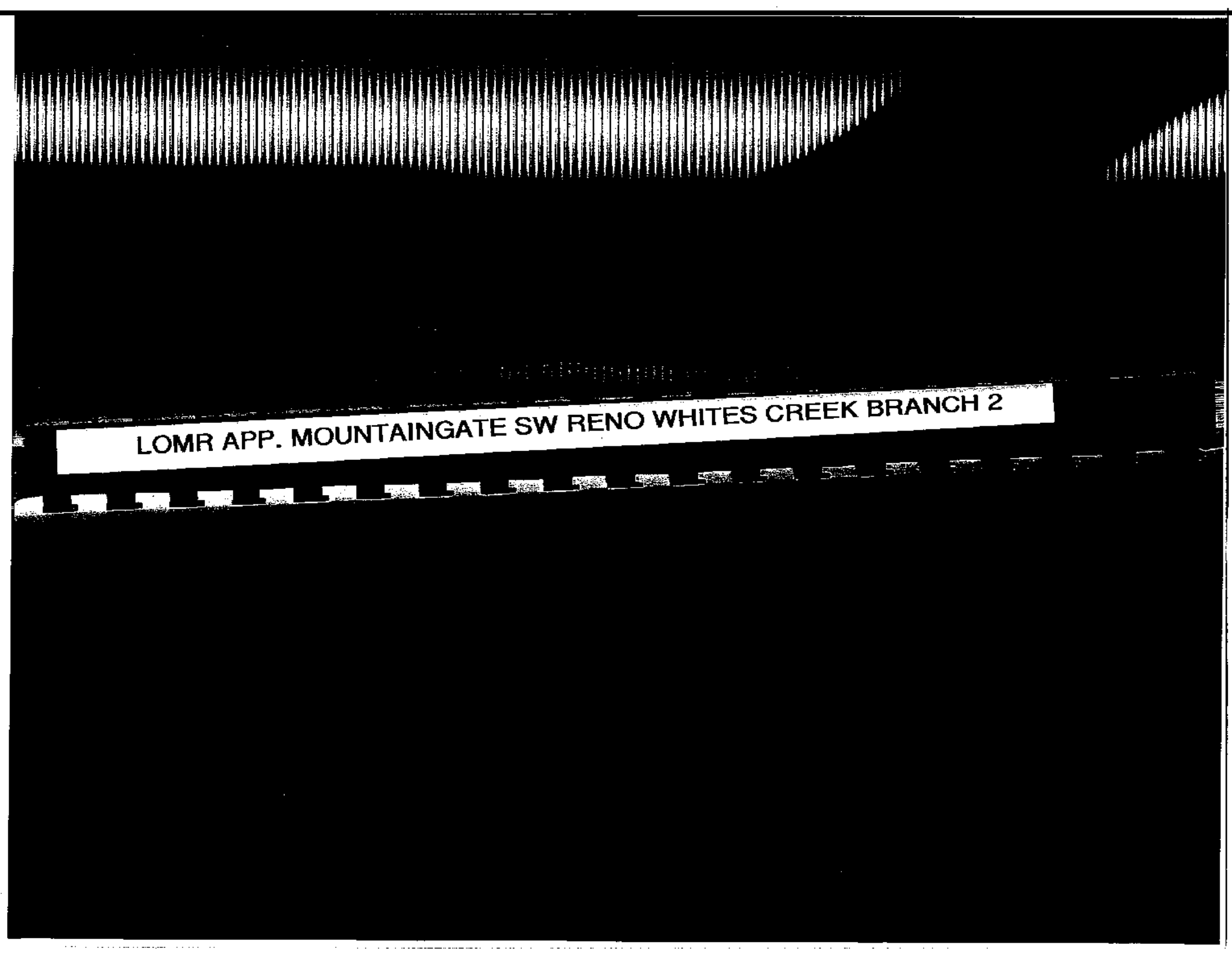

LOMR APP. MOUNTAINGATE SW RENO WHITES CREEK BRANCH 2

# APPLICATION FOR LETTER OF MAP REVISION (LOMR)
# MOUNTAINGATE DEVELOPMENT
# RENO, WASHOE COUNTY, NEVADA

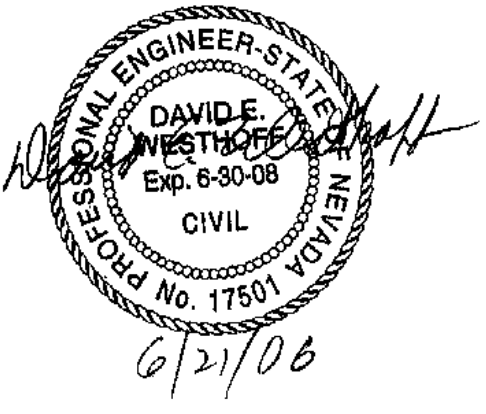
**PREPARED FOR**

**RYDER HOMES**

**PREPARED BY**

**QUAD KNOPF, INC.**

**JUNE 2006**
**JOB NUMBER 060212**




Quad Knopf

## C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4000

☐ No, Attach Explanation

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

## D. SIGNATURE

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

| | | |
|---|---|---|
| Name: David Westhoff | Company: Quad Knopf | |
| Mailing Address:<br>9600 Prototype Court<br>Reno, NV 89521 | Daytime Telephone No.:<br>775-324-1212 | Fax No.:<br>775-324-2311 |
| | E-Mail Address: davidw@quadknopf.com | |
| Signature of Requester (required): David Westhoff | | Date: June 19, 2006 |

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: Steve Varela, Director of Public Works, City of Reno | | Telephone No.:<br>775-334-2350 |
| Community Name: City of Reno | Community Official's Signature (required): | Date: 7/31/06 |

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

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

| | | |
|---|---|---|
| Certifier's Name: Jeff Brooke | License No.: 8658 | Expiration Date: 12/31/06 |
| Company Name: PLACES, CSI | Telephone No.: 775-355-7721 | Fax No.: 775-355-7795 |
| Signature: | | Date: 06/20/06 |

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

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

Seal (Optional)

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☐ No, Attach Explanation

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Seal (Optional)

PUBLIC WORKS DEPARTMENT

MEMORANDUM

DATE: July 27, 2006

TO: Steve Varela, Public Works Director

FROM: Kerri Williams, Sanitary Engineering

SUBJECT: LOMR application for Mountaingate Community, by Ryder Homes, Southwest Reno, Whites Creek Branch near Arrowcreek.

Together with Chris Robinson of Community Development, we concur that this application for LOMR is in conformance with the approved development plans and with the approved Conditional LOMR. The channel as built and modeled will contain the 100 year flows and will remove specified sections from the floodplain and/or active floodway.

Your signature on FEMA for MT-2 is requested. Please return document to me for distribution.

## TABLE OF CONTENTS



## FIGURES



## PLATES



## APPENDICES

# 1.0 INTRODUCTION AND PROJECT BACKGROUND

## 1.1 INTRODUCTION

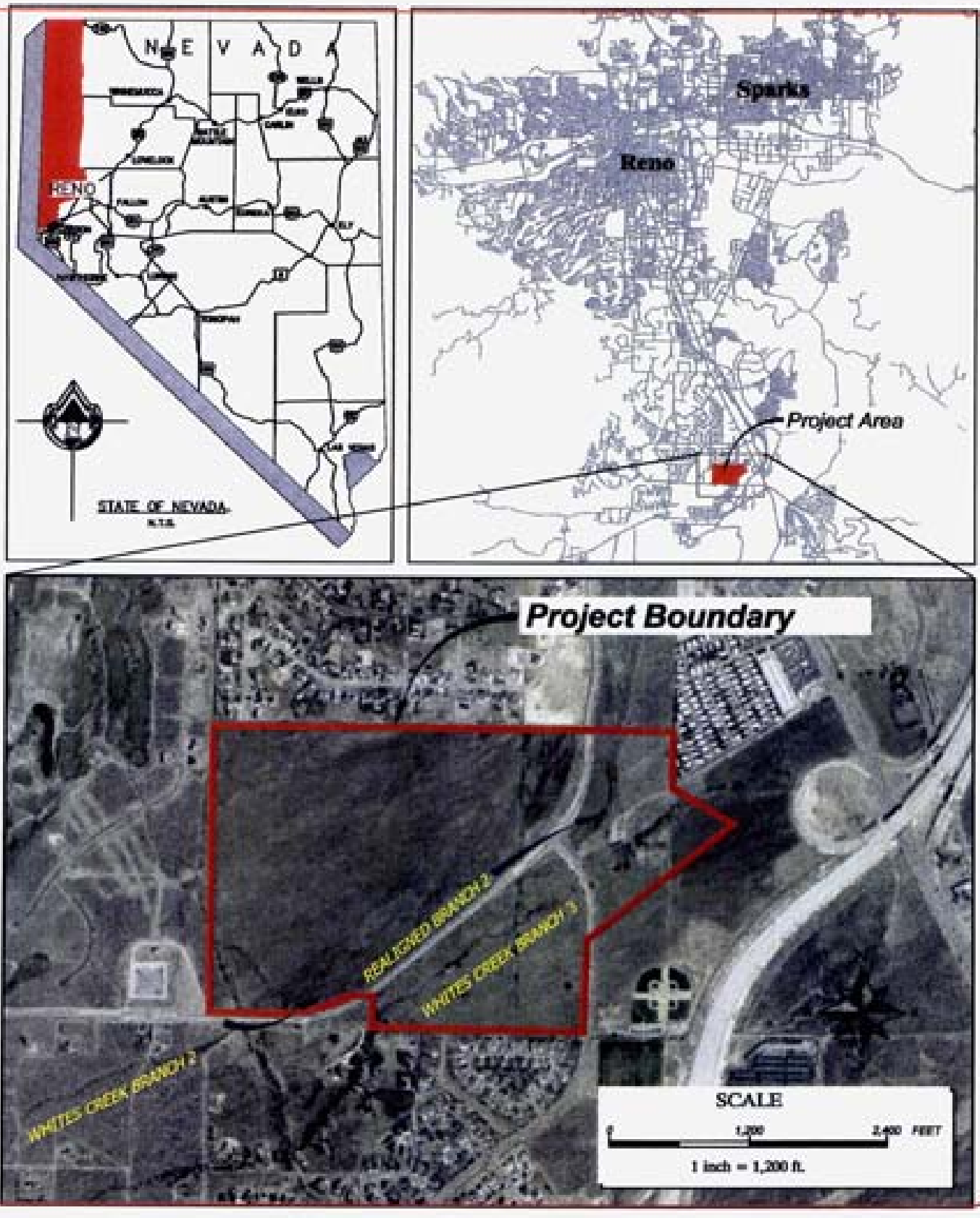
Ryder Homes plans to develop the Dorostkar Property as the Mountaingate Project. The property is located in Section 20, T 18N. , R.20E. in Reno, Washoe County, Nevada (Figure 1). Whites Creek originates upstream of the project area in the Sierra Nevada Mountains near Mt. Rose. The upstream portions of the creek are deeply incised in a single channel. The creek diverges into 4 less defined channels (Branches 1 through 4) as it exits the steeper portions of the watershed (Section 30, T 18 N, R 20 E). Branches 2 and 3 cross the project site. Branch 3 will remain in its natural channel and with no modification, while Branch 2 will be diverted into a designed channel. Because no modifications are proposed for Branch 3 or its floodplain, this document focuses solely on Branch 2.

This application contains the information required for a Letter of Map Revision (LOMR) for the proposed Branch 2 channel. The FEMA forms and supplemental statements are attached as Appendix A. The hydraulic workmap showing the as-built condition of the channel is attached as Plate 1 (Appendix B).

## 1.2 PROJECT BACKGROUND

The Mountaingate project will be a residential community with +/- 225 residential units averaging 13,000 square feet (0.3 acre) in size. The project area is shown on Flood Insurance Rate Map (FIRM) 32031C 3170C. The Branch 2 and Branch 3 floodplains are designated Zone A while the remainder of the property is Zone X.

This report is a continuation of CLOMR Case Number **05-09-0503R**.




PLOT DATE: June 2006
JOB NO. 8060212
DWG. NAME: 0428_Domicilior_R00_v2006.dwg
SCALE: As Noted
SHEET NO.: 2

IMPROVEMENT FOR:

# Figure 1 Vicinity Map

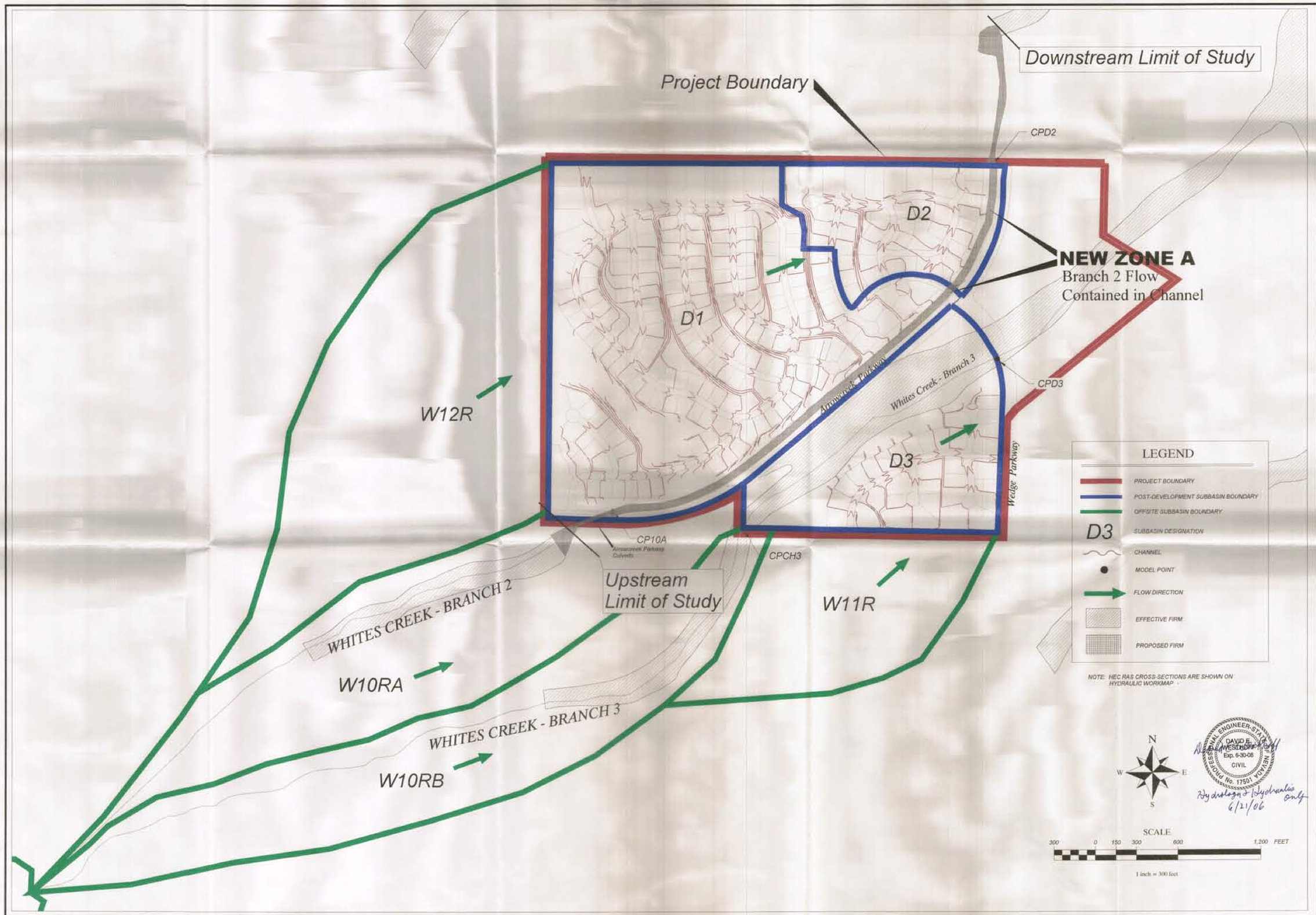
*Mountaingate LOMR*

Quad Knopf Job #060212

Date: June, 2006

PREPARED BY:
Quad Knopf
1010 N. CYPRESS AVE.
P.O. BOX 2699
VISALIA, CA 93279
TEL: (559) 733-0440
FAX: (559) 733-7821

DRW BY: CHK BY:





9600 Prototype Ct.
Reno, Nevada 89521
TEL: (775) 324-1212
FAX: (775) 324-2311
WEB: www.quadknopf.com
N0428
Quad Knopf


References
Proposed grading supplied by Mackay & Somps, Inc.

Revisions:
Date:
1
2
3
4
5
6

Scale: 1" = 300'
Date: June, 2006
File Name: 0428_donsketar_2005.dwg
Drawn By: GH
Designed By: DW

**PLATE 2**
**TOPOGRAPHIC WORKMAP**
**POST-DEVELOPMENT CONDITIONS**
*Mountaingate LOMR*
Washoe County Nevada

Sheet 1 of 1

Quad Knopf Job # 0428

HYDRAULIC WORKMAP FOR

**MOUNTAINGATE DEVELOPMENT**

RENO, WASHOE COUNTY, NEVADA

**HYDRAULIC WORKMAP**
**WHITES CREEK BRANCH 2**

Quad Knopf

DRW BY | CHK BY

3800 Pyrotype Ct
Reno, Nevada 89521
TEL: (775) 324-4212
FAX: (775) 324-2211
Web: www.quadknopf.com

080212

080212_H2O_BASE.DWG

1" = 100'

PLATE 1

Taylor Wright Mahoney Engineering

6/21/06

OF NEVADA — No. 17501 — PROFESSIONAL ENGINEER — STATE OF

DAVID WESTHOFF
Exp. 6-30-08
CIVIL

VALLEY S

LAMPE RD

FLANDERS RD

(Tie-in to effective FIRM)

TRANSITION TO EXISTING CHANNEL

Wedge Parkway Road Crossing

SCALE: 1" = 100'

0' 100' 100'

Arrowcreek Parkway Road Crossing
(Beginning of improvements/tie-in to effective FIRM)

WHITES CREE
CASTLE PIN

END OF DETAILED STUDY

END OF DETAILED STUDY

## 2.0 EXISTING CONDITIONS

Whites Creek originates on the eastern side of the Carson Range in the Sierra Nevada Mountains. The contributing watershed extends to an elevation of over 10,600 feet. The upper reaches are primarily vegetated with pine trees and mountain mahogany brush, which transitions to sage brush, grasses, and suburban area in the lower reaches. Soils are largely in Hydrologic Soil Group C, and have corresponding relatively low infiltration rates.

At approximately elevation 5,000', Whites Creek diverges into four branches (the diffluence). Of these, Branches 2 and 3 pass through the Mountaingate property (Figure 1). Branch 3 will be left in its natural state, and is not a part of this study. Branch 2, however, has been realigned and designed to convey the 100-year flow. Channel improvements began where Branch 2 crosses under Arrow Creek Parkway in three ten foot wide by five foot tall box culverts. The channel slopes on average from three to four percent. Gabion drop structures have been incorporated along with geotextile fabric (details in Appendix C) to control flow velocities, as shown in Figures 2 and 3. Channel improvements end just north of the Mountaingate property boundary where the realigned Branch 2 merges with an existing channel (also the downstream boundary of this study). Channel improvements will be discussed further in Section 4.0.

Figure 2. Looking northeasterly (downstream) of the realigned Whites Creek Branch 2

Figure 3. Detail showing a typical gabion drop structure and geotextile lining, looking east (upstream). The three box culverts in the background are the Arrow Creek Parkway crossing.

## 3.0 HYDROLOGY

The hydrologic analysis for this project was covered in CLOMR Case Number **05-09-0503R**, *Application for Conditional Letter of Map Revision (CLOMR), Mountaingate Development, Reno Nevada* (Nimbus Engineers, 2005).

The 100-year, 24-hour flowrate for Whites Creek Branch 2 was determined to be 1123 cfs at the upstream boundary of this study, and 1144 cfs at Mountaingate's downstream property boundary (Nimbus Engineers, 2005).

## 4.0 HYDRAULIC ANALYSIS OF THE REALIGNED CHANNEL

The realigned Whites Creek Branch 2 channel (including the road crossings at Arrow Creek Parkway and Wedge Parkway) was modeled using the U.S. Army Corps of Engineers model HEC-RAS 3.1.3. This model was run in the mixed flow regime with initial conditions of critical depth at both upstream and downstream boundaries. As shown in CLOMR Case Number **05-09-0503R**, this channel was designed to capture and convey the 100-year, 24-hour storm event in order to modify effective FIRM 32031C3170E. Plate 1 shows the locations of model cross sections.

This realigned channel begins at three ten foot wide by five foot tall box culverts under Arrow Creek Parkway, and follows along the northwest side of Arrow Creek Parkway. The channel passes through three twelve foot wide by six foot tall box culverts under Wedge Parkway, and connects with an existing channel at the northeast corner of the property. Overall, approximately 6000 LF of improvements were made. Channel slope is typically three to four percent, and was lined with a turf-reinforced mat material rated for the velocities and shear stresses expected in the channel. Drop structures were constructed of gabions with 24-foot long scour holes.

