RESPONSE TO FEMA COMMENTS
ON THE
CONDITIONAL LETTER OF MAP REVISION
(CLOMR)
FOR
THE GUBLER AVENUE BRIDGE
ON THE MUDDY RIVER

451-003

August 2007

Prepared for:

CH2M Hill
2285 Corporate Circle; Suite 200
Henderson, Nevada 89074
Phone: (702) 369-6175
Fax: (702) 369-1107

ENGINEERS PLANNERS SURVEYORS

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Phone: (702) 369-6175
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Prepared by:

G. C. Wallace Companies
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2297

ENGINEERS PLANNERS SURVEYORS

G. C. WALLACE, INC.

Writer's Contact Information:
(702) 804-2183

451-003

August 21, 2007

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.
Federal Emergency Management Agency (FEMA) Depot
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304-6425

Re: Case # 07-09-1164R – CLOMR for Gubler Avenue Bridge on the Muddy River

Dear Mr. Qayum:

We are in receipt of your comments, dated July 18, 2007. Below are our responses to your comments.

Comment: "1. The submitted map entitled "*GUBLER AVENUE BRIDGE CLOMR TOPOGRAPHIC WORK MAP, FIGURE 5,* prepared by G. C. Wallace Companies, dated April 5, 2007, does not provide essential information required to complete our detailed review of this request. Please provide the flow line used in the hydraulic model, which was omitted from the submitted topographic work map."

Response: The requested flow line has been added to the topographic work map. Please see the revised Figure 5 included in the appendix.

Comment: "2. The base floodplain and floodway top widths found in the submitted proposed conditions HEC-RAS hydraulic model for the Muddy River do not match the approximate base floodplain and floodway top widths shown on the above-referenced topographic work map at Cross-Sections 7100, 6800. 850, 800, 700, 701, 600, 500, 400, 399, 300, 250, and 200. For example, the base floodplain top width at Cross Section 7100 is approximately 200 feet on the previously mentioned topographic work map; however, it is approximately 414 feet in the submitted proposed conditions HEC-RAS hydraulic model. Please make the necessary revisions to ensure that the base floodplain and floodway top widths shown on the submitted topographic work map match the top widths found in the submitted proposed conditions HEC-RAS hydraulic analysis at all cross sections."

Response: Revisions have been made to the floodway and flood plain boundaries on the topographic work map and to the post-project conditions HEC-RAS model to bring them into better agreement. Note that changes to the HEC-RAS model are relatively minor and are confined to the overbank areas. The changes had little impact on the projected post-project flood elevations. A revised comparison table of

the HEC-RAS models is included in the appendix. Post-project base flood elevations are still lower than Corrected Effective Model base flood elevations at all cross sections. Further explanation of changes made to the HEC-RAS model at each cross section follows:

Section 7100 – No adjustment – This cross section is beyond the limits of the CLOMR study area and is not included on the topographic work map.

Section 6800 – No adjustment – This cross section is beyond the limits of the CLOMR study area and is not included on the topographic work map.

Section 850 –The extreme ends of the left and right overbank areas have been revised to more accurately reflect the topography shown on Figure 5.

Section 800 – The extreme ends of the left and right overbank areas have been revised to more accurately reflect the topography shown on Figure 5.

Section 701 – The extreme ends of the left and right overbank areas have been revised to more accurately reflect the topography shown on Figure 5.

Section 700 – The stationing at the extreme end of the left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 600 – No adjustment.

Section 500 – The left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 400 – The left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 399 – The left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 300 – The extreme end of the left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 250 – The extreme end of the left overbank has been revised to more accurately reflect the topography shown on Figure 5.

Section 200 – No adjustment.

The revised Figure 4 and revised Figure 5 included in the appendix show the new limits of the floodplain and floodway boundaries. HEC-RAS model flow top widths and floodplain and floodway boundary top widths now agree within a tolerance of 5 feet at all cross sections within the CLOMR study area.

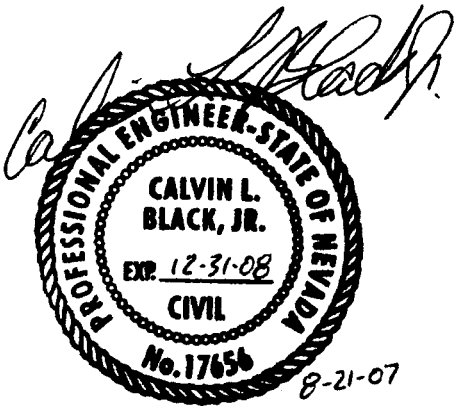
Comment: "3. From our technical review it appears that the delineation of the regulatory floodway for the Muddy River extends outside of the base floodplain delineation between Cross-Sections 250 and 850 as shown on the above-mentioned topographic work map. Please make the necessary changes to the previously mentioned work map and the proposed conditions HEC-RAS hydraulic model to ensure that the floodway widths are less then or equal to the floodplain widths at the previously mentioned locations."

Response: Encroachment stations in the post-project HEC-RAS model have been adjusted to ensure that floodway limits stay within floodplain limits at all cross sections. The topographic work map has been revised to ensure that the floodway boundaries are contained within the floodplain boundaries at all locations.

If you have any questions or require additional information, please contact me at (702) 804-2183.

Very truly yours,

G. C. WALLACE, INC.



Calvin L. Black, Jr., PE
Project Manager
Flood Control Division

CLBjr/jj

Enc.

c: Joe Kuechenmeister, MBjr., Colorado
John Catanese, CCPW
Kevin Eubanks, CCRFCD
John Taylor, CH2M Hill
Jerry E. Pruitt, GCW
Calvin L. Black, GCW

NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

July 18, 2007

Mr. Calvin L. Black, Jr., P.E.
G.C. Wallace Companies
1555 South Rainbow Boulevard
Las Vegas, NV 89146

IN REPLY REFER TO:
Case No.: 07-09-1164R
Community: Clark County, NV
Community No.: 320003

316-AD

Dear Mr. Black:

This responds to your submittal dated May 21, 2007, regarding an April 23, 2007, request 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:	Gubler Avenue Bridge
Flooding Source:	Muddy River
FIRM Panel(s) Affected:	32003C1105 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. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is enclosed for your information.

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) 317-6250.

Sincerely,

Syed Qayum

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.

Enclosures

cc: Mr. Mike Hand
Manager, Design Engineering Division
Department of Public Works
Clark County

Mr. Denis Cederburg, P.E.
Director of Public Works
Clark County

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
Regional Flood Control District
Clark County

NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

Summary of Additional Data Required to Support a
Conditional Letter of Map Revision (CLOMR)

Case No.: 07-09-1164R

Requester: Mr. Calvin L. Black, Jr., P.E.

Community: Clark County, NV

Community No.: 320003

The issues listed below must be addressed before we can continue the review of your request.

1. The submitted map entitled "GUBLER AVENUE BRIDGE CLOMR TOPOGRAPHIC WORK MAP, FIGURE 5," prepared by C.G. Wallace Companies, dated April 5, 2007, does not provide essential information required to complete our detailed review of this request. Please provide the flow line used in the hydraulic model, which was omitted from the submitted topographic work map.

2. The base floodplain and floodway topwidths found in the submitted proposed conditions HEC-RAS hydraulic model for the Muddy River do not match the approximate base floodplain and floodway topwidths shown on the above-referenced topographic work map at Cross Sections 7100, 6800, 850, 800, 700, 701, 600, 500, 400, 399, 300, 250, and 200. For example, the base floodplain topwidth at Cross Section 7100 is approximately 200 feet on the previously mentioned topographic work map; however, it is approximately 414 feet in the submitted proposed conditions HEC-RAS hydraulic model. Please make the necessary revisions to ensure that the base floodplain and floodway topwidths shown on the submitted topographic work map match the topwidths found in the submitted proposed conditions HEC-RAS hydraulic analysis at all cross sections.

3. From our technical review it appears that the delineation of the regulatory floodway for the Muddy River extends outside of the base floodplain delineation between Cross Sections 250 and 850 as shown on the above mentioned topographic work map. Please make the necessary changes to the previously mentioned work map and the proposed conditions HEC-RAS hydraulic model to ensure that the floodway widths are less then or equal to the floodplain widths at the previously mentioned locations.

Please send the required data and/or fee directly to us at the address shown at the bottom of this the first page. For identification purposes, please include the case number referenced above on all correspondence.

Federal Emergency Management Agency

Washington, D.C. 20472

FEE SCHEDULE FOR PROCESSING REQUESTS FOR MAP CHANGES

This notice contains the fee schedule for processing certain types of requests for changes to National Flood Insurance Program (NFIP) maps. The fee schedule allows FEMA to further reduce the expenses to the NFIP by more fully recovering the costs associated with processing conditional and final map change requests. The fee schedule for map changes is effective for all requests dated October 30, 2005, or later and supersedes the fee schedule that was established on September 1, 2002.

To develop the fee schedule for conditional and final map change requests, FEMA evaluated the actual costs of reviewing and processing requests for Conditional Letters of Map Amendment (CLOMAs), Conditional Letters of Map Revision – Based on Fill (CLOMR-Fs), Conditional Letters of Map Revision (CLOMRs), Letters of Map Revision – Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs), and Physical Map Revisions (PMRs).

Based on our review of actual cost data for Fiscal Years 2004 and 2005, FEMA has established the following review and processing fees, which are to be submitted with all requests that are not otherwise exempted under 44 CFR 72.5.

Fee Schedule for Requests for CLOMAs, CLOMR-Fs, and LOMR-Fs

Request for single-lot/single-structure CLOMA and CLOMR-F	$500
Request for single-lot/single structure LOMR-F	$425
Request for single-lot/single-structure LOMR-F based on as-built information (CLOMR-F previously issued by us)	$325
Request for multiple-lot/multiple-structure CLOMA	$700
Request for multiple-lot/multiple-structure CLOMR-F and LOMR-F	$800
Request for multiple-lot/multiple-structure LOMR-F based on as-built information (CLOMR-F previously issued)	$700

Fee Schedule for Requests for CLOMRs

Request based on new hydrology, bridge, culvert, channel, or combination of any of these	$4,000
Request based on levee, berm, or other structural measure	$5,000

Fee Schedule for Requests for LOMRs and PMRs

Requesters must submit the review and processing fees shown below with requests for LOMRs and PMRs that are not based on structural measures or alluvial fans.

Request based on bridge, culvert, channel, or combination thereof	$4,400
Request based on levee, berm, or other structural measure	$6,000
Request based on as-built information submitted as follow-up to CLOMR	$4,000

Fees for CLOMRs, LOMRs, and PMRs Based on Structural Measures on Alluvial Fans

FEMA has revised the initial fee for requests for CLOMRs and LOMRs based on structural measures on alluvial fans to $5,600. FEMA will also continue to recover the remainder of the review and processing costs by invoicing the requester before issuing a determination letter, consistent with current practice. The prevailing private-sector labor rate charged to FEMA ($60 per hour) will be used to calculate the total reimbursable fees.

Payment Submission Requirements

Requesters must make fee payments for non-exempt requests before we render services. This payment must be in the form of a check or money order or by credit card payment. Please make all checks and money orders in U.S. funds payable to the *National Flood Insurance Program.* We will deposit all fees collected to the National Flood Insurance Fund, which is the source of funding for providing this service.

APPENDIX

Supporting Documentation for CLOMR

Section 1 – Maps

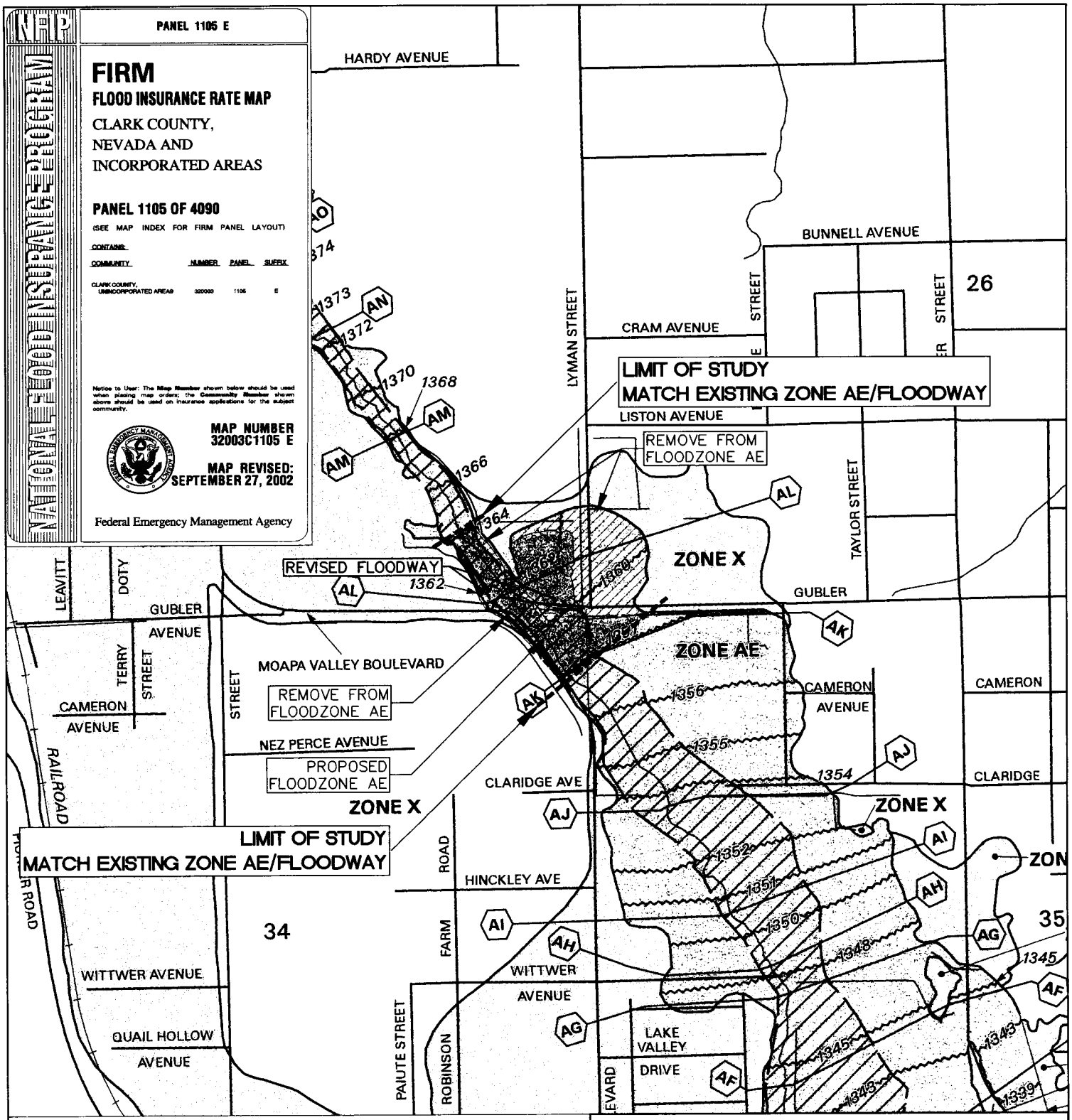
- Revised Figure 4: Proposed F.I.R.M. Revisions
- Revised Figure 5: Topographic Work Map

Section 3 – Hydraulic Analyses

- HEC-RAS Comparison Sheet
- Post-Project Conditions Model – HEC-RAS Model for Proposed Conditions
- CHECK-RAS Analysis of Post-Project Conditions Model

SECTION 1
Maps

Revised Figure 4: Proposed F.I.R.M. Revisions
Revised Figure 5: Topographic Work Map



GUBLER AVENUE
BRIDGE

FIGURE 4

REVISED
F.I.R.M.

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

NORTH

GRAPHIC SCALE

60 0 30 60

(IN FEET)

1 inch = 60 ft.

