TETRA TECH, INC.
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April 3, 2002

Mr. Dennis Holcomb
Project Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009
602-506-1501

Reference: Contract No. 2000C034
Assignement No. 4
Chandler Heights-EMF Mitigation Site HEC-RAS Model and Memo Report

Dear Mr. Holcomb:

Tetra Tech, Inc. is pleased to submit the results of the Chandler Heights-EMF Mitigation Site HEC-RAS model. Several comments from the district on the preliminary report were incorporated into this submittal. The results of the study indicate that the proposed landscape changes will not cause any adverse impacts on the capacity of the East Maricopa Floodway.

Tetra Tech staff used the U.S. Army Corps of Engineers River Analysis System, HEC-RAS, Version 3.0.1 to alter the hydraulic water-surface profile model of the EMF. This report with the attached exhibit will detail the results, findings, and methods used in this analysis. A disk containing all of the information associated with the hydraulic water-surface profile model is attached with this report.

Should you have any questions concerning this report, please call me at 602-682-3300.

Sincerely,

David Jensen

David Jensen, P.E.
Water Resources Project Engineer

Registered Professional Engineer (Civil)
CERTIFICATE NO. 36852
DAVID E. JENSEN
Date Signed 4/4/02
ARIZONA, U.S.A.

Enclosures: Analysis Report, Disk, and Exhibits

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CHANDLER HEIGHTS-EMF MITIGATION SITE HEC-RAS MODEL AND MEMO REPORT

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FCD CONTRACT NO. 2000C034
ASSIGNMENT NO. 4

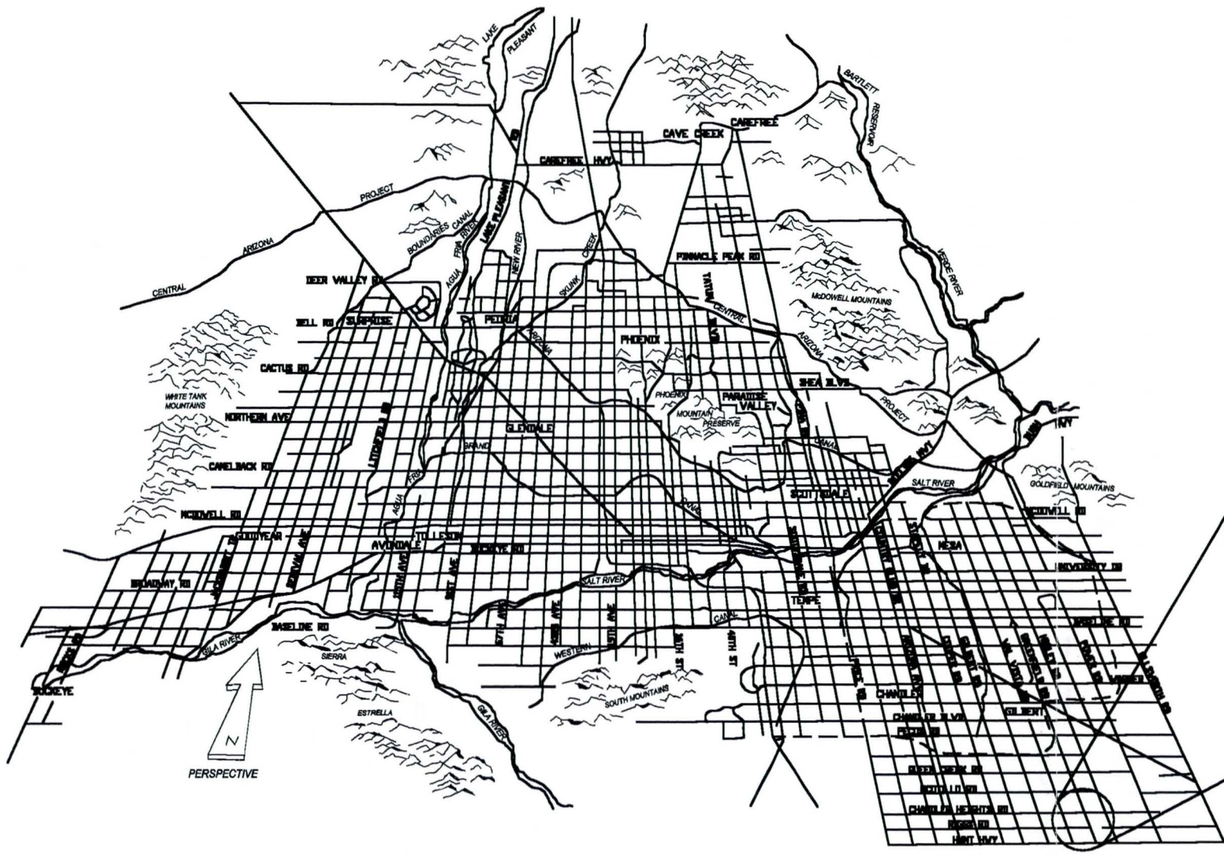
Prepared for:
FLOODCONTROL DISTRICT OF MARICOPA COUNTY
2801 West Durango Street
Phoenix, AZ 85009

Prepared by:
Tetra Tech, Inc.
Infrastructure Southwest Group
4801 E. Washington, Suite 260
Phoenix, AZ 85034-2004
602-682-3300

April 2002

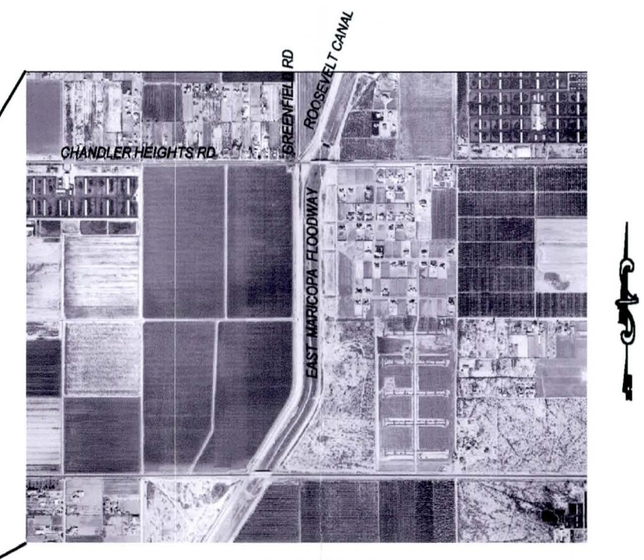
CHANDLER HEIGHTS–EMF MITIGATION SITE

MARICOPA COUNTY, ARIZONA



VICINITY MAP

NOT TO SCALE



LOCATION MAP

NOT TO SCALE

Prepared by

TETRA TECH, INC.

INFRASTRUCTURE SOUTHWEST GROUP

501 North 44th Street, Suite 125, Phoenix, AZ 85008

(602) 629-1100 FAX (602) 629-1186

FIGURE 1

I. BACKGROUND INFORMATION

This analysis was completed to quantify the impacts of the proposed landscape changes at the East Maricopa Floodway-Chandler Heights Mitigation Site. At the site, proposed landscape changes are to mitigate the effects of a new proposed retention basin for the East Maricopa Floodway at another location.

II. DATA COLLECTION

Data for this project was collected from the Flood Control District of Maricopa County (District) and from grading and landscaped plans developed by Tetra Tech, Inc. The District provided Tetra Tech with hard copies and an electronic version of the topographic contours and the base HEC-RAS hydraulic water-surface profile model for the five reaches of the EMF. The HEC-RAS model was created by HNTB for the EMF Capacity Assessment. It was dated January 1999 and was created using HEC-RAS version 2.2. The District also provided a 10-Year Future Conditions HEC-1 output file from the EMF Capacity Assessment study.

Elevation data for the Mitigation Site were created and provided by Tetra Tech, Inc. Tetra Tech completed a survey and designed landscape changes under other contracts. The elevation data from the survey and subsequent landscape changes are based upon the NAVD 88 vertical datum. The benchmark used in the survey is a 1" aluminum rod in a handwell at the northwest corner of Ocotillo Road and Greenfield Road and has an elevation of 1303.10.

III. MODEL DESCRIPTION

Two models were created for this project: an existing and a proposed conditions model. They were both based upon Reach 3 of the EMF Capacity Assessment model. The intent was to have the current EMF model be the existing conditions model, while the proposed conditions model was to be created by extending and modifying existing cross-sections and adding new cross-sections that reflect the proposed changes at the mitigation site. Both models extend one-half mile upstream and one-half mile downstream of the project site; from River Station 11.893-10.252.

A. Geometric Data

Topographic Information. The EMF Capacity Assessment model and topographic information provided by the District was based on the National Geodetic Vertical Datum of 1929, while the proposed changes by Tetra Tech at the Mitigation Site were based upon NAVD 88 datum. The desire of the District was to have the results of this study based on the NAVD 88 datum, therefore, the existing conditions model had to be adjusted. To change the model to the NAVD 88 datum, the difference between the vertical datums was found and all of the elevation data in the existing conditions model was altered to reflect the NAVD 88 datum.

The datum difference was found using the VERTCON program supported by the National Geodetic Survey. The latitude and longitude of the project area were estimated from

the Chandler Heights 7.5 minute topographic quadrangle; at the SW corner of Section 22-2S-6E. The estimated latitude was 33d 14' 01" and the estimated longitude was 111d 00' 01". The VERTCON program indicated the datum shift from 1929 to 1988 in this area is +0.675 meters (2.21454 feet). For the existing conditions model, all of the elevation data obtained from the Reach 3 EMF Capacity Assessment model was shifted up by 2.21 feet to reflect the NAVD 88 datum. This includes data for the Chandler Heights Road Bridge.

Bridge Alterations. In addition to the datum geometric changes, further model alterations were made to the existing conditions model so it would appropriately run using HEC-RAS version 3.0.1. The bridge routine in version 3.0.1 is different and requires changes to some bridges that were originally modeled using version 2.2. When entering the distance from the bridge to the next upstream cross-section, a value of zero is not accepted by version 3.0.1; a positive value must be provided. In the case of the original EMF model, cross-sections were placed at the upstream and downstream entrance of all bridges, actually making the distance to the upstream cross-section zero. To remedy this situation, the width of the bridge decks were decreased by one-tenth of a foot and that value was used as the distance to the upstream cross-section. No other bridge data from the original EMF model was altered.

A quasi-sensitivity analysis was initiated to understand the potential impacts these slight bridge variations would have on the model results. The same bridge alterations were made in the original EMF Capacity Assessment Reach 3 model (HEC-RAS version 2.2; 1929 datum) and as expected, results did not changed when compared to the original EMF model results. The bridge alterations were then made to the existing and proposed conditions models.

Modified Cross-Sections. For the proposed conditions model, all of the cross-sections between River Station 11.249 and 10.749 were modified and extended according to the proposed mitigation changes. Changes in the proposed conditions model topography were based on the landscaping plans submitted by Tetra Tech. The proposed mitigation changes occur only in the left overbank area of the EMF. The main channel and right overbank of each cross-section remained the same as the original EMF model, save the datum elevation shift. An exhibit showing the cross-section locations can be found at the end of this report.

New Cross-Sections. New cross-sections at River Stations 11.141, 11.08, 11.013, 10.89, and 10.796 that highlight additional features at the proposed mitigation site were also added to the proposed conditions model. Elevation data for the left side of the cross-section, in the overbank affected by the mitigation changes, was based upon the Tetra Tech plans. An obstacle was encountered when the elevation data for the main channel were placed into the proposed model. The original EMF topographic data provided by the district and used to cut the new cross-sections contained only contour information at two-foot intervals, while it appears the elevation data in the original EMF Capacity Assessment model was based on data extracted from a triangulated surface. Therefore, the EMF Capacity Assessment model used interpolated elevation data between the two-foot contours.

This obstacle was overcome by interpolating the natural ground slope between the modified cross-sections and estimating the proper channel invert for the new cross-sections. The estimated channel invert elevation was meshed with the original right overbank elevation data, which was altered to the 1988 datum, and the left overbank elevation data from the

Tetra Tech plans.

Downstream Reach Lengths. The downstream reach length value for the main channel and the right overbank were unchanged from the EMF Capacity Assessment model except where new cross-sections were placed. Downstream reach lengths for the left overbank and the new cross-sections were estimated by measuring the distance traveled by the flow's center of gravity between the cross-sections.

Roughness Coefficients. In the modified cross-sections, the roughness coefficients for the main channel and right overbank were unaltered and a roughness value of 0.05 was used for the left overbank. The left overbank roughness coefficient value is a combination of roughness coefficients developed for desert brush overbank and a constructed earth channel with trees and shrubs. The value was estimated after reviewing the planting plans and recommended roughness coefficients found in the District's standards and references. This roughness value was confirmed in Chow's Open Channel Hydraulics text. Roughness values for the new cross-sections followed the same philosophy. Values in the main channel and right overbank were the same as the original EMF model and a coefficient of 0.05 was used in the left overbank.

The planting plan for the mitigation changes is a unique experimental mix and our understanding is that it will be hydro-seeded. The roughness coefficient used in the left overbank assumes the planting plan will be 100% successful. Because the actual success of the plant growth will be less than 100%, the roughness coefficient used is conservative and produces a higher water-surface elevation than will occur with success rates lower than 100%.

Main Channel Bank Stations. The bank stations identify the separation between main channel and overbank flow. In the modified cross-sections, the right bank station was unaltered from the original EMF model. The left bank station was placed at the separation point between the main channel and left overbank. In the new cross-sections, bank stations were also placed at the separation point between the main channel and overbanks.

B. Flow Data

Flow Data. The original EMF Reach 3 HEC-RAS model provided by the district contained three flow profiles: Design; Future; and Existing discharge rates. The Design profile was used for this analysis, as specified by the District. The initial boundary condition for the Design profile was a known WSEL extracted from the original EMF Reach 3 model. The WSEL at River Station 10.252, the beginning station of the proposed conditions model (one-half mile downstream of the project site), was 1298.79 as extracted from the Reach 3 EMF Capacity Assessment model. This value was based upon the 1929 vertical datum. Similar to the rest of the elevation data, this starting WSEL was shifted up by 2.21 feet to 1301.0, which was then used as the known WSEL initial boundary condition in the proposed model.

A 10-year discharge profile for the original EMF model did not exist. The district provided a 10-Year future HEC-1 model from which the 10-Year future discharge rates for the EMF Reach 1, Reach 2, and Reach 3 hydraulic models were extracted. To find the known WSEL for the initial boundary condition of the 10-Year discharge profile at 10.252, the Original EMF Capacity Assessment Reach 1, 2, and 3 models had to be run because each of their initial

boundary conditions are based upon the results of the preceding model. The boundary condition for Reach 1 is critical depth. After running the three models, the WSEL at River Station 10.252 was found to be 1296.4 feet, which was then shifted up by 2.21 feet to coincide with the NAVD 88 datum. Consequently, a value of 1298.6 was used as the known WSEL initial boundary condition in the existing and proposed conditions model.

Additional Sensitivity Analysis/Model Check. We also wanted to understand what effects the new computation methods in HEC-RAS Version 3.0.1 would have on the model results. The original EMF Capacity Assessment model was run in version 3.0.1 and minor differences were noted in many of the hydraulic parameters of the model. Several of the water surface elevations (WSEL's) changed, but the maximum magnitude of change was 0.2 feet. These and other parameter differences caused by the computational algorithm differences in version 3.0.1 were assumed to have a negligible impact on the results of the study.

IV. RESULTS

The results of the existing conditions and the proposed conditions models can be found in Tables 1 and 2, respectively. An electronic version of both models has been attached with this memo report that is found in the appendix.

Table 1. Existing Conditions Results

River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
11.893	6900	1306.8	1302.6	4.2	242.7	6.8	7.9	0.28
	4860	1305.5	1301.9	3.7	233.5	5.7	6.5	0.27
11.798	6900	1306.6	1302.4	4.3	241.9	6.7	7.7	0.29
	4860	1305.3	1301.7	3.7	233.2	5.6	6.4	0.27
11.703	6900	1306.3	1302.4	4.4	241.1	6.5	7.4	0.30
	4860	1305.0	1301.7	3.9	232.0	5.4	6.1	0.29
11.609	6900	1306.1	1302.4	4.4	244.5	6.4	7.5	0.31
	4860	1304.8	1301.7	3.9	236.7	5.3	6.2	0.30
11.572	6900	1306.0	1302.3	4.6	238.6	6.3	7.2	0.32
	4860	1304.7	1301.6	4.0	230.7	5.2	6.0	0.31
11.531	6900	1305.8	1302.3	4.6	241.0	6.2	7.4	0.32
	4860	1304.6	1301.6	4.1	232.9	5.2	6.1	0.32
11.486	6900	1305.7	1302.3	4.7	242.9	6.1	6.9	0.34
	4860	1304.4	1301.7	4.2	234.6	5.0	5.6	0.33
11.391	6900	1305.4	1301.9	4.6	242.8	6.2	7.5	0.32
	4860	1304.1	1301.2	4.1	234.4	5.1	6.2	0.32

Table 1. Existing Conditions Results (cont.)

River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
11.328	6900	1305.2	1301.6	4.6	235.9	6.3	8.2	0.32
	4860	1304.0	1300.9	4.1	226.5	5.3	6.9	0.31
11.321	6900	1303.1	1303.1	11.3	152.5	4.0	4.6	1.00
	4860	1302.1	1302.1	10.3	143.4	3.3	3.6	1.00
11.308	6900	1302.7	1297.8	4.9	186.9	7.6	9.8	0.31
	4860	1300.3	1296.9	4.9	168.4	5.9	7.4	0.35
11.297	6900	1302.8	1297.1	3.6	240.1	8.0	9.8	0.22
	4860	1300.4	1296.4	3.5	223.8	6.1	7.4	0.25
11.260	6900	1302.7	1296.5	3.1	264.7	8.3	10.1	0.19
	4860	1300.3	1295.8	3.1	248.4	6.4	7.7	0.21
11.254	Bridge							
11.249	6900	1302.7	1296.7	3.2	261.1	8.2	9.8	0.20
	4860	1300.3	1296.0	3.2	244.9	6.2	7.4	0.23
11.231	8100	1302.6	1296.7	3.7	274.3	8.3	9.7	0.23
	4980	1300.2	1295.7	3.1	246.7	6.4	7.4	0.22
11.189	8100	1302.5	1296.9	3.8	284.5	8.1	9.6	0.24
	4980	1300.1	1295.9	3.3	244.9	6.2	7.2	0.23
11.127	8100	1302.3	1296.8	3.8	282.1	8.2	9.4	0.24
	4980	1300.0	1295.8	3.3	245.4	6.2	7.1	0.23
11.033	8100	1302.2	1296.7	3.9	260.7	8.1	9.5	0.24
	4980	1299.8	1295.7	3.3	242.2	6.2	7.2	0.24
10.938	8100	1302.0	1296.4	3.8	285.5	8.1	9.7	0.24
	4980	1299.6	1295.4	3.3	244.4	6.2	7.3	0.23
10.843	8100	1301.8	1296.0	3.7	282.0	8.4	9.7	0.23
	4980	1299.5	1295.0	3.2	243.6	6.5	7.4	0.22
10.749	8100	1301.7	1296.1	3.8	257.3	8.2	9.7	0.24
	4980	1299.3	1295.1	3.3	242.5	6.3	7.3	0.23
10.654	8100	1301.5	1296.2	4.0	255.3	8.0	9.3	0.25
	4980	1299.2	1295.2	3.4	240.0	6.1	7.0	0.24

Table 1. Existing Conditions Results (cont.)