## 5.0 HYDRAULIC MODELING RESULTS

As prepared for in its design, flow in Whites Creek Branch 2 is primarily supercritical for the length of the Mountaingate property. The average depth is four feet. During the 100-year event the velocity typically ranges from 8 to 13 feet per second, averaging about 11 feet per second, with peaks of up to 18 feet per second over the gabion drop structures. ft/s

The cross section with the highest velocity occurs at 82+00 (Figures 4 and 5), just upstream of the box culverts at Arrow Creek Parkway. This is due to the steep drop in the channel in the approach to the box culverts (approximately ten feet). In addition to crossing under Arrow Creek Parkway, Whites Creek Branch 2 also passes under Steamboat ditch (Figure 6). While the velocity here may be high, the culvert approach is paved with concrete, and has large diameter ($D_{50}$ > 1') rip rap lining the channel before it. At the downstream end of the channel, the velocity will be reduced to just over four feet per second prior to leaving the project site. This channel will convey 1144 cfs with a minimum 1.0 feet of freeboard.

HEC-RAS model results are summarized in Appendix B. The channel profile in Appendix B does not include the box culverts under Arrow Creek (and the channel upstream) due to the computational limitations in HEC-RAS. These three box culverts were all built with slightly different invert elevations, and flow passes through each in the supercritical regime. As stated in the errors and warning messages, "The program cannot perform supercritical flow through multiple culverts."

The realigned Whites Creek Branch 2 including drop structures and box culverts under Wedge Parkway are in substantial compliance with CLOMR Case Number **05-09-0503R**. The effective FIRM is shown in Figure 7 and the proposed annotated FIRM is shown in Figure 8.

Figure 4. Looking northeast (downstream) at the box culverts under Arrow Creek Parkway. The approach is steep because these culverts also cross under Steamboat Ditch (flowing from left to right past the chain link fence, see Figure 6).

Figure 5. Looking upstream out of the center culvert shown above.

Figure 6. Looking north at the Steamboat Ditch. The road in the background is Arrow Creek Parkway, and the culverts shown in Figures 4 and 5 above flow from right to left under this.

Figure 7. Existing FIRM

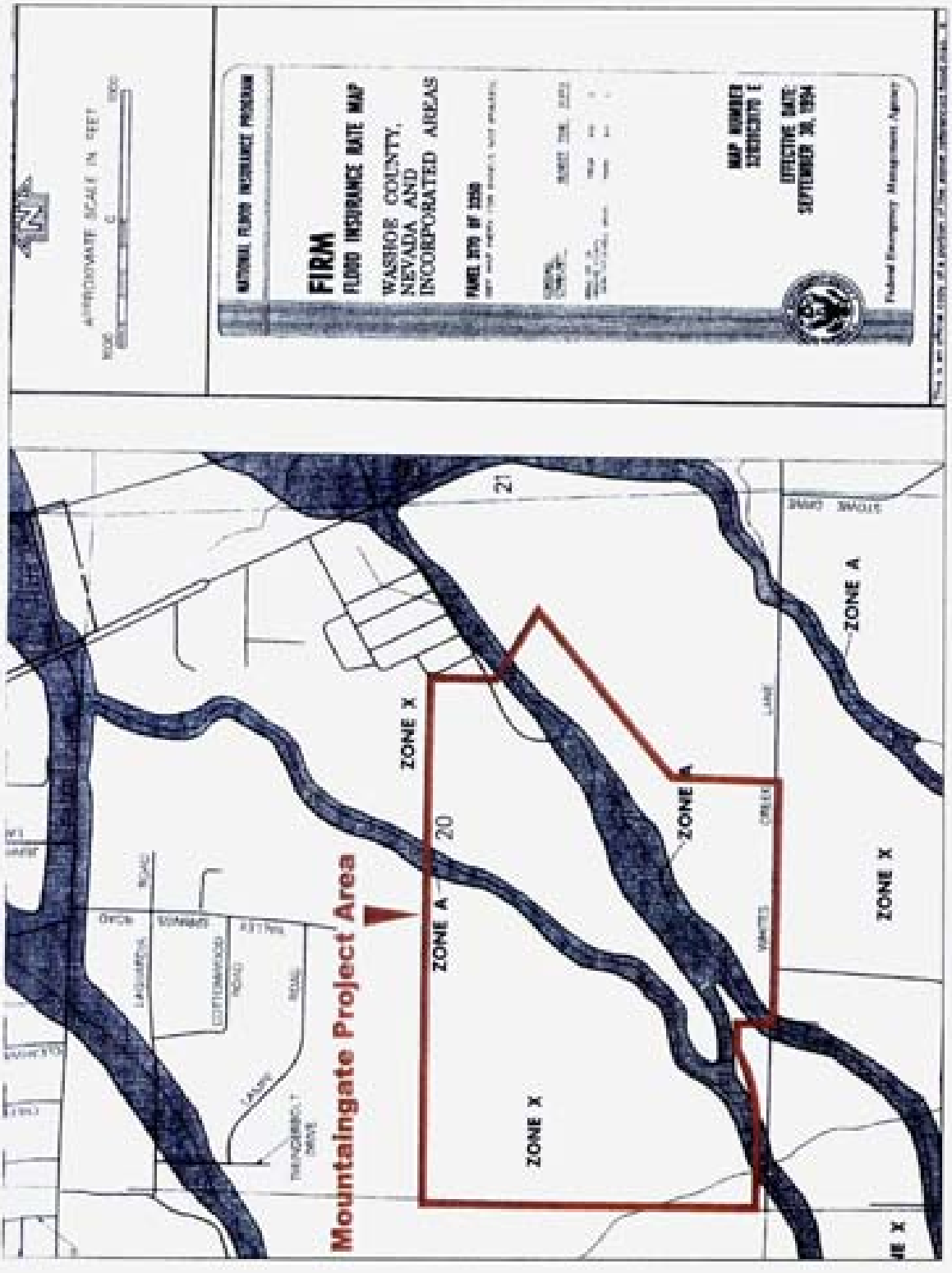
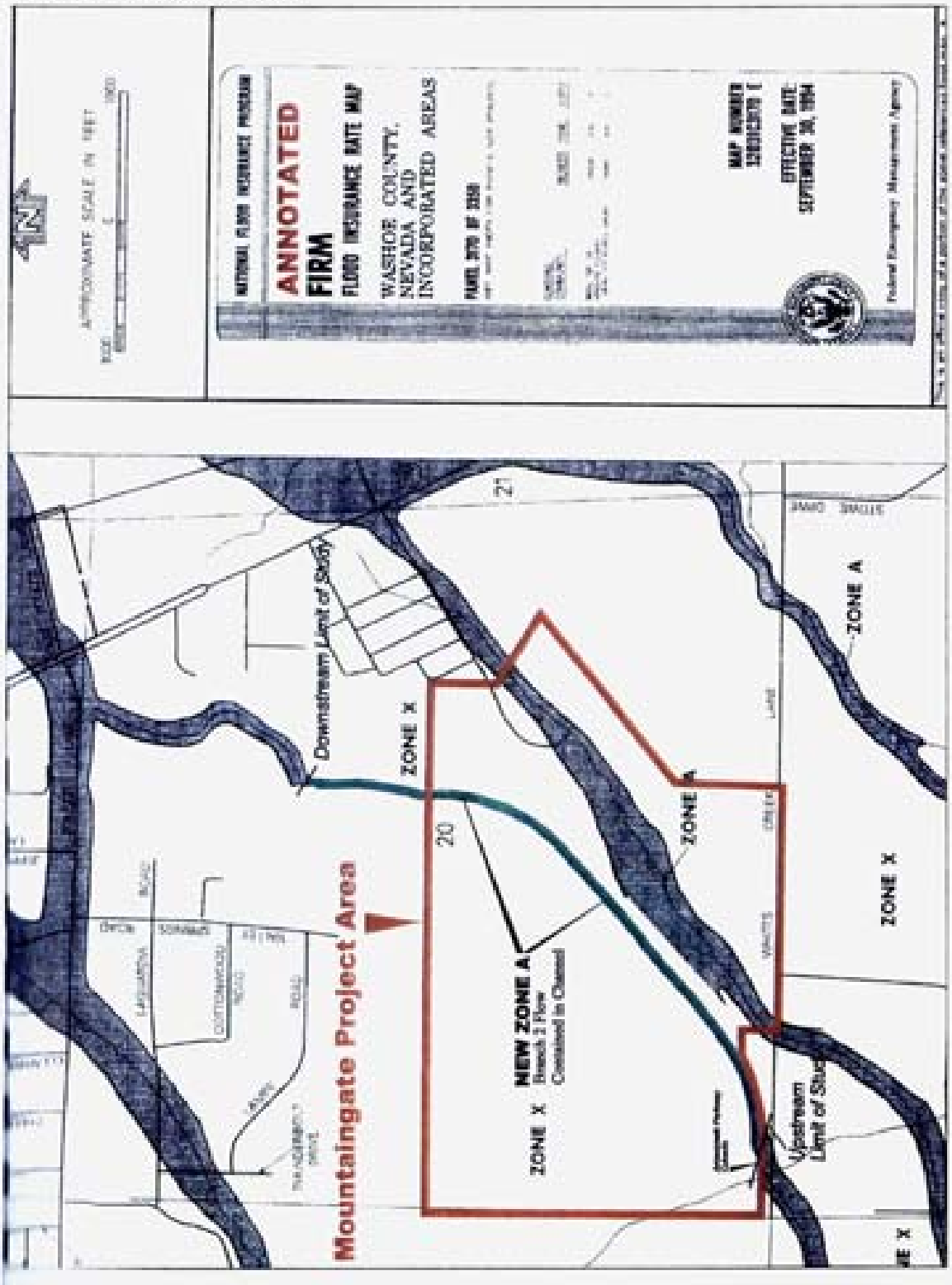


Figure 8. Annotated FIRM



## 6.0 FINDINGS

The findings of this study are listed below:

1. A channel has been designed that can contain and convey the 100-year flow in Whites Creek Branch 2 (1144 cfs) with more than one foot of freeboard.

2. Flow velocities have been maintained at acceptable levels through the use of geotextile matting and gabion drop structures. During the 100-year event, flow will leave the Mountaingate property at under five feet per second.

3. Construction of this channel has re-routed Branch 2 of Whites Creek, changing the effective FIRM in the project area as shown previously in Figure 8.

## 7.0 REFERENCES


City of Reno, Public Works Department, Design Manual, November, 2000.

City of Reno, Major Drainageways Plan, June, 1992.

Department of Water Resources, Washoe County, Nevada, Southern Washoe County, Precipitation Frequency of the United States, NOAA Atlas 14, Volume 1 - Semi-arid Southwestern United States (Map), April 1997.

Nimbus Engineers, Whites Creek Detention Facility Feasibility Study, Washoe County, Nevada, June 1993.

Nimbus Engineers, Hydrologic and Hydraulic Analysis Wedge Meadows Subdivision, Washoe County, Nevada, November 1995.

Nimbus Engineers, Hydrologic and Hydraulic Analysis, Double Diamond Ranch, Phase I, Application for Letter of Map Revision, Additional Data Submittal ,August 1996.

Nimbus Engineers, Request for Letter of Map Revision (LOMR) Galena Meadows Subdivision, February 2001.

Nimbus Engineers, Application for Letter of Map Revision (LOMR), Branch 3 Whites Creek

Nimbus Engineers, Application for Conditional Letter of Map Revision (CLOMR), Branch 2 Whites Creek, January 2005.

Washoe County, Hydrologic Criteria and Drainage Design Manual, December 2, 1996.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L2010, HEC-1, Flood Hydrograph Package, version 4.1, June 1998.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS: River Analysis System, version 3.0, Mar 2001.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Washoe County, Nevada, South Part, August 1983.

U.S. Department of Agriculture, Natural Resource Conservation Service, Urban Hydrology for Small Watersheds (TR-55), June 1986.

Aerial photograph (2004) in Figure 1 from http://maps.cityofreno.net/

# APPENDIX A

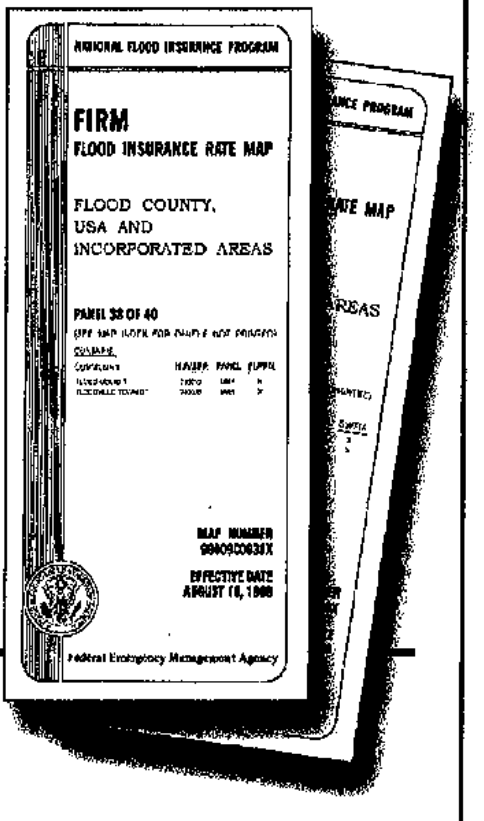
# APPENDIX A
# FEMA FORMS

# MT-2

## MITIGATION DIVISION
## HAZARD IDENTIFICATION BRANCH

REVISIONS TO NATIONAL FLOOD INSURANCE PROGRAM MAPS

APPLICATION FORMS AND INSTRUCTIONS FOR CONDITIONAL LETTERS OF MAP REVISION AND LETTERS OF MAP REVISION




MT-2
FEMA FORM 81-89 SERIES
SEPT 04

FEMA

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# OVERVIEW & CONCURRENCE FORM

*O.M.B No. 1660-0016*
*Expires: August 31, 2007*

## PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

## A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

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

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

## B. OVERVIEW

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

| Community No. | Community Name | State | Map No. | Panel No. | Effective Date |
|---|---|---|---|---|---|
| Ex: 480301<br>480287 | City of Katy<br>Harris County | TX<br>TX | 480301<br>48201C | 0005D<br>0220G | 02/08/83<br>09/28/90 |
| 3320020 | City of Reno | NV | 32031C | 3170E | SEPT. 30,1994 |
| | | | | | |

2. Flooding Source: WHITES CREEK BRANCH 2

3. Project Name/Identifier: MOUNTAINGATE LOMR

4. FEMA zone designations affected: A, X (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 DROP STRUCTURES |

## C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4000

☐ No, Attach Explanation

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

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| | E-Mail Address: davidw@quadknopf.com | |
| Signature of Requester (required):<br>David Westhoff | | Date:<br>June 19, 2006 |

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| Certifier's Name:<br>Jeffrey Brooke | License No.:<br>8658 | Expiration Date:<br>12/31/06 |
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Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE HYDROLOGY & HYDRAULICS FORM

*O.M.B No. 1660-0016*
*Expires: August 31, 2007*

## PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Whites Creek Branch 2
**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 DHS-FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

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

5. Impacts of Sediment Transport on Hydrology

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

## B. HYDRAULICS

1. Reach to be Revised

| | Description | Cross Section | Water-Surface Elevations (ft.) Effective | Proposed/Revised |
|---|---|---|---|---|
| Downstream Limit | Branch 2 Whites Crk. North of Mountaingate Property Line | 1700 | N/A | 4569.01 |
| Upstream Limit | Branch 2 Whites Crk. at Arrowcreek RCBs | 8800 | N/A | 4775.94 |

2. Hydraulic Method Used

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

## B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

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

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

4. Models Submitted ☐ Diskette Submitted

| | Natural Run | | Floodway Run | | Datum |
|---|---|---|---|---|---|
| Duplicate Effective Model* | File Name: | Plan Name: | File Name: | Plan Name: | ____ |
| Corrected Effective Model* | File Name: | Plan Name: | File Name: | Plan Name: | ____ |
| Existing or Pre-Project Conditions Model | File Name: | Plan Name: | File Name: | Plan Name: | ____ |
| Revised or Post-Project Conditions Model | File Name: 060021_MOUNTAINGATE_LOMR.PRJ | Plan Name: | File Name: MOUNTAINGATE LOMR | Plan Name: | 1929 |
| Other - (attach description) | File Name: | Plan Name: | File Name: | Plan 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 DHS-FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

## C. MAPPING REQUIREMENTS

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

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

☒ Annotated FIRM and/or FBFM Included ☐ Digital Mapping (GIS/CADD) Data Submitted (Recommended)

## D. COMMON REGULATORY REQUIREMENTS*

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

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR/CLOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

If Yes, please submit documentation from the community to show that they have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.

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

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

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

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

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

# RIVERINE STRUCTURES FORM

*O.M.B No. 1660-0016*
*Expires: August 31, 2007*

## PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Whites Creek Branch 2
**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: Whites Creek Branch 2 Channel**

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

   Location of Structure: Channel alongside and west of ArrowCreek Parkway

   Downstream Limit/Cross Section: 1000

   Upstream Limit/Cross Section: 8800

2. **Name of Structure: Arrow Springs Drive Culverts**

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

   Location of Structure: Arrow Springs Drive crossing Whites Creek Branch 2 channel

   Downstream Limit/Cross Section: 8100

   Upstream Limit/Cross Section: 8200

3. **Name of Structure: Wedge Parkway Culverts**

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

   Location of Structure: Wedge Parkway crossing Whites Creek Branch 2 channel

   Downstream Limit/Cross Section: 3800

   Upstream Limit/Cross Section: 3900

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

## B. CHANNELIZATION

Flooding Source: Whites Creek Branch 2

Name of Structure: realigned Whites Creek Branch 2 channel

1. Accessory Structures

The channelization includes (check one):

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

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry 1144 (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):

**Hydraulic jumps occur over the gabion drop structures. Channel stability is provided by geotextile lining and grouted rip-rap (see as-built details, Appendix C). Adequate freeboard is maintained throughout the channel.**

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: **Whites Creek Branch 2**

Name of Structure: **Arrow Springs Drive Culverts**

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 – Geotextile Liner
- ☐ 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.

## C. BRIDGE/CULVERT - Continued

Flooding Source: **Whites Creek Branch 2**

Name of Structure: **Wedge Parkway Culverts**

3. 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

4. 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):

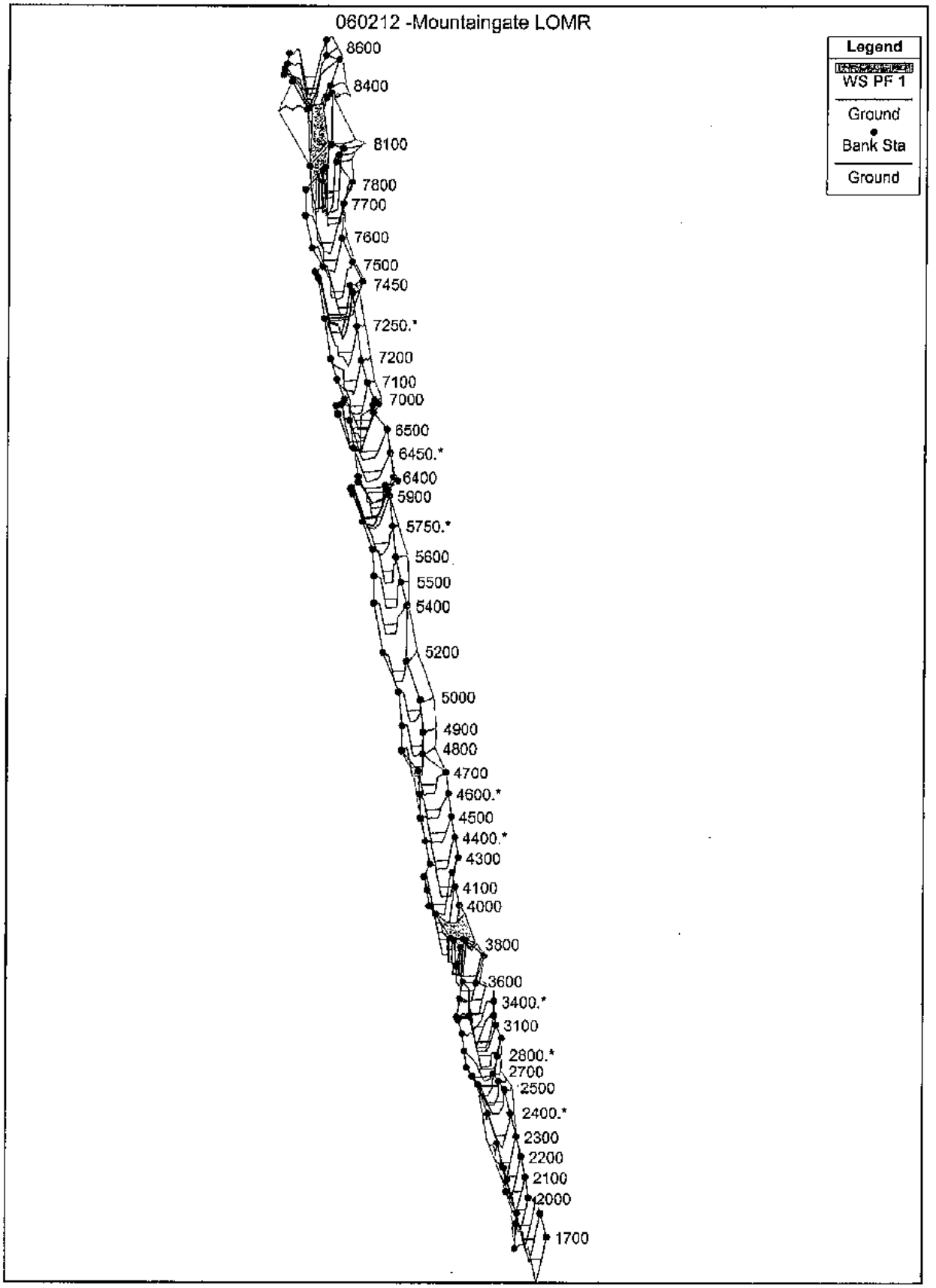
☒ Dimensions (height, width, span, radius, length)
☒ Shape (culverts only)
☒ Material
☐ Beveling or Rounding
☒ Wing Wall Angle
☐ Skew Angle
☐ Distances Between Cross Sections
☐ Erosion Protection
☐ Low Chord Elevations – Upstream and Downstream
☐ Top of Road Elevations – Upstream and Downstream
☒ Structure 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.