LEGEND

- 100 —— SUPPLEMENTAL HEC-RAS CROSS SECTIONS
- (65) —— FIS HEC-RAS CROSS SECTIONS
- PROPOSED FLOODPLAIN
- EFFECTIVE FLOODPLAIN
- PROPOSED FLOODWAY
- EFFECTIVE FLOODWAY BOUNDARY
- 1350 EXISTING INDEX CONTOUR
- EXISTING CONTOUR
- 1350 PROPOSED INDEX CONTOUR
- PROPOSED CONTOUR

NOTE: ELEVATIONS BASED ON 1988 NORTH AMERICAN VERTICAL DATUM

4ft FIS TOPOGRAPHY
1ft TOPOGRAPHY

MATCH EFFECTIVE FLOODPLAIN

MATCH EFFECTIVE FLOODWAY

CHANNEL FLOWLINE

GUBLER AVENUE

MOAPA VALLEY BLVD.

MUDDY RIVER

NO.	DESCRIPTION	DATE	REV.	DATE	APP.	DATE	APP.	DATE

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 08-09-07
PLOT TIME: 11:32:32

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD - LAS VEGAS, NEVADA 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM

F:\451-003\DWG\Hydro\CLOMR\Comments-071827\FIG-5.dwg fmorgopoulos

GUBLER AVENUE BRIDGE CLOMR

FIGURE 5

TOPOGRAPHIC WORKMAP

DRAWING

FIG 5

OF SHTS

SECTION 2
Hydraulic Analyses

HEC-RAS Comparison Sheet
Post-Project Conditions Model – HEC-RAS Model for Proposed Conditions
CHECK-RAS Analysis of Post-Project Conditions Model

HEC-RAS Comparison Sheet

GUBLER AVENUE BRIDGE - HEC-RAS COMPARISON SHEET

River Station	Corresponding FIS River Station	Q Total (cfs)	Duplicate Eff. Model W.S.Elev. (ft)	Corrected Eff. Model W.S.Elev. (ft)	Post-Proj. Cond. Model W.S.Elev. (ft)	Change in W.S.E. Elev. (ft.)
7100	71	21,400	1372.48	1372.56	1372.46	-0.10
7000	70	21,400	1370.34	1370.48	1370.30	-0.18
6900	69	21,400	1367.85	1368.10	1367.78	-0.32
6800	68	21,400	1366.32	1366.71	1366.21	-0.50
6700	67	21,400	1363.43	1364.09	1363.17	-0.92
850	66*	21,400	1361.57	1362.41	1361.66	-0.75
800	N/A	21,400			1360.70	
701	N/A	21,400			1360.55	
700	N/A	21,400			1360.55	
600	N/A	21,400			1360.62	
550	N/A	Bridge				
500	65.5*	21,400	1360.81	1361.22	1360.46	-0.76
400	N/A	21,400			1360.47	
399	N/A	21,400			1360.46	
300	N/A	21,400			1360.16	
250	65*	21,400	1359.02	1359.31	1359.30	-0.01
200		21,400			1358.77	
100	64.5*	21,400	1356.96	1356.95	1356.95	0.00

River Station	Corresponding FIS River Station	Q Total (cfs)	Duplicate Eff. Model Velocity (fps)	Corrected Eff. Model Velocity (fps)	Post-Proj. Cond. Model Velocity (fps)	Change in Velocity (fps)
7100	71	21,400	6.73	6.69	6.74	0.05
7000	70	21,400	7.59	7.51	7.62	0.10
6900	69	21,400	8.83	8.68	8.87	0.19
6800	68	21,400	6.85	6.65	6.91	0.27
6700	67	21,400	8.43	7.96	8.60	0.64
850	66*	21,400	6.90	6.42	8.04	1.62
800	N/A	21,400			10.24	
701	N/A	21,400			8.82	
700	N/A	21,400			8.82	
600	N/A	21,400			8.07	
550	N/A	Bridge				
500	65.5*	21,400	6.34	7.19	8.12	0.92
400	N/A	21,400			7.70	
399	N/A	21,400			7.70	
300	N/A	21,400			7.37	
250	65*	21,400	9.76	9.75	9.43	-0.32
200		21,400			9.53	
100	64.5*	21,400	10.28	10.29	10.29	0.00

* Existing Conditions FIS HEC2 with modified Cross Section

Date: 7/27/07

Prepared by: mgk

Post-Project Conditions Model – HEC-RAS Model for Proposed Conditions

HEC-RAS Plan: Plan 01 River: Muddy River Reach: 01

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)	
01	7100	PF 1	21400	1348.00	1372.46	1361.1960	1373.16	0.003534	6.7448	3200.31	412.05	0.30
01	7100	PF 2	21400	1348.00	1373.38	1361.1960	1374.01	0.002982	6.3784	3355.08	201.06	0.28
01	7000	PF 1	21400	1346.02	1370.30	1361.8680	1371.18	0.003865	7.6168	2854.44	222.58	0.32
01	7000	PF 2	21400	1346.02	1371.16	1361.8230	1372.11	0.004191	7.8651	2745.13	154.48	0.32
01	6900	PF 1	21400	1344.00	1367.78	1359.7020	1368.98	0.005424	8.8675	2456.24	165.96	0.38
01	6900	PF 2	21400	1344.00	1368.59	1359.7070	1369.76	0.005684	8.6800	2465.44	137.94	0.36
01	6800	PF 1	21400	1342.81	1366.21	1356.9790	1366.94	0.003638	6.9140	3201.21	311.84	0.30
01	6800	PF 2	21400	1342.81	1367.06	1356.9580	1367.75	0.003383	6.6781	3204.52	190.07	0.29
01	6700	PF 1	21400	1341.35	1363.17	1355.8950	1364.28	0.005293	8.6038	2566.41	205.86	0.37
01	6700	PF 2	21400	1341.35	1363.74	1355.8930	1365.00	0.006146	9.0451	2383.03	142.19	0.39
01	850	PF 1	21400	1341.80	1361.66	1354.3720	1362.63	0.002655	8.0350	3014.53	717.59	0.38
01	850	PF 2	21400	1341.80	1362.31	1354.3720	1363.28	0.002490	7.9236	2738.39	215.50	0.36
01	800	PF 1	21400	1341.40	1360.70	1354.5740	1362.33	0.005470	10.2424	2091.87	555.10	0.50
01	800	PF 2	21400	1341.40	1361.60	1354.5730	1363.03	0.004447	9.5717	2235.75	163.20	0.46
01	701	PF 1	21400	1340.80	1360.55	1352.6260	1361.76	0.004310	8.8184	2426.74	484.15	0.41
01	701	PF 2	21400	1340.80	1361.48	1352.6090	1362.55	0.003555	8.2894	2581.61	165.80	0.37
01	700	PF 1	21400	1340.80	1360.55	1352.6250	1361.75	0.001685	8.8201	2426.27	483.96	0.41
01	700	PF 2	21400	1340.80	1361.48	1352.6060	1362.55	0.001391	8.2906	2581.23	165.80	0.37
01	600	PF 1	21400	1340.60	1360.62	1351.8700	1361.63	0.001369	8.0667	2652.87	435.81	0.37
01	600	PF 2	21400	1340.60	1361.55	1351.8700	1362.44	0.001134	7.5950	2817.66	177.60	0.34
01	550		Bridge									
01	500	PF 1	21400	1340.20	1360.46	1351.7270	1361.48	0.001358	8.1157	2636.88	407.26	0.37
01	500	PF 2	21400	1340.20	1361.37	1351.7240	1362.28	0.001133	7.6564	2795.06	173.10	0.34
01	400	PF 1	21400	1339.90	1360.47	1351.0870	1361.39	0.001191	7.7021	2778.47	247.00	0.34
01	400	PF 2	21400	1339.90	1361.38	1351.0870	1362.20	0.000997	7.2731	2942.33	179.10	0.32
01	399	PF 1	21400	1339.90	1360.46	1351.0920	1361.39	0.004127	7.7033	2778.02	246.89	0.34

HEC-RAS Plan: Plan 01 River: Muddy River Reach: 01 (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)	
01	399	PF 2	21400	1339.90	1361.38	1351.0920	1362.20	0.003458	7.2740	2941.97	179.10	0.32
01	300	PF 1	21400	1339.20	1360.16	1351.0950	1360.96	0.003654	7.3660	3087.14	430.07	0.33
01	300	PF 2	21400	1339.20	1360.99	1351.0950	1361.85	0.003486	7.4332	2894.34	189.70	0.33
01	250	PF 1	21400	1338.80	1359.30	1352.5910	1360.58	0.010441	9.4272	2465.97	410.54	0.52
01	250	PF 2	21400	1338.80	1359.93	1352.5910	1361.45	0.010755	9.8666	2168.93	200.20	0.53
01	200	PF 1	21400	1336.18	1358.77	1352.0570	1360.04	0.007677	9.5298	2642.54	521.82	0.43
01	200	PF 2	21400	1336.18	1359.40	1352.0590	1360.88	0.007951	9.9275	2267.84	226.20	0.43
01	100	PF 1	21400	1332.60	1356.95	1350.1470	1358.46	0.008491	10.2879	2684.42	1129.24	0.45
01	100	PF 2	21400	1332.60	1357.62	1350.1210	1359.25	0.008747	10.4248	2210.94	280.37	0.45

HEC-RAS Plan: Plan 01 River: Muddy River Reach: 01

Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
			(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
01	7100	PF 1	1372.46		1373.16	412.05	10.18	21381.72	8.10		-141.82	59.24	
01	7100	PF 2	1373.38	0.92	1374.01	201.06		21400.00		-141.82	-141.82	59.24	59.24
01	7000	PF 1	1370.30		1371.18	222.58	1989.80	18890.96	519.25		-73.93	68.42	
01	7000	PF 2	1371.16	0.86	1372.11	154.48	932.86	20467.14		-86.06	-73.93	68.42	68.42
01	6900	PF 1	1367.78		1368.98	165.96	183.00	20866.89	350.10		-69.47	68.47	
01	6900	PF 2	1368.59	0.81	1369.76	137.94		21400.00		-69.47	-69.47	68.47	68.47
01	6800	PF 1	1366.21		1366.94	311.84	136.99	21032.41	230.60		-115.91	74.16	
01	6800	PF 2	1367.06	0.86	1367.75	190.07		21400.00		-115.91	-115.91	74.16	74.16
01	6700	PF 1	1363.17		1364.28	205.86	1426.12	19543.48	430.39		-48.99	89.81	
01	6700	PF 2	1363.74	0.56	1365.00	142.19	146.51	21253.49		-52.38	-48.99	89.81	89.81
01	850	PF 1	1361.66		1362.63	717.59	385.84	20651.13	363.03		-71.70	111.50	
01	850	PF 2	1362.31	0.65	1363.28	215.50	98.87	21301.13		-104.00	-71.70	111.50	111.50
01	800	PF 1	1360.70		1362.33	171.23		21396.91	3.09		-72.40	91.50	
01	800	PF 2	1361.60	0.90	1363.03	163.20		21400.00		-71.70	-72.40	91.50	91.50
01	701	PF 1	1360.55		1361.76	165.80		21400.00			-105.00	65.00	
01	701	PF 2	1361.48	0.93	1362.55	165.80		21400.00		-103.50	-105.00	65.00	62.30
01	700	PF 1	1360.55		1361.75	165.78		21400.00			-105.00	65.00	
01	700	PF 2	1361.48	0.93	1362.55	165.80		21400.00		-103.50	-105.00	65.00	62.30
01	600	PF 1	1360.62		1361.63	177.59		21400.00			-115.80	65.10	
01	600	PF 2	1361.55	0.93	1362.44	177.60		21400.00		-113.50	-115.80	65.10	64.10
01	550 BR U	PF 1	1360.53		1361.62	137.95		21400.00			-115.80	65.10	
01	550 BR U	PF 2	1361.43	0.90	1362.43	105.63		21400.00		-113.50	-115.80	65.10	64.10
01	550 BR D	PF 1	1360.41		1361.50	141.53		21400.00			-108.80	75.00	
01	550 BR D	PF 2	1361.31	0.90	1362.31	110.60		21400.00		-108.80	-108.80	75.00	64.30
01	500	PF 1	1360.46		1361.48	173.09		21400.00			-108.80	75.00	
01	500	PF 2	1361.37	0.91	1362.28	173.10		21400.00		-108.80	-108.80	75.00	64.30
01	400	PF 1	1360.47		1361.39	179.08		21400.00			-113.20	83.80	
01	400	PF 2	1361.38	0.91	1362.20	179.10		21400.00		-113.20	-113.20	83.80	65.90
01	399	PF 1	1360.46		1361.39	179.12		21400.00			-113.20	83.80	
01	399	PF 2	1361.38	0.92	1362.20	179.10		21400.00		-113.20	-113.20	83.80	65.90

HEC-RAS Plan: Plan 01 River: Muddy River Reach: 01 (Continued)

Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
			(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
01	300	PF 1	1360.16		1360.96	320.38	1368.83	20031.18			-112.00	76.00	
01	300	PF 2	1360.99	0.83	1361.85	189.70	71.10	21328.90		-122.00	-112.00	76.00	67.70
01	250	PF 1	1359.30		1360.58	410.54	2155.01	19244.99			-119.20	83.60	
01	250	PF 2	1359.93	0.64	1361.45	200.20		21400.00		-119.20	-119.20	83.60	81.00
01	200	PF 1	1358.77		1360.04	521.82	2391.06	19008.94			-71.10	57.20	
01	200	PF 2	1359.40	0.63	1360.88	226.20	800.49	20599.51		-169.30	-71.10	57.20	56.90
01	100	PF 1	1356.95		1358.46	1129.24	1788.91	19469.83	141.26		-61.76	54.47	
01	100	PF 2	1357.62	0.67	1359.25	280.37	859.26	20540.74		-225.90	-61.76	54.47	54.47

```
                    HEC-RAS Version 3.1.3 May 2005
                     U.S. Army Corp of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX

********************************************************************************

PROJECT DATA
Project Title: Post-ProjectConditionsModel
Project File : Prpsd.prj
Run Date and Time: 7/27/2007 5:04:48 PM

Project in English units

********************************************************************************

PLAN DATA

Plan Title: Plan 01
Plan File : f:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.p01

          Geometry Title: FinalGeometry
          Geometry File : f:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01

          Flow Title    : FIS flow
          Flow File     : f:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03

Plan Summary Information:
Number of:  Cross Sections =   17    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    1    Lateral Structures =    0

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

Computation Options
    Critical depth computed at all cross sections
    Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

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

River = Muddy River      Reach = 01
RS      Profile          Method  Value1  Value2
7100    PF 2                  1 -141.82   59.24
7000    PF 2                  1  -86.06   68.42
6900    PF 2                  1  -69.47   68.47
6800    PF 2                  1 -115.91   74.16
6700    PF 2                  1  -52.38   89.81
850     PF 2                  1    -104   111.5
800     PF 2                  1   -71.7    91.5
701     PF 2                  1  -103.5    62.3
700     PF 2                  1  -103.5    62.3
600     PF 2                  1  -113.5    64.1
500     PF 2                  1  -108.8    64.3
400     PF 2                  1  -113.2    65.9
399     PF 2                  1  -113.2    65.9
300     PF 2                  1    -122    67.7
250     PF 2                  1  -119.2      81
200     PF 2                  1  -169.3    56.9
100     PF 2                  1  -225.9   54.47

********************************************************************************

FLOW DATA

Flow Title: FIS flow
Flow File : f:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03

Flow Data (cfs)
*******************************************************************************
* River          Reach          RS      *          PF 1          PF 2 *
* Muddy River    01             7100    *         21400         21400 *
*******************************************************************************

Boundary Conditions
*************************************************************************************************************
* River          Reach          Profile         *          Upstream                  Downstream    *
*************************************************************************************************************
* Muddy River    01             PF 1            *                                Known WS = 1356.95 *
* Muddy River    01             PF 2            *                                Known WS = 1357.62 *
*************************************************************************************************************

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

GEOMETRY DATA

Geometry Title: FinalGeometry
Geometry File : f:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 7100

INPUT
Description: FIS HEC2 data
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1398.55	1376	-878.44	1373.78	-365.94	1373.51	-141.82	1372	-94.23	1360
-79.87	1356	-61.63	1352	-9.62	1348	9.62	1348	23.19	1352
40.12	1360	48.43	1368	59.24	1372	119.57	1372.56	318.01	1372.38
811.25	1376	874.94	1378.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1398.55	.05	-141.82	.08	59.24	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-141.82	59.24	495.08	533.65	472	.1	.3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 7000

INPUT
Description: FIS HEC2 data
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-720.06	1373.3	-664.33	1372.388	-369.81	372.098	-230.581	371.858	-150.111	372.618
-116.78	1370	-112.61	370.018	-91.721	362.018	-73.931	358.018	-54.371	354.018
-11.19	1350	01	346.018	10.07	1346.02	15.261	350.018	39.951	354.018
68.42	1362	79.871	366.018	91.521	370.018	223.011	373.578	571.431	374.018
625.91	1374.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-720.06	.05	-73.93	.08	68.42	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-73.93	68.42	452.81	479.66	471.01	.1	.3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 6900

INPUT
Description: FIS HEC2 data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-990.29	1368.6	-231.32	1368.65	-110.1	1368.46	-84.18	1368	-79.91	1368
-69.47	1360	-47.69	1356	-33.59	1352	-21.88	1348	-9.5	1344
9.51	1344	29.95	1348	49.56	1352	68.47	1360	76.15	1364
86.95	1368	221.42	1369.41	286.61	1369.41	452.73	1370.59	508.62	1370.53
1013.33	1370.3	1316.07	1371.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-990.29	.05	-69.47	.08	68.47	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-69.47	68.47	424.9	431.97	418.84	.1	.3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 6800

INPUT
Description: FIS HEC2 data
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-154.28	1368	-140.15	1368	-131.98	1368	-115.91	1360	-102.17	1356
-40.65	1352	-28.64	1348	-18.87	1344	0	1342.81	24.35	1344
54.93	1348	58.97	1352	67.91	1360	74.16	1364	266.45	1367.88
516	1368	730.03	1368.3	793.43	1370.04	905.01	1369.21	1369.62	1369.23
1487.35	1369.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-154.28	.05	-115.91	.08	74.16	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-115.91	74.16	579.69	604.52	580.75	.1	.3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 6700

INPUT
Description: FIS HEC2 data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-152.07	1367.1	-114.41	366.495	-92.94	1361.345	-60.91	357.345	-48.99	1353.345
-27.33	1349.3	-17.91	345.345	-3.11	341.345	3.111	341.345	43.251	345.345
65.44	1349.3	89.81	1353.345	101.61	361.345	109.71	365.345	129.431	365.865
704.26	1366.8	994.99	1368.055	1337.71	1369.045				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-152.07	.05	-48.99	.08	89.81	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-48.99	89.81	471.6	438.9	436	.1 .3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 850

INPUT
Description: Existing Conditions Station 66+00
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-556.6	1361.9	-543.9	1361	-455.5	1360	-128.4	1360	-104	1361
-87.3	1361	-71.7	1360	-17.5	1343	-13.4	1342.5	-9.8	1342
0	1341.8	12.3	1342	15.3	1342.2	24	1343	48	1344
63	1345	111.5	1357	144.2	1360	168.4	1362	177.8	1363

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-556.6	.05	-71.7	.08	-13.4	.04	111.5	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-71.7	111.5	35	64	100	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-556.6	-103.3	1361	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 800

INPUT
Description: Station 8+00
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-526.9	1361.8	-508.3	1361	-475	1360	-154	1360	-98	1361
-72.4	1361	-71.7	1360.7	-33	1343	-10	1342	0	1341.4
10	1342	41	1343	73	1357	91.5	1360	102.9	1361
118.4	1362								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-526.9	.05	-72.4	.08	-10	.04	91.5	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-72.4	91.5	75	93	100	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-526.9	-98	1361	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 701

INPUT
Description: Station 7+00 Before Lining
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-470.4	1361	-412.2	1360	-128	1360	-124	1361	-105	1361
-103.5	1360.55	-68	1343	-44	1342	-10	1341	0	1340.8
10	1341	26	1342	62.3	1360.55	65	1361	71.4	1365
75.8	1366								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-470.4	.05	-105	.08	-10	.04	65	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-105	65	1	1	1	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-470.4	-124	1361	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 700

INPUT
Description: Station 7+00 Begin Lining
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-470.4	1361	-412.2	1360	-128	1360	-124	1361	-105	1361
-103.5	1360.55	-68	1343	-44	1342	-10	1341	0	1340.8
10	1341	26	1342	62.3	1360.55	65	1361	71.4	1365
75.8	1366								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-470.4	.05	-105	.04	65	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-105	65	74	44	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-470.4	-124	1361	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 600

INPUT
Description: Station 6+00
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-426	1361	-394.8	1360	-159.5	1360	-153.6	1361	-115.8	1361
-113.5	1360.62	-109.9	1360	-73	1342	-11.3	1341	0	1340.6
11.3	1341	28.7	1342	63.7	1360	64.1	1360.62	65.1	1362
67.2	1365	75	1365.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-426	.05	-115.8	.04	65.1	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-115.8	65.1	57	54	66	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-426	-115.8	1361	T
65.1	75	1361	F

BRIDGE

RIVER: Muddy River
REACH: 01 RS: 550

INPUT
Description: Gubler Avenue Bridge
Distance from Upstream XS = 1
Deck/Roadway Width = 52
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-421	1359.8	1359.58	-390	1359.85	1359.6	-328	1359.88	1355.63
-288	1359.9	1355.65	-228	1360.5	1356.25	-188	1361.3	1357.05
-128	1363.02	1358.77	-68	1365.1	1360.85	-28	1366.1	1361.85
0	1366.5	1362.25	32	1366.7	1362.45	70	1366.4	1362.15
75	1366.28	1362.03						

Upstream Bridge Cross Section Data
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-426	1361	-394.8	1360	-159.5	1360	-153.6	1361	-115.8	1361
-113.5	1360.62	-109.9	1360	-73	1342	-11.3	1341	0	1340.6
11.3	1341	28.7	1342	63.7	1360	64.1	1360.62	65.1	1362
67.2	1365	75	1365.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-426	.05	-115.8	.04	65.1	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
-115.8	65.1	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-426	-115.8	1361	T
65.1	75	1361	F

Downstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-421	1359.8	1359.58	-390	1359.85	1359.6	-328	1359.88	1355.63
-288	1359.9	1355.65	-228	1360.5	1356.25	-188	1361.3	1357.05
-128	1363.02	1358.77	-68	1365.1	1360.85	-28	1366.1	1361.85
0	1366.5	1362.25	32	1366.7	1362.45	70	1366.4	1362.15
75	1366.28	1362.03						

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************************
   -389.2     1361   -369.6     1360   -202.3     1360   -195.8     1361   -182.5     1361
   -172.9     1360   -152.1     1359     -124     1359   -122.3   1358.7   -122.3   1362.8
   -108.8   1363.4   -108.8     1360    -75.6     1342    -11.6     1341        0   1340.2
     13.2     1341     28.2     1342     64.3  1360.46       75   1365.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
   -389.2     .05   -108.8     .04       75     .05

Bank Sta: Left   Right    Coeff Contr.    Expan.
        -108.8      75             .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   -389.2  -108.8    1361       F
       75      75    1361       F

Upstream Embankment side slope              =       1 horiz. to 1.0 vertical
Downstream Embankment side slope            =       1 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=   -31.5    Downstream=   -31.5
Upstream     num=       2
    Width   Elev    Width   Elev
*********************************
    3.42 1340.51    3.42    1364
Downstream     num=       2
    Width   Elev    Width   Elev
*********************************
    3.42 1340.51    3.42    1364

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum               Cd   =     1.2
       Yarnell                KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       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: Muddy River
REACH: 01                 RS: 500

INPUT
Description: Station 5+00
Station Elevation Data    num=      19
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************************
   -389.2     1361   -369.6     1360   -202.3     1360   -195.8     1361   -182.5     1361
   -172.9     1360   -152.1     1359     -124     1359   -122.3   1358.7   -122.3   1362.8
   -108.8   1363.4   -108.8     1360    -75.6     1342    -11.6     1341        0   1340.2
     13.2     1341     28.2     1342     64.3  1360.46       75   1365.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
   -389.2     .05   -108.8     .04       75     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
        -108.8      75             62      48      36             .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   -389.2  -108.8    1361       F
       75      75    1361       F
```

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 400

INPUT
Description: Station 4+00 End Lining
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-272.8	1361	-252.2	1360	-223.7	1360	-211.3	1360	-185.1	1360.7
-136.8	1361	-113.2	1361.5	-113.2	1360	-110.9	1358	-78.9	1342
-38.8	1341	-15	1340.2	-10.3	1340	0	1339.9	10.3	1340
15	1340.2	26.1	1341	63.4	1360	65.9	1360.47	83.8	1364
87.9	1364.9								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-272.8	.05	-223.7	.016	-113.2	.04	83.8	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-113.2	83.8	1	1	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-272.8	-113.2	1362	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 399

INPUT
Description: Station 4+00 After Lining
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-272.8	1361	-252.2	1360	-223.7	1360	-211.3	1360	-185.1	1360.7
-136.8	1361	-113.2	1361.5	-113.2	1360	-110.9	1358	-78.9	1342
-38.8	1341	-15	1340.2	-10.3	1340	0	1339.9	10.3	1340
15	1340.2	26.1	1341	63.4	1360	65.9	1360.46	83.8	1364
87.9	1364.9								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-272.8	.05	-223.7	.016	-113.2	.08	-15	.04	15	.08
83.8	.05								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-113.2	83.8	92	100	113	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-272.8	-113.2	1362	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 300

INPUT
Description: Station 3+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-364.8	1360.2	-352.4	1360	-300.2	1360	-252.6	1359	-247.1	1357
-174	1357	-152	1358	-122	1359	-112	1358	-82	1343
-65	1342	-47	1341	-10	1340	0	1339.2	10	1340
25	1341	60	1359	67.7	1360.15	76	1361.1		

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-364.8	.016	-247.1	.05	-112	.08	-82	.03	-65	.08
-10	.04	10	.08	76	.05				

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-112	76	39.6	59.8	67.9	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-364.8	-252.6	1361	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 250

INPUT
Description: Existing Conditions Station 65+00
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-358.3	1360	-317.4	1359	-310.7	1358	-302.6	1357.5	-268.9	1357
-142	1357	-119.2	1357.7	-112.2	1357	-94.4	1348	-77	1347
-70.3	1346	-26.4	1341	-17.2	1340	-10.5	1339	0	1338.8
10.5	1339	28.9	1340	34.1	1341	57.4	1349	77.3	1358
79.8	1359	81	1359.3	83.6	1360	88.5	1360	117.6	1365

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-358.3	.05	-119.2	.08	-94.4	.03	-77	.08	-10.5	.04
10.5	.08								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-119.2	83.6	56	60.3	54	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-119.2	-42	1357.7	T

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 200

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-465.8	1359	-458.3	1357	-133.6	1357	-106.3	1358	-84.1	1358
-71.1	1357	-68.5	1352	-42.3	1338	-29.7	1338	-24.8	1338.7
-10.1	1338	-5.8	1337	0	1336.18	7.8	1337	11.2	1340
18.6	1344	23.3	1345	31.4	1346	39.3	1347	56.9	1358.77
57.2	1359	65.3	1360						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-465.8	.05	-71.1	.08	57.2	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-71.1	57.2	195.5	193.8	193.5	.1	.3

CROSS SECTION

RIVER: Muddy River
REACH: 01 RS: 100

INPUT
Description: Station 1+00 - Existing Conditions Station 64.5
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1132.82	1358.4	-1016.87	1356	-803.97	1355.79	-430.14	1356.7	-223.51	1356
-169.67	1356.3	-122.9	1356.19	-61.76	1356	-45.54	1340	-39.49	1336
0	1332.6	13.08	1336	16.72	1340	35.16	1348	54.47	1352
73.87	1360	87.35	1361.07						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1132.82	.05	-61.76	.08	54.47	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-61.76	54.47	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Muddy River

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8
01	7100	.05	.08	.05					
01	7000	.05	.08	.05					
01	6900	.05	.08	.05					
01	6800	.05	.08	.05					
01	6700	.05	.08	.05					
01	850	.05	.08	.04	.05				
01	800	.05	.08	.04	.05				
01	701	.05	.08	.04	.05				
01	700	.05	.04	.05					
01	600	.05	.04	.05					
01	550	Bridge							
01	500	.05	.04	.05					
01	400	.05	.016	.04	.05				
01	399	.05	.016	.08	.04	.08	.05		
01	300	.016	.05	.08	.03	.08	.04	.08	.05
01	250	.05	.08	.03	.08	.04	.08		
01	200	.05	.08	.05					
01	100	.05	.08	.05					

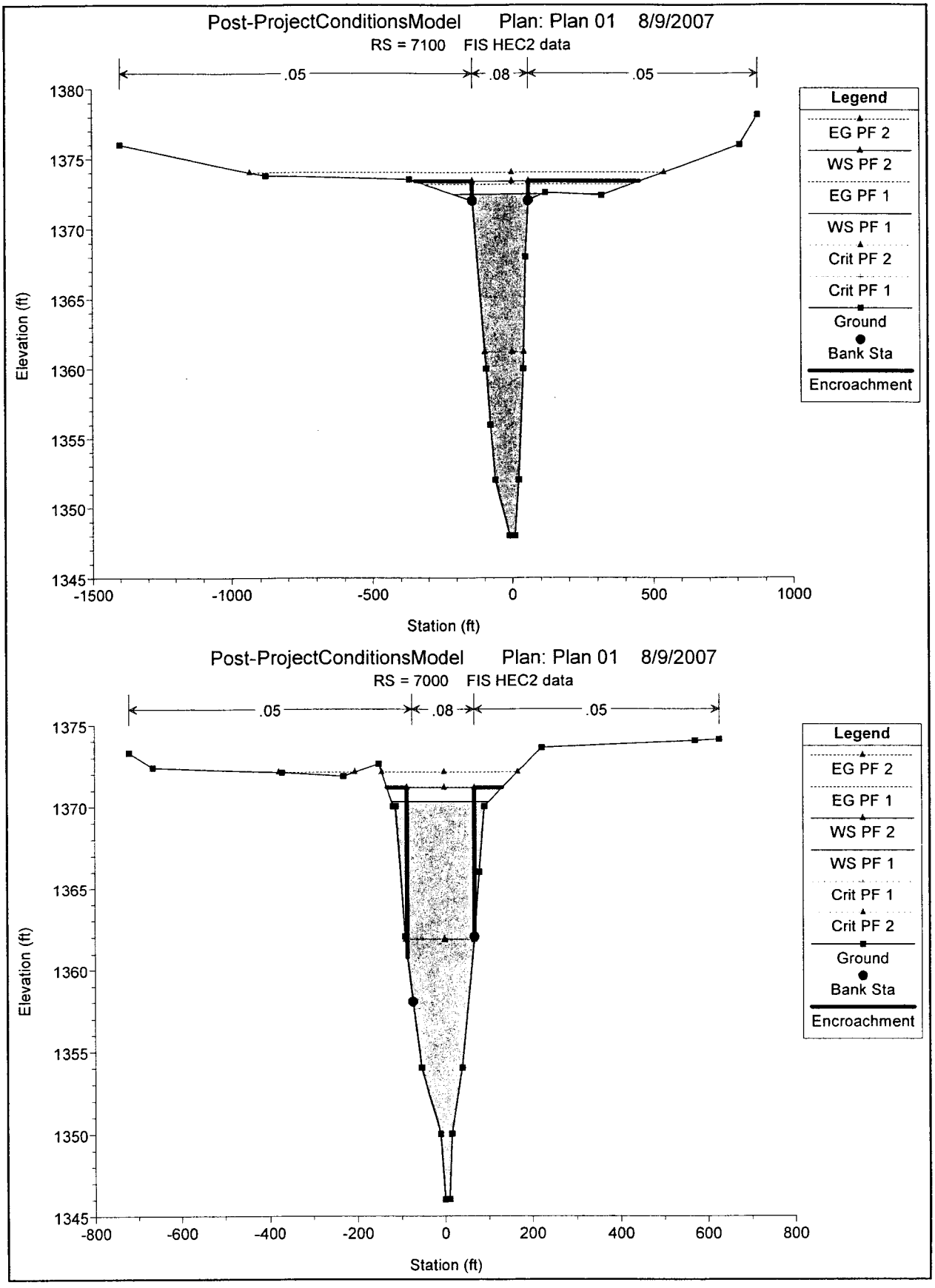
SUMMARY OF REACH LENGTHS

River: Muddy River

Reach	River Sta.	Left	Channel	Right
*01	7100	495.08*	533.65*	472*
*01	7000	452.81*	479.66*	471.01*
*01	6900	424.9*	431.97*	418.84*
*01	6800	579.69*	604.52*	580.75*
*01	6700	471.6*	438.9*	436*
*01	850	35*	64*	100*
*01	800	75*	93*	100*
*01	701	1*	1*	1*
*01	700	74*	44*	30*
*01	600	57*	54*	66*
*01	550	*Bridge	*	*
*01	500	62*	48*	36*
*01	400	1*	1*	1*
*01	399	92*	100*	113*
*01	300	39.6*	59.8*	67.9*
*01	250	56*	60.3*	54*
*01	200	195.5*	193.8*	193.5*
*01	100	0*	0*	0*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Muddy River

