 2: 10' X 6' RCB | 1160 | 1747 | CBUB340 | DUCK4 | 10.35 | 1.16 |
| 0218 | E | 4: 12' X 5' RCBC @ I-15 | 240 | 1747 | CBUB340 | DUCK4 | 10.35 | 1.16 |
| 0221 | P1 | 72" RCP | 9930 | 271 | LBDDB | DUCK3 | 7.67 | 0.94 |
| 0394 | P2 | 48" RCP Outlet | 200 | 271 | LBDDB | DUCK3 | 7.67 | |
| 0398 | P2 | 517 acre-ft Lower Blue Diamond Detention Basin | | 3957 | CBLBDDB | DUCK3 | 7.67 | |
| 0421 | E | 3 Span Bridge 45'W 10'D | 25 | 3921 | CBUB205 | DUCK3 | 7.55 | 1.10 |
| 0422 | P1 | Unlined Levee 3' | 600 | 50 | BUB205 | DUCK3 | 0.13 | 1.20 |
| 0423 | P1 | Conc Chnl 20'W 8'D 2:1 SS | 8082 | 3921 | CBUB205 | DUCK3 | 7.55 | 0.80 |
| 0549 | P1 | 2: 12' X 8' RCB @ Blue Diamond | 200 | 2449 | CBUB150 | DUCK3 | 3.64 | 1.00 |
| 0550 | P1 | Gablon Chnl 40'W 7.5'D 2:1 SS | 5800 | 2394 | CBUB150 | DUCK3 | 3.64 | 0.50 |
| 0683 | P1 | 2: 12' X 7' RCBC @ UPRR | 50 | 2280 | CBUB140 | DUCK3 | 3.35 | 1.58 |
| 0684 | P1 | Gablon Chnl 30'W 6.5'D 2:1 SS | 1050 | 2280 | CBUB140 | DUCK3 | 3.35 | 1.58 |
| 0709 | P1 | 2: 14' X 6' RCBC @ UPRR | 50 | 2280 | CBUB140 | DUCK3 | 3.35 | 1.58 |
| 0710 | P1 | Gablon Chnl 30'W 6.5'D 2:1 SS | 1850 | 2280 | CBUB140 | DUCK3 | 3.35 | 1.58 |
| 0744 | P1 | 2: 12' X 6' RCBC @ Rainbow | 50 | 2062 | CBUB130 | DUCK3 | 3.01 | 1.50 |
| 0745 | P1 | Conc Chnl 12'W 6.5'D 2:1 SS | 4800 | 2062 | CBUB130 | DUCK3 | 3.01 | 1.58 |
| 0835 | P1 | 2: 12' X 6' RCBC @ Blue Diamond | 75 | 2010 | CBUB070 | DUCK3 | 2.77 | 1.60 |
| DCGL | | DUCK CREEK GILESPIE CHANNEL | | | | | | |
| 0000 | E | Natural Wash | 1900 | 1811 | CDLD460 | DUCK3 | 2.56 | |
| 0000 | P2 | Conc Chnl 32'W 6'D 0:1 SS | 1900 | 1811 | CDLD460 | DUCK3 | 2.56 | 0.80 |
| 0035 | P2 | 2: 16' X 4' RCBC @ Silverado Ranch | 60 | 1811 | CDLD460 | DUCK3 | 2.56 | 0.90 |
| 0036 | E | Natural Wash | 1111 | 1811 | CDLD460 | DUCK3 | 2.56 | |
| 0036 | P1 | Conc Chnl 35'W 4'D 0:1 SS | 1111 | 1811 | CDLD460 | DUCK3 | 2.56 | 0.80 |
| 0057 | E | Conc Chnl 32'W 9.0'D 3:1 SS | 1580 | 841 | CDLD460S | DUCK3 | 1.10 | 0.20 |
| 0086 | E | 4: 8' X 5' RCBC @ E Pyle Ave | 60 | 841 | CDLD460S | DUCK3 | 1.10 | 1.20 |
| 0087 | E | Natural Wash | 1080 | 841 | CDLD460S | DUCK3 | 1.10 | |
| 0087 | P1 | Conc Chnl 32'W 3.5'D 3:1 SS | 1080 | 841 | CDLD460S | DUCK3 | 1.10 | 0.90 |
| 0106 | E | 3: 8' X 4' RCBC @ La Cienega | 80 | 841 | CDLD460S | DUCK3 | 1.10 | 0.50 |
| 0107 | E | Conc Chnl 12'W 7'D 2:1 SS | 310 | 567 | CDLD450 | DUCK3 | 0.75 | 1.30 |
| 0112 | E | 2: 10' X 4' RCBC @ E Frias Ave | 60 | 567 | CDLD450 | DUCK3 | 0.75 | 0.50 |
| 0113 | E | Conc Chnl 12'W 7'D 2:1 SS | 490 | 567 | CDLD450 | DUCK3 | 0.75 | 2.40 |
| DCW2 | | DUCK CREEK - TRIBUTARY 2 | | | | | | |
| 0000 | P0 | 1: 8' X 5' RCB | 3000 | 547 | CDCD150N | DUCK3 | 1.88 | 1.10 |

| ID / River Mile | Status | Facility Description | Length (ft.) | Flow (cfs) | HEC-1 Node | HEC-1 Model | Tributary Area (sq.mi.) | Channel Slope (%) ** |
|---|---|---|---|---|---|---|---|---|
| DCWA | | DUCK CREEK WASH | | | | | | |
| 1214 | E | 121,300 cfs PMF Spillway | | 121300 | CDLDCDB | DUCK5SC | 16.16 | |
| 1215 | E | 54" RCP Outlet | 20 | 355 | LDCDB | DUCK5SC | 16.16 | |
| 1216 | E | 1,235 ac-ft Lower Duck Creek Detention Basin | | 5259 | CDLDCDB | DUCK5SC | 16.16 | |
| 1241 | E | Natural Wash | 540 | 4271 | CDLD37B* | DUCK3SC | 6.41 | |
| 1241 | P2 | 2: 20' X 7' RCB | 540 | 4271 | CDLD37B* | DUCK3SC | 6.41 | 1.94 |
| 1258 | E | Natural Wash | 1475 | 4271 | CDLD37B* | DUCK3SC | 6.41 | |
| 1258 | P1 | Conc Chnl 42'W 7'D 0:1 SS | 1475 | 4271 | CDLD37B* | DUCK3SC | 6.41 | 0.70 |
| 1293 | P2 | 2: 20' X 7' RCBC @ Silverado | 150 | 4271 | CDLD37B* | DUCK3SC | 6.41 | 0.80 |
| 1294 | E | Natural Wash | 2175 | 4271 | CDLD37B* | DUCK3SC | 6.41 | |
| 1294 | P2 | Conc Chnl 42'W 7'D 0:1 SS | 2175 | 4271 | CDLD37B* | DUCK3SC | 6.41 | 0.80 |
| 1338 | E | Natural Wash | 825 | 4271 | CDLD37B* | DUCK3SC | 6.41 | |
| 1338 | P1 | Conc Chnl 40'W 6.5'D 2:1 SS | 825 | 4271 | CDLD37B* | DUCK3SC | 6.41 | 0.70 |
| 1350 | P1 | 5: 14' X 6' RCBC @ W Pyle Ave | 70 | 4271 | CDLD37B | DUCK3SC | 6.41 | 0.70 |
| 1351 | E | Natural Wash | 365 | 4271 | CDLD37B | DUCK3SC | 6.41 | |
| 1351 | P1 | Conc Chnl 40'W 6.5'D 2:1 SS | 365 | 4271 | CDLD37B | DUCK3SC | 6.41 | 0.70 |
| 1358 | E | 1: 12' X 6' RCBC @ Las Vegas Blvd | 120 | 4271 | CDLD37B | DUCK3SC | 6.41 | 0.60 |
| 1359 | P1 | Add 4: 14' X 6' RCBC @ Las Vegas Blvd | 120 | 4271 | CDLD37B | DUCK3SC | 6.41 | 0.60 |
| 1362 | E | Natural Wash | 750 | 3018 | CDLD06B | DUCK3SC | 5.14 | |
| 1362 | P1 | Conc Chnl 40'W 5.5'D 2:1 SS | 750 | 3018 | CDLD06B | DUCK3SC | 5.14 | 0.70 |
| 1378 | E | Natural Wash | 2500 | 3018 | CDLD06B | DUCK3SC | 5.14 | |
| 1378 | P1 | Conc Chnl 40'W 5.5'D 2:1 SS | 2500 | 3018 | CDLD06B | DUCK3SC | 5.14 | 1.00 |
| 2150 | P0 | 72" RCP | 3880 | 299 | CDCD010 | DUCK3SC | 0.45 | 1.20 |
| 2223 | P0 | 66" RCP | 5190 | 299 | CDCD010 | DUCK3SC | 0.45 | 2.10 |
| FLCM | | FLAMINGO-CIMMARON BRANCH | | | | | | |
| 0000 | P1 | 78" RCP | 2110 | 391 | UFS27 | FLAM3SC | 0.38 | 1.50 |
| 0040 | P1 | 72" RCP | 2690 | 391 | UFS27 | FLAM3SC | 0.38 | 1.50 |
| FLF4 | | F4 CHANNEL | | | | | | |
| 0014 | E | Conc Chnl 10'W 10'D 2:1 SS | 2340 | 5636 | CUFS19S | FLAM3SC | 6.82 | 0.90 |
| 0050 | E | 28' X 12' RCB | 420 | 5330 | CUFS18 | FLAM3SC | 6.47 | 0.94 |
| 0058 | E | 20' X 12' RCB | 250 | 5330 | CUFS18 | FLAM3SC | 6.47 | 0.94 |
| 0091 | P1 | Conc Chnl 20'W 8.5'D 2:1 SS | 640 | 5330 | CUFS18 | FLAM3SC | 6.47 | 1.28 |
| 0101 | P1 | Conc Chnl 20'W 8.5'D 2:1 SS | 2280 | 4095 | CUFS13 | FLAM3SC | 4.45 | 1.28 |
| 0155 | P1 | Conc Chnl 20'W 7.0'D 2:1 SS | 10550 | 3846 | CUFS12 | FLAM3SC | 4.07 | 1.90 |
| FLJO | | FLAMINGO DIVERSION-JONES BRANCH | | | | | | |
| 0000 | E | 12' X 6' RCB | 3310 | 1179 | CTD11S | FLAM3SC | 1.46 | 1.00 |
| 0076 | E | 96" RCP | 2640 | 699 | CTD9 | FLAM3SC | 0.79 | 1.00 |
| FLOQ | | FLAMINGO OQUENDO | | | | | | |
| 0000 | P1 | Conc Chnl 12'W 7.5'D 0:1 SS | 3160 | 926 | CUFS15W | FLAM3SC | 0.99 | 0.50 |
| FLRB | | FLAMINGO DIVERSION-RAINBOW BRANCH | | | | | | |
| 0000 | P1 | Conc Chnl 12'W 5.0'D 2:1 SS | 3300 | 1086 | CTD6 | FLAM3SC | 1.29 | 1.00 |
| 0062 | P1 | 96" RCP | 2660 | 671 | CTD5 | FLAM3SC | 0.78 | 1.00 |
| FLSB | | FLAMINGO DIVERSION-SOUTH BUFFALO BRANCH | | | | | | |
| 0000 | P1 | 9' X 6' RCB | 7800 | 865 | CTD3S | FLAM3SC | 1.01 | 1.20 |
| FLTR | | FLAMINGO-TROPICANA DIVERSION CHANNEL | | | | | | |
| 0000 | E | Conc Chnl 26'W 19.5'D 0:1 SS | 1480 | 3478 | CTD13 | FLAM3SC | 4.86 | 0.11 |
| 0014 | E | 26' X 18' RCBC | 250 | 3478 | CTD13 | FLAM3SC | 4.86 | 0.11 |
| 0015 | E | Conc Chnl 26'W 18'D 0:1 SS | 460 | 3214 | CTD13N | FLAM3SC | 4.44 | 0.11 |
| FLWA | | FLAMINGO WASH | | | | | | |
| 1439 | E | 66,000 cfs PMF Spillway | | 66000 | CUFS28 | FLAM5SC | 30.38 | |
| 1440 | E | 2: 60" RCP Outlet | 200 | 260 | UPFLDB | FLAM5SC | 30.38 | |
| 1443 | E | 1,100 ac-ft Flamingo Detention Basin | | 11180 | CUFS28 | FLAM5SC | 30.38 | |
| 1444 | P3 | Upgrade to 1,340 ac-ft Flamingo Detention Basin | | 11180 | CUFS28 | FLAM5SC | 30.38 | |
| TRBD | | BLUE DIAMOND CHANNEL | | | | | | |
| 0000 | E | Conc Chnl 10'W 10'D 2:1 SS | 1700 | 4353 | CTD15 | FLAM4SC | 9.49 | 0.70 |
| 0014 | E | 23' X 10' RCB | 130 | 4353 | CTD15 | FLAM4SC | 9.49 | 0.70 |
| 0015 | E | Conc Chnl 10'W 10'D 2:1 SS | 3070 | 4353 | CTD15 | FLAM4SC | 9.49 | 0.90 |
| 0075 | E | Conc Chnl 19.5'W 12'D 0:1 SS | 400 | 4233 | CTD14 | FLAM4SC | 9.24 | 0.48 |
| 0083 | E | 2: 14' X 11' RCBC | 120 | 4233 | CTD14 | FLAM4SC | 9.24 | 0.48 |
| 0084 | E | Conc Chnl 19.5'W 12'D 0:1 SS | 550 | 4233 | CTD14 | FLAM4SC | 9.24 | 0.48 |
| 0096 | E | Conc Chnl 28'W 9'D 0:1 SS | 760 | 4176 | CTBD15* | FLAM3SC | 6.47 | 1.00 |
| 0100 | E | 28' X 10' RCB | 560 | 4176 | CTBD15* | FLAM3SC | 6.47 | 1.03 |
| 0110 | E | Conc Chnl 28'W 9'D 0:1 SS | 1040 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.28 |
| 0140 | E | 28' X 10' RCB | 380 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.28 |

| ID / River Mile | Status | Facility Description | Length (ft.) | Flow (cfs) | HEC-1 Node | HEC-1 Model | Tributary Area (sq.mi.) | Channel Slope (%) ** |
|---|---|---|---|---|---|---|---|---|
| TRBD | | BLUE DIAMOND CHANNEL -- continued | | | | | | |
| 0150 | E | Conc Chnl 28'W 9'D 0:1 SS | 780 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.28 |
| 0170 | E | 26' X 10' RCB | 260 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.11 |
| 0175 | E | Conc Chnl 26'W 9'D 0:1 SS | 1000 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.05 |
| 0180 | E | 26' X 10' RCB | 370 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.13 |
| 0182 | E | Conc Chnl 16'W 9'D 2:1 SS | 2600 | 4176 | CTBD15 | FLAM3SC | 6.47 | 0.64 |
| 0190 | E | 24' X 10' RCB | 430 | 4176 | CTBD15 | FLAM3SC | 6.47 | 0.92 |
| 0200 | E | Conc Chnl 24'W 9'D 0:1 SS | 750 | 4176 | CTBD15 | FLAM3SC | 6.47 | 1.82 |
| 0215 | E | 20' X 10' RCB | 280 | 3508 | CTBD11 | FLAM3SC | 4.70 | 1.29 |
| 0225 | E | Conc Chnl 20'W 10'D 0:1 SS | 950 | 3508 | CTBD11 | FLAM3SC | 4.70 | 1.29 |
| 0230 | E | 20' X 10' RCB | 320 | 3508 | CTBD11 | FLAM3SC | 4.70 | 2.14 |
| 0245 | E | Conc Chnl 20'W 6'D 2:1 SS | 1300 | 3508 | CTBD11 | FLAM3SC | 4.70 | 2.14 |
| 0270 | E | Conc Chnl 23'W 10'D 0:1 SS | 1030 | 3508 | CTBD11 | FLAM3SC | 4.70 | 0.84 |
| 0290 | E | 23' X 10' RCB | 750 | 3508 | CTBD11 | FLAM3SC | 4.70 | 0.84 |
| 0300 | E | Conc Chnl 23'W 10'D 0:1 SS | 450 | 3508 | CTBD11 | FLAM3SC | 4.70 | 1.60 |
| 0310 | E | Conc Chnl 18'W 10.5'D 0:1 SS | 310 | 2023 | CTBD6 | FLAM3SC | 2.64 | 1.60 |
| 0350 | E | 18' X 10.5' RCB @ Buffalo | 260 | 2023 | CTBD6 | FLAM3SC | 2.64 | 0.65 |
| 0370 | E | Conc Chnl 18'W 10'D 0:1 SS | 1150 | 2023 | CTBD6 | FLAM3SC | 2.64 | 0.65 |
| 0380 | E | 18' X 10' RCB | 520 | 2023 | CTBD6 | FLAM3SC | 2.64 | 0.98 |
| 0384 | E | Conc Chnl 18'W 10'D 0:1 SS | 1520 | 2023 | CTBD6 | FLAM3SC | 2.64 | 0.87 |
| 0400 | P1 | 18' X 7' RCB | 2370 | 2023 | CTBD6 | FLAM3SC | 2.64 | 0.90 |
| 0488 | P1 | Conc Chnl 12'W 6.5'D 2:1 SS | 1920 | 2023 | CTBD6 | FLAM3SC | 2.64 | 1.67 |
| 0529 | P1 | 14' X 8' RCBC | 80 | 2023 | CTBD6 | FLAM3SC | 2.64 | 1.67 |
| 0530 | P1 | Conc Chnl 12'W 6.5'D 2:1 SS | 1270 | 2023 | CTBD6 | FLAM3SC | 2.64 | 1.67 |
| 0549 | P1 | 14' X 8' RCBC @ Warm Springs | 200 | 1671 | CTBD5 | FLAM3SC | 2.27 | 1.20 |
| 0550 | P1 | Conc Chnl 12'W 5.5'D 2:1 SS | 2130 | 1350 | CTBD4 | FLAM3SC | 1.78 | 1.20 |
| 0563 | P1 | 14' X 7' RCBC | 750 | 1350 | CTBD4 | FLAM3SC | 1.78 | 1.50 |
| 0600 | P1 | Conc Chnl 12'W 5.5'D 2:1 SS | 2380 | 1350 | CTBD4 | FLAM3SC | 1.78 | 1.10 |
| 0664 | P1 | 14' X 6' RCBC | 80 | 875 | CTBD3 | FLAM3SC | 1.22 | 1.00 |
| 0665 | P1 | Conc Chnl 12'W 5'D 2:1 SS | 600 | 875 | CTBD3 | FLAM3SC | 1.22 | 1.00 |
| 0674 | P1 | 14' X 6' RCBC | 80 | 875 | CTBD3 | FLAM3SC | 1.22 | 1.40 |
| 0675 | P1 | Conc Chnl 12'W 4.5'D 2:1 SS | 580 | 875 | CTBD3 | FLAM3SC | 1.22 | 1.40 |
| 0684 | P1 | 14' X 7' RCBC | 80 | 875 | CTBD3 | FLAM3SC | 1.22 | 0.62 |
| 0685 | P1 | Conc Chnl 12'W 5'D 2:1 SS Outlet | 850 | 875 | CTBD3 | FLAM3SC | 1.22 | 0.62 |
| 0689 | P1 | 3 ac-ft Blue Diamond Debris Basin | | 571 | CTBD2 | FLAM3SC | 0.83 | |
| 0700 | E | Natural Wash | 10900 | 571 | CTBD2 | FLAM3SC | 0.83 | 1.90 |
| TRMC | | TROPICANA WASH - MCCARRAN AIRPORT | | | | | | |
| 0263 | E | 2: 10' X 6' RCB | 1500 | 1620 | CMC8 | FLAM3SC | 2.42 | 1.28 |
| 0290 | E | Rip Rap Chnl 30'W 2'D 4:1 SS | 2440 | 249 | MC8 | FLAM3SC | 0.51 | 0.79 |
| TRWA | | TROPICANA WASH | | | | | | |
| 0441 | E | 10' X 7' RCB | 650 | 486 | TRDB | FLAM5SC | 14.79 | 0.26 |
| 0452 | E | 13,000 cfs PMF Spillway | | 13000 | CTD16 | FLAM5SC | 14.79 | |
| 0453 | E | 10' X 8.5' RCB Outlet | 200 | 486 | TRDB | FLAM5SC | 14.79 | 0.26 |
| 0454 | E | 625 ac-ft Tropicana Detention Basin | | 5765 | CTD16 | FLAM5SC | 14.79 | |
| WGTR | | WAGON TRAIL CHANNEL | | | | | | |
| 0000 | E | Grass Chnl 20'W 10'D 4:1 SS | 2500 | 1620 | CMC8 | FLAM3SC | 2.42 | 0.40 |
| 0050 | E | 2: 12' X 5' RCBC | 340 | 1457 | CMC7B | FLAM3SC | 1.91 | 1.30 |
| 0051 | P3 | Conc Chnl 9'W 4.3'D 2:1 SS | 500 | 1457 | CMC7B | FLAM3SC | 1.91 | 6.42 |
| 0064 | E | 3: 96" CMP Culvert | 50 | 1457 | CMC7B | FLAM3SC | 1.91 | 1.00 |
| 0065 | E | Rip Rap Chnl 35'W 4'D 2:1 SS | 850 | 1457 | CMC7B | FLAM3SC | 1.91 | 1.05 |
| 0080 | E | Rip Rap Chnl 20'W 6'D 2:1 SS | 350 | 856 | CMC7AS | FLAM3SC | 1.30 | 0.36 |
| 0088 | E | 20' X 5' RCAC | 50 | 856 | CMC7AS | FLAM3SC | 1.30 | 1.00 |
| 0089 | E | Rip Rap Chnl 10'W 6.5'D 2:1 SS | 470 | 856 | CMC7AS | FLAM3SC | 1.30 | 1.00 |
| 0097 | E | 20' X 7' RCAC | 30 | 856 | CMC7AS | FLAM3SC | 1.30 | 1.00 |
| 0098 | P1 | Conc Chnl 30'W 5'D 2:1 SS | 700 | 856 | CMC7AS | FLAM3SC | 1.30 | 0.20 |
| 0111 | P2 | 10' X 6' RCB | 980 | 856 | CMC7AS | FLAM3SC | 1.30 | 1.16 |
| 0128 | P1 | Conc Chnl 30'W 4'D 2:1 SS | 860 | 856 | CMC7AS | FLAM3SC | 1.30 | 1.30 |
| 0145 | E | 2: 12' X 4' RCBC | 140 | 694 | CMC6B | FLAM3SC | 1.12 | 0.70 |
| 0146 | E | Rip Rap Chnl 12'W 4.25'D 2:1 SS | 550 | 694 | CMC6B | FLAM3SC | 1.12 | 0.57 |
| 0146 | P1 | Conc Chnl 25'W 4'D 0:1 SS | 550 | 694 | CMC6B | FLAM3SC | 1.12 | 0.57 |
| 0157 | E | 2: 12' X 4' RCBC | 100 | 694 | CMC6B | FLAM3SC | 1.12 | 0.57 |
| 0158 | E | Conc Chnl 12'W 4'D 2:1 SS | 560 | 694 | CMC6B | FLAM3SC | 1.12 | 2.58 |
| 0169 | E | 2: 12' X 4' RCBC | 90 | 694 | CMC6B | FLAM3SC | 1.12 | 0.20 |

*The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.*
***As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.*

REGIONAL FLOOD CONTROL DISTRICT

**2002 LAS VEGAS VALLEY**
**FLOOD CONTROL MASTER PLAN UPDATE**
**FACILITY INVENTORY**
**FIGURE F-20**

**LEGEND**

Street Name Designator AA BB
Parent Stream Name
Stream Name
ID / River Mile 00.00
Distance above confluence
With parent stream
Miles in tenths

Existing Facility ..... E
Proposed or Modified Facility ..... P
Contingency Level
Category B ..... P0
Master Plan ..... P1
Preliminary Design ..... P2
Design ..... P3

Bottom Width ..... W
Depth ..... D
Side Slope, H:V ..... SS

Construction Features

Cast in Place Concrete Pipe ..... CIPCP
Corrugated Metal Arch Pipe Culvert ..... CMAP
Corrugated Metal Pipe Culvert ..... CMP
High Density Polyethylene ..... HDPE
Helical Elliptical Reinforced Concrete Pipe ..... HERCP
Reinforced Concrete Arch Pipe ..... RCAC
Reinforced Concrete Box ..... RCB
Reinforced Concrete Box Culvert ..... RCBC
Reinforced Concrete Pipe ..... RCP
Reinforced Concrete Pipe Culvert ..... RCPC
Storm Sewer Pipe ..... SSP

PBS&J
C.C. WALLACE, INC.

CLOMR

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA CONDITIONAL LETTER OF MAP REVISION APPLICATION

August 2007

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

vtn nevada

# FEMA

# CONDITIONAL LETTER OF MAP REVISION APPLICATION

# DUCK CREEK CHANNEL

# LAS VEGAS BLVD. TO

# LOWER DUCK CREEK DETENTION BASIN

# CLARK COUNTY, NEVADA

## ADDENDUM - RESPONSE TO FEMA COMMENTS

*Prepared for:*

**CLARK COUNTY**
**REGIONAL FLOOD CONTROL DISTRICT**
600 S. GRAND CENTRAL PARKWAY
LAS VEGAS, NEVADA 89106-4511

2007 AUG 10 PM 3:46 RFCD

*Prepared by:*

**VTN Nevada**
2727 S. Rainbow Boulevard
Las Vegas, Nevada 89146
(702) 247-4020




2007 SEP 18 PM 2:42 RFCD

vtn nevada

August 2007

VTN nevada
CONSULTING ENGINEERS • PLANNERS • SURVEYORS
PROVIDING QUALITY PROFESSIONAL
SERVICES SINCE 1960

August 9, 2007

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.
3601 Eisenhower Avenue
Alexandria, VA 22304-6425

Reference: **Case No.:** 07-09-1205R
**Community:** Clark County, NV
**Community No.:** 320003

**Subject: RESPONSE TO FEMA COMMENTS**

Dear Mr. Qayum:

This Addendum is being provided in response to the comment letter dated May 17, 2007 for the Duck Creek Channel – Las Vegas Boulevard to Lower Duck Creek Detention Basin CLOMR. The comments that you provided for the specified project are addressed within the following response summary. A copy of the comment letter is included in Appendix A.

## RESPONSE TO COMMENTS

**Comment 1:**

According to the submitted annotated Flood Insurance Rate Map, the effective Special Flood Hazard Area (SFHA), the area that would be inundated by the base (1-percent-annual-chance) flood, for Duck Creek South Channel (South Channel) would be removed as a result of the proposed channelization along Duck Creek. However, the submitted report entitled "Duck Creek Channel, Las Vegas Boulevard to Lower Duck Creek Detention Basin," prepared by VTN Nevada, dated April 2007, did not include technical data to address the impact of the unnamed tributary to Duck Creek South Channel (unnamed tributary) on the flooding conditions for South Channel. Please provide technical data to quantify the proposed conditions base flood discharge along South Channel and the unnamed tributary. Please also submit a proposed conditions hydraulic analysis and a topographic work map, certified by a registered professional engineer, that delineates the resulting SFHAs for South Channel and the unnamed tributary.



2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5148
TEL. (702) 873-7550 FAX: 362-2597

**Response 1:**

The currently effective flood zone for South Channel is an AE floodway with breakout from Duck Creek. The breakout flow at this location will be contained by construction of the proposed channel. The proposed flood zone is an un-numbered A zone consistent with the flooding source of the unnamed tributary at this point.

A 100 Year flow rate of 1640 cfs has been determined for the unnamed tributary based on the same hydrology referenced in the April 2007 Report, "Hydrologic Analysis Letter Report for Duck Creek Channel Improvements CLOMR Spencer Street to El Dorado Lane". This flow rate is based on tributary area only, and does not assume any breakout from Duck Creek. Subbasin D4B from that report is the tributary Subbasin. The Subbasin D4B area was revised to include only area tributary to South Channel by trimming out area west of Duck Creek. The revised parameters were then input into a HEC-1 model and ran with the appropriate storm distribution and depth area reduction factor. Please see Appendix D for Subbasin Map and HEC-1 run.

In order to model the South Channel and unnamed tributary floodway, a HEC-RAS model was developed (see Appendix C). This model includes sections from the approved LOMR for Silverado Pines Unit No. 3, (Case no. 05-09-1 034P) from approximately Gilespie St downstream to Lower Duck Creek Detention Basin. New cross sections were cut based on 4' contour interval topography for the reach from approximately Gilespie St upstream to the tie-in point at Station 39+00. A small breakout from the unnamed tributary into Duck Creek occurs at Station 36+00. A weir was input into the model along the proposed Duck Creek channel edge upstream and downstream of this section. The model shows a breakout of 42 cfs into Duck Creek. This is a minor percentage of the total flow in Duck Creek, especially considering the disparity in times to peak, and would have a negligible impact on Duck Creek.

Based on this analysis, the Post-Project Work Map and Annotated Flood Zone Map have been revised to show the proposed flood zone for South Channel and the unnamed tributary. Revised maps are included in Appendix B. Electronic versions of the maps, the HEC-RAS model for South Channel and unnamed tributary, and reference files are included on CD in Appendix E.

**Comment 2:**

Effective October 30, 2005, the Federal Emergency Management Agency revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. A copy of the notice summarizing the current fee schedule, which was published in the Federal Register, is enclosed for your information. In accordance with this schedule, the fee for your request is $4,000 and must be submitted before we can continue processing your request. Payment of this fee must be made in the form of a check or money order, payable in U.S. funds to the National Flood Insurance Program, or a credit card payment (Visa or MasterCard only). For identification purposes, the case number referenced above must be included on the check or money order. We will not perform a detailed technical review of your request until we receive this payment.

**Response 2:**

The required fee for this request has been submitted.

If you have any questions or require additional information, do not hesitate to contact me.

Sincerely,

Lant Leavitt, P.E.
VTN Nevada
2727 South Rainbow Boulevard
Las Vegas, NV 89146
lantl@vtnnv.com
(702) 253-2389

# APPENDIX A

## FEMA Comment Letter

# NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

May 17, 2007

Mr. Kevin Eubanks, P.E., CFM
Assistant General Manager
Clark County Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, NV 89106-4511

IN REPLY REFER TO:
Case No.: 07-09-1205R
Community: Clark County, NV
Community No.: 320003

316-AD

Dear Mr. Eubanks:

This responds to your request dated April 25, 2007, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas. Pertinent information about the request is listed below.

| | |
|---|---|
| Identifier: | Duck Creek Channel – Las Vegas Boulevard to Lower Duck Creek Detention Basin |
| Flooding Sources: | Duck Creek, Duck Creek Tributary, Duck Creek South Channel, and Unnamed Tributary to Duck Creek South Channel |
| FIRM Panel(s) Affected: | 32003C2568 E |

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data/fee for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data/fee **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited for any request for which the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you

have specific questions concerning your request, please call the Revisions Coordinator for your State, Mr. Sacha Tohme, CFM, who may be reached at (703) 960-8800, ext. 3028.

Sincerely,

Syed Qayum

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.

Enclosures

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

Mr. Daniel Bender, P.E.
VTN Nevada

# NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

Summary of Additional Data Required to Support a
Conditional Letter of Map Revision

Case No.: 07-09-1205R

Requester: Mr. Kevin Eubanks, P.E., CFM

Community: Clark County, NV

Community No.: 320003

The issue listed below must be addressed before we can continue the review of your request.

According to the submitted annotated Flood Insurance Rate Map, the effective Special Flood Hazard Area (SFHA), the area that would be inundated by the base (1-percent-annual-chance) flood, for Duck Creek South Channel (South Channel) would be removed as a result of the proposed channelization along Duck Creek. However, the submitted report entitled "Duck Creek Channel, Las Vegas Boulevard to Lower Duck Creek Detention Basin," prepared by VTN Nevada, dated April 2007, did not include technical data to address the impact of the unnamed tributary to Duck Creek South Channel (unnamed tributary) on the flooding conditions for South Channel. Please provide technical data to quantify the proposed conditions base flood discharge along South Channel and the unnamed tributary. Please also submit a proposed conditions hydraulic analysis and a topographic work map, certified by a registered professional engineer, that delineates the resulting SFHAs for South Channel and the unnamed tributary.

Effective October 30, 2005, the Federal Emergency Management Agency revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register*, is enclosed for your information. In accordance with this schedule, the fee for your request is $4,000 and must be submitted before we can continue processing your request. Payment of this fee must be made in the form of a check or money order, payable in U.S. funds to the National Flood Insurance Program, or a credit card payment (Visa or MasterCard only). For identification purposes, the case number referenced above must be included on the check or money order. We will not perform a detailed technical review of your request until we receive this payment.

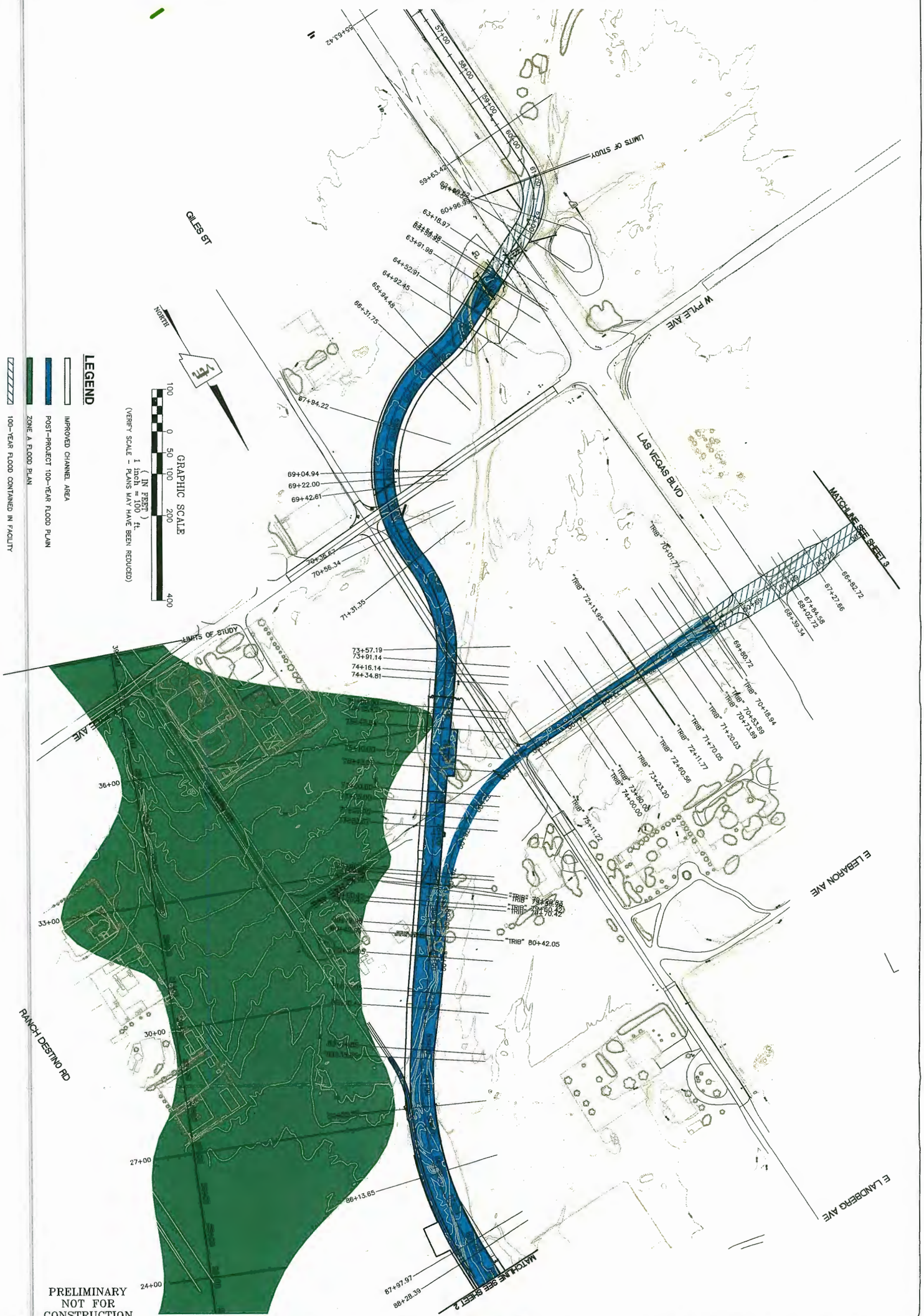
Please send the required data and/or fee directly to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

# APPENDIX B

## MAPS

# POST-PROJECT WORK MAP

POST-SH1
I:\6011\dwg\6657-LOMR\project condition maps.dwg




PRELIMINARY
NOT FOR
CONSTRUCTION

PROFESSIONAL ENGINEER STATE OF NEVADA
DANIEL W. BENDER
EXP. 12/31/08
CIVIL
No. 12006
SEAL

TITLE
POST-PROJECT WORK MAP

PROJECT
DUCK CREEK CLOMR

| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

vtn nevada

CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597

| | |
|---|---|
| WO. NO. | 6657 |
| DESIGNED BY | LL |
| DRAWN BY | JJB |
| DATE | 07/20/06 |
| SCALE HORIZ. | 1"=100' |
| VERT. | NONE |
| DRAWING | |
| SHEET | 1 |
| OF | 3 SHEETS |

POST-SH2
I:\6011\dwg\6657-LOMR\project condition maps.dwg




| | |
|---|---|
| JOB NO. | 6657 |
| DESIGNED BY | LL |
| DRAWN BY | JLB |
| DATE | 07/20/06 |
| SCALE HORIZ. | 1"=100' |
| SCALE VERT. | NONE |
| DRAWING SHEET | 2 |
| OF 3 SHEETS | |

PROFESSIONAL ENGINEER STATE OF NEVADA
DANIEL W. BENDER
EXP. 12/31/08
No. 12805
CIVIL

SEAL

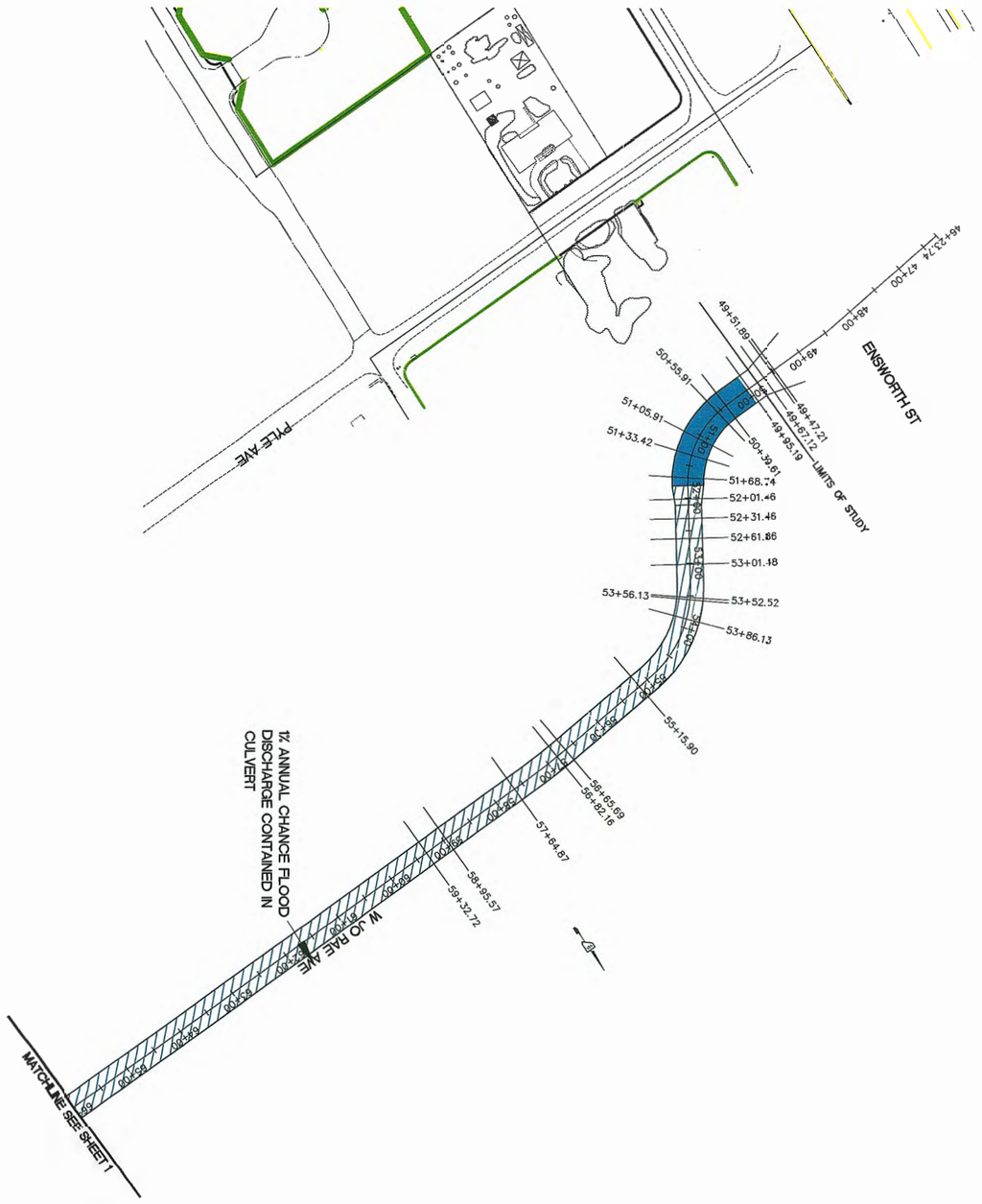
TITLE: POST-PROJECT WORK MAP

PROJECT: DUCK CREEK CLOMR

| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |


vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597

POST-SH3
I:\6011\dwg\6657-LOMR\project condition maps.dwg




GRAPHIC SCALE
100 0 50 100 200 400
( IN FEET )
1 inch = 100 ft.
(VERIFY SCALE - PLANS MAY HAVE BEEN REDUCED)

LEGEND

- IMPROVED CHANNEL AREA
- POST-PROJECT 100-YEAR FLOOD PLAIN
- 100-YEAR FLOOD CONTAINED IN FACILITY

PRELIMINARY
NOT FOR
CONSTRUCTION

WO. NO. 6657
DESIGNED BY LL
DRAWN BY JLB
DATE 07/20/06
SCALE HORIZ. 1"=100'
VERT. NONE
DRAWING
SHEET 3 OF 3 SHEETS

PROFESSIONAL ENGINEER
DANIEL W. [illegible]
No. 12808
EXP. 12/31/08
CIVIL
STATE OF NEVADA
SEAL

TITLE
POST-PROJECT WORK MAP

PROJECT
DUCK CREEK CLOMR

| REV | DATE | BY | REVISION |
|---|---|---|---|
| | | | |

vtn nevada
CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597

# ANNOTATED FLOOD ZONE MAP




## LEGEND

- ZONE A FLOOD PLAIN
- ZONE AE FLOOD PLAIN
- AREA TO BE REMOVED FROM FLOOD ZONE
- EXISTING ZONE A FLOOD PLAN

**PANEL 2568 OF 4090**

| | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2568 | E |

**MAP NUMBER: 32003C2568 E**

PROFESSIONAL ENGINEER-STATE OF NEVADA
DANIEL W. BENDER
EXP. 12/31/08
CIVIL
No. 12806

PRELIMINARY
NOT FOR CONSTRUCTION

NORTH

vtn nevada

# ANNOTATED FLOOD ZONE MAP
# DUCK CREEK CLOMR

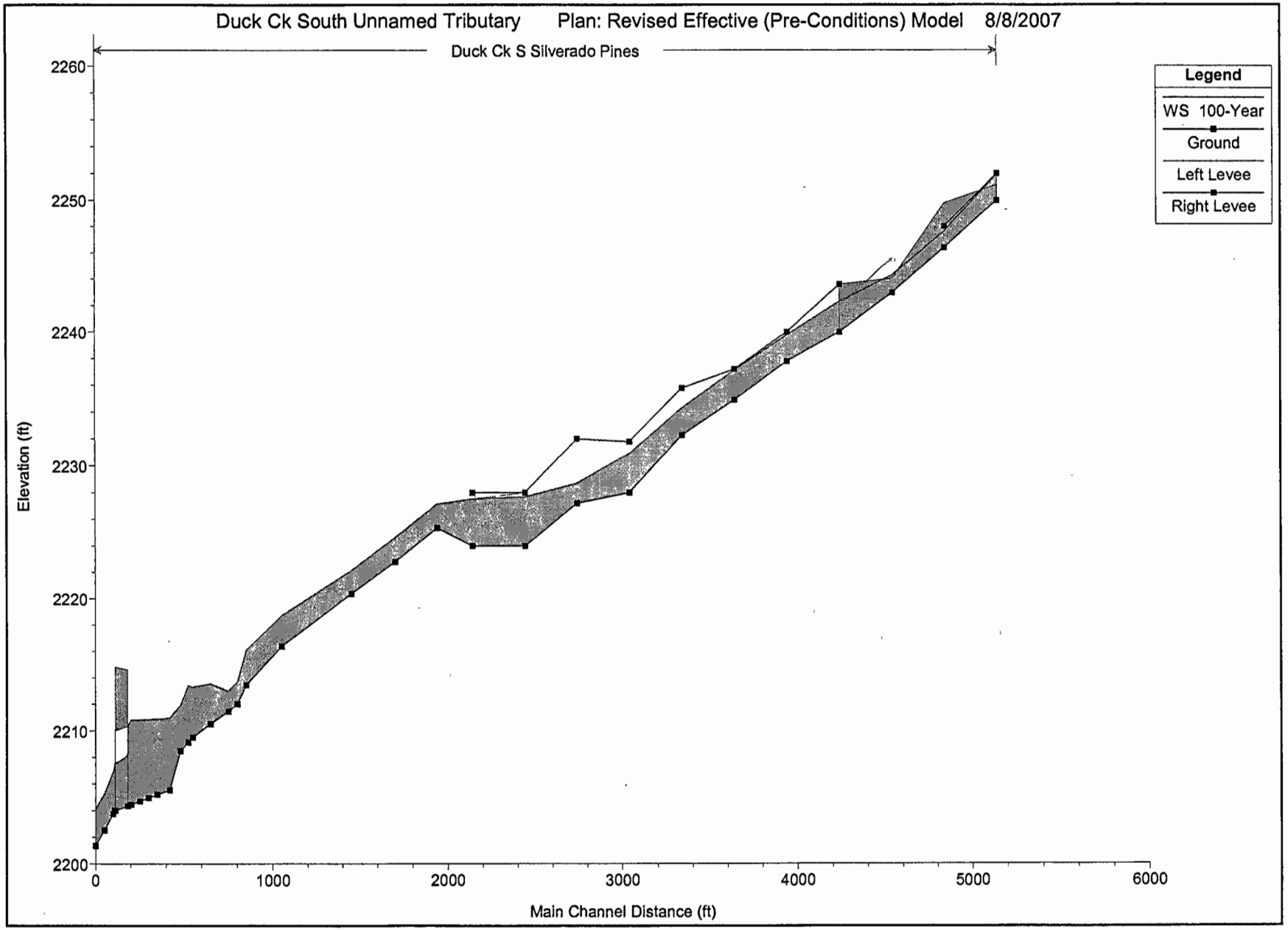
1

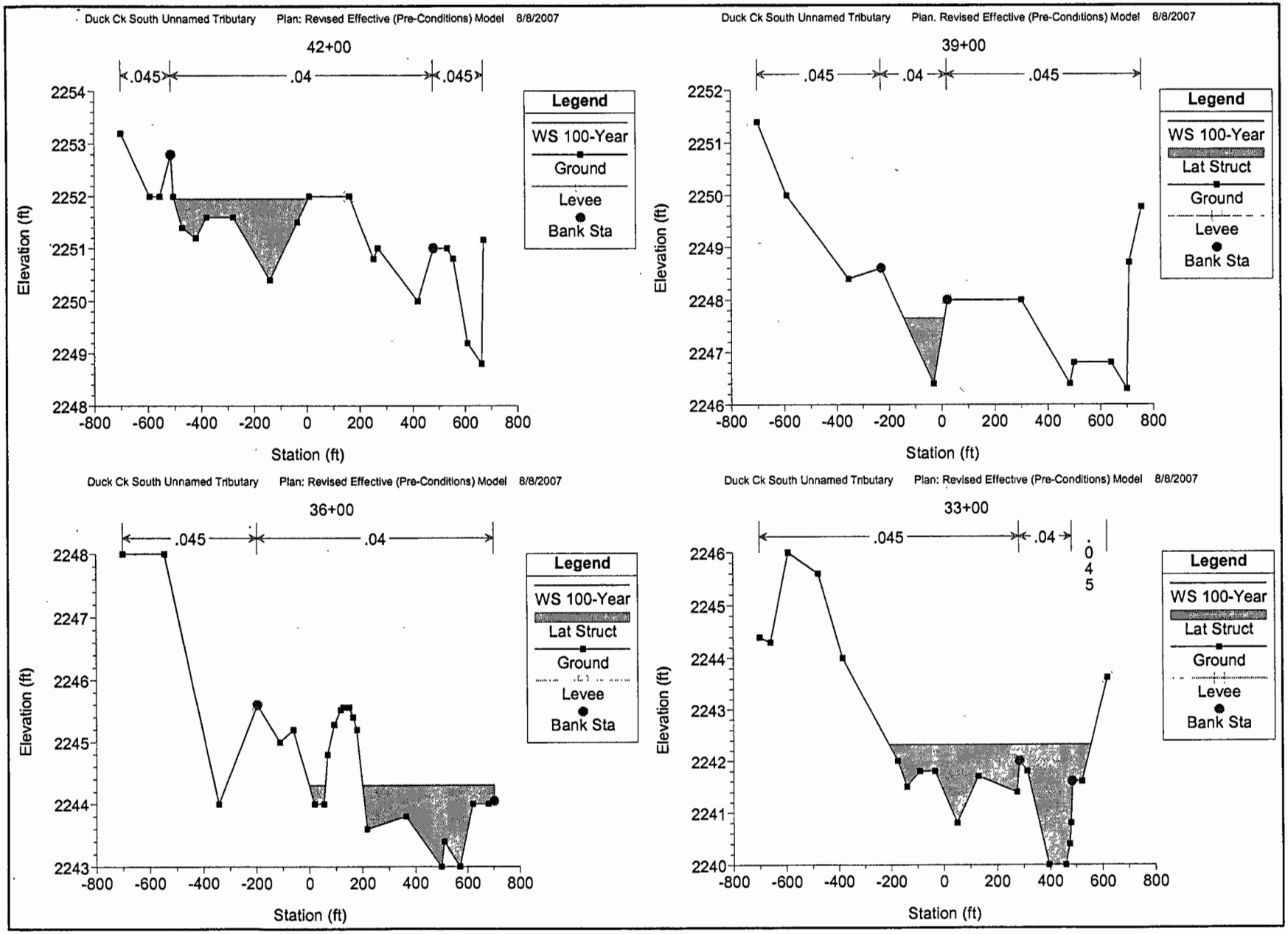
# APPENDIX C

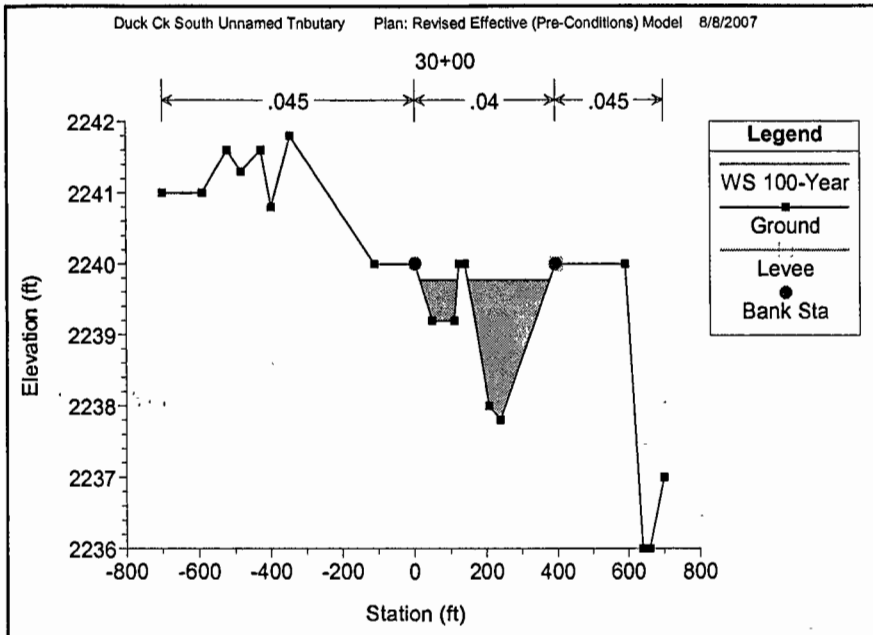
## DUCK CREEK SOUTH CHANNEL
## POST-PROJECT HEC-RAS OUTPUT

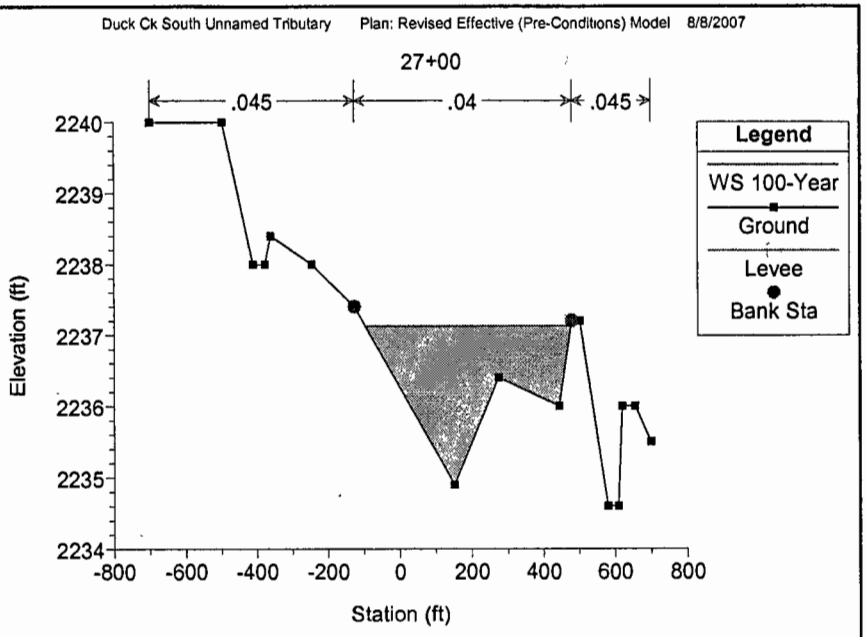
HEC-RAS Plan: RE River: Duck Ck S Reach: Silverado Pines Profile: 100-Year

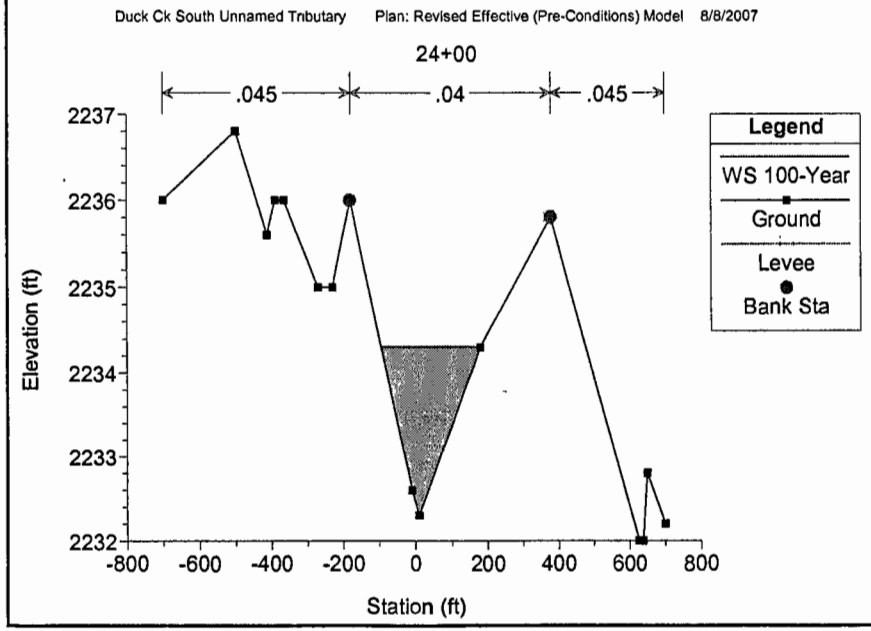
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Silverado Pines | 420000 | 100-Year | 1640.00 | 2250.00 | 2251.96 | 2251.96 | 2252.30 | 0.026422 | 4.70 | 349.06 | 508.56 | 1.00 |
| Silverado Pines | 419999 | | Lat Struct | | | | | | | | | |
| Silverado Pines | 390000 | 100-Year | 1598.00 | 2246.40 | 2247.65 | 2248.01 | 2251.91 | 0.371519 | 16.56 | 96.52 | 154.34 | 3.69 |
| Silverado Pines | 360000 | 100-Year | 1598.00 | 2243.00 | 2244.30 | 2244.27 | 2244.59 | 0.023162 | 4.29 | 372.13 | 561.85 | 0.93 |
| Silverado Pines | 330000 | 100-Year | 1598.00 | 2240.00 | 2242.32 | 2242.01 | 2242.41 | 0.003367 | 2.96 | 734.93 | 764.09 | 0.41 |
| Silverado Pines | 300000 | 100-Year | 1598.00 | 2237.80 | 2239.77 | 2239.77 | 2240.22 | 0.024599 | 5.39 | 296.62 | 333.53 | 1.01 |
| Silverado Pines | 270000 | 100-Year | 1598.00 | 2234.90 | 2237.13 | 2236.58 | 2237.23 | 0.004008 | 2.52 | 634.82 | 573.22 | 0.42 |
| Silverado Pines | 240000 | 100-Year | 1598.00 | 2232.30 | 2234.31 | 2234.31 | 2234.81 | 0.022770 | 5.67 | 281.67 | 276.61 | 0.99 |
| Silverado Pines | 210000 | 100-Year | 1598.00 | 2228.00 | 2230.90 | 2229.97 | 2231.01 | 0.002883 | 2.68 | 595.40 | 381.40 | 0.38 |
| Silverado Pines | 180000 | 100-Year | 1598.00 | 2227.20 | 2228.69 | 2228.69 | 2229.06 | 0.024866 | 4.93 | 324.41 | 420.66 | 0.99 |
| Silverado Pines | 150000 | 100-Year | 1598.00 | 2224.00 | 2227.67 | 2225.45 | 2227.71 | 0.000709 | 1.63 | 980.05 | 462.93 | 0.20 |
| Silverado Pines | 120000 | 100-Year | 1598.00 | 2224.00 | 2227.51 | 2225.20 | 2227.54 | 0.000433 | 1.48 | 1083.01 | 411.89 | 0.16 |
| Silverado Pines | 28700 | 100-Year | 1598.00 | 2225.37 | 2227.15 | | 2227.31 | 0.006463 | 3.27 | 495.54 | 452.50 | 0.54 |
| Silverado Pines | 28650 | 100-Year | 1598.00 | 2222.80 | 2224.64 | | 2225.10 | 0.013304 | 5.72 | 312.53 | 259.47 | 0.81 |
| Silverado Pines | 28600 | 100-Year | 1598.00 | 2220.37 | 2222.12 | 2221.80 | 2222.43 | 0.008571 | 5.00 | 396.26 | 325.45 | 0.67 |
| Silverado Pines | 28500 | 100-Year | 1598.00 | 2216.37 | 2218.69 | | 2219.02 | 0.008579 | 4.59 | 352.48 | 259.84 | 0.65 |
| Silverado Pines | 12 | 100-Year | 1598.00 | 2213.45 | 2216.09 | 2216.09 | 2217.00 | 0.011281 | 10.04 | 226.64 | 158.27 | 1.09 |
| Silverado Pines | 11.5 | 100-Year | 1598.00 | 2212.00 | 2213.69 | 2214.41 | 2215.96 | 0.033331 | 12.83 | 138.26 | 103.65 | 1.74 |
| Silverado Pines | 11 | 100-Year | 1598.00 | 2211.45 | 2212.98 | 2213.32 | 2214.28 | 0.023458 | 9.66 | 177.00 | 149.54 | 1.42 |
| Silverado Pines | 10.0 | 100-Year | 1598.00 | 2210.50 | 2213.54 | 2212.43 | 2213.80 | 0.001869 | 4.33 | 394.89 | 235.59 | 0.45 |
| Silverado Pines | 9.0 | 100-Year | 1598.00 | 2209.50 | 2213.29 | 2211.73 | 2213.62 | 0.001571 | 4.68 | 344.63 | 274.57 | 0.43 |
| Silverado Pines | 8.75 | 100-Year | 1598.00 | 2209.13 | 2213.40 | 2211.08 | 2213.54 | 0.000597 | 3.16 | 522.02 | 217.90 | 0.27 |
| Silverado Pines | 8.3 | 100-Year | 1598.00 | 2208.47 | 2211.88 | 2211.88 | 2213.34 | 0.011169 | 10.15 | 170.99 | 60.43 | 0.97 |
| Silverado Pines | 7.71 | 100-Year | 1598.00 | 2205.55 | 2210.93 | 2208.95 | 2211.41 | 0.002092 | 5.96 | 302.13 | 72.34 | 0.45 |
| Silverado Pines | 7.0 | 100-Year | 1598.00 | 2205.20 | 2210.86 | | 2211.28 | 0.001275 | 5.61 | 322.31 | 74.00 | 0.42 |
| Silverado Pines | 6.5 | 100-Year | 1598.00 | 2204.95 | 2210.82 | | 2211.21 | 0.001107 | 5.36 | 338.57 | 75.31 | 0.39 |
| Silverado Pines | 6.0 | 100-Year | 1598.00 | 2204.70 | 2210.80 | | 2211.15 | 0.000962 | 5.13 | 355.52 | 76.65 | 0.37 |
| Silverado Pines | 5.5 | 100-Year | 1598.00 | 2204.45 | 2210.77 | | 2211.09 | 0.000838 | 4.90 | 372.87 | 77.94 | 0.34 |
| Silverado Pines | 5.28 | 100-Year | 1598.00 | 2204.34 | 2210.36 | 2208.01 | 2211.05 | 0.000309 | 6.65 | 240.62 | 40.02 | 0.48 |
| Silverado Pines | 5 | | Culvert | | | | | | | | | |
| Silverado Pines | 4.6 | 100-Year | 1598.00 | 2204.00 | 2207.40 | 2207.40 | 2208.86 | 0.011188 | 10.15 | 171.23 | 60.77 | 0.97 |
| Silverado Pines | 4.5 | 100-Year | 1598.00 | 2203.75 | 2206.92 | 2207.16 | 2208.66 | 0.014421 | 11.01 | 156.92 | 58.90 | 1.09 |
| Silverado Pines | 4.0 | 100-Year | 1598.00 | 2202.50 | 2205.20 | 2205.89 | 2207.65 | 0.025167 | 13.06 | 131.51 | 57.42 | 1.40 |
| Silverado Pines | 3.5 | 100-Year | 1598.00 | 2201.35 | 2204.09 | 2204.50 | 2206.38 | 0.024046 | 12.90 | 224.58 | 1000.92 | 1.37 |

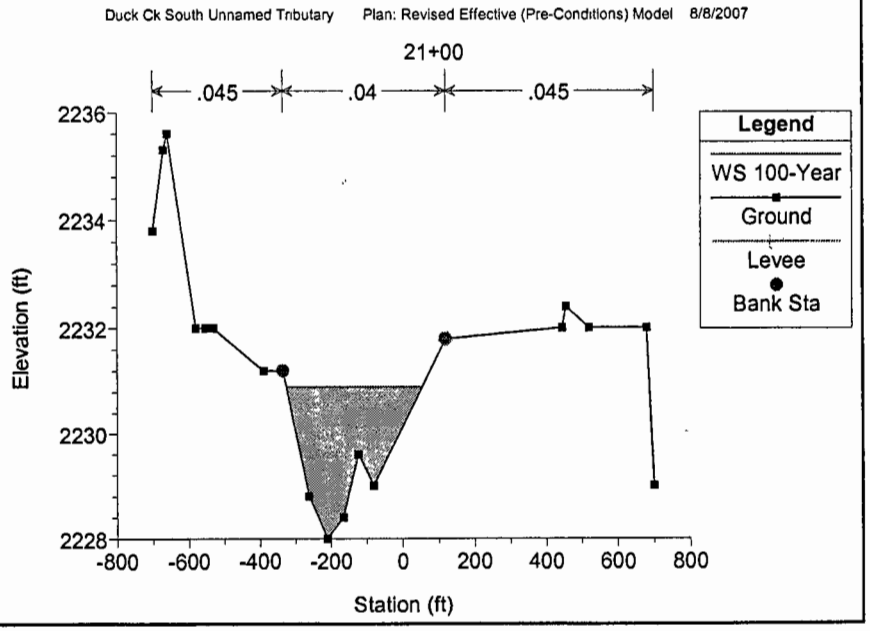

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Duck Ck S Silverado Pines
Legend
WS 100-Year
Ground
Left Levee
Right Levee
Elevation (ft)
2260
2250
2240
2230
2220
2210
2200
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)

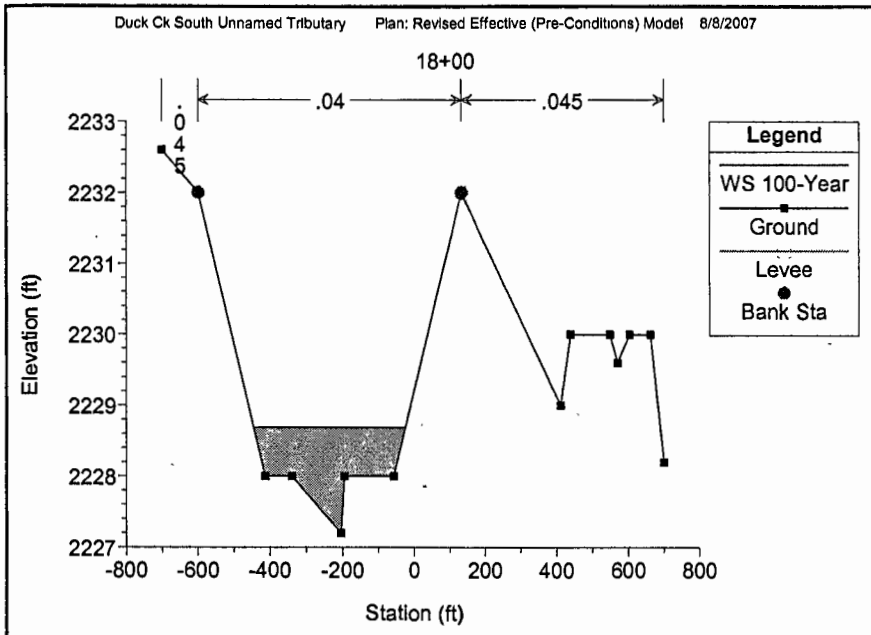

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
42+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Ck South Unnamed Tributary Plan. Revised Effective (Pre-Conditions) Model 8/8/2007
39+00
.045
.04
.045
Legend
WS 100-Year
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
36+00
.045
.04
Legend
WS 100-Year
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
33+00
.045
.04
.045
Legend
WS 100-Year
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

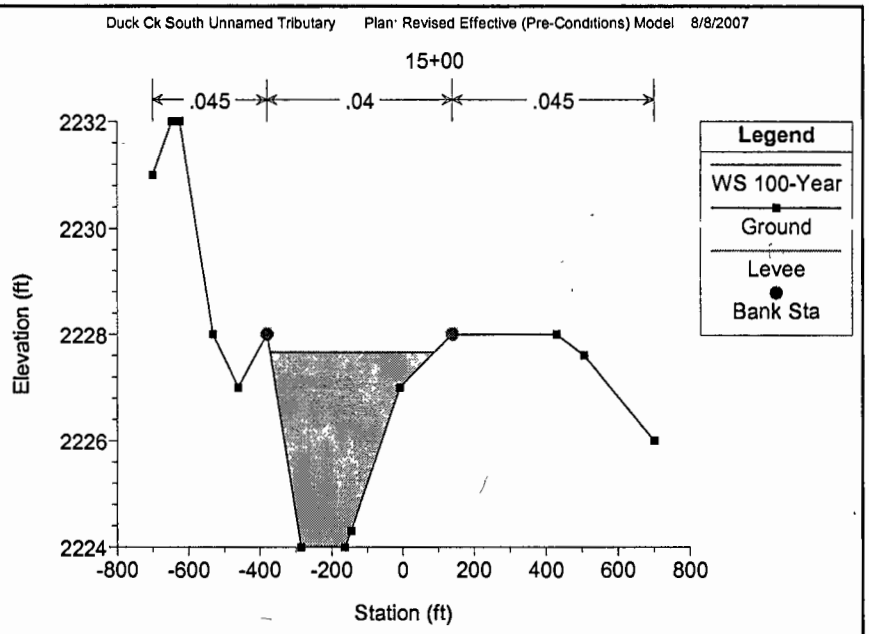

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
30+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

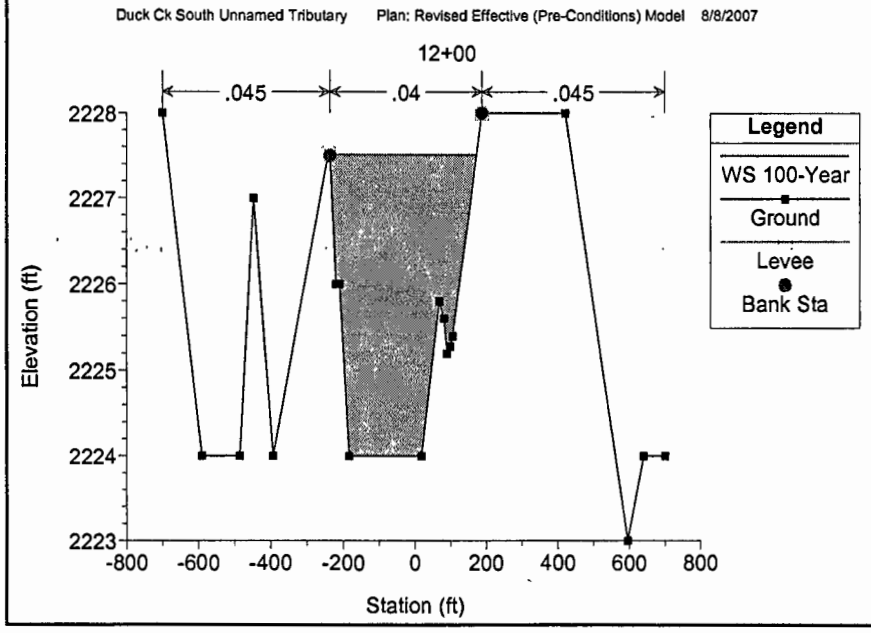

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
27+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

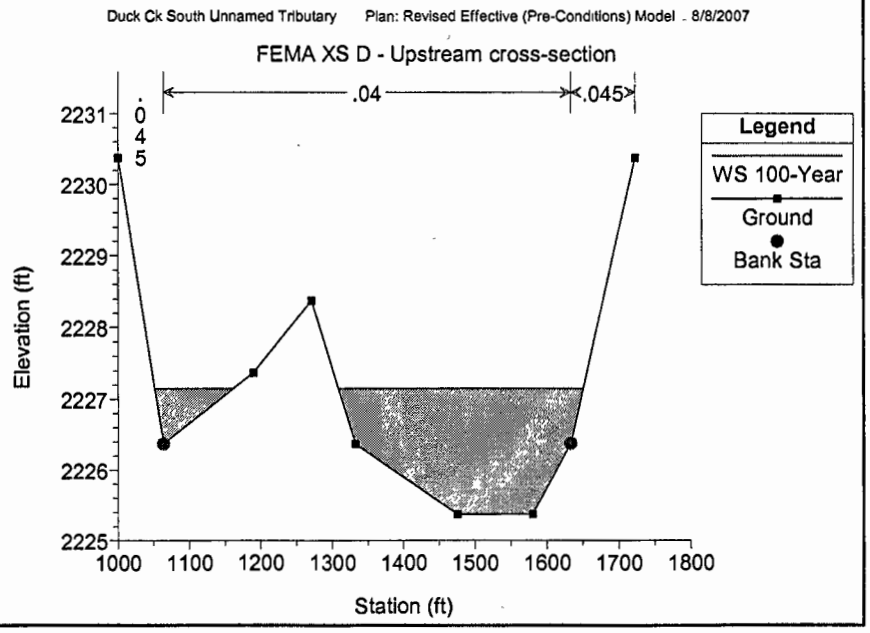

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
24+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

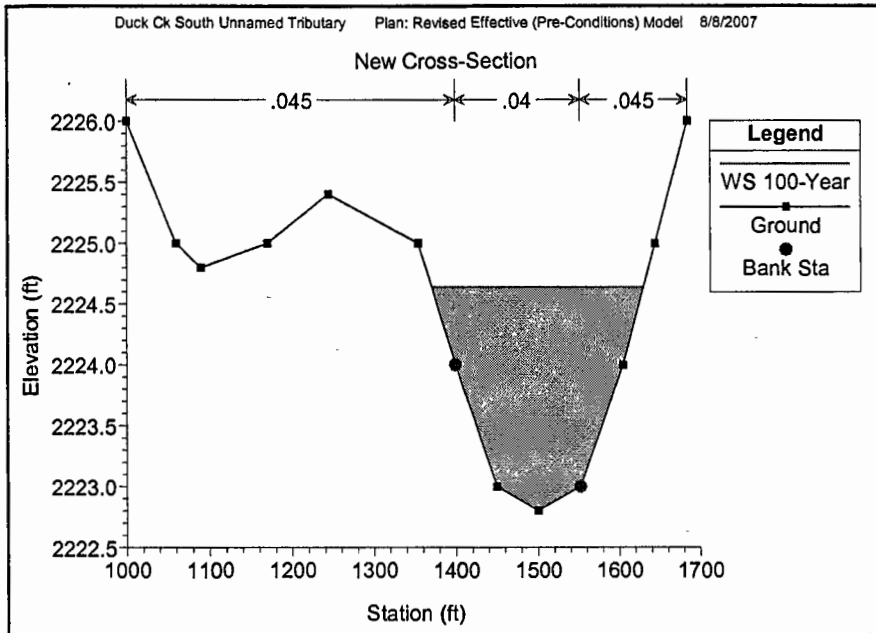

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
21+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

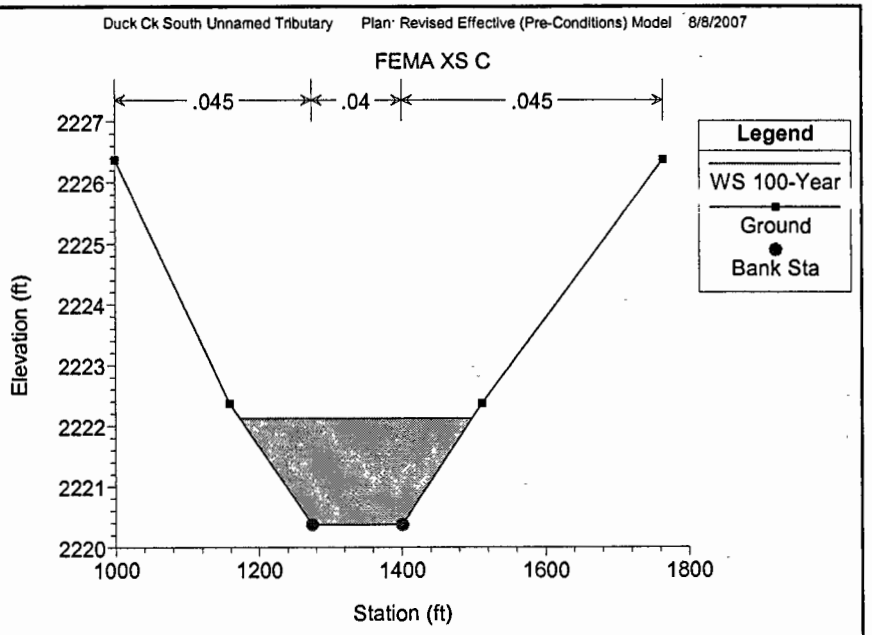

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
18+00
.04
.045
0
4
5
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

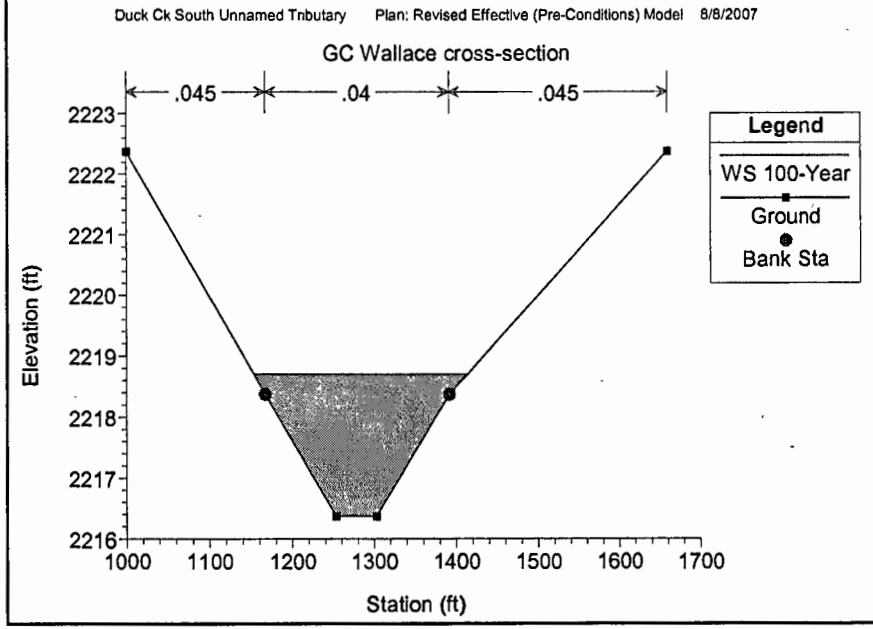

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
15+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

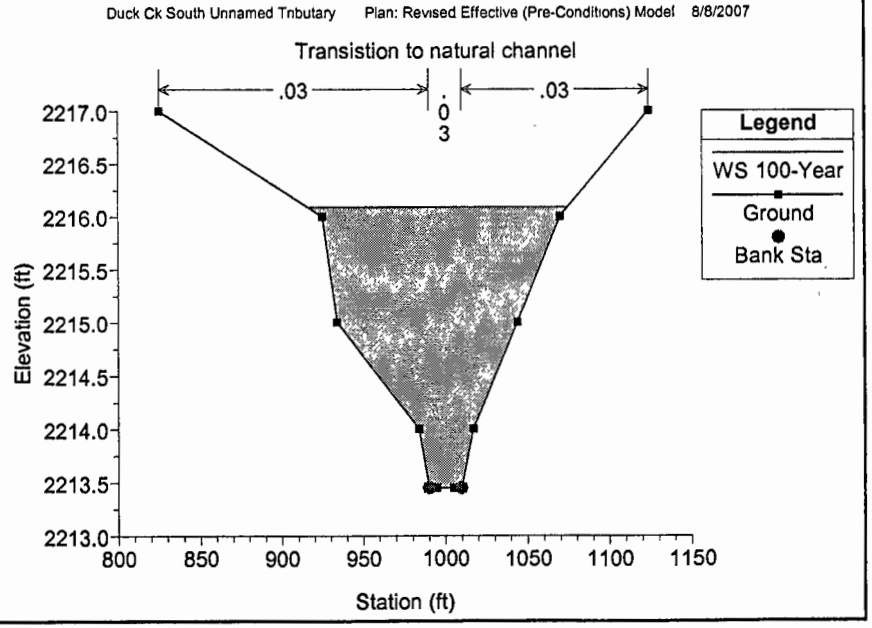

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
12+00
.045
.04
.045
Legend
WS 100-Year
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
FEMA XS D - Upstream cross-section
.04
.045
0
4
5
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

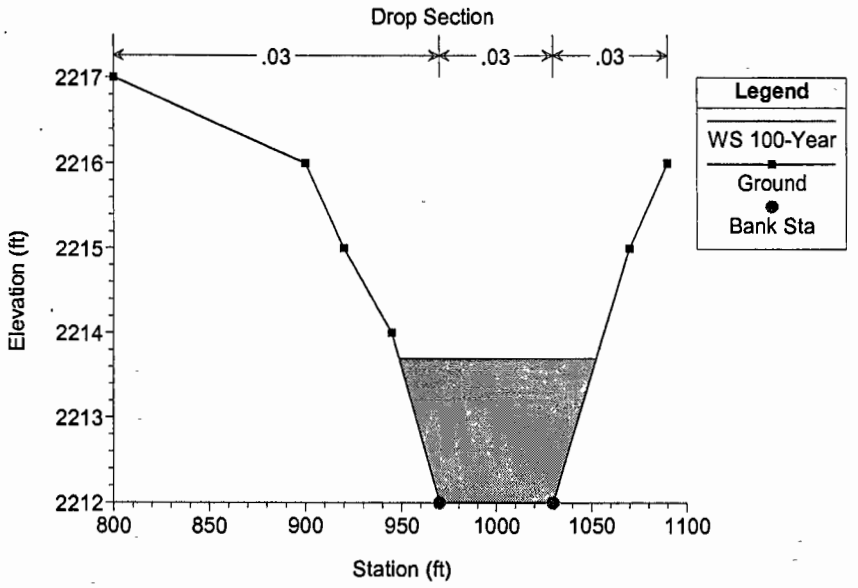

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
New Cross-Section
.045
.04
.045
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
FEMA XS C
.045
.04
.045
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

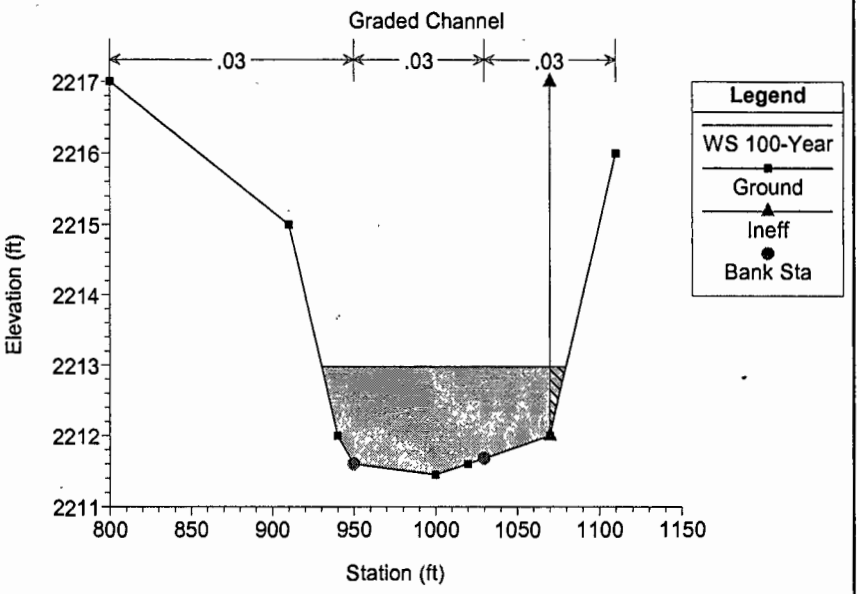

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
GC Wallace cross-section
.045
.04
.045
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Transistion to natural channel
.03
.03
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)

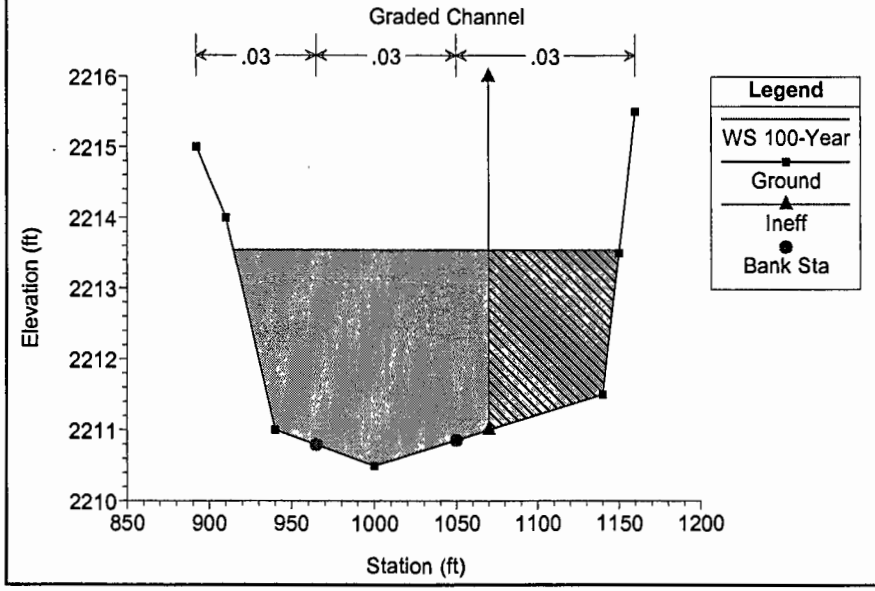
Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007



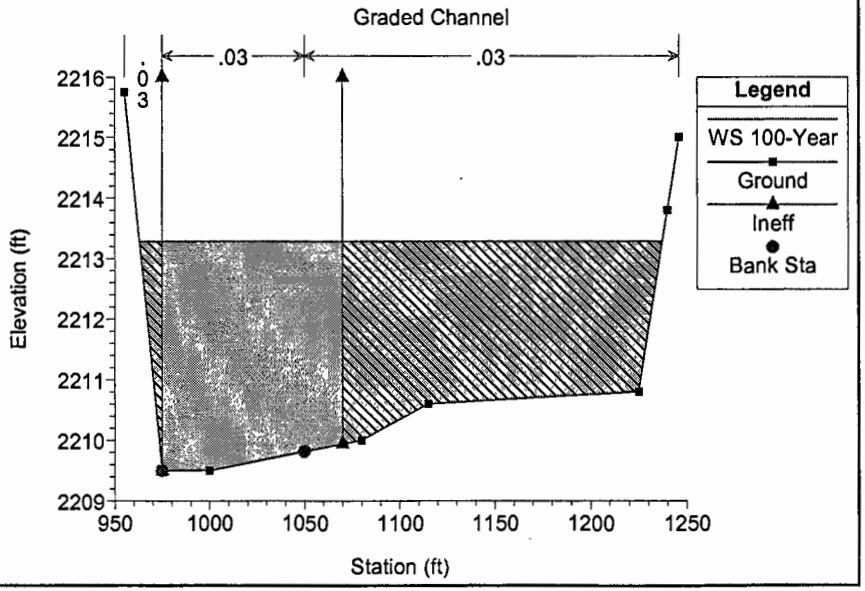

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007

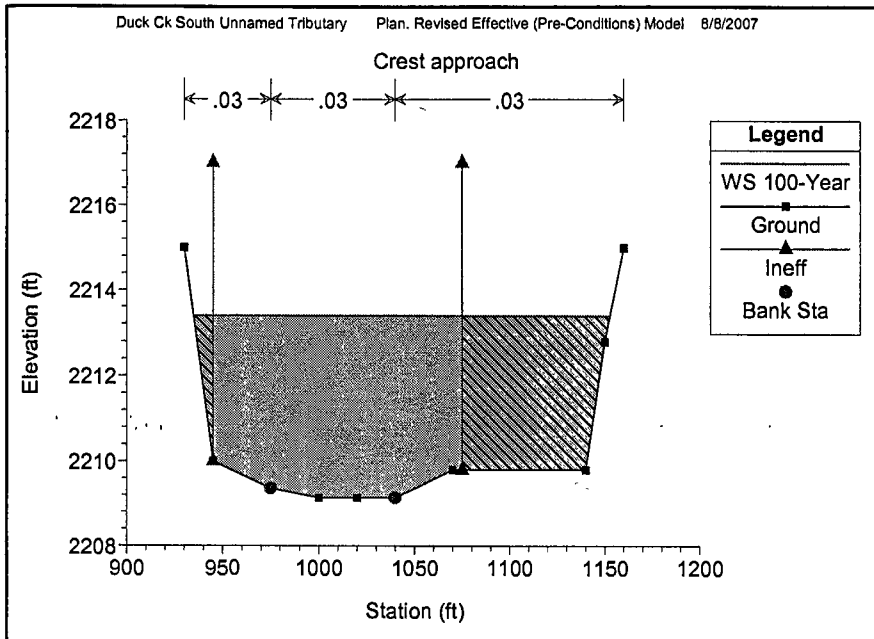


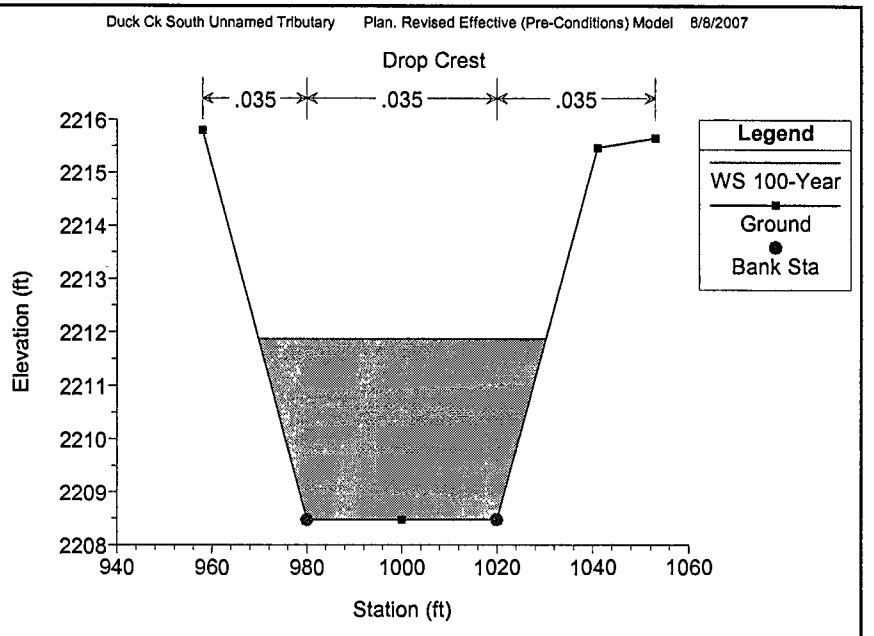

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007

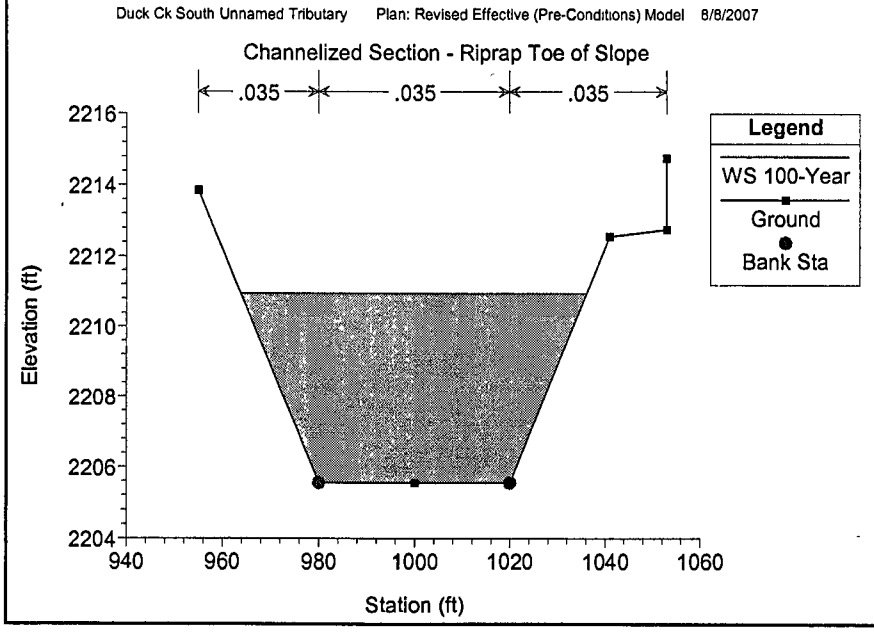


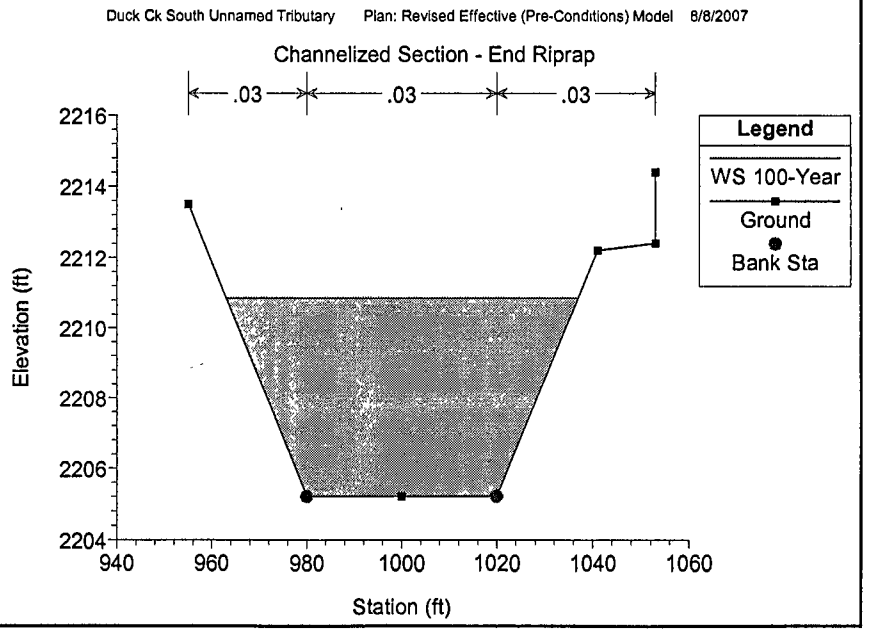

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007

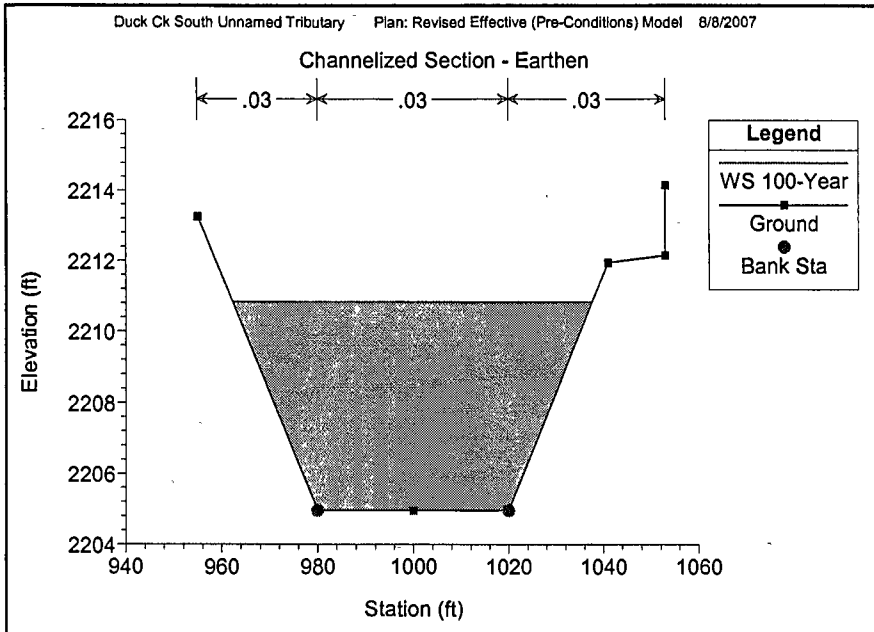


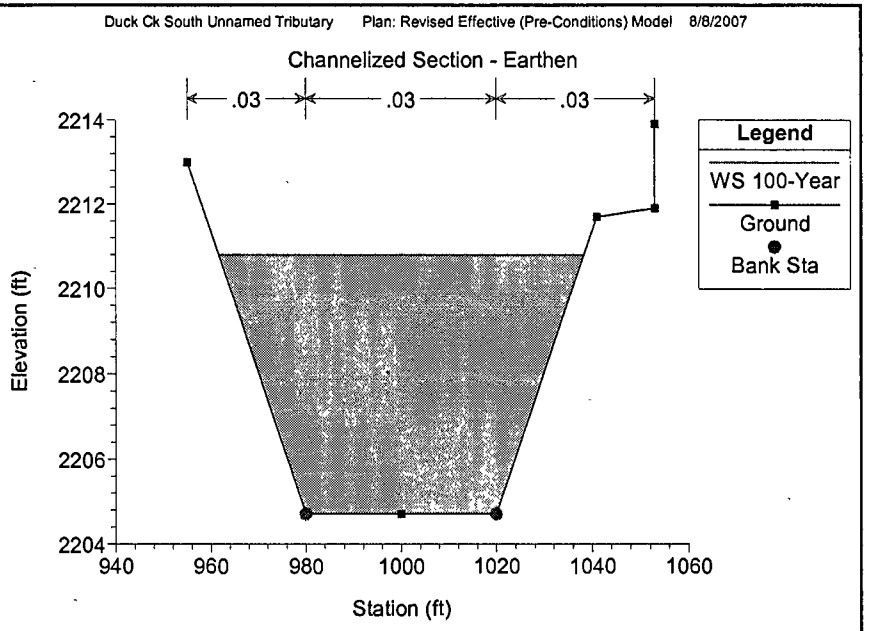

Duck Ck South Unnamed Tributary Plan. Revised Effective (Pre-Conditions) Model 8/8/2007
Crest approach
.03
.03
.03
Legend
WS 100-Year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
2218
2216
2214
2212
2210
2208
900
950
1000
1050
1100
1150
1200

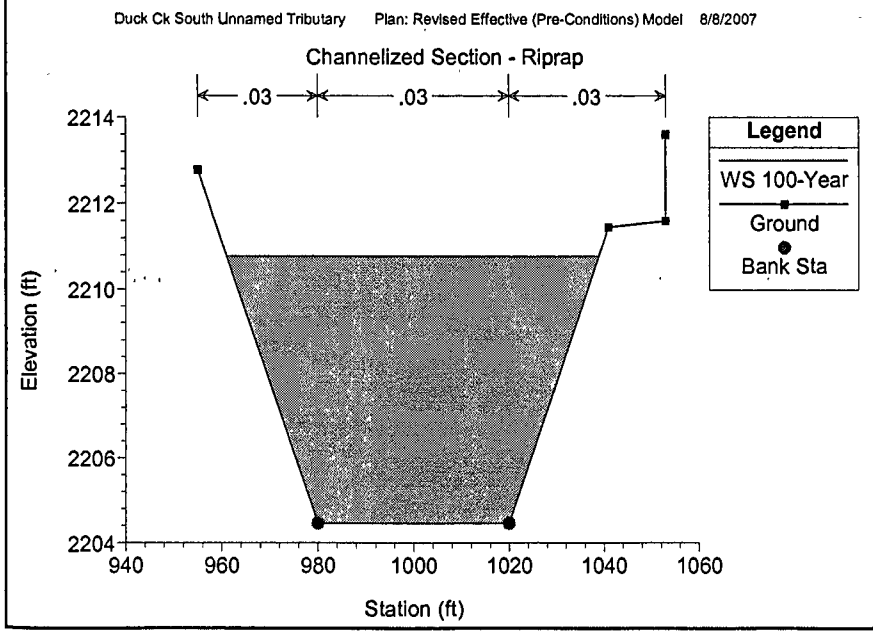

Duck Ck South Unnamed Tributary Plan. Revised Effective (Pre-Conditions) Model 8/8/2007
Drop Crest
.035
.035
.035
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
2216
2215
2214
2213
2212
2211
2210
2209
2208
940
960
980
1000
1020
1040
1060

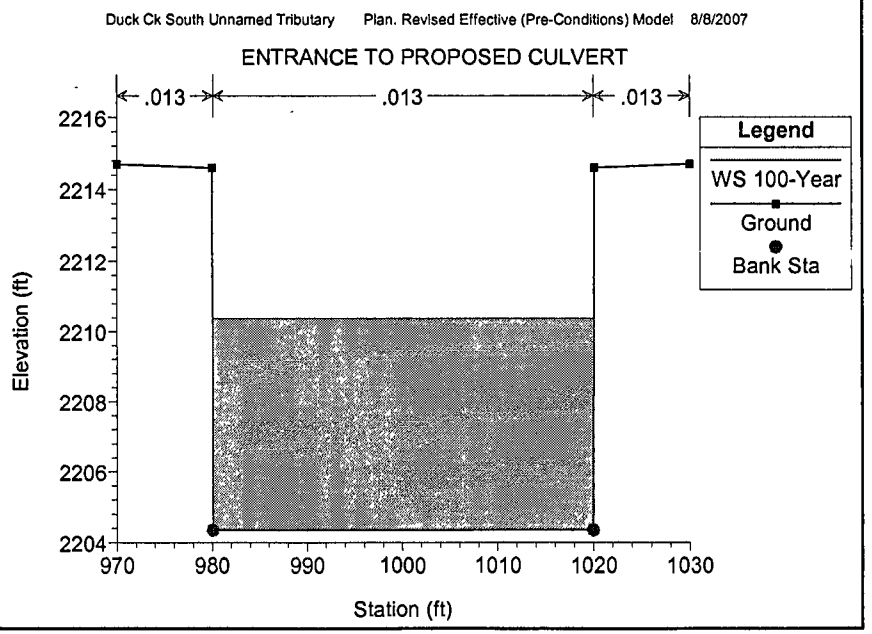

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Channelized Section - Riprap Toe of Slope
.035
.035
.035
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
2216
2214
2212
2210
2208
2206
2204
940
960
980
1000
1020
1040
1060

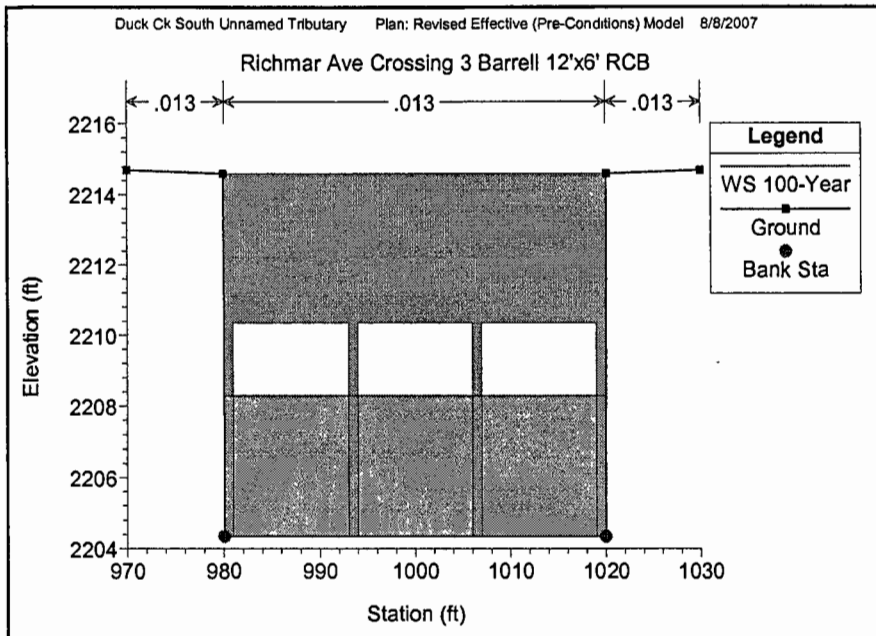

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Channelized Section - End Riprap
.03
.03
.03
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
Station (ft)
2216
2214
2212
2210
2208
2206
2204
940
960
980
1000
1020
1040
1060

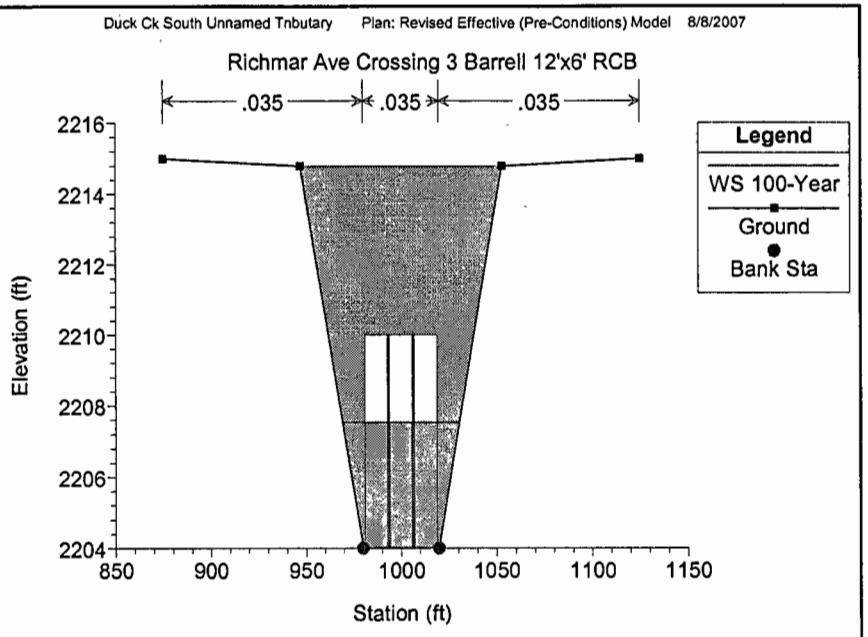

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Channelized Section - Earthen
.03
.03
.03
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
940
960
980
1000
1020
1040
1060
Station (ft)

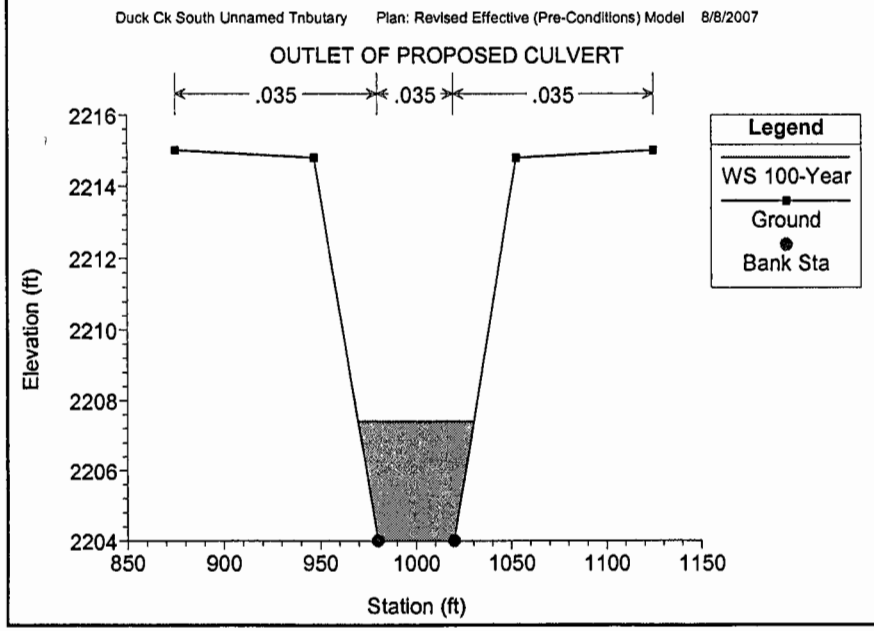

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Channelized Section - Earthen
.03
.03
.03
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2214
2212
2210
2208
2206
2204
940
960
980
1000
1020
1040
1060
Station (ft)

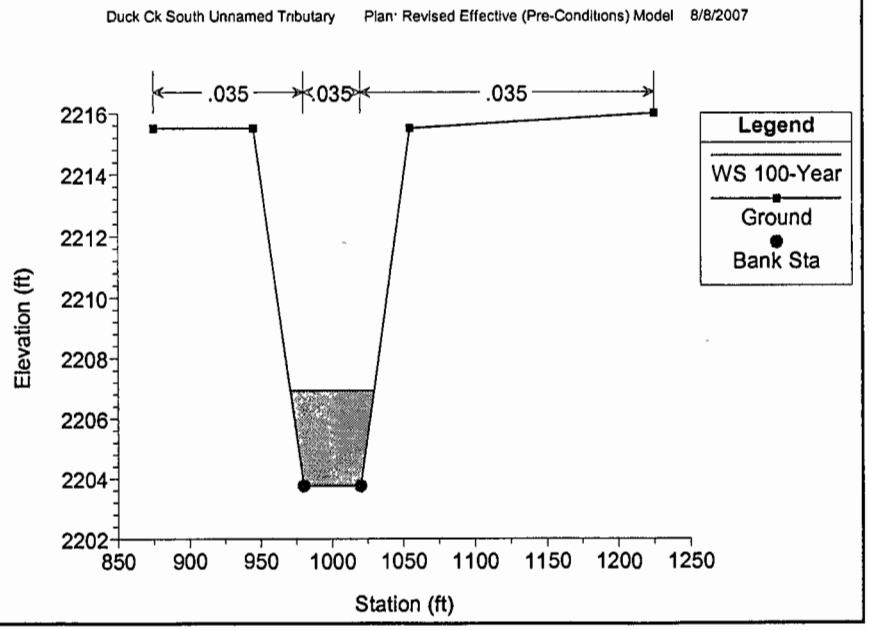

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Channelized Section - Riprap
.03
.03
.03
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2214
2212
2210
2208
2206
2204
940
960
980
1000
1020
1040
1060
Station (ft)

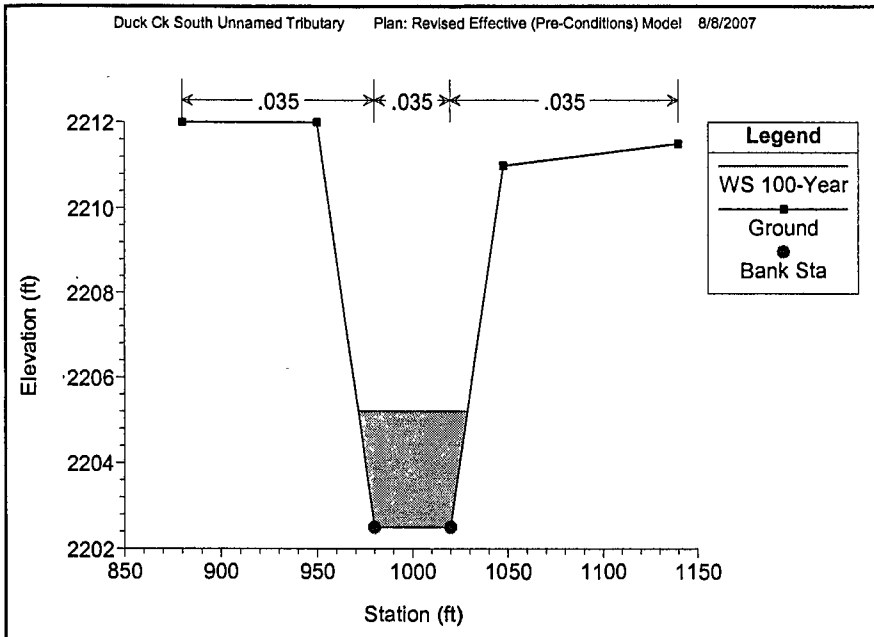

Duck Ck South Unnamed Tributary Plan. Revised Effective (Pre-Conditions) Model 8/8/2007
ENTRANCE TO PROPOSED CULVERT
.013
.013
.013
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
970
980
990
1000
1010
1020
1030
Station (ft)

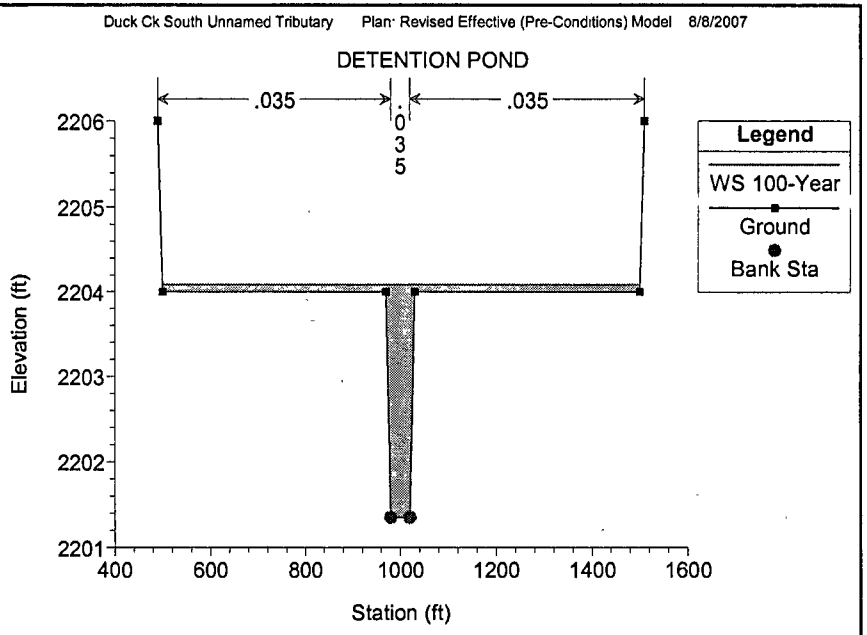

Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Richmar Ave Crossing 3 Barrell 12'x6' RCB
.013
.013
.013
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
970
980
990
1000
1010
1020
1030
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
Richmar Ave Crossing 3 Barrell 12'x6' RCB
.035
.035
.035
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
850
900
950
1000
1050
1100
1150
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
OUTLET OF PROPOSED CULVERT
.035
.035
.035
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
850
900
950
1000
1050
1100
1150
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
.035
.035
.035
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
2216
2214
2212
2210
2208
2206
2204
2202
850
900
950
1000
1050
1100
1150
1200
1250
Station (ft)


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
.035
.035
.035
2212
2210
2208
2206
2204
2202
Elevation (ft)
850
900
950
1000
1050
1100
1150
Station (ft)
Legend
WS 100-Year
Ground
Bank Sta


Duck Ck South Unnamed Tributary Plan: Revised Effective (Pre-Conditions) Model 8/8/2007
DETENTION POND
.035
.035
.035
0
3
5
2206
2205
2204
2203
2202
2201
Elevation (ft)
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
WS 100-Year
Ground
Bank Sta

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  XXXXXX    XXXX       X    X    X    X   XXXXX
```

PROJECT DATA
Project Title: Duck Ck South Unnamed Tributary
Project File : DuckCkSouth.prj
Run Date and Time: 8/8/2007 3:49:14 PM

Project in English units

Project Description:
Hydraulic analysis for Duck Creek South Channel
Prepared in support of the
Approved CLOMR FEMA Case No. 04-09-0432R
Lower Duck Creek Detention Basin to
Silverado Ranch Boulevard
Regulatory Flow with 1.0 foot floodway
Stantec
Consulting Inc June 2004
By vcg

PLAN DATA

Plan Title: Revised Effective (Pre-Conditions) Model
Plan File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\Unnamed Wash\Model for FEMA\DuckCkSouth.p03

Geometry Title: Revised Effective Model
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\Unnamed Wash\Model for FEMA\DuckCkSouth.g03

Flow Title : Regulatory Flow - Revised Boundary
Flow File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\Unnamed Wash\Model for FEMA\DuckCkSouth.f03

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections | = 32 | Multiple Openings | = | 0 |
| | Culverts | = 1 | Inline Structures | = | 0 |
| | Bridges | = 0 | Lateral Structures | = | 1 |

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 = Duck Ck S Reach = Silverado Pines

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 28700 | PF 2 | 1 | 1064 | 1460 |
| 28650 | PF 2 | 1 | 1225 | 1505 |
| 28600 | PF 2 | 1 | 1274.67 | 1401.53 |
| 28500 | PF 2 | 1 | 1220 | 1337 |
| 12 | PF 2 | 1 | 940 | 1050 |
| 11.5 | PF 2 | 1 | 970 | 1030 |
| 11 | PF 2 | 1 | 950 | 1030 |
| 10.0 | PF 2 | 1 | 965 | 1050 |
| 9.0 | PF 2 | 1 | 975 | 1050 |
| 8.75 | PF 2 | 1 | 950 | 1070 |
| 8.3 | PF 2 | 1 | 975 | 1020 |
| 7.71 | PF 2 | 1 | 960 | 1040 |
| 7.0 | PF 2 | 1 | 960 | 1040 |
| 6.5 | PF 2 | 1 | 960 | 1040 |
| 6.0 | PF 2 | 1 | 960 | 1040 |
| 5.5 | PF 2 | 1 | 960 | 1040 |
| 5.28 | PF 2 | 1 | 980.05 | 1020.05 |
| 5 | PF 2 | 4 | | |
| 4.6 | PF 2 | 1 | 980 | 1020 |
| 4.5 | PF 2 | 1 | 980 | 1020 |
| 4.0 | PF 2 | 1 | 980 | 1020 |
| 3.5 | PF 2 | 1 | 500 | 1500 |

FLOW DATA

Flow Title: Regulatory Flow - Revised Boundary
Flow File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\Unnamed Wash\Model for FEMA\DuckCkSouth.f03

Flow Data (cfs)

| River | Reach | RS | 100-Year |
|---|---|---|---|
| Duck Ck S | Silverado Pines | 420000 | 1640 |
| Duck Ck S | Silverado Pines | 390000 | 1598 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Duck Ck S | Silverado Pines | 100-Year | Normal S = 0.012 | Known WS = 2202 |

GEOMETRY DATA

Geometry Title: Revised Effective Model
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics & CLOMR\HEC-RAS\Unnamed Wash\Model for FEMA\DuckCkSouth.g03

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 420000

INPUT
Description: 42+00
Station Elevation Data num= 22

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2253.2 | -593 | 2252 | -555 | 2252 | -514 | 2252.8 | -505 | 2252 |
| -472 | 2251.4 | -420 | 2251.2 | -380 | 2251.6 | -280 | 2251.6 | -140 | 2250.4 |
| -35 | 2251.5 | 10 | 2252 | 162 | 2252 | 253 | 2250.8 | 270 | 2251 |
| 420 | 2250 | 480 | 2251 | 532 | 2251 | 555 | 2250.8 | 610 | 2249.2 |
| 663 | 2248.8 | 670.93 | 2251.16 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -514 | .04 | 480 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -514 | 480 | 300 | 300 | .1 | .3 |

Right Levee Station= 162 Elevation= 2252

LATERAL STRUCTURE

RIVER: Duck Ck S
REACH: Silverado Pines RS: 419999

INPUT
Description:
Lateral structure position = Right overbank
Distance from Upstream XS = 1
Deck/Roadway Width = 1
Weir Coefficient = 2
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|
| 0 | 2251.16 | 300 | 2249.78 | 600 | 2244.05 | 900 | 2243.62 |

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 390000

INPUT
Description: 39+00
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2251.4 | -590 | 2250 | -355 | 2248.4 | -230 | 2248.6 | -30 | 2246.4 |
| 22 | 2248 | 300 | 2248 | 484 | 2246.4 | 500 | 2246.8 | 640 | 2246.8 |
| 700 | 2246.3 | 709.88 | 2248.71 | 757.55 | 2249.78 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -230 | .04 | 22 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -230 | 22 | 300 | 300 | .1 | .3 |

Right Levee Station= 22 Elevation= 2248

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 360000

INPUT
Description: 36+00
Station Elevation Data num= 24

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2248 | -544 | 2248 | -343 | 2244 | -196 | 2245.6 | -110 | 2245 |
| -60 | 2245.2 | 20 | 2244 | 55 | 2244 | 70 | 2244.8 | 95 | 2245.28 |
| 120 | 2245.52 | 130 | 2245.56 | 140 | 2245.56 | 150 | 2245.56 | 165 | 2245.4 |
| 180 | 2245.2 | 218 | 2243.6 | 365 | 2243.8 | 500 | 2243 | 510 | 2243.4 |
| 570 | 2243 | 620 | 2244 | 680 | 2244 | 702.38 | 2244.05 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -196 | .04 | 702.38 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -196 | 702.38 | 300 | 300 | .1 | .3 |

Left Levee Station= -196 Elevation= 2245.6

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 330000

INPUT
Description: 33+00
Station Elevation Data num= 21

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2244.4 | -660 | 2244.3 | -592 | 2246 | -478 | 2245.6 | -385 | 2244 |
| -174 | 2242 | -140 | 2241.5 | -90 | 2241.8 | -33 | 2241.8 | 50 | 2240.8 |
| 130 | 2241.7 | 275 | 2241.4 | 285 | 2242 | 315 | 2241.8 | 396 | 2240 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 460 | 2240 | 475 | 2240.4 | 480 | 2240.8 | 485 | 2241.6 | 522 | 2241.6 |
| 619.68 | 2243.62 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | 285 | .04 | 485 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 285 | 485 | 300 | 300 | 300 | .1 | .3 |

Left Levee Station= 285 Elevation= 2242
Right Levee Station= 619.68 Elevation= 2243.62

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 300000

INPUT
Description: 30+00
Station Elevation Data num= 20

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2241 | -590 | 2241 | -520 | 2241.6 | -482 | 2241.3 | -427 | 2241.6 |
| -399 | 2240.8 | -345 | 2241.8 | -110 | 2240 | 4 | 2240 | 50 | 2239.2 |
| 111 | 2239.2 | 124 | 2240 | 142 | 2240 | 208 | 2238 | 240 | 2237.8 |
| 396 | 2240 | 593 | 2240 | 640 | 2236 | 660 | 2236 | 700 | 2237 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | 4 | .04 | 396 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 4 | 396 | 300 | 300 | 300 | .1 | .3 |

Right Levee Station= 396 Elevation= 2240

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 270000

INPUT
Description: 27+00
Station Elevation Data num= 17

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2240 | -497 | 2240 | -410 | 2238 | -377 | 2238 | -361 | 2238.4 |
| -245 | 2238 | -125 | 2237.4 | 152 | 2234.9 | 275 | 2236.4 | 444 | 2236 |
| 480 | 2237.2 | 502 | 2237.2 | 580 | 2234.6 | 609 | 2234.6 | 620 | 2236 |
| 655 | 2236 | 700 | 2235.5 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -125 | .04 | 480 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -125 | 480 | 300 | 300 | 300 | .1 | .3 |

Right Levee Station= 480 Elevation= 2237.2

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 240000

INPUT
Description: 24+00
Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2236 | -500 | 2236.8 | -412 | 2235.6 | -390 | 2236 | -366 | 2236 |
| -270 | 2235 | -230 | 2235 | -180 | 2236 | -10 | 2232.6 | 10 | 2232.3 |
| 180 | 2234.3 | 380 | 2235.8 | 627 | 2232 | 638 | 2232 | 650 | 2232.8 |
| 700 | 2232.2 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -180 | .04 | 380 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -180 | 380 | 300 | 300 | 300 | .1 | .3 |

Right Levee  Station=  380  Elevation=  2235.8

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines  RS: 210000

INPUT
Description: 21+00
Station Elevation Data  num=  19

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2233.8 | -670 | 2235.3 | -660 | 2235.6 | -580 | 2232 | -553 | 2232 |
| -530 | 2232 | -390 | 2231.2 | -335 | 2231.2 | -262 | 2228.8 | -210 | 2228 |
| -165 | 2228.4 | -123 | 2229.6 | -80 | 2229 | 120 | 2231.8 | 445 | 2232 |
| 456 | 2232.4 | 520 | 2232 | 680 | 2232 | 700 | 2229 | | |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -335 | .04 | 120 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -335 | 120 | 300 | 300 | 300 | .1 | .3 |

Right Levee  Station=  120  Elevation=  2231.8

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines  RS: 180000

INPUT
Description: 18+00
Station Elevation Data  num=  15

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2232.6 | -598 | 2232 | -413 | 2228 | -340 | 2228 | -205 | 2227.2 |
| -195 | 2228 | -57 | 2228 | 135 | 2232 | 412 | 2229 | 440 | 2230 |
| 550 | 2230 | 570 | 2229.6 | 604 | 2230 | 662 | 2230 | 700 | 2228.2 |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -598 | .04 | 135 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -598 | 135 | 300 | 300 | 300 | .1 | .3 |

Right Levee  Station=  135  Elevation=  2232

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines  RS: 150000

INPUT
Description: 15+00
Station Elevation Data  num=  14

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2231 | -646 | 2232 | -624 | 2232 | -531 | 2228 | -460 | 2227 |
| -380 | 2228 | -286 | 2224 | -164 | 2224 | -146 | 2224.3 | -8 | 2227 |
| 140 | 2228 | 430 | 2228 | 506 | 2227.6 | 700 | 2226 | | |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -380 | .04 | 140 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -380 | 140 | 300 | 300 | 300 | .1 | .3 |

Left Levee  Station=  -380  Elevation=  2228
Right Levee  Station=  140  Elevation=  2228

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines  RS: 120000

INPUT
Description: 12+00
Station Elevation Data  num=  21

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -700 | 2228 | -590 | 2224 | -485 | 2224 | -446 | 2227 | -393 | 2224 |
| -240 | 2227.52 | -236 | 2227.5 | -220 | 2226 | -210 | 2226 | -184 | 2224 |
| 18 | 2224 | 70 | 2225.8 | 82 | 2225.6 | 90 | 2225.2 | 100 | 2225.28 |
| 106 | 2225.4 | 190 | 2228 | 423 | 2228 | 595 | 2223 | 640 | 2224 |
| 700 | 2224 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -700 | .045 | -236 | .04 | 190 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -236 | 190 | 200 | 200 | .1 | .3 |

Left Levee Station= -240 Elevation= 2227.52
Right Levee Station= 190 Elevation= 2228

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 28700

INPUT
Description: FEMA XS D - Upstream cross-section
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 2230.37 | 1064 | 2226.37 | 1190 | 2227.37 | 1271 | 2228.37 | 1332.28 | 2226.37 |
| 1476.2 | 2225.37 | 1580.73 | 2225.37 | 1633.49 | 2226.37 | 1722.15 | 2230.37 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 1000 | .045 | 1064 | .04 | 1633.49 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 1064 | 1633.49 | 200 | 241 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 28650

INPUT
Description: New Cross-Section
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 2226 | 1060 | 2225 | 1090 | 2224.8 | 1170 | 2225 | 1245 | 2225.4 |
| 1355 | 2225 | 1400 | 2224 | 1450 | 2223 | 1500 | 2222.8 | 1552 | 2223 |
| 1605 | 2224 | 1645 | 2225 | 1685 | 2226 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 1000 | .045 | 1400 | .04 | 1552 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 1400 | 1552 | 200 | 251 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 28600

INPUT
Description: FEMA XS C
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 1000 | 2226.37 | 1158.6 | 2222.37 | 1274.67 | 2220.37 | 1401.53 | 2220.37 | 1512.13 | 2222.37 |
| 1764.47 | 2226.37 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 1000 | .045 | 1274.67 | .04 | 1401.53 | .045 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 1274.67 | 1401.53 | 425.32 | 398.86 | 353.64 | .1 | .3 |

CROSS SECTION

```
RIVER: Duck Ck S
REACH: Silverado Pines    RS: 28500

INPUT
Description: GC Wallace cross-section
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 2222.37 1167.42 2218.37 1253.26 2216.37 1303.05 2216.37 1392.35 2218.37
 1660.18 2222.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .045 1167.42     .04 1392.35    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1167.42 1392.35              201     201     201             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 12

INPUT
Description: Transistion to natural channel
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     825    2217     925    2216     934    2215     984    2214     990 2213.45
     995 2213.45    1005 2213.45    1010 2213.45    1017    2214    1044    2215
    1070    2216    1124    2217

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     825     .03     990     .03    1010     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990    1010              50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 11.5

INPUT
Description: Drop Section
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     800    2217     900    2216     920    2215     945    2214     970    2212
    1030    2212    1070    2215    1090    2216

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     800     .03     970     .03    1030     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          970    1030              50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 11

INPUT
Description: Graded Channel
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     800    2217     910    2215     940    2212     950  2211.6    1000 2211.45
    1020  2211.6    1030 2211.68    1070    2212    1110    2216

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     800     .03     950     .03    1030     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          950    1030              100     100     100             .1       .3
Ineffective Flow     num=       1
```

```
   Sta L   Sta R    Elev  Permanent
    1070    1110    2217       F

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 10.0

INPUT
Description: Graded Channel
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     892    2215     910    2214     940    2211     9652210.792    1000  2210.5
   10502210.857    1140  2211.5    1150  2213.5    1160  2215.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     892     .03     965     .03    1050     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           965    1050              100     100     100             .1      .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1070    1160    2216       F

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 9.0

INPUT
Description: Graded Channel
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2215.75     975  2209.5    1000  2209.5    10502209.813    1080    2210
    1115  2210.6    1225  2210.8    1240  2213.8    1246    2215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     975     .03    1050     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           975    1050               22      25      30             .1      .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     955     975    2216       F
    1070    1246    2216       F

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 8.75

INPUT
Description: Crest approach
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     930    2215     945    2210     9752209.356    1000 2209.13    1020 2209.13
    1040 2209.13    1070  2209.8    1140  2209.8    1150  2212.8    1160    2215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     930     .03     975     .03    1040     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           975    1040               12      45      70             .1      .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     930     945    2217       F
    1075    1160    2217       F

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 8.3
```

```
INPUT
Description: Drop Crest
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     958  2215.8     980 2208.47    1000 2208.47    1020 2208.47    1041 2215.47
    1053 2215.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     958    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               60      60      60             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 7.71

INPUT
Description: Channelized Section - Riprap Toe of Slope
Grade Break
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2213.85     980 2205.55    1000 2205.55    1020 2205.55    1041 2212.55
    1053 2212.75    1053 2214.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               71      71      71             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 7.0

INPUT
Description: Channelized Section - End Riprap
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955  2213.5     980  2205.2    1000  2205.2    1020  2205.2    1041  2212.2
    1053  2212.4    1053  2214.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 6.5

INPUT
Description: Channelized Section - Earthen
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2213.25     980 2204.95    1000 2204.95    1020 2204.95    1041 2211.95
    1053 2212.15    1053 2214.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION
```

RIVER: Duck Ck S
REACH: Silverado Pines RS: 6.0

INPUT
Description: Channelized Section - Earthen
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2213 | 980 | 2204.7 | 1000 | 2204.7 | 1020 | 2204.7 | 1041 | 2211.7 |
| 1053 | 2211.9 | 1053 | 2213.9 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 955 | .03 | 980 | .03 | 1020 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 5.5

INPUT
Description: Channelized Section - Riprap
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2212.78 | 980 | 2204.45 | 1020 | 2204.45 | 1041 | 2211.45 | 1053 | 2211.6 |
| 1053 | 2213.6 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 955 | .03 | 980 | .03 | 1020 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 17 | 17 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 5.28

INPUT
Description: ENTRANCE TO PROPOSED CULVERT
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 970 | 2214.7 | 980 | 2214.6 | 980.1 | 2204.34 | 1020 | 2204.34 | 1020.1 | 2214.6 |
| 1030 | 2214.7 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 970 | .013 | 980.1 | .013 | 1020 | .013 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980.1 | 1020 | 75 | 75 | .3 | .5 |

CULVERT

RIVER: Duck Ck S
REACH: Silverado Pines RS: 5

INPUT
Description: Richmar Ave Crossing 3 Barrell 12'x6' RCB
Distance from Upstream XS = 2
Deck/Roadway Width = 70
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|
| 950 | 2214.6 | | 1050 | 2214.6 | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 970 | 2214.7 | 980 | 2214.6 | 980.1 | 2204.34 | 1020 | 2204.34 | 1020.1 | 2214.6 |
| 1030 | 2214.7 | | | | | | | | |

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     970    .013   980.1    .013    1020    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
         980.1    1020             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     900  2214.8            1100  2214.8

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     875    2215     947  2214.8     980    2204    1020    2204    1053  2214.8
    1125    2215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     875    .035     980    .035    1020    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
          980    1020             .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      12
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 1 - Wingwall flared 45 deg.; inlet top edge bevel=0.043D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  2      72     .013     .013        0                  .4                1
Number of Barrels =  3
Upstream   Elevation =  2204.35
Centerline Stations
    Sta.    Sta.    Sta.
     987    1000    1013
Downstream Elevation =  2204
Centerline Stations
    Sta.    Sta.    Sta.
     987    1000    1013

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 4.6

INPUT
Description: OUTLET OF PROPOSED CULVERT
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     875    2215     947  2214.8     980    2204    1020    2204    1053  2214.8
    1125    2215

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     875    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          980    1020                10      10      10             .3       .5

CROSS SECTION


RIVER: Duck Ck S
REACH: Silverado Pines    RS: 4.5

INPUT
```

Description:
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 875 | 2215.5 | 945 | 2215.5 | 980 | 2203.75 | 1020 | 2203.75 | 1055 | 2215.5 |
| 1225 | 2216 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 875 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 4.0

INPUT
Description:
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 880 | 2212 | 950 | 2212 | 980 | 2202.5 | 1020 | 2202.5 | 1048 | 2211 |
| 1140 | 2211.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 880 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Ck S
REACH: Silverado Pines RS: 3.5

INPUT
Description: DETENTION POND
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 490 | 2206 | 500 | 2204 | 970 | 2204 | 980 | 2201.35 | 1020 | 2201.35 |
| 1030 | 2204 | 1500 | 2204 | 1510 | 2206 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 490 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 0 | 0 | .1 | .3 |

SUMMARY OF MANNING'S N VALUES

River:Duck Ck S

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| Silverado Pines | 420000 | .045 | .04 | .045 |
| Silverado Pines | 419999 | Lat Struct | | |
| Silverado Pines | 390000 | .045 | .04 | .045 |
| Silverado Pines | 360000 | .045 | .04 | .045 |
| Silverado Pines | 330000 | .045 | .04 | .045 |
| Silverado Pines | 300000 | .045 | .04 | .045 |
| Silverado Pines | 270000 | .045 | .04 | .045 |
| Silverado Pines | 240000 | .045 | .04 | .045 |
| Silverado Pines | 210000 | .045 | .04 | .045 |
| Silverado Pines | 180000 | .045 | .04 | .045 |
| Silverado Pines | 150000 | .045 | .04 | .045 |
| Silverado Pines | 120000 | .045 | .04 | .045 |
| Silverado Pines | 28700 | .045 | .04 | .045 |
| Silverado Pines | 28650 | .045 | .04 | .045 |
| Silverado Pines | 28600 | .045 | .04 | .045 |
| Silverado Pines | 28500 | .045 | .04 | .045 |
| Silverado Pines | 12 | .03 | .03 | .03 |
| Silverado Pines | 11.5 | .03 | .03 | .03 |

| | | | | |
|---|---|---|---|---|
| Silverado Pines | 11 | .03 | .03 | .03 |
| Silverado Pines | 10.0 | .03 | .03 | .03 |
| Silverado Pines | 9.0 | .03 | .03 | .03 |
| Silverado Pines | 8.75 | .03 | .03 | .03 |
| Silverado Pines | 8.3 | .035 | .035 | .035 |
| Silverado Pines | 7.71 | .035 | .035 | .035 |
| Silverado Pines | 7.0 | .03 | .03 | .03 |
| Silverado Pines | 6.5 | .03 | .03 | .03 |
| Silverado Pines | 6.0 | .03 | .03 | .03 |
| Silverado Pines | 5.5 | .03 | .03 | .03 |
| Silverado Pines | 5.28 | .013 | .013 | .013 |
| Silverado Pines | 5 | Culvert | | |
| Silverado Pines | 4.6 | .035 | .035 | .035 |
| Silverado Pines | 4.5 | .035 | .035 | .035 |
| Silverado Pines | 4.0 | .035 | .035 | .035 |
| Silverado Pines | 3.5 | .035 | .035 | .035 |

SUMMARY OF REACH LENGTHS

River: Duck Ck S

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Silverado Pines | 420000 | 300 | 300 | 300 |
| Silverado Pines | 419999 | Lat Struct | | |
| Silverado Pines | 390000 | 300 | 300 | 300 |
| Silverado Pines | 360000 | 300 | 300 | 300 |
| Silverado Pines | 330000 | 300 | 300 | 300 |
| Silverado Pines | 300000 | 300 | 300 | 300 |
| Silverado Pines | 270000 | 300 | 300 | 300 |
| Silverado Pines | 240000 | 300 | 300 | 300 |
| Silverado Pines | 210000 | 300 | 300 | 300 |
| Silverado Pines | 180000 | 300 | 300 | 300 |
| Silverado Pines | 150000 | 300 | 300 | 300 |
| Silverado Pines | 120000 | 200 | 200 | 200 |
| Silverado Pines | 28700 | 200 | 241 | 280 |
| Silverado Pines | 28650 | 200 | 251 | 266.54 |
| Silverado Pines | 28600 | 425.32 | 398.86 | 353.64 |
| Silverado Pines | 28500 | 201 | 201 | 201 |
| Silverado Pines | 12 | 50 | 50 | 50 |
| Silverado Pines | 11.5 | 50 | 50 | 50 |
| Silverado Pines | 11 | 100 | 100 | 100 |
| Silverado Pines | 10.0 | 100 | 100 | 100 |
| Silverado Pines | 9.0 | 22 | 25 | 30 |
| Silverado Pines | 8.75 | 12 | 45 | 70 |
| Silverado Pines | 8.3 | 60 | 60 | 60 |
| Silverado Pines | 7.71 | 71 | 71 | 71 |
| Silverado Pines | 7.0 | 50 | 50 | 50 |
| Silverado Pines | 6.5 | 50 | 50 | 50 |
| Silverado Pines | 6.0 | 50 | 50 | 50 |
| Silverado Pines | 5.5 | 17 | 17 | 17 |
| Silverado Pines | 5.28 | 75 | 75 | 75 |
| Silverado Pines | 5 | Culvert | | |
| Silverado Pines | 4.6 | 10 | 10 | 10 |
| Silverado Pines | 4.5 | 50 | 50 | 50 |
| Silverado Pines | 4.0 | 50 | 50 | 50 |
| Silverado Pines | 3.5 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duck Ck S

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| Silverado Pines | 420000 | .1 | .3 |
| Silverado Pines | 419999 | Lat Struct | |
| Silverado Pines | 390000 | .1 | .3 |
| Silverado Pines | 360000 | .1 | .3 |
| Silverado Pines | 330000 | .1 | .3 |
| Silverado Pines | 300000 | .1 | .3 |
| Silverado Pines | 270000 | .1 | .3 |
| Silverado Pines | 240000 | .1 | .3 |
| Silverado Pines | 210000 | .1 | .3 |

| | | | | |
|---|---|---|---|---|
| Silverado Pines | 180000 | | .1 | .3 |
| Silverado Pines | 150000 | | .1 | .3 |
| Silverado Pines | 120000 | | .1 | .3 |
| Silverado Pines | 28700 | | .1 | .3 |
| Silverado Pines | 28650 | | .1 | .3 |
| Silverado Pines | 28600 | | .1 | .3 |
| Silverado Pines | 28500 | | .1 | .3 |
| Silverado Pines | 12 | | .1 | .3 |
| Silverado Pines | 11.5 | | .1 | .3 |
| Silverado Pines | 11 | | .1 | .3 |
| Silverado Pines | 10.0 | | .1 | .3 |
| Silverado Pines | 9.0 | | .1 | .3 |
| Silverado Pines | 8.75 | | .1 | .3 |
| Silverado Pines | 8.3 | | .1 | .3 |
| Silverado Pines | 7.71 | | .1 | .3 |
| Silverado Pines | 7.0 | | .1 | .3 |
| Silverado Pines | 6.5 | | .1 | .3 |
| Silverado Pines | 6.0 | | .1 | .3 |
| Silverado Pines | 5.5 | | .1 | .3 |
| Silverado Pines | 5.28 | | .3 | .5 |
| Silverado Pines | 5 | Culvert | | |
| Silverado Pines | 4.6 | | .3 | .5 |
| Silverado Pines | 4.5 | | .1 | .3 |
| Silverado Pines | 4.0 | | .1 | .3 |
| Silverado Pines | 3.5 | | .1 | .3 |

# APPENDIX D

## HYDROLOGIC ANALYSIS



```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   25JUL07  TIME  16:51:23   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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
 *** FREE ***
              1         ID     SCENARIO 1 MODEL
              2         ID     FOR DUCK CREEK CHANNEL IMPORVEMENTS CLOMR
              3         ID     FROM SPENCER STREET TO EL DORADO
              4         ID     MODEL BASED ON SIVERADO RANCH INTERCHANGE CLOMR
              5         ID     UPPER DUCK AND CENTRAL CUCK CREEK DETENTION
              6         ID     BASINS INCLUDED
              7         ID     MOUNTAINS EDGE, ARLINGTON RANCH, SOUTH MOUNTAIN AND SOUTHERN
              8         ID     HIGHLANDS DEVELOPMENTS INCLUDED
              9         ID     DESIGN STORM = 100-YEAR 6-HOUR STROM
             10         ID     STORM DISTRIBUTION = SDN3
             11         ID
             12         ID
             13         ID
             14         ID     JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
             15         ID
             16         ID     AREA (SQUARE MILES)    DARF
             17         ID    1.807     0.938
             18         ID
             19         IT       5       0       0     300
             20         IO       5       0       0
             21         IN       5       0       0
             22         JR    PREC   0.938
                        *
             23         KK     D4B
             24         BA   1.807
             25         PB    2.80
             26         PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
             27         PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
             28         PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
             29         PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             30         PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             31         PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
             32         PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
             33         PC   0.998   0.999       1
             34         LS       0    83.8     8.0
             35         UD   0.243
                        *
             36         ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   23        D4B

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   25JUL07  TIME  16:51:23   *
*                                       *
*****************************************
```