APPENDIX B

# APPENDIX B
# HEC-RAS OUTPUT

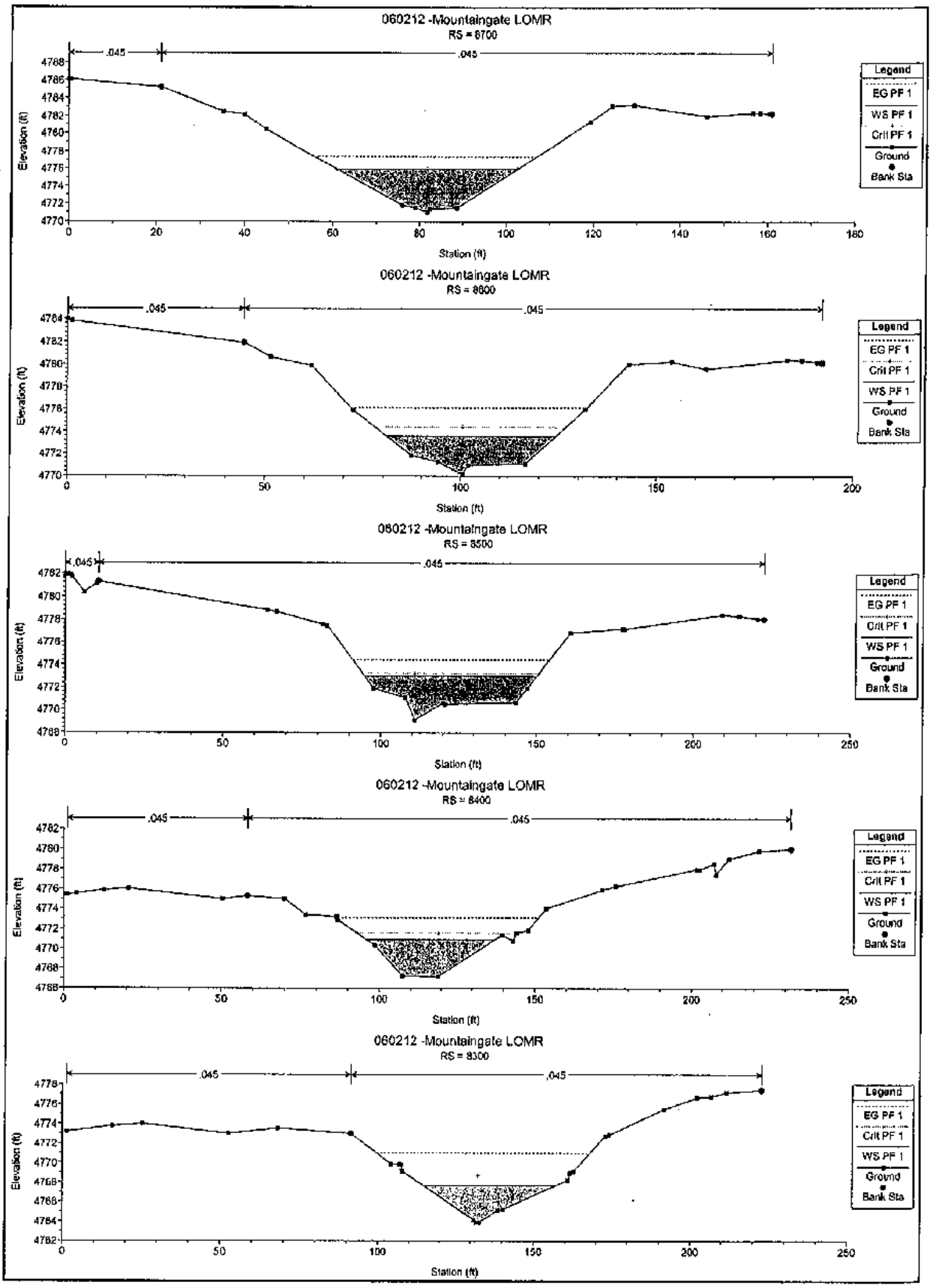

060212 -Mountaingate LOMR
Legend
WS PF 1
Ground
Bank Sta
Ground
8600
8400
8100
7800
7700
7600
7500
7450
7250.*
7200
7100
7000
6500
6450.*
6400
5900
5750.*
5600
5500
5400
5200
5000
4900
4800
4700
4600.*
4500
4400.*
4300
4100
4000
3800
3600
3400.*
3100
2800.*
2700
2500
2400.*
2300
2200
2100
2000
1700

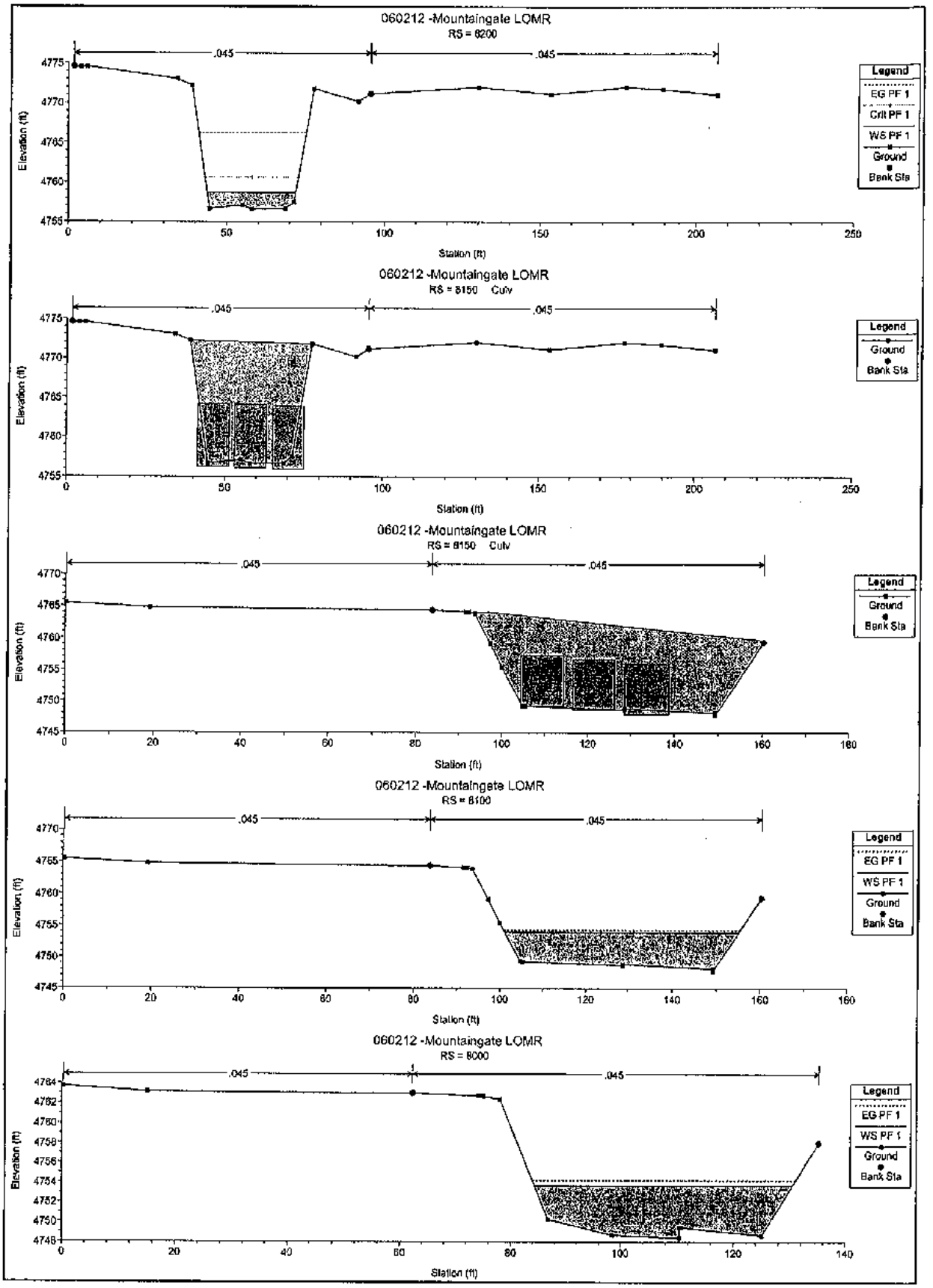
HEC-RAS Plan: LOMR River: RIVER-1 Reach: Reach-1 Profile: PF 1

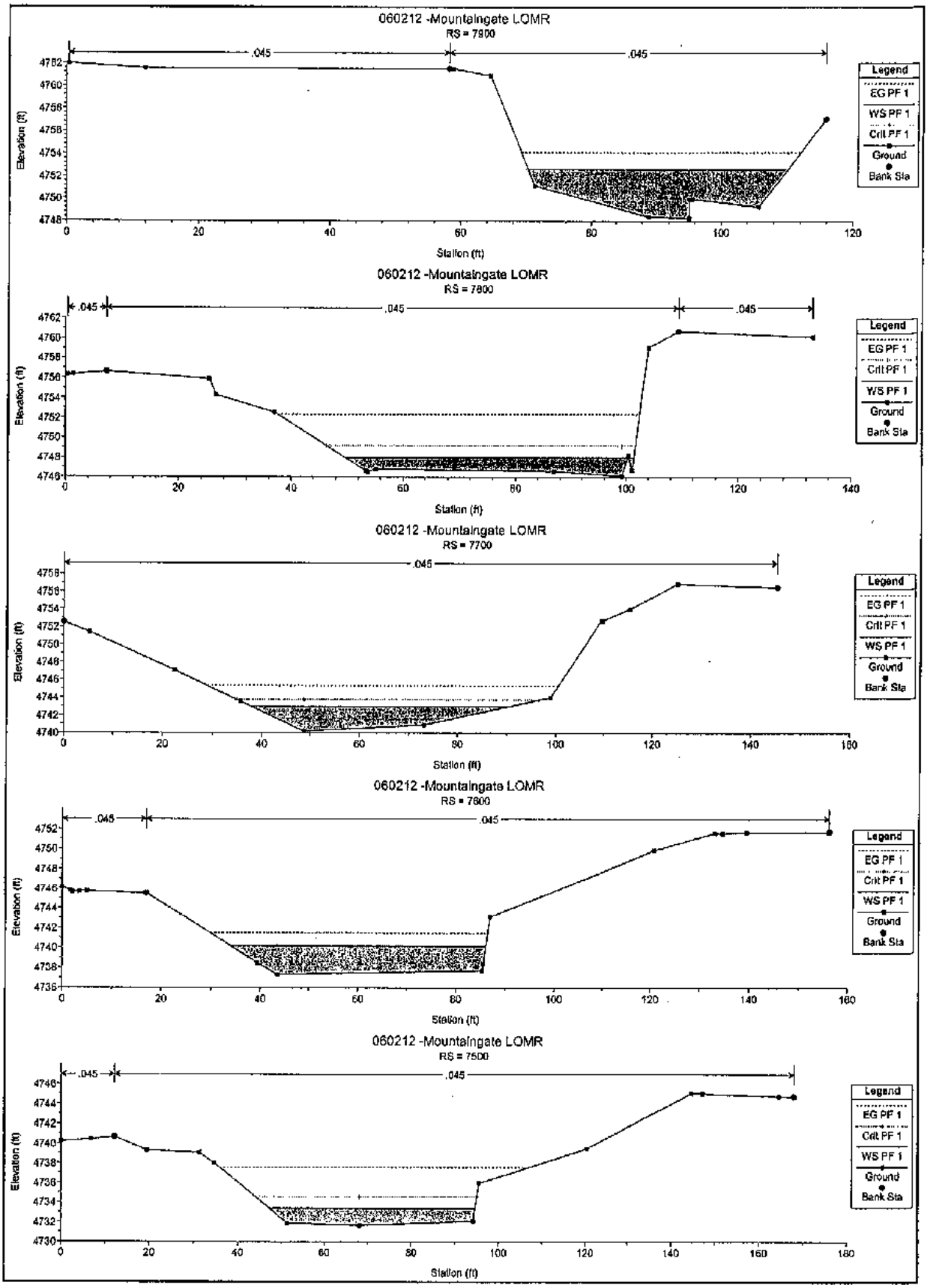
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach-1 | 8700 | PF 1 | 1144.00 | 4771.05 | 4775.94 | 4775.94 | 4777.39 | 0.022075 | 9.65 | 118.49 | 41.51 | 1.01 |
| Reach-1 | 8600 | PF 1 | 1144.00 | 4770.14 | 4773.60 | 4774.38 | 4776.15 | 0.059485 | 12.82 | 89.23 | 43.46 | 1.58 |
| Reach-1 | 8500 | PF 1 | 1144.00 | 4769.10 | 4773.03 | 4773.24 | 4774.44 | 0.030688 | 9.54 | 119.92 | 55.27 | 1.14 |
| Reach-1 | 8400 | PF 1 | 1144.00 | 4767.22 | 4770.90 | 4771.57 | 4773.14 | 0.045350 | 11.99 | 95.40 | 41.64 | 1.40 |
| Reach-1 | 8300 | PF 1 | 1144.00 | 4763.94 | 4767.72 | 4768.75 | 4771.01 | 0.087704 | 14.55 | 78.64 | 42.61 | 1.89 |
| Reach-1 | 8200 | PF 1 | 1144.00 | 4756.57 | 4758.70 | 4760.58 | 4766.25 | 0.218856 | 22.05 | 51.89 | 28.06 | 2.86 |
| Reach-1 | 8150 | | Culvert | | | | | | | | | |
| Reach-1 | 8100 | PF 1 | 1144.00 | 4747.80 | 4753.98 | | 4754.28 | 0.002556 | 4.44 | 257.88 | 54.08 | 2.86 |
| Reach-1 | 8000 | PF 1 | 1144.00 | 4748.43 | 4753.70 | | 4754.23 | 0.005242 | 5.85 | 195.50 | 46.21 | 0.50 |
| Reach-1 | 7900 | PF 1 | 1144.00 | 4748.25 | 4752.59 | 4752.59 | 4754.07 | 0.023407 | 9.75 | 117.29 | 39.92 | 1.00 |
| Reach-1 | 7800 | PF 1 | 1144.00 | 4746.10 | 4748.00 | 4749.17 | 4752.38 | 0.194251 | 16.80 | 68.10 | 51.65 | 2.58 |
| Reach-1 | 7700 | PF 1 | 1144.00 | 4740.18 | 4742.98 | 4743.72 | 4745.33 | 0.066197 | 12.32 | 92.82 | 52.63 | 1.64 |
| Reach-1 | 7600 | PF 1 | 1144.00 | 4737.32 | 4740.18 | 4740.22 | 4741.45 | 0.024458 | 9.06 | 126.28 | 52.11 | 1.03 |
| Reach-1 | 7500 | PF 1 | 1144.00 | 4731.66 | 4733.40 | 4734.56 | 4737.58 | 0.151878 | 16.39 | 69.80 | 47.38 | 2.38 |
| Reach-1 | 7450 | PF 1 | 1144.00 | 4728.27 | 4730.66 | 4730.94 | 4732.07 | 0.035822 | 9.54 | 119.96 | 62.85 | 1.22 |
| Reach-1 | 7400 | PF 1 | 1144.00 | 4724.15 | 4729.11 | 4727.22 | 4729.41 | 0.003392 | 4.44 | 257.86 | 72.22 | 0.41 |
| Reach-1 | 7350 | PF 1 | 1144.00 | 4723.42 | 4728.67 | | 4729.27 | 0.010983 | 6.20 | 184.53 | 75.74 | 0.70 |
| Reach-1 | 7300 | PF 1 | 1144.00 | 4723.27 | 4728.18 | 4728.18 | 4729.17 | 0.024553 | 7.98 | 143.29 | 73.69 | 1.01 |
| Reach-1 | 7250.* | PF 1 | 1144.00 | 4718.50 | 4722.06 | 4722.77 | 4724.44 | 0.071709 | 12.39 | 92.34 | 54.42 | 1.68 |
| Reach-1 | 7200 | PF 1 | 1144.00 | 4713.64 | 4717.08 | 4717.33 | 4718.62 | 0.033630 | 9.97 | 114.72 | 51.39 | 1.18 |
| Reach-1 | 7100 | PF 1 | 1144.00 | 4710.12 | 4712.12 | 4712.94 | 4714.83 | 0.080080 | 13.22 | 86.50 | 49.87 | 1.77 |
| Reach-1 | 7000 | PF 1 | 1144.00 | 4707.24 | 4709.56 | 4709.93 | 4711.09 | 0.042028 | 9.94 | 115.14 | 63.79 | 1.30 |
| Reach-1 | 6900 | PF 1 | 1144.00 | 4705.52 | 4708.04 | 4708.53 | 4710.02 | 0.064102 | 11.28 | 101.45 | 63.39 | 1.57 |
| Reach-1 | 6800 | PF 1 | 1144.00 | 4702.60 | 4704.50 | 4705.82 | 4709.26 | 0.161479 | 17.51 | 65.34 | 41.44 | 2.46 |
| Reach-1 | 6700 | PF 1 | 1144.00 | 4702.47 | 4705.09 | 4705.53 | 4706.76 | 0.046599 | 10.39 | 110.13 | 61.32 | 1.37 |
| Reach-1 | 6600 | PF 1 | 1144.00 | 4702.43 | 4705.20 | 4705.47 | 4706.58 | 0.035394 | 9.41 | 121.55 | 64.71 | 1.21 |
| Reach-1 | 6500 | PF 1 | 1144.00 | 4701.10 | 4703.26 | 4703.70 | 4704.85 | 0.052538 | 10.14 | 112.86 | 72.53 | 1.43 |
| Reach-1 | 6450.* | PF 1 | 1144.00 | 4697.30 | 4699.94 | 4700.08 | 4701.05 | 0.030042 | 8.45 | 135.37 | 75.10 | 1.11 |
| Reach-1 | 6400 | PF 1 | 1144.00 | 4693.53 | 4697.57 | 4696.45 | 4697.92 | 0.005977 | 4.74 | 241.14 | 94.67 | 0.52 |
| Reach-1 | 6300 | PF 1 | 1144.00 | 4694.10 | 4696.72 | 4696.72 | 4697.63 | 0.024809 | 7.67 | 149.10 | 82.90 | 1.01 |
| Reach-1 | 6200 | PF 1 | 1144.00 | 4690.58 | 4692.96 | 4694.13 | 4697.16 | 0.145452 | 16.44 | 69.57 | 46.02 | 2.36 |
| Reach-1 | 6100 | PF 1 | 1144.00 | 4688.90 | 4691.06 | 4692.07 | 4694.33 | 0.102687 | 14.51 | 78.86 | 48.33 | 2.00 |
| Reach-1 | 6000 | PF 1 | 1144.00 | 4688.80 | 4690.84 | 4691.74 | 4693.81 | 0.110624 | 13.83 | 82.73 | 58.29 | 2.05 |
| Reach-1 | 5900 | PF 1 | 1144.00 | 4688.29 | 4691.32 | 4691.34 | 4692.36 | 0.024053 | 8.21 | 139.40 | 68.24 | 1.01 |
| Reach-1 | 5750.* | PF 1 | 1144.00 | 4683.70 | 4686.83 | 4687.24 | 4688.49 | 0.043733 | 10.36 | 110.43 | 59.56 | 1.34 |
| Reach-1 | 5600 | PF 1 | 1144.00 | 4679.10 | 4682.11 | 4682.44 | 4683.94 | 0.033050 | 10.86 | 105.34 | 40.86 | 1.19 |
| Reach-1 | 5500 | PF 1 | 1144.00 | 4674.70 | 4676.79 | 4677.51 | 4679.23 | 0.065140 | 12.55 | 91.16 | 49.03 | 1.62 |
| Reach-1 | 5400 | PF 1 | 1144.00 | 4670.00 | 4672.43 | 4672.80 | 4674.11 | 0.038069 | 10.42 | 109.78 | 52.51 | 1.27 |
| Reach-1 | 5200 | PF 1 | 1144.00 | 4661.70 | 4664.21 | 4664.71 | 4666.14 | 0.045119 | 11.17 | 102.42 | 50.25 | 1.36 |