Reach	River Sta.	Contr.	Expan.
*01	7100	.1*	.3*
*01	7000	.1*	.3*
*01	6900	.1*	.3*
*01	6800	.1*	.3*
*01	6700	.1*	.3*
*01	850	.1*	.3*
*01	800	.1*	.3*
*01	701	.1*	.3*
*01	700	.1*	.3*
*01	600	.1*	.3*
*01	550	*Bridge	*
*01	500	.1*	.3*
*01	400	.1*	.3*
*01	399	.1*	.3*
*01	300	.1*	.3*
*01	250	.3*	.5*
*01	200	.1*	.3*
*01	100	.1*	.3*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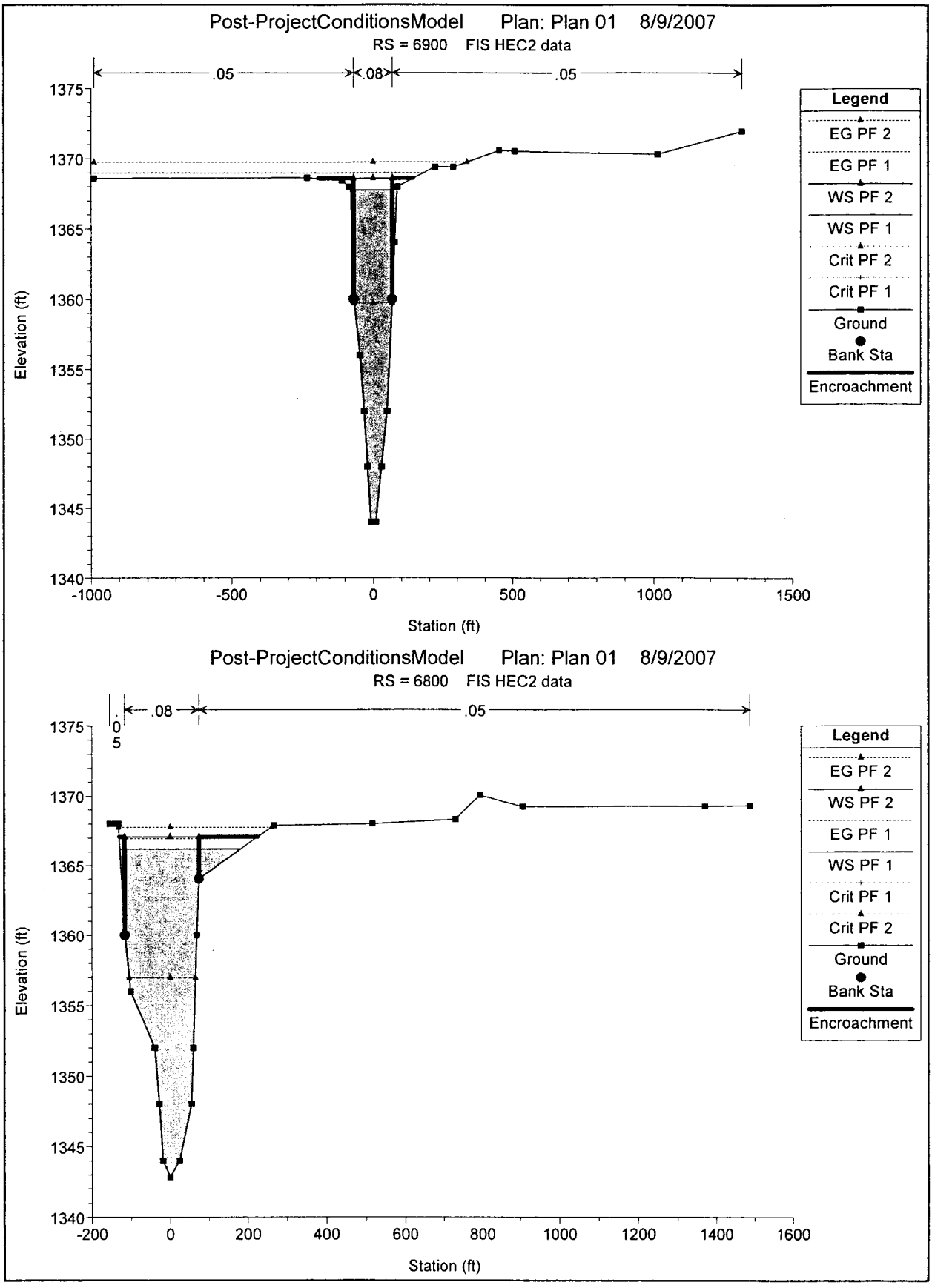
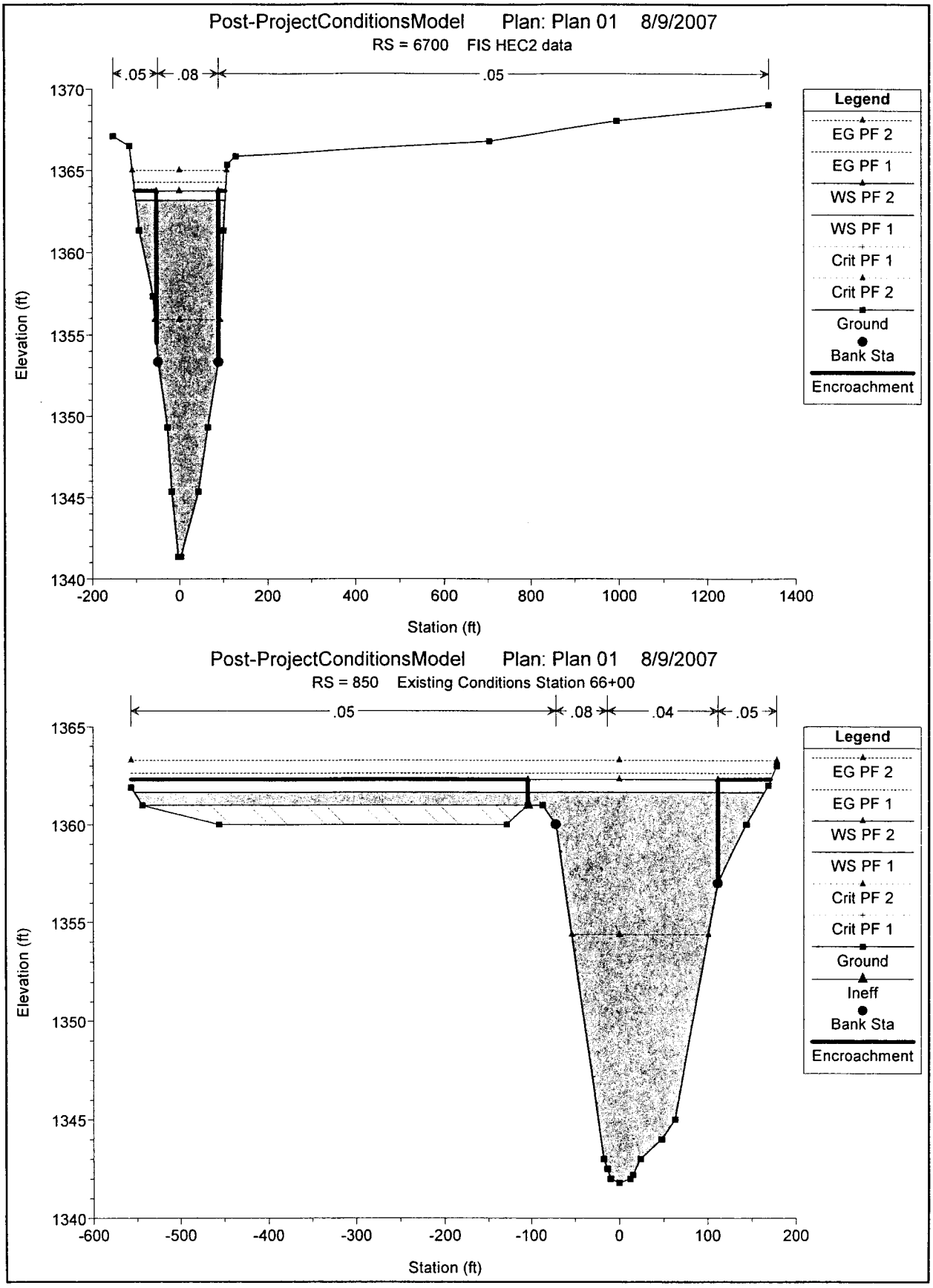
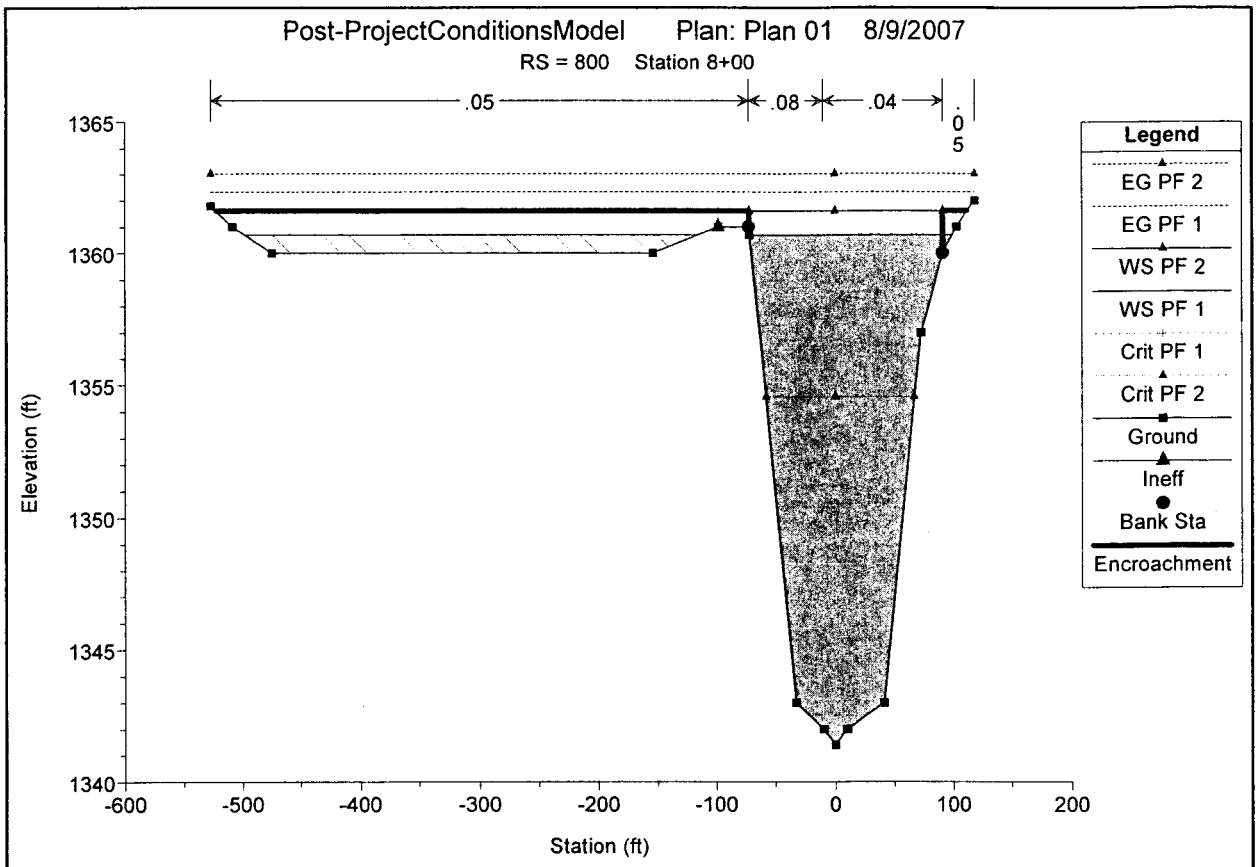
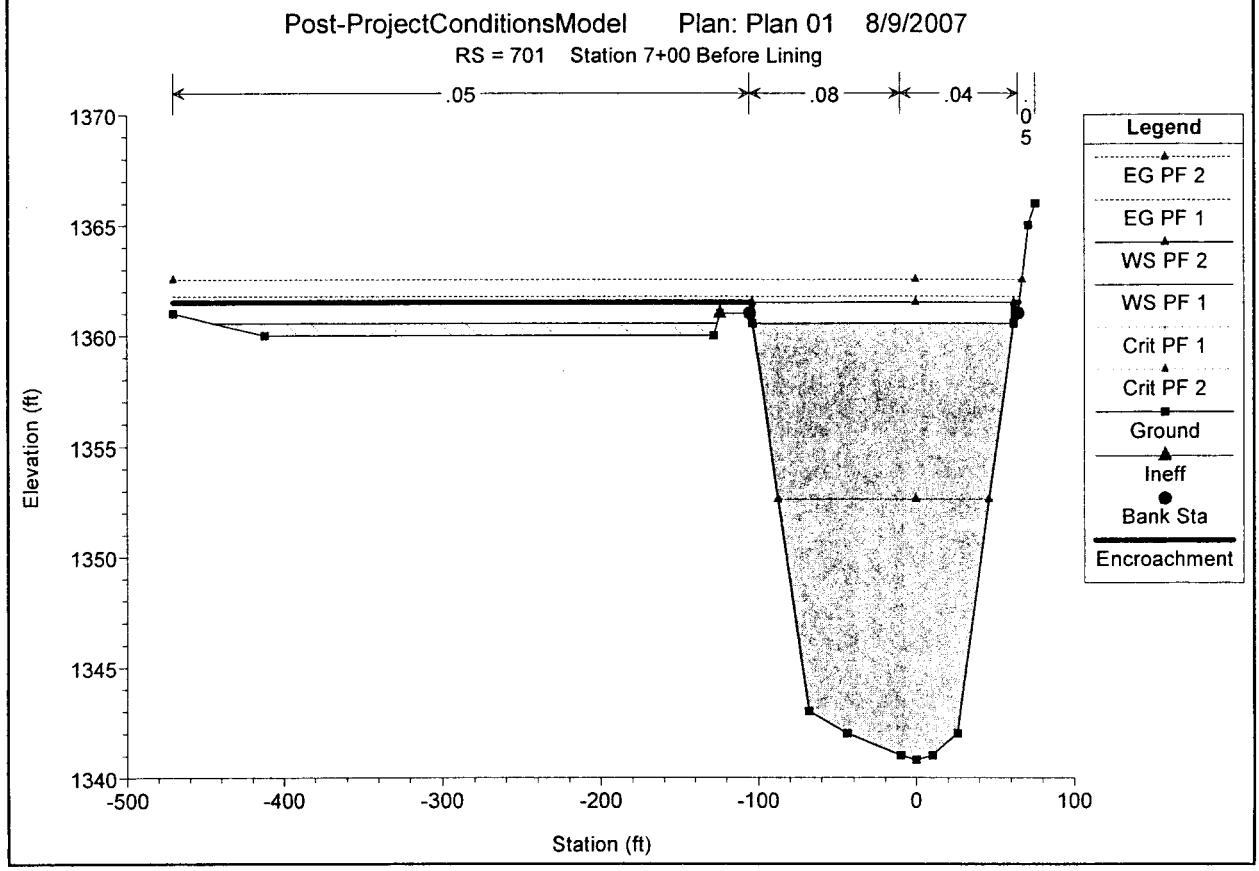
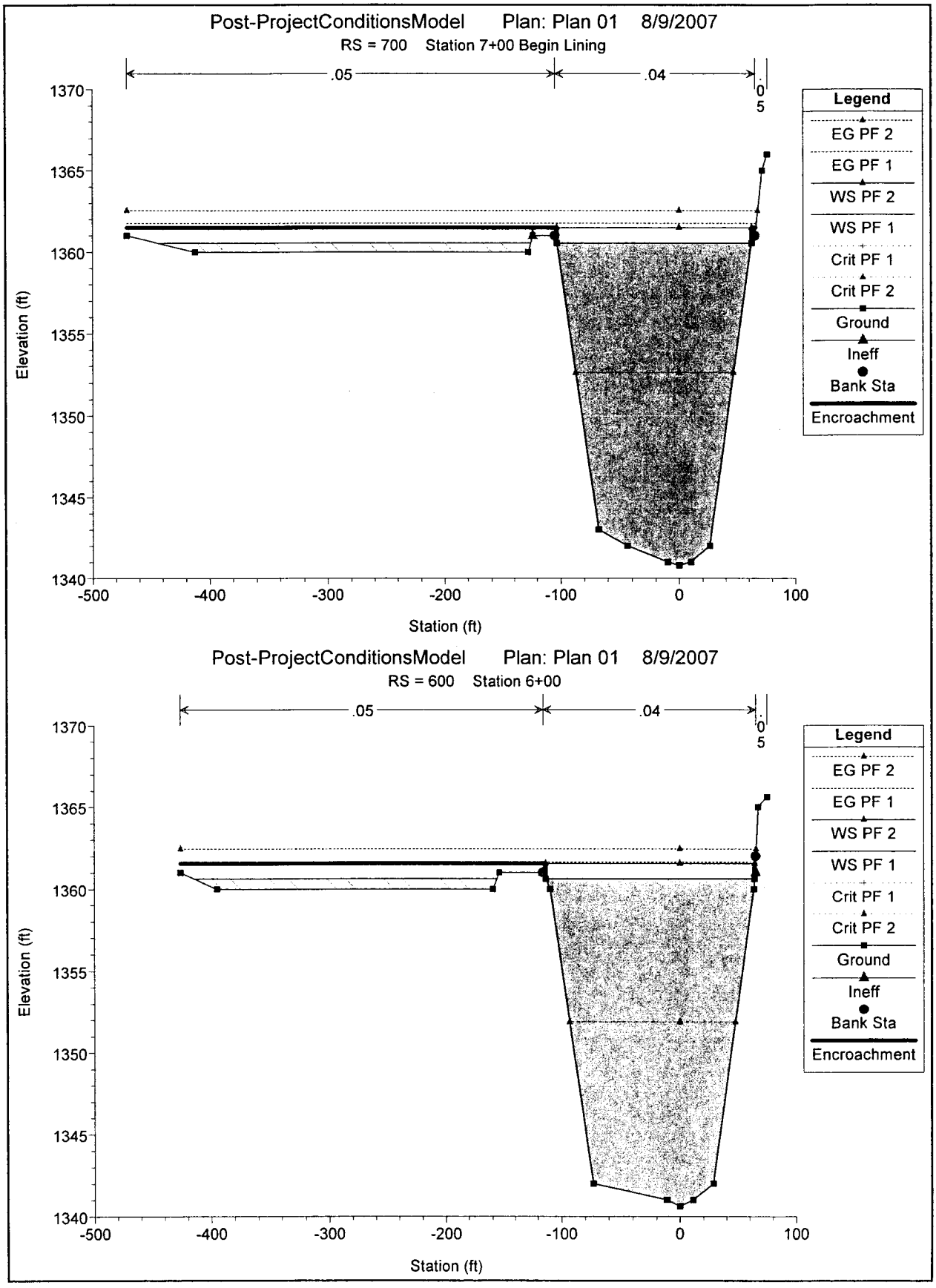
RS = 7100 FIS HEC2 data
.05
.08
.05
Elevation (ft)
1380
1375
1370
1365
1360
1355
1350
1345
-1500
-1000
-500
0
500
1000
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 7000 FIS HEC2 data
.05
.08
.05
Elevation (ft)
1375
1370
1365
1360
1355
1350
1345
-800
-600
-400
-200
0
200
400
600
800
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment