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


SCENARIO 1 MODEL
FOR DUCK CREEK CHANNEL IMPORVEMENTS CLOMR
FROM SPENCER STREET TO EL DORADO
MODEL BASED ON SIVERADO RANCH INTERCHANGE CLOMR
UPPER DUCK AND CENTRAL CUCK CREEK DETENTION

```
                        BASINS INCLUDED
                        MOUNTAINS EDGE, ARLINGTON RANCH, SOUTH MOUNTAIN AND SOUTHERN
                        HIGHLANDS DEVELOPMENTS INCLUDED
                        DESIGN STORM = 100-YEAR 6-HOUR STROM
                        STORM DISTRIBUTION = SDN3


                        JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:

                        AREA (SQUARE MILES)    DARF
                       1.807     0.938


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

     IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME         0000  STARTING TIME
                          NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME         0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE    24.92 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
                     .94
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
                                                                .94

 HYDROGRAPH AT
+                    D4B      1.81     1   FLOW             1640.
                                           TIME              3.67


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




## Duck Creek Channel Improvements CLOMR
## Figure 1A - Subbasin Map

**Legend**

- I-15/Silverado Ranch Boulevard Interchange CLOMR & Duck Creek FIS Subbasins
- Revised/Added Subbasin
- PT14 Selected HEC-1 Concentration Point

**CCRFCD MASTER PLANNED FACILITIES**

- Proposed Facility
- Existing Facility
- Culvert
- Bridge
- Natural Wash
- Unlined Channel
- Lined Channel
- Levee
- Pipeline
- Detention Basin

0 1,000 2,000 4,000 Feet

1 inch equals 2,000 feet

PBSJ

5/16/06 MD C:\Documents and Settings\18824\Desktop\Duck Creek\Duck Creek_Subbasin Map_24x36.mxd

LOMR

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA LETTER OF MAP REVISION APPLICATION

September 2009

prepared for REGIONAL FLOOD CONTROL DISTRICT

prepared by vtn

CLOMR

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA CONDITIONAL LETTER OF MAP REVISION APPLICATION

April 2008

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

vtn nevada

# Federal Emergency Management Agency

Washington, D.C. 20472

**November 5, 2008**

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 07-09-1205R

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

Community: Clark County, NV
Community No.: 320003

104

Dear Mr. Reid:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated April 25, 2007, Mr. Kevin Eubanks, P.E., CFM, Assistant General Manager, Clark County Regional Flood Control District, requested that FEMA evaluate the effects that updated topographic information and existing facilities, including channelization and reinforced-concrete box culverts (RCBs), along Duck Creek South Channel (South Channel) from just upstream of the Lower Duck Creek Detention Basin to just downstream of the confluence with Duck Creek; an unnamed tributary to South Channel from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue; and a proposed project, including channelization and RCBs, along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard, and along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard, would have on the flood hazard information shown on the effective FIRM and FIS report.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Daniel Bender, P.E., and Mr. Lant Leavitt, P.E., both with VTN Nevada, and Mr. Eubanks.

We reviewed the submitted data and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The existing conditions HEC-RAS hydraulic computer model submitted as part of a Letter of Map Revision (Case No. 07-09-0831P), effective October 14, 2008, was used as the base conditions model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the plans entitled "2005 Improvement Plans for Duck Creek Channel Phase II – Las Vegas Boulevard to Silverado Ranch Boulevard," prepared by VTN Nevada, dated March 30, 2006, and the data listed below are received, a revision to the FIRM would be warranted.

**Duck Creek**

As a result of the updated topographic information and proposed project, the elevations of the base (1-percent-annual-chance) flood for Duck Creek will decrease compared to the effective Base Flood Elevations (BFEs) from just downstream of Silverado Ranch Boulevard to just downstream of

Las Vegas Boulevard. The maximum decrease in BFE, 10.4 feet, will occur approximately 200 feet upstream of Jo Rae Avenue.

As a result of the updated topographic information and proposed project, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, will decrease compared to the effective SFHA width along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard. The maximum decrease in SFHA width, approximately 900 feet, will occur approximately 100 feet upstream of Le Baron Avenue. The entire base flood will be contained in the proposed channel and culverts from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard.

As a result of the updated topographic information and proposed project, the width of the regulatory floodway will increase in some areas and decrease in other areas compared to the effective floodway width along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard. The maximum increase in floodway width, approximately 100 feet, will occur approximately 100 feet upstream of Pyle Avenue. The maximum decrease in floodway width, approximately 300 feet, will occur approximately 300 feet downstream of Jo Rae Avenue.

**Duck Creek Tributary**

As a result of the updated topographic information and proposed project, the BFEs for Duck Creek Tributary will decrease compared to the effective BFEs from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in BFE, 10.1 feet, will occur just upstream of Jo Rae Avenue.

As a result of the updated topographic information and proposed project, the width of the SFHA will decrease compared to the effective SFHA width along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in SFHA width, approximately 600 feet, will occur approximately 200 feet upstream of Giles Street. The entire base flood will be contained in the proposed channel and culverts from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard.

As a result of the updated topographic information and proposed project, the width of the regulatory floodway will decrease compared to the effective floodway width along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in floodway width, approximately 300 feet, will occur approximately 100 feet downstream of Giles Street.

**Duck Creek South Channel**

As a result of the updated topographic information and proposed project, the BFEs for South Channel will decrease compared to the effective BFEs from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue. The maximum decrease in BFE, 3.0 feet, will occur approximately 100 feet downstream of Silverado Ranch Boulevard.

As a result of the updated topographic information and proposed project, the width of the SFHA will increase in some areas and decrease in other areas compared to the effective SFHA width along South Channel from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue. The maximum increase in SFHA width, approximately 200 feet, will occur approximately 100 feet downstream of Silverado Ranch Boulevard. The maximum decrease in SFHA

width, approximately 600 feet, will occur approximately 500 feet upstream of Gilespie Street. In addition, an unnamed tributary to South Channel was added from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue. An unnamed tributary to South Channel was removed from just upstream of Silverado Ranch Boulevard to approximately 300 feet upstream of Frias Avenue.

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

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

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

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

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

- Effective October 1, 2007, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $4,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). The payment, along with the revision application, must be forwarded to the following address:

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

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

- Community acknowledgment of the map revision request

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions

- A revised conditions hydraulic analysis of the regulatory floodway for South Channel from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue, together with a topographic work map showing the revised floodplain and floodway boundaries

- As-built plans, certified by a registered professional engineer, of all existing culverts along the unnamed tributary to South Channel from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

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

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

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

Sincerely,

Joshua A. Smith

Joshua A. Smith, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

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

Enclosures

cc: (See attached list.)

Courtesy Copies List – Clark County, NV

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

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

Mr. Daniel Bender, P.E.
VTN Nevada

Mr. Lant Leavitt, P.E.
VTN Nevada

# FEMA

# CONDITIONAL LETTER OF MAP REVISION APPLICATION

# DUCK CREEK CHANNEL

# LAS VEGAS BLVD. TO

# LOWER DUCK CREEK DETENTION BASIN

# CLARK COUNTY, NEVADA

## ADDENDUM - DESIGN UPDATE

*Prepared for:*

**CLARK COUNTY**
**REGIONAL FLOOD CONTROL DISTRICT**
600 S. GRAND CENTRAL PARKWAY
LAS VEGAS, NEVADA 89106-4511

*Prepared by:*

**VTN Nevada**
2727 S. Rainbow Boulevard
Las Vegas, Nevada 89146
(702) 247-4020

vtn nevada




April 2008

VTN nevada
CONSULTING ENGINEERS • PLANNERS • SURVEYORS
PROVIDING QUALITY PROFESSIONAL
SERVICES SINCE 1960

April 10, 2008

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.
3601 Eisenhower Avenue
Alexandria, VA 22304-6425

Reference: **Case No.:** 07-09-1205R
**Community:** Clark County, NV
**Community No.:** 320003

**Subject: ADDENDUM – DESIGN UPDATE**

Dear Mr. Qayum:

This Addendum is being provided to update the flood zone for the Unnamed East Tributary to the Duck Creek Wash. After the February 2008 submittal, it was noticed that in a few cases, the cross sections that were cut perpendicular to the flow line of the wash didn't accurately represent the overbank areas of the wash. In these cases, the east side of the cross section was lower than the west side due to the rotation not being parallel with the overall shape of the contours. Cross sections 55+15, 96+00 and 117+00 have been re-cut to be perpendicular to the overall flow of water. Revised maps are included in Appendix A, hydraulic models have been re-run and are included in Appendix B, and electronic data is included on the CD in Appendix C.

Please include this updated analysis in your current review. If you have any questions or require additional information, please feel free to contact me.

Sincerely,

Lant Leavitt, P.E.
VTN Nevada
2727 South Rainbow Boulevard
Las Vegas, NV 89146
lantl@vtnnv.com
(702) 253-2389

# APPENDIX A
## MAPS

# POST-PROJECT WORK MAP

**LEGEND**

- POST PROJECT ZONE AE FLOOD PLAIN
- 100-YR FLOOD CONTAINMENT IN CULVERT
- POST PROJECT ZONE A FLOOD PLAIN
- EXISTING FLOOD PLAIN
- EXISTING SUBBASIN BOUNDARY

D4B-4 SUBBASIN NAME

NORTH

GRAPHIC SCALE

250 0 125 250 500 1000

( IN FEET )

1 inch = 250 ft.

(VERIFY SCALE – PLANS MAY HAVE BEEN REDUCED)

LAS VEGAS BLVD.

D4B-1

D4B-2

D4B-3

D4B-4

D4B-5

HAVEN ST.

E. STARR AVE.

CHARTAN AVE.

SIDDALL AVE.

ERIE AVE.

E. LEM AVE.

E. CONN AVE.

E. CACTUS AVE.

E. FRIAS AVE.

E. PYLE AVE

E. RICHMAR AVE.

GILESPIE ST.

LA CIENEGA ST.

PLACID ST.

FAIRFIELD AVE.

IRVIN AVE

BERMUDA RD.

E. SILVERADO RANCH BLVD.

LIMITS OF STUDY

204 CFS

266 CFS

HEAVY RIPRAP

2-18'W' ARCH CULVERTS

2-10'W' RCBs

3-8'W' RCBs

4-8'W' RCBs

3-16'W' RCBs

12" CONCRETE BASE, 2:1 RIPRAP SS

12" BOTTOM 2:1 SS, ONE RIPRAP ONE CONCRETE

35' BASE 2:1 SS, CONCRETE

10.5' BOTTOM 2:1 SS, 7'-8" HIGH CONC. CHANNEL

2-18'W' RCPs

18-4x3 RCBs

4x4 RCB

10x4 RCB

"EAST WEST"

"EAST EAST"

"EAST"

"WEST"




vtn nevada

DUCK CREEK
CLOMR
POST PROJECT WORK MAP

Fig. 1

# ANNOTATED FLOOD ZONE MAP

## LEGEND

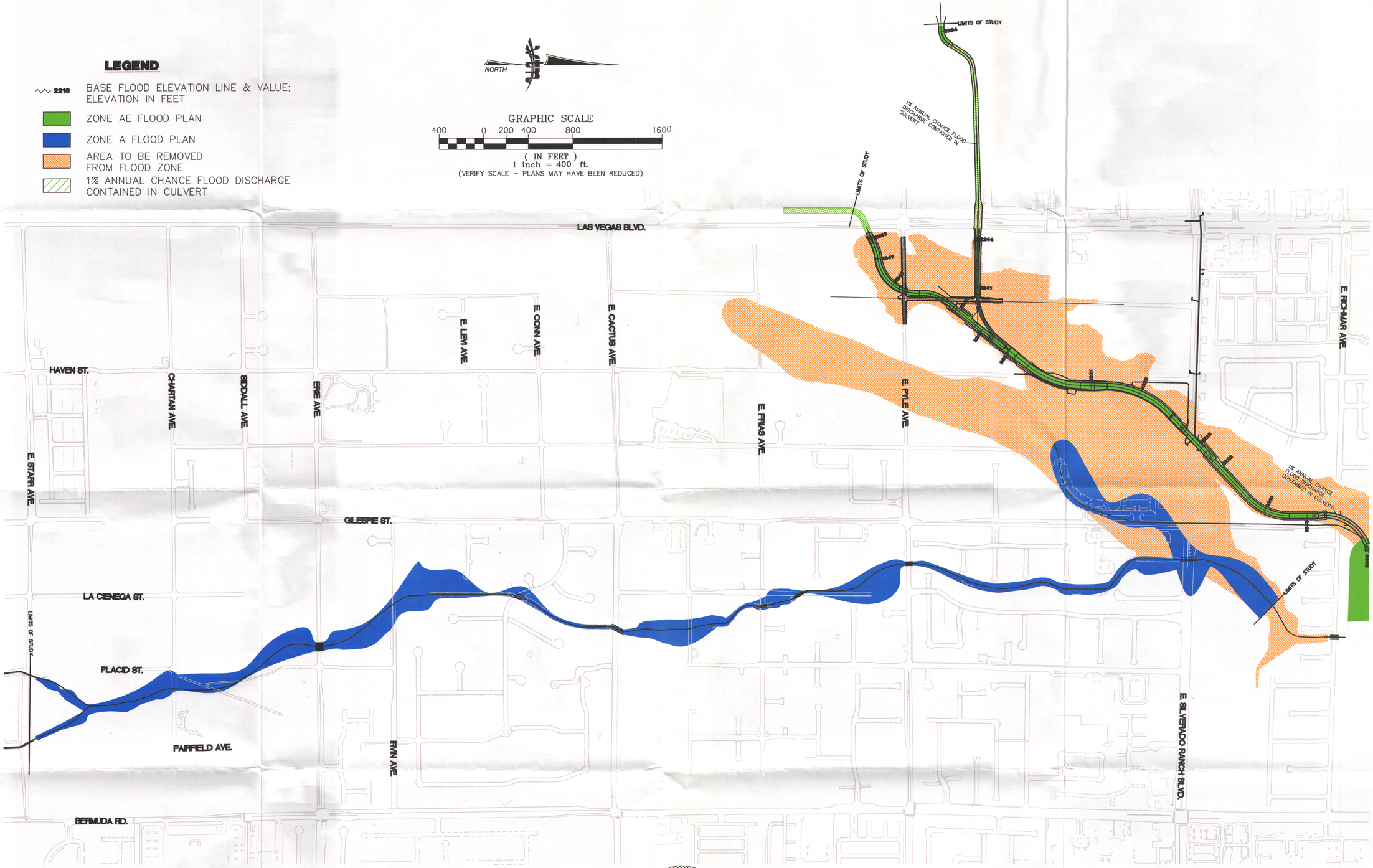
- 2216 — BASE FLOOD ELEVATION LINE & VALUE; ELEVATION IN FEET
- ZONE AE FLOOD PLAN
- ZONE A FLOOD PLAN
- AREA TO BE REMOVED FROM FLOOD ZONE
- 1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

( IN FEET )
1 inch = 400 ft.
(VERIFY SCALE – PLANS MAY HAVE BEEN REDUCED)




### PANEL 2910 OF 4090

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2910 | E |
| HENDERSON, CITY OF | 320005 | 2910 | E |

MAP NUMBER 32003C2910E

### PANEL 2568 OF 4090

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2568 | E |

MAP NUMBER 32003C2568E

PROFESSIONAL ENGINEER-STATE OF NEVADA
LANT K. LEAVITT
EXP. 12/31/09
CIVIL
No. 19287

vtn nevada

# DUCK CREEK
# CLOMR
# ANNOTATED FLOOD ZONE MAP

Fig. 2

# APPENDIX B

## POSR-PROJECT HEC-RAS OUTPUT

HEC-RAS Plan: Plan 02 Profile: PF 1

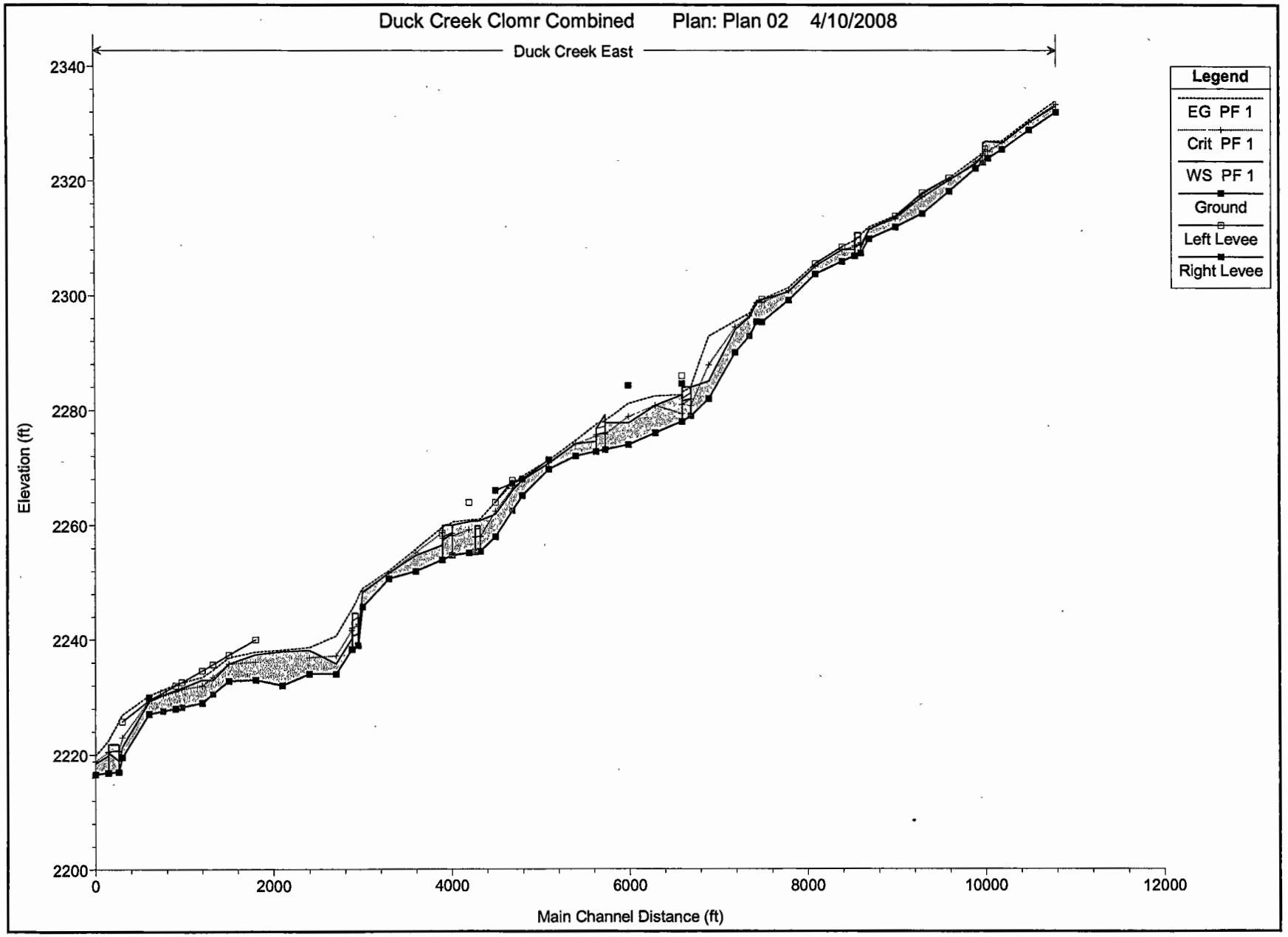
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl | Hydr Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | | (ft) |
| East-West Branch | 500 | PF 1 | 204.00 | 2336.00 | 2338.93 | 2337.63 | 2339.09 | 0.001054 | 3.21 | 63.60 | 28.40 | 0.38 | 2.24 |
| East-West Branch | 400 | PF 1 | 204.00 | 2335.25 | 2338.31 | 2338.31 | 2338.82 | 0.009609 | 5.74 | 35.53 | 34.54 | 1.00 | 1.03 |
| East-West Branch | 300 | PF 1 | 204.00 | 2334.49 | 2337.22 | 2336.82 | 2337.49 | 0.004202 | 4.15 | 49.21 | 41.28 | 0.67 | 1.19 |
| East-West Branch | 200 | PF 1 | 204.00 | 2333.74 | 2336.54 | 2336.54 | 2336.81 | 0.012800 | 4.18 | 48.80 | 96.67 | 1.04 | 0.50 |
| East-West Branch | 100 | PF 1 | 204.00 | 2332.98 | 2334.83 | 2334.94 | 2335.32 | 0.016924 | 5.62 | 36.29 | 58.08 | 1.25 | 0.62 |
| East-East Branch | 500 | PF 1 | 266.00 | 2335.00 | 2336.62 | 2336.30 | 2336.94 | 0.003940 | 4.52 | 59.00 | 45.85 | 0.69 | 1.29 |
| East-East Branch | 400 | PF 1 | 266.00 | 2334.39 | 2336.10 | | 2336.48 | 0.005217 | 4.95 | 53.72 | 43.11 | 0.78 | 1.25 |
| East-East Branch | 300 | PF 1 | 266.00 | 2333.77 | 2335.28 | 2335.28 | 2335.78 | 0.009492 | 5.65 | 47.11 | 48.76 | 1.01 | 0.97 |
| East-East Branch | 200 | PF 1 | 266.00 | 2333.16 | 2334.65 | 2334.49 | 2334.92 | 0.006255 | 4.18 | 63.70 | 75.95 | 0.80 | 0.84 |
| East-East Branch | 100 | PF 1 | 266.00 | 2332.54 | 2333.78 | 2333.78 | 2334.10 | 0.011072 | 4.54 | 58.62 | 94.76 | 1.02 | 0.62 |
| East | 12300 | PF 1 | 464.00 | 2332.00 | 2333.13 | 2333.42 | 2334.04 | 0.029591 | 7.64 | 60.76 | 93.97 | 1.67 | 0.65 |
| East | 12000 | PF 1 | 464.00 | 2328 89 | 2330.26 | 2330.26 | 2330.63 | 0.010444 | 4.84 | 95.85 | 134.69 | 1.01 | 0.71 |
| East | 11700 | PF 1 | 464.00 | 2325.53 | 2326.65 | 2326.70 | 2327.03 | 0.013949 | 4.94 | 93.96 | 159.16 | 1.13 | 0.59 |
| East | 11540 | PF 1 | 464.00 | 2323.99 | 2326.88 | 2325.16 | 2326.90 | 0.000059 | 1.14 | 408.72 | 223.96 | 0.15 | 1.82 |
| East | 11510 | | Culvert | | | | | | | | | | |
| East | 11480.* | PF 1 | 464.00 | 2323.24 | 2324.40 | 2324.40 | 2324.74 | 0.003747 | 4.70 | 98.73 | 144.58 | 1.00 | 0.68 |
| East | 11400 | PF 1 | 464.00 | 2322.24 | 2323.05 | 2323.31 | 2323.93 | 0.048352 | 7.57 | 61.33 | 139.05 | 2.01 | 0.44 |
| East | 11100 | PF 1 | 464.00 | 2318.24 | 2320.20 | 2320.17 | 2320.49 | 0.009123 | 4.33 | 107.18 | 160.83 | 0.93 | 0.67 |
| East | 10800 | PF 1 | 464 00 | 2314.36 | 2317.23 | 2317.23 | 2317.74 | 0.009046 | 5.73 | 81.02 | 78.99 | 1.00 | 1.03 |
| East | 10500 | PF 1 | 464.00 | 2312.00 | 2313.83 | 2313.47 | 2313.99 | 0.003156 | 3.26 | 146.39 | 159.34 | 0.58 | 0.92 |
| East | 10200 | PF 1 | 1008.00 | 2310.00 | 2311.60 | 2311.60 | 2312.03 | 0.009706 | 5.28 | 190.96 | 223.08 | 1.01 | 0.86 |
| East | 10110 | PF 1 | 1008.00 | 2307.50 | 2308.43 | 2309.08 | 2310.72 | 0.016854 | 12.12 | 83.16 | 89.00 | 2.21 | 0.93 |
| East | 10075 | | Bridge | | | | | | | | | | |
| East | 10040 | PF 1 | 1008.00 | 2307.00 | 2308.14 | 2308.58 | 2309.67 | 0.008665 | 9.91 | 101.71 | 89.00 | 1.63 | 1.14 |
| East | 9900 | PF 1 | 1008.00 | 2306.00 | 2308.09 | 2308.09 | 2308.63 | 0.008495 | 5.89 | 171.38 | 161.30 | 0.98 | 1.06 |
| East | 9600 | PF 1 | 1008.00 | 2303.81 | 2305 21 | 2305.25 | 2305.68 | 0.011310 | 5.54 | 182.08 | 222.13 | 1.08 | 0.82 |
| East | 9300 | PF 1 | 1008.00 | 2299.18 | 2300.67 | 2300.85 | 2301.38 | 0.018652 | 6.77 | 148.92 | 195.53 | 1.37 | 0.76 |
| East | 9000 | PF 1 | 1008.00 | 2295.39 | 2299.27 | 2298.75 | 2299.37 | 0.001448 | 2.64 | 421.63 | 426.91 | 0.41 | 0.99 |
| East | 8940 | PF 1 | 1008.00 | 2295.42 | 2298.76 | 2298.76 | 2299.11 | 0.024139 | 4.89 | 219.59 | 328.52 | 0.91 | 0.67 |
| East | 8860.* | PF 1 | 1008.00 | 2292.93 | 2296.26 | 2296.44 | 2296.91 | 0.030695 | 6.68 | 167.41 | 237.19 | 1.07 | 0.71 |
| East | 8700 | PF 1 | 1008.00 | 2290.11 | 2294.04 | 2294.49 | 2295.56 | 0.003518 | 11.03 | 143.89 | 227.62 | 1.17 | 0.63 |
| East | 8400 | PF 1 | 1008.00 | 2282.00 | 2285.06 | 2287.89 | 2292.88 | 0.018800 | 22.44 | 44.92 | 18.90 | 2.57 | 2.38 |
| East | 8200.* | PF 1 | 1008.00 | 2279.00 | 2284 02 | 2280.78 | 2284.13 | 0.000098 | 2.70 | 375.22 | 80.17 | 0.22 | 4.68 |
| East | 8150 | | Bridge | | | | | | | | | | |
| East | 8100 | PF 1 | 1008.00 | 2278.00 | 2282.65 | 2279.35 | 2282.70 | 0.000054 | 1.92 | 523.79 | 114.47 | 0.16 | 4.58 |
| East | 7800 | PF 1 | 1008.00 | 2276.00 | 2280.84 | 2280.84 | 2282.49 | 0.002472 | 10.33 | 97.59 | 29.85 | 1.01 | 3.27 |
| East | 7500 | PF 1 | 1008.00 | 2274.00 | 2277.77 | 2278.87 | 2281.18 | 0.006622 | 14.80 | 68.11 | 25.59 | 1.60 | 2.66 |
| East | 7235 | PF 1 | 1008.00 | 2273.12 | 2277.76 | 2275.81 | 2278.22 | 0.000514 | 5.43 | 185.51 | 40.00 | 0.44 | 4.64 |
| East | 7182.5 | | Bridge | | | | | | | | | | |
| East | 7130 | PF 1 | 1008.00 | 2272.77 | 2274.56 | 2275.42 | 2277.48 | 0.009815 | 13.70 | 73.56 | 41.00 | 1.80 | 1.79 |
| East | 6900 | PF 1 | 1008.00 | 2272.00 | 2274.15 | 2274.15 | 2274.73 | 0.008935 | 6.11 | 164.91 | 145.24 | 1.01 | 1.14 |
| East | 6600 | PF 1 | 1008.00 | 2269.73 | 2270.76 | 2270.87 | 2271.30 | 0.015038 | 5.91 | 170.59 | 233.68 | 1.22 | 0.73 |
| East | 6300 | PF 1 | 1008.00 | 2265.16 | 2267.86 | 2267.86 | 2268.52 | 0.008290 | 6.51 | 154.81 | 117.00 | 1.00 | 1.32 |

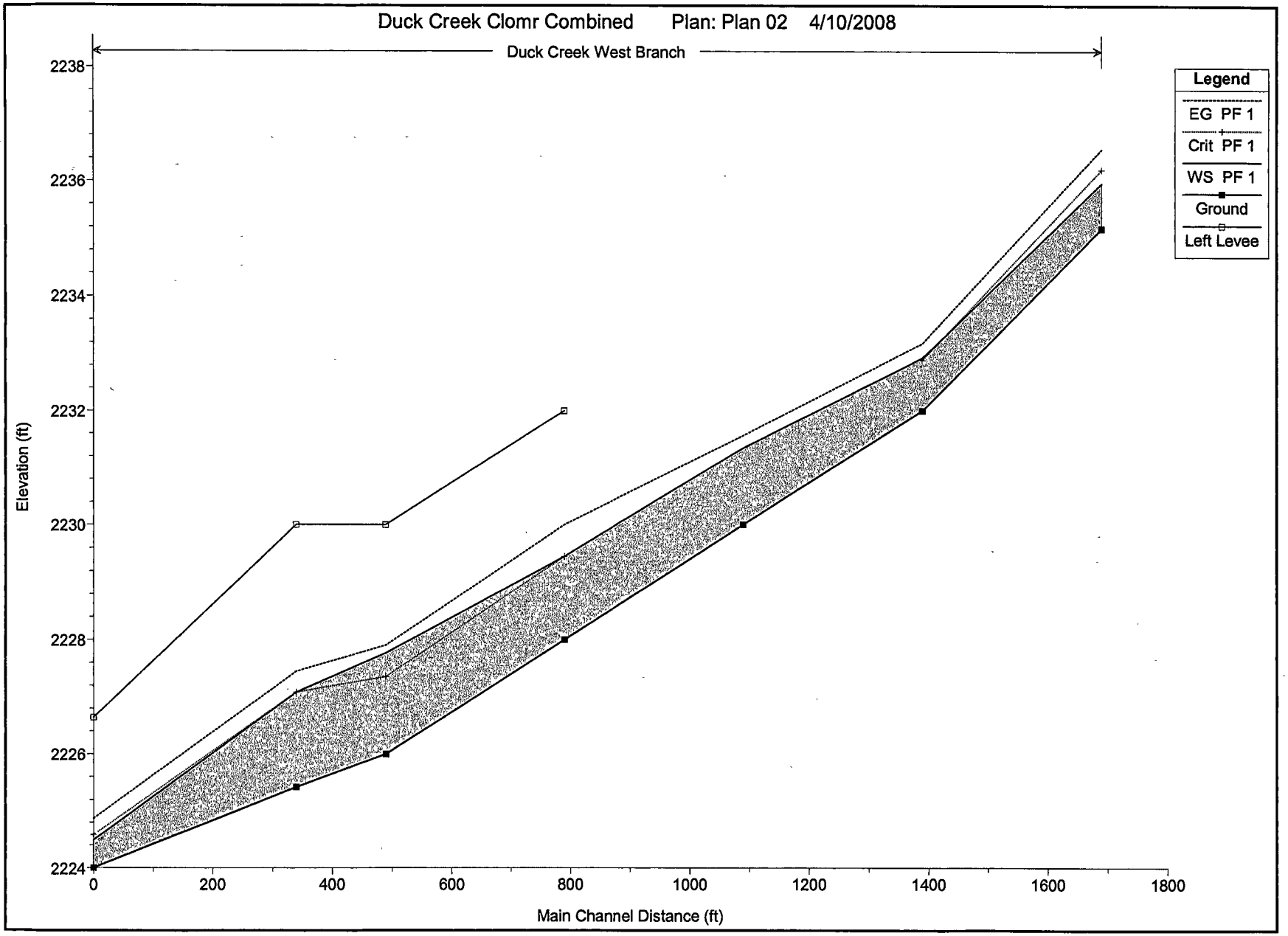
HEC-RAS Plan: Plan 02 Profile: PF 1 (Continued)

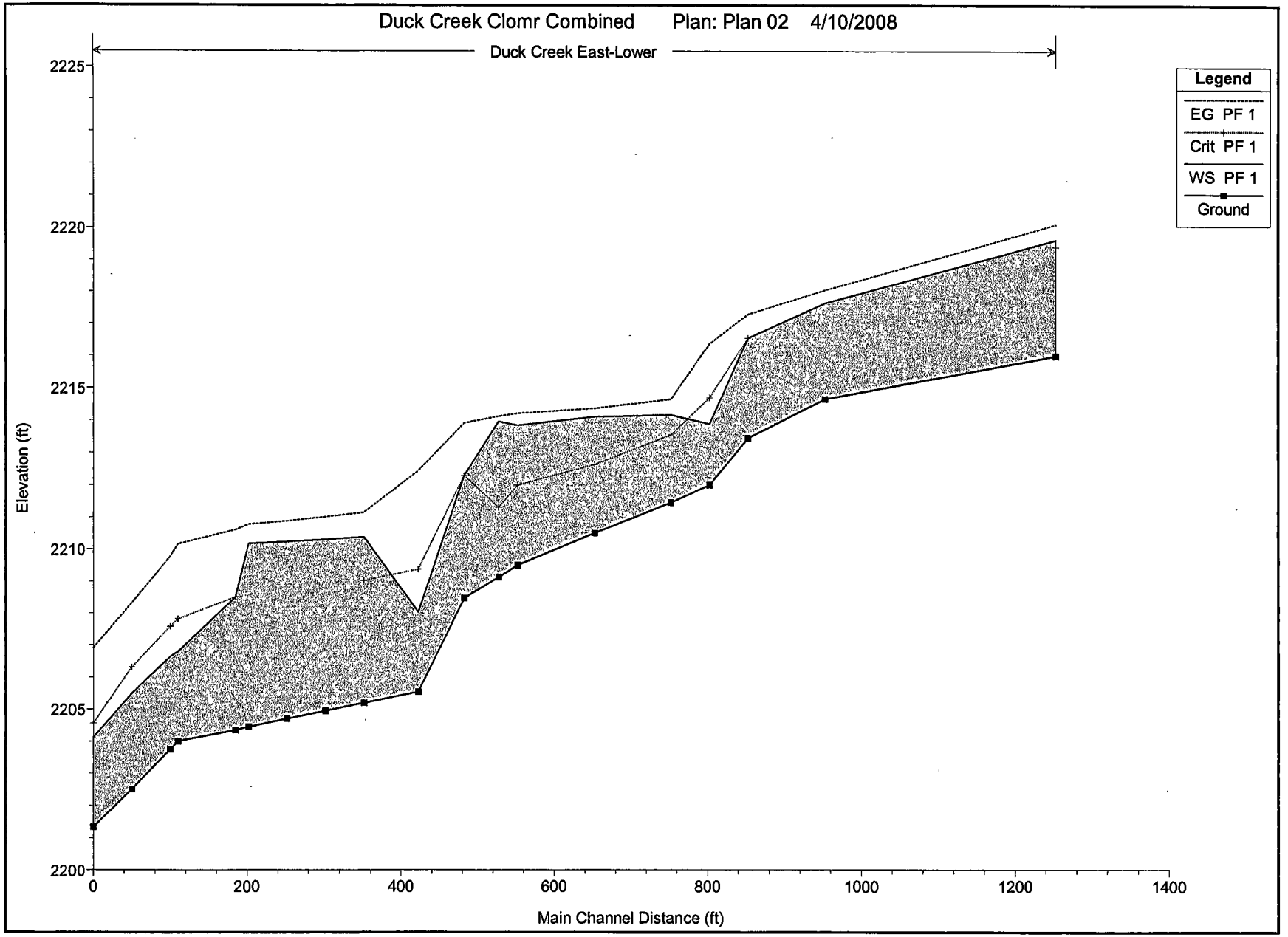
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl | Hydr Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | | (ft) |
| East | 6190.* | PF 1 | 1008.00 | 2262.53 | 2266.04 | 2266.33 | 2267.21 | 0.016854 | 8.70 | 115.80 | 73.02 | 1.22 | 1.59 |
| East | 6000 | PF 1 | 1008.00 | 2258 00 | 2261.93 | 2262.44 | 2264.08 | 0.015158 | 11.76 | 85.75 | 30.19 | 1.23 | 2.84 |
| East | 5830 | PF 1 | 1008.00 | 2255.50 | 2260.89 | 2258.07 | 2261.11 | 0.000375 | 3.75 | 268.59 | 89.84 | 0.38 | 2.99 |
| East | 5800 | | Bridge | | | | | | | | | | |
| East | 5770.* | PF 1 | 1008.00 | 2255.36 | 2260.78 | | 2260.98 | 0.000431 | 3.61 | 278.94 | 111.53 | 0.40 | 2.50 |
| East | 5700 | PF 1 | 1008.00 | 2255.20 | 2260.64 | 2259.21 | 2260.93 | 0.001304 | 4.31 | 234.42 | 187.34 | 0.66 | 1.25 |
| East | 5515.* | PF 1 | 1008.00 | 2254.77 | 2260.06 | 2258.19 | 2260.60 | 0.002011 | 5.89 | 171.02 | 103.70 | 0.81 | 1.65 |
| East | 5457.5 | | Bridge | | | | | | | | | | |
| East | 5400 | PF 1 | 1008.00 | 2254.00 | 2256.53 | 2258.76 | 2259.68 | 0.007478 | 14.23 | 70.81 | 28.00 | 1.58 | 2.53 |
| East | 5100 | PF 1 | 1008.00 | 2252.00 | 2254.77 | 2255.23 | 2255.85 | 0.016467 | 8.34 | 120.86 | 104.93 | 1.37 | 1.15 |
| East | 4800 | PF 1 | 1008.00 | 2250.72 | 2251.77 | 2251.77 | 2252.14 | 0.010456 | 4.90 | 205.71 | 283.33 | 1.01 | 0.73 |
| East | 4500 | PF 1 | 1338.00 | 2245.79 | 2248.35 | 2248.51 | 2249.07 | 0.010168 | 6 95 | 208.68 | 236.53 | 1.10 | 0.88 |
| East | 4450 | PF 1 | 1338.00 | 2239.00 | 2240.66 | 2242.37 | 2247.67 | 0.026211 | 21.24 | 62.98 | 38.00 | 2.91 | 1.66 |
| East | 4415 | | Bridge | | | | | | | | | | |
| East | 4380 | PF 1 | 1338.00 | 2238.30 | 2240.23 | 2241.67 | 2245.40 | 0.016060 | 18.24 | 73 34 | 38.00 | 2.31 | 1.93 |
| East | 4200 | PF 1 | 1338.00 | 2234.00 | 2235.85 | 2237.20 | 2240.68 | 0.047491 | 17.64 | 75.85 | 47.19 | 2.45 | 1.61 |
| East | 3900 | PF 1 | 1338.00 | 2234.00 | 2238.14 | 2236.86 | 2238.64 | 0.001888 | 5.69 | 235.24 | 70.76 | 0.55 | 3.32 |
| East | 3600 | PF 1 | 1338.00 | 2232.00 | 2237.96 | | 2238.23 | 0.000740 | 4.22 | 317.20 | 73.63 | 0.36 | 4.31 |
| East | 3300 | PF 1 | 1338.00 | 2232.96 | 2237.40 | 2236.11 | 2237.88 | 0.001839 | 5.59 | 239.20 | 72.58 | 0.54 | 3.30 |
| East | 3000 | PF 1 | 1338.00 | 2232.80 | 2235.77 | 2235.77 | 2236 85 | 0.007208 | 8.32 | 160.90 | 75.55 | 1.00 | 2.13 |
| East | 2820.* | PF 1 | 1338.00 | 2230.51 | 2232.95 | 2233.45 | 2234.69 | 0.021759 | 10.59 | 126.29 | 72.02 | 1.41 | 1.75 |
| East | 2700 | PF 1 | 1338.00 | 2228.98 | 2233.03 | 2231.94 | 2233.45 | 0.002666 | 5.23 | 255.70 | 86.48 | 0.54 | 2.96 |
| East | 2470.* | PF 1 | 1338.00 | 2228.23 | 2231.59 | 2231.38 | 2232.56 | 0.005357 | 7.88 | 169.72 | 68.91 | 0 89 | 2.46 |
| East | 2400 | PF 1 | 1338.00 | 2228.00 | 2231.23 | 2230.96 | 2232.19 | 0.005017 | 7.83 | 170.85 | 66.48 | 0.86 | 2.57 |
| East | 2260.* | PF 1 | 1338.00 | 2227.58 | 2230.42 | 2230.42 | 2231.31 | 0.007612 | 7.61 | 175.92 | 98.76 | 1.00 | 1.78 |
| East | 2100 | PF 1 | 1338.00 | 2227.09 | 2229.29 | 2229.45 | 2230.27 | 0.005664 | 7.95 | 168.34 | 152.32 | 1.33 | 1.11 |
| East | 1800 | PF 1 | 1338.00 | 2219.57 | 2221.40 | 2223.02 | 2226.96 | 0.019329 | 18.91 | 70.74 | 43.18 | 2.60 | 1.64 |
| East | 1760 | PF 1 | 1338.00 | 2217.00 | 2218.84 | 2220.63 | 2225.94 | 0.023696 | 21.38 | 62.57 | 34.00 | 2.78 | 1.84 |
| East | 1700 | | Bridge | | | | | | | | | | |
| East | 1640 | PF 1 | 1338.00 | 2216.82 | 2219.88 | 2220.45 | 2222.45 | 0.013192 | 12.88 | 103.91 | 34.00 | 1.30 | 3.06 |
| East | 1500 | PF 1 | 1338.00 | 2216.57 | 2218.51 | 2218.86 | 2219.87 | 0.019384 | 9.37 | 142.78 | 88.55 | 1.30 | 1.61 |
| West Branch | 3460 | PF 1 | 692.00 | 2235.18 | 2235.97 | 2236.21 | 2236.56 | 0.020040 | 6.71 | 118.58 | 226.86 | 1.40 | 0.52 |
| West Branch | 3160 | PF 1 | 692.00 | 2232.00 | 2232.93 | 2232.89 | 2233.19 | 0.008853 | 4.13 | 171.60 | 290.20 | 0.91 | 0.59 |
| West Branch | 2860 | PF 1 | 692.00 | 2230.00 | 2231.34 | | 2231.57 | 0.003633 | 4.07 | 202.76 | 274.85 | 0.65 | 0.74 |
| West Branch | 2560 | PF 1 | 692.00 | 2228.00 | 2229.45 | 2229.45 | 2230.00 | 0.007890 | 5.98 | 118.20 | 112.37 | 0.96 | 1.05 |
| West Branch | 2260 | PF 1 | 789.00 | 2226.00 | 2227.78 | 2227.36 | 2227.91 | 0.001597 | 3.38 | 297.42 | 291.35 | 0.46 | 1.02 |
| West Branch | 2110 | PF 1 | 789.00 | 2225.42 | 2227.08 | 2227.08 | 2227.45 | 0.006994 | 5.15 | 175.88 | 245.34 | 0.88 | 0.72 |
| West Branch | 1760 | PF 1 | 789.00 | 2224.00 | 2224.49 | 2224.58 | 2224.87 | 0.008234 | 4.95 | 159.28 | 353.41 | 1.30 | 0.45 |
| East-Lower | 1200 | PF 1 | 1931.00 | 2216.00 | 2219.63 | 2219.41 | 2220.12 | 0.007508 | 5.57 | 347.56 | 250.79 | 0.81 | 1.39 |
| East-Lower | 900 | PF 1 | 1931.00 | 2214.66 | 2217.64 | | 2218.06 | 0.006196 | 5.15 | 375.18 | 247.26 | 0.74 | 1.52 |
| East-Lower | 800 | PF 1 | 1931.00 | 2213.45 | 2216.56 | 2216.56 | 2217.30 | 0.008484 | 9.71 | 317.87 | 230.53 | 0.97 | 1.38 |
| East-Lower | 750 | PF 1 | 1931.00 | 2212.00 | 2213.90 | 2214.70 | 2216.38 | 0.031771 | 13.52 | 160.06 | 108.95 | 1.73 | 1.47 |
| East-Lower | 700 | PF 1 | 1931.00 | 2211.45 | 2214.18 | 2213.55 | 2214.66 | 0.003843 | 5.86 | 351.81 | 173.52 | 0.64 | 2.32 |

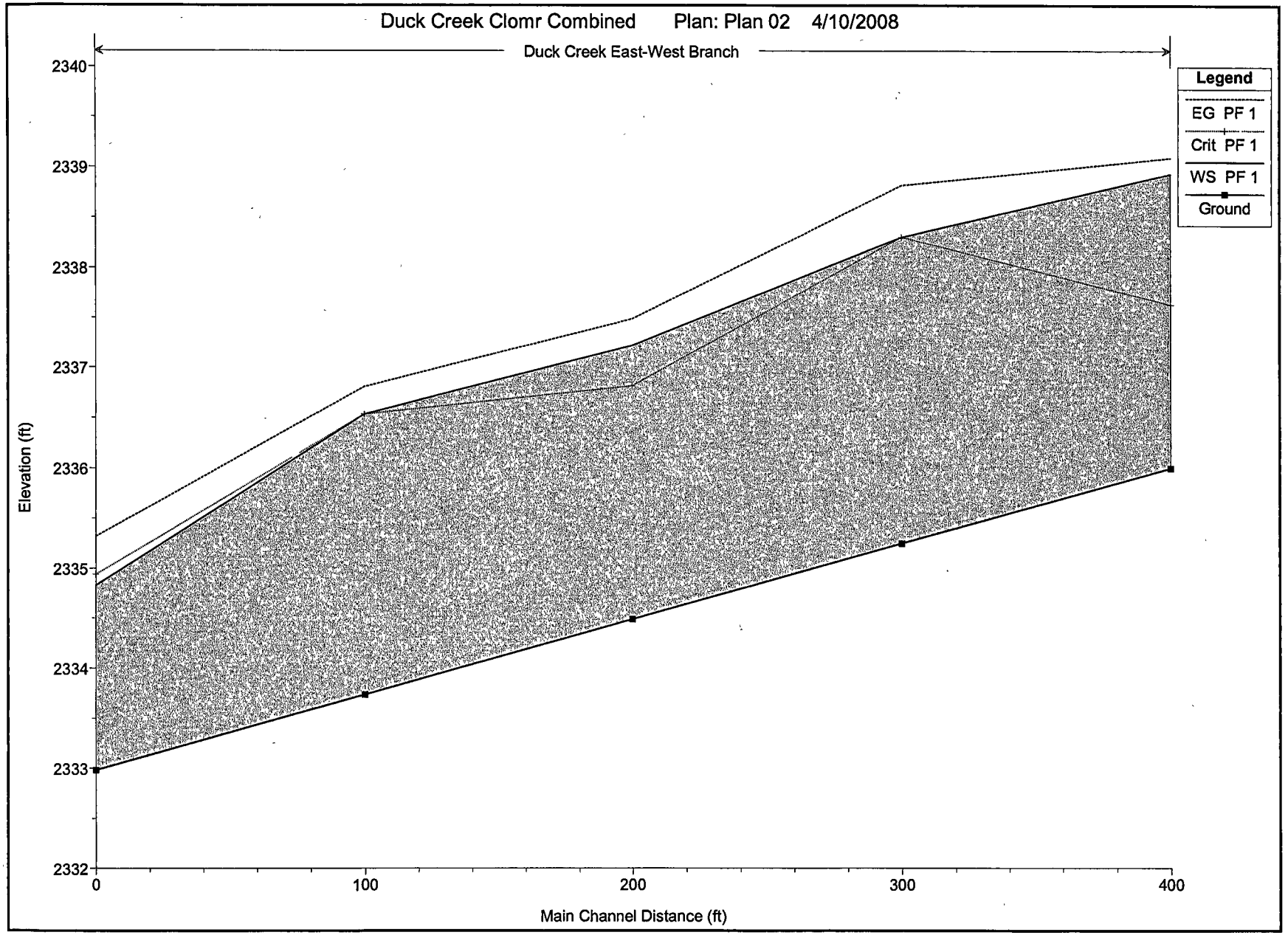
HEC-RAS Plan: Plan 02 Profile: PF 1 (Continued)

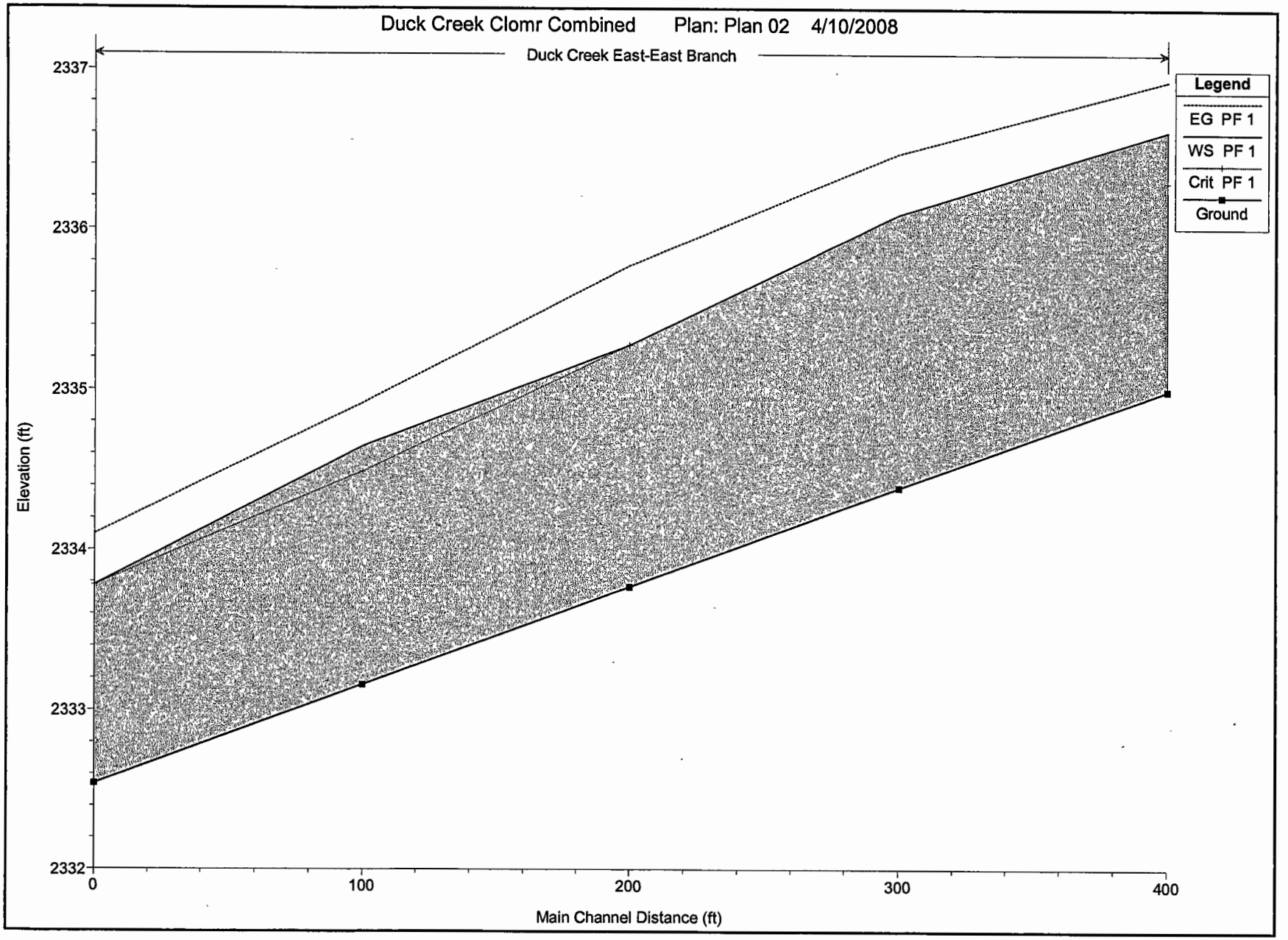
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl | Hydr Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | | (ft) |
| East-Lower | 600 | PF 1 | 1931.00 | 2210.50 | 2214.12 | 2212.64 | 2214.37 | 0.001433 | 4.28 | 486.18 | 245.17 | 0.41 | 3.00 |
| East-Lower | 500 | PF 1 | 1931.00 | 2209.50 | 2213.85 | 2212.00 | 2214.22 | 0.001421 | 4.90 | 397.86 | 279.16 | 0.42 | 4.19 |
| East-Lower | 475 | PF 1 | 1931.00 | 2209.13 | 2213.97 | 2211.30 | 2214.13 | 0.000559 | 3.33 | 596.44 | 222.22 | 0.27 | 4.59 |
| East-Lower | 430 | PF 1 | 1931.00 | 2208.47 | 2212.29 | 2212.29 | 2213.92 | 0.010717 | 10.75 | 196.85 | 62.95 | 0.97 | 3.13 |
| East-Lower | 370 | PF 1 | 1931.00 | 2205.55 | 2208.04 | 2209.38 | 2212.44 | 0.049790 | 17.40 | 118.25 | 54.97 | 1.94 | 2.15 |
| East-Lower | 300 | PF 1 | 1931.00 | 2205.20 | 2210.38 | 2209.02 | 2211.15 | 0.002585 | 7.54 | 287.75 | 71.13 | 0.58 | 4.05 |
| East-Lower | 250 | PF 1 | 1931.00 | 2204.95 | 2210.30 | | 2211.01 | 0.002292 | 7.25 | 299.96 | 72.16 | 0.55 | 4.16 |
| East-Lower | 200 | PF 1 | 1931.00 | 2204.70 | 2210.23 | | 2210.89 | 0.002022 | 6.97 | 313.25 | 73.26 | 0.52 | 4.28 |
| East-Lower | 150 | PF 1 | 1931.00 | 2204.45 | 2210.18 | | 2210.78 | 0.001780 | 6.69 | 327.32 | 74.35 | 0.49 | 4.40 |
| East-Lower | 128 | PF 1 | 1931.00 | 2204.34 | 2208.50 | 2208.50 | 2210.60 | 0.001544 | 11.62 | 166.29 | 39.98 | 1.00 | 4.16 |
| East-Lower | 60 | PF 1 | 1931.00 | 2204.00 | 2206.80 | 2207.82 | 2210.16 | 0.032905 | 15.28 | 135.69 | 57.08 | 1.61 | 2.38 |
| East-Lower | 50 | PF 1 | 1931.00 | 2203.75 | 2206.65 | 2207.58 | 2209.77 | 0.029209 | 14.74 | 140.79 | 57.25 | 1.53 | 2.46 |
| East-Lower | 0 | PF 1 | 1931.00 | 2202.50 | 2205.49 | 2206.31 | 2208.32 | 0.025566 | 14.08 | 148 32 | 59.28 | 1.44 | 2.50 |
| East-Lower | -50 | PF 1 | 1931.00 | 2201.35 | 2204.13 | 2204.57 | 2206.92 | 0.030336 | 14.60 | 257.82 | 1001.25 | 1.54 | 0 26 |

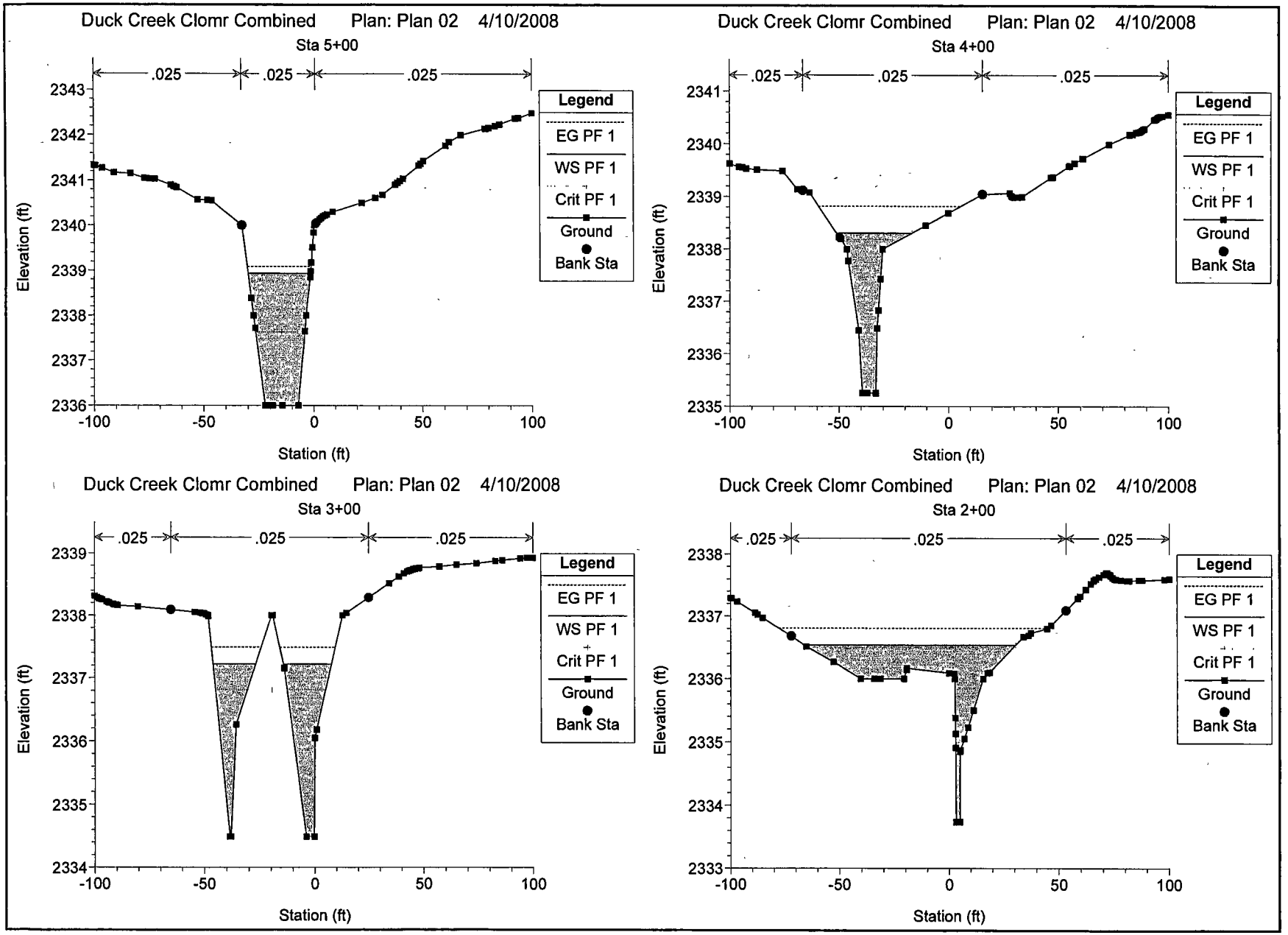

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Duck Creek East
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Left Levee
Right Levee
Elevation (ft)
2340
2320
2300
2280
2260
2240
2220
2200
0
2000
4000
6000
8000
10000
12000
Main Channel Distance (ft)

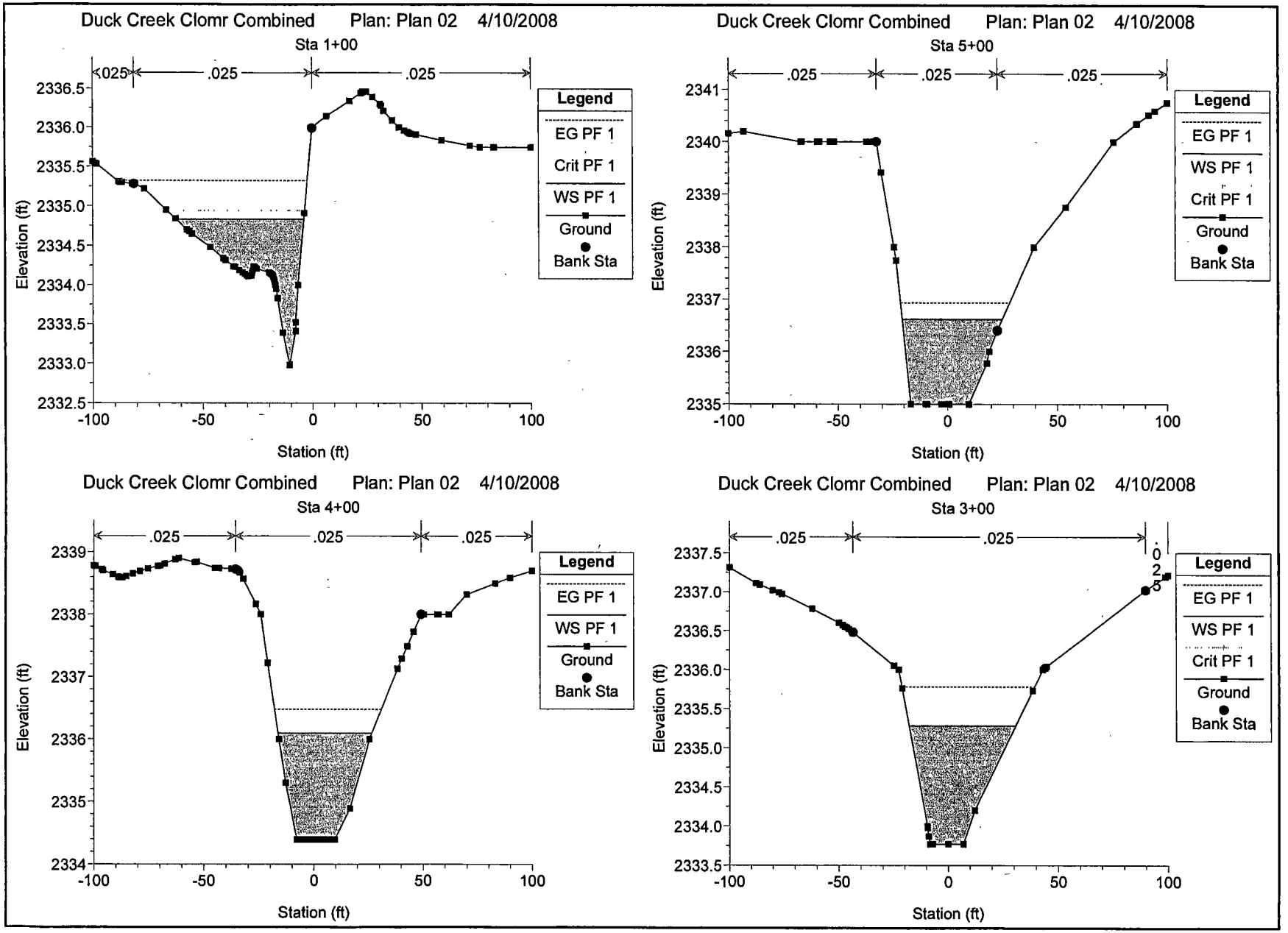

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Duck Creek West Branch
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Left Levee
Elevation (ft)
2238
2236
2234
2232
2230
2228
2226
2224
0
200
400
600
800
1000
1200
1400
1600
1800
Main Channel Distance (ft)

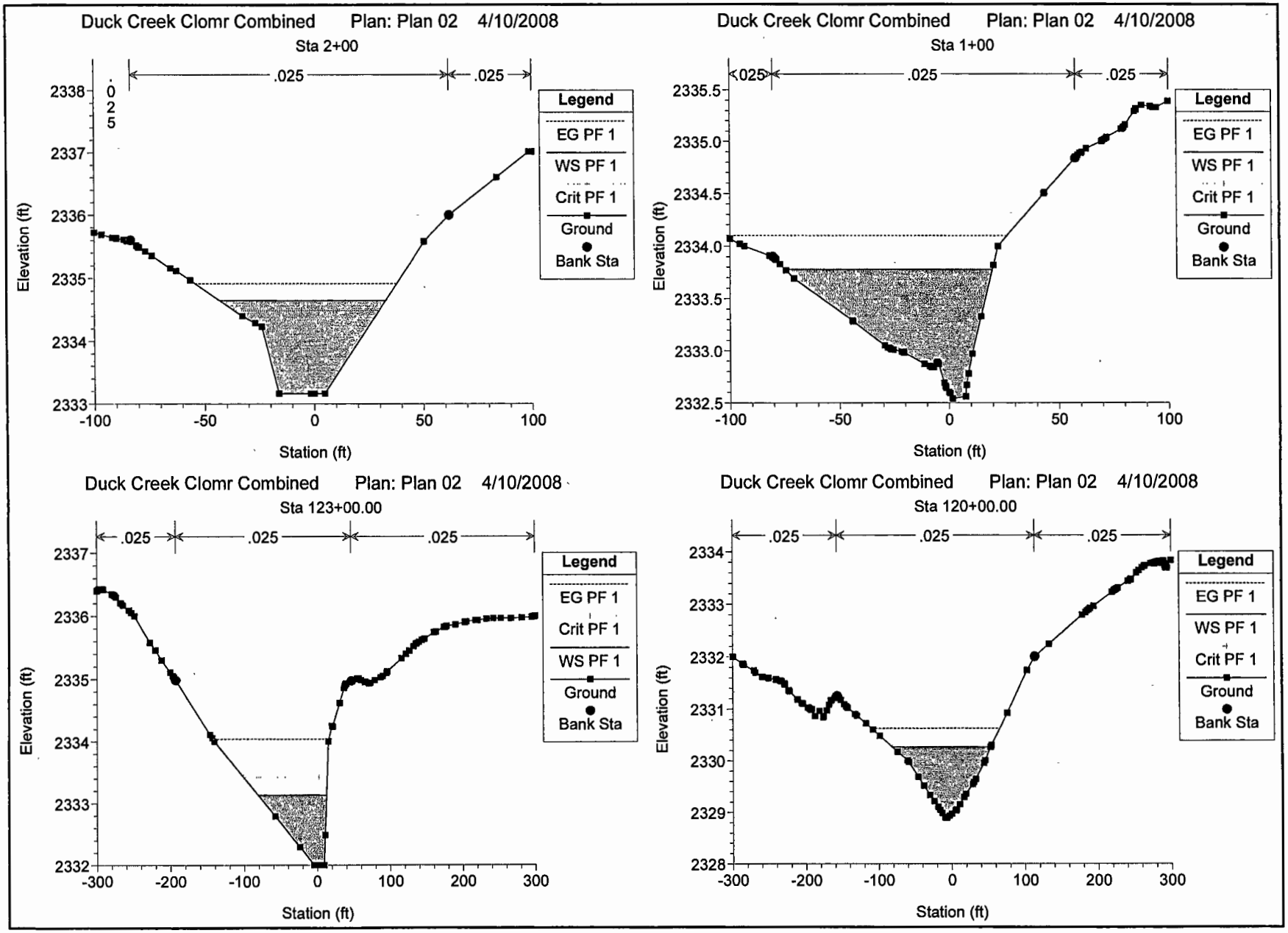

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Duck Creek East-Lower
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2225
2220
2215
2210
2205
2200
0
200
400
600
800
1000
1200
1400
Main Channel Distance (ft)

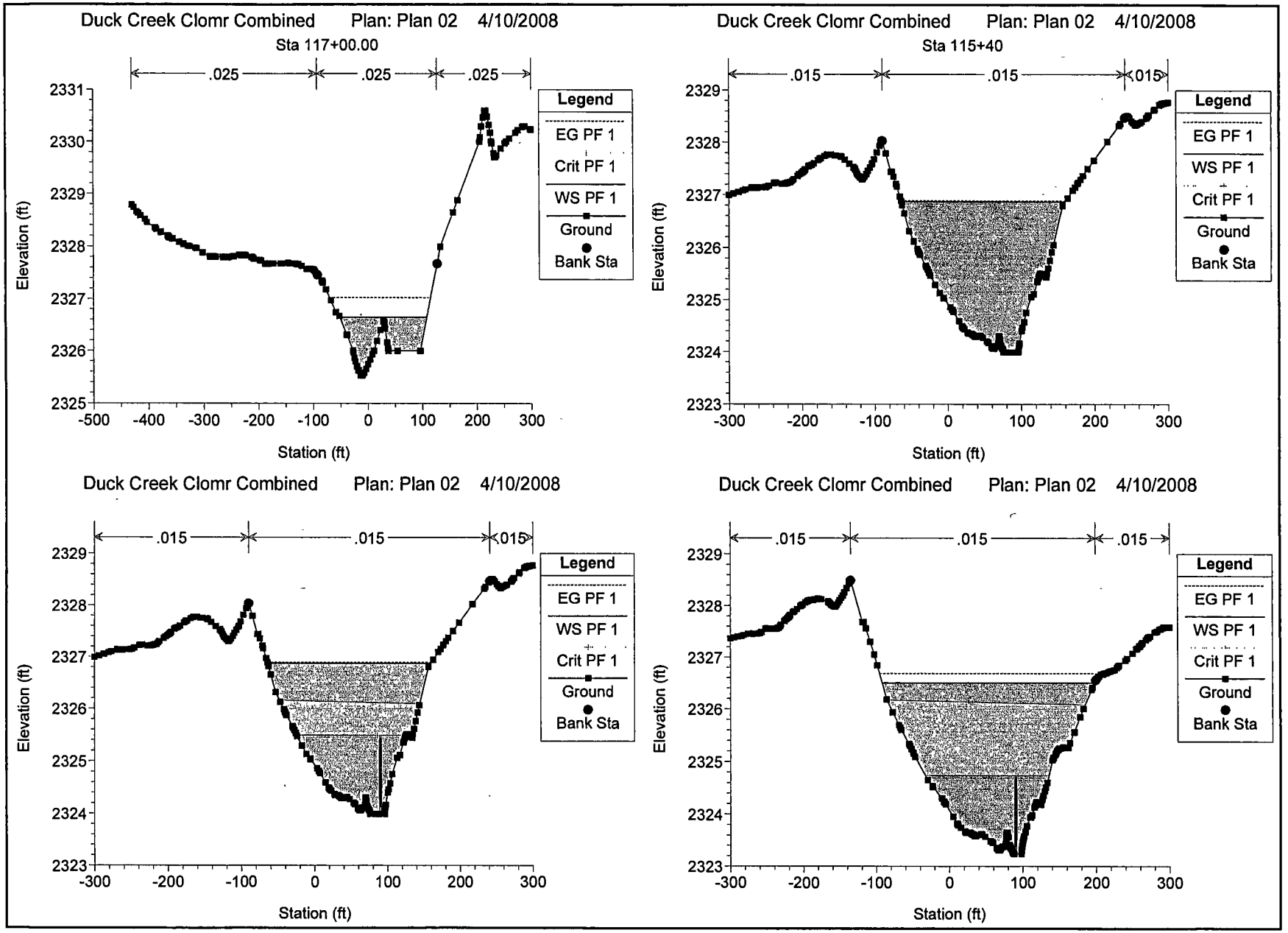

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Duck Creek East-West Branch
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2340
2339
2338
2337
2336
2335
2334
2333
2332
0
100
200
300
400
Main Channel Distance (ft)

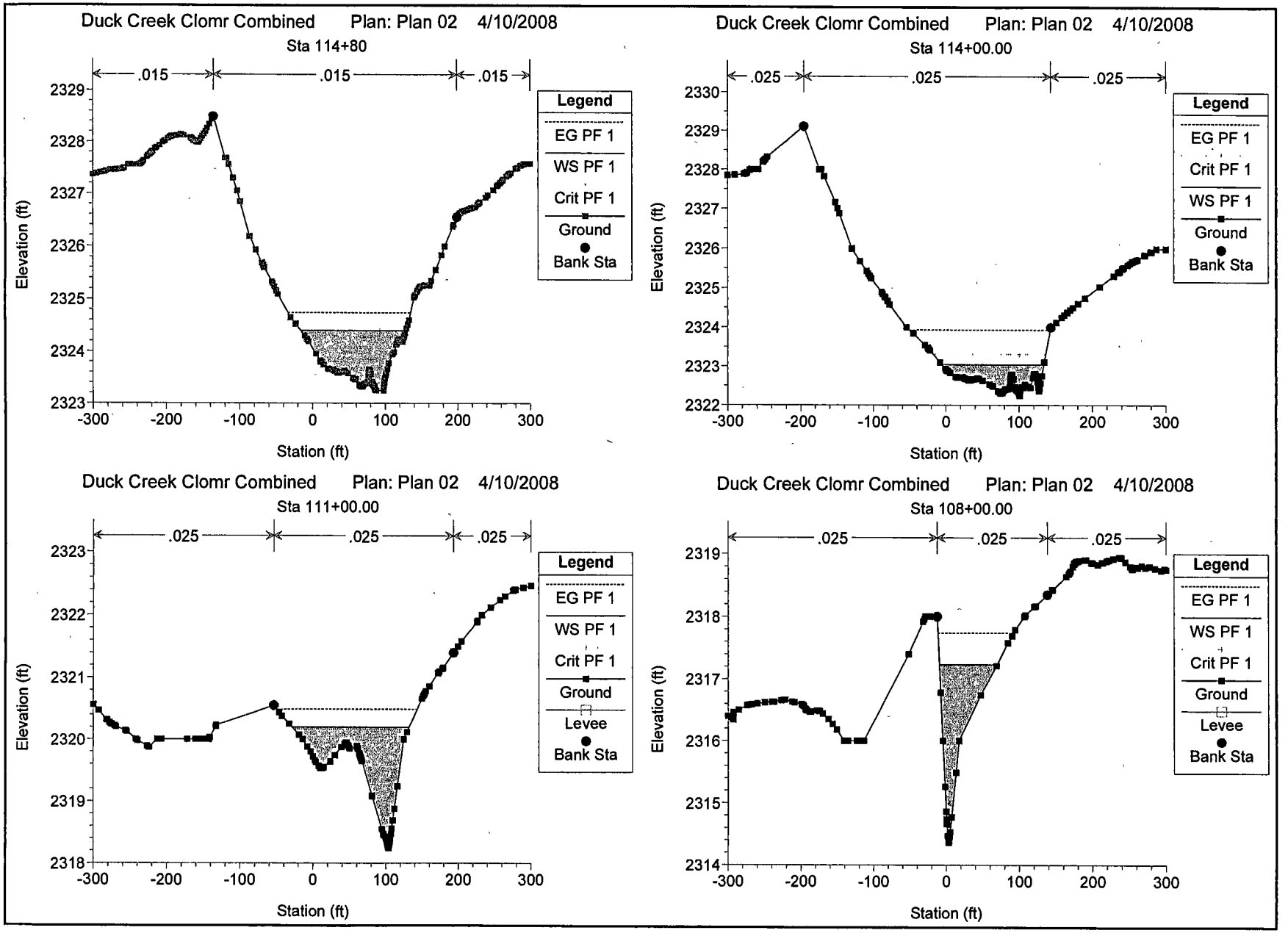

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Duck Creek East-East Branch
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
2337
2336
2335
2334
2333
2332
0
100
200
300
400
Main Channel Distance (ft)

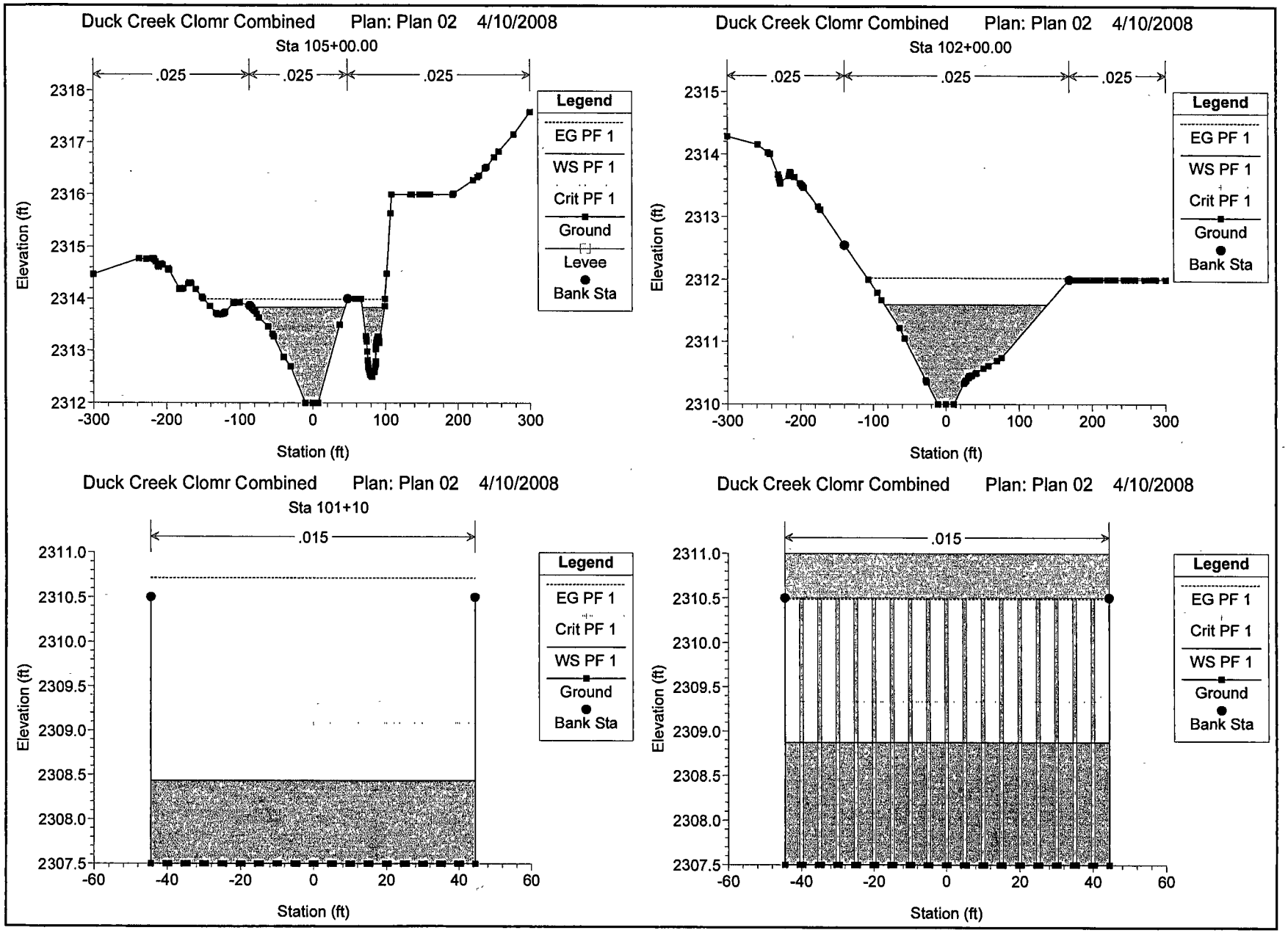

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 5+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 4+00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 3+00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 2+00

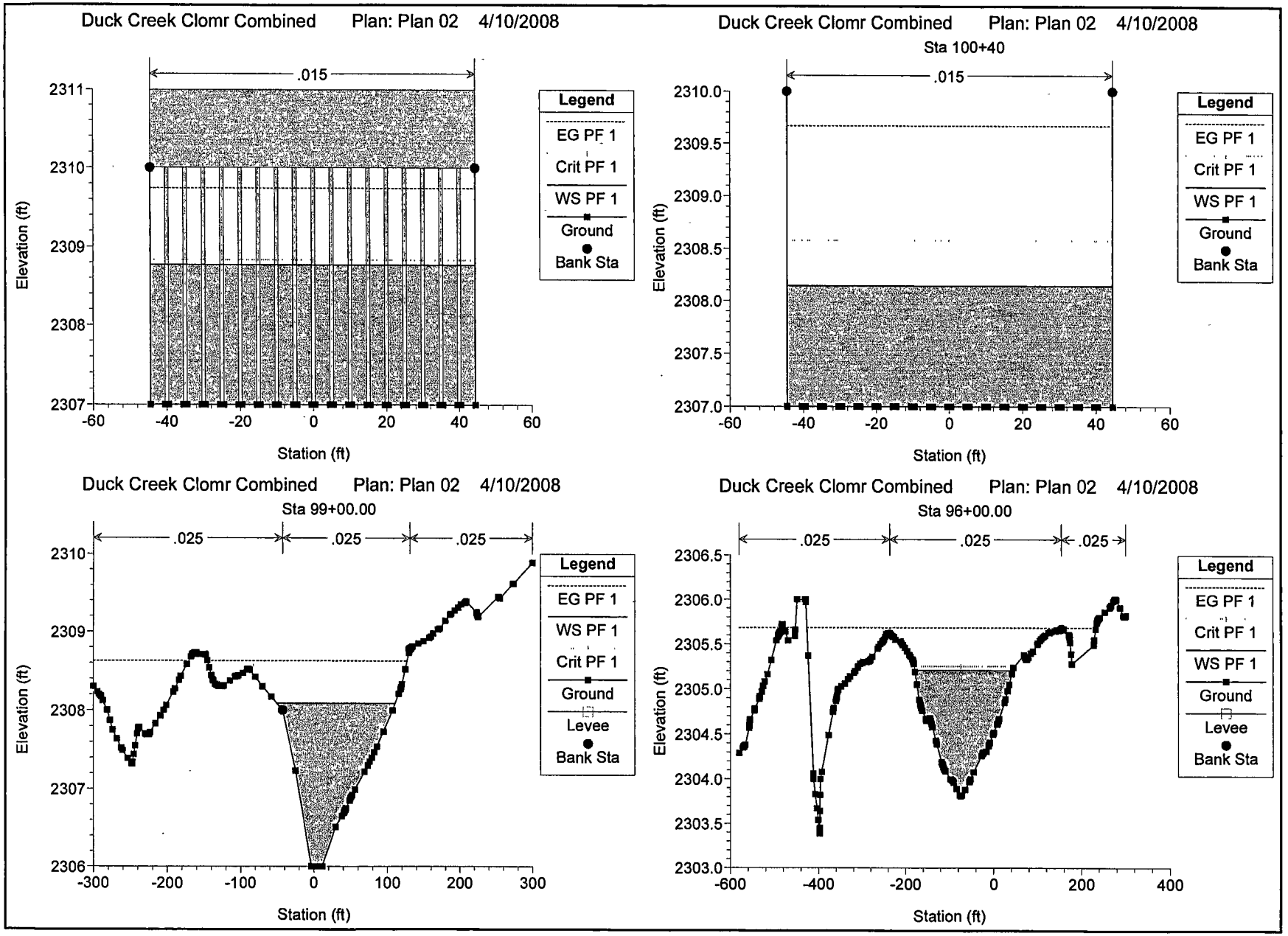

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 1+00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 5+00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 4+00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 3+00

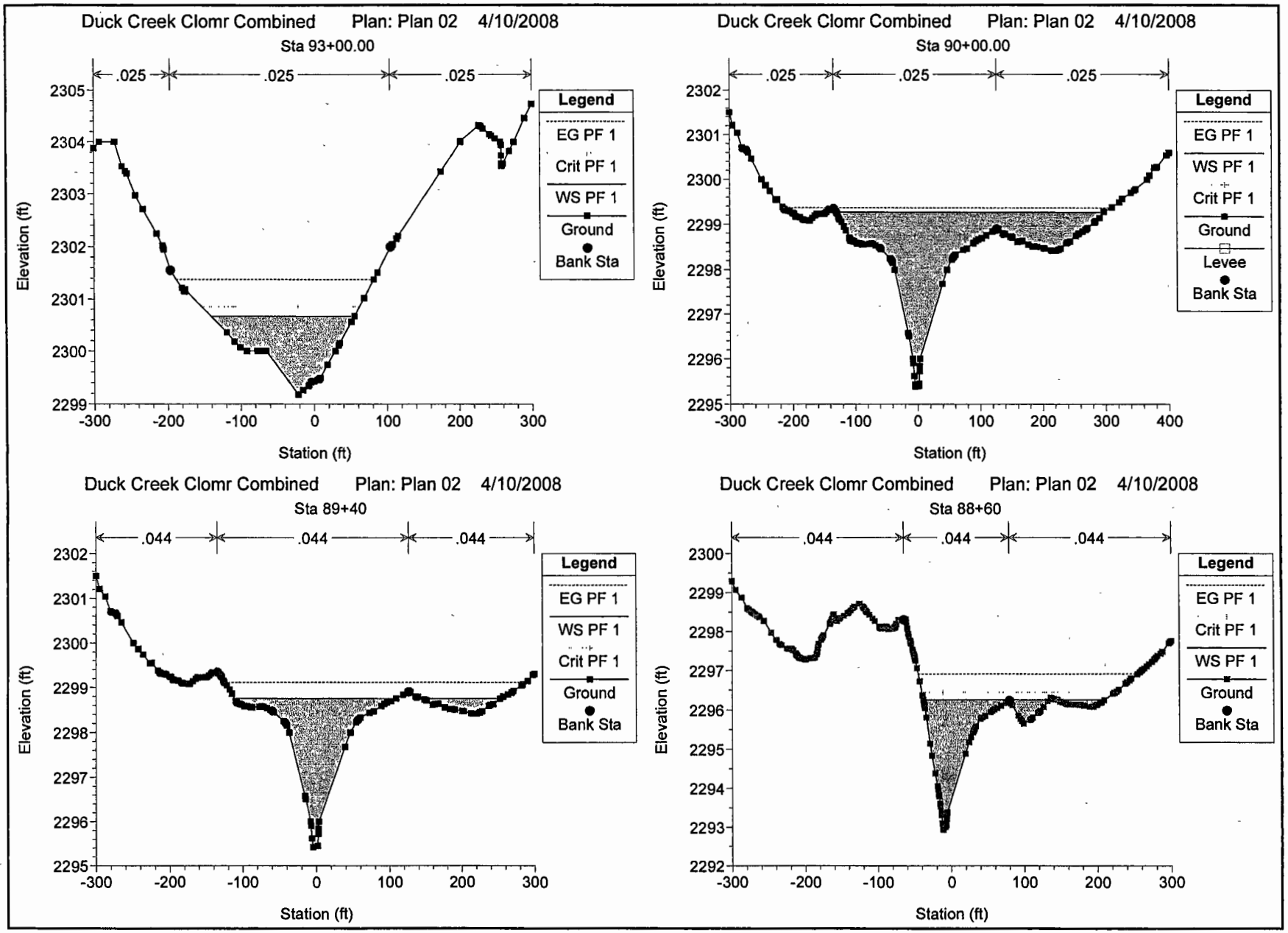

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 2+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 1+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 123+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 120+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

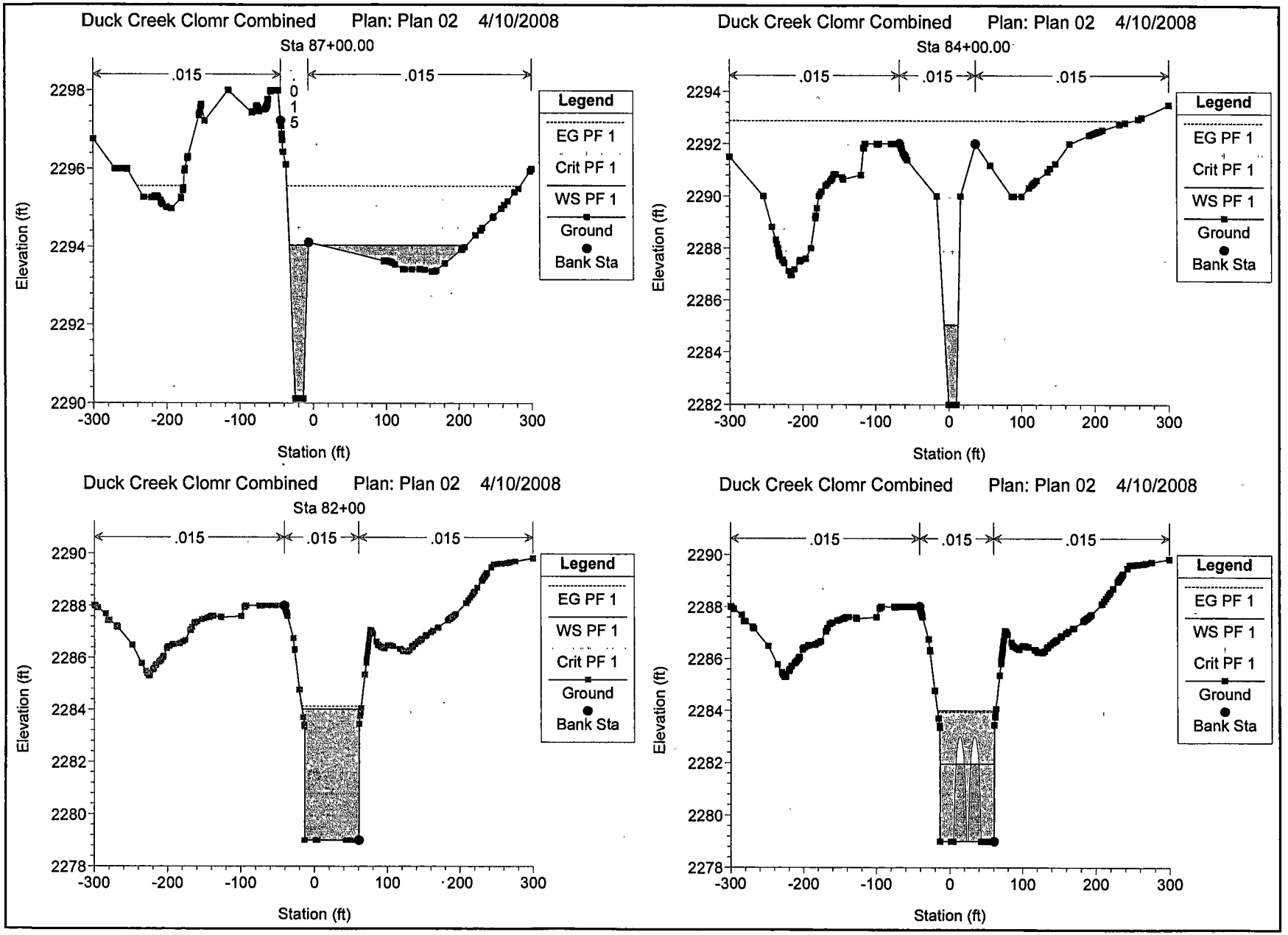

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 117+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 115+40
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

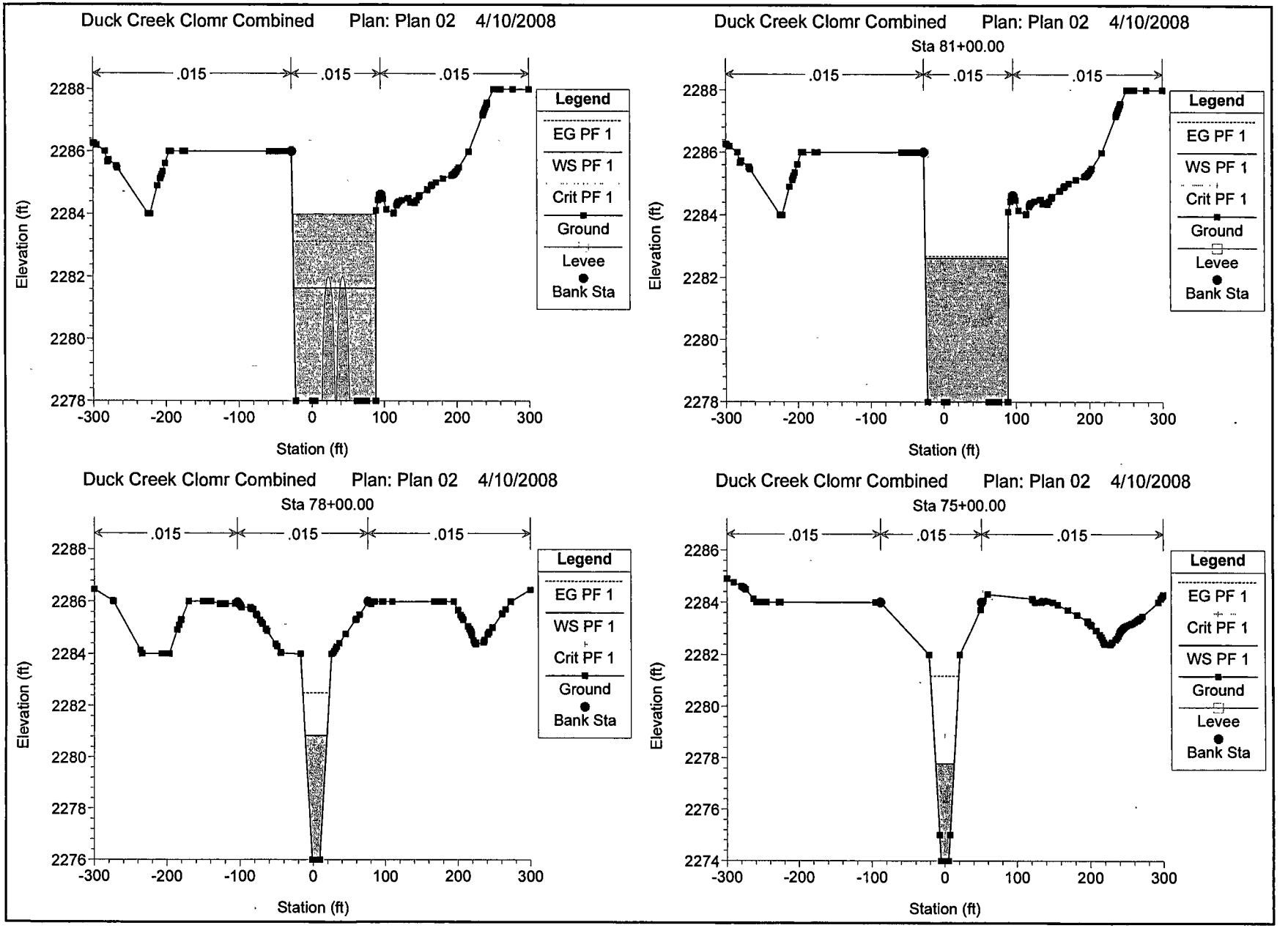

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 114+80
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 114+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 111+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 108+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta

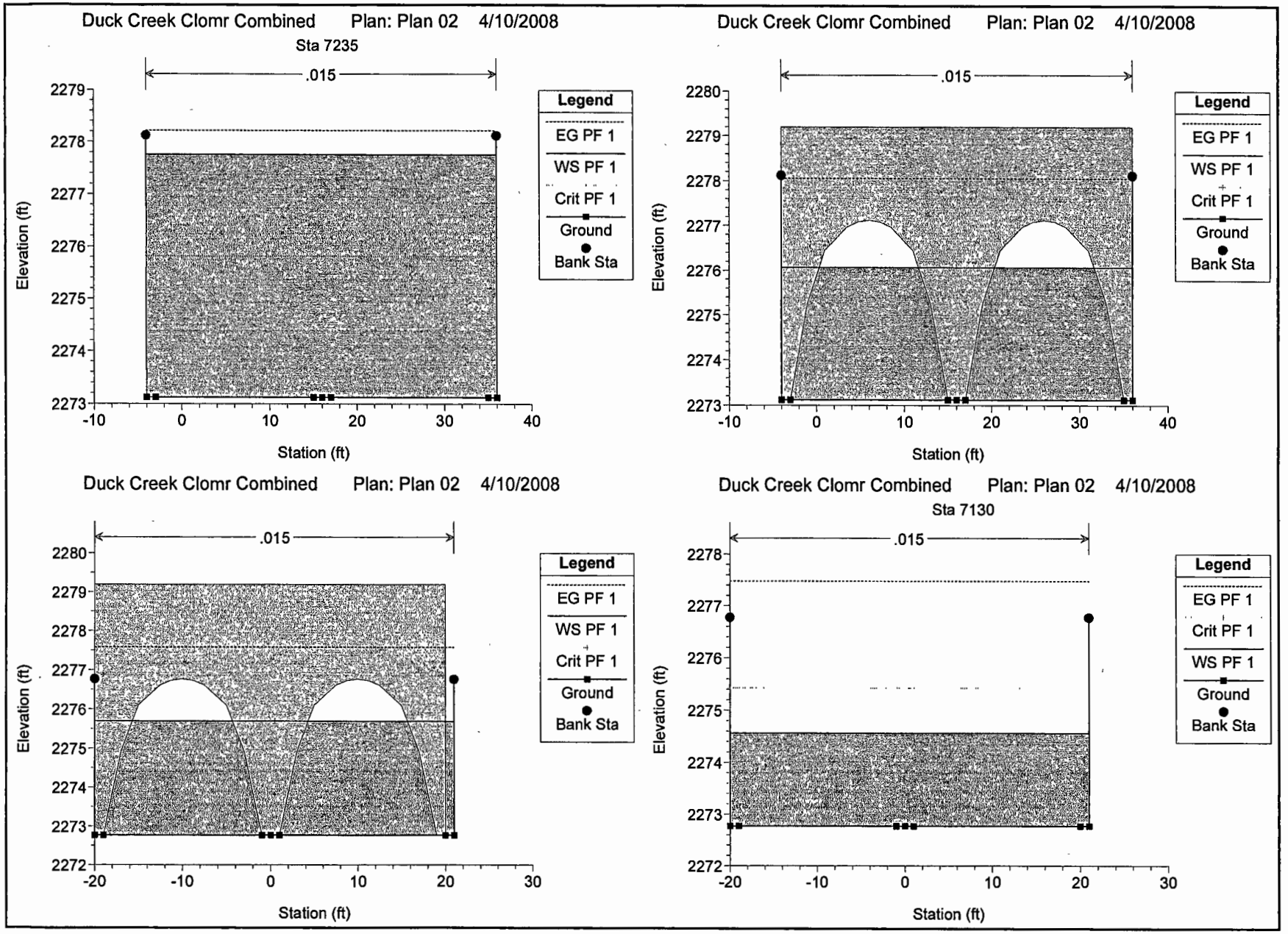

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 105+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 102+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 101+10
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

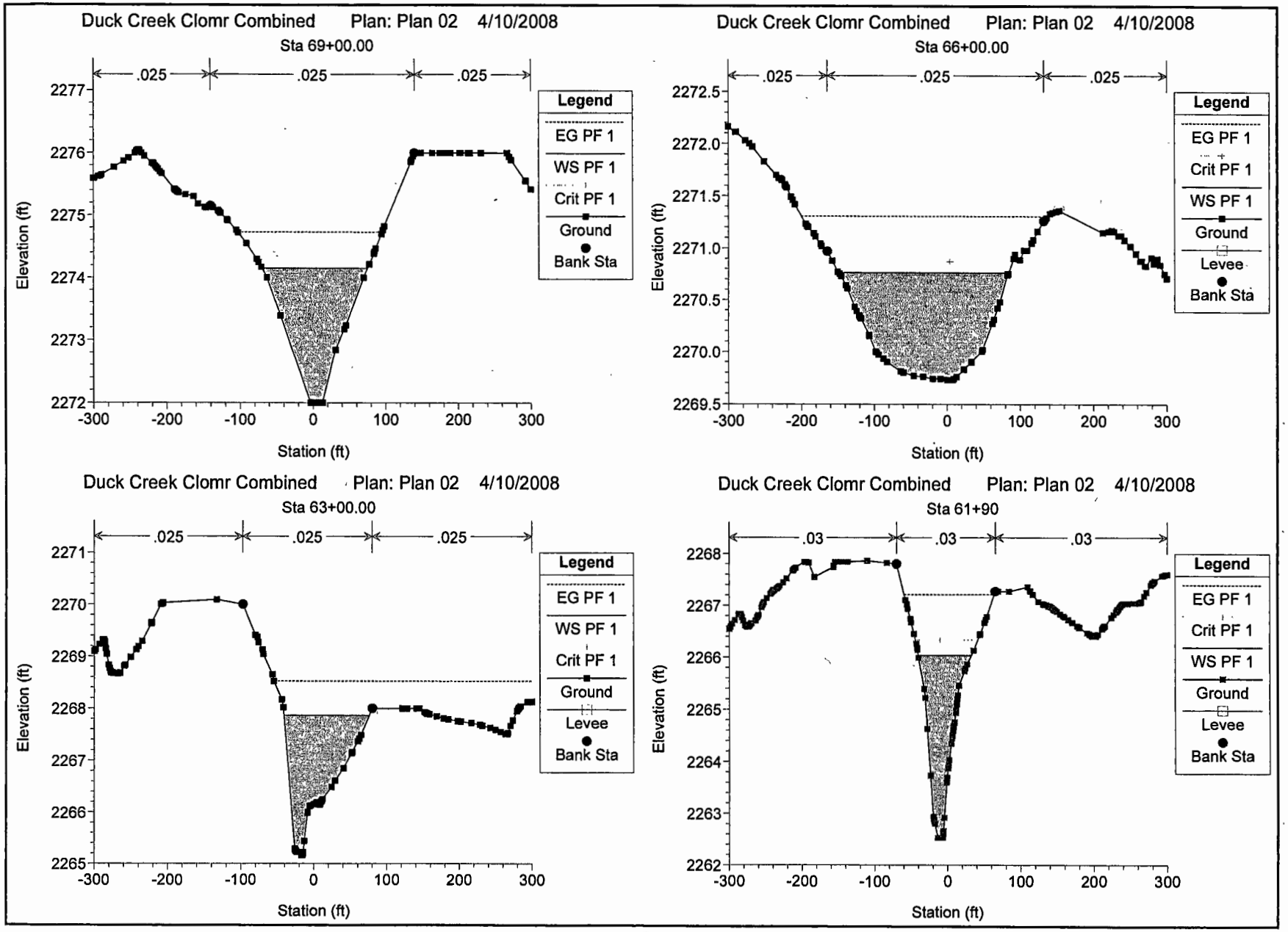

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 100+40
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 99+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 96+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

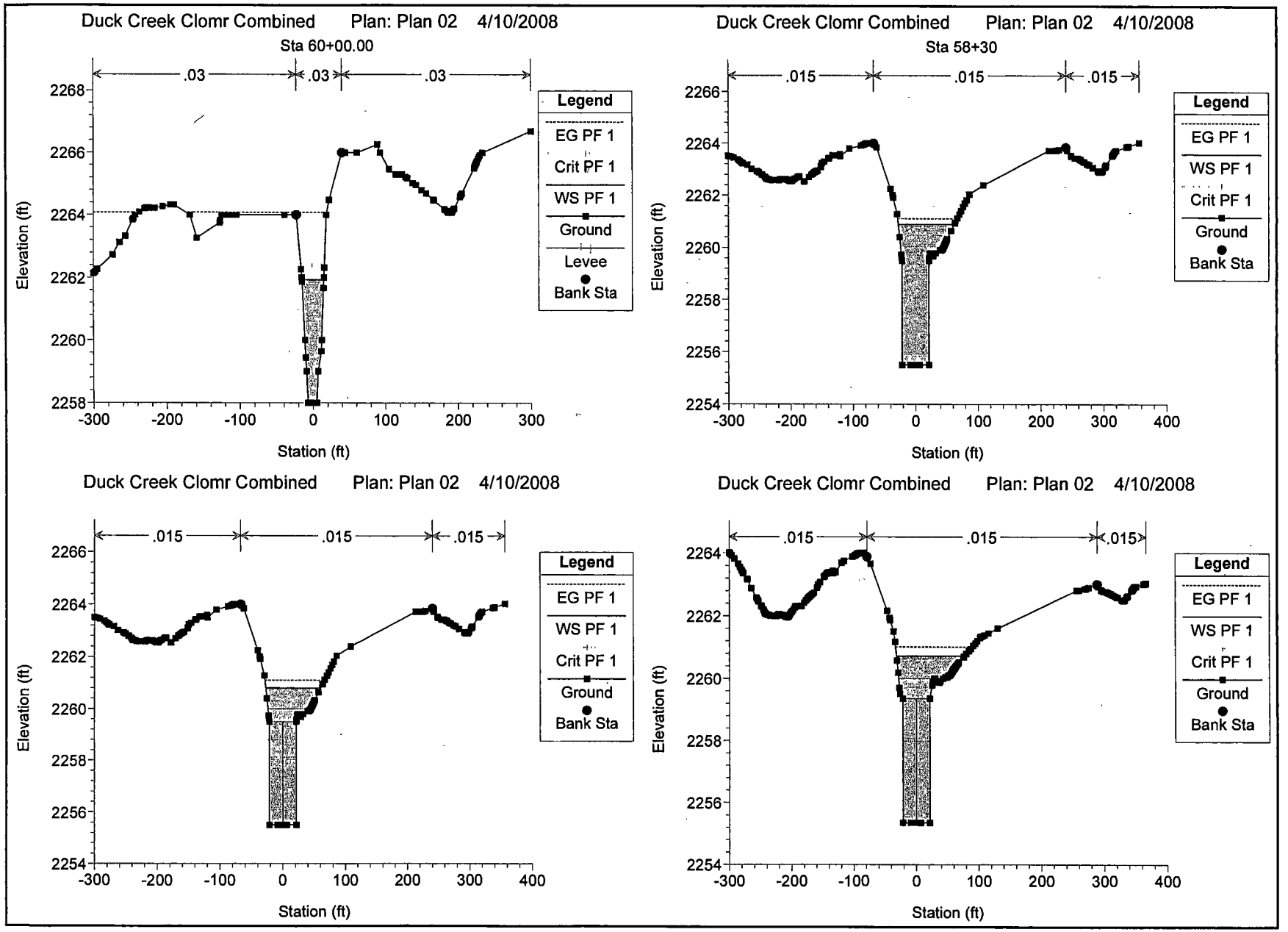

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 93+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 90+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 89+40
.044
.044
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 88+60
.044
.044
.044
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

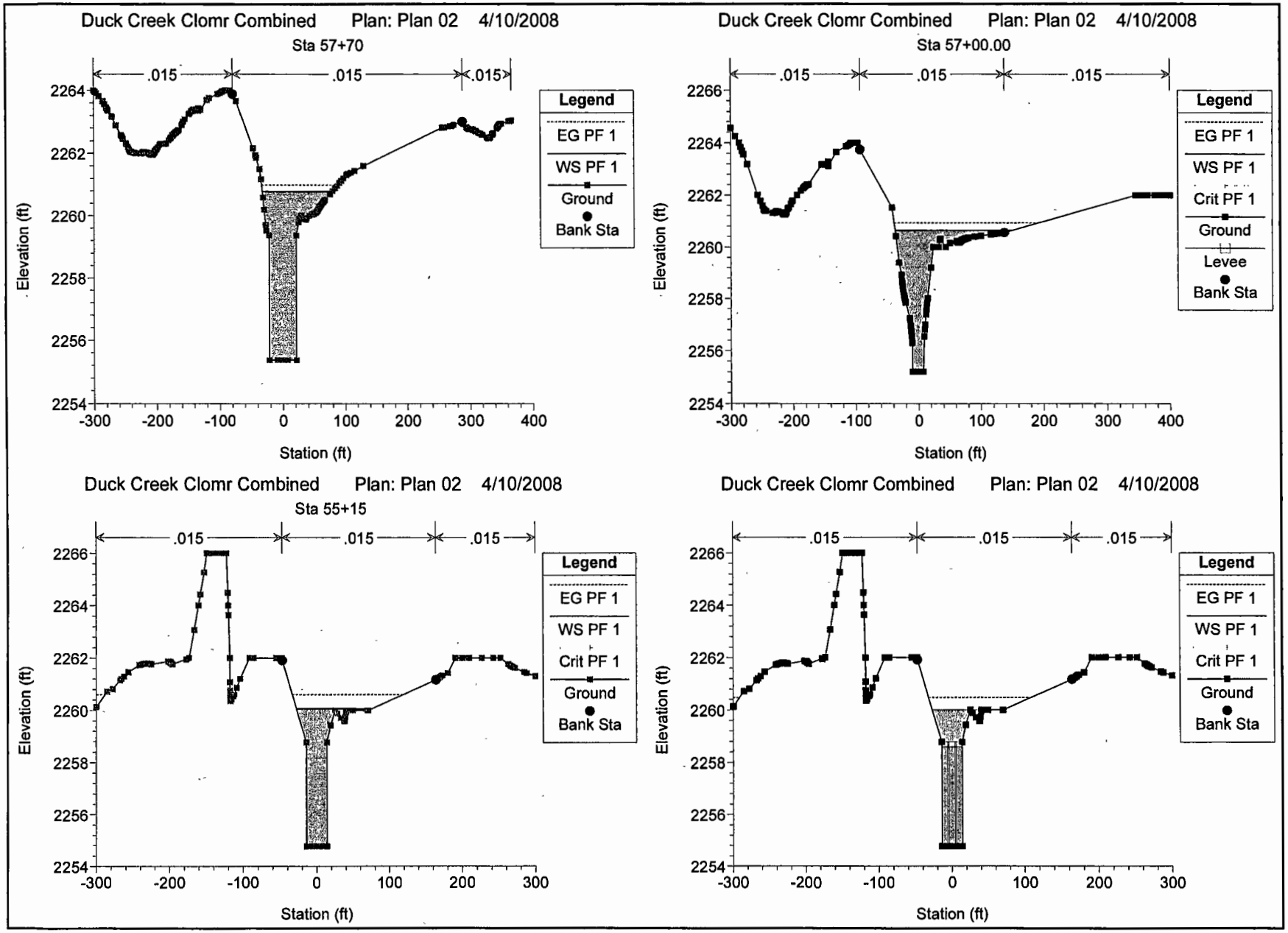

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 87+00.00
.015
.015
0.15
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 84+00.00
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 82+00
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

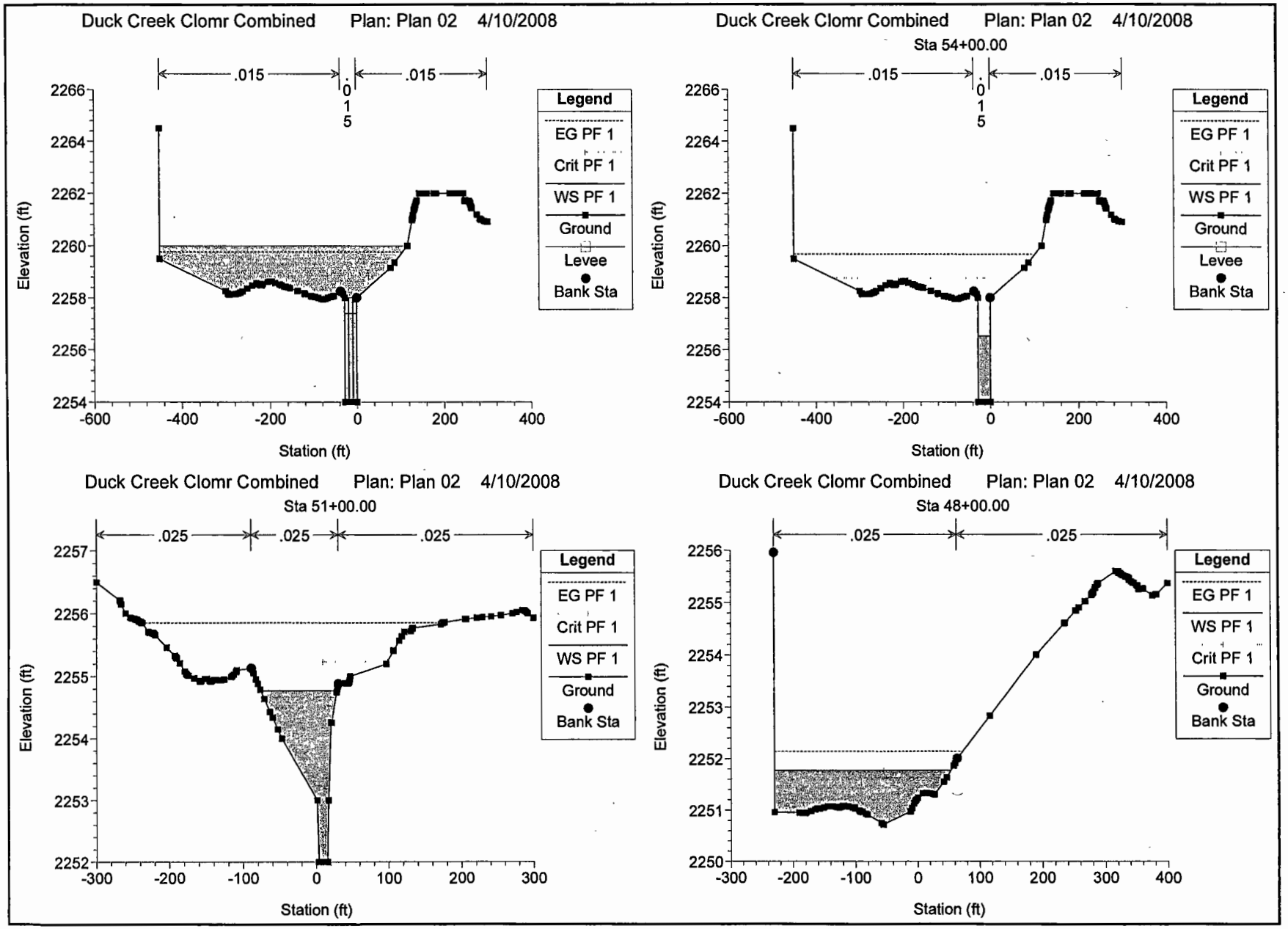

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 81+00.00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 78+00.00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 75+00.00

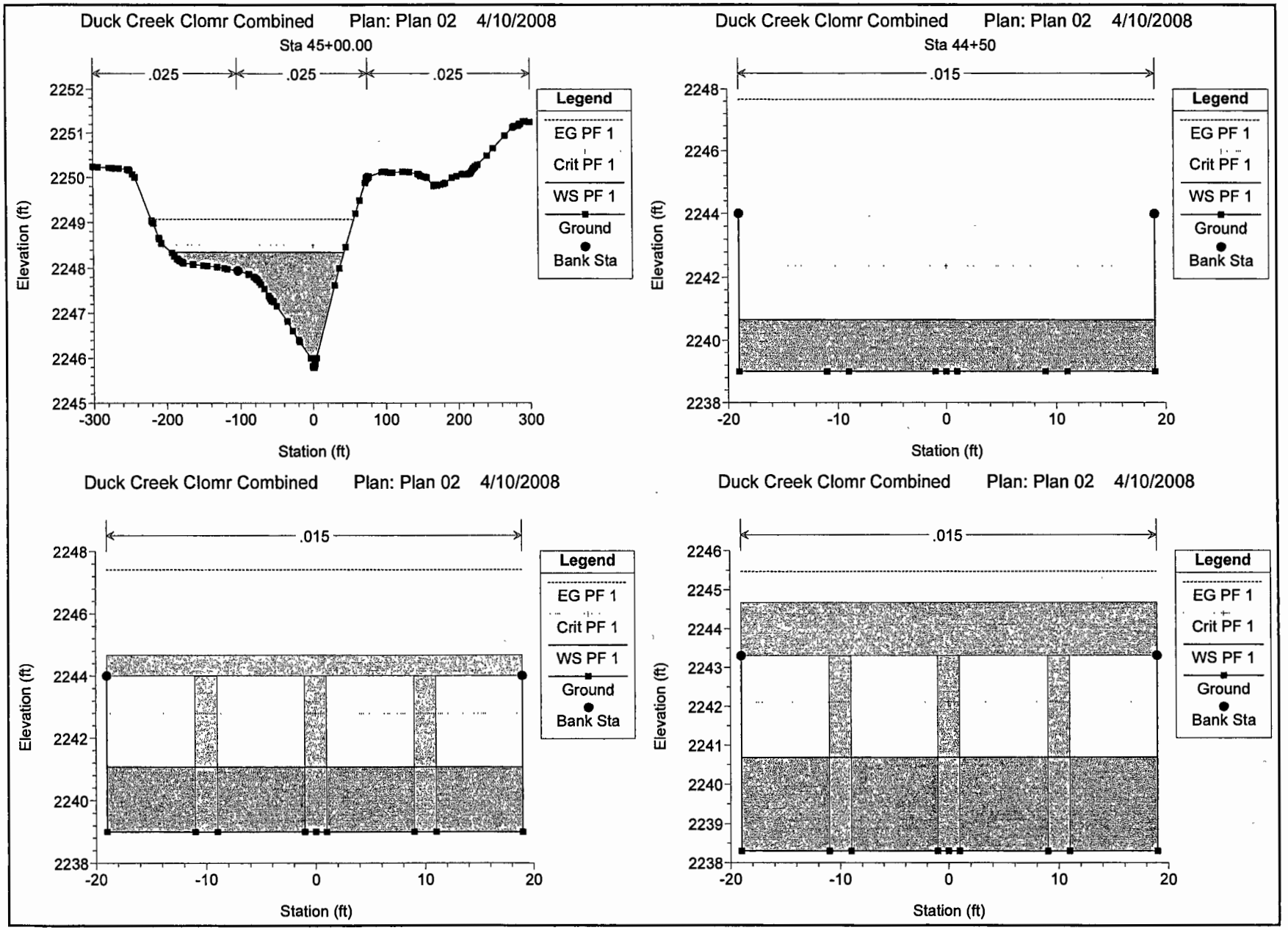

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 7235
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 7130
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

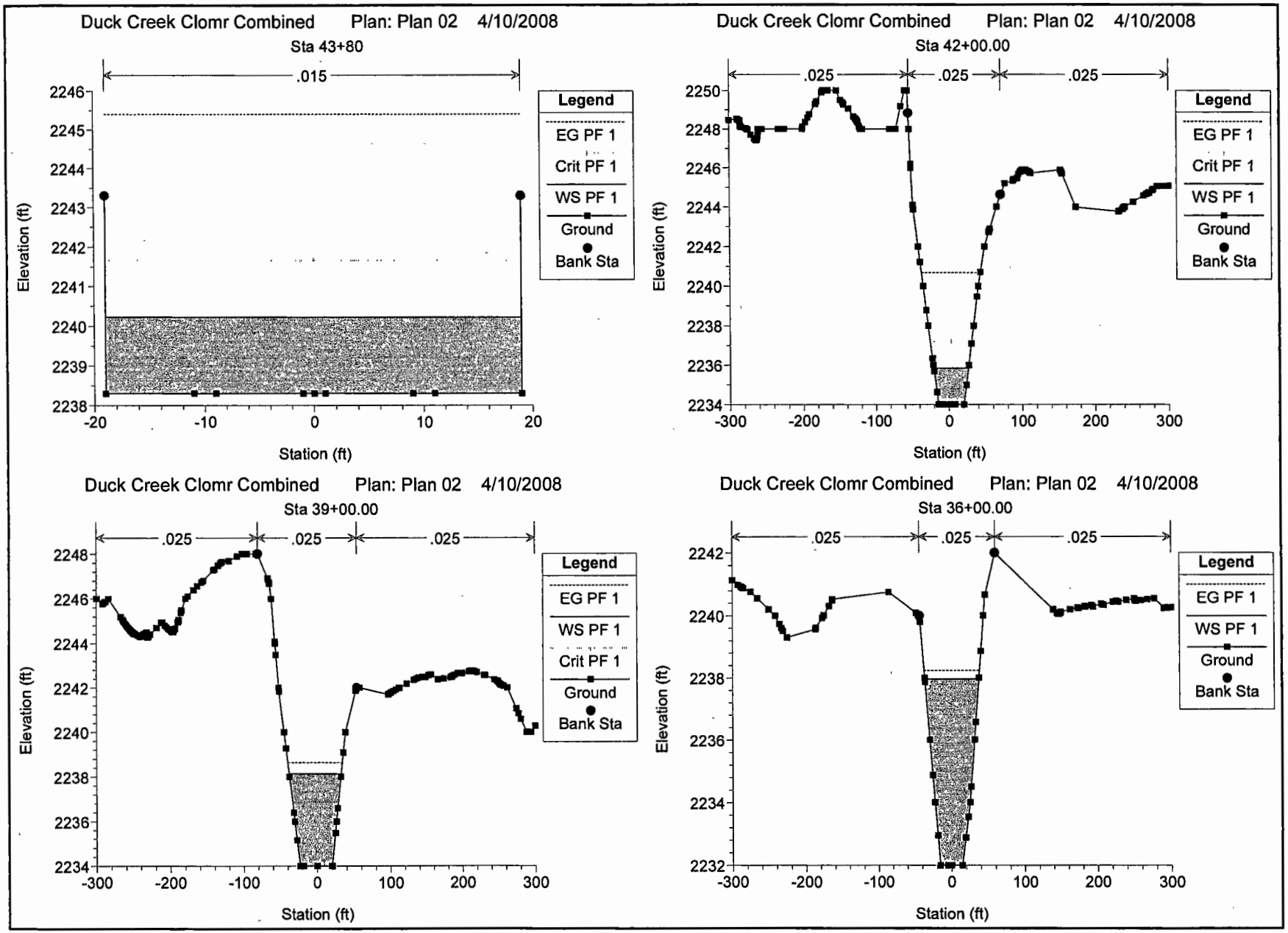

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 69+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 66+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 63+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 61+90
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

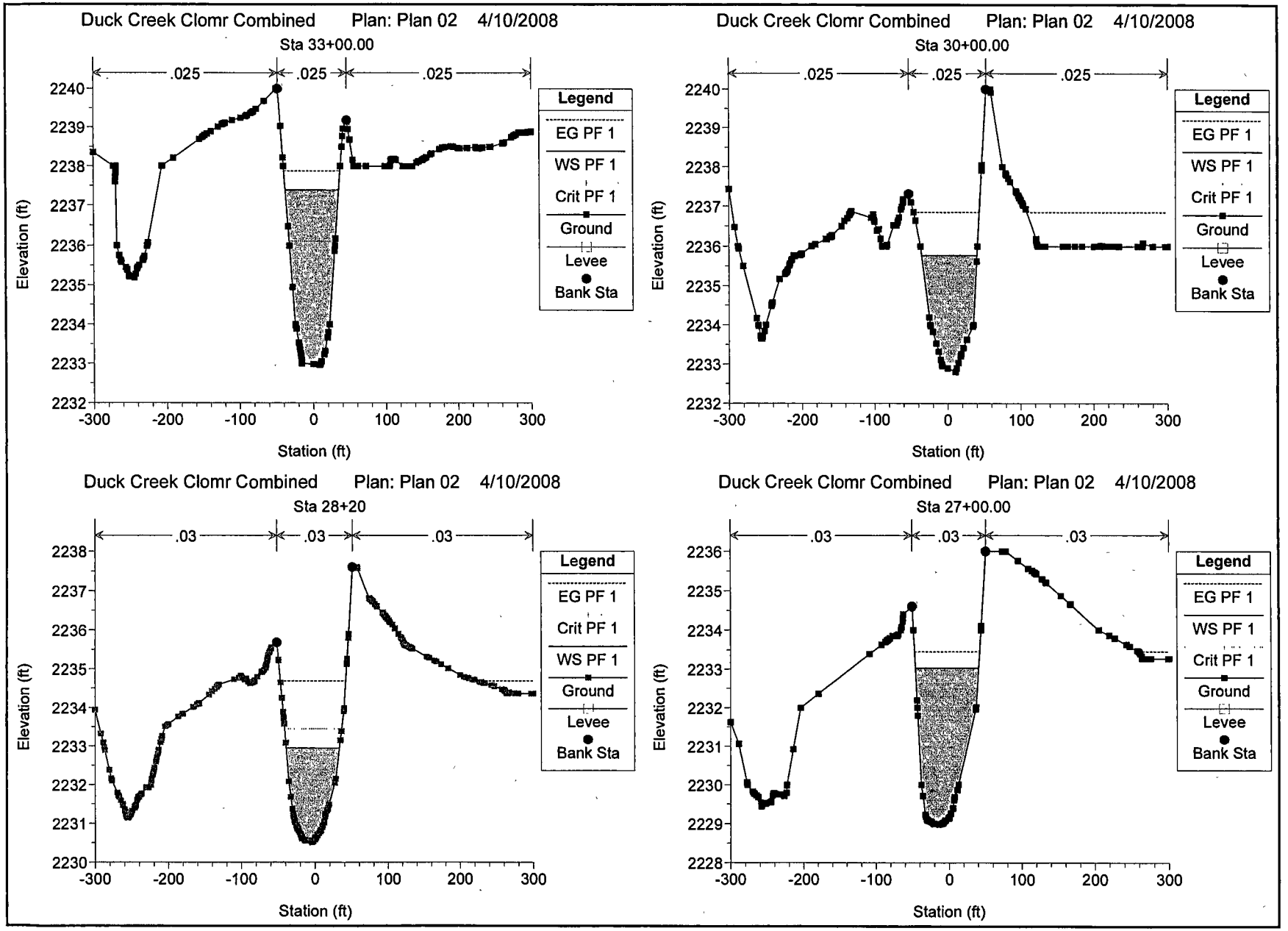

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 60+00.00
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 58+30
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

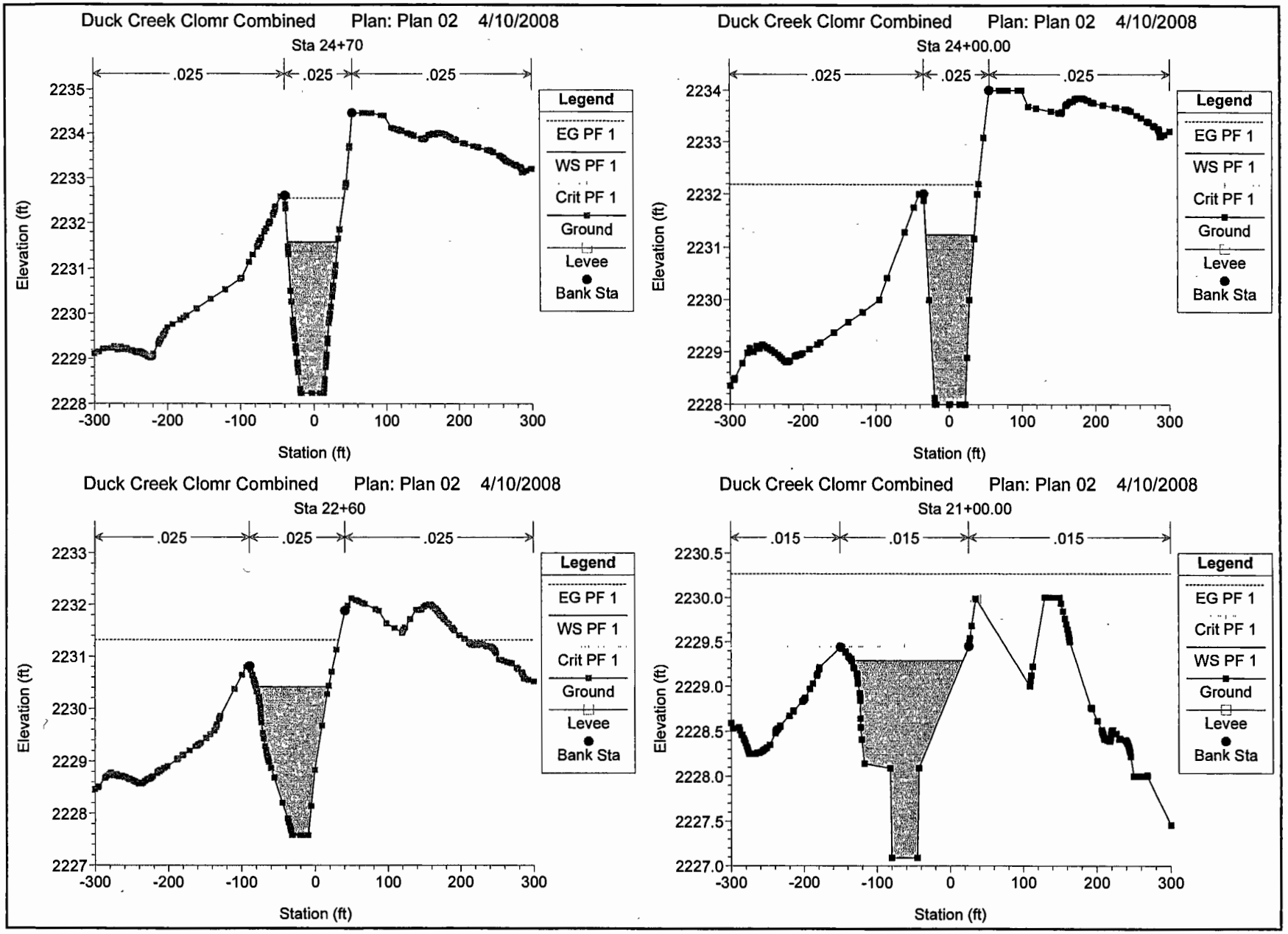

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 57+70
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 57+00.00
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 55+15
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

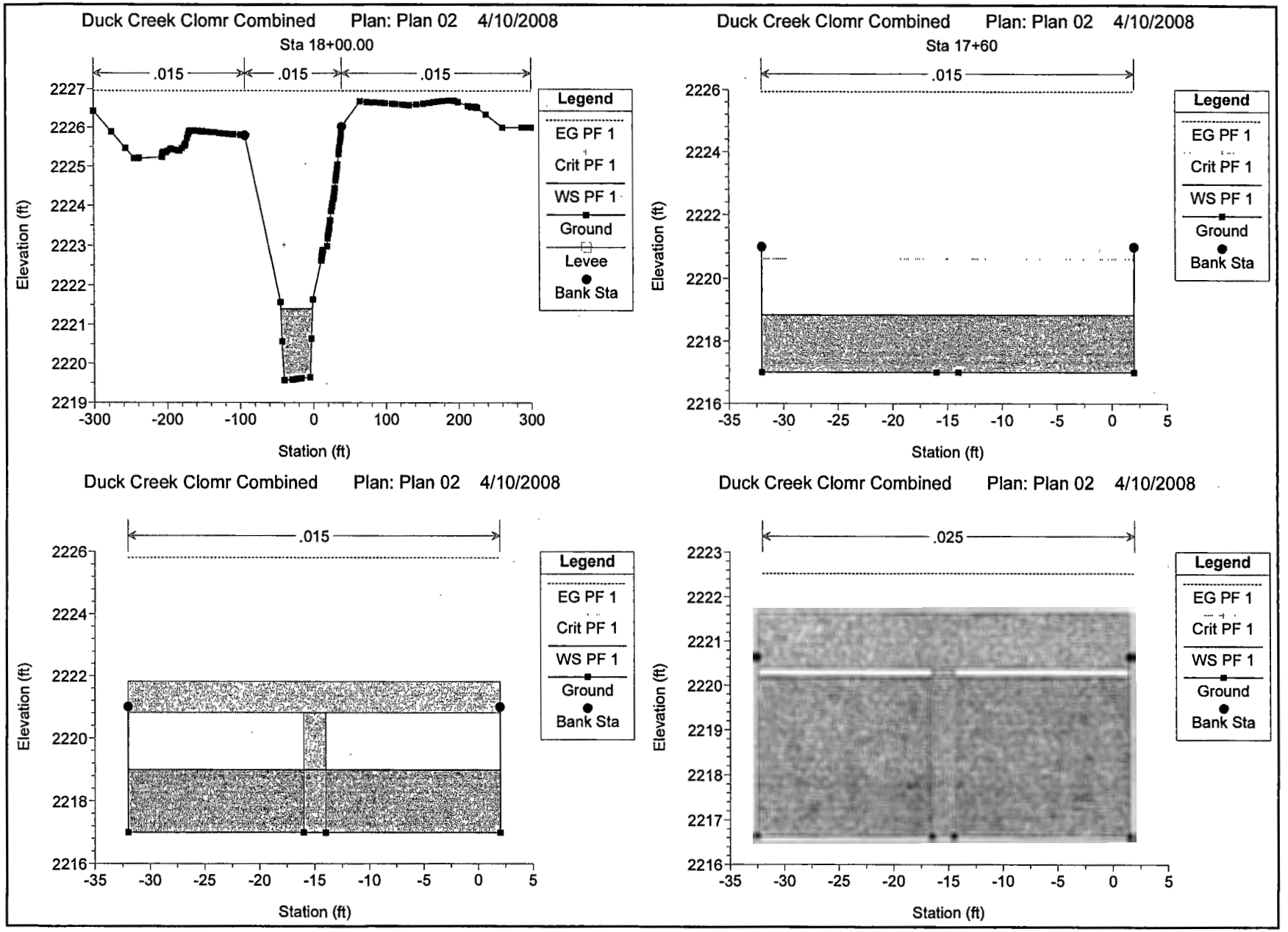

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 54+00.00
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 51+00.00
.025
.025
.025
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 48+00.00

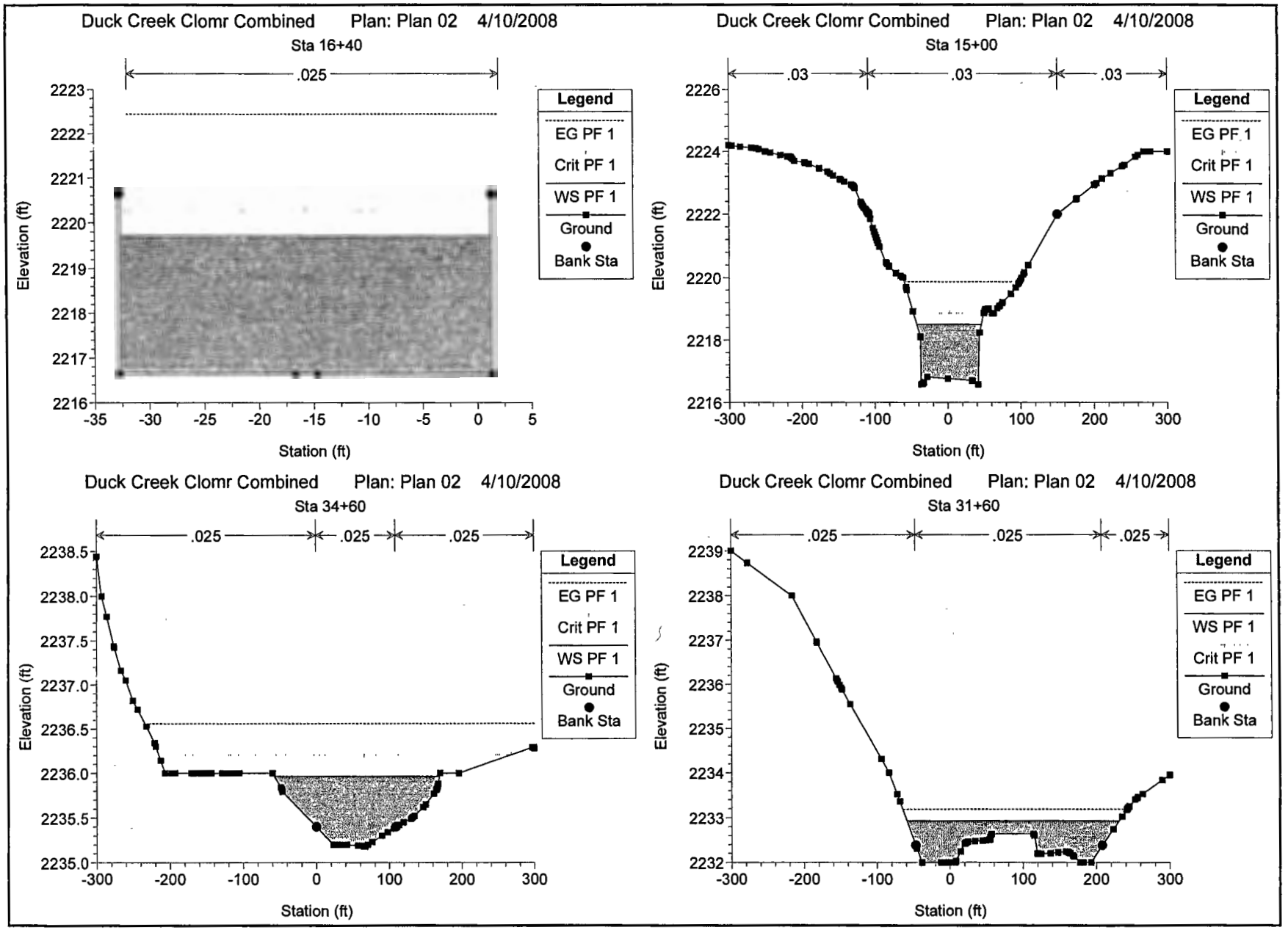

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 45+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 44+50
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

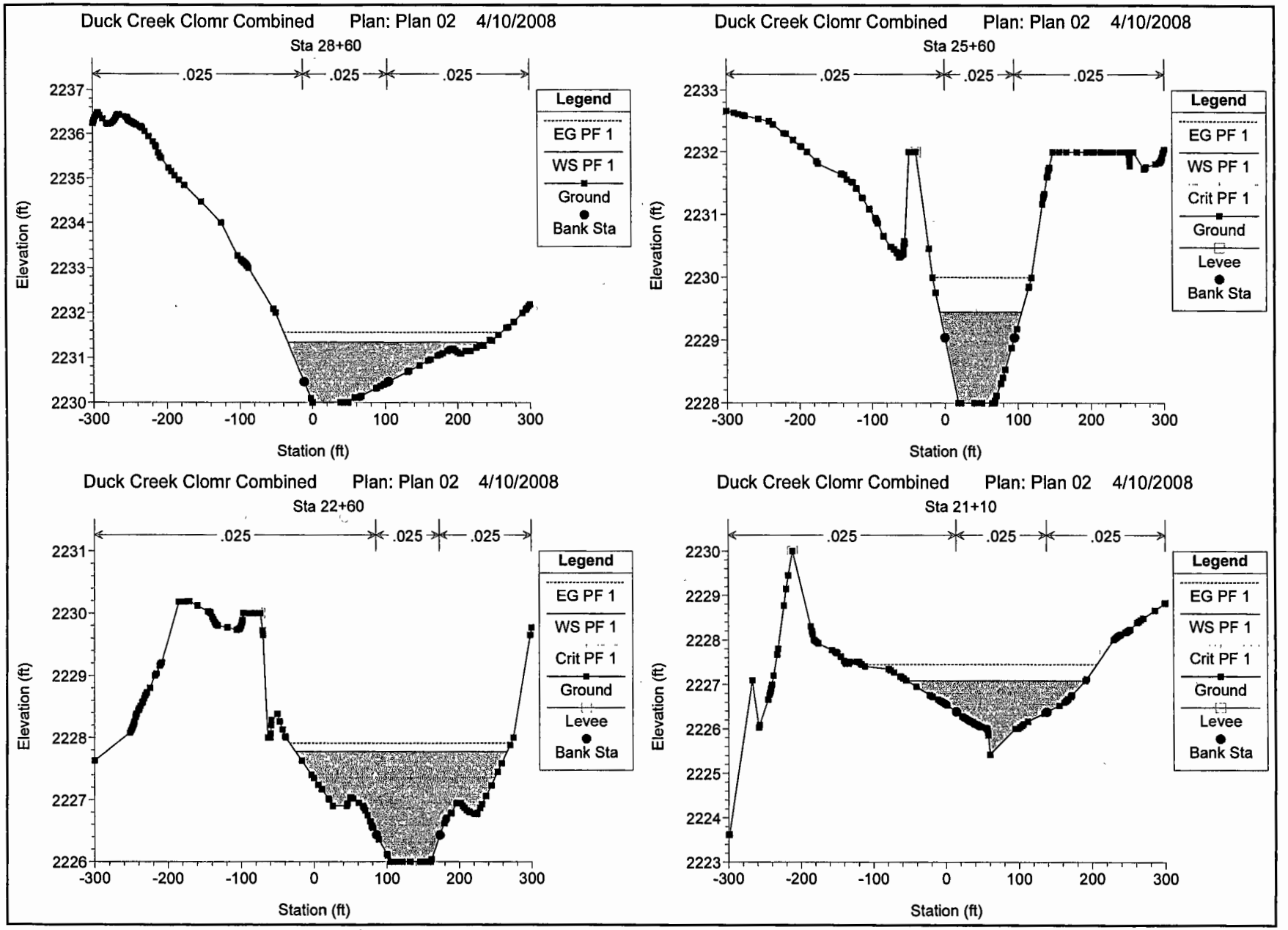

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 43+80
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 42+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 39+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 36+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

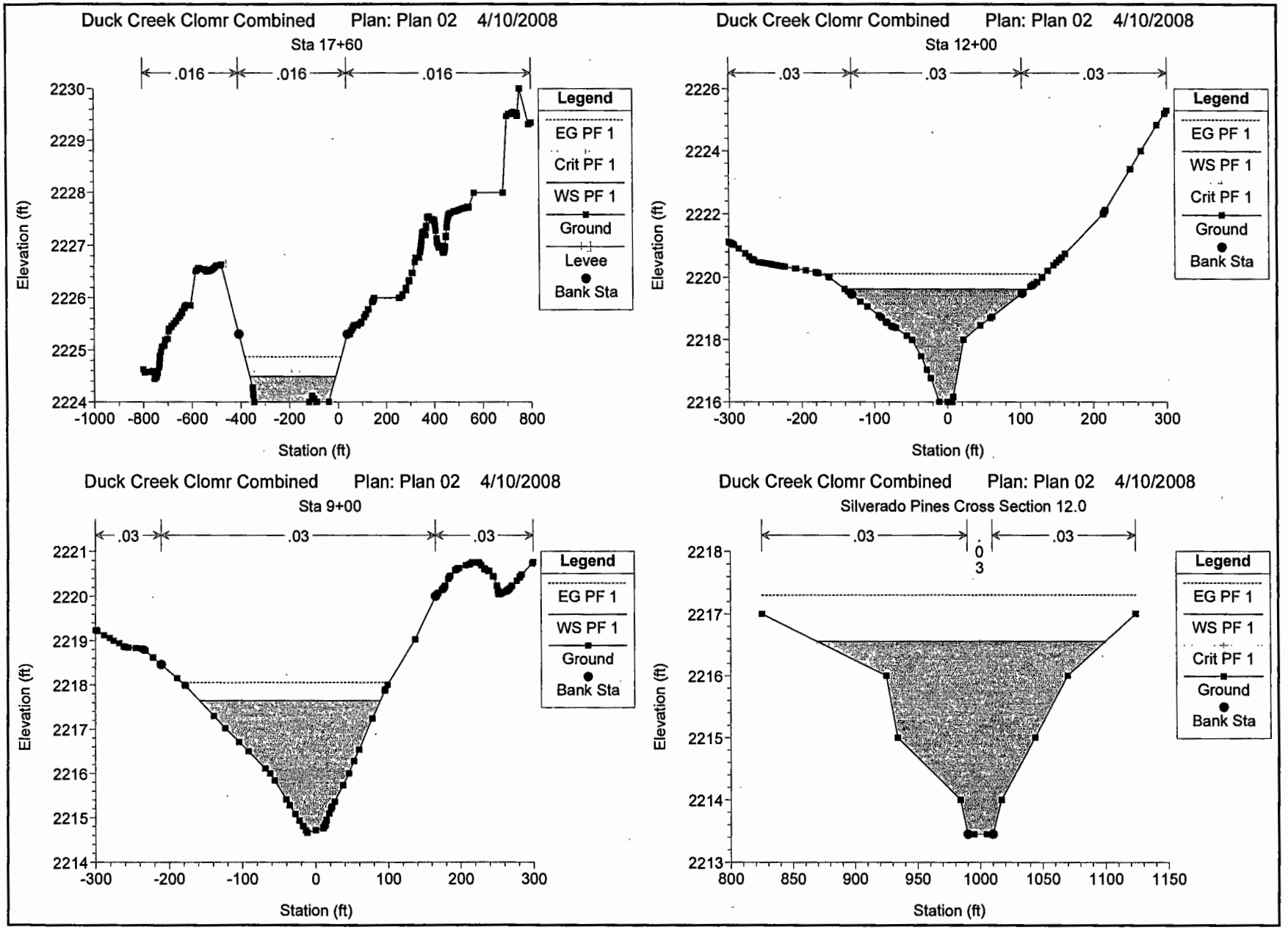

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 33+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 30+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 28+20
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 27+00.00
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

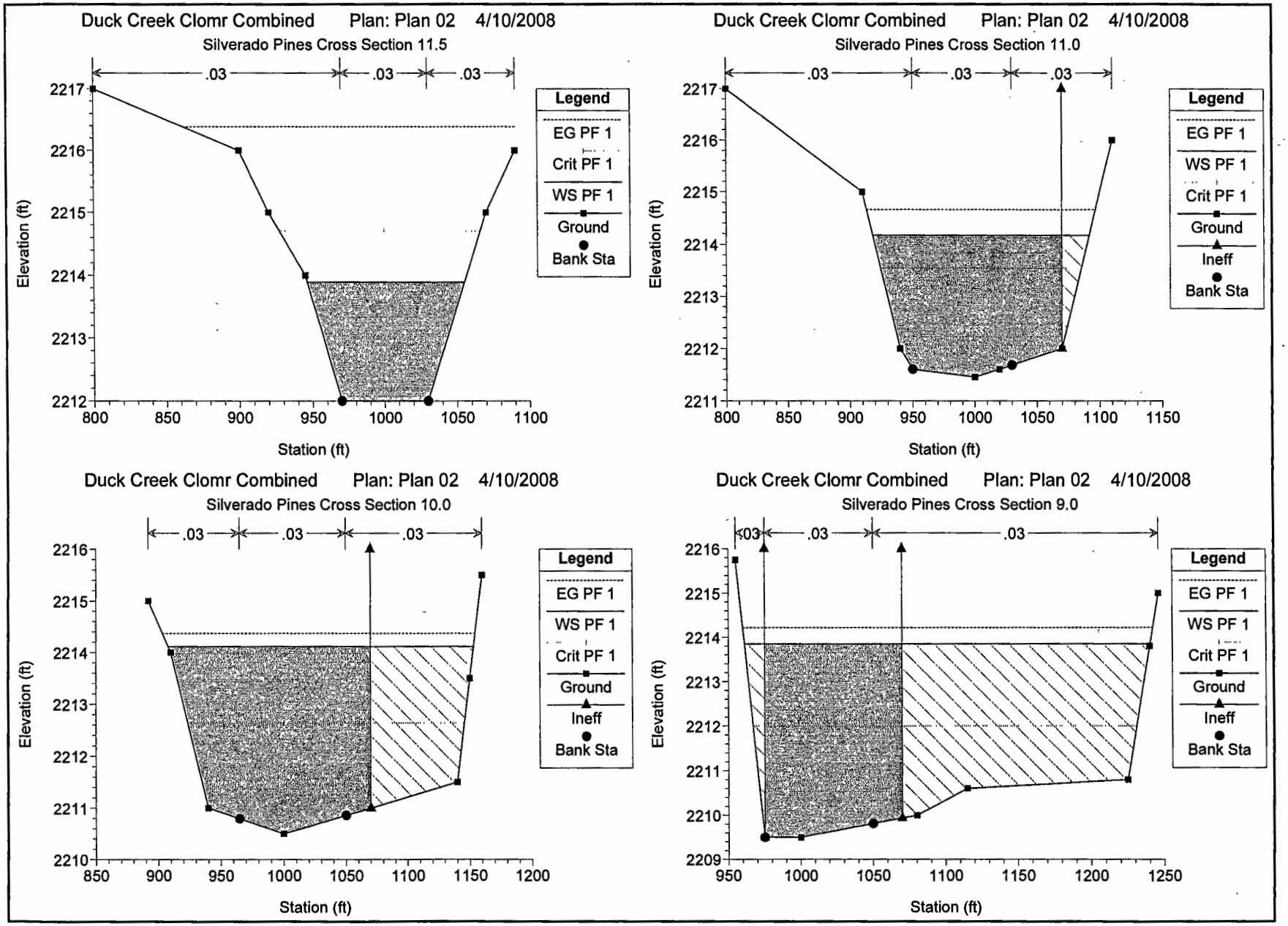

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 24+70
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 24+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 22+60
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 21+00.00
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta

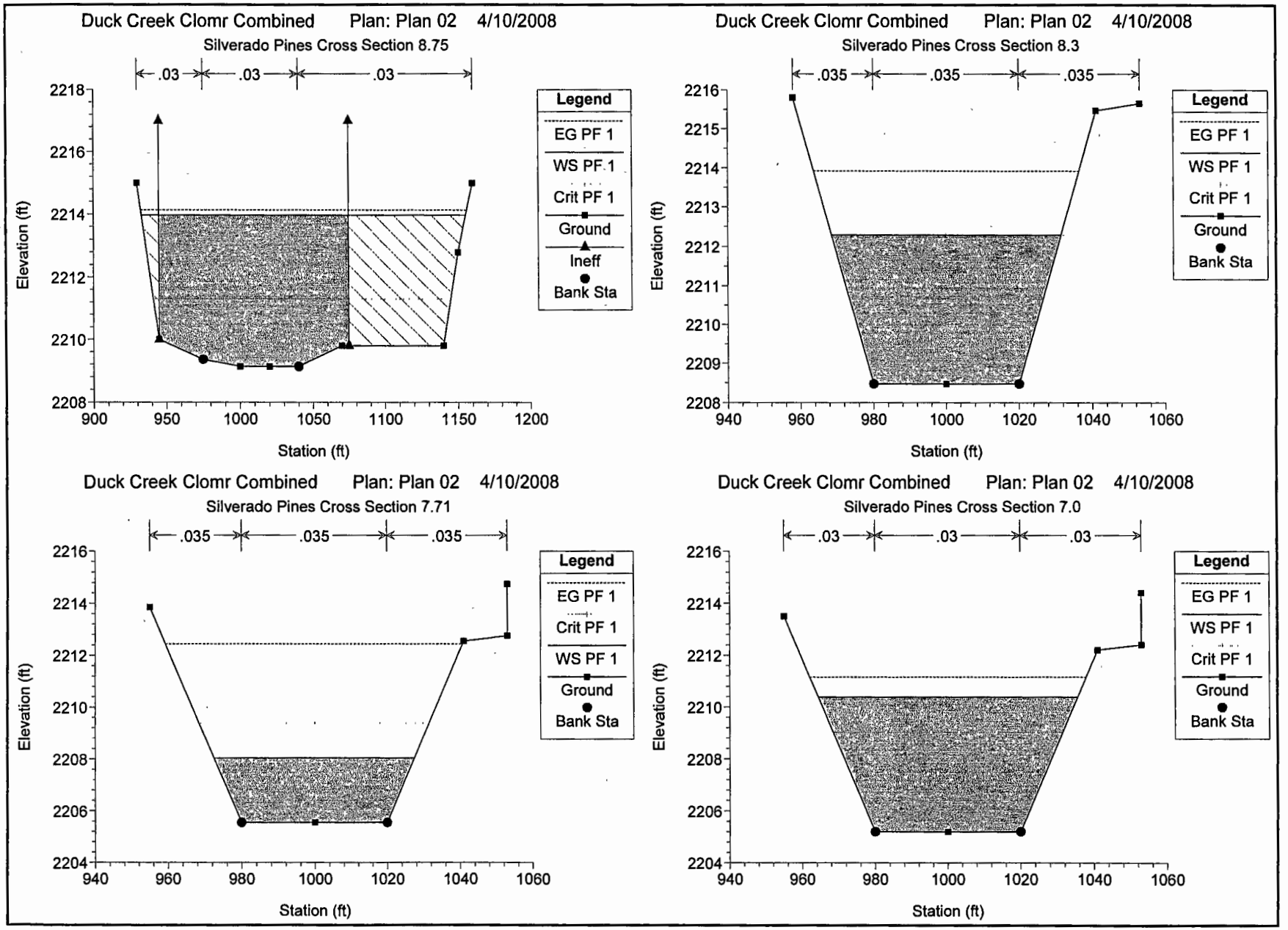

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 18+00.00
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 17+60
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

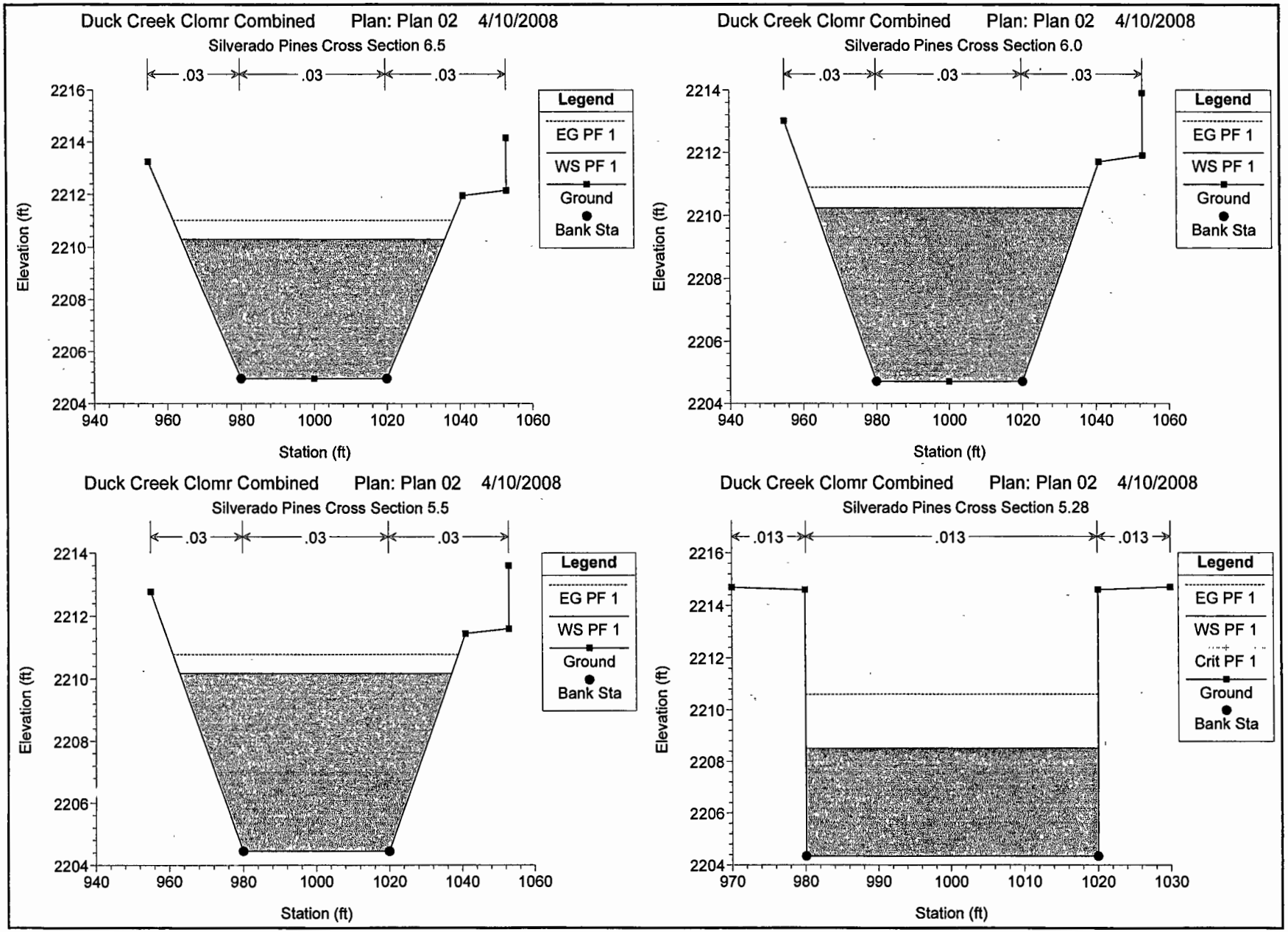

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 16+40
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 15+00
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 34+60
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 31+60
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

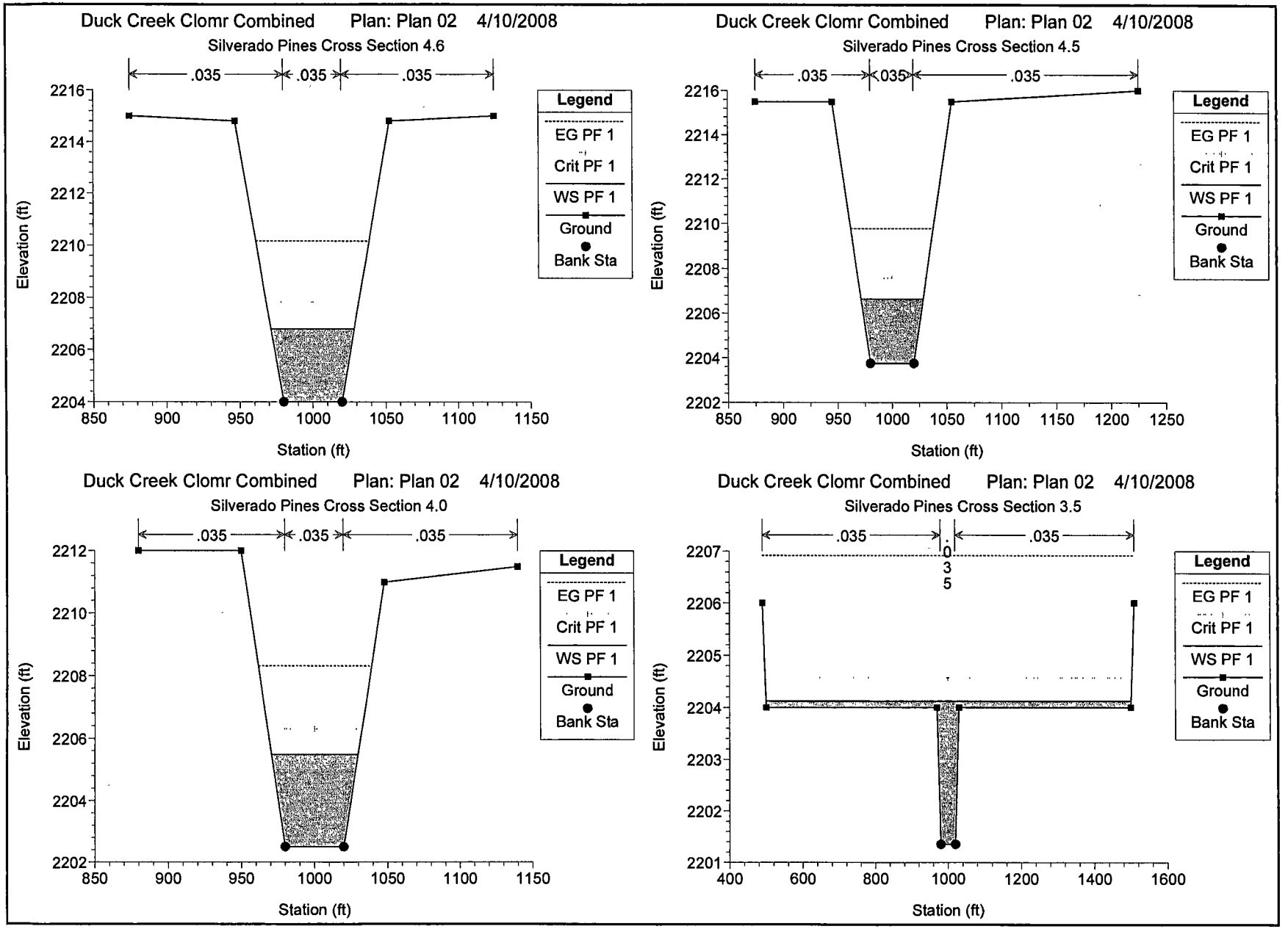

Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 28+60
.025
.025
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 25+60
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 22+60
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 21+10


Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 17+60
.016
.016
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Levee
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 12+00
.03
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Sta 9+00
.03
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 12.0
.03
.03
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 11.5
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 11.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 10.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 9.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 8.75
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 8.3
.035
.035
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 7.71
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 7.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 6.5
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 6.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 5.5
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 5.28
.013
.013
.013
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 4.6
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 4.5
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 4.0
Duck Creek Clomr Combined Plan: Plan 02 4/10/2008
Silverado Pines Cross Section 3.5

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
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PROJECT DATA
Project Title: Duck Creek Clomr Combined
Project File : DCCLOMR.prj
Run Date and Time: 4/10/2008 10:16:44 AM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : j:\JOBS\6657\Hydrology and Hydraulics & CLOMR\6_CLOMR REPORT_MARCH 2008\HEC RAS\Combined\DCCLOMR.p02

Geometry Title: East Existing Channel
Geometry File : j:\JOBS\6657\Hydrology and Hydraulics & CLOMR\6_CLOMR REPORT_MARCH 2008\HEC RAS\Combined\DCCLOMR.g02

Flow Title : Flow 01
Flow File : j:\JOBS\6657\Hydrology and Hydraulics & CLOMR\6_CLOMR REPORT_MARCH 2008\HEC RAS\Combined\DCCLOMR.f01

Plan Summary Information:
Number of: Cross Sections = 92 Multiple Openings = 0
Culverts = 1 Inline Structures = 0
Bridges = 7 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 01
Flow File : j:\JOBS\6657\Hydrology and Hydraulics & CLOMR\6_CLOMR REPORT_MARCH 2008\HEC RAS\Combined\DCCLOMR.f01

Flow Data (cfs)

| River | Reach | RS | PF 1 |
|---|---|---|---|
| Duck Creek | East-West Branch | 500 | 204 |
| Duck Creek | East-East Branch | 500 | 266 |
| Duck Creek | East | 12300 | 464 |
| Duck Creek | East | 10200 | 1008 |
| Duck Creek | East | 4500 | 1338 |
| Duck Creek | West Branch | 3460 | 692 |
| Duck Creek | West Branch | 2260 | 789 |
| Duck Creek | East-Lower | 1200 | 1931 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Duck Creek | East-West Branch | PF 1 | Normal S = 0.005 | |
| Duck Creek | East-East Branch | PF 1 | Normal S = 0.02 | |
| Duck Creek | West Branch | PF 1 | Normal S = 0.02 | |
| Duck Creek | East-Lower | PF 1 | | Normal S = 0.0109 |

GEOMETRY DATA

Geometry Title: East Existing Channel
Geometry File : j:\JOBS\6657\Hydrology and Hydraulics & CLOMR\6_CLOMR REPORT_MARCH 2008\HEC RAS\Combined\DCCLOMR.g02

Reach Connection Table

| River | Reach | Upstream Boundary | Downstream Boundary |
|---|---|---|---|
| Duck Creek | East-West Branch | | Junction 1 |
| Duck Creek | East-East Branch | | Junction 1 |
| Duck Creek | East | Junction 1 | Junction2 |
| Duck Creek | West Branch | | Junction2 |
| Duck Creek | East-Lower | Junction2 | |

JUNCTION INFORMATION

Name: Junction 1
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| Duck Creek | East-West Branch to Duck Creek | East | | 0 | 0 |
| Duck Creek | East-East Branch to Duck Creek | East | | 0 | 0 |

Name: Junction2
Description:
Energy computation Method

| Length across Junction River | Reach | Tributary River | Reach | Length | Angle |
|---|---|---|---|---|---|
| Duck Creek | East to | Duck Creek | East-Lower | 300 | 0 |
| Duck Creek | West Branch to | Duck Creek | East-Lower | 0 | 0 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch RS: 500

INPUT
Description: Sta 5+00
Station Elevation Data num= 63

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2341.33 | -99.87 | 2341.33 | -99.38 | 2341.32 | -96.31 | 2341.27 | -90.87 | 2341.17 |
| -83.27 | 2341.15 | -76.96 | 2341.05 | -74.74 | 2341.04 | -72.19 | 2341.03 | -64.77 | 2340.9 |
| -63.53 | 2340.87 | -63.1 | 2340.86 | -62.16 | 2340.84 | -52.59 | 2340.57 | -48.15 | 2340.56 |
| -46.36 | 2340.55 | -32.61 | 2340 | -28.45 | 2338.38 | -27.45 | 2338 | -26.7 | 2337.72 |
| -22.3 | 2336 | -21.21 | 2336 | -18.83 | 2336 | -14.44 | 2336 | -7.15 | 2336 |
| -4.09 | 2337.65 | -3.49 | 2338 | -1.56 | 2338.85 | -1.42 | 2338.98 | -1.13 | 2339.18 |
| -.58 | 2339.51 | 0 | 2339.84 | .27 | 2340 | 1 | 2340.04 | 1.86 | 2340.09 |
| 2.69 | 2340.13 | 3.51 | 2340.16 | 4.43 | 2340.2 | 5.35 | 2340.22 | 6.26 | 2340.24 |
| 8.95 | 2340.3 | 22.33 | 2340.5 | 28.63 | 2340.61 | 31.9 | 2340.68 | 37.78 | 2340.91 |
| 38.83 | 2340.95 | 39.96 | 2340.99 | 41.36 | 2341.04 | 48.57 | 2341.33 | 49.38 | 2341.37 |
| 50.6 | 2341.43 | 60.72 | 2341.77 | 62.32 | 2341.85 | 67.61 | 2342 | 78.62 | 2342.14 |
| 79.02 | 2342.14 | 80.25 | 2342.16 | 83.19 | 2342.2 | 85.09 | 2342.23 | 85.34 | 2342.24 |
| 92.38 | 2342.37 | 93.89 | 2342.38 | 100 | 2342.49 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -32.61 | .025 | 1 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -32.61 | 1 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch  RS: 400

INPUT
Description: Sta 4+00
Station Elevation Data  num=  67

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2339.62 | -95.68 | 2339.56 | -94.09 | 2339.55 | -92.34 | 2339.53 | -87.42 | 2339.51 |
| -75.68 | 2339.49 | -68.83 | 2339.14 | -66.34 | 2339.12 | -63.29 | 2339.08 | -49.91 | 2338.23 |
| -49.66 | 2338.22 | -49.53 | 2338.22 | -49.4 | 2338.21 | -49.27 | 2338.21 | -49.13 | 2338.2 |
| -48.88 | 2338.19 | -46.31 | 2338 | -45.64 | 2337.78 | -40.96 | 2336.45 | -39.4 | 2335.25 |
| -39.23 | 2335.25 | -37.09 | 2335.25 | -33.29 | 2335.25 | -32.6 | 2336.49 | -32.03 | 2336.83 |
| -31.02 | 2337.43 | -30.05 | 2338 | -10.39 | 2338.45 | 0 | 2338.69 | 15.77 | 2339.05 |
| 28.22 | 2339.07 | 28.77 | 2339.02 | 29.02 | 2339.01 | 29.59 | 2339 | 30.11 | 2338.99 |
| 30.42 | 2338.99 | 30.77 | 2338.99 | 31.16 | 2338.99 | 32 | 2338.99 | 33.77 | 2339 |
| 46.85 | 2339.37 | 47.46 | 2339.37 | 47.76 | 2339.38 | 54.97 | 2339.58 | 55.19 | 2339.58 |
| 55.41 | 2339.59 | 57.54 | 2339.64 | 61.13 | 2339.73 | 61.27 | 2339.73 | 73.09 | 2340 |
| 82.48 | 2340.18 | 83.81 | 2340.19 | 85.42 | 2340.22 | 86.48 | 2340.23 | 87.27 | 2340.24 |
| 88 | 2340.26 | 88.66 | 2340.28 | 89.25 | 2340.29 | 93.65 | 2340.46 | 94.07 | 2340.47 |
| 94.51 | 2340.48 | 94.99 | 2340.5 | 95.51 | 2340.51 | 96.08 | 2340.52 | 96.7 | 2340.53 |
| 97.35 | 2340.53 | 100 | 2340.56 | | | | | | |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -66.34 | .025 | 15.77 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -66.34 | 15.77 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch  RS: 300

INPUT
Description: Sta 3+00
Station Elevation Data  num=  60

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2338.31 | -98.88 | 2338.29 | -98.13 | 2338.27 | -97.35 | 2338.26 | -96.63 | 2338.25 |
| -94.58 | 2338.22 | -93.93 | 2338.21 | -93.26 | 2338.2 | -91.65 | 2338.18 | -91.03 | 2338.17 |
| -90.33 | 2338.17 | -89.63 | 2338.16 | -80.24 | 2338.14 | -65.09 | 2338.09 | -54.22 | 2338.05 |
| -51.67 | 2338.04 | -50.82 | 2338.03 | -49.97 | 2338.03 | -49.12 | 2338.01 | -48.23 | 2338 |
| -48.19 | 2338 | -48.11 | 2337.98 | -38.56 | 2334.49 | -38.14 | 2334.49 | -38.1 | 2334.49 |
| -35.69 | 2336.26 | -19.61 | 2338 | -19.1 | 2338 | -19.05 | 2338 | -13.94 | 2337.16 |
| -13.86 | 2337.15 | -4 | 2334.49 | -.34 | 2334.49 | 0 | 2336.05 | .87 | 2336.18 |
| 12.88 | 2338 | 14.73 | 2338.04 | 24.99 | 2338.29 | 34.41 | 2338.52 | 38.94 | 2338.63 |
| 41.16 | 2338.68 | 42.63 | 2338.71 | 43.48 | 2338.72 | 44.21 | 2338.73 | 45.15 | 2338.74 |
| 45.63 | 2338.75 | 46.11 | 2338.75 | 46.59 | 2338.76 | 46.96 | 2338.76 | 47.33 | 2338.76 |
| 47.77 | 2338.76 | 48.21 | 2338.77 | 57.3 | 2338.79 | 65.13 | 2338.82 | 74.13 | 2338.84 |
| 82.78 | 2338.88 | 85.9 | 2338.89 | 94.13 | 2338.92 | 97.16 | 2338.93 | 100 | 2338.93 |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -65.09 | .025 | 24.99 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -65.09 | 24.99 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch  RS: 200

INPUT
Description: Sta 2+00
Station Elevation Data  num=  73

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2337.29 | -99.53 | 2337.28 | -96.99 | 2337.23 | -88.76 | 2337.05 | -87.56 | 2337.02 |
| -85.34 | 2336.97 | -71.97 | 2336.68 | -65.21 | 2336.51 | -52.72 | 2336.27 | -40.45 | 2336 |
| -34.26 | 2336 | -34.1 | 2336 | -31.44 | 2336 | -20.8 | 2336 | -19.59 | 2336.14 |
| -19.47 | 2336.17 | 0 | 2336.09 | 2.36 | 2336.08 | 2.56 | 2336 | 2.82 | 2335.38 |
| 2.91 | 2335.13 | 2.97 | 2334.91 | 3.21 | 2333.74 | 4.95 | 2333.74 | 4.96 | 2334.85 |
| 5.09 | 2334.87 | 6.93 | 2335.05 | 8.66 | 2335.23 | 11.18 | 2335.5 | 15.64 | 2336 |
| 17.63 | 2336.09 | 18.56 | 2336.1 | 34.04 | 2336.67 | 36.36 | 2336.69 | 37.44 | 2336.73 |
| 44.75 | 2336.8 | 46.52 | 2336.85 | 53.25 | 2337.09 | 58.55 | 2337.28 | 59.58 | 2337.32 |
| 62.17 | 2337.43 | 64.4 | 2337.52 | 65.68 | 2337.57 | 65.94 | 2337.58 | 66.69 | 2337.6 |
| 68.05 | 2337.63 | 70.23 | 2337.67 | 71.28 | 2337.69 | 71.41 | 2337.69 | 71.47 | 2337.7 |
| 71.52 | 2337.7 | 71.57 | 2337.7 | 71.62 | 2337.7 | 71.67 | 2337.7 | 71.72 | 2337.7 |

```
   71.77  2337.7   72.37 2337.68   73.05 2337.67   73.16 2337.66   73.38 2337.65
   74.17 2337.62   75.01  2337.6   75.17  2337.6   75.27  2337.6   75.38  2337.6
   75.77 2337.59   77.97 2337.58   80.79 2337.57    81.9 2337.57   86.26 2337.58
   87.76 2337.58   97.93 2337.59     100  2337.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -71.97    .025   53.25    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -71.97   53.25              100     100     100             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-West Branch   RS: 100

INPUT
Description: Sta 1+00
Station Elevation Data    num=      89
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -100 2335.56   -98.94 2335.54   -98.48 2335.53   -98.25 2335.53    -88.2 2335.31
  -87.91 2335.31   -87.59  2335.3   -87.27  2335.3   -86.65  2335.3   -82.01 2335.28
  -81.18 2335.28   -80.98 2335.28   -80.86 2335.28   -80.84 2335.28   -76.51 2335.22
  -66.52 2334.95   -62.31 2334.84   -57.07  2334.7      -56 2334.68   -54.91 2334.65
  -46.49 2334.48   -40.72 2334.34   -39.75 2334.32   -36.11 2334.24   -35.35 2334.23
   -33.5 2334.19   -31.98 2334.16   -30.86 2334.14   -29.98 2334.12   -29.43 2334.11
  -28.11 2334.12    -28.1 2334.12   -27.82 2334.15   -27.51 2334.18   -27.09 2334.23
  -27.01 2334.24   -26.97 2334.24   -26.64 2334.23    -26.6 2334.23   -26.17 2334.22
  -25.67 2334.21   -20.05 2334.16   -19.47 2334.15   -18.93 2334.14   -18.46 2334.13
  -18.08 2334.11      -18  2334.1   -17.66 2334.07   -17.37 2334.04   -17.08    2334
  -16.74 2333.95   -16.03 2333.83   -13.68 2333.39   -10.68 2332.98    -7.79 2333.41
   -7.77 2333.52    -6.65    2334    -3.62 2334.91       0 2335.99     .03    2336
     .04    2336     6.66 2336.14    17.37 2336.34    22.53 2336.44    23.18 2336.45
   23.46 2336.46    23.72 2336.46    23.97 2336.46    24.21 2336.46    24.48 2336.46
   24.74 2336.46    24.98 2336.46    27.94 2336.39    31.33  2336.3    31.85 2336.28
   32.98 2336.21    36.94 2336.09    39.98    2336    42.44 2335.96     43.9 2335.94
   44.64 2335.93    45.41 2335.92    47.75 2335.91    59.33 2335.84    72.21 2335.77
   76.77 2335.75    82.98 2335.75    83.24 2335.75     100 2335.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -81.18    .025       0    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -81.18       0              100     100     100             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-East Branch   RS: 500

INPUT
Description: Sta 5+00
Station Elevation Data    num=      43
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -100 2340.15   -93.09 2340.19   -66.91    2340   -66.49    2340    -59.4    2340
  -58.98    2340   -58.46    2340    -53.6    2340   -52.56    2340   -51.71    2340
  -36.97    2340   -34.07    2340   -33.26    2340    -32.8    2340   -32.62    2340
  -32.49    2340   -32.48    2340   -32.47    2340   -30.31 2339.42   -24.46    2338
  -23.48 2337.75   -16.87    2335    -9.98    2335    -9.29    2335    -2.87    2335
   -1.88    2335    -1.75    2335    -1.39    2335       0    2335     .36    2335
     .83    2335     9.71    2335   18.07 2335.77     19.1    2336    22.84  2336.4
    39.4    2338    53.81 2338.76    75.52    2340     86.1 2340.34    86.32 2340.35
   91.62 2340.51    94.38 2340.59     100 2340.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -32.49    .025   22.84    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -32.49   22.84              100     100     100             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-East Branch   RS: 400
```

INPUT
Description: Sta 4+00
Station Elevation Data num= 87

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2338.78 | -99.23 | 2338.77 | -96.53 | 2338.72 | -95.79 | 2338.7 | -91.37 | 2338.64 |
| -88.83 | 2338.6 | -88.44 | 2338.59 | -88.26 | 2338.59 | -88.08 | 2338.59 | -87.91 | 2338.59 |
| -87.74 | 2338.59 | -87.58 | 2338.59 | -87.42 | 2338.59 | -86.95 | 2338.59 | -85.22 | 2338.61 |
| -82.16 | 2338.65 | -78.95 | 2338.69 | -75.29 | 2338.73 | -70.71 | 2338.77 | -69.66 | 2338.78 |
| -67.7 | 2338.81 | -62.87 | 2338.88 | -61.36 | 2338.9 | -53.96 | 2338.83 | -53.17 | 2338.84 |
| -44.92 | 2338.74 | -43.98 | 2338.74 | -43.06 | 2338.74 | -37.35 | 2338.73 | -36 | 2338.73 |
| -35.58 | 2338.72 | -35.19 | 2338.72 | -34.84 | 2338.72 | -34.6 | 2338.71 | -34.33 | 2338.7 |
| -34.09 | 2338.69 | -33.65 | 2338.67 | -32.07 | 2338.57 | -26.39 | 2338.16 | -24.14 | 2338 |
| -21.06 | 2337.22 | -15.99 | 2336 | -12.94 | 2335.3 | -7.8 | 2334.39 | -6.72 | 2334.39 |
| -5.85 | 2334.39 | -5.52 | 2334.39 | -5.17 | 2334.39 | -4.77 | 2334.39 | -4.42 | 2334.39 |
| -3.9 | 2334.39 | -3.66 | 2334.39 | -3.45 | 2334.39 | -3.19 | 2334.39 | -2.98 | 2334.39 |
| -2.89 | 2334.39 | -2.76 | 2334.39 | 0 | 2334.39 | 2.6 | 2334.39 | 2.63 | 2334.39 |
| 3.14 | 2334.39 | 3.55 | 2334.39 | 3.67 | 2334.39 | 4.34 | 2334.39 | 4.93 | 2334.39 |
| 5.62 | 2334.39 | 6.96 | 2334.39 | 8.87 | 2334.39 | 9.64 | 2334.39 | 16.68 | 2334.89 |
| 25.61 | 2336 | 38.51 | 2337.13 | 40.4 | 2337.29 | 42.94 | 2337.49 | 45.81 | 2337.72 |
| 49.31 | 2338 | 49.34 | 2338 | 49.35 | 2338 | 50.16 | 2338 | 50.51 | 2338 |
| 56.56 | 2338 | 57.15 | 2338 | 61.83 | 2338 | 70.04 | 2338.32 | 83.06 | 2338.5 |
| 89.95 | 2338.59 | 100 | 2338.7 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -35.58 | .025 | 49.31 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -35.58 | 49.31 | 100 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 300

INPUT
Description: Sta 3+00
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2337.31 | -87.79 | 2337.11 | -86.05 | 2337.09 | -80.19 | 2337.02 | -77.34 | 2336.99 |
| -75.98 | 2336.97 | -62.13 | 2336.78 | -49.96 | 2336.6 | -48.16 | 2336.57 | -47.25 | 2336.55 |
| -46.34 | 2336.54 | -45.44 | 2336.52 | -43.53 | 2336.48 | -24.97 | 2336.05 | -24.76 | 2336.05 |
| -22.72 | 2336 | -21.15 | 2335.76 | -9.58 | 2334 | -9.47 | 2333.98 | -8.92 | 2333.87 |
| -8.23 | 2333.77 | -7.68 | 2333.77 | -7.44 | 2333.77 | -7.12 | 2333.77 | 0 | 2333.77 |
| 6.91 | 2333.77 | 6.98 | 2333.77 | 12.16 | 2334.2 | 38.42 | 2335.73 | 43.09 | 2336 |
| 43.64 | 2336.02 | 43.92 | 2336.02 | 44.01 | 2336.02 | 44.06 | 2336.02 | 44.08 | 2336.02 |
| 44.1 | 2336.02 | 44.12 | 2336.02 | 44.17 | 2336.03 | 44.72 | 2336.04 | 89.78 | 2337.02 |
| 98.75 | 2337.19 | 100 | 2337.21 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -43.53 | .025 | 89.78 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -43.53 | 89.78 | 100 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 200

INPUT
Description: Sta 2+00
Station Elevation Data num= 46

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2335.72 | -96.75 | 2335.69 | -96.63 | 2335.69 | -91.69 | 2335.64 | -91.41 | 2335.64 |
| -90.13 | 2335.64 | -89.82 | 2335.63 | -86.48 | 2335.61 | -85.33 | 2335.6 | -84.97 | 2335.59 |
| -84.8 | 2335.59 | -84.65 | 2335.59 | -84.52 | 2335.59 | -84.4 | 2335.59 | -83.82 | 2335.6 |
| -83.74 | 2335.6 | -83.66 | 2335.6 | -83.59 | 2335.6 | -83.52 | 2335.6 | -83.43 | 2335.6 |
| -83.34 | 2335.6 | -80.92 | 2335.52 | -80.23 | 2335.5 | -79.88 | 2335.49 | -79.65 | 2335.49 |
| -76.71 | 2335.43 | -73.74 | 2335.36 | -65.36 | 2335.16 | -62.81 | 2335.12 | -56.42 | 2334.97 |
| -32.81 | 2334.4 | -26.96 | 2334.29 | -23.94 | 2334.23 | -16.19 | 2333.16 | -1.54 | 2333.16 |
| 0 | 2333.16 | 4.78 | 2333.16 | 50.48 | 2335.58 | 61.98 | 2336 | 83.91 | 2336.6 |
| 98.58 | 2337.01 | 98.97 | 2337.01 | 99.36 | 2337.01 | 99.69 | 2337.01 | 99.97 | 2337.01 |
| 100 | 2337.01 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -83.43 | .025 | 61.98 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -83.43 | 61.98 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 100

INPUT
Description: Sta 1+00
Station Elevation Data num= 93

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2334.07 | -95.58 | 2334.02 | -95.47 | 2334.02 | -93.45 | 2334 | -82.01 | 2333.91 |
| -81.24 | 2333.91 | -80.38 | 2333.9 | -80.14 | 2333.89 | -79.95 | 2333.89 | -79.76 | 2333.89 |
| -79.63 | 2333.89 | -79.57 | 2333.89 | -79.52 | 2333.89 | -79.47 | 2333.88 | -79.43 | 2333.88 |
| -79.4 | 2333.88 | -79.26 | 2333.88 | -79.15 | 2333.88 | -79.05 | 2333.87 | -78.88 | 2333.87 |
| -77.3 | 2333.83 | -74.51 | 2333.77 | -70.88 | 2333.69 | -44.16 | 2333.29 | -43.81 | 2333.28 |
| -29.37 | 2333.05 | -28.01 | 2333.03 | -27.39 | 2333.03 | -26.81 | 2333.02 | -26.3 | 2333.01 |
| -25.38 | 2333.01 | -21.63 | 2332.99 | -20.69 | 2332.99 | -20.48 | 2332.98 | -11.21 | 2332.87 |
| -8.72 | 2332.85 | -8 | 2332.84 | -7.67 | 2332.84 | -7.38 | 2332.84 | -7.13 | 2332.84 |
| -6.91 | 2332.84 | -5.7 | 2332.88 | -5.53 | 2332.88 | -5.36 | 2332.89 | -5.27 | 2332.88 |
| -5.12 | 2332.88 | -4.98 | 2332.88 | -4.82 | 2332.87 | -4.67 | 2332.87 | -2.15 | 2332.69 |
| -1.68 | 2332.66 | -1.45 | 2332.65 | -1.29 | 2332.64 | 0 | 2332.6 | .5 | 2332.59 |
| 1.59 | 2332.54 | 7.55 | 2332.56 | 7.96 | 2332.67 | 8.84 | 2332.78 | 10.61 | 2332.97 |
| 14.7 | 2333.33 | 20.33 | 2333.82 | 22.43 | 2334 | 43.29 | 2334.5 | 43.61 | 2334.51 |
| 57.66 | 2334.84 | 58.83 | 2334.87 | 59.81 | 2334.89 | 60.28 | 2334.89 | 60.76 | 2334.9 |
| 62.7 | 2334.93 | 69.67 | 2335 | 70.1 | 2335.01 | 71 | 2335.02 | 71.77 | 2335.03 |
| 72.14 | 2335.04 | 78.74 | 2335.12 | 79.1 | 2335.12 | 79.49 | 2335.13 | 79.85 | 2335.14 |
| 80.54 | 2335.16 | 84.68 | 2335.29 | 85.28 | 2335.31 | 85.42 | 2335.31 | 85.5 | 2335.32 |
| 85.51 | 2335.32 | 88.06 | 2335.35 | 91.96 | 2335.34 | 93.1 | 2335.33 | 94.27 | 2335.33 |
| 94.48 | 2335.33 | 94.68 | 2335.33 | 100 | 2335.39 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -80.38 | .025 | 57.66 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -80.38 | 57.66 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 12300

INPUT
Description: Sta 123+00.00
Station Elevation Data num= 114

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2336.4 | -299.21 | 2336.41 | -297.86 | 2336.42 | -297.09 | 2336.43 | -296.65 | 2336.43 |
| -296.21 | 2336.43 | -295.73 | 2336.43 | -295.23 | 2336.43 | -294.7 | 2336.43 | -294.16 | 2336.43 |
| -293.6 | 2336.43 | -293.02 | 2336.43 | -292.37 | 2336.43 | -291.02 | 2336.42 | -279.46 | 2336.35 |
| -278.03 | 2336.34 | -277.36 | 2336.34 | -276.71 | 2336.33 | -276.11 | 2336.33 | -275.53 | 2336.32 |
| -273.93 | 2336.3 | -268.02 | 2336.21 | -266.75 | 2336.2 | -264.53 | 2336.17 | -256.15 | 2336.09 |
| -252.84 | 2336.05 | -248.94 | 2336 | -227.74 | 2335.58 | -220.28 | 2335.46 | -212 | 2335.3 |
| -200.11 | 2335.11 | -196.67 | 2335.05 | -195.41 | 2335.03 | -192.64 | 2334.98 | -146.49 | 2334.11 |
| -143.57 | 2334.06 | -140.47 | 2334 | -57.65 | 2332.79 | -23.89 | 2332.29 | -4.53 | 2332 |
| 0 | 2332 | 2.81 | 2332 | 9.11 | 2332 | 10.76 | 2332.49 | 15.64 | 2334 |
| 20.44 | 2334.25 | 21.55 | 2334.24 | 31.16 | 2334.62 | 37.48 | 2334.86 | 38.25 | 2334.89 |
| 38.78 | 2334.9 | 39.06 | 2334.91 | 39.25 | 2334.91 | 39.43 | 2334.92 | 39.8 | 2334.92 |
| 40.18 | 2334.93 | 40.58 | 2334.93 | 47.36 | 2334.97 | 54.95 | 2335 | 55.98 | 2335.01 |
| 57.03 | 2335 | 57.45 | 2335.01 | 60.54 | 2334.98 | 65.79 | 2334.95 | 66.14 | 2334.96 |
| 70.55 | 2334.94 | 71.24 | 2334.93 | 71.59 | 2334.93 | 71.96 | 2334.94 | 73.1 | 2334.94 |
| 79.29 | 2334.98 | 87.4 | 2335.03 | 90.65 | 2335.05 | 95.45 | 2335.1 | 96.65 | 2335.12 |
| 116.1 | 2335.33 | 122.08 | 2335.4 | 126.76 | 2335.45 | 132.59 | 2335.52 | 135.81 | 2335.56 |
| 136.59 | 2335.57 | 136.97 | 2335.57 | 139.99 | 2335.59 | 144.09 | 2335.62 | 147.57 | 2335.64 |
| 160.88 | 2335.74 | 163.65 | 2335.75 | 174.53 | 2335.82 | 175.63 | 2335.82 | 177.08 | 2335.83 |
| 178.31 | 2335.84 | 190.55 | 2335.86 | 203.6 | 2335.9 | 204.31 | 2335.91 | 204.64 | 2335.91 |
| 204.78 | 2335.91 | 205.47 | 2335.91 | 218.3 | 2335.93 | 218.49 | 2335.93 | 220.8 | 2335.93 |
| 220.85 | 2335.93 | 233.37 | 2335.95 | 233.41 | 2335.95 | 242.8 | 2335.96 | 243.03 | 2335.96 |
| 253.06 | 2335.96 | 267.02 | 2335.96 | 281.95 | 2335.97 | 295.64 | 2335.98 | 297.3 | 2335.99 |
| 298.14 | 2335.99 | 299.01 | 2335.99 | 299.89 | 2336 | 300 | 2336 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -192.64 | .025 | 47.36 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -192.64 | 47.36 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 12000

INPUT
Description: Sta 120+00.00
Station Elevation Data num= 228

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2332 | -299.51 | 2332 | -286.58 | 2331.87 | -285.72 | 2331.86 | -285.48 | 2331.86 |
| -285.35 | 2331.86 | -284.87 | 2331.85 | -270.94 | 2331.74 | -268.91 | 2331.7 | -259.54 | 2331.62 |
| -258.23 | 2331.61 | -251.23 | 2331.6 | -250.74 | 2331.59 | -240.75 | 2331.57 | -240.39 | 2331.56 |
| -235.51 | 2331.55 | -234.45 | 2331.54 | -233.24 | 2331.53 | -229.58 | 2331.49 | -229.15 | 2331.48 |
| -228.72 | 2331.47 | -223.69 | 2331.36 | -222.42 | 2331.34 | -211.73 | 2331.19 | -211.06 | 2331.18 |
| -206.05 | 2331.12 | -205.02 | 2331.11 | -203.99 | 2331.1 | -197.69 | 2331.03 | -197.03 | 2331.03 |
| -196.71 | 2331.03 | -195.9 | 2331.02 | -195.59 | 2331.01 | -195.07 | 2331.01 | -194.73 | 2331.01 |
| -194.54 | 2331 | -194.2 | 2331 | -193.88 | 2331 | -193.56 | 2331 | -192.93 | 2330.98 |
| -191.71 | 2331 | -187.51 | 2330.86 | -181.41 | 2330.96 | -176.55 | 2330.84 | -175.46 | 2330.86 |
| -171.47 | 2330.97 | -168.31 | 2331.08 | -165.92 | 2331.16 | -165.58 | 2331.17 | -164.97 | 2331.17 |
| -161 | 2331.21 | -157.67 | 2331.24 | -157.22 | 2331.25 | -156.77 | 2331.25 | -156.55 | 2331.25 |
| -156.33 | 2331.25 | -156.14 | 2331.25 | -155.95 | 2331.24 | -155.8 | 2331.24 | -155.66 | 2331.24 |
| -155.54 | 2331.24 | -155.04 | 2331.22 | -154.7 | 2331.21 | -154.26 | 2331.21 | -152.12 | 2331.17 |
| -147.4 | 2331.09 | -144.82 | 2331.05 | -144 | 2331.04 | -142.68 | 2331.02 | -132.72 | 2330.9 |
| -130.31 | 2330.87 | -117.64 | 2330.72 | -107.93 | 2330.6 | -98.57 | 2330.48 | -74.21 | 2330.17 |
| -73.93 | 2330.17 | -60.39 | 2330 | -58.82 | 2329.97 | -58.81 | 2329.97 | -45.76 | 2329.68 |
| -38.07 | 2329.51 | -29.77 | 2329.33 | -23.98 | 2329.21 | -18.6 | 2329.1 | -16.02 | 2329.04 |
| -12.84 | 2328.98 | -8.99 | 2328.9 | -8.39 | 2328.9 | -8.18 | 2328.89 | -7.96 | 2328.89 |
| -7.74 | 2328.89 | -7.5 | 2328.89 | -7.26 | 2328.89 | -7 | 2328.89 | -6.47 | 2328.9 |
| -3.33 | 2328.93 | 0 | 2328.97 | .06 | 2328.97 | 5.08 | 2329.03 | 5.67 | 2329.03 |
| 6.03 | 2329.04 | 6.55 | 2329.05 | 10.94 | 2329.15 | 16.63 | 2329.29 | 19.27 | 2329.35 |
| 28.74 | 2329.54 | 30.35 | 2329.58 | 32.93 | 2329.64 | 43.97 | 2329.95 | 45.69 | 2330 |
| 53.14 | 2330.26 | 53.54 | 2330.27 | 54.46 | 2330.3 | 76.07 | 2330.92 | 103.19 | 2331.74 |
| 113.8 | 2332 | 133.3 | 2332.24 | 178.8 | 2332.79 | 183.34 | 2332.84 | 185.57 | 2332.87 |
| 187.8 | 2332.89 | 190.06 | 2332.92 | 194.54 | 2332.96 | 220.03 | 2333.23 | 222.45 | 2333.26 |
| 223.59 | 2333.27 | 224.68 | 2333.28 | 225.74 | 2333.29 | 227.74 | 2333.31 | 241.97 | 2333.44 |
| 244.9 | 2333.46 | 245.37 | 2333.47 | 245.77 | 2333.47 | 246.08 | 2333.47 | 246.28 | 2333.48 |
| 246.35 | 2333.48 | 253.22 | 2333.6 | 256.56 | 2333.64 | 260.96 | 2333.69 | 263.81 | 2333.72 |
| 264.12 | 2333.72 | 264.46 | 2333.73 | 264.93 | 2333.73 | 272.91 | 2333.77 | 273.1 | 2333.77 |
| 275.29 | 2333.78 | 275.85 | 2333.78 | 276.06 | 2333.78 | 276.15 | 2333.78 | 276.23 | 2333.78 |
| 276.3 | 2333.78 | 276.37 | 2333.78 | 276.48 | 2333.78 | 277.18 | 2333.77 | 277.7 | 2333.77 |
| 277.74 | 2333.77 | 277.79 | 2333.77 | 277.83 | 2333.76 | 277.88 | 2333.77 | 277.93 | 2333.77 |
| 277.96 | 2333.77 | 277.99 | 2333.77 | 278.03 | 2333.77 | 278.08 | 2333.77 | 278.52 | 2333.78 |
| 278.69 | 2333.78 | 278.81 | 2333.78 | 278.88 | 2333.78 | 278.95 | 2333.78 | 279.02 | 2333.79 |
| 279.08 | 2333.79 | 279.15 | 2333.79 | 279.68 | 2333.79 | 281.06 | 2333.8 | 282.69 | 2333.8 |
| 284.12 | 2333.81 | 284.53 | 2333.81 | 284.74 | 2333.81 | 285 | 2333.81 | 285.06 | 2333.81 |
| 285.12 | 2333.81 | 285.18 | 2333.81 | 285.24 | 2333.81 | 285.29 | 2333.81 | 285.35 | 2333.81 |
| 285.59 | 2333.81 | 285.65 | 2333.81 | 285.71 | 2333.81 | 285.77 | 2333.81 | 285.9 | 2333.81 |
| 286.17 | 2333.81 | 286.36 | 2333.81 | 286.42 | 2333.81 | 286.48 | 2333.81 | 286.53 | 2333.81 |
| 286.57 | 2333.81 | 286.61 | 2333.81 | 286.64 | 2333.81 | 286.66 | 2333.81 | 286.82 | 2333.8 |
| 286.86 | 2333.8 | 287.32 | 2333.79 | 287.82 | 2333.77 | 287.84 | 2333.77 | 287.86 | 2333.77 |
| 287.88 | 2333.77 | 287.9 | 2333.77 | 287.91 | 2333.77 | 287.94 | 2333.77 | 288.19 | 2333.79 |
| 288.35 | 2333.81 | 289.9 | 2333.82 | 290.39 | 2333.8 | 290.7 | 2333.79 | 291.16 | 2333.77 |
| 291.61 | 2333.75 | 292.08 | 2333.73 | 292.96 | 2333.7 | 293.46 | 2333.69 | 293.67 | 2333.69 |
| 293.72 | 2333.69 | 293.77 | 2333.69 | 293.81 | 2333.69 | 294.04 | 2333.69 | 294.31 | 2333.69 |
| 294.62 | 2333.69 | 294.91 | 2333.69 | 300 | 2333.83 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -157.22 | .025 | 113.8 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -157.22 | 113.8 | 330 | 300 | 260 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 11700

INPUT
Description: Sta 117+00.00
Station Elevation Data num= 213

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -430 | 2328.79 | -426.19 | 2328.74 | -421.06 | 2328.66 | -418.02 | 2328.63 | -414.48 | 2328.58 |
| -406.13 | 2328.51 | -402.65 | 2328.45 | -388.04 | 2328.35 | -385.9 | 2328.32 | -377.61 | 2328.27 |
| -377.17 | 2328.26 | -365.24 | 2328.2 | -365.05 | 2328.2 | -363.8 | 2328.18 | -363.59 | 2328.18 |
| -363.52 | 2328.17 | -363.45 | 2328.17 | -363.38 | 2328.17 | -363.31 | 2328.17 | -363.16 | 2328.17 |
| -361.93 | 2328.17 | -361.66 | 2328.16 | -357 | 2328.14 | -355.94 | 2328.14 | -344.28 | 2328.08 |
| -336.81 | 2328.05 | -336.5 | 2328.04 | -328.27 | 2328.01 | -328.2 | 2328.01 | -325.46 | 2328 |