River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
10.566	8100	1301.4	1295.9	3.9	254.3	8.1	9.7	0.24
	4980	1299.0	1294.9	3.4	238.6	6.2	7.3	0.24
10.518	8100	1301.3	1295.9	3.9	256.5	8.0	9.5	0.24
	4980	1299.0	1294.9	3.4	240.8	6.1	7.1	0.24
10.441	8100	1301.2	1295.3	3.7	259.9	8.4	10.0	0.22
	4980	1298.9	1294.3	3.1	243.1	6.6	7.6	0.22
10.346	8100	1301.1	1295.0	3.6	264.8	8.6	10.1	0.21
	4980	1298.8	1294.0	3.0	249.1	6.7	7.7	0.20
10.252	8100	1301.0	1295.2	3.8	254.8	8.4	10.0	0.23
	4980	1298.6	1294.2	3.2	238.6	6.5	7.6	0.22

Table 2. Proposed Conditions Results

River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
11.893	6900.0	1306.8	1302.5	4.2	242.7	6.8	7.9	0.28
	4860.0	1305.5	1301.9	3.7	233.5	5.7	6.5	0.27
11.798	6900.0	1306.6	1302.4	4.2	241.9	6.7	7.7	0.29
	4860.0	1305.3	1301.7	3.7	233.2	5.7	6.4	0.27
11.703	6900.0	1306.3	1302.4	4.4	241.1	6.5	7.4	0.3
	4860.0	1305.0	1301.7	3.9	232.0	5.4	6.2	0.29
11.609	6900.0	1306.1	1302.4	4.4	244.5	6.4	7.5	0.31
	4860.0	1304.8	1301.7	3.9	236.7	5.3	6.2	0.3
11.572	6900.0	1306.0	1302.3	4.6	238.6	6.3	7.2	0.32
	4860.0	1304.7	1301.6	4.0	230.8	5.3	6.0	0.31
11.531	6900.0	1305.8	1302.3	4.6	241.0	6.2	7.4	0.32
	4860.0	1304.6	1301.6	4.1	232.9	5.1	6.1	0.32
11.486	6900.0	1305.7	1302.3	4.7	242.9	6.1	6.9	0.34
	4860.0	1304.4	1301.6	4.2	234.6	5.0	5.6	0.33
11.391	6900.0	1305.4	1301.9	4.6	242.8	6.2	7.5	0.32
	4860.0	1304.1	1301.2	4.1	234.4	5.1	6.2	0.32

Table 2. Proposed Conditions Results (cont.)

River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
11.328	6900.0	1305.2	1301.6	4.6	235.9	6.3	8.2	0.32
	4860.0	1304.0	1300.9	4.1	226.5	5.3	6.9	0.31
11.321	6900.0	1303.1	1303.1	11.3	152.5	4.0	4.6	1
	4860.0	1302.1	1302.1	10.3	143.4	3.3	3.6	1
11.308	6900.0	1302.6	1297.8	4.9	186.2	7.5	9.7	0.32
	4860.0	1300.2	1296.9	4.9	167.8	5.9	7.3	0.36
11.297	6900.0	1302.7	1297.1	3.6	239.6	8.0	9.7	0.23
	4860.0	1300.3	1296.4	3.6	223.3	6.1	7.3	0.26
11.260	6900.0	1302.6	1296.5	3.2	264.1	8.3	10.0	0.19
	4860.0	1300.2	1295.8	3.1	247.8	6.3	7.6	0.22
11.254	Bridge							
11.249	6900.0	1302.6	1296.7	3.3	260.5	8.1	9.7	0.2
	4860.0	1300.2	1296.0	3.2	244.4	6.2	7.3	0.23
11.231	8100.0	1302.5	1296.7	3.7	269.0	8.1	9.7	0.23
	4980.0	1300.2	1295.7	3.2	250.5	6.3	7.3	0.22
11.189	8100.0	1302.4	1296.9	3.0	416.5	6.5	9.5	0.21
	4980.0	1300.1	1295.9	3.2	390.9	5.3	7.2	0.25
11.141	8100.0	1302.4	1296.7	3.0	352.0	7.7	9.3	0.19
	4980.0	1300.0	1295.7	2.6	332.2	5.7	6.9	0.19
11.127	8100.0	1302.3	1296.8	3.3	334.4	7.4	9.4	0.21
	4980.0	1300.0	1295.8	2.9	312.1	5.5	7.1	0.22
11.080	8100.0	1302.3	1296.3	2.7	508.9	7.6	9.6	0.17
	4980.0	1299.9	1295.5	2.4	355.0	6.0	7.2	0.17
11.033	8100.0	1302.1	1296.7	3.8	302.2	7.1	9.5	0.25
	4980.0	1299.7	1295.7	3.4	264.5	5.6	7.1	0.25
11.013	8100.0	1302.1	1296.0	3.4	306.2	7.8	9.7	0.21
	4980.0	1299.7	1295.0	2.9	278.0	6.1	7.3	0.21
10.938	8100.0	1302.1	1296.4	3.1	442.7	8.2	9.7	0.19
	4980.0	1299.7	1295.5	2.8	405.7	6.3	7.3	0.2

Table 2. Proposed Conditions Results

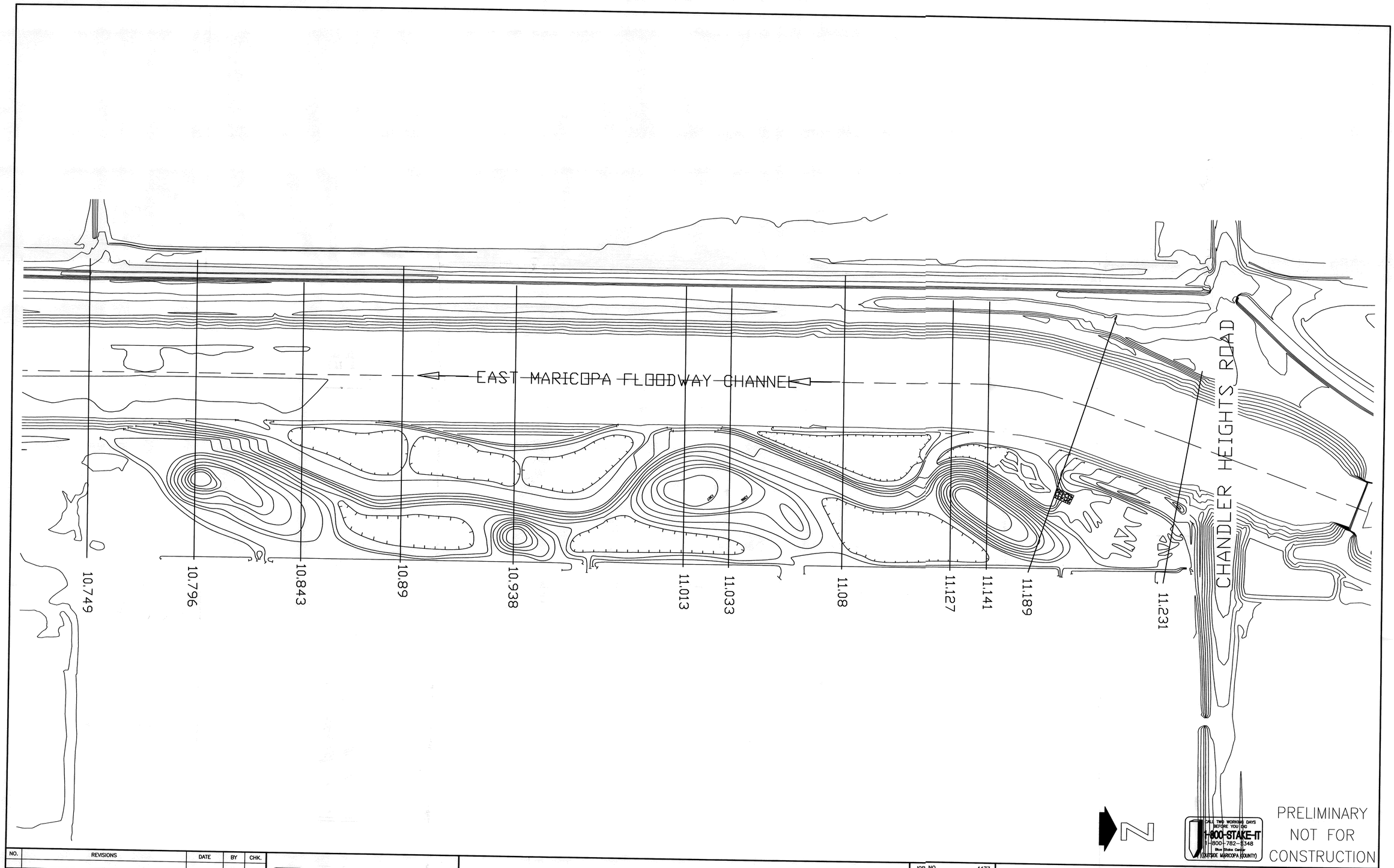
River Station	Discharge (cfs)	WSEL (ft)	Critical WSEL (ft)	Channel Velocity (ft/s)	Top Width (ft)	Hydraulic Depth (ft)	Max.Channel Depth (ft)	Channel Froude No.
10.890	8100.0	1302.0	1295.8	2.3	542.5	7.8	9.8	0.15
	4980.0	1299.6	1295.0	2.1	421.1	5.7	7.4	0.15
10.843	8100.0	1301.9	1296.0	2.8	382.7	7.5	9.8	0.18
	4980.0	1299.5	1295.1	2.5	346.6	5.8	7.4	0.18
10.796	8100.0	1301.8	1296.1	3.7	275.3	8.0	9.7	0.23
	4980.0	1299.4	1295.1	3.2	254.2	6.2	7.3	0.23
10.749	8100.0	1301.7	1296.1	3.8	257.2	8.2	9.7	0.24
	4980.0	1299.3	1295.1	3.3	242.3	6.2	7.3	0.23
10.654	8100.0	1301.5	1296.2	4.0	255.2	8.0	9.3	0.25
	4980.0	1299.1	1295.2	3.4	239.8	6.0	6.9	0.25
10.566	8100.0	1301.4	1295.9	3.9	254.2	8.1	9.7	0.24
	4980.0	1299.0	1294.9	3.4	238.3	6.2	7.3	0.24
10.518	8100.0	1301.3	1295.9	3.9	256.5	8.0	9.5	0.24
	4980.0	1298.9	1294.9	3.4	240.6	6.1	7.1	0.24
10.441	8100.0	1301.2	1295.3	3.7	259.8	8.4	10.0	0.22
	4980.0	1298.8	1294.2	3.1	242.8	6.5	7.6	0.22
10.346	8100.0	1301.1	1295.0	3.6	264.7	8.6	10.1	0.21
	4980.0	1298.7	1294.0	3.0	248.8	6.7	7.7	0.21
10.252	8100.0	1301.0	1295.2	3.8	254.7	8.4	10.0	0.23
	4980.0	1298.6	1294.1	3.2	238.3	6.4	7.6	0.23

V. CONCLUSIONS

As shown by the comparison in Table 3, the proposed changes at the Mitigation Site will not have an adverse impact on the WSEL if the proposed mitigation grading plan is followed during construction. Several of the WSEL's slightly decrease. The difference in velocity between the two conditions is also negligible and will not have an adverse impact on the EMF. It appears the NRCS criteria for freeboard in the EMF will be met when the landscape changes are constructed. An electronic version of both models can be found in the attachments.

Table 3. Existing and Proposed Conditions Comparison

River Station	Design Discharge Existing WSEL (ft)	Design Discharge Proposed WSEL (ft)	Design WSEL Difference (ft)	10-Year Future Existing WSEL (ft)	10-Year Future Proposed WSEL (ft)	10-Year WSEL Difference (ft)
11.893	1306.8	1306.8	0.0	1305.5	1305.5	0.0
11.798	1306.6	1306.6	0.0	1305.3	1305.3	0.0
11.703	1306.3	1306.3	0.0	1305.0	1305.0	0.0
11.609	1306.1	1306.1	0.0	1304.8	1304.8	0.0
11.572	1306.0	1306.0	0.0	1304.7	1304.7	0.0
11.531	1305.8	1305.8	0.0	1304.6	1304.6	0.0
11.486	1305.7	1305.7	0.0	1304.4	1304.4	0.0
11.391	1305.4	1305.4	0.0	1304.1	1304.1	0.0
11.328	1305.2	1305.2	0.0	1304.0	1304.0	0.0
11.321	1303.1	1303.1	0.0	1302.1	1302.1	0.0
11.308	1302.7	1302.6	-0.1	1300.3	1300.2	-0.1
11.297	1302.8	1302.7	-0.1	1300.4	1300.3	-0.1
11.26	1302.7	1302.6	-0.1	1300.3	1300.2	-0.1
11.254	0	0	0	0	0	0
11.249	1302.7	1302.6	-0.1	1300.3	1300.2	-0.1
11.231	1302.6	1302.5	-0.1	1300.2	1300.2	0.0
11.189	1302.5	1302.4	-0.1	1300.1	1300.1	0.0
11.141		1302.4			1300.0	
11.127	1302.3	1302.3	0.0	1300.0	1300.0	0.0
11.08		1302.3			1299.9	
11.033	1302.2	1302.1	-0.1	1299.8	1299.7	-0.1
11.013		1302.1			1299.7	
10.938	1302.0	1302.1	0.1	1299.6	1299.7	0.1
10.89		1302.0			1299.6	
10.843	1301.8	1301.9	0.1	1299.5	1299.5	0.0
10.796		1301.8			1299.4	
10.749	1301.7	1301.7	0.0	1299.3	1299.3	0.0
10.654	1301.5	1301.5	0.0	1299.2	1299.1	-0.1
10.566	1301.4	1301.4	0.0	1299.0	1299.0	0.0
10.518	1301.3	1301.3	0.0	1299.0	1298.9	-0.1
10.441	1301.3	1301.2	-0.1	1298.9	1298.8	-0.1
10.346	1301.2	1301.1	-0.1	1298.8	1298.7	-0.1
10.252	1301.0	1301.0	0.0	1298.6	1298.6	0.0



PLOTSCALE =

NO.	REVISIONS	DATE	BY	CHK.

cbc

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
4801 East Washington Street, Suite 260, Phoenix, AZ 85034
(602) 682-3300 FAX (602) 244-1164

CHANDLER HEIGHTS EMF

JOB NO.	4477
DESIGNED BY:	DEJ
DRAWN BY:	CBC
CHECKED BY:	DEJ
APPROVED BY:	DEJ
DATE:	

HEC-RAS
CROSS SECTION LOCATION

SCALE: HORIZ: 1"= 100
CONT. INTERVAL =
DRAWING NO.
SHEET NO. 1 OF:

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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: EMF Reach 3 Existing
Project File : Existing.prj
Run Date and Time: 12/19/01 4:57:20 PM

Project in English units

Project Description:
EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT (Reach 3)
FCDMC Contract No.
97-06
Prepared by HNTB Corporation, January 1999
Contact: B. Gary Sun
HNTB Corporation
40 North Central Avenue, Suite 300
Phoenix, Arizona 85004
(602)528-4300

REACH 3
QUEEN CREEK ROAD TO HUNT HIGHWAY
(River Mile 13.471 to
Mile 9.018)

The Purpose of the Study is to Determine Channel Capacity for
Three Given 100-Year Discharges.
The Water Surface Profiles Were Calculated
Using the U.S. Army Corps of Engineers' HEC-RAS Computer Program, Version 2.1,
Dated October 1997, as Implemented by Haestad Methods, Inc.

Subcritical
Flow Run
3 Water Surface Profiles with 100-Year Discharges Provided by FCDMC
(Dated 6-10-98)
Profile 1 - Design Discharges
Profile 2 - Future Discharges,
Future Land Use with Retention and without Proposed FCD CIPs
Profile 3 -
Existing Conditions

The Control Line on the Thalweg of East Maricopa
Floodway is Station 5,000, and All Cross
Section Data were Stationed Looking
Downstream. Cross Section Numbers Indicate in River
Miles above the Top of
Drop Structure at the Downstream End of East Maricopa Floodway.

Starting Water Surface Elevationa are the Calculated Water Surface Elevations at Cross Section Mile 9.001 from Reach 2 HEC-RAS 3 Profiles Run.

Leve, Blocked Obstructions, and Ineffective Flow Area Options Were Used to Better Model The Floodplain Limits For Three Different Discharge Sets.

PLAN DATA

Plan Title: EMF Reach 3
Plan File : p:\4534 EMF_RAS\Limits\Existing\Existing.p01

Geometry Title: EMF Reach 3
Geometry File : p:\4534 EMF_RAS\Limits\Existing\Existing.g01

Flow Title : 1-Design, 2- 10 Year Future
Flow File : p:\4534 EMF_RAS\Limits\Existing\Existing.f01

Plan Summary Information:

Number of:	Cross Sections	= 27	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 1			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

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

FLOW DATA

Flow Title: 1-Design, 2- 10 Year Future
Flow File : p:\4534 EMF_RAS\Limits\Existing\Existing.f01

Flow Data (cfs)

River	Reach	RS	Design	10-Year Future
EMF	Reach 3	11.893	6900	4860
EMF	Reach 3	11.26	6900	4860
EMF	Reach 3	11.231	8100	4980
EMF	Reach 3	10.441	8100	4980

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EMF	Reach 3	Design	Known WS = 1301	
EMF	Reach 3	10-Year Future	Known WS = 1298.64	

GEOMETRY DATA

Geometry Title: EMF Reach 3
Geometry File : p:\4534 EMF_RAS\Limits\Existing\Existing.g01

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.893

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.79	1308.31	4232.81	1308.12	4338.31	1308.04	4399.51	1307.93	4443.82	1307.99
4533.1	1307.91	4692.08	1307.99	4760.37	1307.99	4815.24	1308.21	4832.04	1308.36
4839.66	1307.61	4852	1307.14	4859.94	1309.76	4874.53	1309.98	4910.74	1299.35
4913.53	1299.31	4946.83	1299.07	4974.46	1299.06	5004.24	1298.92	5033.04	1298.97
5099.79	1299.81	5104.12	1300.01	5141.77	1310.63	5159.3	1309.8	5168.86	1308.71
5202.69	1310.61	5215.79	1310.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.79	.04	4874.53	.025	5141.77	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.53	5141.77	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4874.53 Elevation= 1309.98
Right Levee Station= 5141.77 Elevation= 1310.63

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1307.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.78	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.55	Flow Area (sq ft)		1641.57	
E.G. Slope (ft/ft)	0.000395	Area (sq ft)		1641.57	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.66	Top Width (ft)		242.66	
Vel Total (ft/s)	4.20	Avg. Vel. (ft/s)		4.20	
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)		6.76	
Conv. Total (cfs)	347077.7	Conv. (cfs)		347077.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.67	
Min Ch El (ft)	1298.92	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.27	379.68	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	50.00	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1305.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.46	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.86	Flow Area (sq ft)		1327.53	
E.G. Slope (ft/ft)	0.000377	Area (sq ft)		1327.53	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	233.49	Top Width (ft)		233.49	
Vel Total (ft/s)	3.66	Avg. Vel. (ft/s)		3.66	
Max Chl Dpth (ft)	6.54	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	250178.7	Conv. (cfs)		250178.7	

Length Wtd. (ft)	500.00	Wetted Per. (ft)	235.13
Min Ch El (ft)	1298.92	Shear (lb/sq ft)	0.13
Alpha	1.00	Stream Power (lb/ft s)	0.49
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	282.69
C & E Loss (ft)	0.00	Cum SA (acres)	47.40