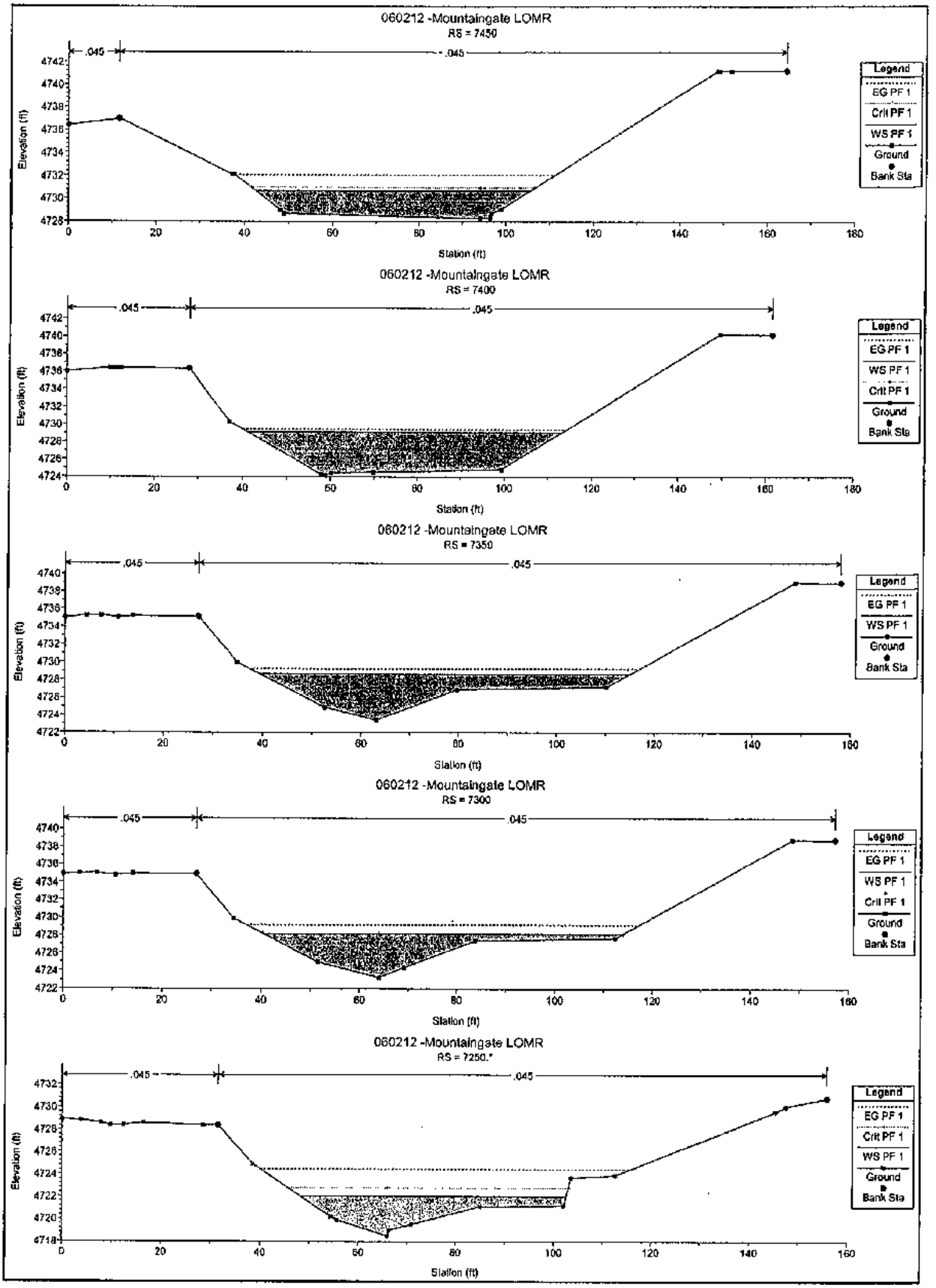
HEC-RAS Plan: LOMR River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

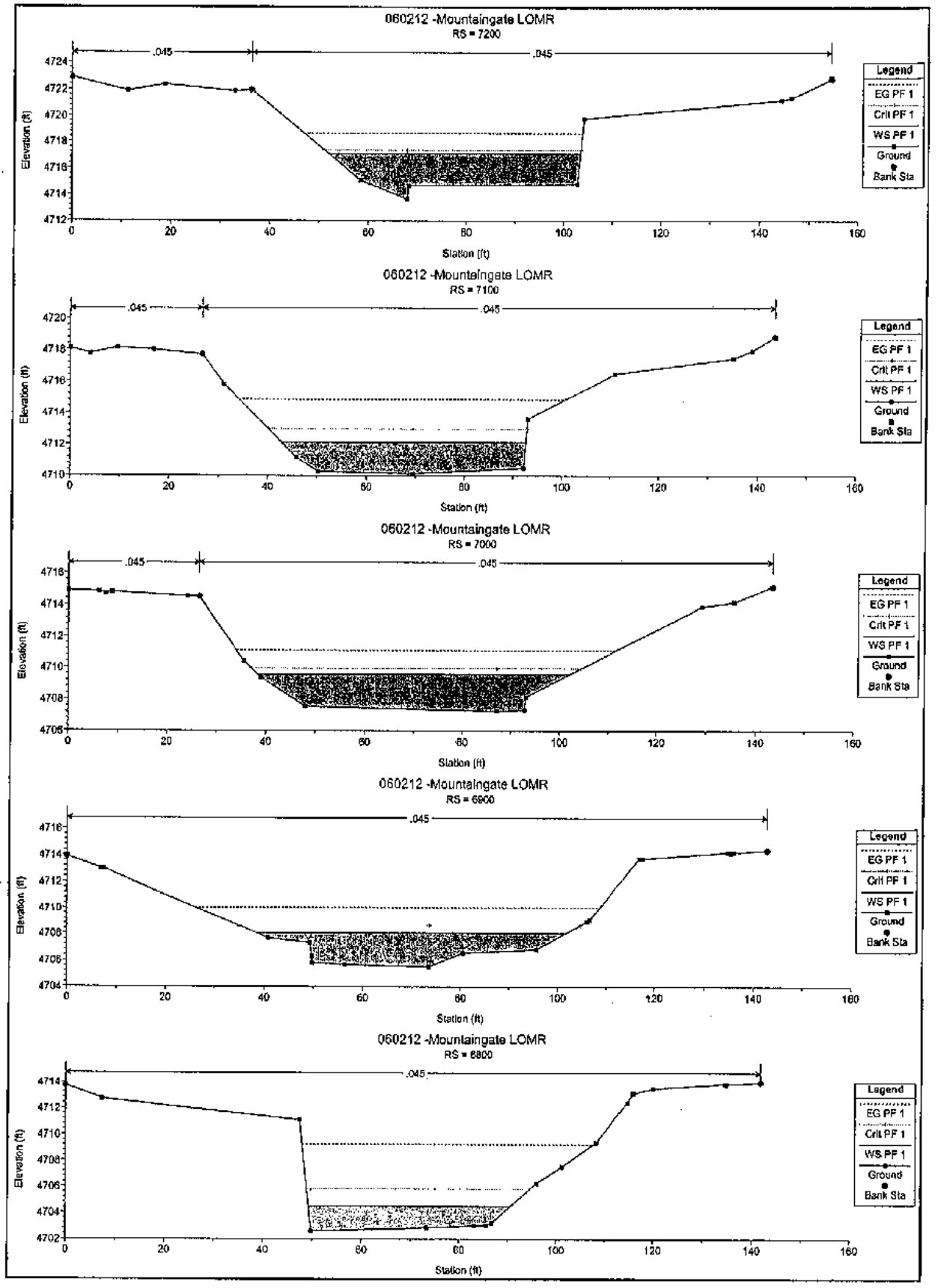
| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| Reach-1 | 5000 | PF 1 | 1144.00 | 4654.54 | 4657.32 | 4657.67 | 4659.01 | 0.037005 | 10.44 | 109.61 | 50.86 | 1.25 |
| Reach-1 | 4900 | PF 1 | 1144.00 | 4648.62 | 4650.98 | 4651.55 | 4653.10 | 0.049528 | 11.67 | 98.07 | 46.94 | 1.42 |
| Reach-1 | 4800 | PF 1 | 1144.00 | 4644.83 | 4647.32 | 4647.73 | 4649.15 | 0.039101 | 10.87 | 105.27 | 46.69 | 1.28 |
| Reach-1 | 4700 | PF 1 | 1144.00 | 4641.59 | 4644.33 | 4644.44 | 4645.58 | 0.027250 | 8.97 | 127.58 | 59.59 | 1.08 |
| Reach-1 | 4600.* | PF 1 | 1144.00 | 4637.40 | 4639.61 | 4640.26 | 4641.71 | 0.059612 | 11.63 | 98.37 | 56.19 | 1.55 |
| Reach-1 | 4500 | PF 1 | 1144.00 | 4633.20 | 4635.62 | 4635.91 | 4637.03 | 0.036378 | 9.55 | 119.85 | 63.73 | 1.23 |
| Reach-1 | 4400.* | PF 1 | 1144.00 | 4628.20 | 4630.40 | 4631.00 | 4632.47 | 0.057149 | 11.56 | 98.96 | 55.30 | 1.52 |
| Reach-1 | 4300 | PF 1 | 1144.00 | 4623.20 | 4625.60 | 4626.07 | 4627.45 | 0.043242 | 10.91 | 104.85 | 51.50 | 1.35 |
| Reach-1 | 4200 | PF 1 | 1144.00 | 4620.13 | 4622.64 | 4623.03 | 4624.35 | 0.038488 | 10.50 | 108.94 | 51.91 | 1.28 |
| Reach-1 | 4100 | PF 1 | 1144.00 | 4616.97 | 4619.50 | 4619.96 | 4621.32 | 0.042106 | 10.84 | 105.56 | 51.31 | 1.33 |
| Reach-1 | 4000 | PF 1 | 1144.00 | 4612.90 | 4617.15 | 4615.93 | 4617.66 | 0.006473 | 5.78 | 197.94 | 60.25 | 0.56 |
| Reach-1 | 3900 | PF 1 | 1144.00 | 4611.96 | 4617.05 | 4614.78 | 4617.45 | 0.003567 | 5.10 | 224.48 | 45.66 | 0.41 |
| Reach-1 | 3850 | | Culvert | | | | | | | | | |
| Reach-1 | 3800 | PF 1 | 1144.00 | 4611.14 | 4614.74 | 4614.74 | 4616.31 | 0.022452 | 10.05 | 113.85 | 36.67 | 1.00 |
| Reach-1 | 3700 | PF 1 | 1144.00 | 4610.08 | 4611.72 | 4612.54 | 4614.48 | 0.102142 | 13.32 | 85.86 | 59.30 | 1.95 |
| Reach-1 | 3600 | PF 1 | 1144.00 | 4607.12 | 4609.81 | 4609.81 | 4611.02 | 0.023526 | 8.82 | 129.74 | 54.15 | 1.00 |
| Reach-1 | 3500 | PF 1 | 1144.00 | 4605.04 | 4608.67 | 4607.95 | 4609.46 | 0.010981 | 7.11 | 160.85 | 51.31 | 0.71 |
| Reach-1 | 3400.* | PF 1 | 1144.00 | 4602.30 | 4606.81 | 4606.81 | 4608.17 | 0.023071 | 9.37 | 122.13 | 45.61 | 1.01 |
| Reach-1 | 3300 | PF 1 | 1144.00 | 4599.61 | 4604.75 | 4604.89 | 4606.22 | 0.025432 | 9.72 | 117.73 | 45.78 | 1.07 |
| Reach-1 | 3200 | PF 1 | 1144.00 | 4599.51 | 4601.12 | 4602.35 | 4605.74 | 0.187987 | 17.24 | 66.36 | 49.86 | 2.63 |
| Reach-1 | 3100 | PF 1 | 1144.00 | 4599.00 | 4601.24 | 4601.80 | 4603.20 | 0.054218 | 11.25 | 101.65 | 56.39 | 1.48 |
| Reach-1 | 3000 | PF 1 | 1144.00 | 4598.90 | 4601.31 | 4601.68 | 4602.91 | 0.040546 | 10.17 | 112.53 | 58.38 | 1.29 |
| Reach-1 | 2900 | PF 1 | 1144.00 | 4596.40 | 4599.33 | 4599.33 | 4600.62 | 0.023432 | 9.12 | 125.46 | 49.03 | 1.00 |
| Reach-1 | 2800.* | PF 1 | 1144.00 | 4594.00 | 4597.36 | 4597.50 | 4598.56 | 0.029729 | 8.80 | 130.07 | 66.18 | 1.11 |
| Reach-1 | 2700 | PF 1 | 1144.00 | 4591.55 | 4596.61 | 4594.39 | 4596.84 | 0.002470 | 3.64 | 297.75 | 80.19 | 0.35 |
| Reach-1 | 2600.* | PF 1 | 1144.00 | 4591.50 | 4596.17 | | 4596.47 | 0.003511 | 4.34 | 263.42 | 77.07 | 0.41 |
| Reach-1 | 2500 | PF 1 | 1144.00 | 4591.55 | 4594.40 | 4594.40 | 4595.47 | 0.023795 | 8.33 | 137.34 | 64.72 | 1.01 |
| Reach-1 | 2400.* | PF 1 | 1144.00 | 4584.20 | 4587.28 | 4588.56 | 4591.50 | 0.121327 | 16.48 | 69.40 | 39.87 | 2.20 |
| Reach-1 | 2300 | PF 1 | 1144.00 | 4576.86 | 4581.80 | 4582.73 | 4584.78 | 0.055931 | 13.87 | 82.49 | 33.42 | 1.56 |
| Reach-1 | 2200 | PF 1 | 1144.00 | 4574.70 | 4580.38 | 4580.30 | 4581.75 | 0.020217 | 9.38 | 121.98 | 41.67 | 0.97 |
| Reach-1 | 2100 | PF 1 | 1144.00 | 4572.65 | 4578.22 | 4578.22 | 4579.63 | 0.022159 | 9.52 | 120.14 | 43.14 | 1.01 |
| Reach-1 | 2000 | PF 1 | 1144.00 | 4570.09 | 4575.44 | 4575.68 | 4577.13 | 0.027610 | 10.42 | 109.80 | 40.57 | 1.12 |
| Reach-1 | 1900 | PF 1 | 1144.00 | 4567.47 | 4573.38 | 4573.17 | 4574.61 | 0.017941 | 8.90 | 128.60 | 43.51 | 0.91 |
| Reach-1 | 1800 | PF 1 | 1144.00 | 4565.67 | 4571.59 | 4571.37 | 4572.89 | 0.018223 | 9.13 | 125.27 | 41.03 | 0.92 |
| Reach-1 | 1700 | PF 1 | 1144.00 | 4562.93 | 4569.01 | 4568.70 | 4570.21 | 0.017017 | 8.81 | 129.84 | 42.67 | 0.89 |

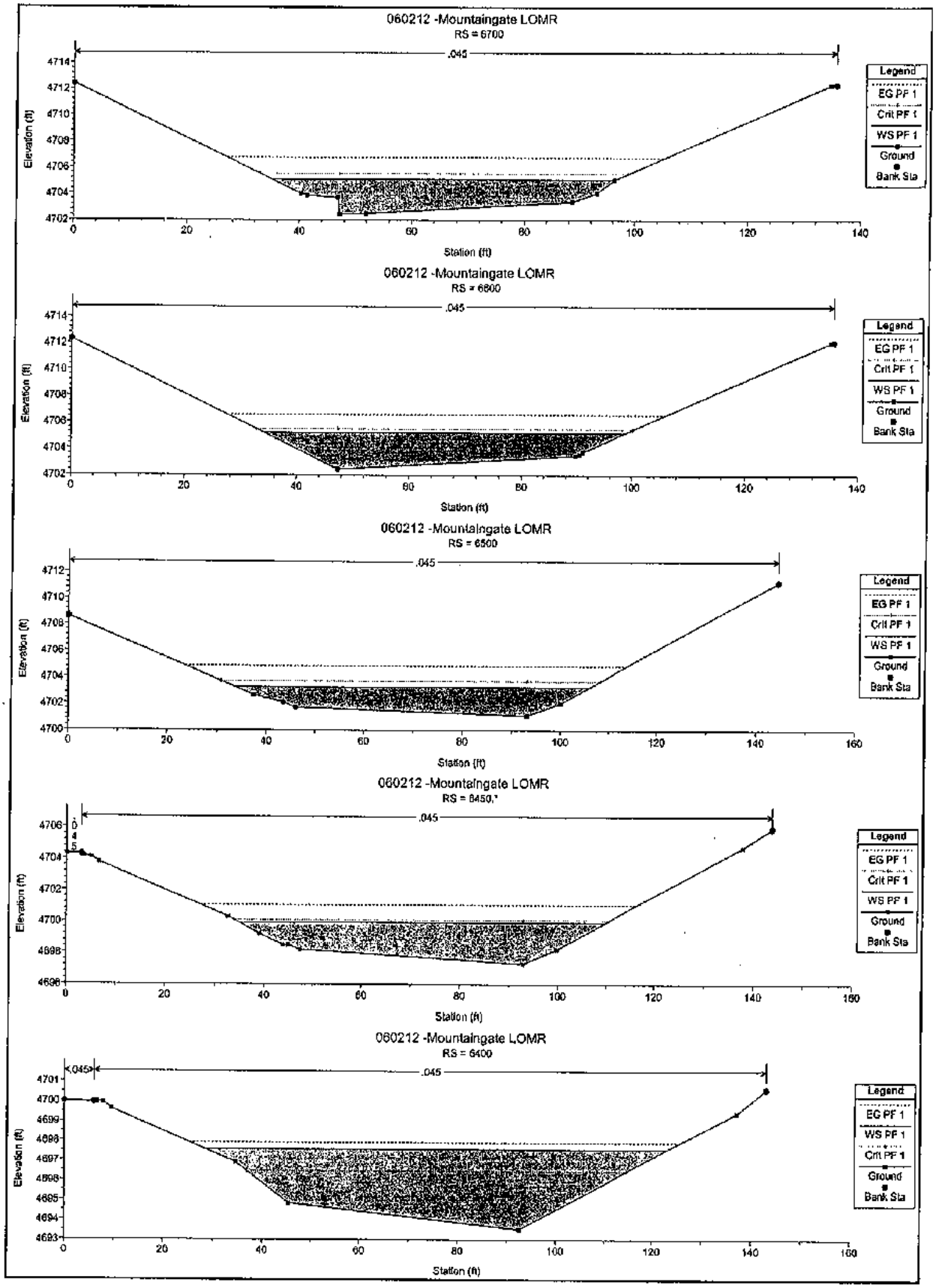

060212 -Mountaingate LOMR
RS = 8700
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8600
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8500
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8400
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8300
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

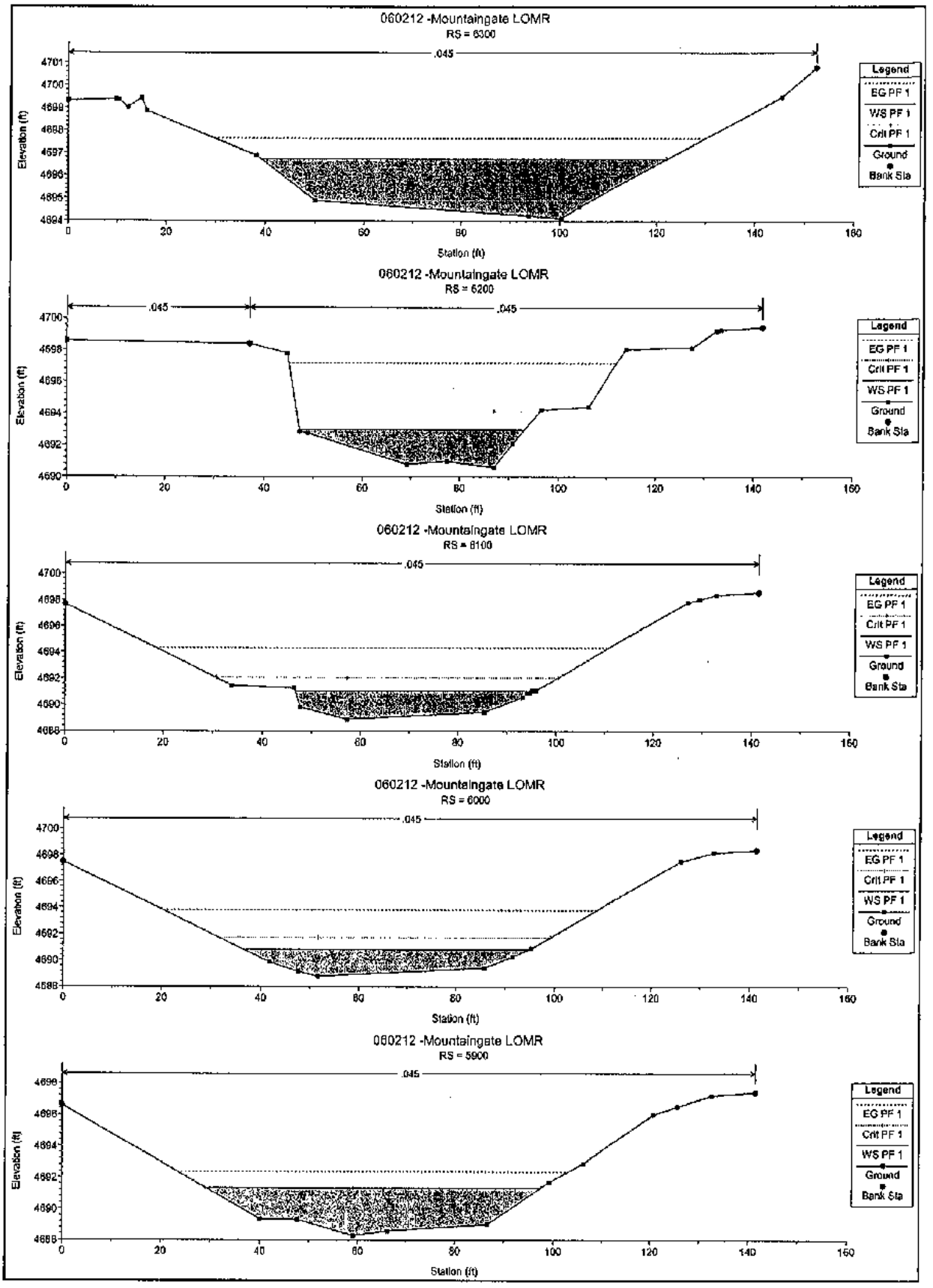

060212 -Mountaingate LOMR
RS = 8200
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8150 Culv
.045
.045
Elevation (ft)
Station (ft)
Legend
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8150 Culv
.045
.045
Elevation (ft)
Station (ft)
Legend
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8100
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 8000
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta

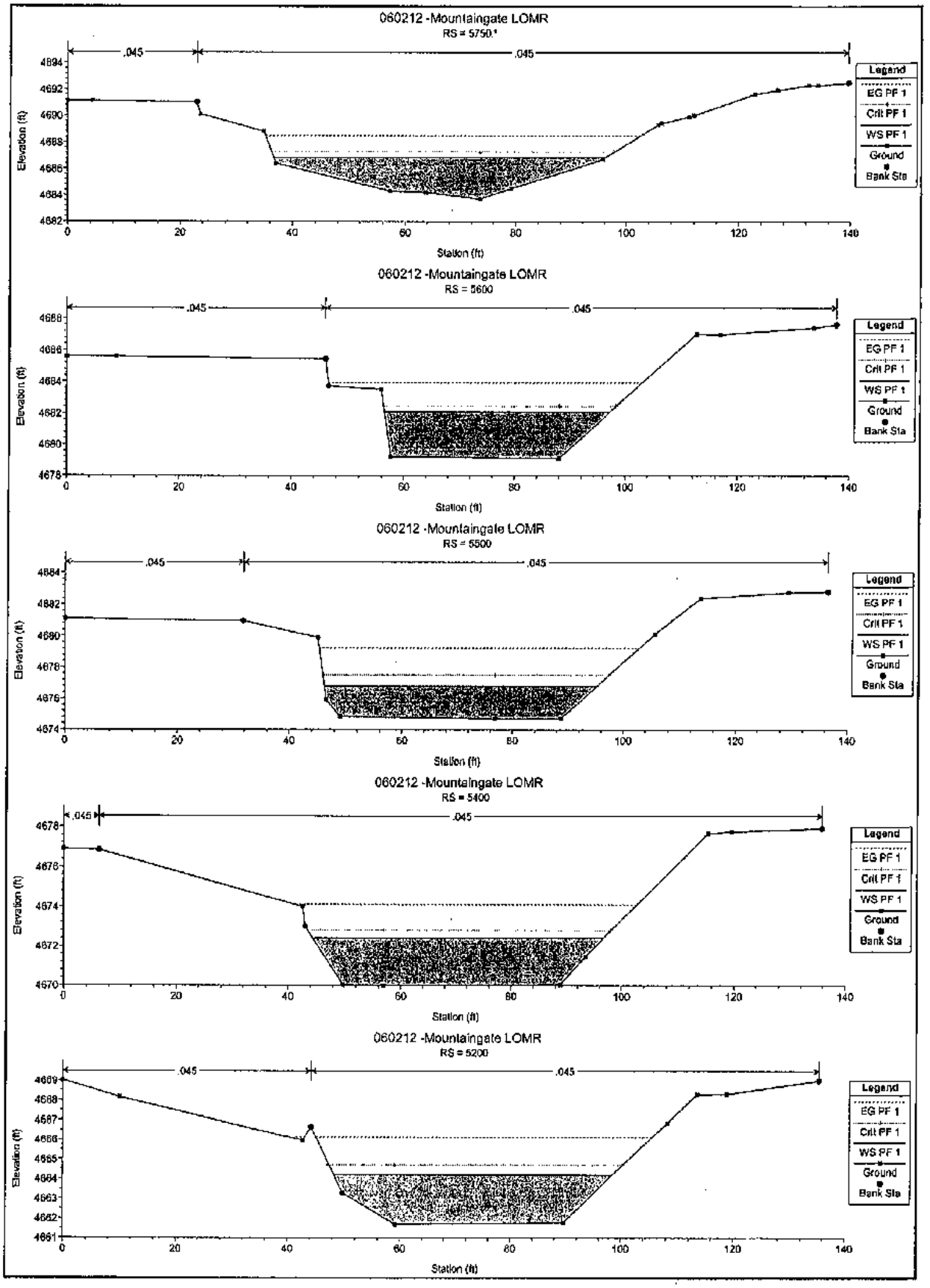

060212 -Mountaingate LOMR
RS = 7900
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7800
.045
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7700
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7600
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7500
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

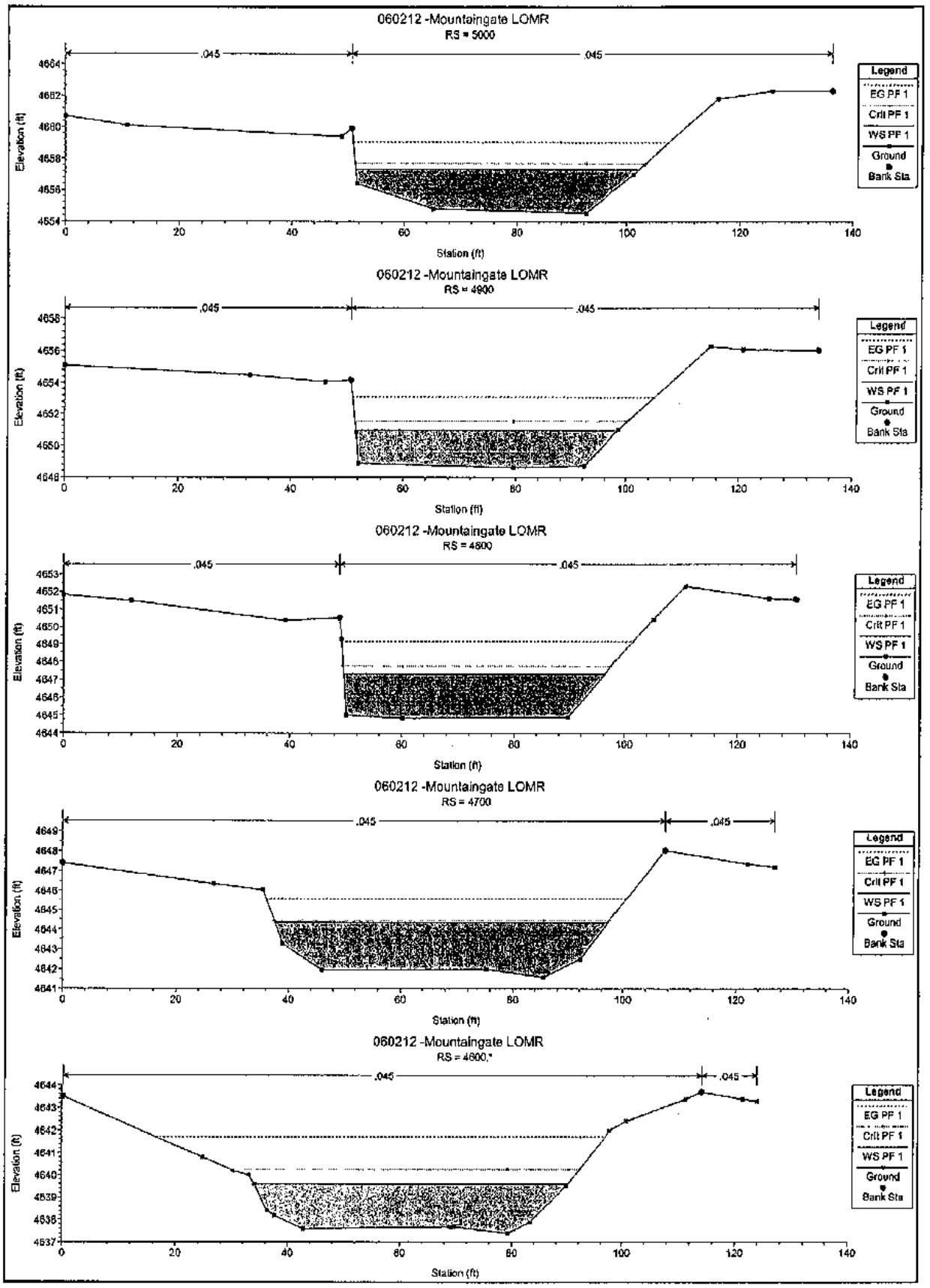

060212 -Mountaingate LOMR
RS = 7450
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7400
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7350
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7300
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7250.*
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

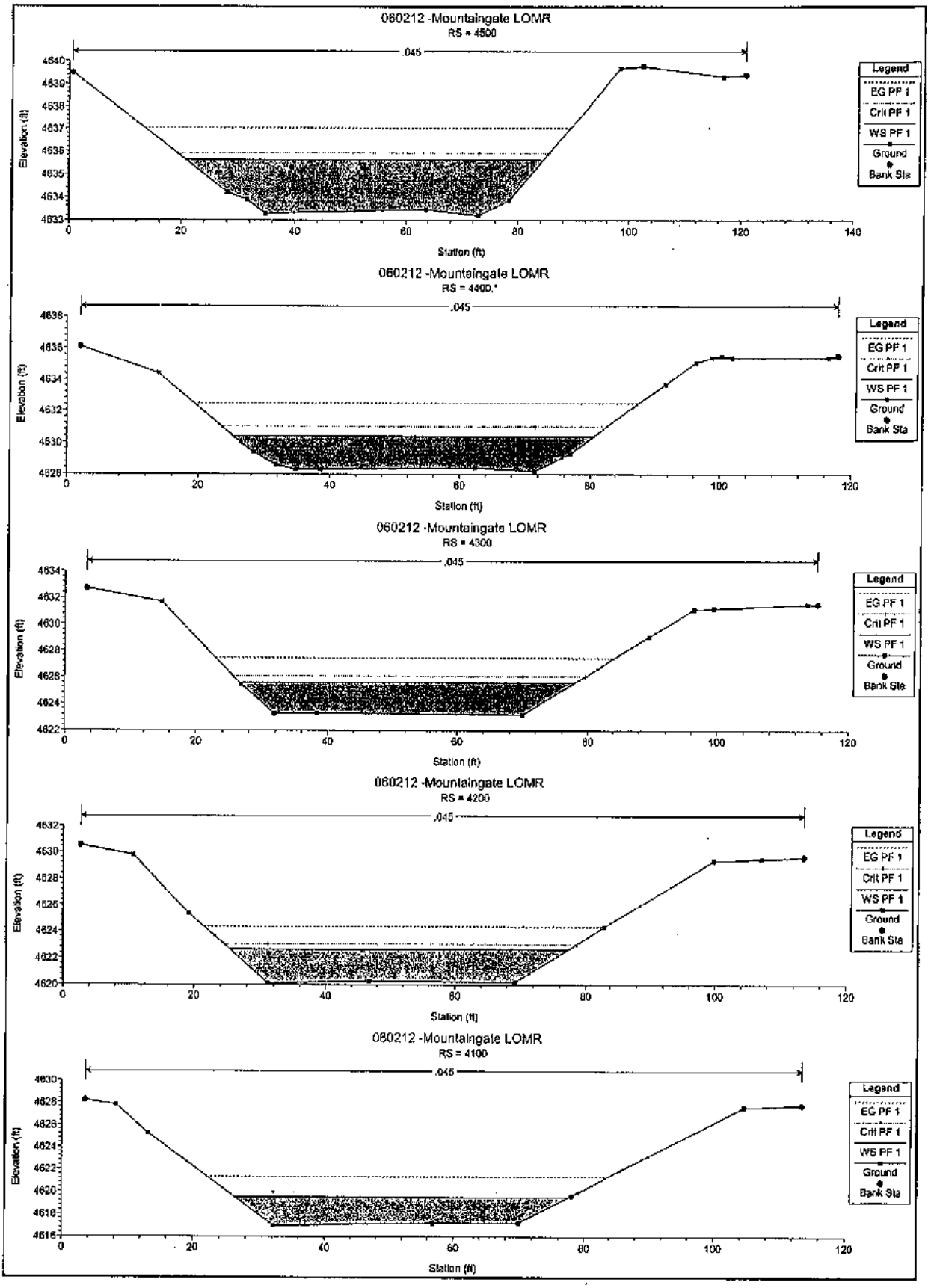

060212 -Mountaingate LOMR
RS = 7200
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7100
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 7000
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6900
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6800
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

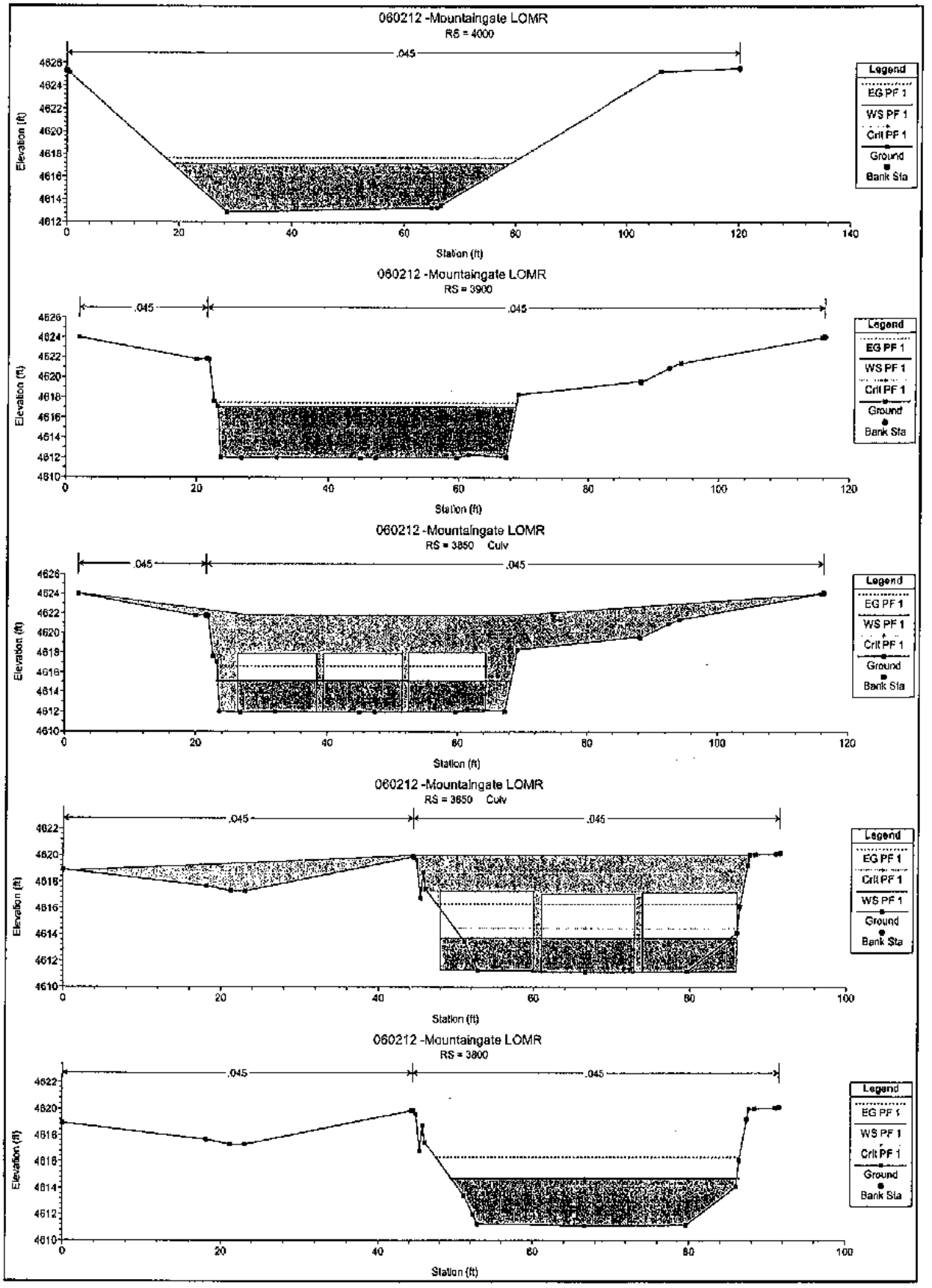

060212 -Mountaingate LOMR
RS = 6700
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6600
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6500
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6450.*
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6400
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 6300
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6200
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6100
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 6000
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 5900
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 5750*
.045
.045
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
060212 -Mountaingate LOMR
RS = 5600
060212 -Mountaingate LOMR
RS = 5500
060212 -Mountaingate LOMR
RS = 5400
060212 -Mountaingate LOMR
RS = 5200