```
-314.46 2327.97  -314.2 2327.97 -314.12 2327.97 -312.67 2327.96 -312.36 2327.96
-301.66 2327.88 -288.61 2327.81 -287.29  2327.8 -286.63  2327.8 -285.97  2327.8
 -285.3  2327.8 -281.26 2327.81 -277.77  2327.8  -265.2  2327.8 -263.85 2327.79
-256.27 2327.79 -253.56  2327.8 -245.73 2327.81 -244.87 2327.81 -234.78 2327.84
-233.62 2327.84 -232.58 2327.84 -232.48 2327.84 -232.43 2327.84 -232.36 2327.84
-231.94 2327.83 -231.47 2327.83 -226.59 2327.84 -225.91 2327.84 -225.73 2327.83
 -225.2 2327.83 -225.08 2327.83 -223.67 2327.83 -223.61 2327.83 -222.96 2327.83
-222.83 2327.83 -212.91  2327.8 -212.34  2327.8 -210.76 2327.79 -210.59 2327.79
-210.48 2327.79 -210.31 2327.79 -208.62 2327.77 -197.58 2327.74 -197.16 2327.74
-197.05 2327.74  -194.9 2327.73 -187.52 2327.68 -186.25 2327.67 -185.58 2327.67
-184.27 2327.67 -181.01 2327.67 -175.13 2327.68  -172.5 2327.68 -172.38 2327.68
-172.14 2327.68 -159.63 2327.68 -157.69 2327.68  -156.2 2327.68 -145.23 2327.69
-143.51 2327.68 -133.92 2327.68 -132.59 2327.68 -131.34 2327.67 -130.97 2327.67
-130.33 2327.67 -129.84 2327.67 -128.56 2327.66 -126.37 2327.67 -120.53 2327.63
-111.91 2327.57 -110.62 2327.57 -107.78 2327.58 -106.69 2327.58 -106.37 2327.58
-105.36 2327.58 -102.36 2327.57 -100.15 2327.57  -99.58 2327.56  -99.24 2327.56
 -98.73 2327.56  -98.22 2327.55  -97.85 2327.55  -97.48 2327.54   -95.9 2327.52
 -91.85 2327.46  -89.99 2327.43  -83.98 2327.35  -83.38 2327.34  -83.09 2327.34
 -82.79 2327.33  -82.49 2327.32  -81.91 2327.31  -76.62 2327.18  -67.56 2326.97
 -58.22 2326.74  -51.77 2326.67  -38.63 2326.31  -38.17  2326.3  -27.48    2326
 -26.57 2325.96  -24.67 2325.86  -22.96 2325.79  -20.15  2325.7  -17.35 2325.62
 -13.69 2325.54   -13.3 2325.53   -13.1 2325.53  -12.89 2325.53  -12.67 2325.53
 -12.42 2325.53  -12.15 2325.53  -11.88 2325.53   -11.6 2325.53  -11.33 2325.53
 -10.39 2325.54   -7.53 2325.58   -3.46 2325.65    -.2 2325.74    4.03 2325.83
   7.95 2325.93   11.07    2326   11.08    2326   16.8 2326.19   23.15  2326.4
  28.52 2326.56   29.07 2326.57   30.59 2326.55  30.71 2326.53   31.86 2326.43
  35.29 2326.16   36.73 2326.05   37.58    2326  54.57    2326   96.15    2326
 127.59 2327.68   133.3    2328  157.06 2328.65 165.46 2328.88  206.05    2330
 207.01 2330.08  209.56 2330.29   212.3 2330.46 214.82 2330.57  215.61  2330.6
 215.78  2330.6  215.95  2330.6  216.12  2330.6 216.31  2330.6  216.49  2330.6
 216.67  2330.6  216.95 2330.59  217.35 2330.58 220.13 2330.48  223.28 2330.32
  225.5 2330.17  227.46    2330  228.11 2329.97 231.88 2329.78  233.34 2329.71
 233.54 2329.71  233.76 2329.71     234  2329.7 234.28  2329.7  234.59 2329.71
 234.92 2329.71  235.26 2329.71  236.75 2329.74 244.85 2329.87  252.18 2329.97
 254.74    2330  260.75 2330.06  271.86 2330.17 276.13 2330.22  284.59 2330.28
 285.75 2330.29  286.33 2330.29   286.9 2330.29 287.45 2330.29  287.99 2330.29
 288.54 2330.29   298.6 2330.24     300 2330.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -430    .025  -91.85    .025  127.59    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -91.85  127.59               120     160     220            .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 11540

INPUT
Description: Sta 115+40
Station Elevation Data    num=     429
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2326.99 -294.22 2327.02 -294.04 2327.02 -293.97 2327.02 -293.77 2327.02
 -287.34 2327.05 -286.81 2327.05 -280.64 2327.08 -277.18  2327.1 -269.36 2327.13
  -268.6 2327.14 -268.24 2327.14 -267.75 2327.14 -264.85 2327.13 -261.65 2327.13
 -261.15 2327.14 -256.42 2327.14 -255.35 2327.14 -255.21 2327.14 -252.68 2327.14
 -251.77 2327.14 -251.29 2327.14 -250.98 2327.14 -250.84 2327.14 -250.42 2327.14
 -250.36 2327.14 -249.86 2327.15 -249.51 2327.15  -248.5 2327.15 -246.34 2327.17
 -245.43 2327.17 -238.78 2327.22 -237.41 2327.23 -236.61 2327.23 -236.09 2327.23
 -235.37 2327.23 -235.31 2327.23 -227.85 2327.21 -226.72 2327.21 -225.13 2327.21
 -224.72 2327.21  -224.5 2327.21 -224.13 2327.21  -223.7 2327.21 -223.55 2327.21
 -223.48 2327.21 -223.33 2327.21 -222.95 2327.21 -222.76 2327.22 -222.23 2327.22
  -221.9 2327.22  -221.5 2327.22 -220.67 2327.22 -219.93 2327.23 -218.96 2327.23
 -218.68 2327.23  -218.6 2327.23 -217.39 2327.24 -217.07 2327.24 -215.95 2327.24
 -215.79 2327.24 -213.59 2327.27 -211.76  2327.3 -205.92 2327.36 -204.08 2327.39
 -203.52 2327.39 -201.27 2327.41 -199.74 2327.43 -199.48 2327.43 -199.36 2327.43
 -198.34 2327.44  -198.2 2327.45 -197.49 2327.45 -196.74 2327.46 -196.46 2327.47
 -195.68 2327.48 -191.38 2327.54 -190.42 2327.55 -188.89 2327.56 -186.47 2327.57
 -183.78  2327.6 -178.29 2327.66 -176.32 2327.68 -175.76 2327.69 -174.02  2327.7
 -169.19 2327.74 -165.92 2327.76 -165.11 2327.77 -164.64 2327.77 -163.93 2327.77
 -163.23 2327.77 -162.75 2327.77 -162.25 2327.77 -160.21 2327.77 -155.41 2327.75
 -153.37 2327.75 -147.43 2327.74 -146.89 2327.73 -146.63 2327.73 -146.36 2327.73
  -146.1 2327.73 -145.59 2327.72 -141.27 2327.67 -134.96 2327.59 -129.58 2327.52
 -129.37 2327.53 -127.79  2327.5 -126.91 2327.48 -125.76 2327.44 -124.65 2327.41
 -123.65 2327.38 -121.98 2327.36  -120.3 2327.33 -118.07 2327.31 -117.84  2327.3
 -117.72  2327.3 -117.59  2327.3 -117.45  2327.3 -117.29 2327.31 -117.13 2327.31
 -116.96 2327.31 -116.79 2327.31 -116.62 2327.31 -116.04 2327.32 -114.25 2327.35
 -111.67  2327.4 -109.56 2327.46 -109.45 2327.46  -106.8 2327.52 -104.18 2327.58
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-103.34  2327.6 -100.92 2327.68  -97.04 2327.81  -93.04 2327.94  -89.88 2328.03
 -84.83 2327.79     -78 2327.44  -77.63 2327.44  -77.22 2327.44  -77.11 2327.44
 -76.54 2327.44  -74.39 2327.35  -70.96 2327.21   -69.9 2327.16  -65.77 2326.97
 -64.11 2326.89  -62.63 2326.81  -59.63 2326.65  -53.12 2326.31  -46.85 2326.12
  -41.8 2325.98  -40.46 2325.93   -39.3  2325.9  -38.23 2325.87  -30.29 2325.66
 -29.65 2325.64  -29.31 2325.63  -27.91 2325.59  -27.46 2325.58  -25.91 2325.53
  -25.5 2325.52  -24.09 2325.47  -17.33 2325.29  -11.07 2325.13   -5.92 2325.04
 -5.74 2325.03   -5.68 2325.03   -5.62 2325.03    3.28 2324.86     3.4 2324.86
  5.35 2324.81    5.46 2324.81    6.07  2324.8    7.19 2324.77   14.96 2324.59
 19.08 2324.49   19.33 2324.48   19.54 2324.48   19.78 2324.47   19.99 2324.47
 20.47 2324.46   20.99 2324.45   22.53 2324.43   26.84 2324.37   27.61 2324.36
 27.79 2324.36   27.97 2324.35   28.13 2324.35    28.3 2324.35   28.38 2324.35
 28.46 2324.35   28.74 2324.35   30.47 2324.35   31.36 2324.35   31.61 2324.35
 31.74 2324.35   31.87 2324.35   32.03 2324.34   32.19 2324.34   32.23 2324.34
 32.51 2324.34   33.47 2324.33   33.93 2324.32   34.08 2324.32   34.23 2324.32
 34.39 2324.32    35.6 2324.31   35.74 2324.31   35.88 2324.31   36.01 2324.31
 36.14 2324.31    36.6  2324.3   36.72 2324.29   36.84 2324.29   36.94 2324.29
 37.04 2324.29   37.15 2324.29   37.25 2324.29   37.35 2324.29   38.03 2324.29
  38.4 2324.29   40.48  2324.3   40.59  2324.3   40.67  2324.3   41.06  2324.3
 41.56  2324.3   43.47 2324.31   44.45  2324.3   47.36 2324.27   52.69  2324.2
 54.61 2324.18   55.25 2324.17   59.03  2324.1   59.09  2324.1   59.43 2324.09
  59.5 2324.09   59.83 2324.08    59.9 2324.08   60.23 2324.08    60.3 2324.08
 60.36 2324.08   60.43 2324.08   60.49 2324.08   60.97 2324.06   61.09 2324.06
 61.15 2324.06    61.2 2324.06   61.26 2324.06   61.32 2324.06   61.45 2324.06
 61.57 2324.06   62.23 2324.06   62.32 2324.06   62.38 2324.06   62.48 2324.06
 63.31 2324.08   64.35  2324.1   64.48  2324.1   64.89 2324.11   65.09  2324.1
 65.22 2324.11   65.52  2324.1   65.58 2324.11    65.9 2324.11   66.23 2324.11
 66.29 2324.11   66.61 2324.11   66.94  2324.1   67.25 2324.11   67.54 2324.11
 67.79 2324.11   67.97 2324.12   68.12 2324.12   68.25 2324.13   68.35 2324.14
 68.42 2324.14   68.52 2324.16   68.63 2324.24   68.87 2324.28   68.93 2324.28
 69.01 2324.29   69.11 2324.29   69.21 2324.29   69.32  2324.3   69.43  2324.3
 69.54  2324.3    69.6  2324.3    69.7  2324.3   69.79  2324.3    69.9  2324.3
    70  2324.3   70.19 2324.29   70.95 2324.23   72.19 2324.12   72.56  2324.1
 72.72 2324.09   72.89 2324.09   73.08 2324.08   73.33 2324.07    73.6 2324.07
 74.21 2324.06   74.26 2324.06   74.32 2324.06   74.37 2324.06   74.42 2324.06
 74.47 2324.06   74.54 2324.06   74.72 2324.05   74.98 2324.03   75.29 2324.02
 75.54    2324   75.55 2323.99    78.2 2323.99   78.26 2323.99   82.65 2323.99
 82.75 2323.99   83.12 2323.99   83.96 2323.99   85.66 2323.99   86.12 2323.99
 91.98 2323.99   94.08 2323.99   95.77 2323.99   95.78    2324   95.87 2324.02
 96.28 2324.08    96.6 2324.12   96.76 2324.13   96.87 2324.14   97.13 2324.16
100.11  2324.4   101.1 2324.46  103.64 2324.57  106.37 2324.75  113.18 2325.06
113.22 2325.06  116.89 2325.11  121.66 2325.35  121.96 2325.36  122.19 2325.37
123.39 2325.42  123.81 2325.44  123.94 2325.45  124.13 2325.45  124.35 2325.46
124.77 2325.48  125.15 2325.49   125.5  2325.5  125.61  2325.5   125.9 2325.51
126.43 2325.51  127.47 2325.51  130.54 2325.49  131.57 2325.48  132.28 2325.47
133.24 2325.45  133.86 2325.45  133.88 2325.44  133.93 2325.45  133.97 2325.45
134.01 2325.45  134.06 2325.45  134.83 2325.51  136.49 2325.61  138.94 2325.76
141.51 2325.92  143.82 2326.06  156.41  2326.8  163.22 2326.94     170 2327.09
173.31 2327.15  176.65 2327.22  177.34 2327.24  180.74  2327.3  184.11 2327.37
190.55  2327.5  199.08 2327.66  217.37 2328.02  233.32 2328.32  235.15 2328.36
240.41 2328.45  241.27 2328.47  241.68 2328.48  242.06 2328.48   242.5 2328.49
242.92  2328.5  243.25  2328.5  243.68 2328.51  244.13 2328.51  245.44  2328.5
245.77 2328.49  246.12 2328.48  246.43 2328.48  246.74 2328.47  247.06 2328.47
247.74 2328.46  247.79 2328.46  250.55 2328.41  252.56 2328.38  253.25 2328.37
255.42 2328.34  256.28 2328.33  257.92 2328.35  258.65 2328.36  258.82 2328.36
258.99 2328.36  259.17 2328.36  259.82 2328.37  262.48 2328.38  264.65  2328.4
 270.5 2328.46  270.59 2328.46  270.93 2328.47  272.34  2328.5  273.37 2328.52
273.44 2328.52  274.28 2328.53  274.42 2328.53  281.11 2328.62   282.1 2328.64
288.39 2328.72  290.23 2328.73  291.17 2328.74  292.12 2328.75   293.1 2328.75
294.07 2328.75  295.05 2328.76  297.05 2328.76     300 2328.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -89.88    .015  241.27    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -89.88  241.27              60      60      60           .1        .3

CULVERT


RIVER: Duck Creek
REACH: East               RS: 11510

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      56
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
```

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|
| -170 | 2326.2 | 2325.49 | 400 | 2326 | 2325.49 |

Upstream Bridge Cross Section Data

Station Elevation Data num= 429

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2326.99 | -294.22 | 2327.02 | -294.04 | 2327.02 | -293.97 | 2327.02 | -293.77 | 2327.02 |
| -287.34 | 2327.05 | -286.81 | 2327.05 | -280.64 | 2327.08 | -277.18 | 2327.1 | -269.36 | 2327.13 |
| -268.6 | 2327.14 | -268.24 | 2327.14 | -267.75 | 2327.14 | -264.85 | 2327.13 | -261.65 | 2327.13 |
| -261.15 | 2327.14 | -256.42 | 2327.14 | -255.35 | 2327.14 | -255.21 | 2327.14 | -252.68 | 2327.14 |
| -251.77 | 2327.14 | -251.29 | 2327.14 | -250.98 | 2327.14 | -250.84 | 2327.14 | -250.42 | 2327.14 |
| -250.36 | 2327.14 | -249.86 | 2327.15 | -249.51 | 2327.15 | -248.5 | 2327.15 | -246.34 | 2327.17 |
| -245.43 | 2327.17 | -238.78 | 2327.22 | -237.41 | 2327.23 | -236.61 | 2327.23 | -236.09 | 2327.23 |
| -235.37 | 2327.23 | -235.31 | 2327.23 | -227.85 | 2327.21 | -226.72 | 2327.21 | -225.13 | 2327.21 |
| -224.72 | 2327.21 | -224.5 | 2327.21 | -224.13 | 2327.21 | -223.7 | 2327.21 | -223.55 | 2327.21 |
| -223.48 | 2327.21 | -223.33 | 2327.21 | -222.95 | 2327.21 | -222.76 | 2327.22 | -222.23 | 2327.22 |
| -221.9 | 2327.22 | -221.5 | 2327.22 | -220.67 | 2327.22 | -219.93 | 2327.23 | -218.96 | 2327.23 |
| -218.68 | 2327.23 | -218.6 | 2327.23 | -217.39 | 2327.24 | -217.07 | 2327.24 | -215.95 | 2327.24 |
| -215.79 | 2327.24 | -213.59 | 2327.27 | -211.76 | 2327.3 | -205.92 | 2327.36 | -204.08 | 2327.39 |
| -203.52 | 2327.39 | -201.27 | 2327.41 | -199.74 | 2327.43 | -199.48 | 2327.43 | -199.36 | 2327.43 |
| -198.34 | 2327.44 | -198.2 | 2327.45 | -197.49 | 2327.45 | -196.74 | 2327.46 | -196.46 | 2327.47 |
| -195.68 | 2327.48 | -191.38 | 2327.54 | -190.42 | 2327.55 | -188.89 | 2327.56 | -186.47 | 2327.57 |
| -183.78 | 2327.6 | -178.29 | 2327.66 | -176.32 | 2327.68 | -175.76 | 2327.69 | -174.02 | 2327.7 |
| -169.19 | 2327.74 | -165.92 | 2327.76 | -165.11 | 2327.77 | -164.64 | 2327.77 | -163.93 | 2327.77 |
| -163.23 | 2327.77 | -162.75 | 2327.77 | -162.25 | 2327.77 | -160.21 | 2327.77 | -155.41 | 2327.75 |
| -153.37 | 2327.75 | -147.43 | 2327.74 | -146.89 | 2327.73 | -146.63 | 2327.73 | -146.36 | 2327.73 |
| -146.1 | 2327.73 | -145.59 | 2327.72 | -141.27 | 2327.67 | -134.96 | 2327.59 | -129.58 | 2327.52 |
| -129.37 | 2327.53 | -127.79 | 2327.5 | -126.91 | 2327.48 | -125.76 | 2327.44 | -124.65 | 2327.41 |
| -123.65 | 2327.38 | -121.98 | 2327.36 | -120.3 | 2327.33 | -118.07 | 2327.31 | -117.84 | 2327.3 |
| -117.72 | 2327.3 | -117.59 | 2327.3 | -117.45 | 2327.3 | -117.29 | 2327.31 | -117.13 | 2327.31 |
| -116.96 | 2327.31 | -116.79 | 2327.31 | -116.62 | 2327.31 | -116.04 | 2327.32 | -114.25 | 2327.35 |
| -111.67 | 2327.4 | -109.56 | 2327.46 | -109.45 | 2327.46 | -106.8 | 2327.52 | -104.18 | 2327.58 |
| -103.34 | 2327.6 | -100.92 | 2327.68 | -97.04 | 2327.81 | -93.04 | 2327.94 | -89.88 | 2328.03 |
| -84.83 | 2327.79 | -78 | 2327.44 | -77.63 | 2327.44 | -77.22 | 2327.44 | -77.11 | 2327.44 |
| -76.54 | 2327.44 | -74.39 | 2327.35 | -70.96 | 2327.21 | -69.9 | 2327.16 | -65.77 | 2326.97 |
| -64.11 | 2326.89 | -62.63 | 2326.81 | -59.63 | 2326.65 | -53.12 | 2326.31 | -46.85 | 2326.12 |
| -41.8 | 2325.98 | -40.46 | 2325.93 | -39.3 | 2325.9 | -38.23 | 2325.87 | -30.29 | 2325.66 |
| -29.65 | 2325.64 | -29.31 | 2325.63 | -27.91 | 2325.59 | -27.46 | 2325.58 | -25.91 | 2325.53 |
| -25.5 | 2325.52 | -24.09 | 2325.47 | -17.33 | 2325.29 | -11.07 | 2325.13 | -5.92 | 2325.04 |
| -5.74 | 2325.03 | -5.68 | 2325.03 | -5.62 | 2325.03 | 3.28 | 2324.86 | 3.4 | 2324.86 |
| 5.35 | 2324.81 | 5.46 | 2324.81 | 6.07 | 2324.8 | 7.19 | 2324.77 | 14.96 | 2324.59 |
| 19.08 | 2324.49 | 19.33 | 2324.48 | 19.54 | 2324.48 | 19.78 | 2324.47 | 19.99 | 2324.47 |
| 20.47 | 2324.46 | 20.99 | 2324.45 | 22.53 | 2324.43 | 26.84 | 2324.37 | 27.61 | 2324.36 |
| 27.79 | 2324.36 | 27.97 | 2324.35 | 28.13 | 2324.35 | 28.3 | 2324.35 | 28.38 | 2324.35 |
| 28.46 | 2324.35 | 28.74 | 2324.35 | 30.47 | 2324.35 | 31.36 | 2324.35 | 31.61 | 2324.35 |
| 31.74 | 2324.35 | 31.87 | 2324.35 | 32.03 | 2324.34 | 32.19 | 2324.34 | 32.23 | 2324.34 |
| 32.51 | 2324.34 | 33.47 | 2324.33 | 33.93 | 2324.32 | 34.08 | 2324.32 | 34.23 | 2324.32 |
| 34.39 | 2324.32 | 35.6 | 2324.31 | 35.74 | 2324.31 | 35.88 | 2324.31 | 36.01 | 2324.31 |
| 36.14 | 2324.31 | 36.6 | 2324.3 | 36.72 | 2324.29 | 36.84 | 2324.29 | 36.94 | 2324.29 |
| 37.04 | 2324.29 | 37.15 | 2324.29 | 37.25 | 2324.29 | 37.35 | 2324.29 | 38.03 | 2324.29 |
| 38.4 | 2324.29 | 40.48 | 2324.3 | 40.59 | 2324.3 | 40.67 | 2324.3 | 41.06 | 2324.3 |
| 41.56 | 2324.3 | 43.47 | 2324.31 | 44.45 | 2324.3 | 47.36 | 2324.27 | 52.69 | 2324.2 |
| 54.61 | 2324.18 | 55.25 | 2324.17 | 59.03 | 2324.1 | 59.09 | 2324.1 | 59.43 | 2324.09 |
| 59.5 | 2324.09 | 59.83 | 2324.08 | 59.9 | 2324.08 | 60.23 | 2324.08 | 60.3 | 2324.08 |
| 60.36 | 2324.08 | 60.43 | 2324.08 | 60.49 | 2324.08 | 60.97 | 2324.06 | 61.09 | 2324.06 |
| 61.15 | 2324.06 | 61.2 | 2324.06 | 61.26 | 2324.06 | 61.32 | 2324.06 | 61.45 | 2324.06 |
| 61.57 | 2324.06 | 62.23 | 2324.06 | 62.32 | 2324.06 | 62.38 | 2324.06 | 62.48 | 2324.06 |
| 63.31 | 2324.08 | 64.35 | 2324.1 | 64.48 | 2324.1 | 64.89 | 2324.11 | 65.09 | 2324.1 |
| 65.22 | 2324.11 | 65.52 | 2324.1 | 65.58 | 2324.11 | 65.9 | 2324.11 | 66.23 | 2324.11 |
| 66.29 | 2324.11 | 66.61 | 2324.11 | 66.94 | 2324.1 | 67.25 | 2324.11 | 67.54 | 2324.11 |
| 67.79 | 2324.11 | 67.97 | 2324.12 | 68.12 | 2324.12 | 68.25 | 2324.13 | 68.35 | 2324.14 |
| 68.42 | 2324.14 | 68.52 | 2324.16 | 68.63 | 2324.24 | 68.87 | 2324.28 | 68.93 | 2324.28 |
| 69.01 | 2324.29 | 69.11 | 2324.29 | 69.21 | 2324.29 | 69.32 | 2324.3 | 69.43 | 2324.3 |
| 69.54 | 2324.3 | 69.6 | 2324.3 | 69.7 | 2324.3 | 69.79 | 2324.3 | 69.9 | 2324.3 |
| 70 | 2324.3 | 70.19 | 2324.29 | 70.95 | 2324.23 | 72.19 | 2324.12 | 72.56 | 2324.1 |
| 72.72 | 2324.09 | 72.89 | 2324.09 | 73.08 | 2324.08 | 73.33 | 2324.07 | 73.6 | 2324.07 |
| 74.21 | 2324.06 | 74.26 | 2324.06 | 74.32 | 2324.06 | 74.37 | 2324.06 | 74.42 | 2324.06 |
| 74.47 | 2324.06 | 74.54 | 2324.06 | 74.72 | 2324.05 | 74.98 | 2324.03 | 75.29 | 2324.02 |
| 75.54 | 2324 | 75.55 | 2323.99 | 78.2 | 2323.99 | 78.26 | 2323.99 | 82.65 | 2323.99 |
| 82.75 | 2323.99 | 83.12 | 2323.99 | 83.96 | 2323.99 | 85.66 | 2323.99 | 86.12 | 2323.99 |
| 91.98 | 2323.99 | 94.08 | 2323.99 | 95.77 | 2323.99 | 95.78 | 2324 | 95.87 | 2324.02 |
| 96.28 | 2324.08 | 96.6 | 2324.12 | 96.76 | 2324.13 | 96.87 | 2324.14 | 97.13 | 2324.16 |
| 100.11 | 2324.4 | 101.1 | 2324.46 | 103.64 | 2324.57 | 106.37 | 2324.75 | 113.18 | 2325.06 |
| 113.22 | 2325.06 | 116.89 | 2325.11 | 121.66 | 2325.35 | 121.96 | 2325.36 | 122.19 | 2325.37 |
| 123.39 | 2325.42 | 123.81 | 2325.44 | 123.94 | 2325.45 | 124.13 | 2325.45 | 124.35 | 2325.46 |
| 124.77 | 2325.48 | 125.15 | 2325.49 | 125.5 | 2325.5 | 125.61 | 2325.5 | 125.9 | 2325.51 |
| 126.43 | 2325.51 | 127.47 | 2325.51 | 130.54 | 2325.49 | 131.57 | 2325.48 | 132.28 | 2325.47 |
| 133.24 | 2325.45 | 133.86 | 2325.45 | 133.88 | 2325.44 | 133.93 | 2325.45 | 133.97 | 2325.45 |
| 134.01 | 2325.45 | 134.06 | 2325.45 | 134.83 | 2325.51 | 136.49 | 2325.61 | 138.94 | 2325.76 |
| 141.51 | 2325.92 | 143.82 | 2326.06 | 156.41 | 2326.8 | 163.22 | 2326.94 | 170 | 2327.09 |
| 173.31 | 2327.15 | 176.65 | 2327.22 | 177.34 | 2327.24 | 180.74 | 2327.3 | 184.11 | 2327.37 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 190.55 | 2327.5 | 199.08 | 2327.66 | 217.37 | 2328.02 | 233.32 | 2328.32 | 235.15 | 2328.36 |
| 240.41 | 2328.45 | 241.27 | 2328.47 | 241.68 | 2328.48 | 242.06 | 2328.48 | 242.5 | 2328.49 |
| 242.92 | 2328.5 | 243.25 | 2328.5 | 243.68 | 2328.51 | 244.13 | 2328.51 | 245.44 | 2328.5 |
| 245.77 | 2328.49 | 246.12 | 2328.48 | 246.43 | 2328.48 | 246.74 | 2328.47 | 247.06 | 2328.47 |
| 247.74 | 2328.46 | 247.79 | 2328.46 | 250.55 | 2328.41 | 252.56 | 2328.38 | 253.25 | 2328.37 |
| 255.42 | 2328.34 | 256.28 | 2328.33 | 257.92 | 2328.35 | 258.65 | 2328.36 | 258.82 | 2328.36 |
| 258.99 | 2328.36 | 259.17 | 2328.36 | 259.82 | 2328.37 | 262.48 | 2328.38 | 264.65 | 2328.4 |
| 270.5 | 2328.46 | 270.59 | 2328.46 | 270.93 | 2328.47 | 272.34 | 2328.5 | 273.37 | 2328.52 |
| 273.44 | 2328.52 | 274.28 | 2328.53 | 274.42 | 2328.53 | 281.11 | 2328.62 | 282.1 | 2328.64 |
| 288.39 | 2328.72 | 290.23 | 2328.73 | 291.17 | 2328.74 | 292.12 | 2328.75 | 293.1 | 2328.75 |
| 294.07 | 2328.75 | 295.05 | 2328.76 | 297.05 | 2328.76 | 300 | 2328.77 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -89.88 | .015 | 241.27 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -89.88 | 241.27 | .1 | .3 |

Downstream Deck/Roadway Coordinates

num= 2

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|
| -170 | 2326.2 | 2324.74 | 400 | 2326 | 2324.74 |

Downstream Bridge Cross Section Data

Station Elevation Data num= 332

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2327.36 | -295.46 | 2327.38 | -295.11 | 2327.38 | -290.07 | 2327.4 | -289.65 | 2327.4 |
| -284.81 | 2327.41 | -282.09 | 2327.43 | -275.96 | 2327.45 | -269.91 | 2327.45 | -269.52 | 2327.46 |
| -261.05 | 2327.46 | -260.66 | 2327.47 | -259.59 | 2327.47 | -257.9 | 2327.49 | -257.18 | 2327.49 |
| -251.97 | 2327.55 | -250.89 | 2327.55 | -250.26 | 2327.56 | -249.24 | 2327.56 | -243.39 | 2327.55 |
| -237.76 | 2327.55 | -237.17 | 2327.56 | -236.13 | 2327.56 | -235.19 | 2327.57 | -233.93 | 2327.57 |
| -232.2 | 2327.6 | -230.76 | 2327.63 | -226.18 | 2327.7 | -224.74 | 2327.73 | -224.3 | 2327.73 |
| -222.54 | 2327.75 | -221.33 | 2327.77 | -221.04 | 2327.77 | -220.23 | 2327.78 | -220.12 | 2327.79 |
| -219.57 | 2327.79 | -218.98 | 2327.8 | -218.76 | 2327.81 | -218.15 | 2327.82 | -214.78 | 2327.87 |
| -214.02 | 2327.88 | -212.82 | 2327.89 | -208.81 | 2327.93 | -204.5 | 2327.99 | -202.96 | 2328 |
| -202.52 | 2328.01 | -201.15 | 2328.02 | -197.36 | 2328.06 | -194.8 | 2328.08 | -194.16 | 2328.09 |
| -193.79 | 2328.09 | -193.24 | 2328.1 | -191.92 | 2328.1 | -190.32 | 2328.11 | -186.55 | 2328.11 |
| -184.95 | 2328.12 | -180.29 | 2328.14 | -179.87 | 2328.13 | -178.85 | 2328.13 | -175.46 | 2328.12 |
| -166.28 | 2328.07 | -166.12 | 2328.08 | -164.88 | 2328.06 | -164.19 | 2328.05 | -163.29 | 2328.04 |
| -162.42 | 2328.02 | -161.63 | 2328.01 | -159 | 2327.99 | -157.25 | 2327.99 | -157.07 | 2327.98 |
| -156.77 | 2327.98 | -156.64 | 2327.99 | -156.11 | 2327.99 | -155.66 | 2328 | -154.26 | 2328.02 |
| -152.23 | 2328.06 | -150.58 | 2328.1 | -150.49 | 2328.1 | -148.41 | 2328.15 | -146.35 | 2328.19 |
| -145.7 | 2328.2 | -143.8 | 2328.26 | -140.75 | 2328.34 | -137.61 | 2328.43 | -135.13 | 2328.49 |
| -119.24 | 2327.68 | -117.28 | 2327.68 | -114.4 | 2327.56 | -108.39 | 2327.3 | -102.86 | 2327.05 |
| -98.66 | 2326.84 | -85.93 | 2326.18 | -77.55 | 2325.93 | -68.99 | 2325.69 | -67.43 | 2325.64 |
| -66.01 | 2325.6 | -55.37 | 2325.33 | -54.06 | 2325.3 | -52.19 | 2325.24 | -51.58 | 2325.23 |
| -49.51 | 2325.17 | -48.96 | 2325.15 | -47.07 | 2325.09 | -29.65 | 2324.65 | -22.75 | 2324.53 |
| -22.51 | 2324.52 | -22.35 | 2324.52 | -10.44 | 2324.3 | -10.28 | 2324.3 | -7.67 | 2324.24 |
| -7.52 | 2324.24 | -6.71 | 2324.22 | -5.21 | 2324.19 | 5.19 | 2323.95 | 10.71 | 2323.82 |
| 11.04 | 2323.81 | 11.32 | 2323.81 | 11.64 | 2323.8 | 11.93 | 2323.79 | 15.33 | 2323.74 |
| 21.09 | 2323.67 | 22.13 | 2323.66 | 22.37 | 2323.66 | 22.61 | 2323.65 | 27.82 | 2323.65 |
| 28.04 | 2323.64 | 28.69 | 2323.64 | 29.97 | 2323.63 | 30.58 | 2323.62 | 30.99 | 2323.62 |
| 31.2 | 2323.61 | 33.01 | 2323.61 | 33.2 | 2323.6 | 33.55 | 2323.6 | 34.17 | 2323.59 |
| 34.32 | 2323.58 | 36.57 | 2323.58 | 39.36 | 2323.6 | 40.8 | 2323.6 | 43.36 | 2323.62 |
| 44.67 | 2323.61 | 48.56 | 2323.57 | 55.7 | 2323.48 | 58.27 | 2323.46 | 59.13 | 2323.45 |
| 64.18 | 2323.35 | 64.26 | 2323.35 | 64.72 | 2323.34 | 64.81 | 2323.34 | 65.26 | 2323.33 |
| 66.14 | 2323.33 | 66.78 | 2323.31 | 68.8 | 2323.31 | 69.92 | 2323.34 | 71.31 | 2323.37 |
| 71.48 | 2323.37 | 72.03 | 2323.38 | 72.3 | 2323.37 | 72.47 | 2323.38 | 72.87 | 2323.37 |
| 72.95 | 2323.38 | 74.77 | 2323.38 | 75.18 | 2323.39 | 75.91 | 2323.39 | 76.15 | 2323.4 |
| 76.35 | 2323.4 | 76.52 | 2323.42 | 76.66 | 2323.43 | 76.76 | 2323.43 | 76.89 | 2323.46 |
| 77.04 | 2323.57 | 77.35 | 2323.62 | 77.44 | 2323.62 | 77.55 | 2323.63 | 77.67 | 2323.64 |
| 77.81 | 2323.64 | 77.96 | 2323.65 | 78.87 | 2323.65 | 79.12 | 2323.64 | 80.14 | 2323.56 |
| 81.8 | 2323.41 | 82.3 | 2323.38 | 82.5 | 2323.37 | 82.74 | 2323.37 | 83 | 2323.36 |
| 83.33 | 2323.35 | 83.69 | 2323.34 | 84.51 | 2323.33 | 84.94 | 2323.33 | 85.18 | 2323.32 |
| 85.53 | 2323.29 | 85.95 | 2323.27 | 86.29 | 2323.25 | 87.82 | 2323.24 | 97.87 | 2323.24 |
| 97.94 | 2323.27 | 98.03 | 2323.29 | 98.22 | 2323.32 | 98.44 | 2323.35 | 98.55 | 2323.36 |
| 98.63 | 2323.36 | 98.73 | 2323.37 | 98.81 | 2323.38 | 99.25 | 2323.42 | 99.52 | 2323.44 |
| 99.71 | 2323.46 | 100.14 | 2323.49 | 100.89 | 2323.54 | 101.58 | 2323.58 | 103.35 | 2323.66 |
| 105.11 | 2323.77 | 105.25 | 2323.77 | 109.99 | 2323.94 | 111.02 | 2323.95 | 112.57 | 2323.98 |
| 115.58 | 2324.13 | 115.89 | 2324.14 | 116.1 | 2324.15 | 116.26 | 2324.15 | 117.39 | 2324.19 |
| 117.48 | 2324.2 | 117.61 | 2324.19 | 117.76 | 2324.2 | 118.06 | 2324.21 | 118.32 | 2324.22 |
| 118.64 | 2324.22 | 118.84 | 2324.23 | 119.21 | 2324.23 | 119.94 | 2324.22 | 122.07 | 2324.21 |
| 122.79 | 2324.2 | 123.29 | 2324.2 | 123.95 | 2324.18 | 124.53 | 2324.18 | 125.06 | 2324.22 |
| 126.22 | 2324.27 | 127.01 | 2324.31 | 127.92 | 2324.35 | 129.71 | 2324.44 | 131.32 | 2324.51 |
| 133.16 | 2324.6 | 140.09 | 2325.03 | 141.12 | 2325.06 | 141.62 | 2325.07 | 142 | 2325.08 |
| 144.01 | 2325.13 | 144.7 | 2325.16 | 144.92 | 2325.16 | 146.31 | 2325.2 | 147.53 | 2325.22 |
| 147.72 | 2325.22 | 148.2 | 2325.23 | 149.08 | 2325.24 | 149.55 | 2325.25 | 151.85 | 2325.25 |
| 154.18 | 2325.26 | 154.66 | 2325.27 | 159.37 | 2325.27 | 160.46 | 2325.26 | 161.61 | 2325.26 |
| 161.68 | 2325.27 | 161.82 | 2325.27 | 163.86 | 2325.35 | 169.8 | 2325.55 | 169.98 | 2325.56 |
| 178.13 | 2325.84 | 182.53 | 2326 | 193.63 | 2326.37 | 194.91 | 2326.41 | 199.17 | 2326.55 |

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  199.87 2326.57     202  2326.6  202.57 2326.61  203.31 2326.63  204.08 2326.63
  206.33 2326.66  208.56 2326.66  208.71 2326.67  209.11 2326.67  210.28 2326.68
  211.03 2326.68  213.38 2326.69  213.87 2326.69  216.25 2326.71  218.55 2326.72
  218.62 2326.72  219.74 2326.73  223.14 2326.74  223.46 2326.74  224.94 2326.75
  227.76 2326.79  229.01 2326.81   229.3 2326.81  229.59 2326.82   229.9 2326.82
  231.02 2326.84  239.31 2326.93  241.98 2326.97  249.35 2327.07  249.51 2327.07
  254.28 2327.15  254.46 2327.15  255.84 2327.17  256.08 2327.17  258.15  2327.2
  258.76  2327.2  259.04 2327.21  259.31 2327.21  259.62 2327.22  259.92 2327.22
  261.68 2327.25  261.92 2327.26   262.6 2327.26  262.82 2327.27   263.3 2327.28
  267.57 2327.33  269.27 2327.36  270.45 2327.37  270.97 2327.38  271.33 2327.38
  271.78 2327.39  273.65  2327.4  280.07 2327.48   281.3 2327.49  281.94 2327.49
  283.23  2327.5  286.47 2327.54  287.43 2327.54  288.15 2327.55   291.5 2327.57
  291.85 2327.58     300 2327.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015 -135.13    .015  199.17    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
       -135.13  199.17             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  2

Culvert Name      Shape      Rise    Span
Culvert #1       Circular     1.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                30      30     .015     .015        0                  .2                1
Upstream    Elevation =  2323.99
            Centerline Station =  89
Downstream Elevation =  2323.24
            Centerline Station =  89

Culvert Name      Shape      Rise    Span
Culvert #2       Circular     1.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                30      30     .015     .015        0                  .2                1
Upstream    Elevation =  2323.99
            Centerline Station =  91
Downstream Elevation =  2323.24
            Centerline Station =  91

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 11480.*

INPUT
Description: Sta 114+80
Station Elevation Data    num=     332
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2327.36 -295.46 2327.38 -295.11 2327.38 -290.07  2327.4 -289.65  2327.4
 -284.81 2327.41 -282.09 2327.43 -275.96 2327.45 -269.91 2327.45 -269.52 2327.46
 -261.05 2327.46 -260.66 2327.47 -259.59 2327.47  -257.9 2327.49 -257.18 2327.49
 -251.97 2327.55 -250.89 2327.55 -250.26 2327.56 -249.24 2327.56 -243.39 2327.55
 -237.76 2327.55 -237.17 2327.56 -236.13 2327.56 -235.19 2327.57 -233.93 2327.57
  -232.2  2327.6 -230.76 2327.63 -226.18  2327.7 -224.74 2327.73  -224.3 2327.73
 -222.54 2327.75 -221.33 2327.77 -221.04 2327.77 -220.23 2327.78 -220.12 2327.79
 -219.57 2327.79 -218.98  2327.8 -218.76 2327.81 -218.15 2327.82 -214.78 2327.87
 -214.02 2327.88 -212.82 2327.89 -208.81 2327.93  -204.5 2327.99 -202.96    2328
 -202.52 2328.01 -201.15 2328.02 -197.36 2328.06  -194.8 2328.08 -194.16 2328.09
 -193.79 2328.09 -193.24  2328.1 -191.92  2328.1 -190.32 2328.11 -186.55 2328.11
 -184.95 2328.12 -180.29 2328.14 -179.87 2328.13 -178.85 2328.13 -175.46 2328.12
 -166.28 2328.07 -166.12 2328.08 -164.88 2328.06 -164.19 2328.05 -163.29 2328.04
 -162.42 2328.02 -161.63 2328.01    -159 2327.99 -157.25 2327.99 -157.07 2327.98
 -156.77 2327.98 -156.64 2327.99 -156.11 2327.99 -155.66    2328 -154.26 2328.02
 -152.23 2328.06 -150.58  2328.1 -150.49  2328.1 -148.41 2328.15 -146.35 2328.19
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  -145.7  2328.2  -143.8 2328.26 -140.75 2328.34 -137.61 2328.43 -135.13 2328.49
 -119.24 2327.68 -117.28 2327.68  -114.4 2327.56 -108.39  2327.3 -102.86 2327.05
  -98.66 2326.84  -85.93 2326.18  -77.55 2325.93  -68.99 2325.69  -67.43 2325.64
  -66.01  2325.6  -55.37 2325.33  -54.06  2325.3  -52.19 2325.24  -51.58 2325.23
  -49.51 2325.17  -48.96 2325.15  -47.07 2325.09  -29.65 2324.65  -22.75 2324.53
  -22.51 2324.52  -22.35 2324.52  -10.44  2324.3  -10.28  2324.3   -7.67 2324.24
   -7.52 2324.24   -6.71 2324.22   -5.21 2324.19    5.19 2323.95   10.71 2323.82
   11.04 2323.81   11.32 2323.81   11.64  2323.8   11.93 2323.79   15.33 2323.74
   21.09 2323.67   22.13 2323.66   22.37 2323.66   22.61 2323.65   27.82 2323.65
   28.04 2323.64   28.69 2323.64   29.97 2323.63   30.58 2323.62   30.99 2323.62
    31.2 2323.61   33.01 2323.61    33.2  2323.6   33.55  2323.6   34.17 2323.59
   34.32 2323.58   36.57 2323.58   39.36  2323.6    40.8  2323.6   43.36 2323.62
   44.67 2323.61   48.56 2323.57    55.7 2323.48   58.27 2323.46   59.13 2323.45
   64.18 2323.35   64.26 2323.35   64.72 2323.34   64.81 2323.34   65.26 2323.33
   66.14 2323.33   66.78 2323.31    68.8 2323.31   69.92 2323.34   71.31 2323.37
   71.48 2323.37   72.03 2323.38    72.3 2323.37   72.47 2323.38   72.87 2323.37
   72.95 2323.38   74.77 2323.38   75.18 2323.39   75.91 2323.39   76.15  2323.4
   76.35  2323.4   76.52 2323.42   76.66 2323.43   76.76 2323.43   76.89 2323.46
   77.04 2323.57   77.35 2323.62   77.44 2323.62   77.55 2323.63   77.67 2323.64
   77.81 2323.64   77.96 2323.65   78.87 2323.65   79.12 2323.64   80.14 2323.56
    81.8 2323.41    82.3 2323.38    82.5 2323.37   82.74 2323.37     83 2323.36
   83.33 2323.35   83.69 2323.34   84.51 2323.33   84.94 2323.33   85.18 2323.32
   85.53 2323.29   85.95 2323.27   86.29 2323.25   87.82 2323.24   97.87 2323.24
   97.94 2323.27   98.03 2323.29   98.22 2323.32   98.44 2323.35   98.55 2323.36
   98.63 2323.36   98.73 2323.37   98.81 2323.38   99.25 2323.42   99.52 2323.44
   99.71 2323.46  100.14 2323.49  100.89 2323.54  101.58 2323.58  103.35 2323.66
  105.11 2323.77  105.25 2323.77  109.99 2323.94  111.02 2323.95  112.57 2323.98
  115.58 2324.13  115.89 2324.14   116.1 2324.15  116.26 2324.15  117.39 2324.19
  117.48  2324.2  117.61 2324.19  117.76  2324.2  118.06 2324.21  118.32 2324.22
  118.64 2324.22  118.84 2324.23  119.21 2324.23  119.94 2324.22  122.07 2324.21
  122.79  2324.2  123.29  2324.2  123.95 2324.18  124.53 2324.18  125.06 2324.22
  126.22 2324.27  127.01 2324.31  127.92 2324.35  129.71 2324.44  131.32 2324.51
  133.16  2324.6  140.09 2325.03  141.12 2325.06  141.62 2325.07     142 2325.08
  144.01 2325.13   144.7 2325.16  144.92 2325.16  146.31  2325.2  147.53 2325.22
  147.72 2325.22   148.2 2325.23  149.08 2325.24  149.55 2325.25  151.85 2325.25
  154.18 2325.26  154.66 2325.27  159.37 2325.27  160.46 2325.26  161.61 2325.26
  161.68 2325.27  161.82 2325.27  163.86 2325.35   169.8 2325.55  169.98 2325.56
  178.13 2325.84  182.53    2326  193.63 2326.37  194.91 2326.41  199.17 2326.55
  199.87 2326.57     202  2326.6  202.57 2326.61  203.31 2326.63  204.08 2326.63
  206.33 2326.66  208.56 2326.66  208.71 2326.67  209.11 2326.67  210.28 2326.68
  211.03 2326.68  213.38 2326.69  213.87 2326.69  216.25 2326.71  218.55 2326.72
  218.62 2326.72  219.74 2326.73  223.14 2326.74  223.46 2326.74  224.94 2326.75
  227.76 2326.79  229.01 2326.81   229.3 2326.81  229.59 2326.82   229.9 2326.82
  231.02 2326.84  239.31 2326.93  241.98 2326.97  249.35 2327.07  249.51 2327.07
  254.28 2327.15  254.46 2327.15  255.84 2327.17  256.08 2327.17  258.15  2327.2
  258.76  2327.2  259.04 2327.21  259.31 2327.21  259.62 2327.22  259.92 2327.22
  261.68 2327.25  261.92 2327.26   262.6 2327.26  262.82 2327.27   263.3 2327.28
  267.57 2327.33  269.27 2327.36  270.45 2327.37  270.97 2327.38  271.33 2327.38
  271.78 2327.39  273.65  2327.4  280.07 2327.48   281.3 2327.49  281.94 2327.49
  283.23  2327.5  286.47 2327.54  287.43 2327.54  288.15 2327.55   291.5 2327.57
  291.85 2327.58     300 2327.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015 -135.13    .015  199.17    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -135.13  199.17               80      80     100             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 11400

INPUT
Description: Sta 114+00.00
Station Elevation Data    num=      276
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2327.85 -290.37 2327.86 -277.79 2327.88 -276.46 2327.89 -275.77 2327.89
 -275.06  2327.9 -273.31 2327.92 -269.55 2327.98 -267.85    2328 -262.26    2328
 -261.58    2328 -260.17    2328 -259.51    2328 -258.91    2328 -258.75    2328
 -258.19    2328 -258.11    2328 -252.01 2328.19 -250.89 2328.21 -249.94 2328.23
 -249.01 2328.25 -248.11 2328.27 -245.97 2328.32 -195.48 2329.11 -174.22    2328
 -173.56    2328 -172.82    2328 -172.63    2328  -171.6    2328 -167.75 2327.83
 -152.32 2327.16 -149.35 2327.01 -146.71 2326.88 -129.68    2326 -118.47 2325.68
 -109.43 2325.43 -107.03 2325.36 -104.94  2325.3 -103.04 2325.25  -88.82  2324.9
  -87.06 2324.85  -84.56 2324.78  -83.75 2324.76  -80.98 2324.68  -80.24 2324.66
  -77.72 2324.58  -54.42    2324  -45.19 2323.85  -44.87 2323.84  -44.76 2323.84
  -44.66 2323.84  -28.73 2323.55  -28.52 2323.55  -25.03 2323.48  -24.82 2323.48
  -23.74 2323.45  -21.73 2323.41   -7.83  2323.1    -.44 2322.93       0 2322.92
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      .37 2322.91       .8  2322.9    1.18 2322.89    2.04 2322.88    2.97 2322.87
     5.73 2322.83    13.44 2322.73   14.83 2322.72   15.15 2322.72   15.47 2322.71
    15.76 2322.71    16.05 2322.71    16.2 2322.71   16.34 2322.71   16.84 2322.71
    19.94 2322.72    21.54 2322.72   21.98 2322.72   22.21 2322.72   22.44 2322.72
    22.73 2322.71    23.02 2322.71    23.6 2322.71   25.31 2322.69   26.13 2322.68
     26.4 2322.68    26.67 2322.68   26.95 2322.67   29.12 2322.67   29.38 2322.67
    29.63 2322.66    29.86 2322.66   30.09 2322.66   30.92 2322.65   31.13 2322.64
    31.34 2322.64    31.52 2322.64   31.71 2322.64   31.89 2322.64   32.08 2322.64
    32.25 2322.64    33.47 2322.64   34.13 2322.64   37.86 2322.66   38.05 2322.66
     38.2 2322.66    38.89 2322.67   39.79 2322.67   43.22 2322.69   44.96 2322.68
    50.17 2322.63    59.72 2322.53   63.16  2322.5    64.3 2322.48   71.06 2322.36
    71.17 2322.36    71.78 2322.35    71.9 2322.35    72.5 2322.34   72.62 2322.34
    73.22 2322.33    73.34 2322.33   73.45 2322.33   73.57 2322.33   73.68 2322.33
    74.54 2322.31    74.75 2322.31   74.85  2322.3   74.95  2322.3   75.06  2322.3
    75.17  2322.3     75.4  2322.3   75.61  2322.3    76.8 2322.31   76.96 2322.31
    77.06 2322.31    77.24 2322.31   78.73 2322.35   80.59 2322.39   80.82 2322.39
    81.55 2322.41    81.91  2322.4   82.14 2322.41   82.68  2322.4   82.79 2322.41
    83.36 2322.41    83.95 2322.41   84.05 2322.41   84.64 2322.41   85.22 2322.41
    85.77 2322.42    86.29 2322.42   86.74 2322.43   87.06 2322.44   87.33 2322.45
    87.56 2322.47    87.74 2322.48   87.88 2322.49   88.05 2322.52   88.25 2322.68
    88.67 2322.74    88.79 2322.75   88.93 2322.76    89.1 2322.77   89.29 2322.77
    89.48 2322.78    89.68 2322.79   89.87 2322.79   89.99 2322.79   90.17 2322.79
    90.33 2322.79    90.52 2322.79    90.7 2322.78   91.04 2322.77    92.4 2322.67
    94.62 2322.47    95.29 2322.43   95.56 2322.41   95.87  2322.4   96.22 2322.39
    96.66 2322.38    97.15 2322.37   98.24 2322.36   98.33 2322.36   98.43 2322.36
    98.52 2322.35    98.61 2322.35    98.7 2322.35   98.82 2322.35   99.14 2322.34
    99.61 2322.31   100.17 2322.28  100.62 2322.25  100.64 2322.24  100.65 2322.24
   100.66 2322.24   100.67 2322.25  100.73 2322.28  101.02 2322.34  101.24 2322.37
   101.35 2322.38   101.43 2322.38  101.61 2322.39  103.69 2322.47  106.16 2322.44
   108.07 2322.53   112.85 2322.48  115.42 2322.44  118.75  2322.7  118.96  2322.7
   119.12  2322.7   119.96 2322.76  120.25 2322.78  120.34 2322.78  120.63 2322.79
   120.92 2322.81   121.19 2322.81  121.43 2322.81  121.51 2322.81  121.71 2322.81
   122.08  2322.8   122.81 2322.76  124.95  2322.6  126.17 2322.49  126.84 2322.41
   127.27 2322.37   127.29 2322.36  127.32 2322.37  127.35 2322.37  127.38 2322.37
   127.41 2322.37   127.95 2322.44  129.11 2322.57  130.82 2322.75  134.23 2323.11
   143.03     2324  150.47 2324.13  157.88 2324.26   161.5 2324.32  165.15 2324.38
   165.91 2324.39   169.62 2324.45  173.31 2324.51  180.35 2324.61  189.67 2324.75
   209.67 2325.04   229.11 2325.32  234.85  2325.4   235.8 2325.41  236.24 2325.42
   236.66 2325.42   237.14 2325.43   237.6 2325.44  240.35 2325.49  240.72  2325.5
    241.1  2325.5   241.44 2325.51  241.78 2325.51  242.12 2325.52  242.87 2325.53
   248.14 2325.59   251.26 2325.63     254 2325.67   254.8 2325.68  254.98 2325.68
   255.17 2325.68   255.36 2325.68  256.07 2325.69  258.98 2325.71  261.35 2325.73
   270.89 2325.84   271.88 2325.85  279.35 2325.92  280.43 2325.93  287.31     2326
      300     2326

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    -300    .025  -195.48    .025   143.03    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       -195.48  143.03               310     300     280              .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 11100

INPUT
Description: Sta 111+00.00
Station Elevation Data     num=     175
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300  2320.56  -293.09  2320.47  -292.54  2320.47   -282.2  2320.32    -281  2320.31
 -278.09  2320.27  -277.86  2320.27  -277.74  2320.27  -276.26  2320.25  -276.05  2320.25
 -274.56  2320.24  -270.81  2320.22  -269.27   2320.2  -256.26  2320.14  -254.67  2320.13
  -241.9     2320  -239.48  2319.98  -226.57  2319.89  -224.29  2319.87  -223.79  2319.87
 -212.66     2320  -212.43     2320  -211.61     2320  -210.81     2320  -210.57     2320
 -207.55     2320  -207.28     2320  -171.83     2320  -171.57     2320  -160.84     2320
 -157.01     2320  -152.05     2320  -151.24     2320  -149.11     2320  -143.88     2320
 -142.82     2320  -142.68     2320  -142.62     2320  -142.18  2320.01  -141.05  2320.03
 -132.82  2320.21  -132.59  2320.22  -132.47  2320.23   -53.44  2320.55   -46.37  2320.44
  -42.59  2320.38   -32.54  2320.25   -18.82  2320.07   -13.81     2320   -7.47  2319.88
   -3.28   2319.8        0  2319.72     2.55  2319.66     3.97  2319.63     7.93  2319.57
    9.53  2319.55    10.04  2319.54    10.54  2319.53    10.89  2319.53    11.21  2319.53
   11.63  2319.53    12.05  2319.53    12.46  2319.53    13.26  2319.54    14.85  2319.55
   23.56  2319.64    30.19  2319.74    38.67  2319.87    43.46  2319.93    44.65  2319.94
   44.66  2319.94    45.22  2319.94    45.24  2319.94    45.25  2319.94    45.26  2319.94
   45.28  2319.94     45.3  2319.95    45.34  2319.95    45.35  2319.95    45.36  2319.95
   45.38  2319.95    45.39  2319.95    45.71  2319.95    45.78  2319.95    45.89  2319.95
   46.07  2319.94     46.2  2319.93    46.54  2319.92    47.15   2319.9    47.63   2319.9
   48.15   2319.9    48.73  2319.89    49.34  2319.87    49.97  2319.85     60.1  2319.87
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 60.15 | 2319.88 | 60.31 | 2319.89 | 61.24 | 2319.85 | 61.53 | 2319.84 | 63.41 | 2319.77 |
| 63.95 | 2319.75 | 64.75 | 2319.72 | 65.51 | 2319.7 | 65.68 | 2319.69 | 66.56 | 2319.66 |
| 66.75 | 2319.65 | 66.86 | 2319.65 | 80.99 | 2319.09 | 81.11 | 2319.08 | 94.56 | 2318.55 |
| 96.35 | 2318.48 | 96.55 | 2318.47 | 96.66 | 2318.47 | 96.78 | 2318.46 | 96.92 | 2318.46 |
| 97.22 | 2318.45 | 99.34 | 2318.43 | 99.44 | 2318.42 | 99.53 | 2318.42 | 99.62 | 2318.42 |
| 99.76 | 2318.41 | 100.51 | 2318.38 | 101.14 | 2318.35 | 101.82 | 2318.32 | 102.27 | 2318.29 |
| 102.81 | 2318.27 | 103.2 | 2318.25 | 103.4 | 2318.24 | 103.43 | 2318.24 | 103.45 | 2318.24 |
| 103.48 | 2318.24 | 103.5 | 2318.24 | 103.52 | 2318.24 | 103.54 | 2318.24 | 103.56 | 2318.24 |
| 103.97 | 2318.26 | 104.44 | 2318.29 | 105.01 | 2318.32 | 105.44 | 2318.35 | 106.17 | 2318.4 |
| 107.1 | 2318.47 | 108.02 | 2318.56 | 109.46 | 2318.69 | 111.75 | 2318.88 | 115.8 | 2319.24 |
| 124.63 | 2320 | 129.3 | 2320.12 | 149.78 | 2320.66 | 151.52 | 2320.7 | 152.59 | 2320.72 |
| 153.48 | 2320.74 | 155.23 | 2320.78 | 160.12 | 2320.86 | 171.73 | 2321.07 | 172.96 | 2321.08 |
| 173.89 | 2321.1 | 178.19 | 2321.14 | 179 | 2321.15 | 179.42 | 2321.16 | 192.68 | 2321.39 |
| 193.39 | 2321.4 | 199.55 | 2321.5 | 204.17 | 2321.58 | 225.64 | 2321.89 | 226.63 | 2321.91 |
| 232.59 | 2322 | 244.71 | 2322.12 | 257.9 | 2322.24 | 264.64 | 2322.3 | 275.58 | 2322.39 |
| 276.87 | 2322.4 | 277.51 | 2322.41 | 278.81 | 2322.41 | 289.7 | 2322.44 | 300 | 2322.47 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -53.44 | .025 | 193.39 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -53.44 | 193.39 | 340 300 | 260 | .1 | .3 |

Left Levee Station= -53.44 Elevation= 2320.55

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 10800

INPUT
Description: Sta 108+00.00
Station Elevation Data num= 170

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2316.4 | -297.05 | 2316.4 | -296.95 | 2316.4 | -296.86 | 2316.4 | -296.77 | 2316.4 |
| -296.58 | 2316.4 | -295.37 | 2316.38 | -293.93 | 2316.36 | -293.12 | 2316.35 | -293.08 | 2316.34 |
| -293.03 | 2316.34 | -293 | 2316.34 | -292.98 | 2316.34 | -292.97 | 2316.35 | -292.95 | 2316.35 |
| -292.94 | 2316.38 | -292.91 | 2316.4 | -292.77 | 2316.45 | -292.71 | 2316.45 | -292.66 | 2316.46 |
| -292.6 | 2316.46 | -292.53 | 2316.46 | -285.61 | 2316.5 | -285.5 | 2316.5 | -273.71 | 2316.57 |
| -271.27 | 2316.58 | -267.23 | 2316.59 | -259.86 | 2316.6 | -259.72 | 2316.6 | -249.73 | 2316.62 |
| -249.56 | 2316.62 | -240.22 | 2316.63 | -236.77 | 2316.63 | -227.05 | 2316.65 | -223.62 | 2316.66 |
| -221.72 | 2316.66 | -212.04 | 2316.63 | -208.73 | 2316.62 | -199.3 | 2316.59 | -198.22 | 2316.58 |
| -197.69 | 2316.58 | -197.19 | 2316.57 | -196.72 | 2316.57 | -196.34 | 2316.56 | -195.97 | 2316.56 |
| -194.26 | 2316.52 | -193.91 | 2316.51 | -193.55 | 2316.51 | -193.16 | 2316.5 | -192.71 | 2316.5 |
| -192.17 | 2316.49 | -191.69 | 2316.49 | -188.06 | 2316.47 | -187.57 | 2316.47 | -185.99 | 2316.47 |
| -178.25 | 2316.49 | -177.1 | 2316.49 | -176.52 | 2316.49 | -176.01 | 2316.49 | -174.98 | 2316.48 |
| -173.94 | 2316.48 | -170 | 2316.44 | -162.28 | 2316.35 | -156.51 | 2316.27 | -150.86 | 2316.18 |
| -140.98 | 2316 | -135.14 | 2316 | -123.27 | 2316 | -116.84 | 2316 | -113.48 | 2316 |
| -51.79 | 2317.4 | -31.62 | 2317.92 | -29.98 | 2317.96 | -28.52 | 2318 | -21.76 | 2318 |
| -12.31 | 2318 | -7.53 | 2316.78 | -4.6 | 2316 | -1.54 | 2315.26 | 0 | 2314.86 |
| .44 | 2314.74 | .83 | 2314.66 | 2.07 | 2314.47 | 2.69 | 2314.4 | 3.04 | 2314.37 |
| 3.15 | 2314.37 | 3.2 | 2314.36 | 3.25 | 2314.36 | 3.29 | 2314.36 | 3.32 | 2314.36 |
| 3.36 | 2314.36 | 3.4 | 2314.36 | 3.41 | 2314.36 | 3.46 | 2314.37 | 3.52 | 2314.37 |
| 3.67 | 2314.38 | 4.19 | 2314.44 | 4.52 | 2314.46 | 4.93 | 2314.51 | 5.09 | 2314.53 |
| 7.41 | 2314.77 | 13.43 | 2315.49 | 13.45 | 2315.49 | 17.58 | 2316 | 47.27 | 2316.74 |
| 68.68 | 2317.21 | 84.42 | 2317.58 | 90.12 | 2317.69 | 94.23 | 2317.79 | 106.88 | 2318 |
| 108.42 | 2318.02 | 120.64 | 2318.16 | 122.23 | 2318.17 | 138.3 | 2318.35 | 144.7 | 2318.42 |
| 144.91 | 2318.43 | 145.73 | 2318.43 | 163.92 | 2318.64 | 167.25 | 2318.68 | 168.23 | 2318.7 |
| 168.67 | 2318.7 | 169.05 | 2318.71 | 170.04 | 2318.73 | 172.87 | 2318.8 | 174.71 | 2318.84 |
| 175.34 | 2318.85 | 175.67 | 2318.85 | 176.02 | 2318.86 | 176.38 | 2318.86 | 176.77 | 2318.87 |
| 177.19 | 2318.87 | 178.05 | 2318.88 | 179.85 | 2318.88 | 181.2 | 2318.89 | 189 | 2318.9 |
| 189.83 | 2318.9 | 190.63 | 2318.9 | 191.41 | 2318.9 | 198.27 | 2318.86 | 199.91 | 2318.85 |
| 207.05 | 2318.83 | 212.65 | 2318.86 | 213.54 | 2318.86 | 213.98 | 2318.86 | 218.72 | 2318.88 |
| 219.94 | 2318.89 | 222.72 | 2318.9 | 228.22 | 2318.92 | 236.23 | 2318.94 | 237.04 | 2318.94 |
| 237.43 | 2318.94 | 237.82 | 2318.94 | 238.23 | 2318.94 | 238.47 | 2318.94 | 238.83 | 2318.93 |
| 239.53 | 2318.93 | 244.45 | 2318.87 | 251.15 | 2318.8 | 253.32 | 2318.77 | 254.24 | 2318.76 |
| 259.45 | 2318.79 | 260.79 | 2318.78 | 261.68 | 2318.78 | 267.04 | 2318.81 | 272.01 | 2318.78 |
| 277.45 | 2318.8 | 285.08 | 2318.77 | 293.18 | 2318.74 | 297.92 | 2318.76 | 300 | 2318.75 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -12.31 | .025 | 138.3 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -12.31 | 138.3 | 300 300 | 300 | .1 | .3 |

Left Levee Station= -12.31 Elevation= 2318

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 10500

INPUT
Description: Sta 105+00.00
Station Elevation Data num= 215

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2314.47 | -237.44 | 2314.77 | -227.75 | 2314.76 | -219.67 | 2314.77 | -218.74 | 2314.77 |
| -218.32 | 2314.77 | -217.95 | 2314.76 | -217.65 | 2314.76 | -217.39 | 2314.76 | -217.16 | 2314.76 |
| -216.79 | 2314.75 | -214.83 | 2314.71 | -211.79 | 2314.63 | -211.06 | 2314.62 | -210.43 | 2314.61 |
| -207.36 | 2314.67 | -205.29 | 2314.65 | -198.25 | 2314.58 | -198.02 | 2314.58 | -197.85 | 2314.57 |
| -197.59 | 2314.56 | -197.46 | 2314.56 | -197.29 | 2314.56 | -197.06 | 2314.55 | -196.74 | 2314.55 |
| -196.36 | 2314.55 | -182.23 | 2314.19 | -182.14 | 2314.18 | -182.07 | 2314.18 | -182.03 | 2314.18 |
| -181.81 | 2314.18 | -181.77 | 2314.18 | -181.73 | 2314.18 | -181.4 | 2314.18 | -181.35 | 2314.18 |
| -180.94 | 2314.18 | -180.46 | 2314.18 | -179.94 | 2314.18 | -179.39 | 2314.18 | -178.75 | 2314.19 |
| -178.09 | 2314.19 | -176.78 | 2314.2 | -170.11 | 2314.28 | -168.52 | 2314.3 | -168.27 | 2314.31 |
| -168.02 | 2314.31 | -167.74 | 2314.31 | -167.45 | 2314.31 | -167.08 | 2314.3 | -166.36 | 2314.29 |
| -159.95 | 2314.18 | -151.67 | 2314.03 | -149.91 | 2314 | -140.52 | 2313.85 | -132.03 | 2313.72 |
| -130.59 | 2313.7 | -129.6 | 2313.69 | -129.17 | 2313.69 | -128.62 | 2313.69 | -128.17 | 2313.69 |
| -127.71 | 2313.69 | -127.25 | 2313.69 | -126.01 | 2313.69 | -123.5 | 2313.7 | -122.29 | 2313.71 |
| -121.7 | 2313.71 | -121.13 | 2313.72 | -120.57 | 2313.73 | -119.48 | 2313.74 | -108.63 | 2313.91 |
| -107.99 | 2313.91 | -107.33 | 2313.92 | -106.67 | 2313.92 | -105.99 | 2313.93 | -105.5 | 2313.93 |
| -104.81 | 2313.93 | -104.12 | 2313.93 | -102.7 | 2313.93 | -102.65 | 2313.93 | -102.6 | 2313.93 |
| -102.53 | 2313.93 | -102.42 | 2313.93 | -102.33 | 2313.93 | -102.28 | 2313.93 | -102.23 | 2313.93 |
| -101.76 | 2313.93 | -101.33 | 2313.94 | -101.28 | 2313.94 | -101.21 | 2313.94 | -101.06 | 2313.94 |
| -101.01 | 2313.94 | -100.98 | 2313.93 | -100.92 | 2313.93 | -100.84 | 2313.93 | -100.81 | 2313.93 |
| -100.79 | 2313.93 | -100.78 | 2313.93 | -100.77 | 2313.93 | -100.75 | 2313.93 | -100.71 | 2313.93 |
| -100.65 | 2313.93 | -100.15 | 2313.92 | -100.07 | 2313.92 | -100.05 | 2313.92 | -100.03 | 2313.92 |
| -100.01 | 2313.92 | -99.93 | 2313.92 | -99.92 | 2313.92 | -99.9 | 2313.92 | -99.89 | 2313.92 |
| -99.87 | 2313.92 | -99.84 | 2313.92 | -99.81 | 2313.92 | -99.76 | 2313.92 | -86.04 | 2313.86 |
| -85.03 | 2313.84 | -84.39 | 2313.84 | -82.99 | 2313.82 | -82.9 | 2313.82 | -82.78 | 2313.81 |
| -82.52 | 2313.81 | -81.02 | 2313.78 | -79.23 | 2313.76 | -76.64 | 2313.7 | -73.67 | 2313.63 |
| -60.85 | 2313.46 | -55.22 | 2313.32 | -53.35 | 2313.27 | -39.75 | 2312.87 | -30.17 | 2312.69 |
| -10.11 | 2312 | 0 | 2312 | 5.85 | 2312 | 7.36 | 2312 | 37.22 | 2313.5 |
| 48.62 | 2314 | 58.58 | 2314 | 66.78 | 2314 | 73.28 | 2313.28 | 73.49 | 2313.28 |
| 74.01 | 2313.21 | 74.2 | 2313.18 | 75.23 | 2312.98 | 75.71 | 2312.81 | 75.95 | 2312.75 |
| 76.14 | 2312.72 | 76.25 | 2312.71 | 76.5 | 2312.68 | 76.77 | 2312.66 | 77.77 | 2312.6 |
| 77.91 | 2312.6 | 78.33 | 2312.58 | 78.46 | 2312.58 | 78.93 | 2312.55 | 79.05 | 2312.55 |
| 79.18 | 2312.54 | 79.33 | 2312.54 | 79.49 | 2312.54 | 80.14 | 2312.53 | 80.29 | 2312.52 |
| 81.38 | 2312.5 | 84.75 | 2312.59 | 84.77 | 2312.59 | 84.84 | 2312.6 | 84.92 | 2312.61 |
| 85.99 | 2312.69 | 86.55 | 2312.74 | 86.63 | 2312.74 | 86.7 | 2312.75 | 86.76 | 2312.77 |
| 86.84 | 2312.79 | 86.96 | 2313.03 | 87.04 | 2313.06 | 87.14 | 2313.08 | 87.28 | 2313.1 |
| 87.52 | 2313.13 | 87.81 | 2313.16 | 88.16 | 2313.19 | 88.55 | 2313.21 | 88.96 | 2313.24 |
| 89.38 | 2313.25 | 89.54 | 2313.26 | 89.78 | 2313.27 | 90.01 | 2313.27 | 90.23 | 2313.27 |
| 90.46 | 2313.27 | 90.73 | 2313.26 | 90.97 | 2313.24 | 91.15 | 2313.22 | 91.3 | 2313.2 |
| 91.39 | 2313.17 | 91.43 | 2313.15 | 99.3 | 2313.86 | 99.54 | 2314 | 101.88 | 2314.49 |
| 107.51 | 2315.64 | 109.08 | 2316 | 134.91 | 2316 | 137.41 | 2316 | 147.48 | 2316 |
| 153.6 | 2316 | 158.85 | 2316 | 162.1 | 2316 | 193.17 | 2316 | 194.58 | 2316.02 |
| 221.58 | 2316.28 | 227.55 | 2316.34 | 229.88 | 2316.37 | 237.95 | 2316.51 | 239.28 | 2316.52 |
| 240.64 | 2316.54 | 250.74 | 2316.72 | 256.94 | 2316.83 | 277.5 | 2317.16 | 300 | 2317.59 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -86.04 | .025 | 48.62 | .025 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
-86.04 48.62 200 300 400 .1 .3
Left Levee Station= -102.23 Elevation= 2313.93

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 10200

INPUT
Description: Sta 102+00.00
Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2314.28 | -258.63 | 2314.15 | -244.35 | 2314.02 | -241.66 | 2314 | -230.68 | 2313.67 |
| -229.37 | 2313.62 | -228.8 | 2313.6 | -228.3 | 2313.57 | -227.93 | 2313.55 | -227.62 | 2313.53 |
| -227.59 | 2313.53 | -227.58 | 2313.53 | -227.58 | 2313.54 | -215.98 | 2313.65 | -215.81 | 2313.65 |
| -215.66 | 2313.65 | -215.53 | 2313.65 | -215.43 | 2313.65 | -215.36 | 2313.65 | -215.25 | 2313.65 |
| -214.94 | 2313.67 | -214.72 | 2313.69 | -214.54 | 2313.7 | -214.41 | 2313.7 | -214.35 | 2313.71 |
| -214.27 | 2313.71 | -214.16 | 2313.71 | -214.02 | 2313.7 | -213.84 | 2313.7 | -213.65 | 2313.7 |
| -213.2 | 2313.69 | -208.4 | 2313.63 | -200.6 | 2313.53 | -198.81 | 2313.51 | -198.19 | 2313.5 |
| -197.57 | 2313.49 | -196.93 | 2313.48 | -195.61 | 2313.46 | -175.91 | 2313.16 | -172.94 | 2313.11 |
| -139.48 | 2312.55 | -106.83 | 2312 | -94.56 | 2311.79 | -88.9 | 2311.67 | -63.92 | 2311.22 |
| -56.73 | 2311.05 | -27.56 | 2310.38 | -26.15 | 2310.35 | -10.97 | 2310 | 0 | 2310 |
| 10.73 | 2310 | 10.87 | 2310 | 24.7 | 2310.33 | 25.93 | 2310.35 | 26.54 | 2310.36 |
| 27.16 | 2310.37 | 27.39 | 2310.37 | 28.03 | 2310.38 | 30.54 | 2310.42 | 31.13 | 2310.42 |

```
   31.76 2310.43   31.93 2310.44   32.54 2310.45   34.11 2310.45   34.51 2310.45
   36.03 2310.46   40.89 2310.49   41.95  2310.5   51.59 2310.57   58.04 2310.61
    69.8 2310.69   76.01 2310.74  167.64    2312  168.08    2312  168.53    2312
  173.94    2312  175.77    2312  183.26    2312  190.21    2312  193.86    2312
   199.3    2312  206.96    2312  207.32    2312  207.61    2312   207.9    2312
  208.38    2312  208.84    2312  209.98    2312  210.42    2312  210.85    2312
  220.41    2312  222.21    2312  222.73    2312  228.73    2312  230.64    2312
  231.59    2312  243.17    2312  251.49    2312  258.17    2312  271.07    2312
  278.05    2312  279.87    2312  286.56    2312     300    2312

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -139.48    .025  168.53    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -139.48  168.53              120      90      50             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 10110

INPUT
Description: Sta 101+10
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -44.5  2310.5   -44.5  2307.5   -40.5  2307.5   -39.5  2307.5   -35.5  2307.5
   -34.5  2307.5   -30.5  2307.5   -29.5  2307.5   -25.5  2307.5   -24.5  2307.5
   -20.5  2307.5   -19.5  2307.5   -15.5  2307.5   -14.5  2307.5   -10.5  2307.5
    -9.5  2307.5    -5.5  2307.5    -4.5  2307.5     -.5  2307.5       0  2307.5
      .5  2307.5     4.5  2307.5     5.5  2307.5     9.5  2307.5    10.5  2307.5
    14.5  2307.5    15.5  2307.5    19.5  2307.5    20.5  2307.5    24.5  2307.5
    25.5  2307.5    29.5  2307.5    30.5  2307.5    34.5  2307.5    35.5  2307.5
    39.5  2307.5    40.5  2307.5    44.5  2307.5    44.5  2310.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -44.5    .015   -44.5    .015    44.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -44.5    44.5              70      70      70             .1      .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 10075

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      66
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -53    2311  2310.5      53    2311  2310.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -44.5  2310.5   -44.5  2307.5   -40.5  2307.5   -39.5  2307.5   -35.5  2307.5
   -34.5  2307.5   -30.5  2307.5   -29.5  2307.5   -25.5  2307.5   -24.5  2307.5
   -20.5  2307.5   -19.5  2307.5   -15.5  2307.5   -14.5  2307.5   -10.5  2307.5
    -9.5  2307.5    -5.5  2307.5    -4.5  2307.5     -.5  2307.5       0  2307.5
      .5  2307.5     4.5  2307.5     5.5  2307.5     9.5  2307.5    10.5  2307.5
    14.5  2307.5    15.5  2307.5    19.5  2307.5    20.5  2307.5    24.5  2307.5
    25.5  2307.5    29.5  2307.5    30.5  2307.5    34.5  2307.5    35.5  2307.5
    39.5  2307.5    40.5  2307.5    44.5  2307.5    44.5  2310.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -44.5    .015   -44.5    .015    44.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -44.5    44.5             .1      .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
```

```
     -53    2311    2310      53    2311    2310

Downstream Bridge Cross Section Data
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -44.5    2310   -44.5    2307   -40.5    2307   -39.5    2307   -35.5    2307
   -34.5    2307   -30.5    2307   -29.5    2307   -25.5    2307   -24.5    2307
   -20.5    2307   -19.5    2307   -15.5    2307   -14.5    2307   -10.5    2307
    -9.5    2307    -5.5    2307    -4.5    2307     -.5    2307       0    2307
      .5    2307     4.5    2307     5.5    2307     9.5    2307    10.5    2307
    14.5    2307    15.5    2307    19.5    2307    20.5    2307    24.5    2307
    25.5    2307    29.5    2307    30.5    2307    34.5    2307    35.5    2307
    39.5    2307    40.5    2307    44.5    2307    44.5    2310

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -44.5    .015   -44.5    .015    44.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -44.5    44.5             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  17

Pier Data
Pier Station     Upstream=     -40    Downstream=     -40
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -35    Downstream=     -35
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -30    Downstream=     -30
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -25    Downstream=     -25
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -20    Downstream=     -20
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -15    Downstream=     -15
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
```

```
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=      -10    Downstream=      -10
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       -5    Downstream=       -5
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=        0    Downstream=        0
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=        5    Downstream=        5
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       10    Downstream=       10
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       15    Downstream=       15
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       20    Downstream=       20
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       25    Downstream=       25
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       30    Downstream=       30
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
```

```
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       35     Downstream=       35
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Pier Data
Pier Station      Upstream=       40     Downstream=       40
Upstream      num=        2
    Width    Elev     Width    Elev
       1   2307.5        1   2310.5
Downstream      num=        2
    Width    Elev     Width    Elev
       1     2307        1     2310

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 10040

INPUT
Description: Sta 100+40
Station Elevation Data     num=       39
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -44.5     2310    -44.5     2307    -40.5     2307    -39.5     2307    -35.5     2307
   -34.5     2307    -30.5     2307    -29.5     2307    -25.5     2307    -24.5     2307
   -20.5     2307    -19.5     2307    -15.5     2307    -14.5     2307    -10.5     2307
    -9.5     2307     -5.5     2307     -4.5     2307      -.5     2307        0     2307
      .5     2307      4.5     2307      5.5     2307      9.5     2307     10.5     2307
    14.5     2307     15.5     2307     19.5     2307     20.5     2307     24.5     2307
    25.5     2307     29.5     2307     30.5     2307     34.5     2307     35.5     2307
    39.5     2307     40.5     2307     44.5     2307     44.5     2310

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
   -44.5     .015    -44.5     .015     44.5     .015

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
        -44.5    44.5                200      140       80             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 9900

INPUT
Description: Sta 99+00.00
Station Elevation Data     num=      210
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300   2308.3  -294.53  2308.23  -294.51  2308.23  -292.18   2308.2  -290.53  2308.18
 -290.11  2308.18  -289.37  2308.17  -287.15  2308.12  -281.26     2308  -277.42  2307.87
 -273.96  2307.75  -268.28  2307.64  -262.63  2307.52  -260.64  2307.49  -253.52  2307.39
  -248.7  2307.32  -248.26  2307.32  -248.08  2307.32   -247.9  2307.32  -247.75  2307.32
 -247.62  2307.32   -247.5  2307.32   -247.4  2307.32  -247.04  2307.34  -245.35  2307.44
 -243.44  2307.55  -240.67   2307.7   -239.6  2307.76   -239.4  2307.76  -239.18  2307.77
 -239.13  2307.77  -238.88  2307.78   -238.6  2307.78  -238.27  2307.78  -237.91  2307.78
```

```
  -237.67 2307.78  -229.8  2307.7 -228.08 2307.69 -227.64 2307.69 -227.19 2307.69
  -226.73 2307.69 -226.25 2307.69 -225.76 2307.69 -225.29 2307.69 -224.79  2307.7
  -224.29  2307.7 -223.24 2307.72 -215.94 2307.83 -209.16 2307.93 -204.44     2308
  -200.94 2308.06 -191.51 2308.23 -189.22 2308.27 -183.94 2308.38 -181.39 2308.43
  -172.94 2308.58 -167.39 2308.68 -166.29  2308.7 -165.67 2308.71 -165.33 2308.71
  -164.94 2308.71 -164.52 2308.72 -163.62 2308.72 -162.71 2308.73 -162.26 2308.73
  -161.82 2308.73 -161.39 2308.73 -160.98 2308.73 -160.61 2308.73 -160.25 2308.73
   -159.9 2308.73 -157.84 2308.71 -157.46 2308.71 -157.05 2308.71 -156.61 2308.71
  -156.14 2308.71 -154.64 2308.71 -150.01 2308.71 -149.54 2308.71 -149.09 2308.71
  -148.67 2308.71 -148.31 2308.71 -148.01  2308.7 -147.75  2308.7 -147.53  2308.7
   -145.2 2308.63  -142.7 2308.54 -139.67 2308.44  -138.3 2308.39 -137.69 2308.38
  -136.96 2308.37 -134.29 2308.33 -132.77 2308.32 -132.23 2308.32  -131.1 2308.31
  -129.31  2308.3  -128.1  2308.3  -127.5  2308.3 -127.39  2308.3  -126.8  2308.3
  -126.68  2308.3  -126.1  2308.3 -125.76  2308.3 -125.15  2308.3 -124.56  2308.3
  -122.82 2308.31 -114.19 2308.37  -107.6 2308.42 -106.57 2308.43 -106.03 2308.43
  -103.97 2308.43 -102.91 2308.44  -96.61 2308.47  -91.15 2308.51  -90.25 2308.52
   -89.81 2308.52  -89.35 2308.52   -88.9 2308.52  -88.44 2308.51  -87.96 2308.51
   -87.49 2308.51  -79.73 2308.42  -70.03  2308.3  -57.57 2308.17   -43.7 2308.01
   -42.23     2308  -24.68 2307.23   -3.36     2306       0     2306    8.62     2306
    11.51     2306   29.52 2306.51   38.22 2306.65   40.72 2306.69   41.41  2306.7
    42.14 2306.72   42.92 2306.73   43.74 2306.75   48.68 2306.85   49.81 2306.88
    50.98  2306.9   52.18 2306.92   55.99 2306.99   69.01 2307.22   73.44  2307.3
    75.98 2307.35   78.83  2307.4   82.08 2307.47   85.79 2307.54   94.89 2307.73
   107.46     2308  115.98 2308.21  118.47 2308.27  119.16 2308.29  120.19 2308.33
   124.81 2308.52  129.68 2308.73  130.17 2308.75  130.43 2308.76  130.72 2308.77
   131.05 2308.77  131.42 2308.78  131.87 2308.79  132.37 2308.79   132.9  2308.8
   134.63 2308.81  142.85 2308.85  149.97 2308.88  157.64 2308.92  158.64 2308.93
   160.16 2308.94  163.08 2308.98  169.88 2309.03  172.28 2309.04  180.07 2309.14
   186.58 2309.22  187.51 2309.23  188.13 2309.23  192.83 2309.27  197.92 2309.31
   201.61 2309.35  202.09 2309.35  206.52 2309.37  207.68 2309.37  208.12 2309.38
   208.32 2309.38  208.51 2309.38  209.02 2309.39  223.18 2309.25  223.19 2309.25
   223.24 2309.24  223.32 2309.24  223.57 2309.23  224.25 2309.21  224.86  2309.2
   225.08 2309.19  225.32 2309.19  225.57 2309.19  253.19 2309.45  253.34 2309.45
    253.5 2309.45  253.87 2309.44  255.56 2309.43  273.44 2309.62  273.71 2309.62
   273.85 2309.62  273.98 2309.62  274.12 2309.62  274.26 2309.62     300 2309.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -42.23    .025  131.42    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -42.23  131.42              310     300     300            .1       .3
Left Levee      Station=   -88.9      Elevation= 2308.52

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 9600

INPUT
Description: Sta 96+00.00
Station Elevation Data    num=     377
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -580 2304.29  -572.1 2304.35 -570.96 2304.36 -569.57 2304.36 -569.45 2304.37
 -569.36 2304.37 -569.28 2304.36 -569.23 2304.36  -569.2 2304.36 -569.18 2304.36
 -566.47 2304.38 -557.57 2304.57 -557.15 2304.59 -556.99  2304.6 -556.86  2304.6
 -556.77 2304.61 -556.74 2304.61 -556.73 2304.62 -556.68 2304.63  -556.6 2304.63
 -556.49 2304.64 -556.35 2304.64 -556.18 2304.65 -555.98 2304.66  -545.5 2304.76
 -545.26 2304.77 -544.98 2304.78 -534.54 2304.89 -534.32  2304.9 -534.08  2304.9
 -533.82 2304.91  -533.2 2304.92 -529.07 2304.97 -526.28 2305.03 -522.67 2305.08
 -516.02 2305.16 -507.32 2305.32  -495.8 2305.54  -492.5 2305.58 -491.69 2305.59
  -491.4  2305.6 -491.04  2305.6 -490.93  2305.6 -490.85  2305.6 -490.28 2305.61
  -490.2 2305.61 -489.64 2305.61 -489.49 2305.62 -488.93 2305.62 -488.65 2305.63
 -488.15 2305.63 -487.66 2305.63 -487.23 2305.64 -486.27 2305.63 -484.06 2305.69
 -484.01 2305.69 -483.96 2305.69 -483.93 2305.69 -483.91  2305.7 -483.89  2305.7
 -483.87 2305.71 -483.84 2305.71  -483.8 2305.71 -483.75 2305.71 -483.69 2305.71
 -483.63 2305.71 -483.44 2305.72 -483.34 2305.72 -483.08 2305.72 -482.81 2305.72
 -482.73 2305.72 -482.65 2305.72 -482.57 2305.72  -482.5 2305.72 -482.45 2305.72
 -482.41 2305.72 -482.37 2305.72  -482.3 2305.72 -481.82  2305.7 -481.75 2305.69
 -481.68 2305.69  -481.6 2305.69 -481.51 2305.69 -476.97 2305.65 -475.73 2305.64
  -469.4 2305.54 -453.89 2305.59 -453.05 2305.66 -448.83     2306 -431.26     2306
 -429.66     2306 -429.41 2305.97 -423.97 2305.37 -412.23 2304.06 -411.72     2304
 -407.59 2303.83  -403.8 2303.67  -400.9 2303.54 -397.77  2303.4 -397.65  2303.4
 -397.59 2303.39 -397.54 2303.39 -397.49  2303.4 -397.45  2303.4  -397.4  2303.4
 -397.36 2303.41 -397.25 2303.45 -396.91 2303.64 -396.52 2303.82 -396.05     2304
 -392.98 2304.08 -377.35 2304.49 -367.46 2304.75 -366.58 2304.77 -365.51 2304.79
 -360.63 2304.87 -359.71 2304.89 -359.31  2304.9 -358.96  2304.9 -358.67 2304.91
 -358.44 2304.92 -357.24 2304.97 -357.04 2304.97 -356.82 2304.98 -356.56 2304.98
 -356.24 2304.99 -355.87 2304.99 -355.47 2304.99 -355.05     2305 -354.61     2305
 -348.25 2305.03 -340.15 2305.06 -332.74 2305.11 -328.02 2305.14 -319.14 2305.18
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  -316.4  2305.2 -310.69 2305.24 -309.75 2305.25 -304.37 2305.28 -299.63 2305.29
 -297.69  2305.3 -288.96  2305.3  -285.8 2305.31  -283.8 2305.31 -281.83 2305.32
 -280.73 2305.33 -276.78 2305.36  -264.4 2305.45  -262.1 2305.47 -258.17  2305.5
 -254.16 2305.52 -253.53 2305.53  -252.9 2305.53 -252.37 2305.53 -251.61 2305.54
 -251.08 2305.54 -250.72 2305.54 -249.54 2305.55 -246.94 2305.58 -244.96  2305.6
 -244.55 2305.61 -244.41 2305.61 -244.27 2305.61 -244.14 2305.61 -243.85 2305.61
 -240.96 2305.62 -240.67 2305.62  -240.4 2305.62 -238.62 2305.61 -238.23 2305.61
 -236.09 2305.61 -235.79 2305.61  -233.5  2305.6 -230.89 2305.59 -229.92 2305.58
 -227.47 2305.58 -223.69 2305.55  -223.4 2305.55 -211.78 2305.53 -209.59 2305.51
  -207.1 2305.49  -205.9 2305.49 -201.78 2305.46 -196.92 2305.42 -191.86 2305.38
 -188.96 2305.36 -185.12 2305.33  -183.7 2305.32 -183.36 2305.31 -183.04 2305.31
 -182.75  2305.3 -182.47  2305.3 -182.23  2305.3    -182 2305.29 -181.57 2305.28
  -178.7 2305.19 -174.38 2305.05 -168.72 2304.88 -167.58 2304.85 -166.98 2304.83
 -166.48 2304.83 -165.84 2304.82 -165.32 2304.81 -164.65 2304.79 -162.03 2304.76
 -154.36 2304.67 -153.64 2304.66 -153.31 2304.66 -153.11 2304.66 -152.91 2304.66
 -152.64 2304.65 -152.38 2304.65 -150.94 2304.66 -145.64 2304.68 -145.25 2304.66
 -143.76 2304.67 -143.35 2304.65 -142.84 2304.65 -142.38 2304.64 -142.12 2304.64
 -141.62 2304.62 -141.36 2304.62 -140.83 2304.61 -140.57 2304.61 -139.42 2304.58
    -139 2304.58 -131.06 2304.43 -129.63 2304.41 -128.85 2304.39  -118.1 2304.19
 -116.67 2304.17 -115.83 2304.16 -115.71 2304.16 -115.59 2304.16 -115.24 2304.16
 -113.84 2304.13 -113.69 2304.13  -112.2 2304.11 -109.88 2304.09 -109.42 2304.09
 -109.32 2304.09  -97.75    2304  -94.66 2303.99  -92.54 2303.98  -91.86 2303.98
  -91.18 2303.97  -90.53 2303.96  -83.83 2303.89  -76.22 2303.82   -75.6 2303.82
  -74.99 2303.82  -74.37 2303.81  -73.75 2303.82  -73.13 2303.82  -72.51 2303.82
  -71.88 2303.82  -64.68 2303.88  -54.98 2303.97   -53.7 2303.98  -52.49    2304
  -45.31 2304.08  -27.65 2304.26  -25.87 2304.28  -25.02 2304.29  -24.21 2304.29
  -23.44  2304.3   -22.7  2304.3   -17.9 2304.31  -17.22 2304.31  -16.55 2304.31
  -11.92 2304.37   -11.2 2304.38   -9.57  2304.4   -8.79 2304.41   -1.55  2304.5
    -.63 2304.51     .32 2304.52     7.4 2304.61    8.47 2304.62   10.62 2304.65
   12.19 2304.67   24.51 2304.85   26.62 2304.89   31.82 2304.98   35.21 2305.05
   41.18 2305.17   44.36 2305.24   68.62 2305.38   68.64 2305.37   68.71 2305.37
   68.82 2305.37   68.95 2305.37   69.11 2305.37   71.23 2305.35   71.96 2305.35
   73.19 2305.33   73.38 2305.33   73.57 2305.33      74 2305.33   74.96 2305.33
   77.05 2305.35    78.6 2305.35   84.27  2305.4   88.91 2305.42   99.58  2305.5
  100.22 2305.51  104.95 2305.54  107.11 2305.56  108.03 2305.56  111.17 2305.58
   111.8 2305.58  114.39 2305.59     117  2305.6  124.12 2305.63  126.72 2305.63
  127.58 2305.64  130.14 2305.64  141.65 2305.65  143.12 2305.66  147.56 2305.66
  149.17 2305.66  151.46 2305.66   153.7 2305.67  156.61 2305.66  158.89 2305.67
  169.93 2305.61  170.97  2305.6  171.43  2305.6  171.82 2305.59  172.15 2305.58
  172.41 2305.58  172.82 2305.56  173.52 2305.52  175.53 2305.39  177.29 2305.28
  227.27 2305.49  227.31  2305.5  227.38  2305.5  228.19 2305.55  231.62 2305.67
  234.41 2305.74  234.89 2305.75  235.41 2305.76  235.98 2305.77  236.62 2305.78
  238.29 2305.78  238.94 2305.79  239.64 2305.79  239.72  2305.8   241.2  2305.8
  241.27  2305.8  252.63 2305.86  252.68 2305.86  263.84 2305.91  264.72 2305.92
  266.49 2305.93  267.38 2305.94  271.64 2305.98  273.28 2305.99  274.08    2306
  274.41    2306  274.79    2306  275.43    2306  276.07 2306.01  276.68    2306
  277.28    2306  277.74    2306  278.35    2306  287.22 2305.91  294.58 2305.82
  295.94 2305.81  296.47 2305.81  297.08 2305.81  297.77 2305.81  298.53 2305.81
  299.35 2305.82     300 2305.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -580    .025 -236.09    .025   153.7    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -236.09   153.7              300     300     300             .1       .3
Left Levee      Station= -240.67      Elevation= 2305.62

CROSS SECTION


RIVER: Duck Creek
REACH: East              RS: 9300

INPUT
Description: Sta 93+00.00
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2303.88 -292.27    2304 -272.09    2304 -271.41    2304 -261.57 2303.53
 -257.31 2303.44 -254.83 2303.39 -243.62 2302.97 -233.35 2302.71 -215.07 2302.24
 -207.16 2302.02 -206.41    2302 -205.88 2301.97 -205.32 2301.95  -196.2 2301.55
 -180.26 2301.21 -178.05 2301.16 -177.23 2301.15 -176.25 2301.14 -175.75 2301.18
 -119.15 2300.36 -108.49 2300.18 -100.49 2300.07  -92.29    2300  -91.38    2300
  -91.31    2300   -91.3    2300  -77.29    2300  -77.27    2300  -75.75    2300
  -75.58    2300  -74.83    2300  -72.55    2300  -68.04    2300  -66.66    2300
  -64.96    2300  -21.85 2299.18  -15.51 2299.26   -8.29 2299.34   -7.16 2299.36
   -4.85 2299.41   -4.47 2299.41   -4.08 2299.42    -3.6 2299.42   -2.56 2299.43
      0 2299.43     4.7 2299.45    5.24 2299.45    5.77 2299.45    6.28 2299.46
   6.76 2299.47    7.24 2299.47    8.07 2299.49   17.93 2299.74   28.87    2300
  33.46 2300.11   34.86 2300.15   51.19 2300.56   55.33 2300.67   68.51 2301.02
  82.09 2301.38   87.07 2301.51  105.18    2302  107.12 2302.03  107.13 2302.04
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  107.15 2302.04  107.16 2302.04  107.24 2302.03  107.25 2302.03  107.26 2302.03
  107.27 2302.03  107.29 2302.03   107.3 2302.03  107.32 2302.04  107.35 2302.04
  107.58 2302.04  107.84 2302.04  108.44 2302.05  113.58 2302.15  116.02  2302.2
  175.15 2303.43  202.57    2304  202.62    2304  202.76 2304.01  202.78 2304.02
  227.98 2304.32  229.57 2304.31  230.44  2304.3  233.49 2304.26  242.25 2304.15
   244.9 2304.12   249.9 2304.07  257.02    2304  258.19 2303.94  258.42 2303.74
  258.47 2303.59  258.69 2303.55  258.79 2303.54  258.93 2303.54  259.13 2303.55
  259.37 2303.55  259.64 2303.56  260.58 2303.58  269.25 2303.83  275.65    2304
   290.1 2304.46  299.84 2304.74     300 2304.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -196.2    .025  105.18    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -196.2  105.18              250     300     340             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 9000

INPUT
Description: Sta 90+00.00
Station Elevation Data    num=     249
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300  2301.5 -295.05 2301.21 -287.39 2301.04 -280.34 2300.71 -279.02 2300.69
  -278.4 2300.69 -277.81 2300.68 -274.94 2300.68 -274.42 2300.67 -273.83 2300.67
 -273.17 2300.66 -272.43 2300.64 -270.73  2300.6 -265.42 2300.46 -249.41    2300
 -243.14 2299.86 -242.32 2299.87 -236.12 2299.74 -226.62 2299.54 -224.34 2299.55
 -215.95 2299.38 -213.94 2299.34 -213.53 2299.33 -213.13 2299.33 -212.71 2299.32
 -212.28 2299.32 -211.82 2299.31 -211.35 2299.31 -210.37 2299.31 -207.82 2299.31
  -207.3  2299.3 -206.79  2299.3 -206.27  2299.3 -204.73 2299.29 -200.37 2299.25
 -199.85 2299.25 -198.97 2299.24 -198.57 2299.24  -198.2 2299.23 -197.87 2299.23
 -195.82 2299.18 -195.55 2299.17 -195.27 2299.17 -194.97 2299.17 -194.64 2299.17
 -194.28 2299.16 -193.91 2299.16 -191.06 2299.16 -190.66 2299.16 -190.26 2299.16
 -189.85 2299.16 -189.45 2299.16 -189.17 2299.16 -188.02 2299.15 -184.11 2299.11
 -183.39  2299.1 -183.02  2299.1 -182.63  2299.1 -181.41 2299.09 -173.49 2299.08
 -173.16 2299.08 -172.85 2299.08 -172.27 2299.09 -168.45 2299.14 -164.41 2299.19
 -161.78 2299.22 -161.65 2299.23 -161.52 2299.23 -161.38 2299.23 -161.26 2299.23
 -161.02 2299.23 -160.75 2299.23 -159.59 2299.23 -154.71 2299.23 -150.39 2299.23
 -150.17 2299.23 -149.96 2299.23 -149.73 2299.23 -149.52 2299.23 -149.11 2299.23
 -148.38 2299.24 -145.94 2299.27 -143.27 2299.31 -141.38 2299.33  -141.2 2299.34
 -141.14 2299.34 -141.11 2299.34  -141.1 2299.34 -134.37 2299.34 -130.77 2299.29
 -130.06 2299.27 -130.03 2299.26 -129.95 2299.26 -129.83 2299.26 -129.54 2299.26
  -129.4 2299.26 -129.25 2299.25 -129.12 2299.25  -128.8 2299.24 -128.35 2299.23
 -126.64 2299.16 -125.85 2299.13 -125.54 2299.12 -124.72  2299.1 -121.67 2299.05
 -117.73 2298.95 -114.57 2298.86 -109.34  2298.7 -108.35 2298.68    -108 2298.67
 -107.63 2298.66 -107.25 2298.65 -104.95 2298.64 -104.56 2298.64 -102.22 2298.63
 -101.36 2298.62  -97.52 2298.59  -97.03 2298.58  -96.79 2298.58  -96.55 2298.58
  -96.09 2298.58   -93.6 2298.58  -93.22 2298.58  -88.82 2298.57   -88.4 2298.56
  -87.94 2298.56  -86.38 2298.56  -76.97 2298.57  -73.65 2298.58   -72.5 2298.57
  -71.38 2298.57   -66.8 2298.54  -61.75 2298.51  -60.67  2298.5  -60.18 2298.49
  -59.75 2298.49  -59.39 2298.48  -59.07 2298.48  -58.49 2298.46  -58.09 2298.46
   -57.6 2298.45  -43.94 2298.25  -42.36 2298.23  -41.64 2298.21     -41  2298.2
   -40.5 2298.19  -40.07 2298.17  -39.36 2298.15  -36.52    2298  -15.29 2296.58
  -14.28 2296.51   -7.82    2296    -7.4 2295.91    -5.9 2295.62   -4.67 2295.43
   -4.28 2295.39       0  2295.4    1.77 2295.41    1.79 2295.45    2.74 2295.73
    2.78 2295.84    3.45    2296   39.41 2297.68   46.55    2298   54.44 2298.23
   55.65 2298.26   56.27 2298.27   56.92 2298.28   57.58 2298.29   58.27  2298.3
   60.41 2298.33   72.74 2298.44   78.44 2298.47   89.19 2298.59   93.17 2298.64
   97.11 2298.67  102.42  2298.7  109.55 2298.76  119.25 2298.84  126.17 2298.89
  126.97  2298.9  127.36  2298.9  127.58  2298.9   127.8  2298.9  128.16  2298.9
  128.51  2298.9   129.2 2298.89  135.79  2298.8  137.85 2298.78  139.63 2298.79
  148.44 2298.73  149.48 2298.73  151.36 2298.71  159.71 2298.62   162.9 2298.63
  167.51 2298.64   176.4 2298.56  177.04 2298.56  183.49 2298.52  186.62 2298.52
  190.62 2298.51  201.19 2298.48  202.89 2298.47  213.14 2298.43  215.18 2298.42
  216.36 2298.42  216.93 2298.42  220.05 2298.42  220.62 2298.42  221.19 2298.42
  224.32 2298.44  224.92 2298.44  225.52 2298.45  228.38 2298.47  237.48 2298.59
  239.49 2298.61  243.72 2298.63  252.84 2298.75  256.87 2298.79  257.34  2298.8
  263.85 2298.84  268.36 2298.88  269.36 2298.89  271.25 2298.92  282.06 2299.04
  283.01 2299.05  283.92 2299.07  290.67 2299.14   297.5 2299.28  310.22 2299.38
   321.8 2299.49   326.5 2299.57  339.97  2299.7  345.24 2299.75  347.51 2299.78
  365.76    2300  369.59 2300.09     377 2300.26  378.75 2300.26  379.26 2300.26
  379.47 2300.26  379.58 2300.26   379.8 2300.26     381 2300.28  381.24 2300.28
   396.1 2300.54  396.31 2300.54  396.51 2300.54     400  2300.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -134.37    .025  126.17    .025
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -134.37  126.17               60      60      60             .1       .3
Left Levee      Station= -134.37      Elevation= 2299.34

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 8940

INPUT
Description: Sta 89+40
Station Elevation Data    num=     227
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300  2301.5 -295.05 2301.21 -287.39 2301.04 -280.34 2300.71 -279.02 2300.69
  -278.4 2300.69 -277.81 2300.68 -274.94 2300.68 -274.42 2300.67 -273.83 2300.67
 -273.17 2300.66 -272.43 2300.64 -270.73  2300.6 -265.42 2300.46 -249.41    2300
 -243.14 2299.86 -242.32 2299.87 -236.12 2299.74 -226.62 2299.54 -224.34 2299.55
 -215.95 2299.38 -213.94 2299.34 -213.53 2299.33 -213.13 2299.33 -212.71 2299.32
 -212.28 2299.32 -211.82 2299.31 -211.35 2299.31 -210.37 2299.31 -207.82 2299.31
  -207.3  2299.3 -206.79  2299.3 -206.27  2299.3 -204.73 2299.29 -200.37 2299.25
 -199.85 2299.25 -198.97 2299.24 -198.57 2299.24  -198.2 2299.23 -197.87 2299.23
 -195.82 2299.18 -195.55 2299.17 -195.27 2299.17 -194.97 2299.17 -194.64 2299.17
 -194.28 2299.16 -193.91 2299.16 -191.06 2299.16 -190.66 2299.16 -190.26 2299.16
 -189.85 2299.16 -189.45 2299.16 -189.17 2299.16 -188.02 2299.15 -184.11 2299.11
 -183.39  2299.1 -183.02  2299.1 -182.63  2299.1 -181.41 2299.09 -173.49 2299.08
 -173.16 2299.08 -172.85 2299.08 -172.27 2299.09 -168.45 2299.14 -164.41 2299.19
 -161.78 2299.22 -161.65 2299.23 -161.52 2299.23 -161.38 2299.23 -161.26 2299.23
 -161.02 2299.23 -160.75 2299.23 -159.59 2299.23 -154.71 2299.23 -150.39 2299.23
 -150.17 2299.23 -149.96 2299.23 -149.73 2299.23 -149.52 2299.23 -149.11 2299.23
 -148.38 2299.24 -145.94 2299.27 -143.27 2299.31 -141.38 2299.33  -141.2 2299.34
 -141.14 2299.34 -141.11 2299.34  -141.1 2299.34 -134.37 2299.34 -130.77 2299.29
 -130.06 2299.27 -130.03 2299.26 -129.95 2299.26 -129.83 2299.26 -129.54 2299.26
  -129.4 2299.26 -129.25 2299.25 -129.12 2299.25  -128.8 2299.24 -128.35 2299.23
 -126.64 2299.16 -125.85 2299.13 -125.54 2299.12 -124.72  2299.1 -121.67 2299.05
 -117.73 2298.95 -114.57 2298.86 -109.34  2298.7 -108.35 2298.68    -108 2298.67
 -107.63 2298.66 -107.25 2298.65 -104.95 2298.64 -104.56 2298.64 -102.22 2298.63
 -101.36 2298.62  -97.52 2298.59  -97.03 2298.58  -96.79 2298.58  -96.55 2298.58
  -96.09 2298.58   -93.6 2298.58  -93.22 2298.58  -88.82 2298.57   -88.4 2298.56
  -87.94 2298.56  -86.38 2298.56  -76.97 2298.57  -73.65 2298.58   -72.5 2298.57
  -71.38 2298.57   -66.8 2298.54  -61.75 2298.51  -60.67  2298.5  -60.18 2298.49
  -59.75 2298.49  -59.39 2298.48  -59.07 2298.48  -58.49 2298.46  -58.09 2298.46
   -57.6 2298.45  -43.94 2298.25  -42.36 2298.23  -41.64 2298.21     -41  2298.2
   -40.5 2298.19  -40.07 2298.17  -39.36 2298.15  -36.52     2298  -15.29 2296.58
  -14.28 2296.51   -7.82     2296    -7.4 2295.91    -5.9 2295.62   -4.28 2295.42
    1.79 2295.45    2.74 2295.73    2.78 2295.84    3.45     2296   39.41 2297.68
   46.55     2298   54.44 2298.23   55.65 2298.26   56.27 2298.27   56.92 2298.28
   57.58 2298.29   58.27  2298.3   60.41 2298.33   72.74 2298.44   78.44 2298.47
   89.19 2298.59   93.17 2298.64   97.11 2298.67  102.42  2298.7  109.55 2298.76
  119.25 2298.84  126.17 2298.89  126.97  2298.9  127.36  2298.9  127.58  2298.9
   127.8  2298.9  128.16  2298.9  128.51  2298.9   129.2 2298.89  135.79  2298.8
  137.85 2298.78  139.63 2298.79  148.44 2298.73  149.48 2298.73  151.36 2298.71
  159.71 2298.62   162.9 2298.63  167.51 2298.64   176.4 2298.56  177.04 2298.56
  183.49 2298.52  186.62 2298.52  190.62 2298.51  201.19 2298.48  202.89 2298.47
  213.14 2298.43  215.18 2298.42  216.36 2298.42  216.93 2298.42  220.05 2298.42
  220.62 2298.42  221.19 2298.42  224.32 2298.44  224.92 2298.44  225.52 2298.45
  228.38 2298.47  237.48 2298.59  239.49 2298.61  243.72 2298.63  252.84 2298.75
  256.87 2298.79  257.34  2298.8  263.85 2298.84  268.36 2298.88  269.36 2298.89
  271.25 2298.92  282.06 2299.04  283.01 2299.05  283.92 2299.07  290.67 2299.14
   297.5 2299.28     300  2299.3

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    -300    .044 -134.37    .044  126.97    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -134.37  126.97               80      80      80             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 8860.*

INPUT
Description: Sta 88+60
Station Elevation Data    num=     422
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2299.29 -294.77 2299.07 -286.67 2298.87 -279.21  2298.6 -277.82 2298.57
 -277.16 2298.57 -276.54 2298.55 -273.51 2298.51 -272.96  2298.5 -272.33 2298.49
```

-272.15 2298.49 -271.89 2298.49 -271.63 2298.49 -271.48 2298.48 -270.87 2298.47
-270.85 2298.47 -269.05 2298.45 -268.5 2298.45 -268.08 2298.44 -265.49 2298.41
-265.04 2298.4 -264.1 2298.39 -263.44 2298.38 -262.03 2298.36 -256.7 2298.28
-256.48 2298.28 -256.45 2298.28 -256.42 2298.28 -256.25 2298.27 -246.51 2297.97
-239.89 2297.79 -239.02 2297.78 -235.39 2297.69 -234.09 2297.67 -232.46 2297.65
-225.32 2297.57 -224.42 2297.56 -223.98 2297.56 -223.57 2297.55 -222.85 2297.55
-222.42 2297.55 -220.83 2297.56 -220.47 2297.57 -220.11 2297.57 -220.01 2297.57
-219.73 2297.57 -219.33 2297.56 -218.92 2297.56 -218.49 2297.55 -217.66 2297.54
-216.85 2297.52 -216.16 2297.51 -213.42 2297.45 -213.21 2297.44 -213.05 2297.43
-212.96 2297.43 -212.93 2297.43 -212.74 2297.41 -212.56 2297.41 -212.35 2297.4
-211.87 2297.39 -211.6 2297.39 -211.14 2297.38 -210.64 2297.37 -209.01 2297.34
-208.58 2297.33 -208.16 2297.33 -207.71 2297.32 -207.26 2297.32 -206.77 2297.31
-206.28 2297.31 -206.13 2297.31 -205.48 2297.3 -205.24 2297.3 -202.54 2297.3
-201.99 2297.29 -201.46 2297.29 -200.91 2297.29 -199.97 2297.28 -199.35 2297.28
-199.28 2297.28 -194.67 2297.3 -194.12 2297.31 -193.19 2297.31 -192.76 2297.32
-192.37 2297.32 -192.02 2297.32 -189.86 2297.31 -189.57 2297.31 -189.28 2297.31
-188.96 2297.32 -188.61 2297.32 -188.23 2297.32 -187.84 2297.32 -187.04 2297.33
-186.97 2297.34 -186.78 2297.34 -184.82 2297.41 -184.4 2297.42 -184.1 2297.44
-183.98 2297.45 -183.74 2297.46 -183.55 2297.49 -183.12 2297.55 -182.83 2297.59
-182.28 2297.66 -181.99 2297.68 -181.61 2297.69 -178.48 2297.79 -177.91 2297.81
-177.48 2297.82 -176.72 2297.84 -176.32 2297.85 -175.91 2297.87 -174.62 2297.91
-166.25 2298.19 -165.9 2298.2 -165.57 2298.21 -164.96 2298.24 -163.82 2298.29
-163.09 2298.32 -162.78 2298.33 -161.41 2298.41 -161.24 2298.41 -161.16 2298.42
-161.08 2298.42 -160.92 2298.43 -160.8 2298.43 -160.5 2298.44 -156.65 2298.29
-156.26 2298.27 -153.87 2298.32 -153.73 2298.32 -153.59 2298.32 -153.45 2298.33
-153.32 2298.33 -153.07 2298.33 -152.78 2298.33 -151.55 2298.35 -146.39 2298.41
-141.83 2298.46 -141.59 2298.47 -141.37 2298.47 -141.13 2298.47 -140.91 2298.48
-140.47 2298.48 -139.7 2298.5 -137.12 2298.54 -134.3 2298.6 -132.3 2298.63
-132.11 2298.64 -132.05 2298.64 -132.02 2298.64 -132.01 2298.64 -125.85 2298.71
-124.89 2298.71 -121.08 2298.65 -120.33 2298.63 -120.3 2298.62 -120.22 2298.62
-120.09 2298.62 -119.78 2298.62 -119.64 2298.62 -119.48 2298.61 -119.34 2298.61
-119 2298.6 -118.53 2298.59 -116.72 2298.54 -115.88 2298.52 -115.55 2298.51
-114.69 2298.49 -111.46 2298.43 -107.3 2298.34 -103.96 2298.27 -98.43 2298.13
-97.38 2298.11 -97.01 2298.11 -96.62 2298.1 -96.22 2298.09 -95.3 2298.08
-95.11 2298.08 -93.85 2298.09 -93.79 2298.09 -93.37 2298.1 -90.9 2298.13
-89.99 2298.14 -89.8 2298.14 -89.23 2298.14 -88.51 2298.14 -87.51 2298.12
-87.22 2298.11 -86.87 2298.1 -85.93 2298.07 -85.69 2298.06 -85.41 2298.06
-85.16 2298.06 -84.91 2298.06 -84.42 2298.07 -81.79 2298.07 -81.38 2298.08
-79.91 2298.08 -78.08 2298.09 -77.65 2298.09 -77.27 2298.09 -76.98 2298.1
-76.81 2298.1 -76.73 2298.11 -76.62 2298.11 -76.38 2298.1 -76.29 2298.1
-76.09 2298.11 -75.83 2298.11 -75.8 2298.11 -75.59 2298.12 -75.42 2298.13
-74.8 2298.18 -74.58 2298.19 -74.15 2298.2 -71.38 2298.29 -71.11 2298.3
-68.06 2298.3 -64.2 2298.3 -61.36 2298.31 -60.69 2298.23 -59.48 2298.08
-58.29 2297.94 -57.22 2297.87 -55.7 2297.77 -55.08 2297.73 -54.49 2297.69
-52.4 2297.54 -51.55 2297.48 -50.79 2297.42 -50.45 2297.4 -50.14 2297.37
-49.89 2297.35 -49.67 2297.34 -49.47 2297.32 -49.26 2297.3 -48.98 2297.28
-48.64 2297.25 -46.48 2297.06 -42.77 2296.72 -39.06 2296.36 -37.96 2296.26
-37.93 2296.26 -37.45 2296.21 -37 2296.16 -36.65 2296.13 -36.35 2296.09
-35.85 2296.04 -33.86 2295.8 -28.9 2295.14 -26.64 2294.83 -22.17 2294.38
-18.99 2294.05 -18.28 2293.98 -18.24 2293.97 -17.19 2293.84 -16.82 2293.79
-15.68 2293.6 -15.2 2293.53 -13.75 2293.37 -13.56 2293.33 -13.46 2293.31
-12.41 2293.1 -11.54 2292.96 -11.27 2292.93 -8.29 2293 -7.05 2293.04
-7.04 2293.06 -6.38 2293.22 -6.35 2293.28 -5.88 2293.38 19.18 2294.88
24.16 2295.17 27.01 2295.3 29.65 2295.42 30.5 2295.46 30.93 2295.47
31.38 2295.49 31.84 2295.51 32.32 2295.52 33.82 2295.58 40.31 2295.77
42.41 2295.8 46.38 2295.84 53.87 2295.94 56.65 2295.98 59.39 2296.01
63.1 2296.04 68.06 2296.1 74.83 2296.17 79.65 2296.23 80.66 2296.2
81.16 2296.19 81.44 2296.18 81.71 2296.17 82.17 2296.16 82.61 2296.15
83.49 2296.12 91.84 2295.85 94.45 2295.77 96.71 2295.71 98.85 2295.65
107.88 2295.74 108.86 2295.76 109.2 2295.76 110.04 2295.77 111.58 2295.8
119.01 2295.92 120.34 2295.94 120.36 2295.94 121.02 2295.95 122.16 2295.97
126.21 2296.07 132.05 2296.22 136.07 2296.3 136.31 2296.3 136.67 2296.29
137.12 2296.29 137.93 2296.28 138.12 2296.28 140.42 2296.28 140.51 2296.27
141.96 2296.27 142.06 2296.27 142.56 2296.27 142.66 2296.27 143.15 2296.26
143.32 2296.26 143.69 2296.26 143.79 2296.26 143.9 2296.26 144.13 2296.26
145.52 2296.25 145.63 2296.25 145.74 2296.25 148.91 2296.21 149.04 2296.21
152.31 2296.18 156.28 2296.16 157.78 2296.15 158.51 2296.14 158.94 2296.14
159.84 2296.14 161.35 2296.14 167.55 2296.13 167.7 2296.13 167.86 2296.13
174.75 2296.13 176.08 2296.12 176.24 2296.12 176.57 2296.12 176.89 2296.13
182.15 2296.1 189.64 2296.07 189.89 2296.07 190.48 2296.07 191.27 2296.07
192.09 2296.07 192.48 2296.07 192.5 2296.07 192.92 2296.07 193.33 2296.07
193.76 2296.07 193.98 2296.07 194.65 2296.08 194.7 2296.08 198.65 2296.12
199.38 2296.12 200.1 2296.13 204.07 2296.17 204.27 2296.18 204.83 2296.18
205.59 2296.19 209.21 2296.24 220.75 2296.4 222.48 2296.42 222.9 2296.43
223.07 2296.43 223.3 2296.43 223.34 2296.43 223.4 2296.43 223.43 2296.43
223.45 2296.43 223.47 2296.43 223.53 2296.43 223.56 2296.43 223.58 2296.43
223.64 2296.43 223.66 2296.43 223.71 2296.43 223.76 2296.43 226.03 2296.46
228.66 2296.5 238.03 2296.66 240.22 2296.7 243.62 2296.74 245.33 2296.78
245.54 2296.79 245.92 2296.79 254.18 2296.9 257.39 2296.95 258.16 2296.96
259.89 2296.99 261.16 2297.01 263.56 2297.05 266.78 2297.1 269.81 2297.16
273.81 2297.22 277.26 2297.28 278.46 2297.31 279.62 2297.34 281.44 2297.37

```
  285.64 2297.43  288.17 2297.48  296.83  2297.7  298.21 2297.73  298.55 2297.73
  299.91 2297.76     300 2297.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .044   -64.2    .044   79.65    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -64.2   79.65              160     160     160              .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 8700

INPUT
Description: Sta 87+00.00
Station Elevation Data    num=     186
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300 2296.76 -270.43     2296 -270.15     2296 -269.72     2296 -269.07     2296
 -266.55     2296 -266.11     2296 -263.35     2296 -262.88     2296 -261.88     2296
 -259.68     2296 -254.02     2296 -253.79     2296 -253.76     2296 -253.72     2296
 -253.54     2296 -253.54 2295.99 -231.39 2295.27 -230.01 2295.27  -220.7 2295.26
 -219.74 2295.26 -219.28 2295.26 -218.84 2295.26 -218.08 2295.27 -215.93  2295.3
 -215.55 2295.31 -215.17 2295.31 -214.76 2295.31 -214.34 2295.31  -213.9  2295.3
 -213.45  2295.3 -212.57 2295.29 -211.71 2295.27 -210.97 2295.26 -208.06 2295.19
 -207.84 2295.18 -207.67 2295.17 -207.57 2295.17 -207.54 2295.16 -207.34 2295.13
 -207.15 2295.12 -206.93 2295.12 -206.42 2295.11 -206.13  2295.1 -205.11 2295.08
 -200.32 2295.02 -199.63 2295.01 -193.78 2294.98 -193.12 2294.98 -180.05 2295.24
 -180.04 2295.24 -179.98 2295.25 -179.77 2295.27 -177.24 2295.44 -176.93 2295.47
 -176.55 2295.52    -175 2295.95 -174.69     2296 -170.96 2296.27 -170.36 2296.31
 -170.35 2296.31 -155.39 2297.35 -154.62 2297.41 -154.29 2297.43 -152.84 2297.58
 -152.66 2297.59 -152.57  2297.6 -152.48  2297.6 -152.19 2297.62 -151.87 2297.64
 -147.37 2297.22 -115.07     2298  -82.63 2297.43  -82.43 2297.44   -81.1 2297.46
  -76.79 2297.59  -76.19  2297.6  -75.42 2297.61  -74.36 2297.57  -74.05 2297.55
  -73.68 2297.54  -72.43 2297.47  -66.29 2297.51  -64.35 2297.53  -63.89 2297.54
  -63.49 2297.55  -63.18 2297.56     -63 2297.57  -62.99 2297.58   -62.8 2297.58
  -62.54 2297.58  -62.24 2297.59  -61.96  2297.6  -61.71 2297.61  -61.52 2297.64
  -60.87 2297.74  -60.63 2297.77  -57.24 2297.97  -56.95     2298  -53.71     2298
  -46.59     2298  -43.34 2297.22  -42.79 2297.09  -42.01 2296.89  -41.39 2296.73
  -40.32 2296.43  -36.51 2296.11  -24.51 2290.11  -19.26 2290.11  -14.01 2290.11
   -6.01 2294.11   96.81 2293.65   97.26 2293.65   97.82 2293.64   98.82 2293.64
   99.06 2293.64  101.91 2293.65  102.03 2293.64  103.83 2293.64  103.95 2293.64
  104.57 2293.64  104.69 2293.64  105.31 2293.63  105.97 2293.63   106.1 2293.63
  106.24 2293.63  108.24 2293.61  108.38 2293.61  108.52 2293.61  112.46 2293.56
  112.61 2293.56  123.47 2293.44  124.37 2293.43  124.91 2293.43  126.02 2293.43
  135.59 2293.43  135.78 2293.43  135.98 2293.43  146.18 2293.44  146.38 2293.44
  146.79 2293.44  147.19 2293.45  153.71 2293.42  163.01 2293.38  164.05 2293.38
  165.04 2293.38  166.05 2293.38  166.56 2293.38  167.08 2293.38  167.59 2293.39
  168.13 2293.39  169.23 2293.41  181.17 2293.59  203.77 2293.93   204.3 2293.94
  204.51 2293.94  204.84 2293.94  204.92 2293.94  204.96 2293.94  204.98 2293.94
  205.01 2293.94  205.08 2293.94  205.09 2293.94  205.11 2293.94  205.12 2293.94
  205.14 2293.94  205.21 2293.94  205.22 2293.94  205.24 2293.94   205.3 2293.94
  205.37 2293.94  208.18     2294  223.08  2294.3  230.02 2294.42   232.4 2294.49
  247.11 2294.76  248.06 2294.79  258.77 2294.99  262.52 2295.08  267.49 2295.17
  276.96 2295.41  282.17  2295.5  297.78 2295.95   298.2 2295.95  299.89     2296
     300     2296

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015   -43.34    .015   -6.01    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -43.34   -6.01              300     300     300              .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 8400

INPUT
Description: Sta 84+00.00
Station Elevation Data    num=     141
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300   2291.5 -253.63     2290  -242.3 2288.81 -236.99 2288.32 -235.28 2288.15
  -233.7     2288  -233.5 2287.97 -233.32 2287.94 -232.76 2287.79  -232.6 2287.77
 -232.03   2287.7 -231.93 2287.69 -228.37 2287.56 -228.16 2287.56 -227.88 2287.55
 -227.56 2287.54 -227.21 2287.53 -225.41 2287.44 -219.54 2287.13 -216.55 2286.98
  -216.3 2286.97 -216.16 2286.97 -216.02 2286.96 -215.89 2286.96 -215.75 2286.96
```

```
-215.61 2286.97 -215.48 2286.97 -215.28 2286.98 -211.28 2287.19 -204.55  2287.5
-203.55 2287.54 -203.25 2287.55    -203 2287.55  -202.8 2287.55 -202.67 2287.55
-202.62 2287.53 -195.82  2287.6 -188.58    2288 -182.44 2289.15 -181.91 2289.25
-180.33 2289.53  -177.4    2290  -176.1 2290.07 -173.95 2290.17 -168.23  2290.4
-167.14 2290.43 -164.99 2290.49 -161.57 2290.58 -159.99 2290.64 -159.39 2290.66
-158.79 2290.69 -157.21  2290.8    -157 2290.81 -156.78 2290.82 -156.54 2290.83
-156.37 2290.83 -156.19 2290.84 -155.87 2290.84 -155.52 2290.84 -155.14 2290.84
 -153.9 2290.83 -145.27 2290.73 -144.27 2290.67 -144.07 2290.66 -144.01 2290.65
-119.65 2290.81 -116.11 2291.85 -115.41 2291.83 -114.28    2292 -113.29    2292
 -97.82    2292  -97.66 2291.99  -97.09 2291.98  -96.52 2291.98  -96.03    2292
 -95.94    2292  -95.93    2292  -95.59    2292  -95.57    2292  -95.03    2292
 -78.46    2292  -77.65    2292   -73.7    2292  -68.16    2292  -67.48    2292
 -66.86    2292  -66.78    2292  -66.56    2292   -66.5    2292  -66.31    2292
 -66.29    2292  -66.24    2292  -65.84 2291.97  -65.24 2291.91  -64.59 2291.84
 -63.83 2291.82  -62.95 2291.73  -62.17 2291.65  -60.99 2291.61  -60.29 2291.59
  -59.6 2291.56  -59.33 2291.54  -59.03 2291.53  -58.69 2291.51   -58.3 2291.49
 -57.85 2291.46  -56.52 2291.38  -16.33    2290   -.33    2282   4.92    2282
  10.17    2282   16.17    2290   36.81    2292   56.87 2291.18   86.55    2290
  89.89    2290  100.14    2290  110.32 2290.32  113.98 2290.42  115.61 2290.47
 117.12 2290.51  118.52 2290.55  121.07 2290.61  135.82 2290.94  139.12 2291.07
 146.53 2291.24  165.84    2292  165.89    2292  165.95    2292  192.67 2292.33
 196.03 2292.37  199.06  2292.4  201.71 2292.43  204.11 2292.46  206.32 2292.48
 210.34 2292.52  233.32 2292.74  241.15  2292.8  258.86 2292.93  263.12    2293
    300 2293.49

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -66.78    .015   36.81    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -66.78   36.81              200     200     200             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                 RS: 8200.*

INPUT
Description: Sta 82+00
Station Elevation Data      num=      309
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2288.01 -299.49    2288 -298.75 2287.98 -295.57 2287.92 -284.88 2287.69
 -281.55 2287.43 -280.76 2287.44 -280.74 2287.44  -280.3 2287.44 -280.18 2287.44
 -280.08 2287.45 -280.04 2287.45 -280.02 2287.45    -280 2287.45 -270.08 2287.23
 -269.82 2287.22  -269.5  2287.2 -268.33 2287.17 -248.39 2286.49 -235.78 2285.78
 -229.87 2285.48 -228.69 2285.41 -228.38  2285.4 -228.36 2285.39 -227.97 2285.38
 -226.21 2285.33 -225.99 2285.32 -225.79 2285.31 -225.51 2285.29 -225.16 2285.29
 -224.99 2285.29 -224.35 2285.31 -224.24 2285.31 -220.28 2285.52 -220.04 2285.53
 -219.73 2285.55 -219.38 2285.57 -218.99 2285.59 -216.98 2285.69 -216.01 2285.73
 -212.32 2285.82 -211.47 2285.85 -210.45 2285.87 -210.35 2285.88 -209.03 2285.92
 -207.12 2285.99 -206.84    2286 -206.69 2286.01 -206.53 2286.01 -206.39 2286.02
 -206.23 2286.03 -206.08 2286.04 -205.93 2286.04 -205.71 2286.06 -205.55 2286.07
 -201.26 2286.35 -200.41 2286.41  -198.8 2286.43 -197.88 2286.44 -197.78 2286.44
 -193.77  2286.5 -192.65 2286.51 -192.32 2286.52 -192.04 2286.52 -191.82 2286.52
 -191.67 2286.52 -191.62 2286.51 -184.05 2286.53 -182.68 2286.56 -179.69 2286.61
 -179.02 2286.62 -175.99 2286.67 -169.16 2287.05 -168.57 2287.08 -166.81 2287.18
 -163.55 2287.33  -162.1 2287.36 -159.71 2287.39 -153.34 2287.47 -152.13 2287.48
 -149.74  2287.5 -145.93 2287.53 -144.17 2287.55 -143.51 2287.55 -142.84 2287.56
 -141.08  2287.6 -140.85  2287.6  -140.6 2287.61 -140.33 2287.61 -140.14 2287.61
 -139.94 2287.61 -139.59 2287.61  -139.2 2287.61 -138.78 2287.61  -137.4 2287.61
 -127.79 2287.58 -126.68 2287.56 -126.45 2287.55 -126.39 2287.55  -99.28  2287.6
  -95.34 2287.95  -94.56 2287.94   -93.3    2288   -92.2    2288  -74.98    2288
   -74.8    2288  -74.17 2287.99  -73.53 2287.99  -72.99    2288  -72.89    2288
  -72.88    2288   -72.5    2288  -72.48    2288  -71.87    2288  -69.77    2288
  -66.86    2288  -59.24    2288   -58.1    2288  -56.34    2288  -53.43    2288
  -52.53    2288  -52.24    2288  -52.07    2288  -50.71    2288  -50.56    2288
  -50.31    2288  -48.14    2288  -47.12    2288  -46.98    2288  -46.58    2288
  -41.97    2288  -41.21    2288  -40.52    2288  -40.43    2288  -40.35    2288
  -40.33    2288  -40.26    2288  -40.23    2288  -40.08 2287.98  -39.85 2287.95
   -39.6 2287.91  -39.32 2287.89  -38.98 2287.84  -38.69  2287.8  -38.24 2287.77
  -37.97 2287.75  -37.71 2287.72  -37.61 2287.71   -37.5  2287.7  -37.37 2287.69
  -37.22 2287.68  -37.05 2287.66  -36.55 2287.61  -28.44 2286.75   -26.8 2286.34
  -26.72 2286.32  -26.58 2286.29  -20.11 2284.76  -15.13  2283.7  -13.79 2283.42
  -13.74  2283.4   -13.4 2283.34  -13.38    2279  -13.29    2279  -13.17    2279
    1.58    2279    3.34    2279    4.55    2279   42.82    2279   46.08    2279
   47.99    2279    50.9    2279   51.73    2279   51.97    2279   52.24    2279
   52.31    2279   60.46    2279   60.75    2279   60.84    2279   61.26 2283.44
   62.47 2283.75   63.03 2283.89   63.74 2284.06   68.89 2285.35   70.75 2285.81
   71.36 2285.95   72.01 2286.11   72.57 2286.24   73.16 2286.38   73.77 2286.51
    74.6  2286.7   75.46 2286.89   76.32 2287.08   76.77 2287.07   77.22 2287.06
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 77.68 | 2287.04 | 78.14 | 2287.02 | 78.6 | 2287 | 80.1 | 2286.93 | 84.92 | 2286.63 |
| 86.48 | 2286.53 | 87.13 | 2286.49 | 88.16 | 2286.48 | 88.55 | 2286.47 | 90.44 | 2286.44 |
| 91.34 | 2286.43 | 92.59 | 2286.41 | 93.37 | 2286.39 | 95.31 | 2286.36 | 95.36 | 2286.36 |
| 95.81 | 2286.37 | 96.42 | 2286.38 | 96.43 | 2286.38 | 100.32 | 2286.47 | 101.24 | 2286.49 |
| 101.72 | 2286.49 | 102.19 | 2286.5 | 102.69 | 2286.49 | 103.34 | 2286.5 | 104.25 | 2286.49 |
| 108.55 | 2286.45 | 117.09 | 2286.35 | 117.19 | 2286.35 | 117.32 | 2286.35 | 118.41 | 2286.34 |
| 118.56 | 2286.33 | 118.59 | 2286.33 | 121.17 | 2286.27 | 121.27 | 2286.26 | 121.34 | 2286.26 |
| 121.39 | 2286.25 | 121.43 | 2286.25 | 121.46 | 2286.25 | 121.49 | 2286.25 | 121.51 | 2286.25 |
| 128.01 | 2286.23 | 130.14 | 2286.28 | 130.7 | 2286.3 | 133.83 | 2286.41 | 134.08 | 2286.42 |
| 134.32 | 2286.42 | 134.53 | 2286.43 | 134.95 | 2286.45 | 135.1 | 2286.45 | 135.26 | 2286.46 |
| 138.79 | 2286.54 | 141.9 | 2286.61 | 143.29 | 2286.64 | 144.57 | 2286.66 | 145.76 | 2286.69 |
| 146.58 | 2286.7 | 146.81 | 2286.71 | 147.11 | 2286.72 | 147.93 | 2286.74 | 152.43 | 2286.84 |
| 152.77 | 2286.85 | 153.81 | 2286.87 | 154.29 | 2286.89 | 160.06 | 2286.98 | 160.46 | 2286.99 |
| 163.27 | 2287.05 | 169.57 | 2287.16 | 170.59 | 2287.18 | 183.2 | 2287.44 | 184.5 | 2287.47 |
| 185.09 | 2287.49 | 185.7 | 2287.5 | 185.98 | 2287.51 | 186.02 | 2287.51 | 186.07 | 2287.51 |
| 186.32 | 2287.51 | 186.97 | 2287.52 | 187.56 | 2287.53 | 188.19 | 2287.55 | 188.98 | 2287.57 |
| 189.81 | 2287.58 | 190.69 | 2287.6 | 192.51 | 2287.65 | 194.33 | 2287.7 | 208.78 | 2288.1 |
| 209.11 | 2288.11 | 211.64 | 2288.22 | 214.21 | 2288.32 | 216.46 | 2288.41 | 218.5 | 2288.5 |
| 220.38 | 2288.57 | 223.8 | 2288.71 | 230.22 | 2288.97 | 231.07 | 2289.01 | 232.16 | 2289.06 |
| 233.42 | 2289.11 | 234.51 | 2289.15 | 235.87 | 2289.21 | 236.66 | 2289.24 | 236.97 | 2289.26 |
| 237.24 | 2289.27 | 243.33 | 2289.48 | 246.51 | 2289.59 | 248.59 | 2289.6 | 249.98 | 2289.6 |
| 251.88 | 2289.61 | 256.75 | 2289.62 | 257.39 | 2289.62 | 257.54 | 2289.62 | 257.64 | 2289.62 |
| 265.04 | 2289.64 | 268.66 | 2289.67 | 276.02 | 2289.71 | 300 | 2289.83 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -40.43 | .015 | 60.84 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -40.43 | 60.84 | 100 | 100 | 100 | .1 | .3 |

BRIDGE

RIVER: Duck Creek
REACH: East RS: 8150

INPUT
Description:
Distance from Upstream XS = 2
Deck/Roadway Width = 96
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 27

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -20 | 2284 | 2283.5 | -20 | 2284 | 2279 | 5 | 2284 | 2279 |
| 7 | 2284 | 2281.15 | 9 | 2284 | 2282.33 | 11.5 | 2284 | 2282.84 |
| 12.75 | 2284 | 2282.96 | 14 | 2284 | 2283 | 15.25 | 2284 | 2282.96 |
| 16.5 | 2284 | 2282.84 | 19 | 2284 | 2282.33 | 21 | 2284 | 2281.15 |
| 23 | 2284 | 2279 | 24 | 2284 | 2279 | 25 | 2284 | 2279 |
| 27 | 2284 | 2281.15 | 29 | 2284 | 2282.33 | 31.5 | 2284 | 2282.84 |
| 32.75 | 2284 | 2282.96 | 34 | 2284 | 2283 | 35.25 | 2284 | 2282.96 |
| 36.5 | 2284 | 2282.84 | 39 | 2284 | 2282.33 | 41 | 2284 | 2281.15 |
| 43 | 2284 | 2279 | 65 | 2284 | 2279 | 65 | 2284 | 2283.5 |

Upstream Bridge Cross Section Data
Station Elevation Data num= 309

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2288.01 | -299.49 | 2288 | -298.75 | 2287.98 | -295.57 | 2287.92 | -284.88 | 2287.69 |
| -281.55 | 2287.43 | -280.76 | 2287.44 | -280.74 | 2287.44 | -280.3 | 2287.44 | -280.18 | 2287.44 |
| -280.08 | 2287.45 | -280.04 | 2287.45 | -280.02 | 2287.45 | -280 | 2287.45 | -270.08 | 2287.23 |
| -269.82 | 2287.22 | -269.5 | 2287.2 | -268.33 | 2287.17 | -248.39 | 2286.49 | -235.78 | 2285.78 |
| -229.87 | 2285.48 | -228.69 | 2285.41 | -228.38 | 2285.4 | -228.36 | 2285.39 | -227.97 | 2285.38 |
| -226.21 | 2285.33 | -225.99 | 2285.32 | -225.79 | 2285.31 | -225.51 | 2285.29 | -225.16 | 2285.29 |
| -224.99 | 2285.29 | -224.35 | 2285.31 | -224.24 | 2285.31 | -220.28 | 2285.52 | -220.04 | 2285.53 |
| -219.73 | 2285.55 | -219.38 | 2285.57 | -218.99 | 2285.59 | -216.98 | 2285.69 | -216.01 | 2285.73 |
| -212.32 | 2285.82 | -211.47 | 2285.85 | -210.45 | 2285.87 | -210.35 | 2285.88 | -209.03 | 2285.92 |
| -207.12 | 2285.99 | -206.84 | 2286 | -206.69 | 2286.01 | -206.53 | 2286.01 | -206.39 | 2286.02 |
| -206.23 | 2286.03 | -206.08 | 2286.04 | -205.93 | 2286.04 | -205.71 | 2286.06 | -205.55 | 2286.07 |
| -201.26 | 2286.35 | -200.41 | 2286.41 | -198.8 | 2286.43 | -197.88 | 2286.44 | -197.78 | 2286.44 |
| -193.77 | 2286.5 | -192.65 | 2286.51 | -192.32 | 2286.52 | -192.04 | 2286.52 | -191.82 | 2286.52 |
| -191.67 | 2286.52 | -191.62 | 2286.51 | -184.05 | 2286.53 | -182.68 | 2286.56 | -179.69 | 2286.61 |
| -179.02 | 2286.62 | -175.99 | 2286.67 | -169.16 | 2287.05 | -168.57 | 2287.08 | -166.81 | 2287.18 |
| -163.55 | 2287.33 | -162.1 | 2287.36 | -159.71 | 2287.39 | -153.34 | 2287.47 | -152.13 | 2287.48 |
| -149.74 | 2287.5 | -145.93 | 2287.53 | -144.17 | 2287.55 | -143.51 | 2287.55 | -142.84 | 2287.56 |
| -141.08 | 2287.6 | -140.85 | 2287.6 | -140.6 | 2287.61 | -140.33 | 2287.61 | -140.14 | 2287.61 |
| -139.94 | 2287.61 | -139.59 | 2287.61 | -139.2 | 2287.61 | -138.78 | 2287.61 | -137.4 | 2287.61 |
| -127.79 | 2287.58 | -126.68 | 2287.56 | -126.45 | 2287.55 | -126.39 | 2287.55 | -99.28 | 2287.6 |
| -95.34 | 2287.95 | -94.56 | 2287.94 | -93.3 | 2288 | -92.2 | 2288 | -74.98 | 2288 |
| -74.8 | 2288 | -74.17 | 2287.99 | -73.53 | 2287.99 | -72.99 | 2288 | -72.89 | 2288 |
| -72.88 | 2288 | -72.5 | 2288 | -72.48 | 2288 | -71.87 | 2288 | -69.77 | 2288 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -66.86 | 2288 | -59.24 | 2288 | -58.1 | 2288 | -56.34 | 2288 | -53.43 | 2288 |
| -52.53 | 2288 | -52.24 | 2288 | -52.07 | 2288 | -50.71 | 2288 | -50.56 | 2288 |
| -50.31 | 2288 | -48.14 | 2288 | -47.12 | 2288 | -46.98 | 2288 | -46.58 | 2288 |
| -41.97 | 2288 | -41.21 | 2288 | -40.52 | 2288 | -40.43 | 2288 | -40.35 | 2288 |
| -40.33 | 2288 | -40.26 | 2288 | -40.23 | 2288 | -40.08 | 2287.98 | -39.85 | 2287.95 |
| -39.6 | 2287.91 | -39.32 | 2287.89 | -38.98 | 2287.84 | -38.69 | 2287.8 | -38.24 | 2287.77 |
| -37.97 | 2287.75 | -37.71 | 2287.72 | -37.61 | 2287.71 | -37.5 | 2287.7 | -37.37 | 2287.69 |
| -37.22 | 2287.68 | -37.05 | 2287.66 | -36.55 | 2287.61 | -28.44 | 2286.75 | -26.8 | 2286.34 |
| -26.72 | 2286.32 | -26.58 | 2286.29 | -20.11 | 2284.76 | -15.13 | 2283.7 | -13.79 | 2283.42 |
| -13.74 | 2283.4 | -13.4 | 2283.34 | -13.38 | 2279 | -13.29 | 2279 | -13.17 | 2279 |
| 1.58 | 2279 | 3.34 | 2279 | 4.55 | 2279 | 42.82 | 2279 | 46.08 | 2279 |
| 47.99 | 2279 | 50.9 | 2279 | 51.73 | 2279 | 51.97 | 2279 | 52.24 | 2279 |
| 52.31 | 2279 | 60.46 | 2279 | 60.75 | 2279 | 60.84 | 2279 | 61.26 | 2283.44 |
| 62.47 | 2283.75 | 63.03 | 2283.89 | 63.74 | 2284.06 | 68.89 | 2285.35 | 70.75 | 2285.81 |
| 71.36 | 2285.95 | 72.01 | 2286.11 | 72.57 | 2286.24 | 73.16 | 2286.38 | 73.77 | 2286.51 |
| 74.6 | 2286.7 | 75.46 | 2286.89 | 76.32 | 2287.08 | 76.77 | 2287.07 | 77.22 | 2287.06 |
| 77.68 | 2287.04 | 78.14 | 2287.02 | 78.6 | 2287 | 80.1 | 2286.93 | 84.92 | 2286.63 |
| 86.48 | 2286.53 | 87.13 | 2286.49 | 88.16 | 2286.48 | 88.55 | 2286.47 | 90.44 | 2286.44 |
| 91.34 | 2286.43 | 92.59 | 2286.41 | 93.37 | 2286.39 | 95.31 | 2286.36 | 95.36 | 2286.36 |
| 95.81 | 2286.37 | 96.42 | 2286.38 | 96.43 | 2286.38 | 100.32 | 2286.47 | 101.24 | 2286.49 |
| 101.72 | 2286.49 | 102.19 | 2286.5 | 102.69 | 2286.49 | 103.34 | 2286.5 | 104.25 | 2286.49 |
| 108.55 | 2286.45 | 117.09 | 2286.35 | 117.19 | 2286.35 | 117.32 | 2286.35 | 118.41 | 2286.34 |
| 118.56 | 2286.33 | 118.59 | 2286.33 | 121.17 | 2286.27 | 121.27 | 2286.26 | 121.34 | 2286.26 |
| 121.39 | 2286.25 | 121.43 | 2286.25 | 121.46 | 2286.25 | 121.49 | 2286.25 | 121.51 | 2286.25 |
| 128.01 | 2286.23 | 130.14 | 2286.28 | 130.7 | 2286.3 | 133.83 | 2286.41 | 134.08 | 2286.42 |
| 134.32 | 2286.42 | 134.53 | 2286.43 | 134.95 | 2286.45 | 135.1 | 2286.45 | 135.26 | 2286.46 |
| 138.79 | 2286.54 | 141.9 | 2286.61 | 143.29 | 2286.64 | 144.57 | 2286.66 | 145.76 | 2286.69 |
| 146.58 | 2286.7 | 146.81 | 2286.71 | 147.11 | 2286.72 | 147.93 | 2286.74 | 152.43 | 2286.84 |
| 152.77 | 2286.85 | 153.81 | 2286.87 | 154.29 | 2286.89 | 160.06 | 2286.98 | 160.46 | 2286.99 |
| 163.27 | 2287.05 | 169.57 | 2287.16 | 170.59 | 2287.18 | 183.2 | 2287.44 | 184.5 | 2287.47 |
| 185.09 | 2287.49 | 185.7 | 2287.5 | 185.98 | 2287.51 | 186.02 | 2287.51 | 186.07 | 2287.51 |
| 186.32 | 2287.51 | 186.97 | 2287.52 | 187.56 | 2287.53 | 188.19 | 2287.55 | 188.98 | 2287.57 |
| 189.81 | 2287.58 | 190.69 | 2287.6 | 192.51 | 2287.65 | 194.33 | 2287.7 | 208.78 | 2288.1 |
| 209.11 | 2288.11 | 211.64 | 2288.22 | 214.21 | 2288.32 | 216.46 | 2288.41 | 218.5 | 2288.5 |
| 220.38 | 2288.57 | 223.8 | 2288.71 | 230.22 | 2288.97 | 231.07 | 2289.01 | 232.16 | 2289.06 |
| 233.42 | 2289.11 | 234.51 | 2289.15 | 235.87 | 2289.21 | 236.66 | 2289.24 | 236.97 | 2289.26 |
| 237.24 | 2289.27 | 243.33 | 2289.48 | 246.51 | 2289.59 | 248.59 | 2289.6 | 249.98 | 2289.6 |
| 251.88 | 2289.61 | 256.75 | 2289.62 | 257.39 | 2289.62 | 257.54 | 2289.62 | 257.64 | 2289.62 |
| 265.04 | 2289.64 | 268.66 | 2289.67 | 276.02 | 2289.71 | 300 | 2289.83 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -40.43 | .015 | 60.84 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -40.43 | 60.84 | .1 | .3 |

Downstream Deck/Roadway Coordinates num= 27

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -30 | 2284 | 2283.5 | -30 | 2284 | 2278 | 14 | 2284 | 2278 |
| 16 | 2284 | 2280.15 | 18 | 2284 | 2281.33 | 20.5 | 2284 | 2281.84 |
| 21.75 | 2284 | 2281.96 | 23 | 2284 | 2282 | 24.25 | 2284 | 2281.96 |
| 25.5 | 2284 | 2281.84 | 28 | 2284 | 2281.33 | 30 | 2284 | 2280.15 |
| 32 | 2284 | 2278 | 33 | 2284 | 2278 | 34 | 2284 | 2278 |
| 36 | 2284 | 2280.15 | 38 | 2284 | 2281.33 | 40.5 | 2284 | 2281.84 |
| 41.75 | 2284 | 2281.96 | 43 | 2284 | 2282 | 44.25 | 2284 | 2281.96 |
| 45.5 | 2284 | 2281.84 | 48 | 2284 | 2281.33 | 50 | 2284 | 2280.15 |
| 52 | 2284 | 2278 | 91 | 2284 | 2278 | 91 | 2284 | 2283.5 |

Downstream Bridge Cross Section Data
Station Elevation Data num= 160

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2286.26 | -299.46 | 2286.25 | -298.69 | 2286.24 | -295.34 | 2286.19 | -284.11 | 2286 |
| -280.61 | 2285.66 | -279.78 | 2285.69 | -279.76 | 2285.69 | -279.3 | 2285.7 | -279.17 | 2285.7 |
| -279.07 | 2285.71 | -279.03 | 2285.71 | -279.01 | 2285.72 | -278.99 | 2285.72 | -278.98 | 2285.73 |
| -268.56 | 2285.53 | -268.29 | 2285.52 | -267.95 | 2285.5 | -266.72 | 2285.46 | -225.07 | 2284.01 |
| -224.74 | 2284 | -224.72 | 2284 | -221.73 | 2284 | -211.75 | 2284.9 | -207.87 | 2285.12 |
| -206.98 | 2285.18 | -205.8 | 2285.25 | -204.41 | 2285.35 | -200.76 | 2285.61 | -195.36 | 2286 |
| -193.66 | 2286 | -192.7 | 2286 | -192.59 | 2286 | -176.73 | 2286 | -173.58 | 2286 |
| -172.88 | 2286 | -58.09 | 2286 | -55.03 | 2286 | -47.02 | 2286 | -45.82 | 2286 |
| -43.97 | 2286 | -39.67 | 2286 | -39.49 | 2286 | -38.06 | 2286 | -37.9 | 2286 |
| -37.64 | 2286 | -34.29 | 2286 | -34.14 | 2286 | -33.72 | 2286 | -27.26 | 2286 |
| -27.24 | 2286 | -22.38 | 2278 | -22.24 | 2278 | -22.06 | 2278 | 0 | 2278 |
| 2.63 | 2278 | 4.45 | 2278 | 61.7 | 2278 | 66.58 | 2278 | 69.44 | 2278 |
| 73.79 | 2278 | 75.4 | 2278 | 75.8 | 2278 | 75.9 | 2278 | 88.1 | 2278 |
| 88.53 | 2278 | 88.67 | 2278 | 89.45 | 2284.11 | 92.52 | 2284.44 | 93.41 | 2284.52 |
| 93.7 | 2284.54 | 94.01 | 2284.56 | 94.28 | 2284.57 | 94.56 | 2284.59 | 94.85 | 2284.6 |
| 95.25 | 2284.61 | 95.66 | 2284.61 | 96.07 | 2284.62 | 96.48 | 2284.62 | 96.89 | 2284.61 |
| 97.31 | 2284.6 | 97.73 | 2284.58 | 98.15 | 2284.56 | 99.52 | 2284.48 | 103.91 | 2284.15 |
| 113.84 | 2284.02 | 114.4 | 2284.05 | 114.41 | 2284.05 | 117.95 | 2284.28 | 118.79 | 2284.33 |

```
  119.23 2284.34  119.66 2284.36  120.11 2284.37  120.71 2284.39  121.54  2284.4
  125.46 2284.44  133.24 2284.49  133.33 2284.49  133.45 2284.49  134.45  2284.5
  134.58  2284.5  136.96  2284.4  137.05 2284.39  137.12 2284.39  137.16 2284.38
   137.2 2284.38  137.23 2284.38  137.25 2284.37  137.27 2284.37  137.27 2284.36
   143.2 2284.35  145.65 2284.44   148.5 2284.54  148.73 2284.55  148.95 2284.56
  149.14 2284.57  149.53 2284.59  149.66 2284.59  149.81  2284.6  160.13 2284.77
  160.34 2284.78  160.61 2284.79  165.46 2284.89  165.77  2284.9  166.72 2284.92
  167.16 2284.94  172.42 2285.01  182.02 2285.13  193.51 2285.23   194.7 2285.24
  195.24 2285.25  195.79 2285.26  196.36 2285.27  196.95 2285.28  197.49 2285.29
  198.06 2285.31  198.78 2285.33  199.54 2285.35  200.34 2285.37     202 2285.43
  203.66 2285.49  217.14    2286  236.38 2287.16  237.16 2287.22  238.15 2287.28
   239.3 2287.35  240.29 2287.41  241.53 2287.49  242.25 2287.53  242.54 2287.55
  242.78 2287.57  251.23    2288  253.13    2288  256.13    2288  260.57    2288
  261.15    2288  261.29    2288  261.38    2288  278.14    2288     300    2288

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -27.26    .015   96.07    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -27.26   96.07            .1       .3
Left Levee      Station=  -27.26      Elevation=    2286
Right Levee     Station=   96.07      Elevation= 2284.62

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 8100

INPUT
Description: Sta 81+00.00
Station Elevation Data    num=     160
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2286.26 -299.46 2286.25 -298.69 2286.24 -295.34 2286.19 -284.11    2286
 -280.61 2285.66 -279.78 2285.69 -279.76 2285.69  -279.3  2285.7 -279.17  2285.7
 -279.07 2285.71 -279.03 2285.71 -279.01 2285.72 -278.99 2285.72 -278.98 2285.73
 -268.56 2285.53 -268.29 2285.52 -267.95  2285.5 -266.72 2285.46 -225.07 2284.01
 -224.74    2284 -224.72    2284 -221.73    2284 -211.75  2284.9 -207.87 2285.12
 -206.98 2285.18  -205.8 2285.25 -204.41 2285.35 -200.76 2285.61 -195.36    2286
 -193.66    2286  -192.7    2286 -192.59    2286 -176.73    2286 -173.58    2286
 -172.88    2286  -58.09    2286  -55.03    2286  -47.02    2286  -45.82    2286
  -43.97    2286  -39.67    2286  -39.49    2286  -38.06    2286   -37.9    2286
  -37.64    2286  -34.29    2286  -34.14    2286  -33.72    2286  -27.26    2286
  -27.24    2286  -22.38    2278  -22.24    2278  -22.06    2278       0    2278
    2.63    2278    4.45    2278    61.7    2278   66.58    2278   69.44    2278
   73.79    2278    75.4    2278    75.8    2278    75.9    2278    88.1    2278
   88.53    2278   88.67    2278   89.45 2284.11   92.52 2284.44   93.41 2284.52
    93.7 2284.54   94.01 2284.56   94.28 2284.57   94.56 2284.59   94.85  2284.6
   95.25 2284.61   95.66 2284.61   96.07 2284.62   96.48 2284.62   96.89 2284.61
   97.31  2284.6   97.73 2284.58   98.15 2284.56   99.52 2284.48  103.91 2284.15
  113.84 2284.02   114.4 2284.05  114.41 2284.05  117.95 2284.28  118.79 2284.33
  119.23 2284.34  119.66 2284.36  120.11 2284.37  120.71 2284.39  121.54  2284.4
  125.46 2284.44  133.24 2284.49  133.33 2284.49  133.45 2284.49  134.45  2284.5
  134.58  2284.5  136.96  2284.4  137.05 2284.39  137.12 2284.39  137.16 2284.38
   137.2 2284.38  137.23 2284.38  137.25 2284.37  137.27 2284.37  137.27 2284.36
   143.2 2284.35  145.65 2284.44   148.5 2284.54  148.73 2284.55  148.95 2284.56
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 149.14 | 2284.57 | 149.53 | 2284.59 | 149.66 | 2284.59 | 149.81 | 2284.6 | 160.13 | 2284.77 |
| 160.34 | 2284.78 | 160.61 | 2284.79 | 165.46 | 2284.89 | 165.77 | 2284.9 | 166.72 | 2284.92 |
| 167.16 | 2284.94 | 172.42 | 2285.01 | 182.02 | 2285.13 | 193.51 | 2285.23 | 194.7 | 2285.24 |
| 195.24 | 2285.25 | 195.79 | 2285.26 | 196.36 | 2285.27 | 196.95 | 2285.28 | 197.49 | 2285.29 |
| 198.06 | 2285.31 | 198.78 | 2285.33 | 199.54 | 2285.35 | 200.34 | 2285.37 | 202 | 2285.43 |
| 203.66 | 2285.49 | 217.14 | 2286 | 236.38 | 2287.16 | 237.16 | 2287.22 | 238.15 | 2287.28 |
| 239.3 | 2287.35 | 240.29 | 2287.41 | 241.53 | 2287.49 | 242.25 | 2287.53 | 242.54 | 2287.55 |
| 242.78 | 2287.57 | 251.23 | 2288 | 253.13 | 2288 | 256.13 | 2288 | 260.57 | 2288 |
| 261.15 | 2288 | 261.29 | 2288 | 261.38 | 2288 | 278.14 | 2288 | 300 | 2288 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -27.26 | .015 | 96.07 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -27.26 | 96.07 | 290 | 300 | .1 | .3 |

Left Levee Station= -27.26 Elevation= 2286
Right Levee Station= 96.07 Elevation= 2284.62

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 7800

INPUT
Description: Sta 78+00.00
Station Elevation Data num= 227

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2286.46 | -274.85 | 2286.02 | -274.6 | 2286.02 | -274.51 | 2286.02 | -273.65 | 2286 |
| -236.79 | 2284.14 | -234.28 | 2284 | -234.21 | 2284 | -234.11 | 2284 | -207.65 | 2284 |
| -205.74 | 2284 | -205.13 | 2284 | -196.83 | 2284 | -185.93 | 2284.92 | -183.36 | 2285.1 |
| -180.77 | 2285.28 | -180.32 | 2285.31 | -170.1 | 2286 | -150.83 | 2286 | -148.42 | 2286 |
| -145.83 | 2286 | -139.61 | 2286 | -139.3 | 2286 | -127.6 | 2285.91 | -125.92 | 2285.9 |
| -120.01 | 2285.9 | -119.36 | 2285.91 | -106.42 | 2285.91 | -106.36 | 2285.91 | -106.33 | 2285.91 |
| -106.32 | 2285.91 | -106.3 | 2285.91 | -106.28 | 2285.92 | -106.27 | 2285.92 | -106.19 | 2285.92 |
| -105.99 | 2285.93 | -105.95 | 2285.93 | -105.92 | 2285.93 | -105.91 | 2285.93 | -105.89 | 2285.93 |
| -105.83 | 2285.93 | -105.51 | 2285.94 | -105.25 | 2285.94 | -105.21 | 2285.94 | -105.19 | 2285.94 |
| -105.16 | 2285.94 | -105.15 | 2285.94 | -105.13 | 2285.94 | -105.12 | 2285.94 | -105.11 | 2285.95 |
| -105.07 | 2285.95 | -104.94 | 2285.95 | -104.93 | 2285.95 | -104.9 | 2285.95 | -104.84 | 2285.95 |
| -104.82 | 2285.95 | -104.81 | 2285.95 | -104.8 | 2285.95 | -104.78 | 2285.95 | -104.77 | 2285.95 |
| -104.76 | 2285.95 | -104.73 | 2285.95 | -104.7 | 2285.95 | -104.69 | 2285.95 | -104.68 | 2285.95 |
| -104.67 | 2285.95 | -104.65 | 2285.96 | -104.64 | 2285.96 | -104.47 | 2285.95 | -104.28 | 2285.95 |
| -104.24 | 2285.95 | -104.23 | 2285.95 | -104.21 | 2285.95 | -104.2 | 2285.95 | -104.13 | 2285.96 |
| -104.03 | 2285.96 | -103.96 | 2285.96 | -103.95 | 2285.96 | -103.94 | 2285.96 | -103.92 | 2285.96 |
| -103.91 | 2285.96 | -103.8 | 2285.96 | -103.73 | 2285.96 | -103.46 | 2285.96 | -103.28 | 2285.96 |
| -102.12 | 2285.95 | -102.11 | 2285.95 | -102.09 | 2285.95 | -102.04 | 2285.95 | -101.99 | 2285.95 |
| -101.95 | 2285.95 | -101.94 | 2285.95 | -101.93 | 2285.95 | -101.92 | 2285.95 | -101.86 | 2285.95 |
| -101.81 | 2285.94 | -101.69 | 2285.94 | -101.66 | 2285.94 | -101.65 | 2285.94 | -101.64 | 2285.94 |
| -101.59 | 2285.94 | -101.56 | 2285.92 | -101.47 | 2285.92 | -101.45 | 2285.92 | -101.44 | 2285.92 |
| -101.36 | 2285.92 | -101.28 | 2285.92 | -101.22 | 2285.91 | -100.86 | 2285.9 | -100.64 | 2285.89 |
| -100.19 | 2285.87 | -100.03 | 2285.87 | -99.17 | 2285.84 | -99.06 | 2285.83 | -97.93 | 2285.78 |
| -97.74 | 2285.77 | -85.86 | 2285.77 | -85.61 | 2285.76 | -85.17 | 2285.73 | -83.68 | 2285.72 |
| -82.91 | 2285.71 | -82.09 | 2285.7 | -78.27 | 2285.52 | -77.33 | 2285.49 | -76.34 | 2285.46 |
| -72.67 | 2285.29 | -70.57 | 2285.21 | -69.21 | 2285.15 | -64.64 | 2284.96 | -62.85 | 2284.88 |
| -51.44 | 2284.38 | -49.26 | 2284.29 | -44.52 | 2284.06 | -43.73 | 2284.03 | -17.12 | 2284 |
| -1.12 | 2276 | 4.13 | 2276 | 9.38 | 2276 | 25.38 | 2284 | 27.72 | 2284.04 |
| 29.26 | 2284.11 | 30.97 | 2284.19 | 32.75 | 2284.27 | 36.29 | 2284.41 | 45.03 | 2284.76 |
| 58.86 | 2285.3 | 59.66 | 2285.33 | 60.45 | 2285.34 | 64.22 | 2285.5 | 76.37 | 2286 |
| 80.78 | 2285.91 | 85.46 | 2286 | 95.57 | 2286 | 95.97 | 2286 | 96.37 | 2286 |
| 97.23 | 2286 | 109.84 | 2286 | 167.63 | 2286 | 167.75 | 2286 | 167.89 | 2286 |
| 170.13 | 2286 | 172.06 | 2286 | 172.35 | 2286 | 172.65 | 2286 | 172.93 | 2286 |
| 173.2 | 2286 | 180.91 | 2286 | 194.35 | 2286 | 200.16 | 2285.68 | 200.37 | 2285.67 |
| 203.67 | 2285.49 | 205.43 | 2285.41 | 207.14 | 2285.33 | 207.46 | 2285.31 | 213.49 | 2285.06 |
| 213.8 | 2285.05 | 215.75 | 2284.96 | 215.99 | 2284.96 | 216.61 | 2284.93 | 217.55 | 2284.88 |
| 218.1 | 2284.84 | 218.33 | 2284.82 | 218.51 | 2284.81 | 218.68 | 2284.79 | 218.8 | 2284.77 |
| 218.95 | 2284.74 | 219.02 | 2284.72 | 221.15 | 2284.52 | 222.57 | 2284.44 | 222.78 | 2284.43 |
| 222.88 | 2284.43 | 222.98 | 2284.43 | 223.09 | 2284.42 | 223.14 | 2284.42 | 223.25 | 2284.42 |
| 223.37 | 2284.42 | 223.5 | 2284.43 | 224.34 | 2284.44 | 224.43 | 2284.44 | 224.51 | 2284.44 |
| 224.55 | 2284.44 | 224.58 | 2284.43 | 224.6 | 2284.43 | 224.67 | 2284.37 | 224.69 | 2284.37 |
| 234.97 | 2284.44 | 234.99 | 2284.45 | 235.04 | 2284.45 | 235.11 | 2284.45 | 235.28 | 2284.46 |
| 235.36 | 2284.46 | 235.79 | 2284.49 | 235.87 | 2284.49 | 236.17 | 2284.52 | 236.54 | 2284.54 |
| 240.76 | 2284.75 | 242.17 | 2284.82 | 242.43 | 2284.82 | 243.07 | 2284.85 | 246.89 | 2285 |
| 247.22 | 2285.01 | 247.62 | 2285.02 | 260.51 | 2285.52 | 261.47 | 2285.56 | 265.45 | 2285.71 |
| 272.92 | 2286 | 300 | 2286.45 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -103.28 | .015 | 76.37 | .015 |

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

```
      -103.28   76.37              300     300     310             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 7500

INPUT
Description: Sta 75+00.00
Station Elevation Data    num=     131
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2284.91  -299.62  2284.9  -290.74 2284.77  -280.14 2284.62  -278.61 2284.59
 -277.86 2284.58  -277.13 2284.56  -276.43 2284.55  -275.76 2284.53  -274.42 2284.49
 -263.31 2284.13  -259.21    2284  -256.85    2284  -248.83    2284  -246.52    2284
 -245.33    2284  -227.85    2284  -225.42    2284   -94.77    2284   -87.78    2284
  -21.32    2282   -7.32    2275   -5.32    2274    -.07    2274    5.18    2274
    7.18    2275   21.18    2282   50.11 2283.72   51.65    2284   51.94 2284.01
   52.52 2284.02   53.98 2284.07   59.96  2284.3  121.48 2284.14  121.55 2284.13
  121.73 2284.11  122.01  2284.1  125.15    2284  132.11    2284  134.12    2284
  134.31 2284.01  134.63 2284.02  134.97 2284.04  135.35 2284.05   135.8 2284.05
  136.25 2284.06  136.76 2284.06  137.31 2284.06  138.49 2284.06  141.91 2284.04
  149.71    2284  156.37 2283.91  169.94 2283.71  182.46 2283.52   196.1 2283.29
  196.39 2283.27   196.7 2283.26  196.95 2283.25   197.2 2283.24  199.94 2283.17
  200.18 2283.17  200.41 2283.16  201.87 2283.12  202.11 2283.11  208.03 2282.93
  208.24 2282.92  208.39 2282.93  212.98 2282.76  213.04 2282.76  215.14 2282.67
  216.81 2282.58  217.85 2282.49  217.92 2282.48  217.99 2282.48  218.07 2282.47
  218.16 2282.47  218.26 2282.47  218.54 2282.47  218.62 2282.46   218.7 2282.46
  218.78 2282.46  218.84 2282.46  219.03 2282.44  219.28 2282.41  227.22 2282.39
  227.53  2282.4  229.06 2282.45   229.7 2282.47  230.11 2282.48  234.32 2282.57
  236.66 2282.63  238.52 2282.72  238.56 2282.73  239.58 2282.82  239.93 2282.84
  240.15 2282.86  240.43 2282.87  240.67 2282.88  240.95 2282.89  241.26  2282.9
  241.63 2282.92  242.46 2282.94  242.92 2282.96   243.4 2282.97   243.9 2282.99
  244.35    2283   244.6 2283.01  245.06 2283.02  245.53 2283.03  245.92 2283.04
  246.59 2283.05  247.02 2283.07  247.69 2283.08  248.35 2283.09  250.34 2283.12
   252.9 2283.15  254.87 2283.17  256.77 2283.19  257.93  2283.2  260.85 2283.25
  263.69  2283.3  264.81 2283.32     266 2283.35  267.26 2283.37  268.52  2283.4
  271.29 2283.47  293.13    2284  296.47 2284.14  297.99  2284.2  299.36 2284.25
     300 2284.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -87.78    .015   51.65    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -87.78   51.65              265     265     265             .1       .3
Right Levee     Station=   59.96      Elevation=  2284.3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 7235

INPUT
Description: Sta 7235
Station Elevation Data    num=       9
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
      -4 2278.12       -4 2273.12       -3 2273.12       15 2273.12       16 2273.12
      17 2273.12       35 2273.12       36 2273.12       36 2278.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      -4    .015      -4    .015      36    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            -4      36              105     105     105             .1       .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 7182.5

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =  102.99
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      26
```

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -310 | 2279.4 | 2277.12 | -4 | 2279.2 | 2273.12 | -3 | 2279.2 | 2273.12 |
| -1 | 2279.2 | 2275.27 | 1 | 2279.2 | 2276.45 | 3.5 | 2279.2 | 2276.96 |
| 4.75 | 2279.2 | 2277.08 | 6 | 2279.2 | 2277.12 | 7.25 | 2279.2 | 2277.08 |
| 8.5 | 2279.2 | 2276.96 | 11 | 2279.2 | 2276.45 | 13 | 2279.2 | 2275.27 |
| 15 | 2279.2 | 2273.12 | 16 | 2279.2 | 2273.12 | 17 | 2279.2 | 2273.12 |
| 19 | 2279.2 | 2275.27 | 21 | 2279.2 | 2276.45 | 23.5 | 2279.2 | 2276.96 |
| 24.75 | 2279.2 | 2277.08 | 26 | 2279.2 | 2277.12 | 27.25 | 2279.2 | 2277.08 |
| 28.5 | 2279.2 | 2276.96 | 31 | 2279.2 | 2276.45 | 33 | 2279.2 | 2275.27 |
| 35 | 2279.2 | 2273.12 | 36 | 2279.2 | 2273.12 | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -4 | 2278.12 | -4 | 2273.12 | -3 | 2273.12 | 15 | 2273.12 | 16 | 2273.12 |
| 17 | 2273.12 | 35 | 2273.12 | 36 | 2273.12 | 36 | 2278.12 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -4 | .015 | -4 | .015 | 36 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -4 | 36 | .1 | .3 |

Downstream Deck/Roadway Coordinates
num= 26

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -310 | 2279.4 | 2276.73 | -20 | 2279.2 | 2272.77 | -19 | 2279.2 | 2272.77 |
| -17 | 2279.2 | 2274.92 | -15 | 2279.2 | 2276.1 | -12.5 | 2279.2 | 2276.61 |
| -11.25 | 2279.2 | 2276.73 | -10 | 2279.2 | 2276.77 | -8.75 | 2279.2 | 2276.73 |
| -7.5 | 2279.2 | 2276.61 | -5 | 2279.2 | 2276.1 | -3 | 2279.2 | 2274.92 |
| -1 | 2279.2 | 2272.77 | 0 | 2279.2 | 2272.77 | 1 | 2279.2 | 2272.77 |
| 3 | 2279.2 | 2274.92 | 5 | 2279.2 | 2276.1 | 7.5 | 2279.2 | 2276.61 |
| 8.75 | 2279.2 | 2276.73 | 10 | 2279.2 | 2276.77 | 11.25 | 2279.2 | 2276.73 |
| 12.5 | 2279.2 | 2276.61 | 15 | 2279.2 | 2276.1 | 17 | 2279.2 | 2274.92 |
| 19 | 2279.2 | 2272.77 | 20 | 2279.2 | 2272.77 | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20 | 2276.77 | -20 | 2272.77 | -19 | 2272.77 | -1 | 2272.77 | 0 | 2272.77 |
| 1 | 2272.77 | 20 | 2272.77 | 21 | 2272.77 | 21 | 2276.77 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20 | .015 | -20 | .015 | 21 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -20 | 21 | .1 | .3 |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

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

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 7130

INPUT

Description: Sta 7130
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20 | 2276.77 | -20 | 2272.77 | -19 | 2272.77 | -1 | 2272.77 | 0 | 2272.77 |
| 1 | 2272.77 | 20 | 2272.77 | 21 | 2272.77 | 21 | 2276.77 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20 | .015 | -20 | .015 | 21 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20 | 21 | 230 | 230 | 230 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6900

INPUT
Description: Sta 69+00.00
Station Elevation Data num= 128

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2275.59 | -299.05 | 2275.59 | -293.64 | 2275.62 | -290.63 | 2275.63 | -288.82 | 2275.65 |
| -271.98 | 2275.77 | -258.65 | 2275.87 | -251.86 | 2275.92 | -243.25 | 2276 | -241.02 | 2276.03 |
| -240.01 | 2276.04 | -239.51 | 2276.04 | -239.01 | 2276.05 | -238.52 | 2276.05 | -238.03 | 2276.05 |
| -237.54 | 2276.04 | -237.05 | 2276.04 | -234.4 | 2276 | -230.4 | 2275.95 | -220.11 | 2275.84 |
| -220.06 | 2275.84 | -220.01 | 2275.84 | -219.96 | 2275.84 | -219.55 | 2275.84 | -219.5 | 2275.84 |
| -219.43 | 2275.84 | -219.37 | 2275.84 | -219.29 | 2275.84 | -219.22 | 2275.84 | -219.05 | 2275.84 |
| -218.16 | 2275.83 | -217.78 | 2275.82 | -217.59 | 2275.82 | -217.49 | 2275.82 | -217.4 | 2275.82 |
| -217.21 | 2275.82 | -215.61 | 2275.79 | -215.35 | 2275.79 | -213.86 | 2275.77 | -213.53 | 2275.76 |
| -211.68 | 2275.74 | -209.04 | 2275.7 | -206.49 | 2275.67 | -189.41 | 2275.42 | -188.54 | 2275.41 |
| -187.7 | 2275.4 | -186.9 | 2275.39 | -186.13 | 2275.38 | -185.39 | 2275.38 | -184.69 | 2275.37 |
| -183.35 | 2275.36 | -174.05 | 2275.33 | -162.85 | 2275.3 | -156.99 | 2275.18 | -147.86 | 2275.13 |
| -146.9 | 2275.13 | -146.01 | 2275.12 | -140.03 | 2275.15 | -139.15 | 2275.15 | -138.65 | 2275.13 |
| -137.22 | 2275.13 | -136.96 | 2275.12 | -136.72 | 2275.12 | -129.94 | 2275.08 | -129.7 | 2275.07 |
| -129.33 | 2275.07 | -128.41 | 2275.06 | -127.18 | 2275.04 | -126.73 | 2275.04 | -126.29 | 2275.03 |
| -117.6 | 2274.93 | -117.18 | 2274.92 | -116.34 | 2274.91 | -104.81 | 2274.76 | -102.46 | 2274.72 |
| -90.95 | 2274.55 | -76.76 | 2274.3 | -74.34 | 2274.25 | -70.46 | 2274.17 | -62.76 | 2274 |
| -44.09 | 2273.39 | -3.46 | 2272 | 0 | 2272 | 8.74 | 2272 | 13.29 | 2272 |
| 31.29 | 2272.84 | 43.51 | 2273.17 | 45.8 | 2273.23 | 70.37 | 2274 | 77.87 | 2274.21 |
| 78.07 | 2274.22 | 78.3 | 2274.22 | 84.08 | 2274.39 | 84.94 | 2274.42 | 86.66 | 2274.47 |
| 94.6 | 2274.7 | 96.62 | 2274.76 | 98.42 | 2274.82 | 135.63 | 2275.86 | 136.42 | 2275.89 |
| 138.46 | 2275.95 | 140.56 | 2276 | 148.99 | 2276 | 165.08 | 2276 | 175.19 | 2276 |
| 176.14 | 2276 | 180.91 | 2276 | 181.38 | 2276 | 184.5 | 2276 | 184.98 | 2276 |
| 185.41 | 2276 | 189.65 | 2276 | 190.12 | 2276 | 202.73 | 2276 | 203.92 | 2276 |
| 214.22 | 2276 | 216.7 | 2276 | 231.7 | 2276 | 267.44 | 2276 | 267.55 | 2276 |
| 267.73 | 2276 | 267.79 | 2276 | 270.42 | 2275.94 | 273.06 | 2275.89 | 292.42 | 2275.56 |
| 292.67 | 2275.55 | 293.18 | 2275.55 | 300 | 2275.42 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -140.03 | .025 | 140.56 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -140.03 | 140.56 | 300 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6600

INPUT
Description: Sta 66+00.00
Station Elevation Data num= 113

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2272.16 | -290.46 | 2272.11 | -289.7 | 2272.11 | -276.63 | 2272.03 | -271.09 | 2272 |
| -267.01 | 2271.97 | -267 | 2271.97 | -250.94 | 2271.83 | -250.87 | 2271.83 | -234.15 | 2271.7 |
| -231.03 | 2271.67 | -229.58 | 2271.67 | -227.2 | 2271.66 | -226.6 | 2271.65 | -225.98 | 2271.65 |
| -222.61 | 2271.61 | -221.95 | 2271.6 | -221.12 | 2271.59 | -219.85 | 2271.58 | -214.1 | 2271.49 |
| -211.8 | 2271.46 | -208.93 | 2271.42 | -193.88 | 2271.23 | -191.88 | 2271.21 | -190.63 | 2271.2 |
| -182.67 | 2271.14 | -180.56 | 2271.11 | -173.57 | 2271.04 | -172.13 | 2271.02 | -164.17 | 2270.97 |
| -157.43 | 2270.88 | -150.2 | 2270.77 | -147.36 | 2270.75 | -145.13 | 2270.73 | -138.68 | 2270.64 |
| -136.72 | 2270.61 | -126.9 | 2270.43 | -124.28 | 2270.39 | -120.86 | 2270.35 | -120.21 | 2270.34 |
| -119.9 | 2270.34 | -119.46 | 2270.33 | -118.08 | 2270.32 | -106.93 | 2270.16 | -106.65 | 2270.15 |
| -97.91 | 2270 | -96.69 | 2269.99 | -93.86 | 2269.97 | -87.29 | 2269.93 | -82.47 | 2269.9 |
| -63.33 | 2269.81 | -59.72 | 2269.8 | -45.59 | 2269.77 | -32.54 | 2269.76 | -19.59 | 2269.74 |
| -8.89 | 2269.74 | 0 | 2269.73 | 2.8 | 2269.73 | 7.52 | 2269.73 | 9.34 | 2269.74 |
| 13.29 | 2269.76 | 23.18 | 2269.83 | 33.48 | 2269.9 | 47.67 | 2270 | 48.7 | 2270.02 |
| 48.74 | 2270.02 | 48.76 | 2270.02 | 62.23 | 2270.27 | 64.28 | 2270.31 | 69.34 | 2270.42 |