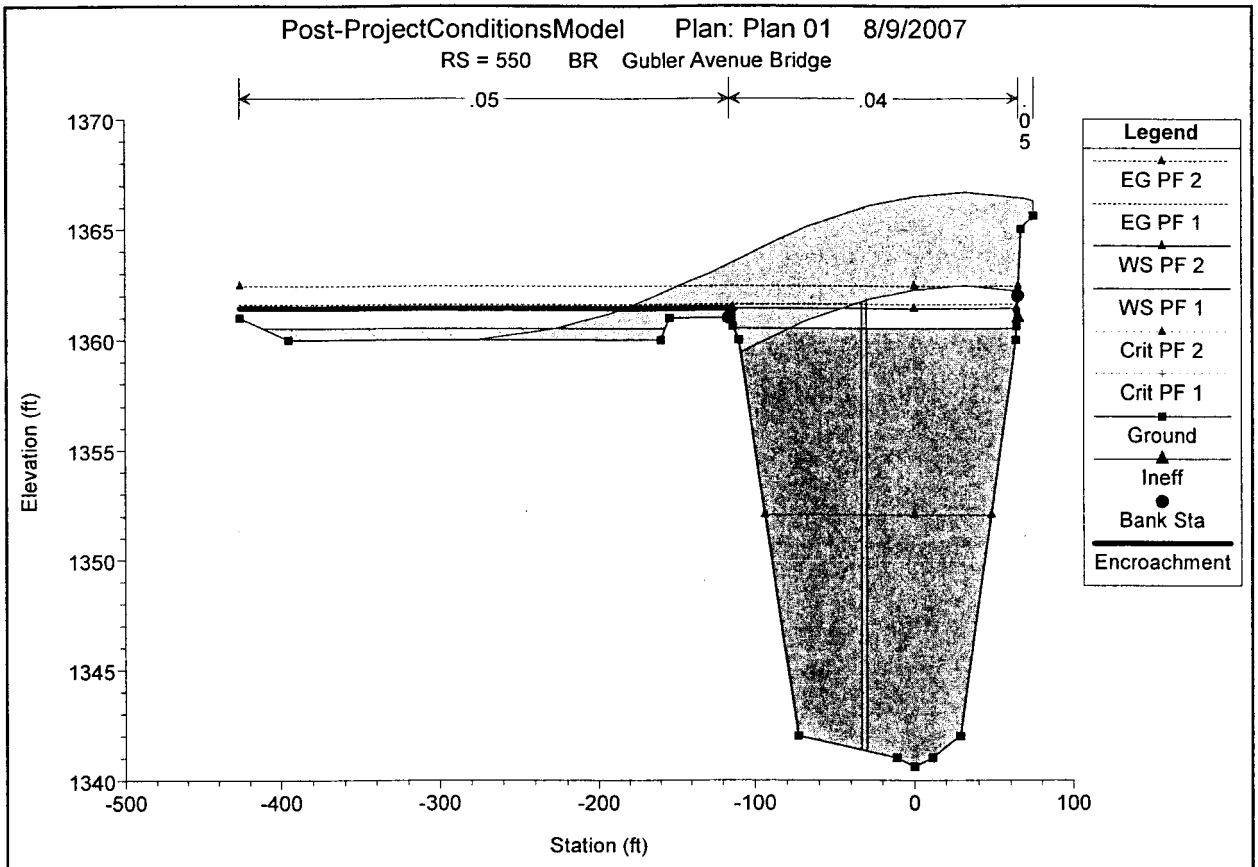

Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 6900 FIS HEC2 data
.05
.08
.05
Elevation (ft)
1375
1370
1365
1360
1355
1350
1345
1340
-1000
-500
0
500
1000
1500
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 6800 FIS HEC2 data
.08
.05
Elevation (ft)
1375
1370
1365
1360
1355
1350
1345
1340
-200
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment

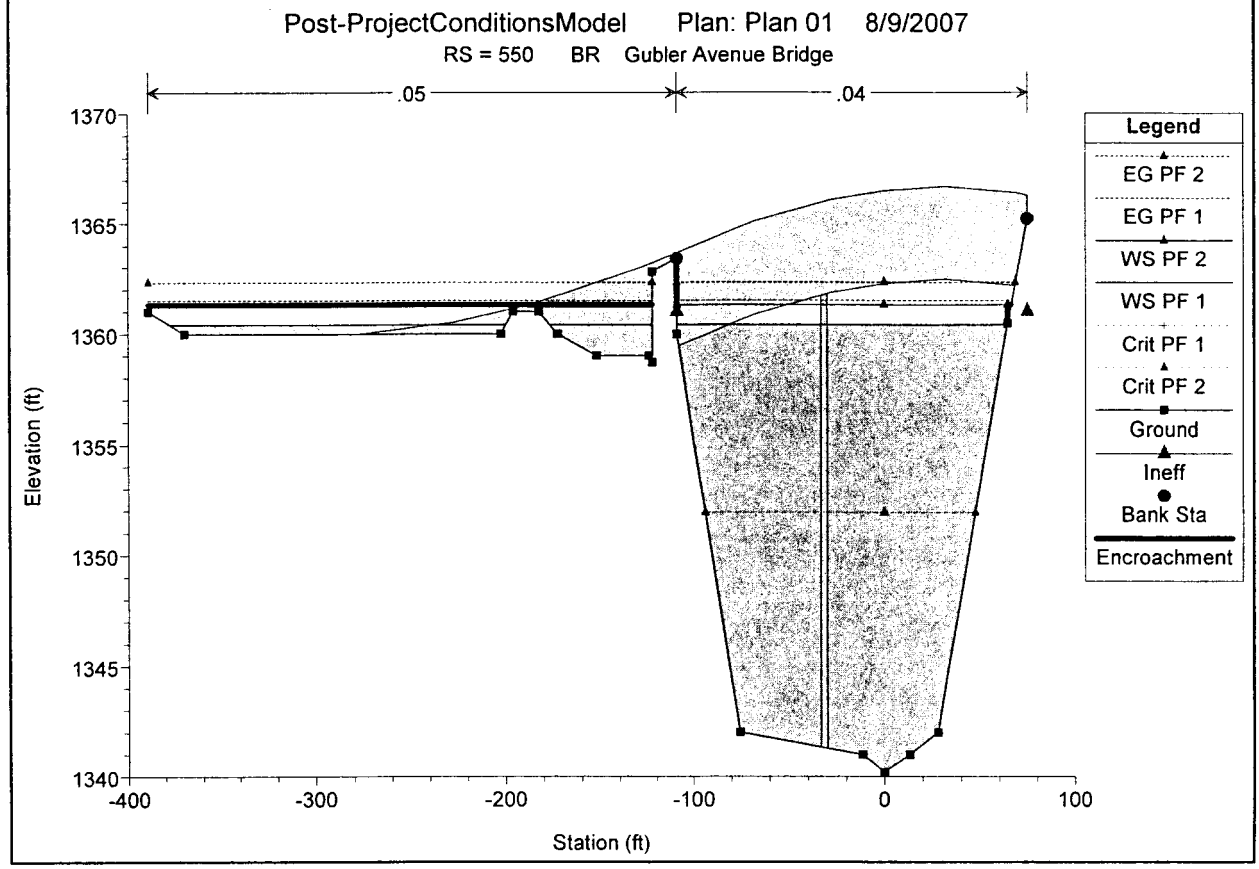

Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 6700 FIS HEC2 data
.05
.08
.05
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-200
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 850 Existing Conditions Station 66+00
.05
.08
.04
.05
Elevation (ft)
1365
1360
1355
1350
1345
1340
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment

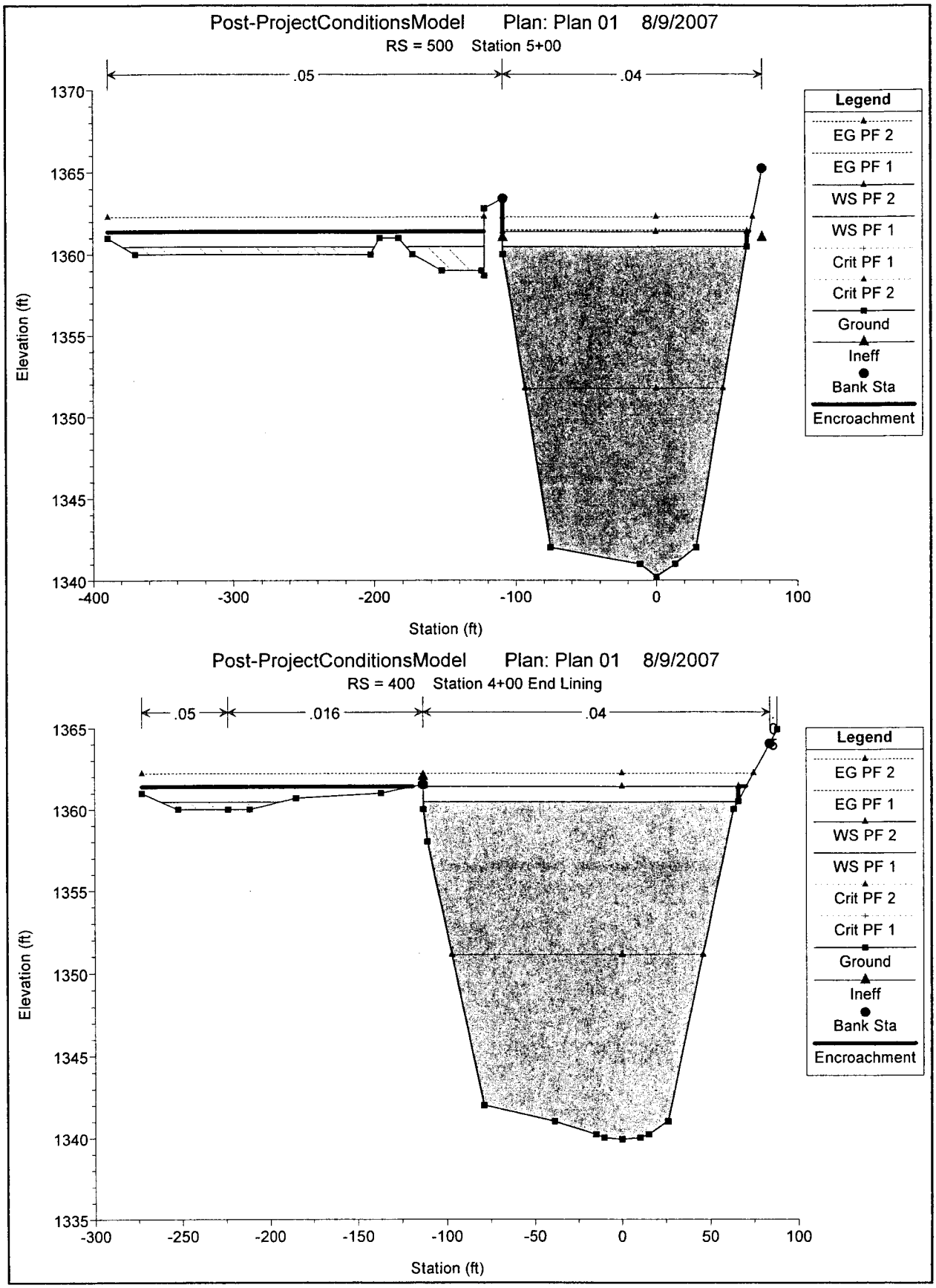

Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 800 Station 8+00
.05
.08
.04
.05
Elevation (ft)
1365
1360
1355
1350
1345
1340
-600
-500
-400
-300
-200
-100
0
100
200
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