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.798

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4266.07	1315.4	4283.82	1314.81	4296.87	1308.93	4313.87	1308.67	4316.15	1307.31
4318.92	1308.15	4321.36	1307.31	4347.48	1307.11	4381.08	1306.74	4486.59	1306.56
4499.44	1306.56	4568.78	1306.71	4592.1	1306.63	4639.08	1306.59	4697.61	1306.63
4798.05	1306.92	4811.92	1307.01	4832.28	1307.34	4839.62	1306.82	4853.27	1306.72
4859.65	1309.85	4875.05	1309.61	4909.97	1299.24	5006.87	1298.88	5091.55	1299.18
5103.82	1299.56	5140.12	1310.41	5156.87	1309.73	5166.96	1309.07	5198	1310.88
5215.24	1310.89								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4266.07	.04	4875.05	.025	5140.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.05	5140.12	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4859.65 Elevation= 1309.85
Right Levee Station= 5140.12 Elevation= 1310.41

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1306.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.56	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.41	Flow Area (sq ft)		1624.78	
E.G. Slope (ft/ft)	0.000408	Area (sq ft)		1624.78	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.92	Top Width (ft)		241.92	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	7.68	Hydr. Depth (ft)		6.72	
Conv. Total (cfs)	341797.9	Conv. (cfs)		341797.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.01	
Min Ch El (ft)	1298.88	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.72	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	0.27	360.93	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	47.22	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1305.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.26	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.72	Flow Area (sq ft)		1316.26	
E.G. Slope (ft/ft)	0.000388	Area (sq ft)		1316.26	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	233.20	Top Width (ft)		233.20	

Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)	3.69
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)	5.64
Conv. Total (cfs)	246801.4	Conv. (cfs)	246801.4
Length Wtd. (ft)	500.00	Wetted Per. (ft)	234.92
Min Ch El (ft)	1298.88	Shear (lb/sq ft)	0.14
Alpha	1.00	Stream Power (lb/ft s)	0.50
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	267.51
C & E Loss (ft)	0.00	Cum SA (acres)	44.73

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.703

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4485.37	1314.11	4507.48	1313.78	4520.75	1312.62	4535	1311.29	4545.53	1310.42
4562.86	1310.41	4571.33	1310.33	4629.3	1310.12	4645.52	1310.18	4746.01	1309.68
4757.74	1309.31	4811.16	1307.95	4841.29	1307.82	4859.86	1309.47	4875.28	1309.5
4912.48	1299.21	4930.54	1299.1	4991.57	1298.92	5010.25	1298.89	5058.44	1299.19
5103.51	1299.21	5120.51	1304.18	5141.71	1310.34	5158.98	1309.69	5169.35	1308.85
5194.78	1310.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4485.37	.04	4875.28	.025	5141.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.28	5141.71	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4875.28 Elevation= 1309.5
Right Levee Station= 5141.71 Elevation= 1310.34

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.63	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.33	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.43	Flow Area (sq ft)		1565.05	
E.G. Slope (ft/ft)	0.000459	Area (sq ft)		1565.05	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.14	Top Width (ft)		241.14	
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)		4.41	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	321896.0	Conv. (cfs)		321896.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		243.12	
Min Ch El (ft)	1298.89	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.81	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	0.27	342.63	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	44.44	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.26	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.03	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.74	Flow Area (sq ft)		1258.37	
E.G. Slope (ft/ft)	0.000447	Area (sq ft)		1258.37	

Q Total (cfs)	4860.00	Flow (cfs)	4860.00
Top Width (ft)	231.99	Top Width (ft)	231.99
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)	3.86
Max Chl Dpth (ft)	6.14	Hydr. Depth (ft)	5.42
Conv. Total (cfs)	229826.1	Conv. (cfs)	229826.1
Length Wtd. (ft)	500.00	Wetted Per. (ft)	233.62
Min Ch El (ft)	1298.89	Shear (lb/sq ft)	0.15
Alpha	1.00	Stream Power (lb/ft s)	0.58
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	252.74
C & E Loss (ft)	0.00	Cum SA (acres)	42.06

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.609

INPUT
Description: Queen Creek Detention Basin located East of the EMF
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4482.74	1311.22	4529.38	1310.91	4538.26	1310.95	4567.38	1303.6	4580.19	1300.28
4672.62	1299.99	4679.77	1300.01	4756.05	1300.25	4806.95	1300.72	4820.62	1301.01
4826.43	1302.69	4852.29	1309.71	4870.34	1310.66	4892.33	1302.58	4903.98	1299.22
4905.6	1299.19	4962.79	1299.21	4995.04	1299.09	5013.55	1298.83	5082.4	1298.6
5083.88	1298.62	5091.04	1299.81	5108.8	1300.79	5113.28	1301.81	5121.35	1304.32
5136.55	1308.86	5141.47	1310.61	5160.77	1309.49	5169.56	1308.38	5194.16	1310.12
5213.86	1310.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4482.74	.04	4870.34	.025	5141.47	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.34	5141.47	194.37	194.37	194.37	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4870.34 Elevation= 1310.66
Right Levee Station= 5141.47 Elevation= 1310.61

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1306.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.09	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1302.36	Flow Area (sq ft)		1560.64	
E.G. Slope (ft/ft)	0.000472	Area (sq ft)		1560.64	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	244.51	Top Width (ft)		244.51	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	7.49	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	317461.4	Conv. (cfs)		317461.4	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		246.49	
Min Ch El (ft)	1298.60	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.27	324.69	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	41.66	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1305.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	

W.S. Elev (ft)	1304.80	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1301.67	Flow Area (sq ft)		1249.31	
E.G. Slope (ft/ft)	0.000470	Area (sq ft)		1249.31	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	236.65	Top Width (ft)		236.65	
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)		3.89	
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)		5.28	
Conv. Total (cfs)	224141.4	Conv. (cfs)		224141.4	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		238.22	
Min Ch El (ft)	1298.60	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		238.35	
C & E Loss (ft)	0.00	Cum SA (acres)		39.37	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.572

INPUT
Description: Downstream of Side Inlet (150' Wide) from the Left Overbank
Invert elevation of spillway is 1301.3 ft
Q(D)=6,900 cfs, Q(F)=10,060 cfs & Q(E)=13,910 cfs
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4228.03	1306.81	4295.67	1306.55	4372.25	1306.68	4407.53	1306.61	4438.92	1306.71
4492.42	1306.81	4509.65	1306.89	4526.49	1309.04	4536.18	1310.02	4581.19	1310.46
4600.92	1310.71	4641.35	1310.94	4693.07	1310.97	4760.4	1311.1	4777.44	1311.27
4806.66	1311.21	4849.84	1311.33	4872.33	1311.32	4908.47	1299.53	4934.51	1299.4
4953.36	1299.21	5007.37	1298.72	5041.14	1298.88	5078.98	1298.99	5092.82	1298.85
5105.78	1298.81	5110.99	1300.61	5141.46	1310.61	5159.88	1310.29	5169.97	1308.71
5191.66	1310.41	5214.3	1310.87						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4228.03	.04	4872.33	.025	5141.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.33	5141.46	218.29	218.29	218.29	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4872.33 Elevation= 1311.32
Right Levee Station= 5141.46 Elevation= 1310.61

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1306.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.96	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1302.32	Flow Area (sq ft)		1510.35	
E.G. Slope (ft/ft)	0.000511	Area (sq ft)		1510.35	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	238.56	Top Width (ft)		238.56	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	305363.6	Conv. (cfs)		305363.6	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		240.74	
Min Ch El (ft)	1298.72	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.91	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.27	317.84	

C & E Loss (ft)	0.00	Cum SA (acres)	0.97	40.58

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1304.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.68	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1301.64	Flow Area (sq ft)		1208.96	
E.G. Slope (ft/ft)	0.000508	Area (sq ft)		1208.96	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	230.71	Top Width (ft)		230.71	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		5.24	
Conv. Total (cfs)	215682.8	Conv. (cfs)		215682.8	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		232.48	
Min Ch El (ft)	1298.72	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		232.86	
C & E Loss (ft)	0.00	Cum SA (acres)		38.32	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.531

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.5	1305.41	4222.25	1305.35	4308	1305.4	4418.16	1305.35	4496.08	1305.12
4511.08	1305.51	4538.05	1306.35	4565.7	1306.85	4582.06	1307.22	4597.83	1308.86
4631.23	1308.91	4644.31	1308.97	4717.44	1309.07	4755.6	1309.21	4838.62	1308.84
4841.32	1308.71	4854.2	1308.37	4858.48	1309.4	4864.3	1309.17	4874.08	1309.27
4908.36	1299.51	4955.57	1299.43	5010.42	1298.47	5017.73	1298.5	5107.63	1299.11
5139.89	1310.21	5158.23	1309.8	5166.2	1308.75	5168.43	1308.64	5181.52	1309.85
5191.07	1310.31	5213.65	1310.85						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.5	.04	4874.08	.025	5139.89	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.08	5139.89	237.2	237.2	237.2	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4858.48 Elevation= 1309.4
Right Levee Station= 5139.89 Elevation= 1310.21

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1306.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.84	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1302.28	Flow Area (sq ft)		1500.21	
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		1500.21	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.04	Top Width (ft)		241.04	
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)		4.60	
Max Chl Dpth (ft)	7.37	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	300031.2	Conv. (cfs)		300031.2	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		243.06	

Min Ch El (ft)	1298.47	Shear (lb/sq ft)		0.20
Alpha	1.00	Stream Power (lb/ft s)		0.94
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.27	310.29
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	39.38

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1304.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.56	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1301.60	Flow Area (sq ft)		1198.09	
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		1198.09	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	232.86	Top Width (ft)		232.86	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)		4.06	
Max Chl Dpth (ft)	6.09	Hydr. Depth (ft)		5.15	
Conv. Total (cfs)	211250.0	Conv. (cfs)		211250.0	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		234.48	
Min Ch El (ft)	1298.47	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		226.83	
C & E Loss (ft)	0.00	Cum SA (acres)		37.16	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.486

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4216.49	1305.41	4289.24	1305.46	4343.09	1305.33	4367.05	1305.32	4449.72	1305.42
4556.33	1305.41	4630.96	1305.73	4648.77	1305.87	4672.63	1308	4678.81	1308.51
4739.01	1309.01	4760.28	1309.08	4812.38	1309.04	4835.67	1308.56	4850.72	1308
4855.54	1309.31	4866.67	1309.21	4871.96	1308.89	4892.33	1302.95	4905.72	1299.13
4916.36	1299.11	4963.19	1299.05	5001.44	1298.78	5013.11	1299.18	5045.85	1299.1
5078.16	1298.91	5106.39	1299.34	5129.52	1306.9	5137.42	1309.62	5149.46	1309.73
5154.37	1309.61	5165.09	1308.79	5188.38	1310.09	5209.96	1310.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4216.49	.04	4866.67	.025	5137.42	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.67	5137.42	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

Left Levee Station= 4855.54 Elevation= 1309.31
Right Levee Station= 5137.42 Elevation= 1309.62

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1306.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.31	Flow Area (sq ft)		1469.68	
E.G. Slope (ft/ft)	0.000572	Area (sq ft)		1469.68	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.89	Top Width (ft)		242.89	
Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)		4.69	

Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)		6.05
Conv. Total (cfs)	288518.5	Conv. (cfs)		288518.5
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.84
Min Ch El (ft)	1298.78	Shear (lb/sq ft)		0.21
Alpha	1.00	Stream Power (lb/ft s)		1.01
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.27	302.21
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	38.06

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.68	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.41	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.65	Flow Area (sq ft)		1164.58	
E.G. Slope (ft/ft)	0.000587	Area (sq ft)		1164.58	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	234.60	Top Width (ft)		234.60	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)		4.17	
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	200538.8	Conv. (cfs)		200538.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		236.16	
Min Ch El (ft)	1298.78	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		220.40	
C & E Loss (ft)	0.00	Cum SA (acres)		35.89	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.391

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4198.58	1305.31	4264.78	1305.36	4371.39	1305.39	4478.02	1305.37	4584.71	1305.38
4630.64	1305.31	4706.78	1305.26	4763.97	1305.19	4783.95	1305.28	4792.56	1305.81
4806.6	1307.01	4822.1	1308.61	4839.06	1307.7	4848.71	1308.91	4866.2	1308.96
4885.37	1303.21	4900.25	1298.81	4940.34	1298.91	4943.29	1298.88	4996.86	1297.9
5026.87	1298.41	5069.74	1298.87	5100.91	1299.14	5133.03	1309.32	5150.72	1308.99
5160.67	1308.51	5175.44	1309.67	5195.42	1310				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4198.58	.04	4866.2	.025	5133.03	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.2	5133.03	335.09	335.09	335.09	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4866.2 Elevation= 1308.96
Right Levee Station= 5133.03 Elevation= 1309.32

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.75	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.43	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1301.88	Flow Area (sq ft)		1505.24	
E.G. Slope (ft/ft)	0.000528	Area (sq ft)		1505.24	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	

Top Width (ft)	242.77	Top Width (ft)		242.77
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		4.58
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		6.20
Conv. Total (cfs)	300341.0	Conv. (cfs)		300341.0
Length Wtd. (ft)	335.09	Wetted Per. (ft)		244.72
Min Ch El (ft)	1297.90	Shear (lb/sq ft)		0.20
Alpha	1.00	Stream Power (lb/ft s)		0.93
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.27	285.13
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	35.27

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.40	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.14	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1301.20	Flow Area (sq ft)		1199.03	
E.G. Slope (ft/ft)	0.000532	Area (sq ft)		1199.03	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	234.44	Top Width (ft)		234.44	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		5.11	
Conv. Total (cfs)	210613.5	Conv. (cfs)		210613.5	
Length Wtd. (ft)	335.09	Wetted Per. (ft)		236.01	
Min Ch El (ft)	1297.90	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)		206.83	
C & E Loss (ft)	0.00	Cum SA (acres)		33.20	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.328

INPUT
Description: Concrete Drop Structure - Begin Transition (Contraction)
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4197.63	1305.31	4260.57	1305.18	4364.57	1305.18	4460.72	1305.23	4506	1305.17
4567.33	1305.01	4596.24	1305.09	4673.99	1305.08	4761.41	1305.27	4782.64	1306.49
4785.09	1306.71	4804.67	1307.34	4822.81	1308.52	4836.14	1307.39	4846.65	1309.06
4861.56	1309.21	4867.11	1309.17	4892.91	1301.91	4905.09	1298.57	4923.76	1298.34
4968.01	1298.21	5001.77	1297.09	5011.18	1297.61	5025.68	1298.01	5077.01	1298.48
5092.72	1298.91	5130.34	1308.72	5133.81	1309.66	5161.04	1308.31	5172.84	1309.33
5192.22	1309.81								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4197.63	.04	4867.11	.025	5133.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867.11	5133.81	36.18	36.18	36.18	.3	.5

Left Levee Station= 4867.11 Elevation= 1309.17
Right Levee Station= 5133.81 Elevation= 1309.66

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.58	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.24	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1301.55	Flow Area (sq ft)		1493.21	
E.G. Slope (ft/ft)	0.000522	Area (sq ft)		1493.21	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	235.94	Top Width (ft)		235.94	

Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)		4.62
Max Chl Dpth (ft)	8.15	Hydr. Depth (ft)		6.33
Conv. Total (cfs)	302149.2	Conv. (cfs)		302149.2
Length Wtd. (ft)	36.18	Wetted Per. (ft)		237.71
Min Ch El (ft)	1297.09	Shear (lb/sq ft)		0.20
Alpha	1.00	Stream Power (lb/ft s)		0.95
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.27	273.60
C & E Loss (ft)	0.50	Cum SA (acres)	0.97	33.43

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1304.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1303.97	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1300.86	Flow Area (sq ft)		1198.02	
E.G. Slope (ft/ft)	0.000510	Area (sq ft)		1198.02	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	226.51	Top Width (ft)		226.51	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)		4.06	
Max Chl Dpth (ft)	6.88	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	215253.0	Conv. (cfs)		215253.0	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		227.94	
Min Ch El (ft)	1297.09	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		197.61	
C & E Loss (ft)	0.41	Cum SA (acres)		31.42	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.321

INPUT
Description: Drop Structure - End Transition (Contraction)
Drop Structure
Crest, elevation 1296.22
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4207.74	1306.11	4255.66	1305.22	4390.86	1305.21	4449.99	1305.25	4481.51	1305.13
4554.1	1304.91	4613.76	1305.1	4660.34	1305.09	4737.25	1305.29	4767.97	1305.95
4770.73	1305.51	4781.01	1303.07	4789.87	1303.05	4797.59	1303.15	4807.11	1303.62
4814.85	1304.21	4820.17	1305.06	4826.54	1305.63	4830.39	1304.89	4835.34	1304.57
4842.58	1306.11	4852.17	1308.99	4875.55	1309.77	4877.25	1309.73	4894.06	1306.71
4897.47	1305.91	4908.89	1304.79	4913.36	1303.72	4919.88	1303.56	4926.32	1301.95
4930.15	1300.61	4932.94	1301.82	4934.53	1298.54	4992.31	1298.5	5028.24	1298.63
5064	1298.71	5065.71	1303.4	5068.71	1302.11	5071.64	1301.91	5077.28	1303.73
5086.49	1304.41	5098.97	1306.4	5110.44	1308.47	5114.12	1309.59	5126.9	1309.59
5150.52	1309.01	5163.9	1308.55	5166.76	1308.79	5191.5	1309.68	5195.15	1309.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4207.74	.04	4875.55	.013	5114.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.55	5114.12	65.83	65.83	65.83	.3	.5

Left Levee Station= 4875.55 Elevation= 1309.77
Right Levee Station= 5114.12 Elevation= 1309.59

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1305.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.99	Wt. n-Val.		0.013	
W.S. Elev (ft)	1303.07	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1303.07	Flow Area (sq ft)		610.14	
E.G. Slope (ft/ft)	0.001623	Area (sq ft)		610.14	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	152.45	Top Width (ft)		152.45	
Vel Total (ft/s)	11.31	Avg. Vel. (ft/s)		11.31	
Max Chl Dpth (ft)	4.56	Hydr. Depth (ft)		4.00	
Conv. Total (cfs)	171256.5	Conv. (cfs)		171256.5	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		158.56	
Min Ch El (ft)	1298.50	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		4.41	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.27	272.73	
C & E Loss (ft)	0.81	Cum SA (acres)	0.97	33.27	

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

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1303.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.013	
W.S. Elev (ft)	1302.14	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1302.14	Flow Area (sq ft)		473.09	
E.G. Slope (ft/ft)	0.001721	Area (sq ft)		473.09	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	143.38	Top Width (ft)		143.38	
Vel Total (ft/s)	10.27	Avg. Vel. (ft/s)		10.27	
Max Chl Dpth (ft)	3.64	Hydr. Depth (ft)		3.30	
Conv. Total (cfs)	117137.5	Conv. (cfs)		117137.5	

Length Wtd. (ft)	65.83	Wetted Per. (ft)	148.39
Min Ch El (ft)	1298.50	Shear (lb/sq ft)	0.34
Alpha	1.00	Stream Power (lb/ft s)	3.52
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	196.92
C & E Loss (ft)	0.63	Cum SA (acres)	31.27

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.308

INPUT
Description: Drop Structure - Begin Transition (Expansion);
Drop Structure End
Sill, elevation 1290.72 ft
Detention Basin located East of the
East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4209.01	1306.21	4246.53	1305.92	4257.55	1305.73	4290.27	1305.49	4323.5	1306.12
4330.94	1306.21	4344.93	1305.97	4410.86	1305.26	4442.33	1305.27	4465.04	1305.18
4565.46	1305.01	4712.62	1305.27	4744.19	1306.2	4762.82	1301.63	4776.92	1301.72
4805.92	1301.81	4824.41	1301.81	4852.1	1308.92	4881.88	1309.35	4889.52	1307.29
4905.17	1303.21	4911.04	1301.45	4932.75	1296.29	4938.27	1295.66	4944.87	1293.95
4945.23	1293.31	5002.28	1292.92	5051.1	1293.1	5057.59	1293.18	5059.19	1294.67
5063.65	1295.41	5075.24	1297.84	5088.73	1301.5	5123.24	1309.48	5127.62	1309.53
5173.15	1309.01	5205.09	1309.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4209.01	.04	4881.88	.013	5123.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4881.88	5123.24	58.67	58.67	58.67	.3	.5