```
   72.65 2270.48   82.64 2270.74   83.24 2270.75   83.54 2270.75   84.11 2270.75
   91.15  2270.9   93.09 2270.94   99.73 2270.89  105.71 2270.98  107.59 2270.98
  108.34 2270.98  109.49 2270.98  115.79 2271.05  118.02 2271.08  123.84 2271.16
  132.35 2271.26  136.27 2271.29     141 2271.33  144.31 2271.34  149.16 2271.35
  153.34 2271.36  213.06 2271.15  220.89 2271.16  225.21 2271.17  227.99 2271.16
  234.24 2271.12  235.46 2271.12   237.7 2271.12  242.55 2271.08  250.57 2271.02
  258.08 2270.95  264.12 2270.88  264.99 2270.88  265.42 2270.88  265.89 2270.88
  270.69 2270.83  271.58 2270.83  279.22 2270.91  282.56 2270.85  287.34  2270.9
   290.9 2270.84  297.12 2270.75     300 2270.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -164.17    .025  132.35    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -164.17  132.35              300     300     300             .1       .3
Right Levee     Station=  153.34      Elevation= 2271.36

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 6300

INPUT
Description: Sta 63+00.00
Station Elevation Data    num=     175
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -300 2269.09 -299.65  2269.1 -298.18 2269.13 -293.14 2269.23 -288.74 2269.31
 -288.27 2269.31 -288.05 2269.32 -287.84 2269.32 -287.64 2269.32 -287.46 2269.32
 -287.29 2269.32 -287.12 2269.31 -286.81 2269.31 -286.21 2269.29 -285.94 2269.28
 -285.75 2269.27 -285.61 2269.25 -284.47 2269.15 -283.05 2269.04 -280.33 2268.83
 -279.23 2268.77 -277.91 2268.71 -277.16 2268.68 -276.95 2268.69 -276.56 2268.68
 -276.33 2268.68 -276.09 2268.68 -275.68 2268.68 -275.17 2268.68 -274.73 2268.67
 -274.26 2268.67 -273.79 2268.67 -272.82 2268.67 -267.92 2268.66 -266.39 2268.67
 -265.88 2268.67 -265.63 2268.67 -265.38 2268.67 -265.12 2268.67 -264.61 2268.68
 -259.34 2268.81 -257.81 2268.83 -250.09 2268.98 -242.52 2269.13 -239.86 2269.19
 -234.57 2269.29 -222.47 2269.63 -222.12 2269.63 -221.96 2269.64  -221.8 2269.64
 -221.67 2269.65 -209.04    2270 -207.45 2270.01 -206.75 2270.02 -206.53 2270.02
 -206.38 2270.02 -206.29 2270.03 -132.79 2270.09  -97.12    2270  -79.96 2269.41
  -77.08 2269.37  -75.68 2269.27  -70.28 2269.13  -69.13 2269.04  -56.4 2268.65
  -54.64 2268.52  -43.69 2268.17   -41.6 2268.02  -25.84 2265.29 -25.75 2265.28
   -25.5 2265.27  -25.24 2265.26 -24.86 2265.25  -24.44 2265.24 -23.99 2265.24
  -23.07 2265.22  -17.14 2265.16 -16.75 2265.16   -16.4 2265.16 -16.13 2265.16
  -15.87 2265.16  -15.63 2265.17 -15.41 2265.17 -15.17 2265.18 -14.97  2265.2
  -14.64 2265.22  -13.04 2265.44  -8.58 2265.99  -8.57 2265.99  -8.44    2266
   -5.92 2266.11   -5.81 2266.11  -5.22 2266.12  -3.98 2266.13       0 2266.15
     1.5 2266.16    2.11 2266.16   3.24 2266.17   3.74 2266.18   3.85 2266.18
     4.3 2266.19    4.45 2266.18   4.53 2266.18   4.57 2266.18    4.6 2266.18
    4.62 2266.17    4.63 2266.17    8.4 2266.14   8.87 2266.16   9.95  2266.2
   10.15  2266.2   10.25 2266.21  10.48 2266.21  11.09 2266.22  11.92 2266.25
   24.35 2266.49   29.13 2266.61  40.79 2266.85  51.74 2267.14  52.77 2267.16
   60.41 2267.37   62.46 2267.42  64.72 2267.49   80.5    2268  121.6    2268
  124.66    2268  128.06    2268 141.13    2268 141.63    2268 141.97    2268
     145    2268  152.23 2267.93 153.91 2267.92 154.75 2267.91 155.58  2267.9
  156.37  2267.9  158.75 2267.89 168.87 2267.85  178.2 2267.81 184.86 2267.79
   197.8 2267.76  201.92 2267.75 202.01 2267.75 216.64 2267.72 228.48 2267.69
  231.64 2267.67  242.57 2267.63 249.82 2267.59 256.86 2267.55 263.62 2267.51
  264.48 2267.51  264.88 2267.51 265.25 2267.51 265.59 2267.51 265.89 2267.51
  266.16 2267.52   266.4 2267.52 266.83 2267.53 270.51 2267.67 273.61 2267.77
  279.18 2267.95  280.48 2267.98 281.26    2268  281.3    2268 281.77 2268.01
  282.28 2268.02  282.71 2268.02 284.18 2268.04 293.68 2268.12 294.23 2268.12
  294.78 2268.12  295.44 2268.13 296.11 2268.13 297.47 2268.13    300 2268.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -97.12    .025    80.5    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -97.12    80.5              110     110     110             .1       .3
Right Levee     Station=    80.5      Elevation=    2268

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 6190.*

INPUT
Description: Sta 61+90
Station Elevation Data    num=     329
```

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2266.54 | -299.6 | 2266.55 | -299.31 | 2266.55 | -298.29 | 2266.58 | -298.14 | 2266.58 |
| -297.99 | 2266.58 | -297.93 | 2266.59 | -295.83 | 2266.64 | -292.21 | 2266.71 | -287.22 | 2266.81 |
| -286.68 | 2266.82 | -286.43 | 2266.83 | -286.2 | 2266.83 | -285.97 | 2266.83 | -285.76 | 2266.83 |
| -285.57 | 2266.83 | -285.38 | 2266.83 | -285.03 | 2266.83 | -284.35 | 2266.83 | -284.04 | 2266.82 |
| -283.82 | 2266.82 | -283.66 | 2266.81 | -282.37 | 2266.76 | -280.76 | 2266.7 | -278.29 | 2266.62 |
| -277.67 | 2266.6 | -276.42 | 2266.59 | -274.92 | 2266.58 | -274.07 | 2266.58 | -273.83 | 2266.59 |
| -273.39 | 2266.59 | -273.13 | 2266.59 | -272.86 | 2266.6 | -272.39 | 2266.61 | -271.81 | 2266.62 |
| -271.31 | 2266.62 | -270.78 | 2266.63 | -270.52 | 2266.64 | -270.25 | 2266.64 | -269.15 | 2266.65 |
| -264.05 | 2266.7 | -263.58 | 2266.71 | -261.85 | 2266.76 | -261.27 | 2266.77 | -260.98 | 2266.78 |
| -260.7 | 2266.79 | -260.41 | 2266.79 | -259.83 | 2266.81 | -255.8 | 2266.96 | -254.63 | 2266.99 |
| -253.84 | 2267.02 | -252.77 | 2267.05 | -252.11 | 2267.06 | -248.15 | 2267.14 | -243.34 | 2267.22 |
| -242.24 | 2267.24 | -241.17 | 2267.25 | -240.37 | 2267.27 | -239.96 | 2267.27 | -239.5 | 2267.28 |
| -239.04 | 2267.29 | -238.57 | 2267.29 | -238.08 | 2267.3 | -237.59 | 2267.3 | -235.06 | 2267.32 |
| -234.75 | 2267.33 | -234.54 | 2267.33 | -234.02 | 2267.33 | -233.59 | 2267.34 | -233.17 | 2267.35 |
| -232.22 | 2267.36 | -231.73 | 2267.36 | -230.65 | 2267.38 | -225.73 | 2267.44 | -221.19 | 2267.52 |
| -212.85 | 2267.67 | -211.99 | 2267.68 | -211.59 | 2267.68 | -211.41 | 2267.69 | -211.38 | 2267.69 |
| -211.23 | 2267.69 | -211.08 | 2267.7 | -210.32 | 2267.71 | -209.26 | 2267.72 | -208.73 | 2267.73 |
| -208.63 | 2267.73 | -196.75 | 2267.84 | -194.94 | 2267.83 | -194.15 | 2267.84 | -193.9 | 2267.83 |
| -193.73 | 2267.83 | -193.62 | 2267.84 | -190.59 | 2267.82 | -182.8 | 2267.55 | -156.64 | 2267.74 |
| -156.58 | 2267.75 | -156.07 | 2267.77 | -154.42 | 2267.84 | -151.3 | 2267.84 | -151.12 | 2267.84 |
| -144.99 | 2267.84 | -144.65 | 2267.84 | -144.56 | 2267.84 | -144.21 | 2267.84 | -144.12 | 2267.84 |
| -143.4 | 2267.84 | -143.31 | 2267.84 | -143.22 | 2267.84 | -138.22 | 2267.84 | -137.43 | 2267.84 |
| -137.01 | 2267.84 | -110.19 | 2267.86 | -83.13 | 2267.82 | -69.7 | 2267.8 | -57.64 | 2267.1 |
| -55.61 | 2267.02 | -54.63 | 2266.93 | -50.83 | 2266.74 | -50.02 | 2266.67 | -45.98 | 2266.45 |
| -42.68 | 2266.26 | -41.61 | 2266.18 | -41.08 | 2266.14 | -39.84 | 2265.99 | -32.14 | 2265.39 |
| -30.67 | 2265.22 | -27.82 | 2264.63 | -23.38 | 2263.73 | -19.6 | 2262.94 | -19.53 | 2262.93 |
| -19.36 | 2262.92 | -19.17 | 2262.9 | -18.91 | 2262.88 | -18.61 | 2262.86 | -18.3 | 2262.84 |
| -17.65 | 2262.8 | -13.48 | 2262.53 | -11.42 | 2262.53 | -10.5 | 2262.53 | -9.6 | 2262.53 |
| -9.58 | 2262.53 | -8.15 | 2262.53 | -6.78 | 2262.53 | -6.6 | 2262.56 | -6.44 | 2262.58 |
| -6.26 | 2262.6 | -6.11 | 2262.63 | -5.86 | 2262.66 | -4.65 | 2262.92 | -1.29 | 2263.6 |
| -1.19 | 2263.62 | -.71 | 2263.69 | .71 | 2263.87 | .72 | 2263.87 | .79 | 2263.88 |
| 1.24 | 2263.93 | 2.17 | 2264.03 | 5.17 | 2264.34 | 6.3 | 2264.45 | 6.76 | 2264.5 |
| 6.87 | 2264.51 | 7.61 | 2264.59 | 7.99 | 2264.63 | 8.07 | 2264.63 | 8.2 | 2264.65 |
| 8.41 | 2264.67 | 8.52 | 2264.68 | 8.58 | 2264.68 | 8.61 | 2264.68 | 8.64 | 2264.69 |
| 8.65 | 2264.68 | 9.52 | 2264.75 | 11.5 | 2264.93 | 11.85 | 2264.98 | 12.67 | 2265.09 |
| 12.82 | 2265.1 | 12.89 | 2265.12 | 13.07 | 2265.13 | 13.52 | 2265.19 | 14.15 | 2265.27 |
| 15.76 | 2265.45 | 23.51 | 2265.73 | 24.64 | 2265.78 | 27.11 | 2265.86 | 35.9 | 2266.13 |
| 44.15 | 2266.43 | 44.92 | 2266.45 | 50.68 | 2266.66 | 52.22 | 2266.72 | 53.92 | 2266.78 |
| 65.81 | 2267.27 | 69.77 | 2267.27 | 84.5 | 2267.27 | 109.66 | 2267.36 | 109.88 | 2267.36 |
| 112.93 | 2267.28 | 113.39 | 2267.27 | 116.55 | 2267.21 | 124.52 | 2267.07 | 130.5 | 2267.03 |
| 131.03 | 2267.02 | 131.39 | 2267.02 | 133.09 | 2267.01 | 134.63 | 2267.01 | 138.04 | 2266.99 |
| 138.72 | 2266.98 | 139.71 | 2266.98 | 140.02 | 2266.98 | 140.29 | 2266.98 | 140.86 | 2266.97 |
| 142.34 | 2266.96 | 144.13 | 2266.94 | 144.97 | 2266.92 | 145.03 | 2266.92 | 145.92 | 2266.91 |
| 146.15 | 2266.91 | 146.76 | 2266.9 | 147.37 | 2266.9 | 149.3 | 2266.88 | 153.93 | 2266.83 |
| 158.14 | 2266.79 | 160.09 | 2266.77 | 164.99 | 2266.72 | 170.05 | 2266.67 | 170.74 | 2266.66 |
| 177.15 | 2266.6 | 179.29 | 2266.58 | 179.55 | 2266.57 | 179.84 | 2266.57 | 180.13 | 2266.57 |
| 190.96 | 2266.47 | 193.23 | 2266.45 | 193.8 | 2266.44 | 195.36 | 2266.43 | 195.45 | 2266.43 |
| 196.18 | 2266.43 | 197.13 | 2266.41 | 197.78 | 2266.41 | 198.11 | 2266.4 | 198.3 | 2266.4 |
| 198.39 | 2266.4 | 198.43 | 2266.4 | 198.45 | 2266.4 | 198.48 | 2266.4 | 198.53 | 2266.4 |
| 198.77 | 2266.4 | 198.88 | 2266.4 | 198.96 | 2266.4 | 199.06 | 2266.4 | 199.1 | 2266.4 |
| 199.13 | 2266.4 | 199.15 | 2266.4 | 199.17 | 2266.4 | 199.19 | 2266.4 | 199.24 | 2266.4 |
| 199.65 | 2266.4 | 199.68 | 2266.4 | 199.72 | 2266.4 | 200.27 | 2266.4 | 200.28 | 2266.4 |
| 200.7 | 2266.4 | 200.73 | 2266.4 | 201.28 | 2266.4 | 201.3 | 2266.4 | 201.36 | 2266.4 |
| 201.77 | 2266.4 | 202.11 | 2266.4 | 202.16 | 2266.4 | 202.18 | 2266.4 | 202.2 | 2266.4 |
| 202.21 | 2266.4 | 202.23 | 2266.4 | 202.25 | 2266.4 | 202.27 | 2266.4 | 202.43 | 2266.4 |
| 202.56 | 2266.4 | 203.13 | 2266.41 | 204.05 | 2266.43 | 204.79 | 2266.43 | 205.58 | 2266.44 |
| 211.06 | 2266.54 | 212.42 | 2266.57 | 213.45 | 2266.58 | 214.2 | 2266.59 | 214.94 | 2266.6 |
| 223.69 | 2266.76 | 227.07 | 2266.82 | 229.94 | 2266.87 | 230.76 | 2266.88 | 231.47 | 2266.9 |
| 232.1 | 2266.91 | 232.63 | 2266.92 | 233.09 | 2266.92 | 233.48 | 2266.93 | 233.82 | 2266.94 |
| 235.19 | 2266.97 | 236.45 | 2266.99 | 237.31 | 2267.01 | 238.73 | 2267.02 | 240.47 | 2267.03 |
| 240.52 | 2267.03 | 246.46 | 2267.03 | 253.97 | 2267.04 | 261.19 | 2267.04 | 262.1 | 2267.05 |
| 262.53 | 2267.05 | 262.92 | 2267.05 | 263.29 | 2267.05 | 263.61 | 2267.05 | 263.9 | 2267.06 |
| 264.15 | 2267.06 | 264.61 | 2267.07 | 268.54 | 2267.18 | 271.84 | 2267.25 | 277.79 | 2267.39 |
| 279.17 | 2267.42 | 280.01 | 2267.43 | 280.05 | 2267.43 | 280.55 | 2267.44 | 281.09 | 2267.45 |
| 281.55 | 2267.45 | 283.12 | 2267.47 | 293.26 | 2267.57 | 293.84 | 2267.57 | 294.43 | 2267.57 |
| 295.13 | 2267.58 | 295.85 | 2267.58 | 297.3 | 2267.59 | 300 | 2267.6 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .03 | -69.7 | .03 | 65.81 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| -69.7 | 65.81 | | 190 | 190 | .1 | .3 |

Left Levee Station= -69.7 Elevation= 2267.8
Right Levee Station= 65.81 Elevation= 2267.27

CROSS SECTION

RIVER: Duck Creek

REACH: East RS: 6000

INPUT
Description: Sta 60+00.00
Station Elevation Data num= 165

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2262.13 | -299.17 | 2262.15 | -297.94 | 2262.18 | -297.76 | 2262.18 | -297.58 | 2262.19 |
| -294.97 | 2262.27 | -273.82 | 2262.73 | -264.46 | 2263.12 | -256.66 | 2263.32 | -246.71 | 2263.84 |
| -245.3 | 2263.88 | -243.06 | 2264 | -237.48 | 2264.09 | -230.36 | 2264.2 | -229.07 | 2264.21 |
| -228.11 | 2264.22 | -227.61 | 2264.22 | -227.06 | 2264.23 | -226.5 | 2264.23 | -225.93 | 2264.23 |
| -225.35 | 2264.23 | -224.76 | 2264.23 | -221.7 | 2264.21 | -221.08 | 2264.21 | -220.45 | 2264.21 |
| -219.93 | 2264.21 | -219.42 | 2264.21 | -218.28 | 2264.21 | -216.39 | 2264.22 | -204.98 | 2264.27 |
| -194.92 | 2264.32 | -193.15 | 2264.32 | -191.88 | 2264.32 | -190.6 | 2264.32 | -189.96 | 2264.32 |
| -189.84 | 2264.32 | -168.09 | 2264 | -158.7 | 2263.26 | -127.15 | 2263.75 | -127.08 | 2263.76 |
| -126.47 | 2263.82 | -124.48 | 2264 | -120.72 | 2264 | -120.5 | 2264 | -113.11 | 2264 |
| -112.7 | 2264 | -112.59 | 2264 | -112.17 | 2264 | -112.06 | 2264 | -111.19 | 2264 |
| -111.08 | 2264 | -110.97 | 2264 | -104.95 | 2264 | -103.99 | 2264 | -103.49 | 2264 |
| -38.52 | 2264 | -22.33 | 2264 | -15.93 | 2262.27 | -15.04 | 2262 | -14.75 | 2261.87 |
| -11.03 | 2260 | -9.83 | 2259.44 | -8.925 | 2259 | -6.925 | 2258 | -.925 | 2258 |
| 5.075 | 2258 | 7.075 | 2259 | 11.55 | 2259.64 | 12.17 | 2260 | 14.84 | 2261.66 |
| 15.42 | 2262 | 15.99 | 2262.32 | 18.7 | 2264 | 22.56 | 2264.48 | 40.44 | 2266 |
| 44.83 | 2266 | 61.15 | 2266 | 89.28 | 2266.26 | 93.17 | 2266 | 105.51 | 2265.47 |
| 115.01 | 2265.3 | 120.49 | 2265.29 | 121.25 | 2265.29 | 122.34 | 2265.3 | 122.69 | 2265.3 |
| 122.99 | 2265.3 | 123.62 | 2265.3 | 128.18 | 2265.22 | 129.48 | 2265.19 | 130.83 | 2265.18 |
| 138.11 | 2265.02 | 142.77 | 2264.96 | 150.36 | 2264.79 | 156.74 | 2264.69 | 166.21 | 2264.49 |
| 166.5 | 2264.48 | 166.82 | 2264.48 | 167.14 | 2264.47 | 181.66 | 2264.19 | 182.3 | 2264.17 |
| 184.93 | 2264.14 | 185.98 | 2264.11 | 186.71 | 2264.1 | 187.07 | 2264.09 | 187.28 | 2264.08 |
| 187.38 | 2264.08 | 187.43 | 2264.08 | 187.45 | 2264.08 | 187.48 | 2264.08 | 187.54 | 2264.08 |
| 187.8 | 2264.07 | 187.93 | 2264.07 | 188.01 | 2264.07 | 188.12 | 2264.07 | 188.17 | 2264.07 |
| 188.2 | 2264.07 | 188.22 | 2264.07 | 188.25 | 2264.07 | 188.27 | 2264.07 | 188.32 | 2264.07 |
| 188.78 | 2264.08 | 188.81 | 2264.08 | 188.86 | 2264.08 | 189.46 | 2264.08 | 189.48 | 2264.08 |
| 189.94 | 2264.08 | 189.95 | 2264.08 | 189.98 | 2264.08 | 190.59 | 2264.08 | 190.61 | 2264.08 |
| 190.67 | 2264.08 | 191.13 | 2264.08 | 191.51 | 2264.08 | 191.56 | 2264.08 | 191.58 | 2264.08 |
| 191.6 | 2264.08 | 191.62 | 2264.08 | 191.64 | 2264.08 | 191.66 | 2264.08 | 191.68 | 2264.08 |
| 191.69 | 2264.08 | 191.86 | 2264.09 | 192 | 2264.1 | 192.63 | 2264.13 | 193.66 | 2264.17 |
| 194.48 | 2264.19 | 195.35 | 2264.21 | 202.93 | 2264.58 | 204.07 | 2264.62 | 204.9 | 2264.66 |
| 205.73 | 2264.69 | 222.35 | 2265.5 | 223.26 | 2265.55 | 224.05 | 2265.59 | 224.74 | 2265.62 |
| 225.33 | 2265.65 | 225.84 | 2265.67 | 226.27 | 2265.7 | 226.65 | 2265.72 | 228.17 | 2265.8 |
| 229.56 | 2265.87 | 230.52 | 2265.92 | 234.02 | 2266 | 234.08 | 2266 | 300 | 2266.69 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .03 | -22.33 | .03 | 40.44 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.33 | 40.44 | 150 | 170 | 260 | .1 | .3 |

Left Levee Station= -22.33 Elevation= 2264
Right Levee Station= 40.44 Elevation= 2266

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5830

INPUT
Description: Sta 58+30
Station Elevation Data num= 333

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2263.51 | -299.29 | 2263.5 | -298.23 | 2263.49 | -298.08 | 2263.49 | -297.93 | 2263.49 |
| -295.69 | 2263.48 | -291.45 | 2263.44 | -284.57 | 2263.37 | -281.74 | 2263.31 | -278.91 | 2263.26 |
| -277.56 | 2263.23 | -276.46 | 2263.22 | -269.54 | 2263.16 | -269.37 | 2263.16 | -262.85 | 2263.01 |
| -254.33 | 2262.93 | -253.12 | 2262.91 | -251.2 | 2262.89 | -250.56 | 2262.87 | -246.41 | 2262.8 |
| -245.2 | 2262.78 | -241.43 | 2262.71 | -240.31 | 2262.67 | -239.31 | 2262.64 | -239.21 | 2262.64 |
| -239 | 2262.64 | -238.65 | 2262.63 | -238.38 | 2262.63 | -238.24 | 2262.63 | -237.96 | 2262.62 |
| -237.76 | 2262.62 | -237.48 | 2262.62 | -237.23 | 2262.62 | -237 | 2262.62 | -236.66 | 2262.62 |
| -236.52 | 2262.62 | -236.02 | 2262.61 | -235.51 | 2262.61 | -234.79 | 2262.61 | -232.89 | 2262.59 |
| -232.36 | 2262.59 | -231.82 | 2262.59 | -231.37 | 2262.59 | -230.94 | 2262.59 | -229.96 | 2262.58 |
| -228.34 | 2262.58 | -222.83 | 2262.58 | -221.68 | 2262.58 | -221.13 | 2262.58 | -220.62 | 2262.58 |
| -220.13 | 2262.58 | -219.66 | 2262.58 | -219.21 | 2262.59 | -218.78 | 2262.59 | -218.56 | 2262.59 |
| -218.38 | 2262.59 | -218.02 | 2262.6 | -217.72 | 2262.6 | -216.89 | 2262.62 | -216.6 | 2262.62 |
| -216.27 | 2262.63 | -215.83 | 2262.63 | -215.33 | 2262.63 | -214.8 | 2262.63 | -212.48 | 2262.63 |
| -209.94 | 2262.63 | -208.97 | 2262.62 | -208.42 | 2262.62 | -207.89 | 2262.62 | -207.33 | 2262.61 |
| -206.23 | 2262.6 | -205.69 | 2262.6 | -205.58 | 2262.6 | -204.13 | 2262.58 | -202.75 | 2262.56 |
| -201.86 | 2262.55 | -201.44 | 2262.54 | -201.02 | 2262.54 | -200.63 | 2262.54 | -200.28 | 2262.54 |
| -199.94 | 2262.54 | -199.62 | 2262.54 | -199.28 | 2262.54 | -198.29 | 2262.55 | -197.65 | 2262.56 |
| -195.31 | 2262.61 | -195.03 | 2262.62 | -194.72 | 2262.62 | -193.56 | 2262.64 | -189.47 | 2262.69 |
| -187.18 | 2262.73 | -186.94 | 2262.73 | -186.64 | 2262.72 | -185.95 | 2262.71 | -178.89 | 2262.53 |
| -177.93 | 2262.55 | -171.06 | 2262.7 | -166.96 | 2262.79 | -165.16 | 2262.82 | -163.54 | 2262.85 |
| -162.09 | 2262.88 | -160.78 | 2262.9 | -159.64 | 2262.92 | -158.66 | 2262.93 | -156.77 | 2262.95 |
| -151.85 | 2263.08 | -151.79 | 2263.08 | -151.27 | 2263.12 | -149.56 | 2263.23 | -146.34 | 2263.29 |

```
-146.15 2263.29 -139.82  2263.4 -139.47 2263.41 -139.37 2263.41 -139.01 2263.42
-138.92 2263.42 -138.17 2263.43 -138.08 2263.43 -137.98 2263.43 -132.82 2263.53
-132.37 2263.53 -132.23 2263.53 -132.05 2263.53    -132 2263.53 -131.81 2263.53
-131.57 2263.53 -131.53 2263.53 -131.21 2263.53 -130.86 2263.54 -130.49 2263.54
-130.09 2263.54 -120.82 2263.59 -120.17 2263.52 -120.14  2263.5 -105.54  2263.8
 -87.03 2263.92  -83.36 2263.95  -80.74 2263.97  -79.34 2263.99  -78.17    2264
 -77.99    2264  -75.89    2264  -66.83    2264  -62.01 2263.85  -39.73 2262.25
 -36.64 2262.01  -35.63 2261.92  -29.3 2261.28  -25.3  2260.4  -22.68 2259.74
 -22.27 2259.64  -21.5  2259.5  -21.5  2255.5  -8.39  2255.5    -.94  2255.5
    -.9  2255.5   -.13  2255.5   6.58  2255.5   21.5  2255.5   21.5  2259.5
  21.83  2259.6  22.71 2259.77  22.97 2259.77  23.61 2259.79  28.61 2259.68
  32.79  2259.8  32.81  2259.8  39.24 2259.91  39.27 2259.91  39.29 2259.91
  39.32 2259.91  39.37 2259.91  39.46 2259.91  39.84 2259.91  40.08 2259.91
  40.42 2259.91  40.72  2259.9  40.78  2259.9  41.16 2259.91  41.71 2259.91
  41.77 2259.91  41.83 2259.91  41.85 2259.91  41.89 2259.91  41.92 2259.91
  41.95 2259.91  41.98 2259.91  42.01 2259.91  42.03 2259.91  42.05 2259.91
  42.09 2259.92  42.38 2259.93  42.94 2259.94  43.45 2259.96  43.97 2259.98
  44.12 2259.98  44.28 2259.99  44.34 2259.99   44.4 2259.99  44.45 2259.99
  44.51 2259.99  44.66    2260  44.81 2260.01  44.98 2260.02   45.5 2260.05
  45.77 2260.06  46.28 2260.09  46.47  2260.1  46.95 2260.12  47.14 2260.13
  47.49 2260.15  47.67 2260.16  48.01 2260.18  48.08 2260.18  49.09 2260.23
  49.44 2260.25  49.79 2260.27  50.92 2260.33  57.18 2260.64  63.36 2260.94
  63.69 2260.96  67.08 2261.12  70.42 2261.27  73.15  2261.4  76.36 2261.56
  78.97 2261.69  81.78 2261.82  86.27 2262.04   86.3 2262.04 108.85  2262.4
 213.42 2263.73 214.94 2263.73 215.85 2263.73 216.49 2263.73 224.37 2263.73
 224.85 2263.73 225.99 2263.74  229.2 2263.76 240.38 2263.85 242.52 2263.73
 248.34 2263.54 249.33  2263.5 254.58 2263.43  257.6 2263.43 258.02 2263.43
 258.62 2263.43 258.82 2263.43 258.98 2263.43 259.33 2263.43 261.85  2263.4
 262.56 2263.38 263.31 2263.38 264.19 2263.36 267.33 2263.31  269.9 2263.28
 274.09 2263.21 277.61 2263.17 282.83 2263.08 282.99 2263.07 283.17 2263.07
 283.35 2263.07 291.36 2262.95 291.71 2262.94 293.16 2262.93 293.28 2262.92
 293.74 2262.91 294.15 2262.91 294.34 2262.91 294.46  2262.9 294.52  2262.9
 294.54  2262.9 294.55  2262.9 294.57  2262.9  294.6  2262.9 294.75  2262.9
 294.82  2262.9 294.86  2262.9 294.92  2262.9 294.95  2262.9 294.97  2262.9
 294.98  2262.9    295  2262.9 295.01  2262.9 295.03  2262.9 295.29  2262.9
  295.3  2262.9 295.33  2262.9 295.66  2262.9 295.67  2262.9 295.93  2262.9
 295.95  2262.9 296.29  2262.9  296.3  2262.9 296.33  2262.9 296.59  2262.9
 296.79  2262.9 296.82  2262.9 296.83  2262.9 296.84  2262.9 296.86  2262.9
 296.87  2262.9 296.88  2262.9 296.89  2262.9 296.99 2262.91 297.07 2262.91
 297.41 2262.92 297.98 2262.94 298.43 2262.95 298.91 2262.96 302.29 2263.09
  303.1 2263.12 303.73 2263.14 304.18 2263.15 304.64 2263.17 313.81 2263.52
 314.32 2263.54 314.66 2263.55 314.75 2263.56 315.13 2263.57 315.46 2263.58
 315.74 2263.59 315.98  2263.6 316.19 2263.61 317.03 2263.65 317.79 2263.68
 318.32  2263.7 320.25 2263.73 320.29 2263.73 337.13 2263.87 338.65 2263.88
 339.39 2263.89  340.1  2263.9 356.67 2264.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -66.83    .015  240.38    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -66.83  240.38                60      60      60             .1      .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 5800

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      56
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
     -40    2260  2259.5       40    2260  2259.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=     333
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2263.51 -299.29  2263.5 -298.23 2263.49 -298.08 2263.49 -297.93 2263.49
 -295.69 2263.48 -291.45 2263.44 -284.57 2263.37 -281.74 2263.31 -278.91 2263.26
 -277.56 2263.23 -276.46 2263.22 -269.54 2263.16 -269.37 2263.16 -262.85 2263.01
 -254.33 2262.93 -253.12 2262.91  -251.2 2262.89 -250.56 2262.87 -246.41  2262.8
  -245.2 2262.78 -241.43 2262.71 -240.31 2262.67 -239.31 2262.64 -239.21 2262.64
    -239 2262.64 -238.65 2262.63 -238.38 2262.63 -238.24 2262.63 -237.96 2262.62
 -237.76 2262.62 -237.48 2262.62 -237.23 2262.62    -237 2262.62 -236.66 2262.62
 -236.52 2262.62 -236.02 2262.61 -235.51 2262.61 -234.79 2262.61 -232.89 2262.59
 -232.36 2262.59 -231.82 2262.59 -231.37 2262.59 -230.94 2262.59 -229.96 2262.58
```

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-228.34 2262.58 -222.83 2262.58 -221.68 2262.58 -221.13 2262.58 -220.62 2262.58
-220.13 2262.58 -219.66 2262.58 -219.21 2262.59 -218.78 2262.59 -218.56 2262.59
-218.38 2262.59 -218.02  2262.6 -217.72  2262.6 -216.89 2262.62  -216.6 2262.62
-216.27 2262.63 -215.83 2262.63 -215.33 2262.63  -214.8 2262.63 -212.48 2262.63
-209.94 2262.63 -208.97 2262.62 -208.42 2262.62 -207.89 2262.62 -207.33 2262.61
-206.23  2262.6 -205.69  2262.6 -205.58  2262.6 -204.13 2262.58 -202.75 2262.56
-201.86 2262.55 -201.44 2262.54 -201.02 2262.54 -200.63 2262.54 -200.28 2262.54
-199.94 2262.54 -199.62 2262.54 -199.28 2262.54 -198.29 2262.55 -197.65 2262.56
-195.31 2262.61 -195.03 2262.62 -194.72 2262.62 -193.56 2262.64 -189.47 2262.69
-187.18 2262.73 -186.94 2262.73 -186.64 2262.72 -185.95 2262.71 -178.89 2262.53
-177.93 2262.55 -171.06  2262.7 -166.96 2262.79 -165.16 2262.82 -163.54 2262.85
-162.09 2262.88 -160.78  2262.9 -159.64 2262.92 -158.66 2262.93 -156.77 2262.95
-151.85 2263.08 -151.79 2263.08 -151.27 2263.12 -149.56 2263.23 -146.34 2263.29
-146.15 2263.29 -139.82  2263.4 -139.47 2263.41 -139.37 2263.41 -139.01 2263.42
-138.92 2263.42 -138.17 2263.43 -138.08 2263.43 -137.98 2263.43 -132.82 2263.53
-132.37 2263.53 -132.23 2263.53 -132.05 2263.53    -132 2263.53 -131.81 2263.53
-131.57 2263.53 -131.53 2263.53 -131.21 2263.53 -130.86 2263.54 -130.49 2263.54
-130.09 2263.54 -120.82 2263.59 -120.17 2263.52 -120.14  2263.5 -105.54  2263.8
 -87.03 2263.92  -83.36 2263.95  -80.74 2263.97  -79.34 2263.99  -78.17    2264
 -77.99    2264  -75.89    2264  -66.83    2264  -62.01 2263.85  -39.73 2262.25
 -36.64 2262.01  -35.63 2261.92  -29.3 2261.28   -25.3  2260.4  -22.68 2259.74
 -22.27 2259.64   -21.5  2259.5   -21.5  2255.5   -8.39  2255.5    -.94  2255.5
    -.9  2255.5    -.13  2255.5    6.58  2255.5    21.5  2255.5    21.5  2259.5
  21.83  2259.6   22.71 2259.77   22.97 2259.77   23.61 2259.79   28.61 2259.68
  32.79  2259.8   32.81  2259.8   39.24 2259.91   39.27 2259.91   39.29 2259.91
  39.32 2259.91   39.37 2259.91   39.46 2259.91   39.84 2259.91   40.08 2259.91
  40.42 2259.91   40.72  2259.9   40.78  2259.9   41.16 2259.91   41.71 2259.91
  41.77 2259.91   41.83 2259.91   41.85 2259.91   41.89 2259.91   41.92 2259.91
  41.95 2259.91   41.98 2259.91   42.01 2259.91   42.03 2259.91   42.05 2259.91
  42.09 2259.92   42.38 2259.93   42.94 2259.94   43.45 2259.96   43.97 2259.98
  44.12 2259.98   44.28 2259.99   44.34 2259.99    44.4 2259.99   44.45 2259.99
  44.51 2259.99   44.66    2260   44.81 2260.01   44.98 2260.02    45.5 2260.05
  45.77 2260.06   46.28 2260.09   46.47  2260.1   46.95 2260.12   47.14 2260.13
  47.49 2260.15   47.67 2260.16   48.01 2260.18   48.08 2260.18   49.09 2260.23
  49.44 2260.25   49.79 2260.27   50.92 2260.33   57.18 2260.64   63.36 2260.94
  63.69 2260.96   67.08 2261.12   70.42 2261.27   73.15  2261.4   76.36 2261.56
  78.97 2261.69   81.78 2261.82   86.27 2262.04    86.3 2262.04  108.85  2262.4
 213.42 2263.73  214.94 2263.73  215.85 2263.73  216.49 2263.73  224.37 2263.73
 224.85 2263.73  225.99 2263.74   229.2 2263.76  240.38 2263.85  242.52 2263.73
 248.34 2263.54  249.33  2263.5  254.58 2263.43   257.6 2263.43  258.02 2263.43
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 274.09 2263.21  277.61 2263.17  282.83 2263.08  282.99 2263.07  283.17 2263.07
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 293.74 2262.91  294.15 2262.91  294.34 2262.91  294.46  2262.9  294.52  2262.9
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  295.3  2262.9  295.33  2262.9  295.66  2262.9  295.67  2262.9  295.93  2262.9
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 296.79  2262.9  296.82  2262.9  296.83  2262.9  296.84  2262.9  296.86  2262.9
 296.87  2262.9  296.88  2262.9  296.89  2262.9  296.99 2262.91  297.07 2262.91
 297.41 2262.92  297.98 2262.94  298.43 2262.95  298.91 2262.96  302.29 2263.09
  303.1 2263.12  303.73 2263.14  304.18 2263.15  304.64 2263.17  313.81 2263.52
 314.32 2263.54  314.66 2263.55  314.75 2263.56  315.13 2263.57  315.46 2263.58
 315.74 2263.59  315.98  2263.6  316.19 2263.61  317.03 2263.65  317.79 2263.68
 318.32  2263.7  320.25 2263.73  320.29 2263.73  337.13 2263.87  338.65 2263.88
 339.39 2263.89   340.1  2263.9  356.67 2264.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -66.83    .015  240.38    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -66.83  240.38             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
     -40    2260 2259.36       40    2260 2259.36

Downstream Bridge Cross Section Data
Station Elevation Data    num=     484
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300    2264 -299.33 2263.98 -298.32 2263.95 -298.18 2263.95 -298.03 2263.95
 -295.91 2263.91 -292.04 2263.82 -291.88 2263.81 -285.65 2263.66 -285.35 2263.65
 -283.01 2263.56 -282.66 2263.55 -280.38 2263.46 -279.98 2263.45 -278.69  2263.4
  -278.1 2263.38 -277.65 2263.36 -271.51 2263.18 -271.08 2263.16 -270.92 2263.16
 -264.73 2262.88 -256.64 2262.58 -255.49 2262.54 -254.01 2262.48 -253.67 2262.47
 -253.06 2262.45 -249.12 2262.32 -249.03 2262.32 -247.97 2262.29 -245.52  2262.2
 -244.39 2262.15 -243.54 2262.11 -243.33  2262.1 -243.25  2262.1 -242.93 2262.09
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -242.54 | 2262.07 | -242.38 | 2262.07 | -242.28 | 2262.07 | -242.1 | 2262.07 | -242.08 | 2262.07 |
| -241.75 | 2262.06 | -241.61 | 2262.06 | -241.49 | 2262.06 | -241.36 | 2262.06 | -241.09 | 2262.05 |
| -241.08 | 2262.05 | -240.9 | 2262.05 | -240.64 | 2262.05 | -240.4 | 2262.05 | -240.18 | 2262.05 |
| -239.86 | 2262.04 | -239.73 | 2262.04 | -239.34 | 2262.04 | -239.25 | 2262.04 | -238.77 | 2262.04 |
| -238.09 | 2262.03 | -236.28 | 2262.02 | -235.78 | 2262.02 | -235.27 | 2262.01 | -234.84 | 2262.01 |
| -234.43 | 2262.01 | -233.5 | 2262 | -231.96 | 2262 | -228.22 | 2261.99 | -227.15 | 2261.99 |
| -226.73 | 2261.99 | -226.63 | 2261.99 | -226.16 | 2261.99 | -225.71 | 2261.99 | -225.64 | 2261.99 |
| -225.27 | 2261.99 | -225.12 | 2261.99 | -224.84 | 2261.99 | -224.63 | 2261.99 | -224.44 | 2261.99 |
| -224.17 | 2261.99 | -224.07 | 2261.99 | -223.74 | 2262 | -223.72 | 2262 | -223.46 | 2262 |
| -223.29 | 2262.01 | -222.88 | 2262.01 | -222.69 | 2262.02 | -222.68 | 2262.02 | -222.5 | 2262.02 |
| -222.42 | 2262.02 | -222.16 | 2262.03 | -222.11 | 2262.03 | -221.88 | 2262.03 | -221.7 | 2262.03 |
| -221.24 | 2262.04 | -221.09 | 2262.04 | -220.81 | 2262.04 | -220.74 | 2262.04 | -220.5 | 2262.05 |
| -220.08 | 2262.05 | -219.61 | 2262.04 | -219.11 | 2262.04 | -218.58 | 2262.04 | -216.9 | 2262.03 |
| -215.32 | 2262.03 | -214.49 | 2262.02 | -214.32 | 2262.02 | -213.57 | 2262.01 | -213.05 | 2262.01 |
| -212.54 | 2262.01 | -212.01 | 2262 | -210.97 | 2261.98 | -210.82 | 2261.98 | -210.46 | 2261.98 |
| -210.35 | 2261.98 | -209.53 | 2261.97 | -208.97 | 2261.96 | -208.71 | 2261.96 | -208.31 | 2261.96 |
| -207.93 | 2261.95 | -207.66 | 2261.95 | -207.56 | 2261.95 | -207.23 | 2261.95 | -206.92 | 2261.95 |
| -206.82 | 2261.95 | -206.62 | 2261.95 | -206.42 | 2261.95 | -206.31 | 2261.95 | -206.02 | 2261.96 |
| -205.65 | 2261.96 | -205.39 | 2261.97 | -205.32 | 2261.97 | -205 | 2261.97 | -204.79 | 2261.98 |
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| -202.35 | 2262.06 | -202.07 | 2262.07 | -200.98 | 2262.1 | -200.6 | 2262.11 | -200.33 | 2262.12 |
| -200.04 | 2262.12 | -198.94 | 2262.15 | -197.18 | 2262.2 | -195.06 | 2262.26 | -194.55 | 2262.27 |
| -193.91 | 2262.29 | -192.88 | 2262.31 | -192.65 | 2262.31 | -192.37 | 2262.31 | -191.71 | 2262.31 |
| -186.45 | 2262.31 | -185.01 | 2262.3 | -184.1 | 2262.32 | -180.05 | 2262.42 | -177.58 | 2262.48 |
| -176.24 | 2262.51 | -174.56 | 2262.55 | -173.68 | 2262.57 | -173.06 | 2262.58 | -171.97 | 2262.6 |
| -171.71 | 2262.61 | -170.49 | 2262.63 | -170.44 | 2262.63 | -169.43 | 2262.65 | -169.06 | 2262.66 |
| -168.52 | 2262.66 | -167.81 | 2262.67 | -166.76 | 2262.69 | -166.73 | 2262.69 | -165.8 | 2262.71 |
| -164.01 | 2262.74 | -159.34 | 2262.89 | -159.28 | 2262.89 | -158.79 | 2262.92 | -157.16 | 2263 |
| -154.1 | 2263.08 | -153.92 | 2263.08 | -147.91 | 2263.24 | -147.58 | 2263.25 | -147.49 | 2263.25 |
| -147.14 | 2263.26 | -147.06 | 2263.26 | -146.35 | 2263.28 | -146.26 | 2263.28 | -146.17 | 2263.28 |
| -144.06 | 2263.34 | -143.94 | 2263.34 | -143.77 | 2263.34 | -143.54 | 2263.34 | -143.28 | 2263.34 |
| -142.98 | 2263.35 | -142.66 | 2263.35 | -142.32 | 2263.36 | -141.94 | 2263.37 | -141.27 | 2263.38 |
| -140.84 | 2263.38 | -140.71 | 2263.38 | -140.54 | 2263.38 | -140.49 | 2263.38 | -140.31 | 2263.38 |
| -140.08 | 2263.38 | -140.04 | 2263.38 | -139.74 | 2263.39 | -139.41 | 2263.39 | -139.06 | 2263.39 |
| -138.68 | 2263.4 | -133.32 | 2263.44 | -132.72 | 2263.38 | -132.68 | 2263.36 | -129.87 | 2263.42 |
| -129.26 | 2263.4 | -129.23 | 2263.39 | -119.1 | 2263.69 | -115.37 | 2263.75 | -101.89 | 2263.88 |
| -98.47 | 2263.91 | -97.79 | 2263.92 | -96.03 | 2263.94 | -94.73 | 2263.96 | -94.31 | 2263.97 |
| -93.65 | 2263.98 | -93.47 | 2263.98 | -91.82 | 2263.98 | -90.49 | 2263.99 | -89.38 | 2264 |
| -89.21 | 2264 | -87.21 | 2264 | -83.1 | 2264 | -78.61 | 2263.88 | -72.86 | 2263.66 |
| -46.29 | 2262.16 | -42.6 | 2261.94 | -41.4 | 2261.86 | -36.09 | 2261.5 | -33.85 | 2261.17 |
| -30.89 | 2260.58 | -29.07 | 2260.19 | -26.95 | 2259.7 | -25.95 | 2259.51 | -21.5 | 2259.36 |
| -21.5 | 2255.36 | -8.9 | 2255.36 | -.94 | 2255.36 | -.89 | 2255.36 | -.07 | 2255.36 |
| 7.11 | 2255.36 | 21.5 | 2255.36 | 21.5 | 2259.36 | 25.5 | 2259.78 | 26.56 | 2259.88 |
| 26.87 | 2259.88 | 27.64 | 2259.89 | 27.9 | 2259.88 | 29.09 | 2260 | 29.45 | 2260 |
| 30.33 | 2260 | 33.67 | 2259.9 | 37.14 | 2259.87 | 38.71 | 2259.91 | 38.73 | 2259.91 |
| 42.83 | 2259.99 | 42.85 | 2259.99 | 46.49 | 2260.03 | 46.52 | 2260.03 | 46.55 | 2260.03 |
| 46.58 | 2260.03 | 46.64 | 2260.03 | 46.75 | 2260.03 | 47.21 | 2260.04 | 47.5 | 2260.04 |
| 47.91 | 2260.04 | 48.27 | 2260.03 | 48.34 | 2260.03 | 48.8 | 2260.04 | 49.46 | 2260.04 |
| 49.54 | 2260.04 | 49.61 | 2260.04 | 49.63 | 2260.04 | 49.68 | 2260.04 | 49.72 | 2260.04 |
| 49.75 | 2260.04 | 49.79 | 2260.04 | 49.83 | 2260.04 | 49.85 | 2260.04 | 49.87 | 2260.05 |
| 49.92 | 2260.05 | 50.27 | 2260.06 | 50.95 | 2260.07 | 51.56 | 2260.08 | 51.62 | 2260.08 |
| 51.66 | 2260.08 | 51.7 | 2260.08 | 51.73 | 2260.08 | 51.8 | 2260.08 | 51.92 | 2260.08 |
| 52.19 | 2260.09 | 52.37 | 2260.08 | 52.44 | 2260.08 | 52.56 | 2260.09 | 52.64 | 2260.09 |
| 52.71 | 2260.09 | 52.77 | 2260.08 | 52.84 | 2260.08 | 53.02 | 2260.09 | 53.2 | 2260.09 |
| 53.23 | 2260.09 | 53.41 | 2260.09 | 53.64 | 2260.1 | 53.72 | 2260.1 | 54.03 | 2260.11 |
| 54.24 | 2260.11 | 54.36 | 2260.11 | 54.97 | 2260.13 | 54.99 | 2260.13 | 55.07 | 2260.13 |
| 55.15 | 2260.13 | 55.18 | 2260.13 | 55.2 | 2260.13 | 55.23 | 2260.13 | 55.27 | 2260.13 |
| 55.32 | 2260.13 | 55.36 | 2260.13 | 55.39 | 2260.14 | 55.42 | 2260.14 | 55.45 | 2260.14 |
| 55.51 | 2260.14 | 55.78 | 2260.15 | 55.89 | 2260.15 | 56.01 | 2260.16 | 56.43 | 2260.17 |
| 56.65 | 2260.18 | 56.66 | 2260.18 | 57.06 | 2260.2 | 57.14 | 2260.2 | 57.36 | 2260.21 |
| 58.07 | 2260.23 | 58.27 | 2260.24 | 58.36 | 2260.24 | 58.49 | 2260.24 | 58.57 | 2260.25 |
| 58.65 | 2260.25 | 58.78 | 2260.26 | 58.81 | 2260.26 | 59.01 | 2260.26 | 59.21 | 2260.27 |
| 59.44 | 2260.28 | 60.15 | 2260.3 | 60.52 | 2260.31 | 60.57 | 2260.31 | 61.21 | 2260.32 |
| 61.47 | 2260.33 | 62.12 | 2260.35 | 62.38 | 2260.36 | 62.87 | 2260.37 | 63.11 | 2260.38 |
| 63.58 | 2260.39 | 65.04 | 2260.43 | 65.52 | 2260.44 | 65.99 | 2260.46 | 67.54 | 2260.49 |
| 68.12 | 2260.51 | 75.57 | 2260.68 | 75.96 | 2260.69 | 76.07 | 2260.7 | 80.05 | 2260.79 |
| 84.08 | 2260.88 | 84.5 | 2260.89 | 87.37 | 2260.95 | 91.24 | 2261.05 | 94.39 | 2261.12 |
| 97.77 | 2261.2 | 97.83 | 2261.2 | 102.2 | 2261.3 | 103.19 | 2261.33 | 103.22 | 2261.33 |
| 105.77 | 2261.35 | 109.59 | 2261.38 | 115.75 | 2261.44 | 130.41 | 2261.6 | 256.49 | 2262.81 |
| 258.32 | 2262.81 | 259.42 | 2262.82 | 260.19 | 2262.82 | 269.69 | 2262.86 | 270.27 | 2262.86 |
| 271.64 | 2262.87 | 275.51 | 2262.9 | 288.99 | 2263 | 289.92 | 2262.96 | 290.61 | 2262.93 |
| 290.87 | 2262.93 | 294.99 | 2262.83 | 295.69 | 2262.81 | 295.74 | 2262.81 | 296.68 | 2262.8 |
| 298.65 | 2262.78 | 299.7 | 2262.77 | 301.98 | 2262.77 | 302.29 | 2262.77 | 302.74 | 2262.77 |
| 302.9 | 2262.77 | 303.02 | 2262.77 | 303.28 | 2262.77 | 305.18 | 2262.75 | 305.71 | 2262.74 |
| 306.28 | 2262.74 | 306.94 | 2262.73 | 309.31 | 2262.71 | 310.36 | 2262.7 | 311.25 | 2262.69 |
| 314.41 | 2262.65 | 317.06 | 2262.63 | 320.06 | 2262.59 | 321 | 2262.58 | 321.12 | 2262.58 |
| 321.25 | 2262.58 | 321.39 | 2262.58 | 327.43 | 2262.51 | 327.69 | 2262.51 | 328.79 | 2262.5 |
| 328.88 | 2262.5 | 329.22 | 2262.49 | 329.53 | 2262.49 | 329.68 | 2262.49 | 329.77 | 2262.48 |
| 329.81 | 2262.48 | 329.83 | 2262.48 | 329.85 | 2262.48 | 329.87 | 2262.48 | 329.98 | 2262.48 |
| 330.04 | 2262.48 | 330.07 | 2262.48 | 330.11 | 2262.48 | 330.14 | 2262.48 | 330.15 | 2262.48 |
| 330.17 | 2262.48 | 330.2 | 2262.48 | 330.39 | 2262.48 | 330.42 | 2262.48 | 330.67 | 2262.48 |

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  330.87 2262.48  330.89 2262.48  331.15 2262.48  331.18 2262.48  331.37 2262.48
  331.52 2262.48  331.54 2262.48  331.58 2262.48  331.67 2262.49  331.73 2262.49
  331.99  2262.5  332.42 2262.51  332.76 2262.51  333.12 2262.52  335.67 2262.59
  336.28  2262.6  336.75 2262.61  337.09 2262.62  337.44 2262.63  337.87 2262.64
  343.39 2262.79  344.35 2262.82  344.74 2262.83     345 2262.83  345.06 2262.84
  345.35 2262.85   345.6 2262.85  345.81 2262.86  345.99 2262.86  346.15 2262.87
  346.78 2262.89  347.36  2262.9  347.75 2262.92  349.21 2262.93  349.24 2262.93
  350.96 2262.94 361.94 2263.01  363.08 2263.01  363.64 2263.02  364.18 2263.02
  364.71 2263.03  365.64 2263.03  366.09 2263.03  366.53 2263.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -78.61    .015  288.99    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -78.61  288.99             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=       0    Downstream=       0
Upstream     num=       2
    Width   Elev    Width   Elev
       1  2255.5       1    2260
Downstream     num=       2
    Width   Elev    Width   Elev
       1 2255.36       1    2260

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 5770.*

INPUT
Description: Sta 57+70
Station Elevation Data    num=     484
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300    2264 -299.33 2263.98 -298.32 2263.95 -298.18 2263.95 -298.03 2263.95
 -295.91 2263.91 -292.04 2263.82 -291.88 2263.81 -285.65 2263.66 -285.35 2263.65
 -283.01 2263.56 -282.66 2263.55 -280.38 2263.46 -279.98 2263.45 -278.69  2263.4
  -278.1 2263.38 -277.65 2263.36 -271.51 2263.18 -271.08 2263.16 -270.92 2263.16
 -264.73 2262.88 -256.64 2262.58 -255.49 2262.54 -254.01 2262.48 -253.67 2262.47
 -253.06 2262.45 -249.12 2262.32 -249.03 2262.32 -247.97 2262.29 -245.52  2262.2
 -244.39 2262.15 -243.54 2262.11 -243.33  2262.1 -243.25  2262.1 -242.93 2262.09
 -242.54 2262.07 -242.38 2262.07 -242.28 2262.07  -242.1 2262.07 -242.08 2262.07
 -241.75 2262.06 -241.61 2262.06 -241.49 2262.06 -241.36 2262.06 -241.09 2262.05
 -241.08 2262.05  -240.9 2262.05 -240.64 2262.05  -240.4 2262.05 -240.18 2262.05
 -239.86 2262.04 -239.73 2262.04 -239.34 2262.04 -239.25 2262.04 -238.77 2262.04
 -238.09 2262.03 -236.28 2262.02 -235.78 2262.02 -235.27 2262.01 -234.84 2262.01
 -234.43 2262.01  -233.5    2262 -231.96    2262 -228.22 2261.99 -227.15 2261.99
 -226.73 2261.99 -226.63 2261.99 -226.16 2261.99 -225.71 2261.99 -225.64 2261.99
 -225.27 2261.99 -225.12 2261.99 -224.84 2261.99 -224.63 2261.99 -224.44 2261.99
 -224.17 2261.99 -224.07 2261.99 -223.74    2262 -223.72    2262 -223.46    2262
 -223.29 2262.01 -222.88 2262.01 -222.69 2262.02 -222.68 2262.02  -222.5 2262.02
 -222.42 2262.02 -222.16 2262.03 -222.11 2262.03 -221.88 2262.03  -221.7 2262.03
 -221.24 2262.04 -221.09 2262.04 -220.81 2262.04 -220.74 2262.04  -220.5 2262.05
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -220.08 | 2262.05 | -219.61 | 2262.04 | -219.11 | 2262.04 | -218.58 | 2262.04 | -216.9 | 2262.03 |
| -215.32 | 2262.03 | -214.49 | 2262.02 | -214.32 | 2262.02 | -213.57 | 2262.01 | -213.05 | 2262.01 |
| -212.54 | 2262.01 | -212.01 | 2262 | -210.97 | 2261.98 | -210.82 | 2261.98 | -210.46 | 2261.98 |
| -210.35 | 2261.98 | -209.53 | 2261.97 | -208.97 | 2261.96 | -208.71 | 2261.96 | -208.31 | 2261.96 |
| -207.93 | 2261.95 | -207.66 | 2261.95 | -207.56 | 2261.95 | -207.23 | 2261.95 | -206.92 | 2261.95 |
| -206.82 | 2261.95 | -206.62 | 2261.95 | -206.42 | 2261.95 | -206.31 | 2261.95 | -206.02 | 2261.96 |
| -205.65 | 2261.96 | -205.39 | 2261.97 | -205.32 | 2261.97 | -205 | 2261.97 | -204.79 | 2261.98 |
| -204.69 | 2261.98 | -204.37 | 2261.99 | -203.43 | 2262.02 | -202.82 | 2262.04 | -202.61 | 2262.05 |
| -202.35 | 2262.06 | -202.07 | 2262.07 | -200.98 | 2262.1 | -200.6 | 2262.11 | -200.33 | 2262.12 |
| -200.04 | 2262.12 | -198.94 | 2262.15 | -197.18 | 2262.2 | -195.06 | 2262.26 | -194.55 | 2262.27 |
| -193.91 | 2262.29 | -192.88 | 2262.31 | -192.65 | 2262.31 | -192.37 | 2262.31 | -191.71 | 2262.31 |
| -186.45 | 2262.31 | -185.01 | 2262.3 | -184.1 | 2262.32 | -180.05 | 2262.42 | -177.58 | 2262.48 |
| -176.24 | 2262.51 | -174.56 | 2262.55 | -173.68 | 2262.57 | -173.06 | 2262.58 | -171.97 | 2262.6 |
| -171.71 | 2262.61 | -170.49 | 2262.63 | -170.44 | 2262.63 | -169.43 | 2262.65 | -169.06 | 2262.66 |
| -168.52 | 2262.66 | -167.81 | 2262.67 | -166.76 | 2262.69 | -166.73 | 2262.69 | -165.8 | 2262.71 |
| -164.01 | 2262.74 | -159.34 | 2262.89 | -159.28 | 2262.89 | -158.79 | 2262.92 | -157.16 | 2263 |
| -154.1 | 2263.08 | -153.92 | 2263.08 | -147.91 | 2263.24 | -147.58 | 2263.25 | -147.49 | 2263.25 |
| -147.14 | 2263.26 | -147.06 | 2263.26 | -146.35 | 2263.28 | -146.26 | 2263.28 | -146.17 | 2263.28 |
| -144.06 | 2263.34 | -143.94 | 2263.34 | -143.77 | 2263.34 | -143.54 | 2263.34 | -143.28 | 2263.34 |
| -142.98 | 2263.35 | -142.66 | 2263.35 | -142.32 | 2263.36 | -141.94 | 2263.37 | -141.27 | 2263.38 |
| -140.84 | 2263.38 | -140.71 | 2263.38 | -140.54 | 2263.38 | -140.49 | 2263.38 | -140.31 | 2263.38 |
| -140.08 | 2263.38 | -140.04 | 2263.38 | -139.74 | 2263.39 | -139.41 | 2263.39 | -139.06 | 2263.39 |
| -138.68 | 2263.4 | -133.32 | 2263.44 | -132.72 | 2263.38 | -132.68 | 2263.36 | -129.87 | 2263.42 |
| -129.26 | 2263.4 | -129.23 | 2263.39 | -119.1 | 2263.69 | -115.37 | 2263.75 | -101.89 | 2263.88 |
| -98.47 | 2263.91 | -97.79 | 2263.92 | -96.03 | 2263.94 | -94.73 | 2263.96 | -94.31 | 2263.97 |
| -93.65 | 2263.98 | -93.47 | 2263.98 | -91.82 | 2263.98 | -90.49 | 2263.99 | -89.38 | 2264 |
| -89.21 | 2264 | -87.21 | 2264 | -83.1 | 2264 | -78.61 | 2263.88 | -72.86 | 2263.66 |
| -46.29 | 2262.16 | -42.6 | 2261.94 | -41.4 | 2261.86 | -36.09 | 2261.5 | -33.85 | 2261.17 |
| -30.89 | 2260.58 | -29.07 | 2260.19 | -26.95 | 2259.7 | -25.95 | 2259.51 | -21.5 | 2259.36 |
| -21.5 | 2255.36 | -8.9 | 2255.36 | -.94 | 2255.36 | -.89 | 2255.36 | -.07 | 2255.36 |
| 7.11 | 2255.36 | 21.5 | 2255.36 | 21.5 | 2259.36 | 25.5 | 2259.78 | 26.56 | 2259.88 |
| 26.87 | 2259.88 | 27.64 | 2259.89 | 27.9 | 2259.88 | 29.09 | 2260 | 29.45 | 2260 |
| 30.33 | 2260 | 33.67 | 2259.9 | 37.14 | 2259.87 | 38.71 | 2259.91 | 38.73 | 2259.91 |
| 42.83 | 2259.99 | 42.85 | 2259.99 | 46.49 | 2260.03 | 46.52 | 2260.03 | 46.55 | 2260.03 |
| 46.58 | 2260.03 | 46.64 | 2260.03 | 46.75 | 2260.03 | 47.21 | 2260.04 | 47.5 | 2260.04 |
| 47.91 | 2260.04 | 48.27 | 2260.03 | 48.34 | 2260.03 | 48.8 | 2260.04 | 49.46 | 2260.04 |
| 49.54 | 2260.04 | 49.61 | 2260.04 | 49.63 | 2260.04 | 49.68 | 2260.04 | 49.72 | 2260.04 |
| 49.75 | 2260.04 | 49.79 | 2260.04 | 49.83 | 2260.04 | 49.85 | 2260.04 | 49.87 | 2260.05 |
| 49.92 | 2260.05 | 50.27 | 2260.06 | 50.95 | 2260.07 | 51.56 | 2260.08 | 51.62 | 2260.08 |
| 51.66 | 2260.08 | 51.7 | 2260.08 | 51.73 | 2260.08 | 51.8 | 2260.08 | 51.92 | 2260.08 |
| 52.19 | 2260.09 | 52.37 | 2260.08 | 52.44 | 2260.08 | 52.56 | 2260.09 | 52.64 | 2260.09 |
| 52.71 | 2260.09 | 52.77 | 2260.08 | 52.84 | 2260.08 | 53.02 | 2260.09 | 53.2 | 2260.09 |
| 53.23 | 2260.09 | 53.41 | 2260.09 | 53.64 | 2260.1 | 53.72 | 2260.1 | 54.03 | 2260.11 |
| 54.24 | 2260.11 | 54.36 | 2260.11 | 54.97 | 2260.13 | 54.99 | 2260.13 | 55.07 | 2260.13 |
| 55.15 | 2260.13 | 55.18 | 2260.13 | 55.2 | 2260.13 | 55.23 | 2260.13 | 55.27 | 2260.13 |
| 55.32 | 2260.13 | 55.36 | 2260.13 | 55.39 | 2260.14 | 55.42 | 2260.14 | 55.45 | 2260.14 |
| 55.51 | 2260.14 | 55.78 | 2260.15 | 55.89 | 2260.15 | 56.01 | 2260.16 | 56.43 | 2260.17 |
| 56.65 | 2260.18 | 56.66 | 2260.18 | 57.06 | 2260.2 | 57.14 | 2260.2 | 57.36 | 2260.21 |
| 58.07 | 2260.23 | 58.27 | 2260.24 | 58.36 | 2260.24 | 58.49 | 2260.24 | 58.57 | 2260.25 |
| 58.65 | 2260.25 | 58.78 | 2260.26 | 58.81 | 2260.26 | 59.01 | 2260.26 | 59.21 | 2260.27 |
| 59.44 | 2260.28 | 60.15 | 2260.3 | 60.52 | 2260.31 | 60.57 | 2260.31 | 61.21 | 2260.32 |
| 61.47 | 2260.33 | 62.12 | 2260.35 | 62.38 | 2260.36 | 62.87 | 2260.37 | 63.11 | 2260.38 |
| 63.58 | 2260.39 | 65.04 | 2260.43 | 65.52 | 2260.44 | 65.99 | 2260.46 | 67.54 | 2260.49 |
| 68.12 | 2260.51 | 75.57 | 2260.68 | 75.96 | 2260.69 | 76.07 | 2260.7 | 80.05 | 2260.79 |
| 84.08 | 2260.88 | 84.5 | 2260.89 | 87.37 | 2260.95 | 91.24 | 2261.05 | 94.39 | 2261.12 |
| 97.77 | 2261.2 | 97.83 | 2261.2 | 102.2 | 2261.3 | 103.19 | 2261.33 | 103.22 | 2261.33 |
| 105.77 | 2261.35 | 109.59 | 2261.38 | 115.75 | 2261.44 | 130.41 | 2261.6 | 256.49 | 2262.81 |
| 258.32 | 2262.81 | 259.42 | 2262.82 | 260.19 | 2262.82 | 269.69 | 2262.86 | 270.27 | 2262.86 |
| 271.64 | 2262.87 | 275.51 | 2262.9 | 288.99 | 2263 | 289.92 | 2262.96 | 290.61 | 2262.93 |
| 290.87 | 2262.93 | 294.99 | 2262.83 | 295.69 | 2262.81 | 295.74 | 2262.81 | 296.68 | 2262.8 |
| 298.65 | 2262.78 | 299.7 | 2262.77 | 301.98 | 2262.77 | 302.29 | 2262.77 | 302.74 | 2262.77 |
| 302.9 | 2262.77 | 303.02 | 2262.77 | 303.28 | 2262.77 | 305.18 | 2262.75 | 305.71 | 2262.74 |
| 306.28 | 2262.74 | 306.94 | 2262.73 | 309.31 | 2262.71 | 310.36 | 2262.7 | 311.25 | 2262.69 |
| 314.41 | 2262.65 | 317.06 | 2262.63 | 320.06 | 2262.59 | 321 | 2262.58 | 321.12 | 2262.58 |
| 321.25 | 2262.58 | 321.39 | 2262.58 | 327.43 | 2262.51 | 327.69 | 2262.51 | 328.79 | 2262.5 |
| 328.88 | 2262.5 | 329.22 | 2262.49 | 329.53 | 2262.49 | 329.68 | 2262.49 | 329.77 | 2262.48 |
| 329.81 | 2262.48 | 329.83 | 2262.48 | 329.85 | 2262.48 | 329.87 | 2262.48 | 329.98 | 2262.48 |
| 330.04 | 2262.48 | 330.07 | 2262.48 | 330.11 | 2262.48 | 330.14 | 2262.48 | 330.15 | 2262.48 |
| 330.17 | 2262.48 | 330.2 | 2262.48 | 330.39 | 2262.48 | 330.42 | 2262.48 | 330.67 | 2262.48 |
| 330.87 | 2262.48 | 330.89 | 2262.48 | 331.15 | 2262.48 | 331.18 | 2262.48 | 331.37 | 2262.48 |
| 331.52 | 2262.48 | 331.54 | 2262.48 | 331.58 | 2262.48 | 331.67 | 2262.49 | 331.73 | 2262.49 |
| 331.99 | 2262.5 | 332.42 | 2262.51 | 332.76 | 2262.51 | 333.12 | 2262.52 | 335.67 | 2262.59 |
| 336.28 | 2262.6 | 336.75 | 2262.61 | 337.09 | 2262.62 | 337.44 | 2262.63 | 337.87 | 2262.64 |
| 343.39 | 2262.79 | 344.35 | 2262.82 | 344.74 | 2262.83 | 345 | 2262.83 | 345.06 | 2262.84 |
| 345.35 | 2262.85 | 345.6 | 2262.85 | 345.81 | 2262.86 | 345.99 | 2262.86 | 346.15 | 2262.87 |
| 346.78 | 2262.89 | 347.36 | 2262.9 | 347.75 | 2262.92 | 349.21 | 2262.93 | 349.24 | 2262.93 |
| 350.96 | 2262.94 | 361.94 | 2263.01 | 363.08 | 2263.01 | 363.64 | 2263.02 | 364.18 | 2263.02 |
| 364.71 | 2263.03 | 365.64 | 2263.03 | 366.09 | 2263.03 | 366.53 | 2263.04 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

```
    -300     .015  -78.61     .015  288.99     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -78.61  288.99               70      70      70             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 5700

INPUT
Description: Sta 57+00.00
Station Elevation Data    num=     207
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300  2264.56  -292.54  2264.25  -286.54     2264  -284.07  2263.84  -281.59  2263.69
 -279.46  2263.56  -273.27  2263.19  -256.86     2262  -252.19  2261.77   -248.9  2261.58
 -247.05  2261.45  -246.78  2261.43  -246.47  2261.42  -246.11  2261.41   -245.7   2261.4
 -245.24  2261.39  -244.73  2261.38  -243.11  2261.37  -232.67   2261.3  -231.67   2261.3
 -231.18   2261.3  -230.74   2261.3  -230.32   2261.3  -229.91   2261.3  -229.51   2261.3
 -229.13  2261.31  -228.79  2261.31  -228.47  2261.32  -228.21  2261.33  -227.49  2261.35
 -227.23  2261.36  -226.94  2261.36  -226.56  2261.37  -226.13  2261.37  -225.66  2261.37
 -223.64  2261.36  -220.58  2261.33  -219.64  2261.32  -216.35  2261.26  -215.15  2261.25
 -214.38  2261.24     -214  2261.24  -213.64  2261.24   -213.3  2261.24  -212.99  2261.24
  -212.7  2261.25  -212.42  2261.26  -212.12  2261.27  -211.26   2261.3   -210.7  2261.32
 -208.66  2261.45  -208.41  2261.46  -208.15  2261.47  -207.13  2261.51  -203.56  2261.65
 -201.57  2261.75   -201.1  2261.77   -200.5  2261.79   -193.5     2262   -187.5  2262.17
 -183.92  2262.26  -182.35  2262.29  -180.94  2262.33  -179.67  2262.35  -178.53  2262.37
 -177.53  2262.39  -176.68   2262.4  -175.04  2262.41  -153.74  2263.18  -153.63  2263.17
 -153.47  2263.17  -153.25  2263.17  -153.01  2263.17  -152.73  2263.18  -152.43  2263.18
 -152.11  2263.19  -151.76  2263.19  -143.67  2263.28   -143.1  2263.16  -143.07  2263.12
 -130.34  2263.65  -114.19  2263.87  -110.99  2263.91   -108.7  2263.95  -107.48  2263.98
 -106.46     2264   -106.3     2264   -96.56     2264   -92.36  2263.74   -41.82  2261.52
  -35.63  2260.41   -30.95   2259.4   -27.22  2258.93   -26.4   2258.69   -26.01  2258.59
  -25.54  2258.48   -24.98  2258.37   -24.16  2258.24   -23.19  2258.11   -22.32     2258
  -22.07  2257.97   -20.97  2257.87    -20.9  2257.86   -20.82  2257.84   -14.04  2257.23
  -13.84  2257.18   -12.64  2256.94   -12.25  2256.85   -11.77  2256.73   -11.19  2256.56
  -10.43  2256.31   -10.26  2256.29     -9.5   2255.2     -.93   2255.2        0   2255.2
    7.73   2255.2     9.07  2256.54      9.8  2256.81    10.32  2256.99    11.88  2257.39
   12.25   2257.5    12.52  2257.58    12.89  2257.67    13.66  2257.83    14.44     2258
   20.01   2259.2     23.8     2260    25.86     2260    32.65     2260    34.08  2260.27
   34.52  2260.28    35.56   2260.3    43.73     2260    50.55  2260.15    50.58  2260.15
    61.1  2260.22    61.14  2260.22    61.19  2260.22    61.23  2260.22    61.31  2260.22
   61.46  2260.21    62.08   2260.2    62.47   2260.2    63.03  2260.19    63.51  2260.18
   63.62  2260.18    64.24  2260.17    65.13  2260.17    65.24  2260.17    65.32  2260.17
   65.37  2260.17    65.42  2260.17    65.48  2260.17    65.53  2260.17    65.58  2260.17
   65.62  2260.17    65.66  2260.17    65.69  2260.17    65.76  2260.17    66.22  2260.18
   67.14  2260.21    67.98  2260.23    68.83  2260.25    69.06  2260.25    69.33  2260.26
   69.43  2260.26    69.53  2260.26    69.71  2260.26    69.95  2260.26     70.2  2260.27
   70.47  2260.27    71.32  2260.28    71.77  2260.28     72.6  2260.29     72.9  2260.29
   73.69   2260.3       74   2260.3    74.58  2260.31    74.87  2260.31    75.43  2260.32
   77.18  2260.33    77.77  2260.33    78.33  2260.34    80.18  2260.35    90.42  2260.39
  100.51  2260.42   116.51  2260.48   121.74  2260.49   126.02  2260.51    130.6  2260.52
  137.99  2260.55   345.71     2262   346.28     2262   346.87     2262   349.86     2262
  350.47     2262   351.69     2262   358.94     2262   364.95     2262   375.97     2262
  379.39     2262   384.08     2262   392.59     2262   393.17     2262   393.45     2262
  393.72     2262      400     2262

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -92.36    .015  137.99    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -92.36  137.99             200     185     100             .1       .3
Left Levee      Station=  -96.56      Elevation=    2264

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 5515.*

INPUT
Description: Sta 55+15
Station Elevation Data    num=     178
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300  2260.13  -299.38  2260.14  -285.18  2260.72  -277.82  2260.81  -267.39  2261.14
 -265.48   2261.2  -261.96  2261.29  -256.39  2261.45  -256.25  2261.45  -256.17  2261.46
 -256.15  2261.46  -240.75  2261.73  -240.67  2261.73  -240.58  2261.73  -240.47  2261.73
 -240.35  2261.73  -240.23  2261.73  -239.98  2261.73  -238.44  2261.75  -236.42  2261.77
 -235.81  2261.77  -234.46  2261.78  -233.64  2261.79  -232.14   2261.8  -230.34   2261.8
```

```
-228.27 2261.79 -228.24 2261.79 -228.09 2261.79 -227.06 2261.79 -226.76 2261.79
-226.68 2261.79 -226.61 2261.78 -226.48 2261.78 -225.34 2261.77 -224.47 2261.76
-201.69 2261.87 -200.84 2261.86 -200.14 2261.85 -199.98 2261.85 -199.94 2261.85
 -199.9 2261.85 -199.87 2261.85 -199.85 2261.85 -199.84 2261.85 -199.83 2261.85
-199.82 2261.85 -199.79 2261.85 -199.76 2261.85 -199.73 2261.85  -199.7 2261.85
-199.68 2261.85 -199.65 2261.85 -199.57 2261.86 -199.45 2261.86 -199.39 2261.86
-199.34 2261.86 -199.31 2261.86 -199.27 2261.86 -199.23 2261.86 -199.18 2261.86
-199.16 2261.86  -199.1 2261.86 -199.07 2261.86 -199.04 2261.86 -199.01 2261.85
-198.97 2261.85 -198.95 2261.85  -198.9 2261.85 -198.58 2261.84 -197.96 2261.82
-197.76 2261.82 -197.66 2261.81 -197.29  2261.8 -195.55 2261.76 -177.07 2261.96
-176.73 2261.94  -172.9    2262 -165.79 2263.07  -160.2    2264 -157.62 2264.43
-152.47 2265.27 -148.48    2266 -145.74    2266 -144.36    2266 -143.09    2266
-140.54    2266 -139.18    2266 -138.34    2266 -135.96    2266 -128.21    2266
-123.91    2266    -122    2266 -120.39 2264.49 -119.83    2264 -119.39 2263.63
 -117.8    2262 -117.54 2261.07 -117.43 2260.75 -117.35 2260.58 -117.29 2260.46
-117.23 2260.39 -117.17 2260.35 -117.15 2260.35 -117.13 2260.35  -117.1 2260.35
-117.07 2260.35 -117.03 2260.35 -116.98 2260.35 -116.92 2260.35 -115.41 2260.42
-113.17 2260.53 -112.35 2260.57 -111.88  2260.6 -108.38 2260.86 -103.74  2261.2
 -91.27    2262  -85.53    2262  -54.87    2262  -47.18    2262  -46.83 2261.91
    -14 2258.77     -14 2254.77      -6 2254.77      -4 2254.77       0 2254.77
      4 2254.77       6 2254.77      14 2254.77      14 2258.77   19.22 2259.42
  25.52    2260    28.5 2259.88   33.31 2259.71   37.89 2259.57   38.13 2259.57
   38.3 2259.57   38.44 2259.57   38.56 2259.57   38.66 2259.57   38.76 2259.58
  38.83 2259.58   39.72 2259.73   40.52 2259.93   40.77    2260   47.07    2260
  49.93    2260   70.25    2260   71.02    2260  164.38 2261.16  164.42 2261.15
 164.52 2261.15  164.66 2261.15  164.89 2261.15  165.18 2261.15  167.71 2261.22
 168.02 2261.22  169.53 2261.26  170.27 2261.27  171.81 2261.31  173.46 2261.33
 180.66 2261.42  191.11    2262  199.94    2262  201.15    2262  209.66    2262
 227.12    2262  242.64    2262  252.34    2262   263.2 2261.76  265.55 2261.72
 266.71 2261.69  267.86 2261.67  269.01 2261.65  270.17 2261.64  272.46 2261.61
 284.93 2261.45  288.44 2261.41     300  2261.3

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
    -300     .015  -46.83     .015  164.38     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -46.83  164.38             1150     115     180             .1       .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 5457.5

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =     111
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -400    2260 2258.77     200    2260 2258.77

Upstream Bridge Cross Section Data
Station Elevation Data    num=     178
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2260.13 -299.38 2260.14 -285.18 2260.72 -277.82 2260.81 -267.39 2261.14
 -265.48  2261.2 -261.96 2261.29 -256.39 2261.45 -256.25 2261.45 -256.17 2261.46
 -256.15 2261.46 -240.75 2261.73 -240.67 2261.73 -240.58 2261.73 -240.47 2261.73
 -240.35 2261.73 -240.23 2261.73 -239.98 2261.73 -238.44 2261.75 -236.42 2261.77
 -235.81 2261.77 -234.46 2261.78 -233.64 2261.79 -232.14  2261.8 -230.34  2261.8
 -228.27 2261.79 -228.24 2261.79 -228.09 2261.79 -227.06 2261.79 -226.76 2261.79
 -226.68 2261.79 -226.61 2261.78 -226.48 2261.78 -225.34 2261.77 -224.47 2261.76
 -201.69 2261.87 -200.84 2261.86 -200.14 2261.85 -199.98 2261.85 -199.94 2261.85
  -199.9 2261.85 -199.87 2261.85 -199.85 2261.85 -199.84 2261.85 -199.83 2261.85
 -199.82 2261.85 -199.79 2261.85 -199.76 2261.85 -199.73 2261.85  -199.7 2261.85
 -199.68 2261.85 -199.65 2261.85 -199.57 2261.86 -199.45 2261.86 -199.39 2261.86
 -199.34 2261.86 -199.31 2261.86 -199.27 2261.86 -199.23 2261.86 -199.18 2261.86
 -199.16 2261.86  -199.1 2261.86 -199.07 2261.86 -199.04 2261.86 -199.01 2261.85
 -198.97 2261.85 -198.95 2261.85  -198.9 2261.85 -198.58 2261.84 -197.96 2261.82
 -197.76 2261.82 -197.66 2261.81 -197.29  2261.8 -195.55 2261.76 -177.07 2261.96
 -176.73 2261.94  -172.9    2262 -165.79 2263.07  -160.2    2264 -157.62 2264.43
 -152.47 2265.27 -148.48    2266 -145.74    2266 -144.36    2266 -143.09    2266
 -140.54    2266 -139.18    2266 -138.34    2266 -135.96    2266 -128.21    2266
 -123.91    2266    -122    2266 -120.39 2264.49 -119.83    2264 -119.39 2263.63
  -117.8    2262 -117.54 2261.07 -117.43 2260.75 -117.35 2260.58 -117.29 2260.46
 -117.23 2260.39 -117.17 2260.35 -117.15 2260.35 -117.13 2260.35  -117.1 2260.35
 -117.07 2260.35 -117.03 2260.35 -116.98 2260.35 -116.92 2260.35 -115.41 2260.42
 -113.17 2260.53 -112.35 2260.57 -111.88  2260.6 -108.38 2260.86 -103.74  2261.2
```

```
  -91.27    2262  -85.53    2262  -54.87    2262  -47.18    2262  -46.83 2261.91
     -14 2258.77     -14 2254.77      -6 2254.77      -4 2254.77       0 2254.77
       4 2254.77       6 2254.77      14 2254.77      14 2258.77   19.22 2259.42
   25.52    2260    28.5 2259.88   33.31 2259.71   37.89 2259.57   38.13 2259.57
    38.3 2259.57   38.44 2259.57   38.56 2259.57   38.66 2259.57   38.76 2259.58
   38.83 2259.58   39.72 2259.73   40.52 2259.93   40.77    2260   47.07    2260
   49.93    2260   70.25    2260   71.02    2260  164.38 2261.16  164.42 2261.15
  164.52 2261.15  164.66 2261.15  164.89 2261.15  165.18 2261.15  167.71 2261.22
  168.02 2261.22  169.53 2261.26  170.27 2261.27  171.81 2261.31  173.46 2261.33
  180.66 2261.42  191.11    2262  199.94    2262  201.15    2262  209.66    2262
  227.12    2262  242.64    2262  252.34    2262   263.2 2261.76  265.55 2261.72
  266.71 2261.69  267.86 2261.67  269.01 2261.65  270.17 2261.64  272.46 2261.61
  284.93 2261.45  288.44 2261.41     300  2261.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -46.83    .015  164.38    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -46.83  164.38             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -500    2260    2258     200    2260    2258

Downstream Bridge Cross Section Data
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -450  2264.5    -450  2259.5    -300 2258.26 -295.65 2258.17 -294.49 2258.15
 -293.88 2258.14 -293.84 2258.14  -293.2 2258.14 -292.54 2258.13 -291.15 2258.13
 -290.79 2258.13  -278.6 2258.14 -278.27 2258.14 -278.23 2258.14 -278.19 2258.14
 -276.64 2258.15  -271.1 2258.17 -271.09 2258.17 -270.95 2258.17 -267.37  2258.2
 -266.33 2258.21 -262.04 2258.25 -251.67 2258.36 -251.12 2258.36 -250.99 2258.36
 -250.87 2258.36 -240.11 2258.47 -239.78 2258.47 -230.34 2258.56 -227.06 2258.53
 -225.09 2258.51 -221.79 2258.49 -219.56 2258.48  -219.1 2258.48 -218.96 2258.48
 -218.84 2258.48 -218.73 2258.48 -218.67 2258.48 -218.62 2258.48 -218.57 2258.48
 -218.53 2258.48 -218.29 2258.49 -218.13  2258.5 -217.99  2258.5 -217.81 2258.51
  -217.7 2258.51 -217.58 2258.51  -217.2 2258.52 -216.68 2258.52 -216.39 2258.53
 -216.21 2258.53 -216.07 2258.53 -215.92 2258.53  -204.6 2258.61 -199.31 2258.63
 -197.79 2258.63 -196.81 2258.63 -195.79 2258.63 -187.56 2258.57 -187.38 2258.57
 -177.23 2258.51 -177.06 2258.51 -172.87 2258.48 -166.72 2258.43 -166.66 2258.43
 -166.48 2258.43 -164.07 2258.42 -163.99 2258.42 -163.91 2258.42 -158.46  2258.4
 -153.74 2258.37 -153.63 2258.37 -153.51 2258.37 -135.96 2258.26  -135.9 2258.26
 -135.75 2258.26 -120.57 2258.17 -119.89 2258.16 -118.98 2258.14 -105.47 2258.07
 -105.31 2258.07 -105.25 2258.07 -105.07 2258.07 -104.53 2258.06 -104.14 2258.05
 -104.04 2258.05    -104 2258.05 -103.63 2258.05 -103.24 2258.05 -103.23 2258.05
 -103.21 2258.05 -103.04 2258.06 -103.02 2258.06 -102.98 2258.06 -102.96 2258.06
 -102.57 2258.06  -96.03 2258.03     -96 2258.03  -95.99 2258.03  -88.57    2258
  -81.49 2257.95  -77.52 2257.94  -74.75 2257.95     -72 2257.96  -66.66    2258
  -59.33 2258.03  -59.32 2258.03  -59.29 2258.03  -54.58 2258.06  -54.39 2258.06
  -52.82 2258.07  -40.11 2258.22  -38.83 2258.23  -38.23 2258.23  -37.65 2258.24
  -37.09 2258.24  -36.57 2258.23  -36.06 2258.23   -30.6 2258.14    -28    2258
     -28    2254     -20    2254     -18    2254     -10    2254      -8    2254
       0    2254       0    2258   78.32 2259.16   87.34 2259.36  117.33    2260
  128.06 2260.98  128.77 2261.04  129.58 2261.11  130.37 2261.17  132.65 2261.36
  133.06 2261.39  133.43 2261.42  133.76 2261.44  134.07 2261.46  134.36 2261.48
  135.38 2261.53  136.04 2261.57  137.58 2261.66  139.01 2261.73  144.38    2262
   149.5    2262  152.94    2262  160.89    2262   161.3    2262  161.67    2262
     162    2262  177.83    2262  183.14    2262  214.37    2262  226.19    2262
  227.83    2262  228.03    2262  230.02    2262  230.21    2262  231.09    2262
   231.3    2262  231.76    2262  231.99    2262  232.47    2262  232.72    2262
  233.17    2262  233.45    2262  243.65    2262  244.54    2262  247.84 2261.71
  248.73 2261.74  249.45 2261.69  250.64 2261.73  257.44 2261.71  258.36 2261.68
  259.16 2261.66  259.81 2261.64  260.28 2261.62  260.62 2261.61  261.08 2261.58
  261.83 2261.51  262.05  2261.5  262.34 2261.48  262.71 2261.47  263.24 2261.45
  263.87 2261.44  264.55 2261.42  275.62 2261.18  282.28 2261.03  283.18 2261.01
  283.64 2261.01  284.09    2261  284.55 2260.99  285.02 2260.99  285.95 2260.98
  291.43 2260.94  293.09 2260.93  299.23 2260.91     300 2260.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -450    .015  -37.09    .015       0    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        -37.09       0             .1       .3
Left Levee      Station= -199.31      Elevation= 2258.63

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
```

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Elevation at which weir flow begins          =
Energy head used in spillway design          =
Spillway height used in design               =
Weir crest shape                             = Broad Crested

Number of Piers =  2

Pier Data
Pier Station     Upstream=      -5    Downstream=      -9
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2254.77       2 2258.77
Downstream     num=       2
    Width   Elev    Width   Elev
       2    2254       2    2258

Pier Data
Pier Station     Upstream=       5    Downstream=     -19
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2254.77       2 2258.77
Downstream     num=       2
    Width   Elev    Width   Elev
       2    2254       2    2258

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: Duck Creek
REACH: East                RS: 5400

INPUT
Description: Sta 54+00.00
Station Elevation Data    num=     199
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -450  2264.5    -450  2259.5    -300 2258.26 -295.65 2258.17 -294.49 2258.15
 -293.88 2258.14 -293.84 2258.14  -293.2 2258.14 -292.54 2258.13 -291.15 2258.13
 -290.79 2258.13  -278.6 2258.14 -278.27 2258.14 -278.23 2258.14 -278.19 2258.14
 -276.64 2258.15  -271.1 2258.17 -271.09 2258.17 -270.95 2258.17 -267.37  2258.2
 -266.33 2258.21 -262.04 2258.25 -251.67 2258.36 -251.12 2258.36 -250.99 2258.36
 -250.87 2258.36 -240.11 2258.47 -239.78 2258.47 -230.34 2258.56 -227.06 2258.53
 -225.09 2258.51 -221.79 2258.49 -219.56 2258.48  -219.1 2258.48 -218.96 2258.48
 -218.84 2258.48 -218.73 2258.48 -218.67 2258.48 -218.62 2258.48 -218.57 2258.48
 -218.53 2258.48 -218.29 2258.49 -218.13  2258.5 -217.99  2258.5 -217.81 2258.51
  -217.7 2258.51 -217.58 2258.51  -217.2 2258.52 -216.68 2258.52 -216.39 2258.53
 -216.21 2258.53 -216.07 2258.53 -215.92 2258.53  -204.6 2258.61 -199.31 2258.63
 -197.79 2258.63 -196.81 2258.63 -195.79 2258.63 -187.56 2258.57 -187.38 2258.57
 -177.23 2258.51 -177.06 2258.51 -172.87 2258.48 -166.72 2258.43 -166.66 2258.43
 -166.48 2258.43 -164.07 2258.42 -163.99 2258.42 -163.91 2258.42 -158.46  2258.4
 -153.74 2258.37 -153.63 2258.37 -153.51 2258.37 -135.96 2258.26  -135.9 2258.26
 -135.75 2258.26 -120.57 2258.17 -119.89 2258.16 -118.98 2258.14 -105.47 2258.07
 -105.31 2258.07 -105.25 2258.07 -105.07 2258.07 -104.53 2258.06 -104.14 2258.05
 -104.04 2258.05    -104 2258.05 -103.63 2258.05 -103.24 2258.05 -103.23 2258.05
 -103.21 2258.05 -103.04 2258.06 -103.02 2258.06 -102.98 2258.06 -102.96 2258.06
 -102.57 2258.06  -96.03 2258.03     -96 2258.03  -95.99 2258.03  -88.57    2258
  -81.49 2257.95  -77.52 2257.94  -74.75 2257.95     -72 2257.96  -66.66    2258
  -59.33 2258.03  -59.32 2258.03  -59.29 2258.03  -54.58 2258.06  -54.39 2258.06
  -52.82 2258.07  -40.11 2258.22  -38.83 2258.23  -38.23 2258.23  -37.65 2258.24
  -37.09 2258.24  -36.57 2258.23  -36.06 2258.23   -30.6 2258.14     -28    2258
     -28    2254     -20    2254     -18    2254     -10    2254      -8    2254
       0    2254       0    2258   78.32 2259.16   87.34 2259.36  117.33    2260
  128.06 2260.98  128.77 2261.04  129.58 2261.11  130.37 2261.17  132.65 2261.36
  133.06 2261.39  133.43 2261.42  133.76 2261.44  134.07 2261.46  134.36 2261.48
  135.38 2261.53  136.04 2261.57  137.58 2261.66  139.01 2261.73  144.38    2262
   149.5    2262  152.94    2262  160.89    2262   161.3    2262  161.67    2262
```

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     162    2262  177.83    2262  183.14    2262  214.37    2262  226.19    2262
  227.83    2262  228.03    2262  230.02    2262  230.21    2262  231.09    2262
   231.3    2262  231.76    2262  231.99    2262  232.47    2262  232.72    2262
  233.17    2262  233.45    2262  243.65    2262  244.54    2262  247.84 2261.71
  248.73 2261.74  249.45 2261.69  250.64 2261.73  257.44 2261.71  258.36 2261.68
  259.16 2261.66  259.81 2261.64  260.28 2261.62  260.62 2261.61  261.08 2261.58
  261.83 2261.51  262.05  2261.5  262.34 2261.48  262.71 2261.47  263.24 2261.45
  263.87 2261.44  264.55 2261.42  275.62 2261.18  282.28 2261.03  283.18 2261.01
  283.64 2261.01  284.09    2261  284.55 2260.99  285.02 2260.99  285.95 2260.98
  291.43 2260.94  293.09 2260.93  299.23 2260.91     300 2260.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -450    .015  -37.09    .015       0    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -37.09       0             300     300     300             .1       .3
Left Levee      Station= -199.31      Elevation= 2258.63

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 5100

INPUT
Description: Sta 51+00.00
Station Elevation Data    num=     173
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300  2256.5 -267.98 2256.21 -267.64 2256.21 -267.46  2256.2 -267.37  2256.2
 -267.28  2256.2 -267.11 2256.19  -266.2 2256.15 -259.88    2256 -253.48 2255.94
 -252.03 2255.93  -250.3 2255.92 -247.85 2255.92 -246.75 2255.91 -246.21 2255.91
 -244.92  2255.9 -244.59  2255.9 -244.52  2255.9 -244.03  2255.9 -242.03 2255.88
 -241.89 2255.88 -240.63 2255.87 -240.28 2255.87 -239.37 2255.87  -238.7 2255.86
 -238.07 2255.85    -237 2255.85 -228.44 2255.71  -226.7  2255.7 -224.47  2255.7
 -223.33 2255.69 -223.01 2255.69 -222.91 2255.69 -222.71 2255.69 -222.39  2255.7
 -222.31  2255.7 -222.23  2255.7 -222.16  2255.7 -222.09 2255.69 -222.02 2255.69
 -221.72 2255.69 -221.62 2255.69 -221.49 2255.68 -221.35 2255.68 -220.86 2255.68
 -219.21 2255.66 -203.48 2255.46 -192.32 2255.33 -191.16 2255.31 -190.62  2255.3
 -189.76 2255.29  -185.6 2255.21 -178.95 2255.08 -177.31 2255.05 -176.63 2255.04
 -176.31 2255.03 -175.98 2255.03 -175.58 2255.02 -175.17 2255.02 -173.87 2255.01
 -166.11 2254.97 -159.01 2254.93 -158.29 2254.92 -157.94 2254.92  -157.6 2254.92
 -157.28 2254.92 -156.97 2254.92 -156.36 2254.93 -151.84 2254.96 -151.19 2254.96
 -150.86 2254.96 -150.53 2254.96 -150.19 2254.96 -149.85 2254.96 -149.15 2254.96
 -145.39 2254.93 -144.72 2254.93 -144.39 2254.93 -144.05 2254.92 -143.72 2254.92
 -143.39 2254.92 -142.04 2254.93 -139.28 2254.94 -137.84 2254.94  -130.9 2254.94
 -129.09 2254.94 -125.46 2254.95 -116.01 2254.99 -114.37 2255.01 -112.42 2255.03
 -109.49 2255.07 -109.05 2255.07 -108.88 2255.08 -108.77 2255.08 -108.69 2255.08
 -108.63 2255.09 -108.57  2255.1  -88.69 2255.13  -85.87 2255.05  -82.41 2254.95
  -79.68 2254.88  -76.52 2254.79  -70.74 2254.64  -63.22 2254.43  -59.75 2254.34
  -52.47 2254.15  -52.37 2254.15  -46.97    2254    1.46    2253    3.46    2252
    9.46    2252   15.46    2252   17.16    2253    20.6 2254.26   21.78 2254.26
   28.72 2254.75    29.5  2254.8   29.88 2254.82   30.29 2254.84   30.61 2254.85
   30.93 2254.86   31.34 2254.88   31.76 2254.88   32.18 2254.89   34.35 2254.89
    42.3 2254.89   44.85 2254.89    45.6  2254.9   46.03 2254.91   46.29 2254.92
   46.52 2254.93   46.72 2254.94   46.96 2254.95   47.52    2255   97.49  2255.2
   107.4 2255.41   115.3 2255.57  118.68 2255.64  122.26 2255.71  131.13 2255.72
  132.89 2255.76  133.05 2255.76   133.4 2255.76  133.85 2255.77  172.29 2255.83
  174.16 2255.85   174.6 2255.85  174.72 2255.85  174.96 2255.85  176.02 2255.86
  177.05 2255.86  177.31 2255.86  205.77 2255.91  206.48 2255.91  206.94 2255.91
  221.53 2255.93  221.62 2255.93   229.2 2255.94  229.25 2255.94  241.42 2255.95
  241.53 2255.95   254.9 2255.97  255.08 2255.97  271.15    2256  276.72 2256.02
  284.86 2256.05  286.21 2256.05  286.93 2256.05   287.7 2256.04  288.59 2256.04
  290.55 2256.02  292.22    2256     300 2255.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -88.69    .025   31.34    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -88.69   31.34             340     300     260             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 4800

INPUT
Description: Sta 48+00.00
Station Elevation Data    num=     189
```

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -230 | 2255.96 | -230 | 2250.96 | -190.07 | 2250.95 | -184.02 | 2250.94 | -182.86 | 2250.94 |
| -182.46 | 2250.94 | -182.36 | 2250.94 | -181.95 | 2250.94 | -181.11 | 2250.94 | -179.41 | 2250.95 |
| -179.23 | 2250.95 | -171.73 | 2250.98 | -165.06 | 2251.01 | -161.46 | 2251.03 | -157.41 | 2251.03 |
| -151.06 | 2251.05 | -144.89 | 2251.07 | -143.82 | 2251.07 | -137.25 | 2251.07 | -130.38 | 2251.06 |
| -129.15 | 2251.06 | -127.59 | 2251.06 | -127.32 | 2251.05 | -127.05 | 2251.05 | -126.8 | 2251.05 |
| -126.02 | 2251.06 | -125.94 | 2251.06 | -125.23 | 2251.06 | -124.89 | 2251.06 | -124.23 | 2251.06 |
| -121.7 | 2251.07 | -120.43 | 2251.08 | -120.11 | 2251.08 | -119.77 | 2251.08 | -119.43 | 2251.08 |
| -118.74 | 2251.08 | -111.99 | 2251.07 | -105.49 | 2251.05 | -104.72 | 2251.05 | -103.98 | 2251.05 |
| -101.8 | 2251.05 | -101.77 | 2251.05 | -101.62 | 2251.03 | -94.97 | 2250.99 | -93.25 | 2250.98 |
| -92.66 | 2250.97 | -92.42 | 2250.97 | -92.18 | 2250.97 | -91.95 | 2250.97 | -91.68 | 2250.97 |
| -90.9 | 2250.97 | -90.63 | 2250.97 | -90.33 | 2250.97 | -90.03 | 2250.97 | -89.41 | 2250.96 |
| -84.08 | 2250.93 | -81.32 | 2250.91 | -59.17 | 2250.75 | -55.61 | 2250.72 | -12.08 | 2250.97 |
| -12.04 | 2250.98 | -9.59 | 2251.04 | -6.48 | 2251.13 | -4.61 | 2251.17 | -3.86 | 2251.18 |
| -3.34 | 2251.19 | -2.66 | 2251.2 | 0 | 2251.23 | .17 | 2251.24 | 7.97 | 2251.32 |
| 12.83 | 2251.33 | 14.2 | 2251.33 | 18.96 | 2251.32 | 19.96 | 2251.32 | 24.65 | 2251.31 |
| 26.79 | 2251.3 | 42.03 | 2251.55 | 46.59 | 2251.63 | 57.64 | 2251.86 | 60.13 | 2251.91 |
| 60.19 | 2251.91 | 63.58 | 2252 | 116.2 | 2252.83 | 190.53 | 2254 | 234.81 | 2254.6 |
| 235.64 | 2254.61 | 236.05 | 2254.61 | 252.97 | 2254.84 | 253.45 | 2254.84 | 258.04 | 2254.9 |
| 268.01 | 2255.02 | 268.56 | 2255.02 | 277.98 | 2255.14 | 278.82 | 2255.15 | 279.2 | 2255.16 |
| 279.84 | 2255.17 | 280.88 | 2255.18 | 281.51 | 2255.2 | 283.87 | 2255.27 | 284.26 | 2255.28 |
| 284.59 | 2255.29 | 287.37 | 2255.34 | 288.48 | 2255.36 | 288.77 | 2255.37 | 288.85 | 2255.37 |
| 288.9 | 2255.37 | 288.91 | 2255.37 | 317.2 | 2255.6 | 317.43 | 2255.6 | 318.02 | 2255.6 |
| 318.54 | 2255.6 | 318.99 | 2255.6 | 320.71 | 2255.6 | 320.97 | 2255.6 | 321.08 | 2255.6 |
| 321.17 | 2255.6 | 321.25 | 2255.6 | 321.32 | 2255.6 | 321.37 | 2255.6 | 321.41 | 2255.6 |
| 321.44 | 2255.59 | 321.44 | 2255.58 | 321.46 | 2255.58 | 321.48 | 2255.58 | 321.52 | 2255.58 |
| 321.59 | 2255.57 | 321.69 | 2255.57 | 322.62 | 2255.57 | 324.28 | 2255.56 | 326.26 | 2255.54 |
| 328.57 | 2255.52 | 329.06 | 2255.52 | 329.45 | 2255.52 | 332.36 | 2255.5 | 332.69 | 2255.5 |
| 332.99 | 2255.5 | 333.79 | 2255.49 | 333.92 | 2255.49 | 334.05 | 2255.49 | 334.18 | 2255.49 |
| 334.3 | 2255.49 | 334.68 | 2255.49 | 334.81 | 2255.49 | 334.92 | 2255.49 | 335.04 | 2255.49 |
| 335.25 | 2255.49 | 335.89 | 2255.49 | 337.8 | 2255.47 | 338.08 | 2255.47 | 338.2 | 2255.47 |
| 338.3 | 2255.47 | 338.36 | 2255.47 | 338.4 | 2255.46 | 338.44 | 2255.46 | 338.53 | 2255.46 |
| 338.54 | 2255.45 | 338.56 | 2255.45 | 338.65 | 2255.45 | 338.7 | 2255.44 | 338.73 | 2255.44 |
| 338.8 | 2255.44 | 338.9 | 2255.44 | 339.15 | 2255.43 | 342.3 | 2255.4 | 344.67 | 2255.38 |
| 346.63 | 2255.37 | 350.63 | 2255.33 | 351.07 | 2255.33 | 351.28 | 2255.33 | 351.47 | 2255.33 |
| 351.65 | 2255.32 | 351.82 | 2255.32 | 351.97 | 2255.32 | 352.35 | 2255.31 | 353.67 | 2255.26 |
| 353.81 | 2255.26 | 353.98 | 2255.26 | 354.16 | 2255.25 | 354.37 | 2255.25 | 355.13 | 2255.25 |
| 355.34 | 2255.25 | 360.18 | 2255.27 | 360.4 | 2255.26 | 360.64 | 2255.26 | 361.41 | 2255.26 |
| 375.87 | 2255.13 | 381.02 | 2255.15 | 382.69 | 2255.15 | 400 | 2255.37 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -230 | .025 | -230 | .025 | 63.58 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -230 | 63.58 | 150 | 300 | 320 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 4500

INPUT
Description: Sta 45+00.00
Station Elevation Data num= 205

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2250.24 | -298.43 | 2250.23 | -293.04 | 2250.23 | -277.95 | 2250.22 | -273.22 | 2250.21 |
| -269.83 | 2250.2 | -264.23 | 2250.2 | -252.8 | 2250.18 | -252.17 | 2250.18 | -251.58 | 2250.18 |
| -251.05 | 2250.17 | -250.61 | 2250.17 | -250.22 | 2250.17 | -249.88 | 2250.16 | -249.28 | 2250.15 |
| -245.59 | 2250.07 | -242.66 | 2250.01 | -242.32 | 2250 | -220.14 | 2249.04 | -219.56 | 2249.02 |
| -218.97 | 2249.01 | -217.75 | 2248.98 | -210.41 | 2248.66 | -209.78 | 2248.64 | -207.21 | 2248.55 |
| -192.39 | 2248.34 | -189.64 | 2248.26 | -185.91 | 2248.21 | -185.42 | 2248.2 | -184.18 | 2248.19 |
| -182.76 | 2248.16 | -179.37 | 2248.14 | -178.57 | 2248.12 | -178.44 | 2248.12 | -178.4 | 2248.12 |
| -178.36 | 2248.12 | -178.27 | 2248.12 | -178.08 | 2248.12 | -177.3 | 2248.11 | -164.37 | 2248.09 |
| -163.8 | 2248.08 | -150.31 | 2248.06 | -150.09 | 2248.06 | -144.79 | 2248.05 | -131.63 | 2248.03 |
| -131.46 | 2248.02 | -121.6 | 2248 | -117.78 | 2247.98 | -117.67 | 2247.98 | -103.34 | 2247.94 |
| -103 | 2247.94 | -102.92 | 2247.94 | -102.82 | 2247.94 | -88.68 | 2247.87 | -87.7 | 2247.86 |
| -81.26 | 2247.81 | -80.19 | 2247.8 | -78.76 | 2247.78 | -78.22 | 2247.77 | -77.5 | 2247.76 |
| -76.8 | 2247.75 | -76.08 | 2247.74 | -73.61 | 2247.69 | -71.16 | 2247.64 | -66.99 | 2247.54 |
| -60.9 | 2247.39 | -59.41 | 2247.34 | -58.71 | 2247.32 | -58.4 | 2247.32 | -57.18 | 2247.28 |
| -56.88 | 2247.27 | -56.61 | 2247.27 | -56.47 | 2247.27 | -56.35 | 2247.27 | -55.8 | 2247.28 |
| -55.6 | 2247.28 | -55.38 | 2247.28 | -55.1 | 2247.27 | -54.77 | 2247.27 | -54.41 | 2247.26 |
| -54.02 | 2247.25 | -50.07 | 2247.16 | -35.25 | 2246.82 | -28.24 | 2246.61 | -19.63 | 2246.41 |
| -18.38 | 2246.37 | -3.2 | 2246 | -.41 | 2245.82 | -.1 | 2245.81 | 0 | 2245.8 |
| .22 | 2245.8 | .39 | 2245.79 | .57 | 2245.79 | .91 | 2245.79 | 1.12 | 2245.8 |
| 1.32 | 2245.8 | 1.66 | 2245.81 | 1.98 | 2245.83 | 2.62 | 2245.87 | 4.24 | 2246 |
| 30.21 | 2247.62 | 36.61 | 2248 | 45.47 | 2248.47 | 59.4 | 2249.2 | 65.25 | 2249.49 |
| 72.8 | 2249.88 | 73.99 | 2249.93 | 75.2 | 2249.98 | 75.7 | 2250 | 76.31 | 2250 |
| 78.37 | 2250.02 | 96.01 | 2250.12 | 97.72 | 2250.12 | 98.51 | 2250.13 | 99.25 | 2250.13 |
| 99.88 | 2250.13 | 100.46 | 2250.13 | 101.02 | 2250.13 | 104.75 | 2250.11 | 106.11 | 2250.11 |

```
  110.62 2250.11  124.52 2250.13  128.92 2250.13  133.65 2250.12  145.03 2250.08
  146.08 2250.07   146.5 2250.07  147.99 2250.05   148.8 2250.04  149.27 2250.03
  149.82 2250.03  153.66 2250.02  156.25 2250.01  157.61    2250  166.95 2249.81
  168.05 2249.84  169.39 2249.83  170.06 2249.83  171.42 2249.82  176.37 2249.84
  180.75 2249.86  183.06 2249.88  192.29    2250  198.52 2250.03  198.55 2250.03
  205.98 2250.07  207.53 2250.08  208.27 2250.08  208.99 2250.08  212.44 2250.07
  213.13 2250.07  213.83 2250.08  213.92 2250.08  214.64 2250.08  215.25 2250.08
  215.95 2250.09  216.52 2250.09  217.13 2250.09  217.22 2250.09  217.26 2250.09
   217.3 2250.09  217.34 2250.09  217.38  2250.1  217.42  2250.1  217.46  2250.1
  218.09 2250.11  219.11 2250.13  219.17 2250.13  219.28 2250.14  219.73 2250.15
  220.97 2250.18   221.7  2250.2  222.08 2250.21  223.18 2250.22  224.36 2250.24
  224.68 2250.25  227.19 2250.28  227.62 2250.29  240.88 2250.49  249.17 2250.66
  265.46 2250.94  276.16 2251.12  277.61 2251.14  278.05 2251.15  278.47 2251.15
  278.86 2251.16  279.23 2251.16  279.58 2251.16  283.89 2251.16  284.24 2251.16
  285.08 2251.19  285.44 2251.19   285.8  2251.2  286.15  2251.2  286.44 2251.21
  287.16 2251.21  291.02 2251.26  291.64 2251.27  291.94 2251.27  292.23 2251.27
  292.52 2251.27  293.34 2251.27  298.59 2251.25  298.75 2251.25     300 2251.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025    -103    .025   76.31    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -103   76.31               50      50      50             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 4450

INPUT
Description: Sta 44+50
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19    2244     -19    2239     -11    2239      -9    2239      -1    2239
       0    2239       1    2239       9    2239      11    2239      19    2239
      19    2244

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -19    .015     -19    .015      19    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -19      19               70      70      70             .1      .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 4415

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      66
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -19 2244.67    2244      19 2244.67    2244

Upstream Bridge Cross Section Data
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19    2244     -19    2239     -11    2239      -9    2239      -1    2239
       0    2239       1    2239       9    2239      11    2239      19    2239
      19    2244

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -19    .015     -19    .015      19    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -19      19             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -19 2244.67  2243.3      19 2244.67  2243.3
```

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19  2243.3     -19  2238.3     -11  2238.3      -9  2238.3      -1  2238.3
       0  2238.3       1  2238.3       9  2238.3      11  2238.3      19  2238.3
      19  2243.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -19    .015     -19    .015      19    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -19      19             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=     -10    Downstream=     -10
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2243.82       2 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       2 2241.07       2 2249.82

Pier Data
Pier Station     Upstream=       0    Downstream=       0
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2243.82       2 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       2 2241.07       2 2249.82

Pier Data
Pier Station     Upstream=      10    Downstream=      10
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2243.82       2 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       2 2241.07       2 2249.82

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

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

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 4380

INPUT
Description: Sta 43+80
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19  2243.3     -19  2238.3     -11  2238.3      -9  2238.3      -1  2238.3
       0  2238.3       1  2238.3       9  2238.3      11  2238.3      19  2238.3
      19  2243.3
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -19    .015      -19    .015       19    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -19      19               180     180     160             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                 RS: 4200

INPUT
Description: Sta 42+00.00
Station Elevation Data      num=      241
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300 2248.46  -289.34 2248.53  -289.06 2248.51  -288.71 2248.49   -288.3 2248.49
 -286.56 2248.46  -286.18 2248.46  -285.85 2248.45  -285.59 2248.43   -285.4 2248.41
 -285.29 2248.39  -285.23 2248.36  -285.18 2248.26  -285.12 2248.22  -284.99 2248.19
 -284.75 2248.16  -284.37 2248.14  -283.88 2248.12   -283.3 2248.11  -282.65 2248.09
 -277.35 2248.04  -275.71 2248.01  -275.49    2248  -274.89 2247.97  -270.65 2247.71
 -265.62 2247.49  -263.79 2247.43  -263.38 2247.43  -262.99 2247.43  -262.71 2247.44
 -262.44 2247.45  -262.23 2247.47  -262.14 2247.48  -261.89 2247.51  -261.66 2247.55
 -261.44  2247.6  -261.23 2247.66  -260.84 2247.79  -260.59 2247.92   -260.5    2248
 -260.28    2248   -259.8    2248  -259.23    2248  -257.42    2248  -255.64    2248
 -233.38    2248  -231.13    2248  -231.06    2248  -230.98    2248   -230.9    2248
 -229.08    2248  -226.48    2248  -225.31    2248  -201.02    2248   -200.4 2248.12
 -196.36 2248.36  -193.19 2248.59  -190.68 2248.76  -182.55  2249.3  -180.83 2249.43
 -173.92  2249.9  -173.71 2249.92  -172.39    2250  -172.17    2250  -170.53    2250
 -165.13    2250  -153.73    2250  -148.07 2249.49  -144.93 2249.38  -143.47 2249.27
 -136.98 2249.05  -129.88 2248.64   -127.5 2248.54  -126.34 2248.49  -125.76 2248.46
  -125.2 2248.42  -124.66 2248.38  -124.24 2248.34   -122.6 2248.16  -121.74 2248.08
 -120.85    2248  -120.77    2248  -119.95    2248  -118.37    2248  -118.11    2248
  -80.24    2248   -71.57    2248   -64.52 2249.18   -59.22    2250    -57.5    2250
  -55.56    2250   -54.37 2248.83   -53.49    2248   -51.51 2246.18    -51.3    2246
  -48.54 2244.09   -48.37    2244    -47.9 2243.86    -41.6    2242   -38.97 2241.22
  -34.82    2240   -30.66 2238.78   -28.03    2238    -22.4 2236.34   -21.25    2236
  -20.21  2235.7   -16.53 2234.62   -14.44    2234    -8.95    2234    -6.97    2234
   -6.28    2234        0    2234      .17    2234     8.41    2234     20.4    2234
   23.66 2234.99    26.95    2236    30.52  2237.1    33.49    2238    38.29 2239.47
   40.04    2240    43.27 2240.71    48.67    2242    54.75 2242.73    55.14 2242.77
   56.05 2242.87    65.37    2244    70.86 2244.62    70.94 2244.63    71.14 2244.64
   71.44 2244.65    71.74 2244.66    76.83  2245.2     87.7 2245.33    88.38 2245.38
   88.65 2245.39    88.86 2245.41     93.5 2245.46     93.6 2245.47    93.68 2245.48
   93.78 2245.49    93.82 2245.49    95.45 2245.68    97.29 2245.77    97.76 2245.79
   98.03  2245.8    98.24  2245.8    98.47 2245.81    98.61 2245.81    98.81 2245.82
   98.88 2245.82    99.04 2245.82    99.11 2245.82    99.34 2245.83    99.39 2245.83
   99.43 2245.83    99.47 2245.83    99.51 2245.83    99.54 2245.83    99.59 2245.83
   99.77 2245.85    99.92 2245.87   100.14 2245.88   100.21 2245.88   100.36 2245.89
  100.43 2245.89   100.45 2245.89   100.48 2245.89   100.61  2245.9   102.05  2245.9
  102.06  2245.9   102.07  2245.9   102.27 2245.89   102.36 2245.88   102.41 2245.88
  102.43 2245.88   102.46 2245.88   102.66 2245.88    102.8 2245.88    102.9 2245.88
  102.97 2245.88   103.05 2245.88   103.09 2245.88   103.13 2245.88   103.16 2245.88
  103.19 2245.88   103.22 2245.88   103.25 2245.88   103.27 2245.88   103.29 2245.88
   103.3 2245.88   105.16  2245.9   108.39 2245.83   108.76 2245.82   108.99 2245.82
  110.13 2245.78   111.67 2245.74   111.98 2245.73   152.53 2245.89   152.94 2245.86
  153.09 2245.85   153.99  2245.8    154.1 2245.79   154.31 2245.78   154.54 2245.76
   155.1 2245.71   173.68    2244   173.71    2244   173.75 2243.98   232.19 2243.76
   232.3 2243.76   232.45 2243.77   232.69 2243.78   233.33 2243.79   237.23 2243.87
  237.68 2243.88   237.85 2243.88   238.11 2243.89   238.94 2243.94   239.17 2243.95
  239.66 2243.97   240.92    2244   252.42 2244.25   266.62 2244.57   269.97 2244.64
  271.05 2244.66   273.05 2244.69   273.66  2244.7   274.23 2244.72   278.29 2244.84
  279.21 2244.88   279.45 2244.89   279.56  2244.9   284.35 2245.04      285 2245.04
  285.33 2245.04   286.08 2245.05      288 2245.05   293.32 2245.06   295.95 2245.06
     300 2245.07

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    -300    .025   -54.37    .025    70.86    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -54.37   70.86               300     300     300             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                 RS: 3900

INPUT
```

```
Description: Sta 39+00.00
Station Elevation Data    num=     289
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300    2246  -299.91    2246  -291.72 2245.77  -290.53 2245.81  -290.24 2245.82
  -289.15 2245.84  -287.73 2245.87  -283.89    2246  -267.08 2245.19  -264.56 2245.06
   -263.3 2244.99   -262.9 2244.97  -260.85 2244.87  -259.36  2244.8  -258.22 2244.75
  -256.73 2244.69  -255.23 2244.64  -254.03 2244.59  -253.26 2244.57  -252.86 2244.55
   -251.3 2244.51  -250.76 2244.49  -250.52 2244.48   -249.7 2244.46  -249.22 2244.45
  -248.65 2244.44  -248.06 2244.43  -247.23 2244.41  -244.52 2244.38  -243.13 2244.36
  -241.72 2244.34  -241.17 2244.33   -240.8 2244.32  -240.08 2244.31     -240 2244.31
   -239.9  2244.3   -239.8  2244.3  -239.67  2244.3  -239.61  2244.3  -239.52  2244.3
  -239.37  2244.3  -239.32  2244.3  -239.25  2244.3  -239.13  2244.3  -239.04 2244.31
  -237.43 2244.35  -237.35 2244.35  -236.83 2244.38  -236.12 2244.43  -235.88 2244.42
  -235.79 2244.42  -235.72 2244.42  -235.62 2244.42  -235.44 2244.42  -235.35 2244.42
  -234.95 2244.42  -234.86 2244.42  -234.42 2244.42  -234.33 2244.42  -233.87 2244.43
  -233.59 2244.44  -233.52 2244.44   -233.1 2244.46  -232.27  2244.5  -232.19  2244.5
  -232.17 2244.49  -231.18 2244.28  -231.15 2244.28  -231.12 2244.27  -231.09 2244.27
  -231.04 2244.27  -230.98 2244.27  -230.91 2244.27  -230.83 2244.27  -230.75 2244.27
  -230.73 2244.27  -230.65 2244.27  -230.56 2244.28  -230.21 2244.28  -229.84  2244.3
     -229 2244.33  -227.29  2244.4  -227.18  2244.4  -227.07 2244.41  -226.98 2244.41
  -226.89 2244.41  -218.48  2244.7  -212.38 2244.93  -212.11 2244.94  -211.86 2244.94
  -211.61 2244.95  -211.38 2244.95  -211.28 2244.95  -211.07 2244.95  -210.87 2244.95
  -210.67 2244.94  -207.43 2244.81  -205.16 2244.73  -202.71 2244.66  -202.21 2244.65
  -201.88 2244.65  -201.56 2244.64  -201.45 2244.64  -201.33 2244.64   -201.2 2244.64
   -200.8 2244.63  -198.89 2244.56  -197.62 2244.53   -196.9 2244.51  -196.61 2244.51
   -196.5 2244.51  -196.39 2244.51  -196.29 2244.51   -196.2 2244.51  -196.14 2244.51
  -196.08 2244.51  -196.03 2244.52  -195.93 2244.53  -195.66 2244.56   -195.4 2244.58
  -195.29 2244.59  -195.14  2244.6  -194.97 2244.61  -193.82 2244.65  -193.64 2244.66
  -193.46 2244.67  -189.64 2244.95  -188.83 2245.01  -188.34 2245.06  -185.81 2245.38
  -184.94 2245.48  -184.85 2245.47  -179.09    2246  -176.13 2246.11  -168.22 2246.39
  -163.27 2246.57   -157.6 2246.73  -154.86  2246.8  -141.16 2247.28  -139.25 2247.32
  -134.76 2247.48  -134.16  2247.5  -131.27 2247.58  -129.14 2247.64  -128.68 2247.65
  -119.65 2247.69  -108.15 2247.89  -101.73    2248   -94.66    2248   -82.43    2248
   -80.19    2248   -66.32 2246.91   -65.96 2246.87   -64.62 2246.73   -64.43 2246.71
   -64.19 2246.68   -61.71    2246   -57.03 2244.08   -56.83    2244   -55.49 2243.48
   -51.69    2242    -51.1 2241.83   -44.48    2240   -41.87 2239.27    -37.3    2238
   -31.52 2236.39    -30.1    2236   -27.03 2235.15   -22.91    2234   -18.88    2234
        0    2234    20.09    2234    24.77 2235.48    26.33    2236    28.1 2236.59
    32.56    2238    35.85 2239.09    38.8    2240    53.09 2241.87    54.6    2242
    57.39    2242    57.54    2242   58.22    2242    97.28  2241.7   98.66 2241.73
   100.11 2241.77   101.62  2241.8  104.73 2241.86  108.04 2241.92  112.09 2241.99
   113.01    2242   122.91 2242.18  133.11 2242.36  136.31 2242.41  139.13 2242.45
   144.39 2242.49   144.75 2242.49  145.09 2242.49  145.39 2242.48  145.69 2242.48
   145.99 2242.48   146.29 2242.48  146.61 2242.48  148.02 2242.48  148.37 2242.49
   149.08 2242.49   153.16 2242.56  153.91 2242.57  156.39  2242.6  166.25 2242.38
   174.49 2242.42   183.89 2242.47  184.32 2242.47  184.69 2242.47  184.97 2242.48
    185.2 2242.48   185.36 2242.49  185.58  2242.5  185.73 2242.51  186.38 2242.53
   189.05 2242.58   193.25 2242.64  194.03 2242.65  194.24 2242.65   194.4 2242.65
   194.65 2242.66   194.79 2242.66  194.97 2242.66  195.26 2242.66  195.61 2242.66
   197.87 2242.65   198.31 2242.64  198.71 2242.64  199.05 2242.64  199.34 2242.65
   199.59 2242.65    199.8 2242.65  199.97 2242.66   200.1 2242.66  200.16 2242.67
   200.19 2242.67   209.28 2242.73  209.59 2242.73   209.9 2242.73   210.2 2242.73
   210.47 2242.73   210.69 2242.73  210.83 2242.73  210.94 2242.74  211.27 2242.75
   211.43 2242.75   211.63 2242.75  211.86 2242.75  212.12 2242.76  212.41 2242.76
   212.74 2242.76   213.07 2242.76  213.42 2242.76  214.23 2242.75  214.68 2242.75
   215.15 2242.75   215.66 2242.74  216.18 2242.74  216.71 2242.74   220.1  2242.7
   230.14 2242.58   231.76 2242.56  244.37 2242.37  247.57 2242.32  248.21 2242.31
   248.78  2242.3   249.22 2242.29   249.5 2242.28  250.38 2242.23  251.32 2242.19
   252.21 2242.16   252.76 2242.15  253.42 2242.13  254.15 2242.12  254.99 2242.11
   256.87 2242.08   262.14    2242  274.44 2241.06  277.39 2240.83  280.46 2240.58
288.4574    2240290.8398    2240294.3631    2240     3002240.269

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    -300    .025   -80.19    .025     54.6    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -80.19    54.6               310     300     290             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3600

INPUT
Description: Sta 36+00.00
Station Elevation Data    num=     163
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2241.13  -292.28 2240.99  -288.29 2240.93  -287.41 2240.91  -286.55  2240.9
  -284.96 2240.88  -275.24 2240.76  -265.78 2240.55  -250.77  2240.2  -241.89    2240
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -236.1 | 2239.74 | -233.31 | 2239.6 | -231.52 | 2239.51 | -225.94 | 2239.3 | -187.1 | 2239.56 |
| -187.03 | 2239.57 | -186.9 | 2239.58 | -186.72 | 2239.59 | -186.24 | 2239.61 | -177.35 | 2239.93 |
| -175.42 | 2240 | -175.12 | 2240.01 | -168.17 | 2240.3 | -163.94 | 2240.48 | -163.63 | 2240.49 |
| -163.44 | 2240.51 | -163.4 | 2240.52 | -85.44 | 2240.75 | -47.96 | 2240.09 | -43.16 | 2240 |
| -42.4 | 2239.8 | -36.25 | 2238 | -36.15 | 2237.97 | -35.77 | 2237.86 | -29.32 | 2236 |
| -25.41 | 2234.87 | -22.36 | 2234 | -18.71 | 2232.95 | -15.39 | 2232 | -4.8 | 2232 |
| 0 | 2232 | 14.57 | 2232 | 19.23 | 2232.88 | 22.76 | 2233.54 | 25.15 | 2234 |
| 26.66 | 2234.5 | 31.42 | 2236 | 33.14 | 2236.57 | 37.66 | 2238 | 40.29 | 2238.86 |
| 43.87 | 2240 | 46.16 | 2240.67 | 46.22 | 2240.67 | 46.32 | 2240.67 | 46.35 | 2240.66 |
| 46.37 | 2240.66 | 46.38 | 2240.66 | 59.74 | 2242 | 139.05 | 2240.19 | 139.09 | 2240.19 |
| 139.17 | 2240.19 | 139.53 | 2240.18 | 144.2 | 2240.09 | 144.21 | 2240.08 | 144.25 | 2240.08 |
| 144.31 | 2240.08 | 146.03 | 2240.06 | 146.04 | 2240.06 | 146.05 | 2240.06 | 146.06 | 2240.06 |
| 146.08 | 2240.06 | 146.09 | 2240.06 | 146.11 | 2240.06 | 146.14 | 2240.06 | 146.16 | 2240.06 |
| 146.17 | 2240.06 | 146.18 | 2240.06 | 146.2 | 2240.06 | 146.29 | 2240.06 | 146.31 | 2240.06 |
| 146.34 | 2240.06 | 146.36 | 2240.06 | 146.39 | 2240.06 | 146.55 | 2240.06 | 146.58 | 2240.06 |
| 146.6 | 2240.06 | 146.62 | 2240.06 | 146.64 | 2240.06 | 146.67 | 2240.06 | 146.74 | 2240.06 |
| 146.77 | 2240.06 | 146.79 | 2240.05 | 146.86 | 2240.05 | 146.88 | 2240.05 | 146.9 | 2240.05 |
| 146.97 | 2240.05 | 147 | 2240.05 | 147.02 | 2240.05 | 147.04 | 2240.05 | 147.06 | 2240.05 |
| 147.1 | 2240.05 | 147.39 | 2240.05 | 147.93 | 2240.08 | 147.94 | 2240.08 | 147.95 | 2240.08 |
| 147.97 | 2240.09 | 148 | 2240.09 | 148.05 | 2240.09 | 148.16 | 2240.08 | 148.71 | 2240.09 |
| 148.93 | 2240.09 | 149.31 | 2240.09 | 149.42 | 2240.09 | 149.45 | 2240.09 | 149.48 | 2240.09 |
| 149.5 | 2240.1 | 149.53 | 2240.1 | 149.67 | 2240.11 | 149.71 | 2240.11 | 149.74 | 2240.11 |
| 149.77 | 2240.11 | 162.95 | 2240.19 | 163.01 | 2240.19 | 163.07 | 2240.19 | 163.19 | 2240.19 |
| 172.72 | 2240.25 | 174.26 | 2240.23 | 182.32 | 2240.29 | 183.38 | 2240.27 | 191.69 | 2240.32 |
| 194.27 | 2240.28 | 205.48 | 2240.37 | 206.48 | 2240.35 | 208.44 | 2240.33 | 221.1 | 2240.43 |
| 225.92 | 2240.46 | 228.7 | 2240.43 | 239.37 | 2240.49 | 239.47 | 2240.49 | 239.55 | 2240.48 |
| 250.07 | 2240.54 | 250.17 | 2240.53 | 250.26 | 2240.53 | 250.53 | 2240.51 | 250.64 | 2240.51 |
| 250.75 | 2240.5 | 250.88 | 2240.49 | 251.02 | 2240.49 | 251.19 | 2240.48 | 251.55 | 2240.47 |
| 252.35 | 2240.46 | 259.55 | 2240.48 | 268.26 | 2240.51 | 277.24 | 2240.54 | 290.35 | 2240.23 |
| 292.33 | 2240.24 | 292.87 | 2240.24 | 293.36 | 2240.24 | 293.89 | 2240.24 | 294.3 | 2240.24 |
| 294.99 | 2240.24 | 295.13 | 2240.25 | 300 | 2240.25 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -43.16 | .025 | 59.74 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -43.16 | 59.74 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 3300

INPUT
Description: Sta 33+00.00
Station Elevation Data num= 198

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2238.35 | -273.07 | 2238 | -270.67 | 2237.6 | -270.25 | 2237.73 | -270.1 | 2237.81 |
| -270.01 | 2237.9 | -269.99 | 2238 | -269.85 | 2237.81 | -268.76 | 2236 | -265.46 | 2235.75 |
| -263.49 | 2235.63 | -262.78 | 2235.6 | -262.31 | 2235.58 | -256.4 | 2235.45 | -254.6 | 2235.4 |
| -254.11 | 2235.38 | -252.13 | 2235.25 | -251.74 | 2235.23 | -251.69 | 2235.22 | -251.66 | 2235.21 |
| -244.8 | 2235.19 | -243.06 | 2235.28 | -241.16 | 2235.42 | -240.83 | 2235.43 | -240.12 | 2235.46 |
| -238.1 | 2235.51 | -233.44 | 2235.63 | -232.8 | 2235.65 | -232.12 | 2235.67 | -231 | 2235.73 |
| -227.19 | 2235.99 | -227.02 | 2236 | -226.25 | 2236.07 | -206.59 | 2238 | -205.97 | 2238.01 |
| -190.45 | 2238.21 | -154.55 | 2238.69 | -150.57 | 2238.74 | -149.55 | 2238.76 | -147.39 | 2238.79 |
| -144.03 | 2238.83 | -138.62 | 2238.89 | -128.61 | 2239.01 | -123.21 | 2239.07 | -122.48 | 2239.08 |
| -121.76 | 2239.09 | -121.08 | 2239.09 | -120.41 | 2239.1 | -119.11 | 2239.11 | -109.38 | 2239.18 |
| -97.71 | 2239.24 | -90.81 | 2239.28 | -90.15 | 2239.29 | -89.45 | 2239.3 | -88.73 | 2239.31 |
| -84.15 | 2239.36 | -82.67 | 2239.38 | -82.28 | 2239.38 | -81.62 | 2239.39 | -80.97 | 2239.4 |
| -80.32 | 2239.41 | -76.69 | 2239.47 | -65.73 | 2239.68 | -49.32 | 2240 | -48.09 | 2240 |
| -47.9 | 2240 | -47.38 | 2240 | -43.46 | 2239.03 | -40.49 | 2238.22 | -39.67 | 2238 |
| -33.79 | 2236.48 | -31.96 | 2236 | -27.93 | 2234.95 | -24.22 | 2234 | -23.85 | 2233.96 |
| -23.1 | 2233.89 | -19.65 | 2233.53 | -18.71 | 2233.43 | -18.03 | 2233.35 | -17.21 | 2233.25 |
| -16.8 | 2233.19 | -16.3 | 2233.09 | -15.9 | 2233.03 | -15.89 | 2233 | 0 | 2232.98 |
| 8.6 | 2232.96 | 9.73 | 2233 | 10.88 | 2233.05 | 14.49 | 2233.23 | 15.77 | 2233.32 |
| 19.12 | 2233.67 | 20.35 | 2233.8 | 22.24 | 2234 | 29.42 | 2235.87 | 29.9 | 2236 |
| 30.53 | 2236.17 | 37.58 | 2238 | 39.6 | 2238.5 | 40.69 | 2238.77 | 41.47 | 2238.96 |
| 46.29 | 2239.18 | 46.44 | 2239.14 | 48.02 | 2238.95 | 50.28 | 2238.68 | 54.62 | 2238.16 |
| 55.97 | 2238 | 60.95 | 2238 | 61.26 | 2238 | 61.56 | 2238 | 61.84 | 2238 |
| 62.03 | 2238 | 72.86 | 2238 | 73.19 | 2238 | 73.36 | 2238 | 98.88 | 2238 |
| 98.98 | 2238 | 103.53 | 2238 | 103.62 | 2238 | 105.84 | 2238 | 106.31 | 2238.03 |
| 107.17 | 2238.13 | 107.33 | 2238.15 | 107.57 | 2238.16 | 107.68 | 2238.16 | 108.06 | 2238.17 |
| 108.52 | 2238.17 | 109.04 | 2238.18 | 109.6 | 2238.18 | 110.19 | 2238.19 | 110.8 | 2238.19 |
| 111.44 | 2238.19 | 111.71 | 2238.18 | 112.35 | 2238.18 | 113 | 2238.17 | 114.36 | 2238.16 |
| 123.98 | 2238 | 131.95 | 2238 | 136.75 | 2238 | 142.88 | 2238.09 | 145.37 | 2238.12 |
| 146.99 | 2238.13 | 150.6 | 2238.16 | 151.83 | 2238.17 | 153.03 | 2238.19 | 154.58 | 2238.2 |
| 156.63 | 2238.22 | 157.25 | 2238.23 | 162.04 | 2238.3 | 164.02 | 2238.33 | 174.79 | 2238.44 |
| 178.85 | 2238.48 | 179.84 | 2238.48 | 181.88 | 2238.49 | 190.47 | 2238.51 | 191.56 | 2238.51 |
| 193.85 | 2238.5 | 200.23 | 2238.47 | 200.54 | 2238.47 | 202.25 | 2238.46 | 202.4 | 2238.46 |

```
  202.57 2238.46   202.9 2238.46  212.61 2238.47  212.94 2238.47  213.26 2238.47
  224.72 2238.49  224.89 2238.48  226.06 2238.47  227.37 2238.46  227.89 2238.46
   228.8 2238.46   229.1 2238.46  232.16 2238.47  233.98 2238.48  243.52  2238.5
  244.59  2238.5  245.09  2238.5   261.1 2238.59  261.66 2238.59  262.28  2238.6
  263.53 2238.61  273.29 2238.74  276.31 2238.78  277.29 2238.79   279.2 2238.81
  283.12 2238.86  283.44 2238.86  283.76 2238.86  283.99 2238.86  284.35 2238.86
  284.72 2238.86  288.26 2238.86   292.5 2238.86  292.92 2238.86  294.98 2238.87
  298.09 2238.88  299.68 2238.88     300 2238.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -47.38    .025   46.29    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -47.38   46.29              300     300     310             .1       .3
Left Levee      Station=  -47.38      Elevation=    2240

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3000

INPUT
Description: Sta 30+00.00
Station Elevation Data    num=     233
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2237.43 -292.23 2236.47 -287.66    2236 -286.82 2235.94  -280.8  2235.5
 -262.38 2234.17 -260.18    2234 -259.88 2233.97 -257.33 2233.72 -256.57 2233.67
 -256.38 2233.66 -256.19 2233.65 -255.99 2233.65 -255.78 2233.65 -255.56 2233.65
 -255.32 2233.66 -255.13 2233.67 -254.35  2233.7    -252 2233.84 -250.21    2234
 -242.35 2234.49  -242.1 2234.51 -241.85 2234.53 -241.58 2234.54 -241.31 2234.55
 -240.74 2234.57 -231.17 2235.17 -223.48  2235.3 -222.26 2235.33 -221.64 2235.34
 -221.02 2235.36 -220.39 2235.39 -219.81 2235.41 -217.92 2235.51 -217.21 2235.54
  -216.5 2235.57 -214.61 2235.65 -214.05 2235.67 -211.65 2235.77 -210.62 2235.76
 -210.61 2235.76 -210.59 2235.76 -210.55 2235.75 -210.49 2235.75 -210.42 2235.75
 -209.96 2235.76 -209.88 2235.76 -209.37 2235.77 -209.29 2235.77 -209.21 2235.77
 -202.46 2235.78  -202.3 2235.79 -200.82  2235.8 -200.45 2235.81  -187.1    2236
 -186.53 2236.01 -181.85 2236.05 -181.65 2236.05 -166.86 2236.18 -165.85 2236.18
 -161.64 2236.23 -159.95 2236.24 -159.55 2236.24 -159.34 2236.24 -159.24 2236.24
 -159.13 2236.25 -158.68 2236.26  -158.3 2236.27 -145.17  2236.5 -141.17 2236.63
    -137  2236.7 -134.67 2236.78 -134.18 2236.79 -133.74  2236.8 -132.98 2236.83
 -132.59 2236.84  -132.2 2236.85 -131.39 2236.87 -131.22 2236.87 -104.47 2236.71
 -101.83 2236.79 -101.21 2236.72 -100.41 2236.65  -99.88 2236.61  -96.49 2236.39
  -94.03 2236.42  -91.62 2236.19  -89.33 2236.02  -89.07    2236  -88.29    2236
  -86.93    2236  -83.57    2236  -82.67 2236.04  -82.46 2236.04  -73.76 2236.52
  -69.85 2236.52  -68.41 2236.59  -67.39 2236.64  -66.12 2236.72  -63.37 2236.92
  -62.47 2236.99  -60.95 2237.09  -60.67 2237.11  -60.56 2237.12  -60.39 2237.15
  -60.29 2237.17  -60.28 2237.18  -52.83 2237.31  -49.79  2237.1  -46.18 2236.85
  -43.78 2236.64  -36.75    2236  -25.04  2234.2  -23.74    2234  -23.03 2233.97
   -20.3 2233.83  -15.41 2233.53  -12.24 2233.32   -9.59 2233.11   -8.16    2233
   -7.73 2232.97   -7.63 2232.95       0 2232.89   10.63  2232.8   12.11 2232.89
   14.63 2233.03   17.61  2233.2   18.65 2233.26   21.48 2233.41   26.11 2233.63
    34.2 2233.96   35.24    2234   39.82 2235.62   40.98    2236   46.56 2237.92
    46.8    2238   46.95 2238.05   52.69    2240   53.22    2240   53.39    2240
   53.42    2240   53.72    2240   54.12    2240   55.26    2240   58.94    2240
   59.55 2239.92   75.39    2238    79.6 2237.84   79.67 2237.83   79.74 2237.83
   79.98 2237.82   80.07 2237.82    80.8 2237.79   83.08 2237.71   85.77 2237.62
    93.8 2237.39   94.05 2237.38   95.08 2237.34    97.1 2237.28    98.3 2237.23
   98.62 2237.21   99.96 2237.17  100.74 2237.14   102.5 2237.08  102.96 2237.06
  104.09 2237.02  107.25 2236.93  121.61 2236.19  121.75 2236.16  122.17 2236.11
  122.94 2236.05  123.74    2236  123.77    2236  123.88    2236  123.98    2236
   124.1    2236  124.36    2236  124.58    2236  124.83    2236  125.13    2236
  125.47    2236  125.86    2236  126.96    2236  129.15    2236  129.63    2236
  129.88    2236  130.18    2236  130.28    2236  130.69    2236  130.99    2236
  132.03    2236   132.4    2236  132.73    2236     133    2236  134.03    2236
  158.15    2236  158.28    2236  165.16    2236  165.18    2236  165.22    2236
  174.67    2236  184.41    2236  184.46    2236  200.99    2236  201.01    2236
  208.94    2236  209.56 2236.01  210.01 2236.02  210.52 2236.02  211.04 2236.02
  212.47 2236.01  212.66 2236.01  212.75 2236.01  217.32    2236  217.86    2236
  218.62    2236  219.79    2236  228.39    2236  229.66    2236   232.9    2236
  233.13    2236  233.41    2236  233.89    2236  234.57    2236   259.9    2236
   260.4    2236  261.03    2236  261.77    2236  266.03    2236   266.7 2236.08
  279.77    2236  297.14    2236     300    2236

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -52.83    .025   52.69    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -52.83   52.69              180     180     180             .1       .3
```

Left Levee Station= -52.83 Elevation= 2237.31

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 2820.*

INPUT
Description: Sta 28+20
Station Elevation Data num= 418

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2233.94 | -292.18 | 2233.32 | -288.87 | 2233.09 | -287.58 | 2232.96 | -286.74 | 2232.89 |
| -280.68 | 2232.38 | -278.04 | 2232.16 | -277.15 | 2232.1 | -270.05 | 2231.79 | -268.5 | 2231.72 |
| -267.64 | 2231.68 | -265.15 | 2231.59 | -262.75 | 2231.49 | -262.48 | 2231.48 | -262.14 | 2231.46 |
| -259.92 | 2231.35 | -259.62 | 2231.33 | -258.52 | 2231.27 | -258.29 | 2231.25 | -258.16 | 2231.24 |
| -257.95 | 2231.19 | -257.06 | 2231.16 | -256.29 | 2231.14 | -256.1 | 2231.14 | -255.91 | 2231.14 |
| -255.71 | 2231.14 | -255.5 | 2231.14 | -255.28 | 2231.14 | -255.03 | 2231.15 | -254.84 | 2231.15 |
| -254.06 | 2231.17 | -252.47 | 2231.22 | -252.41 | 2231.22 | -252.3 | 2231.23 | -252.11 | 2231.24 |
| -251.81 | 2231.25 | -251.69 | 2231.25 | -251.45 | 2231.26 | -251.01 | 2231.28 | -249.89 | 2231.32 |
| -246.83 | 2231.4 | -246.35 | 2231.41 | -245.92 | 2231.43 | -245.55 | 2231.44 | -245.27 | 2231.44 |
| -245.05 | 2231.46 | -244.88 | 2231.46 | -244.74 | 2231.47 | -242.99 | 2231.6 | -242.24 | 2231.65 |
| -242.05 | 2231.66 | -241.98 | 2231.66 | -241.85 | 2231.66 | -241.73 | 2231.67 | -241.61 | 2231.68 |
| -241.48 | 2231.68 | -241.33 | 2231.68 | -241.21 | 2231.68 | -241 | 2231.69 | -240.93 | 2231.69 |
| -240.63 | 2231.69 | -240.36 | 2231.69 | -240.22 | 2231.69 | -238.34 | 2231.73 | -237.8 | 2231.74 |
| -237.2 | 2231.76 | -236.55 | 2231.77 | -230.73 | 2231.92 | -229.66 | 2231.93 | -229.04 | 2231.93 |
| -228.47 | 2231.93 | -227.98 | 2231.93 | -227.59 | 2231.93 | -227.34 | 2231.93 | -227.17 | 2231.93 |
| -227.08 | 2231.92 | -227.03 | 2231.92 | -224.1 | 2231.99 | -223.47 | 2232.1 | -223.38 | 2232.12 |
| -222.99 | 2232.14 | -221.76 | 2232.24 | -221.14 | 2232.28 | -220.51 | 2232.33 | -219.88 | 2232.38 |
| -219.3 | 2232.43 | -217.39 | 2232.59 | -216.68 | 2232.64 | -215.96 | 2232.7 | -214.75 | 2232.8 |
| -214.06 | 2232.86 | -213.5 | 2232.9 | -211.08 | 2233.09 | -210.05 | 2233.15 | -210.04 | 2233.15 |
| -210.02 | 2233.16 | -209.98 | 2233.15 | -209.92 | 2233.16 | -209.85 | 2233.16 | -209.38 | 2233.2 |
| -209.3 | 2233.2 | -208.79 | 2233.24 | -208.71 | 2233.24 | -208.63 | 2233.25 | -204.52 | 2233.51 |
| -201.83 | 2233.54 | -201.67 | 2233.54 | -200.18 | 2233.56 | -199.81 | 2233.57 | -186.38 | 2233.76 |
| -185.8 | 2233.77 | -181.09 | 2233.83 | -180.89 | 2233.83 | -179.9 | 2233.84 | -166.01 | 2234.01 |
| -164.99 | 2234.02 | -160.75 | 2234.08 | -159.05 | 2234.09 | -158.65 | 2234.1 | -158.44 | 2234.1 |
| -158.34 | 2234.1 | -158.23 | 2234.11 | -157.77 | 2234.11 | -157.39 | 2234.12 | -144.18 | 2234.33 |
| -140.15 | 2234.42 | -135.96 | 2234.48 | -133.61 | 2234.53 | -133.12 | 2234.54 | -132.67 | 2234.55 |
| -131.91 | 2234.57 | -131.52 | 2234.58 | -131.12 | 2234.58 | -130.31 | 2234.6 | -130.14 | 2234.6 |
| -109.44 | 2234.73 | -103.22 | 2234.77 | -100.56 | 2234.83 | -99.94 | 2234.81 | -99.13 | 2234.78 |
| -98.6 | 2234.77 | -95.19 | 2234.72 | -93.06 | 2234.74 | -92.71 | 2234.75 | -90.28 | 2234.67 |
| -87.98 | 2234.62 | -87.72 | 2234.62 | -87.48 | 2234.62 | -86.93 | 2234.63 | -85.93 | 2234.64 |
| -85.61 | 2234.64 | -85.56 | 2234.64 | -85.31 | 2234.64 | -84.44 | 2234.65 | -84.21 | 2234.66 |
| -83.72 | 2234.66 | -82.18 | 2234.67 | -81.91 | 2234.68 | -81.28 | 2234.7 | -81.07 | 2234.7 |
| -77.89 | 2234.8 | -72.38 | 2234.93 | -72.35 | 2234.93 | -72.31 | 2234.93 | -71.94 | 2234.92 |
| -71.44 | 2234.92 | -71.4 | 2234.92 | -70.34 | 2234.94 | -68.38 | 2234.98 | -66.93 | 2235.03 |
| -66.68 | 2235.04 | -65.9 | 2235.09 | -65.62 | 2235.11 | -64.62 | 2235.2 | -64.24 | 2235.23 |
| -63.69 | 2235.29 | -63.44 | 2235.36 | -61.85 | 2235.42 | -60.95 | 2235.46 | -59.42 | 2235.52 |
| -59.14 | 2235.53 | -59.03 | 2235.53 | -58.85 | 2235.55 | -58.75 | 2235.55 | -58.74 | 2235.56 |
| -51.25 | 2235.68 | -49.08 | 2235.24 | -48.98 | 2235.22 | -46.3 | 2234.65 | -44.51 | 2234.25 |
| -42.9 | 2233.89 | -42.24 | 2233.74 | -41.52 | 2233.58 | -39.28 | 2233.08 | -35.39 | 2232.08 |
| -32.74 | 2231.68 | -30.57 | 2231.37 | -29.61 | 2231.23 | -29.08 | 2231.18 | -28.18 | 2231.1 |
| -27.55 | 2231.05 | -27.05 | 2231.03 | -25.6 | 2230.95 | -24.96 | 2230.92 | -24.72 | 2230.91 |
| -24.44 | 2230.9 | -24.13 | 2230.88 | -23.74 | 2230.87 | -23.41 | 2230.86 | -23.31 | 2230.86 |
| -22.37 | 2230.82 | -21.05 | 2230.77 | -19.89 | 2230.71 | -19.42 | 2230.69 | -19.08 | 2230.68 |
| -18.98 | 2230.68 | -18.6 | 2230.65 | -18.02 | 2230.63 | -17.7 | 2230.61 | -17.62 | 2230.6 |
| -17.59 | 2230.6 | -14.4 | 2230.57 | -14.05 | 2230.56 | -13.68 | 2230.56 | -13.31 | 2230.56 |
| -12.89 | 2230.55 | -12.45 | 2230.55 | -11.95 | 2230.55 | -11.02 | 2230.55 | -4.04 | 2230.51 |
| -3.39 | 2230.53 | -3.06 | 2230.53 | -2.73 | 2230.54 | -2.09 | 2230.55 | -.49 | 2230.58 |
| .13 | 2230.6 | .42 | 2230.6 | .69 | 2230.61 | .95 | 2230.62 | 1.17 | 2230.62 |
| 1.24 | 2230.63 | 1.36 | 2230.63 | 2.86 | 2230.68 | 3.05 | 2230.69 | 3.57 | 2230.7 |
| 5.17 | 2230.74 | 6.55 | 2230.78 | 6.73 | 2230.78 | 7.32 | 2230.8 | 7.58 | 2230.81 |
| 7.77 | 2230.81 | 7.86 | 2230.82 | 7.95 | 2230.82 | 8.24 | 2230.83 | 9.79 | 2230.91 |
| 10.28 | 2230.94 | 12.13 | 2231.02 | 12.39 | 2231.03 | 13.54 | 2231.17 | 13.84 | 2231.2 |
| 14.29 | 2231.23 | 16.39 | 2231.33 | 17.51 | 2231.38 | 18.96 | 2231.48 | 27.07 | 2232.05 |
| 28.44 | 2232.15 | 34.49 | 2233.15 | 36.02 | 2233.39 | 39.19 | 2233.9 | 39.52 | 2233.95 |
| 39.55 | 2233.96 | 39.57 | 2233.96 | 39.66 | 2233.97 | 39.73 | 2233.99 | 39.74 | 2233.99 |
| 43.39 | 2235.12 | 43.7 | 2235.21 | 43.9 | 2235.27 | 45.61 | 2235.8 | 45.95 | 2235.9 |
| 51.48 | 2237.6 | 52.01 | 2237.6 | 52.18 | 2237.6 | 52.21 | 2237.6 | 52.51 | 2237.6 |
| 52.92 | 2237.6 | 54.06 | 2237.6 | 57.76 | 2237.6 | 58.37 | 2237.57 | 74.04 | 2236.81 |
| 74.29 | 2236.8 | 74.51 | 2236.8 | 75.11 | 2236.79 | 75.77 | 2236.78 | 77.24 | 2236.76 |
| 78.04 | 2236.74 | 78.52 | 2236.74 | 78.59 | 2236.73 | 78.66 | 2236.73 | 78.9 | 2236.73 |
| 78.99 | 2236.73 | 79.21 | 2236.72 | 79.73 | 2236.71 | 82.02 | 2236.66 | 84.72 | 2236.6 |
| 92.79 | 2236.44 | 93.04 | 2236.43 | 94.08 | 2236.41 | 95.8 | 2236.37 | 96.11 | 2236.37 |
| 97.31 | 2236.34 | 97.63 | 2236.32 | 98.98 | 2236.3 | 99.76 | 2236.28 | 101.53 | 2236.24 |
| 101.99 | 2236.23 | 103.13 | 2236.2 | 106.31 | 2236.14 | 109.81 | 2236.04 | 114.75 | 2235.9 |
| 117.82 | 2235.82 | 118.58 | 2235.8 | 119.27 | 2235.78 | 120.73 | 2235.73 | 120.88 | 2235.72 |
| 121.3 | 2235.7 | 122.07 | 2235.66 | 122.88 | 2235.64 | 122.91 | 2235.64 | 123.02 | 2235.63 |
| 123.12 | 2235.63 | 123.24 | 2235.63 | 123.5 | 2235.63 | 123.72 | 2235.63 | 123.97 | 2235.62 |
| 124.27 | 2235.62 | 124.61 | 2235.62 | 125.01 | 2235.61 | 126.11 | 2235.6 | 128.31 | 2235.58 |
| 128.8 | 2235.58 | 129.05 | 2235.58 | 129.24 | 2235.57 | 129.35 | 2235.57 | 129.45 | 2235.57 |

```
  129.86 2235.57  130.16 2235.56  131.21 2235.55  131.58 2235.55  131.91 2235.55
  132.18 2235.54  133.22 2235.53  133.28 2235.53  134.13 2235.53  154.18 2235.32
  157.45 2235.29  157.59 2235.29   164.5 2235.22  164.52 2235.22  164.56 2235.22
  166.91  2235.2  167.57 2235.19  174.06 2235.12  183.84 2235.02  183.89 2235.02
   200.5 2234.85  200.52 2234.85  205.68  2234.8  208.49 2234.78  209.12 2234.78
  209.57 2234.78  210.08 2234.78   210.6 2234.78  212.04 2234.77  212.23 2234.77
  212.32 2234.76  216.91 2234.73  217.46 2234.73  218.22 2234.73   219.4 2234.72
  219.83 2234.72  227.03 2234.67  228.04 2234.67  229.32 2234.66  232.57 2234.64
   232.8 2234.64  233.08 2234.64  233.57 2234.63  234.25 2234.63  242.83 2234.58
  247.24 2234.55  257.47 2234.48  259.23 2234.47   259.7 2234.47  259.87 2234.46
  260.21 2234.46  260.33 2234.46  260.84 2234.44   261.2 2234.43  261.58 2234.43
  262.99  2234.4  263.64 2234.36  263.75 2234.36  263.89 2234.36     264 2234.36
  264.13 2234.36  264.41 2234.36  264.73 2234.36  265.09 2234.36  265.49 2234.36
  265.86 2234.36  266.54 2234.39  267.31 2234.39  275.42 2234.37  279.67 2234.36
  297.13 2234.36  298.89 2234.36     300 2234.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .03  -51.25     .03   51.48     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -51.25   51.48              120     120     120            .1      .3
Left Levee      Station=  -51.25      Elevation= 2235.68

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2700

INPUT
Description: Sta 27+00.00
Station Elevation Data    num=     194
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2231.62 -288.82 2231.06 -277.95 2230.06 -277.05    2230 -269.92 2229.82
 -268.37 2229.78  -267.5 2229.76    -265 2229.72 -262.59 2229.68 -262.32 2229.67
 -258.34 2229.54 -258.11 2229.53 -257.98 2229.52 -257.77 2229.44 -252.27  2229.5
 -252.26 2229.51 -252.21 2229.51  -252.1 2229.52 -251.91 2229.52 -251.61 2229.52
 -251.24 2229.53  -250.8 2229.53  -246.6 2229.54 -246.12 2229.54 -245.69 2229.55
 -245.32 2229.55 -245.04 2229.55 -244.82 2229.56 -244.65 2229.56 -244.51 2229.57
 -242.75 2229.72 -241.99 2229.76  -241.8 2229.77  -241.6 2229.77 -241.36 2229.78
 -241.08 2229.78 -240.75 2229.78 -240.38 2229.78 -239.97 2229.77 -238.08 2229.76
 -237.54 2229.75 -236.93 2229.75 -236.28 2229.75 -229.36 2229.75 -228.74 2229.75
 -228.17 2229.74 -227.67 2229.74 -227.28 2229.74 -227.03 2229.73 -226.86 2229.73
 -226.77 2229.72 -226.72 2229.71 -223.78 2229.79 -223.15 2229.98 -223.05    2230
 -214.39 2230.92 -204.11    2232 -179.39 2232.36 -108.63 2233.39  -92.18 2233.63
  -86.58  2233.7  -85.02 2233.73  -84.7 2233.73  -84.4 2233.74  -83.52 2233.75
  -83.29 2233.76  -82.8 2233.76 -80.98 2233.79 -76.95 2233.85 -71.41 2233.87
  -71.38 2233.87 -70.97 2233.86 -70.47 2233.85 -70.43 2233.85 -69.37 2233.89
  -65.69    2234 -64.63 2234.08 -63.24 2234.22 -62.69  2234.3 -62.44  2234.4
  -50.19  2234.6 -48.52    2234 -43.76 2232.19 -43.25    2232  -42.7 2231.79
  -37.97    2230 -35.93 2229.71 -32.42 2229.23 -31.93 2229.18 -30.43 2229.11
  -29.94  2229.1 -29.75 2229.09 -29.54 2229.09  -29.3 2229.08    -29 2229.08
  -28.67 2229.08 -27.94 2229.07 -26.03 2229.06 -25.67 2229.06 -25.33 2229.06
  -25.04 2229.05 -24.26 2229.04  -21.8    2229 -21.53    2229 -21.25    2229
  -20.96    2229 -20.64 2228.99  -20.3 2228.99  -19.2 2228.99 -13.82 2228.98
 -13.06 2228.99 -12.68 2228.99  -12.3 2228.99 -11.56 2228.99   -9.7    2229
   -8.98 2229.01  -8.64 2229.01  -8.32 2229.02  -8.02 2229.02  -7.77 2229.02
   -7.55 2229.03   -5.8 2229.07  -5.59 2229.07  -4.98 2229.08  -1.31 2229.13
    -.62 2229.14   -.32 2229.15    -.1 2229.15       0 2229.16     .11 2229.16
     .45 2229.17   2.24 2229.26   4.96 2229.38   5.27  2229.4    6.6  2229.6
    6.95 2229.64   7.47 2229.68  11.21 2229.86   12.9    2230   36.4 2231.95
   36.78 2231.98  36.81 2231.98  36.84 2231.98  36.94 2231.99  37.02    2232
   37.04 2232.01  43.85    2234  44.25 2234.11  50.67    2236  73.31    2236
   73.78    2236  74.38    2236  75.04    2236  76.52    2236  77.32    2236
   78.49    2236  95.14 2235.76 109.19 2235.56 114.15 2235.51 117.23 2235.47
  117.99 2235.46 118.68 2235.45 120.15 2235.43 127.76  2235.3 128.68 2235.29
  132.74 2235.22 133.59 2235.21 153.71 2234.87 166.48 2234.66 167.14 2234.65
  205.37    2234 219.57 2233.86 226.79 2233.79 242.64 2233.63 247.07 2233.58
  257.33 2233.47  259.1 2233.45 259.74 2233.44  260.2 2233.43 261.07 2233.39
  262.87 2233.33 263.52 2233.27 263.63 2233.27 263.77 2233.27 263.88 2233.27
  264.01 2233.26 264.29 2233.26 264.62 2233.26 264.98 2233.26 265.38 2233.26
   267.2 2233.26 275.34 2233.26 298.89 2233.26     300 2233.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .03  -50.19     .03   50.67     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -50.19   50.67              230     230     210            .1      .3
Left Levee      Station=  -50.19      Elevation=  2234.6
```

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 2470.*

INPUT
Description: Sta 24+70
Station Elevation Data num= 381

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2229.11 | -295.09 | 2229.14 | -295.07 | 2229.14 | -294.49 | 2229.14 | -293.88 | 2229.15 |
| -293.84 | 2229.15 | -288.29 | 2229.21 | -283.66 | 2229.22 | -283.56 | 2229.22 | -276.91 | 2229.23 |
| -276.74 | 2229.23 | -275.97 | 2229.23 | -273.41 | 2229.27 | -268.51 | 2229.19 | -266.88 | 2229.21 |
| -265.97 | 2229.23 | -264.12 | 2229.26 | -263.36 | 2229.24 | -260.83 | 2229.21 | -260.55 | 2229.21 |
| -260.22 | 2229.2 | -256.48 | 2229.23 | -256.38 | 2229.23 | -256.14 | 2229.23 | -256.01 | 2229.22 |
| -255.79 | 2229.2 | -253.99 | 2229.19 | -250.12 | 2229.17 | -250.03 | 2229.17 | -250.02 | 2229.17 |
| -249.96 | 2229.18 | -249.85 | 2229.18 | -249.65 | 2229.18 | -249.63 | 2229.18 | -249.34 | 2229.18 |
| -248.95 | 2229.18 | -248.49 | 2229.18 | -245.73 | 2229.16 | -244.09 | 2229.15 | -243.59 | 2229.14 |
| -243.14 | 2229.14 | -242.75 | 2229.14 | -242.46 | 2229.13 | -242.23 | 2229.14 | -242.05 | 2229.13 |
| -241.9 | 2229.13 | -240.06 | 2229.15 | -239.81 | 2229.16 | -239.26 | 2229.16 | -239.07 | 2229.16 |
| -238.86 | 2229.16 | -238.6 | 2229.16 | -238.31 | 2229.16 | -237.97 | 2229.15 | -237.58 | 2229.15 |
| -237.15 | 2229.15 | -235.22 | 2229.13 | -235.17 | 2229.13 | -234.61 | 2229.12 | -233.97 | 2229.11 |
| -233.29 | 2229.11 | -232.51 | 2229.1 | -230.28 | 2229.08 | -227.33 | 2229.04 | -226.04 | 2229.03 |
| -225.39 | 2229.03 | -224.84 | 2229.02 | -224.79 | 2229.02 | -224.48 | 2229.02 | -224.32 | 2229.02 |
| -224.27 | 2229.02 | -224.15 | 2229.02 | -223.95 | 2229.02 | -223.86 | 2229.02 | -223.67 | 2229.02 |
| -223.6 | 2229.02 | -223.42 | 2229.02 | -223.37 | 2229.02 | -223.33 | 2229.01 | -223.28 | 2229.01 |
| -223.04 | 2229.01 | -222.36 | 2229.03 | -221.64 | 2229.03 | -221.28 | 2229.03 | -220.86 | 2229.04 |
| -220.51 | 2229.04 | -220.2 | 2229.05 | -219.54 | 2229.1 | -219.44 | 2229.1 | -212.65 | 2229.32 |
| -211.42 | 2229.36 | -211.01 | 2229.37 | -210.59 | 2229.39 | -210.37 | 2229.39 | -210.17 | 2229.4 |
| -209.77 | 2229.41 | -209.37 | 2229.43 | -208.58 | 2229.44 | -206.16 | 2229.5 | -205.74 | 2229.52 |
| -205.3 | 2229.53 | -204.84 | 2229.54 | -204.36 | 2229.55 | -202.33 | 2229.61 | -199.6 | 2229.69 |
| -192.68 | 2229.76 | -182.33 | 2229.86 | -177.92 | 2229.91 | -173.72 | 2229.96 | -159.47 | 2230.11 |
| -140 | 2230.33 | -120.34 | 2230.54 | -99.64 | 2230.78 | -97.94 | 2230.8 | -87.65 | 2231.15 |
| -82.42 | 2231.31 | -76.55 | 2231.49 | -74.92 | 2231.54 | -74.58 | 2231.55 | -74.27 | 2231.56 |
| -73.35 | 2231.59 | -73.11 | 2231.6 | -72.59 | 2231.62 | -70.69 | 2231.68 | -66.47 | 2231.81 |
| -63.83 | 2231.88 | -60.67 | 2231.98 | -60.64 | 2231.98 | -60.21 | 2231.99 | -59.69 | 2232 |
| -59.64 | 2232 | -58.53 | 2232.04 | -54.68 | 2232.18 | -53.57 | 2232.23 | -52.12 | 2232.3 |
| -51.54 | 2232.34 | -51.28 | 2232.37 | -44.1 | 2232.59 | -38.9 | 2232.6 | -38.45 | 2232.61 |
| -37.86 | 2232.42 | -37.53 | 2232.32 | -34.88 | 2231.5 | -34.6 | 2231.42 | -34.3 | 2231.32 |
| -31.67 | 2230.51 | -30.54 | 2230.27 | -28.59 | 2229.86 | -28.32 | 2229.81 | -28.31 | 2229.81 |
| -27.49 | 2229.67 | -27.21 | 2229.62 | -27.11 | 2229.6 | -26.99 | 2229.59 | -26.86 | 2229.56 |
| -26.69 | 2229.54 | -26.51 | 2229.51 | -26.1 | 2229.45 | -25.04 | 2229.28 | -24.84 | 2229.25 |
| -24.65 | 2229.22 | -24.49 | 2229.2 | -24.06 | 2229.13 | -22.7 | 2228.91 | -22.55 | 2228.89 |
| -22.39 | 2228.86 | -22.23 | 2228.84 | -22.05 | 2228.81 | -21.86 | 2228.78 | -21.25 | 2228.69 |
| -18.86 | 2228.32 | -18.27 | 2228.23 | -17.4 | 2228.23 | -17.06 | 2228.23 | -16.83 | 2228.23 |
| -3.22 | 2228.23 | -2.54 | 2228.23 | 7.61 | 2228.23 | 12.18 | 2228.23 | 13.41 | 2228.23 |
| 13.89 | 2228.33 | 14.13 | 2228.39 | 14.37 | 2228.44 | 14.84 | 2228.54 | 16.01 | 2228.8 |
| 16.46 | 2228.9 | 16.56 | 2228.92 | 16.68 | 2228.94 | 16.88 | 2228.99 | 17.07 | 2229.03 |
| 17.23 | 2229.06 | 17.36 | 2229.09 | 18.47 | 2229.34 | 18.6 | 2229.37 | 18.98 | 2229.45 |
| 20.53 | 2229.79 | 21.3 | 2229.88 | 21.73 | 2229.93 | 21.92 | 2229.96 | 22.06 | 2229.97 |
| 22.12 | 2229.98 | 22.19 | 2229.99 | 22.41 | 2230.01 | 23.53 | 2230.16 | 25.25 | 2230.38 |
| 25.44 | 2230.41 | 26.28 | 2230.55 | 26.5 | 2230.58 | 26.83 | 2230.63 | 28.53 | 2230.84 |
| 29.19 | 2230.93 | 30.25 | 2231.08 | 34.22 | 2231.66 | 36.02 | 2231.86 | 44.59 | 2232.8 |
| 45.06 | 2232.85 | 45.3 | 2232.88 | 45.32 | 2232.88 | 45.34 | 2232.88 | 45.4 | 2232.89 |
| 45.46 | 2232.89 | 45.47 | 2232.9 | 49.76 | 2233.68 | 50.01 | 2233.72 | 54.06 | 2234.47 |
| 68.14 | 2234.47 | 70.24 | 2234.47 | 72.31 | 2234.47 | 76.39 | 2234.47 | 76.78 | 2234.47 |
| 76.85 | 2234.47 | 77.45 | 2234.47 | 78.1 | 2234.47 | 79.56 | 2234.47 | 79.78 | 2234.47 |
| 80.35 | 2234.47 | 81.5 | 2234.47 | 93.88 | 2234.42 | 97.92 | 2234.41 | 98.27 | 2234.41 |
| 108.09 | 2234.13 | 111.78 | 2234.11 | 116.68 | 2234.09 | 118.93 | 2234.08 | 119.71 | 2234.07 |
| 120.46 | 2234.07 | 121.14 | 2234.06 | 122.59 | 2234.06 | 130.1 | 2234.01 | 131.01 | 2234.01 |
| 135.01 | 2233.98 | 135.85 | 2233.98 | 139.3 | 2233.95 | 149.25 | 2233.89 | 150.9 | 2233.88 |
| 151.43 | 2233.88 | 151.93 | 2233.87 | 152.39 | 2233.87 | 152.73 | 2233.88 | 153.04 | 2233.88 |
| 153.39 | 2233.88 | 153.71 | 2233.88 | 154.28 | 2233.89 | 155.7 | 2233.91 | 159.02 | 2233.96 |
| 159.81 | 2233.96 | 160.21 | 2233.97 | 161.27 | 2233.97 | 161.83 | 2233.98 | 164.67 | 2233.99 |
| 165.74 | 2234 | 166.25 | 2233.99 | 166.75 | 2234 | 167.22 | 2234 | 167.76 | 2234 |
| 168.23 | 2233.99 | 168.29 | 2233.99 | 168.69 | 2233.98 | 168.95 | 2233.99 | 171.83 | 2234 |
| 172.06 | 2234.01 | 172.21 | 2234.02 | 172.23 | 2234.02 | 172.26 | 2234.02 | 172.29 | 2234.02 |
| 172.33 | 2234.02 | 172.37 | 2234.02 | 172.43 | 2234.02 | 172.54 | 2234.01 | 173.24 | 2234.01 |
| 174.35 | 2234.01 | 175.31 | 2234.01 | 175.87 | 2234.01 | 176.84 | 2234 | 177.93 | 2234 |
| 179.02 | 2233.99 | 179.31 | 2233.99 | 179.42 | 2233.99 | 179.47 | 2233.99 | 179.59 | 2233.99 |
| 180.19 | 2233.99 | 181.16 | 2233.99 | 181.3 | 2233.99 | 181.35 | 2233.99 | 181.39 | 2233.99 |
| 181.42 | 2233.99 | 181.48 | 2233.99 | 181.53 | 2233.99 | 181.59 | 2233.99 | 181.75 | 2233.99 |
| 182.86 | 2233.97 | 182.99 | 2233.97 | 183.06 | 2233.97 | 183.11 | 2233.97 | 183.17 | 2233.97 |
| 183.35 | 2233.96 | 184.83 | 2233.96 | 187.88 | 2233.93 | 190.07 | 2233.91 | 193.71 | 2233.88 |
| 194.33 | 2233.87 | 195.02 | 2233.86 | 195.74 | 2233.86 | 197.21 | 2233.85 | 206.66 | 2233.79 |
| 209.91 | 2233.77 | 220.66 | 2233.72 | 226.3 | 2233.7 | 227.72 | 2233.69 | 227.79 | 2233.69 |
| 239.35 | 2233.64 | 240.97 | 2233.64 | 242.25 | 2233.63 | 242.85 | 2233.62 | 243.4 | 2233.62 |
| 243.42 | 2233.62 | 244.44 | 2233.61 | 247.28 | 2233.59 | 247.79 | 2233.58 | 255.7 | 2233.51 |
| 257.91 | 2233.49 | 259.66 | 2233.47 | 260.29 | 2233.46 | 260.74 | 2233.46 | 261.38 | 2233.45 |
| 261.6 | 2233.44 | 263.37 | 2233.42 | 264.02 | 2233.4 | 264.12 | 2233.4 | 264.26 | 2233.4 |