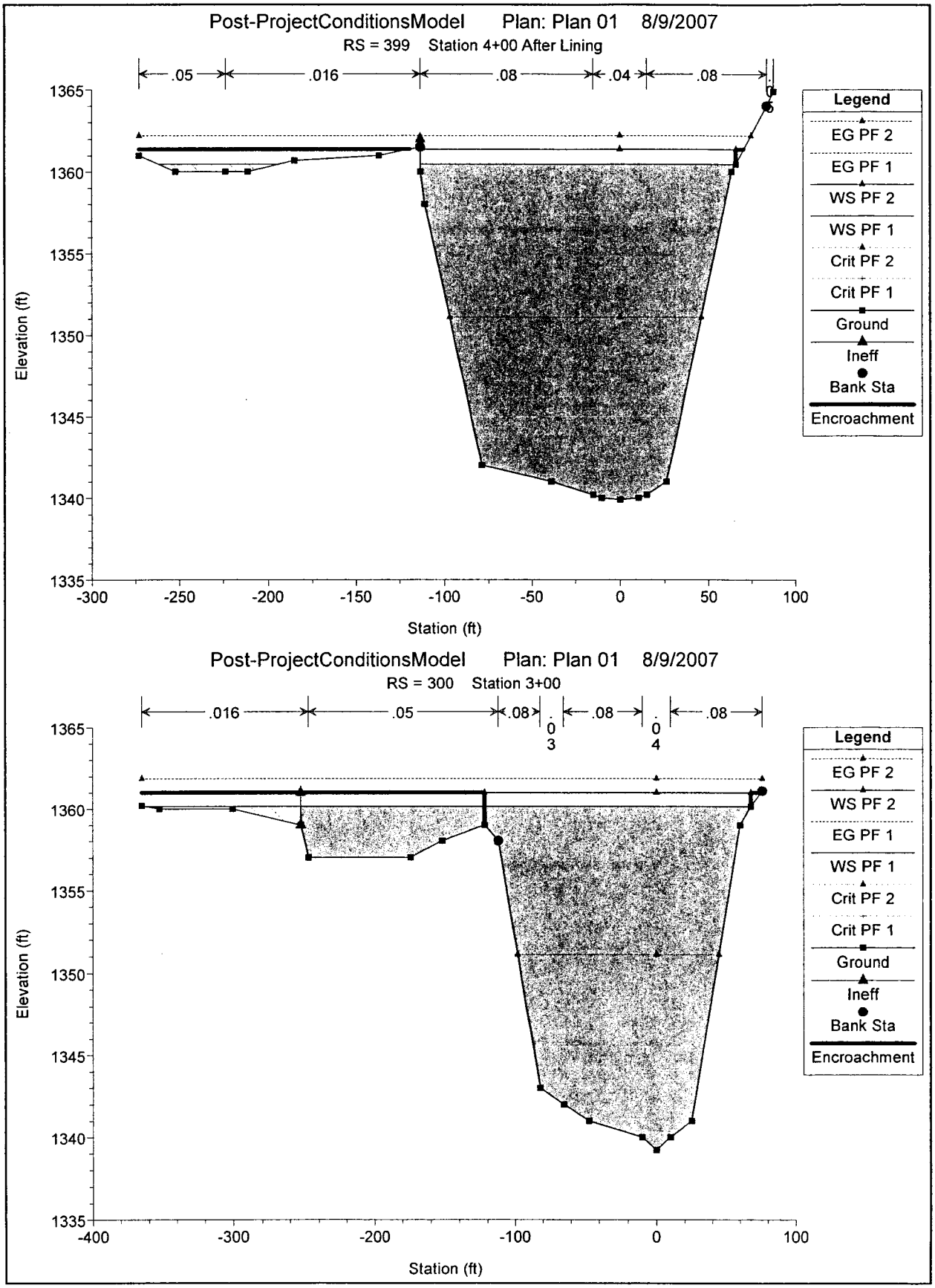

Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 701 Station 7+00 Before Lining
.05
.08
.04
.05
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-500
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment

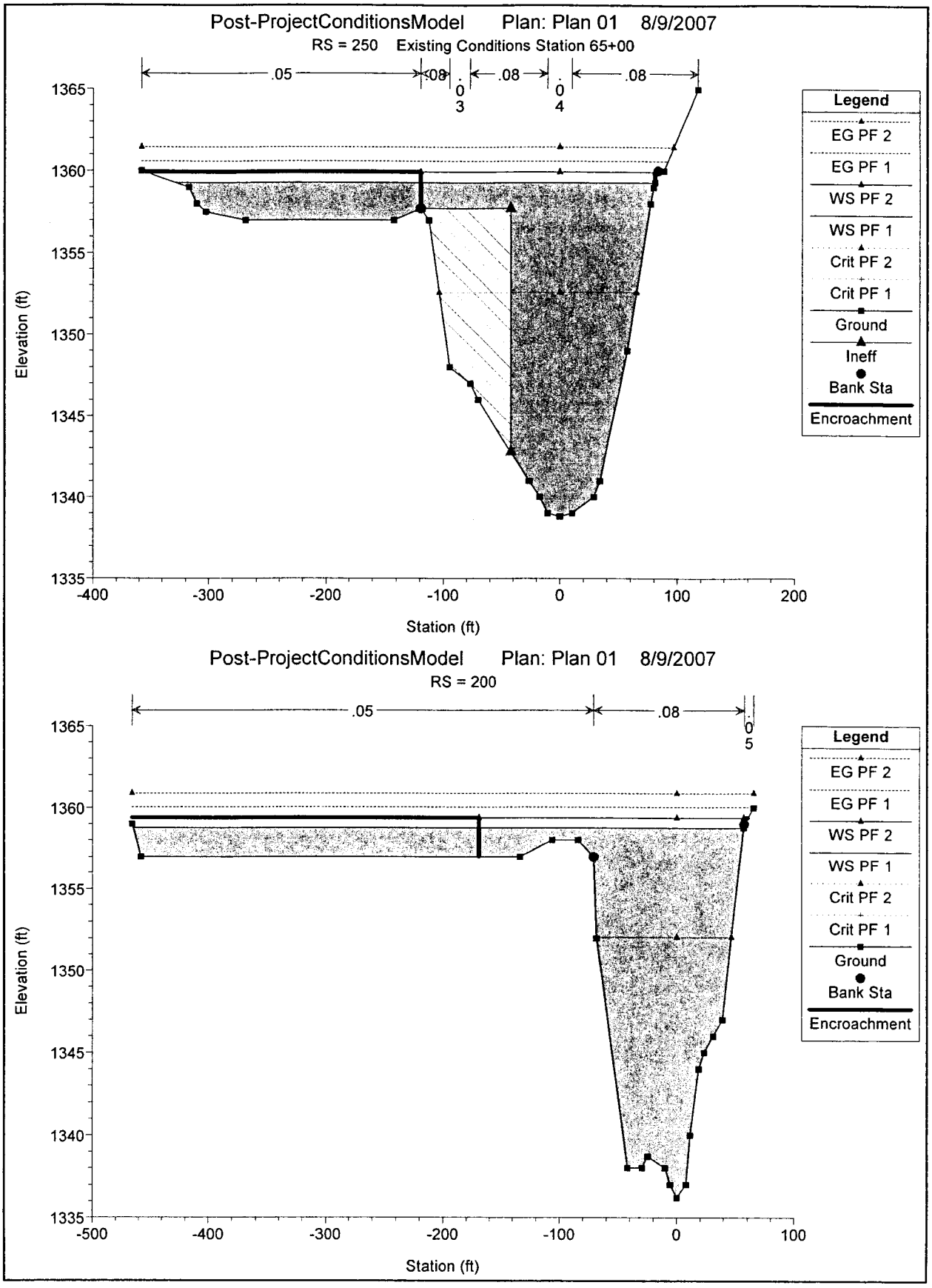

Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 700 Station 7+00 Begin Lining
.05
.04
.05
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-500
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 600 Station 6+00
.05
.04
.05
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-500
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment


Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 550 BR Gubler Avenue Bridge
.05
.04
.05
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-500
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment


Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 550 BR Gubler Avenue Bridge
.05
.04
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment


Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 500 Station 5+00
.05
.04
Elevation (ft)
1370
1365
1360
1355
1350
1345
1340
-400
-300
-200
-100
0
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Ineff
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 400 Station 4+00 End Lining
.05
.016
.04
Elevation (ft)
1365
1360
1355
1350
1345
1340
1335
-300
-250
-200
-150
-100
-50
0
50
100
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment


Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 399 Station 4+00 After Lining
.05
.016
.08
.04
.08
Elevation (ft)
Station (ft)
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 300 Station 3+00
.016
.05
.08
.08
.08
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
EG PF 1
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment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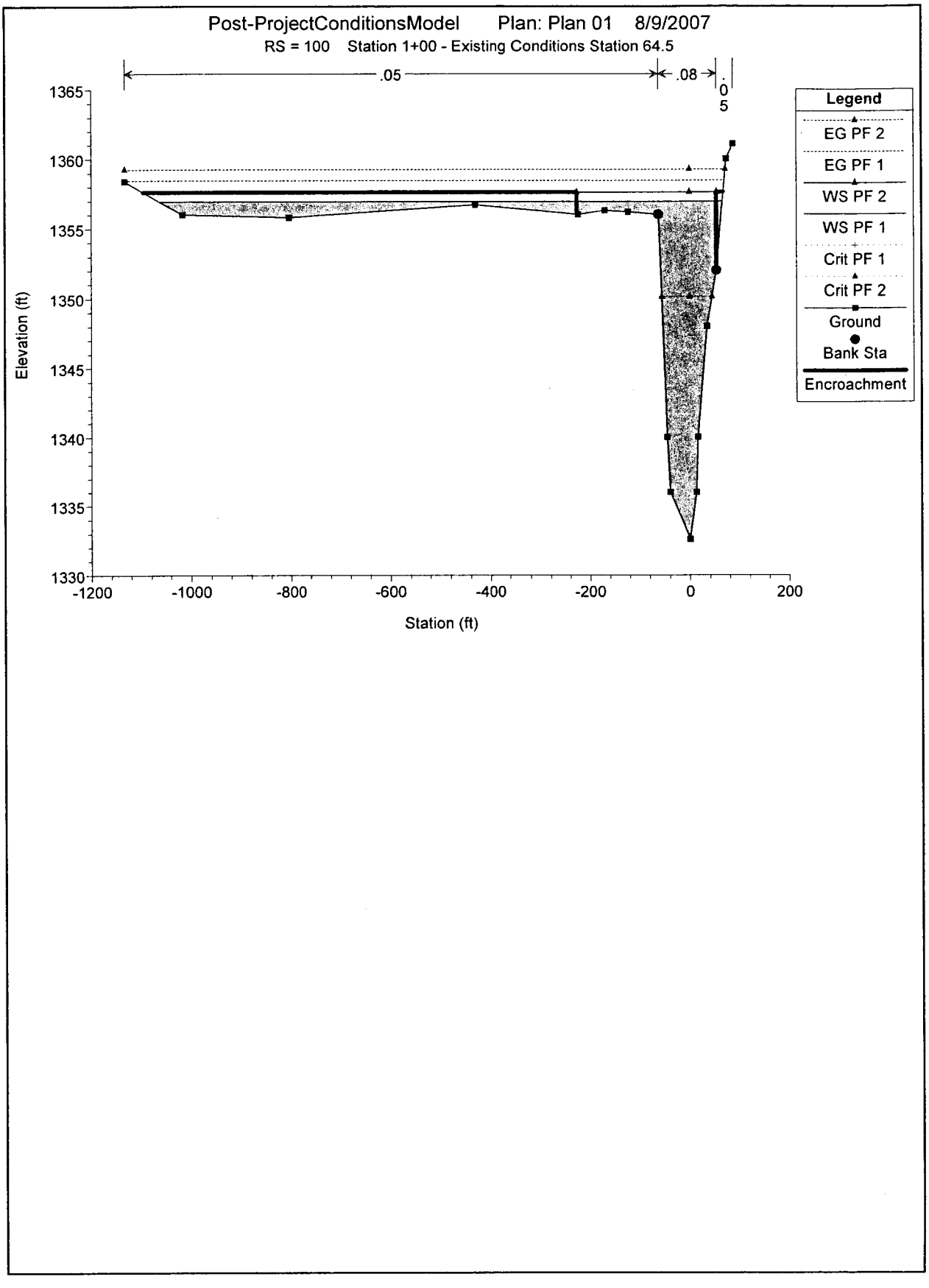
RS = 250 Existing Conditions Station 65+00
.05
.08
.03
.08
.04
.08
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
1365
1360
1355
1350
1345
1340
1335
-400
-300
-200
-100
0
100
200
Station (ft)
Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 200
.05
.08
.05
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 2
Crit PF 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1365
1360
1355
1350
1345
1340
1335
-500
-400
-300
-200
-100
0
100
Station (ft)


Post-ProjectConditionsModel Plan: Plan 01 8/9/2007
RS = 100 Station 1+00 - Existing Conditions Station 64.5
.05
.08
.0
5
Legend
EG PF 2
EG PF 1
WS PF 2
WS PF 1
Crit PF 1
Crit PF 2
Ground
Bank Sta
Encroachment
Elevation (ft)
1365
1360
1355
1350
1345
1340
1335
1330
-1200
-1000
-800
-600
-400
-200
0
200
Station (ft)

CHECK-RAS Analysis of Post-Project Conditions Model

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.prj
Plan File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.p01
Geometry File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01
Flow File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03
Report File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.xs
Selected profiles: PF 1;PF 2
Date: 8/9/2007
Time: 10:26:53 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
Muddy River,01						
7100	495.08	533.65	472	412.05	21400	D
7000	452.81	479.66	471.01	222.58	21400	
6900	424.9	431.97	418.84	165.96	21400	
6800	579.69	604.52	580.75	311.84	21400	
6700	471.6	438.9	436	205.86	21400	
850	35	64	100	717.59	21400	
800	75	93	100	171.23	21400	
701	1	1	1	165.8	21400	
700	74	44	30	165.78	21400	D
600	57	54	66	177.59	21400	
550	Bridge #1-Up					
550	Bridge #1-Dn					
500	62	48	36	173.09	21400	D
400	1	1	1	179.08	21400	D
399	92	100	113	179.12	21400	
300	39.6	59.8	67.9	320.38	21400	
250	56	60.3	54	410.54	21400	
200	195.5	193.8	193.5	521.82	21400	
100	0	0	0	1129.24	21400	

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

DISCHARGE CHECK

XS DC 02 Constant dicharge used for the Muddy River,01

Response: The discharge was obtained from the effective flood insurance study.

LOCATION CHECK

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is Muddy River,01
Known WS = 1356.95 is specified as the downstream boundary
for profile PF 1

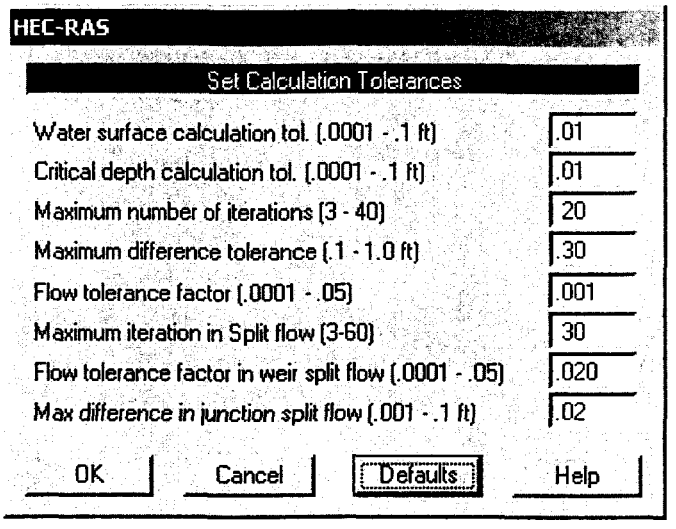
Response: The known water surface was obtained from the effective flood insurance study for the starting cross section 100 (64.5).

```
XS BC 02 The name of the stream is Muddy River,01
         Known WS = 1357.62 is specified as the downstream boundary
         for profile PF 2
```

Response: The known water surface was obtained from the effective flood insurance study for the starting cross section 100 (64.5) with encroachment.

```
XS BC 03 Maximum number of iterations is 0
         It should not be less than 20.
```

Response: The maximum number of iterations is set at 20, as shown below.




```
LATERAL WEIRS CHECK
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---END---
```

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.prj
Plan File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.p01
Geometry File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01
Flow File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03
Report File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.nt
Selected profiles: PF 1;PF 2
Date: 8/9/2007
Time: 10:26:52 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
Muddy River,01						
7100		0.05	0.08	0.05	0.1	0.3
7000		0.05	0.08	0.05	0.1	0.3
6900		0.05	0.08	0.05	0.1	0.3
6800		0.05	0.08	0.05	0.1	0.3
6700		0.05	0.08	0.05	0.1	0.3
850		0.05	0.08	0.05	0.1	0.3
		-----	0.04	-----		
800		0.05	0.08	0.05	0.1	0.3
		-----	0.04	-----		
701		0.05	0.08	0.05	0.1	0.3
		-----	0.04	-----		
700		0.05	0.04	0.05	0.1	0.3
600		0.05	0.04	0.05	0.1	0.3
550	Bridge-Up	0.05	0.04	0.05	0.1	0.3
550	Bridge-Dn	0.05	0.04	0.05	0.1	0.3
500		0.05	0.04	0.05	0.1	0.3
400		0.05	0.04	0.05	0.1	0.3
		0.016	-----	-----		
399		0.05	0.08	0.05	0.1	0.3
		0.016	0.04	-----		
		-----	0.08	-----		
300		0.016	0.08	0.05	0.1	0.3
		0.05	0.03	-----		
		-----	0.08	-----		
		-----	0.04	-----		
		-----	0.08	-----		
250		0.05	0.08	-----	0.3	0.5
		-----	0.03	-----		
		-----	0.08	-----		
		-----	0.04	-----		
		-----	0.08	-----		
200		0.05	0.08	0.05	0.1	0.3
100		0.05	0.08	0.05	0.1	0.3

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.016	0.05
Right Overbank n Value:	0.05	0.05
Channel n Value:	0.03	0.08
Contraction Coefficient:	0.1	0.3
Expansion Coefficient:	0.3	0.5

ROUGHNESS COEFFICIENT CHECK

RS: 7100
NT RC 05 The left overbank n value of 0.05 and the right overbank n value of 0.05 are less than or equal to the channel n value of 0.08 The overbank n values should be reevaluated.