060212 -Mountaingate LOMR
RS = 5000
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4900
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4800
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4700
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4600.*
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 4500
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4400.*
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4300
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4200
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 4100
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 4000
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3900
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3850 Culv
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3850 Culv
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3800
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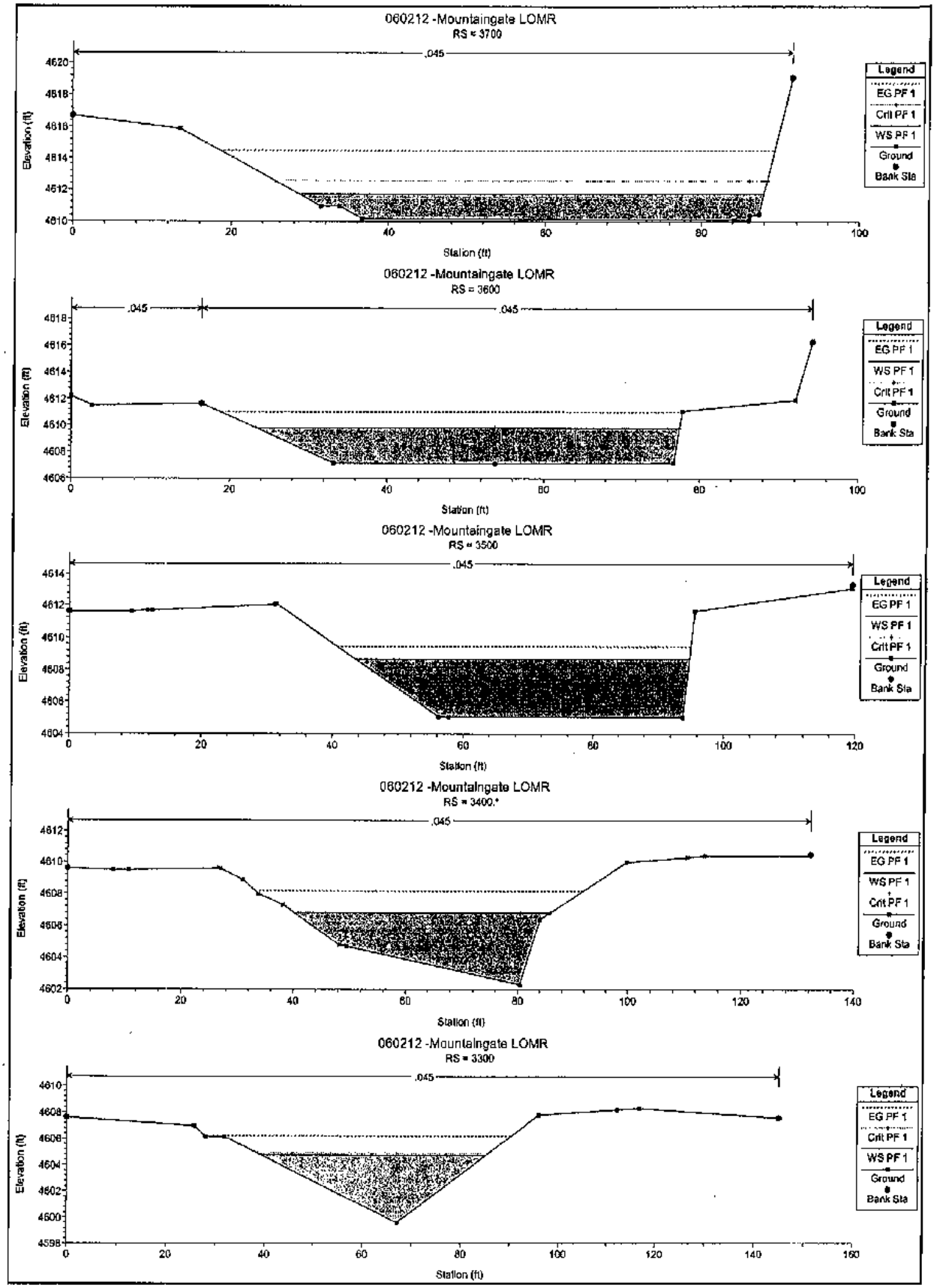
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 3700
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3600
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3500
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3400.*
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3300
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Elevation (ft)
Station (ft)
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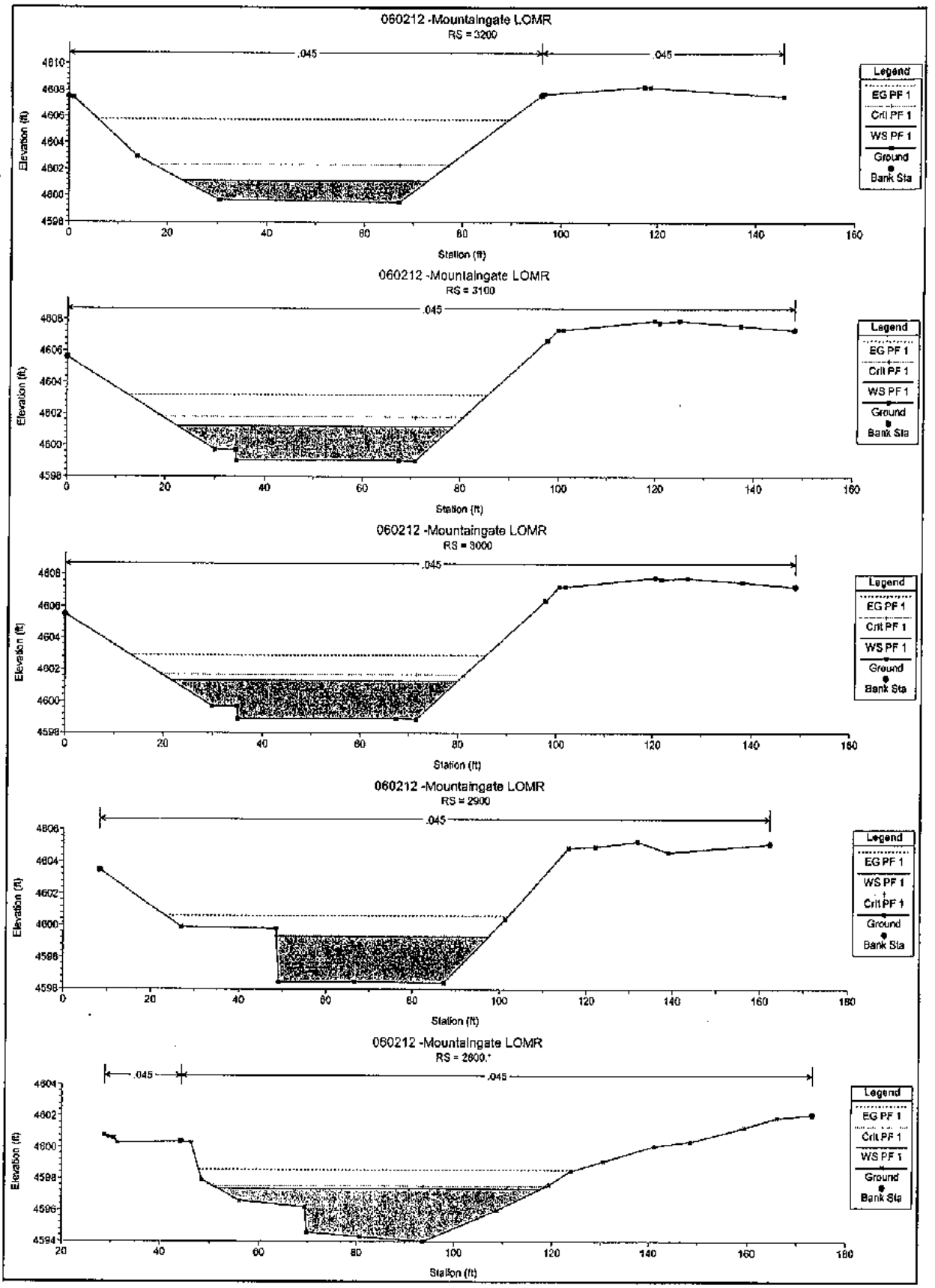
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 3200
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3100
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 3000
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2900
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2800.*
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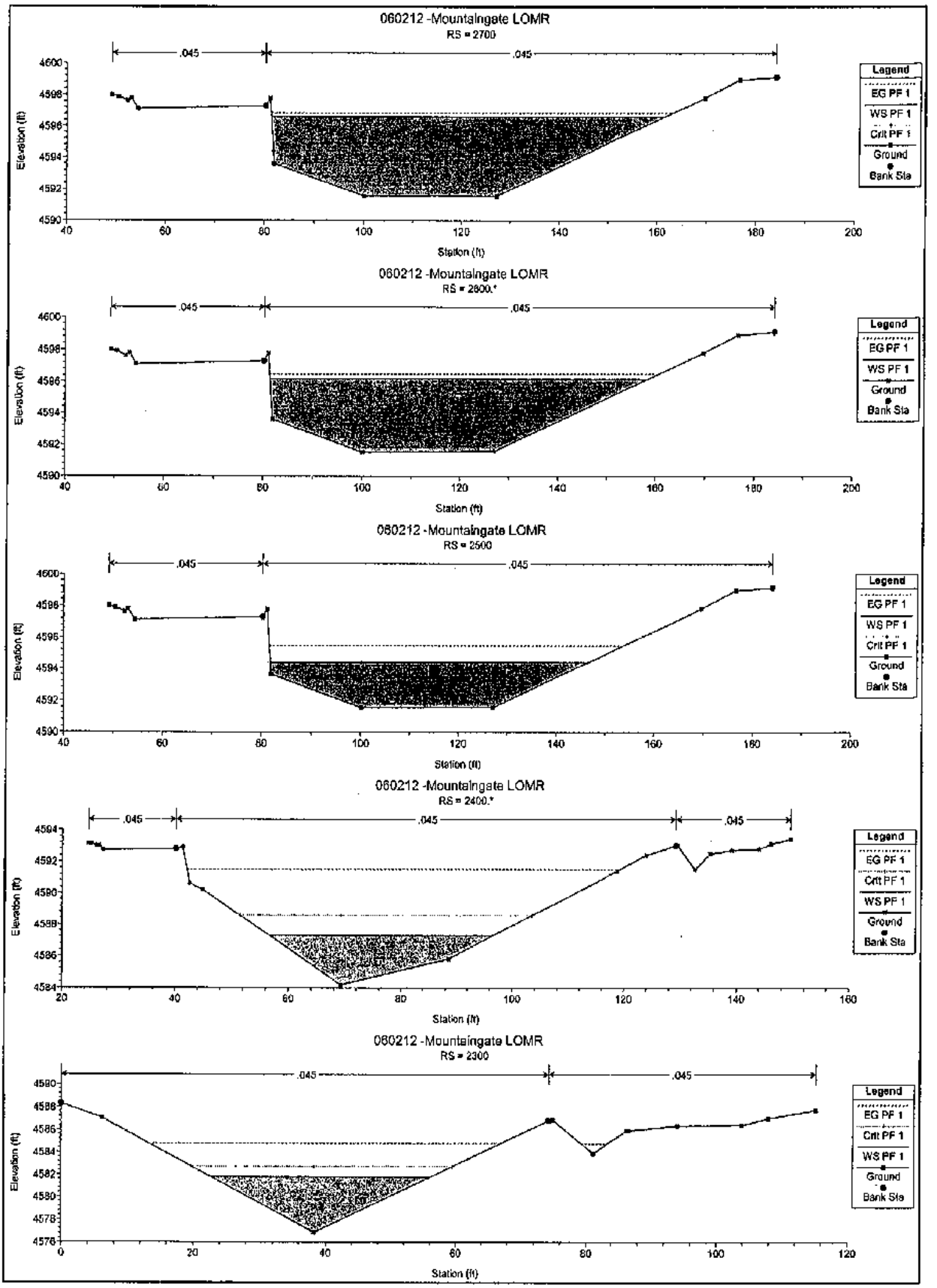
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 2700
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.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2600.*
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2500
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2400.*
.045
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2300
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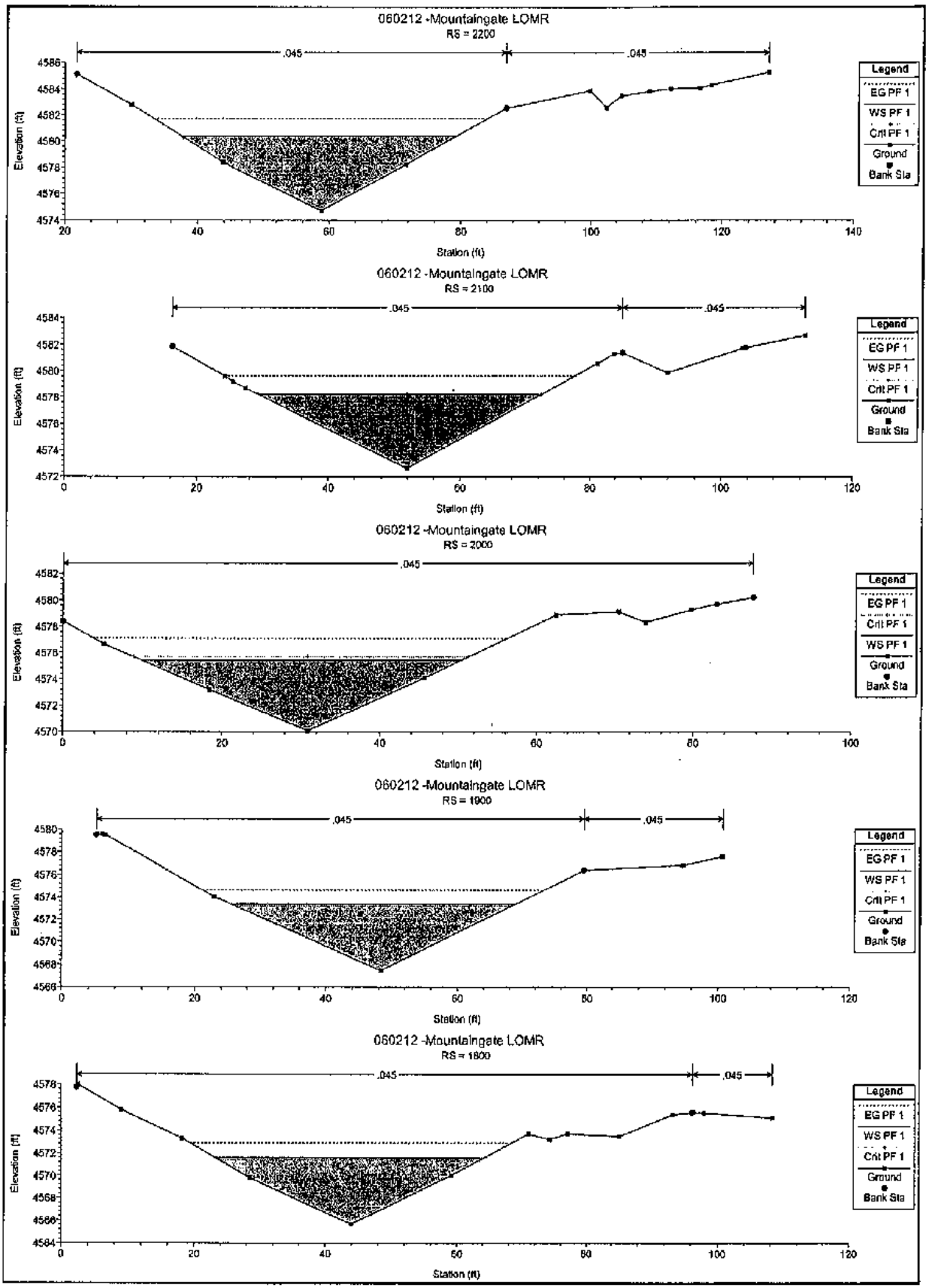
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 2200
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2100
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 2000
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 1900
.045
.045
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
060212 -Mountaingate LOMR
RS = 1800
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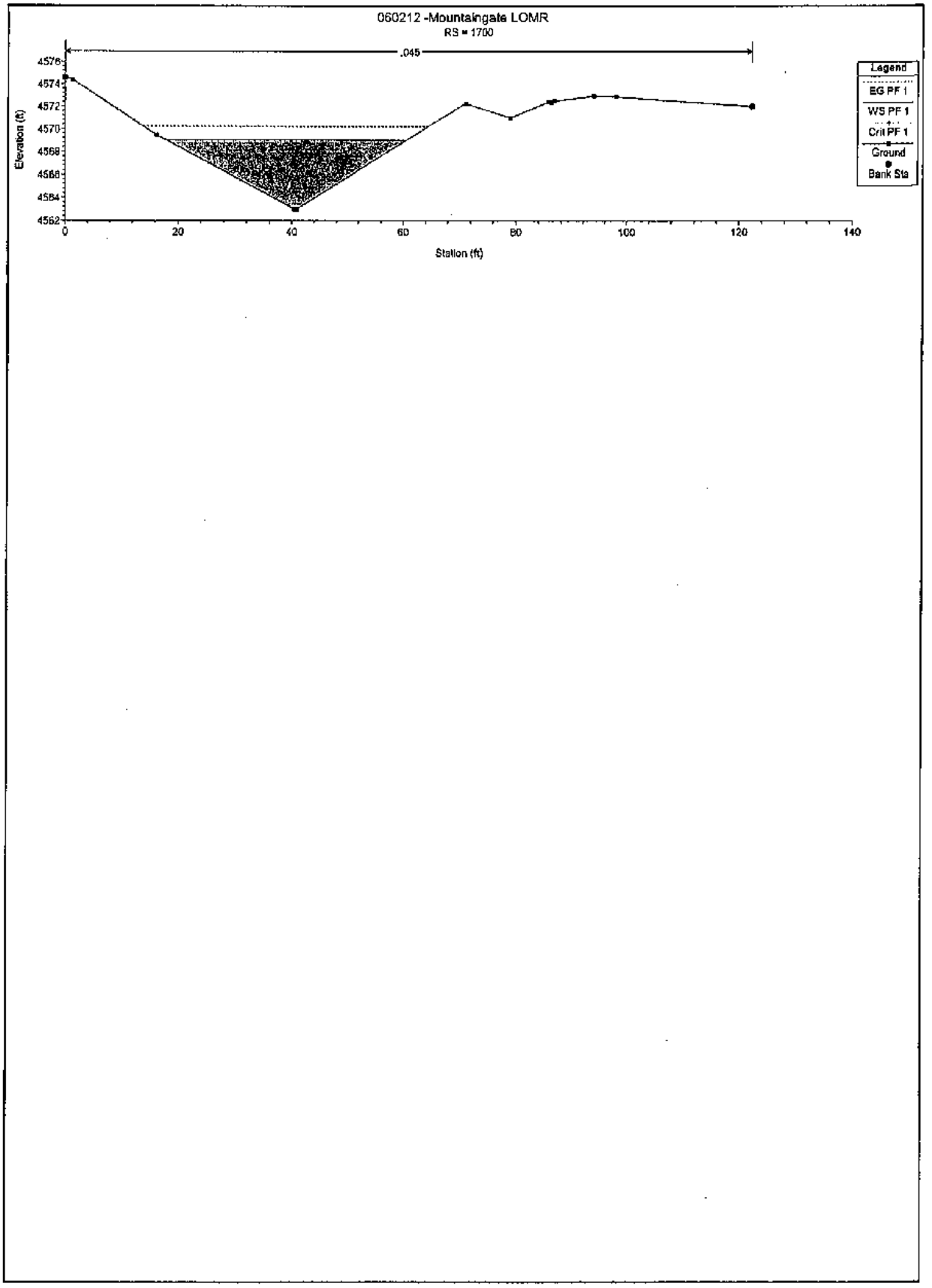
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta


060212 -Mountaingate LOMR
RS = 1700
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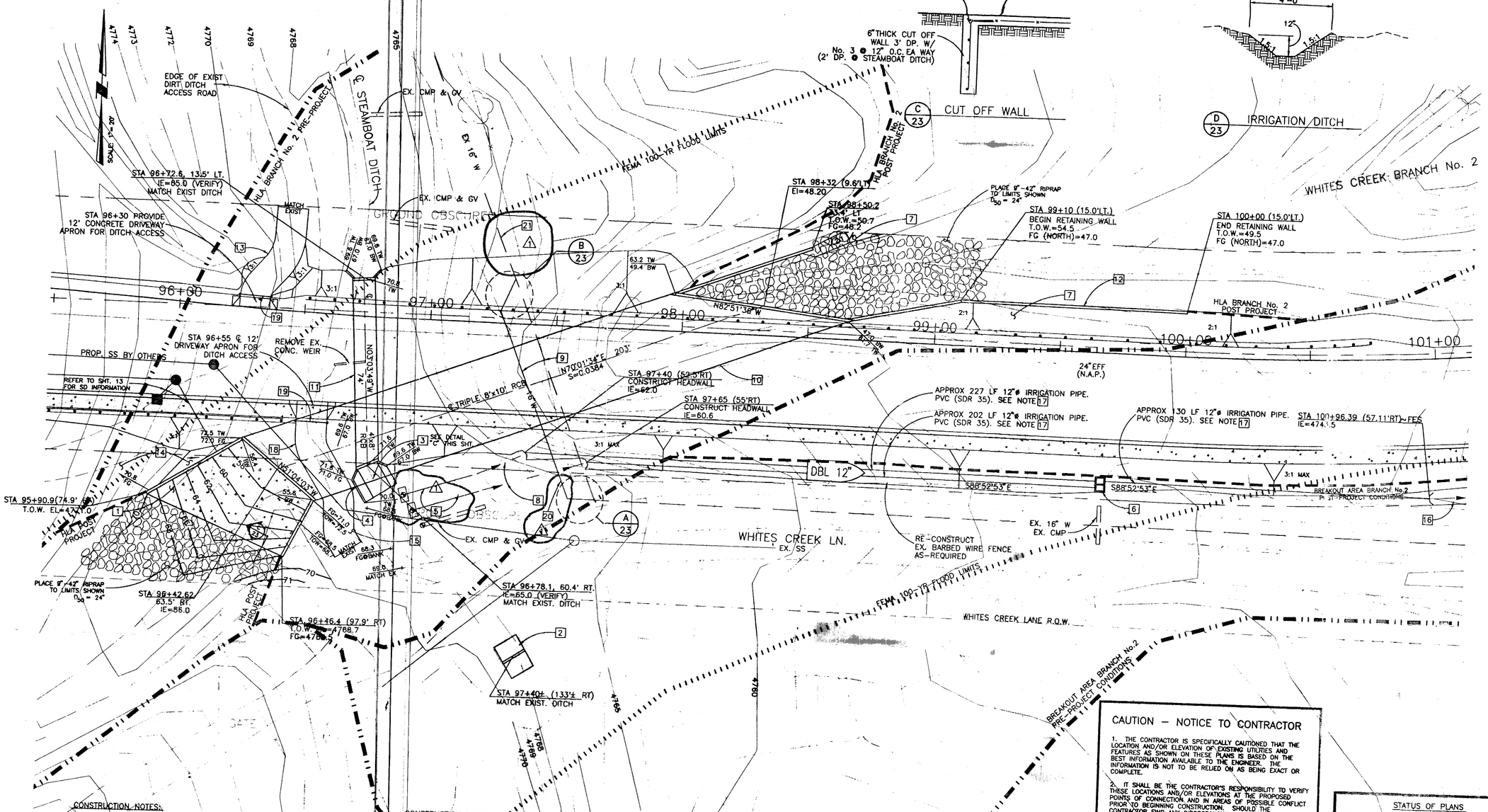
Elevation (ft)
4576
4574
4572
4570
4568
4566
4564
4562
0
20
40
60
80
100
120
140
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

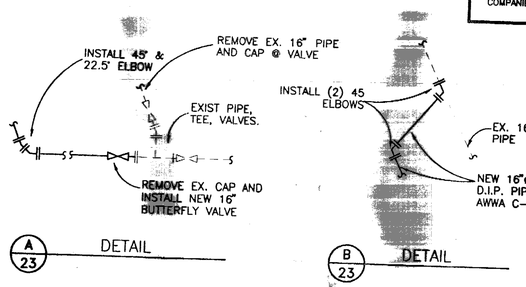



CONSTRUCTION NOTES:

1. CONST. CONCRETE APRON PER FG ELEVATIONS AS SHOWN. SEE DETAIL 'C' THIS SHEET
2. CONSTRUCT CONCRETE RECTANGULAR SHARP CRESTED WEIR AND SLAB BELOW WITH EMBEDDED GALVANIZED STEEL PLATES TO FORM EDGE OF WEIR AND SLOTS FOR REMOVEABLE 2x BOARDS. WEIR MARKINGS, CONSTRUCTION, AND GEOMETRY PER STEAMBOAT DITCH AUTHORITIES DIRECTION.
3. SHOTCRETE DITCH APPROX. 12 LF BEYOND HEADWALL. USE W6x6-W1.4xW1.4 WWF REINFORCING. CONSTRUCT 2' DEEP CUT OFF WALL AT END OF SHOTCRETE APRON. SEE DETAIL 'C' THIS SHEET, SIMILAR.
4. CONSTRUCT APPROXIMATELY 15 LF 3' HIGH CONCRETE RETAINING WALL . SEE DETAIL 'E' SHEET 26 FOR STRUCTURAL REQUIREMENTS.
5. THE CONTRACTOR IS TO RECONSTRUCT IRRIGATION DIVERSION BOXES IN THE NEW LOCATION IDENTICAL TO THE EXISTING STRUCTURES. CONTRACTOR SHALL COORDINATE ALL IRRIGATION RELATED WORK WITH THE STEAMBOAT DITCH COMPANY.
6. CONSTRUCT 4'x6' CONCRETE JUNCTION BOX WITH 12"ø GATE VALVE AS SHOWN IN DETAIL 'E'. USE 6' CONCRETE WALLS AND SLAB WITH #4 @ 12" O.C. EA WAY. DOWEL INTO WALLS. FIELD LOCATE TO ALIGN WITH EXISTING DITCH AND CROSSING UNDER WHITES CREEK LANE
7. 2:1 SLOPES TO RECEIVE 6"-12" RIPRAP
8. CONSTRUCT IRRIGATION DITCH FROM CMP TO HEADWALL. SEE DETAIL 'D' THIS SHEET.
9. RELOCATE EXISTING 16"ø D.I.P. UNDER PROPOSED RCB AS SHOWN. USE A MINIMUM 10' HORIZONTAL OFFSET FROM EXISTING LINE. USE 45 ELBOWS WITH THRUST BLOCKS AS NECESSARY TO ACHEIVE GARDE BELOW RCB. MINIMUM COVER IS 42".
10. CONSTRUCT (3) 8'x10' C.I.P. OR PRE-CAST RCB WITH WING WALL AND END CONFIGURATIONS AS SHOWN. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS. DESIGN LOADING OF HS20-44. ALLOWABLE SOIL BEARING PRESSURE OF 3000 PSF.
11. CONSTRUCT 4'x8' C.I.P. OR PRE-CAST RCB WITH WINGWALL CONFIGURATIONS AS SHOWN. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS. DESIGN LOADING OF HS20-44. ALLOWABLE SOIL BEARING PRESSURE OF 3000 PSF.