```
  264.37 2233.39   264.5 2233.39  264.78 2233.39   265.1 2233.39  265.46 2233.39
  265.85 2233.38  267.65 2233.37  269.15 2233.36  271.74 2233.34  275.68 2233.31
  277.88  2233.3  279.71 2233.28  284.18 2233.25  284.98 2233.24  285.28 2233.24
  285.49 2233.23  285.89 2233.21  286.73 2233.17  287.04 2233.14  287.09 2233.14
  287.16 2233.14  287.21 2233.14  287.27 2233.14   287.4 2233.14  287.56 2233.14
  287.73 2233.14  287.92 2233.14  288.79 2233.15  292.85 2233.17  298.91 2233.21
     300 2233.21

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -38.45    .025   54.06    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -38.45   54.06               70      70      70             .1      .3
Left Levee      Station=  -38.45      Elevation= 2232.61

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2400

INPUT
Description: Sta 24+00.00
Station Elevation Data    num=     196
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2228.35 -295.02 2228.46    -295 2228.46 -294.41 2228.47  -293.8 2228.49
 -293.76 2228.49 -283.44 2228.78 -283.34 2228.78 -276.42 2228.98 -273.05 2229.07
 -268.08    2229 -263.63 2229.11 -259.68 2229.06 -255.89 2229.14 -253.36 2229.11
 -249.44 2229.07 -248.94 2229.08 -244.99 2229.04 -242.82 2229.02 -238.99 2228.98
 -234.34 2228.94 -231.59  2228.9 -229.33 2228.87 -226.34 2228.83 -223.81  2228.8
 -223.45  2228.8 -223.29  2228.8 -223.11  2228.8 -222.91  2228.8 -222.63  2228.8
 -222.32  2228.8 -221.99  2228.8  -221.3 2228.81 -220.57 2228.81  -220.2 2228.81
 -219.78 2228.82 -219.42 2228.82 -218.34 2228.83 -211.46 2228.91 -210.21 2228.92
 -209.79 2228.92 -209.37 2228.93 -208.94 2228.93 -208.54 2228.93 -208.13 2228.94
 -207.33 2228.94 -204.88 2228.94 -204.45 2228.95 -204.01 2228.95 -203.54 2228.95
 -203.05 2228.95    -201 2228.97 -191.21 2229.05 -180.72 2229.14 -176.25 2229.18
 -157.55 2229.37 -137.81 2229.57 -117.89 2229.76  -95.18    2230  -84.75 2230.42
   -60.6 2231.28  -47.88 2231.75   -40.6    2232  -35.33    2232  -34.88    2232
  -34.43 2231.88  -27.21    2230  -20.07 2228.12  -19.62    2228  -18.49    2228
  -18.04    2228  -17.74    2228       0    2228     .89    2228   14.13    2228
   20.09    2228    21.7    2228   24.29 2228.89   27.55    2230   34.12 2231.16
   38.79    2232   40.27  2232.2   47.31 2233.08   55.09    2234   69.11    2234
    71.2    2234   73.26    2234   77.72    2234    80.7    2234   94.74    2234
   99.12    2234  108.89 2233.68  119.69 2233.65  139.97 2233.59  149.88 2233.56
  151.53 2233.55  152.05 2233.55  152.55 2233.55  153.01 2233.55  153.35 2233.56
  153.66 2233.56     154 2233.56  154.32 2233.57  154.89 2233.58  159.61  2233.7
   160.4 2233.71   160.8 2233.72  161.85 2233.73  162.41 2233.74  165.24 2233.77
   166.3 2233.78  166.81 2233.78  167.31 2233.79  167.78 2233.79  168.31 2233.79
  168.78 2233.78  169.24 2233.78  172.37 2233.82   172.6 2233.83  172.75 2233.84
  172.77 2233.84   172.8 2233.84  172.83 2233.84  172.87 2233.84  172.91 2233.84
  172.96 2233.84  173.07 2233.84  173.77 2233.84  174.88 2233.84  175.83 2233.85
  176.39 2233.85  177.36 2233.85  178.44 2233.85  179.53 2233.84  179.82 2233.84
  179.93 2233.84  179.98 2233.84  180.09 2233.84  180.69 2233.85  181.66 2233.85
   181.8 2233.85  181.85 2233.85  181.89 2233.85  181.92 2233.85  181.98 2233.85
  182.03 2233.85  182.09 2233.85  182.25 2233.85  183.35 2233.84  183.48 2233.84
  183.55 2233.84   183.6 2233.84  183.66 2233.84  183.84 2233.83  185.31 2233.83
  188.35 2233.81  190.53  2233.8  194.16 2233.77  194.77 2233.76  195.46 2233.76
  196.18 2233.76  197.64 2233.75  210.29 2233.71  226.61 2233.67  228.02 2233.66
   239.6 2233.63  241.22 2233.63  242.49 2233.62  243.09 2233.62  243.64 2233.62
  244.67 2233.61   247.5 2233.59  255.89 2233.51  261.54 2233.46  269.28 2233.39
  271.86 2233.37  277.97 2233.31   279.8 2233.29  284.25 2233.25  285.04 2233.24
  285.34 2233.23  285.55 2233.22  285.95  2233.2  286.79 2233.14  287.09  2233.1
  287.14  2233.1  287.21  2233.1  287.26  2233.1  287.32  2233.1  287.45  2233.1
  287.61  2233.1  287.78  2233.1  287.97  2233.1  288.84 2233.11  292.88 2233.14
     300  2233.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -34.88    .025   55.09    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -34.88   55.09              140     140     140             .1      .3
Left Levee      Station=  -34.88      Elevation=    2232

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2260.*
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INPUT
Description: Sta 22+60
Station Elevation Data num= 451

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2228.46 | -296.41 | 2228.49 | -296.03 | 2228.49 | -296.01 | 2228.49 | -295.54 | 2228.5 |
| -295.06 | 2228.51 | -295.02 | 2228.51 | -286.8 | 2228.67 | -286.72 | 2228.67 | -285.47 | 2228.69 |
| -283.34 | 2228.72 | -281.2 | 2228.74 | -280.36 | 2228.75 | -278.95 | 2228.78 | -278.51 | 2228.78 |
| -276.23 | 2228.75 | -274.86 | 2228.72 | -274.55 | 2228.72 | -272.62 | 2228.74 | -271 | 2228.75 |
| -270.18 | 2228.74 | -268.87 | 2228.72 | -267.85 | 2228.7 | -266.56 | 2228.71 | -265.55 | 2228.71 |
| -265.4 | 2228.72 | -265.33 | 2228.72 | -265.26 | 2228.72 | -265.19 | 2228.72 | -265.08 | 2228.72 |
| -264.97 | 2228.72 | -264.84 | 2228.72 | -264.83 | 2228.72 | -264.57 | 2228.72 | -264.31 | 2228.72 |
| -264.18 | 2228.72 | -264.02 | 2228.72 | -263.9 | 2228.72 | -263.52 | 2228.71 | -262.81 | 2228.71 |
| -261.26 | 2228.7 | -260.88 | 2228.7 | -260.75 | 2228.69 | -260.63 | 2228.69 | -260.5 | 2228.69 |
| -260.37 | 2228.69 | -260.26 | 2228.69 | -260.04 | 2228.69 | -259.68 | 2228.69 | -259.34 | 2228.69 |
| -259.28 | 2228.69 | -259.23 | 2228.69 | -259.12 | 2228.69 | -258.99 | 2228.69 | -258.85 | 2228.69 |
| -258.33 | 2228.69 | -256.14 | 2228.67 | -256.02 | 2228.67 | -254.4 | 2228.66 | -253.92 | 2228.66 |
| -253.12 | 2228.65 | -251.35 | 2228.64 | -250.23 | 2228.64 | -247.83 | 2228.62 | -247.64 | 2228.62 |
| -245.9 | 2228.61 | -245.45 | 2228.6 | -243.65 | 2228.59 | -243.11 | 2228.59 | -241.26 | 2228.57 |
| -240.07 | 2228.56 | -239.56 | 2228.56 | -239.25 | 2228.56 | -238.96 | 2228.56 | -238.83 | 2228.56 |
| -238.7 | 2228.56 | -238.69 | 2228.56 | -238.53 | 2228.56 | -238.31 | 2228.56 | -238.06 | 2228.56 |
| -237.79 | 2228.56 | -237.24 | 2228.57 | -236.66 | 2228.57 | -236.37 | 2228.57 | -236.03 | 2228.58 |
| -235.75 | 2228.58 | -235.61 | 2228.58 | -234.88 | 2228.58 | -232.25 | 2228.61 | -231.19 | 2228.62 |
| -229.4 | 2228.64 | -228.4 | 2228.65 | -228.07 | 2228.65 | -227.73 | 2228.65 | -227.39 | 2228.65 |
| -227.07 | 2228.66 | -226.74 | 2228.66 | -226.1 | 2228.66 | -225.55 | 2228.66 | -224.15 | 2228.67 |
| -223.81 | 2228.68 | -223.46 | 2228.68 | -223.08 | 2228.68 | -222.69 | 2228.69 | -221.06 | 2228.71 |
| -215.12 | 2228.77 | -215.1 | 2228.78 | -214.98 | 2228.78 | -214.81 | 2228.78 | -214.6 | 2228.78 |
| -214.35 | 2228.79 | -213.76 | 2228.8 | -213.43 | 2228.8 | -213.25 | 2228.8 | -212.4 | 2228.8 |
| -212.07 | 2228.81 | -211.07 | 2228.82 | -210.7 | 2228.82 | -209.64 | 2228.83 | -209.25 | 2228.83 |
| -205.91 | 2228.86 | -205.5 | 2228.87 | -204.89 | 2228.87 | -201.32 | 2228.9 | -187.93 | 2229.03 |
| -187.46 | 2229.04 | -186.41 | 2229.05 | -180.47 | 2229.11 | -179.47 | 2229.12 | -170.67 | 2229.2 |
| -162.62 | 2229.28 | -160.38 | 2229.29 | -158.8 | 2229.31 | -158.04 | 2229.32 | -156.6 | 2229.33 |
| -154.79 | 2229.35 | -147.93 | 2229.44 | -142.2 | 2229.51 | -136.68 | 2229.58 | -134.27 | 2229.65 |
| -133.24 | 2229.69 | -130.18 | 2229.8 | -129.64 | 2229.82 | -129.52 | 2229.82 | -129.39 | 2229.83 |
| -128.36 | 2229.86 | -109.1 | 2230.37 | -98.96 | 2230.64 | -93.15 | 2230.79 | -88.95 | 2230.8 |
| -88.59 | 2230.81 | -88.21 | 2230.79 | -88.1 | 2230.79 | -88.01 | 2230.78 | -87.9 | 2230.78 |
| -87.79 | 2230.77 | -87.68 | 2230.77 | -86.91 | 2230.73 | -84.89 | 2230.64 | -84.86 | 2230.64 |
| -84.82 | 2230.64 | -84.77 | 2230.63 | -84.63 | 2230.63 | -82.9 | 2230.55 | -82.49 | 2230.53 |
| -82.38 | 2230.52 | -82.26 | 2230.52 | -82.01 | 2230.5 | -81.11 | 2230.47 | -81 | 2230.46 |
| -80.89 | 2230.46 | -80.79 | 2230.45 | -80.72 | 2230.45 | -80.65 | 2230.44 | -80.6 | 2230.44 |
| -80.22 | 2230.42 | -78.85 | 2230.33 | -78.46 | 2230.32 | -76.49 | 2230.21 | -76.37 | 2230.21 |
| -76.27 | 2230.21 | -76.17 | 2230.2 | -76.11 | 2230.2 | -76.05 | 2230.19 | -75.96 | 2230.18 |
| -75.72 | 2230.14 | -75.64 | 2230.13 | -74.16 | 2230.03 | -74.02 | 2230.02 | -73.91 | 2230 |
| -73.84 | 2229.98 | -73.68 | 2229.88 | -73.52 | 2229.82 | -72.74 | 2229.73 | -70.75 | 2229.53 |
| -69.69 | 2229.43 | -67.68 | 2229.28 | -66.63 | 2229.2 | -66.13 | 2229.17 | -65.63 | 2229.13 |
| -65.13 | 2229.1 | -64.85 | 2229.09 | -64.56 | 2229.07 | -64.08 | 2229.04 | -63.6 | 2229.02 |
| -62.67 | 2228.98 | -59.9 | 2228.86 | -55.56 | 2228.68 | -44.53 | 2228.2 | -37.46 | 2227.9 |
| -37.41 | 2227.9 | -35.9 | 2227.82 | -34.43 | 2227.75 | -33.71 | 2227.71 | -33.65 | 2227.71 |
| -33.3 | 2227.69 | -33.18 | 2227.68 | -32.94 | 2227.67 | -32.88 | 2227.67 | -31.5 | 2227.58 |
| -30.9 | 2227.58 | -30.66 | 2227.58 | -30.5 | 2227.58 | -21.04 | 2227.58 | -20.56 | 2227.58 |
| -13.5 | 2227.58 | -10.32 | 2227.58 | -9.46 | 2227.58 | -5.52 | 2228.14 | -.56 | 2228.83 |
| 9.44 | 2229.67 | 16.54 | 2230.27 | 18.8 | 2230.43 | 22.92 | 2230.7 | 29.51 | 2231.13 |
| 41.35 | 2231.88 | 41.89 | 2231.9 | 41.94 | 2231.9 | 42.57 | 2231.92 | 42.68 | 2231.92 |
| 44.79 | 2231.98 | 44.95 | 2231.98 | 50.25 | 2232.12 | 50.27 | 2232.13 | 50.29 | 2232.13 |
| 56.16 | 2232.09 | 58.37 | 2232.08 | 60.54 | 2232.06 | 65.25 | 2232.03 | 68.4 | 2232.01 |
| 83.23 | 2231.91 | 87.85 | 2231.88 | 98.17 | 2231.64 | 109.58 | 2231.55 | 119.91 | 2231.46 |
| 120.88 | 2231.49 | 121.85 | 2231.52 | 123.7 | 2231.56 | 130.99 | 2231.72 | 139.47 | 2231.9 |
| 140.93 | 2231.9 | 141.46 | 2231.9 | 141.5 | 2231.9 | 143.2 | 2231.89 | 143.75 | 2231.89 |
| 144.28 | 2231.89 | 144.76 | 2231.89 | 145.12 | 2231.9 | 145.45 | 2231.9 | 145.81 | 2231.9 |
| 146.15 | 2231.9 | 146.75 | 2231.91 | 149.78 | 2231.95 | 151.73 | 2231.97 | 152.57 | 2231.98 |
| 152.99 | 2231.98 | 153.67 | 2231.99 | 154.1 | 2231.99 | 154.69 | 2231.99 | 157.68 | 2232.01 |
| 158.13 | 2232.01 | 158.8 | 2232.01 | 159.34 | 2232 | 159.87 | 2232 | 160.29 | 2231.99 |
| 160.36 | 2231.99 | 160.92 | 2231.98 | 161.42 | 2231.97 | 161.9 | 2231.96 | 162.89 | 2231.95 |
| 165.17 | 2231.93 | 165.21 | 2231.92 | 165.45 | 2231.93 | 165.61 | 2231.93 | 165.63 | 2231.93 |
| 165.66 | 2231.93 | 165.7 | 2231.93 | 165.74 | 2231.93 | 165.78 | 2231.93 | 165.83 | 2231.93 |
| 165.95 | 2231.92 | 166.69 | 2231.91 | 166.99 | 2231.91 | 167.86 | 2231.89 | 168.47 | 2231.88 |
| 168.86 | 2231.88 | 169.46 | 2231.87 | 169.64 | 2231.86 | 170.48 | 2231.84 | 170.53 | 2231.84 |
| 171.11 | 2231.83 | 171.34 | 2231.82 | 171.62 | 2231.82 | 172.77 | 2231.8 | 173.08 | 2231.79 |
| 173.19 | 2231.79 | 173.25 | 2231.79 | 173.36 | 2231.79 | 174 | 2231.79 | 175.02 | 2231.77 |
| 175.17 | 2231.77 | 175.22 | 2231.77 | 175.26 | 2231.77 | 175.3 | 2231.77 | 175.36 | 2231.77 |
| 175.41 | 2231.77 | 175.48 | 2231.77 | 175.64 | 2231.77 | 176.81 | 2231.74 | 176.94 | 2231.74 |
| 177.02 | 2231.74 | 177.07 | 2231.74 | 177.13 | 2231.74 | 177.32 | 2231.73 | 178.88 | 2231.71 |
| 182.09 | 2231.66 | 184.39 | 2231.63 | 188.22 | 2231.56 | 188.87 | 2231.55 | 189.6 | 2231.54 |
| 190.36 | 2231.53 | 191.9 | 2231.5 | 198.33 | 2231.41 | 198.46 | 2231.41 | 198.71 | 2231.41 |
| 199.05 | 2231.41 | 199.45 | 2231.4 | 205.26 | 2231.34 | 206.57 | 2231.33 | 212.1 | 2231.27 |
| 212.6 | 2231.26 | 213.07 | 2231.26 | 213.58 | 2231.25 | 213.79 | 2231.25 | 214 | 2231.25 |
| 214.68 | 2231.24 | 215.02 | 2231.23 | 215.36 | 2231.23 | 215.52 | 2231.23 | 215.69 | 2231.22 |
| 215.84 | 2231.22 | 215.96 | 2231.22 | 216.07 | 2231.22 | 216.31 | 2231.22 | 219.14 | 2231.21 |
| 221.85 | 2231.21 | 222.23 | 2231.21 | 222.35 | 2231.21 | 222.47 | 2231.21 | 222.49 | 2231.21 |
| 222.58 | 2231.21 | 222.7 | 2231.21 | 222.81 | 2231.21 | 222.92 | 2231.21 | 223.12 | 2231.21 |
| 223.31 | 2231.22 | 223.38 | 2231.22 | 223.46 | 2231.22 | 223.51 | 2231.22 | 223.74 | 2231.23 |
| 223.81 | 2231.23 | 223.9 | 2231.24 | 223.98 | 2231.24 | 224.11 | 2231.24 | 224.63 | 2231.25 |

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  224.97 2231.25  225.41 2231.25  225.79 2231.25  225.95 2231.25  226.12 2231.25
  230.32 2231.23  230.56 2231.23  234.48  2231.2  234.68  2231.2  235.63 2231.19
  236.04 2231.19  236.21 2231.19  237.92 2231.19  239.26 2231.19   239.9 2231.19
  240.48 2231.19  241.57 2231.18  242.26 2231.18  243.34 2231.17  243.91 2231.16
  244.49 2231.15  244.55 2231.15  245.06 2231.15  245.97 2231.13  246.29 2231.13
  246.81 2231.12  247.32  2231.1  247.84 2231.09  248.79 2231.06  252.61 2230.94
  253.34 2230.94  253.42 2230.94  253.66 2230.94   254.2 2230.94  255.86 2230.93
  258.93 2230.91   259.2 2230.91  259.38 2230.91  259.58 2230.91  263.51 2230.89
  267.06 2230.88  267.56 2230.87  269.14 2230.87  269.75 2230.87  269.94 2230.87
  270.28 2230.86  276.73 2230.78  278.67 2230.75  283.37 2230.69   284.2 2230.68
  284.52 2230.67  284.74 2230.66  285.16 2230.65  286.05 2230.61  286.37 2230.58
  286.42 2230.58  286.49 2230.58  286.55 2230.58  286.61 2230.58  286.75 2230.58
  286.91 2230.58  287.09 2230.58   287.3 2230.57  288.21 2230.57  292.48 2230.55
     300 2230.52

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -88.59    .025   41.35    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -88.59   41.35              140     160     160             .1       .3
Left Levee      Station=  -88.59      Elevation= 2230.81

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2100

INPUT
Description: Sta 21+00.00
Station Elevation Data    num=     242
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300 2228.59 -297.45 2228.53 -289.69 2228.54 -288.18 2228.51 -286.06 2228.46
 -285.06 2228.46 -283.13 2228.42 -282.16  2228.4 -280.57 2228.37 -278.84 2228.33
 -277.91 2228.31 -277.18 2228.29 -276.27 2228.27 -275.55 2228.25 -275.45 2228.25
  -275.4 2228.25 -275.35 2228.25  -275.3 2228.25 -275.22 2228.25 -275.14 2228.25
 -275.05 2228.25 -274.86 2228.25 -274.67 2228.25 -274.58 2228.25 -274.47 2228.25
 -274.38 2228.25 -274.11 2228.25 -272.51 2228.25 -272.24 2228.25 -272.15 2228.25
 -272.06 2228.25 -271.97 2228.25 -271.88 2228.25  -271.8 2228.25 -271.64 2228.25
 -271.15 2228.25 -271.07 2228.25 -270.99 2228.25  -270.9 2228.25  -270.8 2228.25
 -270.43 2228.25 -268.79 2228.25  -267.3 2228.25 -266.73 2228.25 -264.68 2228.26
 -262.98 2228.26 -261.61 2228.26 -259.63 2228.27 -257.47 2228.28 -257.11 2228.28
  -256.5 2228.29 -254.31  2228.3 -251.92 2228.31 -251.17 2228.32 -247.17 2228.35
 -239.77 2228.48 -239.75 2228.49 -239.67 2228.49 -239.55 2228.49  -239.4 2228.49
 -239.22  2228.5  -238.8 2228.51 -238.57 2228.51 -237.84 2228.51  -237.6 2228.52
 -236.89 2228.52 -236.63 2228.53 -235.88 2228.53  -235.6 2228.53 -233.23 2228.55
 -232.94 2228.56 -220.47 2228.67 -220.14 2228.67 -215.18 2228.72 -214.47 2228.73
 -202.51 2228.83 -200.92 2228.84  -199.8 2228.85 -199.26 2228.86 -198.24 2228.87
 -192.09 2228.97 -188.02 2229.03 -182.39 2229.12 -181.66 2229.14 -179.49 2229.19
 -179.11  2229.2 -179.02  2229.2 -178.93 2229.21 -149.98 2229.44 -149.27 2229.44
 -149.08 2229.44  -148.9 2229.44 -148.71 2229.44 -148.51 2229.44  -148.3 2229.44
 -143.17 2229.39 -143.16 2229.39 -143.12 2229.38 -143.04 2229.38 -142.95 2229.38
  -142.7 2229.38 -139.52 2229.34 -138.76 2229.33 -138.56 2229.33 -138.34 2229.33
 -137.89 2229.32 -136.23 2229.31 -136.02 2229.31 -135.82 2229.31 -135.65 2229.31
 -135.51 2229.31 -135.39  2229.3  -135.3  2229.3 -134.59 2229.28 -132.08 2229.21
 -131.36  2229.2 -127.75 2229.14 -127.53 2229.14 -127.33 2229.14 -127.16 2229.13
 -127.04 2229.13 -126.94 2229.12 -126.76 2229.11 -126.32 2229.04 -126.18 2229.03
 -123.46 2228.92  -123.2 2228.91    -123 2228.89 -122.88 2228.84 -122.57 2228.64
 -122.29 2228.54 -120.85 2228.41 -117.19 2228.14  -82.08 2228.09  -80.08 2227.09
  -45.08 2227.09  -43.08 2228.09   25.65 2229.45   26.22 2229.49   26.27 2229.49
   26.94 2229.54   27.06 2229.54    29.3 2229.68   29.47 2229.68   35.09 2229.98
   35.11 2229.99   35.13 2229.99  108.98    2229  110.01 2229.06  111.04 2229.12
     113 2229.22  129.73    2230  131.27    2230  131.88    2230  140.66    2230
  144.79    2230  149.52    2230  151.81 2229.93  154.57 2229.84  156.98 2229.76
  158.92  2229.7  160.49 2229.64  161.73 2229.59  162.67 2229.55  163.29 2229.52
  163.53  2229.5  192.16 2228.76   192.3 2228.76  192.56 2228.76  192.92 2228.76
  193.35 2228.75   200.9 2228.61  206.76 2228.51  207.29 2228.49  207.79 2228.48
  208.33 2228.47  208.56 2228.47  208.78 2228.46   209.5 2228.44  209.86 2228.43
  210.22 2228.42  210.39 2228.42  210.57 2228.41  210.73 2228.41  210.86 2228.41
  210.98 2228.41  211.23 2228.41  214.23  2228.4  217.11 2228.39  217.51 2228.39
  217.64 2228.39  217.76  2228.4  217.88  2228.4  218.01  2228.4  218.12  2228.4
  218.24  2228.4  218.45 2228.41  218.65 2228.42  218.73 2228.42  218.81 2228.43
  218.87 2228.43  219.11 2228.46  219.18 2228.46  219.28 2228.47   219.5 2228.48
  220.05  2228.5  220.41 2228.49  220.88 2228.51  221.29  2228.5  221.45  2228.5
  221.63 2228.51  226.09 2228.47  226.34 2228.47   230.5 2228.41  230.72 2228.42
  231.72 2228.41  232.16 2228.41  238.75  2228.4   239.9 2228.39   240.5 2228.38
  241.12 2228.37  241.73 2228.36  242.69 2228.34  243.03 2228.33  243.58 2228.31
  244.12 2228.29  244.67 2228.27  245.68 2228.22  249.73    2228  250.51    2228
  250.85    2228  251.42    2228  253.18    2228  256.44    2228  256.72    2228
  257.13    2228  261.29    2228  265.06    2228  267.27    2228  267.91 2228.01
```

```
  268.12    2228     300 2227.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015 -149.98    .015   25.65    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -149.98   25.65               300     300     300             .1       .3
Left Levee      Station= -149.98      Elevation= 2229.44
Right Levee     Station=   35.09      Elevation= 2229.98

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 1800

INPUT
Description: Sta 18+00.00
Station Elevation Data    num=     200
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2226.42  -275.77 2225.89  -256.51 2225.47  -244.43 2225.21  -238.18 2225.22
  -238.13 2225.21  -206.51 2225.24  -206.49 2225.25   -205.9 2225.31  -205.56 2225.33
  -204.87 2225.35  -204.59 2225.36  -204.44 2225.36  -204.27 2225.37  -204.08 2225.37
  -203.81 2225.36  -203.61 2225.36  -203.39 2225.36  -201.95 2225.36  -201.72 2225.36
  -201.48 2225.36  -201.02 2225.37  -198.57  2225.4  -194.86 2225.44  -194.58 2225.44
  -194.08 2225.44  -193.83 2225.45  -193.52 2225.44  -193.26 2225.44     -193 2225.44
  -192.46 2225.44  -187.58 2225.42  -183.75  2225.4  -183.22  2225.4  -182.96  2225.4
   -182.7 2225.41  -182.45 2225.41  -182.21 2225.41  -178.75 2225.47  -175.57 2225.52
  -175.07 2225.53  -174.83 2225.54  -174.62 2225.54  -174.43 2225.55  -174.26 2225.56
  -173.67 2225.59  -171.55 2225.73  -170.02 2225.82  -168.99 2225.87  -168.51 2225.89
  -168.26  2225.9  -167.99 2225.91  -167.48 2225.91   -167.2 2225.91  -166.87 2225.92
  -162.41  2225.9  -162.09 2225.91  -161.75 2225.92  -156.75  2225.9  -156.42 2225.91
  -150.98 2225.89  -150.66  2225.9  -150.33  2225.9  -142.59 2225.88  -142.27 2225.88
  -141.99 2225.88  -136.75 2225.87  -133.69 2225.87  -126.92 2225.85  -121.65 2225.84
  -115.88 2225.83  -108.88 2225.82  -108.19 2225.82   -98.79 2225.81   -98.44 2225.81
   -97.99  2225.8   -92.44 2225.79   -44.88 2221.57   -42.88 2220.57   -39.88 2219.57
   -29.32 2219.58   -25.48 2219.59   -22.87  2219.6   -18.93 2219.61   -16.49 2219.62
    -4.88 2219.64    -2.88 2220.64     -.88 2221.64    10.98 2222.63       11 2222.63
    11.43  2222.7    11.79 2222.75    12.13 2222.79    12.46 2222.83    12.83 2222.86
    13.18 2222.89    13.53  2222.9       19 2222.99    19.89 2223.18    20.35 2223.27
    20.96  2223.3    21.42 2223.38    21.72  2223.4    21.99 2223.42    22.46 2223.49
    23.44 2223.63    24.99 2223.87    26.13 2223.98    26.63 2224.06    28.13 2224.17
     28.5 2224.22    29.25 2224.32    29.63 2224.37    30.14 2224.45    31.17 2224.64
    31.71 2224.73    31.86 2224.74    32.29  2224.8    33.16 2224.91    33.61 2224.97
    34.08 2225.05    35.58 2225.32    36.12  2225.4    36.19 2225.41    36.72 2225.49
    36.79 2225.49     37.9 2225.64     38.5 2225.72    39.02 2225.81    39.04 2225.81
    39.08 2225.82    39.11 2225.83    39.12 2225.83    39.13 2225.83    39.15 2225.83
    39.26 2225.85     40.1 2226.02    40.12 2226.02    40.13 2226.02    40.14 2226.02
    40.15 2226.02    40.15 2226.03    65.63 2226.68     74.6 2226.66    77.41 2226.65
    85.05 2226.65    88.41 2226.65    95.59 2226.64    100.3 2226.63    110.5 2226.62
   114.75 2226.61    123.7  2226.6   127.02 2226.59   133.38 2226.58   133.58 2226.58
   133.76 2226.58   143.35  2226.6   143.53  2226.6   152.88 2226.62   153.05 2226.62
   161.57 2226.64   166.84 2226.66    172.8 2226.67   179.04 2226.69    187.8  2226.7
    192.2  2226.7   193.08  2226.7   194.03  2226.7   195.26 2226.69    200.1 2226.66
   213.99 2226.56   217.86 2226.54   219.16 2226.53   219.82 2226.53   220.41 2226.53
   220.92 2226.53   221.31 2226.53   222.47 2226.54   222.77 2226.54   223.12 2226.54
   223.55 2226.54   224.01 2226.53   224.55 2226.53   225.14 2226.52   225.78 2226.51
   226.45 2226.51   238.58 2226.34   260.89     2226    287.5     2226   288.39     2226
   292.68     2226   292.72     2226   293.12     2226   293.16     2226    293.2     2226
   293.24     2226   296.49     2226   298.08     2226   299.99     2226      300     2226

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015  -92.44    .015    40.1    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -92.44    40.1               40      40      40             .1       .3
Left Levee      Station=  -92.44      Elevation= 2225.79

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 1760

INPUT
Description: Sta 17+60
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -32    2221      -32    2217      -16    2217      -14    2217        2    2217
```

```
     2    2221

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -32    .015     -32    .015       2    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -32       2              120     120     120             .1       .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 1700

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =     116
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -32 2221.82 2220.82       2 2221.82 2220.82

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -32    2221     -32    2217     -16    2217     -14    2217       2    2217
       2    2221

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -32    .015     -32    .015       2    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
           -32       2             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -32 2221.82 2220.57       2 2221.82 2220.57

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -32 2220.82     -32 2216.82     -16 2216.82     -14 2216.82       2 2216.82
       2 2220.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -32    .025     -32    .025       2    .025

Bank Sta: Left   Right    Coeff Contr.   Expan.
           -32       2             .1       .3

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=     -15    Downstream=     -15
Upstream     num=       2
    Width   Elev    Width   Elev
       2 2216.82       2 2220.82
Downstream     num=       2
    Width   Elev    Width   Elev
       2 2216.57       2 2220.57

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer
```

High Flow Method
Energy Only

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

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 1640

INPUT
Description: Sta 16+40
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -32 | 2220.82 | -32 | 2216.82 | -16 | 2216.82 | -14 | 2216.82 | 2 | 2216.82 |
| 2 | 2220.82 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -32 | .025 | -32 | .025 | 2 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -32 | 2 | 100 | 140 | 180 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 1500

INPUT
Description: Sta 15+00
Station Elevation Data num= 167

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2224.2 | -295.6 | 2224.18 | -283.87 | 2224.15 | -268.76 | 2224.12 | -264.39 | 2224.11 |
| -262.5 | 2224.1 | -258.46 | 2224.07 | -249.99 | 2224 | -249.05 | 2223.99 | -242.59 | 2223.96 |
| -228.86 | 2223.88 | -227.98 | 2223.88 | -219.07 | 2223.84 | -218.87 | 2223.83 | -218.61 | 2223.83 |
| -218.49 | 2223.83 | -218.12 | 2223.84 | -217.05 | 2223.84 | -216.86 | 2223.84 | -216.17 | 2223.83 |
| -216.1 | 2223.83 | -216.03 | 2223.83 | -215.97 | 2223.83 | -215.9 | 2223.83 | -215.83 | 2223.83 |
| -215.7 | 2223.83 | -214.99 | 2223.82 | -214.71 | 2223.82 | -214.51 | 2223.81 | -213.69 | 2223.79 |
| -212.13 | 2223.75 | -209.74 | 2223.69 | -195.51 | 2223.64 | -195.04 | 2223.62 | -190 | 2223.6 |
| -189.84 | 2223.6 | -189.68 | 2223.59 | -189.57 | 2223.59 | -189.46 | 2223.59 | -175.81 | 2223.46 |
| -175.59 | 2223.46 | -175.1 | 2223.45 | -164.33 | 2223.35 | -160.78 | 2223.29 | -156.49 | 2223.22 |
| -147.2 | 2223.11 | -145.64 | 2223.09 | -141.09 | 2223.03 | -131.84 | 2222.94 | -130.2 | 2222.92 |
| -129.67 | 2222.91 | -129.17 | 2222.9 | -128.71 | 2222.89 | -128.28 | 2222.88 | -127.9 | 2222.87 |
| -127.53 | 2222.85 | -126.83 | 2222.82 | -118.74 | 2222.38 | -117.26 | 2222.31 | -116.4 | 2222.27 |
| -115.41 | 2222.24 | -114.34 | 2222.2 | -112.4 | 2222.16 | -111.57 | 2222.13 | -110.65 | 2222.1 |
| -108.58 | 2222.03 | -107.63 | 2222 | -105.79 | 2221.85 | -102.08 | 2221.56 | -100.56 | 2221.44 |
| -99.18 | 2221.34 | -97.91 | 2221.26 | -96.66 | 2221.17 | -95.5 | 2221.1 | -93.45 | 2220.98 |
| -84.66 | 2220.49 | -83.95 | 2220.47 | -83.2 | 2220.44 | -80.74 | 2220.38 | -80.39 | 2220.36 |
| -80.25 | 2220.35 | -70.92 | 2220.15 | -70.86 | 2220.15 | -70.81 | 2220.14 | -64.49 | 2220.06 |
| -62.27 | 2220.02 | -61.2 | 2220 | -56.91 | 2219.69 | -56.78 | 2219.67 | -56.11 | 2219.61 |
| -47.74 | 2218.92 | -37.72 | 2218.11 | -37.55 | 2218.09 | -36.65 | 2216.57 | -35.98 | 2216.58 |
| -35.33 | 2216.58 | -34.75 | 2216.59 | -34.32 | 2216.6 | -33.93 | 2216.61 | -32.94 | 2216.64 |
| -28.36 | 2216.81 | 0 | 2216.76 | 32.97 | 2216.7 | 33.45 | 2216.69 | 33.99 | 2216.68 |
| 41.42 | 2216.57 | 43.13 | 2218.24 | 43.21 | 2218.24 | 43.29 | 2218.24 | 43.37 | 2218.24 |
| 43.44 | 2218.24 | 43.52 | 2218.24 | 49.27 | 2218.87 | 49.84 | 2218.86 | 50.49 | 2218.92 |
| 50.8 | 2218.94 | 51.11 | 2218.96 | 51.43 | 2218.98 | 51.76 | 2218.98 | 52.1 | 2218.99 |
| 53.92 | 2219 | 54.69 | 2218.98 | 55.83 | 2219 | 56.2 | 2219.01 | 60.67 | 2218.87 |
| 61.26 | 2218.85 | 61.55 | 2218.85 | 61.85 | 2218.85 | 62.15 | 2218.85 | 62.45 | 2218.86 |
| 62.77 | 2218.86 | 63.1 | 2218.87 | 67.94 | 2219.02 | 70.54 | 2219.08 | 71.28 | 2219.1 |
| 71.6 | 2219.11 | 74.65 | 2219.19 | 74.94 | 2219.2 | 75.17 | 2219.22 | 86.57 | 2219.49 |
| 93.29 | 2219.69 | 96.75 | 2219.8 | 97.97 | 2219.85 | 99.22 | 2219.9 | 100.51 | 2219.96 |
| 101.23 | 2220 | 103.69 | 2220.11 | 105.23 | 2220.17 | 110.45 | 2220.4 | 150.52 | 2222 |
| 175.89 | 2222.47 | 176.76 | 2222.49 | 177.3 | 2222.5 | 200.45 | 2222.93 | 201.24 | 2222.95 |
| 203.97 | 2222.99 | 211.16 | 2223.13 | 222.92 | 2223.3 | 238.86 | 2223.53 | 241.68 | 2223.57 |
| 256.82 | 2223.83 | 260.35 | 2223.89 | 267.97 | 2224 | 268.24 | 2224 | 274.68 | 2224 |
| 277.23 | 2224 | 300 | 2224 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .03 | -108.58 | .03 | 150.52 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -108.58 | 150.52 | 280 | 300 | 320 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 3460

INPUT
Description: Sta 34+60
Station Elevation Data num= 97

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2238.44 | -293.03 | 2238 | -286.14 | 2237.77 | -276.45 | 2237.44 | -275.63 | 2237.42 |
| -266.69 | 2237.16 | -260.08 | 2237.05 | -250.51 | 2236.82 | -244.09 | 2236.72 | -232.1 | 2236.53 |
| -220.88 | 2236.34 | -218.96 | 2236.3 | -212.34 | 2236.14 | -206.6 | 2236 | -197.76 | 2236 |
| -197.34 | 2236 | -196.94 | 2236 | -193.04 | 2236 | -170.86 | 2236 | -169.45 | 2236 |
| -165.55 | 2236 | -164.99 | 2236 | -163.93 | 2236 | -163.57 | 2236 | -163.11 | 2236 |
| -162.59 | 2236 | -162.57 | 2236 | -162.56 | 2236 | -157.05 | 2236 | -149.51 | 2236 |
| -149.37 | 2236 | -149.27 | 2236 | -149.19 | 2236 | -149.14 | 2236 | -148.25 | 2236 |
| -145.83 | 2236 | -144 | 2236 | -143.29 | 2236 | -128.78 | 2236 | -127.48 | 2236 |
| -123.96 | 2236 | -119.61 | 2236 | -111.93 | 2236 | -109.6 | 2236 | -107.96 | 2236 |
| -106.84 | 2236 | -105.26 | 2236 | -60.07 | 2236 | -59.94 | 2236 | -59.76 | 2236 |
| -48.64 | 2235.84 | -47.23 | 2235.82 | -46.63 | 2235.8 | -46.39 | 2235.8 | -46.25 | 2235.79 |
| 0 | 2235.4 | 23.22 | 2235.2 | 30.45 | 2235.2 | 38.6 | 2235.2 | 41.94 | 2235.2 |
| 56.74 | 2235.19 | 60.09 | 2235.19 | 64.97 | 2235.18 | 65.85 | 2235.18 | 66.27 | 2235.18 |
| 66.73 | 2235.18 | 67.51 | 2235.19 | 70.72 | 2235.2 | 76.51 | 2235.23 | 89.93 | 2235.3 |
| 97.7 | 2235.34 | 106.3 | 2235.38 | 109.39 | 2235.4 | 113.65 | 2235.42 | 119.67 | 2235.45 |
| 130.13 | 2235.49 | 131.28 | 2235.5 | 132.77 | 2235.51 | 134.77 | 2235.52 | 146.76 | 2235.62 |
| 150.42 | 2235.65 | 161.58 | 2235.77 | 164.55 | 2235.81 | 165.09 | 2235.82 | 165.59 | 2235.82 |
| 166.02 | 2235.83 | 166.39 | 2235.84 | 166.7 | 2235.85 | 167.58 | 2235.88 | 170.23 | 2236 |
| 195.97 | 2236 | 297.43 | 2236.29 | 297.84 | 2236.29 | 298.3 | 2236.29 | 298.82 | 2236.29 |
| 299.38 | 2236.29 | 300 | 2236.28 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | 0 | .025 | 109.39 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 0 | 109.39 | 295 | 300 | 305 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 3160

INPUT
Description: Sta 31+60
Station Elevation Data num= 95

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2239 | -277.55 | 2238.73 | -216.29 | 2238 | -182.91 | 2236.97 | -182.04 | 2236.94 |
| -155.76 | 2236.13 | -154.62 | 2236.09 | -153.64 | 2236.06 | -151.14 | 2235.98 | -149.08 | 2235.92 |
| -147.95 | 2235.88 | -136.74 | 2235.55 | -94.11 | 2234.31 | -83.78 | 2234 | -72.37 | 2233.52 |
| -68.91 | 2233.36 | -47.14 | 2232.38 | -46.46 | 2232.35 | -45.68 | 2232.31 | -38.56 | 2232 |
| -12.42 | 2232 | -4.74 | 2232 | 0 | 2232 | 3.54 | 2232 | 7.13 | 2232 |
| 8.13 | 2232.03 | 14.54 | 2232.24 | 19.88 | 2232.41 | 20.53 | 2232.42 | 20.88 | 2232.43 |
| 21.19 | 2232.43 | 21.5 | 2232.44 | 21.93 | 2232.44 | 22.39 | 2232.45 | 22.88 | 2232.45 |
| 23.46 | 2232.45 | 24.67 | 2232.46 | 33.97 | 2232.47 | 44.36 | 2232.48 | 49.21 | 2232.49 |
| 52.94 | 2232.5 | 53.95 | 2232.51 | 54.21 | 2232.51 | 54.43 | 2232.51 | 54.6 | 2232.51 |
| 54.68 | 2232.51 | 54.76 | 2232.52 | 54.78 | 2232.52 | 54.93 | 2232.56 | 55.99 | 2232.61 |
| 56.44 | 2232.62 | 56.55 | 2232.63 | 56.61 | 2232.63 | 113.95 | 2232.64 | 115.25 | 2232.6 |
| 119.57 | 2232.2 | 119.6 | 2232.2 | 119.82 | 2232.2 | 119.84 | 2232.2 | 120.22 | 2232.19 |
| 120.25 | 2232.19 | 120.74 | 2232.19 | 124.71 | 2232.19 | 137.6 | 2232.2 | 147.94 | 2232.22 |
| 158.72 | 2232.24 | 159.39 | 2232.24 | 160.09 | 2232.24 | 160.83 | 2232.23 | 161.54 | 2232.23 |
| 162.28 | 2232.22 | 163.05 | 2232.21 | 163.82 | 2232.21 | 164.59 | 2232.2 | 167.98 | 2232.15 |
| 169.57 | 2232.13 | 177.95 | 2232 | 182.49 | 2232 | 192.85 | 2232 | 208.112 | 232.377 |
| 222.83 | 2232.74 | 234.95 | 2233.02 | 240.95 | 2233.17 | 241.58 | 2233.19 | 242.23 | 2233.2 |
| 242.83 | 2233.21 | 243.44 | 2233.23 | 244.66 | 2233.25 | 252.66 | 2233.4 | 255.59 | 2233.43 |
| 256.35 | 2233.45 | 262.77 | 2233.52 | 289.58 | 2233.83 | 299.66 | 2233.94 | 300 | 2233.95 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -47.14 | .025 | 208.11 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -47.14 | 208.11 | 340 | 300 | 260 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 2860

INPUT
Description: Sta 28+60
Station Elevation Data num= 211

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2236.23 | -299.88 | 2236.23 | -298.97 | 2236.28 | -298.52 | 2236.31 | -297.53 | 2236.36 |
| -296.26 | 2236.39 | -294.94 | 2236.43 | -293.76 | 2236.47 | -293.68 | 2236.48 | -293.58 | 2236.48 |
| -293.47 | 2236.48 | -293.33 | 2236.47 | -293.18 | 2236.47 | -293.02 | 2236.47 | -292.85 | 2236.47 |
| -290.84 | 2236.42 | -286.71 | 2236.34 | -281.58 | 2236.24 | -281.04 | 2236.23 | -280.74 | 2236.23 |
| -280.44 | 2236.22 | -280.15 | 2236.22 | -279.9 | 2236.22 | -279.64 | 2236.22 | -279.39 | 2236.22 |
| -278.81 | 2236.22 | -275.8 | 2236.23 | -274.95 | 2236.24 | -272.4 | 2236.27 | -270.46 | 2236.31 |
| -268.65 | 2236.36 | -267.48 | 2236.41 | -266.42 | 2236.43 | -265.82 | 2236.44 | -265.51 | 2236.44 |
| -265.32 | 2236.44 | -265.11 | 2236.44 | -264.81 | 2236.44 | -264.46 | 2236.44 | -263.68 | 2236.43 |
| -255.51 | 2236.39 | -254.22 | 2236.38 | -253.84 | 2236.38 | -253.5 | 2236.37 | -253.22 | 2236.37 |
| -253.01 | 2236.37 | -252.86 | 2236.36 | -252.76 | 2236.36 | -252.68 | 2236.36 | -252.43 | 2236.34 |
| -252.2 | 2236.33 | -252.06 | 2236.32 | -251.88 | 2236.32 | -251.65 | 2236.31 | -251.4 | 2236.31 |
| -251.12 | 2236.3 | -250.82 | 2236.3 | -250.5 | 2236.3 | -250.16 | 2236.29 | -249.79 | 2236.29 |
| -249.48 | 2236.28 | -247.96 | 2236.27 | -247.49 | 2236.27 | -247.01 | 2236.26 | -246.54 | 2236.26 |
| -246.08 | 2236.26 | -245.64 | 2236.25 | -244.4 | 2236.24 | -244.02 | 2236.23 | -243.61 | 2236.23 |
| -243.19 | 2236.22 | -240.91 | 2236.21 | -240.42 | 2236.2 | -235.99 | 2236.17 | -235.51 | 2236.17 |
| -235.05 | 2236.16 | -234.61 | 2236.16 | -234.2 | 2236.15 | -233.95 | 2236.15 | -233.59 | 2236.15 |
| -233.26 | 2236.14 | -232.66 | 2236.13 | -229.04 | 2236.05 | -223.85 | 2235.94 | -218.01 | 2235.82 |
| -214.66 | 2235.74 | -213.82 | 2235.71 | -210.68 | 2235.57 | -208.47 | 2235.49 | -206.6 | 2235.45 |
| -196.63 | 2235.23 | -192.89 | 2235.15 | -188.39 | 2235.06 | -182.35 | 2234.96 | -174.98 | 2234.84 |
| -152.19 | 2234.47 | -125.17 | 2234 | -102.59 | 2233.27 | -98.46 | 2233.19 | -96.82 | 2233.16 |
| -96.31 | 2233.15 | -95.84 | 2233.15 | -94.49 | 2233.13 | -94.16 | 2233.13 | -93.75 | 2233.12 |
| -92.9 | 2233.11 | -91.53 | 2233.09 | -90.99 | 2233.08 | -90.49 | 2233.06 | -89.92 | 2233.05 |
| -89.3 | 2233.04 | -87.8 | 2233 | -53.46 | 2232.08 | -50.49 | 2232 | -11.712 | 230.454 |
| -2.58 | 2230.09 | -.63 | 2230 | 0 | 2230 | 37.84 | 2230 | 41.45 | 2230 |
| 42.95 | 2230 | 43.66 | 2230 | 48.68 | 2230 | 57.79 | 2230.11 | 57.81 | 2230.11 |
| 57.83 | 2230.11 | 57.84 | 2230.11 | 57.86 | 2230.11 | 57.96 | 2230.11 | 58.07 | 2230.1 |
| 58.14 | 2230.1 | 58.18 | 2230.1 | 58.2 | 2230.1 | 58.23 | 2230.1 | 58.25 | 2230.1 |
| 58.28 | 2230.1 | 58.32 | 2230.1 | 58.35 | 2230.1 | 58.43 | 2230.1 | 59.08 | 2230.1 |
| 59.44 | 2230.1 | 59.53 | 2230.1 | 59.62 | 2230.1 | 60.2 | 2230.1 | 60.49 | 2230.1 |
| 61.19 | 2230.1 | 61.21 | 2230.1 | 61.24 | 2230.1 | 61.25 | 2230.1 | 61.26 | 2230.1 |
| 64.03 | 2230.11 | 64.05 | 2230.11 | 64.08 | 2230.11 | 64.12 | 2230.11 | 64.32 | 2230.11 |
| 64.41 | 2230.12 | 64.93 | 2230.12 | 66.3 | 2230.14 | 66.93 | 2230.14 | 87.18 | 2230.31 |
| 88.33 | 2230.32 | 93.44 | 2230.36 | 97.55 | 2230.39 | 99.21 | 2230.41 | 104.5 | 2230.46 |
| 130.59 | 2230.68 | 132.58 | 2230.7 | 147.24 | 2230.82 | 159.15 | 2230.93 | 162.6 | 2230.96 |
| 172.09 | 2231.04 | 174.73 | 2231.06 | 176.43 | 2231.07 | 179.57 | 2231.1 | 185.76 | 2231.15 |
| 187.95 | 2231.17 | 189.78 | 2231.19 | 190.44 | 2231.19 | 192.14 | 2231.2 | 192.4 | 2231.2 |
| 192.7 | 2231.2 | 193 | 2231.2 | 193.28 | 2231.2 | 193.55 | 2231.2 | 193.79 | 2231.2 |
| 194.02 | 2231.2 | 194.23 | 2231.2 | 197.15 | 2231.16 | 200.08 | 2231.12 | 203.19 | 2231.09 |
| 204.08 | 2231.09 | 204.72 | 2231.09 | 210.89 | 2231.15 | 213.17 | 2231.15 | 217.87 | 2231.15 |
| 225.68 | 2231.23 | 230.2 | 2231.27 | 235.35 | 2231.27 | 244.4 | 2231.39 | 247.44 | 2231.38 |
| 256.3 | 2231.51 | 267.33 | 2231.67 | 269.84 | 2231.68 | 277.41 | 2231.8 | 277.65 | 2231.8 |
| 289.71 | 2232 | 294.11 | 2232.07 | 294.32 | 2232.08 | 295.66 | 2232.1 | 297.89 | 2232.15 |
| 300 | 2232.19 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -11.71 | .025 | 104.5 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -11.71 | 104.5 | 350 | 300 | 250 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 2560

INPUT
Description: Sta 25+60
Station Elevation Data num= 202

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2232.66 | -289.63 | 2232.63 | -283.97 | 2232.61 | -277.71 | 2232.59 | -275.04 | 2232.58 |
| -256.12 | 2232.53 | -241.62 | 2232.49 | -236.1 | 2232.44 | -221.74 | 2232.3 | -218.31 | 2232.29 |
| -208.52 | 2232.19 | -198.61 | 2232.09 | -197.14 | 2232.08 | -189.38 | 2232 | -176.67 | 2231.85 |
| -174.33 | 2231.81 | -142.55 | 2231.64 | -142.34 | 2231.64 | -141.96 | 2231.65 | -141.44 | 2231.64 |
| -140.83 | 2231.64 | -137.91 | 2231.63 | -134.46 | 2231.56 | -128.24 | 2231.52 | -126.08 | 2231.51 |
| -121.92 | 2231.42 | -121.23 | 2231.41 | -113.57 | 2231.27 | -112.89 | 2231.26 | -104.05 | 2231.09 |
| -103.37 | 2231.08 | -95.62 | 2230.94 | -95.01 | 2230.93 | -94.4 | 2230.91 | -93.8 | 2230.9 |
| -93.21 | 2230.89 | -92.08 | 2230.86 | -84.17 | 2230.66 | -74.61 | 2230.49 | -74.59 | 2230.49 |
| -74.57 | 2230.49 | -74.48 | 2230.49 | -74.39 | 2230.49 | -74.21 | 2230.49 | -73.98 | 2230.49 |
| -73.48 | 2230.49 | -69.8 | 2230.45 | -66.21 | 2230.41 | -65.69 | 2230.4 | -65.53 | 2230.4 |
| -65.37 | 2230.4 | -65.22 | 2230.39 | -65.08 | 2230.39 | -64.84 | 2230.39 | -62.99 | 2230.34 |
| -62.81 | 2230.33 | -62.72 | 2230.33 | -62.63 | 2230.33 | -62.55 | 2230.33 | -62.47 | 2230.33 |
| -62.4 | 2230.33 | -62.34 | 2230.33 | -62.27 | 2230.33 | -61.46 | 2230.34 | -60.49 | 2230.35 |
| -59.32 | 2230.36 | -57.56 | 2230.37 | -57.34 | 2230.37 | -57.25 | 2230.37 | -57.17 | 2230.37 |
| -57.11 | 2230.37 | -57.06 | 2230.37 | -57.02 | 2230.37 | -56.95 | 2230.38 | -56.85 | 2230.39 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -56.53 | 2230.46 | -56.37 | 2230.5 | -56.02 | 2230.58 | -55.35 | 2230.55 | -55.02 | 2230.54 |
| -49.11 | 2232 | -44.07 | 2232 | -42.2 | 2232 | -39.49 | 2232 | -22 | 2230.46 |
| -16.96 | 2230 | -12.81 | 2229.76 | 0 | 2229.04 | 18.59 | 2228 | 21.64 | 2228 |
| 21.97 | 2228 | 39.96 | 2228 | 40.93 | 2228 | 43.94 | 2228 | 44.42 | 2228 |
| 44.89 | 2228 | 48.84 | 2228 | 49.05 | 2228 | 49.47 | 2228 | 49.7 | 2228 |
| 50.19 | 2228 | 50.43 | 2228 | 64.76 | 2228 | 65.96 | 2228 | 67.23 | 2228 |
| 67.31 | 2228 | 67.51 | 2228 | 68.36 | 2228.03 | 70.36 | 2228.11 | 76.32 | 2228.3 |
| 76.53 | 2228.31 | 79.25 | 2228.4 | 82.62 | 2228.53 | 91.2 | 2228.88 | 95.17 | 2229.04 |
| 98.32 | 2229.18 | 114.6 | 2229.84 | 114.93 | 2229.85 | 115.03 | 2229.86 | 115.1 | 2229.86 |
| 118.57 | 2230 | 133.68 | 2231.17 | 134.89 | 2231.26 | 135.23 | 2231.28 | 135.54 | 2231.29 |
| 135.8 | 2231.3 | 136.05 | 2231.31 | 136.79 | 2231.33 | 140.54 | 2231.6 | 141.25 | 2231.63 |
| 142.43 | 2231.71 | 143.5 | 2231.75 | 148.28 | 2232 | 157.04 | 2232 | 157.61 | 2232 |
| 166.87 | 2232 | 181.09 | 2232 | 181.34 | 2232 | 194.32 | 2232 | 194.59 | 2232 |
| 202.89 | 2232 | 203.16 | 2232 | 203.36 | 2232 | 203.58 | 2232 | 204.44 | 2232 |
| 213.71 | 2232 | 214.36 | 2232 | 216.29 | 2232 | 221.4 | 2232 | 221.66 | 2232 |
| 222.61 | 2232 | 223.36 | 2232 | 223.8 | 2232 | 224.43 | 2232 | 224.85 | 2232 |
| 225.82 | 2232 | 228.05 | 2232 | 230.65 | 2232 | 240.12 | 2232 | 240.22 | 2232 |
| 240.62 | 2232 | 240.8 | 2232 | 240.88 | 2232 | 240.97 | 2232 | 241.78 | 2232 |
| 243.48 | 2232 | 243.67 | 2232 | 244.53 | 2232 | 244.74 | 2232 | 245.16 | 2232 |
| 245.41 | 2232 | 247.4 | 2232 | 249.57 | 2232 | 250.06 | 2232 | 250.6 | 2232 |
| 251.19 | 2232 | 251.27 | 2232 | 251.83 | 2231.97 | 251.84 | 2231.97 | 252.4 | 2231.93 |
| 252.42 | 2231.93 | 252.83 | 2231.89 | 253.12 | 2231.85 | 253.32 | 2231.81 | 253.41 | 2231.78 |
| 258.19 | 2232 | 272.79 | 2231.73 | 273.35 | 2231.74 | 273.97 | 2231.74 | 275.33 | 2231.76 |
| 288.33 | 2231.81 | 292.92 | 2231.83 | 294.21 | 2231.84 | 294.82 | 2231.85 | 295.38 | 2231.86 |
| 295.89 | 2231.87 | 296.33 | 2231.88 | 296.73 | 2231.9 | 297.09 | 2231.92 | 298.21 | 2231.98 |
| 298.63 | 2232 | 300 | 2232.04 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | 0 | .025 | 95.17 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 0 | 95.17 | 320 | 300 | 280 | .1 | .3 |

Left Levee Station= -39.49 Elevation=

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 2260

INPUT
Description: Sta 22+60
Station Elevation Data num= 228

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2227.63 | -251.88 | 2228.08 | -250.69 | 2228.11 | -249.68 | 2228.13 | -248.67 | 2228.16 |
| -247.91 | 2228.18 | -247.23 | 2228.2 | -246.63 | 2228.22 | -246.13 | 2228.24 | -245.71 | 2228.26 |
| -244.37 | 2228.33 | -244.11 | 2228.34 | -243.8 | 2228.36 | -243.44 | 2228.37 | -243.02 | 2228.38 |
| -242.53 | 2228.39 | -240.31 | 2228.44 | -239.73 | 2228.45 | -239.17 | 2228.47 | -237.5 | 2228.51 |
| -235.38 | 2228.56 | -234.87 | 2228.57 | -234.42 | 2228.58 | -232.67 | 2228.63 | -230.99 | 2228.68 |
| -228.97 | 2228.72 | -228.55 | 2228.73 | -224.44 | 2228.8 | -217.84 | 2229 | -215.88 | 2229.03 |
| -211.33 | 2229.16 | -210.42 | 2229.18 | -210.23 | 2229.19 | -210.09 | 2229.19 | -209.91 | 2229.19 |
| -208.31 | 2229.21 | -184.94 | 2230.18 | -184.07 | 2230.18 | -184.02 | 2230.18 | -182.54 | 2230.18 |
| -180.86 | 2230.18 | -177.07 | 2230.18 | -176 | 2230.18 | -173.24 | 2230.19 | -172.79 | 2230.19 |
| -172.28 | 2230.19 | -171.72 | 2230.19 | -171.12 | 2230.19 | -159.63 | 2230.12 | -145.47 | 2230.03 |
| -143.95 | 2230.02 | -143.23 | 2230.02 | -142.56 | 2230.01 | -141.64 | 2230 | -139.72 | 2229.94 |
| -138.1 | 2229.9 | -136.51 | 2229.86 | -135.73 | 2229.85 | -134.97 | 2229.83 | -134.23 | 2229.82 |
| -133.66 | 2229.81 | -133.11 | 2229.81 | -132.01 | 2229.8 | -118.7 | 2229.77 | -105.95 | 2229.73 |
| -104.21 | 2229.74 | -103.64 | 2229.74 | -103.08 | 2229.74 | -102.55 | 2229.75 | -102.01 | 2229.75 |
| -101.5 | 2229.76 | -101 | 2229.77 | -100.05 | 2229.8 | -99.19 | 2229.84 | -98.81 | 2229.85 |
| -98.48 | 2229.87 | -98.23 | 2229.89 | -97.23 | 2230 | -96.82 | 2230 | -94.82 | 2230 |
| -93.06 | 2230 | -92.54 | 2230 | -89.6 | 2230 | -87.92 | 2230 | -87.44 | 2230 |
| -86.97 | 2230 | -86.3 | 2230 | -85.65 | 2230 | -84.44 | 2230 | -82.1 | 2230 |
| -81.33 | 2230 | -74.02 | 2230 | -73.95 | 2230 | -73.86 | 2230 | -73.62 | 2230 |
| -70.5 | 2229.72 | -69.85 | 2229.65 | -63.43 | 2228 | -62.87 | 2228 | -59.8 | 2228 |
| -59.51 | 2228.07 | -58.85 | 2228.2 | -58.56 | 2228.28 | -50.24 | 2228.38 | -47.11 | 2228.26 |
| -43.04 | 2228.13 | -39.61 | 2228.02 | -38.91 | 2228 | -16.7 | 2227.63 | -3.36 | 2227.4 |
| 0 | 2227.35 | 6.17 | 2227.24 | 10.72 | 2227.17 | 19.47 | 2227.02 | 20.77 | 2227 |
| 25.63 | 2226.9 | 44.85 | 2226.9 | 44.89 | 2226.91 | 44.99 | 2226.92 | 45.14 | 2226.92 |
| 45.36 | 2226.93 | 45.51 | 2226.93 | 45.67 | 2226.94 | 45.87 | 2226.94 | 46.12 | 2226.94 |
| 49.91 | 2227.03 | 49.95 | 2227.03 | 50.04 | 2227.04 | 50.17 | 2227.04 | 50.33 | 2227.04 |
| 50.51 | 2227.04 | 50.68 | 2227.04 | 50.87 | 2227.04 | 51.03 | 2227.04 | 53.5 | 2227.02 |
| 61.31 | 2226.95 | 66.7 | 2226.9 | 67.02 | 2226.9 | 67.33 | 2226.89 | 67.65 | 2226.89 |
| 67.96 | 2226.88 | 68.67 | 2226.87 | 70.32 | 2226.83 | 73.35 | 2226.75 | 77.09 | 2226.65 |
| 79.08 | 2226.58 | 79.54 | 2226.57 | 80.56 | 2226.55 | 85.68 | 2226.43 | 88.55 | 2226.36 |
| 88.63 | 2226.36 | 99.95 | 2226.12 | 100.89 | 2226.1 | 104.88 | 2226 | 107.2 | 2226 |
| 110.48 | 2226 | 111.22 | 2226 | 112.85 | 2226 | 117.33 | 2226 | 117.88 | 2226 |
| 118.64 | 2226 | 119.16 | 2226 | 119.69 | 2226 | 121.44 | 2226 | 131.5 | 2226 |
| 132.23 | 2226 | 145.86 | 2226 | 147.02 | 2226 | 148.34 | 2226 | 149.15 | 2226 |
| 149.48 | 2226 | 150.15 | 2226 | 157.18 | 2226 | 157.51 | 2226 | 157.85 | 2226 |
| 159.15 | 2226 | 160.22 | 2226 | 161.64 | 2226.04 | 161.65 | 2226.04 | 173.28 | 2226.43 |

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  179.01 2226.62  180.72 2226.67  181.16 2226.68  181.63 2226.69  182.15  2226.7
  182.82 2226.71  188.07 2226.78  188.99 2226.79  196.15 2226.94  196.49 2226.94
  196.84 2226.94  197.19 2226.95  197.55 2226.95  197.92 2226.95  198.29 2226.95
  200.91 2226.95  201.25 2226.95  201.56 2226.95  201.82 2226.95  201.99 2226.95
  202.18 2226.95  204.61  2226.9  206.87 2226.87  210.29 2226.83  213.35 2226.81
   214.7  2226.8  219.84 2226.78  221.91 2226.77  222.71 2226.77  222.97 2226.77
  223.24 2226.77  223.49 2226.77  223.75 2226.77  223.98 2226.77   224.2 2226.78
  224.28 2226.78  224.51 2226.78  224.97 2226.79  228.54 2226.87  231.26 2226.93
  236.74 2227.06  244.18 2227.23  252.92 2227.45  258.44 2227.59   270.1 2227.88
  274.83    2228  298.27 2229.65     300 2229.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025   85.68    .025  173.28    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         85.68  173.28              150     150     150             .1       .3
Left Levee      Station=  -74.02      Elevation=

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch        RS: 2110

INPUT
Description: Sta 21+10
Station Elevation Data    num=     224
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2223.61 -299.46 2223.62 -299.14 2223.62 -299.03 2223.62 -298.93 2223.62
 -298.84 2223.63 -267.21 2227.09 -258.25 2226.03 -257.23 2226.09 -245.56 2226.66
  -243.5 2226.77 -242.83 2226.81 -242.17 2226.85  -241.7 2226.89 -241.24 2226.92
 -240.33 2226.99 -237.94  2227.2 -232.94 2227.67 -231.76  2227.8 -223.79 2228.77
 -220.45 2229.15 -217.45 2229.45 -211.49    2230 -186.52  2228.3 -184.99  2228.2
 -184.01 2228.13 -182.04    2228 -181.06 2227.99 -179.67 2227.97 -178.17 2227.95
 -176.67 2227.93 -175.92 2227.92 -157.16 2227.77  -152.8 2227.73    -152 2227.72
 -151.23 2227.72  -150.5 2227.71 -149.88  2227.7 -145.54 2227.63  -144.6 2227.62
 -140.62 2227.53 -138.56 2227.49 -138.33 2227.48 -138.08 2227.48 -137.68 2227.48
 -137.23 2227.47 -136.78 2227.47 -136.42 2227.47 -136.14 2227.47 -135.87 2227.47
 -135.56 2227.47 -134.97 2227.47 -134.71 2227.47 -134.22 2227.47 -134.05 2227.48
 -133.92 2227.48 -133.84 2227.48 -133.74 2227.49 -133.63  2227.5  -133.4  2227.5
 -133.07  2227.5 -132.66 2227.51  -123.7 2227.51 -122.57 2227.51 -122.02 2227.51
 -121.49 2227.51 -120.98 2227.51 -120.49  2227.5 -120.11  2227.5 -119.74  2227.5
 -117.18 2227.46  -116.3 2227.45 -111.81 2227.41  -111.8 2227.41  -79.14 2227.35
  -76.53 2227.32  -71.95 2227.27  -63.21 2227.18  -61.97 2227.17  -59.65 2227.14
   -58.6 2227.13  -55.04 2227.09  -40.95 2226.95  -22.59 2226.76  -21.98 2226.75
  -19.61 2226.73  -18.44 2226.72  -11.09 2226.66   -8.47 2226.63   -7.08 2226.62
   -5.66 2226.61   -4.23 2226.59    -2.8 2226.58   -1.38 2226.56       0 2226.55
     .09 2226.55    1.55 2226.53    14.2 2226.38   21.84 2226.28   23.59 2226.26
   25.34 2226.24   25.59 2226.24   25.89 2226.24   26.74 2226.23   28.79 2226.21
   29.69  2226.2   29.92 2226.19   30.32 2226.19   31.81 2226.18   32.47 2226.17
   33.02 2226.17   33.26 2226.16   33.37 2226.16   33.47 2226.16   33.61 2226.16
   33.83 2226.16   33.93 2226.16   34.25 2226.16   34.91 2226.15      35 2226.15
   35.08 2226.15   35.15 2226.15    35.2 2226.15   35.35 2226.15   35.68 2226.15
   35.73 2226.15    35.8 2226.15   35.86 2226.15   35.92 2226.15   36.93 2226.14
   36.98 2226.14   38.05 2226.12    38.1 2226.12   38.17 2226.12   38.24 2226.12
   38.31 2226.12   38.59 2226.12   39.02 2226.11   39.17 2226.11   39.29 2226.11
   39.43  2226.1   39.53  2226.1   39.58  2226.1   39.63  2226.1   39.68  2226.1
   39.73  2226.1   39.78  2226.1   39.82  2226.1   39.86  2226.1   39.91  2226.1
   40.28  2226.1   40.64  2226.1   40.71  2226.1   40.99  2226.1      41  2226.1
   41.01  2226.1   41.03  2226.1   41.08  2226.1   41.66  2226.1   42.41 2226.09
   42.62 2226.09   43.39 2226.08   43.47 2226.08   44.25 2226.07   45.06 2226.06
   45.89 2226.05   46.74 2226.05   47.59 2226.04   48.44 2226.04   53.71 2226.02
   54.61 2226.01   55.05 2226.01   55.52    2226    55.9    2226   56.16 2225.99
   56.57 2225.96   56.91 2225.93   57.11 2225.91   57.54 2225.85   59.83 2225.42
   94.73    2226   96.39    2226   96.93    2226   98.03    2226   98.19    2226
  101.47 2226.04  103.96 2226.07  106.11  2226.1  111.82 2226.16  134.35 2226.34
    1382226.372   155.2 2226.52  161.71 2226.59  164.13 2226.62  165.45 2226.64
   166.7 2226.66  167.32 2226.67  170.69 2226.72  171.46 2226.74  172.36 2226.76
  190.73 2227.08  192.57 2227.12   229.2    2228   229.31    2228  231.19 2228.03
  232.95 2228.05  234.22 2228.07   235.4 2228.09  236.77  2228.1     238 2228.11
  239.15 2228.12  245.33 2228.16  246.42 2228.17  247.56 2228.18   248.8  2228.2
  250.22 2228.21  251.71 2228.23  261.69 2228.38  263.81 2228.41  266.43 2228.44
   269.8 2228.48  285.85 2228.66  299.25 2228.82     300 2228.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025    14.2    .025     138    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          14.2     138              330     340     350             .1       .3
```

Left Levee Station= -211.49 Elevation=

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 1760

INPUT
Description: Sta 17+60
Station Elevation Data num= 421

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -800.19 | 2224.62 | -795.29 | 2224.56 | -782.91 | 2224.57 | -772.54 | 2224.58 | -759.77 | 2224.59 |
| -759.31 | 2224.57 | -755.21 | 2224.46 | -755.07 | 2224.46 | -755.01 | 2224.46 | -754.96 | 2224.46 |
| -754.92 | 2224.46 | -754.72 | 2224.46 | -754.51 | 2224.45 | -754.31 | 2224.45 | -754.29 | 2224.45 |
| -754.16 | 2224.44 | -754.14 | 2224.44 | -754.12 | 2224.44 | -746.74 | 2224.47 | -746.74 | 2224.48 |
| -746.73 | 2224.48 | -746.33 | 2224.49 | -746.2 | 2224.5 | -745.32 | 2224.52 | -744.35 | 2224.54 |
| -744.05 | 2224.54 | -743.79 | 2224.55 | -743.61 | 2224.55 | -743.51 | 2224.55 | -743.43 | 2224.55 |
| -743.26 | 2224.55 | -743 | 2224.56 | -742.82 | 2224.56 | -742.62 | 2224.56 | -742.5 | 2224.56 |
| -741.85 | 2224.56 | -735.71 | 2224.66 | -735.7 | 2224.66 | -735.65 | 2224.66 | -735.61 | 2224.67 |
| -734.32 | 2224.71 | -734.26 | 2224.71 | -734.19 | 2224.71 | -734.07 | 2224.73 | -733.92 | 2224.78 |
| -733.82 | 2224.8 | -733.62 | 2224.81 | -732.88 | 2224.85 | -732.46 | 2224.87 | -732.24 | 2224.87 |
| -732.04 | 2224.88 | -731.52 | 2224.89 | -728.01 | 2224.97 | -724.27 | 2225.06 | -713.93 | 2225.08 |
| -710.05 | 2225.19 | -700.67 | 2225.21 | -695.97 | 2225.36 | -694.33 | 2225.41 | -684.27 | 2225.44 |
| -683.67 | 2225.46 | -674.79 | 2225.5 | -674.5 | 2225.5 | -674.25 | 2225.51 | -665.62 | 2225.55 |
| -665.38 | 2225.55 | -665.15 | 2225.56 | -655.38 | 2225.61 | -655.22 | 2225.61 | -655.07 | 2225.62 |
| -648.67 | 2225.65 | -648.42 | 2225.66 | -641.7 | 2225.7 | -641.46 | 2225.71 | -640.42 | 2225.72 |
| -639.62 | 2225.73 | -639.36 | 2225.74 | -631.18 | 2225.8 | -630.91 | 2225.8 | -628.3 | 2225.83 |
| -625.46 | 2225.85 | -625.25 | 2225.85 | -625.11 | 2225.85 | -621.78 | 2225.86 | -616.84 | 2225.85 |
| -616.78 | 2225.86 | -604.49 | 2225.85 | -582.94 | 2226.51 | -582.68 | 2226.51 | -582.12 | 2226.51 |
| -577.05 | 2226.53 | -572.4 | 2226.56 | -571.83 | 2226.57 | -571.01 | 2226.57 | -565.8 | 2226.56 |
| -562.73 | 2226.55 | -557.58 | 2226.55 | -552.52 | 2226.55 | -548.87 | 2226.55 | -548.01 | 2226.55 |
| -547.22 | 2226.54 | -545.24 | 2226.53 | -538.82 | 2226.5 | -536.22 | 2226.51 | -531.13 | 2226.52 |
| -530.27 | 2226.52 | -527.97 | 2226.52 | -527.61 | 2226.52 | -526.75 | 2226.52 | -526.42 | 2226.51 |
| -525.01 | 2226.52 | -520.04 | 2226.54 | -519.72 | 2226.53 | -517.25 | 2226.54 | -515.67 | 2226.54 |
| -513.49 | 2226.55 | -510.02 | 2226.56 | -505.77 | 2226.58 | -502.34 | 2226.59 | -498.12 | 2226.62 |
| -496.94 | 2226.62 | -496.44 | 2226.62 | -495.37 | 2226.62 | -492.84 | 2226.62 | -490.68 | 2226.62 |
| -485.84 | 2226.62 | -482.77 | 2226.62 | -478.5 | 2226.64 | -406.52 | 2225.302 | -350.89 | 2224.27 |
| -350.78 | 2224.26 | -349.33 | 2224.15 | -348.92 | 2224.13 | -345.42 | 2224 | -119.25 | 2224 |
| -107.59 | 2224.11 | -105.45 | 2224.08 | -98.65 | 2224.05 | -89.83 | 2224 | -88.68 | 2224 |
| -88.55 | 2224 | -38.33 | 2224 | 38.75 | 2225.3 | 43.93 | 2225.3 | 46.46 | 2225.3 |
| 47.36 | 2225.31 | 47.98 | 2225.31 | 48.31 | 2225.31 | 49.34 | 2225.32 | 54.93 | 2225.37 |
| 55.8 | 2225.38 | 61 | 2225.42 | 62.42 | 2225.44 | 62.53 | 2225.44 | 67.02 | 2225.47 |
| 68.12 | 2225.47 | 68.32 | 2225.48 | 68.55 | 2225.48 | 68.75 | 2225.48 | 68.94 | 2225.48 |
| 77.75 | 2225.47 | 78.77 | 2225.47 | 79.29 | 2225.47 | 79.81 | 2225.47 | 80.33 | 2225.48 |
| 82.45 | 2225.49 | 83.08 | 2225.49 | 93.23 | 2225.51 | 93.87 | 2225.51 | 94.52 | 2225.52 |
| 95.21 | 2225.52 | 98.1 | 2225.54 | 108.41 | 2225.63 | 115.34 | 2225.69 | 115.81 | 2225.69 |
| 126.07 | 2225.78 | 143.06 | 2225.92 | 145.39 | 2225.94 | 146.57 | 2225.95 | 148.08 | 2225.97 |
| 149.12 | 2225.98 | 150.81 | 2226 | 253.51 | 2226 | 255.15 | 2226 | 258.18 | 2226.01 |
| 268.56 | 2226.04 | 268.77 | 2226.05 | 268.82 | 2226.06 | 268.84 | 2226.06 | 268.85 | 2226.06 |
| 268.87 | 2226.06 | 268.89 | 2226.06 | 268.9 | 2226.07 | 268.92 | 2226.07 | 268.94 | 2226.07 |
| 268.98 | 2226.07 | 283.31 | 2226.15 | 283.34 | 2226.16 | 283.39 | 2226.16 | 283.44 | 2226.17 |
| 283.5 | 2226.18 | 283.56 | 2226.18 | 283.64 | 2226.19 | 283.71 | 2226.2 | 295.51 | 2226.32 |
| 295.57 | 2226.32 | 295.65 | 2226.33 | 295.74 | 2226.33 | 295.83 | 2226.33 | 296.16 | 2226.34 |
| 296.66 | 2226.34 | 307.26 | 2226.48 | 310.56 | 2226.48 | 320.61 | 2226.69 | 323.34 | 2226.77 |
| 338.32 | 2226.78 | 342.81 | 2226.88 | 344.71 | 2226.94 | 345.94 | 2226.98 | 346.34 | 2226.99 |
| 346.77 | 2227.01 | 347.98 | 2227.06 | 349.42 | 2227.11 | 349.7 | 2227.12 | 349.97 | 2227.14 |
| 351.18 | 2227.21 | 351.93 | 2227.24 | 357.17 | 2227.23 | 357.44 | 2227.24 | 357.93 | 2227.26 |
| 365.51 | 2227.2 | 368.28 | 2227.33 | 368.46 | 2227.34 | 368.62 | 2227.34 | 368.75 | 2227.35 |
| 368.85 | 2227.36 | 368.92 | 2227.37 | 368.95 | 2227.37 | 373.84 | 2227.53 | 374.09 | 2227.53 |
| 374.2 | 2227.53 | 374.29 | 2227.53 | 374.57 | 2227.52 | 374.68 | 2227.52 | 374.82 | 2227.52 |
| 374.96 | 2227.52 | 375.11 | 2227.52 | 375.62 | 2227.53 | 376.09 | 2227.53 | 378.48 | 2227.53 |
| 378.82 | 2227.53 | 378.96 | 2227.53 | 379.1 | 2227.53 | 379.24 | 2227.53 | 379.84 | 2227.54 |
| 379.94 | 2227.55 | 380.04 | 2227.55 | 380.12 | 2227.55 | 380.15 | 2227.55 | 380.22 | 2227.54 |
| 380.28 | 2227.54 | 380.33 | 2227.54 | 380.42 | 2227.53 | 380.47 | 2227.53 | 380.51 | 2227.53 |
| 380.53 | 2227.53 | 391.34 | 2227.49 | 391.38 | 2227.49 | 391.42 | 2227.49 | 391.46 | 2227.49 |
| 391.54 | 2227.5 | 391.59 | 2227.5 | 391.65 | 2227.5 | 391.72 | 2227.5 | 391.8 | 2227.5 |
| 391.89 | 2227.5 | 392.28 | 2227.49 | 392.43 | 2227.49 | 392.61 | 2227.49 | 393.19 | 2227.48 |
| 393.71 | 2227.48 | 397.04 | 2227.48 | 397.56 | 2227.47 | 398.08 | 2227.46 | 398.64 | 2227.46 |
| 398.95 | 2227.46 | 399.07 | 2227.47 | 399.18 | 2227.47 | 399.27 | 2227.47 | 399.35 | 2227.47 |
| 399.4 | 2227.48 | 399.51 | 2227.49 | 399.55 | 2227.49 | 399.61 | 2227.49 | 399.69 | 2227.49 |
| 399.8 | 2227.49 | 399.94 | 2227.49 | 400.09 | 2227.49 | 401.05 | 2227.47 | 401.27 | 2227.47 |
| 401.48 | 2227.47 | 401.66 | 2227.47 | 401.84 | 2227.47 | 402.01 | 2227.46 | 402.54 | 2227.45 |
| 402.71 | 2227.45 | 402.87 | 2227.45 | 403.34 | 2227.44 | 403.79 | 2227.43 | 404.62 | 2227.4 |
| 405.69 | 2227.36 | 407.28 | 2227.28 | 410.73 | 2227.13 | 411.73 | 2227.09 | 412.01 | 2227.08 |
| 412.3 | 2227.07 | 412.64 | 2227.07 | 413.01 | 2227.06 | 413.77 | 2227.05 | 416.54 | 2227.01 |
| 420.65 | 2226.97 | 422.08 | 2226.96 | 422.44 | 2226.96 | 422.8 | 2226.96 | 423.16 | 2226.96 |
| 423.89 | 2226.96 | 424.25 | 2226.96 | 424.96 | 2226.96 | 431.38 | 2227 | 432.43 | 2227 |
| 432.75 | 2227 | 433.05 | 2227 | 433.31 | 2227 | 433.55 | 2227 | 433.75 | 2226.99 |
| 433.93 | 2226.99 | 434.09 | 2226.98 | 435.27 | 2226.93 | 435.96 | 2226.9 | 436.08 | 2226.9 |
| 436.26 | 2226.9 | 437.04 | 2226.88 | 437.7 | 2226.88 | 438.16 | 2226.87 | 438.39 | 2226.87 |

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  438.62 2226.87  438.84 2226.87  439.08 2226.87  439.57 2226.88  439.83 2226.88
  440.07 2226.88  440.32 2226.88  441.88 2226.89  442.12 2226.89  442.34 2226.89
  442.54 2226.89  442.74 2226.89  442.92  2226.9  443.09  2226.9  443.57 2226.92
  443.94 2226.93  444.69 2226.94  444.93 2226.95  445.13 2226.95  445.32 2226.96
  445.82 2226.98  449.25 2227.16  449.82 2227.18  452.84 2227.34  453.78 2227.38
   454.6 2227.41  456.53 2227.48  458.16 2227.52  458.34 2227.52   458.9 2227.54
  459.07 2227.54  459.65 2227.55  459.81 2227.55   460.4 2227.57  460.55 2227.57
  461.04 2227.57  461.53 2227.58  462.03 2227.58  462.17 2227.59  462.68 2227.59
  463.78  2227.6  463.91  2227.6  469.85 2227.61  469.99 2227.61  482.27 2227.64
  491.85 2227.65  502.28 2227.67  513.58 2227.69  523.27  2227.7  531.07 2227.71
  540.26 2227.73  542.28 2227.73  543.84 2227.73  544.12 2227.72  544.21 2227.72
  566.03    2228  683.92    2228  700.46 2229.47  709.19 2229.51  711.49 2229.51
  721.83 2229.53  727.21 2229.54  729.34 2229.55  730.49 2229.54  731.03 2229.54
  731.54 2229.53     732 2229.52  732.38 2229.51  741.46 2229.53  742.06 2229.51
  742.66  2229.5  743.81 2229.47  752.63    2230  790.96 2229.31  791.17 2229.31
     800 2229.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -800.19    .016  -406.5    .016   38.75    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -406.5   38.75              220     230     240             .1       .3
Left Levee      Station=  -478.5      Elevation=

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 1200

INPUT
Description: Sta 12+00
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2221.12 -299.01  2221.1 -298.12 2221.09 -296.46 2221.08 -295.65 2221.06
 -294.83 2221.06 -294.08 2221.04 -293.38 2221.03 -292.72 2221.02 -286.44 2220.91
 -277.61 2220.76  -272.3 2220.66 -268.26 2220.58 -267.77 2220.57  -267.5 2220.57
 -267.21 2220.57 -266.89 2220.56 -266.55 2220.56 -266.19 2220.56 -265.45 2220.55
 -258.91 2220.49 -258.62 2220.49 -258.33 2220.49 -258.12 2220.49  -257.9 2220.48
  -257.7 2220.48 -257.24 2220.48 -253.86 2220.47 -251.55 2220.46 -249.52 2220.46
 -245.63 2220.44 -244.77 2220.44 -241.66 2220.42 -241.07 2220.41 -240.51 2220.41
 -237.67  2220.4 -236.12  2220.4 -235.44 2220.39  -232.3 2220.38 -230.26 2220.37
 -227.05 2220.36    -225 2220.35 -223.06 2220.34 -209.03 2220.28 -207.71 2220.28
 -194.13 2220.22 -180.62 2220.16 -178.98 2220.15  -176.6 2220.13 -163.14 2220.02
 -161.48    2220 -140.63 2219.63 -136.09 2219.55 -130.78 2219.46 -119.09 2219.22
 -109.41 2219.06   -94.1 2218.79  -91.23 2218.74  -89.37  2218.7   -84.1 2218.58
   -83.3 2218.56  -82.16 2218.54  -76.58 2218.45  -75.38 2218.43  -74.94 2218.42
  -74.72 2218.42  -74.49 2218.42  -73.63 2218.41  -70.11 2218.38   -55.7 2218.13
  -55.43 2218.13  -48.29    2218  -35.91 2217.47  -28.48 2217.03  -22.98 2216.76
  -11.44    2216       0    2216    3.83    2216    6.35    2216    7.68 2216.16
   21.89    2218   45.31 2218.47   58.87  2218.7   61.67 2218.75  102.89  2219.5
  114.57 2219.72   116.1 2219.74  116.54 2219.75   116.9 2219.76  117.55 2219.77
  119.33  2219.8   123.1 2219.86  130.17    2220  137.87 2220.22  145.79  2220.4
  149.69 2220.49  153.44 2220.57  156.86 2220.65  161.56 2220.76  213.27    2222
  214.12 2222.03  215.51 2222.09  216.64 2222.13   250.4 2223.42  265.07    2224
  286.39 2224.83  297.39  2225.2     300  2225.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .03 -130.78     .03  102.89     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -130.78  102.89              275     300     325             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 900

INPUT
Description: Sta 9+00
Station Elevation Data    num=     167
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2219.24 -299.35 2219.24 -297.85 2219.22 -288.79 2219.12 -280.87 2219.06
 -275.78    2219 -268.06 2218.94 -262.13 2218.87 -261.35 2218.86 -260.43 2218.86
 -260.07 2218.85 -259.12 2218.85  -255.7 2218.84 -245.35 2218.83 -237.26 2218.82
 -236.72 2218.81 -236.17 2218.81  -235.6 2218.81    -235  2218.8 -234.38 2218.79
 -233.74 2218.79 -232.39 2218.77 -222.24 2218.62 -210.64 2218.46 -189.03 2218.15
 -178.35    2218 -177.66 2217.99 -177.31 2217.98 -138.66  2217.3 -123.01 2217.02
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -104.31 | 2216.71 | -91.66 | 2216.5 | -68.47 | 2216.11 | -62.06 | 2216 | -55.84 | 2215.84 |
| -55.79 | 2215.84 | -40.27 | 2215.41 | -35.69 | 2215.28 | -27.83 | 2215.08 | -22.3 | 2214.93 |
| -17.38 | 2214.81 | -16.72 | 2214.8 | -13.54 | 2214.71 | -11.55 | 2214.66 | 0 | 2214.72 |
| 10.39 | 2214.76 | 10.42 | 2214.77 | 10.5 | 2214.77 | 10.63 | 2214.78 | 10.78 | 2214.78 |
| 10.95 | 2214.79 | 12.23 | 2214.82 | 12.85 | 2214.83 | 13.03 | 2214.84 | 13.18 | 2214.85 |
| 13.44 | 2214.86 | 14.51 | 2214.93 | 14.97 | 2214.95 | 18.55 | 2215.09 | 21.03 | 2215.2 |
| 21.67 | 2215.23 | 22.4 | 2215.25 | 22.53 | 2215.25 | 26.13 | 2215.36 | 37.4 | 2215.73 |
| 45.66 | 2216 | 52.6 | 2216.28 | 59.6 | 2216.54 | 77.89 | 2217.24 | 95.39 | 2217.87 |
| 96.17 | 2217.9 | 99.23 | 2218 | 137.5 | 2219.03 | 165.95 | 2220 | 166.31 | 2220.01 |
| 167.16 | 2220.03 | 167.64 | 2220.04 | 168.17 | 2220.05 | 168.8 | 2220.06 | 170.22 | 2220.08 |
| 174.67 | 2220.14 | 175.34 | 2220.15 | 175.96 | 2220.16 | 176.91 | 2220.18 | 178.07 | 2220.2 |
| 179.34 | 2220.24 | 183.49 | 2220.39 | 184.65 | 2220.42 | 185.24 | 2220.44 | 186.29 | 2220.46 |
| 193.21 | 2220.58 | 193.99 | 2220.59 | 195.29 | 2220.6 | 196.68 | 2220.62 | 197.66 | 2220.63 |
| 198.73 | 2220.63 | 208.11 | 2220.69 | 212.24 | 2220.71 | 213.19 | 2220.72 | 213.64 | 2220.72 |
| 216.17 | 2220.75 | 216.52 | 2220.75 | 216.89 | 2220.76 | 217.26 | 2220.76 | 217.69 | 2220.76 |
| 218.14 | 2220.76 | 218.6 | 2220.76 | 222.44 | 2220.76 | 223.83 | 2220.76 | 224.26 | 2220.76 |
| 224.67 | 2220.76 | 225.03 | 2220.76 | 225.35 | 2220.75 | 225.64 | 2220.75 | 226.35 | 2220.74 |
| 229.07 | 2220.69 | 233.02 | 2220.62 | 233.6 | 2220.61 | 234.29 | 2220.6 | 238.48 | 2220.57 |
| 239.24 | 2220.56 | 239.87 | 2220.56 | 244.87 | 2220.45 | 245.83 | 2220.44 | 250.38 | 2220.24 |
| 250.39 | 2220.23 | 251.72 | 2220.13 | 252 | 2220.08 | 252.13 | 2220.07 | 252.33 | 2220.06 |
| 252.63 | 2220.06 | 253.05 | 2220.05 | 253.57 | 2220.05 | 253.69 | 2220.05 | 254.05 | 2220.05 |
| 254.2 | 2220.05 | 254.48 | 2220.06 | 254.5 | 2220.06 | 254.52 | 2220.06 | 254.54 | 2220.06 |
| 254.56 | 2220.06 | 254.6 | 2220.06 | 254.89 | 2220.06 | 255.33 | 2220.07 | 255.43 | 2220.07 |
| 255.75 | 2220.08 | 256.3 | 2220.08 | 256.36 | 2220.08 | 257.7 | 2220.08 | 257.74 | 2220.08 |
| 260.86 | 2220.1 | 260.94 | 2220.1 | 262.55 | 2220.11 | 263.36 | 2220.11 | 264.23 | 2220.13 |
| 265.07 | 2220.14 | 265.91 | 2220.15 | 266.98 | 2220.16 | 267.88 | 2220.18 | 270.04 | 2220.22 |
| 271.09 | 2220.24 | 277.35 | 2220.35 | 281.29 | 2220.42 | 281.97 | 2220.44 | 284.1 | 2220.48 |
| 298.47 | 2220.73 | 300 | 2220.76 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .03 | -210.64 | .03 | 165.95 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -210.64 | 165.95 | 100 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 800

INPUT
Description: Silverado Pines Cross Section 12.0
Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 825 | 2217 | 925 | 2216 | 934 | 2215 | 984 | 2214 | 990 | 2213.45 |
| 995 | 2213.45 | 1005 | 2213.45 | 1010 | 2213.45 | 1017 | 2214 | 1044 | 2215 |
| 1070 | 2216 | 1124 | 2217 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 825 | .03 | 990 | .03 | 1010 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 990 | 1010 | 50 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 750

INPUT
Description: Silverado Pines Cross Section 11.5
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 2217 | 900 | 2216 | 920 | 2215 | 945 | 2214 | 970 | 2212 |
| 1030 | 2212 | 1070 | 2215 | 1090 | 2216 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 800 | .03 | 970 | .03 | 1030 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 970 | 1030 | 50 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek

REACH: East-Lower RS: 700

INPUT
Description: Silverado Pines Cross Section 11.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 2217 | 910 | 2215 | 940 | 2212 | 950 | 2211.6 | 1000 | 2211.45 |
| 1020 | 2211.6 | 1030 | 2211.68 | 1070 | 2212 | 1110 | 2216 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 800 | .03 | 950 | .03 | 1030 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 950 | 1030 | 100 | 100 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1070 | 1110 | 2217 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 600

INPUT
Description: Silverado Pines Cross Section 10.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 892 | 2215 | 910 | 2214 | 940 | 2211 | 9652210.792 | | 1000 | 2210.5 |
| 10502210.857 | | 1140 | 2211.5 | 1150 | 2213.5 | 1160 | 2215.5 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 892 | .03 | 965 | .03 | 1050 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 965 | 1050 | 100 | 100 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1070 | 1160 | 2216 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 500

INPUT
Description: Silverado Pines Cross Section 9.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2215.75 | 975 | 2209.5 | 1000 | 2209.5 | 10502209.813 | | 1080 | 2210 |
| 1115 | 2210.6 | 1225 | 2210.8 | 1240 | 2213.8 | 1246 | 2215 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 955 | .03 | 975 | .03 | 1050 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 975 | 1050 | 22 | 25 | 30 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 955 | 975 | 2216 | F |
| 1070 | 1246 | 2216 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 475

INPUT
Description: Silverado Pines Cross Section 8.75
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 930 | 2215 | 945 | 2210 | 9752209.356 | | 1000 | 2209.13 | 1020 | 2209.13 |
| 1040 | 2209.13 | 1070 | 2209.8 | 1140 | 2209.8 | 1150 | 2212.8 | 1160 | 2215 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

```
     930     .03     975     .03    1040     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           975    1040               12       45       70             .1       .3
Ineffective Flow     num=       2
  Sta L   Sta R    Elev  Permanent
     930     945    2217       F
    1075    1160    2217       F

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 430

INPUT
Description: Silverado Pines Cross Section 8.3
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     958  2215.8     980 2208.47    1000 2208.47    1020 2208.47    1041 2215.47
    1053 2215.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     958    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               60       60       60             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 370

INPUT
Description: Silverado Pines Cross Section 7.71
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2213.85     980 2205.55    1000 2205.55    1020 2205.55    1041 2212.55
    1053 2212.75    1053 2214.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               71       71       71             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 300

INPUT
Description: Silverado Pines Cross Section 7.0
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955  2213.5     980  2205.2    1000  2205.2    1020  2205.2    1041  2212.2
    1053  2212.4    1053  2214.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50       50       50             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 250

INPUT
Description: Silverado Pines Cross Section 6.5
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2213.25     980 2204.95    1000 2204.95    1020 2204.95    1041 2211.95
    1053 2212.15    1053 2214.15
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 200

INPUT
Description: Silverado Pines Cross Section 6.0
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955    2213     980  2204.7    1000  2204.7    1020  2204.7    1041  2211.7
    1053  2211.9    1053  2213.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 150

INPUT
Description: Silverado Pines Cross Section 5.5
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2212.78     980 2204.45    1020 2204.45    1041 2211.45    1053  2211.6
    1053  2213.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               17      17      17             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 128

INPUT
Description: Silverado Pines Cross Section 5.28
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     970  2214.7     980  2214.6   980.1 2204.34    1020 2204.34  1020.1  2214.6
    1030  2214.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     970    .013   980.1    .013    1020    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         980.1    1020               75      75      75             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-Lower         RS: 60

INPUT
Description: Silverado Pines Cross Section 4.6
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     875    2215     947  2214.8     980    2204    1020    2204    1053  2214.8
    1125    2215
```

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 875 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 10 | 10 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 50

INPUT
Description: Silverado Pines Cross Section 4.5
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 875 | 2215.5 | 945 | 2215.5 | 980 | 2203.75 | 1020 | 2203.75 | 1055 | 2215.5 |
| 1225 | 2216 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 875 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: 0

INPUT
Description: Silverado Pines Cross Section 4.0
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 880 | 2212 | 950 | 2212 | 980 | 2202.5 | 1020 | 2202.5 | 1048 | 2211 |
| 1140 | 2211.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 880 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-Lower RS: -50

INPUT
Description: Silverado Pines Cross Section 3.5
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 490 | 2206 | 500 | 2204 | 970 | 2204 | 980 | 2201.35 | 1020 | 2201.35 |
| 1030 | 2204 | 1500 | 2204 | 1510 | 2206 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 490 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 0 | 0 | .1 | .3 |

SUMMARY OF MANNING'S N VALUES

River:Duck Creek

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| East-West Branch | 500 | .025 | .025 | .025 |
| East-West Branch | 400 | .025 | .025 | .025 |
| East-West Branch | 300 | .025 | .025 | .025 |
| East-West Branch | 200 | .025 | .025 | .025 |
| East-West Branch | 100 | .025 | .025 | .025 |
| East-East Branch | 500 | .025 | .025 | .025 |

| | | | | |
|---|---|---|---|---|
| East-East Branch | 400 | .025 | .025 | .025 |
| East-East Branch | 300 | .025 | .025 | .025 |
| East-East Branch | 200 | .025 | .025 | .025 |
| East-East Branch | 100 | .025 | .025 | .025 |
| East | 12300 | .025 | .025 | .025 |
| East | 12000 | .025 | .025 | .025 |
| East | 11700 | .025 | .025 | .025 |
| East | 11540 | .015 | .015 | .015 |
| East | 11510 | Culvert | | |
| East | 11480.* | .015 | .015 | .015 |
| East | 11400 | .025 | .025 | .025 |
| East | 11100 | .025 | .025 | .025 |
| East | 10800 | .025 | .025 | .025 |
| East | 10500 | .025 | .025 | .025 |
| East | 10200 | .025 | .025 | .025 |
| East | 10110 | .015 | .015 | .015 |
| East | 10075 | Bridge | | |
| East | 10040 | .015 | .015 | .015 |
| East | 9900 | .025 | .025 | .025 |
| East | 9600 | .025 | .025 | .025 |
| East | 9300 | .025 | .025 | .025 |
| East | 9000 | .025 | .025 | .025 |
| East | 8940 | .044 | .044 | .044 |
| East | 8860.* | .044 | .044 | .044 |
| East | 8700 | .015 | .015 | .015 |
| East | 8400 | .015 | .015 | .015 |
| East | 8200.* | .015 | .015 | .015 |
| East | 8150 | Bridge | | |
| East | 8100 | .015 | .015 | .015 |
| East | 7800 | .015 | .015 | .015 |
| East | 7500 | .015 | .015 | .015 |
| East | 7235 | .015 | .015 | .015 |
| East | 7182.5 | Bridge | | |
| East | 7130 | .015 | .015 | .015 |
| East | 6900 | .025 | .025 | .025 |
| East | 6600 | .025 | .025 | .025 |
| East | 6300 | .025 | .025 | .025 |
| East | 6190.* | .03 | .03 | .03 |
| East | 6000 | .03 | .03 | .03 |
| East | 5830 | .015 | .015 | .015 |
| East | 5800 | Bridge | | |
| East | 5770.* | .015 | .015 | .015 |
| East | 5700 | .015 | .015 | .015 |
| East | 5515.* | .015 | .015 | .015 |
| East | 5457.5 | Bridge | | |
| East | 5400 | .015 | .015 | .015 |
| East | 5100 | .025 | .025 | .025 |
| East | 4800 | .025 | .025 | .025 |
| East | 4500 | .025 | .025 | .025 |
| East | 4450 | .015 | .015 | .015 |
| East | 4415 | Bridge | | |
| East | 4380 | .015 | .015 | .015 |
| East | 4200 | .025 | .025 | .025 |
| East | 3900 | .025 | .025 | .025 |
| East | 3600 | .025 | .025 | .025 |
| East | 3300 | .025 | .025 | .025 |
| East | 3000 | .025 | .025 | .025 |
| East | 2820.* | .03 | .03 | .03 |
| East | 2700 | .03 | .03 | .03 |
| East | 2470.* | .025 | .025 | .025 |
| East | 2400 | .025 | .025 | .025 |
| East | 2260.* | .025 | .025 | .025 |
| East | 2100 | .015 | .015 | .015 |
| East | 1800 | .015 | .015 | .015 |
| East | 1760 | .015 | .015 | .015 |
| East | 1700 | Bridge | | |
| East | 1640 | .025 | .025 | .025 |
| East | 1500 | .03 | .03 | .03 |
| West Branch | 3460 | .025 | .025 | .025 |
| West Branch | 3160 | .025 | .025 | .025 |
| West Branch | 2860 | .025 | .025 | .025 |
| West Branch | 2560 | .025 | .025 | .025 |
| West Branch | 2260 | .025 | .025 | .025 |
| West Branch | 2110 | .025 | .025 | .025 |
| West Branch | 1760 | .016 | .016 | .016 |
| East-Lower | 1200 | .03 | .03 | .03 |
| East-Lower | 900 | .03 | .03 | .03 |
| East-Lower | 800 | .03 | .03 | .03 |
| East-Lower | 750 | .03 | .03 | .03 |
| East-Lower | 700 | .03 | .03 | .03 |
| East-Lower | 600 | .03 | .03 | .03 |

| | | | | |
|---|---|---|---|---|
| East-Lower | 500 | .03 | .03 | .03 |
| East-Lower | 475 | .03 | .03 | .03 |
| East-Lower | 430 | .035 | .035 | .035 |
| East-Lower | 370 | .035 | .035 | .035 |
| East-Lower | 300 | .03 | .03 | .03 |
| East-Lower | 250 | .03 | .03 | .03 |
| East-Lower | 200 | .03 | .03 | .03 |
| East-Lower | 150 | .03 | .03 | .03 |
| East-Lower | 128 | .013 | .013 | .013 |
| East-Lower | 60 | .035 | .035 | .035 |
| East-Lower | 50 | .035 | .035 | .035 |
| East-Lower | 0 | .035 | .035 | .035 |
| East-Lower | -50 | .035 | .035 | .035 |

SUMMARY OF REACH LENGTHS

River: Duck Creek

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| East-West Branch | 500 | 100 | 100 | 100 |
| East-West Branch | 400 | 100 | 100 | 100 |
| East-West Branch | 300 | 100 | 100 | 100 |
| East-West Branch | 200 | 100 | 100 | 100 |
| East-West Branch | 100 | 100 | 100 | 100 |
| East-East Branch | 500 | 100 | 100 | 100 |
| East-East Branch | 400 | 100 | 100 | 100 |
| East-East Branch | 300 | 100 | 100 | 100 |
| East-East Branch | 200 | 100 | 100 | 100 |
| East-East Branch | 100 | 100 | 100 | 100 |
| East | 12300 | 300 | 300 | 300 |
| East | 12000 | 330 | 300 | 260 |
| East | 11700 | 120 | 160 | 220 |
| East | 11540 | 60 | 60 | 60 |
| East | 11510 | Culvert | | |
| East | 11480.* | 80 | 80 | 100 |
| East | 11400 | 310 | 300 | 280 |
| East | 11100 | 340 | 300 | 260 |
| East | 10800 | 300 | 300 | 300 |
| East | 10500 | 200 | 300 | 400 |
| East | 10200 | 120 | 90 | 50 |
| East | 10110 | 70 | 70 | 70 |
| East | 10075 | Bridge | | |
| East | 10040 | 200 | 140 | 80 |
| East | 9900 | 310 | 300 | 300 |
| East | 9600 | 300 | 300 | 300 |
| East | 9300 | 250 | 300 | 340 |
| East | 9000 | 60 | 60 | 60 |
| East | 8940 | 80 | 80 | 80 |
| East | 8860.* | 160 | 160 | 160 |
| East | 8700 | 300 | 300 | 300 |
| East | 8400 | 200 | 200 | 200 |
| East | 8200.* | 100 | 100 | 100 |
| East | 8150 | Bridge | | |
| East | 8100 | 290 | 300 | 300 |
| East | 7800 | 300 | 300 | 310 |
| East | 7500 | 265 | 265 | 265 |
| East | 7235 | 105 | 105 | 105 |
| East | 7182.5 | Bridge | | |
| East | 7130 | 230 | 230 | 230 |
| East | 6900 | 300 | 300 | 300 |
| East | 6600 | 300 | 300 | 300 |
| East | 6300 | 110 | 110 | 110 |
| East | 6190.* | 190 | 190 | 190 |
| East | 6000 | 150 | 170 | 260 |
| East | 5830 | 60 | 60 | 60 |
| East | 5800 | Bridge | | |
| East | 5770.* | 70 | 70 | 70 |
| East | 5700 | 200 | 185 | 100 |
| East | 5515.* | 1150 | 115 | 180 |
| East | 5457.5 | Bridge | | |
| East | 5400 | 300 | 300 | 300 |
| East | 5100 | 340 | 300 | 260 |
| East | 4800 | 150 | 300 | 320 |
| East | 4500 | 50 | 50 | 50 |
| East | 4450 | 70 | 70 | 70 |
| East | 4415 | Bridge | | |
| East | 4380 | 180 | 180 | 160 |

| | | | | |
|---|---|---|---|---|
| East | 4200 | 300 | 300 | 300 |
| East | 3900 | 310 | 300 | 290 |
| East | 3600 | 300 | 300 | 300 |
| East | 3300 | 300 | 300 | 310 |
| East | 3000 | 180 | 180 | 180 |
| East | 2820.* | 120 | 120 | 120 |
| East | 2700 | 230 | 230 | 210 |
| East | 2470.* | 70 | 70 | 70 |
| East | 2400 | 140 | 140 | 140 |
| East | 2260.* | 140 | 160 | 160 |
| East | 2100 | 300 | 300 | 300 |
| East | 1800 | 40 | 40 | 40 |
| East | 1760 | 120 | 120 | 120 |
| East | 1700 | Bridge | | |
| East | 1640 | 100 | 140 | 180 |
| East | 1500 | 280 | 300 | 320 |
| West Branch | 3460 | 295 | 300 | 305 |
| West Branch | 3160 | 340 | 300 | 260 |
| West Branch | 2860 | 350 | 300 | 250 |
| West Branch | 2560 | 320 | 300 | 280 |
| West Branch | 2260 | 150 | 150 | 150 |
| West Branch | 2110 | 330 | 340 | 350 |
| West Branch | 1760 | 220 | 230 | 240 |
| East-Lower | 1200 | 275 | 300 | 325 |
| East-Lower | 900 | 100 | 100 | 100 |
| East-Lower | 800 | 50 | 50 | 50 |
| East-Lower | 750 | 50 | 50 | 50 |
| East-Lower | 700 | 100 | 100 | 100 |
| East-Lower | 600 | 100 | 100 | 100 |
| East-Lower | 500 | 22 | 25 | 30 |
| East-Lower | 475 | 12 | 45 | 70 |
| East-Lower | 430 | 60 | 60 | 60 |
| East-Lower | 370 | 71 | 71 | 71 |
| East-Lower | 300 | 50 | 50 | 50 |
| East-Lower | 250 | 50 | 50 | 50 |
| East-Lower | 200 | 50 | 50 | 50 |
| East-Lower | 150 | 17 | 17 | 17 |
| East-Lower | 128 | 75 | 75 | 75 |
| East-Lower | 60 | 10 | 10 | 10 |
| East-Lower | 50 | 50 | 50 | 50 |
| East-Lower | 0 | 50 | 50 | 50 |
| East-Lower | -50 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duck Creek

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| East-West Branch | 500 | .1 | .3 |
| East-West Branch | 400 | .1 | .3 |
| East-West Branch | 300 | .1 | .3 |
| East-West Branch | 200 | .1 | .3 |
| East-West Branch | 100 | .1 | .3 |
| East-East Branch | 500 | .1 | .3 |
| East-East Branch | 400 | .1 | .3 |
| East-East Branch | 300 | .1 | .3 |
| East-East Branch | 200 | .1 | .3 |
| East-East Branch | 100 | .1 | .3 |
| East | 12300 | .1 | .3 |
| East | 12000 | .1 | .3 |
| East | 11700 | .1 | .3 |
| East | 11540 | .1 | .3 |
| East | 11510 | Culvert | |
| East | 11480.* | .1 | .3 |
| East | 11400 | .1 | .3 |
| East | 11100 | .1 | .3 |
| East | 10800 | .1 | .3 |
| East | 10500 | .1 | .3 |
| East | 10200 | .1 | .3 |
| East | 10110 | .1 | .3 |
| East | 10075 | Bridge | |
| East | 10040 | .1 | .3 |
| East | 9900 | .1 | .3 |
| East | 9600 | .1 | .3 |
| East | 9300 | .1 | .3 |
| East | 9000 | .1 | .3 |
| East | 8940 | .1 | .3 |

| | | | | |
|---|---|---|---|---|
| East | 8860.* | | .1 | .3 |
| East | 8700 | | .1 | .3 |
| East | 8400 | | .1 | .3 |
| East | 8200.* | | .1 | .3 |
| East | 8150 | Bridge | | |
| East | 8100 | | .1 | .3 |
| East | 7800 | | .1 | .3 |
| East | 7500 | | .1 | .3 |
| East | 7235 | | .1 | .3 |
| East | 7182.5 | Bridge | | |
| East | 7130 | | .1 | .3 |
| East | 6900 | | .1 | .3 |
| East | 6600 | | .1 | .3 |
| East | 6300 | | .1 | .3 |
| East | 6190.* | | .1 | .3 |
| East | 6000 | | .1 | .3 |
| East | 5830 | | .1 | .3 |
| East | 5800 | Bridge | | |
| East | 5770.* | | .1 | .3 |
| East | 5700 | | .1 | .3 |
| East | 5515.* | | .1 | .3 |
| East | 5457.5 | Bridge | | |
| East | 5400 | | .1 | .3 |
| East | 5100 | | .1 | .3 |
| East | 4800 | | .1 | .3 |
| East | 4500 | | .1 | .3 |
| East | 4450 | | .1 | .3 |
| East | 4415 | Bridge | | |
| East | 4380 | | .1 | .3 |
| East | 4200 | | .1 | .3 |
| East | 3900 | | .1 | .3 |
| East | 3600 | | .1 | .3 |
| East | 3300 | | .1 | .3 |
| East | 3000 | | .1 | .3 |
| East | 2820.* | | .1 | .3 |
| East | 2700 | | .1 | .3 |
| East | 2470.* | | .1 | .3 |
| East | 2400 | | .1 | .3 |
| East | 2260.* | | .1 | .3 |
| East | 2100 | | .1 | .3 |
| East | 1800 | | .1 | .3 |
| East | 1760 | | .1 | .3 |
| East | 1700 | Bridge | | |
| East | 1640 | | .1 | .3 |
| East | 1500 | | .1 | .3 |
| West Branch | 3460 | | .1 | .3 |
| West Branch | 3160 | | .1 | .3 |
| West Branch | 2860 | | .1 | .3 |
| West Branch | 2560 | | .1 | .3 |
| West Branch | 2260 | | .1 | .3 |
| West Branch | 2110 | | .1 | .3 |
| West Branch | 1760 | | .1 | .3 |
| East-Lower | 1200 | | .1 | .3 |
| East-Lower | 900 | | .1 | .3 |
| East-Lower | 800 | | .1 | .3 |
| East-Lower | 750 | | .1 | .3 |
| East-Lower | 700 | | .1 | .3 |
| East-Lower | 600 | | .1 | .3 |
| East-Lower | 500 | | .1 | .3 |
| East-Lower | 475 | | .1 | .3 |
| East-Lower | 430 | | .1 | .3 |
| East-Lower | 370 | | .1 | .3 |
| East-Lower | 300 | | .1 | .3 |
| East-Lower | 250 | | .1 | .3 |
| East-Lower | 200 | | .1 | .3 |
| East-Lower | 150 | | .1 | .3 |
| East-Lower | 128 | | .1 | .3 |
| East-Lower | 60 | | .1 | .3 |
| East-Lower | 50 | | .1 | .3 |
| East-Lower | 0 | | .1 | .3 |
| East-Lower | -50 | | .1 | .3 |

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RFCD
2009 SEP 22 PM 3:51

September 17, 2009

William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate
FEMA National Service Provider
3601 Eisenhower Avenue
Alexandria, VA 22304-6425

Reference: **Case No.:** 07-09-1205R
**Community:** Clark County, NV
**Community No.:** 320003

**Subject: REQUEST FOR LETTER OF MAP REVISION**

Dear Mr. Blanton:

This letter has been prepared to address the final two bullet items in the November 5, 2008 FEMA response to the CLOMR request for the Duck Creek Wash – Las Vegas Boulevard to Lower Duck Creek Detention Basin. A copy of the FEMA letter has been included at the end of this letter. Following are the required data items and the response to each item.

**Required Data Bullet #7:**

A revised conditions hydraulic analysis of the regulatory floodway for South Channel from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue, together with a topographic work map showing the revised floodplain and floodway boundaries

**Response to #7:**

A revised conditions hydraulic analysis of the regulatory floodway for South Channel has been provided for the reach from upstream of Lower Duck Creek Detention Basin to just downstream of Silverado Ranch Boulevard. The southern limit of the revised conditions hydraulic analysis was revised from Le Baron Avenue to Silverado Ranch Boulevard in accordance with the email received from FEMA Revisions Coordinator Sacha Tohme on May 7, 2009 (included in "Correspondence" folder on CD in Appendix D.) A Method 4 analysis was used as a first pass to determine the floodway for the reach between Silverado Ranch Blvd. and the Silverado Pines LOMR upstream limit. This was followed by a Method 1 analysis to refine the floodway limits for this reach. The extent of encroachment used to determine the floodway limits was based on an allowable rise in water surface of 1.0'. See Table 1, below, for floodway data.



2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5148
TEL. (702) 873-7550 FAX: 362-2597

**TABLE 1**

| FLOODWAY DATA TABLE | | | | | | | |
|---|---|---|---|---|---|---|---|
| FLOODING SOURCE | | FLOODWAY | | | BASE FLOOD WATER SURFACE ELEVATION | | |
| REACH | RIVER STA | WIDTH (FT) | AREA (SQFT) | MEAN VELOCITY (FPS) | WITHOUT FLOODWAY (FT) | WITH FLOODWAY (FT) | INCREASE (FT) |
| East-lower | 1640 | 45.03 | 223.02 | 9.54 | 2220.38 | 2221.35 | 0.97 |
| East-lower | 1500 | 70 | 404.49 | 5.26 | 2221.08 | 2221.82 | 0.75 |
| East-lower | 1200 | 70 | 282.81 | 7.52 | 2219.55 | 2220.48 | 0.93 |
| East-lower | 900 | 70 | 214.44 | 9.92 | 2217.38 | 2218.03 | 0.64 |
| East-lower | 800 | 70 | 209.66 | 10.14 | 2216.53 | 2216.92 | 0.39 |

The target increase of 1.0' was reached at the upstream cross section 1640. Cross sections downstream of 1640 did not see the maximum increase of 1.0', but further encroachment into these sections would result in an increase in excess of 1.0' at cross section 1640.

In addition to the revised conditions hydraulic analysis of South Channel, other revisions were made to the hydraulic model based on review by Clark County Development Services. These include:

- Revisions to channel geometry to match as-built information (existing culvert survey as-builts are included in Appendix C, other as-builts are included electronically in Appendix D);
- Corrected reversal of cross sections for sections not cut from left to right looking downstream;
- Reduction of flow in West Branch to account for 200 cfs intercepted and conveyed by an existing 7'x3' RCB storm drain system (see Appendix D for 7'x3' RCB storm drain system as-builts and hydraulic analysis.) This existing storm drain is located in Gilespie Street just upstream of Silverado Ranch Boulevard and discharges at the outlet of the 2-16'x4' RCB East Branch crossing at Silverado Ranch Boulevard.

"I hereby certify in accordance with 44CFR at Part 65.2 that the plans included in the appendices for Silver Creek Professional Parc, October 2001, Dominion, August 1995, Wellington Estates Channel Plans, May 1997, and Meister Park, August 1998 represent conditions on the ground as they exist today."




Revisions made to cross sections are described in Table 2, below.

**TABLE 2**

| REVISIONS TO CLOMR CROSS SECTIONS | | |
|---|---|---|
| Reach | Cross Section ID / River Sta | Description of Revision |
| East-West Br. | 500 | Section flipped |
| East-West Br. | 400 | Section flipped |
| East-West Br. | 300 | Section flipped |
| East-West Br. | 200 | Section flipped |
| East-West Br. | 100 | Section flipped |
| East-East Br. | 500 | Section flipped |
| East-East Br. | 400 | Section flipped |
| East-East Br. | 300 | Section flipped |
| East-East Br. | 200 | Section flipped |
| East-East Br. | 100 | Section flipped |
| East | 12300 | Section flipped |
| East | 12000 | Section flipped |
| East | 11700 | Section flipped |
| East | 11540 | Section flipped |
| East | 11480 | Section flipped |
| East | 11400 | Section flipped |
| East | 11100 | Section flipped |
| East | 10800 | Section flipped |
| East | 10500 | Section flipped |
| East | 10200 | Section flipped |
| East | 10110 | Section flipped |
| East | 10040 | Section flipped |
| East | 9900 | Section flipped |
| East | 9600 | Section flipped |
| East | 9300 | Section flipped |
| East | 9000 | Section flipped |
| East | 8940 | Section revised per As-Built 95-19705 |
| East | 8939 | Section added to model change in roughness per As-Built 95-19705 |
| East | 8860 | Section revised per As-Built 95-19705 |
| East | 8700 | Section revised per As-Built 95-19705 |
| East | 8400 | Section revised per As-Built 95-19705 |
| East | 8250 | Section added to model per As-Built 95-19705 |
| East | 8200 | Section revised per As-Built 95-19705 |
| East | 8100 | Section revised per As-Built 95-19705 |
| East | 7800 | Section revised per As-Built 95-19705 |
| East | 7500 | Section revised per As-Built 95-19705 |
| East | 7235 | Section revised per As-Built 95-19705 |
| East | 7130 | Section revised per As-Built 95-19705 |
| East | 6900 | Section flipped |
| East | 6600 | Section flipped |
| East | 6300 | Section flipped |
| East | 6250 | Section added to model start of improved channel per As-Built 98-13279 |
| East | 6190 | Section revised per As-Built 98-13279 |
| East | 6000 | Section revised per As-Built 98-13279 |
| East | 5900 | Section added to model transition point in channel per As-Built 98-13279 |
| East | 5830 | Section revised per As-Built 98-13279 |
| East | 5770 | Section revised per As-Built 98-13279 |
| East | 5700 | Section revised per As-Built 98-13279 |

| | | |
|---|---|---|
| East | 5545 | Section added to model transition point in channel per As-Built 98-13279 |
| East | 5530 | Section added to model angle point in channel per As-Built 98-13279 |
| East | 5515 | Section replaced with section at Sta 55+05 |
| East | 5505 | Section added per As-Built 98-13279 |
| East | 5420 | Section added per As-Built 98-13279 |
| East | 5400 | Section replaced with section at Sta 54+20 |
| East | 5350 | Section added per As-Built 98-13279 |
| East | 5100 | Section revised per As-Built 98-13279 |
| East | 4810 | Section added to model change in roughness per As-Built 98-13279 |
| East | 4800 | Section revised per As-Built 98-13279 |
| East | 4500 | Section flipped |
| East | 4450 | Section revised per As-Built 97-10459 |
| East | 4380 | Section revised per As-Built 97-10459 |
| East | 4200 | Section revised per As-Built 97-10459 |
| East | 3900 | Section revised per As-Built 97-10459 |
| East | 3600 | Section revised per As-Built 97-10459 |
| East | 3300 | Section revised per As-Built 97-10459 |
| East | 3000 | Section revised per As-Built 97-10459 |
| East | 2820 | Section revised per As-Built 97-10459 |
| East | 2700 | Section revised per As-Built 01-33428 |
| East | 2470 | Section revised per As-Built 01-33428 |
| East | 2400 | Section revised per As-Built 01-33428 |
| East | 2260 | Section revised per As-Built 01-33428 |
| East | 2100 | Section revised per As-Built 01-33428 |
| East | 2008.56 | Section added to model change in channel geometry per As-Built L1704 |
| East | 1800 | Section revised per As-Built L1704 |
| East | 1799.9 | Section added to model change in channel geometry per As-Built L1704 |
| East | 1641 | Section added per As-built L1704 |
| East | 1640 | Section replaced with section at Sta 16+41 |
| West Branch | 3460 | Section flipped |
| West Branch | 3160 | Section flipped |
| West Branch | 2860 | Section flipped |
| West Branch | 2560 | Section flipped |
| West Branch | 2260 | Section flipped |
| West Branch | 2110 | Section flipped |
| West Branch | 1760 | Section flipped |
| East-Lower | 1640 | Section added per As-built L1704 |
| East-Lower | 1500 | Section added per As-built L1704 |
| East-Lower | 1200 | Section added per As-built L1704 |
| East-Lower | 900 | Section flipped |

In general, flipping cross sections so they are cut left to right looking downstream didn't change mapping or hydraulics. Revising sections with as-built information provided a more comprehensive accounting of improved channel sections and generally resulted in showing a better containment of the unnamed tributary to South Channel.

The unnamed tributary to South Channel consists of reaches of improved and unimproved channel. Because of this, a flow regime of "mixed flow" has been selected in the HEC-RAS model. However, the minimum depth for mapping in natural/earthen sections is critical depth. Therefore, Table 3 has been created to show where critical depth controls in natural/earthen sections. The mapping has been based on the controlling water surface elevations shown below.

## TABLE 3

WATER SURFACE ELEVATIONS USED IN MAPPING
(Min. depth for mapping in natural/earthen sections is critical depth)

| Reach | River Sta | Channel Type | W.S. Elev (ft) | Crit W.S. (ft) | Reach | River Sta | Channel Type | W.S. Elev (ft) | Crit W.S. (ft) |
|---|---|---|---|---|---|---|---|---|---|
| East-West Br. | 500 | Earthen | **2338.9** | 2337.6 | East | 6000 | Lined | **2262.8** | 2262.8 |
| East-West Br. | 400 | Earthen | **2338.3** | 2338.3 | East | 5900 | Lined | **2261.6** | 2262.3 |
| East-West Br. | 300 | Earthen | **2337.2** | 2336.8 | East | 5830 | Lined | **2263.4** | 2259.7 |
| East-West Br. | 200 | Earthen | **2336.5** | 2336.5 | East | 5770 | Lined | **2263.0** | 2263.0 |
| East-West Br. | 100 | Earthen | 2334.8 | **2334.9** | East | 5700 | Lined | **2260.7** | 2260.7 |
| East-East Br. | 500 | Earthen | **2336.6** | 2336.3 | East | 5545 | Lined | **2259.2** | 2260.0 |
| East-East Br. | 400 | Earthen | **2336.1** | 2336.1 | East | 5530 | Lined | **2260.6** | 2258.1 |
| East-East Br. | 300 | Earthen | **2335.3** | 2335.3 | East | 5505 | Lined | **2260.6** | 2257.9 |
| East-East Br. | 200 | Earthen | **2334.7** | 2334.5 | East | 5420 | Lined | **2258.7** | 2258.7 |
| East-East Br. | 100 | Earthen | **2333.8** | 2333.8 | East | 5350 | Lined | **2257.3** | 2257.3 |
| East | 12300 | Earthen | 2333.1 | **2333.4** | East | 5100 | Lined | **2254.5** | 2255.5 |
| East | 12000 | Earthen | **2330.3** | 2330.3 | East | 4810 | Earthen | **2251.8** | 2251.6 |
| East | 11700 | Earthen | **2326.9** | 2326.7 | East | 4800 | Earthen | **2251.6** | 2251.6 |
| East | 11540 | Earthen | **2327.0** | 2325.0 | East | 4500 | Earthen | 2248.4 | **2248.5** |
| East | 11480 | Earthen | **2324.2** | 2324.2 | East | 4450 | Lined | **2240.7** | 2242.4 |
| East | 11400 | Earthen | 2322.9 | **2323.2** | East | 4380 | Lined | **2240.4** | 2241.7 |
| East | 11100 | Earthen | **2320.2** | 2320.2 | East | 4200 | Lined | **2234.4** | 2235.8 |
| East | 10800 | Earthen | **2317.2** | 2317.2 | East | 3900 | Lined | **2236.4** | 2235.1 |
| East | 10500 | Earthen | **2313.8** | 2313.5 | East | 3600 | Lined | **2235.6** | 2235.6 |
| East | 10200 | Earthen | **2311.6** | 2311.6 | East | 3300 | Lined | **2234.3** | 2234.3 |
| East | 10110 | Lined | **2307.9** | 2308.6 | East | 3000 | Lined | **2233.8** | 2233.8 |
| East | 10040 | Lined | **2307.9** | 2308.3 | East | 2820 | Lined | **2233.5** | 2233.5 |
| East | 9900 | Earthen | **2308.1** | 2308.1 | East | 2700 | Lined | **2233.3** | 2233.3 |
| East | 9600 | Earthen | 2305.2 | **2305.3** | East | 2470 | Lined | **2230.7** | 2230.7 |
| East | 9300 | Earthen | 2300.6 | **2300.9** | East | 2400 | Lined | **2229.7** | 2229.9 |
| East | 9000 | Earthen | **2298.8** | 2298.7 | East | 2260 | Lined | **2228.0** | 2228.1 |
| East | 8940 | Lined | **2298.1** | 2297.8 | East | 2100 | Lined | **2226.7** | 2227.1 |
| East | 8939 | Lined | **2297.8** | 2297.8 | East | 2008.56 | Lined | **2225.9** | 2226.4 |
| East | 8860 | Lined | **2293.1** | 2294.0 | East | 1800 | Lined | **2219.1** | 2220.7 |
| East | 8700 | Lined | **2292.5** | 2292.8 | East | 1799.9 | Lined | **2219.5** | 2221.1 |
| East | 8400 | Lined | **2284.9** | 2286.9 | East | 1641 | Lined | **2219.1** | 2219.7 |
| East | 8250 | Lined | **2280.7** | 2282.7 | West Branch | 3460 | Lined | **2236.0** | 2236.2 |
| East | 8200 | Lined | **2283.4** | 2279.9 | West Branch | 3160 | Lined | **2232.9** | 2232.9 |
| East | 8100 | Lined | **2282.0** | 2282.0 | West Branch | 2860 | Lined | **2231.4** | 2231.4 |
| East | 7800 | Lined | **2280.1** | 2280.1 | West Branch | 2560 | Lined | **2229.4** | 2229.4 |
| East | 7500 | Lined | **2278.2** | 2278.8 | West Branch | 2260 | Lined | **2227.6** | 2227.4 |
| East | 7235 | Lined | **2278.0** | 2275.7 | West Branch | 2110 | Lined | **2226.9** | 2226.9 |
| East | 7130 | Lined | **2274.6** | 2275.4 | West Branch | 1760 | Lined | **2224.4** | 2224.5 |
| East | 6900 | Earthen | **2274.2** | 2274.2 | East-Lower | 1640 | Earthen | **2220.4** | 2220.4 |
| East | 6600 | Earthen | 2270.8 | **2270.9** | East-Lower | 1500 | Earthen | **2221.1** | 2219.1 |
| East | 6300 | Earthen | **2267.9** | 2267.9 | East-Lower | 1200 | Earthen | **2219.6** | 2219.6 |
| East | 6250 | Lined | **2264.8** | 2262.3 | East-Lower | 900 | Earthen | 2217.4 | **2217.5** |
| East | 6190 | Lined | **2264.6** | 2264.6 | East-Lower | 800 | Earthen | 2216.5 | **2216.6** |

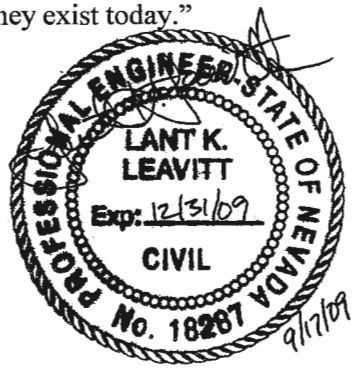
**Required Data Bullet #8:**

As-built plans, certified by a registered professional engineer, of all the existing culverts along the unnamed tributary to South Channel from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue.

**Response to #8:**

The existing culverts along the unnamed tributary to South Channel have been surveyed and as-built plans prepared to certify their size and location. See Appendix C for culvert as-built plans.

"I hereby certify in accordance with 44CFR at Part 65.2 that Figures 1 through 9 in Appendix C depict the results of field survey for existing culverts on the unnamed tributary to the South Channel and they represent conditions on the ground as they exist today."




Revised maps and hydraulic modeling results have been included with this letter in Appendices A and B. Revised FEMA MT-2 Forms have been included for the tributary to Duck Creek South Channel following this cover letter. If you have any questions or require additional information, please feel free to contact me.

Sincerely,

Lant Leavitt, P.E., CFM
VTN Nevada
2727 South Rainbow Boulevard
Las Vegas, NV 89146
lantl@vtnnv.com
(702) 253-2389



# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA LETTER OF MAP REVISION APPLICATION

# November 2008 FEMA Response to CLOMR Request

# Federal Emergency Management Agency

Washington, D.C. 20472

**November 5, 2008**

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 07-09-1205R

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

Community: Clark County, NV
Community No.: 320003

104

Dear Mr. Reid:

This responds to a request that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) comment on the effects that a proposed project would have on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated April 25, 2007, Mr. Kevin Eubanks, P.E., CFM, Assistant General Manager, Clark County Regional Flood Control District, requested that FEMA evaluate the effects that updated topographic information and existing facilities, including channelization and reinforced-concrete box culverts (RCBs), along Duck Creek South Channel (South Channel) from just upstream of the Lower Duck Creek Detention Basin to just downstream of the confluence with Duck Creek; an unnamed tributary to South Channel from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue; and a proposed project, including channelization and RCBs, along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard, and along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard, would have on the flood hazard information shown on the effective FIRM and FIS report.

All data required to complete our review of this request for a Conditional Letter of Map Revision (CLOMR) were submitted with letters from Mr. Daniel Bender, P.E., and Mr. Lant Leavitt, P.E., both with VTN Nevada, and Mr. Eubanks.

We reviewed the submitted data and the data used to prepare the effective FIRM for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. The existing conditions HEC-RAS hydraulic computer model submitted as part of a Letter of Map Revision (Case No. 07-09-0831P), effective October 14, 2008, was used as the base conditions model in our review of the proposed conditions model for this CLOMR request. We believe that, if the proposed project is constructed as shown on the plans entitled "2005 Improvement Plans for Duck Creek Channel Phase II – Las Vegas Boulevard to Silverado Ranch Boulevard," prepared by VTN Nevada, dated March 30, 2006, and the data listed below are received, a revision to the FIRM would be warranted.

**Duck Creek**

As a result of the updated topographic information and proposed project, the elevations of the base (1-percent-annual-chance) flood for Duck Creek will decrease compared to the effective Base Flood Elevations (BFEs) from just downstream of Silverado Ranch Boulevard to just downstream of

Las Vegas Boulevard. The maximum decrease in BFE, 10.4 feet, will occur approximately 200 feet upstream of Jo Rae Avenue.

As a result of the updated topographic information and proposed project, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, will decrease compared to the effective SFHA width along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard. The maximum decrease in SFHA width, approximately 900 feet, will occur approximately 100 feet upstream of Le Baron Avenue. The entire base flood will be contained in the proposed channel and culverts from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard.

As a result of the updated topographic information and proposed project, the width of the regulatory floodway will increase in some areas and decrease in other areas compared to the effective floodway width along Duck Creek from just downstream of Silverado Ranch Boulevard to just downstream of Las Vegas Boulevard. The maximum increase in floodway width, approximately 100 feet, will occur approximately 100 feet upstream of Pyle Avenue. The maximum decrease in floodway width, approximately 300 feet, will occur approximately 300 feet downstream of Jo Rae Avenue.

**Duck Creek Tributary**

As a result of the updated topographic information and proposed project, the BFEs for Duck Creek Tributary will decrease compared to the effective BFEs from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in BFE, 10.1 feet, will occur just upstream of Jo Rae Avenue.

As a result of the updated topographic information and proposed project, the width of the SFHA will decrease compared to the effective SFHA width along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in SFHA width, approximately 600 feet, will occur approximately 200 feet upstream of Giles Street. The entire base flood will be contained in the proposed channel and culverts from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard.

As a result of the updated topographic information and proposed project, the width of the regulatory floodway will decrease compared to the effective floodway width along Duck Creek Tributary from just upstream of the confluence with Duck Creek to just downstream of Las Vegas Boulevard. The maximum decrease in floodway width, approximately 300 feet, will occur approximately 100 feet downstream of Giles Street.

**Duck Creek South Channel**

As a result of the updated topographic information and proposed project, the BFEs for South Channel will decrease compared to the effective BFEs from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue. The maximum decrease in BFE, 3.0 feet, will occur approximately 100 feet downstream of Silverado Ranch Boulevard.

As a result of the updated topographic information and proposed project, the width of the SFHA will increase in some areas and decrease in other areas compared to the effective SFHA width along South Channel from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue. The maximum increase in SFHA width, approximately 200 feet, will occur approximately 100 feet downstream of Silverado Ranch Boulevard. The maximum decrease in SFHA

width, approximately 600 feet, will occur approximately 500 feet upstream of Gilespie Street. In addition, an unnamed tributary to South Channel was added from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue. An unnamed tributary to South Channel was removed from just upstream of Silverado Ranch Boulevard to approximately 300 feet upstream of Frias Avenue.

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

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

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

  Form 2, entitled "Riverine Hydrology & Hydraulics Form"

  Form 3, entitled "Riverine Structures Form"

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

- Effective October 1, 2007, FEMA revised the fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps. In accordance with this schedule, the current fee for this map revision request is $4,800 and must be received before we can begin processing the request. Please note, however, that the fee schedule is subject to change, and requesters are required to submit the fee in effect at the time of the submittal. Payment of this fee shall be made in the form of a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). The payment, along with the revision application, must be forwarded to the following address:

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

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

- Community acknowledgment of the map revision request

- A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a statement by your community that it has notified all affected property owners and affected adjacent jurisdictions

- A revised conditions hydraulic analysis of the regulatory floodway for South Channel from just upstream of the Lower Duck Creek Detention Basin to just downstream of Le Baron Avenue, together with a topographic work map showing the revised floodplain and floodway boundaries

- As-built plans, certified by a registered professional engineer, of all existing culverts along the unnamed tributary to South Channel from approximately 100 feet upstream of Silverado Ranch Boulevard to just downstream of Starr Avenue

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the BFEs would change as a result of the project, a 90-day appeal period would be initiated, during which community officials and interested persons may appeal the revised BFEs based on scientific or technical data.

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

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

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

Sincerely,

Joshua A. Smith

Joshua A. Smith, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

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

Enclosures

cc: (See attached list.)

Courtesy Copies List – Clark County, NV

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

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

Mr. Daniel Bender, P.E.
VTN Nevada

Mr. Lant Leavitt, P.E.
VTN Nevada

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA LETTER OF MAP REVISION APPLICATION

# FEMA Forms

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# OVERVIEW & CONCURRENCE FORM

*O.M.B No. 1660-0016*
*Expires: 12/31/2010*

## 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 44 CFR Ch. 1, Parts 60, 65 & 72)

## B. OVERVIEW

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

| Community No. | Community Name | State | Map No. | Panel No. | Effective Date |
|---|---|---|---|---|---|
| Ex: 480301 | City of Katy | TX | 480301 | 0005D | 02/08/83 |
| 480287 | Harris County | TX | 48201C | 0220G | 09/28/90 |
| 320003 | Clark County | NV | 320003 | 2568 | 10/14/08 |
| | | | | | |

2. a. Flooding Source: Duck Creek and Duck Creek Tributary

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

3. Project Name/Identifier: Duck Creek Channel

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

5. Basis for Request and Type of Revision:

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

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

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

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

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

## 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/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

## D. SIGNATURE

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

| | | |
|---|---|---|
| Name: Lant Leavitt, P.E. | Company: VTN Nevada | |
| Mailing Address:<br>2727 S. Rainbow Blvd.<br>Las Vegas, NV 89146 | Daytime Telephone No.: (702) 247-4020 | Fax No.: (702) 253-2397 |
| | E-Mail Address: lantl@vtnnv.com | |
| Signature of Requester (required): | Date: 9/15/09 | |

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: Layne Weber, P.E., Principal Engineer | Community Name: Clark County | |
| Mailing Address:<br>500 S. Grand Central Parkway, 1st Floor<br>Las Vegas, NV 89155 | Daytime Telephone No.: (702) 455-6050 | Fax No.: (702) 388-5810 |
| | E-Mail Address: wlweber@co.clark.nv.us | |
| Community Official's Signature (required): | Date: | |

### CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

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

| | | |
|---|---|---|
| Certifier's Name: Lant Leavitt, P.E. | License No.: 18287 | Expiration Date: 12/31/09 |
| Company Name: VTN Nevada | Telephone No.: (702) 247-4020 | Fax No.: (702) 253-2397 |
| Signature: | | Date: 9/15/09 |

**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: 12/31/2010*

## 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: Duck Creek South Channel Tributary
**Note:** Fill out one form for each flooding source studied

## A. HYDROLOGY

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

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

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

| Location | Drainage Area (Sq. Mi.) | Effective/FIS (cfs) | Revised (cfs) |
|---|---|---|---|
| West Branch | 1.15 | N/A | 789 |
| East Branch | 5.57 | N/A | 1338 |
| Lower Branch | 6.73 | N/A | 1931 |

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

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1
☐ Regional Regression Equations ☐ Other (please attach description)

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

4. Review/Approval of Analysis

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

5. Impacts of Sediment Transport on Hydrology

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 | Silverado Pines LOMR | 8+00 | 2216.8 | 2216.6 |
| Upstream Limit | Starr Avenue | "EW" 5+00 | N/A | 2338.9 |
| | Starr Avenue | "EE" 5+00 | N/A | 2336.6 |

2. Hydraulic Method/Model Used

HEC-RAS

## 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 may help 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/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

| 4. Models Submitted | Natural Run | | Floodway Run | | Datum |
|---|---|---|---|---|---|
| Duplicate Effective Model* | File Name: SPU3LOMR | Plan Name: Plan 10 | File Name: SPU3LOMR | Plan Name: Plan 10 | NAVD88 |
| Corrected Effective Model* | File Name: | Plan Name: | File Name: | Plan Name: | _____ |
| Existing or Pre-Project Conditions Model | File Name: | Plan Name: | File Name: | Plan Name: | _____ |
| Revised or Post-Project Conditions Model | File Name: DCLOMR | Plan Name: Plan 01 | File Name: DCLOMR | Plan Name: Plan 01 | NAVD88 |
| Other - (attach description) | File Name: | Plan Name: | File Name: | Plan Name: | _____ |

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

☒ Digital Models Submitted? (Required)

## C. MAPPING REQUIREMENTS

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

☒ Digital Mapping (GIS/CADD) Data Submitted

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 (Required)

## D. COMMON REGULATORY REQUIREMENTS*

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

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
   - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. 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.

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/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you 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.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
*Expires: 12/31/2010*

## 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: Duck Creek South Channel Tributary
**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/Basin .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport .....complete Section F (if required)

Description Of Structure

**1. Name of Structure: 2-16'x4' RCB**

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

Location of Structure: Silverado Ranch Blvd.

Downstream Limit/Cross Section: 16+41

Upstream Limit/Cross Section: 17+99.9

**2. Name of Structure: 35' Base 2:1 SS Conc. Channel**

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

Location of Structure: Silverado Ranch Blvd.

Downstream Limit/Cross Section: 18+00

Upstream Limit/Cross Section: 21+00

**3. Name of Structure: 4-8'x5' RCB**

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

Location of Structure: 44+15

Downstream Limit/Cross Section: 43+80

Upstream Limit/Cross Section: 44+50

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

## B. CHANNELIZATION

Flooding Source: Duck Creek South Channel Tributary

Name of Structure: 35' Base 2:1 SS Conc. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/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 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):

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: Duck Creek South Channel Tributary

Name of Structure: 2-16'x4' RCB

1. This revision reflects (check one):

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

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

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

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
*Expires: 12/31/2010*

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Flooding Source: Duck Creek South Channel Tributary
**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/Basin .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport .....complete Section F (if required)

Description Of Structure

**1. Name of Structure: 12' Conc. Base 2:1 SS Channel**

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

Location of Structure: Silverado Ranch Blvd.

Downstream Limit/Cross Section: 51+00

Upstream Limit/Cross Section: 54+20

**2. Name of Structure: 3-8'x4' RCB**

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

Location of Structure: 54+62.50

Downstream Limit/Cross Section: 54+20

Upstream Limit/Cross Section: 55+05

**3. Name of Structure: 12' Conc. Base 2:1 SS Channel**

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

Location of Structure: Frias Ave.

Downstream Limit/Cross Section: 55+05

Upstream Limit/Cross Section: 57+70

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

## B. CHANNELIZATION

Flooding Source: Duck Creek South Channel Tributary

Name of Structure: 12' Conc. Base 2:1 SS Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/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 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):

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: Duck Creek South Channel Tributary

Name of Structure: 3-8'x4' RCB

1. This revision reflects (check one):

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

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

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

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
*Expires: 12/31/2010*

## PAPERWORK REDUCTION ACT

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Flooding Source: Duck Creek South Channel Tributary
**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/Basin.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

**1. Name of Structure: 12' Conc. Base 2:1 SS Channel**

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

Location of Structure: Frias Ave.

Downstream Limit/Cross Section: 51+00

Upstream Limit/Cross Section: 62+50

**2. Name of Structure: 3-8'x4' RCB**

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

Location of Structure: 54+62.50

Downstream Limit/Cross Section: 54+20

Upstream Limit/Cross Section: 55+05

**3. Name of Structure: 2-10'x4' RCB**

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

Location of Structure: Frias Ave.

Downstream Limit/Cross Section: 57+70

Upstream Limit/Cross Section: 58+30

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

## B. CHANNELIZATION

Flooding Source: Duck Creek South Channel Tributary

Name of Structure: 12' Conc. Base 2:1 SS Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/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 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):

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: Duck Creek South Channel Tributary

Name of Structure: 3-8'x4' RCB

1. This revision reflects (check one):

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

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

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

- ☒ Dimensions (height, width, span, radius, length)
- ☒ 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 [Attach Section D (Dam/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: Duck Creek South Channel Tributary

Name of Structure: 2-10'x4' RCB

1. This revision reflects (check one):

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

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

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

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
*Expires: 12/31/2010*

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Flooding Source: Duck Creek South Channel Tributary
**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/Basin .....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport .....complete Section F (if required)

Description Of Structure

**1. Name of Structure: 2-18'x4' Arch Culverts**

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

Location of Structure: Cactus Ave.

Downstream Limit/Cross Section: 71+30

Upstream Limit/Cross Section: 72+35

**2. Name of Structure: 10' Base 2:1 SS Conc. Channel**

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

Location of Structure: Between Irvin Ave. and Cactus Ave.

Downstream Limit/Cross Section: 72+35

Upstream Limit/Cross Section: 88+60

**3. Name of Structure: 2-18'x4' Arch Culverts**

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

Location of Structure: 81+50

Downstream Limit/Cross Section: 81+00

Upstream Limit/Cross Section: 82+00

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

## B. CHANNELIZATION

Flooding Source: Duck Creek South Channel Tributary

Name of Structure: 10' Base 2:1 SS Conc. Channel

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/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 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):

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: Duck Creek South Channel Tributary

Name of Structure: 2-18'x4' Arch Culverts

1. This revision reflects (check one):

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

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

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

- ☒ Dimensions (height, width, span, radius, length)
- ☒ 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 [Attach Section D (Dam/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: Duck Creek South Channel Tributary

Name of Structure: 2-18'x4' Arch Culverts

1. This revision reflects (check one):

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

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

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

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
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Flooding Source: Duck Creek South Channel Tributary
**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/Basin ..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport ..... complete Section F (if required)

Description Of Structure

**1. Name of Structure: 18-4'x3' RCBs**

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

Location of Structure: Erie Ave.

Downstream Limit/Cross Section: 100+40

Upstream Limit/Cross Section: 101+10

**2. Name of Structure: 2-18" RCPs**

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

Location of Structure: Between Irvin Ave. and Cactus Ave.

Downstream Limit/Cross Section: 72+35

Upstream Limit/Cross Section: 88+60

**3. Name of Structure:**

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

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

## 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 [Attach Section D (Dam/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: Duck Creek South Channel Tributary

Name of Structure: 18-4'x3' RCBs

1. This revision reflects (check one):

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

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

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

- ☒ Dimensions (height, width, span, radius, length)
- ☒ 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 [Attach Section D (Dam/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: Duck Creek South Channel Tributary

Name of Structure: 2-18" RCPs

1. This revision reflects (check one):

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

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

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

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

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

## FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX A

# Maps

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX **A.2**

# Annotated Flood Zone Map

**LEGEND**

- POST PROJECT ZONE AE FLOODPLAIN
- POST PROJECT ZONE AE FLOODWAY
- 100-YR FLOOD CONTAINMENT IN CULVERT
- POST PROJECT ZONE A FLOODPLAIN
- EXISTING FLOOD ZONE
- AREA REMOVED FROM EXISTING FLOOD ZONE
- EXISTING FLOODWAY TO REMAIN
- EXISTING SUBBASIN BOUNDARY
- D4B-4 SUBBASIN NAME

NORTH

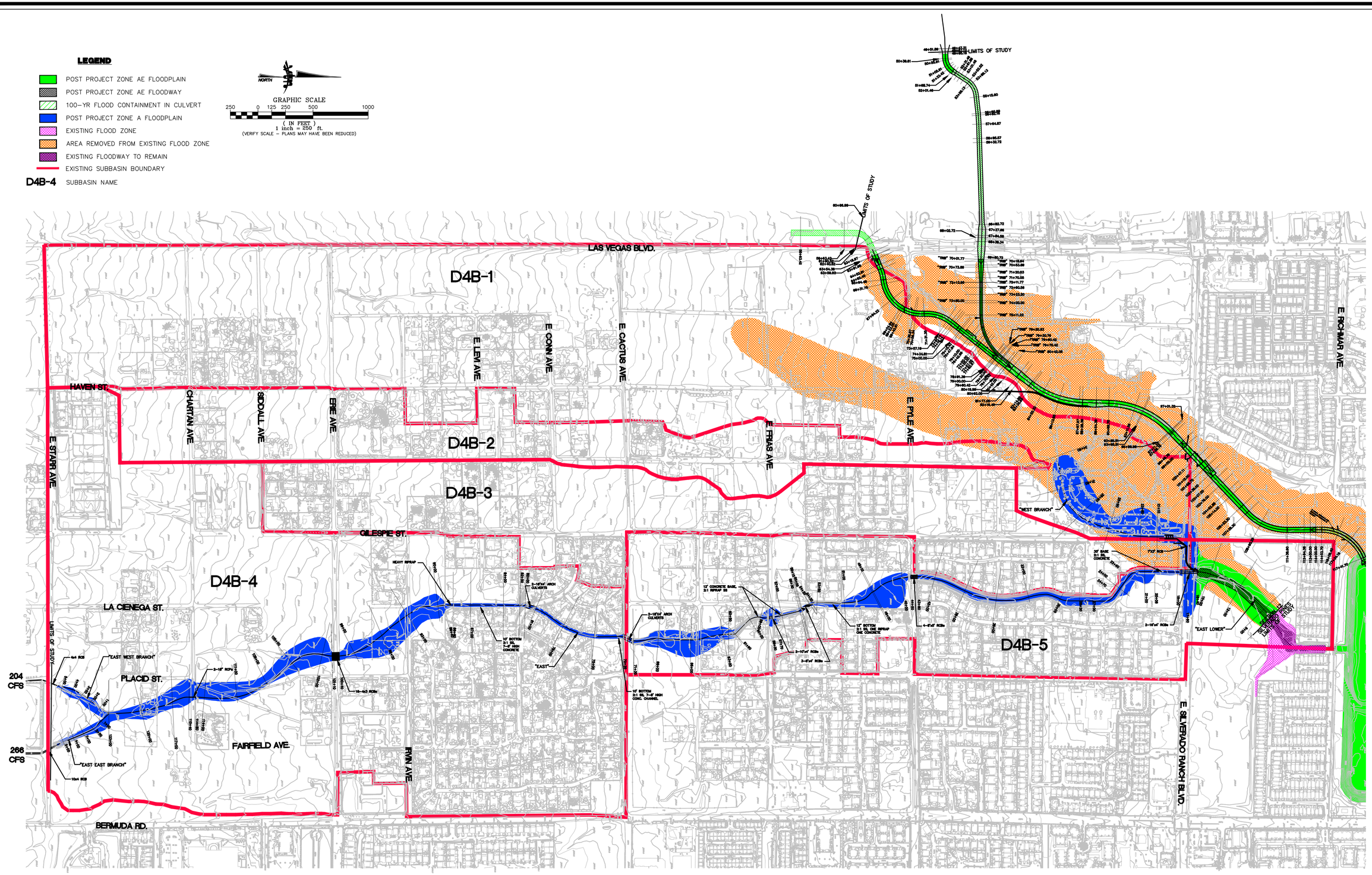
GRAPHIC SCALE

250 0 125 250 500 1000

( IN FEET )

1 inch = 250 ft.