RS: 7000
NT RC 05 The left overbank n value of 0.05 and the right overbank n value of 0.05 are less than or equal to the channel n value of 0.08 The overbank n values should be reevaluated.

RS: 6900
NT RC 05 The left overbank n value of 0.05 and the right overbank n value of 0.05 are less than or equal to the channel n value of 0.08 The overbank n values should be reevaluated.

RS: 6800
NT RC 05 The left overbank n value of 0.05 and the right overbank n value

```
         of 0.05 are less than or equal to the channel n value of 0.08
         The overbank n values should be reevaluated.

RS:      6700
NT RC 05 The left overbank n value of 0.05 and the right overbank n value
         of 0.05 are less than or equal to the channel n value of 0.08
         The overbank n values should be reevaluated.
```

Response: The cross sections and n values were imported from the HEC2 file submitted with the effective flood insurance study.

```
RS:      200
NT RC 05 The left overbank n value of 0.05 and the right overbank n value
         of 0.05 are less than or equal to the channel n value of 0.08
         The overbank n values should be reevaluated.
```

Response: The cross section is similar to those previously submitted with the effective flood insurance study.

```
TRANSITION LOSS COEFFICIENT CHECK
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RS:      700
NT TL 01 This is section 4
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      600
NT TL 01 This is section 3
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      550
NT TL 01 This is section Bridge-Up
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      550
NT TL 01 This is section Bridge-Dn
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.

RS:      500
NT TL 01 This is section 2
         Contraction and expansion loss coefficients are 0.1 and 0.3
         They should be equal to 0.3 and 0.5 respectively.
```

Response: The Checkras.txt file indicates that this message is generated when the default values of 0.3 for Cc and 0.5 for Ce are not used. The HEC-RAS Hydraulic Reference Manual suggests "where the change in river cross section is small, and the flow is subcritical, coefficients of contraction and expansion are typically on the order of 0.1 and 0.3, respectively." Because there is no abrupt contraction or expansion at the bridge, the lower values were believed to be more representative.

```
RS:      250
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
         respectively. However, this cross section is not at the structure.
         They should be equal to 0.1 and 0.3.
```

Response: At Cross Section 250, the channel experiences an abrupt contraction.

```
ROUGHNESS COEFFICIENT AT STRUCTURES
-----------------------------------

RS:      550
NT RS 02 The channel n value of 0.04 for the upstream internal bridge opening
         section is equal or larger than the channel n value of 0.04 at Section 3.
         Usually, the channel n value of the bridge opening section is
```

```
         less than the channel n value of Section 3.
         The selection of the n value(s) should be reevaluated.

RS:      550
NT RS 02 The channel n value of 0.04 for the downstream internal bridge opening
         section is equal or larger than the channel n value of 0.04 at Section 2
         Usually, the channel n value of the bridge opening section is
         less than the channel n value of Section 2.
         The selection of the n value(s) should be reevaluated.
```

Response: There is no change to the channel lining at the bridge.

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---END---
```

CHECK-RAS Program: Floodway Check
Encroachment Method, Starting WSEL, Floodway Width, and Surcharge Review

Project File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.prj
Plan File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.p01
Geometry File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01
Flow File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03
Report File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.fw
Selected profiles: PF 1;PF 2
Date: 8/9/2007
Time: 10:26:55 AM

SECNO	Method	Surcharge	EncStaL	EncStaR	LStaEff	RStaEff	Structure
Muddy River,01							
7100					-209.51	328.37	
7100	1	0.92	-141.82	59.24	-141.82	59.24	
7000					-120.61	101.97	
7000	1	0.86	-86.06	68.42	-86.06	68.42	
6900					-79.62	86.34	
6900	1	0.81	-69.47	68.47	-69.47	68.47	
6800					-128.38	183.47	
6800	1	0.86	-115.91	74.16	-115.91	74.16	
6700					-100.56	105.3	
6700	1	0.56	-52.38	89.81	-52.38	89.81	
850					-553.26	164.33	
850	1	0.65	-104	111.5	-104	111.5	
800					-71.71	99.53	
800	1	0.9	-71.7	91.5	-71.7	91.5	
701					-103.5	62.3	
701	1	0.93	-103.5	62.3	-103.5	62.3	
700					-128	62.29	
700	1	0.93	-103.5	62.3	-103.5	62.3	
600					-113.49	64.1	
600	1	0.93	-113.5	64.1	-113.5	64.1	
550					-108.75	64.04	Bridge #1-Up
550					-107.82	64.2	Bridge #1-Dn
550	0	0.9	-113.5	64.1	-108.75	64.1	Bridge #1-Up
550	0	0.9	-108.8	64.3	-107.82	64.3	Bridge #1-Dn
500					-124	64.29	
500	1	0.91	-108.8	64.3	-108.8	64.3	
400					-211.3	65.88	
400	1	0.91	-113.2	65.9	-113.2	65.9	
399					-113.2	65.92	
399	1	0.92	-113.2	65.9	-113.2	65.9	
300					-252.6	67.78	
300	1	0.83	-122	67.7	-122	67.7	
250					-329.55	80.99	
250	1	0.64	-119.2	81	-119.2	81	
200					-464.93	56.9	
200	1	0.63	-169.3	56.9	-169.3	56.9	
100					-1062.76	66.47	
100	1	0.67	-225.9	54.47	-225.9	54.47	

ENCROACHMENT METHOD CHECK

RS: 550
FW EM 01 Floodway encroachment method is not selected at this section.

Response: Section 550 is a bridge.

FLOODWAY WIDTH CHECK

RS: 7000
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 7000
FW FW 03 The right channel bank station may not be at the proper location.

RS: 6900
FW FW 03 The Left channel bank station may not be at the proper location.

```
RS:       6900
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       6800
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       6700
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       6700
FW FW 03  The right channel bank station may not be at the proper
          location.
```

Response: The cross sections were obtained from the effective flood insurance study for cross sections 67 to 71.

```
RS:       800
FW FW 01  Left encroachment station -71.7 is more than left channel bank
          station -72.4 and less than the right channel bank station 91.5
          Left encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       701
FW FW 01  Left encroachment station -103.5 is more than left channel bank
          station -105 and less than the right channel bank station 65
          Left encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       701
FW FW 01  Right encroachment station 62.3 is less than right channel bank
          station 65 and greater than the left channel bank station -105
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       700
FW FW 01  Left encroachment station -103.5 is more than left channel bank
          station -105 and less than the right channel bank station 65
          Left encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       700
FW FW 01  Right encroachment station 62.3 is less than right channel bank
          station 65 and greater than the left channel bank station -105
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       400
FW FW 01  Right encroachment station 65.9 is less than right channel bank
          station 83.8 and greater than the left channel bank station -113.2
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       399
FW FW 01  Right encroachment station 65.9 is less than right channel bank
          station 83.8 and greater than the left channel bank station -113.2
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       300
FW FW 01  Right encroachment station 67.7 is less than right channel bank
          station 76 and greater than the left channel bank station -112
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       250
FW FW 01  Right encroachment station 81 is less than right channel bank
          station 83.6 and greater than the left channel bank station -119.2
          Right encroachment station is within the channel.
          The encroachment station or channel bank station should be adjusted.

RS:       200
FW FW 01  Right encroachment station 56.9 is less than right channel bank
          station 57.2 and greater than the left channel bank station -71.1
          Right encroachment station is within the channel.
```

```
          The encroachment station or channel bank station should be adjusted.
```

Response: The encroachment stations for Sections 200, 250, 300, 399, 400, 700, 701, and 800 were set at the Profile 1 water surface (100-year flood plain) within the floodway. If the encroachment stations were set at the bank stations, then the floodway would extend beyond the calculated floodplain.

```
RS:       100
FW FW 03  The right channel bank station may not be at the proper
          location.
```

Response: The cross section was obtained from the effective flood insurance study for cross section 64.5.

```
SURCHARGE CHECK
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DISCHARGE CHECK
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STARTING WATER-SURFACE ELEVATION CHECK
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FW SW 04  The name of the stream is Muddy River
          Encroachment method 1 is used.
          Total conveyance for the natural profile is 232240.8
          Total conveyance for the floodway profile is 228808.8
          The difference in conveyance between the floodway profile and the
          natural profile is more than 1%.
          Normal Depth option with the same energy slope as the natural
          profile must be used for the floodway profile and rerun the plan.
          This message is not applicable for the revisions.
```

Response: This model is a revision, using a known water surface as the boundary condition.

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---END---
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CHECK-RAS Program: Structure Check

Project File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.prj
Plan File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.p01
Geometry File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.g01
Flow File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.f03
Report File: F:\451-003\Calc\Hydro\CLOMR\Comments-071807\Prpsd.br
Selected profiles: PF 1;PF 2
Date: 8/9/2007
Time: 10:26:56 AM

RS	MaxLoChord	MnTpRd	EGEL	WSEL	MinChEl	Structure
Muddy River,01						
7100			1373.16	1372.46	1348	
7000			1371.18	1370.3	1346.02	
6900			1368.98	1367.78	1344	
6800			1366.94	1366.21	1342.81	
6700			1364.28	1363.17	1341.35	
850			1362.63	1361.66	1341.8	
800			1362.33	1360.7	1341.4	
701			1361.76	1360.55	1340.8	
700			1361.75	1360.55	1340.8	
600			1361.63	1360.62	1340.6	
550	1362.45	1360	1361.62	1360.53	1340.6	Bridge #1-Up
550	1362.45	1360	1361.5	1360.41	1340.2	Bridge #1-Dn
500			1361.48	1360.46	1340.2	
400			1361.39	1360.47	1339.9	
399			1361.39	1360.46	1339.9	
300			1360.96	1360.16	1339.2	
250			1360.58	1359.3	1338.8	
200			1360.04	1358.77	1336.18	
100			1358.46	1356.95	1332.6	

RIVER/REACH: Muddy River, 01
RIVER STATION: 550
TYPE OF STRUCTURE: Bridge

Description:	Gubler Avenue Bridge
Distance from Upstream XS:	1
Deck/Roadway Width:	52
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	0
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	700	44.00	1360.55	0	1361.75	165.78	
4	700	44.00	1361.48	0.93	1362.55	165.8	
3	600	54.00	1360.62	0	1361.63	177.59	
3	600	54.00	1361.55	0.93	1362.44	177.6	
	550	52.00	1360.53	0	1361.62	137.95	Bridge #1-Up
	550	1.00	1360.41	0	1361.5	141.53	Bridge #1-Dn
	550	52.00	1361.43	0.9	1362.43	105.63	Bridge #1-Up
	550	1.00	1361.31	0.9	1362.31	110.6	Bridge #1-Dn
2	500	48.00	1360.46	0	1361.48	173.09	
2	500	48.00	1361.37	0.91	1362.28	173.1	
1	400	1.00	1360.47	0	1361.39	179.08	
1	400	1.00	1361.38	0.91	1362.2	179.1	

	Ineffective Flow, Section 3 Sta L	Sta R	Elev	Ineffective Flow, Section 2 Sta L	Sta R	Elev
1	-426	-115.8	1361	-389.2	-108.8	1361
2	65.1	75	1361	75	75	1361

BRIDGE:
Bridge Name: Bridge #1
LowFlowMethod: Highest Energy Answer

```
Momentum Cd:     1.2
HighFlowMethod: Energy Only
SluiceGate Cd: 0        Submerged Cd:   0

-------------------------------------------------------------------------------
Additional Bridge Parameters
Add Friction component to Momentum
Add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
MaxLowChord:   1362.45  MinTopRd:  1361.01       MinElPrs:       1362.45
               1362.45             1363.7                       1362.45
-------------------------------------------------------------------------------


Opening Type      StagStaL    StagStaR  EncStaL   EncStaR   LIfStaS   RIfStaS
-------------------------------------------------------------------------------
Bridge                                                                65.1   U
                                                                      75     D
                                        -113.5    64.1                       U
                                        -113.5    64.1                       D
-------------------------------------------------------------------------------

                  LAbutSt     RAbutSt   LMnTpRd   RMnTpRd   MnTpRd    MxLoCd
-------------------------------------------------------------------------------
Bridge #1         -109.90     65.23     1360.00   1364.93   1360.00   1362.45 U
                  -124.00     68.15     1360.00   1363.22   1360.00   1362.45 D
                  -108.80     64.30     1363.69   1364.93   1363.69   1362.45 U
                  -108.80     64.30     1363.69   1364.84   1363.69   1362.45 D
-------------------------------------------------------------------------------


Name          Q Total.  Q Struc   Q Weir    Selected Method     Flow Type
-------------------------------------------------------------------------------
Bridge #1     21400     21400     0         Energy only         Low and Weir Flow
              21400     21400     0         Energy only         Low Flow
-------------------------------------------------------------------------------

GEOMETRIC CHECK
-----------------

TYPE OF FLOW CHECK
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RS:       550 This is Bridge #1
BR LW 01  Type of flow is low and weir flow because,
          1. EGEL 3 of 1361.63 is greater than MinTopRd of 1361.01.
          2. EGEL 3 of 1361.63 is less than MxLoCdU of 1362.45.

RS:       550 This is Bridge #1
BR LF 01  Type of flow is low flow because,
          1. EGEL 3 of 1362.44 is equal to or less than MinTopRd of 1363.7.
          2. EGEL 3 of 1362.44 is less than MxLoCdU of 1362.5.

DISTANCE CHECK
---------------

RS:       550 This is Bridge #1
ST DT 01  'Distance from Upstream XS' of 1.00 is less than the height of the
          bridge opening of  21.85
          Section 3 should be placed at the foot of the road embankment or
          wing walls.
          Distances at Sections 4 & 3, and 'Distance from Upstream XS' should
          be adjusted.


RS:       550 This is Bridge #1
ST DT 02  The channel distance of 1 at Downstream Internal Section is less than
          the height of the bridge opening of 22.25
          Section 2 should be placed at the foot of the road embankment or
          wing walls.
          Distances at Sections 4, 3 & 2 should be adjusted.


INEFFECTIVE FLOW CHECK
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```
RS:       600 This is Section 3
ST IF 02  Weir flow occurs at Bridge
          However, the ineffective flow elevation of 1361 between stations -426
          and -115.8 is equal to or greater than the WSEL of 1360.62
          The LMnTpRdU is 1360
          The ineffective flow elevation should be equal to or lower than the MnTpRd
          It should also be less than the WSEL.