Left Levee Station= 4881.88 Elevation= 1309.35
Right Levee Station= 5123.24 Elevation= 1309.48

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1303.04	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.37	Wt. n-Val.		0.013	
W.S. Elev (ft)	1302.67	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1297.83	Flow Area (sq ft)		1416.57	
E.G. Slope (ft/ft)	0.000124	Area (sq ft)		1416.57	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	186.79	Top Width (ft)		186.79	
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)		4.87	
Max Chl Dpth (ft)	9.75	Hydr. Depth (ft)		7.58	
Conv. Total (cfs)	618527.6	Conv. (cfs)		618527.6	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		189.73	
Min Ch El (ft)	1292.92	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.28	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.27	271.20	
C & E Loss (ft)	0.08	Cum SA (acres)	0.97	33.01	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.013	
W.S. Elev (ft)	1300.29	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1296.88	Flow Area (sq ft)		995.08	
E.G. Slope (ft/ft)	0.000174	Area (sq ft)		995.08	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	168.38	Top Width (ft)		168.38	
Vel Total (ft/s)	4.88	Avg. Vel. (ft/s)		4.88	
Max Chl Dpth (ft)	7.37	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	368393.9	Conv. (cfs)		368393.9	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		170.71	
Min Ch El (ft)	1292.92	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.31	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)		195.81	
C & E Loss (ft)	0.09	Cum SA (acres)		31.03	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.297

INPUT
Description: Drop Structure - End Transition (Expansion);
Detention Basin
Located just East of the East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4223.73	1303.71	4244.85	1301.57	4277.52	1304.83	4292.34	1306.05	4299.21	1306.04
4334.76	1306.31	4364.29	1306.51	4370.8	1306.64	4388.42	1306.79	4405.75	1306.99
4414	1307.01	4451.25	1305.64	4469.66	1305.64	4486.98	1305.78	4515.76	1305.94
4531.01	1306.11	4554.85	1305.69	4578.31	1305.17	4608.04	1305.15	4691.47	1305.2
4700.43	1305.41	4711.98	1305.49	4724.94	1305.75	4743.19	1301.64	4769.74	1301.88
4794.32	1301.81	4810.15	1301.69	4823.35	1305.29	4827.81	1306.61	4836.02	1306.93
4839.35	1307.71	4845.64	1308.24	4852.73	1308.31	4859.56	1307.61	4875.2	1303.91
4878.89	1303.21	4880.98	1302.38	4889.27	1299.81	4895.45	1297.39	4900.47	1295.73
4914.52	1294.11	4923.13	1294.06	4931.49	1293.86	4945.58	1293.8	5001.15	1292.99
5052.01	1293.61	5070.63	1293.6	5085.43	1293.44	5089.54	1294.49	5146.59	1309.89

5186.17 1309.51 5216.69 1310

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4223.73	.04	4852.73	.03	5146.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4852.73	5146.59	140	195.02	255	.3	.5

Left Levee Station= 4852.73 Elevation= 1308.31
Right Levee Station= 5146.59 Elevation= 1309.89

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.74	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1297.07	Flow Area (sq ft)		1921.73	
E.G. Slope (ft/ft)	0.000333	Area (sq ft)		1921.73	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	240.03	Top Width (ft)		240.03	
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)		3.59	
Max Chl Dpth (ft)	9.75	Hydr. Depth (ft)		8.01	
Conv. Total (cfs)	378301.0	Conv. (cfs)		378301.0	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		242.54	
Min Ch El (ft)	1292.99	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.59	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.27	268.95	
C & E Loss (ft)	0.02	Cum SA (acres)	0.97	32.73	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.37	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1296.36	Flow Area (sq ft)		1371.01	
E.G. Slope (ft/ft)	0.000462	Area (sq ft)		1371.01	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	223.83	Top Width (ft)		223.83	
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)		3.54	
Max Chl Dpth (ft)	7.38	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	226103.4	Conv. (cfs)		226103.4	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		225.66	
Min Ch El (ft)	1292.99	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.62	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		194.22	
C & E Loss (ft)	0.03	Cum SA (acres)		30.77	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.26

INPUT
Description: Chandler Heights Road Bridge (Upstream Face)
Dense Grass in
Channel Bottom
4 Span Bridge with Riprap Protection
Manning n
Value of .030 used for Channel
Use Field Survey Data for This
Cross Section
Skew Angle18.86 Degrees, Cross Section Data
Adjusted

Downstream of Inlet from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,060 cfs & Q(E)=13,910 cfs
Q(D)=6,900 cfs, Q(F)=10,060 cfs
& Q(E)=13,910 cfs

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1310.31	4794.79	1310.64	4807.2	1310.71	4827.58	1312.44	4843.98	1311.77
4853.53	1306.29	4861.19	1305.3	4899.71	1294.78	4926.74	1293.38	5000.57	1292.61
5074.51	1293.31	5109.16	1294.4	5137.41	1303.39	5146.82	1304.88	5165.74	1312.27
5226.91	1311.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4843.98	5165.74	57.31	57.31	57.31	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4843.98 Elevation= 1311.77
Right Levee Station= 5165.74 Elevation= 1312.27

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.87	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.72	Reach Len. (ft)	0.30	0.30	0.30
Crit W.S. (ft)	1296.49	Flow Area (sq ft)		2204.21	
E.G. Slope (ft/ft)	0.000239	Area (sq ft)		2204.21	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	264.66	Top Width (ft)		264.66	
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)		3.13	
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)		8.33	
Conv. Total (cfs)	445867.1	Conv. (cfs)		445867.1	
Length Wtd. (ft)	0.30	Wetted Per. (ft)		267.08	
Min Ch El (ft)	1292.61	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.27	259.71	
C & E Loss (ft)	0.00	Cum SA (acres)	0.97	31.60	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.47	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.32	Reach Len. (ft)	0.30	0.30	0.30
Crit W.S. (ft)	1295.83	Flow Area (sq ft)		1589.98	
E.G. Slope (ft/ft)	0.000323	Area (sq ft)		1589.98	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	248.37	Top Width (ft)		248.37	
Vel Total (ft/s)	3.06	Avg. Vel. (ft/s)		3.06	
Max Chl Dpth (ft)	7.71	Hydr. Depth (ft)		6.40	
Conv. Total (cfs)	270268.6	Conv. (cfs)		270268.6	
Length Wtd. (ft)	0.30	Wetted Per. (ft)		250.09	
Min Ch El (ft)	1292.61	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		187.59	
C & E Loss (ft)	0.00	Cum SA (acres)		29.71	

BRIDGE RIVER: EMF
REACH: Reach 3 RS: 11.254

INPUT
Description: Chandler Heights Road 4-Span Bridge
Elongated Piers With
Semi-Circular Ends
Distance from Upstream XS = .3
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4763.34	1313.18	1309.21	4809.84	1313.33	1309.21	4839.01	1313.18	1308.21
4853.53	1313.17	1306.21	4853.54	1313.17	1308.25	4889.06	1313.13	1308.2
4926.14	1313.09	1308.18	4936.17	1313.08	1308.13	4982.92	1313	1308.04
5000.03	1312.95	1308	5029.65	1312.9	1307.95	5073.64	1312.86	1307.88
5076.71	1312.85	1307.88	5124.3	1312.78	1307.87	5146.16	1312.75	1307.86
5146.82	1312.75	1302.21	5162.06	1312.68	1304.21	5165.74	1312.67	1305.21
5211.21	1312.53	1306.21	5226.91	1312.42	1307.21			

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1310.31	4794.79	1310.64	4807.2	1310.71	4827.58	1312.44	4843.98	1311.77
4853.53	1306.29	4861.19	1305.3	4899.71	1294.78	4926.74	1293.38	5000.57	1292.61
5074.51	1293.31	5109.16	1294.4	5137.41	1303.39	5146.82	1304.88	5165.74	1312.27
5226.91	1311.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
4843.98	5165.74	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4843.98 Elevation= 1311.77
Right Levee Station= 5165.74 Elevation= 1312.27

Downstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4763.34	1313.18	1309.21	4809.84	1313.33	1309.21	4839.01	1313.18	1308.21
4844.79	1313.17	1308.21	4852.34	1313.17	1304.21	4854.67	1313.16	1308.07
4889.06	1313.13	1308.02	4927.62	1313.09	1307.96	4936.17	1313.08	1307.94
4982.92	1313	1307.86	5001.46	1312.96	1307.83	5029.65	1312.9	1307.77
5074.77	1312.88	1307.67	5076.71	1312.85	1307.67	5124.3	1312.78	1307.62
5145.58	1312.72	1307.6	5145.59	1312.72	1304.21	5162.06	1312.68	1305.21
5211.21	1312.53	1306.21	5217.93	1312.42	1307.21			

Downstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4773.32	1311.62	4804.54	1312.41	4810.78	1312.37	4838.25	1312.67	4844.79	1312.9
4852.34	1305.56	4870.98	1303.43	4904.08	1294.18	4924.66	1293.87	4999.19	1292.9
5072.6	1293.09	5110.53	1295.02	5136.59	1303.23	5145.58	1305.56	5160.69	1311.71
5217.93	1311.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 4773.32     .04 4844.79     .03 5160.69     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4844.79 5160.69             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888       F
888       F
Left Levee      Station= 4844.79      Elevation=  1312.9
Right Levee     Station= 5160.69      Elevation= 1311.71

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream= 4926.74    Downstream= 4924.66 Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.38    2.36 1305.18    3.79 1305.18    3.79 1309.21 Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.87    2.36 1304.96    3.79 1304.96    3.79 1309.21

Pier Data
Pier Station     Upstream= 5000.57    Downstream= 4999.19 Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1291.61    2.36    1305    3.79    1305    3.79 1309.21 Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36  1291.9    2.36 1304.83    3.79 1304.83    3.79 1309.21

Pier Data
Pier Station     Upstream= 5074.51    Downstream=  5072.6 Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.31    2.36 1304.88    3.79 1304.88    3.79 1309.21 Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.09    2.36 1304.67    3.79 1304.67    3.79 1309.21

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =    1.33
       Yarnell                 KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

BRIDGE OUTPUT Profile #Design
Opening : Single BR

E.G. US. (ft)	1302.87	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1302.72	E.G. Elev (ft)	1302.86	1302.84
Q Total (cfs)	6900.00	W.S. Elev (ft)	1302.70	1302.66
Q Bridge (cfs)	6900.00	Crit W.S. (ft)	1296.57	1296.76
Q Weir (cfs)		Max Chl Dpth (ft)	10.08	9.76
Weir Sta Lft (ft)		Vel Total (ft/s)	3.24	3.35
Weir Sta Rgt (ft)		Flow Area (sq ft)	2130.84	2060.63
Weir Submerg		Froude # Chl	0.20	0.21
Weir Max Depth (ft)		Specif Force (cu ft)	10317.26	9827.23
Min El Weir Flow (ft)	1312.69	Hydr Depth (ft)	8.28	8.11
Min El Prs (ft)	1308.25	W.P. Total (ft)	317.34	312.56
Delta EG (ft)	0.04	Conv. Total (cfs)	375644.5	358853.0
Delta WS (ft)	0.05	Top Width (ft)	257.44	253.99
BR Open Area (sq ft)	3470.18	Frctn Loss (ft)	0.02	0.00
BR Open Vel (ft/s)	3.35	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.14	0.15
Br Sel Method	Energy only	Power Total (lb/ft s)	0.46	0.51

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10-Year Future
Opening : Single BR

E.G. US. (ft)	1300.47	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1300.32	E.G. Elev (ft)	1300.46	1300.43
Q Total (cfs)	4860.00	W.S. Elev (ft)	1300.30	1300.26
Q Bridge (cfs)	4860.00	Crit W.S. (ft)	1295.88	1296.07
Q Weir (cfs)		Max Chl Dpth (ft)	7.68	7.35
Weir Sta Lft (ft)		Vel Total (ft/s)	3.17	3.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	1533.04	1468.68
Weir Submerg		Froude # Chl	0.22	0.23
Weir Max Depth (ft)		Specif Force (cu ft)	5716.55	5368.22
Min El Weir Flow (ft)	1312.69	Hydr Depth (ft)	6.36	6.18
Min El Prs (ft)	1308.25	W.P. Total (ft)	285.94	281.16
Delta EG (ft)	0.05	Conv. Total (cfs)	232604.0	219003.9
Delta WS (ft)	0.06	Top Width (ft)	241.12	237.73
BR Open Area (sq ft)	3470.18	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	3.31	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.15	0.16
Br Sel Method	Energy only	Power Total (lb/ft s)	0.46	0.53

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.249

INPUT
Description: Chandler Height Road Bridge (Downstream Face)
Dense Grass in Channel Bottom
4 Span Bridge with Riprap Protection
Manning n Value of .030 used for Channel
Use Field Survey Data for This Cross Section
Skew Angle 19.00 Degrees, Cross Section Data Adjusted
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4773.32	1311.62	4804.54	1312.41	4810.78	1312.37	4838.25	1312.67	4844.79	1312.9
4852.34	1305.56	4870.98	1303.43	4904.08	1294.18	4924.66	1293.87	4999.19	1292.9
5072.6	1293.09	5110.53	1295.02	5136.59	1303.23	5145.58	1305.56	5160.69	1311.71
5217.93	1311.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4773.32	.04	4844.79	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4844.79	5160.69	150	95.09	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent	888	F	888	F

Left Levee Station= 4844.79 Elevation= 1312.9
Right Levee Station= 5160.69 Elevation= 1311.71

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.67	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1296.68	Flow Area (sq ft)		2128.41	
E.G. Slope (ft/ft)	0.000264	Area (sq ft)		2128.41	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	261.10	Top Width (ft)		261.10	
Vel Total (ft/s)	3.24	Avg. Vel. (ft/s)		3.24	
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)		8.15	
Conv. Total (cfs)	424401.0	Conv. (cfs)		424401.0	
Length Wtd. (ft)	95.09	Wetted Per. (ft)		263.50	
Min Ch El (ft)	1292.90	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.43	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.27	256.95	
C & E Loss (ft)	0.02	Cum SA (acres)	0.97	31.26	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.26	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1296.01	Flow Area (sq ft)		1519.34	
E.G. Slope (ft/ft)	0.000369	Area (sq ft)		1519.34	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	244.85	Top Width (ft)		244.85	
Vel Total (ft/s)	3.20	Avg. Vel. (ft/s)		3.20	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.21	
Conv. Total (cfs)	252952.5	Conv. (cfs)		252952.5	
Length Wtd. (ft)	95.09	Wetted Per. (ft)		246.54	
Min Ch El (ft)	1292.90	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.45	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		185.61	
C & E Loss (ft)	0.00	Cum SA (acres)		29.40	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.231

INPUT
Description: Just Downstream of Chandler Heights Road Bridge
Downstream of
Side Inlet (60' Wide) from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,470 cfs & Q(E)=14,320 cfs;
Dense Grass in channel bed
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4223.41	1303.01	4286.31	1302.8	4365.26	1302.62	4397.8	1302.62	4444.21	1302.73
4503.31	1302.61	4541.6	1302.67	4582.12	1302.5	4607.6	1302.5	4628.99	1302.44
4647.23	1303.21	4653.57	1305.24	4671.71	1305.84	4685.57	1305.51	4699.59	1306.79
4751.36	1307.11	4800.8	1305.94	4816.15	1303.44	4825.08	1302.63	4829.5	1302.83
4848.82	1302.31	4858.6	1304.17	4871.41	1304.34	4899.91	1294.82	4904.44	1293.25
4933.04	1293.11	5004.04	1293.14	5100	1292.83	5143.88	1303.5	5160.69	1313.83
5197.16	1313.11	5201.03	1313.09	5216.94	1312.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4223.41	.04	4871.41	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4871.41	5160.69	221.88	221.88	221.88	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Left Levee Station= 4751.36 Elevation= 1307.71
Right Levee Station= 5160.69 Elevation= 1313.83

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	1302.56	Reach Len. (ft)	221.88	221.88	221.88
Crit W.S. (ft)	1296.72	Flow Area (sq ft)	1.37	2180.94	
E.G. Slope (ft/ft)	0.000340	Area (sq ft)	1.37	2180.94	
Q Total (cfs)	8100.00	Flow (cfs)	0.24	8099.76	
Top Width (ft)	274.07	Top Width (ft)	10.77	263.30	
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)	0.17	3.71	
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)	0.13	8.28	
Conv. Total (cfs)	439252.0	Conv. (cfs)	12.8	439239.2	
Length Wtd. (ft)	221.88	Wetted Per. (ft)	10.79	265.99	
Min Ch El (ft)	1292.83	Shear (lb/sq ft)	0.00	0.17	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.65	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.26	252.25	
C & E Loss (ft)	0.00	Cum SA (acres)	0.96	30.69	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.23	Reach Len. (ft)	221.88	221.88	221.88
Crit W.S. (ft)	1295.73	Flow Area (sq ft)		1585.82	
E.G. Slope (ft/ft)	0.000340	Area (sq ft)		1585.82	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	

Top Width (ft)	246.72	Top Width (ft)	246.72
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	3.14
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)	6.43
Conv. Total (cfs)	270055.0	Conv. (cfs)	270055.0
Length Wtd. (ft)	221.88	Wetted Per. (ft)	248.75
Min Ch El (ft)	1292.83	Shear (lb/sq ft)	0.14
Alpha	1.00	Stream Power (lb/ft s)	0.43
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	182.22
C & E Loss (ft)	0.00	Cum SA (acres)	28.86

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.189

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4282.94	1302.71	4323.12	1302.73	4396.47	1302.62	4428.62	1302.56	4526.06	1302.63
4545.88	1302.61	4553.32	1302.73	4571.77	1303.79	4581.89	1305.28	4599.32	1305.6
4615.66	1305.61	4635.69	1308.91	4637.95	1309.02	4677.66	1309.13	4714.48	1308.5
4724.14	1308.31	4741.8	1307.62	4750.77	1307.4	4774.37	1306.6	4799.64	1303.4
4816.51	1302.51	4823.49	1301.61	4832.16	1302.54	4846.91	1302.35	4855.25	1304.45
4867	1304.31	4894.33	1296.17	4904.99	1292.91	4945.28	1293.6	4967.54	1293.61
5014.61	1293.21	5102.61	1293.07	5142.31	1305.05	5155.45	1304.47	5167.81	1303.76
5175.47	1307.91	5182.37	1311.79	5200.5	1311.44	5214.52	1309.02	5216.65	1308.84
5220.62	1310.01	5226.99	1308.22	5239.88	1306.83	5256.77	1307.04	5262.35	1308.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4282.94	.04	4867	.03	5142.31	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867	5142.31	276	326.49	374	.1	.3

Left Levee Station= 4677.66 Elevation= 1309.13
Right Levee Station= 5182.37 Elevation= 1311.79