(VERIFY SCALE – PLANS MAY HAVE BEEN REDUCED)




IMPERIAL ENGINEER - STATE OF NEVADA
LANT V. LEAVITT
EXP. 12/31/09
CIVIL
No. 10157

vtn nevada

# DUCK CREEK
# LOMR
# POST PROJECT WORK MAP

Fig. 1

# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX **A.1**

# Post-Project Work Map

vtn

## LEGEND

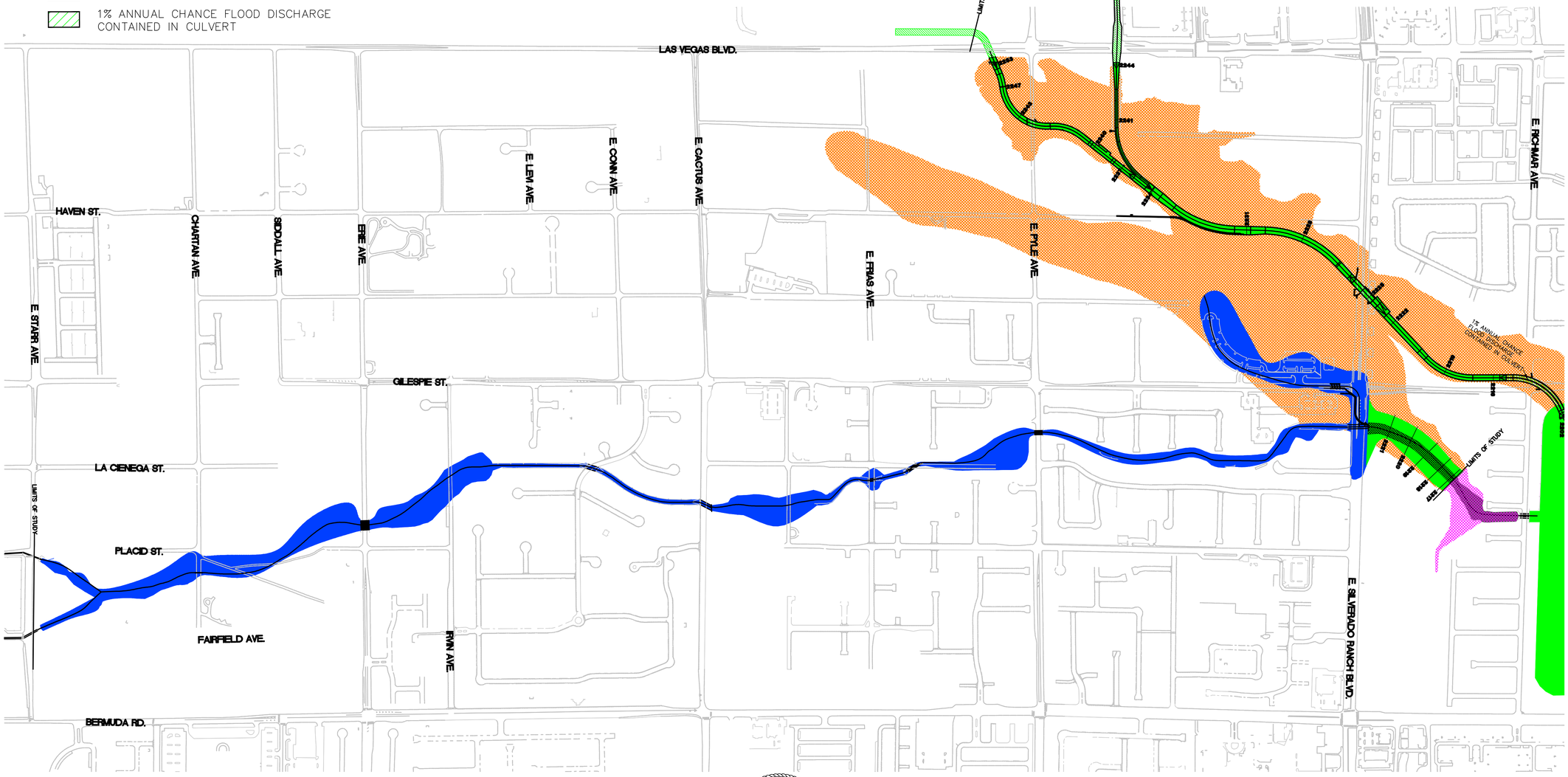
- 2216 — BASE FLOOD ELEVATION LINE & VALUE; ELEVATION IN FEET
- ZONE AE FLOODPLAIN
- POST PROJECT ZONE AE FLOODWAY
- ZONE A FLOOD LAIN
- AREA TO BE REMOVED FROM EXISTING FLOOD ZONE
- EXISTING FLOODPLAIN TO REMAIN
- EXISTING FLOODWAY TO REMAIN
- 1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

( IN FEET )
1 inch = 400 ft.
(VERIFY SCALE – PLANS MAY HAVE BEEN REDUCED)




### PANEL 2910 OF 4090

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2910 | E |
| HENDERSON, CITY OF | 320005 | 2910 | E |

MAP NUMBER 32003C2910E

### PANEL 2568 OF 4090

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CLARK COUNTY, UNINCORPORATED AREAS | 320003 | 2568 | E |

MAP NUMBER 32003C2568E

PROFESSIONAL ENGINEER-STATE OF NEVADA
LANT K. LEAVITT
EXP. 12/31/09
CIVIL
No. 18257

vtm nevada

# DUCK CREEK
# LOMR
# ANNOTATED FLOOD ZONE MAP

Fig. 2

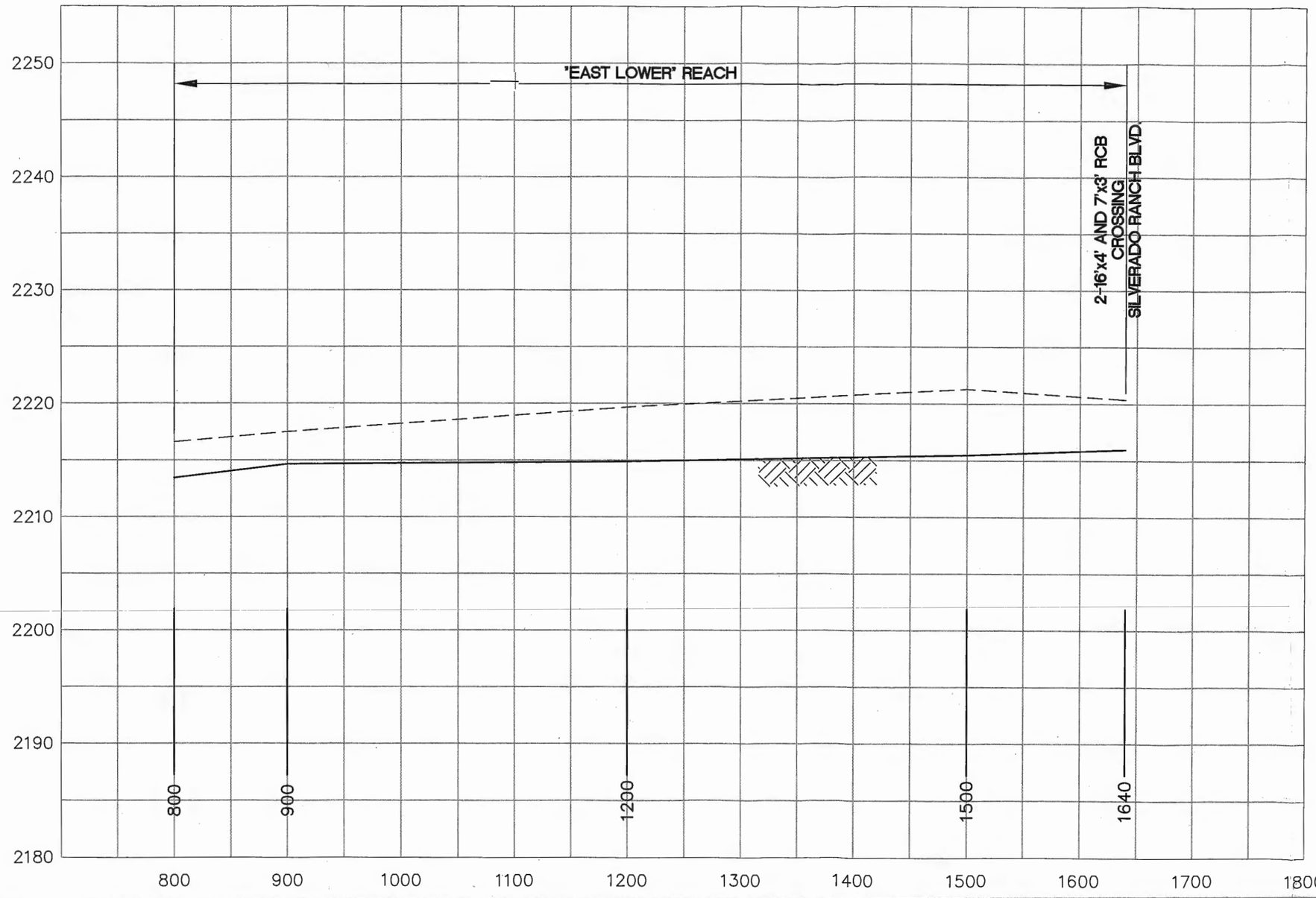
# DUCK CREEK CHANNEL

## LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN

FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX A.3

# Flood Profile




**LEGEND**

- 100 YEAR FLOOD
- STREAM BED
- 800 — CROSS SECTION LOCATION


CONSULTING ENGINEERS • PLANNERS • LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89146-5148 PHONE (702) 873-7550 FAX (702) 362-2597


| REV | DATE | BY | REVISION |
|---|---|---|---|

TITLE: DUCK CREEK LOMR

PROJECT: FLOOD PROFILE
UNNAMED WASH

SEAL
LANT K. LEAVITT
EXP. 12/31/09
CIVIL
No. 18287
7/16/09

| | |
|---|---|
| WO NO. | 6657 |
| BY | JLB |
| DATE | 08/21/09 |
| SCALE HORIZ. VERT. | |
| SHEET | FIG. 3 |

# DUCK CREEK CHANNEL

LAS VEGAS BLVD. TO
LOWER DUCK CREEK DETENTION BASIN

FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX B

## Post Project
## HEC-RAS Output

VTN

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| East-West Branch | 500 | PF 1 | 204 | 2336 | 2338.93 | 2337.63 | 2339.09 | 0.001054 | 3.21 | 63.6 | 28.4 | 0.38 |
| East-West Branch | 500 | PF 2 | 204 | 2336 | 2338.93 | 2337.63 | 2339.09 | 0.001054 | 3.21 | 63.6 | 28.4 | 0.38 |
| East-West Branch | 400 | PF 1 | 204 | 2335.25 | 2338.31 | 2338.31 | 2338.82 | 0.009609 | 5.74 | 35.53 | 34.54 | 1 |
| East-West Branch | 400 | PF 2 | 204 | 2335.25 | 2338.31 | 2338.31 | 2338.82 | 0.009609 | 5.74 | 35.53 | 34.54 | 1 |
| East-West Branch | 300 | PF 1 | 204 | 2334.49 | 2337.22 | 2336.82 | 2337.49 | 0.004202 | 4.15 | 49.21 | 41.28 | 0.67 |
| East-West Branch | 300 | PF 2 | 204 | 2334.49 | 2337.22 | 2336.82 | 2337.49 | 0.004202 | 4.15 | 49.21 | 41.28 | 0.67 |
| East-West Branch | 200 | PF 1 | 204 | 2333.74 | 2336.54 | 2336.54 | 2336.81 | 0.0128 | 4.18 | 48.8 | 96.67 | 1.04 |
| East-West Branch | 200 | PF 2 | 204 | 2333.74 | 2336.54 | 2336.54 | 2336.81 | 0.0128 | 4.18 | 48.8 | 96.67 | 1.04 |
| East-West Branch | 100 | PF 1 | 204 | 2332.98 | 2334.83 | 2334.94 | 2335.32 | 0.016924 | 5.62 | 36.29 | 58.08 | 1.25 |
| East-West Branch | 100 | PF 2 | 204 | 2332.98 | 2334.83 | 2334.94 | 2335.32 | 0.016924 | 5.62 | 36.29 | 58.08 | 1.25 |
| East-East Branch | 500 | PF 1 | 266 | 2335 | 2336.62 | 2336.3 | 2336.94 | 0.00394 | 4.52 | 59 | 45.85 | 0.69 |
| East-East Branch | 500 | PF 2 | 266 | 2335 | 2336.62 | 2336.3 | 2336.94 | 0.00394 | 4.52 | 59 | 45.85 | 0.69 |
| East-East Branch | 400 | PF 1 | 266 | 2334.39 | 2336.1 | | 2336.48 | 0.005217 | 4.95 | 53.72 | 43.11 | 0.78 |
| East-East Branch | 400 | PF 2 | 266 | 2334.39 | 2336.1 | | 2336.48 | 0.005217 | 4.95 | 53.72 | 43.11 | 0.78 |
| East-East Branch | 300 | PF 1 | 266 | 2333.77 | 2335.28 | 2335.28 | 2335.78 | 0.009492 | 5.65 | 47.11 | 48.76 | 1.01 |
| East-East Branch | 300 | PF 2 | 266 | 2333.77 | 2335.28 | 2335.28 | 2335.78 | 0.009492 | 5.65 | 47.11 | 48.76 | 1.01 |
| East-East Branch | 200 | PF 1 | 266 | 2333.16 | 2334.65 | 2334.49 | 2334.92 | 0.006255 | 4.18 | 63.7 | 75.95 | 0.8 |
| East-East Branch | 200 | PF 2 | 266 | 2333.16 | 2334.65 | 2334.49 | 2334.92 | 0.006255 | 4.18 | 63.7 | 75.95 | 0.8 |
| East-East Branch | 100 | PF 1 | 266 | 2332.54 | 2333.78 | 2333.78 | 2334.1 | 0.011072 | 4.54 | 58.62 | 94.76 | 1.02 |
| East-East Branch | 100 | PF 2 | 266 | 2332.54 | 2333.78 | 2333.78 | 2334.1 | 0.011072 | 4.54 | 58.62 | 94.76 | 1.02 |
| East | 12300 | PF 1 | 464 | 2332 | 2333.13 | 2333.42 | 2334.04 | 0.029591 | 7.64 | 60.76 | 93.97 | 1.67 |
| East | 12300 | PF 2 | 464 | 2332 | 2333.13 | 2333.42 | 2334.04 | 0.029591 | 7.64 | 60.76 | 93.97 | 1.67 |
| East | 12000 | PF 1 | 464 | 2328.89 | 2330.26 | 2330.26 | 2330.63 | 0.010444 | 4.84 | 95.85 | 134.69 | 1.01 |
| East | 12000 | PF 2 | 464 | 2328.89 | 2330.26 | 2330.26 | 2330.63 | 0.010444 | 4.84 | 95.85 | 134.69 | 1.01 |
| East | 11700 | PF 1 | 464 | 2325.53 | 2326.89 | 2326.7 | 2327.07 | 0.004798 | 3.44 | 135.06 | 177.1 | 0.69 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 11700 | PF 2 | 464 | 2325.53 | 2326.89 | 2326.7 | 2327.07 | 0.004798 | 3.44 | 135.06 | 177.1 | 0.69 |
| East | 11640 | PF 1 | 464 | 2322.9 | 2326.98 | 2324.99 | 2327 | 0.000045 | 1.03 | 448.64 | 230.97 | 0.13 |
| East | 11540 | PF 2 | 464 | 2322.9 | 2326.98 | 2324.99 | 2327 | 0.000045 | 1.03 | 448.64 | 230.97 | 0.13 |
| East | 11510 | | Culvert | | | | | | | | | |
| East | 11480 | PF 1 | 464 | 2322 | 2324.2 | 2324.2 | 2324.58 | 0.003674 | 4.95 | 93.72 | 124.78 | 1.01 |
| East | 11480 | PF 2 | 464 | 2322 | 2324.2 | 2324.2 | 2324.58 | 0.003674 | 4.95 | 93.72 | 124.78 | 1.01 |
| East | 11400 | PF 1 | 464 | 2321.9 | 2322.89 | 2323.16 | 2323.8 | 0.046437 | 7.66 | 60.6 | 131.05 | 1.98 |
| East | 11400 | PF 2 | 464 | 2321.9 | 2322.89 | 2323.16 | 2323.8 | 0.046437 | 7.66 | 60.6 | 131.05 | 1.98 |
| East | 11100 | PF 1 | 464 | 2318.24 | 2320.21 | 2320.17 | 2320.49 | 0.008778 | 4.27 | 108.72 | 161.92 | 0.92 |
| East | 11100 | PF 2 | 464 | 2318.24 | 2320.21 | 2320.17 | 2320.49 | 0.008778 | 4.27 | 108.72 | 161.92 | 0.92 |
| East | 10800 | PF 1 | 464 | 2314.36 | 2317.22 | 2317.22 | 2317.74 | 0.009437 | 5.82 | 79.67 | 78.2 | 1.02 |
| East | 10800 | PF 2 | 464 | 2314.36 | 2317.22 | 2317.22 | 2317.74 | 0.009437 | 5.82 | 79.67 | 78.2 | 1.02 |
| East | 10500 | PF 1 | 464 | 2312 | 2313.84 | 2313.46 | 2313.99 | 0.003119 | 3.24 | 147.09 | 159.83 | 0.58 |
| East | 10500 | PF 2 | 464 | 2312 | 2313.84 | 2313.46 | 2313.99 | 0.003119 | 3.24 | 147.09 | 159.83 | 0.58 |
| East | 10200 | PF 1 | 1008 | 2310 | 2311.59 | 2311.59 | 2312.03 | 0.009818 | 5.3 | 190.14 | 222.61 | 1.01 |
| East | 10200 | PF 2 | 1008 | 2310 | 2311.59 | 2311.59 | 2312.03 | 0.009818 | 5.3 | 190.14 | 222.61 | 1.01 |
| East | 10110 | PF 1 | 1008 | 2307 | 2307.86 | 2308.58 | 2310.55 | 0.022077 | 13.15 | 76.64 | 89 | 2.5 |
| East | 10110 | PF 2 | 1008 | 2307 | 2307.86 | 2308.58 | 2310.55 | 0.022077 | 13.15 | 76.64 | 89 | 2.5 |
| East | 10075 | | Bridge | | | | | | | | | |
| East | 10040 | PF 1 | 1008 | 2306.7 | 2307.85 | 2308.28 | 2309.36 | 0.008568 | 9.88 | 102.06 | 89 | 1.63 |
| East | 10040 | PF 2 | 1008 | 2306.7 | 2307.85 | 2308.28 | 2309.36 | 0.008568 | 9.88 | 102.06 | 89 | 1.63 |
| East | 9900 | PF 1 | 1008 | 2306 | 2308.06 | 2308.06 | 2308.63 | 0.009019 | 6.01 | 167.79 | 158.44 | 1.01 |
| East | 9900 | PF 2 | 1008 | 2306 | 2308.06 | 2308.06 | 2308.63 | 0.009019 | 6.01 | 167.79 | 158.44 | 1.01 |
| East | 9600 | PF 1 | 1008 | 2303.81 | 2305.23 | 2305.25 | 2305.68 | 0.010431 | 5.39 | 187.14 | 223.88 | 1.04 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 9600 | PF 2 | 1008 | 2303.81 | 2305.23 | 2305.25 | 2305.68 | 0.010431 | 5.39 | 187.14 | 223.88 | 1.04 |
| East | 9300 | PF 1 | 1008 | 2299.18 | 2300.64 | 2300.85 | 2301.4 | 0.020334 | 6.98 | 144.36 | 193.03 | 1.42 |
| East | 9300 | PF 2 | 1008 | 2299.18 | 2300.64 | 2300.85 | 2301.4 | 0.020334 | 6.98 | 144.36 | 193.03 | 1.42 |
| East | 9000 | PF 1 | 1008 | 2295.39 | 2298.76 | 2298.72 | 2299.16 | 0.008175 | 5.03 | 200.54 | 221.34 | 0.93 |
| East | 9000 | PF 2 | 1008 | 2295.39 | 2298.76 | 2298.72 | 2299.16 | 0.008175 | 5.03 | 200.54 | 221.34 | 0.93 |
| East | 8940 | PF 1 | 1008 | 2295.5 | 2298.07 | 2297.84 | 2298.74 | 0.005295 | 6.56 | 153.55 | 80.01 | 0.84 |
| East | 8940 | PF 2 | 1008 | 2295.5 | 2298.07 | 2297.84 | 2298.74 | 0.005295 | 6.56 | 153.55 | 80.01 | 0.84 |
| East | 8939 | PF 1 | 1008 | 2295.5 | 2297.84 | 2297.84 | 2298.7 | 0.024972 | 7.46 | 135.21 | 80 | 1.01 |
| East | 8939 | PF 2 | 1008 | 2295.5 | 2297.84 | 2297.84 | 2298.7 | 0.024972 | 7.46 | 135.21 | 80 | 1.01 |
| East | 8860 | PF 1 | 1008 | 2289.1 | 2293.13 | 2293.96 | 2295.93 | 0.0446 | 13.43 | 75.06 | 27.27 | 1.43 |
| East | 8860 | PF 2 | 1008 | 2289.1 | 2293.13 | 2293.96 | 2295.93 | 0.0446 | 13.43 | 75.06 | 27.27 | 1.43 |
| East | 8700 | PF 1 | 1008 | 2287.9 | 2292.47 | 2292.75 | 2294.43 | 0.00315 | 11.21 | 89.88 | 29.32 | 1.13 |
| East | 8700 | PF 2 | 1008 | 2287.9 | 2292.47 | 2292.75 | 2294.43 | 0.00315 | 11.21 | 89.88 | 29.32 | 1.13 |
| East | 8400 | PF 1 | 1008 | 2282 | 2284.91 | 2286.85 | 2292.01 | 0.018688 | 21.39 | 47.12 | 22.45 | 2.6 |
| East | 8400 | PF 2 | 1008 | 2282 | 2284.91 | 2286.85 | 2292.01 | 0.018688 | 21.39 | 47.12 | 22.45 | 2.6 |
| East | 8250 | PF 1 | 1008 | 2277.8 | 2280.65 | 2282.65 | 2288.12 | 0.020003 | 21.92 | 45.98 | 22.23 | 2.69 |
| East | 8250 | PF 2 | 1008 | 2277.8 | 2280.65 | 2282.65 | 2288.12 | 0.020003 | 21.92 | 45.98 | 22.23 | 2.69 |
| East | 8200 | PF 1 | 1008 | 2277.1 | 2283.4 | 2279.89 | 2283.68 | 0.0002 | 4.21 | 240.76 | 42.96 | 0.3 |
| East | 8200 | PF 2 | 1008 | 2277.1 | 2283.4 | 2279.89 | 2283.68 | 0.0002 | 4.21 | 240.76 | 42.96 | 0.3 |
| East | 8150 | | Bridge | | | | | | | | | |
| East | 8100 | PF 1 | 1008 | 2276.7 | 2281.97 | | 2282.36 | 0.000364 | 5.04 | 200.21 | 38.11 | 0.39 |
| East | 8100 | PF 2 | 1008 | 2276.7 | 2281.97 | | 2282.36 | 0.000364 | 5.04 | 200.21 | 38.11 | 0.39 |
| East | 7800 | PF 1 | 1008 | 2275.3 | 2280.14 | 2280.14 | 2281.76 | 0.002468 | 10.23 | 98.53 | 30.73 | 1.01 |
| East | 7800 | PF 2 | 1008 | 2275.3 | 2280.14 | 2280.14 | 2281.76 | 0.002468 | 10.23 | 98.53 | 30.73 | 1.01 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 7500 | PF 1 | 1008 | 2274 | 2278.17 | 2278.84 | 2280.7 | 0.004499 | 12.75 | 79.06 | 27.89 | 1.33 |
| East | 7500 | PF 2 | 1008 | 2274 | 2278.17 | 2278.84 | 2280.7 | 0.004499 | 12.75 | 79.06 | 27.89 | 1.33 |
| East | 7235 | PF 1 | 1008 | 2273.03 | 2277.98 | 2275.72 | 2278.38 | 0.000422 | 5.1 | 197.82 | 40 | 0.4 |
| East | 7235 | PF 2 | 1008 | 2273.03 | 2277.98 | 2275.72 | 2278.38 | 0.000422 | 5.1 | 197.82 | 40 | 0.4 |
| East | 7182.5 | | Bridge | | | | | | | | | |
| East | 7130 | PF 1 | 1008 | 2272.75 | 2274.63 | 2275.44 | 2277.42 | 0.008875 | 13.39 | 75.25 | 40 | 1.72 |
| East | 7130 | PF 2 | 1008 | 2272.75 | 2274.63 | 2275.44 | 2277.42 | 0.008875 | 13.39 | 75.25 | 40 | 1.72 |
| East | 6900 | PF 1 | 1008 | 2272 | 2274.15 | 2274.15 | 2274.73 | 0.008911 | 6.11 | 165.08 | 145.34 | 1.01 |
| East | 6900 | PF 2 | 1008 | 2272 | 2274.15 | 2274.15 | 2274.73 | 0.008911 | 6.11 | 165.08 | 145.34 | 1.01 |
| East | 6600 | PF 1 | 1008 | 2269.73 | 2270.76 | 2270.87 | 2271.31 | 0.015141 | 5.92 | 170.13 | 233.31 | 1.22 |
| East | 6600 | PF 2 | 1008 | 2269.73 | 2270.76 | 2270.87 | 2271.31 | 0.015141 | 5.92 | 170.13 | 233.31 | 1.22 |
| East | 6300 | PF 1 | 1008 | 2265.16 | 2267.86 | 2267.86 | 2268.52 | 0.008367 | 6.53 | 154.3 | 116.84 | 1 |
| East | 6300 | PF 2 | 1008 | 2265.16 | 2267.86 | 2267.86 | 2268.52 | 0.008367 | 6.53 | 154.3 | 116.84 | 1 |
| East | 6250 | PF 1 | 1008 | 2257.78 | 2264.82 | 2262.26 | 2265.17 | 0.000302 | 6.33 | 380.02 | 95.94 | 0.42 |
| East | 6250 | PF 2 | 1008 | 2257.78 | 2264.82 | 2262.26 | 2265.17 | 0.000302 | 6.33 | 380.02 | 95.94 | 0.42 |
| East | 6190 | PF 1 | 1008 | 2257.7 | 2264.58 | | 2265.13 | 0.000432 | 7.45 | 289.14 | 70.05 | 0.5 |
| East | 6190 | PF 2 | 1008 | 2257.7 | 2264.58 | | 2265.13 | 0.000432 | 7.45 | 289.14 | 70.05 | 0.5 |
| East | 6000 | PF 1 | 1008 | 2257.47 | 2262.75 | 2262.75 | 2264.83 | 0.001815 | 12.8 | 127.2 | 36.17 | 0.98 |
| East | 6000 | PF 2 | 1008 | 2257.47 | 2262.75 | 2262.75 | 2264.83 | 0.001815 | 12.8 | 127.2 | 36.17 | 0.98 |
| East | 5900 | PF 1 | 1008 | 2256.97 | 2261.61 | 2262.27 | 2264.52 | 0.002982 | 14.96 | 104.24 | 33.17 | 1.22 |
| East | 5900 | PF 2 | 1008 | 2256.97 | 2261.61 | 2262.27 | 2264.52 | 0.002982 | 14.96 | 104.24 | 33.17 | 1.22 |
| East | 5830 | PF 1 | 1008 | 2256 | 2263.38 | 2259.65 | 2263.51 | 0.000113 | 3.55 | 411.14 | 344.13 | 0.23 |
| East | 5830 | PF 2 | 1008 | 2256 | 2263.38 | 2259.65 | 2263.51 | 0.000113 | 3.55 | 411.14 | 344.13 | 0.23 |
| East | 5800 | | Bridge | | | | | | | | | |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| East | 5770 | PF 1 | 1008 | 2255.6 | 2262.97 | | 2263.33 | 0.000301 | 5.25 | 290.81 | 169.71 | 0.34 |
| East | 5770 | PF 2 | 1008 | 2255.6 | 2262.97 | | 2263.33 | 0.000301 | 5.25 | 290.81 | 169.71 | 0.34 |
| East | 5700 | PF 1 | 1008 | 2255.41 | 2260.69 | 2260.69 | 2262.77 | 0.001815 | 12.8 | 127.2 | 36.17 | 0.98 |
| East | 5700 | PF 2 | 1008 | 2255.41 | 2260.69 | 2260.69 | 2262.77 | 0.001815 | 12.8 | 127.2 | 36.17 | 0.98 |
| East | 5545 | PF 1 | 1008 | 2254.7 | 2259.18 | 2259.97 | 2262.29 | 0.003299 | 15.47 | 100.8 | 32.96 | 1.29 |
| East | 5545 | PF 2 | 1008 | 2254.7 | 2259.18 | 2259.97 | 2262.29 | 0.003299 | 15.47 | 100.8 | 32.96 | 1.29 |
| East | 5530 | PF 1 | 1008 | 2254.5 | 2260.55 | 2258.09 | 2261.19 | 0.000625 | 6.41 | 157.55 | 29.1 | 0.46 |
| East | 5530 | PF 2 | 1008 | 2254.5 | 2260.55 | 2258.09 | 2261.19 | 0.000625 | 6.41 | 157.55 | 29.1 | 0.46 |
| East | 5505 | PF 1 | 1008 | 2254.2 | 2260.58 | 2257.88 | 2261.16 | 0.000471 | 6.15 | 172.79 | 38.24 | 0.43 |
| East | 5505 | PF 2 | 1008 | 2254.2 | 2260.58 | 2257.88 | 2261.16 | 0.000471 | 6.15 | 172.79 | 38.24 | 0.43 |
| East | 5462.5 | | Bridge | | | | | | | | | |
| East | 5420 | PF 1 | 1008 | 2253.9 | 2258.67 | | 2259.78 | 0.001393 | 8.45 | 119.32 | 25 | 0.68 |
| East | 5420 | PF 2 | 1008 | 2253.9 | 2258.67 | | 2259.78 | 0.001393 | 8.45 | 119.32 | 25 | 0.68 |
| East | 5350 | PF 1 | 1008 | 2253.16 | 2257.29 | 2257.29 | 2259.36 | 0.003175 | 11.53 | 87.39 | 21.16 | 1 |
| East | 5350 | PF 2 | 1008 | 2253.16 | 2257.29 | 2257.29 | 2259.36 | 0.003175 | 11.53 | 87.39 | 21.16 | 1 |
| East | 5100 | PF 1 | 1008 | 2249.99 | 2254.51 | 2255.48 | 2257.65 | 0.018979 | 14.36 | 74.71 | 82.64 | 2.35 |
| East | 5100 | PF 2 | 1008 | 2249.99 | 2254.51 | 2255.48 | 2257.65 | 0.018979 | 14.36 | 74.71 | 82.64 | 2.35 |
| East | 4810 | PF 1 | 1008 | 2248.7 | 2251.78 | 2251.55 | 2252.07 | 0.004731 | 4.29 | 234.71 | 217.24 | 0.73 |
| East | 4810 | PF 2 | 1008 | 2248.7 | 2251.78 | 2251.55 | 2252.07 | 0.004731 | 4.29 | 234.71 | 217.24 | 0.73 |
| East | 4800 | PF 1 | 1008 | 2248.5 | 2251.55 | 2251.55 | 2251.99 | 0.009839 | 5.35 | 188.25 | 216.7 | 1.01 |
| East | 4800 | PF 2 | 1008 | 2248.5 | 2251.55 | 2251.55 | 2251.99 | 0.009839 | 5.35 | 188.25 | 216.7 | 1.01 |
| East | 4500 | PF 1 | 1338 | 2245.79 | 2248.37 | 2248.51 | 2249.06 | 0.009801 | 6.86 | 211.69 | 237.66 | 1.08 |
| East | 4500 | PF 2 | 1338 | 2245.79 | 2248.37 | 2248.51 | 2249.06 | 0.009801 | 6.86 | 211.69 | 237.66 | 1.08 |
| East | 4450 | PF 1 | 1338 | 2239 | 2240.66 | 2242.37 | 2247.67 | 0.026261 | 21.26 | 62.95 | 38 | 2.91 |
| East | 4450 | PF 2 | 1338 | 2239 | 2240.66 | 2242.37 | 2247.67 | 0.026261 | 21.26 | 62.95 | 38 | 2.91 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 4415 | | Bridge | | | | | | | | | |
| East | 4380 | PF 1 | 1338 | 2238.3 | 2240.41 | 2241.67 | 2244.74 | 0.012114 | 16.71 | 80.08 | 38 | 2.03 |
| East | 4380 | PF 2 | 1338 | 2238.3 | 2240.41 | 2241.67 | 2244.74 | 0.012114 | 16.71 | 80.08 | 38 | 2.03 |
| East | 4200 | PF 1 | 1338 | 2232.88 | 2234.43 | 2235.78 | 2239.54 | 0.114345 | 18.14 | 73.75 | 51.23 | 2.66 |
| East | 4200 | PF 2 | 1338 | 2232.88 | 2234.43 | 2235.78 | 2239.54 | 0.114345 | 18.14 | 73.75 | 51.23 | 2.66 |
| East | 3900 | PF 1 | 1338 | 2232.2 | 2236.36 | 2235.14 | 2236.89 | 0.002004 | 5.88 | 227.62 | 68.03 | 0.57 |
| East | 3900 | PF 2 | 1338 | 2232.2 | 2236.36 | 2235.14 | 2236.89 | 0.002004 | 5.88 | 227.62 | 68.03 | 0.57 |
| East | 3600 | PF 1 | 1338 | 2231.75 | 2235.62 | | 2236.22 | 0.002426 | 6.26 | 213.86 | 67.2 | 0.62 |
| East | 3600 | PF 2 | 1338 | 2231.75 | 2235.62 | | 2236.22 | 0.002426 | 6.26 | 213.86 | 67.2 | 0.62 |
| East | 3300 | PF 1 | 1338 | 2231 | 2234.25 | | 2235.2 | 0.004782 | 7.83 | 170.93 | 64.09 | 0.84 |
| East | 3300 | PF 2 | 1338 | 2231 | 2234.25 | | 2235.2 | 0.004782 | 7.83 | 170.93 | 64.09 | 0.84 |
| East | 3000 | PF 1 | 1338 | 2230.49 | 2233.81 | | 2234.22 | 0.001764 | 5.14 | 260.39 | 86.65 | 0.52 |
| East | 3000 | PF 2 | 1338 | 2230.49 | 2233.81 | | 2234.22 | 0.001764 | 5.14 | 260.39 | 86.65 | 0.52 |
| East | 2820 | PF 1 | 1338 | 2230.04 | 2233.54 | | 2233.91 | 0.001495 | 4.87 | 274.59 | 87.37 | 0.48 |
| East | 2820 | PF 2 | 1338 | 2230.04 | 2233.54 | | 2233.91 | 0.001495 | 4.87 | 274.59 | 87.37 | 0.48 |
| East | 2700 | PF 1 | 1338 | 2229.8 | 2233.3 | | 2233.64 | 0.003604 | 4.7 | 284.68 | 91.91 | 0.47 |
| East | 2700 | PF 2 | 1338 | 2229.8 | 2233.3 | | 2233.64 | 0.003604 | 4.7 | 284.68 | 91.91 | 0.47 |
| East | 2470 | PF 1 | 1338 | 2227.88 | 2230.73 | 2230.73 | 2231.97 | 0.017835 | 8.93 | 149.78 | 61.06 | 1.01 |
| East | 2470 | PF 2 | 1338 | 2227.88 | 2230.73 | 2230.73 | 2231.97 | 0.017835 | 8.93 | 149.78 | 61.06 | 1.01 |
| East | 2400 | PF 1 | 1338 | 2227.01 | 2229.66 | 2229.92 | 2230.76 | 0.01553 | 7.13 | 161.22 | 110.2 | 0.9 |
| East | 2400 | PF 2 | 1338 | 2227.01 | 2229.66 | 2229.92 | 2230.76 | 0.01553 | 7.13 | 161.22 | 110.2 | 0.9 |
| East | 2260 | PF 1 | 1338 | 2226 | 2227.97 | 2228.12 | 2228.97 | 0.0104 | 8.02 | 166.81 | 109.42 | 1.14 |
| East | 2260 | PF 2 | 1338 | 2226 | 2227.97 | 2228.12 | 2228.97 | 0.0104 | 8.02 | 166.81 | 109.42 | 1.14 |
| East | 2100 | PF 1 | 1338 | 2224.04 | 2226.67 | 2227.08 | 2228.11 | 0.003384 | 10.05 | 175.67 | 140.22 | 1.16 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East | 2100 | PF 2 | 1338 | 2224.04 | 2226.67 | 2227.08 | 2228.11 | 0.003384 | 10.05 | 175.67 | 140.22 | 1.16 |
| East | 2008.56 | PF 1 | 1338 | 2223.08 | 2225.92 | 2226.38 | 2227.75 | 0.003858 | 10.83 | 123.54 | 51.88 | 1.24 |
| East | 2008.56 | PF 2 | 1338 | 2223.08 | 2225.92 | 2226.38 | 2227.75 | 0.003858 | 10.83 | 123.54 | 51.88 | 1.24 |
| East | 1800 | PF 1 | 1338 | 2217.41 | 2219.11 | 2220.74 | 2225.64 | 0.02426 | 20.5 | 65.26 | 41.8 | 2.89 |
| East | 1800 | PF 2 | 1338 | 2217.41 | 2219.11 | 2220.74 | 2225.64 | 0.02426 | 20.5 | 65.26 | 41.8 | 2.89 |
| East | 1799.9 | PF 1 | 1338 | 2217.4 | 2219.46 | 2221.1 | 2225.5 | 0.017738 | 19.72 | 67.84 | 33 | 2.42 |
| East | 1799.9 | PF 2 | 1338 | 2217.4 | 2219.46 | 2221.1 | 2225.5 | 0.017738 | 19.72 | 67.84 | 33 | 2.42 |
| East | 1700 | | Bridge | | | | | | | | | |
| East | 1641 | PF 1 | 1338 | 2216 | 2219.11 | 2219.7 | 2221.75 | 0.004783 | 13.02 | 102.77 | 33 | 1.3 |
| East | 1641 | PF 2 | 1338 | 2216 | 2219.11 | 2219.7 | 2221.75 | 0.004783 | 13.02 | 102.77 | 33 | 1.3 |
| West Branch | 3460 | PF 1 | 692 | 2235.18 | 2235.97 | 2236.21 | 2236.56 | 0.02004 | 6.71 | 118.58 | 226.86 | 1.4 |
| West Branch | 3460 | PF 2 | 692 | 2235.18 | 2235.97 | 2236.21 | 2236.56 | 0.02004 | 6.71 | 118.58 | 226.86 | 1.4 |
| West Branch | 3160 | PF 1 | 692 | 2232 | 2232.92 | 2232.89 | 2233.19 | 0.008971 | 4.15 | 170.89 | 290.04 | 0.92 |
| West Branch | 3160 | PF 2 | 692 | 2232 | 2232.92 | 2232.89 | 2233.19 | 0.008971 | 4.15 | 170.89 | 290.04 | 0.92 |
| West Branch | 2860 | PF 1 | 692 | 2230 | 2231.36 | | 2231.57 | 0.00346 | 4 | 206.53 | 276.22 | 0.64 |
| West Branch | 2860 | PF 2 | 692 | 2230 | 2231.36 | | 2231.57 | 0.00346 | 4 | 206.53 | 276.22 | 0.64 |
| West Branch | 2560 | PF 1 | 692 | 2228 | 2229.44 | 2229.44 | 2230 | 0.008149 | 6.04 | 116.95 | 111.89 | 0.97 |
| West Branch | 2560 | PF 2 | 692 | 2228 | 2229.44 | 2229.44 | 2230 | 0.008149 | 6.04 | 116.95 | 111.89 | 0.97 |
| West Branch | 2260 | PF 1 | 789 | 2226 | 2227.63 | 2227.35 | 2227.81 | 0.002409 | 3.91 | 255.68 | 276.62 | 0.55 |
| West Branch | 2260 | PF 2 | 789 | 2226 | 2227.63 | 2227.35 | 2227.81 | 0.002409 | 3.91 | 255.68 | 276.62 | 0.55 |
| West Branch | 2110 | PF 1 | 589 | 2225.42 | 2226.91 | 2226.91 | 2227.25 | 0.007873 | 4.84 | 135.72 | 218.16 | 0.91 |
| West Branch | 2110 | PF 2 | 589 | 2225.42 | 2226.91 | 2226.91 | 2227.25 | 0.007873 | 4.84 | 135.72 | 218.16 | 0.91 |
| West Branch | 1760 | PF 1 | 589 | 2224 | 2224.4 | 2224.45 | 2224.65 | 0.007259 | 4.27 | 150.42 | 464.58 | 1.2 |
| West Branch | 1760 | PF 2 | 589 | 2224 | 2224.4 | 2224.45 | 2224.65 | 0.007259 | 4.27 | 150.42 | 464.58 | 1.2 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East lower | 1640 | PF 1 | 2127 | 2216 | 2220.38 | 2220.38 | 2222.55 | 0.002463 | 11.84 | 180.42 | 42.84 | 1 |
| East lower | 1640 | PF 2 | 2127 | 2216 | 2221.35 | 2220.38 | 2222.79 | 0.001254 | 9.66 | 223.02 | 45.03 | 0.74 |
| | | | | | | | | | | | | |
| East lower | 1500 | PF 1 | 2127 | 2215.5 | 2221.08 | 2219.14 | 2221.43 | 0.002372 | 5.08 | 513.44 | 222.46 | 0.41 |
| East lower | 1500 | PF 2 | 2127 | 2215.5 | 2221.82 | | 2222.25 | 0.002201 | 5.26 | 404.49 | 70 | 0.39 |
| | | | | | | | | | | | | |
| East lower | 1200 | PF 1 | 2127 | 2214.9 | 2219.55 | 2219.55 | 2220.35 | 0.005555 | 7.83 | 352.13 | 241.88 | 0.78 |
| East lower | 1200 | PF 2 | 2127 | 2214.9 | 2220.48 | | 2221.36 | 0.003795 | 7.53 | 282.81 | 70 | 0.66 |
| | | | | | | | | | | | | |
| East lower | 900 | PF 1 | 2127 | 2214.66 | 2217.38 | 2217.48 | 2218.24 | 0.009078 | 7.87 | 313.42 | 225.14 | 0.94 |
| East lower | 900 | PF 2 | 2127 | 2214.66 | 2218.03 | 2218.03 | 2219.55 | 0.009918 | 9.92 | 214.44 | 70 | 1 |
| | | | | | | | | | | | | |
| East lower | 800 | PF 1 | 2127 | 2213.45 | 2216.53 | 2216.58 | 2217.39 | 0.007918 | 7.71 | 312.39 | 226.85 | 0.89 |
| East lower | 800 | PF 2 | 2127 | 2213.45 | 2216.92 | 2216.98 | 2218.52 | 0.010658 | 10.14 | 209.66 | 70 | 1.03 |
| | | | | | | | | | | | | |
| East lower | 750 | PF 1 | 2127 | 2212 | 2214.04 | 2214.86 | 2216.54 | 0.029199 | 13.62 | 176.36 | 113.27 | 1.68 |
| East lower | 750 | PF 2 | 2127 | 2212 | 2213.77 | 2214.86 | 2217.33 | 0.049268 | 16.11 | 147.11 | 105.83 | 2.13 |
| | | | | | | | | | | | | |
| East lower | 700 | PF 1 | 2127 | 2211.45 | 2214.48 | 2213.69 | 2214.94 | 0.003146 | 5.7 | 398.66 | 179.63 | 0.59 |
| East lower | 700 | PF 2 | 2127 | 2211.45 | 2214.48 | 2213.69 | 2214.94 | 0.003146 | 5.7 | 398.66 | 179.63 | 0.59 |
| | | | | | | | | | | | | |
| East lower | 600 | PF 1 | 2127 | 2210.5 | 2214.44 | 2212.77 | 2214.69 | 0.001281 | 4.29 | 538.73 | 252.5 | 0.39 |
| East lower | 600 | PF 2 | 2127 | 2210.5 | 2214.44 | 2212.77 | 2214.69 | 0.001281 | 4.29 | 538.73 | 252.5 | 0.39 |
| | | | | | | | | | | | | |
| East lower | 500 | PF 1 | 2127 | 2209.5 | 2214.16 | 2212.18 | 2214.54 | 0.001362 | 5.02 | 427.06 | 281.69 | 0.41 |
| East lower | 500 | PF 2 | 2127 | 2209.5 | 2214.16 | 2212.18 | 2214.54 | 0.001362 | 5.02 | 427.06 | 281.69 | 0.41 |
| | | | | | | | | | | | | |
| East lower | 475 | PF 1 | 2127 | 2209.13 | 2214.28 | 2211.44 | 2214.46 | 0.000544 | 3.43 | 637.32 | 224.6 | 0.27 |
| East lower | 475 | PF 2 | 2127 | 2209.13 | 2214.28 | 2211.44 | 2214.46 | 0.000544 | 3.43 | 637.32 | 224.6 | 0.27 |
| | | | | | | | | | | | | |
| East lower | 430 | PF 1 | 2127 | 2208.47 | 2212.53 | 2212.53 | 2214.24 | 0.010427 | 11.04 | 212.09 | 64.39 | 0.97 |
| East lower | 430 | PF 2 | 2127 | 2208.47 | 2212.53 | 2212.53 | 2214.24 | 0.010427 | 11.04 | 212.09 | 64.39 | 0.97 |
| | | | | | | | | | | | | |
| East lower | 370 | PF 1 | 2127 | 2205.55 | 2208.22 | 2209.61 | 2212.79 | 0.0475 | 17.79 | 127.95 | 56.02 | 1.92 |
| East lower | 370 | PF 2 | 2127 | 2205.55 | 2208.22 | 2209.61 | 2212.79 | 0.0475 | 17.79 | 127.95 | 56.02 | 1.92 |
| | | | | | | | | | | | | |
| East lower | 300 | PF 1 | 2127 | 2205.2 | 2210.78 | 2209.26 | 2211.56 | 0.00238 | 7.6 | 316.52 | 73.52 | 0.57 |

## HEC-RAS PROFILE OUTPUT TABLE

| 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 # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East-lower | 300 | PF 2 | 2127 | 2205.2 | 2210.78 | 2209.26 | 2211.56 | 0.00238 | 7.6 | 316.52 | 73.52 | 0.57 |
| | | | | | | | | | | | | |
| East-lower | 250 | PF 1 | 2127 | 2204.95 | 2210.71 | | 2211.43 | 0.002113 | 7.31 | 329.86 | 74.61 | 0.54 |
| East-lower | 250 | PF 2 | 2127 | 2204.95 | 2210.71 | | 2211.43 | 0.002113 | 7.31 | 329.86 | 74.61 | 0.54 |
| | | | | | | | | | | | | |
| East-lower | 200 | PF 1 | 2127 | 2204.7 | 2210.65 | | 2211.31 | 0.00187 | 7.03 | 344.19 | 75.75 | 0.51 |
| East-lower | 200 | PF 2 | 2127 | 2204.7 | 2210.65 | | 2211.31 | 0.00187 | 7.03 | 344.19 | 75.75 | 0.51 |
| | | | | | | | | | | | | |
| East-lower | 150 | PF 1 | 2127 | 2204.45 | 2210.6 | | 2211.21 | 0.001653 | 6.76 | 359.2 | 76.88 | 0.48 |
| East-lower | 150 | PF 2 | 2127 | 2204.45 | 2210.6 | | 2211.21 | 0.001653 | 6.76 | 359.2 | 76.88 | 0.48 |
| | | | | | | | | | | | | |
| East-lower | 128 | PF 1 | 2127 | 2204.34 | 2208.78 | 2208.78 | 2211.02 | 0.001512 | 12.01 | 177.33 | 39.99 | 1 |
| East-lower | 128 | PF 2 | 2127 | 2204.34 | 2208.78 | 2208.78 | 2211.02 | 0.001512 | 12.01 | 177.33 | 39.99 | 1 |
| | | | | | | | | | | | | |
| East-lower | 60 | PF 1 | 2127 | 2204 | 2206.94 | 2208.06 | 2210.57 | 0.033192 | 15.89 | 144.23 | 57.99 | 1.63 |
| East-lower | 60 | PF 2 | 2127 | 2204 | 2206.94 | 2208.06 | 2210.57 | 0.033192 | 15.89 | 144.23 | 57.99 | 1.63 |
| | | | | | | | | | | | | |
| East-lower | 50 | PF 1 | 2127 | 2203.75 | 2206.79 | 2207.82 | 2210.18 | 0.029655 | 15.35 | 149.34 | 58.13 | 1.55 |
| East-lower | 50 | PF 2 | 2127 | 2203.75 | 2206.79 | 2207.82 | 2210.18 | 0.029655 | 15.35 | 149.34 | 58.13 | 1.55 |
| | | | | | | | | | | | | |
| East-lower | 0 | PF 1 | 2127 | 2202.5 | 2205.64 | 2206.54 | 2208.69 | 0.025825 | 14.64 | 157.67 | 60.29 | 1.46 |
| East-lower | 0 | PF 2 | 2127 | 2202.5 | 2205.64 | 2206.54 | 2208.69 | 0.025825 | 14.64 | 157.67 | 60.29 | 1.46 |
| | | | | | | | | | | | | |
| East-lower | -50 | PF 1 | 2127 | 2201.35 | 2204.14 | 2204.61 | 2207.22 | 0.034052 | 15.53 | 274.93 | 1001.42 | 1.64 |
| East-lower | -50 | PF 2 | 2127 | 2201.35 | 2204.14 | 2204.61 | 2207.22 | 0.034052 | 15.53 | 274.93 | 1001.42 | 1.64 |

## HEC-RAS ENCROACHMENT TABLE 1

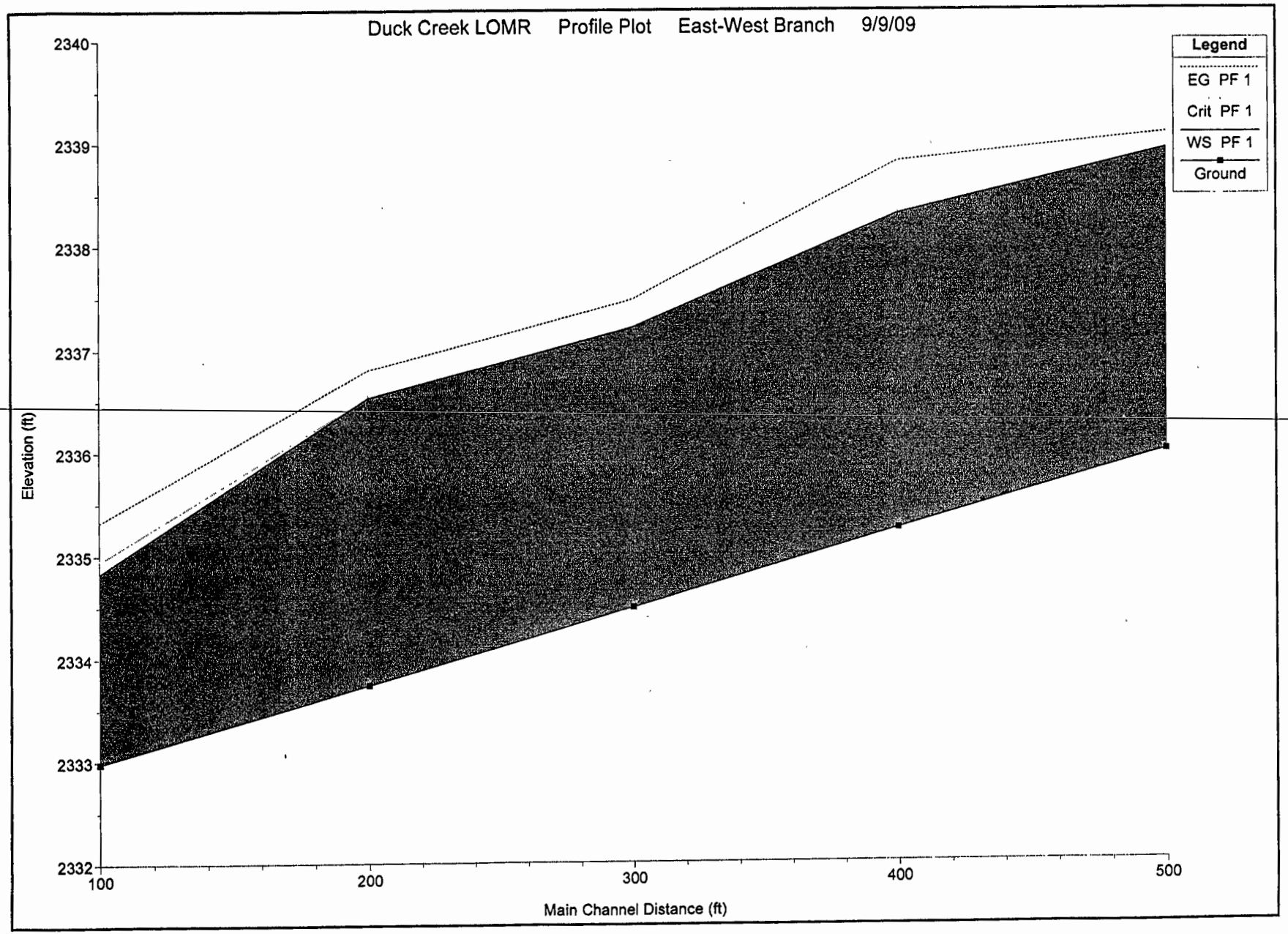
| Reach | River Sta | Profile | W.S. Elev (ft) | Prof Delta WS (ft) | E.G. Elev (ft) | Top Wdth Act (ft) | Q Left (cfs) | Q Channel (cfs) | Q Right (cfs) | Enc Sta L (ft) | Ch Sta L (ft) | Ch Sta R (ft) | Enc Sta R (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East-lower | 1640 | PF 1 | 2220.38 | | 2222.55 | 42.84 | 2.87 | 2124.01 | 0.12 | | -32 | 9 | |
| East-lower | 1640 | PF 2 | 2221.35 | 0.97 | 2222.79 | 45.03 | 8.51 | 2115.91 | 2.58 | | -32 | 9 | |
| | | | | | | | | | | | | | |
| East-lower | 1500 | PF 1 | 2221.08 | | 2221.43 | 222.46 | 177.33 | 1856.14 | 93.53 | | -38.33 | 38.33 | |
| East-lower | 1500 | PF 2 | 2221.82 | 0.75 | 2222.25 | 70 | | 2127 | | -35 | -38.33 | 38.33 | 35 |
| | | | | | | | | | | | | | |
| East-lower | 1200 | PF 1 | 2219.55 | | 2220.35 | 241.88 | 197.25 | 1708.55 | 221.21 | | -21.89 | 48.29 | |
| East-lower | 1200 | PF 2 | 2220.48 | 0.93 | 2221.36 | 70 | 0.19 | 2126.81 | | -22 | -21.89 | 48.29 | 48 |
| | | | | | | | | | | | | | |
| East-lower | 900 | PF 1 | 2217.38 | | 2218.24 | 225.14 | 90.32 | 1826.62 | 210.06 | | -45.66 | 62.06 | |
| East-lower | 900 | PF 2 | 2218.03 | 0.64 | 2219.55 | 70 | | 2127 | | -26 | -45.66 | 62.06 | 44 |
| | | | | | | | | | | | | | |
| East-lower | 800 | PF 1 | 2216.53 | | 2217.39 | 226.85 | 53.77 | 1961.73 | 111.5 | | 934 | 1044 | |
| East-lower | 800 | PF 2 | 2216.92 | 0.39 | 2218.52 | 70 | | 2127 | | 955 | 934 | 1044 | 1025 |

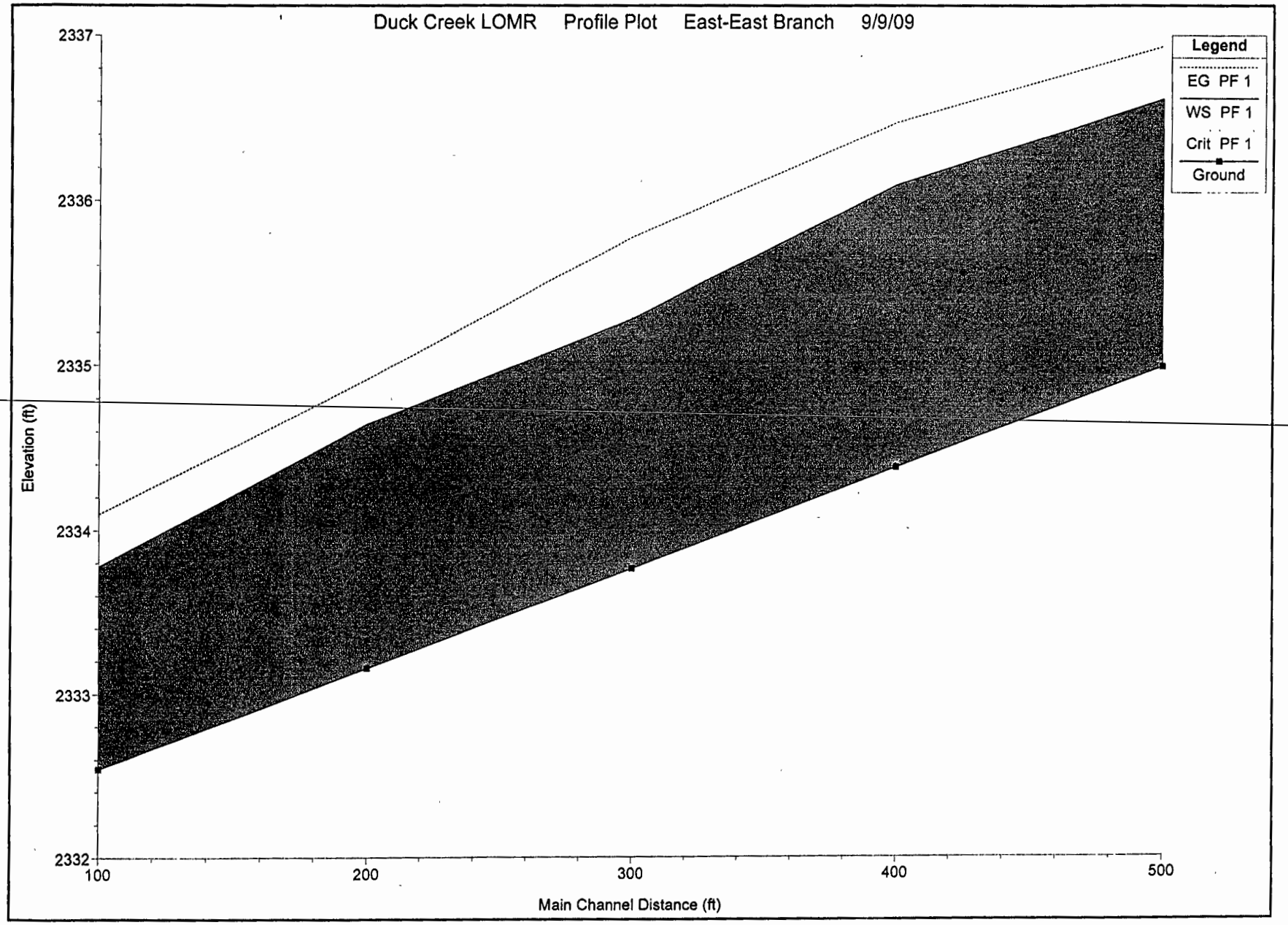
## HEC-RAS ENCROACHMENT TABLE 2

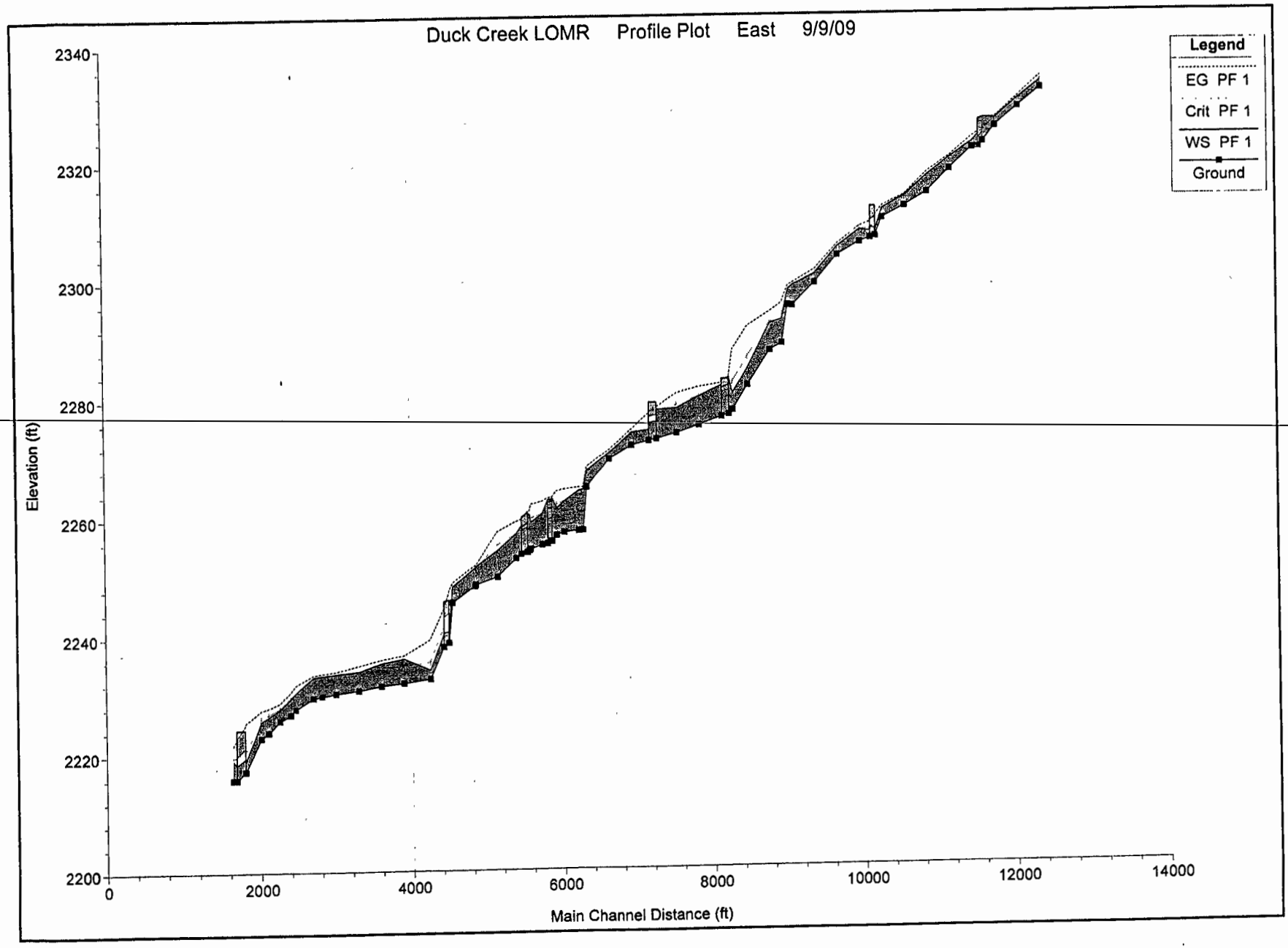
| Reach | River Sta | Profile | Prof Delta WS (ft) | Top Width Act (ft) | K Perc L | Enc Sta L (ft) | Dist Center L (ft) | Center Station (ft) | Dist Center R (ft) | Enc Sta R (ft) | K Perc R | Enc WD (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East-lower | 1640 | PF 1 | | 42.84 | | | | -11.5 | | | | |
| East-lower | 1640 | PF 2 | 0.97 | 45.03 | | | | -11.5 | | | | |
| | | | | | | | | | | | | |
| East-lower | 1500 | PF 1 | | 222.46 | | | | 0 | | | | |
| East-lower | 1500 | PF 2 | 0.75 | 70 | 13.56 | -35 | 35 | 0 | 35 | 35 | 7.86 | 70 |
| | | | | | | | | | | | | |
| East-lower | 1200 | PF 1 | | 241.88 | | | | 13.2 | | | | |
| East-lower | 1200 | PF 2 | 0.93 | 70 | 17.75 | -22 | 35.2 | 13.2 | 34.8 | 48 | 16.26 | 70 |
| | | | | | | | | | | | | |
| East-lower | 900 | PF 1 | | 225.14 | | | | 8.2 | | | | |
| East-lower | 900 | PF 2 | 0.64 | 70 | 6.88 | -26 | 34.2 | 8.2 | 35.8 | 44 | 15.83 | 70 |
| | | | | | | | | | | | | |
| East-lower | 800 | PF 1 | | 226.85 | | | | 989 | | | | |
| East-lower | 800 | PF 2 | 0.39 | 70 | 5.57 | 955 | 34 | 989 | 36 | 1025 | 7.71 | 70 |

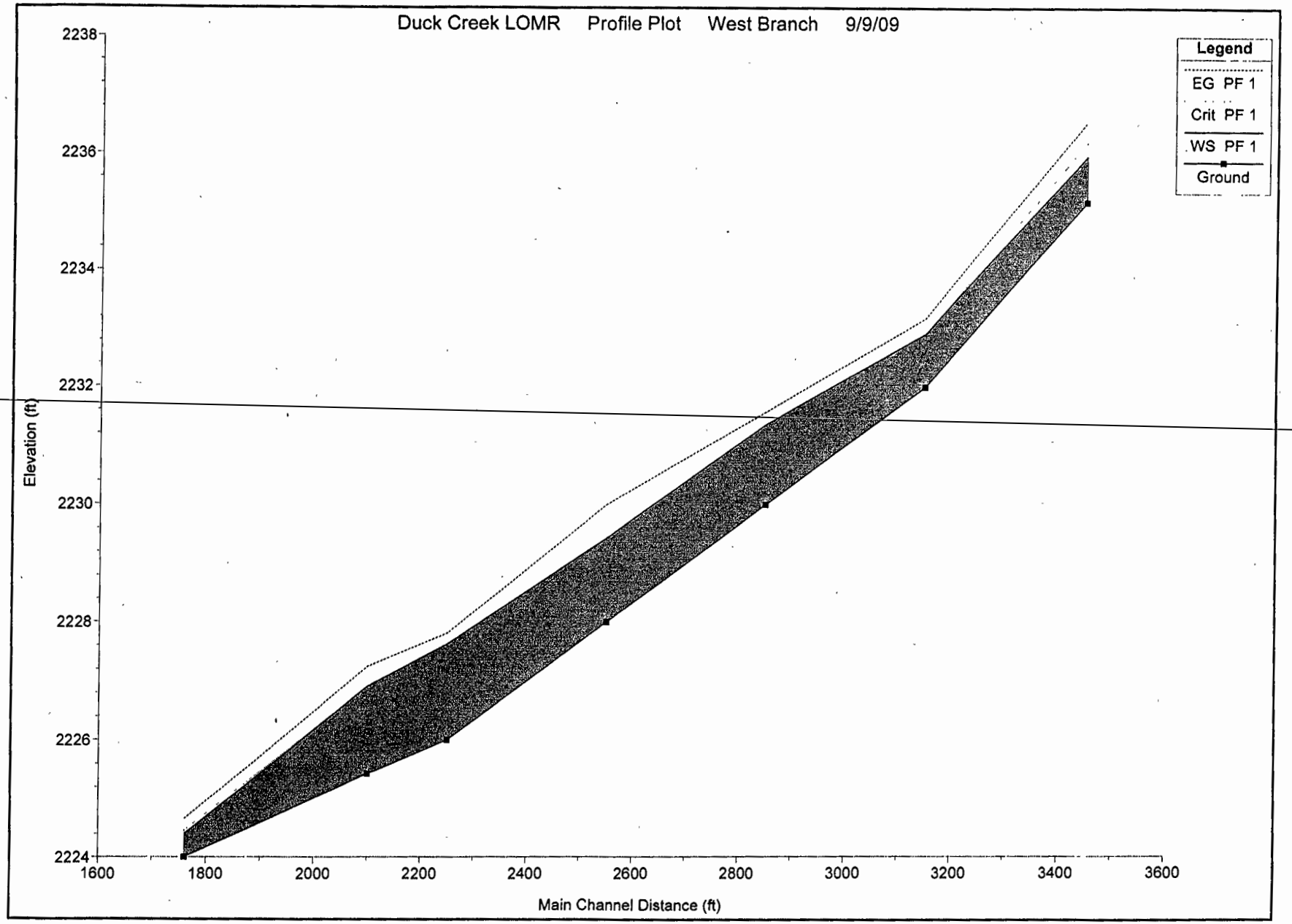
## HEC-RAS ENCROACHMENT TABLE 3

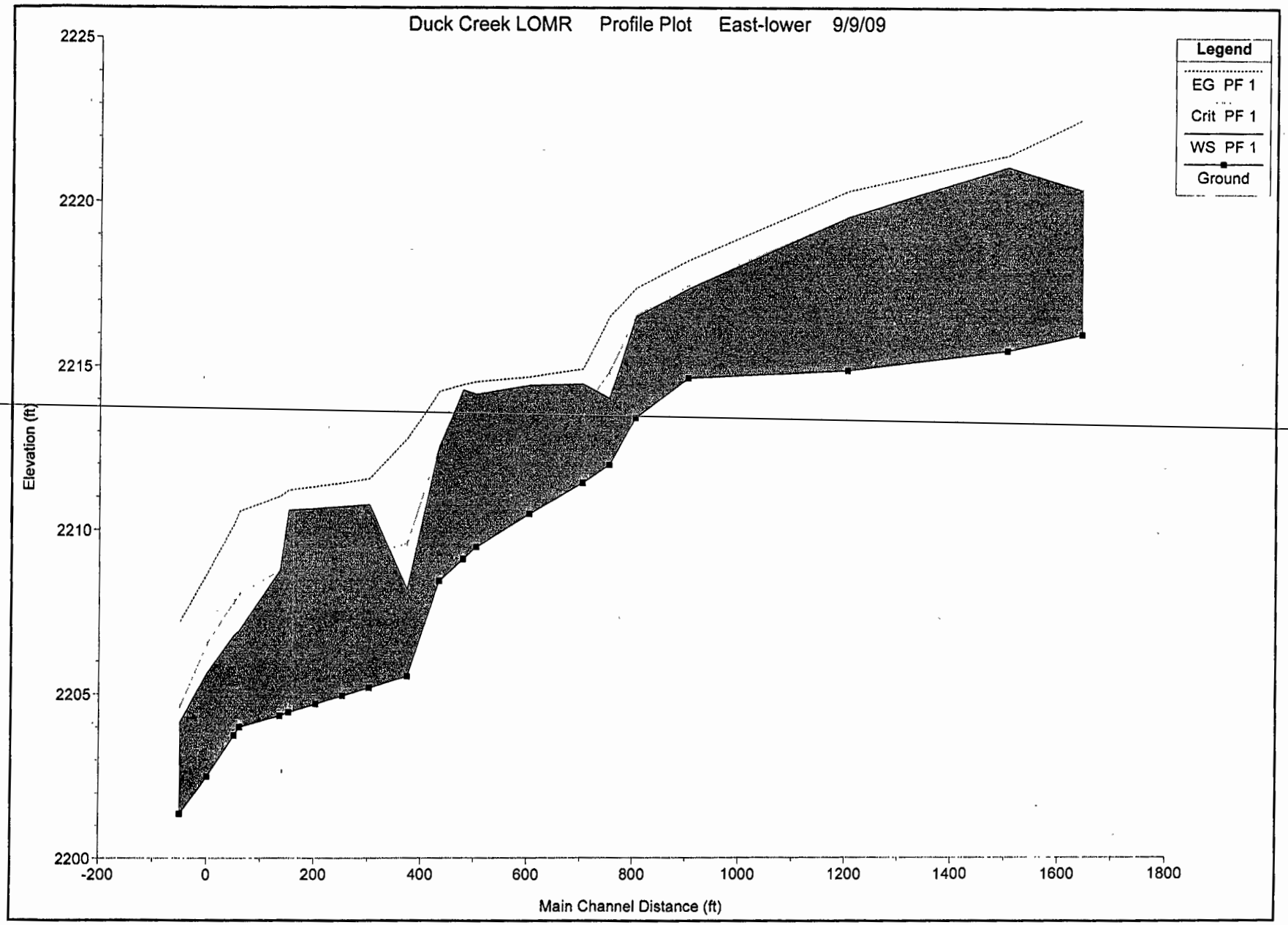
| Reach | River Sta | Profile | Top Width Act (ft) | Area (sq ft) | Vel Total (ft/s) | W.S. Elev (ft) | Base WS (ft) | Prof Delta WS (ft) |
|---|---|---|---|---|---|---|---|---|
| East-lower | 1640 | PF 1 | 42.84 | 180.42 | 11.79 | 2220.38 | 2220.38 | |
| East-lower | 1640 | PF 2 | 45.03 | 223.02 | 9.54 | 2221.35 | 2220.38 | 0.97 |
| | | | | | | | | |
| East-lower | 1500 | PF 1 | 222.46 | 513.44 | 4.14 | 2221.08 | 2221.08 | |
| East-lower | 1500 | PF 2 | 70 | 404.49 | 5.26 | 2221.82 | 2221.08 | 0.75 |
| | | | | | | | | |
| East-lower | 1200 | PF 1 | 241.88 | 352.13 | 6.04 | 2219.55 | 2219.55 | |
| East-lower | 1200 | PF 2 | 70 | 282.81 | 7.52 | 2220.48 | 2219.55 | 0.93 |
| | | | | | | | | |
| East-lower | 900 | PF 1 | 225.14 | 313.42 | 6.79 | 2217.38 | 2217.38 | |
| East-lower | 900 | PF 2 | 70 | 214.44 | 9.92 | 2218.03 | 2217.38 | 0.64 |
| | | | | | | | | |
| East-lower | 800 | PF 1 | 226.85 | 312.39 | 6.81 | 2216.53 | 2216.53 | |
| East-lower | 800 | PF 2 | 70 | 209.66 | 10.14 | 2216.92 | 2216.53 | 0.39 |

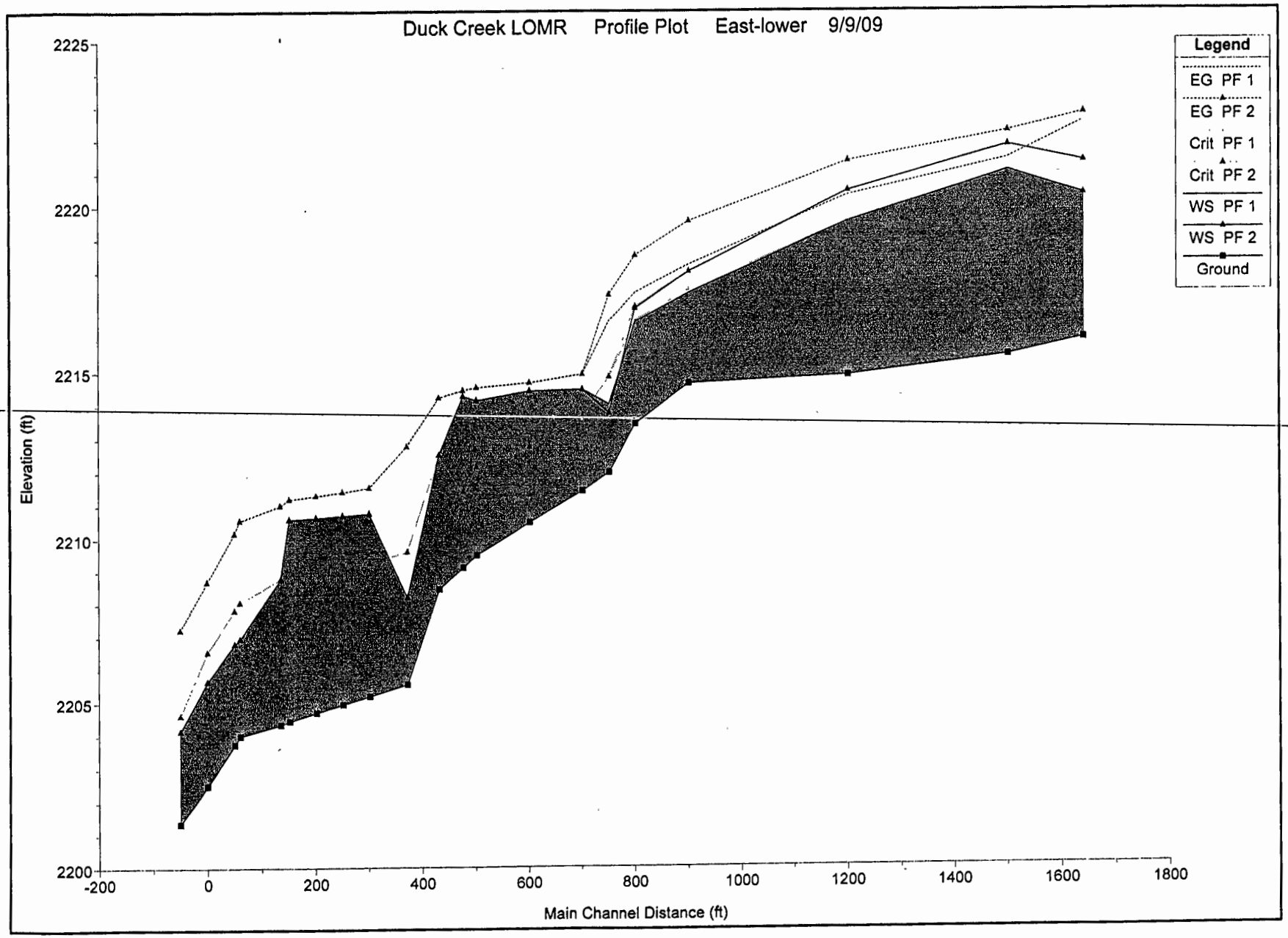

Duck Creek LOMR Profile Plot East-West Branch 9/9/09
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
2340
2339
2338
2337
2336
2335
2334
2333
2332
Elevation (ft)
100
200
300
400
500
Main Channel Distance (ft)

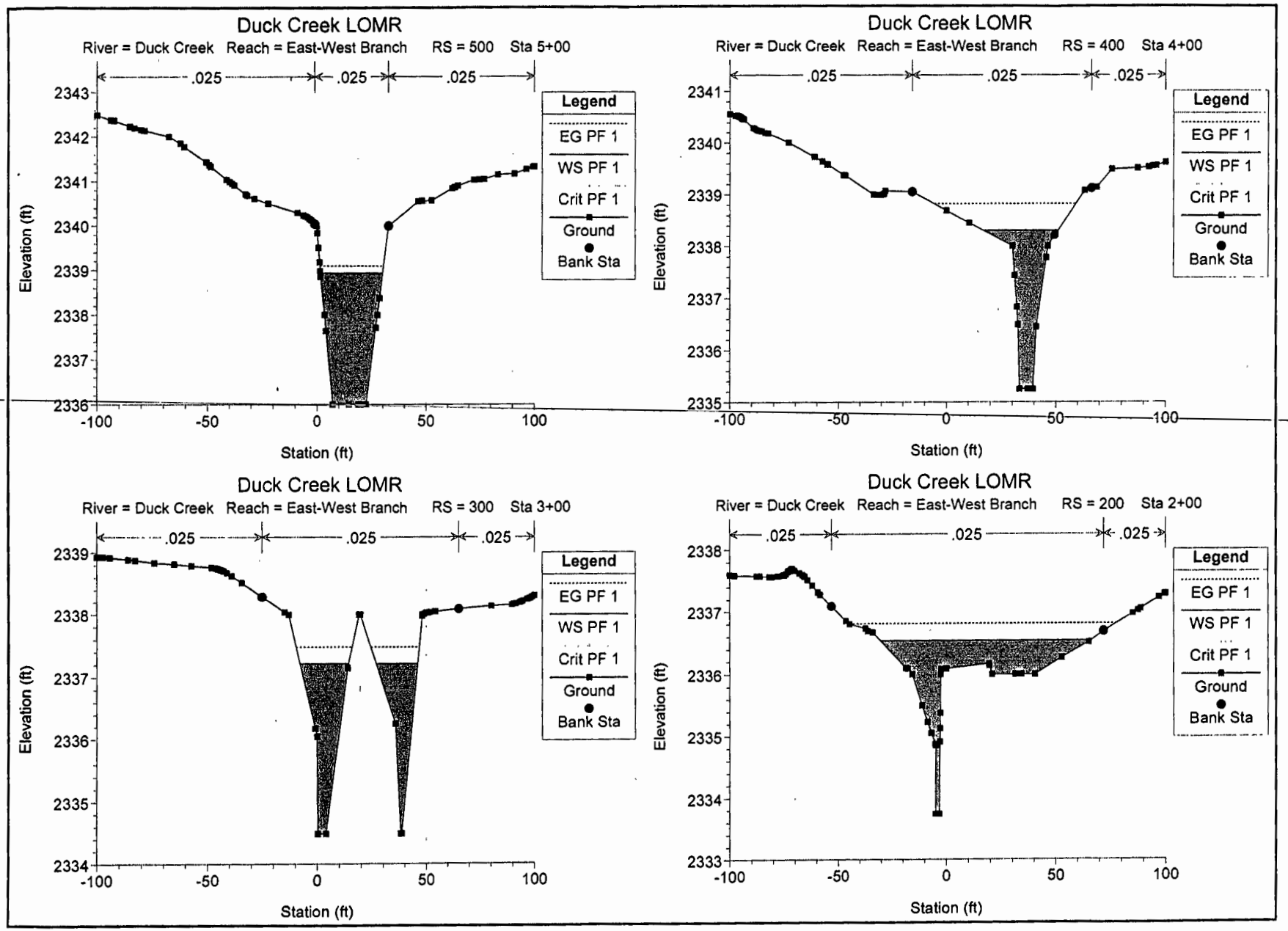

Duck Creek LOMR Profile Plot East-East Branch 9/9/09
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
2337
2336
2335
2334
2333
2332
100
200
300
400
500
Main Channel Distance (ft)

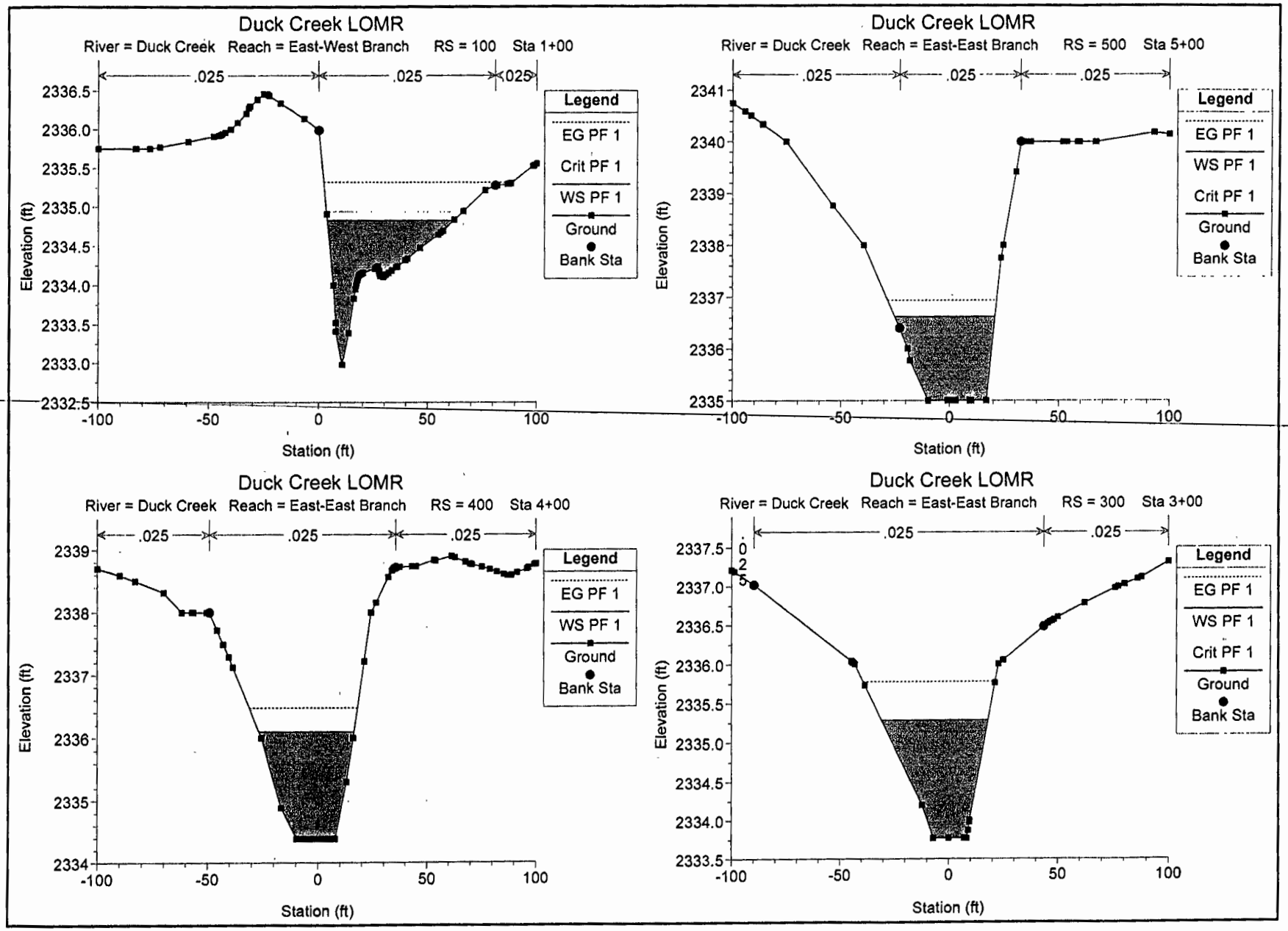

Duck Creek LOMR Profile Plot East 9/9/09
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2340
2320
2300
2280
2260
2240
2220
2200
0
2000
4000
6000
8000
10000
12000
14000
Main Channel Distance (ft)

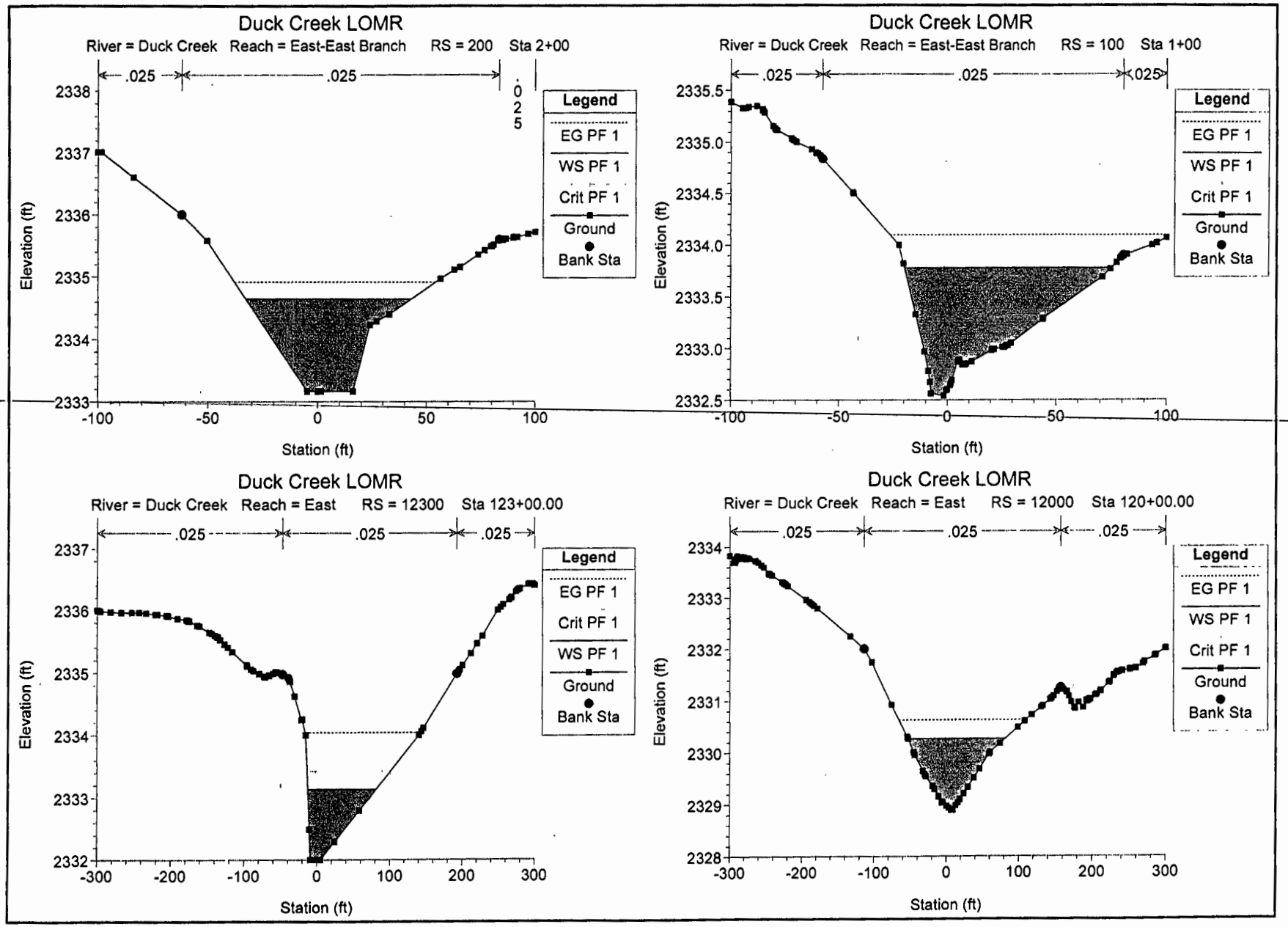

Duck Creek LOMR Profile Plot West Branch 9/9/09
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2238
2236
2234
2232
2230
2228
2226
2224
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
Main Channel Distance (ft)

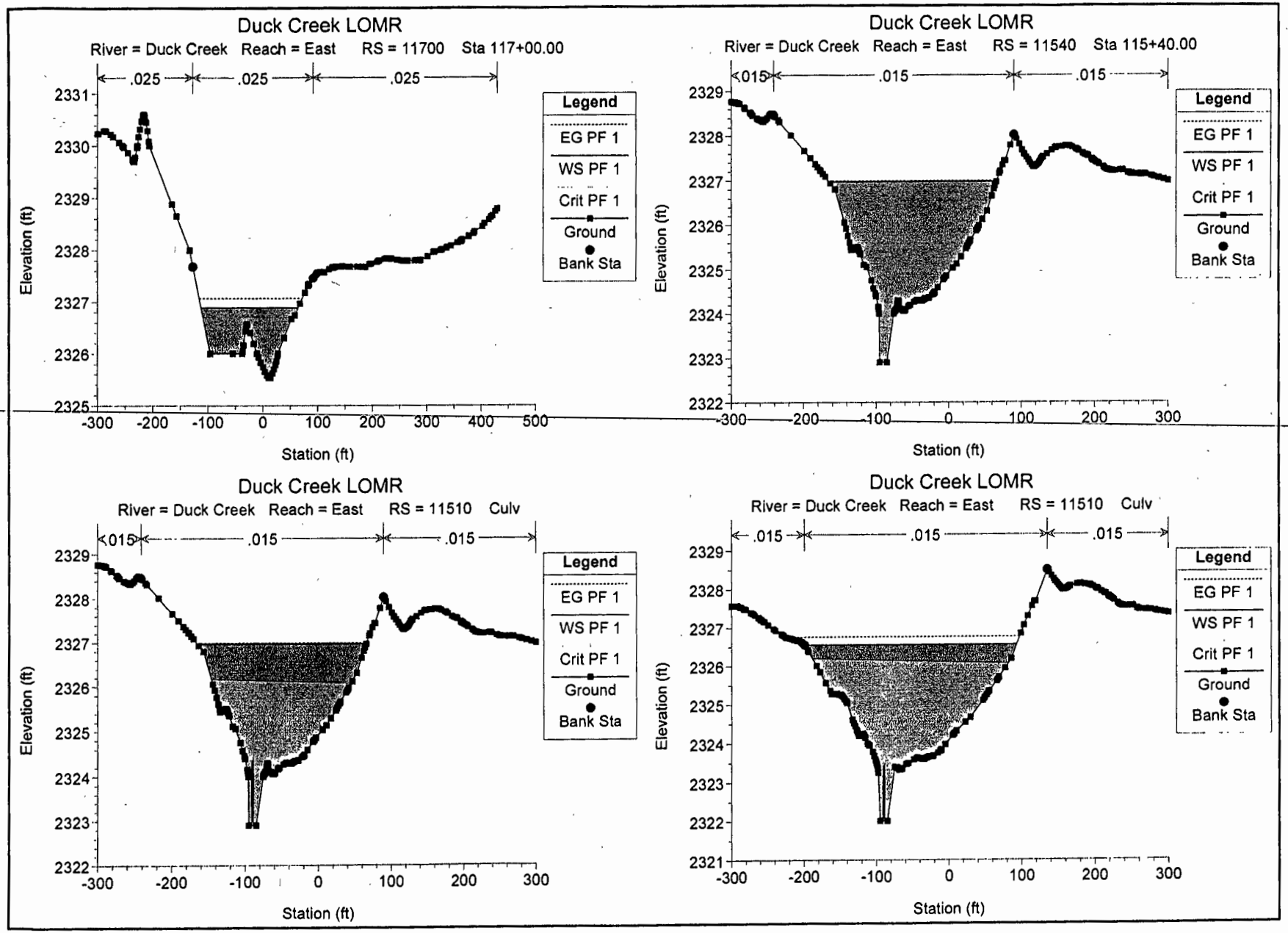

Duck Creek LOMR Profile Plot East-lower 9/9/09
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2225
2220
2215
2210
2205
2200
-200
0
200
400
600
800
1000
1200
1400
1600
1800
Main Channel Distance (ft)

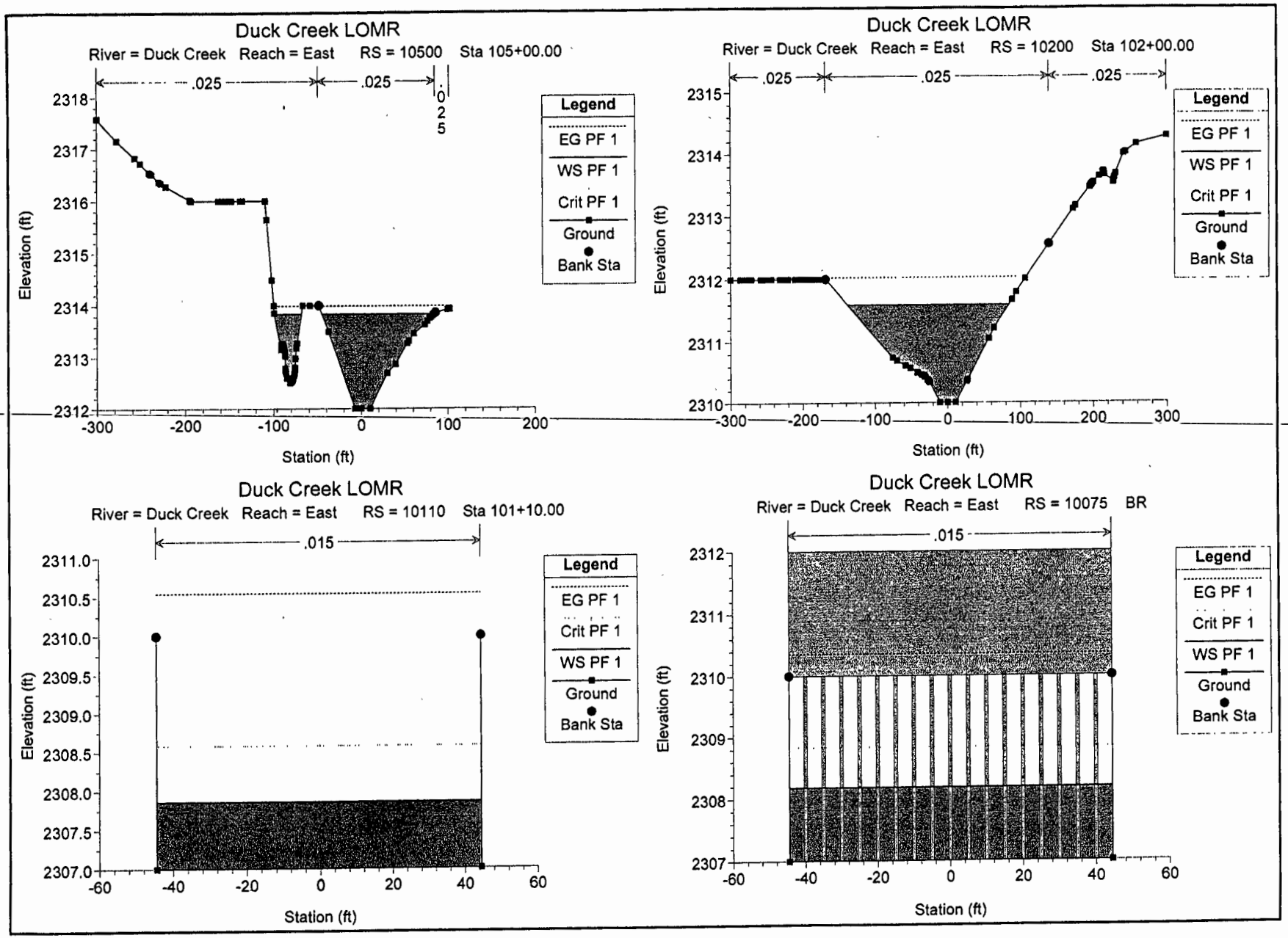

Duck Creek LOMR Profile Plot East-lower 9/9/09
Legend
EG PF 1
EG PF 2
Crit PF 1
Crit PF 2
WS PF 1
WS PF 2
Ground
Elevation (ft)
2225
2220
2215
2210
2205
2200
-200
0
200
400
600
800
1000
1200
1400
1600
1800
Main Channel Distance (ft)

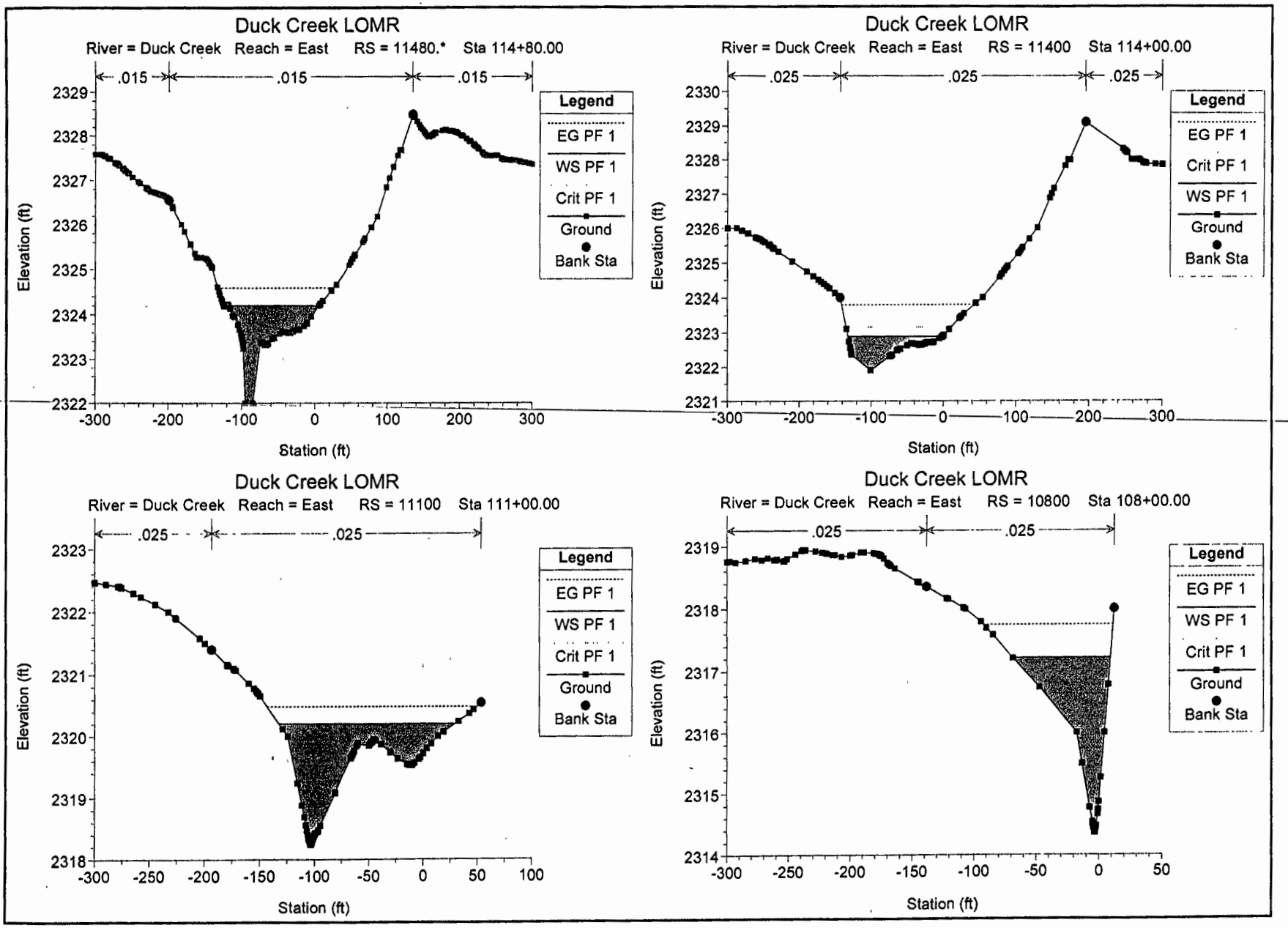

Duck Creek LOMR
River = Duck Creek Reach = East-West Branch RS = 500 Sta 5+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-West Branch RS = 400 Sta 4+00
Duck Creek LOMR
River = Duck Creek Reach = East-West Branch RS = 300 Sta 3+00
Duck Creek LOMR
River = Duck Creek Reach = East-West Branch RS = 200 Sta 2+00

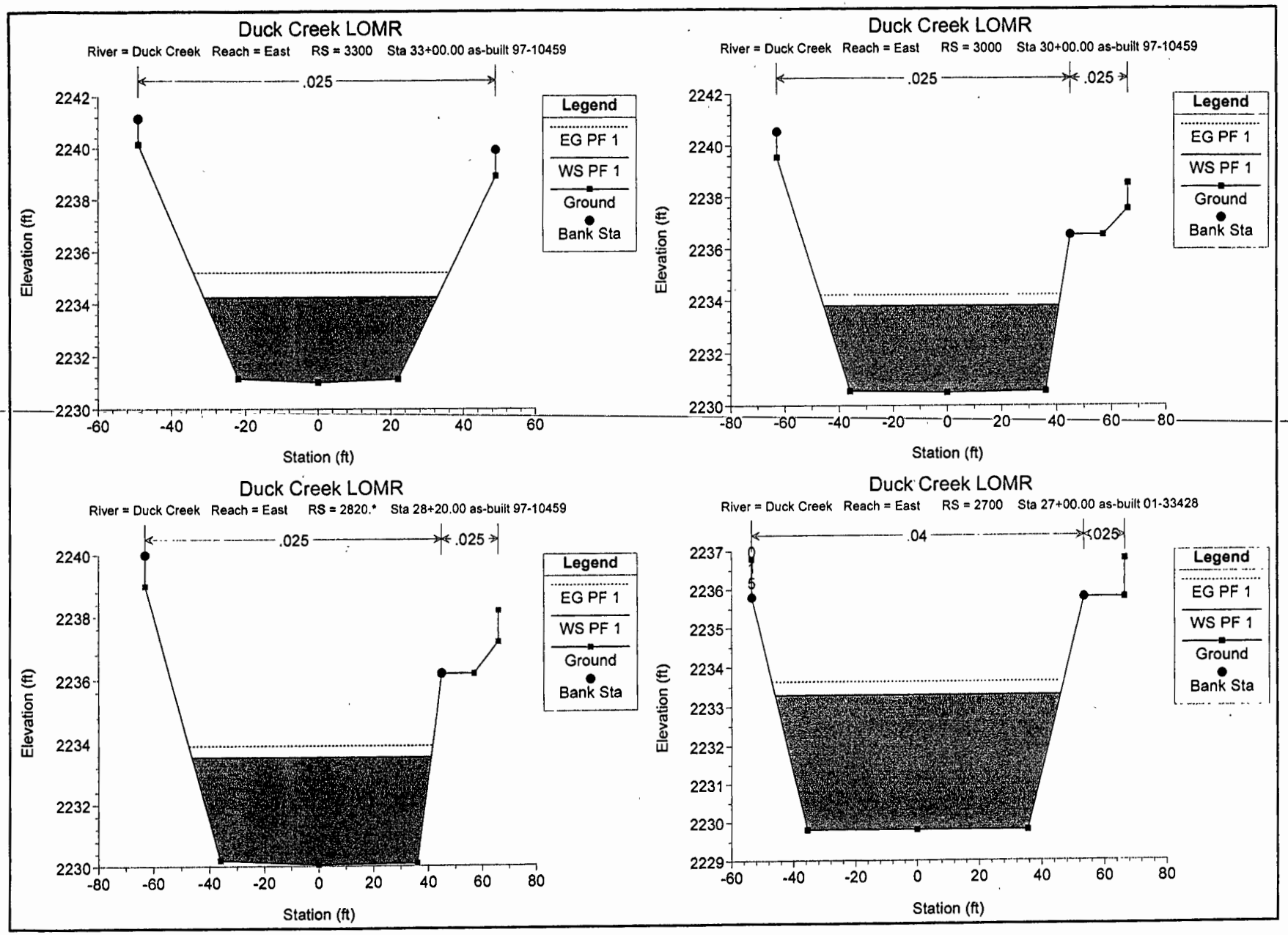

Duck Creek LOMR
River = Duck Creek Reach = East-West Branch RS = 100 Sta 1+00
.025
.025
.025
Elevation (ft)
2336.5
2336.0
2335.5
2335.0
2334.5
2334.0
2333.5
2333.0
2332.5
-100
-50
0
50
100
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-East Branch RS = 500 Sta 5+00
.025
.025
.025
Elevation (ft)
2341
2340
2339
2338
2337
2336
2335
-100
-50
0
50
100
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-East Branch RS = 400 Sta 4+00
.025
.025
.025
Elevation (ft)
2339
2338
2337
2336
2335
2334
-100
-50
0
50
100
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-East Branch RS = 300 Sta 3+00
.025
.025
Elevation (ft)
2337.5
2337.0
2336.5
2336.0
2335.5
2335.0
2334.5
2334.0
2333.5
-100
-50
0
50
100
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

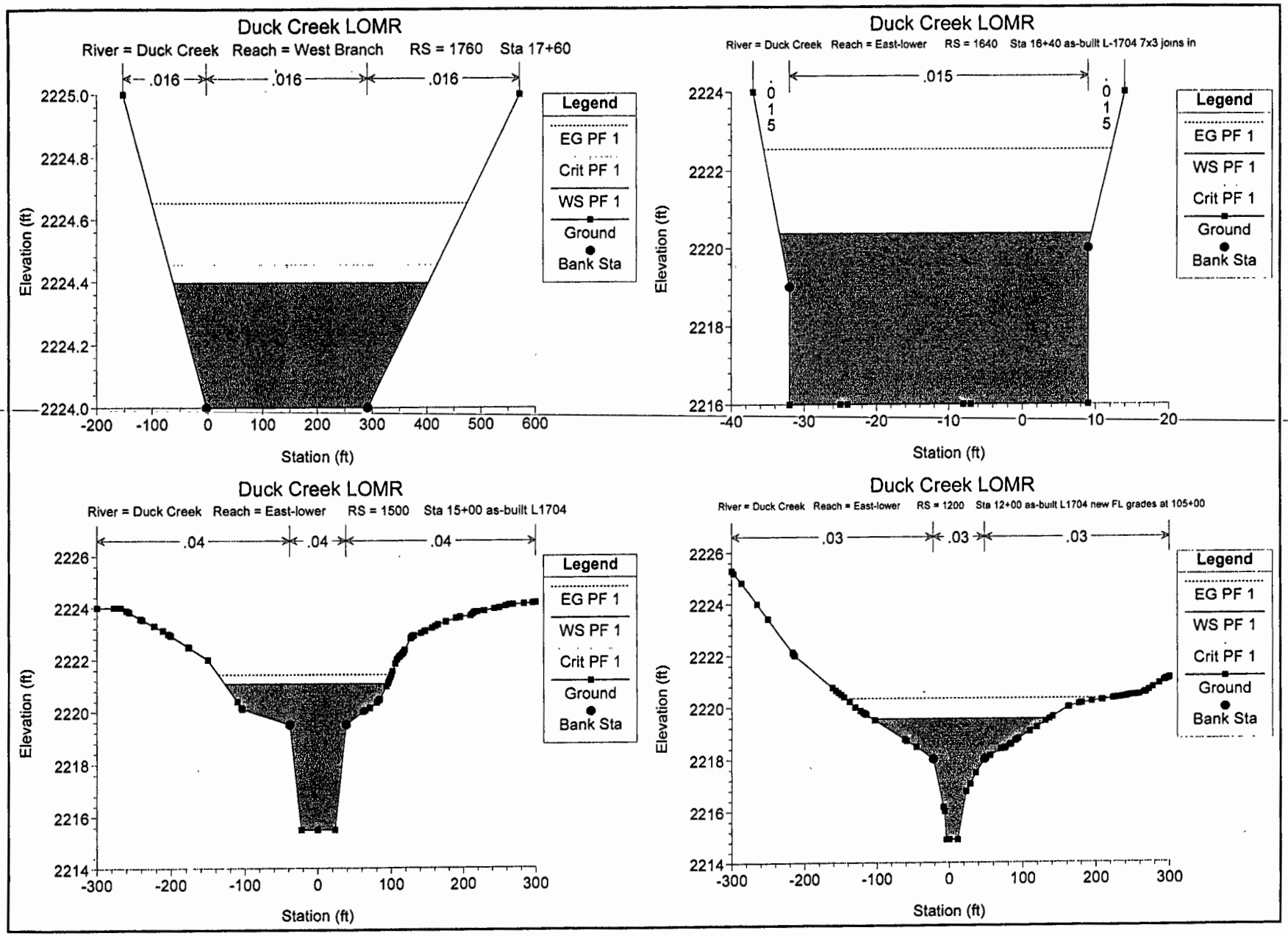

Duck Creek LOMR
River = Duck Creek Reach = East-East Branch RS = 200 Sta 2+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-East Branch RS = 100 Sta 1+00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 12300 Sta 123+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 12000 Sta 120+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

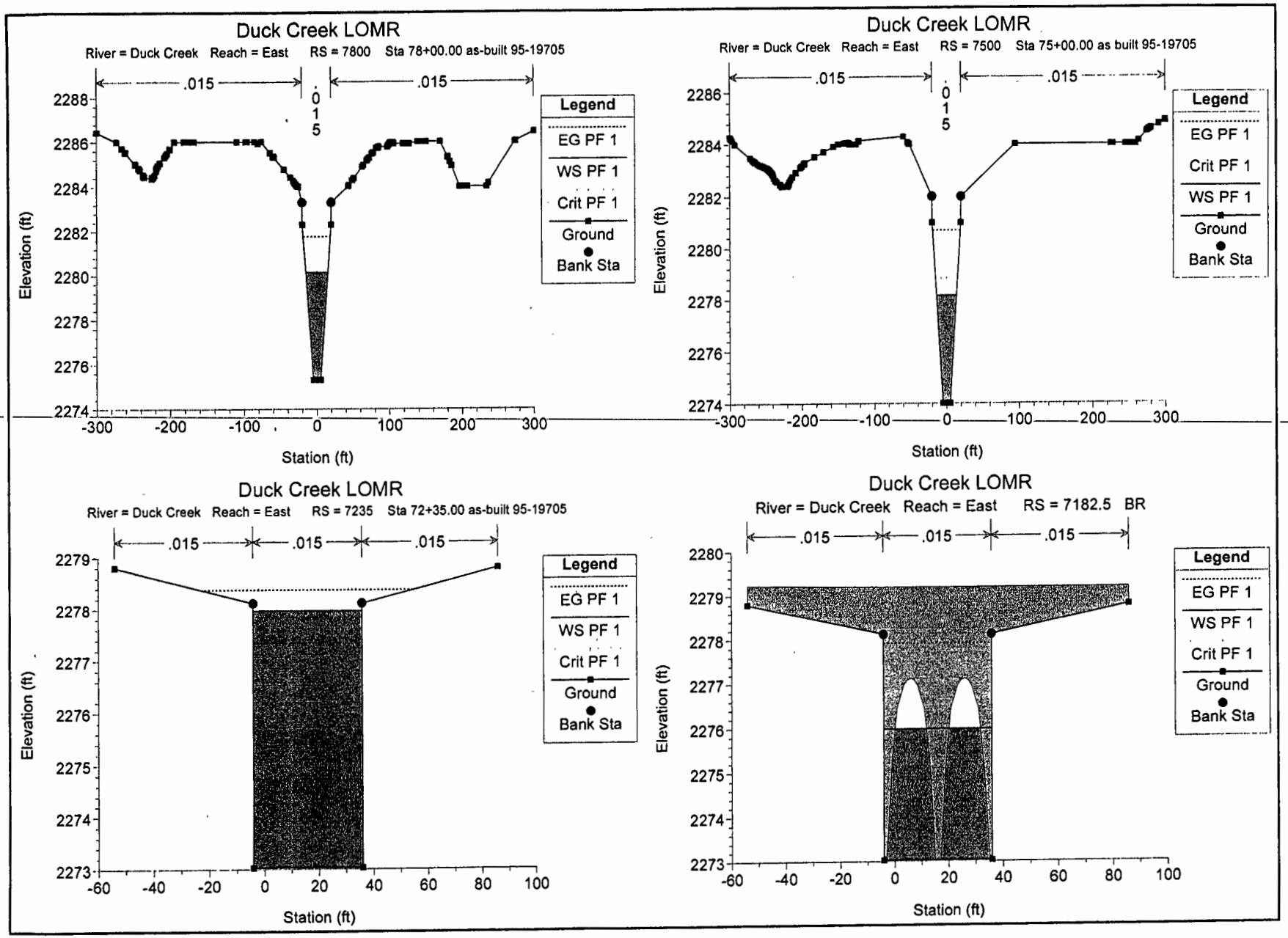

Duck Creek LOMR
River = Duck Creek Reach = East RS = 11700 Sta 117+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 11540 Sta 115+40.00
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 11510 Culv
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 11510 Culv
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

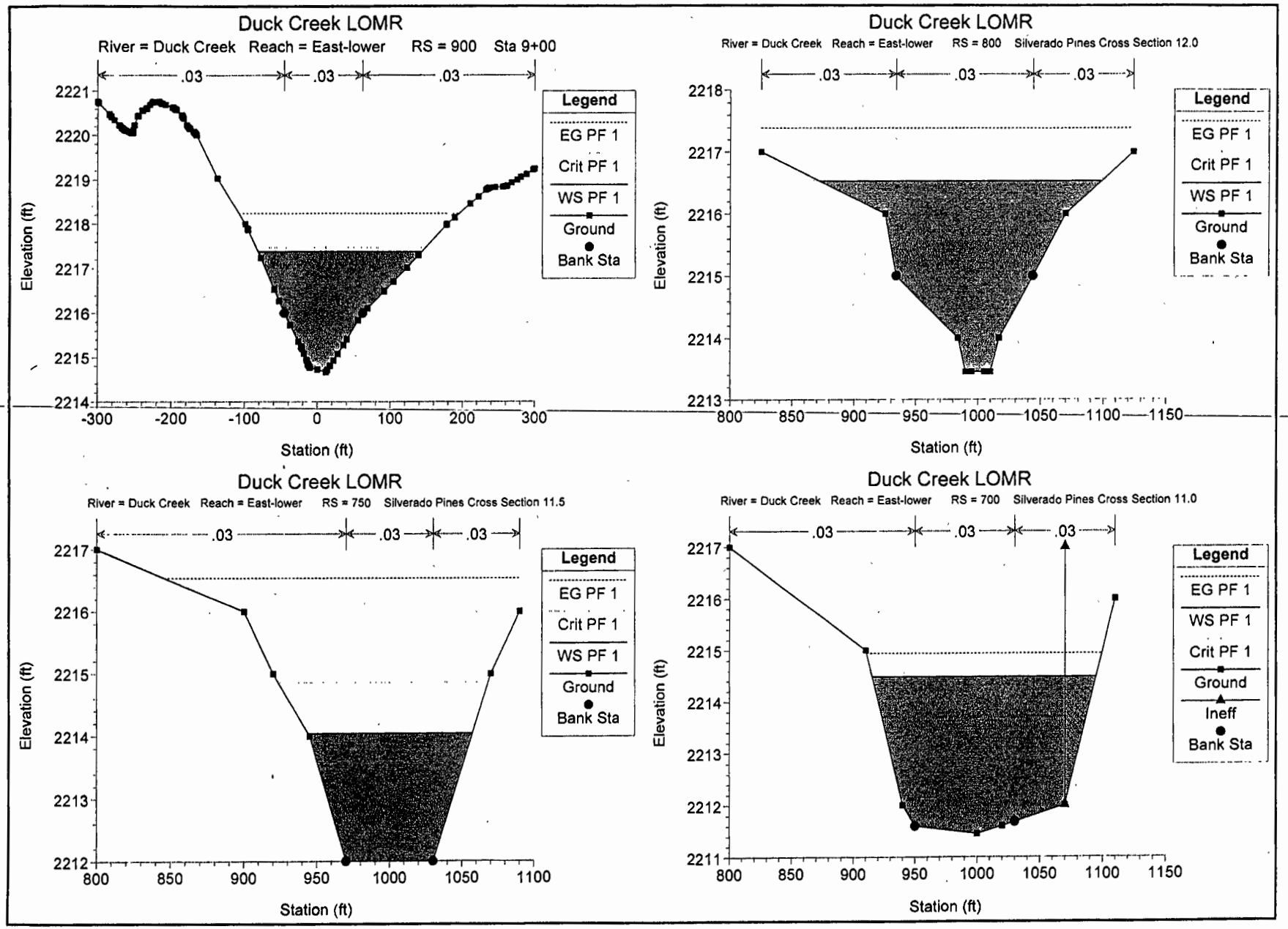

Duck Creek LOMR
River = Duck Creek Reach = East RS = 10500 Sta 105+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 10200 Sta 102+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 10110 Sta 101+10.00
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 10075 BR
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

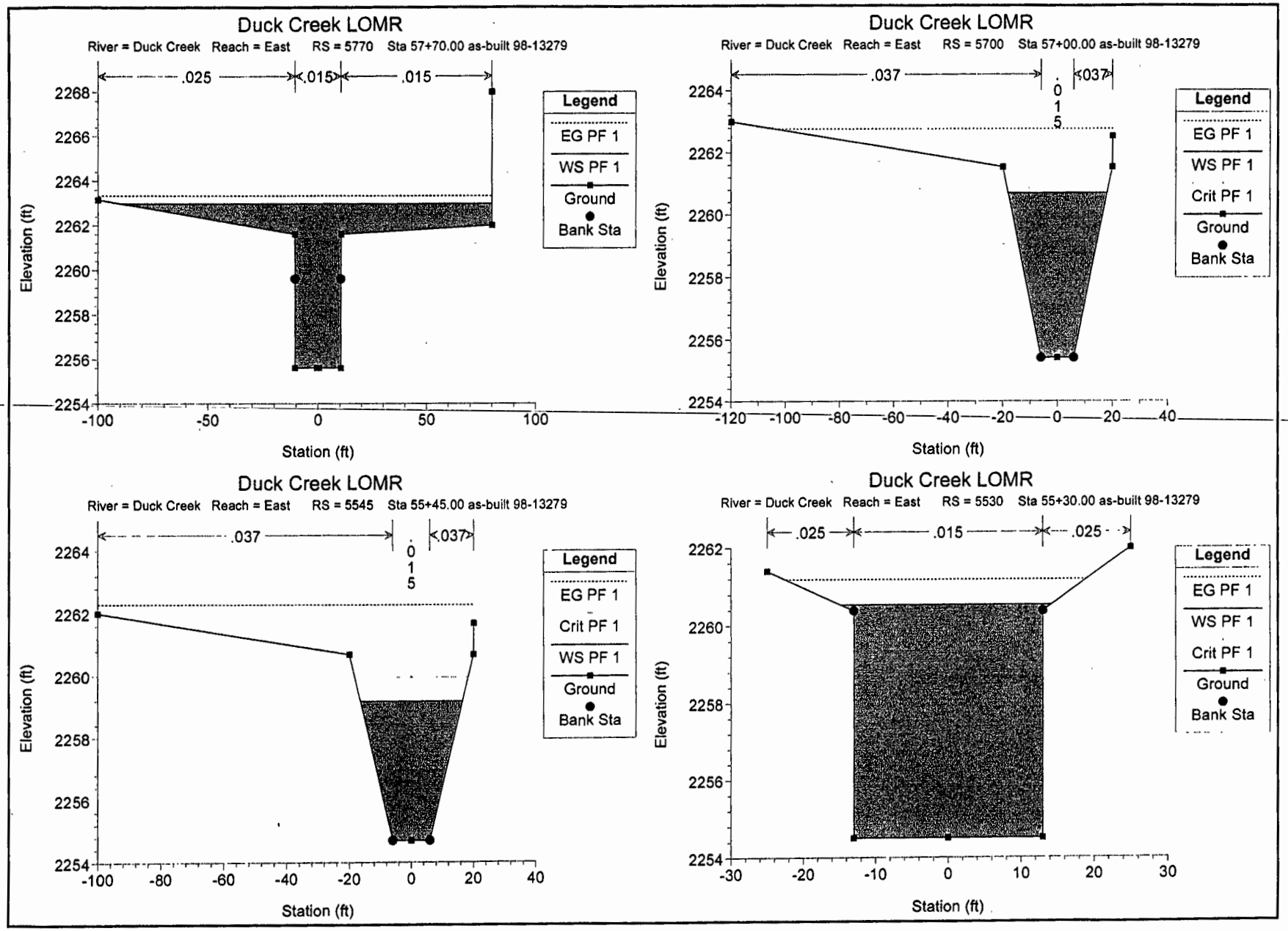

Duck Creek LOMR
River = Duck Creek Reach = East RS = 11480.* Sta 114+80.00
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 11400 Sta 114+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 11100 Sta 111+00.00
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 10800 Sta 108+00.00
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

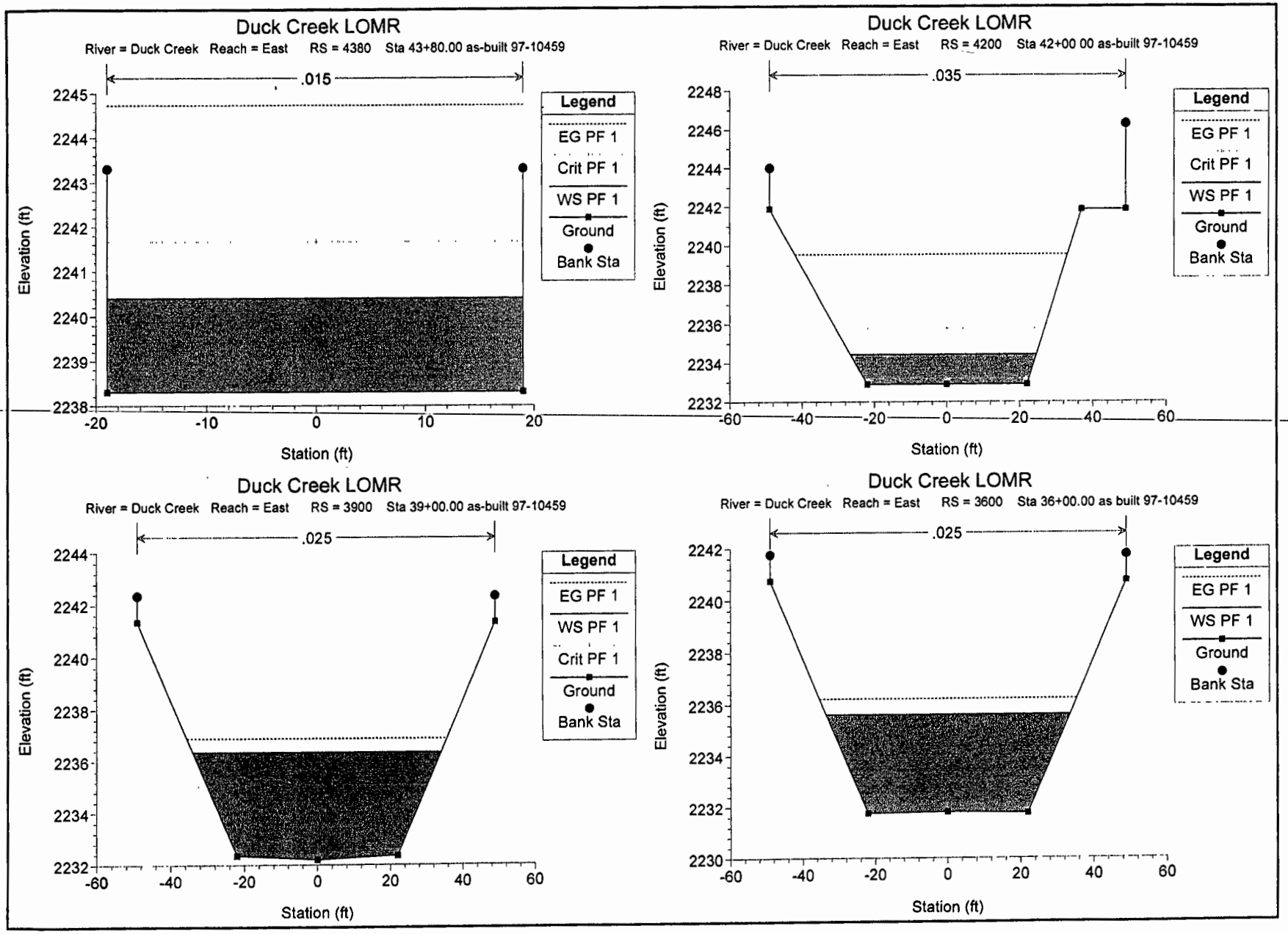

Duck Creek LOMR
River = Duck Creek Reach = East RS = 3300 Sta 33+00.00 as-built 97-10459
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 3000 Sta 30+00.00 as-built 97-10459
.025
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 2820.* Sta 28+20.00 as-built 97-10459
.025
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 2700 Sta 27+00.00 as-built 01-33428
.04
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

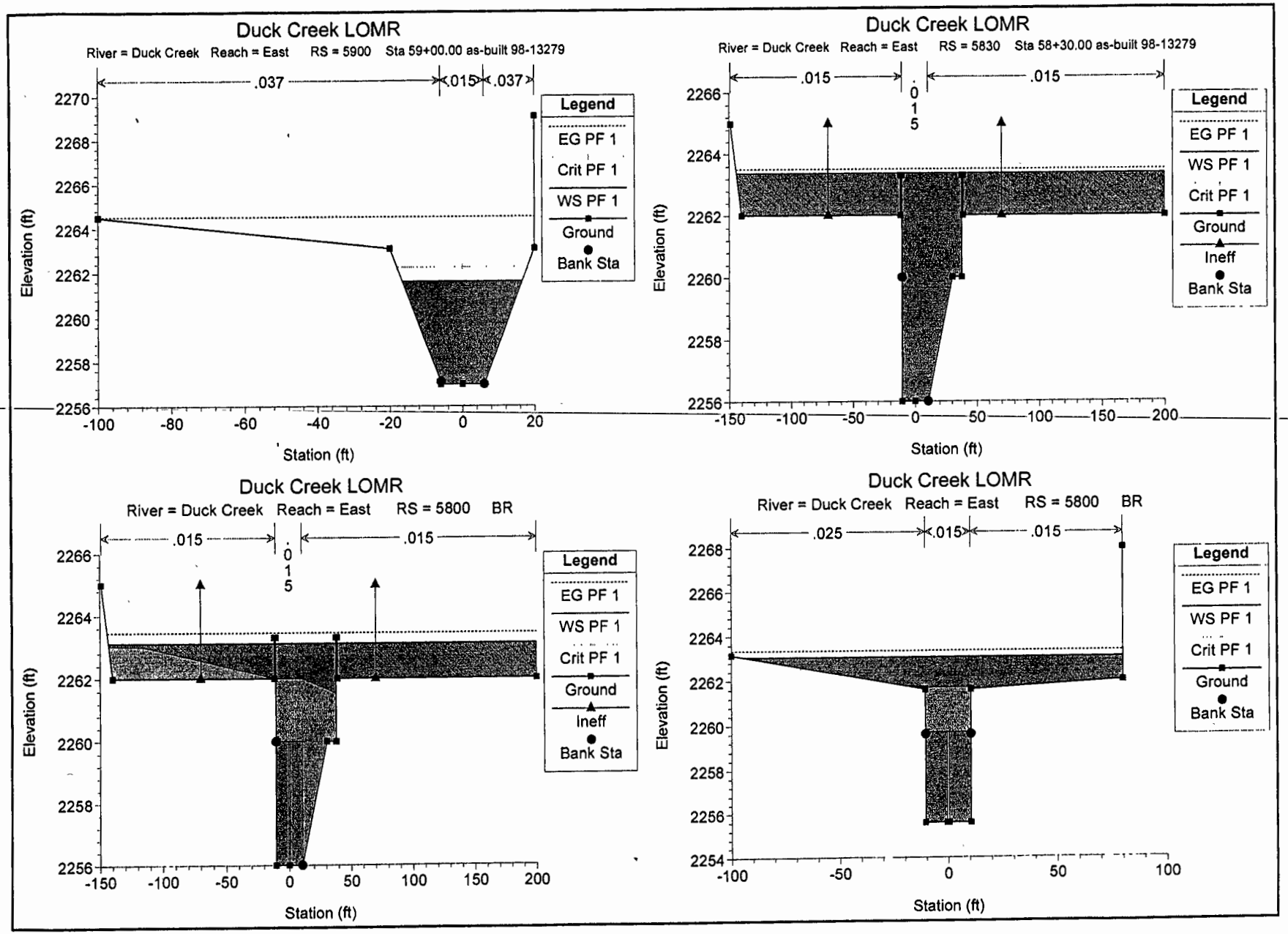

Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 1760 Sta 17+60
.016
.016
.016
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1640 Sta 16+40 as-built L-1704 7x3 joins in
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1500 Sta 15+00 as-built L1704
.04
.04
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1200 Sta 12+00 as-built L1704 new FL grades at 105+00
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

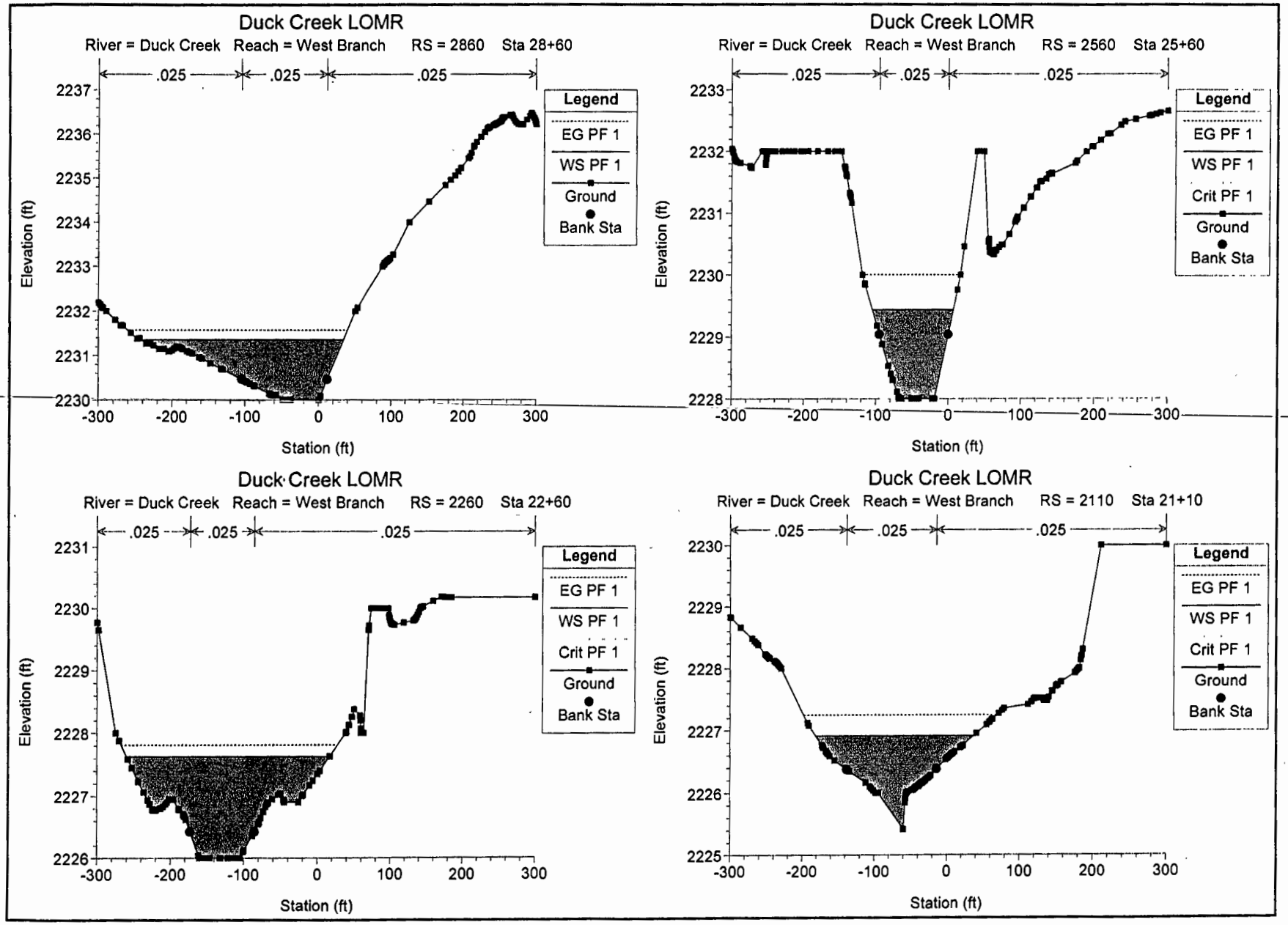

Duck Creek LOMR
River = Duck Creek Reach = East RS = 7800 Sta 78+00.00 as-built 95-19705
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 7500 Sta 75+00.00 as built 95-19705
Duck Creek LOMR
River = Duck Creek Reach = East RS = 7235 Sta 72+35.00 as-built 95-19705
Duck Creek LOMR
River = Duck Creek Reach = East RS = 7182.5 BR

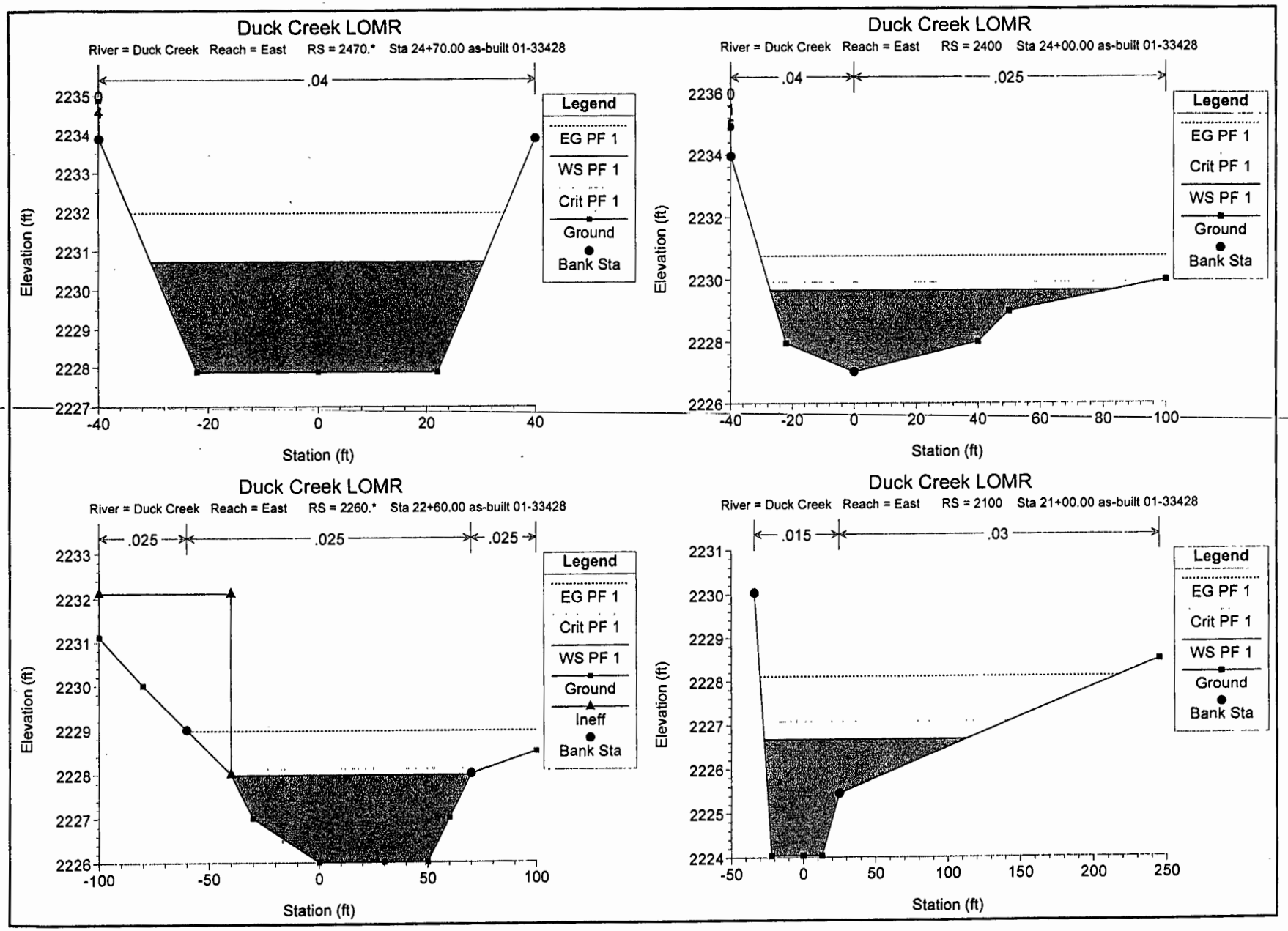

Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 900 Sta 9+00
.03
.03
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 800 Silverado Pines Cross Section 12.0
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 750 Silverado Pines Cross Section 11.5
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 700 Silverado Pines Cross Section 11.0
Ineff

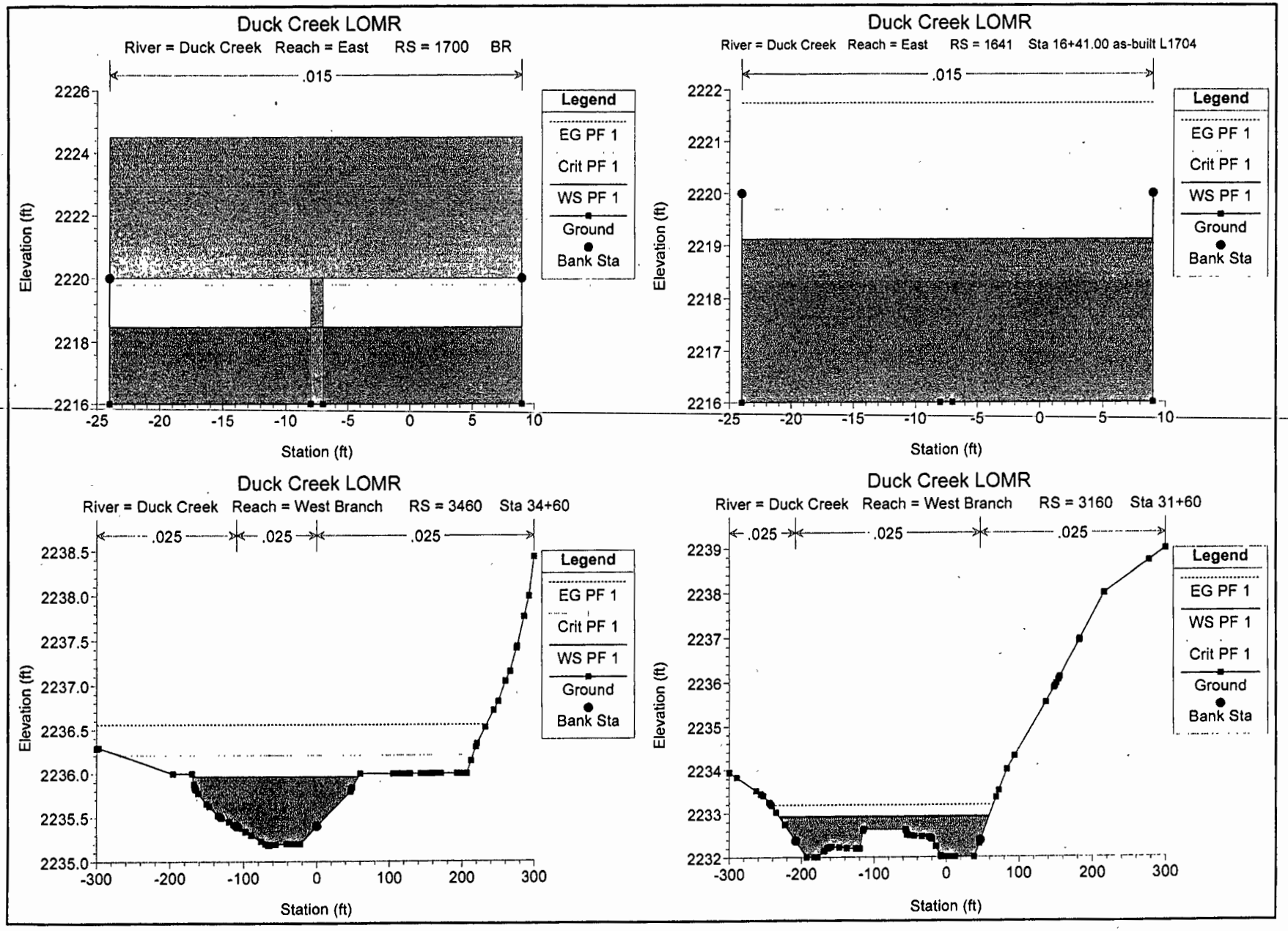

Duck Creek LOMR
River = Duck Creek Reach = East RS = 5770 Sta 57+70.00 as-built 98-13279
.025
.015
.015
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5700 Sta 57+00.00 as-built 98-13279
.037
.037
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5545 Sta 55+45.00 as-built 98-13279
.037
.037
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5530 Sta 55+30.00 as-built 98-13279
.025
.015
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

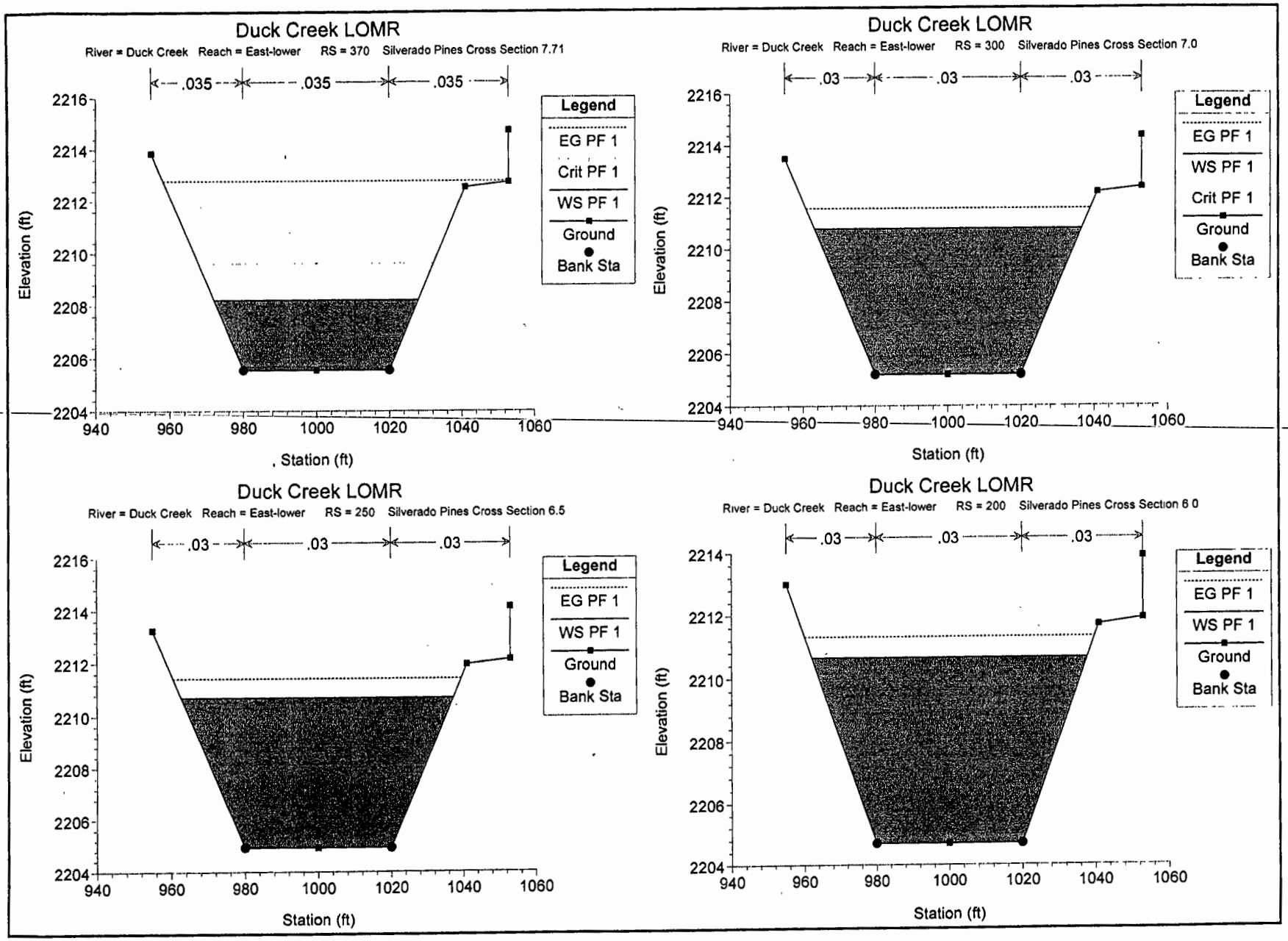

Duck Creek LOMR
River = Duck Creek Reach = East RS = 4380 Sta 43+80.00 as-built 97-10459
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4200 Sta 42+00 00 as-built 97-10459
.035
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 3900 Sta 39+00.00 as-built 97-10459
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 3600 Sta 36+00.00 as built 97-10459
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta

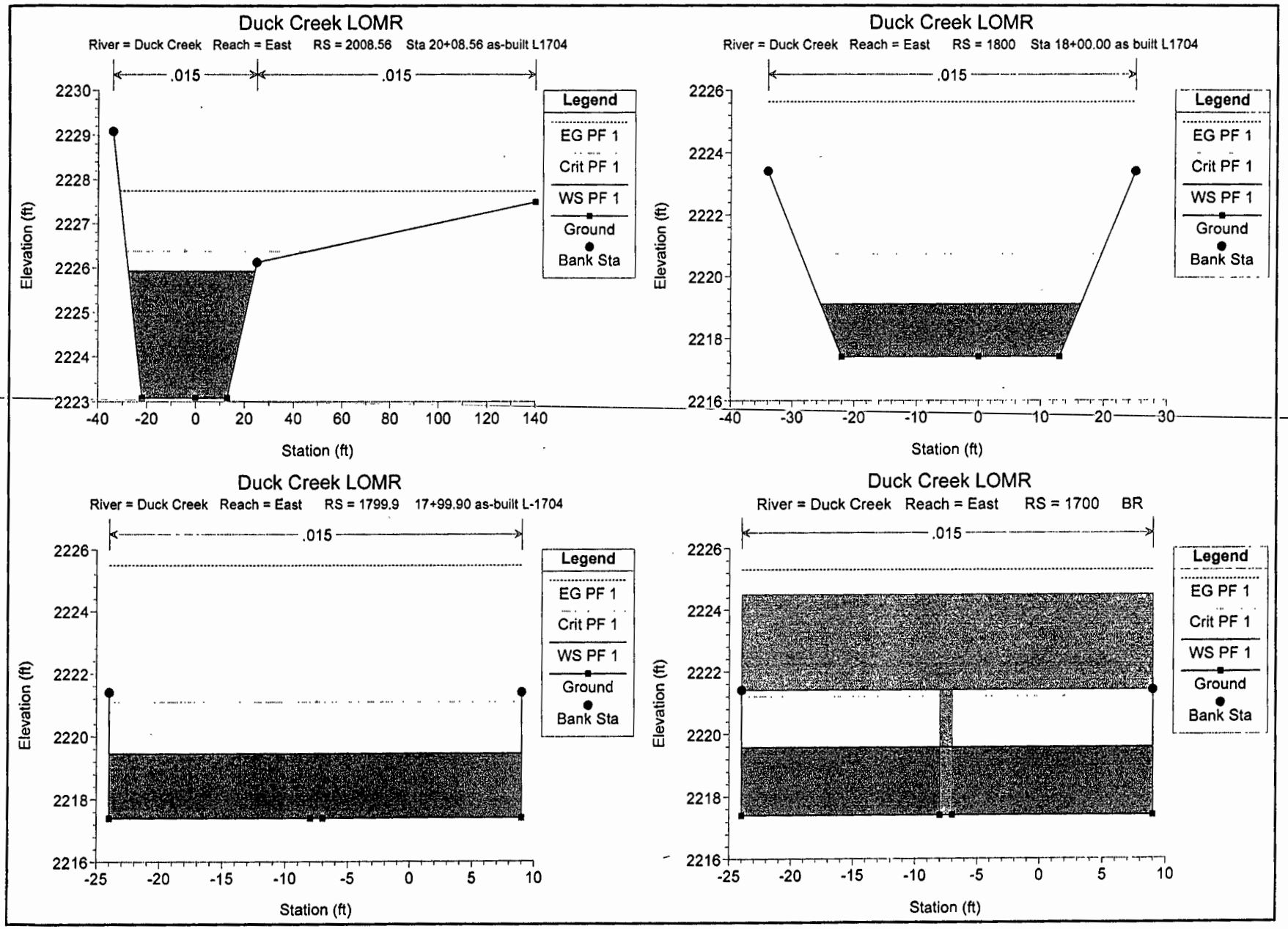

Duck Creek LOMR
River = Duck Creek Reach = East RS = 5900 Sta 59+00.00 as-built 98-13279
.037
.015
.037
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5830 Sta 58+30.00 as-built 98-13279
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5800 BR
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5800 BR
.025
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

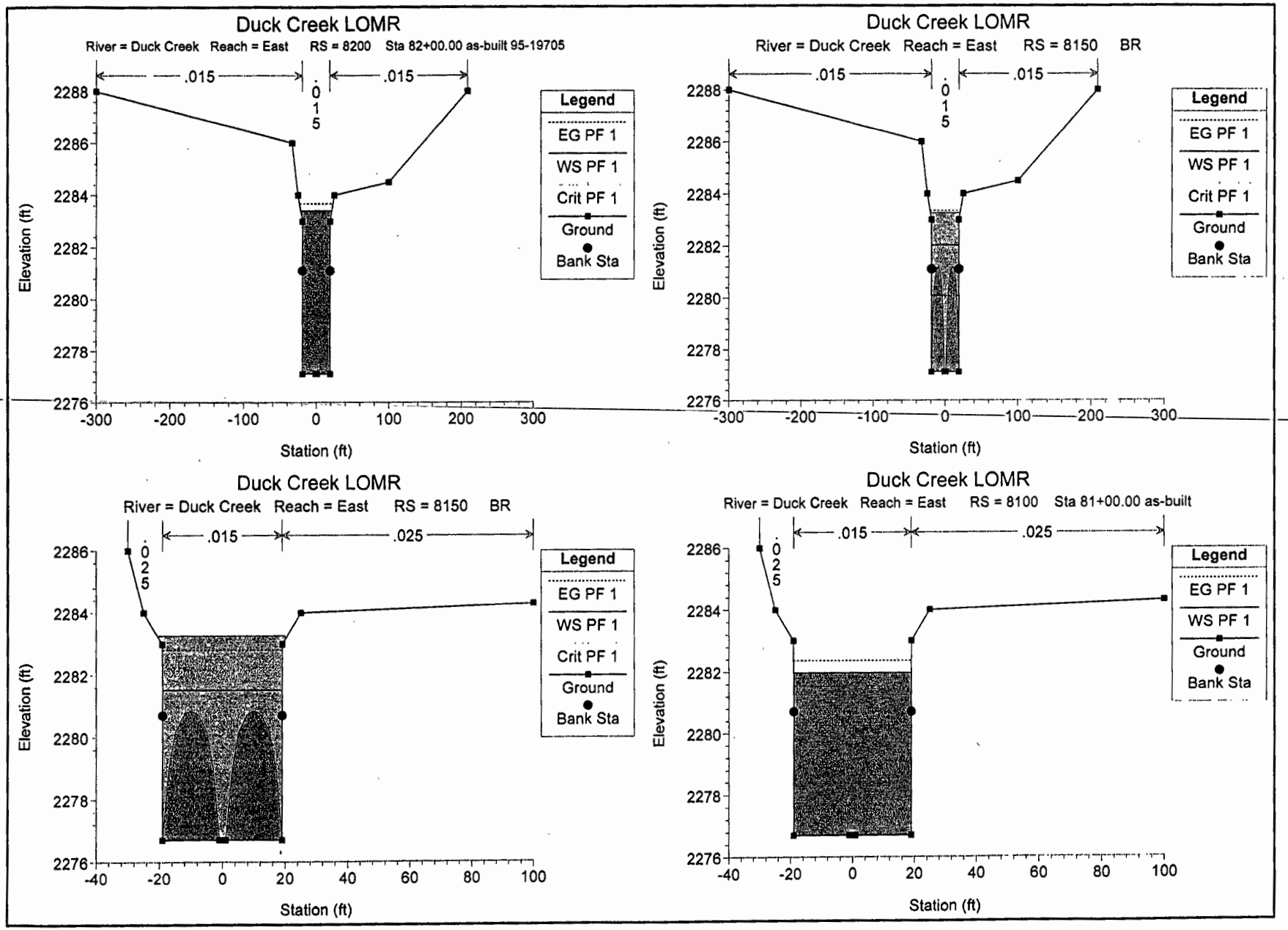

Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 2860 Sta 28+60
.025
.025
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 2560 Sta 25+60
Crit PF 1
Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 2260 Sta 22+60
Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 2110 Sta 21+10

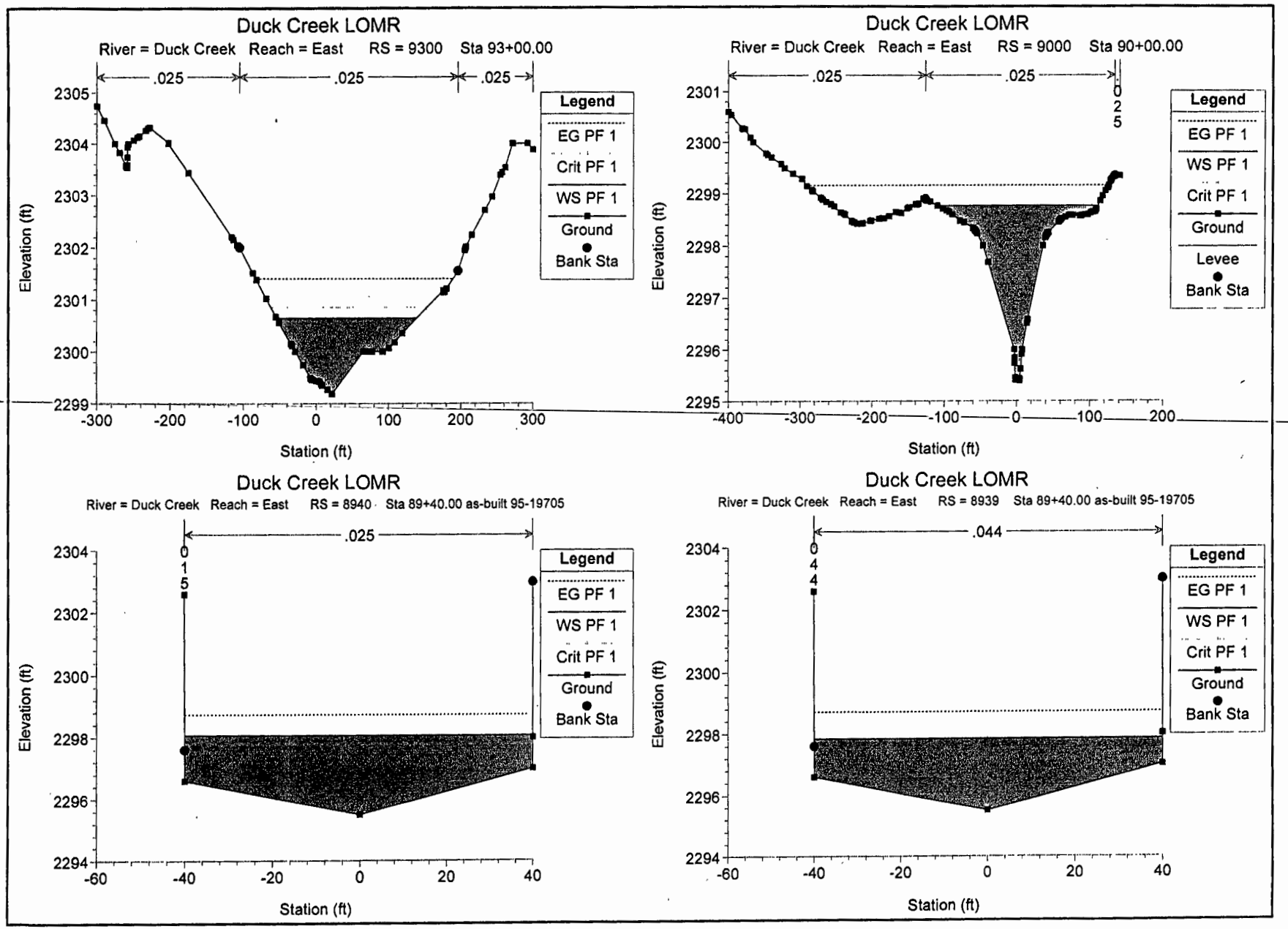

Duck Creek LOMR
River = Duck Creek Reach = East RS = 2470.* Sta 24+70.00 as-built 01-33428
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 2400 Sta 24+00.00 as-built 01-33428
.04
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 2260.* Sta 22+60.00 as-built 01-33428
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 2100 Sta 21+00.00 as-built 01-33428
.015
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

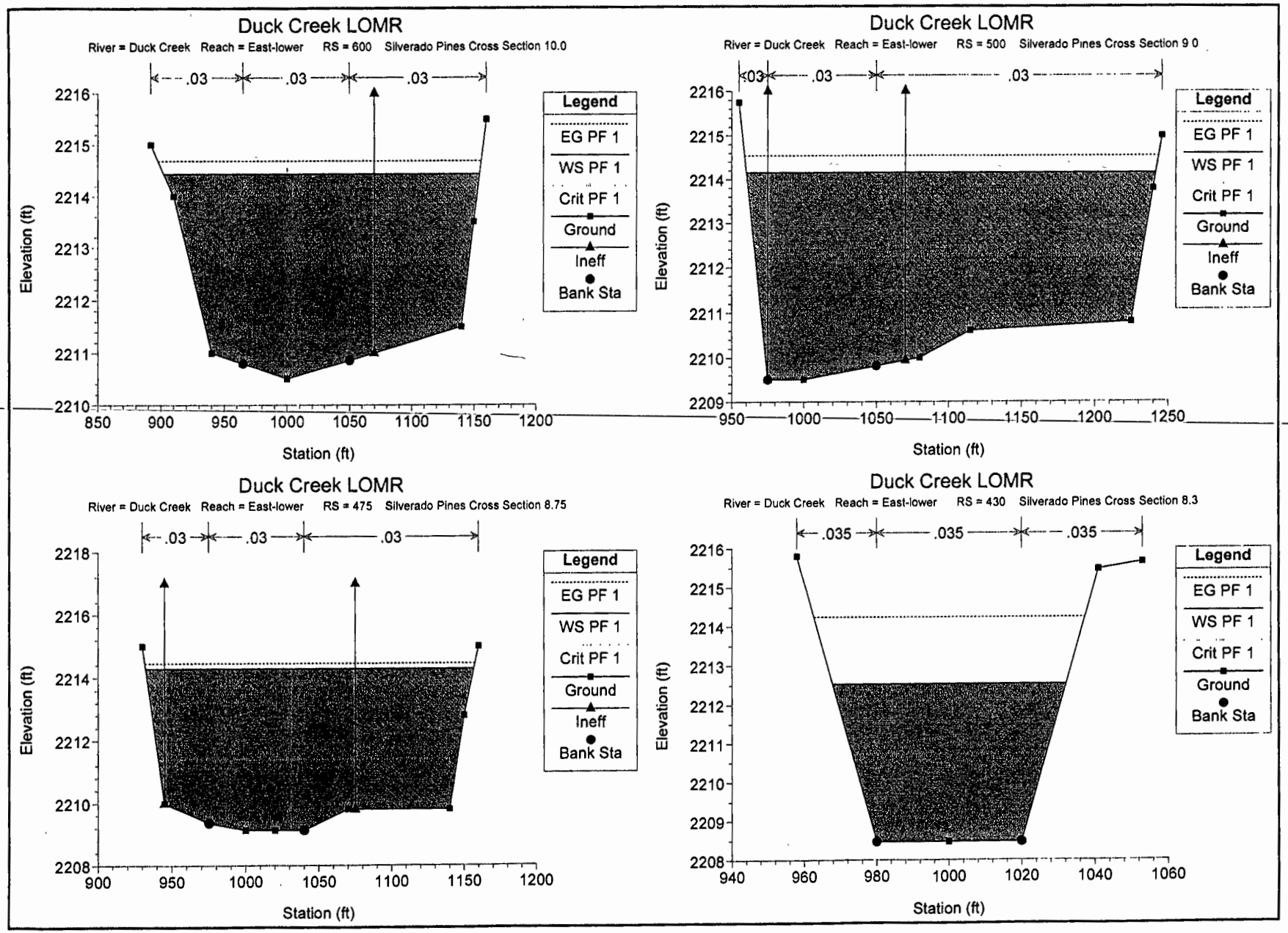

Duck Creek LOMR
River = Duck Creek Reach = East RS = 1700 BR
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 1641 Sta 16+41.00 as-built L1704
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 3460 Sta 34+60
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = West Branch RS = 3160 Sta 31+60
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

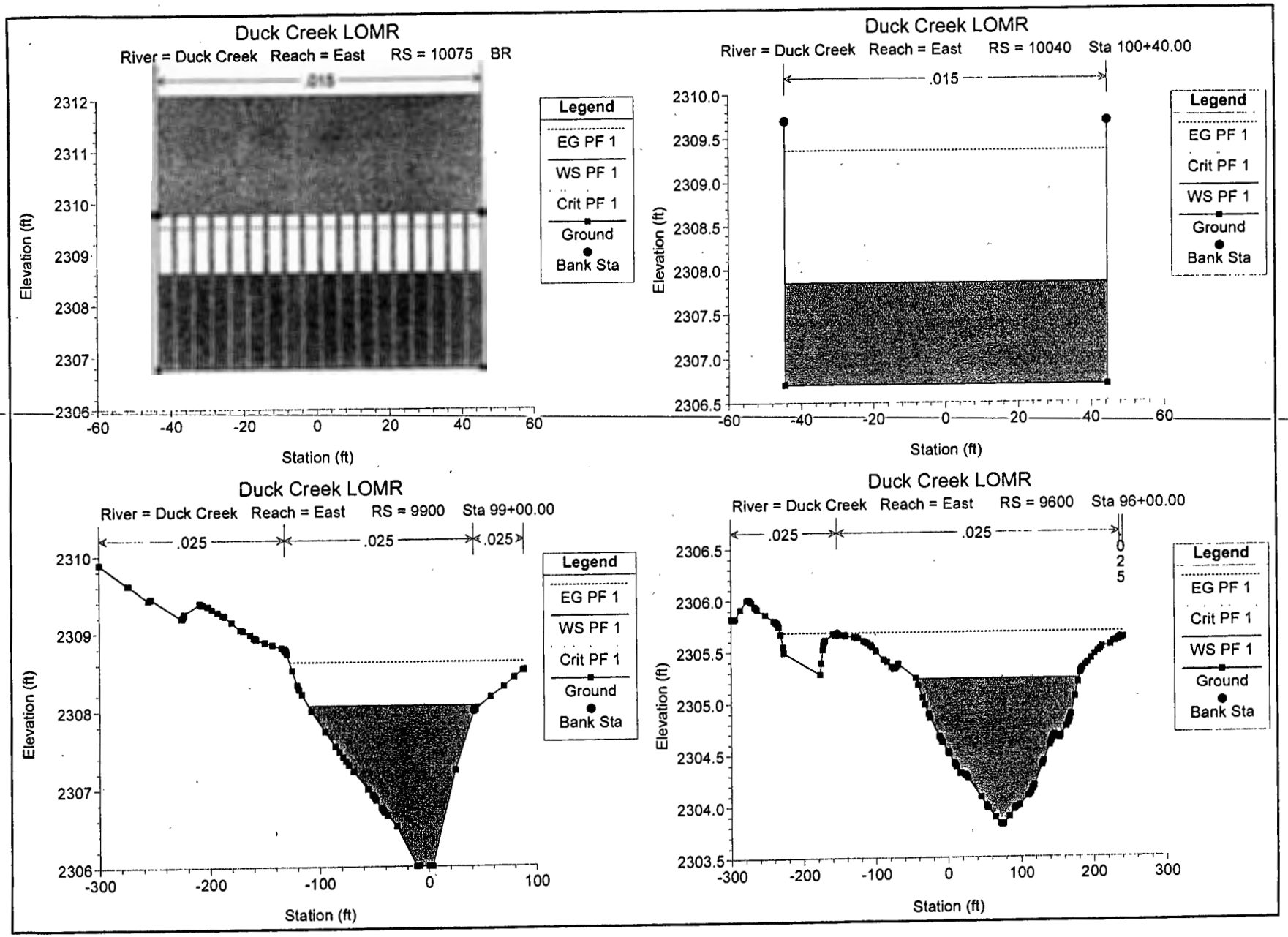

Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 370 Silverado Pines Cross Section 7.71
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 300 Silverado Pines Cross Section 7.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 250 Silverado Pines Cross Section 6.5
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 200 Silverado Pines Cross Section 6.0
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

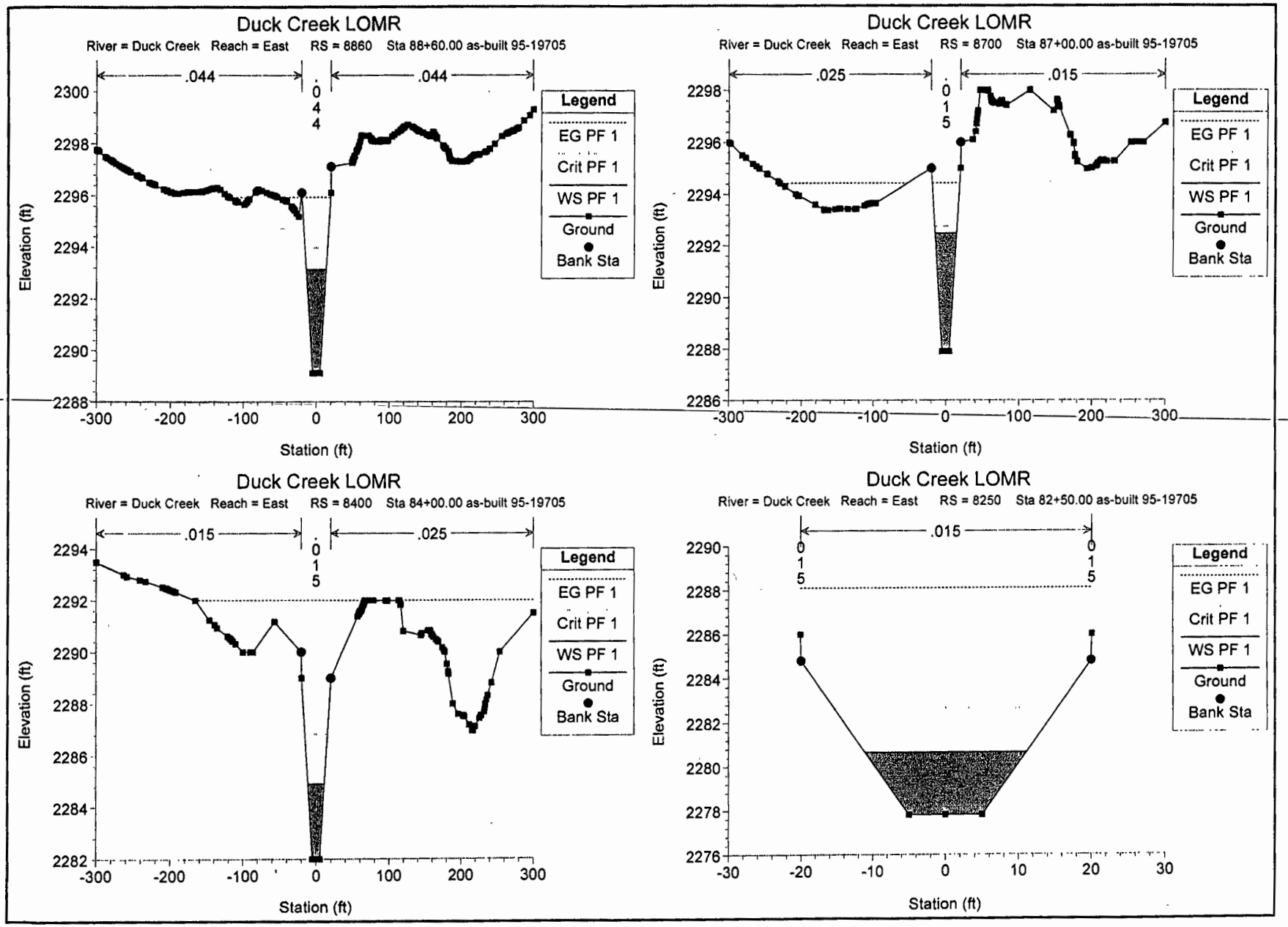

Duck Creek LOMR
River = Duck Creek Reach = East RS = 2008.56 Sta 20+08.56 as-built L1704
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 1800 Sta 18+00.00 as built L1704
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 1799.9 17+99.90 as-built L-1704
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 1700 BR
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

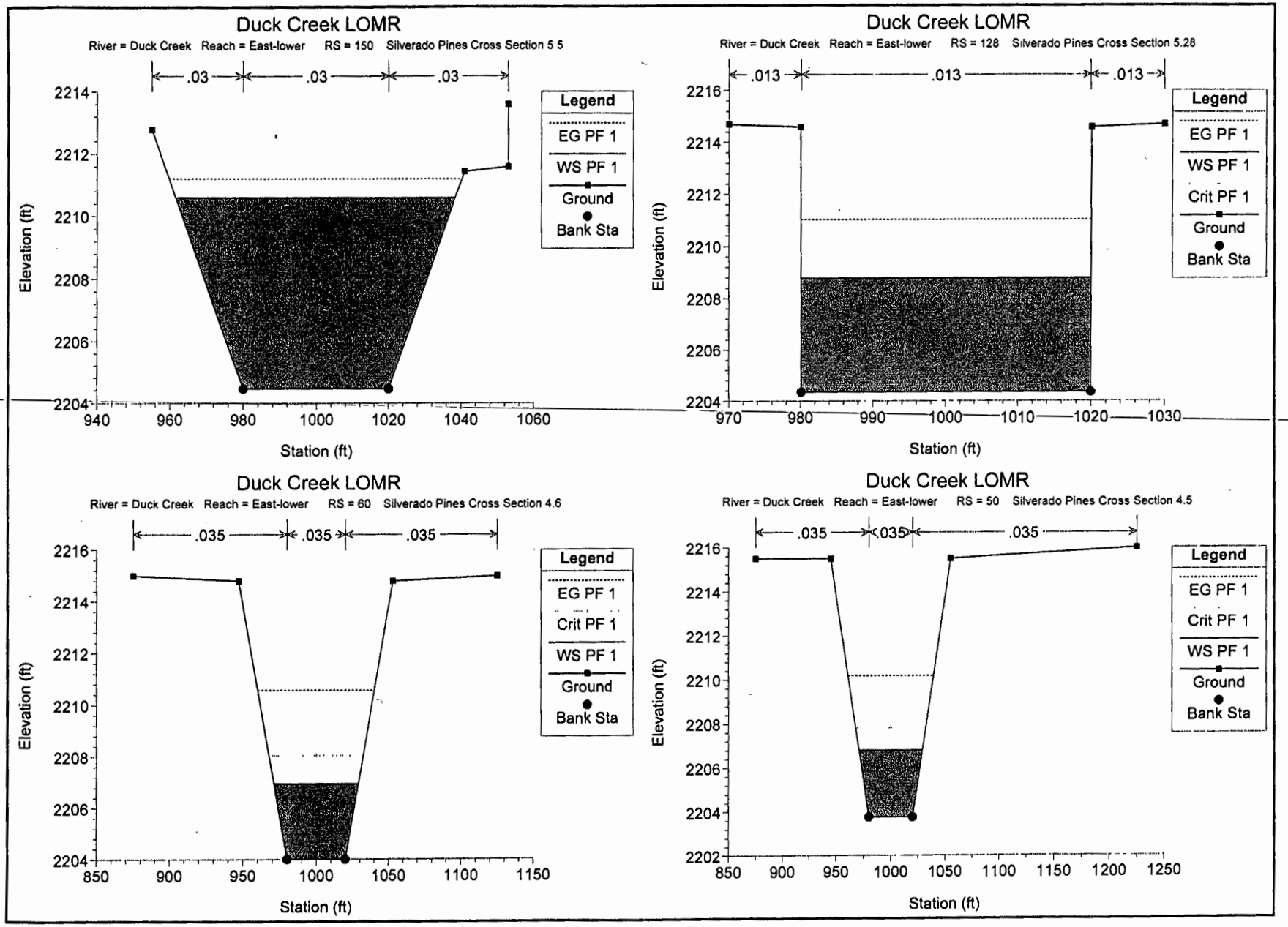

Duck Creek LOMR
River = Duck Creek Reach = East RS = 8200 Sta 82+00.00 as-built 95-19705
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8150 BR
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8150 BR
.025
.015
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8100 Sta 81+00.00 as-built
.025
.015
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

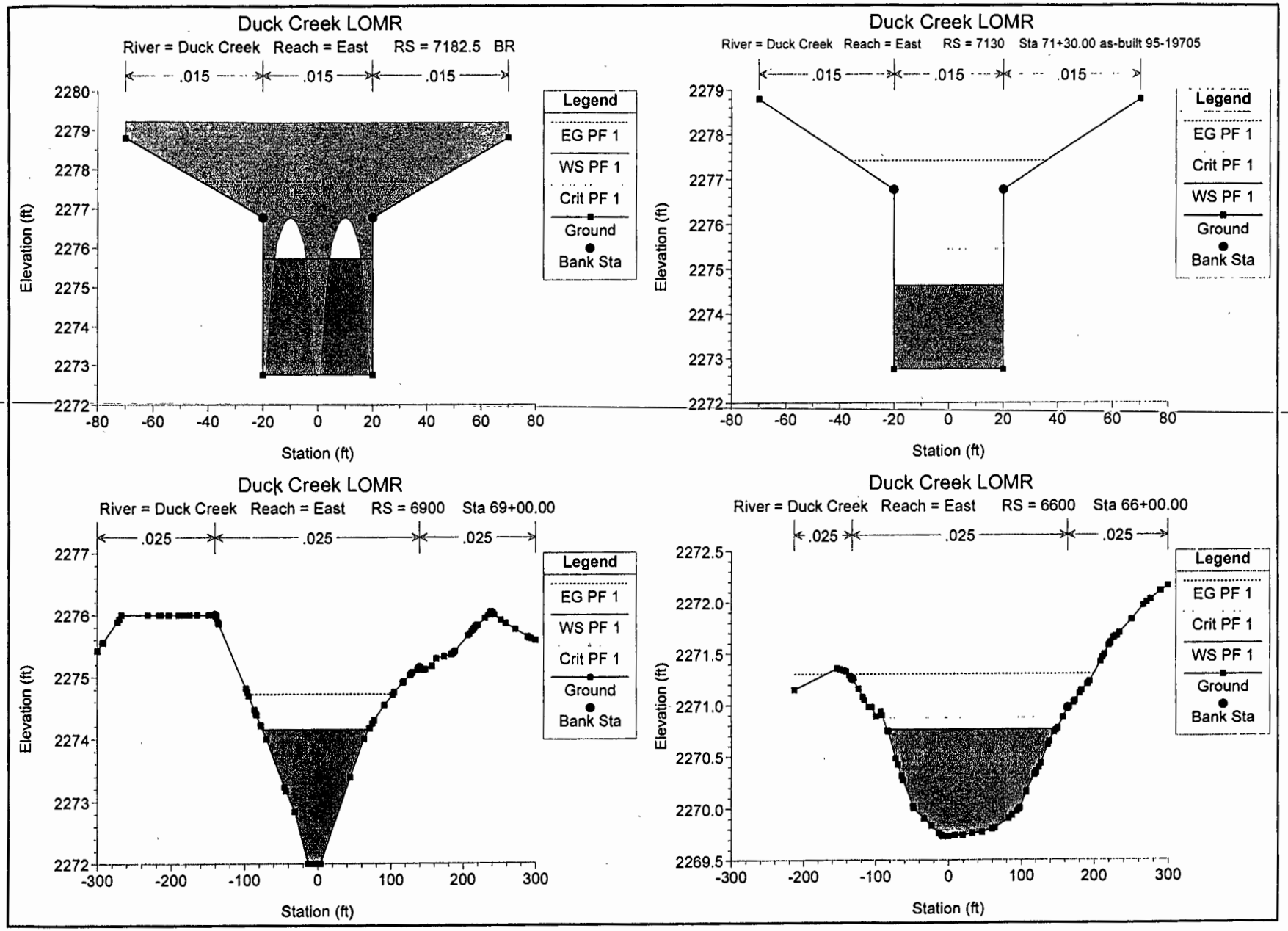

Duck Creek LOMR
River = Duck Creek Reach = East RS = 9300 Sta 93+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 9000 Sta 90+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8940 Sta 89+40.00 as-built 95-19705
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8939 Sta 89+40.00 as-built 95-19705
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

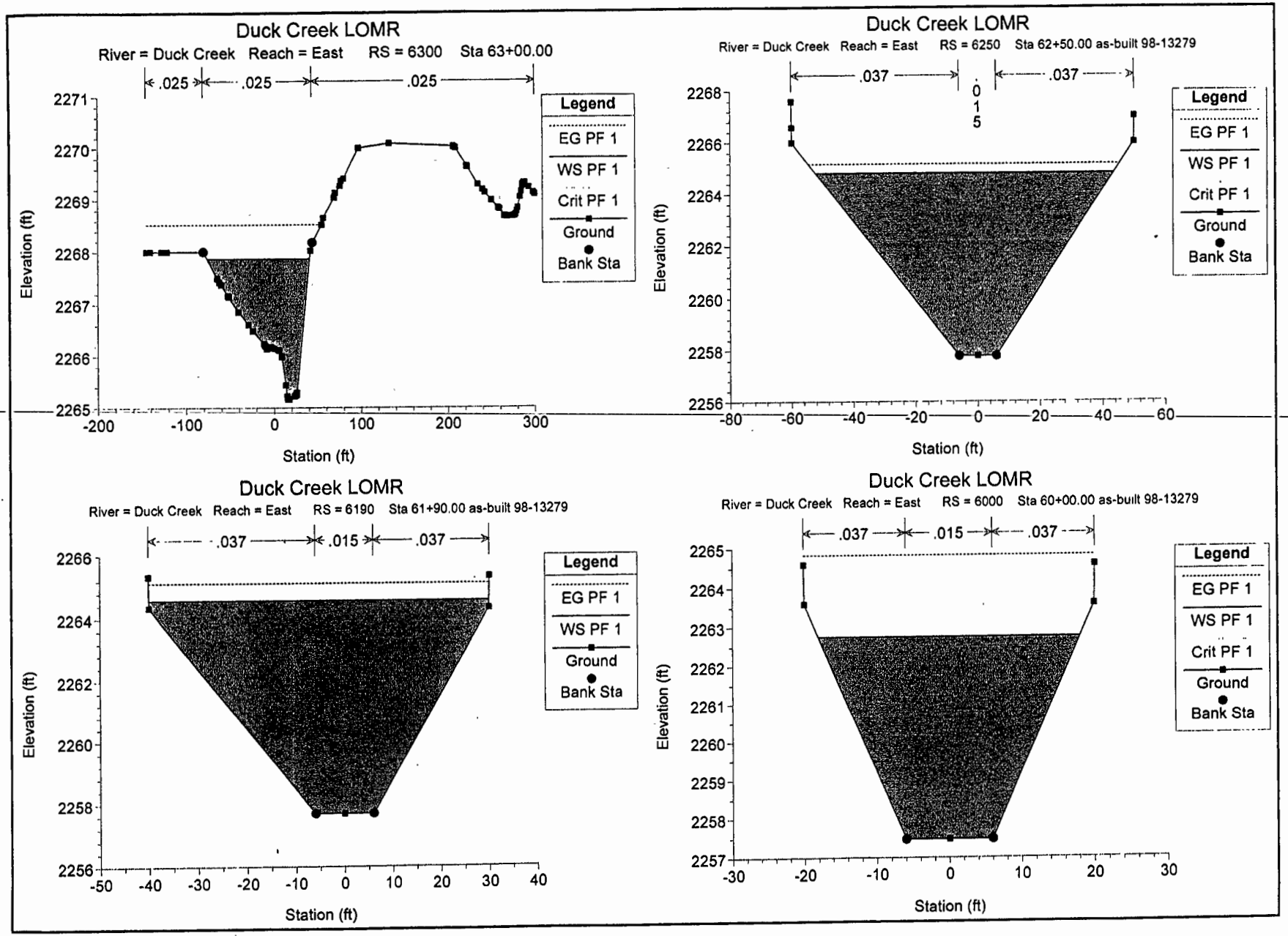

Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 600 Silverado Pines Cross Section 10.0
.03
.03
.03
Elevation (ft)
2216
2215
2214
2213
2212
2211
2210
850
900
950
1000
1050
1100
1150
1200
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 500 Silverado Pines Cross Section 9 0
.03
.03
.03
Elevation (ft)
2216
2215
2214
2213
2212
2211
2210
2209
950
1000
1050
1100
1150
1200
1250
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 475 Silverado Pines Cross Section 8.75
.03
.03
.03
Elevation (ft)
2218
2216
2214
2212
2210
2208
900
950
1000
1050
1100
1150
1200
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 430 Silverado Pines Cross Section 8.3
.035
.035
.035
Elevation (ft)
2216
2215
2214
2213
2212
2211
2210
2209
2208
940
960
980
1000
1020
1040
1060
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

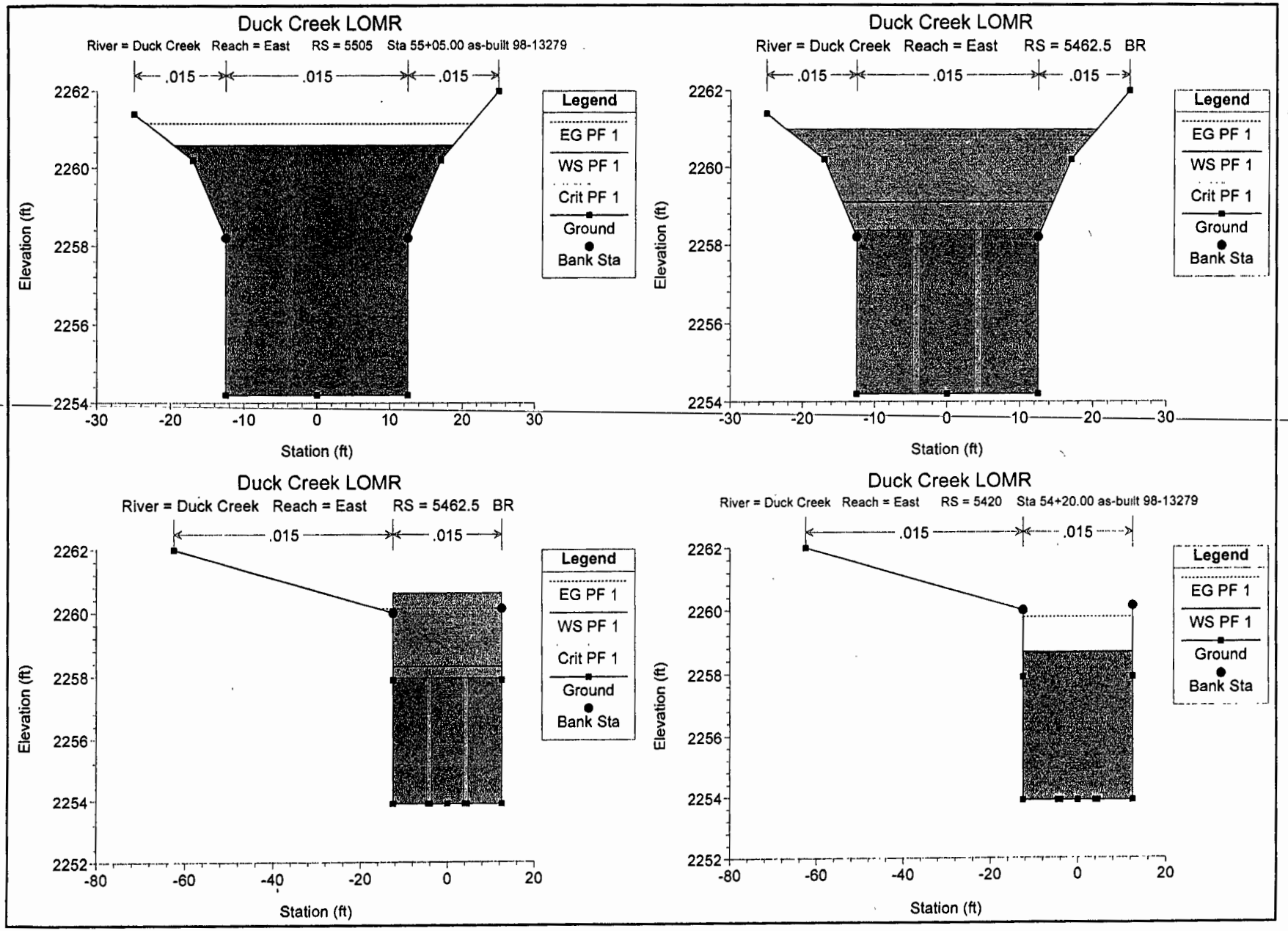

Duck Creek LOMR
River = Duck Creek Reach = East RS = 10075 BR
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 10040 Sta 100+40.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 9900 Sta 99+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 9600 Sta 96+00.00
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