RS:       500 This is Section 2
ST IF 02  Weir flow occurs at Bridge
          However, the ineffective flow elevation of 1361 between stations -389.2
          and -108.8 is equal to or greater than the WSEL of 1360.46
          The LMnTpRdD is 1360 and the MxLoCdD is 1362.45
          The ineffective flow elevation should be between the LMnTpRdD and the MxLoCdD
          if LMnTpRdD is greater than MxLoCdD. Otherwise, It should be equal to LMnTpRdD.
          It should also be less than the WSEL.

RS:       600 This is Section 3.
ST IF 05  Weir flow occurs at Bridge
          The right ineffective flow station of 65.1 is less than
          the right abutment station of 65.23
          The right ineffective flow station should be adjusted.

RS:       500 This is Section 2.
ST IF 05  Weir flow occurs at Bridge
          The left ineffective flow station of -108.8 is greater than
          the left abutment station of -124.00
          The left ineffective flow station should be adjusted.

RS:       700 This is Section 4
ST IF 07  Ineffective flow option was considered at this section.
          However, it should be a fully expanded cross section.
          Ineffective flow stations and elevations should be cleared from
          this section, unless the areas beyond the ineffective flow stations
          are not within the flow path of the stream.
          This message should be ignored if this section is Section 2 of
          the upstream structure.

RS:       400 This is Section 1
ST IF 07  Ineffective flow option was considered at this section.
          However, it should be a fully expanded cross section.
          Ineffective flow stations and elevations should be cleared from
          this section, unless the ares beyond the ineffective flow stations
          are not within the flow path of the stream.
          This message should be ignored if this section is Section 3 of the downstream
          structure.

RS:       600 This is Section 3
ST IF 09  'Permanent Ineffective Flow Areas' option is used.
          HEC-RAS version 3.0.1 will compute higher water-surface elevation
          than it should be computed if weir flow occurs at the structure.
          Please disable this option.
```

Response: The ineffective flow areas are the result of the natural topography east of the channel.

```
FLOODWAY CHECK
--------------

RS:       550 This is Bridge
ST FW 01  Encroachment Method was not specified at this river station.
          For flood insurance studies Encroachment Methods 4 and 1
          should be used.
```

Response: There is no further encroachment desired at the bridge. HEC-RAS does not allow the user to choose an encroachment method at a bridge.

```
RS:       500 This is Section 2
ST FW 04  The right encroachment station of 64.3 is less than the
          right bank station of 75
          The encroachment station and/or channel bank station should be reevaluated.

RS:       500 This is Section 2
ST FW 10  Right encroachment station 64.3 is less than the right ineffective flow
          station 75 and greater than the left ineffective flow station -108.8
          Right encroachment station is within the effective flow area.
          Right encroachment station should at least be equal to the right
          ineffective flow station.
```

```
RS:       600 This is Section 3
ST FW 04  The left encroachment station of -113.5 is greater than the
          left bank station of -115.8
          The left encroachment station is within the channel.
          The encroachment station and/or channel bank station should be reevaluated.

RS:       600 This is Section 3
ST FW 04  The right encroachment station of 64.1 is less than the
          right bank station of 65.1
          The right encroachment station is within the channel.
          The encroachment station and/or channel bank station should be reevaluated.

RS:       600 This is Section 3
ST FW 10  Left encroachment station -113.5 is more than the left ineffective flow
          station -115.8 and less than the right ineffective flow station 65.1
          Left encroachment station is within the effective flow area.
          Left encroachment station should at least be equal to the left
          ineffective flow station.

RS:       600 This is Section 3
ST FW 10  Right encroachment station 64.1 is less than the right ineffective flow
          station 65.1 and greater than the left ineffective flow station -115.8
          Right encroachment station is within the effective flow area.
          Right encroachment station should at least be equal to the right
          ineffective flow station.
```

Response: The encroachment stations for Sections 500 and 600 were set at the Profile 1 water surface (100-year flood plain) within the floodway. If the encroachment stations were set at the bank stations, then the floodway would extend beyond the calculated floodplain.

```
---END
```

2nd RESPONSE TO COMMENTS ON THE CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR THE GUBLER AVENUE BRIDGE ON THE MUDDY RIVER

451-003

September 2007

Prepared for:

CH2M Hill
2285 Corporate Circle; Suite 200
Henderson, Nevada 89074
Phone: (702) 369-6175
Fax: (702) 369-1107

ENGINEERS PLANNERS SURVEYORS

2nd RESPONSE TO COMMENTS ON THE CONDITIONAL LETTER OF MAP REVISION (CLOMR) FOR THE GUBLER AVENUE BRIDGE ON THE MUDDY RIVER

451-003

September 2007

Prepared for:

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ENGINEERS · PLANNERS · SURVEYORS

G. C. WALLACE, INC.

451-003

Writer's Contact Information:
(702) 804-2183

September 25, 2007

Joe Kuechenmeister, EIT, CFM
Civil Associate II
Michael Baker Jr., Inc.
FEMA Map Coordination Contractor
355 Union Boulevard, Suite 200
Lakewood, Colorado 80228

Re: CLOMR for the Gubler Avenue Bridge on the Muddy River
(CLOMR Case# 07-09-1164R)

Dear Mr. Kuechenmeister:

We are in receipt of your emailed comment, dated September 12, 2007, on the subject CLOMR requesting that the existing culvert at Gubler Avenue be added to the Corrected Effective HEC-RAS hydraulic model. This letter is in response to your comment.

The existing culvert at Gubler Avenue was in place at the time the July 1995 Muddy River Flood Insurance Study Restudy (Muddy River FIS) was submitted. However, the Gubler Avenue culvert as well as other low flow culvert crossings along the Muddy River were anticipated to be overwhelmed during the 100-year storm event and were, therefore, purposefully omitted from the Muddy River FIS hydraulic models. Pertinent excerpts from the Muddy River FIS are attached for your reference.

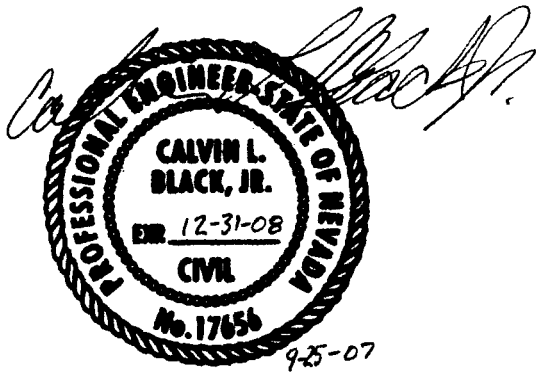
According to the Muddy River FIS, the existing Gubler Avenue low flow crossing is a 96-inch diameter circular culvert. The estimated capacity of the culvert during the 100-year event is 360 cfs, which is less than 2 percent of the total 100-year flow rate of 21,400 cfs. Therefore, the existing low-flow culvert is considered to have a minor impact on 100-year flood elevations. Pertinent culvert capacity calculations are attached.

Our decision to omit the existing Gubler Avenue low-flow culvert is, therefore, consistent with the methodologies used in the Effective Muddy River FIS hydraulic models. This decision is also based on the relative insignificance of the culvert capacity when compared with the magnitude of the 100-year event peak flow rate.

If you have any questions or require additional information, please contact us at 804-2183.

Very truly yours,

G. C. WALLACE, INC.



Calvin L. Black, Jr., PE
Project Manager
Flood Control Division

CLBjr/jj

Enc.

c: John Catanese, CCPW
Kevin Eubanks, CCRFCD
John Taylor, CH2M Hill
Jerry E. Pruitt, GCW
Calvin L. Black, GCW

APPENDIX

CLOMR FOR THE GUBLER AVENUE BRIDGE-2ND RESPONSE TO COMMENTS
APPENDIX LAYOUT

- Email Comment Letter
- Reference Material - Muddy River FIS excerpt
- HEC-RAS Comparison Sheet
- Estimated Capacity Calculation

Michelle Castell

From: Joseph Kuechenmeister [Joseph.Kuechenmeister@mapmodteam.com]
Sent: Wednesday, September 12, 2007 9:30 AM
To: Cal Black Jr
Subject: CLOMR Case# 07-09-1164R

Hello Calvin,

I was just putting the finishing touches on your CLOMR request when I noticed a significant problem with the HEC-RAS modeling. Apparently I missed the fact that the corrected effective or existing conditions HEC-RAS model did not have the existing low flow culvert for Gubler Avenue modeled in the submitted corrected effective HEC-RAS model. After obtaining the effective HEC-2 models from the FEMA library it became apparent that the culvert was not modeled in the effective study so the lack of the culvert in the duplicate effective model is ok. However, the corrected effective model should have incorporated all the existing hydraulic structures along with the updated topographic data for the revised reach of the Muddy River. Since the majority of the project area was mapped with 1-foot contours, I'm hoping that you have the data necessary to incorporate the culvert into the existing conditions HEC-RAS model. This will not change much of the submittal but I need an accurate baseline conditions HEC-RAS model that represents the existing site conditions so the CLOMR can reference the proper information. The proposed conditions HEC-RAS model will not be affected, just the HEC-RAS Comparison sheet that address the differences between the submitted HEC-RAS models.

I had already project your case for completion this month so I'm hoping we can resolve this issue quickly so that I can still meet my deadline. Please give me a call or send me an email as soon as possible.

Thanks,

Joe Kuechenmeister, EIT, CFM
Michael Baker Jr., Inc.
Civil Associate II
RMC VIII - Denver
Phone: (720) 479-3181
Fax: (720) 479-3157

DRAFT

FLOOD INSURANCE STUDY RESTUDY

MUDDY RIVER

CLARK COUNTY, NEVADA

JULY 1995

GCW will be responsible for obtaining all necessary rights-of-entry for the study area. The District and the affected entities will assist as necessary.

c. GCW will provide field surveys to obtain the physical dimensions of specific hydraulic structures within the study area in accordance with FEMA Document 37. The specific hydraulic structures will include:

- The Nevada Department of Wildlife Dam
- The private pedestrian bridge upstream of Overton.
- The Highway 169 bridge over the Muddy River.
- A rock-armored levee below Wells Siding on the east side of the Muddy River.
- The I-15 bridges over the Muddy River.
- The Highway 168 bridge over the Muddy River upstream from I-15.
- The UPPR bridge over the Muddy River just upstream from I-15.
- The UPPR bridge on the Muddy River just upstream from the Reed Gardner Power Plant.

Low flow crossings (dip crossing) of the Muddy River which do not significantly constrict the Muddy River and Meadow Valley Wash watercourses will not be included in the ground surveys. The low flow culverts at the dip crossings will be identified during the field reconnaissance. The Civilian Conservation Corps levees on the Meadow Valley Wash will not be included in the ground surveys. Any additional ground surveys deemed necessary by the District or FEMA will be performed as a supplemental items to

Alternative Analysis

"Two COE dams, Pine Canyon and Mathews Canyon Dams, are located in the drainage area of Meadow Valley Wash above the Town of Caliente, Lincoln County, Nevada. The SCS has constructed a watershed protection and flood prevention project in the headwaters of Meadow Valley Wash. Because of the distance from the study area, their effect on major flood flows in the study area is minimal." (Reference 1)

"The Wells Siding Diversion Dam is used to divert flow from the Muddy River to Bowman Reservoir. The maximum flow in the diversion channel is 1,000 cfs and water must be pumped from the channel to the reservoir to fill the final 10 feet of the reservoir pool. The diversion channel is also used to spill water from the reservoir to the Muddy River during flood conditions. This prevents the reliable use of Bowman Reservoir for flood storage during flood events." (Reference 2)

There is a rock-armored levee protecting the east side of the Valley below Wells Siding. "Immediately below the Wells Siding Diversion Dam, the top of the levee is approximately 30 feet above the channel bottom and flow in the channel is contained by this levee up to approximately 24,000 cfs." (Reference 2)

At Highway 169, there is a 200-foot x 30-foot bridge with no encroachment in the channel other than four 10-foot diameter bridge piers. The sides of the channel are protected by rock gabions beneath and directly upstream and downstream of the bridge. (Reference 2)

At the Gubler Road crossing, there is "an 8-foot diameter circular concrete culvert below the roadway. Low flow is carried beneath the roadway while flood flows are expected to flow over the road surface." (Reference 2)

At Cooper Street, there is a low-water crossing which consists of a two-barrel, 4-foot x 2-foot box culvert. Large flows pass through a roadway dip section above the culverts.

"A private pedestrian bridge (to serve the Raymond residence) crosses the Muddy River just upstream of the City of Overton. Although the deck of the bridge is above the channel banks, there are concrete abutments on either side which constrict flow. Also, the abutments can act as a trap for large debris carried by a flood flow." (Reference 2)

The Nevada Department of Wildlife operates a small dam at the lower end of the Muddy River. This structure is used to back up the Muddy River and allows the Department to irrigate the fields in the Overton Wildlife Management Area.

The structure was originally constructed in the early forties and consisted of a concrete gravity structure with 5 bays. The structure has a 6.5-foot drop with an additional 2 feet of height provided by wooden flash boards. Originally no provision was made to control sedimentation behind the structure. Photographs from the forties in fact show the channel upstream of the structure completely filled with sediment up to the bottom of the flash boards.

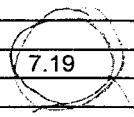
GUBLER AVENUE BRIDGE - HEC-RAS COMPARISON SHEET

River Station	Corresponding FIS River Station	Q Total (cfs)	Duplicate Eff. Model W.S.Elev. (ft)	Corrected Eff. Model W.S.Elev. (ft)	Post-Proj. Cond. Model W.S.Elev. (ft)	Change in W.S.E. Elev. (ft.)
7100	71	21,400	1372.48	1372.56	1372.46	-0.10
7000	70	21,400	1370.34	1370.48	1370.3	-0.18
6900	69	21,400	1367.85	1368.10	1367.78	-0.32
6800	68	21,400	1366.32	1366.71	1366.21	-0.50
6700	67	21,400	1363.43	1364.09	1363.19	-0.90
850	66*	21,400	1361.57	1362.41	1361.68	-0.73
800	N/A	21,400			1360.69	
701	N/A	21,400			1360.57	
700	N/A	21,400			1360.57	
600	N/A	21,400			1360.63	
550	N/A	Bridge				
500	65.5*	21,400	1360.81	1361.22	1360.47	-0.75
400	N/A	21,400			1360.48	
399	N/A	21,400			1360.48	
300	N/A	21,400			1360.19	
250	65*	21,400	1359.02	1359.31	1359.29	-0.02
200		21,400			1358.77	
100	64.5*	21,400	1356.96	1356.95	1356.95	0.00

River Station	Corresponding FIS River Station	Q Total (cfs)	Duplicate Eff. Model Velocity (fps)	Corrected Eff. Model Velocity (fps)	Post-Proj. Cond. Model Velocity (fps)	Change in Velocity (fps)
7100	71	21,400	6.73	6.69	6.74	0.05
7000	70	21,400	7.59	7.51	7.62	0.10
6900	69	21,400	8.83	8.68	8.86	0.18
6800	68	21,400	6.85	6.65	6.91	0.26
6700	67	21,400	8.43	7.96	8.59	0.63
850	66*	21,400	6.90	6.42	8.05	1.63
800	N/A	21,400			10.33	
701	N/A	21,400			8.73	
700	N/A	21,400			8.73	
600	N/A	21,400			8.06	
550	N/A	Bridge				
500	65.5*	21,400	6.34	7.19	8.07	0.88
400	N/A	21,400			7.69	
399	N/A	21,400			7.68	
300	N/A	21,400			7.31	
250	65*	21,400	9.76	9.75	9.46	-0.29
200		21,400			9.53	
100	64.5*	21,400	10.28	10.29	10.29	0.00

* Existing Conditions FIS HEC2 with modified Cross Section

Date: 4/4/07
Prepared by: mgk



velocity used to estimate capacity

G. C. WALLACE COMPANIES
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DATE: SHEET NO. OF
SUBJECT: JOB NO.
CLIENT: CHECKED BY CALC BY

PIPE CAPACITY CALCULATION

$Q = V \times A$

$Q = 7.19 \times 50.27$

$Q \approx 361.41$

V = velocity from corrected effective HEC-RAS Model (fps)

A = Area of the 96"-pipe at Gubler Ave.

$A = \pi r^2$

$A = \pi 4^2$

$A \approx 50.27$

Therefore, $Q \approx 360$ cfs is the estimated capacity of the culvert under Gubler Ave during the 100-YR storm event.