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.69	Element			
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	1302.46	Reach Len. (ft)	276.00	326.49	374.00
Crit W.S. (ft)	1296.92	Flow Area (sq ft)	6.64	2110.84	
E.G. Slope (ft/ft)	0.000374	Area (sq ft)	6.64	2110.84	
Q Total (cfs)	8100.00	Flow (cfs)	2.54	8097.46	
Top Width (ft)	283.91	Top Width (ft)	23.40	260.51	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)	0.38	3.84	
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	0.28	8.10	
Conv. Total (cfs)	418914.8	Conv. (cfs)	131.2	418783.7	
Length Wtd. (ft)	326.48	Wetted Per. (ft)	23.52	263.31	
Min Ch El (ft)	1292.91	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.72	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.24	241.32	
C & E Loss (ft)	0.00	Cum SA (acres)	0.87	29.35	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.29	Element			
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.12	Reach Len. (ft)	276.00	326.49	374.00

Crit W.S. (ft)	1295.91	Flow Area (sq ft)	1520.65
E.G. Slope (ft/ft)	0.000388	Area (sq ft)	1520.65
Q Total (cfs)	4980.00	Flow (cfs)	4980.00
Top Width (ft)	244.93	Top Width (ft)	244.93
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)	3.27
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)	6.21
Conv. Total (cfs)	252974.8	Conv. (cfs)	252974.8
Length Wtd. (ft)	326.49	Wetted Per. (ft)	247.04
Min Ch El (ft)	1292.91	Shear (lb/sq ft)	0.15
Alpha	1.00	Stream Power (lb/ft s)	0.49
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	174.31
C & E Loss (ft)	0.00	Cum SA (acres)	27.61

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.127

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4212.75	1302.81	4306.26	1302.77	4406.26	1302.48	4413.07	1302.49	4507.16	1302.4
4520.91	1302.61	4540.72	1303.22	4548.72	1305.02	4563.11	1305.26	4574.46	1305.03
4598.63	1309.51	4605.38	1309.82	4638.99	1310.67	4699.06	1309.74	4707.97	1308.78
4723.92	1308.01	4755.19	1307.75	4781.83	1303.64	4810.12	1302.66	4817.38	1301.66
4826.36	1302.71	4841.18	1301.79	4850.4	1304.3	4861.37	1304.16	4875.59	1299.69
4897.89	1292.91	4933.76	1293.01	5000.58	1293.28	5005.77	1293.07	5015.59	1293.08
5097.28	1293.41	5105.44	1295.39	5135.04	1304.74	5159.06	1304.98	5168.1	1310.92
5175.86	1311.21	5186.12	1311.48						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4212.75	.04	4861.37	.03	5135.04	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.37	5135.04	500	500	500	.1	.3

Left Levee Station= 4638.99 Elevation= 1310.67
Right Levee Station= 5135.04 Elevation= 1304.74

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.57	Element			
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	1302.34	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.77	Flow Area (sq ft)	6.64	2119.43	
E.G. Slope (ft/ft)	0.000368	Area (sq ft)	6.64	2119.43	
Q Total (cfs)	8100.00	Flow (cfs)	2.16	8097.84	
Top Width (ft)	281.90	Top Width (ft)	21.62	260.28	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)	0.32	3.82	
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)	0.31	8.14	
Conv. Total (cfs)	422058.7	Conv. (cfs)	112.4	421946.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	21.80	263.01	
Min Ch El (ft)	1292.91	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.71	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.20	225.47	
C & E Loss (ft)	0.00	Cum SA (acres)	0.73	27.40	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.17	Element			

Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.00	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.78	Flow Area (sq ft)		1527.69	
E.G. Slope (ft/ft)	0.000382	Area (sq ft)		1527.69	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	245.43	Top Width (ft)		245.43	
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)		3.26	
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	254659.1	Conv. (cfs)		254659.1	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		247.44	
Min Ch El (ft)	1292.91	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		162.89	
C & E Loss (ft)	0.00	Cum SA (acres)		25.77	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.033

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.28	1302.31	4307.21	1302.67	4407.2	1302.33	4508.72	1302.35	4517.84	1302.48
4553.14	1304.31	4570.83	1305.15	4593.87	1310.48	4609.43	1310.76	4690.24	1311.1
4699.47	1311.11	4709.93	1310.7	4735.3	1309.53	4772.96	1308.28	4790.8	1304.49
4816	1302.01	4826.6	1302.75	4841.12	1302.2	4850.51	1304.33	4861.62	1304.23
4874.8	1300.21	4898.39	1293.04	4906.79	1292.62	4940.36	1292.93	4960.96	1292.67
5000.57	1292.81	5011.89	1293.02	5095.3	1293.46	5105.49	1295.83	5108.79	1296.76
5134.81	1305.11	5157.24	1303.78	5177.78	1306.33	5192.28	1307.41	5205.15	1307.69
5209.71	1307.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.28	.04	4861.62	.03	5134.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.62	5134.81	500	500	500	.1	.3

Left Levee Station= 4699.47 Elevation= 1311.11
Right Levee Station= 5134.81 Elevation= 1305.11

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.38	Element			
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	1302.15	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.65	Flow Area (sq ft)	0.23	2082.80	
E.G. Slope (ft/ft)	0.000384	Area (sq ft)	0.23	2082.80	
Q Total (cfs)	8100.00	Flow (cfs)	0.03	8099.97	
Top Width (ft)	260.47	Top Width (ft)	3.35	257.13	
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	0.12	3.89	
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)	0.07	8.10	
Conv. Total (cfs)	413294.2	Conv. (cfs)	1.4	413292.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	3.36	259.74	
Min Ch El (ft)	1292.62	Shear (lb/sq ft)	0.00	0.19	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.75	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	0.16	201.35	
C & E Loss (ft)	0.00	Cum SA (acres)	0.58	24.43	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	1299.81	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.65	Flow Area (sq ft)		1498.58	
E.G. Slope (ft/ft)	0.000400	Area (sq ft)		1498.58	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	242.16	Top Width (ft)		242.16	
Vel Total (ft/s)	3.32	Avg. Vel. (ft/s)		3.32	
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		6.19	
Conv. Total (cfs)	248893.2	Conv. (cfs)		248893.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.06	
Min Ch El (ft)	1292.62	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.51	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		145.52	
C & E Loss (ft)	0.00	Cum SA (acres)		22.97	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.938

INPUT
Description: Dense Grass in channel bed
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.27	1301.91	4311.64	1301.69	4408.14	1301.59	4500.64	1301.35	4504.71	1301.94
4512.74	1302.81	4516.72	1302.32	4520.69	1301.6	4534.5	1302.08	4547.79	1304.17
4573.99	1304.91	4594.88	1311.21	4608.97	1311.58	4621.23	1312.23	4668.08	1311.63
4697.19	1311.11	4711.85	1310.57	4735.18	1309.23	4772.44	1308.3	4779.58	1306.64
4788.54	1304.41	4819.39	1301.15	4827.11	1302.24	4842.24	1301.49	4850.94	1303.3
4861.77	1303.51	4898.49	1292.87	4909.68	1292.32	5000.64	1292.9	5019.9	1292.82
5096.02	1292.91	5106.69	1295.61	5109.46	1296.42	5135.91	1304.76	5161.16	1303.49
5176.44	1305.51	5191.3	1307.18	5209.42	1308.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.27	.04	4861.77	.03	5135.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4861.77	5135.91	500	500	500	.1	.3

Left Levee Station= 4621.23 Elevation= 1312.23
Right Levee Station= 5135.91 Elevation= 1304.76

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.040	0.030	
W.S. Elev (ft)	1301.96	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.40	Flow Area (sq ft)	8.26	2113.51	
E.G. Slope (ft/ft)	0.000371	Area (sq ft)	8.26	2113.51	
Q Total (cfs)	8100.00	Flow (cfs)	2.90	8097.10	
Top Width (ft)	285.20	Top Width (ft)	25.27	259.93	
Vel Total (ft/s)	3.82	Avg. Vel. (ft/s)	0.35	3.83	
Max Chl Dpth (ft)	9.64	Hydr. Depth (ft)	0.33	8.13	
Conv. Total (cfs)	420632.1	Conv. (cfs)	150.5	420481.6	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	25.43	262.54	
Min Ch El (ft)	1292.32	Shear (lb/sq ft)	0.01	0.19	
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.71	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.11	177.27	
C & E Loss (ft)	0.00	Cum SA (acres)	0.42	21.47	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	1299.61	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.38	Flow Area (sq ft)		1521.08	
E.G. Slope (ft/ft)	0.000386	Area (sq ft)		1521.08	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	244.37	Top Width (ft)		244.37	
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)		3.27	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	253610.5	Conv. (cfs)		253610.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		246.29	
Min Ch El (ft)	1292.32	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.49	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		128.19	
C & E Loss (ft)	0.00	Cum SA (acres)		20.18	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.843

INPUT
Description: End Dense Grass in channel bed
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.26	1302.21	4312.55	1302.12	4409.09	1301.88	4508.87	1301.91	4513.44	1301.7
4517.57	1302.11	4533.79	1302.07	4543.03	1303.09	4562.21	1302.93	4565.44	1302.96
4592.82	1310.11	4605.9	1310.22	4619.84	1311.32	4694.67	1310.2	4701.55	1309.59
4713.26	1308.91	4727.36	1308.78	4748.07	1308.23	4767.69	1307.83	4783.67	1303.88
4809.52	1302.31	4813.08	1302.3	4817.56	1301.44	4826.92	1301.91	4841.79	1301.27
4848.54	1303.71	4862.81	1303.83	4895.89	1292.94	4908.24	1292.3	4911.45	1292.25
4973.02	1292.11	4993.46	1292.25	5009.09	1292.5	5059.09	1292.16	5098.86	1293.18
5108.1	1295.71	5115.7	1298.18	5134.92	1304.54	5144.4	1304.08	5156.11	1303.87
5161.83	1303.61	5176.85	1305.75	5190.84	1307.03	5208.72	1308.06		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.26	.04	4862.81	.025	5134.92	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.81	5134.92	500	500	500	.1	.3

Left Levee Station= 4619.84 Elevation= 1311.32
Right Levee Station= 5134.92 Elevation= 1304.54

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.040	0.025	
W.S. Elev (ft)	1301.82	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.98	Flow Area (sq ft)	5.73	2165.63	
E.G. Slope (ft/ft)	0.000235	Area (sq ft)	5.73	2165.63	
Q Total (cfs)	8100.00	Flow (cfs)	1.28	8098.72	
Top Width (ft)	281.59	Top Width (ft)	23.81	257.78	
Vel Total (ft/s)	3.73	Avg. Vel. (ft/s)	0.22	3.74	
Max Chl Dpth (ft)	9.71	Hydr. Depth (ft)	0.24	8.40	
Conv. Total (cfs)	528240.8	Conv. (cfs)	83.3	528157.4	
Length Wtd. (ft)	500.00	Wetted Per. (ft)	23.96	260.56	
Min Ch El (ft)	1292.11	Shear (lb/sq ft)	0.00	0.12	
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.46	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.03	152.71	
C & E Loss (ft)	0.00	Cum SA (acres)	0.14	18.49	

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.47	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.99	Flow Area (sq ft)		1577.12	
E.G. Slope (ft/ft)	0.000236	Area (sq ft)		1577.12	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	243.55	Top Width (ft)		243.55	
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)		3.16	
Max Chl Dpth (ft)	7.36	Hydr. Depth (ft)		6.48	
Conv. Total (cfs)	323874.8	Conv. (cfs)		323874.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		245.57	
Min Ch El (ft)	1292.11	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		110.41	
C & E Loss (ft)	0.00	Cum SA (acres)		17.38	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.749

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.25	1303.21	4241.38	1303.11	4282.61	1302.89	4306.9	1302.73	4380.3	1302.7
4421.26	1302.81	4490.41	1302.76	4538.41	1302.7	4556.35	1302.79	4580.3	1302.92
4593.28	1303.41	4596.42	1304.08	4602.9	1304.23	4612.02	1303.68	4621.13	1304.17
4625.16	1304.21	4636.13	1304.05	4651.34	1304.25	4660.04	1303.9	4710.03	1303.51
4725.78	1303.81	4740.07	1303.9	4760.04	1303.57	4767.96	1303.93	4795.74	1304.98
4806.95	1304.51	4814.31	1303.41	4828.19	1303.31	4843.24	1302.65	4860.68	1304.03
4862.86	1303.71	4896.96	1292.94	4910.04	1292.43	4960.65	1292.01	4995.11	1292.25
5012.19	1292.41	5060.04	1292.34	5099.65	1293.69	5111.09	1296.73	5134.52	1304.24
5157.67	1303.71	5174.55	1305.81	5192.99	1307.13	5207.5	1307.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.25	.04	4860.68	.025	5134.52	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4860.68	5134.52	500	500	500	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Left Levee Station= 4795.74 Elevation= 1304.98
Right Levee Station= 5134.52 Elevation= 1304.24

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.68	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.09	Flow Area (sq ft)		2105.67	
E.G. Slope (ft/ft)	0.000257	Area (sq ft)		2105.67	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.22	Top Width (ft)		257.22	
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)		3.85	
Max Chl Dpth (ft)	9.67	Hydr. Depth (ft)		8.19	

Conv. Total (cfs)	505025.0	Conv. (cfs)	505025.0
Length Wtd. (ft)	500.00	Wetted Per. (ft)	259.77
Min Ch El (ft)	1292.01	Shear (lb/sq ft)	0.13
Alpha	1.00	Stream Power (lb/ft s)	0.50
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	128.19
C & E Loss (ft)	0.00	Cum SA (acres)	15.54

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.33	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.08	Flow Area (sq ft)		1519.52	
E.G. Slope (ft/ft)	0.000266	Area (sq ft)		1519.52	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	242.47	Top Width (ft)		242.47	
Vel Total (ft/s)	3.28	Avg. Vel. (ft/s)		3.28	
Max Chl Dpth (ft)	7.32	Hydr. Depth (ft)		6.27	
Conv. Total (cfs)	305461.8	Conv. (cfs)		305461.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.29	
Min Ch El (ft)	1292.01	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		92.63	
C & E Loss (ft)	0.00	Cum SA (acres)		14.59	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.654

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.24	1304.51	4260.97	1304.54	4307.48	1304.67	4310.97	1304.65	4360.98	1305.3
4364.36	1305.31	4410.97	1305.57	4457.77	1304.92	4514.08	1305.09	4560.97	1305.18
4563.99	1305.11	4610.98	1305.01	4663.79	1304.68	4710.98	1304.63	4764.35	1303.71
4797.76	1302.91	4809.24	1303.15	4815.88	1301.88	4820.99	1302.2	4827.33	1302.27
4841.44	1301.41	4862.58	1303.95	4883.68	1297.79	4900.77	1292.74	4913.33	1292.35
4961.47	1292.21	4997.55	1292.3	5013.12	1292.4	5060.97	1292.4	5101.18	1293.95
5110.07	1296.31	5116.33	1298.31	5135.28	1304.58	5158.96	1303.4	5170.22	1305.19
5193.51	1306.81	5209.42	1307.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.24	.04	4862.58	.025	5135.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.58	5135.28	465.44	465.44	465.44	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4862.58 Elevation= 1303.95
Right Levee Station= 5135.28 Elevation= 1304.58

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.53	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1296.17	Flow Area (sq ft)		2038.96	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)		2038.96	

Q Total (cfs)	8100.00	Flow (cfs)	8100.00
Top Width (ft)	255.20	Top Width (ft)	255.20
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	3.97
Max Chl Dpth (ft)	9.32	Hydr. Depth (ft)	7.99
Conv. Total (cfs)	481272.2	Conv. (cfs)	481272.2
Length Wtd. (ft)	465.44	Wetted Per. (ft)	257.64
Min Ch El (ft)	1292.21	Shear (lb/sq ft)	0.14
Alpha	1.00	Stream Power (lb/ft s)	0.56
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	104.41
C & E Loss (ft)	0.00	Cum SA (acres)	12.60

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.18	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1295.16	Flow Area (sq ft)		1456.43	
E.G. Slope (ft/ft)	0.000302	Area (sq ft)		1456.43	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	240.03	Top Width (ft)		240.03	
Vel Total (ft/s)	3.42	Avg. Vel. (ft/s)		3.42	
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)		6.07	
Conv. Total (cfs)	286604.2	Conv. (cfs)		286604.2	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		241.76	
Min Ch El (ft)	1292.21	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		75.56	
C & E Loss (ft)	0.00	Cum SA (acres)		11.82	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.566

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.79	1304.81	4261.85	1304.74	4299.91	1304.4	4323.81	1304.27	4361.85	1304.35
4411.85	1304.81	4461.84	1304.63	4499.55	1304.67	4524.2	1304.73	4561.84	1304.66
4599.35	1304.71	4624.39	1304.5	4661.85	1304.28	4761.85	1303.01	4793.49	1301.57
4801.87	1302.91	4814.64	1301.58	4827.88	1301.5	4841.4	1301.07	4863.63	1303.73
4900.88	1292.61	4911.85	1292.13	4961.84	1292.37	5011.84	1292.26	5061.85	1291.71
5096.04	1292.81	5101.85	1294.17	5129.28	1302.51	5135.55	1304.34	5161.76	1302.99
5171.01	1304.01	5191.76	1305.92	5209.25	1307.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.79	.04	4863.63	.025	5135.55	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4863.63	5135.55	280	250	222	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4863.63 Elevation= 1303.73
Right Levee Station= 5135.55 Elevation= 1304.34

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	

W.S. Elev (ft)	1301.41	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1295.92	Flow Area (sq ft)		2056.61	
E.G. Slope (ft/ft)	0.000274	Area (sq ft)		2056.61	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.23	Top Width (ft)		254.23	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.69	Hydr. Depth (ft)		8.09	
Conv. Total (cfs)	489333.7	Conv. (cfs)		489333.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.77	
Min Ch El (ft)	1291.71	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		82.52	
C & E Loss (ft)	0.00	Cum SA (acres)		9.88	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.05	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1294.90	Flow Area (sq ft)		1475.24	
E.G. Slope (ft/ft)	0.000287	Area (sq ft)		1475.24	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	238.56	Top Width (ft)		238.56	
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)		3.38	
Max Chl Dpth (ft)	7.34	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	293890.1	Conv. (cfs)		293890.1	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		240.42	
Min Ch El (ft)	1291.71	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.37	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		59.89	
C & E Loss (ft)	0.00	Cum SA (acres)		9.27	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.518

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4258.45	1307.28	4270.94	1306.8	4308.36	1306.22	4319.34	1305.84	4370.51	1305.61
4421.71	1305.45	4472.9	1305.13	4524.09	1304.66	4575.29	1304.74	4626.47	1304.41
4677.67	1304.27	4703.2	1303.81	4728.84	1303.59	4772.47	1302.48	4791.69	1301.81
4799.57	1303.03	4809.96	1301.41	4817.08	1301.95	4824.01	1301.87	4844.77	1300.51
4864.63	1303.69	4873.97	1301.01	4897	1294.21	4904.18	1292.43	4908.56	1292.41
4933.61	1292.3	4984.8	1292.31	4997.31	1292.36	5036	1291.83	5052.87	1292.01
5087.17	1292.33	5101.39	1292.67	5137.14	1303.76	5159.71	1303.19	5167.77	1304.41
5187.78	1306.02	5203.51	1306.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4258.45	.04	4864.63	.025	5137.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.63	5137.14	460	408.26	365	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4864.63 Elevation= 1303.69
Right Levee Station= 5137.14 Elevation= 1303.76