CONSTRUCTION NOTES:

12. CONST. CONCRETE RETAINING WALL TO LIMITS SHOWN. SEE DETAIL 'E' SHEET 26.
13. CONSTRUCT APPROXIMATELY 40 LF 12' MINIMUM WIDE GRAVEL DITCH ACCESS RAMP. 12 % MAX. GRADE.
14. FILL AGAINST WING WALL AS SHOWN TO ACHIEVE POSITIVE DRAINAGE AROUND WING WALL. REFER TO SHEET 13 FOR ADDITIONAL DIRECTION REGARDING DITCH DAYLIGHT LOCATION AND GRADING IN THIS AREA.
15. GRADE AREA TO FINISH GRADE ELEVATIONS AS SHOWN.
16. CONSTRUCT APPROXIMATELY 20 LF IRRIGATION DITCH FROM FES TO EXISTING IRRIGATION DITCH . SEE DETAIL 'D' THIS SHEET. REFER TO SHEET 14 FOR ADDITIONAL INFORMATION.
17. FLATTEN ROADWAY FILL SLOPE SO AS TO ACHIEVE A MINIMUM OF 1' OF COVER OVER 12" PVC IRRIGATION PIPES.
18. CONSTRUCT APPROXIMATELY 110 LF 12' MINIMUM WIDE GRAVEL DITCH ACCESS. AS SHOWN. 12% MAX GRADE.
19. CONSTRUCT 6' HIGH CHAIN LINK FENCE DOUBLE SWING GATE BEHIND APRON.
20. PRIOR TO THE RELOCATION OF THE EXISTING 16"ø WATER LINE, THE CONTRACTOR IS REQUIRED TO SUBMIT A WATER DISINFECTION PLAN TO WASHOE COUNTY FOR APPROVAL.
21. THE CONTRACTOR IS REQUIRED TO POTHOLE TO VERIFY THE LOCATION & ELEVATION OF THE EXISTING 16" WATER LINE & INFORM THE ENGINEER OF HIS/HER FINDINGS PRIOR TO ANY CONSTRUCTION.




## CAUTION – NOTICE TO CONTRACTOR

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND FEATURES AS SHOWN ON THESE PLANS IS BASED ON THE BEST INFORMATION AVAILABLE TO THE ENGINEER. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THESE LOCATIONS AND/OR ELEVATIONS AT THE PROPOSED POINTS OF CONNECTION AND IN AREAS OF POSSIBLE CONFLICT PRIOR TO BEGINNING CONSTRUCTION. SHOULD THE CONTRACTOR FIND ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE OR RELOCATE ALL EXISTING UTILITIES AND FEATURES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS. CONTRACTOR SHALL OBTAIN APPROVALS FROM THE GOVERNING AGENCIES, THE ENGINEER, AND THE UTILITY COMPANIES PRIOR TO SUCH REMOVAL AND/OR RELOCATION.

STATUS OF PLANS

| | |
|---|---|
| ☐ PRELIMINARY | DATE: |
| ☐ INITIAL SUBMITTAL | DATE: |
| ☐ FINAL SUBMITTAL | DATE: |
| ☒ APPROVED BY WASHOE CO. ENG. | DATE: 10/10/97 |
| ☒ APPROVED BY WASHOE CO. UTIL. | DATE: 10/10/97 |
| ☐ LATEST REVISION | DATE: |

APPROVED: YES ☐ NO ☐

RECORD DRAWINGS
THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED TO CFA BY THE CONTRACTOR AND HAVE BEEN ADJUSTED TO REFLECT THESE CHANGES. THE ENGINEER BY STAMPING AND SIGNING THESE PLANS IS ONLY DOING SO FOR DESIGN PURPOSES. THERE ARE NO WARRANTIES OR GUARANTEES AS TO THE ACCURACY OF THE AS-BUILT INFORMATION.
04-05-99

BRYAN G. SPRAGUE 10/10/97 CIVIL STATE OF NEVADA No. 8109 PROFESSIONAL ENGINEER

| REVISIONS | | | BY |
|---|---|---|---|
| 1 | 10/10/97 | Includes items from Addendum #1 (10/22/97) | JAG |
| MARK | DATE | | |

DESIGNED BY GS DATE SURVEYED
DRAWN BY GS DATE 4/10/97
CHECKED BY BGS DATE
APPROVED BY DATE
R.E. NO.

cfa PLANNERS • ENGINEERS • SURVEYORS • LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 856-1150 FAX: (702) 856-1160

ARROWCREEK SAD # 23

# PLAN 3-8'x10' RCB

WASHOE COUNTY NEVADA

JOB. NO. 58-0C3.27
DATE 9/12/97
SHEET 23 29

FILE NO: X:\PROJECTS\58-003.00\WC23BOX

| CURVE TABLE C | | | | |
|---|---|---|---|---|
| NO. | DELTA | RADIUS | LENGTH | TANGENT |
| 1 | 04°34'16" | 500.00' | 39.89' | 19.96' |
| 2 | 03°26'19" | 200.00' | 12.00' | 6.00' |
| 3 | 01°10'31" | 1981.50' | 40.65' | 20.32' |
| 4 | 180°00'00" | 7.00' | 21.99' | INFINITE |
| 5 | 03°13'13" | 2000.00' | 112.41' | 56.22' |
| 6 | 03°13'13" | 2000.00' | 112.41' | 56.22' |
| 7 | 41°09'07" | 1390.50' | 998.71' | 521.99' |
| 8 | 41°09'07" | 1428.00' | 1025.64' | 536.07' |
| 9 | 41°09'07" | 1392.50' | 1000.15' | 522.74' |
| 10 | 90°58'21" | 40.00' | 63.51' | 40.68' |
| 11 | 90°00'00" | 40.00' | 62.83' | 40.00' |

SCALE: 1" = 40'

MATCH LINE FG=4804.68
STA 90+88.38 (1.64'LT.)~BCR ● MED. CURB
STA 91+00.37 (2'LT.)~ECR ● MED. CURB

STA 91+96.92 (20.5'LT.)~BCR TC=4798.73
STA 93+09.27 (17.34'LT.)~ECR TC=4792.86

STA 93+55.24 (14.76' LT)
END CURB & GUTTER
BEGIN MEDIAN CURB
CB# 18 TYPE 4R
TC=4790.31
IE=4387.18
IE=4787.18
$Q_{10}$ = 1.79 cfs
$Q_{100}$ = 7.83 cfs

STA 94+15.30
6'-24' DRIVEWAY APRON
CONSTRUCT 5' DP CONCRETE APRON AS SHOWN

STA 96+00 (30'RT.)
SDMH#12 TYPE1(48"ø)
RIM=4774.80
IE=4770.40 (18"ø IN)
IE=4770.90 (12"ø IN)
IE=4768.40 (18"ø OUT)

STA 94.58.80 (8.93' LT.) TC=4784.43
℄ TC=4783.65

INSTALL DOUBLE SWING CHAIN LINK GATES PER DETAIL SHEET 25B

STEAMBOAT DITCH

STA 96+25.00~GB TC=4773.88
STA 96+30.00 ℄ OF 12' ACCESS
STA 96+50 BEGIN GUARD RAIL (DT.)

STA 95+96.92 (1.16' LT.)~BCR TC=4775.94

HLA FLOOD LIMITS BRANCH #2 MAIN CHANNEL (PREPROJECT CONDITIONS)

PROPOSED PVC SLEEVES FOR FUTURE UTILITIES BY OTHERS

STA 97+55.00 (38.28'LT) TC=4767.12
STA 97+16.00 (38.14'LT) TC=4767.25
STA 96+76.00 (21'LT.)~BCR TC=4771.55
STA 96+56.00 (21'LT.)~BCR TC=4785.10

INSTALL THREE (3) "END OF ROAD" MARKERS PER SDPWC DWG No W-9

FEMA 100-YR FLOOD LIMITS (PREPROJECT CONDITIONS)

STA 101+00.00 ~ MATCH LINE/PVI SEE SHEET 14 FG=4748.20

WHITES CREEK BRANCH 2

BRANCH #2 MAIN CHANNEL (PREPROJECT CONDITIONS) HLA FLOOD LIMITS

ISLAND NOSE SHALL BE CONCRETE (TYP). SEE DETAIL SHEET 25B.

205.64' CROSS SLOPE TRANSITION
103.56' CROSS SLOPE TRANSITION
166.20' CROSS SLOPE TRANSITION

10 LF 12"ø PVC SDR 35 S=0.1560
$Q_{10}$ =1.75 cfs
$V_{10}$ =12.08 fps
$Q_{cap}$ =12.94 cfs

PROPOSED 24" EFF BY OTHERS

63LF 12"ø PVC SDR 35 S=0.0679
$Q_{10}$ =1.48 cfs
$V_{10}$ =8.22 fps
$Q_{cap}$ =8.62 cfs

37' TAPER

33LF 18"ø RCP CL. IV S=0.1333
$Q_{10}$ =7.08 cfs
$V_{10}$ =15.88 fps
$Q_{cap}$ =35.62 cfs

5' MIN. FROM ℄ OF DITCH TO EDGE OF WALL.

STA 96+15.42 (48.2'RT) PROVIDE OPENING IN WING WALL FOR RCP. IE=4764.00

STA 90+50.00 ~ SEE SHEET 12

STA 90+75.00 (24'RT) SDMH# 10 TYPE 1 (48"ø) RIM=4803.32 IE=4799.10 (W) IE=4799.00 (E)

STA 90+77.66 (32.09'RT.) ~ ECR TC=4803.47

STA 91+49.60 (30.5'RT.)~BCR TC=4800.66

STA 91+90.25 (30.92'RT.)~ECR TC=4798.83

STA 91+42.60 (5'RT.) RP MED CURB

STA 94+90.60 (37.08'RT.)~BCR TC=4781.60

STA 95+31.83 (37.5'RT.)~ECR TC=4779.14

STA 93+30.51 ~ EVC TC=4791.55

STA 94+00.00 (30'RT) SDMH#11 TYPE 1 (48"ø) RIM=4786.78 IE=4782.90 (N) IE=4782.50 (W) IE=4782.40 (E)

STA 95+93 (37.5'RT.) CB#19 TYPE 4R TC=4775.46 IE=4772.46 $Q_{10}$ = 2.31 cfs $Q_{100}$ = 9.51 cfs

STA 92+00 BEGIN GUARD RAIL (RT.)

STA 96+55.00 ℄ OF 12' ACCESS

STA 97+50 END GUARD RAIL (RT.)

STA 92+83.01~BC FG=4754.52

WHITES CREEK LANE EX. 16" W

REFER TO SHEET 23 FOR WATERLINE RELOCATION

REFER TO SHEET 23 FOR ADDITIONAL IMPROVEMENTS IN THIS AREA

BREAKOUT AREA FROM BRANCH #2 (PREPROJECT CONDITIONS) HLA FLOOD LIMITS

FEMA 100-YR FLOOD LIMITS (PREPROJECT CONDITIONS)

ARROWCREEK PARKWAY

SHEET INDEX

CONSTRUCTION NOTES:

1. GUARD RAIL SHALL CONFORM TO R65-67 OF NDOT STANDARD DETAILS FOR ROAD AND BRIDGE CONSTRUCTION, JULY 1995 EDITION. FACE OF RAIL SHALL BE AT BACK OF SIDEWALK. PROVIDE 2' SHOULDER FROM BACK OF SIDEWALK.
2. REFER TO THE ABOVE NOTE No. 1. FACE OF RAIL SHALL BE 4.5' FROM FRONT FACE OF CURB. PROVIDE 6' SHOULDER BEHIND CURB IN THIS AREA AS SHOWN.
3. VERTICAL DEFLECTION OF EFFLUENT LINE SHALL NOT EXCEED 2 DEGREES PER JOINT.
4. 2H SLOPES SHALL RECEIVE 6"-12"ø ROCK RIP-RAP.
5. DAYLIGHT BROW DITCH TO END OF WINGWALL.
6. NO PARKING SIGN EACH SIDE (M.U.T.C.D. R8-3)
7. CONSTRUCT CONCRETE MEDIAN ISLAND AS SHOWN. ISLAND NOSES ARE TO BE AS SHOWN ON DETAIL SHEET 25B. AREA BETWEEN NOSES ARE TO BE 4" CONCRETE W/FIBERMESH.
8. FILL TO DRAIN TO END OF WINGWALL. SEE DETAILS SHEET 23.
9. HLA FLOOD PLAIN LIMITS- POST PROJECT CONDITION.
10. ALLOW THE CONTRACTOR FOR THE INSTALLATION OF THE EFFLUENT & SEWER LINES TIME TO PLACE THE PIPES ONCE SUBGRADE HAS BEEN ESTABLISHED. COORDINATE WITH CONTRACTOR ON THE INSTALLATION OF 24" EFFLUENT AND SANITARY SEWER LINES.

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VERTICAL: 1" = 4'

HORIZONTAL: 1" = 40'

FINISH GRADE ℄

400.00' VC
PVI STA = 91+30.51
PVI ELEV = 4803.55
A.D. = -3.76
K = 106.25

STA 90+50.00 ~ MATCH LINE SEE SHEET 12

STA 94+20 ~ PROFILE GRADE BREAK

STA 97+30 ~ PROFILE GRADE BREAK

STA 101+00.00 ~ MATCH LINE SEE SHEET 14

325 LF 18"ø RCP CL. IV S=0.0508 $Q_{10}$=9.76 cfs $V_{10}$=10.87 fps $Q_{cap}$=22.04 cfs

200 LF 18"ø RCP CL. IV S=0.0600 $Q_{10}$=11.59 cfs $Q_{cap}$=23.99 cfs

190 LF SS BY OTHERS

92 LF SS BY OTHERS

-6.00%

-5.41%

PVI STA = 96+25 GRADE BREAK
PVI ELEV = 4773.88

PVI STA = 101+00 GRADE BREAK
PVI ELEV = 4748.20

EVC STA = 93+30.51
℄s = 4791.55

STA 90+75.00 (24'RT) SDMH# 10 TYPE 1 (48"ø) IE=4799.10 (W) IE=4799.00 (E)

STA 94+00.00 (30'RT) SDMH# 11 TYPE 1 (48"ø) IE=4782.90 (N) IE=4782.50 (W) IE=4782.40 (E)

STA 94+25.59 (20.12'RT) FUTURE SSMH# IE=4772.52 (OUT)

STA 96+00.00 (30'RT) SDMH#12 TYPE 1 (48"ø) IE=4770.40 (W) IE=4770.90 (12"ø) IE=4768.40 (OUT)

STA 96+14.93 (23.19'RT) FUTURE SSMH# TYPE 1A (48"ø) IE=4767.91 (IN) IE=4767.81 (OUT)

STA 96+73.6 ℄ 4'x8' RCB

STA 96+69.68 (77.98'RT) FUTURE SSMH# (48"ø) IE=4766.37(IN) IE=4758.40 (OUT)

RELOCATE 16" WATER UNDER RCB SEE SHT. 23

EX. 16" WATER

STA 97+61.52 (86.00'RT) FUTURE SSMH TYPE 1A (48"ø) IE=4751.58 (IN)

STA 98+07.25 ℄ TRIPLE 8'x10' RCB

STA 99+85.63 ~ BC FG=4754.52

NOT A PART– SHOWN FOR INFORMATION ONLY. PROPOSED LINE IS TO BE CONSTRUCTED UNDER A SEPARATE CONTRACT WITH WASHOE COUNTY. COORDINATE PER NOTE 10 ON SHEET 13

NOT A PART– SHOWN FOR INFORMATION ONLY. PROPOSED LINE IS TO BE CONSTRUCTED UNDER A SEPARATE CONTRACT WITH WASHOE COUNTY. COORDINATE PER NOTE 10 ON SHEET 13

FINISH GRADE

EXISTING GRADE

TOP OF 24"ø EFFLUENT PIPE CL. 200 AWWA C-151

RECORD DRAWINGS
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04-05-99

| STATUS OF PLANS | | |
|---|---|---|
| ☐ PRELIMINARY | DATE: | |
| ☐ INITIAL SUBMITTAL | DATE: | |
| ☐ FINAL SUBMITTAL | DATE: | |
| 99+00 | | 100+00 |
| ☒ APPROVED BY WASHOE CO. ENG. | DATE: 10/10/97 | |
| ☒ APPROVED BY WASHOE CO. UTIL. | DATE: 10/10/97 | |
| ☐ LATEST REVISION APPROVED: YES ☐ NO ☐ | DATE: | |

BENCH MARK:
THE MONUMENT IS A NEVADA HIGHWAY SURVEY DISC, SET IN A CONCRETE POST WHICH PROJECTS 2 INCHES ABOVE THE GROUND AT STATION WA-00039-1-115. ELEVATION = 4598.57

BRYAN G. SPRAGUE, CIVIL, No. 9870, STATE OF NEVADA, REGISTERED PROFESSIONAL ENGINEER

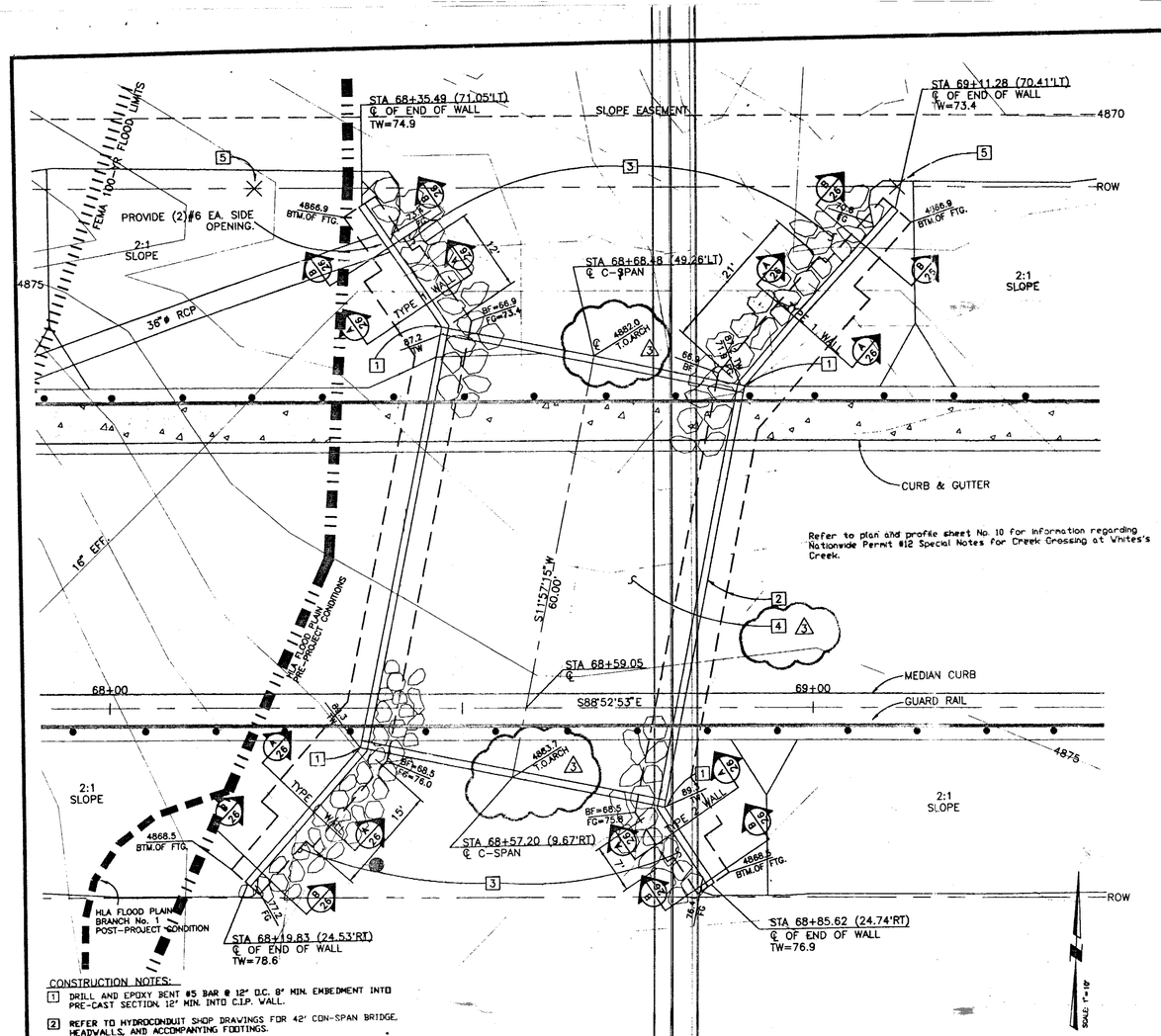
| REVISIONS | DATE | MARK | BY |
|---|---|---|---|
| 1) REVISIONS AS DIRECTED BY WC | 7/11/98 | 1 | JAG |
| 2) INCLUDES ITEMS FROM ADDENDUM #1 (10/22/97) | 11/14/97 | 2 | TH |