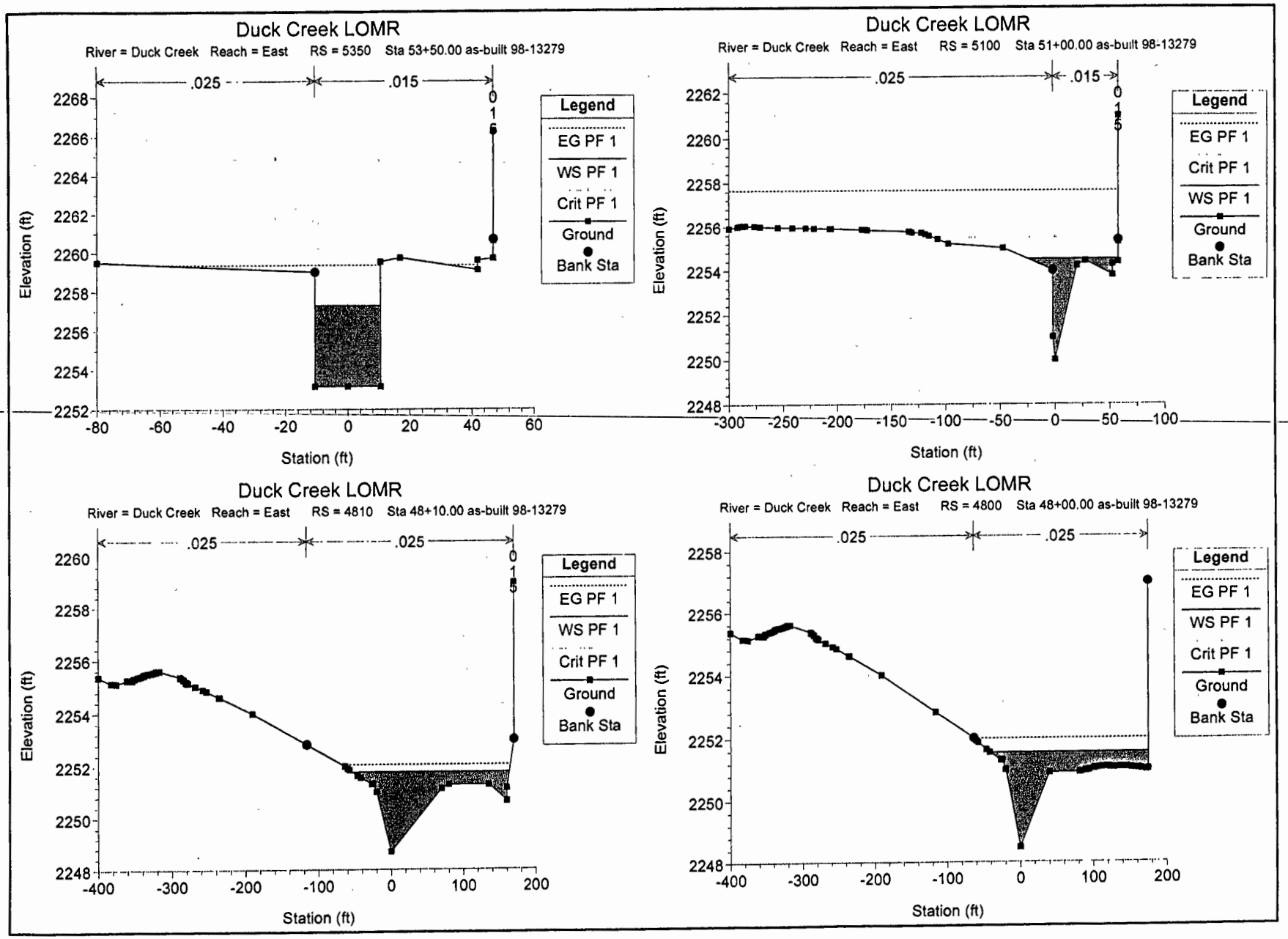

Duck Creek LOMR
River = Duck Creek Reach = East RS = 8660 Sta 88+60.00 as-built 95-19705
.044
.044
.044
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8700 Sta 87+00.00 as-built 95-19705
.025
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8400 Sta 84+00.00 as-built 95-19705
.015
.025
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 8250 Sta 82+50.00 as-built 95-19705
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

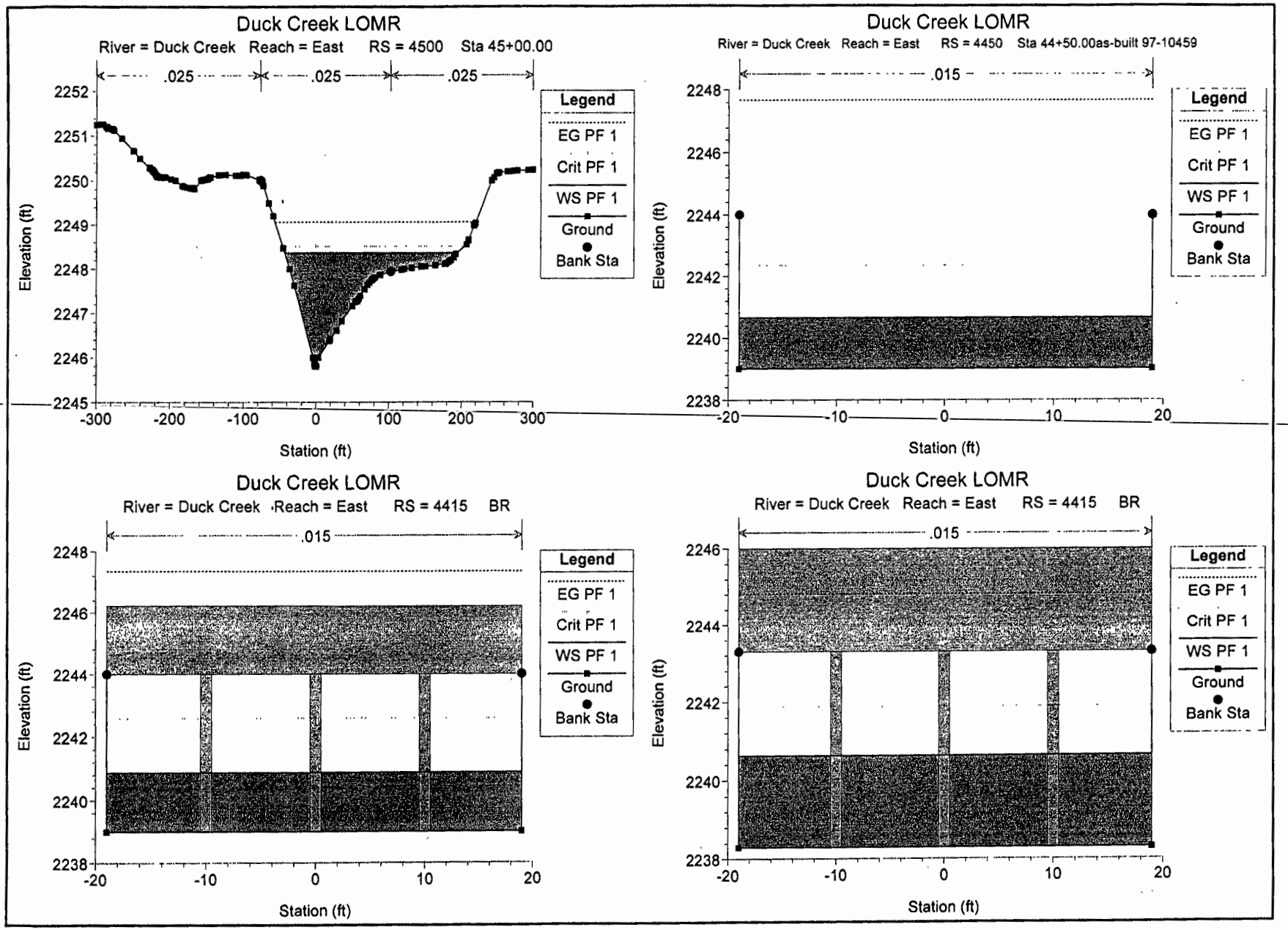

Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 150 Silverado Pines Cross Section 5 5
.03
.03
.03
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 128 Silverado Pines Cross Section 5.28
.013
.013
.013
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 60 Silverado Pines Cross Section 4.6
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 50 Silverado Pines Cross Section 4.5
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

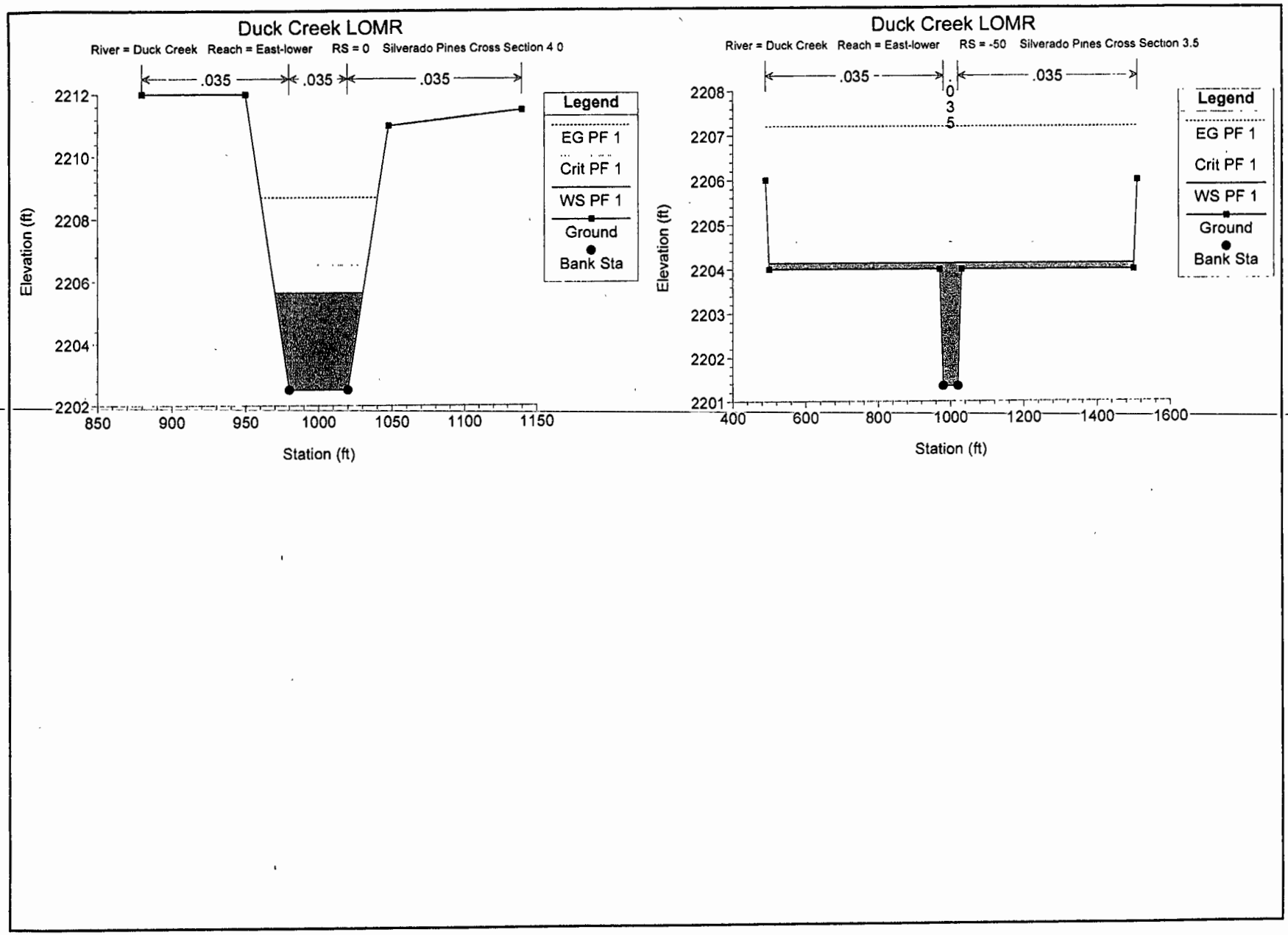

Duck Creek LOMR
River = Duck Creek Reach = East RS = 7182.5 BR
.015
.015
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 7130 Sta 71+30.00 as-built 95-19705
.015
.015
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 6900 Sta 69+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 6600 Sta 66+00.00
.025
.025
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

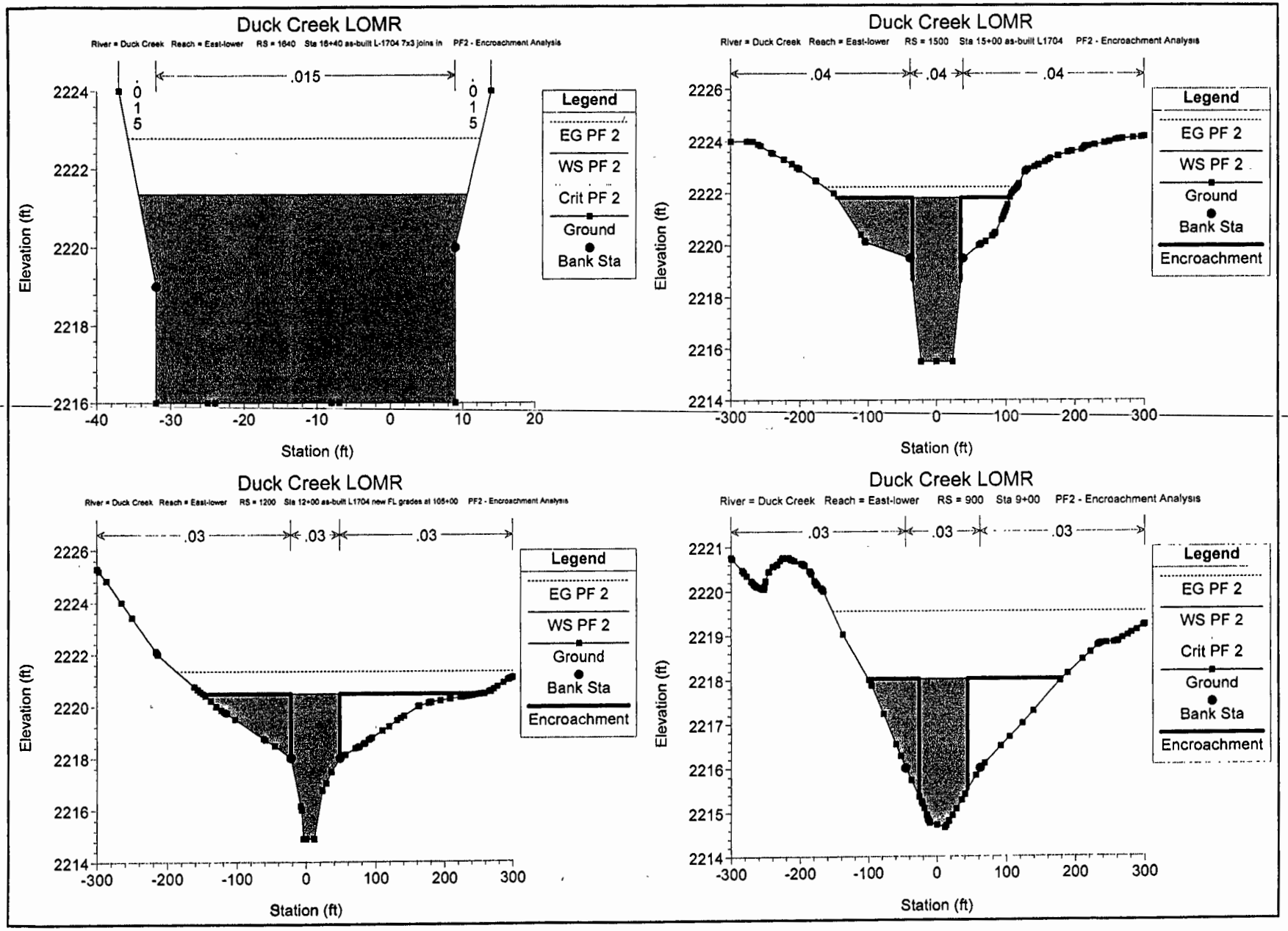

Duck Creek LOMR
River = Duck Creek Reach = East RS = 6300 Sta 63+00.00
.025
.025
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 6250 Sta 62+50.00 as-built 98-13279
.037
.037
.015
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 6190 Sta 61+90.00 as-built 98-13279
.037
.015
.037
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East RS = 6000 Sta 60+00.00 as-built 98-13279
.037
.015
.037
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

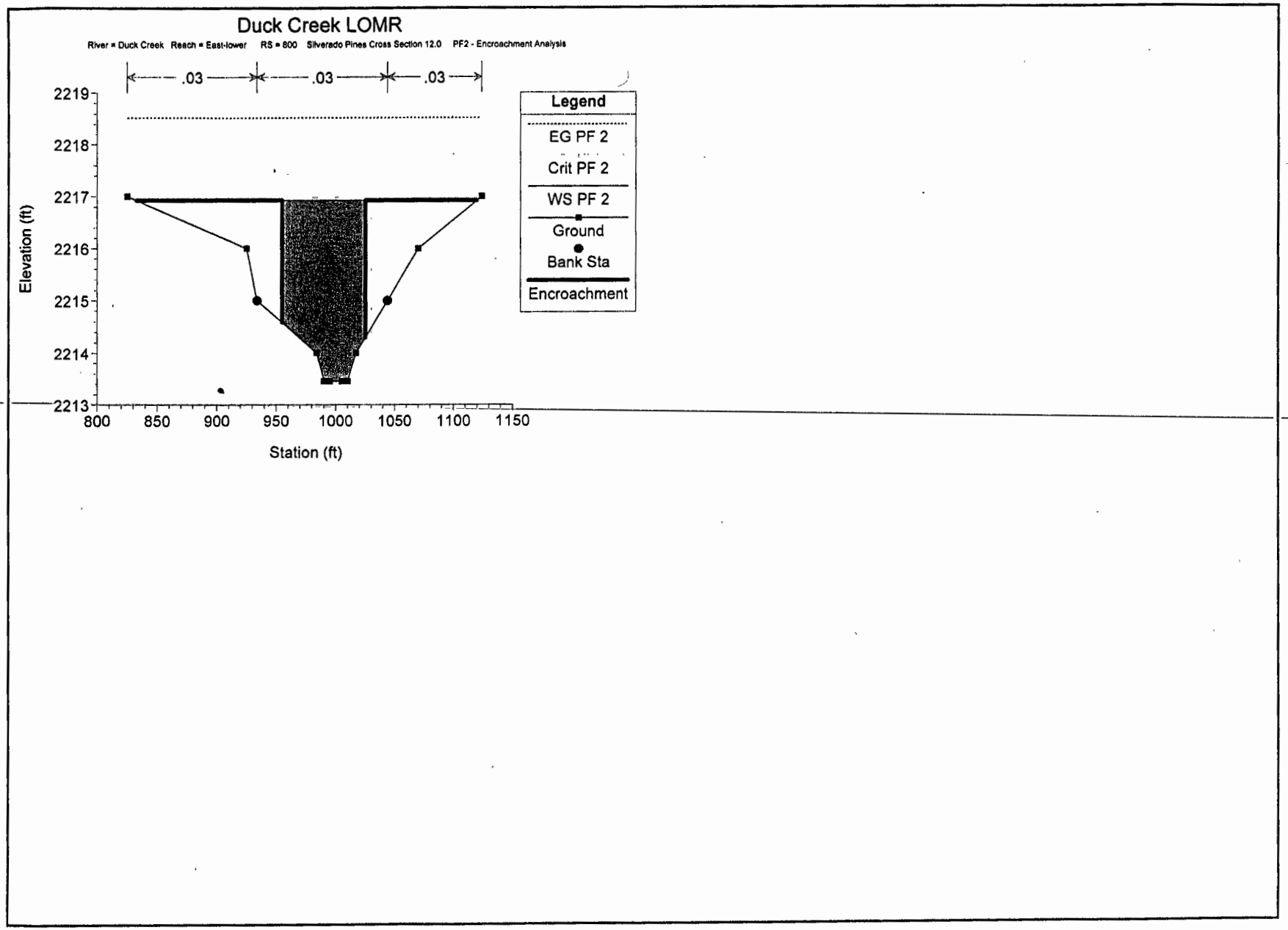

Duck Creek LOMR
River = Duck Creek Reach = East RS = 5505 Sta 55+05.00 as-built 98-13279
.015
.015
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5462.5 BR
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5462.5 BR
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5420 Sta 54+20.00 as-built 98-13279


Duck Creek LOMR
River = Duck Creek Reach = East RS = 5350 Sta 53+50.00 as-built 98-13279
.025
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 5100 Sta 51+00.00 as-built 98-13279
.025
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4810 Sta 48+10.00 as-built 98-13279
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4800 Sta 48+00.00 as-built 98-13279
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


Duck Creek LOMR
River = Duck Creek Reach = East RS = 4500 Sta 45+00.00
.025
.025
.025
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4450 Sta 44+50.00as-built 97-10459
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4415 BR
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Duck Creek LOMR
River = Duck Creek Reach = East RS = 4415 BR
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 0 Silverado Pines Cross Section 4 0
.035
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
2212
2210
2208
2206
2204
2202
850
900
950
1000
1050
1100
1150
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = -50 Silverado Pines Cross Section 3.5
.035
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
2208
2207
2206
2205
2204
2203
2202
2201
400
600
800
1000
1200
1400
1600
Station (ft)


Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1640 Sta 16+40 as-built L-1704 7x3 joins in PF2 - Encroachment Analysis
.015
.015
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1500 Sta 15+00 as-built L1704 PF2 - Encroachment Analysis
.04
.04
.04
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 1200 Sta 12+00 as-built L1704 new FL grades at 105+00 PF2 - Encroachment Analysis
.03
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 900 Sta 9+00 PF2 - Encroachment Analysis
.03
.03
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


Duck Creek LOMR
River = Duck Creek Reach = East-lower RS = 800 Silverado Pines Cross Section 12.0 PF2 - Encroachment Analysis
.03
.03
.03
Legend
EG PF 2
Crit PF 2
WS PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
2219
2218
2217
2216
2215
2214
2213
800
850
900
950
1000
1050
1100
1150
Station (ft)

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: Duck Creek LOMR
Project File : DCLOMR.prj
Run Date and Time: 9/3/2009 11:03:24 AM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : J:\JOBS\6657\Hydrology and Hydraulics_ CLOMR_LOMR\HEC-RAS\LOMR\DCLOMR.p01

Geometry Title: East Existing Channel
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics_ CLOMR_LOMR\HEC-RAS\LOMR\DCLOMR.g03

Flow Title : Flow 01
Flow File : J:\JOBS\6657\Hydrology and Hydraulics_ CLOMR_LOMR\HEC-RAS\LOMR\DCLOMR.f01

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections | = 102 | Multiple Openings | = | 0 |
| | Culverts | = 1 | Inline Structures | = | 0 |
| | Bridges | = 7 | Lateral Structures | = | 0 |

Computational Information

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

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

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

River = Duck Creek Reach = East-lower

| RS | Profile | Method | Value1 | Value2 |
|---|---|---|---|---|
| 1500 | PF 2 | 1 | -35 | 35 |
| 1200 | PF 2 | 1 | -22 | 48 |
| 900 | PF 2 | 1 | -26 | 44 |
| 800 | PF 2 | 1 | 955 | 1025 |

FLOW DATA

Flow Title: Flow 01
Flow File : J:\JOBS\6657\Hydrology and Hydraulics_ CLOMR_LOMR\HEC-RAS\LOMR\DCLOMR.f01

Flow Data (cfs)

| River | Reach | RS | PF 1 | PF 2 |
|---|---|---|---|---|
| Duck Creek | East-West Branch | 500 | 204 | 204 |
| Duck Creek | East-East Branch | 500 | 266 | 266 |
| Duck Creek | East | 12300 | 464 | 464 |
| Duck Creek | East | 10200 | 1008 | 1008 |
| Duck Creek | East | 4500 | 1338 | 1338 |
| Duck Creek | West Branch | 3460 | 692 | 692 |
| Duck Creek | West Branch | 2260 | 789 | 789 |
| Duck Creek | West Branch | 2110 | 589 | 589 |
| Duck Creek | East-lower | 1640 | 2127 | 2127 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Duck Creek | East-West Branch | PF 1 | Normal S = 0.005 | |
| Duck Creek | East-East Branch | PF 1 | Normal S = 0.02 | |
| Duck Creek | West Branch | PF 1 | Normal S = 0.02 | |
| Duck Creek | East-lower | PF 1 | | Normal S = 0.0109 |

GEOMETRY DATA

Geometry Title: East Existing Channel
Geometry File : J:\JOBS\6657\Hydrology and Hydraulics_ CLOMR_LOMR\HEC-RAS\LOMR\DCLOMR.g03

Reach Connection Table

| River | Reach | Upstream Boundary | Downstream Boundary |
|---|---|---|---|
| Duck Creek | East-West Branch | | Junction 1 |
| Duck Creek | East-East Branch | | Junction 1 |
| Duck Creek | East | Junction 1 | junction 3 |
| Duck Creek | West Branch | | junction 3 |
| Duck Creek | East-lower | junction 3 | |

JUNCTION INFORMATION

Name: Junction 1
Description:
Energy computation Method

| Length across Junction | | Tributary | | | |
|---|---|---|---|---|---|
| River | Reach | River | Reach | Length | Angle |
| Duck Creek | East-West Branch to Duck Creek | East | | 0 | 0 |
| Duck Creek | East-East Branch to Duck Creek | East | | 0 | 0 |

Name: junction 3
Description:
Energy computation Method

| Length across Junction | | Tributary | | | |
|---|---|---|---|---|---|
| River | Reach | River | Reach | Length | Angle |

| | | | | | |
|---|---|---|---|---|---|
| Duck Creek | East | to Duck Creek | East-lower | 1 | 0 |
| Duck Creek | West Branch | to Duck Creek | East-lower | 0 | 0 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch RS: 500

INPUT
Description: Sta 5+00
Station Elevation Data num= 64

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2342.49 | -93.89 | 2342.38 | -92.38 | 2342.37 | -85.34 | 2342.24 | -85.09 | 2342.23 |
| -83.19 | 2342.2 | -80.25 | 2342.16 | -79.02 | 2342.14 | -78.62 | 2342.14 | -67.61 | 2342 |
| -62.32 | 2341.85 | -60.72 | 2341.77 | -50.6 | 2341.43 | -49.38 | 2341.37 | -48.57 | 2341.33 |
| -41.36 | 2341.04 | -39.96 | 2340.99 | -38.83 | 2340.95 | -37.78 | 2340.91 | -32.612 | 340.708 |
| -31.9 | 2340.68 | -28.63 | 2340.61 | -22.33 | 2340.5 | -8.95 | 2340.3 | -6.26 | 2340.24 |
| -5.35 | 2340.22 | -4.43 | 2340.2 | -3.51 | 2340.16 | -2.69 | 2340.13 | -1.86 | 2340.09 |
| -1 | 2340.04 | -.27 | 2340 | 0 | 2339.84 | .58 | 2339.51 | 1.13 | 2339.18 |
| 1.42 | 2338.98 | 1.56 | 2338.85 | 3.49 | 2338 | 4.09 | 2337.65 | 7.15 | 2336 |
| 14.44 | 2336 | 18.83 | 2336 | 21.21 | 2336 | 22.3 | 2336 | 26.7 | 2337.72 |
| 27.45 | 2338 | 28.45 | 2338.38 | 32.61 | 2340 | 46.36 | 2340.55 | 48.15 | 2340.56 |
| 52.59 | 2340.57 | 62.16 | 2340.84 | 63.1 | 2340.86 | 63.53 | 2340.87 | 64.77 | 2340.9 |
| 72.19 | 2341.03 | 74.74 | 2341.04 | 76.96 | 2341.05 | 83.27 | 2341.15 | 90.87 | 2341.17 |
| 96.31 | 2341.27 | 99.38 | 2341.32 | 99.87 | 2341.33 | 100 | 2341.33 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -1 | .025 | 32.61 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -1 | 32.61 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch RS: 400

INPUT
Description: Sta 4+00
Station Elevation Data num= 67

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2340.56 | -97.35 | 2340.53 | -96.7 | 2340.53 | -96.08 | 2340.52 | -95.51 | 2340.51 |
| -94.99 | 2340.5 | -94.51 | 2340.48 | -94.07 | 2340.47 | -93.65 | 2340.46 | -89.25 | 2340.29 |
| -88.66 | 2340.28 | -88 | 2340.26 | -87.27 | 2340.24 | -86.48 | 2340.23 | -85.42 | 2340.22 |
| -83.81 | 2340.19 | -82.48 | 2340.18 | -73.09 | 2340 | -61.27 | 2339.73 | -61.13 | 2339.73 |
| -57.54 | 2339.64 | -55.41 | 2339.59 | -55.19 | 2339.58 | -54.97 | 2339.58 | -47.76 | 2339.38 |
| -47.46 | 2339.37 | -46.85 | 2339.37 | -33.77 | 2339 | -32 | 2338.99 | -31.16 | 2338.99 |
| -30.77 | 2338.99 | -30.42 | 2338.99 | -30.11 | 2338.99 | -29.59 | 2339 | -29.02 | 2339.01 |
| -28.77 | 2339.02 | -28.22 | 2339.07 | -15.77 | 2339.05 | 0 | 2338.69 | 10.39 | 2338.45 |
| 30.05 | 2338 | 31.02 | 2337.43 | 32.03 | 2336.83 | 32.6 | 2336.49 | 33.29 | 2335.25 |
| 37.09 | 2335.25 | 39.23 | 2335.25 | 39.4 | 2335.25 | 40.96 | 2336.45 | 45.64 | 2337.78 |
| 46.31 | 2338 | 48.88 | 2338.19 | 49.13 | 2338.2 | 49.27 | 2338.21 | 49.4 | 2338.21 |
| 49.53 | 2338.22 | 49.66 | 2338.22 | 49.91 | 2338.23 | 63.29 | 2339.08 | 66.34 | 2339.12 |
| 68.83 | 2339.14 | 75.68 | 2339.49 | 87.42 | 2339.51 | 92.34 | 2339.53 | 94.09 | 2339.55 |
| 95.68 | 2339.56 | 100 | 2339.62 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -15.77 | .025 | 66.34 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -15.77 | 66.34 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek

REACH: East-West Branch  RS: 300

INPUT
Description: Sta 3+00
Station Elevation Data  num=  60

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2338.93 | -97.16 | 2338.93 | -94.13 | 2338.92 | -85.9 | 2338.89 | -82.78 | 2338.88 |
| -74.13 | 2338.84 | -65.13 | 2338.82 | -57.3 | 2338.79 | -48.21 | 2338.77 | -47.77 | 2338.76 |
| -47.33 | 2338.76 | -46.96 | 2338.76 | -46.59 | 2338.76 | -46.11 | 2338.75 | -45.63 | 2338.75 |
| -45.15 | 2338.74 | -44.21 | 2338.73 | -43.48 | 2338.72 | -42.63 | 2338.71 | -41.16 | 2338.68 |
| -38.94 | 2338.63 | -34.41 | 2338.52 | -24.99 | 2338.29 | -14.73 | 2338.04 | -12.88 | 2338 |
| -.87 | 2336.18 | 0 | 2336.05 | .34 | 2334.49 | 4 | 2334.49 | 13.86 | 2337.15 |
| 13.94 | 2337.16 | 19.05 | 2338 | 19.1 | 2338 | 19.61 | 2338 | 35.69 | 2336.26 |
| 38.1 | 2334.49 | 38.14 | 2334.49 | 38.56 | 2334.49 | 48.11 | 2337.98 | 48.19 | 2338 |
| 48.23 | 2338 | 49.12 | 2338.01 | 49.97 | 2338.03 | 50.82 | 2338.03 | 51.67 | 2338.04 |
| 54.22 | 2338.05 | 65.09 | 2338.09 | 80.24 | 2338.14 | 89.63 | 2338.16 | 90.33 | 2338.17 |
| 91.03 | 2338.17 | 91.65 | 2338.18 | 93.26 | 2338.2 | 93.93 | 2338.21 | 94.58 | 2338.22 |
| 96.63 | 2338.25 | 97.35 | 2338.26 | 98.13 | 2338.27 | 98.88 | 2338.29 | 100 | 2338.31 |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -24.99 | .025 | 65.09 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24.99 | 65.09 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch  RS: 200

INPUT
Description: Sta 2+00
Station Elevation Data  num=  73

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2337.6 | -97.93 | 2337.59 | -87.76 | 2337.58 | -86.26 | 2337.58 | -81.9 | 2337.57 |
| -80.79 | 2337.57 | -77.97 | 2337.58 | -75.77 | 2337.59 | -75.38 | 2337.6 | -75.27 | 2337.6 |
| -75.17 | 2337.6 | -75.01 | 2337.6 | -74.17 | 2337.62 | -73.38 | 2337.65 | -73.16 | 2337.66 |
| -73.05 | 2337.67 | -72.37 | 2337.68 | -71.77 | 2337.7 | -71.72 | 2337.7 | -71.67 | 2337.7 |
| -71.62 | 2337.7 | -71.57 | 2337.7 | -71.52 | 2337.7 | -71.47 | 2337.7 | -71.41 | 2337.69 |
| -71.28 | 2337.69 | -70.23 | 2337.67 | -68.05 | 2337.63 | -66.69 | 2337.6 | -65.94 | 2337.58 |
| -65.68 | 2337.57 | -64.4 | 2337.52 | -62.17 | 2337.43 | -59.58 | 2337.32 | -58.55 | 2337.28 |
| -53.25 | 2337.09 | -46.52 | 2336.85 | -44.75 | 2336.8 | -37.44 | 2336.73 | -36.36 | 2336.69 |
| -34.04 | 2336.67 | -18.56 | 2336.1 | -17.63 | 2336.09 | -15.64 | 2336 | -11.18 | 2335.5 |
| -8.66 | 2335.23 | -6.93 | 2335.05 | -5.09 | 2334.87 | -4.96 | 2334.85 | -4.95 | 2333.74 |
| -3.21 | 2333.74 | -2.97 | 2334.91 | -2.91 | 2335.13 | -2.82 | 2335.38 | -2.56 | 2336 |
| -2.36 | 2336.08 | 0 | 2336.09 | 19.47 | 2336.17 | 19.59 | 2336.14 | 20.8 | 2336 |
| 31.44 | 2336 | 34.1 | 2336 | 34.26 | 2336 | 40.45 | 2336 | 52.72 | 2336.27 |
| 65.21 | 2336.51 | 71.97 | 2336.68 | 85.34 | 2336.97 | 87.56 | 2337.02 | 88.76 | 2337.05 |
| 96.99 | 2337.23 | 99.53 | 2337.28 | 100 | 2337.29 | | | | |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -53.25 | .025 | 71.97 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -53.25 | 71.97 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-West Branch  RS: 100

INPUT
Description: Sta 1+00
Station Elevation Data  num=  89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2335.75 | -83.24 | 2335.75 | -82.98 | 2335.75 | -76.77 | 2335.75 | -72.21 | 2335.77 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -59.33 | 2335.84 | -47.75 | 2335.91 | -45.41 | 2335.92 | -44.64 | 2335.93 | -43.9 | 2335.94 |
| -42.44 | 2335.96 | -39.98 | 2336 | -36.94 | 2336.09 | -32.98 | 2336.21 | -31.85 | 2336.28 |
| -31.33 | 2336.3 | -27.94 | 2336.39 | -24.98 | 2336.46 | -24.74 | 2336.46 | -24.48 | 2336.46 |
| -24.21 | 2336.46 | -23.97 | 2336.46 | -23.72 | 2336.46 | -23.46 | 2336.46 | -23.18 | 2336.45 |
| -22.53 | 2336.44 | -17.37 | 2336.34 | -6.66 | 2336.14 | -.04 | 2336 | -.03 | 2336 |
| 0 | 2335.99 | 3.62 | 2334.91 | 6.65 | 2334 | 7.77 | 2333.52 | 7.79 | 2333.41 |
| 10.68 | 2332.98 | 13.68 | 2333.39 | 16.03 | 2333.83 | 16.74 | 2333.95 | 17.08 | 2334 |
| 17.37 | 2334.04 | 17.66 | 2334.07 | 18 | 2334.1 | 18.08 | 2334.11 | 18.46 | 2334.13 |
| 18.93 | 2334.14 | 19.47 | 2334.15 | 20.05 | 2334.16 | 25.67 | 2334.21 | 26.17 | 2334.22 |
| 26.6 | 2334.23 | 26.64 | 2334.23 | 26.97 | 2334.24 | 27.01 | 2334.24 | 27.09 | 2334.23 |
| 27.51 | 2334.18 | 27.82 | 2334.15 | 28.1 | 2334.12 | 28.11 | 2334.12 | 29.43 | 2334.11 |
| 29.98 | 2334.12 | 30.86 | 2334.14 | 31.98 | 2334.16 | 33.5 | 2334.19 | 35.35 | 2334.23 |
| 36.11 | 2334.24 | 39.75 | 2334.32 | 40.72 | 2334.34 | 46.49 | 2334.48 | 54.91 | 2334.65 |
| 56 | 2334.68 | 57.07 | 2334.7 | 62.31 | 2334.84 | 66.52 | 2334.95 | 76.51 | 2335.22 |
| 80.84 | 2335.28 | 80.86 | 2335.28 | 80.98 | 2335.28 | 81.18 | 2335.28 | 82.01 | 2335.28 |
| 86.65 | 2335.3 | 87.27 | 2335.3 | 87.59 | 2335.3 | 87.91 | 2335.31 | 88.2 | 2335.31 |
| 98.25 | 2335.53 | 98.48 | 2335.53 | 98.94 | 2335.54 | 100 | 2335.56 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | 0 | .025 | 81.18 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 0 | 81.18 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 500

INPUT
Description: Sta 5+00
Station Elevation Data num= 43

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2340.75 | -94.38 | 2340.59 | -91.62 | 2340.51 | -86.32 | 2340.35 | -86.1 | 2340.34 |
| -75.52 | 2340 | -53.81 | 2338.76 | -39.4 | 2338 | -22.84 | 2336.4 | -19.1 | 2336 |
| -18.07 | 2335.77 | -9.71 | 2335 | -.83 | 2335 | -.36 | 2335 | 0 | 2335 |
| 1.39 | 2335 | 1.75 | 2335 | 1.88 | 2335 | 2.87 | 2335 | 9.29 | 2335 |
| 9.98 | 2335 | 16.87 | 2335 | 23.48 | 2337.75 | 24.46 | 2338 | 30.31 | 2339.42 |
| 32.47 | 2340 | 32.48 | 2340 | 32.49 | 2340 | 32.62 | 2340 | 32.8 | 2340 |
| 33.26 | 2340 | 34.07 | 2340 | 36.97 | 2340 | 51.71 | 2340 | 52.56 | 2340 |
| 53.6 | 2340 | 58.46 | 2340 | 58.98 | 2340 | 59.4 | 2340 | 66.49 | 2340 |
| 66.91 | 2340 | 93.09 | 2340.19 | 100 | 2340.15 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -22.84 | .025 | 32.49 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -22.84 | 32.49 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 400

INPUT
Description: Sta 4+00
Station Elevation Data num= 87

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2338.7 | -89.95 | 2338.59 | -83.06 | 2338.5 | -70.04 | 2338.32 | -61.83 | 2338 |
| -57.15 | 2338 | -56.56 | 2338 | -50.51 | 2338 | -50.16 | 2338 | -49.35 | 2338 |
| -49.34 | 2338 | -49.31 | 2338 | -45.81 | 2337.72 | -42.94 | 2337.49 | -40.4 | 2337.29 |
| -38.51 | 2337.13 | -25.61 | 2336 | -16.68 | 2334.89 | -9.64 | 2334.39 | -8.87 | 2334.39 |
| -6.96 | 2334.39 | -5.62 | 2334.39 | -4.93 | 2334.39 | -4.34 | 2334.39 | -3.67 | 2334.39 |
| -3.55 | 2334.39 | -3.14 | 2334.39 | -2.63 | 2334.39 | -2.6 | 2334.39 | 0 | 2334.39 |
| 2.76 | 2334.39 | 2.89 | 2334.39 | 2.98 | 2334.39 | 3.19 | 2334.39 | 3.45 | 2334.39 |
| 3.66 | 2334.39 | 3.9 | 2334.39 | 4.42 | 2334.39 | 4.77 | 2334.39 | 5.17 | 2334.39 |

```
    5.52 2334.39    5.85 2334.39    6.72 2334.39     7.8 2334.39   12.94  2335.3
   15.99    2336   21.06 2337.22   24.14    2338   26.39 2338.16   32.07 2338.57
   33.65 2338.67   34.09 2338.69   34.33  2338.7    34.6 2338.71   34.84 2338.72
   35.19 2338.72   35.58 2338.72      36 2338.73   37.35 2338.73   43.06 2338.74
   43.98 2338.74   44.92 2338.74   53.17 2338.84   53.96 2338.83   61.36  2338.9
   62.87 2338.88    67.7 2338.81   69.66 2338.78   70.71 2338.77   75.29 2338.73
   78.95 2338.69   82.16 2338.65   85.22 2338.61   86.95 2338.59   87.42 2338.59
   87.58 2338.59   87.74 2338.59   87.91 2338.59   88.08 2338.59   88.26 2338.59
   88.44 2338.59   88.83  2338.6   91.37 2338.64   95.79  2338.7   96.53 2338.72
   99.23 2338.77     100 2338.78

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -49.31    .025   35.58    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -49.31   35.58              100     100     100             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-East Branch   RS: 300

INPUT
Description: Sta 3+00
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -100 2337.21  -98.75 2337.19  -89.78 2337.02  -44.72 2336.04  -44.17 2336.03
  -44.12 2336.02   -44.1 2336.02  -44.08 2336.02  -44.06 2336.02  -44.01 2336.02
  -43.92 2336.02  -43.64 2336.02  -43.09    2336  -38.42 2335.73  -12.16  2334.2
   -6.98 2333.77   -6.91 2333.77       0 2333.77    7.12 2333.77    7.44 2333.77
    7.68 2333.77    8.23 2333.77    8.92 2333.87    9.47 2333.98    9.58    2334
   21.15 2335.76   22.72    2336   24.76 2336.05   24.97 2336.05   43.53 2336.48
   45.44 2336.52   46.34 2336.54   47.25 2336.55   48.16 2336.57   49.96  2336.6
   62.13 2336.78   75.98 2336.97   77.34 2336.99   80.19 2337.02   86.05 2337.09
   87.79 2337.11     100 2337.31

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -89.78    .025   43.53    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -89.78   43.53              100     100     100             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-East Branch   RS: 200

INPUT
Description: Sta 2+00
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -100 2337.01  -99.97 2337.01  -99.69 2337.01  -99.36 2337.01  -98.97 2337.01
  -98.58 2337.01  -83.91  2336.6  -61.98    2336  -50.48 2335.58   -4.78 2333.16
       0 2333.16    1.54 2333.16   16.19 2333.16   23.94 2334.23   26.96 2334.29
   32.81  2334.4   56.42 2334.97   62.81 2335.12   65.36 2335.16   73.74 2335.36
   76.71 2335.43   79.65 2335.49   79.88 2335.49   80.23  2335.5   80.92 2335.52
   83.34  2335.6   83.43  2335.6   83.52  2335.6   83.59  2335.6   83.66  2335.6
   83.74  2335.6   83.82  2335.6    84.4 2335.59   84.52 2335.59   84.65 2335.59
    84.8 2335.59   84.97 2335.59   85.33  2335.6   86.48 2335.61   89.82 2335.63
   90.13 2335.64   91.41 2335.64   91.69 2335.64   96.63 2335.69   96.75 2335.69
     100 2335.72

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025  -61.98    .025   83.43    .025
```

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -61.98 | 83.43 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-East Branch RS: 100

INPUT
Description: Sta 1+00
Station Elevation Data num= 93

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2335.39 | -94.68 | 2335.33 | -94.48 | 2335.33 | -94.27 | 2335.33 | -93.1 | 2335.33 |
| -91.96 | 2335.34 | -88.06 | 2335.35 | -85.51 | 2335.32 | -85.5 | 2335.32 | -85.42 | 2335.31 |
| -85.28 | 2335.31 | -84.68 | 2335.29 | -80.54 | 2335.16 | -79.85 | 2335.14 | -79.49 | 2335.13 |
| -79.1 | 2335.12 | -78.74 | 2335.12 | -72.14 | 2335.04 | -71.77 | 2335.03 | -71 | 2335.02 |
| -70.1 | 2335.01 | -69.67 | 2335 | -62.7 | 2334.93 | -60.76 | 2334.9 | -60.28 | 2334.89 |
| -59.81 | 2334.89 | -58.83 | 2334.87 | -57.66 | 2334.84 | -43.61 | 2334.51 | -43.29 | 2334.5 |
| -22.43 | 2334 | -20.33 | 2333.82 | -14.7 | 2333.33 | -10.61 | 2332.97 | -8.84 | 2332.78 |
| -7.96 | 2332.67 | -7.55 | 2332.56 | -1.59 | 2332.54 | -.5 | 2332.59 | 0 | 2332.6 |
| 1.29 | 2332.64 | 1.45 | 2332.65 | 1.68 | 2332.66 | 2.15 | 2332.69 | 4.67 | 2332.87 |
| 4.82 | 2332.87 | 4.98 | 2332.88 | 5.12 | 2332.88 | 5.27 | 2332.88 | 5.36 | 2332.89 |
| 5.53 | 2332.88 | 5.7 | 2332.88 | 6.91 | 2332.84 | 7.13 | 2332.84 | 7.38 | 2332.84 |
| 7.67 | 2332.84 | 8 | 2332.84 | 8.72 | 2332.85 | 11.21 | 2332.87 | 20.48 | 2332.98 |
| 20.69 | 2332.99 | 21.63 | 2332.99 | 25.38 | 2333.01 | 26.3 | 2333.01 | 26.81 | 2333.02 |
| 27.39 | 2333.03 | 28.01 | 2333.03 | 29.37 | 2333.05 | 43.81 | 2333.28 | 44.16 | 2333.29 |
| 70.88 | 2333.69 | 74.51 | 2333.77 | 77.3 | 2333.83 | 78.88 | 2333.87 | 79.05 | 2333.87 |
| 79.15 | 2333.88 | 79.26 | 2333.88 | 79.4 | 2333.88 | 79.43 | 2333.88 | 79.47 | 2333.88 |
| 79.52 | 2333.89 | 79.57 | 2333.89 | 79.63 | 2333.89 | 79.76 | 2333.89 | 79.95 | 2333.89 |
| 80.14 | 2333.89 | 80.38 | 2333.9 | 81.24 | 2333.91 | 82.01 | 2333.91 | 93.45 | 2334 |
| 95.47 | 2334.02 | 95.58 | 2334.02 | 100 | 2334.07 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .025 | -57.66 | .025 | 80.38 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -57.66 | 80.38 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 12300

INPUT
Description: Sta 123+00.00
Station Elevation Data num= 114

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2336 | -299.89 | 2336 | -299.01 | 2335.99 | -298.14 | 2335.99 | -297.3 | 2335.99 |
| -295.64 | 2335.98 | -281.95 | 2335.97 | -267.02 | 2335.96 | -253.06 | 2335.96 | -243.03 | 2335.96 |
| -242.8 | 2335.96 | -233.41 | 2335.95 | -233.37 | 2335.95 | -220.85 | 2335.93 | -220.8 | 2335.93 |
| -218.49 | 2335.93 | -218.3 | 2335.93 | -205.47 | 2335.91 | -204.78 | 2335.91 | -204.64 | 2335.91 |
| -204.31 | 2335.91 | -203.6 | 2335.9 | -190.55 | 2335.86 | -178.31 | 2335.84 | -177.08 | 2335.83 |
| -175.63 | 2335.82 | -174.53 | 2335.82 | -163.65 | 2335.75 | -160.88 | 2335.74 | -147.57 | 2335.64 |
| -144.09 | 2335.62 | -139.99 | 2335.59 | -136.97 | 2335.57 | -136.59 | 2335.57 | -135.81 | 2335.56 |
| -132.59 | 2335.52 | -126.76 | 2335.45 | -122.08 | 2335.4 | -116.1 | 2335.33 | -96.65 | 2335.12 |
| -95.45 | 2335.1 | -90.65 | 2335.05 | -87.4 | 2335.03 | -79.29 | 2334.98 | -73.1 | 2334.94 |
| -71.96 | 2334.94 | -71.59 | 2334.93 | -71.24 | 2334.93 | -70.55 | 2334.94 | -66.14 | 2334.96 |
| -65.79 | 2334.95 | -60.54 | 2334.98 | -57.45 | 2335.01 | -57.03 | 2335 | -55.98 | 2335.01 |
| -54.95 | 2335 | -47.36 | 2334.97 | -40.58 | 2334.93 | -40.18 | 2334.93 | -39.8 | 2334.92 |
| -39.43 | 2334.92 | -39.25 | 2334.91 | -39.06 | 2334.91 | -38.78 | 2334.9 | -38.25 | 2334.89 |
| -37.48 | 2334.86 | -31.16 | 2334.62 | -21.55 | 2334.24 | -20.44 | 2334.25 | -15.64 | 2334 |
| -10.76 | 2332.49 | -9.11 | 2332 | -2.81 | 2332 | 0 | 2332 | 4.53 | 2332 |
| 23.89 | 2332.29 | 57.65 | 2332.79 | 140.47 | 2334 | 143.57 | 2334.06 | 146.49 | 2334.11 |
| 192.64 | 2334.98 | 195.41 | 2335.03 | 196.67 | 2335.05 | 200.11 | 2335.11 | 212 | 2335.3 |
| 220.28 | 2335.46 | 227.74 | 2335.58 | 248.94 | 2336 | 252.84 | 2336.05 | 256.15 | 2336.09 |
| 264.53 | 2336.17 | 266.75 | 2336.2 | 268.02 | 2336.21 | 273.93 | 2336.3 | 275.53 | 2336.32 |
| 276.11 | 2336.33 | 276.71 | 2336.33 | 277.36 | 2336.34 | 278.03 | 2336.34 | 279.46 | 2336.35 |

```
  291.02 2336.42  292.37 2336.43  293.02 2336.43   293.6 2336.43  294.16 2336.43
   294.7 2336.43  295.23 2336.43  295.73 2336.43  296.21 2336.43  296.65 2336.43
  297.09 2336.43  297.86 2336.42  299.21 2336.41     300  2336.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -47.36    .025  192.64    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -47.36  192.64              290     300     310             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 12000

INPUT
Description: Sta 120+00.00
Station Elevation Data    num=     228
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
    -300 2333.83 -294.91 2333.69 -294.62 2333.69 -294.31 2333.69 -294.04 2333.69
 -293.81 2333.69 -293.77 2333.69 -293.72 2333.69 -293.67 2333.69 -293.46 2333.69
 -292.96  2333.7 -292.08 2333.73 -291.61 2333.75 -291.16 2333.77  -290.7 2333.79
 -290.39  2333.8  -289.9 2333.82 -288.35 2333.81 -288.19 2333.79 -287.94 2333.77
 -287.91 2333.77  -287.9 2333.77 -287.88 2333.77 -287.86 2333.77 -287.84 2333.77
 -287.82 2333.77 -287.32 2333.79 -286.86  2333.8 -286.82  2333.8 -286.66 2333.81
 -286.64 2333.81 -286.61 2333.81 -286.57 2333.81 -286.53 2333.81 -286.48 2333.81
 -286.42 2333.81 -286.36 2333.81 -286.17 2333.81  -285.9 2333.81 -285.77 2333.81
 -285.71 2333.81 -285.65 2333.81 -285.59 2333.81 -285.35 2333.81 -285.29 2333.81
 -285.24 2333.81 -285.18 2333.81 -285.12 2333.81 -285.06 2333.81    -285 2333.81
 -284.74 2333.81 -284.53 2333.81 -284.12 2333.81 -282.69  2333.8 -281.06  2333.8
 -279.68 2333.79 -279.15 2333.79 -279.08 2333.79 -279.02 2333.79 -278.95 2333.78
 -278.88 2333.78 -278.81 2333.78 -278.69 2333.78 -278.52 2333.78 -278.08 2333.77
 -278.03 2333.77 -277.99 2333.77 -277.96 2333.77 -277.93 2333.77 -277.88 2333.77
 -277.83 2333.76 -277.79 2333.77 -277.74 2333.77  -277.7 2333.77 -277.18 2333.77
 -276.48 2333.78 -276.37 2333.78  -276.3 2333.78 -276.23 2333.78 -276.15 2333.78
 -276.06 2333.78 -275.85 2333.78 -275.29 2333.78  -273.1 2333.77 -272.91 2333.77
 -264.93 2333.73 -264.46 2333.73 -264.12 2333.72 -263.81 2333.72 -260.96 2333.69
 -256.56 2333.64 -253.22  2333.6 -246.35 2333.48 -246.28 2333.48 -246.08 2333.47
 -245.77 2333.47 -245.37 2333.47  -244.9 2333.46 -241.97 2333.44 -227.74 2333.31
 -225.74 2333.29 -224.68 2333.28 -223.59 2333.27 -222.45 2333.26 -220.03 2333.23
 -194.54 2332.96 -190.06 2332.92  -187.8 2332.89 -185.57 2332.87 -183.34 2332.84
  -178.8 2332.79  -133.3 2332.24  -113.8    2332 -103.19 2331.74  -76.07 2330.92
  -54.46  2330.3  -53.54 2330.27  -53.14 2330.26  -45.69    2330  -43.97 2329.95
  -32.93 2329.64  -30.35 2329.58  -28.74 2329.54  -19.27 2329.35  -16.63 2329.29
  -10.94 2329.15   -6.55 2329.05   -6.03 2329.04   -5.67 2329.03   -5.08 2329.03
    -.06 2328.97       0 2328.97    3.33 2328.93    6.47  2328.9       7 2328.89
    7.26 2328.89     7.5 2328.89    7.74 2328.89    7.96 2328.89    8.18 2328.89
    8.39  2328.9    8.99  2328.9   12.84 2328.98   16.02 2329.04    18.6  2329.1
   23.98 2329.21   29.77 2329.33   38.07 2329.51   45.76 2329.68   58.81 2329.97
   58.82 2329.97   60.39    2330   73.93 2330.17   74.21 2330.17   98.57 2330.48
  107.93  2330.6  117.64 2330.72  130.31 2330.87  132.72  2330.9  142.68 2331.02
     144 2331.04  144.82 2331.05   147.4 2331.09  152.12 2331.17  154.26 2331.21
   154.7 2331.21  155.04 2331.22  155.54 2331.24  155.66 2331.24   155.8 2331.24
  155.95 2331.24  156.14 2331.25  156.33 2331.25  156.55 2331.25  156.77 2331.25
  157.22 2331.25  157.67 2331.24     161 2331.21  164.97 2331.17  165.58 2331.17
  165.92 2331.16  168.31 2331.08  171.47 2330.97  175.46 2330.86  176.55 2330.84
  181.41 2330.96  187.51 2330.86  191.71    2331  192.93 2330.98  193.56    2331
  193.88    2331   194.2    2331  194.54    2331  194.73 2331.01  195.07 2331.01
  195.59 2331.01   195.9 2331.02  196.71 2331.03  197.03 2331.03  197.69 2331.03
  203.99  2331.1  205.02 2331.11  206.05 2331.12  211.06 2331.18  211.73 2331.19
  222.42 2331.34  223.69 2331.36  228.72 2331.47  229.15 2331.48  229.58 2331.49
  233.24 2331.53  234.45 2331.54  235.51 2331.55  240.39 2331.56  240.75 2331.57
  250.74 2331.59  251.23  2331.6  258.23 2331.61  259.54 2331.62  268.91  2331.7
  270.94 2331.74  284.87 2331.85  285.35 2331.86  285.48 2331.86  285.72 2331.86
  286.58 2331.87  299.51    2332     300    2332

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

| | | | | | |
|---|---|---|---|---|---|
| -300 | .025 | -113.8 | .025 | 157.22 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -113.8 | 157.22 | 290 | 300 | 310 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 11700

INPUT
Description: Sta 117+00.00
Station Elevation Data num= 213

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2330.23 | -298.6 | 2330.24 | -288.54 | 2330.29 | -287.99 | 2330.29 | -287.45 | 2330.29 |
| -286.9 | 2330.29 | -286.33 | 2330.29 | -285.75 | 2330.29 | -284.59 | 2330.28 | -276.13 | 2330.22 |
| -271.86 | 2330.17 | -260.75 | 2330.06 | -254.74 | 2330 | -252.18 | 2329.97 | -244.85 | 2329.87 |
| -236.75 | 2329.74 | -235.26 | 2329.71 | -234.92 | 2329.71 | -234.59 | 2329.71 | -234.28 | 2329.7 |
| -234 | 2329.7 | -233.76 | 2329.71 | -233.54 | 2329.71 | -233.34 | 2329.71 | -231.88 | 2329.78 |
| -228.11 | 2329.97 | -227.46 | 2330 | -225.5 | 2330.17 | -223.28 | 2330.32 | -220.13 | 2330.48 |
| -217.35 | 2330.58 | -216.95 | 2330.59 | -216.67 | 2330.6 | -216.49 | 2330.6 | -216.31 | 2330.6 |
| -216.12 | 2330.6 | -215.95 | 2330.6 | -215.78 | 2330.6 | -215.61 | 2330.6 | -214.82 | 2330.57 |
| -212.3 | 2330.46 | -209.56 | 2330.29 | -207.01 | 2330.08 | -206.05 | 2330 | -165.46 | 2328.88 |
| -157.06 | 2328.65 | -133.3 | 2328 | -127.59 | 2327.68 | -96.15 | 2326 | -54.57 | 2326 |
| -37.58 | 2326 | -36.73 | 2326.05 | -35.29 | 2326.16 | -31.86 | 2326.43 | -30.71 | 2326.53 |
| -30.59 | 2326.55 | -29.07 | 2326.57 | -28.52 | 2326.56 | -23.15 | 2326.4 | -16.8 | 2326.19 |
| -11.08 | 2326 | -11.07 | 2326 | -7.95 | 2325.93 | -4.03 | 2325.83 | .2 | 2325.74 |
| 3.46 | 2325.65 | 7.53 | 2325.58 | 10.39 | 2325.54 | 11.33 | 2325.53 | 11.6 | 2325.53 |
| 11.88 | 2325.53 | 12.15 | 2325.53 | 12.42 | 2325.53 | 12.67 | 2325.53 | 12.89 | 2325.53 |
| 13.1 | 2325.53 | 13.3 | 2325.53 | 13.69 | 2325.54 | 17.35 | 2325.62 | 20.15 | 2325.7 |
| 22.96 | 2325.79 | 24.67 | 2325.86 | 26.57 | 2325.96 | 27.48 | 2326 | 38.17 | 2326.3 |
| 38.63 | 2326.31 | 51.77 | 2326.67 | 58.22 | 2326.74 | 67.56 | 2326.97 | 76.62 | 2327.18 |
| 81.91 | 2327.31 | 82.49 | 2327.32 | 82.79 | 2327.33 | 83.09 | 2327.34 | 83.38 | 2327.34 |
| 83.98 | 2327.35 | 89.99 | 2327.43 | 91.85 | 2327.46 | 95.9 | 2327.52 | 97.48 | 2327.54 |
| 97.85 | 2327.55 | 98.22 | 2327.55 | 98.73 | 2327.56 | 99.24 | 2327.56 | 99.58 | 2327.56 |
| 100.15 | 2327.57 | 102.36 | 2327.57 | 105.36 | 2327.58 | 106.37 | 2327.58 | 106.69 | 2327.58 |
| 107.78 | 2327.58 | 110.62 | 2327.57 | 111.91 | 2327.57 | 120.53 | 2327.63 | 126.37 | 2327.67 |
| 128.56 | 2327.66 | 129.84 | 2327.67 | 130.33 | 2327.67 | 130.97 | 2327.67 | 131.34 | 2327.67 |
| 132.59 | 2327.68 | 133.92 | 2327.68 | 143.51 | 2327.68 | 145.23 | 2327.69 | 156.2 | 2327.68 |
| 157.69 | 2327.68 | 159.63 | 2327.68 | 172.14 | 2327.68 | 172.38 | 2327.68 | 172.5 | 2327.68 |
| 175.13 | 2327.68 | 181.01 | 2327.67 | 184.27 | 2327.67 | 185.58 | 2327.67 | 186.25 | 2327.67 |
| 187.52 | 2327.68 | 194.9 | 2327.73 | 197.05 | 2327.74 | 197.16 | 2327.74 | 197.58 | 2327.74 |
| 208.62 | 2327.77 | 210.31 | 2327.79 | 210.48 | 2327.79 | 210.59 | 2327.79 | 210.76 | 2327.79 |
| 212.34 | 2327.8 | 212.91 | 2327.8 | 222.83 | 2327.83 | 222.96 | 2327.83 | 223.61 | 2327.83 |
| 223.67 | 2327.83 | 225.08 | 2327.83 | 225.2 | 2327.83 | 225.73 | 2327.83 | 225.91 | 2327.84 |
| 226.59 | 2327.84 | 231.47 | 2327.83 | 231.94 | 2327.83 | 232.36 | 2327.84 | 232.43 | 2327.84 |
| 232.48 | 2327.84 | 232.58 | 2327.84 | 233.62 | 2327.84 | 234.78 | 2327.84 | 244.87 | 2327.81 |
| 245.73 | 2327.81 | 253.56 | 2327.8 | 256.27 | 2327.79 | 263.85 | 2327.79 | 265.2 | 2327.8 |
| 277.77 | 2327.8 | 281.26 | 2327.81 | 285.3 | 2327.8 | 285.97 | 2327.8 | 286.63 | 2327.8 |
| 287.29 | 2327.8 | 288.61 | 2327.81 | 301.66 | 2327.88 | 312.36 | 2327.96 | 312.67 | 2327.96 |
| 314.12 | 2327.97 | 314.2 | 2327.97 | 314.46 | 2327.97 | 325.46 | 2328 | 328.2 | 2328.01 |
| 328.27 | 2328.01 | 336.5 | 2328.04 | 336.81 | 2328.05 | 344.28 | 2328.08 | 355.94 | 2328.14 |
| 357 | 2328.14 | 361.66 | 2328.16 | 361.93 | 2328.17 | 363.16 | 2328.17 | 363.31 | 2328.17 |
| 363.38 | 2328.17 | 363.45 | 2328.17 | 363.52 | 2328.17 | 363.59 | 2328.18 | 363.8 | 2328.18 |
| 365.05 | 2328.2 | 365.24 | 2328.2 | 377.17 | 2328.26 | 377.61 | 2328.27 | 385.9 | 2328.32 |
| 388.04 | 2328.35 | 402.65 | 2328.45 | 406.13 | 2328.51 | 414.48 | 2328.58 | 418.02 | 2328.63 |
| 421.06 | 2328.66 | 426.19 | 2328.74 | 430 | 2328.79 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -127.59 | .025 | 91.85 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -127.59 | 91.85 | 180 | 160 | 150 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek

REACH: East RS: 11540

INPUT
Description: Sta 115+40.00
Station Elevation Data num= 419

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2328.77 | -297.05 | 2328.76 | -295.05 | 2328.76 | -294.07 | 2328.75 | -293.1 | 2328.75 |
| -292.12 | 2328.75 | -291.17 | 2328.74 | -290.23 | 2328.73 | -288.39 | 2328.72 | -282.1 | 2328.64 |
| -281.11 | 2328.62 | -274.42 | 2328.53 | -274.28 | 2328.53 | -273.44 | 2328.52 | -273.37 | 2328.52 |
| -272.34 | 2328.5 | -270.93 | 2328.47 | -270.59 | 2328.46 | -270.5 | 2328.46 | -264.65 | 2328.4 |
| -262.48 | 2328.38 | -259.82 | 2328.37 | -259.17 | 2328.36 | -258.99 | 2328.36 | -258.82 | 2328.36 |
| -258.65 | 2328.36 | -257.92 | 2328.35 | -256.28 | 2328.33 | -255.42 | 2328.34 | -253.25 | 2328.37 |
| -252.56 | 2328.38 | -250.55 | 2328.41 | -247.79 | 2328.46 | -247.74 | 2328.46 | -247.06 | 2328.47 |
| -246.74 | 2328.47 | -246.43 | 2328.48 | -246.12 | 2328.48 | -245.77 | 2328.49 | -245.44 | 2328.5 |
| -244.13 | 2328.51 | -243.68 | 2328.51 | -243.25 | 2328.5 | -242.92 | 2328.5 | -242.5 | 2328.49 |
| -242.06 | 2328.48 | -241.68 | 2328.48 | -241.27 | 2328.47 | -240.41 | 2328.45 | -235.15 | 2328.36 |
| -233.32 | 2328.32 | -217.37 | 2328.02 | -199.08 | 2327.66 | -190.55 | 2327.5 | -184.11 | 2327.37 |
| -180.74 | 2327.3 | -177.34 | 2327.24 | -176.65 | 2327.22 | -173.31 | 2327.15 | -170 | 2327.09 |
| -163.22 | 2326.94 | -156.41 | 2326.8 | -143.82 | 2326.06 | -141.51 | 2325.92 | -138.94 | 2325.76 |
| -136.49 | 2325.61 | -134.83 | 2325.51 | -134.06 | 2325.45 | -134.01 | 2325.45 | -133.97 | 2325.45 |
| -133.93 | 2325.45 | -133.88 | 2325.44 | -133.86 | 2325.45 | -133.24 | 2325.45 | -132.28 | 2325.47 |
| -131.57 | 2325.48 | -130.54 | 2325.49 | -127.47 | 2325.51 | -126.43 | 2325.51 | -125.9 | 2325.51 |
| -125.61 | 2325.5 | -125.5 | 2325.5 | -125.15 | 2325.49 | -124.77 | 2325.48 | -124.35 | 2325.46 |
| -124.13 | 2325.45 | -123.94 | 2325.45 | -123.81 | 2325.44 | -123.39 | 2325.42 | -122.19 | 2325.37 |
| -121.96 | 2325.36 | -121.66 | 2325.35 | -116.89 | 2325.11 | -113.22 | 2325.06 | -113.18 | 2325.06 |
| -106.37 | 2324.75 | -103.64 | 2324.57 | -101.1 | 2324.46 | -100.11 | 2324.4 | -97.13 | 2324.16 |
| -96.87 | 2324.14 | -96.76 | 2324.13 | -96.6 | 2324.12 | -96.28 | 2324.08 | -95.87 | 2324.02 |
| -95.78 | 2324 | -95 | 2322.9 | -85 | 2322.9 | -75.54 | 2324 | -75.29 | 2324.02 |
| -74.98 | 2324.03 | -74.72 | 2324.05 | -74.54 | 2324.06 | -74.47 | 2324.06 | -74.42 | 2324.06 |
| -74.37 | 2324.06 | -74.32 | 2324.06 | -74.26 | 2324.06 | -74.21 | 2324.06 | -73.6 | 2324.07 |
| -73.33 | 2324.07 | -73.08 | 2324.08 | -72.89 | 2324.09 | -72.72 | 2324.09 | -72.56 | 2324.1 |
| -72.19 | 2324.12 | -70.95 | 2324.23 | -70.19 | 2324.29 | -70 | 2324.3 | -69.9 | 2324.3 |
| -69.79 | 2324.3 | -69.7 | 2324.3 | -69.6 | 2324.3 | -69.54 | 2324.3 | -69.43 | 2324.3 |
| -69.32 | 2324.3 | -69.21 | 2324.29 | -69.11 | 2324.29 | -69.01 | 2324.29 | -68.93 | 2324.28 |
| -68.87 | 2324.28 | -68.63 | 2324.24 | -68.52 | 2324.16 | -68.42 | 2324.14 | -68.35 | 2324.14 |
| -68.25 | 2324.13 | -68.12 | 2324.12 | -67.97 | 2324.12 | -67.79 | 2324.11 | -67.54 | 2324.11 |
| -67.25 | 2324.11 | -66.94 | 2324.1 | -66.61 | 2324.11 | -66.29 | 2324.11 | -66.23 | 2324.11 |
| -65.9 | 2324.11 | -65.58 | 2324.11 | -65.52 | 2324.1 | -65.22 | 2324.11 | -65.09 | 2324.1 |
| -64.89 | 2324.11 | -64.48 | 2324.1 | -64.35 | 2324.1 | -63.31 | 2324.08 | -62.48 | 2324.06 |
| -62.38 | 2324.06 | -62.32 | 2324.06 | -62.23 | 2324.06 | -61.57 | 2324.06 | -61.45 | 2324.06 |
| -61.32 | 2324.06 | -61.26 | 2324.06 | -61.2 | 2324.06 | -61.15 | 2324.06 | -61.09 | 2324.06 |
| -60.97 | 2324.06 | -60.49 | 2324.08 | -60.43 | 2324.08 | -60.36 | 2324.08 | -60.3 | 2324.08 |
| -60.23 | 2324.08 | -59.9 | 2324.08 | -59.83 | 2324.08 | -59.5 | 2324.09 | -59.43 | 2324.09 |
| -59.09 | 2324.1 | -59.03 | 2324.1 | -55.25 | 2324.17 | -54.61 | 2324.18 | -52.69 | 2324.2 |
| -47.36 | 2324.27 | -44.45 | 2324.3 | -43.47 | 2324.31 | -41.56 | 2324.3 | -41.06 | 2324.3 |
| -40.67 | 2324.3 | -40.59 | 2324.3 | -40.48 | 2324.3 | -38.4 | 2324.29 | -38.03 | 2324.29 |
| -37.35 | 2324.29 | -37.25 | 2324.29 | -37.15 | 2324.29 | -37.04 | 2324.29 | -36.94 | 2324.29 |
| -36.84 | 2324.29 | -36.72 | 2324.29 | -36.6 | 2324.3 | -36.14 | 2324.31 | -36.01 | 2324.31 |
| -35.88 | 2324.31 | -35.74 | 2324.31 | -35.6 | 2324.31 | -34.39 | 2324.32 | -34.23 | 2324.32 |
| -34.08 | 2324.32 | -33.93 | 2324.32 | -33.47 | 2324.33 | -32.51 | 2324.34 | -32.23 | 2324.34 |
| -32.19 | 2324.34 | -32.03 | 2324.34 | -31.87 | 2324.35 | -31.74 | 2324.35 | -31.61 | 2324.35 |
| -31.36 | 2324.35 | -30.47 | 2324.35 | -28.74 | 2324.35 | -28.46 | 2324.35 | -28.38 | 2324.35 |
| -28.3 | 2324.35 | -28.13 | 2324.35 | -27.97 | 2324.35 | -27.79 | 2324.36 | -27.61 | 2324.36 |
| -26.84 | 2324.37 | -22.53 | 2324.43 | -20.99 | 2324.45 | -20.47 | 2324.46 | -19.99 | 2324.47 |
| -19.78 | 2324.47 | -19.54 | 2324.48 | -19.33 | 2324.48 | -19.08 | 2324.49 | -14.96 | 2324.59 |
| -7.19 | 2324.77 | -6.07 | 2324.8 | -5.46 | 2324.81 | -5.35 | 2324.81 | -3.4 | 2324.86 |
| -3.28 | 2324.86 | 5.62 | 2325.03 | 5.68 | 2325.03 | 5.74 | 2325.03 | 5.92 | 2325.04 |
| 11.07 | 2325.13 | 17.33 | 2325.29 | 24.09 | 2325.47 | 25.5 | 2325.52 | 25.91 | 2325.53 |
| 27.46 | 2325.58 | 27.91 | 2325.59 | 29.31 | 2325.63 | 29.65 | 2325.64 | 30.29 | 2325.66 |
| 38.23 | 2325.87 | 39.3 | 2325.9 | 40.46 | 2325.93 | 41.8 | 2325.98 | 46.85 | 2326.12 |
| 53.12 | 2326.31 | 59.63 | 2326.65 | 62.63 | 2326.81 | 64.11 | 2326.89 | 65.77 | 2326.97 |
| 69.9 | 2327.16 | 70.96 | 2327.21 | 74.39 | 2327.35 | 76.54 | 2327.44 | 77.11 | 2327.44 |
| 77.22 | 2327.44 | 77.63 | 2327.44 | 78 | 2327.44 | 84.83 | 2327.79 | 89.88 | 2328.03 |
| 93.04 | 2327.94 | 97.04 | 2327.81 | 100.92 | 2327.68 | 103.34 | 2327.6 | 104.18 | 2327.58 |
| 106.8 | 2327.52 | 109.45 | 2327.46 | 109.56 | 2327.46 | 111.67 | 2327.4 | 114.25 | 2327.35 |
| 116.04 | 2327.32 | 116.62 | 2327.31 | 116.79 | 2327.31 | 116.96 | 2327.31 | 117.13 | 2327.31 |
| 117.29 | 2327.31 | 117.45 | 2327.3 | 117.59 | 2327.3 | 117.72 | 2327.3 | 117.84 | 2327.3 |
| 118.07 | 2327.31 | 120.3 | 2327.33 | 121.98 | 2327.36 | 123.65 | 2327.38 | 124.65 | 2327.41 |
| 125.76 | 2327.44 | 126.91 | 2327.48 | 127.79 | 2327.5 | 129.37 | 2327.53 | 129.58 | 2327.52 |
| 134.96 | 2327.59 | 141.27 | 2327.67 | 145.59 | 2327.72 | 146.1 | 2327.73 | 146.36 | 2327.73 |

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  146.63 2327.73  146.89 2327.73  147.43 2327.74  153.37 2327.75  155.41 2327.75
  160.21 2327.77  162.25 2327.77  162.75 2327.77  163.23 2327.77  163.93 2327.77
  164.64 2327.77  165.11 2327.77  165.92 2327.76  169.19 2327.74  174.02  2327.7
  175.76 2327.69  176.32 2327.68  178.29 2327.66  183.78  2327.6  186.47 2327.57
  188.89 2327.56  190.42 2327.55  191.38 2327.54  195.68 2327.48  196.46 2327.47
  196.74 2327.46  197.49 2327.45   198.2 2327.45  198.34 2327.44  199.36 2327.43
  199.48 2327.43  199.74 2327.43  201.27 2327.41  203.52 2327.39  204.08 2327.39
  205.92 2327.36  211.76  2327.3  213.59 2327.27  215.79 2327.24  215.95 2327.24
  217.07 2327.24  217.39 2327.24   218.6 2327.23  218.68 2327.23  218.96 2327.23
  219.93 2327.23  220.67 2327.22   221.5 2327.22   221.9 2327.22  222.23 2327.22
  222.76 2327.22  222.95 2327.21  223.33 2327.21  223.48 2327.21  223.55 2327.21
   223.7 2327.21  224.13 2327.21   224.5 2327.21  224.72 2327.21  225.13 2327.21
  226.72 2327.21  227.85 2327.21  235.31 2327.23  235.37 2327.23  236.09 2327.23
  236.61 2327.23  237.41 2327.23  238.78 2327.22  245.43 2327.17  246.34 2327.17
   248.5 2327.15  249.51 2327.15  249.86 2327.15  250.36 2327.14  250.42 2327.14
  250.84 2327.14  250.98 2327.14  251.29 2327.14  251.77 2327.14  252.68 2327.14
  255.21 2327.14  255.35 2327.14  256.42 2327.14  261.15 2327.14  261.65 2327.13
  264.85 2327.13  267.75 2327.14  268.24 2327.14   268.6 2327.14  269.36 2327.13
  277.18  2327.1  280.64 2327.08  286.81 2327.05  287.34 2327.05  293.77 2327.02
  293.97 2327.02  294.04 2327.02  294.22 2327.02     300 2326.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015 -241.27    .015   89.88    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -241.27   89.88               60      60      60           .1        .3

CULVERT


RIVER: Duck Creek
REACH: East               RS: 11510

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      56
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -200  2326.2             200    2326

Upstream Bridge Cross Section Data
Station Elevation Data    num=     419
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2328.77 -297.05 2328.76 -295.05 2328.76 -294.07 2328.75  -293.1 2328.75
 -292.12 2328.75 -291.17 2328.74 -290.23 2328.73 -288.39 2328.72  -282.1 2328.64
 -281.11 2328.62 -274.42 2328.53 -274.28 2328.53 -273.44 2328.52 -273.37 2328.52
 -272.34  2328.5 -270.93 2328.47 -270.59 2328.46  -270.5 2328.46 -264.65  2328.4
 -262.48 2328.38 -259.82 2328.37 -259.17 2328.36 -258.99 2328.36 -258.82 2328.36
 -258.65 2328.36 -257.92 2328.35 -256.28 2328.33 -255.42 2328.34 -253.25 2328.37
 -252.56 2328.38 -250.55 2328.41 -247.79 2328.46 -247.74 2328.46 -247.06 2328.47
 -246.74 2328.47 -246.43 2328.48 -246.12 2328.48 -245.77 2328.49 -245.44  2328.5
 -244.13 2328.51 -243.68 2328.51 -243.25  2328.5 -242.92  2328.5  -242.5 2328.49
 -242.06 2328.48 -241.68 2328.48 -241.27 2328.47 -240.41 2328.45 -235.15 2328.36
 -233.32 2328.32 -217.37 2328.02 -199.08 2327.66 -190.55  2327.5 -184.11 2327.37
 -180.74  2327.3 -177.34 2327.24 -176.65 2327.22 -173.31 2327.15    -170 2327.09
 -163.22 2326.94 -156.41  2326.8 -143.82 2326.06 -141.51 2325.92 -138.94 2325.76
 -136.49 2325.61 -134.83 2325.51 -134.06 2325.45 -134.01 2325.45 -133.97 2325.45
 -133.93 2325.45 -133.88 2325.44 -133.86 2325.45 -133.24 2325.45 -132.28 2325.47
 -131.57 2325.48 -130.54 2325.49 -127.47 2325.51 -126.43 2325.51  -125.9 2325.51
 -125.61  2325.5  -125.5  2325.5 -125.15 2325.49 -124.77 2325.48 -124.35 2325.46
 -124.13 2325.45 -123.94 2325.45 -123.81 2325.44 -123.39 2325.42 -122.19 2325.37
 -121.96 2325.36 -121.66 2325.35 -116.89 2325.11 -113.22 2325.06 -113.18 2325.06
 -106.37 2324.75 -103.64 2324.57  -101.1 2324.46 -100.11  2324.4  -97.13 2324.16
  -96.87 2324.14  -96.76 2324.13   -96.6 2324.12  -96.28 2324.08  -95.87 2324.02
  -95.78    2324     -95  2322.9     -85  2322.9  -75.54    2324  -75.29 2324.02
  -74.98 2324.03  -74.72 2324.05  -74.54 2324.06  -74.47 2324.06  -74.42 2324.06
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -74.37 | 2324.06 | -74.32 | 2324.06 | -74.26 | 2324.06 | -74.21 | 2324.06 | -73.6 | 2324.07 |
| -73.33 | 2324.07 | -73.08 | 2324.08 | -72.89 | 2324.09 | -72.72 | 2324.09 | -72.56 | 2324.1 |
| -72.19 | 2324.12 | -70.95 | 2324.23 | -70.19 | 2324.29 | -70 | 2324.3 | -69.9 | 2324.3 |
| -69.79 | 2324.3 | -69.7 | 2324.3 | -69.6 | 2324.3 | -69.54 | 2324.3 | -69.43 | 2324.3 |
| -69.32 | 2324.3 | -69.21 | 2324.29 | -69.11 | 2324.29 | -69.01 | 2324.29 | -68.93 | 2324.28 |
| -68.87 | 2324.28 | -68.63 | 2324.24 | -68.52 | 2324.16 | -68.42 | 2324.14 | -68.35 | 2324.14 |
| -68.25 | 2324.13 | -68.12 | 2324.12 | -67.97 | 2324.12 | -67.79 | 2324.11 | -67.54 | 2324.11 |
| -67.25 | 2324.11 | -66.94 | 2324.1 | -66.61 | 2324.11 | -66.29 | 2324.11 | -66.23 | 2324.11 |
| -65.9 | 2324.11 | -65.58 | 2324.11 | -65.52 | 2324.1 | -65.22 | 2324.11 | -65.09 | 2324.1 |
| -64.89 | 2324.11 | -64.48 | 2324.1 | -64.35 | 2324.1 | -63.31 | 2324.08 | -62.48 | 2324.06 |
| -62.38 | 2324.06 | -62.32 | 2324.06 | -62.23 | 2324.06 | -61.57 | 2324.06 | -61.45 | 2324.06 |
| -61.32 | 2324.06 | -61.26 | 2324.06 | -61.2 | 2324.06 | -61.15 | 2324.06 | -61.09 | 2324.06 |
| -60.97 | 2324.06 | -60.49 | 2324.08 | -60.43 | 2324.08 | -60.36 | 2324.08 | -60.3 | 2324.08 |
| -60.23 | 2324.08 | -59.9 | 2324.08 | -59.83 | 2324.08 | -59.5 | 2324.09 | -59.43 | 2324.09 |
| -59.09 | 2324.1 | -59.03 | 2324.1 | -55.25 | 2324.17 | -54.61 | 2324.18 | -52.69 | 2324.2 |
| -47.36 | 2324.27 | -44.45 | 2324.3 | -43.47 | 2324.31 | -41.56 | 2324.3 | -41.06 | 2324.3 |
| -40.67 | 2324.3 | -40.59 | 2324.3 | -40.48 | 2324.3 | -38.4 | 2324.29 | -38.03 | 2324.29 |
| -37.35 | 2324.29 | -37.25 | 2324.29 | -37.15 | 2324.29 | -37.04 | 2324.29 | -36.94 | 2324.29 |
| -36.84 | 2324.29 | -36.72 | 2324.29 | -36.6 | 2324.3 | -36.14 | 2324.31 | -36.01 | 2324.31 |
| -35.88 | 2324.31 | -35.74 | 2324.31 | -35.6 | 2324.31 | -34.39 | 2324.32 | -34.23 | 2324.32 |
| -34.08 | 2324.32 | -33.93 | 2324.32 | -33.47 | 2324.33 | -32.51 | 2324.34 | -32.23 | 2324.34 |
| -32.19 | 2324.34 | -32.03 | 2324.34 | -31.87 | 2324.35 | -31.74 | 2324.35 | -31.61 | 2324.35 |
| -31.36 | 2324.35 | -30.47 | 2324.35 | -28.74 | 2324.35 | -28.46 | 2324.35 | -28.38 | 2324.35 |
| -28.3 | 2324.35 | -28.13 | 2324.35 | -27.97 | 2324.35 | -27.79 | 2324.36 | -27.61 | 2324.36 |
| -26.84 | 2324.37 | -22.53 | 2324.43 | -20.99 | 2324.45 | -20.47 | 2324.46 | -19.99 | 2324.47 |
| -19.78 | 2324.47 | -19.54 | 2324.48 | -19.33 | 2324.48 | -19.08 | 2324.49 | -14.96 | 2324.59 |
| -7.19 | 2324.77 | -6.07 | 2324.8 | -5.46 | 2324.81 | -5.35 | 2324.81 | -3.4 | 2324.86 |
| -3.28 | 2324.86 | 5.62 | 2325.03 | 5.68 | 2325.03 | 5.74 | 2325.03 | 5.92 | 2325.04 |
| 11.07 | 2325.13 | 17.33 | 2325.29 | 24.09 | 2325.47 | 25.5 | 2325.52 | 25.91 | 2325.53 |
| 27.46 | 2325.58 | 27.91 | 2325.59 | 29.31 | 2325.63 | 29.65 | 2325.64 | 30.29 | 2325.66 |
| 38.23 | 2325.87 | 39.3 | 2325.9 | 40.46 | 2325.93 | 41.8 | 2325.98 | 46.85 | 2326.12 |
| 53.12 | 2326.31 | 59.63 | 2326.65 | 62.63 | 2326.81 | 64.11 | 2326.89 | 65.77 | 2326.97 |
| 69.9 | 2327.16 | 70.96 | 2327.21 | 74.39 | 2327.35 | 76.54 | 2327.44 | 77.11 | 2327.44 |
| 77.22 | 2327.44 | 77.63 | 2327.44 | 78 | 2327.44 | 84.83 | 2327.79 | 89.88 | 2328.03 |
| 93.04 | 2327.94 | 97.04 | 2327.81 | 100.92 | 2327.68 | 103.34 | 2327.6 | 104.18 | 2327.58 |
| 106.8 | 2327.52 | 109.45 | 2327.46 | 109.56 | 2327.46 | 111.67 | 2327.4 | 114.25 | 2327.35 |
| 116.04 | 2327.32 | 116.62 | 2327.31 | 116.79 | 2327.31 | 116.96 | 2327.31 | 117.13 | 2327.31 |
| 117.29 | 2327.31 | 117.45 | 2327.3 | 117.59 | 2327.3 | 117.72 | 2327.3 | 117.84 | 2327.3 |
| 118.07 | 2327.31 | 120.3 | 2327.33 | 121.98 | 2327.36 | 123.65 | 2327.38 | 124.65 | 2327.41 |
| 125.76 | 2327.44 | 126.91 | 2327.48 | 127.79 | 2327.5 | 129.37 | 2327.53 | 129.58 | 2327.52 |
| 134.96 | 2327.59 | 141.27 | 2327.67 | 145.59 | 2327.72 | 146.1 | 2327.73 | 146.36 | 2327.73 |
| 146.63 | 2327.73 | 146.89 | 2327.73 | 147.43 | 2327.74 | 153.37 | 2327.75 | 155.41 | 2327.75 |
| 160.21 | 2327.77 | 162.25 | 2327.77 | 162.75 | 2327.77 | 163.23 | 2327.77 | 163.93 | 2327.77 |
| 164.64 | 2327.77 | 165.11 | 2327.77 | 165.92 | 2327.76 | 169.19 | 2327.74 | 174.02 | 2327.7 |
| 175.76 | 2327.69 | 176.32 | 2327.68 | 178.29 | 2327.66 | 183.78 | 2327.6 | 186.47 | 2327.57 |
| 188.89 | 2327.56 | 190.42 | 2327.55 | 191.38 | 2327.54 | 195.68 | 2327.48 | 196.46 | 2327.47 |
| 196.74 | 2327.46 | 197.49 | 2327.45 | 198.2 | 2327.45 | 198.34 | 2327.44 | 199.36 | 2327.43 |
| 199.48 | 2327.43 | 199.74 | 2327.43 | 201.27 | 2327.41 | 203.52 | 2327.39 | 204.08 | 2327.39 |
| 205.92 | 2327.36 | 211.76 | 2327.3 | 213.59 | 2327.27 | 215.79 | 2327.24 | 215.95 | 2327.24 |
| 217.07 | 2327.24 | 217.39 | 2327.24 | 218.6 | 2327.23 | 218.68 | 2327.23 | 218.96 | 2327.23 |
| 219.93 | 2327.23 | 220.67 | 2327.22 | 221.5 | 2327.22 | 221.9 | 2327.22 | 222.23 | 2327.22 |
| 222.76 | 2327.22 | 222.95 | 2327.21 | 223.33 | 2327.21 | 223.48 | 2327.21 | 223.55 | 2327.21 |
| 223.7 | 2327.21 | 224.13 | 2327.21 | 224.5 | 2327.21 | 224.72 | 2327.21 | 225.13 | 2327.21 |
| 226.72 | 2327.21 | 227.85 | 2327.21 | 235.31 | 2327.23 | 235.37 | 2327.23 | 236.09 | 2327.23 |
| 236.61 | 2327.23 | 237.41 | 2327.23 | 238.78 | 2327.22 | 245.43 | 2327.17 | 246.34 | 2327.17 |
| 248.5 | 2327.15 | 249.51 | 2327.15 | 249.86 | 2327.15 | 250.36 | 2327.14 | 250.42 | 2327.14 |
| 250.84 | 2327.14 | 250.98 | 2327.14 | 251.29 | 2327.14 | 251.77 | 2327.14 | 252.68 | 2327.14 |
| 255.21 | 2327.14 | 255.35 | 2327.14 | 256.42 | 2327.14 | 261.15 | 2327.14 | 261.65 | 2327.13 |
| 264.85 | 2327.13 | 267.75 | 2327.14 | 268.24 | 2327.14 | 268.6 | 2327.14 | 269.36 | 2327.13 |
| 277.18 | 2327.1 | 280.64 | 2327.08 | 286.81 | 2327.05 | 287.34 | 2327.05 | 293.77 | 2327.02 |
| 293.97 | 2327.02 | 294.04 | 2327.02 | 294.22 | 2327.02 | 300 | 2326.99 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -241.27 | .015 | 89.88 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -241.27 | 89.88 | .1 | .3 |

Downstream Deck/Roadway Coordinates

num= 2

| Sta Hi Cord | Lo Cord | Sta Hi Cord | Lo Cord |
|---|---|---|---|
| -200 | 2326.2 | 200 | 2326 |

Downstream Bridge Cross Section Data

Station Elevation Data num= 302

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2327.58 | -291.85 | 2327.58 | -291.5 | 2327.57 | -288.15 | 2327.55 | -287.43 | 2327.54 |
| -286.47 | 2327.54 | -283.23 | 2327.5 | -281.94 | 2327.49 | -281.3 | 2327.49 | -280.07 | 2327.48 |
| -273.65 | 2327.4 | -271.78 | 2327.39 | -271.33 | 2327.38 | -270.97 | 2327.38 | -270.45 | 2327.37 |
| -269.27 | 2327.36 | -267.57 | 2327.33 | -263.3 | 2327.28 | -262.82 | 2327.27 | -262.6 | 2327.26 |
| -261.92 | 2327.26 | -261.68 | 2327.25 | -259.92 | 2327.22 | -259.62 | 2327.22 | -259.31 | 2327.21 |
| -259.04 | 2327.21 | -258.76 | 2327.2 | -258.15 | 2327.2 | -256.08 | 2327.17 | -255.84 | 2327.17 |
| -254.46 | 2327.15 | -254.28 | 2327.15 | -249.51 | 2327.07 | -249.35 | 2327.07 | -241.98 | 2326.97 |
| -239.31 | 2326.93 | -231.02 | 2326.84 | -229.9 | 2326.82 | -229.59 | 2326.82 | -229.3 | 2326.81 |
| -229.01 | 2326.81 | -227.76 | 2326.79 | -224.94 | 2326.75 | -223.46 | 2326.74 | -223.14 | 2326.74 |
| -219.74 | 2326.73 | -218.62 | 2326.72 | -218.55 | 2326.72 | -216.25 | 2326.71 | -213.87 | 2326.69 |
| -213.38 | 2326.69 | -211.03 | 2326.68 | -210.28 | 2326.68 | -209.11 | 2326.67 | -208.71 | 2326.67 |
| -208.56 | 2326.66 | -206.33 | 2326.66 | -204.08 | 2326.63 | -203.31 | 2326.63 | -202.57 | 2326.61 |
| -202 | 2326.6 | -199.87 | 2326.57 | -199.17 | 2326.55 | -194.91 | 2326.41 | -193.63 | 2326.37 |
| -182.53 | 2326 | -178.13 | 2325.84 | -169.98 | 2325.56 | -169.8 | 2325.55 | -163.86 | 2325.35 |
| -161.82 | 2325.27 | -161.68 | 2325.27 | -161.61 | 2325.26 | -160.46 | 2325.26 | -159.37 | 2325.27 |
| -154.66 | 2325.27 | -154.18 | 2325.26 | -151.85 | 2325.25 | -149.55 | 2325.25 | -149.08 | 2325.24 |
| -148.2 | 2325.23 | -147.72 | 2325.22 | -147.53 | 2325.22 | -146.31 | 2325.2 | -144.92 | 2325.16 |
| -144.7 | 2325.16 | -144.01 | 2325.13 | -142 | 2325.08 | -141.62 | 2325.07 | -141.12 | 2325.06 |
| -140.09 | 2325.03 | -133.16 | 2324.6 | -131.32 | 2324.51 | -129.71 | 2324.44 | -127.92 | 2324.35 |
| -127.01 | 2324.31 | -126.22 | 2324.27 | -125.06 | 2324.22 | -124.53 | 2324.18 | -123.95 | 2324.18 |
| -123.29 | 2324.2 | -122.79 | 2324.2 | -122.07 | 2324.21 | -119.94 | 2324.22 | -119.21 | 2324.23 |
| -118.84 | 2324.23 | -118.64 | 2324.22 | -118.32 | 2324.22 | -118.06 | 2324.21 | -117.76 | 2324.2 |
| -117.61 | 2324.19 | -117.48 | 2324.2 | -117.39 | 2324.19 | -116.26 | 2324.15 | -116.1 | 2324.15 |
| -115.89 | 2324.14 | -115.58 | 2324.13 | -112.57 | 2323.98 | -111.02 | 2323.95 | -109.99 | 2323.94 |
| -105.25 | 2323.77 | -105.11 | 2323.77 | -103.35 | 2323.66 | -101.58 | 2323.58 | -100.89 | 2323.54 |
| -100.14 | 2323.49 | -99.71 | 2323.46 | -99.52 | 2323.44 | -99.25 | 2323.42 | -98.81 | 2323.38 |
| -98.73 | 2323.37 | -98.63 | 2323.36 | -98.55 | 2323.36 | -98.44 | 2323.35 | -98.22 | 2323.32 |
| -98.03 | 2323.29 | -97.94 | 2323.27 | -97.87 | 2323.24 | -95 | 2322 | -85 | 2322 |
| -74.77 | 2323.38 | -72.95 | 2323.38 | -72.87 | 2323.37 | -72.47 | 2323.38 | -72.3 | 2323.37 |
| -72.03 | 2323.38 | -71.48 | 2323.37 | -71.31 | 2323.37 | -69.92 | 2323.34 | -68.8 | 2323.31 |
| -66.78 | 2323.31 | -66.14 | 2323.33 | -65.26 | 2323.33 | -64.81 | 2323.34 | -64.72 | 2323.34 |
| -64.26 | 2323.35 | -64.18 | 2323.35 | -59.13 | 2323.45 | -58.27 | 2323.46 | -55.7 | 2323.48 |
| -48.56 | 2323.57 | -44.67 | 2323.61 | -43.36 | 2323.62 | -40.8 | 2323.6 | -39.36 | 2323.6 |
| -36.57 | 2323.58 | -34.32 | 2323.58 | -34.17 | 2323.59 | -33.55 | 2323.6 | -33.2 | 2323.6 |
| -33.01 | 2323.61 | -31.2 | 2323.61 | -30.99 | 2323.62 | -30.58 | 2323.62 | -29.97 | 2323.63 |
| -28.69 | 2323.64 | -28.04 | 2323.64 | -27.82 | 2323.65 | -22.61 | 2323.65 | -22.37 | 2323.66 |
| -22.13 | 2323.66 | -21.09 | 2323.67 | -15.33 | 2323.74 | -11.93 | 2323.79 | -11.64 | 2323.8 |
| -11.32 | 2323.81 | -11.04 | 2323.81 | -10.71 | 2323.82 | -5.19 | 2323.95 | 5.21 | 2324.19 |
| 6.71 | 2324.22 | 7.52 | 2324.24 | 7.67 | 2324.24 | 10.28 | 2324.3 | 10.44 | 2324.3 |
| 22.35 | 2324.52 | 22.51 | 2324.52 | 22.75 | 2324.53 | 29.65 | 2324.65 | 47.07 | 2325.09 |
| 48.96 | 2325.15 | 49.51 | 2325.17 | 51.58 | 2325.23 | 52.19 | 2325.24 | 54.06 | 2325.3 |
| 55.37 | 2325.33 | 66.01 | 2325.6 | 67.43 | 2325.64 | 68.99 | 2325.69 | 77.55 | 2325.93 |
| 85.93 | 2326.18 | 98.66 | 2326.84 | 102.86 | 2327.05 | 108.39 | 2327.3 | 114.4 | 2327.56 |
| 117.28 | 2327.68 | 119.24 | 2327.68 | 135.13 | 2328.49 | 137.61 | 2328.43 | 140.75 | 2328.34 |
| 143.8 | 2328.26 | 145.7 | 2328.2 | 146.35 | 2328.19 | 148.41 | 2328.15 | 150.49 | 2328.1 |
| 150.58 | 2328.1 | 152.23 | 2328.06 | 154.26 | 2328.02 | 155.66 | 2328 | 156.11 | 2327.99 |
| 156.64 | 2327.99 | 156.77 | 2327.98 | 157.07 | 2327.98 | 157.25 | 2327.99 | 159 | 2327.99 |
| 161.63 | 2328.01 | 162.42 | 2328.02 | 163.29 | 2328.04 | 164.19 | 2328.05 | 164.88 | 2328.06 |
| 166.12 | 2328.08 | 166.28 | 2328.07 | 175.46 | 2328.12 | 178.85 | 2328.13 | 179.87 | 2328.13 |
| 180.29 | 2328.14 | 184.95 | 2328.12 | 186.55 | 2328.11 | 190.32 | 2328.11 | 191.92 | 2328.1 |
| 193.24 | 2328.1 | 193.79 | 2328.09 | 194.16 | 2328.09 | 194.8 | 2328.08 | 197.36 | 2328.06 |
| 201.15 | 2328.02 | 202.52 | 2328.01 | 202.96 | 2328 | 204.5 | 2327.99 | 208.81 | 2327.93 |
| 212.82 | 2327.89 | 214.02 | 2327.88 | 214.78 | 2327.87 | 218.15 | 2327.82 | 218.76 | 2327.81 |
| 218.98 | 2327.8 | 219.57 | 2327.79 | 220.12 | 2327.79 | 220.23 | 2327.78 | 221.04 | 2327.77 |
| 221.33 | 2327.77 | 222.54 | 2327.75 | 224.3 | 2327.73 | 224.74 | 2327.73 | 226.18 | 2327.7 |
| 230.76 | 2327.63 | 232.2 | 2327.6 | 233.93 | 2327.57 | 235.19 | 2327.57 | 236.13 | 2327.56 |
| 237.17 | 2327.56 | 237.76 | 2327.55 | 243.39 | 2327.55 | 249.24 | 2327.56 | 250.26 | 2327.56 |
| 250.89 | 2327.55 | 251.97 | 2327.55 | 257.18 | 2327.49 | 257.9 | 2327.49 | 259.59 | 2327.47 |
| 260.66 | 2327.47 | 261.05 | 2327.46 | 269.52 | 2327.46 | 269.91 | 2327.45 | 275.96 | 2327.45 |
| 282.09 | 2327.43 | 284.81 | 2327.41 | 289.65 | 2327.4 | 290.07 | 2327.4 | 295.11 | 2327.38 |
| 295.46 | 2327.38 | 300 | 2327.36 | | | | | | |

Manning's n Values num= 3

```
     Sta    n Val     Sta    n Val     Sta    n Val
    -300     .015 -199.17     .015  135.13     .015

Bank Sta: Left   Right    Coeff Contr.    Expan.
       -199.17  135.13             .1        .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  2

Culvert Name      Shape      Rise    Span
Culvert #2       Circular     1.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit
Loss Coef
                  1      58     .015      .015         0                    .2
1
Upstream   Elevation =  2322.86
           Centerline Station = -91
Downstream Elevation =  2321.91
           Centerline Station = -91

Culvert Name      Shape      Rise    Span
Culvert #1       Circular     1.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit
Loss Coef
                  1      58     .015      .015         0                    .2
1
Upstream   Elevation =  2322.92
           Centerline Station = -89
Downstream Elevation =  2321.96
           Centerline Station = -89

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 11480.*

INPUT
Description: Sta 114+80.00
Station Elevation Data    num=     302
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -300  2327.58  -291.85  2327.58   -291.5  2327.57  -288.15  2327.55  -287.43  2327.54
  -286.47  2327.54  -283.23   2327.5  -281.94  2327.49   -281.3  2327.49  -280.07  2327.48
  -273.65   2327.4  -271.78  2327.39  -271.33  2327.38  -270.97  2327.38  -270.45  2327.37
  -269.27  2327.36  -267.57  2327.33   -263.3  2327.28  -262.82  2327.27   -262.6  2327.26
  -261.92  2327.26  -261.68  2327.25  -259.92  2327.22  -259.62  2327.22  -259.31  2327.21
  -259.04  2327.21  -258.76   2327.2  -258.15   2327.2  -256.08  2327.17  -255.84  2327.17
  -254.46  2327.15  -254.28  2327.15  -249.51  2327.07  -249.35  2327.07  -241.98  2326.97
  -239.31  2326.93  -231.02  2326.84   -229.9  2326.82  -229.59  2326.82   -229.3  2326.81
  -229.01  2326.81  -227.76  2326.79  -224.94  2326.75  -223.46  2326.74  -223.14  2326.74
  -219.74  2326.73  -218.62  2326.72  -218.55  2326.72  -216.25  2326.71  -213.87  2326.69
  -213.38  2326.69  -211.03  2326.68  -210.28  2326.68  -209.11  2326.67  -208.71  2326.67
  -208.56  2326.66  -206.33  2326.66  -204.08  2326.63  -203.31  2326.63  -202.57  2326.61
     -202   2326.6  -199.87  2326.57  -199.17  2326.55  -194.91  2326.41  -193.63  2326.37
  -182.53     2326  -178.13  2325.84  -169.98  2325.56   -169.8  2325.55  -163.86  2325.35
  -161.82  2325.27  -161.68  2325.27  -161.61  2325.26  -160.46  2325.26  -159.37  2325.27
  -154.66  2325.27  -154.18  2325.26  -151.85  2325.25  -149.55  2325.25  -149.08  2325.24
```

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 -148.2 2325.23 -147.72 2325.22 -147.53 2325.22 -146.31  2325.2 -144.92 2325.16
 -144.7 2325.16 -144.01 2325.13    -142 2325.08 -141.62 2325.07 -141.12 2325.06
-140.09 2325.03 -133.16  2324.6 -131.32 2324.51 -129.71 2324.44 -127.92 2324.35
-127.01 2324.31 -126.22 2324.27 -125.06 2324.22 -124.53 2324.18 -123.95 2324.18
-123.29  2324.2 -122.79  2324.2 -122.07 2324.21 -119.94 2324.22 -119.21 2324.23
-118.84 2324.23 -118.64 2324.22 -118.32 2324.22 -118.06 2324.21 -117.76  2324.2
-117.61 2324.19 -117.48  2324.2 -117.39 2324.19 -116.26 2324.15  -116.1 2324.15
-115.89 2324.14 -115.58 2324.13 -112.57 2323.98 -111.02 2323.95 -109.99 2323.94
-105.25 2323.77 -105.11 2323.77 -103.35 2323.66 -101.58 2323.58 -100.89 2323.54
-100.14 2323.49  -99.71 2323.46  -99.52 2323.44  -99.25 2323.42  -98.81 2323.38
 -98.73 2323.37  -98.63 2323.36  -98.55 2323.36  -98.44 2323.35  -98.22 2323.32
 -98.03 2323.29  -97.94 2323.27  -97.87 2323.24     -95    2322     -85    2322
 -74.77 2323.38  -72.95 2323.38  -72.87 2323.37  -72.47 2323.38   -72.3 2323.37
 -72.03 2323.38  -71.48 2323.37  -71.31 2323.37  -69.92 2323.34   -68.8 2323.31
 -66.78 2323.31  -66.14 2323.33  -65.26 2323.33  -64.81 2323.34  -64.72 2323.34
 -64.26 2323.35  -64.18 2323.35  -59.13 2323.45  -58.27 2323.46   -55.7 2323.48
 -48.56 2323.57  -44.67 2323.61  -43.36 2323.62   -40.8  2323.6  -39.36  2323.6
 -36.57 2323.58  -34.32 2323.58  -34.17 2323.59  -33.55  2323.6   -33.2  2323.6
 -33.01 2323.61   -31.2 2323.61  -30.99 2323.62  -30.58 2323.62  -29.97 2323.63
 -28.69 2323.64  -28.04 2323.64  -27.82 2323.65  -22.61 2323.65  -22.37 2323.66
 -22.13 2323.66  -21.09 2323.67  -15.33 2323.74  -11.93 2323.79  -11.64  2323.8
 -11.32 2323.81  -11.04 2323.81  -10.71 2323.82   -5.19 2323.95    5.21 2324.19
   6.71 2324.22    7.52 2324.24    7.67 2324.24   10.28  2324.3   10.44  2324.3
  22.35 2324.52   22.51 2324.52   22.75 2324.53   29.65 2324.65   47.07 2325.09
  48.96 2325.15   49.51 2325.17   51.58 2325.23   52.19 2325.24   54.06  2325.3
  55.37 2325.33   66.01  2325.6   67.43 2325.64   68.99 2325.69   77.55 2325.93
  85.93 2326.18   98.66 2326.84  102.86 2327.05  108.39  2327.3   114.4 2327.56
 117.28 2327.68  119.24 2327.68  135.13 2328.49  137.61 2328.43  140.75 2328.34
  143.8 2328.26   145.7  2328.2  146.35 2328.19  148.41 2328.15  150.49  2328.1
 150.58  2328.1  152.23 2328.06  154.26 2328.02  155.66    2328  156.11 2327.99
 156.64 2327.99  156.77 2327.98  157.07 2327.98  157.25 2327.99     159 2327.99
 161.63 2328.01  162.42 2328.02  163.29 2328.04  164.19 2328.05  164.88 2328.06
 166.12 2328.08  166.28 2328.07  175.46 2328.12  178.85 2328.13  179.87 2328.13
 180.29 2328.14  184.95 2328.12  186.55 2328.11  190.32 2328.11  191.92  2328.1
 193.24  2328.1  193.79 2328.09  194.16 2328.09   194.8 2328.08  197.36 2328.06
 201.15 2328.02  202.52 2328.01  202.96    2328   204.5 2327.99  208.81 2327.93
 212.82 2327.89  214.02 2327.88  214.78 2327.87  218.15 2327.82  218.76 2327.81
 218.98  2327.8  219.57 2327.79  220.12 2327.79  220.23 2327.78  221.04 2327.77
 221.33 2327.77  222.54 2327.75   224.3 2327.73  224.74 2327.73  226.18  2327.7
 230.76 2327.63   232.2  2327.6  233.93 2327.57  235.19 2327.57  236.13 2327.56
 237.17 2327.56  237.76 2327.55  243.39 2327.55  249.24 2327.56  250.26 2327.56
 250.89 2327.55  251.97 2327.55  257.18 2327.49   257.9 2327.49  259.59 2327.47
 260.66 2327.47  261.05 2327.46  269.52 2327.46  269.91 2327.45  275.96 2327.45
 282.09 2327.43  284.81 2327.41  289.65  2327.4  290.07  2327.4  295.11 2327.38
 295.46 2327.38     300 2327.36

Manning's n Values        num=       3
    Sta   n Val     Sta    n Val     Sta   n Val
   -300    .015 -199.17     .015  135.13    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -199.17  135.13              100      80      80             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 11400

INPUT
Description: Sta 114+00.00
Station Elevation Data    num=     174
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -300     2326 -287.31     2326 -280.43 2325.93 -279.35 2325.92 -271.88 2325.85
 -270.89 2325.84 -261.35 2325.73 -258.98 2325.71 -256.07 2325.69 -255.36 2325.68
 -255.17 2325.68 -254.98 2325.68  -254.8 2325.68    -254 2325.67 -251.26 2325.63
 -248.14 2325.59 -242.87 2325.53 -242.12 2325.52 -241.78 2325.51 -241.44 2325.51
  -241.1  2325.5 -240.72  2325.5 -240.35 2325.49  -237.6 2325.44 -237.14 2325.43
 -236.66 2325.42 -236.24 2325.42  -235.8 2325.41 -234.85  2325.4 -229.11 2325.32
 -209.67 2325.04 -189.67 2324.75 -180.35 2324.61 -173.31 2324.51 -169.62 2324.45
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -165.91 | 2324.39 | -165.15 | 2324.38 | -161.5 | 2324.32 | -157.88 | 2324.26 | -150.47 | 2324.13 |
| -143.03 | 2324 | -134.23 | 2323.11 | -130.82 | 2322.75 | -129.11 | 2322.57 | -127.95 | 2322.44 |
| -127.41 | 2322.37 | -100.64 | 2321.9 | -74.75 | 2322.31 | -74.54 | 2322.31 | -73.68 | 2322.33 |
| -73.57 | 2322.33 | -73.45 | 2322.33 | -73.34 | 2322.33 | -73.22 | 2322.33 | -72.62 | 2322.34 |
| -72.5 | 2322.34 | -71.9 | 2322.35 | -71.78 | 2322.35 | -71.17 | 2322.36 | -71.06 | 2322.36 |
| -64.3 | 2322.48 | -63.16 | 2322.5 | -59.72 | 2322.53 | -50.17 | 2322.63 | -44.96 | 2322.68 |
| -43.22 | 2322.69 | -39.79 | 2322.67 | -38.89 | 2322.67 | -38.2 | 2322.66 | -38.05 | 2322.66 |
| -37.86 | 2322.66 | -34.13 | 2322.64 | -33.47 | 2322.64 | -32.25 | 2322.64 | -32.08 | 2322.64 |
| -31.89 | 2322.64 | -31.71 | 2322.64 | -31.52 | 2322.64 | -31.34 | 2322.64 | -31.13 | 2322.64 |
| -30.92 | 2322.65 | -30.09 | 2322.66 | -29.86 | 2322.66 | -29.63 | 2322.66 | -29.38 | 2322.67 |
| -29.12 | 2322.67 | -26.95 | 2322.67 | -26.67 | 2322.68 | -26.4 | 2322.68 | -26.13 | 2322.68 |
| -25.31 | 2322.69 | -23.6 | 2322.71 | -23.02 | 2322.71 | -22.73 | 2322.71 | -22.44 | 2322.72 |
| -22.21 | 2322.72 | -21.98 | 2322.72 | -21.54 | 2322.72 | -19.94 | 2322.72 | -16.84 | 2322.71 |
| -16.34 | 2322.71 | -16.2 | 2322.71 | -16.05 | 2322.71 | -15.76 | 2322.71 | -15.47 | 2322.71 |
| -15.15 | 2322.72 | -14.83 | 2322.72 | -13.44 | 2322.73 | -5.73 | 2322.83 | -2.97 | 2322.87 |
| -2.04 | 2322.88 | -1.18 | 2322.89 | -.8 | 2322.9 | -.37 | 2322.91 | 0 | 2322.92 |
| .44 | 2322.93 | 7.83 | 2323.1 | 21.73 | 2323.41 | 23.74 | 2323.45 | 24.82 | 2323.48 |
| 25.03 | 2323.48 | 28.52 | 2323.55 | 28.73 | 2323.55 | 44.66 | 2323.84 | 44.76 | 2323.84 |
| 44.87 | 2323.84 | 45.19 | 2323.85 | 54.42 | 2324 | 77.72 | 2324.58 | 80.24 | 2324.66 |
| 80.98 | 2324.68 | 83.75 | 2324.76 | 84.56 | 2324.78 | 87.06 | 2324.85 | 88.82 | 2324.9 |
| 103.04 | 2325.25 | 104.94 | 2325.3 | 107.03 | 2325.36 | 109.43 | 2325.43 | 118.47 | 2325.68 |
| 129.68 | 2326 | 146.71 | 2326.88 | 149.35 | 2327.01 | 152.32 | 2327.16 | 167.75 | 2327.83 |
| 171.6 | 2328 | 172.63 | 2328 | 172.82 | 2328 | 173.56 | 2328 | 174.22 | 2328 |
| 195.48 | 2329.11 | 245.97 | 2328.32 | 248.11 | 2328.27 | 249.01 | 2328.25 | 249.94 | 2328.23 |
| 250.89 | 2328.21 | 252.01 | 2328.19 | 258.11 | 2328 | 258.19 | 2328 | 258.75 | 2328 |
| 258.91 | 2328 | 259.51 | 2328 | 260.17 | 2328 | 261.58 | 2328 | 262.26 | 2328 |
| 267.85 | 2328 | 269.55 | 2327.98 | 273.31 | 2327.92 | 275.06 | 2327.9 | 275.77 | 2327.89 |
| 276.46 | 2327.89 | 277.79 | 2327.88 | 290.37 | 2327.86 | 300 | 2327.85 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -143.03 | .025 | 195.48 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -143.03 | 195.48 | 280 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 11100

INPUT
Description: Sta 111+00.00
Station Elevation Data num= 132

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2322.47 | -289.7 | 2322.44 | -278.81 | 2322.41 | -277.51 | 2322.41 | -276.87 | 2322.4 |
| -275.58 | 2322.39 | -264.64 | 2322.3 | -257.9 | 2322.24 | -244.71 | 2322.12 | -232.59 | 2322 |
| -226.63 | 2321.91 | -225.64 | 2321.89 | -204.17 | 2321.58 | -199.55 | 2321.5 | -193.39 | 2321.4 |
| -192.68 | 2321.39 | -179.42 | 2321.16 | -179 | 2321.15 | -178.19 | 2321.14 | -173.89 | 2321.1 |
| -172.96 | 2321.08 | -171.73 | 2321.07 | -160.12 | 2320.86 | -155.23 | 2320.78 | -153.48 | 2320.74 |
| -152.59 | 2320.72 | -151.52 | 2320.7 | -149.78 | 2320.66 | -129.3 | 2320.12 | -124.63 | 2320 |
| -115.8 | 2319.24 | -111.75 | 2318.88 | -109.46 | 2318.69 | -108.02 | 2318.56 | -107.1 | 2318.47 |
| -106.17 | 2318.4 | -105.44 | 2318.35 | -105.01 | 2318.32 | -104.44 | 2318.29 | -103.97 | 2318.26 |
| -103.56 | 2318.24 | -103.54 | 2318.24 | -103.52 | 2318.24 | -103.5 | 2318.24 | -103.48 | 2318.24 |
| -103.45 | 2318.24 | -103.43 | 2318.24 | -103.4 | 2318.24 | -103.2 | 2318.25 | -102.81 | 2318.27 |
| -102.27 | 2318.29 | -101.82 | 2318.32 | -101.14 | 2318.35 | -100.51 | 2318.38 | -99.76 | 2318.41 |
| -99.62 | 2318.42 | -99.53 | 2318.42 | -99.44 | 2318.42 | -99.34 | 2318.43 | -97.22 | 2318.45 |
| -96.92 | 2318.46 | -96.78 | 2318.46 | -96.66 | 2318.47 | -96.55 | 2318.47 | -96.35 | 2318.48 |
| -94.56 | 2318.55 | -81.11 | 2319.08 | -80.99 | 2319.09 | -66.86 | 2319.65 | -66.75 | 2319.65 |
| -66.56 | 2319.66 | -65.68 | 2319.69 | -65.51 | 2319.7 | -64.75 | 2319.72 | -63.95 | 2319.75 |
| -63.41 | 2319.77 | -61.53 | 2319.84 | -61.24 | 2319.85 | -60.31 | 2319.89 | -60.15 | 2319.88 |
| -60.1 | 2319.87 | -49.97 | 2319.85 | -49.34 | 2319.87 | -48.73 | 2319.89 | -48.15 | 2319.9 |
| -47.63 | 2319.9 | -47.15 | 2319.9 | -46.54 | 2319.92 | -46.2 | 2319.93 | -46.07 | 2319.94 |
| -45.89 | 2319.95 | -45.78 | 2319.95 | -45.71 | 2319.95 | -45.39 | 2319.95 | -45.38 | 2319.95 |
| -45.36 | 2319.95 | -45.35 | 2319.95 | -45.34 | 2319.95 | -45.3 | 2319.95 | -45.28 | 2319.94 |
| -45.26 | 2319.94 | -45.25 | 2319.94 | -45.24 | 2319.94 | -45.22 | 2319.94 | -44.66 | 2319.94 |
| -44.65 | 2319.94 | -43.46 | 2319.93 | -38.67 | 2319.87 | -30.19 | 2319.74 | -23.56 | 2319.64 |
| -14.85 | 2319.55 | -13.26 | 2319.54 | -12.46 | 2319.53 | -12.05 | 2319.53 | -11.63 | 2319.53 |
| -11.21 | 2319.53 | -10.89 | 2319.53 | -10.54 | 2319.53 | -10.04 | 2319.54 | -9.53 | 2319.55 |

```
   -7.93 2319.57   -3.97 2319.63   -2.55 2319.66       0 2319.72    3.28  2319.8
    7.47 2319.88   13.81    2320   18.82 2320.07   32.54 2320.25   42.59 2320.38
   46.37 2320.44   53.44 2320.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -193.39    .025   53.44    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -193.39   53.44               260     300     340             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 10800

INPUT
Description: Sta 108+00.00
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2318.75 -297.92 2318.76 -293.18 2318.74 -285.08 2318.77 -277.45  2318.8
 -272.01 2318.78 -267.04 2318.81 -261.68 2318.78 -260.79 2318.78 -259.45 2318.79
 -254.24 2318.76 -253.32 2318.77 -251.15  2318.8 -244.45 2318.87 -239.53 2318.93
 -238.83 2318.93 -238.47 2318.94 -238.23 2318.94 -237.82 2318.94 -237.43 2318.94
 -237.04 2318.94 -236.23 2318.94 -228.22 2318.92 -222.72  2318.9 -219.94 2318.89
 -218.72 2318.88 -213.98 2318.86 -213.54 2318.86 -212.65 2318.86 -207.05 2318.83
 -199.91 2318.85 -198.27 2318.86 -191.41  2318.9 -190.63  2318.9 -189.83  2318.9
    -189  2318.9  -181.2 2318.89 -179.85 2318.88 -178.05 2318.88 -177.19 2318.87
 -176.77 2318.87 -176.38 2318.86 -176.02 2318.86 -175.67 2318.85 -175.34 2318.85
 -174.71 2318.84 -172.87  2318.8 -170.04 2318.73 -169.05 2318.71 -168.67  2318.7
 -168.23  2318.7 -167.25 2318.68 -163.92 2318.64 -145.73 2318.43 -144.91 2318.43
  -144.7 2318.42  -138.3 2318.35 -122.23 2318.17 -120.64 2318.16 -108.42 2318.02
 -106.88    2318  -94.23 2317.79  -90.12 2317.69  -84.42 2317.58  -68.68 2317.21
  -47.27 2316.74  -17.58    2316  -13.45 2315.49  -13.43 2315.49   -7.41 2314.77
   -5.09 2314.53   -4.93 2314.51   -4.52 2314.46   -4.19 2314.44   -3.67 2314.38
   -3.52 2314.37   -3.46 2314.37   -3.41 2314.36    -3.4 2314.36   -3.36 2314.36
   -3.32 2314.36   -3.29 2314.36   -3.25 2314.36    -3.2 2314.36   -3.15 2314.37
   -3.04 2314.37   -2.69  2314.4   -2.07 2314.47    -.83 2314.66    -.44 2314.74
       0 2314.86    1.54 2315.26     4.6    2316    7.53 2316.78   12.31    2318

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -138.3    .025   12.31    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -138.3   12.31               300     300     300             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 10500

INPUT
Description: Sta 105+00.00
Station Elevation Data    num=     133
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2317.59  -277.5 2317.16 -256.94 2316.83 -250.74 2316.72 -240.64 2316.54
 -239.28 2316.52 -237.95 2316.51 -229.88 2316.37 -227.55 2316.34 -221.58 2316.28
 -194.58 2316.02 -193.17    2316  -162.1    2316 -158.85    2316  -153.6    2316
 -147.48    2316 -137.41    2316 -134.91    2316 -109.08    2316 -107.51 2315.64
 -101.88 2314.49  -99.54    2314   -99.3 2313.86  -91.43 2313.15  -91.39 2313.17
   -91.3  2313.2  -91.15 2313.22  -90.97 2313.24  -90.73 2313.26  -90.46 2313.27
  -90.23 2313.27  -90.01 2313.27  -89.78 2313.27  -89.54 2313.26  -89.38 2313.25
  -88.96 2313.24  -88.55 2313.21  -88.16 2313.19  -87.81 2313.16  -87.52 2313.13
  -87.28  2313.1  -87.14 2313.08  -87.04 2313.06  -86.96 2313.03  -86.84 2312.79
  -86.76 2312.77   -86.7 2312.75  -86.63 2312.74  -86.55 2312.74  -85.99 2312.69
  -84.92 2312.61  -84.84  2312.6  -84.77 2312.59  -84.75 2312.59  -81.38  2312.5
  -80.29 2312.52  -80.14 2312.53  -79.49 2312.54  -79.33 2312.54  -79.18 2312.54
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -79.05 | 2312.55 | -78.93 | 2312.55 | -78.46 | 2312.58 | -78.33 | 2312.58 | -77.91 | 2312.6 |
| -77.77 | 2312.6 | -76.77 | 2312.66 | -76.5 | 2312.68 | -76.25 | 2312.71 | -76.14 | 2312.72 |
| -75.95 | 2312.75 | -75.71 | 2312.81 | -75.23 | 2312.98 | -74.2 | 2313.18 | -74.01 | 2313.21 |
| -73.49 | 2313.28 | -73.28 | 2313.28 | -66.78 | 2314 | -58.58 | 2314 | -48.62 | 2314 |
| -37.22 | 2313.5 | -7.36 | 2312 | -5.85 | 2312 | 0 | 2312 | 10.11 | 2312 |
| 30.17 | 2312.69 | 39.75 | 2312.87 | 53.35 | 2313.27 | 55.22 | 2313.32 | 60.85 | 2313.46 |
| 73.67 | 2313.63 | 76.64 | 2313.7 | 79.23 | 2313.76 | 81.02 | 2313.78 | 82.52 | 2313.81 |
| 82.78 | 2313.81 | 82.9 | 2313.82 | 82.99 | 2313.82 | 84.39 | 2313.84 | 85.03 | 2313.84 |
| 86.04 | 2313.86 | 99.76 | 2313.92 | 99.81 | 2313.92 | 99.84 | 2313.92 | 99.87 | 2313.92 |
| 99.89 | 2313.92 | 99.9 | 2313.92 | 99.92 | 2313.92 | 99.93 | 2313.92 | 100.01 | 2313.92 |
| 100.03 | 2313.92 | 100.05 | 2313.92 | 100.07 | 2313.92 | 100.15 | 2313.92 | 100.65 | 2313.93 |
| 100.71 | 2313.93 | 100.75 | 2313.93 | 100.77 | 2313.93 | 100.78 | 2313.93 | 100.79 | 2313.93 |
| 100.81 | 2313.93 | 100.84 | 2313.93 | 100.92 | 2313.93 | 100.98 | 2313.93 | 101.01 | 2313.94 |
| 101.06 | 2313.94 | 101.21 | 2313.94 | 101.28 | 2313.94 | 101.33 | 2313.94 | 101.76 | 2313.93 |
| 102.23 | 2313.93 | 102.28 | 2313.93 | 102.33 | 2313.93 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -48.62 | .025 | 86.04 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -48.62 | 86.04 | 400 | 300 | 200 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 10200

INPUT
Description: Sta 102+00.00
Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2312 | -286.56 | 2312 | -279.87 | 2312 | -278.05 | 2312 | -271.07 | 2312 |
| -258.17 | 2312 | -251.49 | 2312 | -243.17 | 2312 | -231.59 | 2312 | -230.64 | 2312 |
| -228.73 | 2312 | -222.73 | 2312 | -222.21 | 2312 | -220.41 | 2312 | -210.85 | 2312 |
| -210.42 | 2312 | -209.98 | 2312 | -208.84 | 2312 | -208.38 | 2312 | -207.9 | 2312 |
| -207.61 | 2312 | -207.32 | 2312 | -206.96 | 2312 | -199.3 | 2312 | -193.86 | 2312 |
| -190.21 | 2312 | -183.26 | 2312 | -175.77 | 2312 | -173.94 | 2312 | -168.53 | 2312 |
| -168.08 | 2312 | -167.64 | 2312 | -76.01 | 2310.74 | -69.8 | 2310.69 | -58.04 | 2310.61 |
| -51.59 | 2310.57 | -41.95 | 2310.5 | -40.89 | 2310.49 | -36.03 | 2310.46 | -34.51 | 2310.45 |
| -34.11 | 2310.45 | -32.54 | 2310.45 | -31.93 | 2310.44 | -31.76 | 2310.43 | -31.13 | 2310.42 |
| -30.54 | 2310.42 | -28.03 | 2310.38 | -27.39 | 2310.37 | -27.16 | 2310.37 | -26.54 | 2310.36 |
| -25.93 | 2310.35 | -24.7 | 2310.33 | -10.87 | 2310 | -10.73 | 2310 | 0 | 2310 |
| 10.97 | 2310 | 26.15 | 2310.35 | 27.56 | 2310.38 | 56.73 | 2311.05 | 63.92 | 2311.22 |
| 88.9 | 2311.67 | 94.56 | 2311.79 | 106.83 | 2312 | 139.48 | 2312.55 | 172.94 | 2313.11 |
| 175.91 | 2313.16 | 195.61 | 2313.46 | 196.93 | 2313.48 | 197.57 | 2313.49 | 198.19 | 2313.5 |
| 198.81 | 2313.51 | 200.6 | 2313.53 | 208.4 | 2313.63 | 213.2 | 2313.69 | 213.65 | 2313.7 |
| 213.84 | 2313.7 | 214.02 | 2313.7 | 214.16 | 2313.71 | 214.27 | 2313.71 | 214.35 | 2313.71 |
| 214.41 | 2313.7 | 214.54 | 2313.7 | 214.72 | 2313.69 | 214.94 | 2313.67 | 215.25 | 2313.65 |
| 215.36 | 2313.65 | 215.43 | 2313.65 | 215.53 | 2313.65 | 215.66 | 2313.65 | 215.81 | 2313.65 |
| 215.98 | 2313.65 | 227.58 | 2313.54 | 227.58 | 2313.53 | 227.59 | 2313.53 | 227.62 | 2313.53 |
| 227.93 | 2313.55 | 228.3 | 2313.57 | 228.8 | 2313.6 | 229.37 | 2313.62 | 230.68 | 2313.67 |
| 241.66 | 2314 | 244.35 | 2314.02 | 258.63 | 2314.15 | 300 | 2314.28 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -168.53 | .025 | 139.48 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -168.53 | 139.48 | 50 | 90 | 120 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 10110

INPUT
Description: Sta 101+10.00

```
Station Elevation Data    num=       4
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
   -44.5     2310   -44.5     2307    44.5     2307    44.5     2310

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
   -44.5     .015   -44.5     .015    44.5     .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -44.5    44.5                70      70      70            .1       .3

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 10075

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      66
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -150    2312            -53    2312    2310      53    2312    2310
     150    2312

Upstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
   -44.5     2310   -44.5     2307    44.5     2307    44.5     2310

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
   -44.5     .015   -44.5     .015    44.5     .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -44.5    44.5            .1       .3

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -150    2312            -53    2312  2309.7      53    2312  2309.7
     150    2312

Downstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
   -44.5   2309.7   -44.5   2306.7    44.5   2306.7    44.5   2309.7

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
   -44.5     .015   -44.5     .015    44.5     .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -44.5    44.5            .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  17

Pier Data
Pier Station     Upstream=     -40    Downstream=     -40
```

```
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -35    Downstream=     -35
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -30    Downstream=     -30
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -25    Downstream=     -25
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -20    Downstream=     -20
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -15    Downstream=     -15
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=     -10    Downstream=     -10
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      -5    Downstream=      -5
Upstream      num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream    num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310
```

```
Pier Data
Pier Station     Upstream=       0    Downstream=       0
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=       5    Downstream=       5
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      10    Downstream=      10
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      15    Downstream=      15
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      20    Downstream=      20
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      25    Downstream=      25
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      30    Downstream=      30
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
       1    2307       1    2310

Pier Data
Pier Station     Upstream=      35    Downstream=      35
Upstream     num=        2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=        2
    Width   Elev    Width   Elev
```

```
      1    2307       1    2310

Pier Data
Pier Station     Upstream=      40    Downstream=      40
Upstream     num=       2
    Width   Elev    Width   Elev
       1  2307.5       1  2310.5
Downstream     num=       2
    Width   Elev    Width   Elev
       1    2307       1    2310

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

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

BRIDGE OUTPUT  Profile #PF 2

  E.G. US. (ft)              2310.55    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)              2307.86    E.G. Elev (ft)           2310.36       2309.44
  Q Total (cfs)              1008.00    W.S. Elev (ft)           2308.18       2308.53
  Q Bridge (cfs)             1008.00    Crit W.S. (ft)           2308.83       2308.53
  Q Weir (cfs)                          Max Chl Dpth (ft)          1.18          1.83
  Weir Sta Lft (ft)                     Vel Total (ft/s)          11.82          7.65
  Weir Sta Rgt (ft)                     Flow Area (sq ft)         85.25        131.84
  Weir Submerg                          Froude # Chl               1.91          1.00
  Weir Max Depth (ft)                   Specif Force (cu ft)     420.60        360.05
  Min El Weir Flow (ft)      2312.01    Hydr Depth (ft)            1.18          1.83
  Min El Prs (ft)            2310.00    W.P. Total (ft)          114.63        137.92
  Delta EG (ft)              2310.55    Conv. Total (cfs)        6932.7        12673.0
  Delta WS (ft)                 0.01    Top Width (ft)           72.00         72.00
  BR Open Area (sq ft)        216.00    Frctn Loss (ft)            0.04
  BR Open Vel (ft/s)           11.82    C & E Loss (ft)            0.15
  Coef of Q                             Shear Total (lb/sq ft)     0.98          0.38
  Br Sel Method          Energy only    Power Total (lb/ft s)     11.61          2.89


Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note:    Momentum answer is not valid if the water surface is above the low chord or if
there is weir
         flow.  The momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the
need for
         additional cross sections.
Warning: The energy equation could not be balanced within the specified number of
iterations.  The
         program used critical depth for the water surface and continued on with the
calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the
need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is
less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross
sections.

CROSS SECTION
```

RIVER: Duck Creek
REACH: East RS: 10040

INPUT
Description: Sta 100+40.00
Station Elevation Data num= 4

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|
| -44.5 | 2309.7 | -44.5 | 2306.7 | 44.5 | 2306.7 | 44.5 | 2309.7 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -44.5 | .015 | -44.5 | .015 | 44.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -44.5 | 44.5 | 200 | 140 | 80 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 9900

INPUT
Description: Sta 99+00.00
Station Elevation Data num= 93

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2309.89 | -274.26 | 2309.62 | -274.12 | 2309.62 | -273.98 | 2309.62 | -273.85 | 2309.62 |
| -273.71 | 2309.62 | -273.44 | 2309.62 | -255.56 | 2309.43 | -253.87 | 2309.44 | -253.5 | 2309.45 |
| -253.34 | 2309.45 | -253.19 | 2309.45 | -225.57 | 2309.19 | -225.32 | 2309.19 | -225.08 | 2309.19 |
| -224.86 | 2309.2 | -224.25 | 2309.21 | -223.57 | 2309.23 | -223.32 | 2309.24 | -223.24 | 2309.24 |
| -223.19 | 2309.25 | -223.18 | 2309.25 | -209.02 | 2309.39 | -208.51 | 2309.38 | -208.32 | 2309.38 |
| -208.12 | 2309.38 | -207.68 | 2309.37 | -206.52 | 2309.37 | -202.09 | 2309.35 | -201.61 | 2309.35 |
| -197.92 | 2309.31 | -192.83 | 2309.27 | -188.13 | 2309.23 | -187.51 | 2309.23 | -186.58 | 2309.22 |
| -180.07 | 2309.14 | -172.28 | 2309.04 | -169.88 | 2309.03 | -163.08 | 2308.98 | -160.16 | 2308.94 |
| -158.64 | 2308.93 | -157.64 | 2308.92 | -149.97 | 2308.88 | -142.85 | 2308.85 | -134.63 | 2308.81 |
| -132.9 | 2308.8 | -132.37 | 2308.79 | -131.87 | 2308.79 | -131.42 | 2308.78 | -131.05 | 2308.77 |
| -130.72 | 2308.77 | -130.43 | 2308.76 | -130.17 | 2308.75 | -129.68 | 2308.73 | -124.81 | 2308.52 |
| -120.19 | 2308.33 | -119.16 | 2308.29 | -118.47 | 2308.27 | -115.98 | 2308.21 | -107.46 | 2308 |
| -94.89 | 2307.73 | -85.79 | 2307.54 | -82.08 | 2307.47 | -78.83 | 2307.4 | -75.98 | 2307.35 |
| -73.44 | 2307.3 | -69.01 | 2307.22 | -55.99 | 2306.99 | -52.18 | 2306.92 | -50.98 | 2306.9 |
| -49.81 | 2306.88 | -48.68 | 2306.85 | -43.74 | 2306.75 | -42.92 | 2306.73 | -42.14 | 2306.72 |
| -41.41 | 2306.7 | -40.72 | 2306.69 | -38.22 | 2306.65 | -29.52 | 2306.51 | -11.51 | 2306 |
| -8.62 | 2306 | 0 | 2306 | 3.36 | 2306 | 24.68 | 2307.23 | 42.23 | 2308 |
| 43.7 | 2308.01 | 57.57 | 2308.17 | 70.03 | 2308.3 | 79.73 | 2308.42 | 87.49 | 2308.51 |
| 87.96 | 2308.51 | 88.44 | 2308.51 | 88.9 | 2308.52 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -131.42 | .025 | 42.23 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -131.42 | 42.23 | 300 | 300 | 310 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 9600

INPUT
Description: Sta 96+00.00
Station Elevation Data num= 213

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2305.82 | -299.35 | 2305.82 | -298.53 | 2305.81 | -297.77 | 2305.81 | -297.08 | 2305.81 |
| -296.47 | 2305.81 | -295.94 | 2305.81 | -294.58 | 2305.82 | -287.22 | 2305.91 | -278.35 | 2306 |
| -277.74 | 2306 | -277.28 | 2306 | -276.68 | 2306 | -276.07 | 2306.01 | -275.43 | 2306 |
| -274.79 | 2306 | -274.41 | 2306 | -274.08 | 2306 | -273.28 | 2305.99 | -271.64 | 2305.98 |
| -267.38 | 2305.94 | -266.49 | 2305.93 | -264.72 | 2305.92 | -263.84 | 2305.91 | -252.68 | 2305.86 |
| -252.63 | 2305.86 | -241.27 | 2305.8 | -241.2 | 2305.8 | -239.72 | 2305.8 | -239.64 | 2305.79 |
| -238.94 | 2305.79 | -238.29 | 2305.78 | -236.62 | 2305.78 | -235.98 | 2305.77 | -235.41 | 2305.76 |

```
-234.89 2305.75 -234.41 2305.74 -231.62 2305.67 -228.19 2305.55 -227.38  2305.5
-227.31  2305.5 -227.27 2305.49 -177.29 2305.28 -175.53 2305.39 -173.52 2305.52
-172.82 2305.56 -172.41 2305.58 -172.15 2305.58 -171.82 2305.59 -171.43  2305.6
-170.97  2305.6 -169.93 2305.61 -158.89 2305.67 -156.61 2305.66  -153.7 2305.67
-151.46 2305.66 -149.17 2305.66 -147.56 2305.66 -143.12 2305.66 -141.65 2305.65
-130.14 2305.64 -127.58 2305.64 -126.72 2305.63 -124.12 2305.63    -117  2305.6
-114.39 2305.59  -111.8 2305.58 -111.17 2305.58 -108.03 2305.56 -107.11 2305.56
-104.95 2305.54 -100.22 2305.51  -99.58  2305.5  -88.91 2305.42  -84.27  2305.4
  -78.6 2305.35  -77.05 2305.35  -74.96 2305.33     -74 2305.33  -73.57 2305.33
 -73.38 2305.33  -73.19 2305.33  -71.96 2305.35  -71.23 2305.35  -69.11 2305.37
 -68.95 2305.37  -68.82 2305.37  -68.71 2305.37  -68.64 2305.37  -68.62 2305.38
 -44.36 2305.24  -41.18 2305.17  -35.21 2305.05  -31.82 2304.98  -26.62 2304.89
 -24.51 2304.85  -12.19 2304.67  -10.62 2304.65   -8.47 2304.62    -7.4 2304.61
   -.32 2304.52     .63 2304.51    1.55  2304.5    8.79 2304.41    9.57  2304.4
   11.2 2304.38   11.92 2304.37   16.55 2304.31   17.22 2304.31    17.9 2304.31
   22.7  2304.3   23.44  2304.3   24.21 2304.29   25.02 2304.29   25.87 2304.28
  27.65 2304.26   45.31 2304.08   52.49     2304   53.7 2303.98   54.98 2303.97
  64.68 2303.88   71.88 2303.82   72.51 2303.82   73.13 2303.82   73.75 2303.82
  74.37 2303.81   74.99 2303.82    75.6 2303.82   76.22 2303.82   83.83 2303.89
  90.53 2303.96   91.18 2303.97   91.86 2303.98   92.54 2303.98   94.66 2303.99
  97.75     2304 109.32 2304.09  109.42 2304.09  109.88 2304.09   112.2 2304.11
 113.69 2304.13  113.84 2304.13  115.24 2304.16  115.59 2304.16  115.71 2304.16
 115.83 2304.16  116.67 2304.17   118.1 2304.19  128.85 2304.39  129.63 2304.41
 131.06 2304.43     139 2304.58  139.42 2304.58  140.57 2304.61  140.83 2304.61
 141.36 2304.62  141.62 2304.62  142.12 2304.64  142.38 2304.64  142.84 2304.65
 143.35 2304.65  143.76 2304.67  145.25 2304.66  145.64 2304.68  150.94 2304.66
 152.38 2304.65  152.64 2304.65  152.91 2304.66  153.11 2304.66  153.31 2304.66
 153.64 2304.66  154.36 2304.67  162.03 2304.76  164.65 2304.79  165.32 2304.81
 165.84 2304.82  166.48 2304.83  166.98 2304.83  167.58 2304.85  168.72 2304.88
 174.38 2305.05   178.7 2305.19  181.57 2305.28     182 2305.29  182.23  2305.3
 182.47  2305.3  182.75  2305.3  183.04 2305.31  183.36 2305.31   183.7 2305.32
 185.12 2305.33  188.96 2305.36  191.86 2305.38  196.92 2305.42  201.78 2305.46
  205.9 2305.49   207.1 2305.49  209.59 2305.51  211.78 2305.53   223.4 2305.55
 223.69 2305.55  227.47 2305.58  229.92 2305.58  230.89 2305.59   233.5  2305.6
 235.79 2305.61  236.07 2305.61  236.09 2305.61  238.23 2305.61  238.62 2305.61
  240.4 2305.62  240.67 2305.62  240.96 2305.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -153.7    .025  236.07    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -153.7  236.07              300     300     300             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 9300

INPUT
Description: Sta 93+00.00
Station Elevation Data    num=     108
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -300 2304.74 -299.84 2304.74  -290.1 2304.46 -275.65     2304 -269.25 2303.83
 -260.58 2303.58 -259.64 2303.56 -259.37 2303.55 -259.13 2303.55 -258.93 2303.54
 -258.79 2303.54 -258.69 2303.55 -258.47 2303.59 -258.42 2303.74 -258.19 2303.94
 -257.02     2304  -249.9 2304.07  -244.9 2304.12 -242.25 2304.15 -233.49 2304.26
 -230.44   2304.3 -229.57 2304.31 -227.98 2304.32 -202.78 2304.02 -202.76 2304.01
 -202.62     2304 -202.57     2304 -175.15 2303.43 -116.02  2302.2 -113.58 2302.15
 -108.44 2302.05 -107.84 2302.04 -107.58 2302.04 -107.35 2302.04 -107.32 2302.04
  -107.3 2302.03 -107.29 2302.03 -107.27 2302.03 -107.26 2302.03 -107.25 2302.03
 -107.24 2302.03 -107.16 2302.04 -107.15 2302.04 -107.13 2302.04 -107.12 2302.03
 -105.18     2302  -87.07 2301.51  -82.09 2301.38  -68.51 2301.02  -55.33 2300.67
  -51.19 2300.56  -34.86 2300.15  -33.46 2300.11  -28.87     2300  -17.93 2299.74
   -8.07 2299.49   -7.24 2299.47   -6.76 2299.47   -6.28 2299.46   -5.77 2299.45
   -5.24 2299.45    -4.7 2299.45       0 2299.43    2.56 2299.43     3.6 2299.42
    4.08 2299.42    4.47 2299.41    4.85 2299.41    7.16 2299.36    8.29 2299.34
   15.51 2299.26   21.85 2299.18   64.96     2300   66.66     2300   68.04     2300
   72.55     2300   74.83     2300   75.58     2300   75.75     2300   77.27     2300
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 77.29 | 2300 | 91.3 | 2300 | 91.31 | 2300 | 91.38 | 2300 | 92.29 | 2300 |
| 100.49 | 2300.07 | 108.49 | 2300.18 | 119.15 | 2300.36 | 175.75 | 2301.18 | 176.25 | 2301.14 |
| 177.23 | 2301.15 | 178.05 | 2301.16 | 180.26 | 2301.21 | 196.2 | 2301.55 | 205.32 | 2301.95 |
| 205.88 | 2301.97 | 206.41 | 2302 | 207.16 | 2302.02 | 215.07 | 2302.24 | 233.35 | 2302.71 |
| 243.62 | 2302.97 | 254.83 | 2303.39 | 257.31 | 2303.44 | 261.57 | 2303.53 | 271.41 | 2304 |
| 272.09 | 2304 | 292.27 | 2304 | 300 | 2303.88 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -105.18 | .025 | 196.2 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -105.18 | 196.2 | 350 | 300 | 250 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 9000

INPUT
Description: Sta 90+00.00
Station Elevation Data num= 165

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -400 | 2300.6 | -396.51 | 2300.54 | -396.31 | 2300.54 | -396.1 | 2300.54 | -381.24 | 2300.28 |
| -381 | 2300.28 | -379.8 | 2300.26 | -379.58 | 2300.26 | -379.47 | 2300.26 | -379.26 | 2300.26 |
| -378.75 | 2300.26 | -377 | 2300.26 | -369.59 | 2300.09 | -365.76 | 2300 | -347.51 | 2299.78 |
| -345.24 | 2299.75 | -339.97 | 2299.7 | -326.5 | 2299.57 | -321.8 | 2299.49 | -310.22 | 2299.38 |
| -297.5 | 2299.28 | -290.67 | 2299.14 | -283.92 | 2299.07 | -283.01 | 2299.05 | -282.06 | 2299.04 |
| -271.25 | 2298.92 | -269.36 | 2298.89 | -268.36 | 2298.88 | -263.85 | 2298.84 | -257.34 | 2298.8 |
| -256.87 | 2298.79 | -252.84 | 2298.75 | -243.72 | 2298.63 | -239.49 | 2298.61 | -237.48 | 2298.59 |
| -228.38 | 2298.47 | -225.52 | 2298.45 | -224.92 | 2298.44 | -224.32 | 2298.44 | -221.19 | 2298.42 |
| -220.62 | 2298.42 | -220.05 | 2298.42 | -216.93 | 2298.42 | -216.36 | 2298.42 | -215.18 | 2298.42 |
| -213.14 | 2298.43 | -202.89 | 2298.47 | -201.19 | 2298.48 | -190.62 | 2298.51 | -186.62 | 2298.52 |
| -183.49 | 2298.52 | -177.04 | 2298.56 | -176.4 | 2298.56 | -167.51 | 2298.64 | -162.9 | 2298.63 |
| -159.71 | 2298.62 | -151.36 | 2298.71 | -149.48 | 2298.73 | -148.44 | 2298.73 | -139.63 | 2298.79 |
| -137.85 | 2298.78 | -135.79 | 2298.8 | -129.2 | 2298.89 | -128.51 | 2298.9 | -128.16 | 2298.9 |
| -127.8 | 2298.9 | -127.58 | 2298.9 | -127.36 | 2298.9 | -126.97 | 2298.9 | -126.17 | 2298.89 |
| -119.25 | 2298.84 | -109.55 | 2298.76 | -102.42 | 2298.7 | -97.11 | 2298.67 | -93.17 | 2298.64 |
| -89.19 | 2298.59 | -78.44 | 2298.47 | -72.74 | 2298.44 | -60.41 | 2298.33 | -58.27 | 2298.3 |
| -57.58 | 2298.29 | -56.92 | 2298.28 | -56.27 | 2298.27 | -55.65 | 2298.26 | -54.44 | 2298.23 |
| -46.55 | 2298 | -39.41 | 2297.68 | -3.45 | 2296 | -2.78 | 2295.84 | -2.74 | 2295.73 |
| -1.79 | 2295.45 | -1.77 | 2295.41 | 0 | 2295.4 | 4.28 | 2295.39 | 4.67 | 2295.43 |
| 5.9 | 2295.62 | 7.4 | 2295.91 | 7.82 | 2296 | 14.28 | 2296.51 | 15.29 | 2296.58 |
| 36.52 | 2298 | 39.36 | 2298.15 | 40.07 | 2298.17 | 40.5 | 2298.19 | 41 | 2298.2 |
| 41.64 | 2298.21 | 42.36 | 2298.23 | 43.94 | 2298.25 | 57.6 | 2298.45 | 58.09 | 2298.46 |
| 58.49 | 2298.46 | 59.07 | 2298.48 | 59.39 | 2298.48 | 59.75 | 2298.49 | 60.18 | 2298.49 |
| 60.67 | 2298.5 | 61.75 | 2298.51 | 66.8 | 2298.54 | 71.38 | 2298.57 | 72.5 | 2298.57 |
| 73.65 | 2298.58 | 76.97 | 2298.57 | 86.38 | 2298.56 | 87.94 | 2298.56 | 88.4 | 2298.56 |
| 88.82 | 2298.57 | 93.22 | 2298.58 | 93.6 | 2298.58 | 96.09 | 2298.58 | 96.55 | 2298.58 |
| 96.79 | 2298.58 | 97.03 | 2298.58 | 97.52 | 2298.59 | 101.36 | 2298.62 | 102.22 | 2298.63 |
| 104.56 | 2298.64 | 104.95 | 2298.64 | 107.25 | 2298.65 | 107.63 | 2298.66 | 108 | 2298.67 |
| 108.35 | 2298.68 | 109.34 | 2298.7 | 114.57 | 2298.86 | 117.73 | 2298.95 | 121.67 | 2299.05 |
| 124.72 | 2299.1 | 125.54 | 2299.12 | 125.85 | 2299.13 | 126.64 | 2299.16 | 128.35 | 2299.23 |
| 128.8 | 2299.24 | 129.12 | 2299.25 | 129.25 | 2299.25 | 129.4 | 2299.26 | 129.54 | 2299.26 |
| 129.83 | 2299.26 | 129.95 | 2299.26 | 130.03 | 2299.26 | 130.06 | 2299.27 | 130.77 | 2299.29 |
| 134.37 | 2299.34 | 141.1 | 2299.34 | 141.11 | 2299.34 | 141.14 | 2299.34 | 141.2 | 2299.34 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -400 | .025 | -126.17 | .025 | 134.37 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -126.17 | 134.37 | 80 | 60 | 50 | .1 | .3 |

Left Levee Station= -129.2 Elevation=

CROSS SECTION

RIVER: Duck Creek

REACH: East RS: 8940

INPUT
Description: Sta 89+40.00 as-built 95-19705
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -40.1 | 2302.6 | -40 | 2297.6 | -40 | 2296.6 | 0 | 2295.5 | 40 | 2297 |
| 40 | 2298 | 40 | 2303 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -40.1 | .015 | -40 | .025 | 40 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -40 | 40 | 1 | 1 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8939

INPUT
Description: Sta 89+40.00 as-built 95-19705
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -40.1 | 2302.6 | -40 | 2297.6 | -40 | 2296.6 | 0 | 2295.5 | 40 | 2297 |
| 40 | 2298 | 40 | 2303 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -40.1 | .044 | -40 | .044 | 40 | .044 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -40 | 40 | 79 | 79 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8860

INPUT
Description: Sta 88+60.00 as-built 95-19705
Station Elevation Data num= 394

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2297.76 | -299.91 | 2297.76 | -298.55 | 2297.73 | -298.21 | 2297.73 | -296.83 | 2297.7 |
| -288.17 | 2297.48 | -285.64 | 2297.43 | -281.44 | 2297.37 | -279.62 | 2297.34 | -278.46 | 2297.31 |
| -277.26 | 2297.28 | -273.81 | 2297.22 | -269.81 | 2297.16 | -266.78 | 2297.1 | -263.56 | 2297.05 |
| -261.16 | 2297.01 | -259.89 | 2296.99 | -258.16 | 2296.96 | -257.39 | 2296.95 | -254.18 | 2296.9 |
| -245.92 | 2296.79 | -245.54 | 2296.79 | -245.33 | 2296.78 | -243.62 | 2296.74 | -240.22 | 2296.7 |
| -238.03 | 2296.66 | -228.66 | 2296.5 | -226.03 | 2296.46 | -223.76 | 2296.43 | -223.71 | 2296.43 |
| -223.66 | 2296.43 | -223.64 | 2296.43 | -223.58 | 2296.43 | -223.56 | 2296.43 | -223.53 | 2296.43 |
| -223.47 | 2296.43 | -223.45 | 2296.43 | -223.43 | 2296.43 | -223.4 | 2296.43 | -223.34 | 2296.43 |
| -223.3 | 2296.43 | -223.07 | 2296.43 | -222.9 | 2296.43 | -222.48 | 2296.42 | -220.75 | 2296.4 |
| -209.21 | 2296.24 | -205.59 | 2296.19 | -204.83 | 2296.18 | -204.27 | 2296.18 | -204.07 | 2296.17 |
| -200.1 | 2296.13 | -199.38 | 2296.12 | -198.65 | 2296.12 | -194.7 | 2296.08 | -194.65 | 2296.08 |
| -193.98 | 2296.07 | -193.76 | 2296.07 | -193.33 | 2296.07 | -192.92 | 2296.07 | -192.5 | 2296.07 |
| -192.48 | 2296.07 | -192.09 | 2296.07 | -191.27 | 2296.07 | -190.48 | 2296.07 | -189.89 | 2296.07 |
| -189.64 | 2296.07 | -182.15 | 2296.1 | -176.89 | 2296.13 | -176.57 | 2296.12 | -176.24 | 2296.12 |
| -176.08 | 2296.12 | -174.75 | 2296.13 | -167.86 | 2296.13 | -167.7 | 2296.13 | -167.55 | 2296.13 |
| -161.35 | 2296.14 | -159.84 | 2296.14 | -158.94 | 2296.14 | -158.51 | 2296.14 | -157.78 | 2296.15 |
| -156.28 | 2296.16 | -152.31 | 2296.18 | -149.04 | 2296.21 | -148.91 | 2296.21 | -145.74 | 2296.25 |
| -145.63 | 2296.25 | -145.52 | 2296.25 | -144.13 | 2296.26 | -143.9 | 2296.26 | -143.79 | 2296.26 |
| -143.69 | 2296.26 | -143.32 | 2296.26 | -143.15 | 2296.26 | -142.66 | 2296.27 | -142.56 | 2296.27 |
| -142.06 | 2296.27 | -141.96 | 2296.27 | -140.51 | 2296.27 | -140.42 | 2296.28 | -138.12 | 2296.28 |
| -137.93 | 2296.28 | -137.12 | 2296.29 | -136.67 | 2296.29 | -136.31 | 2296.3 | -136.07 | 2296.3 |
| -132.05 | 2296.22 | -126.21 | 2296.07 | -122.16 | 2295.97 | -121.02 | 2295.95 | -120.36 | 2295.94 |
| -120.34 | 2295.94 | -119.01 | 2295.92 | -111.58 | 2295.8 | -110.04 | 2295.77 | -109.2 | 2295.76 |
| -108.86 | 2295.76 | -107.88 | 2295.74 | -98.85 | 2295.65 | -96.71 | 2295.71 | -94.45 | 2295.77 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -91.84 | 2295.85 | -83.49 | 2296.12 | -82.61 | 2296.15 | -82.17 | 2296.16 | -81.71 | 2296.17 |
| -81.44 | 2296.18 | -81.16 | 2296.19 | -80.66 | 2296.2 | -79.65 | 2296.23 | -74.83 | 2296.17 |
| -68.06 | 2296.1 | -63.1 | 2296.04 | -59.39 | 2296.01 | -56.65 | 2295.98 | -53.87 | 2295.94 |
| -46.38 | 2295.84 | -42.41 | 2295.8 | -40.31 | 2295.77 | -33.82 | 2295.58 | -32.32 | 2295.52 |
| -31.84 | 2295.51 | -31.38 | 2295.49 | -30.93 | 2295.47 | -30.5 | 2295.46 | -29.65 | 2295.42 |
| -27.01 | 2295.3 | -24.16 | 2295.17 | -20 | 2296.1 | -5 | 2289.1 | 0 | 2289.1 |
| 5 | 2289.1 | 20 | 2296.1 | 20.1 | 2297.1 | 48.64 | 2297.25 | 48.98 | 2297.28 |
| 49.26 | 2297.3 | 49.47 | 2297.32 | 49.67 | 2297.34 | 49.89 | 2297.35 | 50.14 | 2297.37 |
| 50.45 | 2297.4 | 50.79 | 2297.42 | 51.55 | 2297.48 | 52.4 | 2297.54 | 54.49 | 2297.69 |
| 55.08 | 2297.73 | 55.7 | 2297.77 | 57.22 | 2297.87 | 58.29 | 2297.94 | 59.48 | 2298.08 |
| 60.69 | 2298.23 | 61.36 | 2298.31 | 64.2 | 2298.3 | 68.06 | 2298.3 | 71.11 | 2298.3 |
| 71.38 | 2298.29 | 74.15 | 2298.2 | 74.58 | 2298.19 | 74.8 | 2298.18 | 75.42 | 2298.13 |
| 75.59 | 2298.12 | 75.8 | 2298.11 | 75.83 | 2298.11 | 76.09 | 2298.11 | 76.29 | 2298.1 |
| 76.38 | 2298.1 | 76.62 | 2298.11 | 76.73 | 2298.11 | 76.81 | 2298.1 | 76.98 | 2298.1 |
| 77.27 | 2298.09 | 77.65 | 2298.09 | 78.08 | 2298.09 | 79.91 | 2298.08 | 81.38 | 2298.08 |
| 81.79 | 2298.07 | 84.42 | 2298.07 | 84.91 | 2298.06 | 85.16 | 2298.06 | 85.41 | 2298.06 |
| 85.69 | 2298.06 | 85.93 | 2298.07 | 86.87 | 2298.1 | 87.22 | 2298.11 | 87.51 | 2298.12 |
| 88.51 | 2298.14 | 89.23 | 2298.14 | 89.8 | 2298.14 | 89.99 | 2298.14 | 90.9 | 2298.13 |
| 93.37 | 2298.1 | 93.79 | 2298.09 | 93.85 | 2298.09 | 95.11 | 2298.08 | 95.3 | 2298.08 |
| 96.22 | 2298.09 | 96.62 | 2298.1 | 97.01 | 2298.11 | 97.38 | 2298.11 | 98.43 | 2298.13 |
| 103.96 | 2298.27 | 107.3 | 2298.34 | 111.46 | 2298.43 | 114.69 | 2298.49 | 115.55 | 2298.51 |
| 115.88 | 2298.52 | 116.72 | 2298.54 | 118.53 | 2298.59 | 119 | 2298.6 | 119.34 | 2298.61 |
| 119.48 | 2298.61 | 119.64 | 2298.62 | 119.78 | 2298.62 | 120.09 | 2298.62 | 120.22 | 2298.62 |
| 120.3 | 2298.62 | 120.33 | 2298.63 | 121.08 | 2298.65 | 124.89 | 2298.71 | 125.85 | 2298.71 |
| 132.01 | 2298.64 | 132.02 | 2298.64 | 132.05 | 2298.64 | 132.11 | 2298.64 | 132.3 | 2298.63 |
| 134.3 | 2298.6 | 137.12 | 2298.54 | 139.7 | 2298.5 | 140.47 | 2298.48 | 140.91 | 2298.48 |
| 141.13 | 2298.47 | 141.37 | 2298.47 | 141.59 | 2298.47 | 141.83 | 2298.46 | 146.39 | 2298.41 |
| 151.55 | 2298.35 | 152.78 | 2298.33 | 153.07 | 2298.33 | 153.32 | 2298.33 | 153.45 | 2298.33 |
| 153.59 | 2298.32 | 153.73 | 2298.32 | 153.87 | 2298.32 | 156.26 | 2298.27 | 156.65 | 2298.29 |
| 160.5 | 2298.44 | 160.8 | 2298.43 | 160.92 | 2298.43 | 161.08 | 2298.42 | 161.16 | 2298.42 |
| 161.24 | 2298.41 | 161.41 | 2298.41 | 162.78 | 2298.33 | 163.09 | 2298.32 | 163.82 | 2298.29 |
| 164.96 | 2298.24 | 165.57 | 2298.21 | 165.9 | 2298.2 | 166.25 | 2298.19 | 174.62 | 2297.91 |
| 175.91 | 2297.87 | 176.32 | 2297.85 | 176.72 | 2297.84 | 177.48 | 2297.82 | 177.91 | 2297.81 |
| 178.48 | 2297.79 | 181.61 | 2297.69 | 181.99 | 2297.68 | 182.28 | 2297.66 | 182.83 | 2297.59 |
| 183.12 | 2297.55 | 183.55 | 2297.49 | 183.74 | 2297.46 | 183.98 | 2297.45 | 184.1 | 2297.44 |
| 184.4 | 2297.42 | 184.82 | 2297.41 | 186.78 | 2297.34 | 186.97 | 2297.34 | 187.04 | 2297.33 |
| 187.84 | 2297.32 | 188.23 | 2297.32 | 188.61 | 2297.32 | 188.96 | 2297.32 | 189.28 | 2297.31 |
| 189.57 | 2297.31 | 189.86 | 2297.31 | 192.02 | 2297.32 | 192.37 | 2297.32 | 192.76 | 2297.32 |
| 193.19 | 2297.31 | 194.12 | 2297.31 | 194.67 | 2297.3 | 199.28 | 2297.28 | 199.35 | 2297.28 |
| 199.97 | 2297.28 | 200.91 | 2297.29 | 201.46 | 2297.29 | 201.99 | 2297.29 | 202.54 | 2297.3 |
| 205.24 | 2297.3 | 205.48 | 2297.3 | 206.13 | 2297.31 | 206.28 | 2297.31 | 206.77 | 2297.31 |
| 207.26 | 2297.32 | 207.71 | 2297.32 | 208.16 | 2297.33 | 208.58 | 2297.33 | 209.01 | 2297.34 |
| 210.64 | 2297.37 | 211.14 | 2297.38 | 211.6 | 2297.39 | 211.87 | 2297.39 | 212.35 | 2297.4 |
| 212.56 | 2297.41 | 212.74 | 2297.41 | 212.93 | 2297.43 | 212.96 | 2297.43 | 213.05 | 2297.43 |
| 213.21 | 2297.44 | 213.42 | 2297.45 | 216.16 | 2297.51 | 216.85 | 2297.52 | 217.66 | 2297.54 |
| 218.49 | 2297.55 | 218.92 | 2297.56 | 219.33 | 2297.56 | 219.73 | 2297.57 | 220.01 | 2297.57 |
| 220.11 | 2297.57 | 220.47 | 2297.57 | 220.83 | 2297.56 | 222.42 | 2297.55 | 222.85 | 2297.55 |
| 223.57 | 2297.55 | 223.98 | 2297.56 | 224.42 | 2297.56 | 225.32 | 2297.57 | 232.46 | 2297.65 |
| 234.09 | 2297.67 | 235.39 | 2297.69 | 239.02 | 2297.78 | 239.89 | 2297.79 | 246.51 | 2297.97 |
| 256.25 | 2298.27 | 256.42 | 2298.28 | 256.45 | 2298.28 | 256.48 | 2298.28 | 256.7 | 2298.28 |
| 262.03 | 2298.36 | 263.44 | 2298.38 | 264.1 | 2298.39 | 265.04 | 2298.4 | 265.49 | 2298.41 |
| 268.08 | 2298.44 | 268.5 | 2298.45 | 269.05 | 2298.45 | 270.85 | 2298.47 | 270.87 | 2298.47 |
| 271.48 | 2298.48 | 271.63 | 2298.49 | 271.89 | 2298.49 | 272.15 | 2298.49 | 272.33 | 2298.49 |
| 272.96 | 2298.5 | 273.51 | 2298.51 | 276.54 | 2298.55 | 277.16 | 2298.57 | 277.82 | 2298.57 |
| 279.21 | 2298.6 | 286.67 | 2298.87 | 294.77 | 2299.07 | 300 | 2299.29 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .044 | -20 | .044 | 20.1 | .044 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20 | 20.1 | 160 | 160 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8700

INPUT

Description: Sta 87+00.00 as-built 95-19705
Station Elevation Data num= 188

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2296 | -299.89 | 2296 | -298.2 | 2295.95 | -297.78 | 2295.95 | -282.17 | 2295.5 |
| -276.96 | 2295.41 | -267.49 | 2295.17 | -262.52 | 2295.08 | -258.77 | 2294.99 | -248.06 | 2294.79 |
| -247.11 | 2294.76 | -232.4 | 2294.49 | -230.02 | 2294.42 | -223.08 | 2294.3 | -208.18 | 2294 |
| -205.37 | 2293.94 | -205.3 | 2293.94 | -205.24 | 2293.94 | -205.22 | 2293.94 | -205.21 | 2293.94 |
| -205.14 | 2293.94 | -205.12 | 2293.94 | -205.11 | 2293.94 | -205.09 | 2293.94 | -205.08 | 2293.94 |
| -205.01 | 2293.94 | -204.98 | 2293.94 | -204.96 | 2293.94 | -204.92 | 2293.94 | -204.84 | 2293.94 |
| -204.51 | 2293.94 | -204.3 | 2293.94 | -203.77 | 2293.93 | -181.17 | 2293.59 | -169.23 | 2293.41 |
| -168.13 | 2293.39 | -167.59 | 2293.39 | -167.08 | 2293.38 | -166.56 | 2293.38 | -166.05 | 2293.38 |
| -165.04 | 2293.38 | -164.05 | 2293.38 | -163.01 | 2293.38 | -153.71 | 2293.42 | -147.19 | 2293.45 |
| -146.79 | 2293.44 | -146.38 | 2293.44 | -146.18 | 2293.44 | -135.98 | 2293.43 | -135.78 | 2293.43 |
| -135.59 | 2293.43 | -126.02 | 2293.43 | -124.91 | 2293.43 | -124.37 | 2293.43 | -123.47 | 2293.44 |
| -112.61 | 2293.56 | -112.46 | 2293.56 | -108.52 | 2293.61 | -108.38 | 2293.61 | -108.24 | 2293.61 |
| -106.24 | 2293.63 | -106.1 | 2293.63 | -105.97 | 2293.63 | -105.31 | 2293.63 | -104.69 | 2293.64 |
| -104.57 | 2293.64 | -103.95 | 2293.64 | -103.83 | 2293.64 | -102.03 | 2293.64 | -101.91 | 2293.65 |
| -99.06 | 2293.64 | -98.82 | 2293.64 | -97.82 | 2293.64 | -97.26 | 2293.65 | -96.81 | 2293.65 |
| -20 | 2295 | -5 | 2287.9 | 0 | 2287.9 | 5 | 2287.9 | 20 | 2295 |
| 20.1 | 2296 | 36.51 | 2296.11 | 40.32 | 2296.43 | 41.39 | 2296.73 | 42.01 | 2296.89 |
| 42.79 | 2297.09 | 43.34 | 2297.22 | 46.59 | 2298 | 53.71 | 2298 | 56.95 | 2298 |
| 57.24 | 2297.97 | 60.63 | 2297.77 | 60.87 | 2297.74 | 61.52 | 2297.64 | 61.71 | 2297.61 |
| 61.96 | 2297.6 | 62.24 | 2297.59 | 62.54 | 2297.58 | 62.8 | 2297.58 | 62.99 | 2297.58 |
| 63 | 2297.57 | 63.18 | 2297.56 | 63.49 | 2297.55 | 63.89 | 2297.54 | 64.35 | 2297.53 |
| 66.29 | 2297.51 | 72.43 | 2297.47 | 73.68 | 2297.54 | 74.05 | 2297.55 | 74.36 | 2297.57 |
| 75.42 | 2297.61 | 76.19 | 2297.6 | 76.79 | 2297.59 | 81.1 | 2297.46 | 82.43 | 2297.44 |
| 82.63 | 2297.43 | 115.07 | 2298 | 147.37 | 2297.22 | 151.87 | 2297.64 | 152.19 | 2297.62 |
| 152.48 | 2297.6 | 152.57 | 2297.6 | 152.66 | 2297.59 | 152.84 | 2297.58 | 154.29 | 2297.43 |
| 154.62 | 2297.41 | 155.39 | 2297.35 | 170.35 | 2296.31 | 170.36 | 2296.31 | 170.96 | 2296.27 |
| 174.69 | 2296 | 175 | 2295.95 | 176.55 | 2295.52 | 176.93 | 2295.47 | 177.24 | 2295.44 |
| 179.77 | 2295.27 | 179.98 | 2295.25 | 180.04 | 2295.24 | 180.05 | 2295.24 | 193.12 | 2294.98 |
| 193.78 | 2294.98 | 199.63 | 2295.01 | 200.32 | 2295.02 | 205.11 | 2295.08 | 206.13 | 2295.1 |
| 206.42 | 2295.11 | 206.93 | 2295.12 | 207.15 | 2295.12 | 207.34 | 2295.13 | 207.54 | 2295.16 |
| 207.57 | 2295.17 | 207.67 | 2295.17 | 207.84 | 2295.18 | 208.06 | 2295.19 | 210.97 | 2295.26 |
| 211.71 | 2295.27 | 212.57 | 2295.29 | 213.45 | 2295.3 | 213.9 | 2295.3 | 214.34 | 2295.31 |
| 214.76 | 2295.31 | 215.17 | 2295.31 | 215.55 | 2295.31 | 215.93 | 2295.3 | 218.08 | 2295.27 |
| 218.84 | 2295.26 | 219.28 | 2295.26 | 219.74 | 2295.26 | 220.7 | 2295.26 | 230.01 | 2295.27 |
| 231.39 | 2295.27 | 253.54 | 2295.99 | 253.54 | 2296 | 253.72 | 2296 | 253.76 | 2296 |
| 253.79 | 2296 | 254.02 | 2296 | 259.68 | 2296 | 261.88 | 2296 | 262.88 | 2296 |
| 263.35 | 2296 | 266.11 | 2296 | 266.55 | 2296 | 269.07 | 2296 | 269.72 | 2296 |
| 270.15 | 2296 | 270.43 | 2296 | 300 | 2296.76 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -20 | .015 | 20.1 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20 | 20.1 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8400

INPUT
Description: Sta 84+00.00 as-built 95-19705
Station Elevation Data num= 141

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2293.49 | -263.12 | 2293 | -258.86 | 2292.93 | -241.15 | 2292.8 | -233.32 | 2292.74 |
| -210.34 | 2292.52 | -206.32 | 2292.48 | -204.11 | 2292.46 | -201.71 | 2292.43 | -199.06 | 2292.4 |
| -196.03 | 2292.37 | -192.67 | 2292.33 | -165.95 | 2292 | -165.89 | 2292 | -165.84 | 2292 |
| -146.53 | 2291.24 | -139.12 | 2291.07 | -135.82 | 2290.94 | -121.07 | 2290.61 | -118.52 | 2290.55 |
| -117.12 | 2290.51 | -115.61 | 2290.47 | -113.98 | 2290.42 | -110.32 | 2290.32 | -100.14 | 2290 |
| -89.89 | 2290 | -86.55 | 2290 | -56.87 | 2291.18 | -20.1 | 2290 | -20 | 2289 |
| -5 | 2282 | 0 | 2282 | 5 | 2282 | 20 | 2289 | 56.52 | 2291.38 |
| 57.85 | 2291.46 | 58.3 | 2291.49 | 58.69 | 2291.51 | 59.03 | 2291.53 | 59.33 | 2291.54 |
| 59.6 | 2291.56 | 60.29 | 2291.59 | 60.99 | 2291.61 | 62.17 | 2291.65 | 62.95 | 2291.73 |
| 63.83 | 2291.82 | 64.59 | 2291.84 | 65.24 | 2291.91 | 65.84 | 2291.97 | 66.24 | 2292 |
| 66.29 | 2292 | 66.31 | 2292 | 66.5 | 2292 | 66.56 | 2292 | 66.78 | 2292 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 66.86 | 2292 | 67.48 | 2292 | 68.16 | 2292 | 73.7 | 2292 | 77.65 | 2292 |
| 78.46 | 2292 | 95.03 | 2292 | 95.57 | 2292 | 95.59 | 2292 | 95.93 | 2292 |
| 95.94 | 2292 | 96.03 | 2292 | 96.52 | 2291.98 | 97.09 | 2291.98 | 97.66 | 2291.99 |
| 97.82 | 2292 | 113.29 | 2292 | 114.28 | 2292 | 115.41 | 2291.83 | 116.11 | 2291.85 |
| 119.65 | 2290.81 | 144.01 | 2290.65 | 144.07 | 2290.66 | 144.27 | 2290.67 | 145.27 | 2290.73 |
| 153.9 | 2290.83 | 155.14 | 2290.84 | 155.52 | 2290.84 | 155.87 | 2290.84 | 156.19 | 2290.84 |
| 156.37 | 2290.83 | 156.54 | 2290.83 | 156.78 | 2290.82 | 157 | 2290.81 | 157.21 | 2290.8 |
| 158.79 | 2290.69 | 159.39 | 2290.66 | 159.99 | 2290.64 | 161.57 | 2290.58 | 164.99 | 2290.49 |
| 167.14 | 2290.43 | 168.23 | 2290.4 | 173.95 | 2290.17 | 176.1 | 2290.07 | 177.4 | 2290 |
| 180.33 | 2289.53 | 181.91 | 2289.25 | 182.44 | 2289.15 | 188.58 | 2288 | 195.82 | 2287.6 |
| 202.62 | 2287.53 | 202.67 | 2287.55 | 202.8 | 2287.55 | 203 | 2287.55 | 203.25 | 2287.55 |
| 203.55 | 2287.54 | 204.55 | 2287.5 | 211.28 | 2287.19 | 215.28 | 2286.98 | 215.48 | 2286.97 |
| 215.61 | 2286.97 | 215.75 | 2286.96 | 215.89 | 2286.96 | 216.02 | 2286.96 | 216.16 | 2286.97 |
| 216.3 | 2286.97 | 216.55 | 2286.98 | 219.54 | 2287.13 | 225.41 | 2287.44 | 227.21 | 2287.53 |
| 227.56 | 2287.54 | 227.88 | 2287.55 | 228.16 | 2287.56 | 228.37 | 2287.56 | 231.93 | 2287.69 |
| 232.03 | 2287.7 | 232.6 | 2287.77 | 232.76 | 2287.79 | 233.32 | 2287.94 | 233.5 | 2287.97 |
| 233.7 | 2288 | 235.28 | 2288.15 | 236.99 | 2288.32 | 242.3 | 2288.81 | 253.63 | 2290 |
| 300 | 2291.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -20.1 | .015 | 20 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20.1 | 20 | 200 | 200 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8250

INPUT
Description: Sta 82+50.00 as-built 95-19705
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20.1 | 2286 | -20 | 2284.8 | -5 | 2277.8 | 0 | 2277.8 | 5 | 2277.8 |
| 20 | 2284.8 | 20.1 | 2286 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20.1 | .015 | -20 | .015 | 20 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20 | 20 | 80 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8200

INPUT
Description: Sta 82+00.00 as-built 95-19705
Station Elevation Data num= 15

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2288 | -33 | 2286 | -25 | 2284 | -19.1 | 2283 | -19 | 2281.1 |
| -19 | 2277.1 | -1 | 2277.1 | 0 | 2277.1 | 1 | 2277.1 | 19 | 2277.1 |
| 19 | 2281.1 | 19.1 | 2283 | 25 | 2284 | 100 | 2284.5 | 209 | 2288 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -19 | .015 | 19 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -19 | 19 | 100 | 100 | .3 | .5 |

BRIDGE

RIVER: Duck Creek
REACH: East RS: 8150

INPUT
Description:
Distance from Upstream XS = 2
Deck/Roadway Width = 96
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 26

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -310 | 2283.47 | 2281.19 | -20 | 2283.27 | 2277.1 | -19 | 2283.27 | 2277.1 |
| -17 | 2283.27 | 2279.34 | -15 | 2283.27 | 2280.52 | -12.5 | 2283.27 | 2281.03 |
| -11.25 | 2283.27 | 2281.15 | -10 | 2283.27 | 2281.19 | -8.75 | 2283.27 | 2281.15 |
| -7.5 | 2283.27 | 2281.03 | -5 | 2283.27 | 2280.52 | -3 | 2283.27 | 2279.34 |
| -1 | 2283.27 | 2277.1 | 0 | 2283.27 | 2277.1 | 1 | 2283.27 | 2277.1 |
| 3 | 2283.27 | 2279.34 | 5 | 2283.27 | 2280.52 | 7.5 | 2283.27 | 2281.03 |
| 8.75 | 2283.27 | 2281.15 | 10 | 2283.27 | 2281.19 | 11.25 | 2283.27 | 2281.15 |
| 12.5 | 2283.27 | 2281.03 | 15 | 2283.27 | 2280.52 | 17 | 2283.27 | 2279.34 |
| 19 | 2283.27 | 2277.1 | 20 | 2283.27 | 2277.1 | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2288 | -33 | 2286 | -25 | 2284 | -19.1 | 2283 | -19 | 2281.1 |
| -19 | 2277.1 | -1 | 2277.1 | 0 | 2277.1 | 1 | 2277.1 | 19 | 2277.1 |
| 19 | 2281.1 | 19.1 | 2283 | 25 | 2284 | 100 | 2284.5 | 209 | 2288 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -19 | .015 | 19 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -19 | 19 | .3 | .5 |

Downstream Deck/Roadway Coordinates
num= 26

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -310 | 2283.47 | 2280.8 | -20 | 2283.27 | 2276.7 | -19 | 2283.27 | 2276.7 |
| -17 | 2283.27 | 2278.99 | -15 | 2283.27 | 2280.17 | -12.5 | 2283.27 | 2280.68 |
| -11.25 | 2283.27 | 2280.8 | -10 | 2283.27 | 2280.84 | -8.75 | 2283.27 | 2280.8 |
| -7.5 | 2283.27 | 2280.68 | -5 | 2283.27 | 2280.17 | -3 | 2283.27 | 2278.99 |
| -1 | 2283.27 | 2276.7 | 0 | 2283.27 | 2276.7 | 1 | 2283.27 | 2276.7 |
| 3 | 2283.27 | 2278.99 | 5 | 2283.27 | 2280.17 | 7.5 | 2283.27 | 2280.68 |
| 8.75 | 2283.27 | 2280.8 | 10 | 2283.27 | 2280.84 | 11.25 | 2283.27 | 2280.8 |
| 12.5 | 2283.27 | 2280.68 | 15 | 2283.27 | 2280.17 | 17 | 2283.27 | 2278.99 |
| 19 | 2283.27 | 2276.7 | 20 | 2283.27 | 2276.7 | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -30 | 2286 | -25 | 2284 | -19.1 | 2283 | -19 | 2280.7 | -19 | 2276.7 |
| -1 | 2276.7 | 0 | 2276.7 | 1 | 2276.7 | 19 | 2276.7 | 19 | 2280.7 |
| 19.1 | 2283 | 25 | 2284 | 100 | 2284.3 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -30 | .025 | -19 | .015 | 19 | .025 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -19 | 19 | .3 | .5 |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #PF 2

| | | | Inside BR US | Inside BR DS |
|---|---|---|---|---|
| E.G. US. (ft) | 2283.68 | Element | | |
| W.S. US. (ft) | 2283.40 | E.G. Elev (ft) | 2283.36 | 2282.82 |
| Q Total (cfs) | 1008.00 | W.S. Elev (ft) | 2282.02 | 2281.52 |
| Q Bridge (cfs) | 1008.00 | Crit W.S. (ft) | 2280.07 | 2279.67 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 4.92 | 4.82 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 9.28 | 9.14 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 108.65 | 110.25 |
| Weir Submerg | | Froude # Chl | 0.74 | 0.73 |
| Weir Max Depth (ft) | | Specif Force (cu ft) | 637.15 | 623.88 |
| Min El Weir Flow (ft) | 2283.16 | Hydr Depth (ft) | | |
| Min El Prs (ft) | 2281.19 | W.P. Total (ft) | 77.53 | 77.68 |
| Delta EG (ft) | 1.32 | Conv. Total (cfs) | 13477.7 | 13793.0 |
| Delta WS (ft) | 1.44 | Top Width (ft) | | |
| BR Open Area (sq ft) | 108.65 | Frctn Loss (ft) | 0.52 | 0.00 |
| BR Open Vel (ft/s) | 9.28 | C & E Loss (ft) | 0.02 | 0.45 |
| Coef of Q | | Shear Total (lb/sq ft) | 0.49 | 0.47 |
| Br Sel Method | Energy only | Power Total (lb/ft s) | 4.54 | 4.33 |

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.

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 8100

INPUT
Description: Sta 81+00.00 as-built
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -30 | 2286 | -25 | 2284 | -19.1 | 2283 | -19 | 2280.7 | -19 | 2276.7 |
| -1 | 2276.7 | 0 | 2276.7 | 1 | 2276.7 | 19 | 2276.7 | 19 | 2280.7 |
| 19.1 | 2283 | 25 | 2284 | 100 | 2284.3 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -30 | .025 | -19 | .015 | 19 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -19 | 19 | 290 | 300 | 300 | .3 | .5 |

CROSS SECTION

RIVER: Duck Creek

REACH: East RS: 7800

INPUT
Description: Sta 78+00.00 as-built 95-19705
Station Elevation Data num= 230

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2286.45 | -272.92 | 2286 | -265.45 | 2285.71 | -261.47 | 2285.56 | -260.51 | 2285.52 |
| -247.62 | 2285.02 | -247.22 | 2285.01 | -246.89 | 2285 | -243.07 | 2284.85 | -242.43 | 2284.82 |
| -242.17 | 2284.82 | -240.76 | 2284.75 | -236.54 | 2284.54 | -236.17 | 2284.52 | -235.87 | 2284.49 |
| -235.79 | 2284.49 | -235.36 | 2284.46 | -235.28 | 2284.46 | -235.11 | 2284.45 | -235.04 | 2284.45 |
| -234.99 | 2284.45 | -234.97 | 2284.44 | -224.69 | 2284.37 | -224.67 | 2284.37 | -224.6 | 2284.43 |
| -224.58 | 2284.43 | -224.55 | 2284.44 | -224.51 | 2284.44 | -224.43 | 2284.44 | -224.34 | 2284.44 |
| -223.5 | 2284.43 | -223.37 | 2284.42 | -223.25 | 2284.42 | -223.14 | 2284.42 | -223.09 | 2284.42 |
| -222.98 | 2284.43 | -222.88 | 2284.43 | -222.78 | 2284.43 | -222.57 | 2284.44 | -221.15 | 2284.52 |
| -219.02 | 2284.72 | -218.95 | 2284.74 | -218.8 | 2284.77 | -218.68 | 2284.79 | -218.51 | 2284.81 |
| -218.33 | 2284.82 | -218.1 | 2284.84 | -217.55 | 2284.88 | -216.61 | 2284.93 | -215.99 | 2284.96 |
| -215.75 | 2284.96 | -213.8 | 2285.05 | -213.49 | 2285.06 | -207.46 | 2285.31 | -207.14 | 2285.33 |
| -205.43 | 2285.41 | -203.67 | 2285.49 | -200.37 | 2285.67 | -200.16 | 2285.68 | -194.35 | 2286 |
| -180.91 | 2286 | -173.2 | 2286 | -172.93 | 2286 | -172.65 | 2286 | -172.35 | 2286 |
| -172.06 | 2286 | -170.13 | 2286 | -167.89 | 2286 | -167.75 | 2286 | -167.63 | 2286 |
| -109.84 | 2286 | -97.23 | 2286 | -96.37 | 2286 | -95.97 | 2286 | -95.57 | 2286 |
| -85.46 | 2286 | -80.78 | 2285.91 | -76.37 | 2286 | -64.22 | 2285.5 | -60.45 | 2285.34 |
| -59.66 | 2285.33 | -58.86 | 2285.3 | -45.03 | 2284.76 | -36.29 | 2284.41 | -32.75 | 2284.27 |
| -30.97 | 2284.19 | -29.26 | 2284.11 | -27.72 | 2284.04 | -25.38 | 2284 | -20.1 | 2283.3 |
| -20 | 2282.3 | -5 | 2275.3 | 0 | 2275.3 | 5 | 2275.3 | 20 | 2282.3 |
| 20.1 | 2283.3 | 43.73 | 2284.03 | 44.52 | 2284.06 | 49.26 | 2284.29 | 51.44 | 2284.38 |
| 62.85 | 2284.88 | 64.64 | 2284.96 | 69.21 | 2285.15 | 70.57 | 2285.21 | 72.67 | 2285.29 |
| 76.34 | 2285.46 | 77.33 | 2285.49 | 78.27 | 2285.52 | 82.09 | 2285.7 | 82.91 | 2285.71 |
| 83.68 | 2285.72 | 85.17 | 2285.73 | 85.61 | 2285.76 | 85.86 | 2285.77 | 97.74 | 2285.77 |
| 97.93 | 2285.78 | 99.06 | 2285.83 | 99.17 | 2285.84 | 100.03 | 2285.87 | 100.19 | 2285.87 |
| 100.64 | 2285.89 | 100.86 | 2285.9 | 101.22 | 2285.91 | 101.28 | 2285.92 | 101.36 | 2285.92 |
| 101.44 | 2285.92 | 101.45 | 2285.92 | 101.47 | 2285.92 | 101.56 | 2285.92 | 101.59 | 2285.94 |
| 101.64 | 2285.94 | 101.65 | 2285.94 | 101.66 | 2285.94 | 101.69 | 2285.94 | 101.81 | 2285.94 |
| 101.86 | 2285.95 | 101.92 | 2285.95 | 101.93 | 2285.95 | 101.94 | 2285.95 | 101.95 | 2285.95 |
| 101.99 | 2285.95 | 102.04 | 2285.95 | 102.09 | 2285.95 | 102.11 | 2285.95 | 102.12 | 2285.95 |
| 103.28 | 2285.96 | 103.46 | 2285.96 | 103.73 | 2285.96 | 103.8 | 2285.96 | 103.91 | 2285.96 |
| 103.92 | 2285.96 | 103.94 | 2285.96 | 103.95 | 2285.96 | 103.96 | 2285.96 | 104.03 | 2285.96 |
| 104.13 | 2285.96 | 104.2 | 2285.95 | 104.21 | 2285.95 | 104.23 | 2285.95 | 104.24 | 2285.95 |
| 104.28 | 2285.95 | 104.47 | 2285.95 | 104.64 | 2285.96 | 104.65 | 2285.96 | 104.67 | 2285.95 |
| 104.68 | 2285.95 | 104.69 | 2285.95 | 104.7 | 2285.95 | 104.73 | 2285.95 | 104.76 | 2285.95 |
| 104.77 | 2285.95 | 104.78 | 2285.95 | 104.8 | 2285.95 | 104.81 | 2285.95 | 104.82 | 2285.95 |
| 104.84 | 2285.95 | 104.9 | 2285.95 | 104.93 | 2285.95 | 104.94 | 2285.95 | 105.07 | 2285.95 |
| 105.11 | 2285.95 | 105.12 | 2285.94 | 105.13 | 2285.94 | 105.15 | 2285.94 | 105.16 | 2285.94 |
| 105.19 | 2285.94 | 105.21 | 2285.94 | 105.25 | 2285.94 | 105.51 | 2285.94 | 105.83 | 2285.93 |
| 105.89 | 2285.93 | 105.91 | 2285.93 | 105.92 | 2285.93 | 105.95 | 2285.93 | 105.99 | 2285.93 |
| 106.19 | 2285.92 | 106.27 | 2285.92 | 106.28 | 2285.92 | 106.3 | 2285.91 | 106.32 | 2285.91 |
| 106.33 | 2285.91 | 106.36 | 2285.91 | 106.42 | 2285.91 | 119.36 | 2285.91 | 120.01 | 2285.9 |
| 125.92 | 2285.9 | 127.6 | 2285.91 | 139.3 | 2286 | 139.61 | 2286 | 145.83 | 2286 |
| 148.42 | 2286 | 150.83 | 2286 | 170.1 | 2286 | 180.32 | 2285.31 | 180.77 | 2285.28 |
| 183.36 | 2285.1 | 185.93 | 2284.92 | 196.83 | 2284 | 205.13 | 2284 | 205.74 | 2284 |
| 207.65 | 2284 | 234.11 | 2284 | 234.21 | 2284 | 234.28 | 2284 | 236.79 | 2284.14 |
| 273.65 | 2286 | 274.51 | 2286.02 | 274.6 | 2286.02 | 274.85 | 2286.02 | 300 | 2286.46 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .015 | -20.1 | .015 | 20.1 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20.1 | 20.1 | 300 | 300 | 310 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 7500

INPUT
Description: Sta 75+00.00 as built 95-19705
Station Elevation Data num= 129

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|

```
   -300 2284.28 -299.36 2284.25 -297.99  2284.2 -296.47 2284.14 -293.13    2284
-271.29 2283.47 -268.52  2283.4 -267.26 2283.37    -266 2283.35 -264.81 2283.32
-263.69  2283.3 -260.85 2283.25 -257.93  2283.2 -256.77 2283.19 -254.87 2283.17
 -252.9 2283.15 -250.34 2283.12 -248.35 2283.09 -247.69 2283.08 -247.02 2283.07
-246.59 2283.05 -245.92 2283.04 -245.53 2283.03 -245.06 2283.02  -244.6 2283.01
-244.35    2283  -243.9 2282.99  -243.4 2282.97 -242.92 2282.96 -242.46 2282.94
-241.63 2282.92 -241.26  2282.9 -240.95 2282.89 -240.67 2282.88 -240.43 2282.87
-240.15 2282.86 -239.93 2282.84 -239.58 2282.82 -238.56 2282.73 -238.52 2282.72
-236.66 2282.63 -234.32 2282.57 -230.11 2282.48  -229.7 2282.47 -229.06 2282.45
-227.53  2282.4 -227.22 2282.39 -219.28 2282.41 -219.03 2282.44 -218.84 2282.46
-218.78 2282.46  -218.7 2282.46 -218.62 2282.46 -218.54 2282.47 -218.26 2282.47
-218.16 2282.47 -218.07 2282.47 -217.99 2282.48 -217.92 2282.48 -217.85 2282.49
-216.81 2282.58 -215.14 2282.67 -213.04 2282.76 -212.98 2282.76 -208.39 2282.93
-208.24 2282.92 -208.03 2282.93 -202.11 2283.11 -201.87 2283.12 -200.41 2283.16
-200.18 2283.17 -199.94 2283.17  -197.2 2283.24 -196.95 2283.25  -196.7 2283.26
-196.39 2283.27  -196.1 2283.29 -182.46 2283.52 -169.94 2283.71 -156.37 2283.91
-149.71    2284 -141.91 2284.04 -138.49 2284.06 -137.31 2284.06 -136.76 2284.06
-136.25 2284.06  -135.8 2284.05 -135.35 2284.05 -134.97 2284.04 -134.63 2284.02
-134.31 2284.01 -134.12    2284 -132.11    2284 -125.15    2284 -122.01  2284.1
-121.73 2284.11 -121.55 2284.13 -121.48 2284.14  -59.96  2284.3  -53.98 2284.07
 -52.52 2284.02  -51.94 2284.01  -51.65    2284   -20.1    2282     -20    2281
     -5    2274       0    2274       5    2274      20    2281    20.1    2282
  94.77    2284  225.42    2284  227.85    2284  245.33    2284  246.52    2284
 248.83    2284  256.85    2284  259.21    2284  263.31 2284.13  274.42 2284.49
 275.76 2284.53  276.43 2284.55  277.13 2284.56  277.86 2284.58  278.61 2284.59
 280.14 2284.62  290.74 2284.77  299.62  2284.9     300 2284.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .015   -20.1    .015    20.1    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -20.1    20.1              265     265     265             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 7235

INPUT
Description: Sta 72+35.00 as-built 95-19705
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -54  2278.8      -4 2278.12      -4 2273.03      36 2273.03      36 2278.12
      86  2278.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -54    .015      -4    .015      36    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            -4      36              105     105     105             .3       .5

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 7182.5

INPUT
Description:
Distance from Upstream XS =       1
Deck/Roadway Width        =     103
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      27
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -310  2279.4 2277.12      -4  2279.2 2273.12      -3  2279.2 2273.12
      -1  2279.2 2275.27       1  2279.2 2276.45     3.5  2279.2 2276.96
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4.75 | 2279.2 | 2277.08 | 6 | 2279.2 | 2277.12 | 7.25 | 2279.2 | 2277.08 |
| 8.5 | 2279.2 | 2276.96 | 11 | 2279.2 | 2276.45 | 13 | 2279.2 | 2275.27 |
| 15 | 2279.2 | 2273.03 | 16 | 2279.2 | 2273.03 | 17 | 2279.2 | 2273.03 |
| 19 | 2279.2 | 2275.27 | 21 | 2279.2 | 2276.45 | 23.5 | 2279.2 | 2276.96 |
| 24.75 | 2279.2 | 2277.08 | 26 | 2279.2 | 2277.12 | 27.25 | 2279.2 | 2277.08 |
| 28.5 | 2279.2 | 2276.96 | 31 | 2279.2 | 2276.45 | 33 | 2279.2 | 2275.27 |
| 35 | 2279.2 | 2273.12 | 36 | 2279.2 | 2273.12 | 100 | 2279.2 | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -54 | 2278.8 | -4 | 2278.12 | -4 | 2273.03 | 36 | 2273.03 | 36 | 2278.12 |
| 86 | 2278.8 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -54 | .015 | -4 | .015 | 36 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -4 | 36 | .3 | .5 |

Downstream Deck/Roadway Coordinates
num= 27

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -310 | 2279.4 | 2276.73 | -20 | 2279.2 | 2272.77 | -19 | 2279.2 | 2272.77 |
| -17 | 2279.2 | 2274.92 | -15 | 2279.2 | 2276.1 | -12.5 | 2279.2 | 2276.61 |
| -11.25 | 2279.2 | 2276.73 | -10 | 2279.2 | 2276.77 | -8.75 | 2279.2 | 2276.73 |
| -7.5 | 2279.2 | 2276.61 | -5 | 2279.2 | 2276.1 | -3 | 2279.2 | 2274.92 |
| -1 | 2279.2 | 2272.75 | 0 | 2279.2 | 2272.75 | 1 | 2279.2 | 2272.75 |
| 3 | 2279.2 | 2274.92 | 5 | 2279.2 | 2276.1 | 7.5 | 2279.2 | 2276.61 |
| 8.75 | 2279.2 | 2276.73 | 10 | 2279.2 | 2276.77 | 11.25 | 2279.2 | 2276.73 |
| 12.5 | 2279.2 | 2276.61 | 15 | 2279.2 | 2276.1 | 17 | 2279.2 | 2274.92 |
| 19 | 2279.2 | 2272.77 | 20 | 2279.2 | 2272.77 | 100 | 2279.2 | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -70 | 2278.8 | -20 | 2276.77 | -20 | 2272.75 | 20 | 2272.75 | 20 | 2276.77 |
| 70 | 2278.8 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -70 | .015 | -20 | .015 | 20 | .015 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| -20 | 20 | .3 | .5 |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

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

BRIDGE OUTPUT  Profile #PF 2

| | | | | |
|---|---|---|---|---|
| E.G. US. (ft) | 2278.38 | Element | Inside BR US | Inside BR DS |
| W.S. US. (ft) | 2277.98 | E.G. Elev (ft) | 2277.92 | 2277.68 |
| Q Total (cfs) | 1008.00 | W.S. Elev (ft) | 2275.98 | 2275.71 |
| Q Bridge (cfs) | 1008.00 | Crit W.S. (ft) | 2275.98 | 2275.71 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 2.95 | 2.96 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 11.17 | 11.25 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 90.27 | 89.62 |
| Weir Submerg | | Froude # Chl | 1.15 | 1.15 |
| Weir Max Depth (ft) | | Specif Force (cu ft) | 491.88 | 494.20 |
| Min El Weir Flow (ft) | 2279.21 | Hydr Depth (ft) | 3.90 | 3.96 |
| Min El Prs (ft) | 2277.12 | W.P. Total (ft) | 57.67 | 58.07 |
| Delta EG (ft) | 0.96 | Conv. Total (cfs) | 12055.0 | 11856.1 |
| Delta WS (ft) | 3.34 | Top Width (ft) | 23.17 | 22.62 |
| BR Open Area (sq ft) | 106.49 | Frctn Loss (ft) | | |
| BR Open Vel (ft/s) | 11.25 | C & E Loss (ft) | | |
| Coef of Q | | Shear Total (lb/sq ft) | 0.68 | 0.70 |
| Br Sel Method | Energy only | Power Total (lb/ft s) | 7.63 | 7.83 |

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than
the downstream energy.  This is not physically possible, the momentum answer has been
disregarded.
Warning: The energy equation could not be balanced within the specified number of iterations.  The
program used critical depth for the water surface and continued on with the calculations.