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.33	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1295.90	Flow Area (sq ft)		2058.39	
E.G. Slope (ft/ft)	0.000276	Area (sq ft)		2058.39	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	256.45	Top Width (ft)		256.45	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)		8.03	
Conv. Total (cfs)	487207.4	Conv. (cfs)		487207.4	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		259.02	
Min Ch El (ft)	1291.83	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		70.72	
C & E Loss (ft)	0.01	Cum SA (acres)		8.41	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.97	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1294.90	Flow Area (sq ft)		1470.71	
E.G. Slope (ft/ft)	0.000294	Area (sq ft)		1470.71	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	240.79	Top Width (ft)		240.79	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)		3.39	
Max Chl Dpth (ft)	7.14	Hydr. Depth (ft)		6.11	
Conv. Total (cfs)	290578.5	Conv. (cfs)		290578.5	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		242.66	
Min Ch El (ft)	1291.83	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		51.44	
C & E Loss (ft)	0.01	Cum SA (acres)		7.89	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.441

INPUT
Description: Downstream of Side Inlet from the Left Bank
Q(D)=8,100 cfs,
Q(F)=10,790 cfs & Q(E)=14,650 cfs
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4203.3	1306.51	4235.34	1306.29	4261.67	1306.22	4287.54	1306.27	4327.76	1306.52
4380.59	1306.41	4440.03	1305.88	4499.48	1305.61	4558.96	1305.41	4618.41	1304.49
4649.32	1304.41	4685.49	1304.91	4697.36	1304.49	4721.67	1303.82	4737.32	1303
4770.29	1302.11	4783.88	1302.13	4794.06	1301.79	4802.65	1300.64	4809.22	1301.77
4852.28	1300.41	4860.25	1302.73	4872.95	1302.43	4883.31	1299.61	4910.83	1292
4915.66	1291.71	4975.62	1291.27	5001.12	1291.49	5034.6	1291.58	5067.01	1291.51
5095.33	1291.81	5105.93	1292.13	5144.26	1303.33	5157.98	1303.24	5164.91	1303.01
5168.87	1304.51	5173.15	1304.78	5181.65	1304.83	5198.26	1306.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4203.3	.04	4872.95	.025	5144.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.95	5144.26	500	500	500	.1	.3

Ineffective Flow num= 2

```
   Sta L   Sta R    Elev  Permanent
888        F
888        F
Left Levee       Station= 4860.25       Elevation= 1302.73
Right Levee      Station= 5144.26       Elevation= 1303.33
```

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.24	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.26	Flow Area (sq ft)		2187.04	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)		2187.04	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	259.80	Top Width (ft)		259.80	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	9.97	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	534408.3	Conv. (cfs)		534408.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		262.37	
Min Ch El (ft)	1291.27	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		50.82	
C & E Loss (ft)	0.00	Cum SA (acres)		5.99	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.88	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.25	Flow Area (sq ft)		1592.07	
E.G. Slope (ft/ft)	0.000228	Area (sq ft)		1592.07	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	243.05	Top Width (ft)		243.05	
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)		3.13	
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)		6.55	
Conv. Total (cfs)	329550.3	Conv. (cfs)		329550.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.96	
Min Ch El (ft)	1291.27	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		37.09	
C & E Loss (ft)	0.00	Cum SA (acres)		5.62	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.346

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4204.52	1306.61	4236.47	1306.98	4273.71	1307.15	4295.96	1307.17	4336.33	1306.87
4365.99	1306.71	4414.92	1306.48	4431.91	1306.56	4458.29	1306.89	4474.42	1306.88
4503.66	1306.61	4533.9	1306.34	4550.58	1306.25	4593.38	1306.23	4612.78	1306.18
4652.86	1305.41	4685.14	1304.99	4712.36	1304.79	4727.78	1304.44	4735.75	1304.2
4749.1	1303.01	4771.13	1301.77	4785.51	1301.37	4803.47	1300.57	4810.82	1301.39
4828.94	1301.01	4851.17	1300.14	4860.03	1302.51	4869	1302.73	4872.63	1302.31
4891.24	1296.31	4903.87	1292.84	4911.3	1291.44	4924.19	1291.27	4950.31	1291.16
4984	1291.51	5002.09	1291.38	5012.03	1291.4	5069.26	1291.09	5092.68	1291.33
5105.64	1291.61	5111.11	1292.99	5129.38	1297.84	5148.95	1303.43	5165.41	1302.81
5178.97	1304.41	5191.87	1304.74	5197.09	1305.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4204.52	.04	4869	.025	5148.95	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4869	5148.95	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4869 Elevation= 1302.73
Right Levee Station= 5148.95 Elevation= 1303.43

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1301.34	Element			
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.14	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.97	Flow Area (sq ft)		2271.12	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		2271.12	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	264.70	Top Width (ft)		264.70	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	10.05	Hydr. Depth (ft)		8.58	
Conv. Total (cfs)	562024.0	Conv. (cfs)		562024.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.33	
Min Ch El (ft)	1291.09	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		25.24	
C & E Loss (ft)	0.00	Cum SA (acres)		2.98	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1298.92	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.78	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.98	Flow Area (sq ft)		1663.03	
E.G. Slope (ft/ft)	0.000204	Area (sq ft)		1663.03	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	249.07	Top Width (ft)		249.07	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	7.69	Hydr. Depth (ft)		6.68	
Conv. Total (cfs)	348690.9	Conv. (cfs)		348690.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		251.00	
Min Ch El (ft)	1291.09	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		18.40	
C & E Loss (ft)	0.00	Cum SA (acres)		2.80	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.252

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4658.04	1307.01	4698.66	1305.67	4705.96	1305.35	4719.74	1304.51	4737.35	1303.15
4785.48	1302.24	4793.47	1301.97	4799.57	1301.92	4824.28	1301.91	4836.29	1301.7
4845.85	1303.36	4867.88	1303.52	4873.51	1303.61	4910.83	1292.01	4925.86	1291.47
4957.19	1291.18	4987.25	1291.46	5003.76	1291.75	5043.67	1291.01	5054.5	1291.12
5103.62	1291.91	5144.94	1303.29	5163.49	1302.37	5165.79	1302.31	5178.08	1303.58
5197.94	1304.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4658.04	.04	4873.51	.025	5144.94	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4873.51	5144.94	0	0	0	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888		F	

Left Levee Station= 4873.51 Elevation= 1303.61
Right Levee Station= 5144.94 Elevation= 1303.29

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.00	Reach Len. (ft)			
Crit W.S. (ft)	1295.16	Flow Area (sq ft)		2125.84	
E.G. Slope (ft/ft)	0.000246	Area (sq ft)		2125.84	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.72	Top Width (ft)		254.72	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81	
Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)		8.35	
Conv. Total (cfs)	516336.6	Conv. (cfs)		516336.6	
Length Wtd. (ft)		Wetted Per. (ft)		257.34	
Min Ch El (ft)	1291.01	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1298.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.64	Reach Len. (ft)			
Crit W.S. (ft)	1294.15	Flow Area (sq ft)		1543.78	
E.G. Slope (ft/ft)	0.000247	Area (sq ft)		1543.78	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	238.56	Top Width (ft)		238.56	
Vel Total (ft/s)	3.23	Avg. Vel. (ft/s)		3.23	
Max Chl Dpth (ft)	7.63	Hydr. Depth (ft)		6.47	
Conv. Total (cfs)	316920.7	Conv. (cfs)		316920.7	
Length Wtd. (ft)		Wetted Per. (ft)		240.50	
Min Ch El (ft)	1291.01	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 3	11.893	.04	.025	.04
Reach 3	11.798	.04	.025	.04
Reach 3	11.703	.04	.025	.04
Reach 3	11.609	.04	.025	.04

Reach 3	11.572	.04	.025	.04
Reach 3	11.531	.04	.025	.04
Reach 3	11.486	.04	.025	.04
Reach 3	11.391	.04	.025	.04
Reach 3	11.328	.04	.025	.04
Reach 3	11.321	.04	.013	.04
Reach 3	11.308	.04	.013	.04
Reach 3	11.297	.04	.03	.04
Reach 3	11.26	.04	.03	.04
Reach 3	11.254	Bridge		
Reach 3	11.249	.04	.03	.04
Reach 3	11.231	.04	.03	.04
Reach 3	11.189	.04	.03	.04
Reach 3	11.127	.04	.03	.04
Reach 3	11.033	.04	.03	.04
Reach 3	10.938	.04	.03	.04
Reach 3	10.843	.04	.025	.04
Reach 3	10.749	.04	.025	.04
Reach 3	10.654	.04	.025	.04
Reach 3	10.566	.04	.025	.04
Reach 3	10.518	.04	.025	.04
Reach 3	10.441	.04	.025	.04
Reach 3	10.346	.04	.025	.04
Reach 3	10.252	.04	.025	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 3	11.893	500	500	500
Reach 3	11.798	500	500	500
Reach 3	11.703	500	500	500
Reach 3	11.609	194.37	194.37	194.37
Reach 3	11.572	218.29	218.29	218.29
Reach 3	11.531	237.2	237.2	237.2
Reach 3	11.486	500	500	500
Reach 3	11.391	335.09	335.09	335.09
Reach 3	11.328	36.18	36.18	36.18
Reach 3	11.321	65.83	65.83	65.83
Reach 3	11.308	58.67	58.67	58.67
Reach 3	11.297	140	195.02	255
Reach 3	11.26	57.31	57.31	57.31
Reach 3	11.254	Bridge		
Reach 3	11.249	150	95.09	40
Reach 3	11.231	221.88	221.88	221.88
Reach 3	11.189	276	326.49	374
Reach 3	11.127	500	500	500
Reach 3	11.033	500	500	500
Reach 3	10.938	500	500	500
Reach 3	10.843	500	500	500
Reach 3	10.749	500	500	500
Reach 3	10.654	465.44	465.44	465.44
Reach 3	10.566	280	250	222
Reach 3	10.518	460	408.26	365
Reach 3	10.441	500	500	500
Reach 3	10.346	500	500	500
Reach 3	10.252	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EMF

Reach	River Sta.	Contr.	Expan.
Reach 3	11.893	.1	.3
Reach 3	11.798	.1	.3
Reach 3	11.703	.1	.3
Reach 3	11.609	.1	.3
Reach 3	11.572	.1	.3
Reach 3	11.531	.1	.3
Reach 3	11.486	.1	.3
Reach 3	11.391	.1	.3
Reach 3	11.328	.3	.5
Reach 3	11.321	.3	.5
Reach 3	11.308	.3	.5
Reach 3	11.297	.3	.5
Reach 3	11.26	.3	.5
Reach 3	11.254	Bridge	
Reach 3	11.249	.3	.5
Reach 3	11.231	.3	.5
Reach 3	11.189	.1	.3
Reach 3	11.127	.1	.3
Reach 3	11.033	.1	.3
Reach 3	10.938	.1	.3
Reach 3	10.843	.1	.3
Reach 3	10.749	.1	.3
Reach 3	10.654	.1	.3
Reach 3	10.566	.1	.3
Reach 3	10.518	.1	.3
Reach 3	10.441	.1	.3
Reach 3	10.346	.1	.3
Reach 3	10.252	.3	.5

Profile Output Table - Standard Table 1

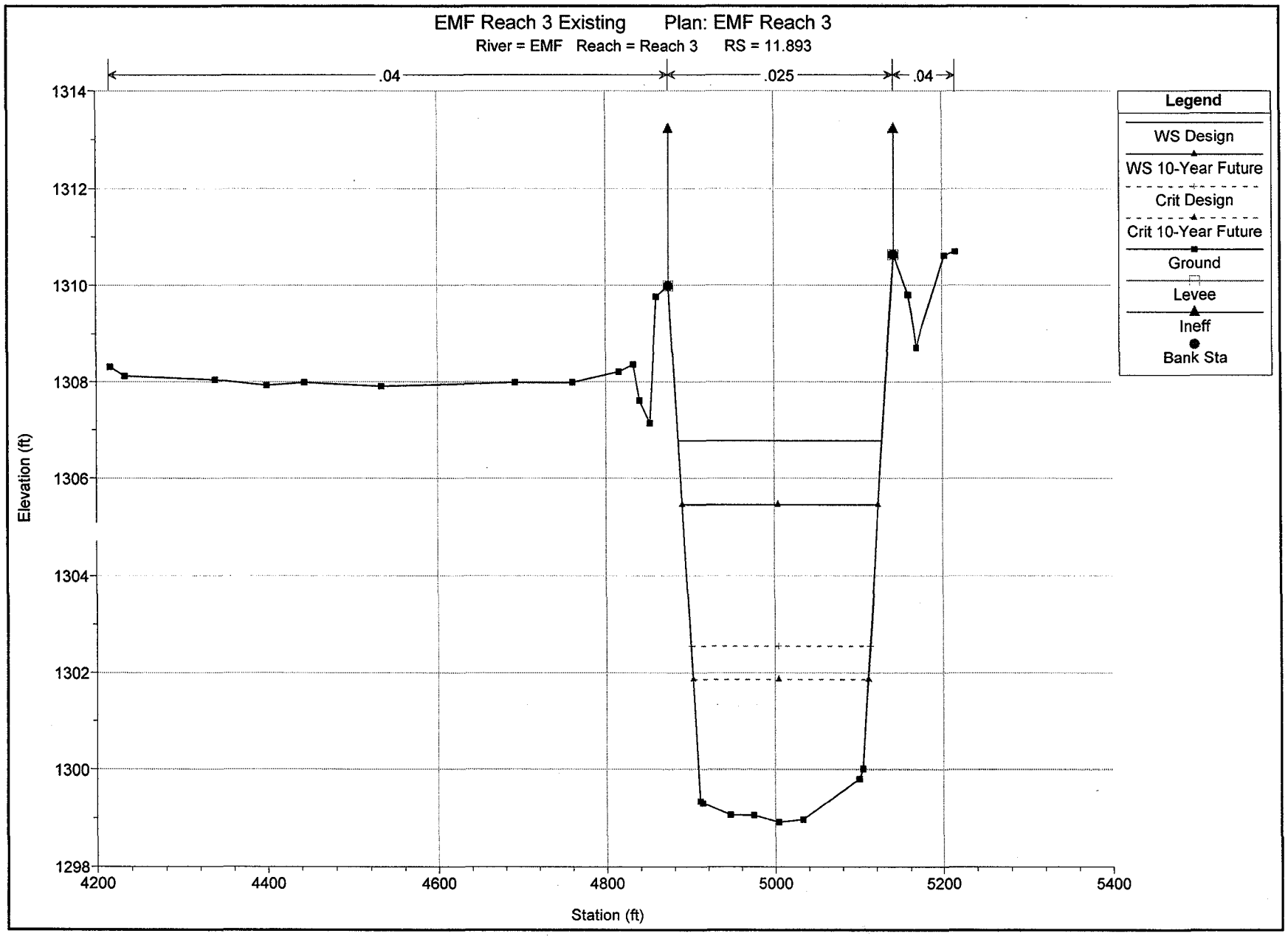
Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	11.893	6900.00	1298.92	1306.8	1302.55	1307.05	0.000395	4.20	1641.57	242.66	0.28
Reach 3	11.893	4860.00	1298.92	1305.5	1301.86	1305.67	0.000377	3.66	1327.53	233.49	0.27
Reach 3	11.798	6900.00	1298.88	1306.6	1302.41	1306.84	0.000408	4.25	1624.78	241.92	0.29
Reach 3	11.798	4860.00	1298.88	1305.3	1301.72	1305.47	0.000388	3.69	1316.26	233.20	0.27
Reach 3	11.703	6900.00	1298.89	1306.3	1302.43	1306.63	0.000459	4.41	1565.05	241.14	0.30
Reach 3	11.703	4860.00	1298.89	1305.0	1301.74	1305.26	0.000447	3.86	1258.37	231.99	0.29
Reach 3	11.609	6900.00	1298.60	1306.1	1302.36	1306.40	0.000472	4.42	1560.64	244.51	0.31
Reach 3	11.609	4860.00	1298.60	1304.8	1301.67	1305.03	0.000470	3.89	1249.31	236.65	0.30
Reach 3	11.572	6900.00	1298.72	1306.0	1302.32	1306.29	0.000511	4.57	1510.35	238.56	0.32
Reach 3	11.572	4860.00	1298.72	1304.7	1301.64	1304.93	0.000508	4.02	1208.96	230.71	0.31
Reach 3	11.531	6900.00	1298.47	1305.8	1302.28	1306.17	0.000529	4.60	1500.21	241.04	0.32
Reach 3	11.531	4860.00	1298.47	1304.6	1301.60	1304.82	0.000529	4.06	1198.09	232.86	0.32
Reach 3	11.486	6900.00	1298.78	1305.7	1302.31	1306.03	0.000572	4.69	1469.68	242.89	0.34
Reach 3	11.486	4860.00	1298.78	1304.4	1301.65	1304.68	0.000587	4.17	1164.58	234.60	0.33
Reach 3	11.391	6900.00	1297.90	1305.4	1301.88	1305.75	0.000528	4.58	1505.24	242.77	0.32
Reach 3	11.391	4860.00	1297.90	1304.1	1301.20	1304.40	0.000532	4.05	1199.03	234.44	0.32
Reach 3	11.328	6900.00	1297.09	1305.2	1301.55	1305.58	0.000522	4.62	1493.21	235.94	0.32
Reach 3	11.328	4860.00	1297.09	1304.0	1300.86	1304.22	0.000510	4.06	1198.02	226.51	0.31
Reach 3	11.321	6900.00	1298.50	1303.1	1303.07	1305.05	0.001623	11.31	610.14	152.45	1.00
Reach 3	11.321	4860.00	1298.50	1302.1	1302.14	1303.78	0.001721	10.27	473.09	143.38	1.00
Reach 3	11.308	6900.00	1292.92	1302.7	1297.83	1303.04	0.000124	4.87	1416.57	186.79	0.31
Reach 3	11.308	4860.00	1292.92	1300.3	1296.88	1300.67	0.000174	4.88	995.08	168.38	0.35
Reach 3	11.297	6900.00	1292.99	1302.7	1297.07	1302.94	0.000333	3.59	1921.73	240.03	0.22
Reach 3	11.297	4860.00	1292.99	1300.4	1296.36	1300.56	0.000462	3.54	1371.01	223.83	0.25
Reach 3	11.26	6900.00	1292.61	1302.7	1296.49	1302.87	0.000239	3.13	2204.21	264.66	0.19
Reach 3	11.26	4860.00	1292.61	1300.3	1295.83	1300.47	0.000323	3.06	1589.98	248.37	0.21
Reach 3	11.254	Bridge									
Reach 3	11.249	6900.00	1292.90	1302.7	1296.68	1302.83	0.000264	3.24	2128.41	261.10	0.20
Reach 3	11.249	4860.00	1292.90	1300.3	1296.01	1300.42	0.000369	3.20	1519.34	244.85	0.23