DESIGNED BY GS DATE SURVEYED
DRAWN BY CS/AC DATE 4/10/97
APPROVED BY DATE
R. E. NO.

cfa PLANNERS • ENGINEERS • SURVEYORS
LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 856-1150 FAX (702) 856-1160

ARROWCREEK SAD # 23
PLAN & PROFILE
ARROWCREEK PARKWAY
WASHOE COUNTY NEVADA

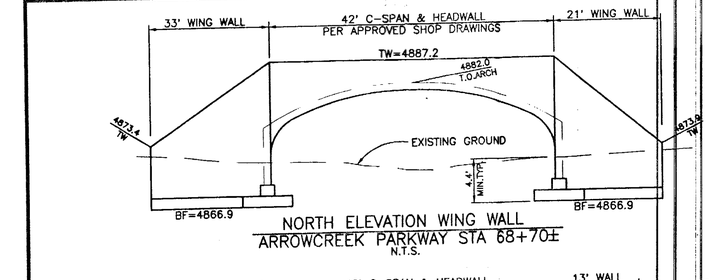
JOB. NO. 88-003.27
DATE 9/12/97
SHEET 13 OF 29
FILE NO: K:\PROJECTS\88-003.00\SAD\PPAP13



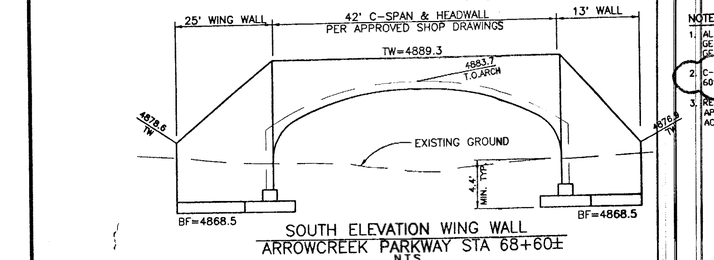

CONSTRUCTION NOTES:

1. DRILL AND EPOXY BENT #5 BAR @ 12" O.C. 8" MIN. EMBEDMENT INTO PRE-CAST SECTION. 12" MIN. INTO C.I.P. WALL.
2. REFER TO HYDROCONDUIT SHOP DRAWINGS FOR 42' CON-SPAN BRIDGE, HEADWALLS, AND ACCOMPANYING FOOTINGS.
3. PLACE A 6' WIDE LAYER OF 12"-24" RIPRAP FROM FACE OF WALL ALONG EACH WING WALL AND ADJACENT TO THE C-SPAN WALLS 10' INTO THE C-SPAN. RIPRAP SHALL EXTEND TO A VERTICAL PLANE TO TOP OF FOOTING.
4. 42' CON-SPAN PRE-CAST BRIDGE, 60' LONG. 11' RISE. (2)
5. MAINTAIN BLACK VINYL COATED CHAIN LINK FENCE. REFER TO PLAN AND PROFILE DRAWINGS, AND DETAIL SHEET 25B.

# PLAN 42' CON-SPAN BRIDGE WHITES CREEK BRANCH No. 1



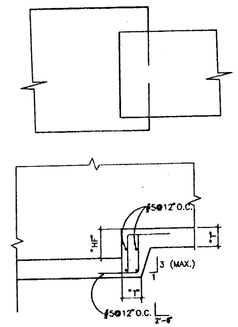

NORTH ELEVATION WING WALL
ARROWCREEK PARKWAY STA 68+70±
N.T.S.




SOUTH ELEVATION WING WALL
ARROWCREEK PARKWAY STA 68+60±
N.T.S.

NOTES:

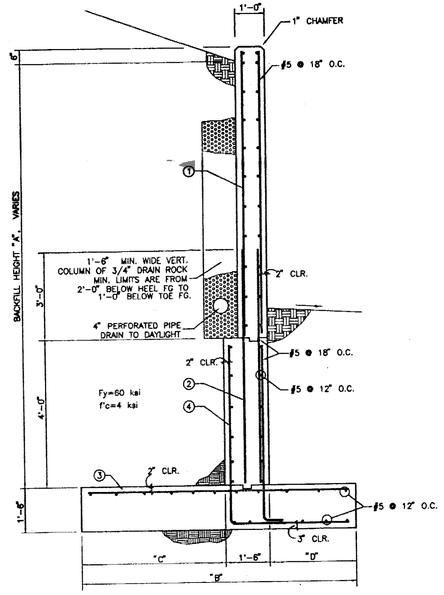
1. ALL EXCAVATION AND EMBANKMENT SHALL CONFORM TO GEOTECHNICAL INVESTIGATIONS AS REFERENCED IN THE GENERAL NOTES ON THE TITLE SHEET.
2. C-SPAN SHALL BE PRE-CAST 42' SPAN, 11' RISE, 60'-0" LONG. (2)
3. REFER TO HYDRO-CONDUIT SHOP DRAWINGS AS APPROVED BY ENGINEER FOR C-SPAN, HEADWALL, AND ACCOMPANYING FOOTING.




NOTES:
1. MAINTAIN THICKNESS OF FOOTING "T" IN VERTICAL STEP.
2. FOOTING STEP "HF" SHALL BE LIMITED TO 2'-6" WHERE POSSIBLE.

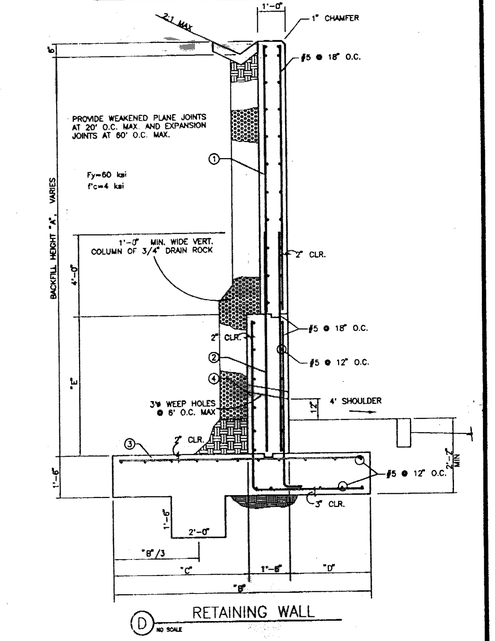
C STEPPED FOOTING

| WALL TYPE | DIMENSIONS A | B | C | D | REINFORCING EXAMPLE: 4,18 = #4 @ 18" O.C. ① | ② | ③ | ④ |
|---|---|---|---|---|---|---|---|---|
| 1 | 13' TO 18' | 10'-0" | 5'-5" | 3'-0" | 6,12 | 7,12 | 7,12 | 8,12 |
| 2 | 11'-6"TO15'-6" | 8'-6" | 4'-6" | 2'-6" | 5,12 | 6,12 | 6,12 | 7,12 |

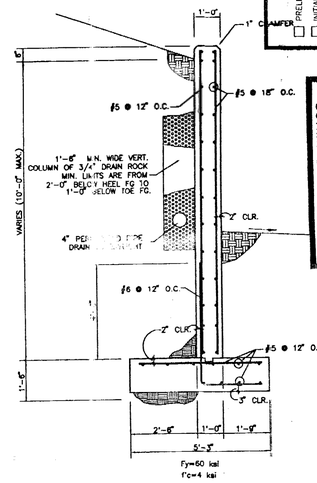



A WING WALL
NO SCALE

| DIMENSIONS A | B | C | D | E | REINFORCING EXAMPLE: 4,18 = #4 @ 18" O.C. ① | ② | ③ | ④ |
|---|---|---|---|---|---|---|---|---|
| 13' | 9'-3" | 4'-9" | 3'-0" | 4'-0" | 5,12 | 6,12 | 6,12 | 7,12 |
| 15' | 10'-9" | 5'-6" | 3'-9" | 4'-0" | 5,12 | 6,12 | 7,12 | 8,12 |
| 17' | 13'-3" | 8'-0" | 3'-9" | 6'-0" | 6,12 | 6,10 | 8,10 | 8,8 |
| 19' | 16'-9" | 11'-6" | 3'-9" | 6'-0" | 6,12 | 6,8 | 8,8 | 8,6 |

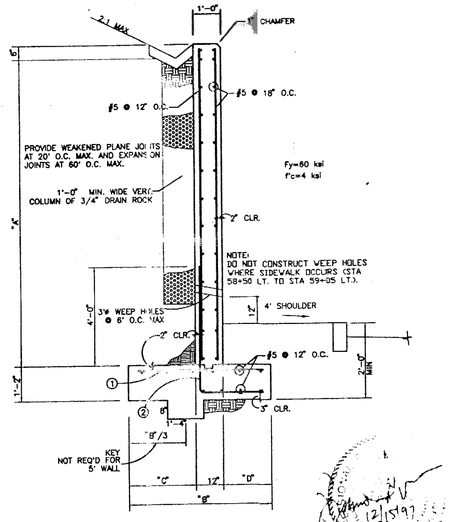



D RETAINING WALL
NO SCALE




H WING WALL
NO SCALE

| DIMENSIONS A | B | C | D | REINFORCING EXAMPLE: 4,18 = #4 @ 18" O.C. ① | ② |
|---|---|---|---|---|---|
| 5'-0" | 3'-3" | 1'-6" | 0'-9" | 5,12 | 5,12 |
| 7'-0" | 4'-0" | 2'-3" | 1'-3" | 5,12 | 5,12 |
| 9'-0" | 4'-3" | 2'-6" | 1'-9" | 5,12 | 6,12 |
| 11'-0" | 7'-0" | 3'-6" | 2'-6" | 5,10 | 6,10 |




E RETAINING WALL
NO SCALE

STATUS OF PLANS

| | | DATE: |
|---|---|---|
| ☐ | PRELIMINARY | |
| ☐ | INITIAL SUBMITTAL | DATE: |
| ☐ | FINAL SUBMITTAL | DATE: |
| ☒ | APPROVED BY WASHOE CO. ENG. | DATE 10/10/97 |
| ☒ | APPROVED BY WASHOE CO. UTIL. | DATE 10/10/97 |
| ☒ | LATEST REVISION | DATE 12/15/97 |
| ☒ | APPROVED: YES ☐ NO ☐ | |

RECORD DRAWINGS
THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED TO THE CONTRACTOR AND HAVE BEEN ADJUSTED TO REFLECT MINOR CHANGES MADE IN THE FIELD. BY SIGNING THESE PLANS I'M ONLY DOING SO TO CONFIRM THAT I HAVE RECEIVED THEM. I MAKE NO WARRANTIES OR GUARANTEES AS TO THEIR ACCURACY OR COMPLETENESS.
04-05-99

| | | | | | |
|---|---|---|---|---|---|
| | | | | JAG | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 12/15/97 | 1 | REVISION TO C-SPAN HEIGHT. | | | |

DESIGNED BY GS — DATE SURVEYED
DRAWN BY GS — DATE 4/10/97
CHECKED BY RGS — DATE
APPROVED BY — DATE

cfa PLANNERS • ENGINEERS • SURVEYORS • LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RL NV 89502 (702) 858-1150 FAX: (702) 858-1160

ARROWCREEK SAD # 23
PLAN / DETAILS
WASHOE COUNTY NEVADA

JOB. NO. 88-003.227
DATE 9/12/97
SHEET 26 OF 29

FILE NO: X:\PROJECTS\88-003.00\WC\CSPAN

SAD #23 IMPROVEMENTS

CROSSROW COURT

FIELDCREEK LN

THOMAS CREEK RD

ARROWCREEK PARKWAY

WEDGE PARKWAY

SCALE: 1"=300'

MATCH LINE SEE BELOW

MATCH LINE ABOVE SEE

REFER TO SHEET 22 FOR IMPROVEMENTS AT THOMAS CREEK ROAD & FIELDCREEK LANE

REFER TO SHEET 23 FOR IMPROVEMENTS IN THIS AREA

N.A.P. FOR INFORMATION ONLY

RECORD DRAWINGS
THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED TO CFA BY THE CONTRACTOR AND HAVE BEEN ADJUSTED TO REFLECT THESE CHANGES. THE ENGINEER BY STAMPING AND SIGNING THESE PLANS IS ONLY DOING SO FOR DESIGN PURPOSES. THERE ARE NO WARRANTIES OR GUARANTEES AS TO THE ACCURACY OF THE AS-BUILT INFORMATION.
04-05-99

STATUS OF PLANS

| | |
|---|---|
| ☐ PRELIMINARY | DATE: |
| ☐ INITIAL SUBMITTAL | DATE: |
| ☐ FINAL SUBMITTAL | DATE: |
| ☒ APPROVED BY WASHOE CO. ENG. | DATE: 10/10/97 |
| ☒ APPROVED BY WASHOE CO. UTIL. | DATE: 10/10/97 |
| ☐ LATEST REVISION | DATE: |

APPROVED YES☐ NO☐

BRYAN C. GREGUE NEVADA No.8109 CIVIL 9/12/97

| | | | |
|---|---|---|---|
| DESIGNED BY | GS | DATE SURVEYED | |
| DRAWN BY | GS/AC | DATE | 4/10/97 |
| CHECKED BY | RGS | DATE | |
| APPROVED BY | | DATE | |

R. E. NO.

REVISIONS

| DATE | MARK | BY |
|---|---|---|


cfa
ENGINEERS • SURVEYORS
PLANNERS • LANDSCAPE ARCHITECTS
1150 CORPORATE BLVD. RENO, NV 89502 (702) 856-1150 FAX: (702) 856-1160


ARROWCREEK SAD # 23

# KEY SHEET

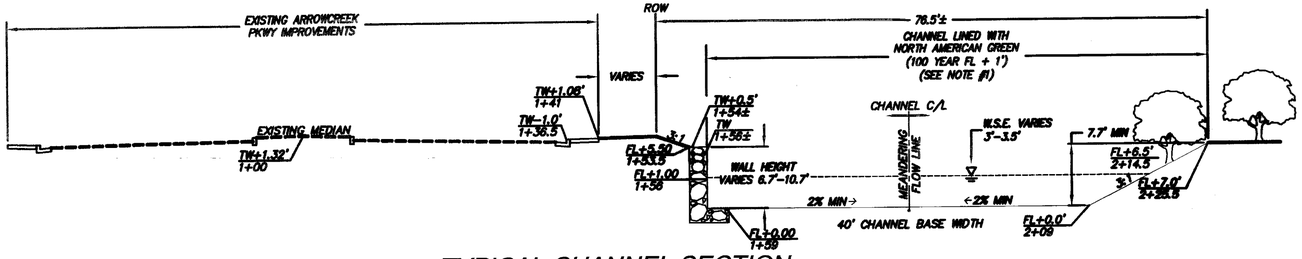
WASHOE COUNTY NEVADA

JOB NO. 98-003.27

DATE 5/12/97

SHEET 2 OF 29

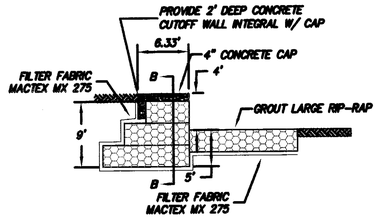
FILE NO: X:\PROJECTS\98-003.00\SAD\WCKEY1.DWG




## TYPICAL CHANNEL SECTION

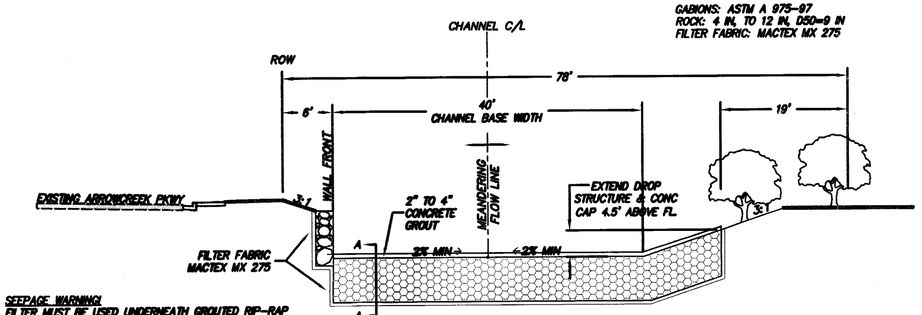
NOT TO SCALE

NOTE:
CONC CAP AND RIPRAP GROUT TO BE COLORIZED PER TO MATCH HEADWALL COLORIZATION PER SPECIFICATIONS ON SHEET L15




## CROSS SECTION A-A

NOT TO SCALE




GABIONS: ASTM A 975-97
ROCK: 4 IN, TO 12 IN, D50=9 IN
FILTER FABRIC: MACTEX MX 275

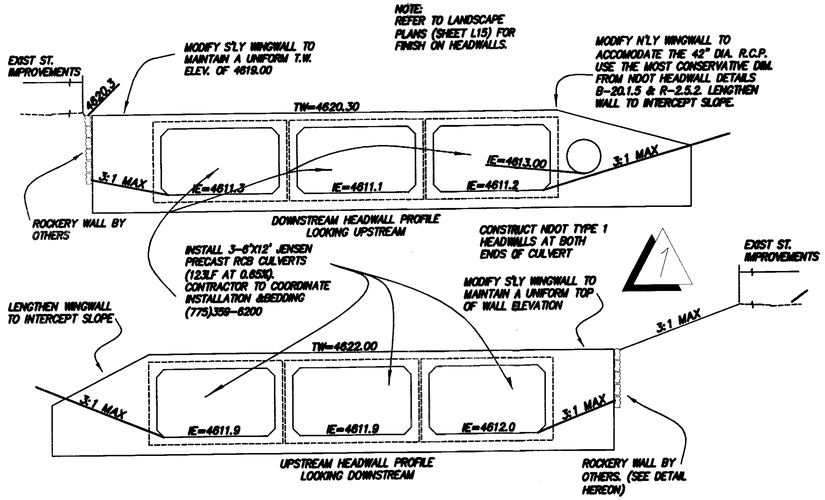
**SEEPAGE WARNING!**
FILTER MUST BE USED UNDERNEATH GROUTED RIP-RAP AND BEHIND ROCKERY WALL. SOILS BEHIND AND BELOW ROCKERY WALL MUST HAVE A PERMEABILITY OF ABOUT 4 TIMES LESS THAN THE FILTER FABRIC. BANKS IN STILLING BASIN MUST BE PROTECTED FROM SEEPAGE.

**NOTE**
THIS DETAIL PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL COORDINATE DROP STRUCTURE INSTALLATION DIRECTLY WITH MACCAFERRI, INC. @ (908) 371-5805.

## SECTION B-B
## DROP STRUCTURE DETAIL

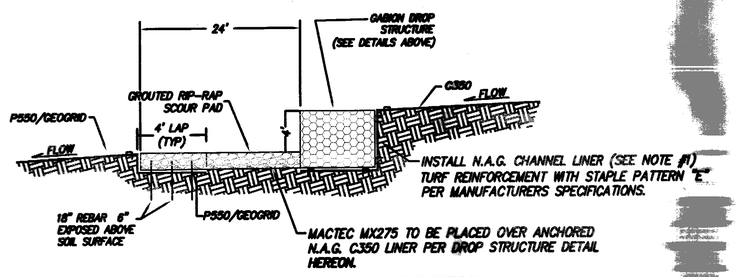
NOT TO SCALE

NOTE:
REFER TO LANDSCAPE PLANS (SHEET L15) FOR FINISH ON HEADWALLS.




## HEADWALL DETAILS

NOT TO SCALE




## CHANNEL LINER OVERLAP DETAIL

NOT TO SCALE

NOTE:
FOR FUTHER INFORMATION ON:
1. CHANNEL LINER (NAG P550) AND BIAXIAL GEOGRID (BX1500) - CONTACT NORTH AMERICAN GREEN AT (303) 765-1042
2. GABION DROP STRUCTURES - CONTACT MACCAFERRI, INC. AT (916) 371-5805
3. ROCKERY CHANNEL WALLS - CONTACT PEZONELLA ASSOCIATES @ (775) 856-5566

PROFESSIONAL LAND SURVEYOR
JEFFREY F. BROOKE
Exp: 12-31-06
No. 8658
STATE OF NEVADA
06/20/06
Survey Data Only

| NO. | REVISION | DATE |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | MINOR REVISIONS TO HEADWALLS | 12/7/05 |

DATE: DECEMBER 2005
SCALE: As Noted NOT TO SCALE
DRAWN BY: JLT
DESIGNED BY: DMP
CHECKED BY:

PLACES Consulting Services Incorporated
Planners • Landscape Architects • Civil Engineers • Surveyors
1380 Greg Street, Suite 210
Sparks, Nevada 89431-6070
phone: (775) 355-7721
facsimile: (775) 355-7795

PLAN FOR THE IMPROVEMENT OF
# AS-BUILT DETAILS
RENO, NEVADA
MOUNTAINGATE - OFFSITE IMPROVEMENTS

SHEET D1 OF D1
SEE T1 FOR SHEET INDEX

PROJECT NO.
060212

SIGNED AND SEALED FOR REVIEW BY PUBLIC AGENCY ONLY

# APPENDIX C

# APPENDIX C
# DETAILS