CROSS SECTION

RIVER: Duck Creek
REACH: East  RS: 7130

INPUT
Description: Sta 71+30.00 as-built 95-19705
Station Elevation Data  num=  6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -70 | 2278.8 | -20 | 2276.77 | -20 | 2272.75 | 20 | 2272.75 | 20 | 2276.77 |
| 70 | 2278.8 | | | | | | | | |

Manning's n Values  num=  3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -70 | .015 | -20 | .015 | 20 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -20 | 20 | 230 | 230 | .3 | .5 |

CROSS SECTION

RIVER: Duck Creek
REACH: East  RS: 6900

INPUT
Description: Sta 69+00.00
Station Elevation Data  num=  128

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2275.42 | -293.18 | 2275.55 | -292.67 | 2275.55 | -292.42 | 2275.56 | -273.06 | 2275.89 |
| -270.42 | 2275.94 | -267.79 | 2276 | -267.73 | 2276 | -267.55 | 2276 | -267.44 | 2276 |
| -231.7 | 2276 | -216.7 | 2276 | -214.22 | 2276 | -203.92 | 2276 | -202.73 | 2276 |
| -190.12 | 2276 | -189.65 | 2276 | -185.41 | 2276 | -184.98 | 2276 | -184.5 | 2276 |
| -181.38 | 2276 | -180.91 | 2276 | -176.14 | 2276 | -175.19 | 2276 | -165.08 | 2276 |
| -148.99 | 2276 | -140.56 | 2276 | -138.46 | 2275.95 | -136.42 | 2275.89 | -135.63 | 2275.86 |
| -98.42 | 2274.82 | -96.62 | 2274.76 | -94.6 | 2274.7 | -86.66 | 2274.47 | -84.94 | 2274.42 |
| -84.08 | 2274.39 | -78.3 | 2274.22 | -78.07 | 2274.22 | -77.87 | 2274.21 | -70.37 | 2274 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -45.8 | 2273.23 | -43.51 | 2273.17 | -31.29 | 2272.84 | -13.29 | 2272 | -8.74 | 2272 |
| 0 | 2272 | 3.46 | 2272 | 44.09 | 2273.39 | 62.76 | 2274 | 70.46 | 2274.17 |
| 74.34 | 2274.25 | 76.76 | 2274.3 | 90.95 | 2274.55 | 102.46 | 2274.72 | 104.81 | 2274.76 |
| 116.34 | 2274.91 | 117.18 | 2274.92 | 117.6 | 2274.93 | 126.29 | 2275.03 | 126.73 | 2275.04 |
| 127.18 | 2275.04 | 128.41 | 2275.06 | 129.33 | 2275.07 | 129.7 | 2275.07 | 129.94 | 2275.08 |
| 136.72 | 2275.12 | 136.96 | 2275.12 | 137.22 | 2275.13 | 138.65 | 2275.13 | 139.15 | 2275.15 |
| 140.03 | 2275.15 | 146.01 | 2275.12 | 146.9 | 2275.13 | 147.86 | 2275.13 | 156.99 | 2275.18 |
| 162.85 | 2275.3 | 174.05 | 2275.33 | 183.35 | 2275.36 | 184.69 | 2275.37 | 185.39 | 2275.38 |
| 186.13 | 2275.38 | 186.9 | 2275.39 | 187.7 | 2275.4 | 188.54 | 2275.41 | 189.41 | 2275.42 |
| 206.49 | 2275.67 | 209.04 | 2275.7 | 211.68 | 2275.74 | 213.53 | 2275.76 | 213.86 | 2275.77 |
| 215.35 | 2275.79 | 215.61 | 2275.79 | 217.21 | 2275.82 | 217.4 | 2275.82 | 217.49 | 2275.82 |
| 217.59 | 2275.82 | 217.78 | 2275.82 | 218.16 | 2275.83 | 219.05 | 2275.84 | 219.22 | 2275.84 |
| 219.29 | 2275.84 | 219.37 | 2275.84 | 219.43 | 2275.84 | 219.5 | 2275.84 | 219.55 | 2275.84 |
| 219.96 | 2275.84 | 220.01 | 2275.84 | 220.06 | 2275.84 | 220.11 | 2275.84 | 230.4 | 2275.95 |
| 234.4 | 2276 | 237.05 | 2276.04 | 237.54 | 2276.04 | 238.03 | 2276.05 | 238.52 | 2276.05 |
| 239.01 | 2276.05 | 239.51 | 2276.04 | 240.01 | 2276.04 | 241.02 | 2276.03 | 243.25 | 2276 |
| 251.86 | 2275.92 | 258.65 | 2275.87 | 271.98 | 2275.77 | 288.82 | 2275.65 | 290.63 | 2275.63 |
| 293.64 | 2275.62 | 299.05 | 2275.59 | 300 | 2275.59 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -140.56 | .025 | 140.03 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -140.56 | 140.03 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6600

INPUT
Description: Sta 66+00.00
Station Elevation Data num= 92

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -213.06 | 2271.15 | -153.34 | 2271.36 | -149.16 | 2271.35 | -144.31 | 2271.34 | -141 | 2271.33 |
| -136.27 | 2271.29 | -132.35 | 2271.26 | -123.84 | 2271.16 | -118.02 | 2271.08 | -115.79 | 2271.05 |
| -109.49 | 2270.98 | -108.34 | 2270.98 | -107.59 | 2270.98 | -105.71 | 2270.98 | -99.73 | 2270.89 |
| -93.09 | 2270.94 | -91.15 | 2270.9 | -84.11 | 2270.75 | -83.54 | 2270.75 | -83.24 | 2270.75 |
| -82.64 | 2270.74 | -72.65 | 2270.48 | -69.34 | 2270.42 | -64.28 | 2270.31 | -62.23 | 2270.27 |
| -48.76 | 2270.02 | -48.74 | 2270.02 | -48.7 | 2270.02 | -47.67 | 2270 | -33.48 | 2269.9 |
| -23.18 | 2269.83 | -13.29 | 2269.76 | -9.34 | 2269.74 | -7.52 | 2269.73 | -2.8 | 2269.73 |
| 0 | 2269.73 | 8.89 | 2269.74 | 19.59 | 2269.74 | 32.54 | 2269.76 | 45.59 | 2269.77 |
| 59.72 | 2269.8 | 63.33 | 2269.81 | 82.47 | 2269.9 | 87.29 | 2269.93 | 93.86 | 2269.97 |
| 96.69 | 2269.99 | 97.91 | 2270 | 106.65 | 2270.15 | 106.93 | 2270.16 | 118.08 | 2270.32 |
| 119.46 | 2270.33 | 119.9 | 2270.34 | 120.21 | 2270.34 | 120.86 | 2270.35 | 124.28 | 2270.39 |
| 126.9 | 2270.43 | 136.72 | 2270.61 | 138.68 | 2270.64 | 145.13 | 2270.73 | 147.36 | 2270.75 |
| 150.2 | 2270.77 | 157.43 | 2270.88 | 164.17 | 2270.97 | 172.13 | 2271.02 | 173.57 | 2271.04 |
| 180.56 | 2271.11 | 182.67 | 2271.14 | 190.63 | 2271.2 | 191.88 | 2271.21 | 193.88 | 2271.23 |
| 208.93 | 2271.42 | 211.8 | 2271.46 | 214.1 | 2271.49 | 219.85 | 2271.58 | 221.12 | 2271.59 |
| 221.95 | 2271.6 | 222.61 | 2271.61 | 225.98 | 2271.65 | 226.6 | 2271.65 | 227.2 | 2271.66 |
| 229.58 | 2271.67 | 231.03 | 2271.67 | 234.15 | 2271.7 | 250.87 | 2271.83 | 250.94 | 2271.83 |
| 267 | 2271.97 | 267.01 | 2271.97 | 271.09 | 2272 | 276.63 | 2272.03 | 289.7 | 2272.11 |
| 290.46 | 2272.11 | 300 | 2272.16 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -213.06 | .025 | -132.35 | .025 | 164.17 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -132.35 | 164.17 | 300 | 300 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6300

INPUT

Description: Sta 63+00.00
Station Elevation Data num= 131

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -145 | 2268 | -141.97 | 2268 | -141.63 | 2268 | -141.13 | 2268 | -128.06 | 2268 |
| -124.66 | 2268 | -121.6 | 2268 | -80.5 | 2268 | -64.72 | 2267.49 | -62.46 | 2267.42 |
| -60.41 | 2267.37 | -52.77 | 2267.16 | -51.74 | 2267.14 | -40.79 | 2266.85 | -29.13 | 2266.61 |
| -24.35 | 2266.49 | -11.92 | 2266.25 | -11.09 | 2266.22 | -10.48 | 2266.21 | -10.25 | 2266.21 |
| -10.15 | 2266.2 | -9.95 | 2266.2 | -8.87 | 2266.16 | -8.4 | 2266.14 | -4.63 | 2266.17 |
| -4.62 | 2266.17 | -4.6 | 2266.18 | -4.57 | 2266.18 | -4.53 | 2266.18 | -4.45 | 2266.18 |
| -4.3 | 2266.19 | -3.85 | 2266.18 | -3.74 | 2266.18 | -3.24 | 2266.17 | -2.11 | 2266.16 |
| -1.5 | 2266.16 | 0 | 2266.15 | 3.98 | 2266.13 | 5.22 | 2266.12 | 5.81 | 2266.11 |
| 5.92 | 2266.11 | 8.44 | 2266 | 8.57 | 2265.99 | 8.58 | 2265.99 | 13.04 | 2265.44 |
| 14.64 | 2265.22 | 14.97 | 2265.2 | 15.17 | 2265.18 | 15.41 | 2265.17 | 15.63 | 2265.17 |
| 15.87 | 2265.16 | 16.13 | 2265.16 | 16.4 | 2265.16 | 16.75 | 2265.16 | 17.14 | 2265.16 |
| 23.07 | 2265.22 | 23.99 | 2265.24 | 24.44 | 2265.24 | 24.86 | 2265.25 | 25.24 | 2265.26 |
| 25.5 | 2265.27 | 25.75 | 2265.28 | 25.84 | 2265.29 | 41.6 | 2268.02 | 43.69 | 2268.17 |
| 54.64 | 2268.52 | 56.4 | 2268.65 | 69.13 | 2269.04 | 70.28 | 2269.13 | 75.68 | 2269.27 |
| 77.08 | 2269.37 | 79.96 | 2269.41 | 97.12 | 2270 | 132.79 | 2270.09 | 206.29 | 2270.03 |
| 206.38 | 2270.02 | 206.53 | 2270.02 | 206.75 | 2270.02 | 207.45 | 2270.01 | 209.04 | 2270 |
| 221.67 | 2269.65 | 221.8 | 2269.64 | 221.96 | 2269.64 | 222.12 | 2269.63 | 222.47 | 2269.63 |
| 234.57 | 2269.29 | 239.86 | 2269.19 | 242.52 | 2269.13 | 250.09 | 2268.98 | 257.81 | 2268.83 |
| 259.34 | 2268.81 | 264.61 | 2268.68 | 265.12 | 2268.67 | 265.38 | 2268.67 | 265.63 | 2268.67 |
| 265.88 | 2268.67 | 266.39 | 2268.67 | 267.92 | 2268.66 | 272.82 | 2268.67 | 273.79 | 2268.67 |
| 274.26 | 2268.67 | 274.73 | 2268.67 | 275.17 | 2268.68 | 275.68 | 2268.68 | 276.09 | 2268.68 |
| 276.33 | 2268.68 | 276.56 | 2268.68 | 276.95 | 2268.69 | 277.16 | 2268.68 | 277.91 | 2268.71 |
| 279.23 | 2268.77 | 280.33 | 2268.83 | 283.05 | 2269.04 | 284.47 | 2269.15 | 285.61 | 2269.25 |
| 285.75 | 2269.27 | 285.94 | 2269.28 | 286.21 | 2269.29 | 286.81 | 2269.31 | 287.12 | 2269.31 |
| 287.29 | 2269.32 | 287.46 | 2269.32 | 287.64 | 2269.32 | 287.84 | 2269.32 | 288.05 | 2269.32 |
| 288.27 | 2269.31 | 288.74 | 2269.31 | 293.14 | 2269.23 | 298.18 | 2269.13 | 299.65 | 2269.1 |
| 300 | 2269.09 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -145 | .025 | -80.5 | .025 | 43.69 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -80.5 | 43.69 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6250

INPUT
Description: Sta 62+50.00 as-built 98-13279
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -60.1 | 2267.6 | -60 | 2266.6 | -60 | 2266 | -6 | 2257.78 | 0 | 2257.78 |
| 6 | 2257.78 | 50 | 2266 | 50.1 | 2267 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -60.1 | .037 | -6 | .015 | 6 | .037 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -6 | 6 | 30 | 60 | 90 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6190

INPUT
Description: Sta 61+90.00 as-built 98-13279
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -40.1 | 2265.34 | -40 | 2264.34 | -6 | 2257.7 | 0 | 2257.7 | 6 | 2257.7 |
| 30 | 2264.34 | 30.1 | 2265.34 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -40.1 | .037 | -6 | .015 | 6 | .037 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -6 | 6 | 200 | 190 | 180 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 6000

INPUT
Description: Sta 60+00.00 as-built 98-13279
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -20.1 | 2264.59 | -20 | 2263.59 | -6 | 2257.47 | 0 | 2257.47 | 6 | 2257.47 |
| 20 | 2263.59 | 20.1 | 2264.59 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -20.1 | .037 | -6 | .015 | 6 | .037 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -6 | 6 | 120 | 100 | 80 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5900

INPUT
Description: Sta 59+00.00 as-built 98-13279
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2264.5 | -20 | 2263.09 | -6 | 2257.09 | -6 | 2256.97 | 0 | 2256.97 |
| 6 | 2256.97 | 20 | 2263.09 | 20 | 2269.09 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -100 | .037 | -6 | .015 | 6 | .037 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -6 | 6 | 60 | 60 | 60 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5830

INPUT
Description: Sta 58+30.00 as-built 98-13279
Station Elevation Data num= 15

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -149 | 2265 | -140 | 2262 | -11.6 | 2262 | -11.6 | 2263.3 | -10.6 | 2263.3 |
| -10.5 | 2260 | -10.5 | 2256 | 0 | 2256 | 10.5 | 2256 | 30.5 | 2260 |
| 38 | 2260 | 38 | 2263.3 | 39 | 2263.3 | 39 | 2262 | 200 | 2262 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -149 | .015 | -10.5 | .015 | 10.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -10.5 | 10.5 | 60 | 60 | 60 | .3 | .5 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|

```
   -149     -70              F
     70     200              F

BRIDGE


RIVER: Duck Creek
REACH: East                RS: 5800

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      56
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -255 2263.15            -115    2263           -10.5    2262    2260
    10.5    2262    2260     115 2260.23

Upstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -149     2265    -140     2262   -11.6     2262   -11.6   2263.3   -10.6   2263.3
   -10.5     2260   -10.5     2256       0     2256    10.5     2256    30.5     2260
      38     2260      38   2263.3      39   2263.3      39     2262     200     2262

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -149    .015   -10.5    .015    10.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -10.5    10.5             .3      .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -149     -70              F
      70     200              F

Downstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -255 2262.91            -115  2262.4           -10.5 2261.69 2259.69
    10.5 2261.69 2259.69     115 2260.19

Downstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -100 2263.15   -10.6   2261.6   -10.5   2259.6   -10.5   2255.6     -.5   2255.6
       0   2255.6      .5   2255.6    10.5   2255.6    10.5   2259.6    10.6   2261.6
      80     2262      80     2268

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025   -10.5    .015    10.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -10.5    10.5             .3       .5

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=       0     Downstream=       0
```

Upstream num= 2

| Width | Elev | Width | Elev |
|---|---|---|---|
| 1 | 2256 | 1 | 2260 |

Downstream num= 2

| Width | Elev | Width | Elev |
|---|---|---|---|
| 1 | 2255.69 | 1 | 2260 |

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #PF 2

| | | Element | Inside BR US | Inside BR DS |
|---|---|---|---|---|
| E.G. US. (ft) | 2263.51 | E.G. Elev (ft) | 2263.45 | 2263.35 |
| W.S. US. (ft) | 2263.38 | W.S. Elev (ft) | 2263.12 | 2263.05 |
| Q Total (cfs) | 1008.00 | Crit W.S. (ft) | 2262.80 | 2262.60 |
| Q Bridge (cfs) | 423.53 | Max Chl Dpth (ft) | 7.12 | 7.45 |
| Q Weir (cfs) | | Vel Total (ft/s) | 4.51 | 3.92 |
| Weir Sta Lft (ft) | | Flow Area (sq ft) | 223.73 | 257.40 |
| Weir Sta Rgt (ft) | | Froude # Chl | 0.30 | 0.25 |
| Weir Submerg | | Specif Force (cu ft) | 632.72 | 678.62 |
| Weir Max Depth (ft) | | Hydr Depth (ft) | 1.62 | 1.48 |
| Min El Weir Flow (ft) | 2261.64 | W.P. Total (ft) | 198.99 | 231.65 |
| Min El Prs (ft) | 2260.00 | Conv. Total (cfs) | 25002.0 | 26610.0 |
| Delta EG (ft) | 0.18 | Top Width (ft) | 341.34 | 174.23 |
| Delta WS (ft) | 0.41 | Frctn Loss (ft) | 0.09 | 0.00 |
| BR Open Area (sq ft) | 80.25 | C & E Loss (ft) | 0.02 | 0.02 |
| BR Open Vel (ft/s) | 5.28 | Shear Total (lb/sq ft) | 0.11 | 0.10 |
| Coef of Q | | Power Total (lb/ft s) | 0.51 | 0.39 |
| Br Sel Method | Energy only | | | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
energy was used.
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,
energy was used.

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5770

INPUT
Description: Sta 57+70.00 as-built 98-13279
Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -100 | 2263.15 | -10.6 | 2261.6 | -10.5 | 2259.6 | -10.5 | 2255.6 | -.5 | 2255.6 |
| 0 | 2255.6 | .5 | 2255.6 | 10.5 | 2255.6 | 10.5 | 2259.6 | 10.6 | 2261.6 |
| 80 | 2262 | 80 | 2268 | | | | | | |

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025   -10.5    .015    10.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -10.5    10.5               70      70      70             .3       .5

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 5700

INPUT
Description: Sta 57+00.00 as-built 98-13279
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -120    2263     -20 2261.53      -6 2255.41       0 2255.41       6 2255.41
      20 2261.53    20.1 2262.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -120    .037      -6    .015       6    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            -6       6              155     155     155             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 5545

INPUT
Description: Sta 55+45.00 as-built 98-13279
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -100    2262     -20 2260.69      -6  2254.7       0  2254.7       6  2254.7
      20 2260.69    20.1 2261.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .037      -6    .015       6    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            -6       6               10      15      25             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 5530

INPUT
Description: Sta 55+30.00 as-built 98-13279
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -25  2261.4     -13 2260.39     -13  2254.5       0  2254.5      13  2254.5
      13 2260.39      25    2262

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -25    .025     -13    .015      13    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -13      13               20      25      35             .1       .3

CROSS SECTION


RIVER: Duck Creek
```

```
REACH: East                RS: 5505

INPUT
Description: Sta 55+05.00 as-built 98-13279
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -25  2261.4     -17  2260.2   -12.5  2258.2   -12.5  2254.2       0  2254.2
    12.5  2254.2    12.5  2258.2      17  2260.2      25    2262

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -25    .015   -12.5    .015    12.5    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -12.5    12.5                85      85      85             .3       .5

BRIDGE


RIVER: Duck Creek
REACH: East                RS: 5462.5

INPUT
Description:
Distance from Upstream XS =       1
Deck/Roadway Width        =      83
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -30    2261 2258.37      30    2261 2258.37

Upstream Bridge Cross Section Data
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -25  2261.4     -17  2260.2   -12.5  2258.2   -12.5  2254.2       0  2254.2
    12.5  2254.2    12.5  2258.2      17  2260.2      25    2262

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -25    .015   -12.5    .015    12.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -12.5    12.5             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   -12.5 2260.64 2257.96    12.5 2260.64 2257.96

Downstream Bridge Cross Section Data
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -62.5    2262   -12.5    2260   -12.5  2257.9   -12.5  2253.9    -4.5  2253.9
      -4  2253.9       0  2253.9       4  2253.9     4.5  2253.9    12.5  2253.9
    12.5  2257.9    12.5 2260.14

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -62.5    .015   -12.5    .015    12.5    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -12.5    12.5             .3       .5

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
```

Weir crest shape = Broad Crested

Number of Piers = 2

Pier Data
Pier Station Upstream= -4.25 Downstream= -4.25
Upstream num= 2
Width Elev Width Elev
1 2254.37 1 2258.37
Downstream num= 2
Width Elev Width Elev
1 2253.96 1 2257.96

Pier Data
Pier Station Upstream= 4.25 Downstream= 4.25
Upstream num= 2
Width Elev Width Elev
1 2254.37 1 2258.37
Downstream num= 2
Width Elev Width Elev
1 2253.96 1 2257.96

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

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

BRIDGE OUTPUT Profile #PF 2

| | | | | |
|---|---|---|---|---|
| E.G. US. (ft) | 2261.16 | Element | Inside BR US | Inside BR DS |
| W.S. US. (ft) | 2260.58 | E.G. Elev (ft) | 2260.81 | 2260.13 |
| Q Total (cfs) | 1008.00 | W.S. Elev (ft) | 2259.10 | 2258.33 |
| Q Bridge (cfs) | 1008.00 | Crit W.S. (ft) | 2258.12 | 2257.82 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 4.90 | 4.43 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 10.50 | 10.79 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 95.98 | 93.38 |
| Weir Submerg | | Froude # Chl | 0.85 | 0.90 |
| Weir Max Depth (ft) | | Specif Force (cu ft) | 598.61 | 561.56 |
| Min El Weir Flow (ft) | 2261.01 | Hydr Depth (ft) | | |
| Min El Prs (ft) | 2258.37 | W.P. Total (ft) | 72.28 | 70.36 |
| Delta EG (ft) | 1.37 | Conv. Total (cfs) | 11646.6 | 11171.7 |
| Delta WS (ft) | 1.91 | Top Width (ft) | | |
| BR Open Area (sq ft) | 93.38 | Frctn Loss (ft) | 0.65 | 0.00 |
| BR Open Vel (ft/s) | 10.79 | C & E Loss (ft) | 0.03 | 0.35 |
| Coef of Q | | Shear Total (lb/sq ft) | 0.62 | 0.67 |
| Br Sel Method | Energy only | Power Total (lb/ft s) | 6.52 | 7.28 |

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir
flow. The momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,
energy was used.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.

Warning: The 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,
energy was used.

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5420

INPUT
Description: Sta 54+20.00 as-built 98-13279
Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -62.5 | 2262 | -12.5 | 2260 | -12.5 | 2257.9 | -12.5 | 2253.9 | -4.5 | 2253.9 |
| -4 | 2253.9 | 0 | 2253.9 | 4 | 2253.9 | 4.5 | 2253.9 | 12.5 | 2253.9 |
| 12.5 | 2257.9 | 12.5 | 2260.14 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -62.5 | .015 | -12.5 | .015 | 12.5 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -12.5 | 12.5 | 105 | 70 | 35 | .3 | .5 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5350

INPUT
Description: Sta 53+50.00 as-built 98-13279
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -80 | 2259.5 | -10.58 | 2259 | -10.58 | 2253.16 | 0 | 2253.16 | 10.58 | 2253.16 |
| 10.58 | 2259.54 | 16.92 | 2259.74 | 41.92 | 2259.1 | 41.92 | 2259.6 | 46.92 | 2259.7 |
| 47.01 | 2260.6 | 47.02 | 2260.7 | 47.03 | 2266.32 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -80 | .025 | -10.58 | .015 | 47.02 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -10.58 | 47.02 | 250 | 250 | 250 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 5100

INPUT
Description: Sta 51+00.00 as-built 98-13279
Station Elevation Data num= 51

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2255.93 | -292.22 | 2256 | -290.55 | 2256.02 | -288.59 | 2256.04 | -287.7 | 2256.04 |
| -286.93 | 2256.05 | -286.21 | 2256.05 | -284.86 | 2256.05 | -276.72 | 2256.02 | -271.15 | 2256 |
| -255.08 | 2255.97 | -254.9 | 2255.97 | -241.53 | 2255.95 | -241.42 | 2255.95 | -229.25 | 2255.94 |
| -229.2 | 2255.94 | -221.62 | 2255.93 | -221.53 | 2255.93 | -206.94 | 2255.91 | -206.48 | 2255.91 |
| -205.77 | 2255.91 | -177.31 | 2255.86 | -177.05 | 2255.86 | -176.02 | 2255.86 | -174.96 | 2255.85 |
| -174.72 | 2255.85 | -174.6 | 2255.85 | -174.16 | 2255.85 | -172.29 | 2255.83 | -133.85 | 2255.77 |
| -133.4 | 2255.76 | -133.05 | 2255.76 | -132.89 | 2255.76 | -131.13 | 2255.72 | -122.26 | 2255.71 |
| -118.68 | 2255.64 | -115.3 | 2255.57 | -107.4 | 2255.41 | -97.49 | 2255.2 | -47.52 | 2255 |
| -2.1 | 2254 | -2 | 2251 | 0 | 2249.99 | 20 | 2254.21 | 27.5 | 2254.42 |
| 52.5 | 2253.78 | 52.5 | 2254.28 | 57.5 | 2254.38 | 57.59 | 2255.28 | 57.6 | 2255.38 |

57.61 2261

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -2.1 | .015 | 57.6 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -2.1 | 57.6 | 290 | 290 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 4810

INPUT
Description: Sta 48+10.00 as-built 98-13279
Station Elevation Data num= 124

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -400 | 2255.37 | -382.69 | 2255.15 | -381.02 | 2255.15 | -375.87 | 2255.13 | -361.41 | 2255.26 |
| -360.64 | 2255.26 | -360.4 | 2255.26 | -360.18 | 2255.27 | -355.34 | 2255.25 | -355.13 | 2255.25 |
| -354.37 | 2255.25 | -354.16 | 2255.25 | -353.98 | 2255.26 | -353.81 | 2255.26 | -353.67 | 2255.26 |
| -352.35 | 2255.31 | -351.97 | 2255.32 | -351.82 | 2255.32 | -351.65 | 2255.32 | -351.47 | 2255.33 |
| -351.28 | 2255.33 | -351.07 | 2255.33 | -350.63 | 2255.33 | -346.63 | 2255.37 | -344.67 | 2255.38 |
| -342.3 | 2255.4 | -339.15 | 2255.43 | -338.9 | 2255.44 | -338.8 | 2255.44 | -338.73 | 2255.44 |
| -338.7 | 2255.44 | -338.65 | 2255.45 | -338.56 | 2255.45 | -338.54 | 2255.45 | -338.53 | 2255.46 |
| -338.44 | 2255.46 | -338.4 | 2255.46 | -338.36 | 2255.47 | -338.3 | 2255.47 | -338.2 | 2255.47 |
| -338.08 | 2255.47 | -337.8 | 2255.47 | -335.89 | 2255.49 | -335.25 | 2255.49 | -335.04 | 2255.49 |
| -334.92 | 2255.49 | -334.81 | 2255.49 | -334.68 | 2255.49 | -334.3 | 2255.49 | -334.18 | 2255.49 |
| -334.05 | 2255.49 | -333.92 | 2255.49 | -333.79 | 2255.49 | -332.99 | 2255.5 | -332.69 | 2255.5 |
| -332.36 | 2255.5 | -329.45 | 2255.52 | -329.06 | 2255.52 | -328.57 | 2255.52 | -326.26 | 2255.54 |
| -324.28 | 2255.56 | -322.62 | 2255.57 | -321.69 | 2255.57 | -321.59 | 2255.57 | -321.52 | 2255.58 |
| -321.48 | 2255.58 | -321.46 | 2255.58 | -321.44 | 2255.58 | -321.44 | 2255.59 | -321.41 | 2255.6 |
| -321.37 | 2255.6 | -321.32 | 2255.6 | -321.25 | 2255.6 | -321.17 | 2255.6 | -321.08 | 2255.6 |
| -320.97 | 2255.6 | -320.71 | 2255.6 | -318.99 | 2255.6 | -318.54 | 2255.6 | -318.02 | 2255.6 |
| -317.43 | 2255.6 | -317.2 | 2255.6 | -288.91 | 2255.37 | -288.9 | 2255.37 | -288.85 | 2255.37 |
| -288.77 | 2255.37 | -288.48 | 2255.36 | -287.37 | 2255.34 | -284.59 | 2255.29 | -284.26 | 2255.28 |
| -283.87 | 2255.27 | -281.51 | 2255.2 | -280.88 | 2255.18 | -279.84 | 2255.17 | -279.2 | 2255.16 |
| -278.82 | 2255.15 | -277.98 | 2255.14 | -268.56 | 2255.02 | -268.01 | 2255.02 | -258.04 | 2254.9 |
| -253.45 | 2254.84 | -252.97 | 2254.84 | -236.05 | 2254.61 | -235.64 | 2254.61 | -234.81 | 2254.6 |
| -190.53 | 2254 | -116.2 | 2252.83 | -63.58 | 2252 | -60.19 | 2251.91 | -60.13 | 2251.91 |
| -57.64 | 2251.86 | -46.59 | 2251.63 | -42.03 | 2251.55 | -26.79 | 2251.3 | -24.65 | 2251.31 |
| -19.96 | 2251 | 0 | 2248.7 | 70 | 2251.13 | 80 | 2251.28 | 135 | 2251.28 |
| 160 | 2250.65 | 160 | 2251.15 | 170 | 2253 | 170.1 | 2259 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -400 | .025 | -116.2 | .025 | 170 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -116.2 | 170 | 1 | 10 | 20 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 4800

INPUT
Description: Sta 48+00.00 as-built 98-13279
Station Elevation Data num= 166

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -400 | 2255.37 | -382.69 | 2255.15 | -381.02 | 2255.15 | -375.87 | 2255.13 | -361.41 | 2255.26 |
| -360.64 | 2255.26 | -360.4 | 2255.26 | -360.18 | 2255.27 | -355.34 | 2255.25 | -355.13 | 2255.25 |
| -354.37 | 2255.25 | -354.16 | 2255.25 | -353.98 | 2255.26 | -353.81 | 2255.26 | -353.67 | 2255.26 |
| -352.35 | 2255.31 | -351.97 | 2255.32 | -351.82 | 2255.32 | -351.65 | 2255.32 | -351.47 | 2255.33 |
| -351.28 | 2255.33 | -351.07 | 2255.33 | -350.63 | 2255.33 | -346.63 | 2255.37 | -344.67 | 2255.38 |
| -342.3 | 2255.4 | -339.15 | 2255.43 | -338.9 | 2255.44 | -338.8 | 2255.44 | -338.73 | 2255.44 |
| -338.7 | 2255.44 | -338.65 | 2255.45 | -338.56 | 2255.45 | -338.54 | 2255.45 | -338.53 | 2255.46 |
| -338.44 | 2255.46 | -338.4 | 2255.46 | -338.36 | 2255.47 | -338.3 | 2255.47 | -338.2 | 2255.47 |

```
 -338.08 2255.47  -337.8 2255.47 -335.89 2255.49 -335.25 2255.49 -335.04 2255.49
 -334.92 2255.49 -334.81 2255.49 -334.68 2255.49  -334.3 2255.49 -334.18 2255.49
 -334.05 2255.49 -333.92 2255.49 -333.79 2255.49 -332.99  2255.5 -332.69  2255.5
 -332.36  2255.5 -329.45 2255.52 -329.06 2255.52 -328.57 2255.52 -326.26 2255.54
 -324.28 2255.56 -322.62 2255.57 -321.69 2255.57 -321.59 2255.57 -321.52 2255.58
 -321.48 2255.58 -321.46 2255.58 -321.44 2255.58 -321.44 2255.59 -321.41  2255.6
 -321.37  2255.6 -321.32  2255.6 -321.25  2255.6 -321.17  2255.6 -321.08  2255.6
 -320.97  2255.6 -320.71  2255.6 -318.99  2255.6 -318.54  2255.6 -318.02  2255.6
 -317.43  2255.6  -317.2  2255.6 -288.91 2255.37  -288.9 2255.37 -288.85 2255.37
 -288.77 2255.37 -288.48 2255.36 -287.37 2255.34 -284.59 2255.29 -284.26 2255.28
 -283.87 2255.27 -281.51  2255.2 -280.88 2255.18 -279.84 2255.17  -279.2 2255.16
 -278.82 2255.15 -277.98 2255.14 -268.56 2255.02 -268.01 2255.02 -258.04  2254.9
 -253.45 2254.84 -252.97 2254.84 -236.05 2254.61 -235.64 2254.61 -234.81  2254.6
 -190.53    2254  -116.2 2252.83  -63.58    2252  -60.19 2251.91  -60.13 2251.91
  -57.64 2251.86  -46.59 2251.63  -42.03 2251.55  -26.79  2251.3  -24.65 2251.31
  -19.96    2251       0  2248.5      40  2250.9   81.32 2250.91   84.08 2250.93
   89.41 2250.96   90.03 2250.97   90.33 2250.97   90.63 2250.97    90.9 2250.97
   91.68 2250.97   91.95 2250.97   92.18 2250.97   92.42 2250.97   92.66 2250.97
   93.25 2250.98   94.97 2250.99  101.62 2251.03  101.77 2251.05   101.8 2251.05
  103.98 2251.05  104.72 2251.05  105.49 2251.05  111.99 2251.07  118.74 2251.08
  119.43 2251.08  119.77 2251.08  120.11 2251.08  120.43 2251.08   121.7 2251.07
  124.23 2251.06  124.89 2251.06  125.23 2251.06  125.94 2251.06  126.02 2251.06
   126.8 2251.05  127.05 2251.05  127.32 2251.05  127.59 2251.06  129.15 2251.06
  130.38 2251.06  137.25 2251.07  143.82 2251.07  144.89 2251.07  151.06 2251.05
  157.41 2251.03  161.46 2251.03  165.06 2251.01  171.73 2250.98     175    2251
     175    2257

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -400    .025  -63.58    .025     175    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -63.58     175             320     300     150              .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East                 RS: 4500

INPUT
Description: Sta 45+00.00
Station Elevation Data    num=     205
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2251.25 -298.75 2251.25 -298.59 2251.25 -293.34 2251.27 -292.52 2251.27
 -292.23 2251.27 -291.94 2251.27 -291.64 2251.27 -291.02 2251.26 -287.16 2251.21
 -286.44 2251.21 -286.15  2251.2  -285.8  2251.2 -285.44 2251.19 -285.08 2251.19
 -284.24 2251.16 -283.89 2251.16 -279.58 2251.16 -279.23 2251.16 -278.86 2251.16
 -278.47 2251.15 -278.05 2251.15 -277.61 2251.14 -276.16 2251.12 -265.46 2250.94
 -249.17 2250.66 -240.88 2250.49 -227.62 2250.29 -227.19 2250.28 -224.68 2250.25
 -224.36 2250.24 -223.18 2250.22 -222.08 2250.21  -221.7  2250.2 -220.97 2250.18
 -219.73 2250.15 -219.28 2250.14 -219.17 2250.13 -219.11 2250.13 -218.09 2250.11
 -217.46  2250.1 -217.42  2250.1 -217.38  2250.1 -217.34 2250.09  -217.3 2250.09
 -217.26 2250.09 -217.22 2250.09 -217.13 2250.09 -216.52 2250.09 -215.95 2250.09
 -215.25 2250.08 -214.64 2250.08 -213.92 2250.08 -213.83 2250.08 -213.13 2250.07
 -212.44 2250.07 -208.99 2250.08 -208.27 2250.08 -207.53 2250.08 -205.98 2250.07
 -198.55 2250.03 -198.52 2250.03 -192.29    2250 -183.06 2249.88 -180.75 2249.86
 -176.37 2249.84 -171.42 2249.82 -170.06 2249.83 -169.39 2249.83 -168.05 2249.84
 -166.95 2249.81 -157.61    2250 -156.25 2250.01 -153.66 2250.02 -149.82 2250.03
 -149.27 2250.03  -148.8 2250.04 -147.99 2250.05  -146.5 2250.07 -146.08 2250.07
 -145.03 2250.08 -133.65 2250.12 -128.92 2250.13 -124.52 2250.13 -110.62 2250.11
 -106.11 2250.11 -104.75 2250.11 -101.02 2250.13 -100.46 2250.13  -99.88 2250.13
  -99.25 2250.13  -98.51 2250.13  -97.72 2250.12  -96.01 2250.12  -78.37 2250.02
  -76.31    2250   -75.7    2250   -75.2 2249.98  -73.99 2249.93   -72.8 2249.88
  -65.25 2249.49   -59.4  2249.2  -45.47 2248.47  -36.61    2248  -30.21 2247.62
   -4.24    2246  -2.62 2245.87  -1.98 2245.83  -1.66 2245.81  -1.32  2245.8
   -1.12  2245.8   -.91 2245.79   -.57 2245.79   -.39 2245.79   -.22  2245.8
       0  2245.8     .1 2245.81     .41 2245.82     3.2    2246  18.38 2246.37
   19.63 2246.41   28.24 2246.61   35.25 2246.82   50.07 2247.16   54.02 2247.25
   54.41 2247.26   54.77 2247.27    55.1 2247.27   55.38 2247.28    55.6 2247.28
```

```
   55.8 2247.28   56.35 2247.27   56.47 2247.27   56.61 2247.27   56.88 2247.27
  57.18 2247.28    58.4 2247.32   58.71 2247.32   59.41 2247.34    60.9 2247.39
  66.99 2247.54   71.16 2247.64   73.61 2247.69   76.08 2247.74    76.8 2247.75
   77.5 2247.76   78.22 2247.77   78.76 2247.78   80.19  2247.8   81.26 2247.81
   87.7 2247.86   88.68 2247.87  102.82 2247.94  102.92 2247.94     103 2247.94
 103.34 2247.94  117.67 2247.98  117.78 2247.98   121.6    2248  131.46 2248.02
 131.63 2248.03  144.79 2248.05  150.09 2248.06  150.31 2248.06   163.8 2248.08
 164.37 2248.09   177.3 2248.11  178.08 2248.12  178.27 2248.12  178.36 2248.12
  178.4 2248.12  178.44 2248.12  178.57 2248.12  179.37 2248.14  182.76 2248.16
 184.18 2248.19  185.42  2248.2  185.91 2248.21  189.64 2248.26  192.39 2248.34
 207.21 2248.55  209.78 2248.64  210.41 2248.66  217.75 2248.98  218.97 2249.01
 219.56 2249.02  220.14 2249.04  242.32    2250  242.66 2250.01  245.59 2250.07
 249.28 2250.15  249.88 2250.16  250.22 2250.17  250.61 2250.17  251.05 2250.17
 251.58 2250.18  252.17 2250.18   252.8 2250.18  264.23  2250.2  269.83  2250.2
 273.22 2250.21  277.95 2250.22  293.04 2250.23  298.43 2250.23     300 2250.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -76.31    .025     103    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -76.31     103                50      50      50             .1      .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 4450

INPUT
Description: Sta 44+50.00as-built 97-10459
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19    2244     -19    2239      19    2239      19    2244

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -19    .015     -19    .015      19    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -19      19                70      70      70             .3      .5

BRIDGE


RIVER: Duck Creek
REACH: East               RS: 4415

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =      66
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -19 2246.21    2244      19 2246.21    2244

Upstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -19    2244     -19    2239      19    2239      19    2244

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -19    .015     -19    .015      19    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
           -19      19             .3      .5
```

```
Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
     -19    2246  2243.3       19    2246  2243.3

Downstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -19  2243.3      -19  2238.3       19  2238.3       19  2243.3

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -19    .015      -19    .015       19    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -19      19             .3       .5

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=     -10    Downstream=     -10
Upstream     num=       2
    Width   Elev    Width   Elev
       1 2243.82       1 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       1 2241.07       1 2249.82

Pier Data
Pier Station     Upstream=       0    Downstream=       0
Upstream     num=       2
    Width   Elev    Width   Elev
       1 2243.82       1 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       1 2241.07       1 2249.82

Pier Data
Pier Station     Upstream=      10    Downstream=      10
Upstream     num=       2
    Width   Elev    Width   Elev
       1 2243.82       1 2249.82
Downstream     num=       2
    Width   Elev    Width   Elev
       1 2241.07       1 2249.82

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

BRIDGE OUTPUT Profile #PF 2

| | | | Inside BR US | Inside BR DS |
|---|---|---|---|---|
| E.G. US. (ft) | 2247.67 | Element | | |
| W.S. US. (ft) | 2240.66 | E.G. Elev (ft) | 2247.35 | 2244.81 |
| Q Total (cfs) | 1338.00 | W.S. Elev (ft) | 2240.87 | 2240.63 |
| Q Bridge (cfs) | 1338.00 | Crit W.S. (ft) | 2242.58 | 2241.88 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 1.87 | 2.33 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 20.42 | 16.42 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 65.53 | 81.51 |
| Weir Submerg | | Froude # Chl | 2.63 | 1.90 |
| Weir Max Depth (ft) | | Specif Force (cu ft) | 909.76 | 777.01 |
| Min El Weir Flow (ft) | 2246.22 | Hydr Depth (ft) | 1.87 | 2.33 |
| Min El Prs (ft) | 2244.00 | W.P. Total (ft) | 49.98 | 53.63 |
| Delta EG (ft) | 2.93 | Conv. Total (cfs) | 7776.7 | 10673.6 |
| Delta WS (ft) | 0.25 | Top Width (ft) | 35.00 | 35.00 |
| BR Open Area (sq ft) | 175.00 | Frctn Loss (ft) | 0.06 | 1.39 |
| BR Open Vel (ft/s) | 20.42 | C & E Loss (ft) | 0.27 | 1.14 |
| Coef of Q | | Shear Total (lb/sq ft) | 2.42 | 1.49 |
| Br Sel Method | Energy only | Power Total (lb/ft s) | 49.48 | 24.47 |

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir
flow. The momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.
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: Duck Creek
REACH: East RS: 4380

INPUT
Description: Sta 43+80.00 as-built 97-10459
Station Elevation Data num= 4

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|
| -19 | 2243.3 | -19 | 2238.3 | 19 | 2238.3 | 19 | 2243.3 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -19 | .015 | -19 | .015 | 19 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -19 | 19 | 200 | 180 | 160 | .3 .5 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 4200

INPUT
Description: Sta 42+00.00 as-built 97-10459
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -49 | 2244 | -49 | 2241.88 | -22 | 2232.88 | 0 | 2232.88 | 22 | 2232.88 |
| 37 | 2241.86 | 49 | 2241.86 | 49 | 2246.3 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -49 | .035 | -49 | .035 | 49 | .035 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -49      49             360     350     340             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3900

INPUT
Description: Sta 39+00.00 as-built 97-10459
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -49 2242.35     -49 2241.35     -22 2232.35       0  2232.2      22 2232.35
      49 2241.35      49 2242.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -49    .025     -49    .025      49    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -49      49             280     300     320             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3600

INPUT
Description: Sta 36+00.00 as built 97-10459
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -49 2241.75     -49 2240.75     -22 2231.75       0  2231.8      22 2231.75
      49 2240.75      49 2241.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -49    .025     -49    .025      49    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -49      49             280     300     320             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3300

INPUT
Description: Sta 33+00.00 as-built 97-10459
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -49 2241.15     -49 2240.15     -22 2231.15       0    2231      22 2231.13
      49 2238.92      49 2239.92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -49    .025     -49    .025      49    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -49      49             320     300     280             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 3000
```

INPUT
Description: Sta 30+00.00 as-built 97-10459
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -63 | 2240.55 | -63 | 2239.55 | -36 | 2230.55 | 0 | 2230.49 | 36 | 2230.55 |
| 45 | 2236.55 | 57 | 2236.55 | 66 | 2237.55 | 66 | 2238.55 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -63 | .025 | -63 | .025 | 45 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -63 | 45 | 160 | 180 | 220 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 2820.*

INPUT
Description: Sta 28+20.00 as-built 97-10459
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -63 | 2240 | -63 | 2239 | -36 | 2230.19 | 0 | 2230.04 | 36 | 2230.09 |
| 45 | 2236.19 | 57 | 2236.19 | 66 | 2237.19 | 66 | 2238.19 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -63 | .025 | -63 | .025 | 45 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -63 | 45 | 120 | 120 | 120 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 2700

INPUT
Description: Sta 27+00.00 as-built 01-33428
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -53.5 | 2236.8 | -53.4 | 2235.8 | -35.5 | 2229.8 | 0 | 2229.8 | 35.5 | 2229.8 |
| 53.5 | 2235.8 | 66.5 | 2235.8 | 66.6 | 2236.8 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -53.5 | .015 | -53.4 | .04 | 53.5 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -53.4 | 53.5 | 160 | 230 | 280 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 2470.*

INPUT
Description: Sta 24+70.00 as-built 01-33428
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -40 | 2234.88 | -39.9 | 2233.88 | -22 | 2227.88 | 0 | 2227.88 | 22 | 2227.88 |
| 40 | 2233.88 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -40 | .04 | -39.9 | .04 | 40 | .04 |

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -39.9      40              70      70      70             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2400

INPUT
Description: Sta 24+00.00 as-built 01-33428
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -40 2234.95   -39.9 2233.95     -22 2227.95       0 2227.01      40    2228
      50    2229     100    2230

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -40    .015   -39.9     .04       0    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -39.9       0             140     140     140             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2260.*

INPUT
Description: Sta 22+60.00 as-built 01-33428
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -100 2232.11   -99.9 2231.11     -80    2230     -60    2229     -40    2228
     -30    2227       0    2226      30    2226      50    2226      60    2227
      70    2228     100  2228.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -100    .025     -60    .025      70    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -60      70             160     150     140             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    -100     -40 2232.11       T

CROSS SECTION


RIVER: Duck Creek
REACH: East               RS: 2100

INPUT
Description: Sta 21+00.00 as-built 01-33428
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -34 2230.04     -22 2224.04       0 2224.04      13 2224.04      25 2225.45
     245  2228.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -34    .015     -34    .015      25     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -34      25            94.1    94.1    94.1             .1       .3

CROSS SECTION
```

RIVER: Duck Creek
REACH: East RS: 2008.56

INPUT
Description: Sta 20+08.56 as-built L1704
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -34 | 2229.08 | -22 | 2223.08 | 0 | 2223.08 | 13 | 2223.08 | 25 | 2226.13 |
| 140 | 2227.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -34 | .015 | -34 | .015 | 25 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -34 | 25 | 208.56 | 208.56 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 1800

INPUT
Description: Sta 18+00.00 as built L1704
Station Elevation Data num= 5

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -34 | 2223.41 | -22 | 2217.41 | 0 | 2217.41 | 13 | 2217.41 | 25 | 2223.41 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -34 | .015 | -34 | .015 | 25 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -34 | 25 | .1 | .1 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East RS: 1799.9

INPUT
Description: 17+99.90 as-built L-1704
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24 | 2221.4 | -24 | 2217.4 | -8 | 2217.4 | -7 | 2217.4 | 9 | 2217.4 |
| 9 | 2221.4 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24 | .015 | -24 | .015 | 9 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24 | 9 | 159 | 159 | .3 | .5 |

BRIDGE

RIVER: Duck Creek
REACH: East RS: 1700

INPUT
Description:
Distance from Upstream XS = 2
Deck/Roadway Width = 116
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

```
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -24  2224.5  2221.4       9  2224.5  2221.4

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -24  2221.4     -24  2217.4      -8  2217.4      -7  2217.4       9  2217.4
       9  2221.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -24    .015     -24    .015       9    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -24       9             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     -24  2224.5    2220       9  2224.5    2220

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -24    2220     -24    2216      -8    2216      -7    2216       9    2216
       9    2220

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -24    .015     -24    .015       9    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -24       9             .3       .5

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    -7.5    Downstream=    -7.5
Upstream     num=       2
    Width   Elev    Width   Elev
       1  2217.4       1  2221.4
Downstream     num=       2
    Width   Elev    Width   Elev
       1    2216       1    2220

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

BRIDGE OUTPUT  Profile #PF 2
```

| | | | Inside BR US | Inside BR DS |
|---|---|---|---|---|
| E.G. US. (ft) | 2225.50 | Element | | |
| W.S. US. (ft) | 2219.46 | E.G. Elev (ft) | 2225.31 | 2222.92 |
| Q Total (cfs) | 1338.00 | W.S. Elev (ft) | 2219.58 | 2218.47 |
| Q Bridge (cfs) | 1338.00 | Crit W.S. (ft) | 2221.20 | 2219.80 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 2.18 | 2.47 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 19.22 | 16.94 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 69.63 | 78.98 |
| Weir Submerg | | Froude # Chl | 2.30 | 1.90 |
| Weir Max Depth (ft) | | Specif Force (cu ft) | 874.27 | 801.38 |
| Min El Weir Flow (ft) | 2224.51 | Hydr Depth (ft) | 2.18 | 2.47 |
| Min El Prs (ft) | 2221.40 | W.P. Total (ft) | 40.70 | 41.87 |
| Delta EG (ft) | 3.75 | Conv. Total (cfs) | 9864.9 | 11944.9 |
| Delta WS (ft) | 0.34 | Top Width (ft) | 32.00 | 32.00 |
| BR Open Area (sq ft) | 128.00 | Frctn Loss (ft) | 0.04 | 1.75 |
| BR Open Vel (ft/s) | 19.22 | C & E Loss (ft) | 0.15 | 0.64 |
| Coef of Q | | Shear Total (lb/sq ft) | 1.96 | 1.48 |
| Br Sel Method | Energy only | Power Total (lb/ft s) | 37.75 | 25.03 |

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir
flow. The momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.
Warning: The energy loss was 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: Duck Creek
REACH: East RS: 1641

INPUT
Description: Sta 16+41.00 as-built L1704
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -24 | 2220 | -24 | 2216 | -8 | 2216 | -7 | 2216 | 9 | 2216 |
| 9 | 2220 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -24 | .015 | -24 | .015 | 9 | .015 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -24 | 9 | 1 | 1 | .3 | .5 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 3460

INPUT
Description: Sta 34+60
Station Elevation Data num= 97

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2236.28 | -299.38 | 2236.29 | -298.82 | 2236.29 | -298.3 | 2236.29 | -297.84 | 2236.29 |
| -297.43 | 2236.29 | -195.97 | 2236 | -170.23 | 2236 | -167.58 | 2235.88 | -166.7 | 2235.85 |
| -166.39 | 2235.84 | -166.02 | 2235.83 | -165.59 | 2235.82 | -165.09 | 2235.82 | -164.55 | 2235.81 |
| -161.58 | 2235.77 | -150.42 | 2235.65 | -146.76 | 2235.62 | -134.77 | 2235.52 | -132.77 | 2235.51 |
| -131.28 | 2235.5 | -130.13 | 2235.49 | -119.67 | 2235.45 | -113.65 | 2235.42 | -109.39 | 2235.4 |
| -106.3 | 2235.38 | -97.7 | 2235.34 | -89.93 | 2235.3 | -76.51 | 2235.23 | -70.72 | 2235.2 |
| -67.51 | 2235.19 | -66.73 | 2235.18 | -66.27 | 2235.18 | -65.85 | 2235.18 | -64.97 | 2235.18 |
| -60.09 | 2235.19 | -56.74 | 2235.19 | -41.94 | 2235.2 | -38.6 | 2235.2 | -30.45 | 2235.2 |
| -23.22 | 2235.2 | 0 | 2235.4 | 46.25 | 2235.79 | 46.39 | 2235.8 | 46.63 | 2235.8 |

```
   47.23 2235.82   48.64 2235.84   59.76    2236   59.94    2236   60.07    2236
  105.26    2236  106.84    2236  107.96    2236   109.6    2236  111.93    2236
  119.61    2236  123.96    2236  127.48    2236  128.78    2236  143.29    2236
     144    2236  145.83    2236  148.25    2236  149.14    2236  149.19    2236
  149.27    2236  149.37    2236  149.51    2236  157.05    2236  162.56    2236
  162.57    2236  162.59    2236  163.11    2236  163.57    2236  163.93    2236
  164.99    2236  165.55    2236  169.45    2236  170.86    2236  193.04    2236
  196.94    2236  197.34    2236  197.76    2236   206.6    2236  212.34 2236.14
  218.96  2236.3  220.88 2236.34   232.1 2236.53  244.09 2236.72  250.51 2236.82
  260.08 2237.05  266.69 2237.16  275.63 2237.42  276.45 2237.44  286.14 2237.77
  293.03    2238     300 2238.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -109.39    .025       0    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -109.39       0              295     300     305             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch        RS: 3160

INPUT
Description: Sta 31+60
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2233.95 -299.66 2233.94 -289.58 2233.83 -262.77 2233.52 -256.35 2233.45
 -255.59 2233.43 -252.66  2233.4 -244.66 2233.25 -243.44 2233.23 -242.83 2233.21
 -242.23  2233.2 -241.58 2233.19 -240.95 2233.17 -234.95 2233.02 -222.83 2232.74
 -208.112232.377 -192.85    2232 -182.49    2232 -177.95    2232 -169.57 2232.13
 -167.98 2232.15 -164.59  2232.2 -163.82 2232.21 -163.05 2232.21 -162.28 2232.22
 -161.54 2232.23 -160.83 2232.23 -160.09 2232.24 -159.39 2232.24 -158.72 2232.24
 -147.94 2232.22  -137.6  2232.2 -124.71 2232.19 -120.74 2232.19 -120.25 2232.19
 -120.22 2232.19 -119.84  2232.2 -119.82  2232.2  -119.6  2232.2 -119.57  2232.2
 -115.25  2232.6 -113.95 2232.64  -56.61 2232.63  -56.55 2232.63  -56.44 2232.62
  -55.99 2232.61  -54.93 2232.56  -54.78 2232.52  -54.76 2232.52  -54.68 2232.51
   -54.6 2232.51  -54.43 2232.51  -54.21 2232.51  -53.95 2232.51  -52.94  2232.5
  -49.21 2232.49  -44.36 2232.48  -33.97 2232.47  -24.67 2232.46  -23.46 2232.45
  -22.88 2232.45  -22.39 2232.45  -21.93 2232.44   -21.5 2232.44  -21.19 2232.43
  -20.88 2232.43  -20.53 2232.42  -19.88 2232.41  -14.54 2232.24   -8.13 2232.03
   -7.13    2232   -3.54    2232       0    2232    4.74    2232   12.42    2232
   38.56    2232   45.68 2232.31   46.46 2232.35   47.14 2232.38   68.91 2233.36
   72.37 2233.52   83.78    2234   94.11 2234.31  136.74 2235.55  147.95 2235.88
  149.08 2235.92  151.14 2235.98  153.64 2236.06  154.62 2236.09  155.76 2236.13
  182.04 2236.94  182.91 2236.97  216.29    2238  277.55 2238.73     300    2239

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025 -208.11    .025   47.14    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       -208.11   47.14              340     300     260             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch        RS: 2860

INPUT
Description: Sta 28+60
Station Elevation Data    num=     211
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2232.19 -297.89 2232.15 -295.66  2232.1 -294.32 2232.08 -294.11 2232.07
 -289.71    2232 -277.65  2231.8 -277.41  2231.8 -269.84 2231.68 -267.33 2231.67
  -256.3 2231.51 -247.44 2231.38  -244.4 2231.39 -235.35 2231.27  -230.2 2231.27
 -225.68 2231.23 -217.87 2231.15 -213.17 2231.15 -210.89 2231.15 -204.72 2231.09
```

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-204.08 2231.09 -203.19 2231.09 -200.08 2231.12 -197.15 2231.16 -194.23  2231.2
-194.02  2231.2 -193.79  2231.2 -193.55  2231.2 -193.28  2231.2    -193  2231.2
 -192.7  2231.2  -192.4  2231.2 -192.14  2231.2 -190.44 2231.19 -189.78 2231.19
-187.95 2231.17 -185.76 2231.15 -179.57  2231.1 -176.43 2231.07 -174.73 2231.06
-172.09 2231.04  -162.6 2230.96 -159.15 2230.93 -147.24 2230.82 -132.58  2230.7
-130.59 2230.68  -104.5 2230.46  -99.21 2230.41  -97.55 2230.39  -93.44 2230.36
 -88.33 2230.32  -87.18 2230.31  -66.93 2230.14   -66.3 2230.14  -64.93 2230.12
 -64.41 2230.12  -64.32 2230.11  -64.12 2230.11  -64.08 2230.11  -64.05 2230.11
 -64.03 2230.11  -61.26  2230.1  -61.25  2230.1  -61.24  2230.1  -61.21  2230.1
 -61.19  2230.1  -60.49  2230.1   -60.2  2230.1  -59.62  2230.1  -59.53  2230.1
 -59.44  2230.1  -59.08  2230.1  -58.43  2230.1  -58.35  2230.1  -58.32  2230.1
 -58.28  2230.1  -58.25  2230.1  -58.23  2230.1   -58.2  2230.1  -58.18  2230.1
 -58.14  2230.1  -58.07  2230.1  -57.96 2230.11  -57.86 2230.11  -57.84 2230.11
 -57.83 2230.11  -57.81 2230.11  -57.79 2230.11  -48.68    2230  -43.66    2230
 -42.95    2230  -41.45    2230  -37.84    2230       0    2230     .63    2230
   2.58 2230.09   11.712230.454   50.49    2232   53.46 2232.08    87.8    2233
   89.3 2233.04   89.92 2233.05   90.49 2233.06   90.99 2233.08   91.53 2233.09
   92.9 2233.11   93.75 2233.12   94.16 2233.13   94.49 2233.13   95.84 2233.15
  96.31 2233.15   96.82 2233.16   98.46 2233.19  102.59 2233.27  125.17    2234
 152.19 2234.47  174.98 2234.84  182.35 2234.96  188.39 2235.06  192.89 2235.15
 196.63 2235.23   206.6 2235.45  208.47 2235.49  210.68 2235.57  213.82 2235.71
 214.66 2235.74  218.01 2235.82  223.85 2235.94  229.04 2236.05  232.66 2236.13
 233.26 2236.14  233.59 2236.15  233.95 2236.15   234.2 2236.15  234.61 2236.16
 235.05 2236.16  235.51 2236.17  235.99 2236.17  240.42  2236.2  240.91 2236.21
 243.19 2236.22  243.61 2236.23  244.02 2236.23   244.4 2236.24  245.64 2236.25
 246.08 2236.26  246.54 2236.26  247.01 2236.26  247.49 2236.27  247.96 2236.27
 249.48 2236.28  249.79 2236.29  250.16 2236.29   250.5  2236.3  250.82  2236.3
 251.12  2236.3   251.4 2236.31  251.65 2236.31  251.88 2236.32  252.06 2236.32
  252.2 2236.33  252.43 2236.34  252.68 2236.36  252.76 2236.36  252.86 2236.36
 253.01 2236.37  253.22 2236.37   253.5 2236.37  253.84 2236.38  254.22 2236.38
 255.51 2236.39  263.68 2236.43  264.46 2236.44  264.81 2236.44  265.11 2236.44
 265.32 2236.44  265.51 2236.44  265.82 2236.44  266.42 2236.43  267.48 2236.41
 268.65 2236.36  270.46 2236.31   272.4 2236.27  274.95 2236.24   275.8 2236.23
 278.81 2236.22  279.39 2236.22  279.64 2236.22   279.9 2236.22  280.15 2236.22
 280.44 2236.22  280.74 2236.23  281.04 2236.23  281.58 2236.24  286.71 2236.34
 290.84 2236.42  292.85 2236.47  293.02 2236.47  293.18 2236.47  293.33 2236.47
 293.47 2236.48  293.58 2236.48  293.68 2236.48  293.76 2236.47  294.94 2236.43
 296.26 2236.39  297.53 2236.36  298.52 2236.31  298.97 2236.28  299.88 2236.23
    300 2236.23

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -104.5    .025   11.71    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -104.5   11.71               350     300     250             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch          RS: 2560

INPUT
Description: Sta 25+60
Station Elevation Data      num=     202
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -300 2232.04 -298.63     2232 -298.21 2231.98 -297.09 2231.92 -296.73  2231.9
 -296.33 2231.88 -295.89 2231.87 -295.38 2231.86 -294.82 2231.85 -294.21 2231.84
 -292.92 2231.83 -288.33 2231.81 -275.33 2231.76 -273.97 2231.74 -273.35 2231.74
 -272.79 2231.73 -258.19     2232 -253.41 2231.78 -253.32 2231.81 -253.12 2231.85
 -252.83 2231.89 -252.42 2231.93  -252.4 2231.93 -251.84 2231.97 -251.83 2231.97
 -251.27     2232 -251.19     2232  -250.6     2232 -250.06     2232 -249.57     2232
  -247.4     2232 -245.41     2232 -245.16     2232 -244.74     2232 -244.53     2232
 -243.67     2232 -243.48     2232 -241.78     2232 -240.97     2232 -240.88     2232
  -240.8     2232 -240.62     2232 -240.22     2232 -240.12     2232 -230.65     2232
 -228.05     2232 -225.82     2232 -224.85     2232 -224.43     2232  -223.8     2232
 -223.36     2232 -222.61     2232 -221.66     2232  -221.4     2232 -216.29     2232
 -214.36     2232 -213.71     2232 -204.44     2232 -203.58     2232 -203.36     2232
 -203.16     2232 -202.89     2232 -194.59     2232 -194.32     2232 -181.34     2232
```

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 -181.09    2232 -166.87    2232 -157.61    2232 -157.04    2232 -148.28    2232
  -143.5 2231.75 -142.43 2231.71 -141.25 2231.63 -140.54  2231.6 -136.79 2231.33
 -136.05 2231.31  -135.8  2231.3 -135.54 2231.29 -135.23 2231.28 -134.89 2231.26
 -133.68 2231.17 -118.57    2230  -115.1 2229.86 -115.03 2229.86 -114.93 2229.85
  -114.6 2229.84  -98.32 2229.18  -95.17 2229.04   -91.2 2228.88  -82.62 2228.53
  -79.25  2228.4  -76.53 2228.31  -76.32  2228.3  -70.36 2228.11  -68.36 2228.03
  -67.51    2228  -67.31    2228  -67.23    2228  -65.96    2228  -64.76    2228
  -50.43    2228  -50.19    2228   -49.7    2228  -49.47    2228  -49.05    2228
  -48.84    2228  -44.89    2228  -44.42    2228  -43.94    2228  -40.93    2228
  -39.96    2228  -21.97    2228  -21.64    2228  -18.59    2228       0 2229.04
   12.81 2229.76   16.96    2230      22 2230.46   39.49    2232    42.2    2232
   44.07    2232   49.11    2232   55.02 2230.54   55.35 2230.55   56.02 2230.58
   56.37  2230.5   56.53 2230.46   56.85 2230.39   56.95 2230.38   57.02 2230.37
   57.06 2230.37   57.11 2230.37   57.17 2230.37   57.25 2230.37   57.34 2230.37
   57.56 2230.37   59.32 2230.36   60.49 2230.35   61.46 2230.34   62.27 2230.33
   62.34 2230.33    62.4 2230.33   62.47 2230.33   62.55 2230.33   62.63 2230.33
   62.72 2230.33   62.81 2230.33   62.99 2230.34   64.84 2230.39   65.08 2230.39
   65.22 2230.39   65.37  2230.4   65.53  2230.4   65.69  2230.4   66.21 2230.41
    69.8 2230.45   73.48 2230.49   73.98 2230.49   74.21 2230.49   74.39 2230.49
   74.48 2230.49   74.57 2230.49   74.59 2230.49   74.61 2230.49   84.17 2230.66
   92.08 2230.86   93.21 2230.89    93.8  2230.9    94.4 2230.91   95.01 2230.93
   95.62 2230.94  103.37 2231.08  104.05 2231.09  112.89 2231.26  113.57 2231.27
  121.23 2231.41  121.92 2231.42  126.08 2231.51  128.24 2231.52  134.46 2231.56
  137.91 2231.63  140.83 2231.64  141.44 2231.64  141.96 2231.65  142.34 2231.64
  142.55 2231.64  174.33 2231.81  176.67 2231.85  189.38    2232  197.14 2232.08
  198.61 2232.09  208.52 2232.19  218.31 2232.29  221.74  2232.3   236.1 2232.44
  241.62 2232.49  256.12 2232.53  275.04 2232.58  277.71 2232.59  283.97 2232.61
  289.63 2232.63     300 2232.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025  -95.17    .025       0    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -95.17       0              320     300     280             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch        RS: 2260

INPUT
Description: Sta 22+60
Station Elevation Data    num=     193
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300 2229.77 -298.27 2229.65 -274.83    2228  -270.1 2227.88 -258.44 2227.59
 -252.92 2227.45 -244.18 2227.23 -236.74 2227.06 -231.26 2226.93 -228.54 2226.87
 -224.97 2226.79 -224.51 2226.78 -224.28 2226.78  -224.2 2226.78 -223.98 2226.77
 -223.75 2226.77 -223.49 2226.77 -223.24 2226.77 -222.97 2226.77 -222.71 2226.77
 -221.91 2226.77 -219.84 2226.78  -214.7  2226.8 -213.35 2226.81 -210.29 2226.83
 -206.87 2226.87 -204.61  2226.9 -202.18 2226.95 -201.99 2226.95 -201.82 2226.95
 -201.56 2226.95 -201.25 2226.95 -200.91 2226.95 -198.29 2226.95 -197.92 2226.95
 -197.55 2226.95 -197.19 2226.95 -196.84 2226.94 -196.49 2226.94 -196.15 2226.94
 -188.99 2226.79 -188.07 2226.78 -182.82 2226.71 -182.15  2226.7 -181.63 2226.69
 -181.16 2226.68 -180.72 2226.67 -179.01 2226.62 -173.28 2226.43 -161.65 2226.04
 -161.64 2226.04 -160.22    2226 -159.15    2226 -157.85    2226 -157.51    2226
 -157.18    2226 -150.15    2226 -149.48    2226 -149.15    2226 -148.34    2226
 -147.02    2226 -145.86    2226 -132.23    2226  -131.5    2226 -121.44    2226
 -119.69    2226 -119.16    2226 -118.64    2226 -117.88    2226 -117.33    2226
 -112.85    2226 -111.22    2226 -110.48    2226  -107.2    2226 -104.88    2226
 -100.89  2226.1  -99.95 2226.12  -88.63 2226.36  -88.55 2226.36  -85.68 2226.43
  -80.56 2226.55  -79.54 2226.57  -79.08 2226.58  -77.09 2226.65  -73.35 2226.75
  -70.32 2226.83  -68.67 2226.87  -67.96 2226.88  -67.65 2226.89  -67.33 2226.89
  -67.02  2226.9   -66.7  2226.9  -61.31 2226.95   -53.5 2227.02  -51.03 2227.04
  -50.87 2227.04  -50.68 2227.04  -50.51 2227.04  -50.33 2227.04  -50.17 2227.04
  -50.04 2227.04  -49.95 2227.03  -49.91 2227.03  -46.12 2226.94  -45.87 2226.94
  -45.67 2226.94  -45.51 2226.93  -45.36 2226.93  -45.14 2226.92  -44.99 2226.92
  -44.89 2226.91  -44.85  2226.9  -25.63  2226.9  -20.77    2227  -19.47 2227.02
  -10.72 2227.17   -6.17 2227.24       0 2227.35    3.36  2227.4    16.7 2227.63
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 38.91 | 2228 | 39.61 | 2228.02 | 43.04 | 2228.13 | 47.11 | 2228.26 | 50.24 | 2228.38 |
| 58.56 | 2228.28 | 58.85 | 2228.2 | 59.51 | 2228.07 | 59.8 | 2228 | 62.87 | 2228 |
| 63.43 | 2228 | 69.85 | 2229.65 | 70.5 | 2229.72 | 73.62 | 2230 | 73.86 | 2230 |
| 73.95 | 2230 | 74.02 | 2230 | 81.33 | 2230 | 82.1 | 2230 | 84.44 | 2230 |
| 85.65 | 2230 | 86.3 | 2230 | 86.97 | 2230 | 87.44 | 2230 | 87.92 | 2230 |
| 89.6 | 2230 | 92.54 | 2230 | 93.06 | 2230 | 94.82 | 2230 | 96.82 | 2230 |
| 97.23 | 2230 | 98.23 | 2229.89 | 98.48 | 2229.87 | 98.81 | 2229.85 | 99.19 | 2229.84 |
| 100.05 | 2229.8 | 101 | 2229.77 | 101.5 | 2229.76 | 102.01 | 2229.75 | 102.55 | 2229.75 |
| 103.08 | 2229.74 | 103.64 | 2229.74 | 104.21 | 2229.74 | 105.95 | 2229.73 | 118.7 | 2229.77 |
| 132.01 | 2229.8 | 133.11 | 2229.81 | 133.66 | 2229.81 | 134.23 | 2229.82 | 134.97 | 2229.83 |
| 135.73 | 2229.85 | 136.51 | 2229.86 | 138.1 | 2229.9 | 139.72 | 2229.94 | 141.64 | 2230 |
| 142.56 | 2230.01 | 143.23 | 2230.02 | 143.95 | 2230.02 | 145.47 | 2230.03 | 159.63 | 2230.12 |
| 171.12 | 2230.19 | 171.72 | 2230.19 | 172.28 | 2230.19 | 172.79 | 2230.19 | 173.24 | 2230.19 |
| 176 | 2230.18 | 177.07 | 2230.18 | 180.86 | 2230.18 | 182.54 | 2230.18 | 184.02 | 2230.18 |
| 184.07 | 2230.18 | 184.94 | 2230.18 | 300 | 2230.18 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .025 | -173.28 | .025 | -85.68 | .025 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -173.28 | -85.68 | 150 | 150 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: West Branch RS: 2110

INPUT
Description: Sta 21+10
Station Elevation Data num= 203

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2228.83 | -299.25 | 2228.82 | -285.85 | 2228.66 | -269.8 | 2228.48 | -266.43 | 2228.44 |
| -263.81 | 2228.41 | -261.69 | 2228.38 | -251.71 | 2228.23 | -250.22 | 2228.21 | -248.8 | 2228.2 |
| -247.56 | 2228.18 | -246.42 | 2228.17 | -245.33 | 2228.16 | -239.15 | 2228.12 | -238 | 2228.11 |
| -236.77 | 2228.1 | -235.4 | 2228.09 | -234.22 | 2228.07 | -232.95 | 2228.05 | -231.19 | 2228.03 |
| -229.31 | 2228 | -229.2 | 2228 | -192.57 | 2227.12 | -190.73 | 2227.08 | -172.36 | 2226.76 |
| -171.46 | 2226.74 | -170.69 | 2226.72 | -167.32 | 2226.67 | -166.7 | 2226.66 | -165.45 | 2226.64 |
| -164.13 | 2226.62 | -161.71 | 2226.59 | -155.2 | 2226.52 | -1382 | 226.372 | -134.35 | 2226.34 |
| -111.82 | 2226.16 | -106.11 | 2226.1 | -103.96 | 2226.07 | -101.47 | 2226.04 | -98.19 | 2226 |
| -98.03 | 2226 | -96.93 | 2226 | -96.39 | 2226 | -94.73 | 2226 | -59.83 | 2225.42 |
| -57.54 | 2225.85 | -57.11 | 2225.91 | -56.91 | 2225.93 | -56.57 | 2225.96 | -56.16 | 2225.99 |
| -55.9 | 2226 | -55.52 | 2226 | -55.05 | 2226.01 | -54.61 | 2226.01 | -53.71 | 2226.02 |
| -48.44 | 2226.04 | -47.59 | 2226.04 | -46.74 | 2226.05 | -45.89 | 2226.05 | -45.06 | 2226.06 |
| -44.25 | 2226.07 | -43.47 | 2226.08 | -43.39 | 2226.08 | -42.62 | 2226.09 | -42.41 | 2226.09 |
| -41.66 | 2226.1 | -41.08 | 2226.1 | -41.03 | 2226.1 | -41.01 | 2226.1 | -41 | 2226.1 |
| -40.99 | 2226.1 | -40.71 | 2226.1 | -40.64 | 2226.1 | -40.28 | 2226.1 | -39.91 | 2226.1 |
| -39.86 | 2226.1 | -39.82 | 2226.1 | -39.78 | 2226.1 | -39.73 | 2226.1 | -39.68 | 2226.1 |
| -39.63 | 2226.1 | -39.58 | 2226.1 | -39.53 | 2226.1 | -39.43 | 2226.1 | -39.29 | 2226.11 |
| -39.17 | 2226.11 | -39.02 | 2226.11 | -38.59 | 2226.12 | -38.31 | 2226.12 | -38.24 | 2226.12 |
| -38.17 | 2226.12 | -38.1 | 2226.12 | -38.05 | 2226.12 | -36.98 | 2226.14 | -36.93 | 2226.14 |
| -35.92 | 2226.15 | -35.86 | 2226.15 | -35.8 | 2226.15 | -35.73 | 2226.15 | -35.68 | 2226.15 |
| -35.35 | 2226.15 | -35.2 | 2226.15 | -35.15 | 2226.15 | -35.08 | 2226.15 | -35 | 2226.15 |
| -34.91 | 2226.15 | -34.25 | 2226.16 | -33.93 | 2226.16 | -33.83 | 2226.16 | -33.61 | 2226.16 |
| -33.47 | 2226.16 | -33.37 | 2226.16 | -33.26 | 2226.16 | -33.02 | 2226.17 | -32.47 | 2226.17 |
| -31.81 | 2226.18 | -30.32 | 2226.19 | -29.92 | 2226.19 | -29.69 | 2226.2 | -28.79 | 2226.21 |
| -26.74 | 2226.23 | -25.89 | 2226.24 | -25.59 | 2226.24 | -25.34 | 2226.24 | -23.59 | 2226.26 |
| -21.84 | 2226.28 | -14.2 | 2226.38 | -1.55 | 2226.53 | -.09 | 2226.55 | 0 | 2226.55 |
| 1.38 | 2226.56 | 2.8 | 2226.58 | 4.23 | 2226.59 | 5.66 | 2226.61 | 7.08 | 2226.62 |
| 8.47 | 2226.63 | 11.09 | 2226.66 | 18.44 | 2226.72 | 19.61 | 2226.73 | 21.98 | 2226.75 |
| 22.59 | 2226.76 | 40.95 | 2226.95 | 55.04 | 2227.09 | 58.6 | 2227.13 | 59.65 | 2227.14 |
| 61.97 | 2227.17 | 63.21 | 2227.18 | 71.95 | 2227.27 | 76.53 | 2227.32 | 79.14 | 2227.35 |
| 111.8 | 2227.41 | 111.81 | 2227.41 | 116.3 | 2227.45 | 117.18 | 2227.46 | 119.74 | 2227.5 |
| 120.11 | 2227.5 | 120.49 | 2227.5 | 120.98 | 2227.51 | 121.49 | 2227.51 | 122.02 | 2227.51 |
| 122.57 | 2227.51 | 123.7 | 2227.51 | 132.66 | 2227.51 | 133.07 | 2227.5 | 133.4 | 2227.5 |
| 133.63 | 2227.5 | 133.74 | 2227.49 | 133.84 | 2227.48 | 133.92 | 2227.48 | 134.05 | 2227.48 |
| 134.22 | 2227.47 | 134.71 | 2227.47 | 134.97 | 2227.47 | 135.56 | 2227.47 | 135.87 | 2227.47 |
| 136.14 | 2227.47 | 136.42 | 2227.47 | 136.78 | 2227.47 | 137.23 | 2227.47 | 137.68 | 2227.48 |
| 138.08 | 2227.48 | 138.33 | 2227.48 | 138.56 | 2227.49 | 140.62 | 2227.53 | 144.6 | 2227.62 |

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  145.54 2227.63  149.88  2227.7   150.5 2227.71  151.23 2227.72     152 2227.72
   152.8 2227.73  157.16 2227.77  175.92 2227.92  176.67 2227.93  178.17 2227.95
  179.67 2227.97  181.06 2227.99  182.04    2228  184.01 2228.13  184.99  2228.2
  186.52  2228.3  211.49    2230     300    2230

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300    .025    -138    .025   -14.2    .025

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -138   -14.2              330     340     350             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: West Branch        RS: 1760

INPUT
Description: Sta 17+60
Station Elevation Data    num=       4
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
 -152.29     2225   -2.57     2224  291.63     2224  571.63     2225

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -152.29    .016   -2.57    .016  291.63    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         -2.57  291.63              220     230     240             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 1640

INPUT
Description: Sta 16+40 as-built L-1704 7x3 joins in
Station Elevation Data    num=      10
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
     -37     2224     -32     2219     -32     2216     -25     2216     -24     2216
      -8     2216      -7     2216       9     2216       9     2220      14     2224

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -37    .015     -32    .015       9    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -32       9              150     140     125             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 1500

INPUT
Description: Sta 15+00 as-built L1704
Station Elevation Data    num=     113
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
    -300     2224 -277.23     2224 -274.68     2224 -268.24     2224 -267.97     2224
 -260.35 2223.89 -256.82 2223.83 -241.68 2223.57 -238.86 2223.53 -222.92  2223.3
 -211.16 2223.13 -203.97 2222.99 -201.24 2222.95 -200.45 2222.93  -177.3  2222.5
 -176.76 2222.49 -175.89 2222.47 -150.52     2222 -110.45  2220.4 -105.23 2220.17
 -103.69 2220.11  -38.33  2219.5  -22.33  2215.5        0  2215.5   23.33  2215.5
   38.33  2219.5    61.2     2220   62.27 2220.02   64.49 2220.06   70.81 2220.14
   70.86 2220.15   70.92 2220.15   80.25 2220.35   80.39 2220.36   80.74 2220.38
    83.2 2220.44   83.95 2220.47   84.66 2220.49   93.45 2220.98    95.5  2221.1
   96.66 2221.17   97.91 2221.26   99.18 2221.34  100.56 2221.44  102.08 2221.56
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  105.79 2221.85  107.63    2222  108.58 2222.03  110.65  2222.1  111.57 2222.13
   112.4 2222.16  114.34  2222.2  115.41 2222.24   116.4 2222.27  117.26 2222.31
  118.74 2222.38  126.83 2222.82  127.53 2222.85   127.9 2222.87  128.28 2222.88
  128.71 2222.89  129.17  2222.9  129.67 2222.91   130.2 2222.92  131.84 2222.94
  141.09 2223.03  145.64 2223.09   147.2 2223.11  156.49 2223.22  160.78 2223.29
  164.33 2223.35   175.1 2223.45  175.59 2223.46  175.81 2223.46  189.46 2223.59
  189.57 2223.59  189.68 2223.59  189.84  2223.6     190  2223.6  195.04 2223.62
  195.51 2223.64  209.74 2223.69  212.13 2223.75  213.69 2223.79  214.51 2223.81
  214.71 2223.82  214.99 2223.82   215.7 2223.83  215.83 2223.83   215.9 2223.83
  215.97 2223.83  216.03 2223.83   216.1 2223.83  216.17 2223.83  216.86 2223.84
  217.05 2223.84  218.12 2223.84  218.49 2223.83  218.61 2223.83  218.87 2223.83
  219.07 2223.84  227.98 2223.88  228.86 2223.88  242.59 2223.96  249.05 2223.99
  249.99    2224  258.46 2224.07   262.5  2224.1  264.39 2224.11  268.76 2224.12
  283.87 2224.15   295.6 2224.18     300  2224.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .04  -38.33     .04   38.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -38.33   38.33              320     300     280            .1        .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 1200

INPUT
Description: Sta 12+00 as-built L1704 new FL grades at 105+00
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -300  2225.3 -297.39  2225.2 -286.39 2224.83 -265.07    2224  -250.4 2223.42
 -216.64 2222.13 -215.51 2222.09 -214.12 2222.03 -213.27    2222 -161.56 2220.76
 -156.86 2220.65 -153.44 2220.57 -149.69 2220.49 -145.79  2220.4 -137.87 2220.22
 -130.17    2220  -123.1 2219.86 -119.33  2219.8 -117.55 2219.77  -116.9 2219.76
 -116.54 2219.75  -116.1 2219.74 -114.57 2219.72 -102.89  2219.5  -61.67 2218.75
  -58.87  2218.7  -45.31 2218.47  -21.89    2218   -7.68 2216.16   -6.35    2216
   -3.83  2214.9       0  2214.9   11.44  2214.9   22.98 2216.76   28.48 2217.03
   35.91 2217.47   48.29    2218   55.43 2218.13    55.7 2218.13   70.11 2218.38
   73.63 2218.41   74.49 2218.42   74.72 2218.42   74.94 2218.42   75.38 2218.43
   76.58 2218.45   82.16 2218.54    83.3 2218.56    84.1 2218.58   89.37  2218.7
   91.23 2218.74    94.1 2218.79  109.41 2219.06  119.09 2219.22  130.78 2219.46
  136.09 2219.55  140.63 2219.63  161.48    2220  163.14 2220.02   176.6 2220.13
  178.98 2220.15  180.62 2220.16  194.13 2220.22  207.71 2220.28  209.03 2220.28
  223.06 2220.34     225 2220.35  227.05 2220.36  230.26 2220.37   232.3 2220.38
  235.44 2220.39  236.12  2220.4  237.67  2220.4  240.51 2220.41  241.07 2220.41
  241.66 2220.42  244.77 2220.44  245.63 2220.44  249.52 2220.46  251.55 2220.46
  253.86 2220.47  257.24 2220.48   257.7 2220.48   257.9 2220.48  258.12 2220.49
  258.33 2220.49  258.62 2220.49  258.91 2220.49  265.45 2220.55  266.19 2220.56
  266.55 2220.56  266.89 2220.56  267.21 2220.57   267.5 2220.57  267.77 2220.57
  268.26 2220.58   272.3 2220.66  277.61 2220.76  286.44 2220.91  292.72 2221.02
  293.38 2221.03  294.08 2221.04  294.83 2221.06  295.65 2221.06  296.46 2221.08
  298.12 2221.09  299.01  2221.1     300 2221.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -300     .03  -21.89     .03   48.29     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -21.89   48.29              275     300     325            .1        .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 900

INPUT
Description: Sta 9+00
```

Station Elevation Data num= 167

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -300 | 2220.76 | -298.47 | 2220.73 | -284.1 | 2220.48 | -281.97 | 2220.44 | -281.29 | 2220.42 |
| -277.35 | 2220.35 | -271.09 | 2220.24 | -270.04 | 2220.22 | -267.88 | 2220.18 | -266.98 | 2220.16 |
| -265.91 | 2220.15 | -265.07 | 2220.14 | -264.23 | 2220.13 | -263.36 | 2220.11 | -262.55 | 2220.11 |
| -260.94 | 2220.1 | -260.86 | 2220.1 | -257.74 | 2220.08 | -257.7 | 2220.08 | -256.36 | 2220.08 |
| -256.3 | 2220.08 | -255.75 | 2220.08 | -255.43 | 2220.07 | -255.33 | 2220.07 | -254.89 | 2220.06 |
| -254.6 | 2220.06 | -254.56 | 2220.06 | -254.54 | 2220.06 | -254.52 | 2220.06 | -254.5 | 2220.06 |
| -254.48 | 2220.06 | -254.2 | 2220.05 | -254.05 | 2220.05 | -253.69 | 2220.05 | -253.57 | 2220.05 |
| -253.05 | 2220.05 | -252.63 | 2220.06 | -252.33 | 2220.06 | -252.13 | 2220.07 | -252 | 2220.08 |
| -251.72 | 2220.13 | -250.39 | 2220.23 | -250.38 | 2220.24 | -245.83 | 2220.44 | -244.87 | 2220.45 |
| -239.87 | 2220.56 | -239.24 | 2220.56 | -238.48 | 2220.57 | -234.29 | 2220.6 | -233.6 | 2220.61 |
| -233.02 | 2220.62 | -229.07 | 2220.69 | -226.35 | 2220.74 | -225.64 | 2220.75 | -225.35 | 2220.75 |
| -225.03 | 2220.76 | -224.67 | 2220.76 | -224.26 | 2220.76 | -223.83 | 2220.76 | -222.44 | 2220.76 |
| -218.6 | 2220.76 | -218.14 | 2220.76 | -217.69 | 2220.76 | -217.26 | 2220.76 | -216.89 | 2220.76 |
| -216.52 | 2220.75 | -216.17 | 2220.75 | -213.64 | 2220.72 | -213.19 | 2220.72 | -212.24 | 2220.71 |
| -208.11 | 2220.69 | -198.73 | 2220.63 | -197.66 | 2220.63 | -196.68 | 2220.62 | -195.29 | 2220.6 |
| -193.99 | 2220.59 | -193.21 | 2220.58 | -186.29 | 2220.46 | -185.24 | 2220.44 | -184.65 | 2220.42 |
| -183.49 | 2220.39 | -179.34 | 2220.24 | -178.07 | 2220.2 | -176.91 | 2220.18 | -175.96 | 2220.16 |
| -175.34 | 2220.15 | -174.67 | 2220.14 | -170.22 | 2220.08 | -168.8 | 2220.06 | -168.17 | 2220.05 |
| -167.64 | 2220.04 | -167.16 | 2220.03 | -166.31 | 2220.01 | -165.95 | 2220 | -137.5 | 2219.03 |
| -99.23 | 2218 | -96.17 | 2217.9 | -95.39 | 2217.87 | -77.89 | 2217.24 | -59.6 | 2216.54 |
| -52.6 | 2216.28 | -45.66 | 2216 | -37.4 | 2215.73 | -26.13 | 2215.36 | -22.53 | 2215.25 |
| -22.4 | 2215.25 | -21.67 | 2215.23 | -21.03 | 2215.2 | -18.55 | 2215.09 | -14.97 | 2214.95 |
| -14.51 | 2214.93 | -13.44 | 2214.86 | -13.18 | 2214.85 | -13.03 | 2214.84 | -12.85 | 2214.83 |
| -12.23 | 2214.82 | -10.95 | 2214.79 | -10.78 | 2214.78 | -10.63 | 2214.78 | -10.5 | 2214.77 |
| -10.42 | 2214.77 | -10.39 | 2214.76 | 0 | 2214.72 | 11.55 | 2214.66 | 13.54 | 2214.71 |
| 16.72 | 2214.8 | 17.38 | 2214.81 | 22.3 | 2214.93 | 27.83 | 2215.08 | 35.69 | 2215.28 |
| 40.27 | 2215.41 | 55.79 | 2215.84 | 55.84 | 2215.84 | 62.06 | 2216 | 68.47 | 2216.11 |
| 91.66 | 2216.5 | 104.31 | 2216.71 | 123.01 | 2217.02 | 138.66 | 2217.3 | 177.31 | 2217.98 |
| 177.66 | 2217.99 | 178.35 | 2218 | 189.03 | 2218.15 | 210.64 | 2218.46 | 222.24 | 2218.62 |
| 232.39 | 2218.77 | 233.74 | 2218.79 | 234.38 | 2218.79 | 235 | 2218.8 | 235.6 | 2218.81 |
| 236.17 | 2218.81 | 236.72 | 2218.81 | 237.26 | 2218.82 | 245.35 | 2218.83 | 255.7 | 2218.84 |
| 259.12 | 2218.85 | 260.07 | 2218.85 | 260.43 | 2218.86 | 261.35 | 2218.86 | 262.13 | 2218.87 |
| 268.06 | 2218.94 | 275.78 | 2219 | 280.87 | 2219.06 | 288.79 | 2219.12 | 297.85 | 2219.22 |
| 299.35 | 2219.24 | 300 | 2219.24 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -300 | .03 | -45.66 | .03 | 62.06 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| -45.66 | 62.06 | 100 | 100 | 100 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 800

INPUT
Description: Silverado Pines Cross Section 12.0
Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 825 | 2217 | 925 | 2216 | 934 | 2215 | 984 | 2214 | 990 | 2213.45 |
| 995 | 2213.45 | 1005 | 2213.45 | 1010 | 2213.45 | 1017 | 2214 | 1044 | 2215 |
| 1070 | 2216 | 1124 | 2217 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 825 | .03 | 934 | .03 | 1044 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 934 | 1044 | 50 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 750

INPUT
Description: Silverado Pines Cross Section 11.5
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 2217 | 900 | 2216 | 920 | 2215 | 945 | 2214 | 970 | 2212 |
| 1030 | 2212 | 1070 | 2215 | 1090 | 2216 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 800 | .03 | 970 | .03 | 1030 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 970 | 1030 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 700

INPUT
Description: Silverado Pines Cross Section 11.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 2217 | 910 | 2215 | 940 | 2212 | 950 | 2211.6 | 1000 | 2211.45 |
| 1020 | 2211.6 | 1030 | 2211.68 | 1070 | 2212 | 1110 | 2216 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 800 | .03 | 950 | .03 | 1030 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 950 | 1030 | 100 | 100 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1070 | 1110 | 2217 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 600

INPUT
Description: Silverado Pines Cross Section 10.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 892 | 2215 | 910 | 2214 | 940 | 2211 | 965 | 2210.792 | 1000 | 2210.5 |
| 1050 | 2210.857 | 1140 | 2211.5 | 1150 | 2213.5 | 1160 | 2215.5 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 892 | .03 | 965 | .03 | 1050 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 965 | 1050 | 100 | 100 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 1070 | 1160 | 2216 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 500

INPUT
Description: Silverado Pines Cross Section 9.0
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2215.75 | 975 | 2209.5 | 1000 | 2209.5 | 10502209.813 | | 1080 | 2210 |
| 1115 | 2210.6 | 1225 | 2210.8 | 1240 | 2213.8 | 1246 | 2215 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 955 | .03 | 975 | .03 | 1050 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 975 | 1050 | 22 | 25 | 30 .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 955 | 975 | 2216 | F |
| 1070 | 1246 | 2216 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 475

INPUT
Description: Silverado Pines Cross Section 8.75
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 930 | 2215 | 945 | 2210 | 9752209.356 | | 1000 | 2209.13 | 1020 | 2209.13 |
| 1040 | 2209.13 | 1070 | 2209.8 | 1140 | 2209.8 | 1150 | 2212.8 | 1160 | 2215 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 930 | .03 | 975 | .03 | 1040 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 975 | 1040 | 12 | 45 | 70 .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 930 | 945 | 2217 | F |
| 1075 | 1160 | 2217 | F |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 430

INPUT
Description: Silverado Pines Cross Section 8.3
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 958 | 2215.8 | 980 | 2208.47 | 1000 | 2208.47 | 1020 | 2208.47 | 1041 | 2215.47 |
| 1053 | 2215.65 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 958 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 60 | 60 | 60 .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 370

INPUT
Description: Silverado Pines Cross Section 7.71
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2213.85 | 980 | 2205.55 | 1000 | 2205.55 | 1020 | 2205.55 | 1041 | 2212.55 |

```
    1053 2212.75    1053 2214.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955    .035     980    .035    1020    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               71      71      71             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 300

INPUT
Description: Silverado Pines Cross Section 7.0
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955  2213.5     980  2205.2    1000  2205.2    1020  2205.2    1041  2212.2
    1053  2212.4    1053  2214.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 250

INPUT
Description: Silverado Pines Cross Section 6.5
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955 2213.25     980 2204.95    1000 2204.95    1020 2204.95    1041 2211.95
    1053 2212.15    1053 2214.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION


RIVER: Duck Creek
REACH: East-lower         RS: 200

INPUT
Description: Silverado Pines Cross Section 6.0
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     955    2213     980  2204.7    1000  2204.7    1020  2204.7    1041  2211.7
    1053  2211.9    1053  2213.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     955     .03     980     .03    1020     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           980    1020               50      50      50             .1       .3

CROSS SECTION
```

RIVER: Duck Creek
REACH: East-lower RS: 150

INPUT
Description: Silverado Pines Cross Section 5.5
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 955 | 2212.78 | 980 | 2204.45 | 1020 | 2204.45 | 1041 | 2211.45 | 1053 | 2211.6 |
| 1053 | 2213.6 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 955 | .03 | 980 | .03 | 1020 | .03 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 17 | 17 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 128

INPUT
Description: Silverado Pines Cross Section 5.28
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 970 | 2214.7 | 980 | 2214.6 | 980.1 | 2204.34 | 1020 | 2204.34 | 1020.1 | 2214.6 |
| 1030 | 2214.7 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 970 | .013 | 980.1 | .013 | 1020 | .013 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980.1 | 1020 | 75 | 75 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 60

INPUT
Description: Silverado Pines Cross Section 4.6
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 875 | 2215 | 947 | 2214.8 | 980 | 2204 | 1020 | 2204 | 1053 | 2214.8 |
| 1125 | 2215 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 875 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 10 | 10 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 50

INPUT
Description: Silverado Pines Cross Section 4.5
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 875 | 2215.5 | 945 | 2215.5 | 980 | 2203.75 | 1020 | 2203.75 | 1055 | 2215.5 |

1225 2216

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 875 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: 0

INPUT
Description: Silverado Pines Cross Section 4.0
Station Elevation Data num= 6

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 880 | 2212 | 950 | 2212 | 980 | 2202.5 | 1020 | 2202.5 | 1048 | 2211 |
| 1140 | 2211.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 880 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 50 | 50 | .1 | .3 |

CROSS SECTION

RIVER: Duck Creek
REACH: East-lower RS: -50

INPUT
Description: Silverado Pines Cross Section 3.5
Station Elevation Data num= 8

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 490 | 2206 | 500 | 2204 | 970 | 2204 | 980 | 2201.35 | 1020 | 2201.35 |
| 1030 | 2204 | 1500 | 2204 | 1510 | 2206 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 490 | .035 | 980 | .035 | 1020 | .035 |

| Bank Sta: Left | Right | Lengths: Left Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|
| 980 | 1020 | 0 | 0 | .1 | .3 |

SUMMARY OF MANNING'S N VALUES

River:Duck Creek

| Reach | River Sta. | n1 | n2 | n3 |
|---|---|---|---|---|
| East-West Branch | 500 | .025 | .025 | .025 |
| East-West Branch | 400 | .025 | .025 | .025 |
| East-West Branch | 300 | .025 | .025 | .025 |
| East-West Branch | 200 | .025 | .025 | .025 |
| East-West Branch | 100 | .025 | .025 | .025 |
| East-East Branch | 500 | .025 | .025 | .025 |
| East-East Branch | 400 | .025 | .025 | .025 |
| East-East Branch | 300 | .025 | .025 | .025 |
| East-East Branch | 200 | .025 | .025 | .025 |
| East-East Branch | 100 | .025 | .025 | .025 |
| East | 12300 | .025 | .025 | .025 |
| East | 12000 | .025 | .025 | .025 |
| East | 11700 | .025 | .025 | .025 |

| | | | | |
|---|---|---|---|---|
| East | 11540 | .015 | .015 | .015 |
| East | 11510 | Culvert | | |
| East | 11480.* | .015 | .015 | .015 |
| East | 11400 | .025 | .025 | .025 |
| East | 11100 | .025 | .025 | .025 |
| East | 10800 | .025 | .025 | .025 |
| East | 10500 | .025 | .025 | .025 |
| East | 10200 | .025 | .025 | .025 |
| East | 10110 | .015 | .015 | .015 |
| East | 10075 | Bridge | | |
| East | 10040 | .015 | .015 | .015 |
| East | 9900 | .025 | .025 | .025 |
| East | 9600 | .025 | .025 | .025 |
| East | 9300 | .025 | .025 | .025 |
| East | 9000 | .025 | .025 | .025 |
| East | 8940 | .015 | .025 | .015 |
| East | 8939 | .044 | .044 | .044 |
| East | 8860 | .044 | .044 | .044 |
| East | 8700 | .025 | .015 | .015 |
| East | 8400 | .015 | .015 | .025 |
| East | 8250 | .015 | .015 | .015 |
| East | 8200 | .015 | .015 | .015 |
| East | 8150 | Bridge | | |
| East | 8100 | .025 | .015 | .025 |
| East | 7800 | .015 | .015 | .015 |
| East | 7500 | .015 | .015 | .015 |
| East | 7235 | .015 | .015 | .015 |
| East | 7182.5 | Bridge | | |
| East | 7130 | .015 | .015 | .015 |
| East | 6900 | .025 | .025 | .025 |
| East | 6600 | .025 | .025 | .025 |
| East | 6300 | .025 | .025 | .025 |
| East | 6250 | .037 | .015 | .037 |
| East | 6190 | .037 | .015 | .037 |
| East | 6000 | .037 | .015 | .037 |
| East | 5900 | .037 | .015 | .037 |
| East | 5830 | .015 | .015 | .015 |
| East | 5800 | Bridge | | |
| East | 5770 | .025 | .015 | .015 |
| East | 5700 | .037 | .015 | .037 |
| East | 5545 | .037 | .015 | .037 |
| East | 5530 | .025 | .015 | .025 |
| East | 5505 | .015 | .015 | .015 |
| East | 5462.5 | Bridge | | |
| East | 5420 | .015 | .015 | .015 |
| East | 5350 | .025 | .015 | .015 |
| East | 5100 | .025 | .015 | .015 |
| East | 4810 | .025 | .025 | .015 |
| East | 4800 | .025 | .025 | .025 |
| East | 4500 | .025 | .025 | .025 |
| East | 4450 | .015 | .015 | .015 |
| East | 4415 | Bridge | | |
| East | 4380 | .015 | .015 | .015 |
| East | 4200 | .035 | .035 | .035 |
| East | 3900 | .025 | .025 | .025 |
| East | 3600 | .025 | .025 | .025 |
| East | 3300 | .025 | .025 | .025 |
| East | 3000 | .025 | .025 | .025 |
| East | 2820.* | .025 | .025 | .025 |
| East | 2700 | .015 | .04 | .025 |
| East | 2470.* | .04 | .04 | .04 |
| East | 2400 | .015 | .04 | .025 |
| East | 2260.* | .025 | .025 | .025 |
| East | 2100 | .015 | .015 | .03 |
| East | 2008.56 | .015 | .015 | .015 |
| East | 1800 | .015 | .015 | .015 |
| East | 1799.9 | .015 | .015 | .015 |
| East | 1700 | Bridge | | |
| East | 1641 | .015 | .015 | .015 |
| West Branch | 3460 | .025 | .025 | .025 |

| | | | | |
|---|---|---|---|---|
| West Branch | 3160 | .025 | .025 | .025 |
| West Branch | 2860 | .025 | .025 | .025 |
| West Branch | 2560 | .025 | .025 | .025 |
| West Branch | 2260 | .025 | .025 | .025 |
| West Branch | 2110 | .025 | .025 | .025 |
| West Branch | 1760 | .016 | .016 | .016 |
| East-lower | 1640 | .015 | .015 | .015 |
| East-lower | 1500 | .04 | .04 | .04 |
| East-lower | 1200 | .03 | .03 | .03 |
| East-lower | 900 | .03 | .03 | .03 |
| East-lower | 800 | .03 | .03 | .03 |
| East-lower | 750 | .03 | .03 | .03 |
| East-lower | 700 | .03 | .03 | .03 |
| East-lower | 600 | .03 | .03 | .03 |
| East-lower | 500 | .03 | .03 | .03 |
| East-lower | 475 | .03 | .03 | .03 |
| East-lower | 430 | .035 | .035 | .035 |
| East-lower | 370 | .035 | .035 | .035 |
| East-lower | 300 | .03 | .03 | .03 |
| East-lower | 250 | .03 | .03 | .03 |
| East-lower | 200 | .03 | .03 | .03 |
| East-lower | 150 | .03 | .03 | .03 |
| East-lower | 128 | .013 | .013 | .013 |
| East-lower | 60 | .035 | .035 | .035 |
| East-lower | 50 | .035 | .035 | .035 |
| East-lower | 0 | .035 | .035 | .035 |
| East-lower | -50 | .035 | .035 | .035 |

SUMMARY OF REACH LENGTHS

River: Duck Creek

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| East-West Branch | 500 | 100 | 100 | 100 |
| East-West Branch | 400 | 100 | 100 | 100 |
| East-West Branch | 300 | 100 | 100 | 100 |
| East-West Branch | 200 | 100 | 100 | 100 |
| East-West Branch | 100 | 100 | 100 | 100 |
| East-East Branch | 500 | 100 | 100 | 100 |
| East-East Branch | 400 | 100 | 100 | 100 |
| East-East Branch | 300 | 100 | 100 | 100 |
| East-East Branch | 200 | 100 | 100 | 100 |
| East-East Branch | 100 | 100 | 100 | 100 |
| East | 12300 | 290 | 300 | 310 |
| East | 12000 | 290 | 300 | 310 |
| East | 11700 | 180 | 160 | 150 |
| East | 11540 | 60 | 60 | 60 |
| East | 11510 | Culvert | | |
| East | 11480.* | 100 | 80 | 80 |
| East | 11400 | 280 | 300 | 310 |
| East | 11100 | 260 | 300 | 340 |
| East | 10800 | 300 | 300 | 300 |
| East | 10500 | 400 | 300 | 200 |
| East | 10200 | 50 | 90 | 120 |
| East | 10110 | 70 | 70 | 70 |
| East | 10075 | Bridge | | |
| East | 10040 | 200 | 140 | 80 |
| East | 9900 | 300 | 300 | 310 |
| East | 9600 | 300 | 300 | 300 |
| East | 9300 | 350 | 300 | 250 |
| East | 9000 | 80 | 60 | 50 |
| East | 8940 | 1 | 1 | 1 |
| East | 8939 | 79 | 79 | 79 |
| East | 8860 | 160 | 160 | 160 |
| East | 8700 | 300 | 300 | 300 |
| East | 8400 | 200 | 200 | 200 |

| | | | | |
|---|---|---|---|---|
| East | 8250 | 80 | 50 | 30 |
| East | 8200 | 100 | 100 | 100 |
| East | 8150 | Bridge | | |
| East | 8100 | 290 | 300 | 300 |
| East | 7800 | 300 | 300 | 310 |
| East | 7500 | 265 | 265 | 265 |
| East | 7235 | 105 | 105 | 105 |
| East | 7182.5 | Bridge | | |
| East | 7130 | 230 | 230 | 230 |
| East | 6900 | 300 | 300 | 300 |
| East | 6600 | 300 | 300 | 300 |
| East | 6300 | 50 | 50 | 50 |
| East | 6250 | 30 | 60 | 90 |
| East | 6190 | 200 | 190 | 180 |
| East | 6000 | 120 | 100 | 80 |
| East | 5900 | 60 | 60 | 60 |
| East | 5830 | 60 | 60 | 60 |
| East | 5800 | Bridge | | |
| East | 5770 | 70 | 70 | 70 |
| East | 5700 | 155 | 155 | 155 |
| East | 5545 | 10 | 15 | 25 |
| East | 5530 | 20 | 25 | 35 |
| East | 5505 | 85 | 85 | 85 |
| East | 5462.5 | Bridge | | |
| East | 5420 | 105 | 70 | 35 |
| East | 5350 | 250 | 250 | 250 |
| East | 5100 | 290 | 290 | 290 |
| East | 4810 | 1 | 10 | 20 |
| East | 4800 | 320 | 300 | 150 |
| East | 4500 | 50 | 50 | 50 |
| East | 4450 | 70 | 70 | 70 |
| East | 4415 | Bridge | | |
| East | 4380 | 200 | 180 | 160 |
| East | 4200 | 360 | 350 | 340 |
| East | 3900 | 280 | 300 | 320 |
| East | 3600 | 280 | 300 | 320 |
| East | 3300 | 320 | 300 | 280 |
| East | 3000 | 160 | 180 | 220 |
| East | 2820.* | 120 | 120 | 120 |
| East | 2700 | 160 | 230 | 280 |
| East | 2470.* | 70 | 70 | 70 |
| East | 2400 | 140 | 140 | 140 |
| East | 2260.* | 160 | 150 | 140 |
| East | 2100 | 94.1 | 94.1 | 94.1 |
| East | 2008.56 | 208.56 | 208.56 | 208.56 |
| East | 1800 | .1 | .1 | .1 |
| East | 1799.9 | 159 | 159 | 159 |
| East | 1700 | Bridge | | |
| East | 1641 | 1 | 1 | 1 |
| West Branch | 3460 | 295 | 300 | 305 |
| West Branch | 3160 | 340 | 300 | 260 |
| West Branch | 2860 | 350 | 300 | 250 |
| West Branch | 2560 | 320 | 300 | 280 |
| West Branch | 2260 | 150 | 150 | 150 |
| West Branch | 2110 | 330 | 340 | 350 |
| West Branch | 1760 | 220 | 230 | 240 |
| East-lower | 1640 | 150 | 140 | 125 |
| East-lower | 1500 | 320 | 300 | 280 |
| East-lower | 1200 | 275 | 300 | 325 |
| East-lower | 900 | 100 | 100 | 100 |
| East-lower | 800 | 50 | 50 | 50 |
| East-lower | 750 | 50 | 50 | 50 |
| East-lower | 700 | 100 | 100 | 100 |
| East-lower | 600 | 100 | 100 | 100 |
| East-lower | 500 | 22 | 25 | 30 |
| East-lower | 475 | 12 | 45 | 70 |
| East-lower | 430 | 60 | 60 | 60 |
| East-lower | 370 | 71 | 71 | 71 |
| East-lower | 300 | 50 | 50 | 50 |
| East-lower | 250 | 50 | 50 | 50 |

| | | | | |
|---|---|---|---|---|
| East-lower | 200 | 50 | 50 | 50 |
| East-lower | 150 | 17 | 17 | 17 |
| East-lower | 128 | 75 | 75 | 75 |
| East-lower | 60 | 10 | 10 | 10 |
| East-lower | 50 | 50 | 50 | 50 |
| East-lower | 0 | 50 | 50 | 50 |
| East-lower | -50 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Duck Creek

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| East-West Branch | 500 | .1 | .3 |
| East-West Branch | 400 | .1 | .3 |
| East-West Branch | 300 | .1 | .3 |
| East-West Branch | 200 | .1 | .3 |
| East-West Branch | 100 | .1 | .3 |
| East-East Branch | 500 | .1 | .3 |
| East-East Branch | 400 | .1 | .3 |
| East-East Branch | 300 | .1 | .3 |
| East-East Branch | 200 | .1 | .3 |
| East-East Branch | 100 | .1 | .3 |
| East | 12300 | .1 | .3 |
| East | 12000 | .1 | .3 |
| East | 11700 | .1 | .3 |
| East | 11540 | .1 | .3 |
| East | 11510 | Culvert | |
| East | 11480.* | .1 | .3 |
| East | 11400 | .1 | .3 |
| East | 11100 | .1 | .3 |
| East | 10800 | .1 | .3 |
| East | 10500 | .1 | .3 |
| East | 10200 | .1 | .3 |
| East | 10110 | .1 | .3 |
| East | 10075 | Bridge | |
| East | 10040 | .1 | .3 |
| East | 9900 | .1 | .3 |
| East | 9600 | .1 | .3 |
| East | 9300 | .1 | .3 |
| East | 9000 | .1 | .3 |
| East | 8940 | .1 | .3 |
| East | 8939 | .1 | .3 |
| East | 8860 | .1 | .3 |
| East | 8700 | .1 | .3 |
| East | 8400 | .1 | .3 |
| East | 8250 | .1 | .3 |
| East | 8200 | .3 | .5 |
| East | 8150 | Bridge | |
| East | 8100 | .3 | .5 |
| East | 7800 | .1 | .3 |
| East | 7500 | .1 | .3 |
| East | 7235 | .3 | .5 |
| East | 7182.5 | Bridge | |
| East | 7130 | .3 | .5 |
| East | 6900 | .1 | .3 |
| East | 6600 | .1 | .3 |
| East | 6300 | .1 | .3 |
| East | 6250 | .1 | .3 |
| East | 6190 | .1 | .3 |
| East | 6000 | .1 | .3 |
| East | 5900 | .1 | .3 |
| East | 5830 | .3 | .5 |
| East | 5800 | Bridge | |
| East | 5770 | .3 | .5 |
| East | 5700 | .1 | .3 |

| | | | | |
|---|---|---|---|---|
| East | 5545 | | .1 | .3 |
| East | 5530 | | .1 | .3 |
| East | 5505 | | .3 | .5 |
| East | 5462.5 | Bridge | | |
| East | 5420 | | .3 | .5 |
| East | 5350 | | .1 | .3 |
| East | 5100 | | .1 | .3 |
| East | 4810 | | .1 | .3 |
| East | 4800 | | .1 | .3 |
| East | 4500 | | .1 | .3 |
| East | 4450 | | .3 | .5 |
| East | 4415 | Bridge | | |
| East | 4380 | | .3 | .5 |
| East | 4200 | | .1 | .3 |
| East | 3900 | | .1 | .3 |
| East | 3600 | | .1 | .3 |
| East | 3300 | | .1 | .3 |
| East | 3000 | | .1 | .3 |
| East | 2820.* | | .1 | .3 |
| East | 2700 | | .1 | .3 |
| East | 2470.* | | .1 | .3 |
| East | 2400 | | .1 | .3 |
| East | 2260.* | | .1 | .3 |
| East | 2100 | | .1 | .3 |
| East | 2008.56 | | .1 | .3 |
| East | 1800 | | .1 | .3 |
| East | 1799.9 | | .3 | .5 |
| East | 1700 | Bridge | | |
| East | 1641 | | .3 | .5 |
| West Branch | 3460 | | .1 | .3 |
| West Branch | 3160 | | .1 | .3 |
| West Branch | 2860 | | .1 | .3 |
| West Branch | 2560 | | .1 | .3 |
| West Branch | 2260 | | .1 | .3 |
| West Branch | 2110 | | .1 | .3 |
| West Branch | 1760 | | .1 | .3 |
| East-lower | 1640 | | .1 | .3 |
| East-lower | 1500 | | .1 | .3 |
| East-lower | 1200 | | .1 | .3 |
| East-lower | 900 | | .1 | .3 |
| East-lower | 800 | | .1 | .3 |
| East-lower | 750 | | .1 | .3 |
| East-lower | 700 | | .1 | .3 |
| East-lower | 600 | | .1 | .3 |
| East-lower | 500 | | .1 | .3 |
| East-lower | 475 | | .1 | .3 |
| East-lower | 430 | | .1 | .3 |
| East-lower | 370 | | .1 | .3 |
| East-lower | 300 | | .1 | .3 |
| East-lower | 250 | | .1 | .3 |
| East-lower | 200 | | .1 | .3 |
| East-lower | 150 | | .1 | .3 |
| East-lower | 128 | | .1 | .3 |
| East-lower | 60 | | .1 | .3 |
| East-lower | 50 | | .1 | .3 |
| East-lower | 0 | | .1 | .3 |
| East-lower | -50 | | .1 | .3 |

# DUCK CREEK CHANNEL

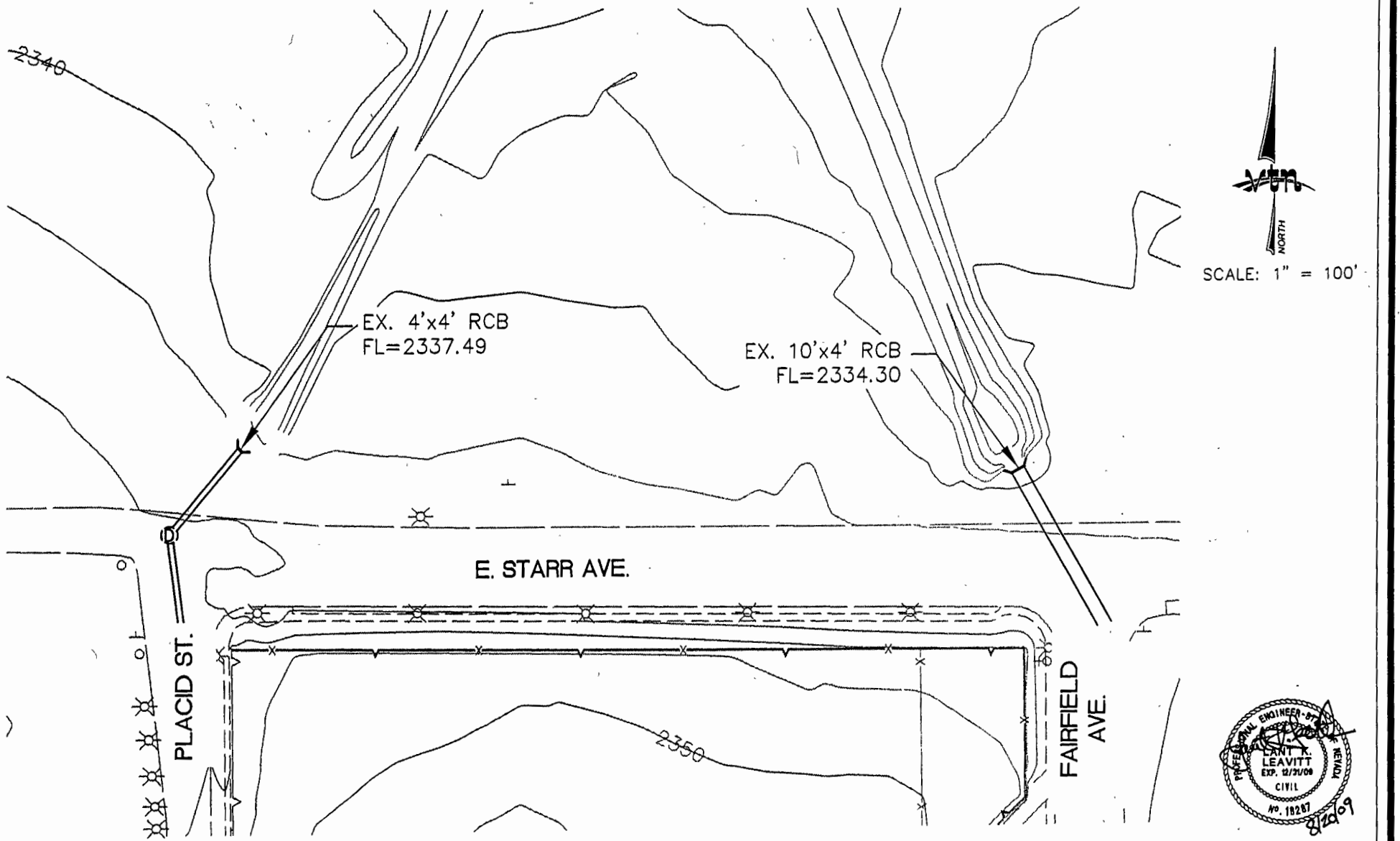
LAS VEGAS BLVD. TO
LOWER DUCK CREEK DETENTION BASIN

FEMA LETTER OF MAP REVISION APPLICATION

# APPENDIX C

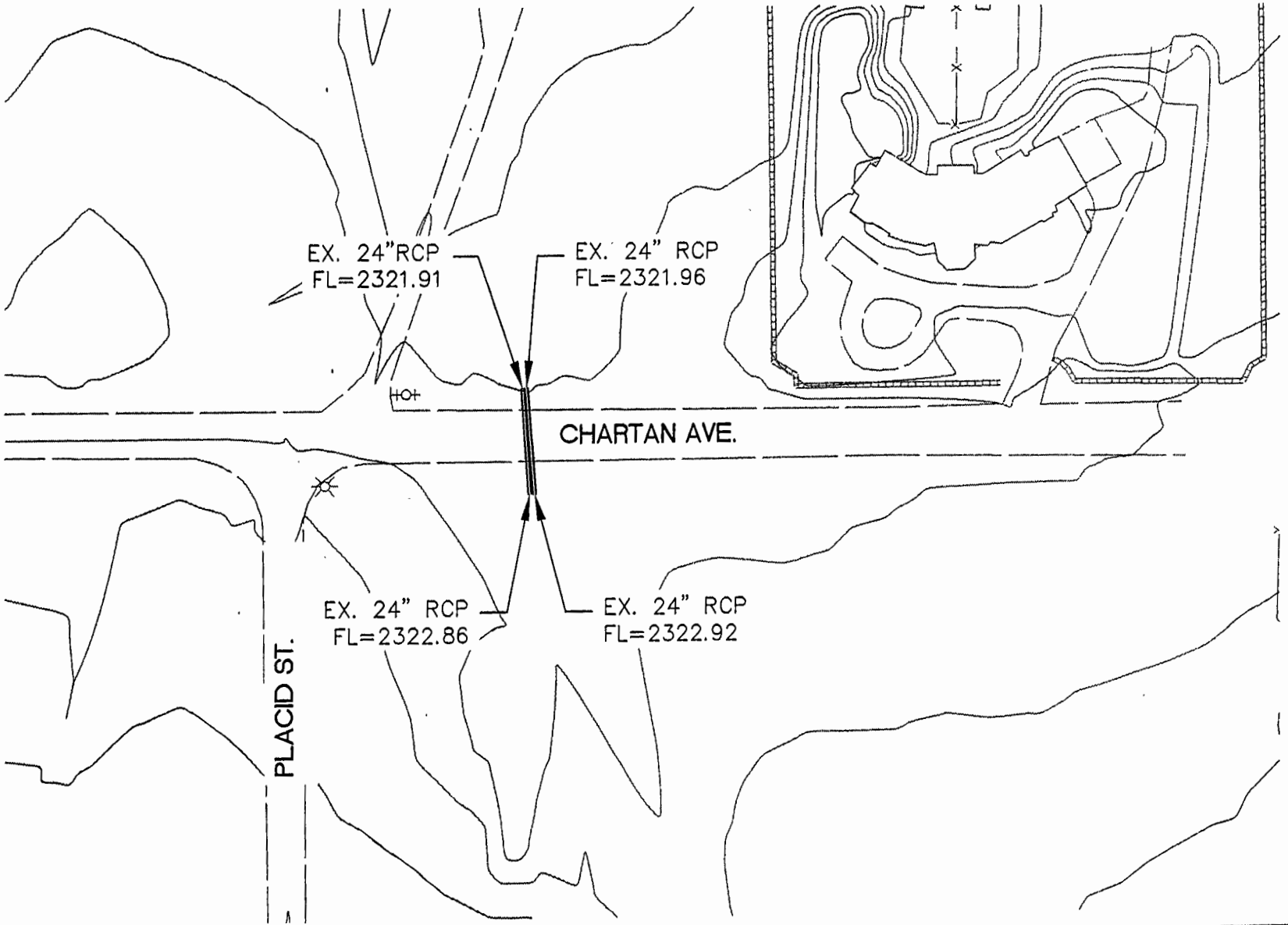
## Existing Culverts As-Builts

vtn




DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 4'x4' RCB AT PLACID ST./STARR AVE.
AND 10'x4' RCB AT FAIRFIELD AVE./STARR AVE.

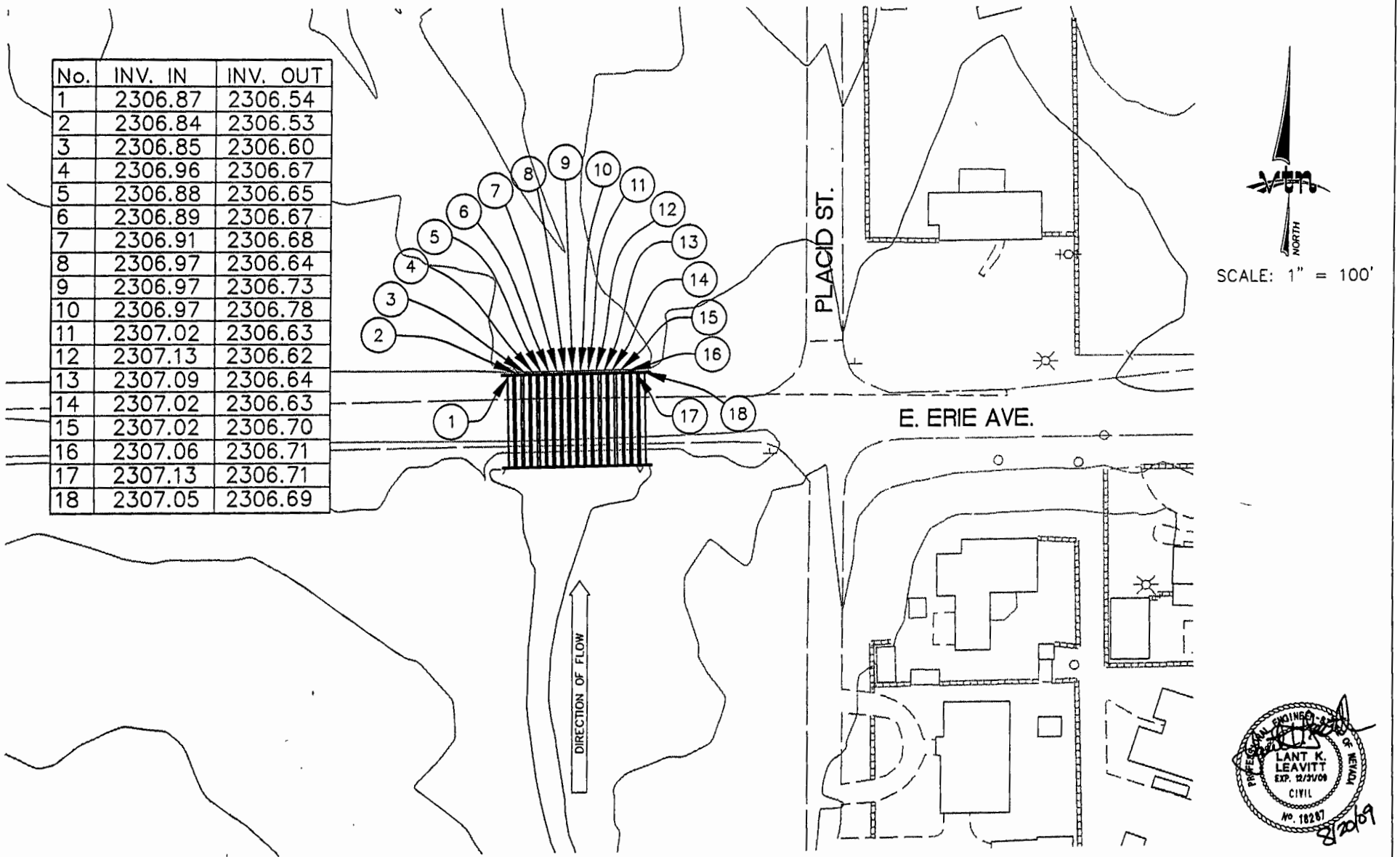
Fig. 1




DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 2-24" RCPs AT
CHARTAN AVE./PLACID ST.

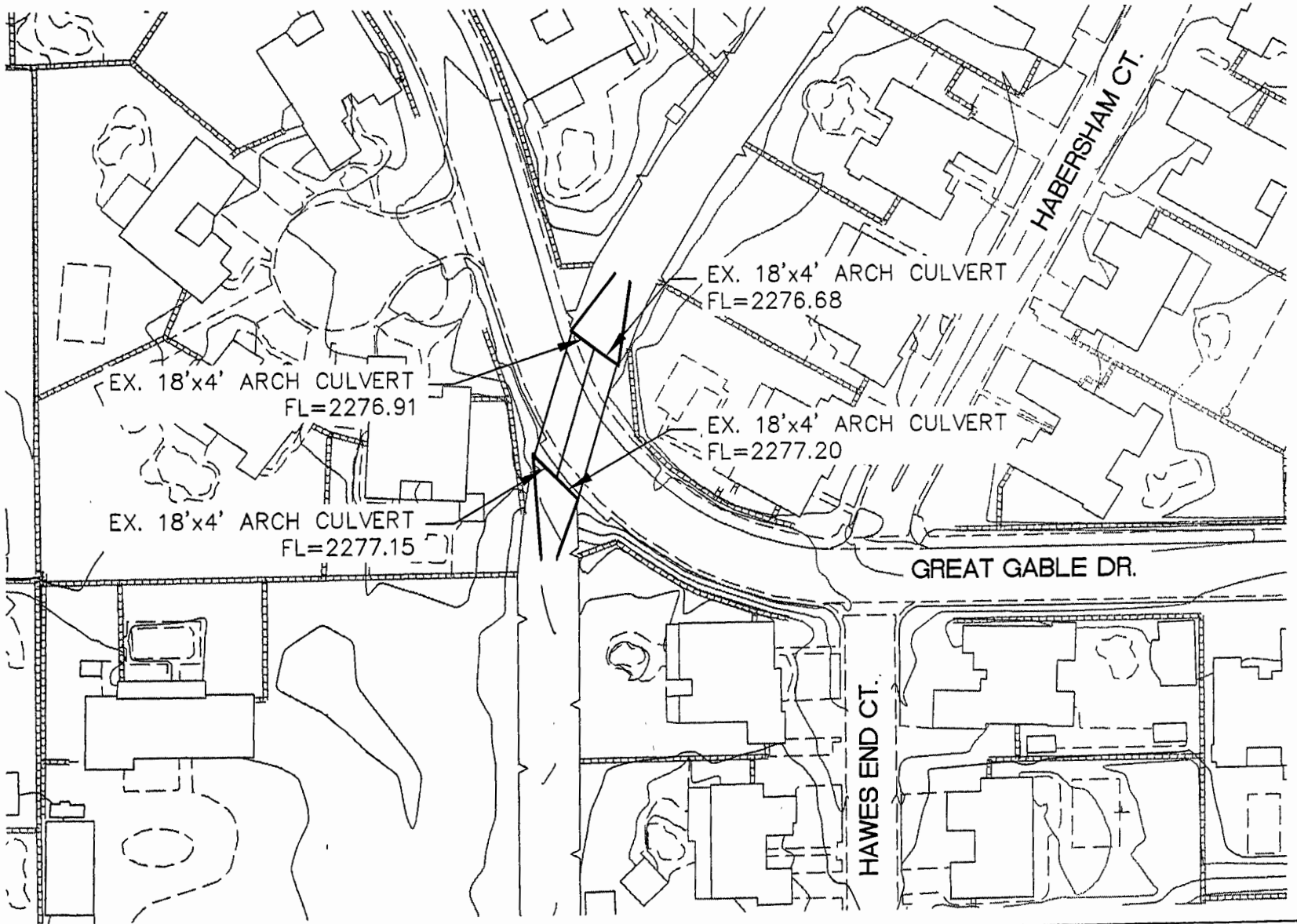
Fig. 2

| No. | INV. IN | INV. OUT |
|---|---|---|
| 1 | 2306.87 | 2306.54 |
| 2 | 2306.84 | 2306.53 |
| 3 | 2306.85 | 2306.60 |
| 4 | 2306.96 | 2306.67 |
| 5 | 2306.88 | 2306.65 |
| 6 | 2306.89 | 2306.67 |
| 7 | 2306.91 | 2306.68 |
| 8 | 2306.97 | 2306.64 |
| 9 | 2306.97 | 2306.73 |
| 10 | 2306.97 | 2306.78 |
| 11 | 2307.02 | 2306.63 |
| 12 | 2307.13 | 2306.62 |
| 13 | 2307.09 | 2306.64 |
| 14 | 2307.02 | 2306.63 |
| 15 | 2307.02 | 2306.70 |
| 16 | 2307.06 | 2306.71 |
| 17 | 2307.13 | 2306.71 |
| 18 | 2307.05 | 2306.69 |




DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 18-4'x3' RCBs AT
E.ERIE AVE./PLACID ST..

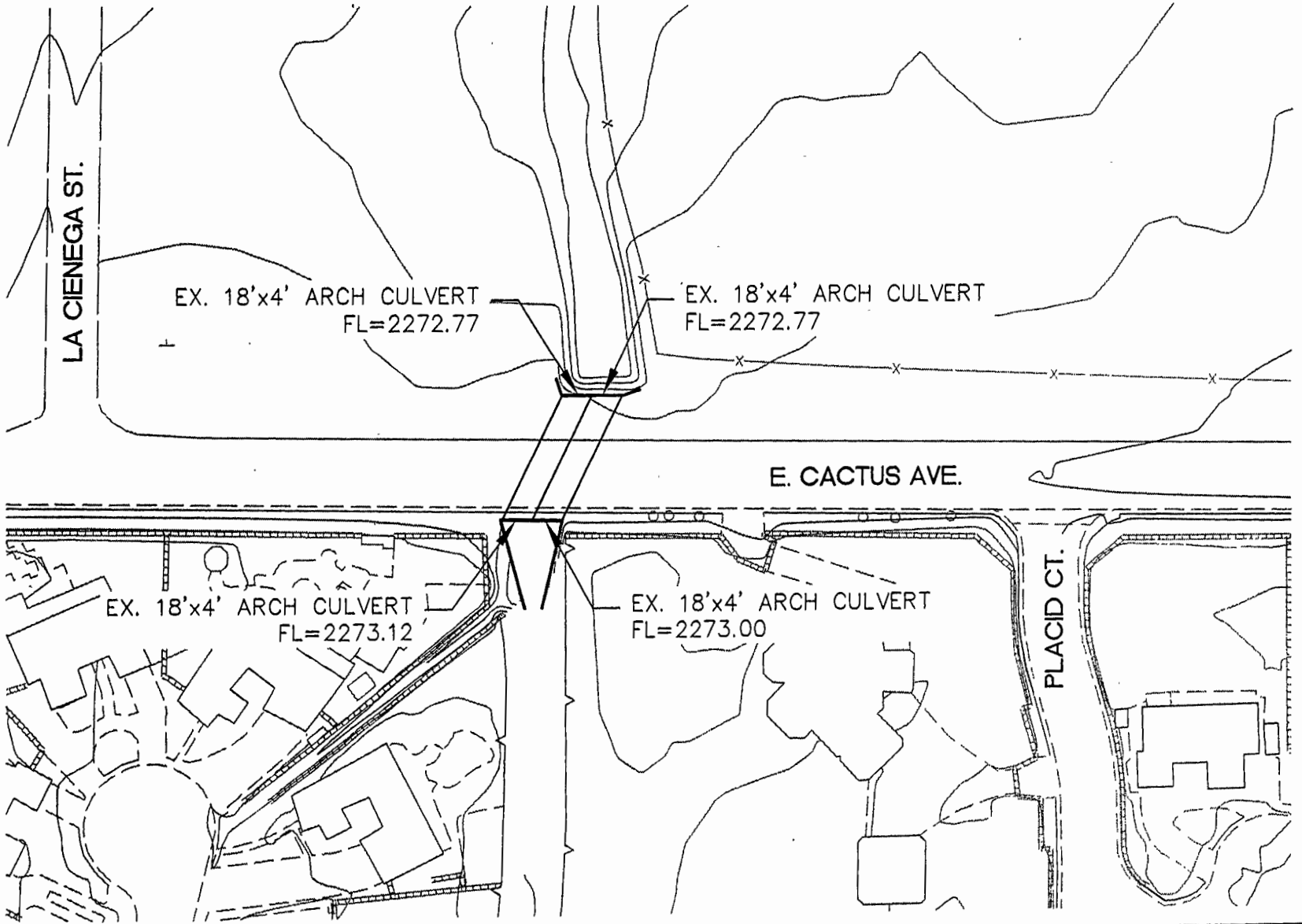
Fig. 3




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DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 2-18'x4' ARCH CULVERTS
WEST OF GREAT GABLE DRIVE./HAWES END CT..

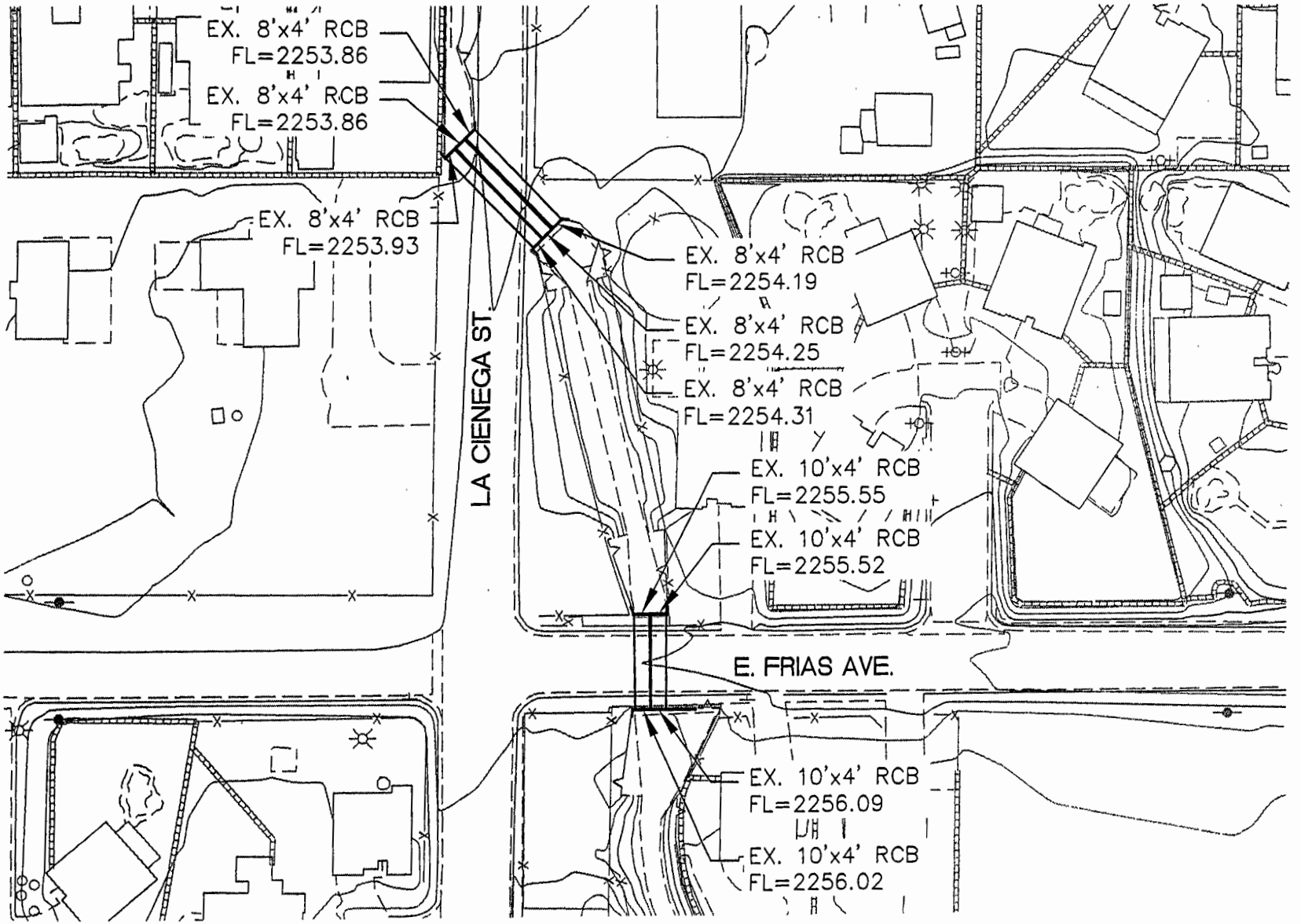
Fig. 4




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No. 18287
STATE OF NEVADA

DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 2-18'x4' ARCH CULVERTS
WEST OF E. CACTUS AVE./PLACID CT..

Fig. 5

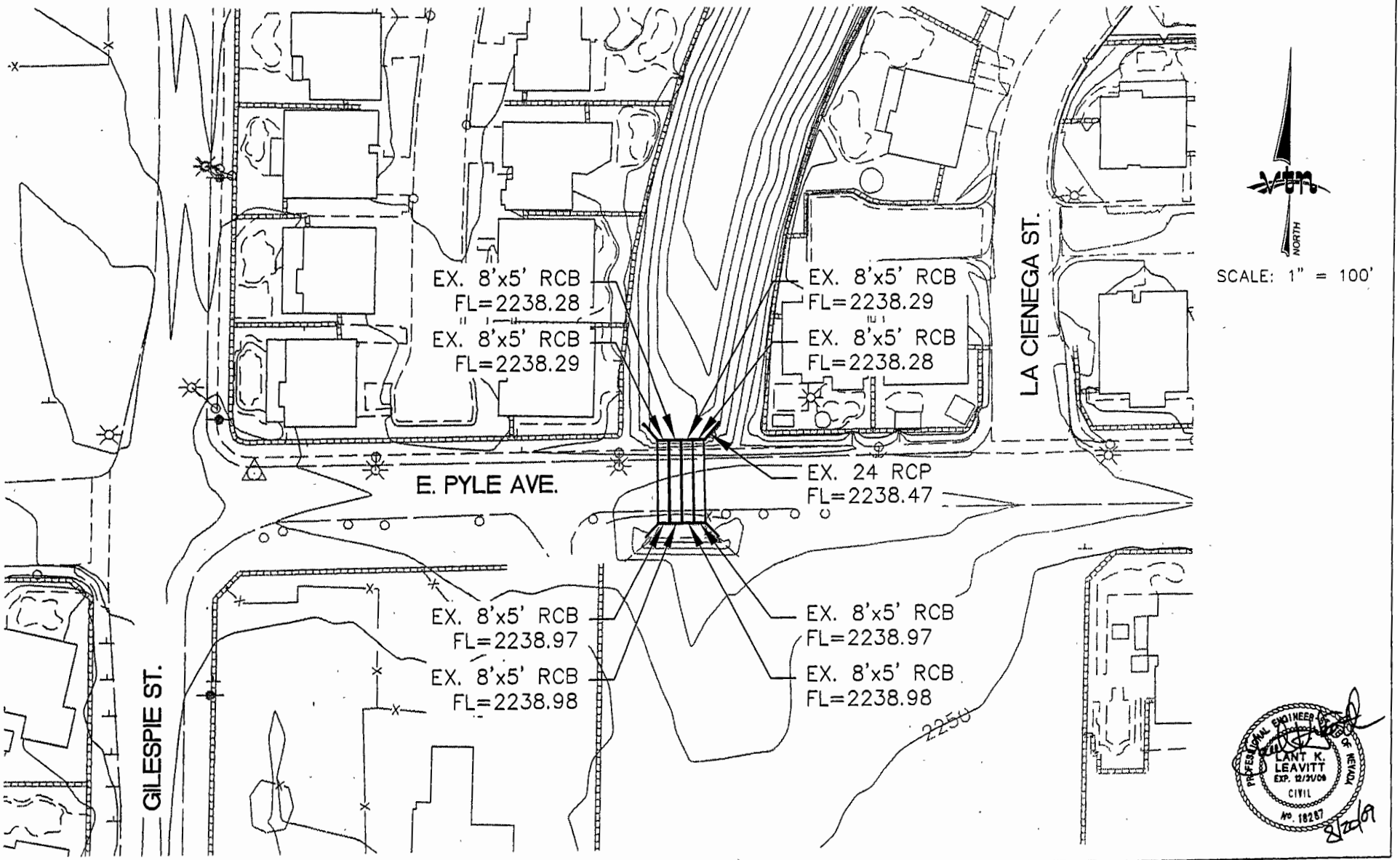






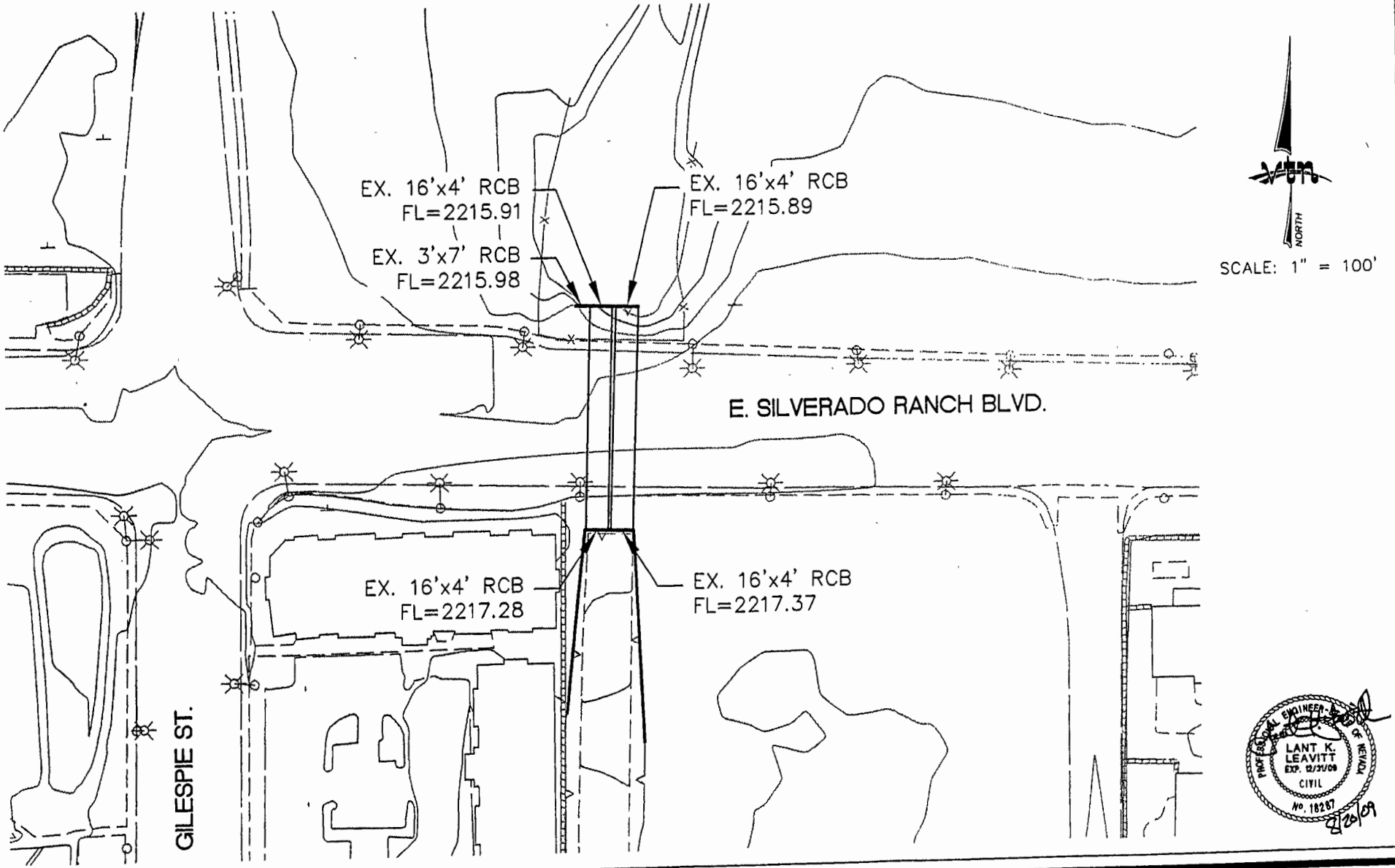
DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 2-10'x4' RCBs EAST OF E. FRIAS AVE./LA CIENEGA ST. AND 3-8'x4' RCBs NORTH OF E. FRIAS AVE./LA CIENEGA ST.

Fig. 6




DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 4-8'x5' RCBs EAST OF
E. PYLE AVE./GILESPIE ST..

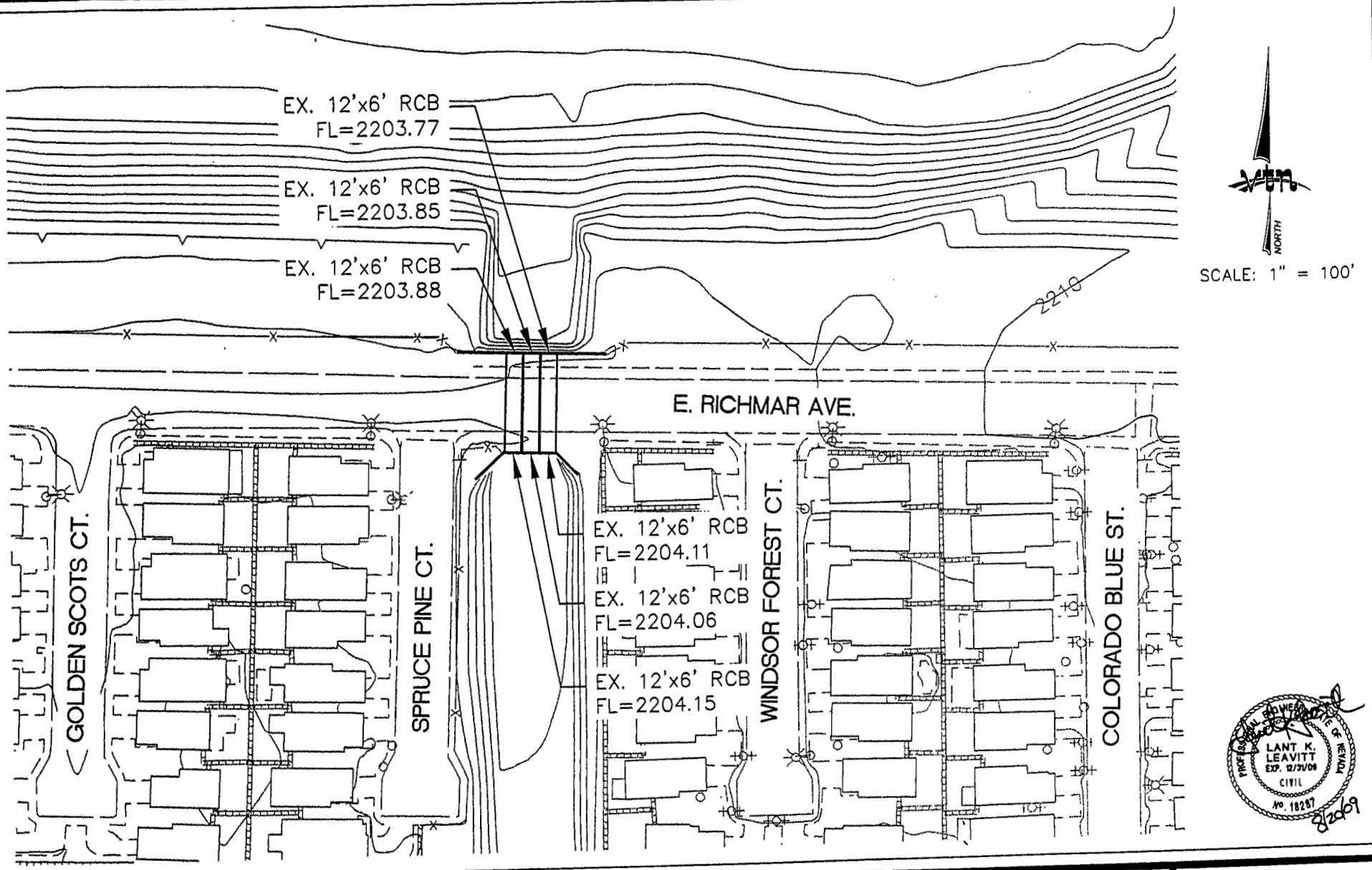
Fig. 7




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4/28/09

DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 2-16'x4' RCBs EAST OF
E. SILVERADO RANCH BLVD./GILESPIE ST..

Fig. 8




DUCK CREEK CHANNEL LOMR-
LAS VEGAS BLVD. TO LOWER DUCK CREEK DETENTION BASIN
EXISTING CULVERT AS BUILTS - 3-12'x6' RCBs EAST OF
E. ROCHMAR AVE./SPRUCE PINE CT.

Fig. 9