Reach 3	11.231	8100.00	1292.83	1302.6	1296.72	1302.78	0.000340	3.71	2182.31	274.07	0.23
Reach 3	11.231	4980.00	1292.83	1300.2	1295.73	1300.38	0.000340	3.14	1585.82	246.72	0.22
Reach 3	11.189	8100.00	1292.91	1302.5	1296.92	1302.69	0.000374	3.84	2117.48	283.91	0.24
Reach 3	11.189	4980.00	1292.91	1300.1	1295.91	1300.29	0.000388	3.27	1520.65	244.93	0.23
Reach 3	11.127	8100.00	1292.91	1302.3	1296.77	1302.57	0.000368	3.82	2126.07	281.90	0.24
Reach 3	11.127	4980.00	1292.91	1300.0	1295.78	1300.17	0.000382	3.26	1527.69	245.43	0.23
Reach 3	11.033	8100.00	1292.62	1302.1	1296.65	1302.38	0.000384	3.89	2083.02	260.47	0.24
Reach 3	11.033	4980.00	1292.62	1299.8	1295.65	1299.98	0.000400	3.32	1498.58	242.16	0.24
Reach 3	10.938	8100.00	1292.32	1302.0	1296.40	1302.19	0.000371	3.83	2121.77	285.20	0.24
Reach 3	10.938	4980.00	1292.32	1299.6	1295.38	1299.78	0.000386	3.27	1521.08	244.37	0.23
Reach 3	10.843	8100.00	1292.11	1301.8	1295.98	1302.04	0.000235	3.74	2171.36	281.59	0.23
Reach 3	10.843	4980.00	1292.11	1299.5	1294.99	1299.63	0.000236	3.16	1577.12	243.55	0.22
Reach 3	10.749	8100.00	1292.01	1301.7	1296.09	1301.91	0.000257	3.85	2105.67	257.22	0.24
Reach 3	10.749	4980.00	1292.01	1299.3	1295.08	1299.50	0.000266	3.28	1519.52	242.47	0.23
Reach 3	10.654	8100.00	1292.21	1301.5	1296.17	1301.78	0.000283	3.97	2038.96	255.20	0.25
Reach 3	10.654	4980.00	1292.21	1299.2	1295.16	1299.36	0.000302	3.42	1456.43	240.03	0.24
Reach 3	10.566	8100.00	1291.71	1301.4	1295.92	1301.65	0.000274	3.94	2056.61	254.23	0.24
Reach 3	10.566	4980.00	1291.71	1299.0	1294.90	1299.22	0.000287	3.38	1475.24	238.56	0.24
Reach 3	10.518	8100.00	1291.83	1301.3	1295.90	1301.57	0.000276	3.94	2058.39	256.45	0.24
Reach 3	10.518	4980.00	1291.83	1299.0	1294.90	1299.14	0.000294	3.39	1470.71	240.79	0.24
Reach 3	10.441	8100.00	1291.27	1301.2	1295.26	1301.46	0.000230	3.70	2187.04	259.80	0.22
Reach 3	10.441	4980.00	1291.27	1298.9	1294.25	1299.03	0.000228	3.13	1592.07	243.05	0.22
Reach 3	10.346	8100.00	1291.09	1301.1	1294.97	1301.34	0.000208	3.57	2271.12	264.70	0.21
Reach 3	10.346	4980.00	1291.09	1298.8	1293.98	1298.92	0.000204	2.99	1663.03	249.07	0.20
Reach 3	10.252	8100.00	1291.01	1301.0	1295.16	1301.23	0.000246	3.81	2125.84	254.72	0.23
Reach 3	10.252	4980.00	1291.01	1298.6	1294.15	1298.80	0.000247	3.23	1543.78	238.56	0.22

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 3	11.893	1307.05	1306.78	0.27	0.20	0.00		6900.00		242.66
Reach 3	11.893	1305.67	1305.46	0.21	0.19	0.00		4860.00		233.49
Reach 3	11.798	1306.84	1306.56	0.28	0.22	0.00		6900.00		241.92
Reach 3	11.798	1305.47	1305.26	0.21	0.21	0.00		4860.00		233.20
Reach 3	11.703	1306.63	1306.33	0.30	0.23	0.00		6900.00		241.14
Reach 3	11.703	1305.26	1305.03	0.23	0.23	0.00		4860.00		231.99
Reach 3	11.609	1306.40	1306.09	0.30	0.10	0.00		6900.00		244.51
Reach 3	11.609	1305.03	1304.80	0.23	0.09	0.00		4860.00		236.65
Reach 3	11.572	1306.29	1305.96	0.32	0.11	0.00		6900.00		238.56
Reach 3	11.572	1304.93	1304.68	0.25	0.11	0.00		4860.00		230.71
Reach 3	11.531	1306.17	1305.84	0.33	0.13	0.00		6900.00		241.04
Reach 3	11.531	1304.82	1304.56	0.26	0.13	0.00		4860.00		232.86
Reach 3	11.486	1306.03	1305.69	0.34	0.27	0.00		6900.00		242.89
Reach 3	11.486	1304.68	1304.41	0.27	0.28	0.00		4860.00		234.60
Reach 3	11.391	1305.75	1305.43	0.33	0.18	0.00		6900.00		242.77
Reach 3	11.391	1304.40	1304.14	0.26	0.17	0.00		4860.00		234.44
Reach 3	11.328	1305.58	1305.24	0.33	0.03	0.50		6900.00		235.94
Reach 3	11.328	1304.22	1303.97	0.26	0.03	0.41		4860.00		226.51
Reach 3	11.321	1305.05	1303.07	1.99	0.02	0.81		6900.00		152.45
Reach 3	11.321	1303.78	1302.14	1.64	0.03	0.63		4860.00		143.38
Reach 3	11.308	1303.04	1302.67	0.37	0.01	0.08		6900.00		186.79
Reach 3	11.308	1300.67	1300.29	0.37	0.02	0.09		4860.00		168.38
Reach 3	11.297	1302.94	1302.74	0.20	0.05	0.02		6900.00		240.03
Reach 3	11.297	1300.56	1300.37	0.20	0.07	0.03		4860.00		223.83
Reach 3	11.26	1302.87	1302.72	0.15	0.00	0.00		6900.00		264.66
Reach 3	11.26	1300.47	1300.32	0.15	0.00	0.00		4860.00		248.37
Reach 3	11.254	Bridge								
Reach 3	11.249	1302.83	1302.67	0.16	0.03	0.02		6900.00		261.10
Reach 3	11.249	1300.42	1300.26	0.16	0.03	0.00		4860.00		244.85

Reach 3	11.231	1302.78	1302.56	0.21	0.08	0.00	0.24	8099.76	274.07
Reach 3	11.231	1300.38	1300.23	0.15	0.08	0.00		4980.00	246.72
Reach 3	11.189	1302.69	1302.46	0.23	0.12	0.00	2.54	8097.46	283.91
Reach 3	11.189	1300.29	1300.12	0.17	0.13	0.00		4980.00	244.93
Reach 3	11.127	1302.57	1302.34	0.23	0.19	0.00	2.16	8097.84	281.90
Reach 3	11.127	1300.17	1300.00	0.17	0.20	0.00		4980.00	245.43
Reach 3	11.033	1302.38	1302.15	0.23	0.19	0.00	0.03	8099.97	260.47
Reach 3	11.033	1299.98	1299.81	0.17	0.20	0.00		4980.00	242.16
Reach 3	10.938	1302.19	1301.96	0.23	0.15	0.00	2.90	8097.10	285.20
Reach 3	10.938	1299.78	1299.61	0.17	0.15	0.00		4980.00	244.37
Reach 3	10.843	1302.04	1301.82	0.22	0.12	0.00	1.28	8098.72	281.59
Reach 3	10.843	1299.63	1299.47	0.15	0.13	0.00		4980.00	243.55
Reach 3	10.749	1301.91	1301.68	0.23	0.13	0.00		8100.00	257.22
Reach 3	10.749	1299.50	1299.33	0.17	0.14	0.00		4980.00	242.47
Reach 3	10.654	1301.78	1301.53	0.25	0.13	0.00		8100.00	255.20
Reach 3	10.654	1299.36	1299.18	0.18	0.14	0.00		4980.00	240.03
Reach 3	10.566	1301.65	1301.41	0.24	0.07	0.00		8100.00	254.23
Reach 3	10.566	1299.22	1299.05	0.18	0.07	0.00		4980.00	238.56
Reach 3	10.518	1301.57	1301.33	0.24	0.10	0.01		8100.00	256.45
Reach 3	10.518	1299.14	1298.97	0.18	0.11	0.01		4980.00	240.79
Reach 3	10.441	1301.46	1301.24	0.21	0.11	0.00		8100.00	259.80
Reach 3	10.441	1299.03	1298.88	0.15	0.11	0.00		4980.00	243.05
Reach 3	10.346	1301.34	1301.14	0.20	0.11	0.00		8100.00	264.70
Reach 3	10.346	1298.92	1298.78	0.14	0.11	0.00		4980.00	249.07
Reach 3	10.252	1301.23	1301.00	0.23				8100.00	254.72
Reach 3	10.252	1298.80	1298.64	0.16				4980.00	238.56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.025
.04
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1312
1310
1308
1306
1304
1302
1300
1298
4200
4400
4600
4800
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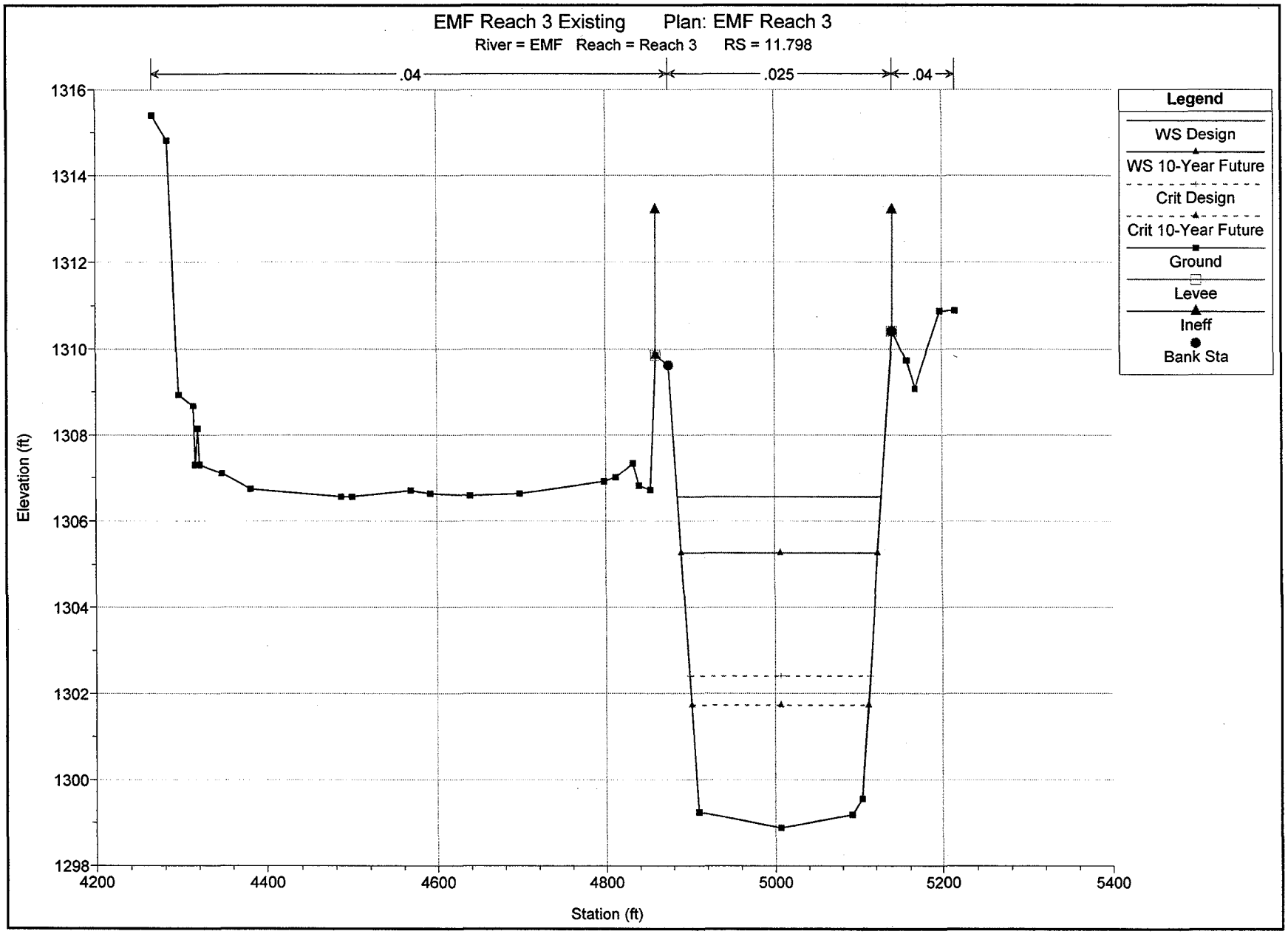
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1316
1314
1312
1310
1308
1306
1304
1302
1300
1298
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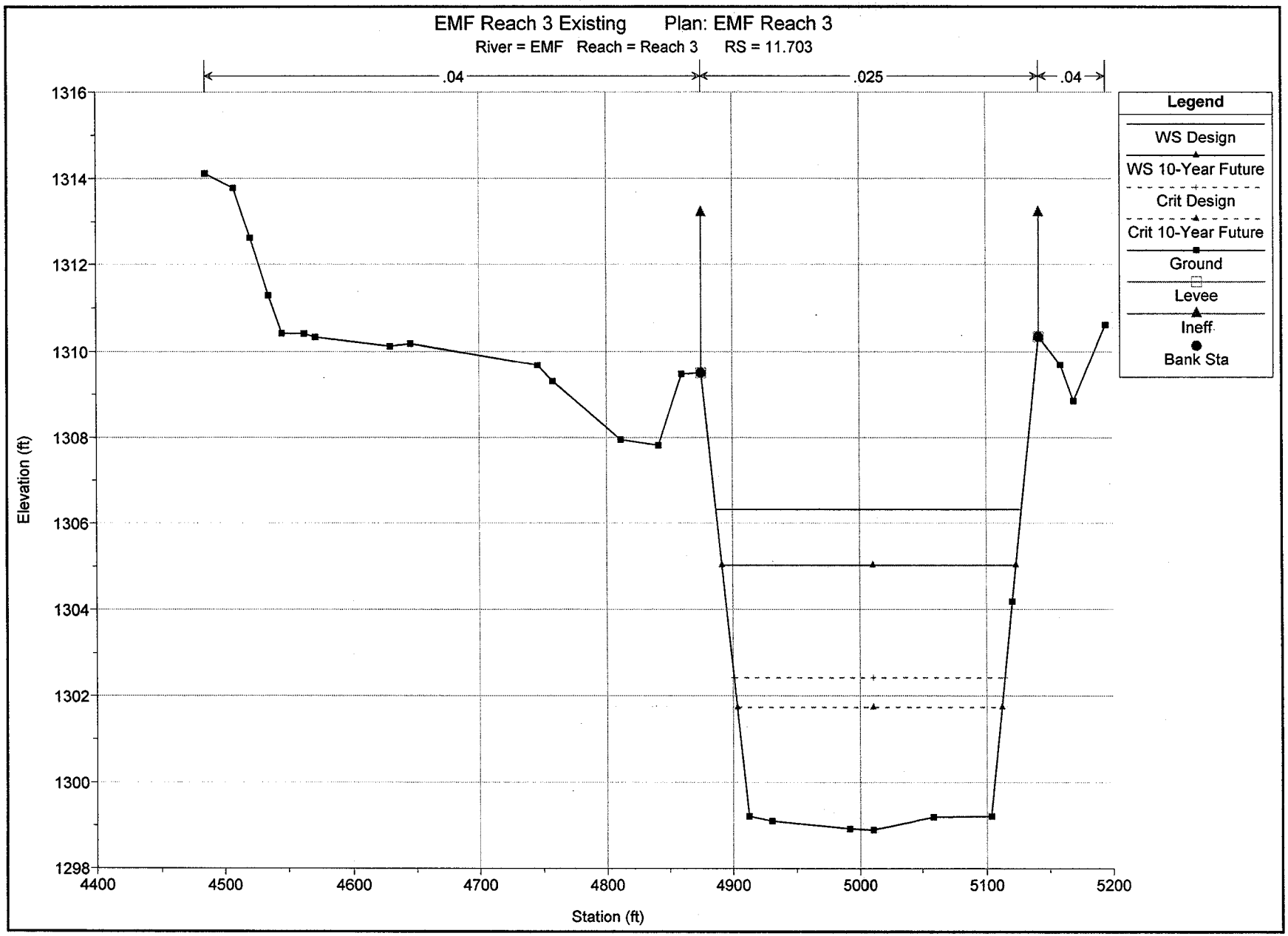
4400
4600
4800
5000
5200
5400
Station (ft)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WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1316
1314
1312
1310
1308
1306
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1302
1300
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5000
5100
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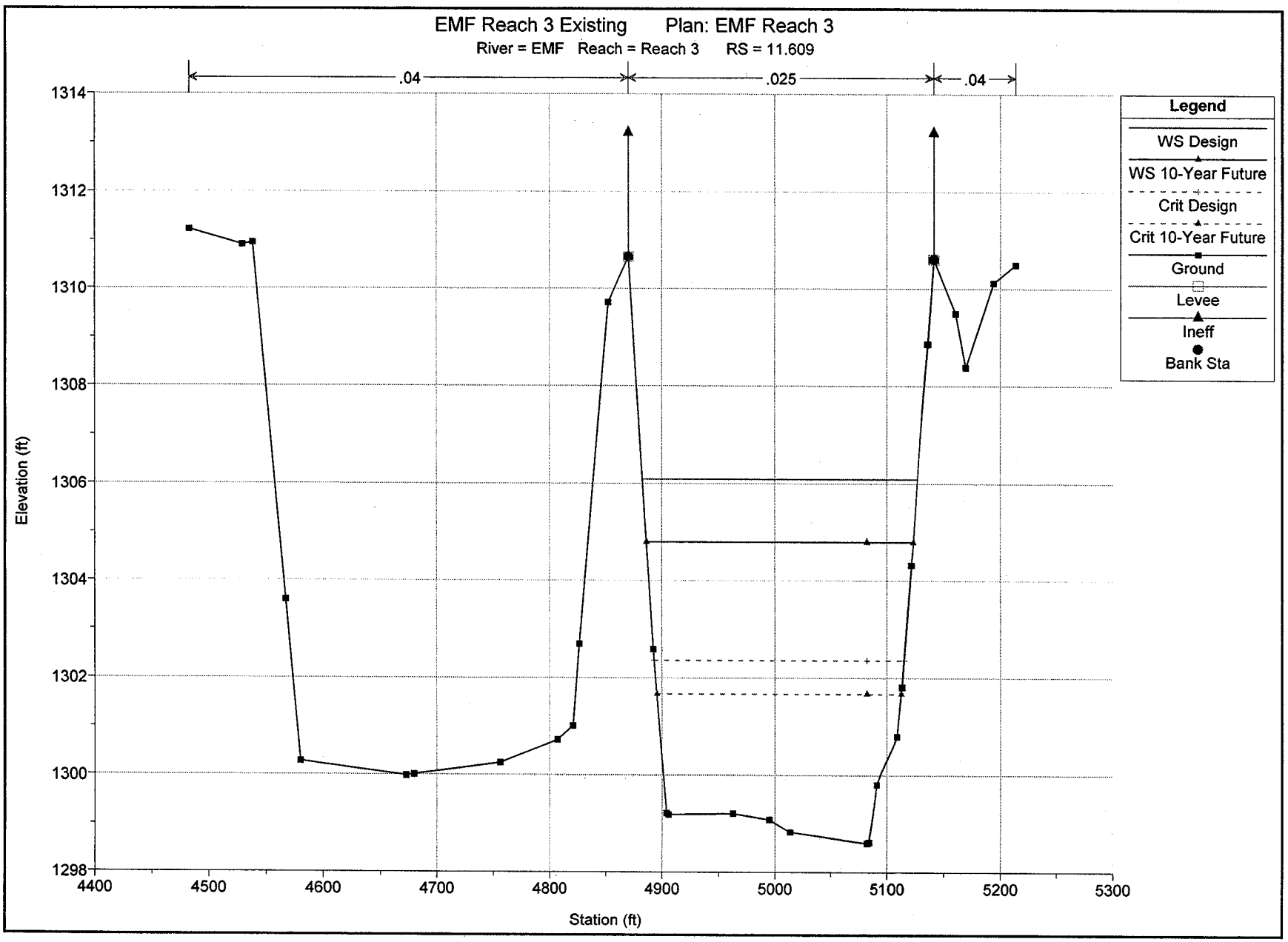
Station (ft)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1302
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1298
4400
4500
4600
4700
4800
4900
5000
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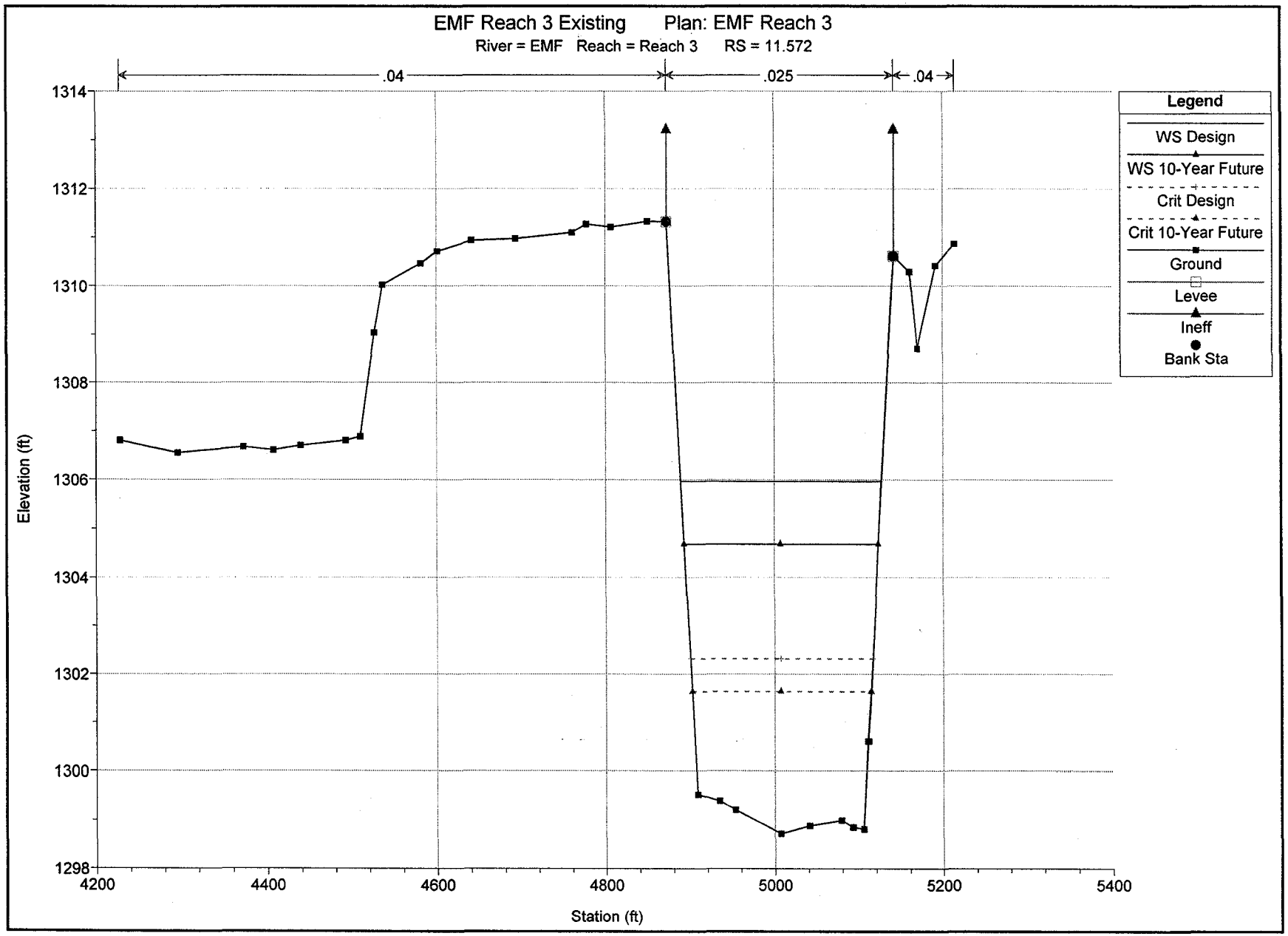
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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.04
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1300
1298
4200
4400
4600
4800
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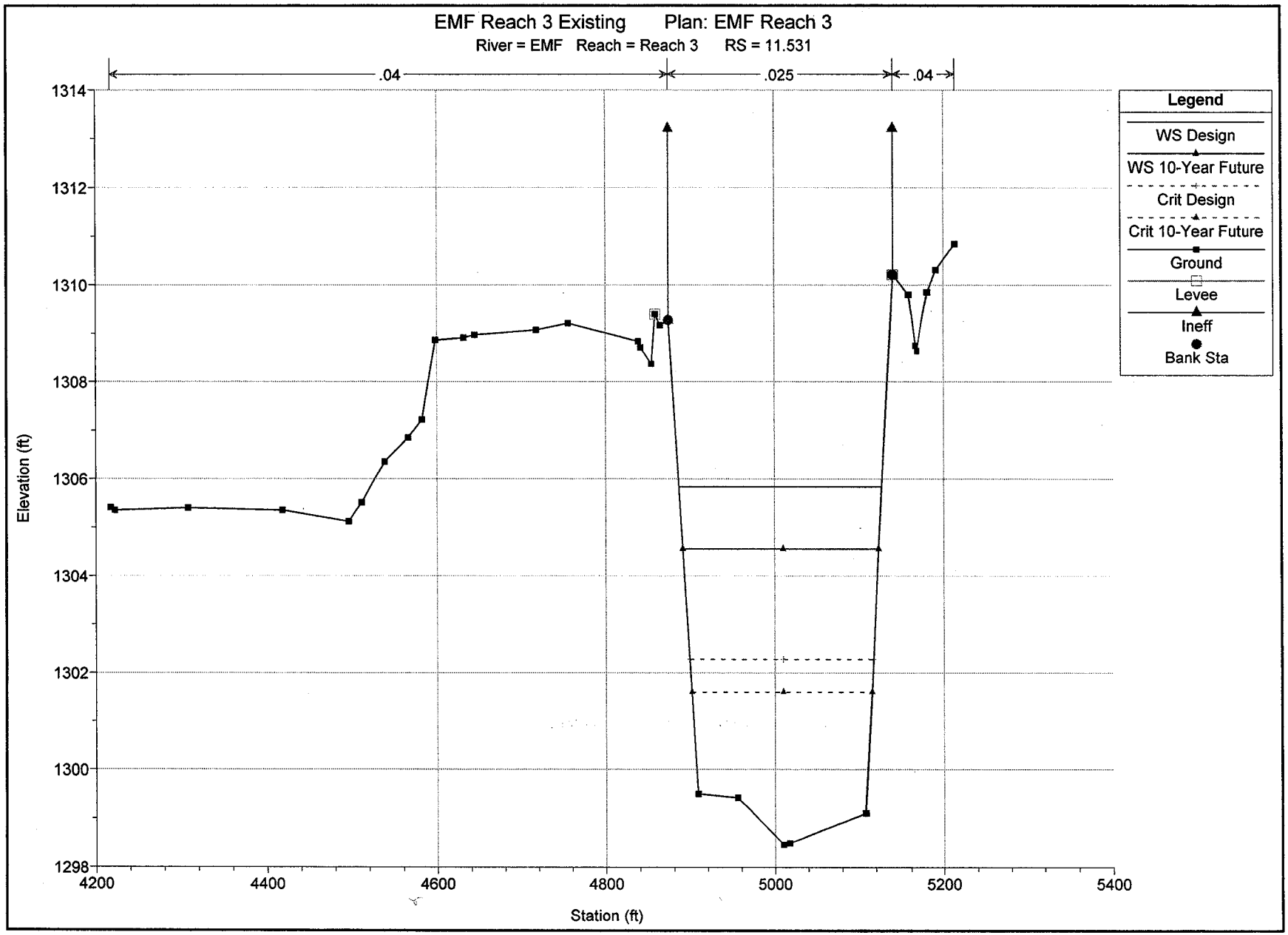
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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.04
Elevation (ft)
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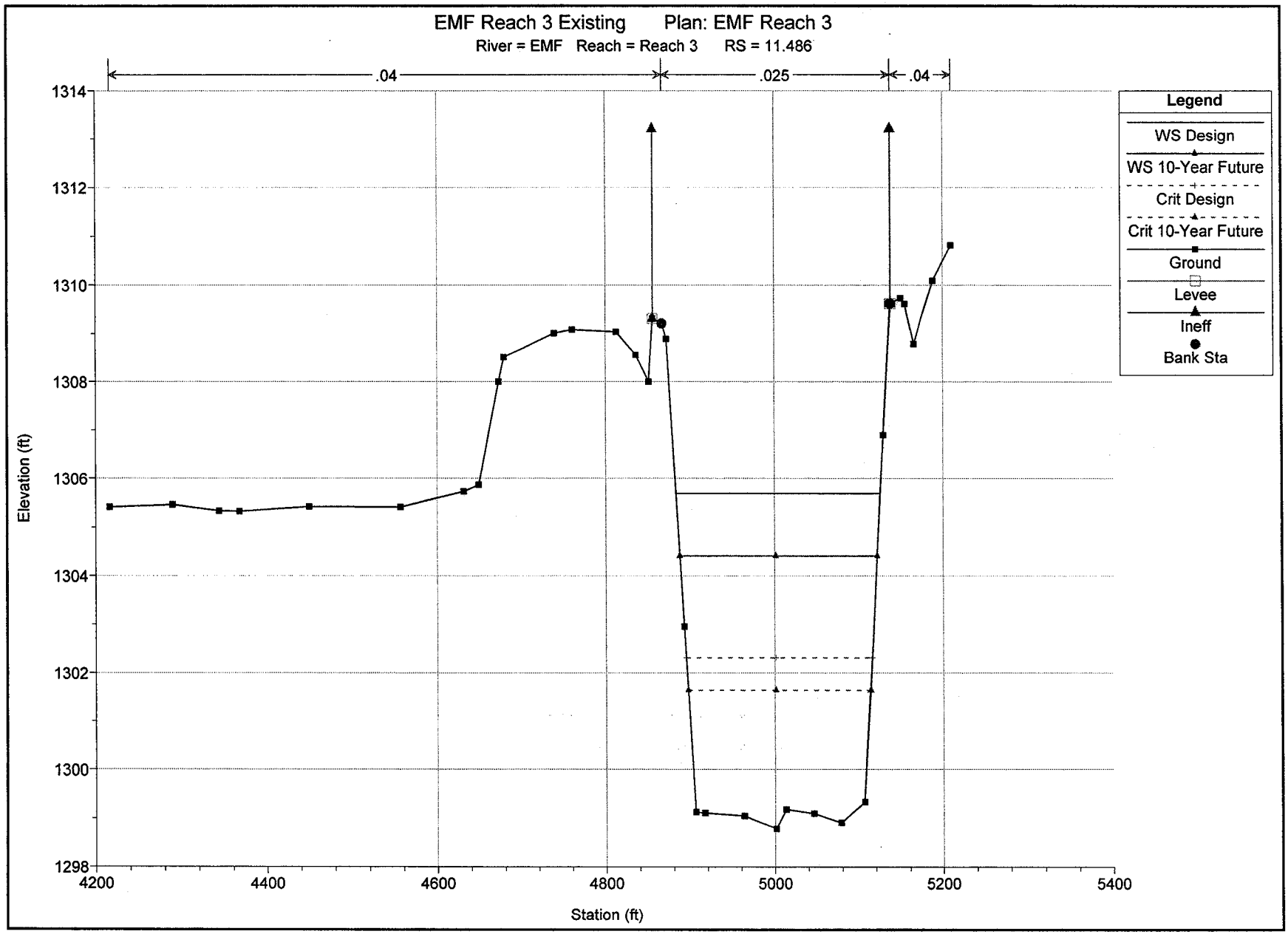
1308
1306
1304
1302
1300
1298
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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.04
Elevation (ft)
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1308
1306
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1302
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1298
4200
4400
4600
4800
5000
5200
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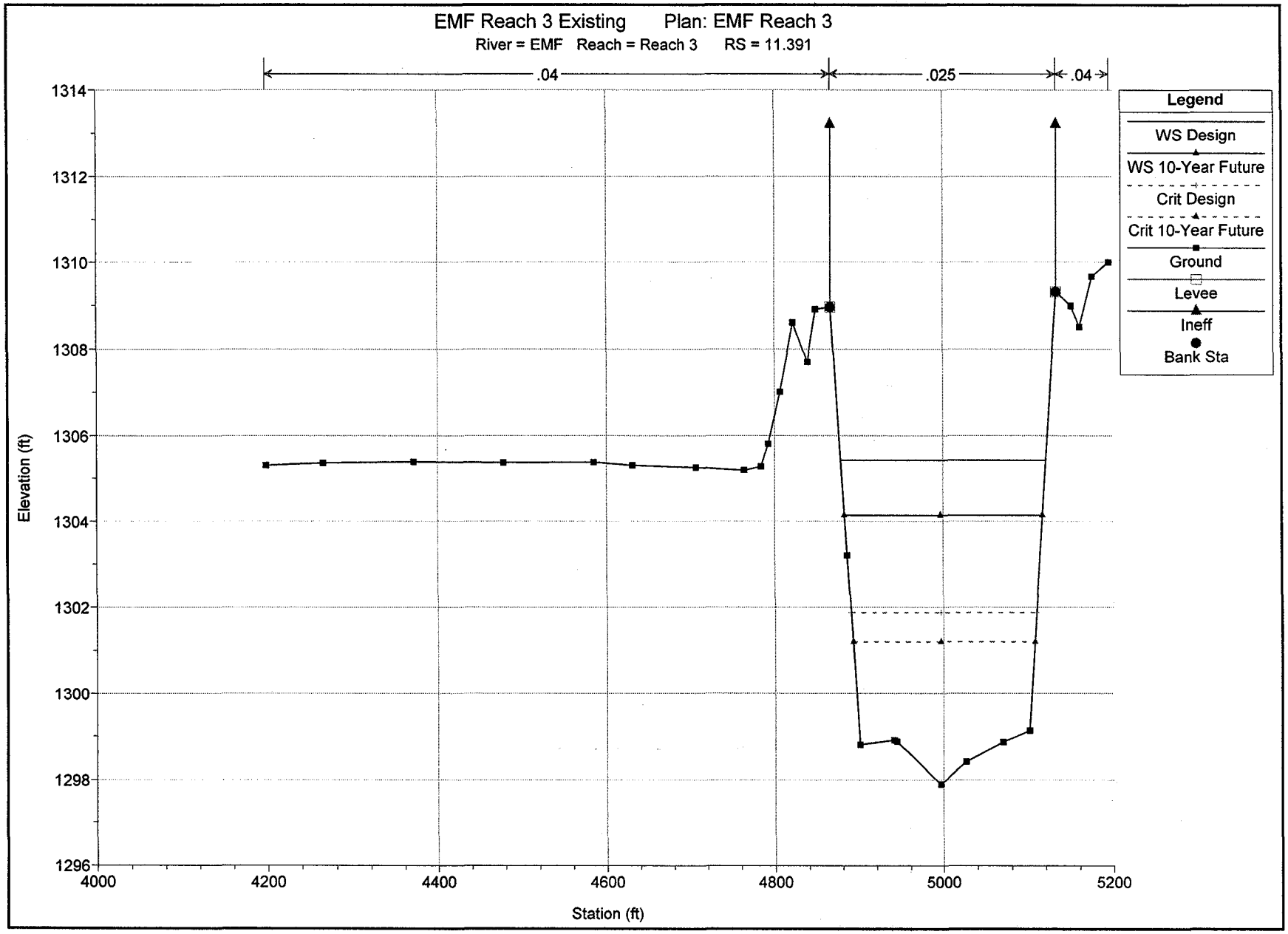
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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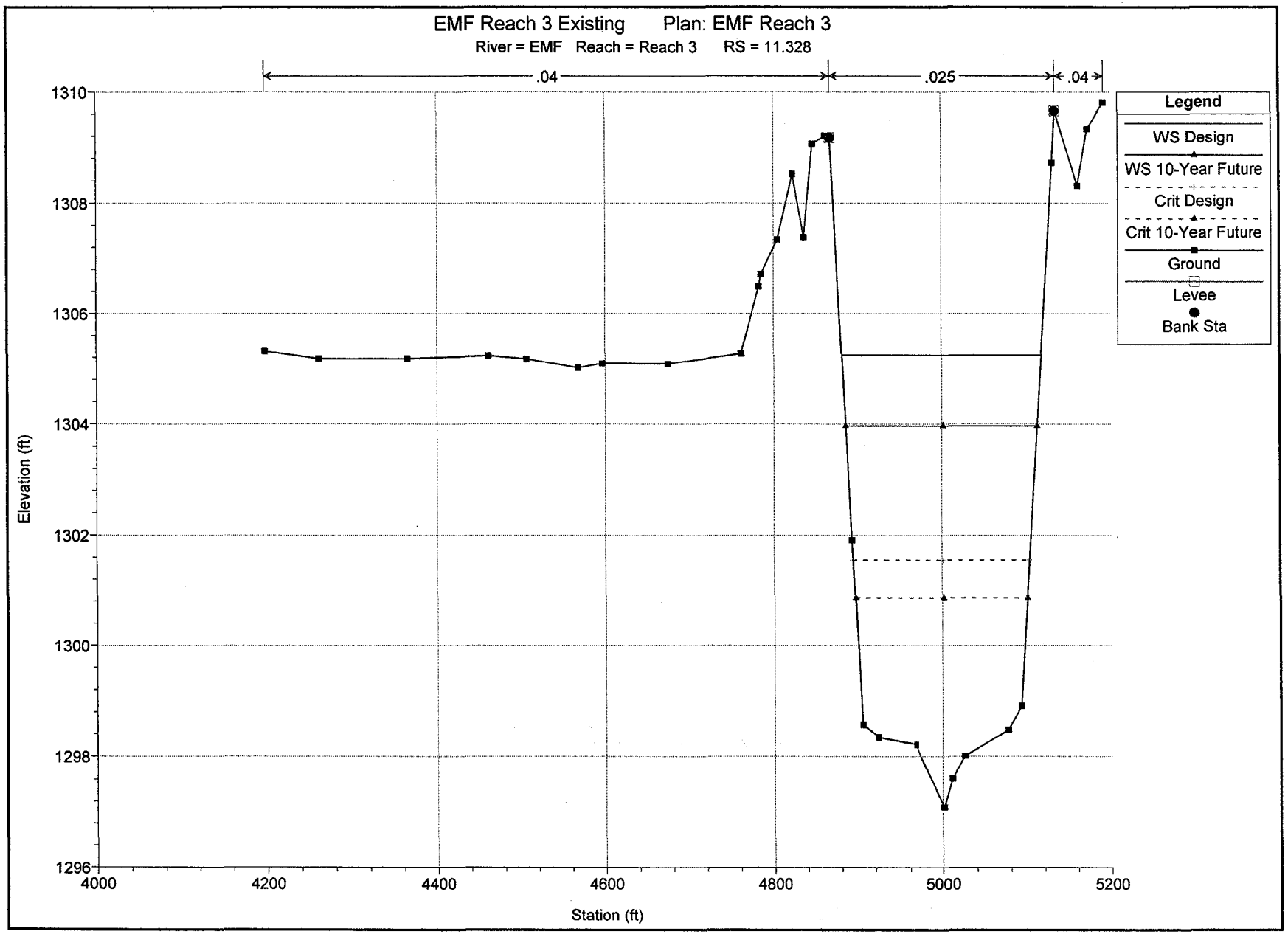
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1314
1312
1310
1308
1306
1304
1302
1300
1298
1296
4000
4200
4400
4600
4800
5000
5200
Station (ft)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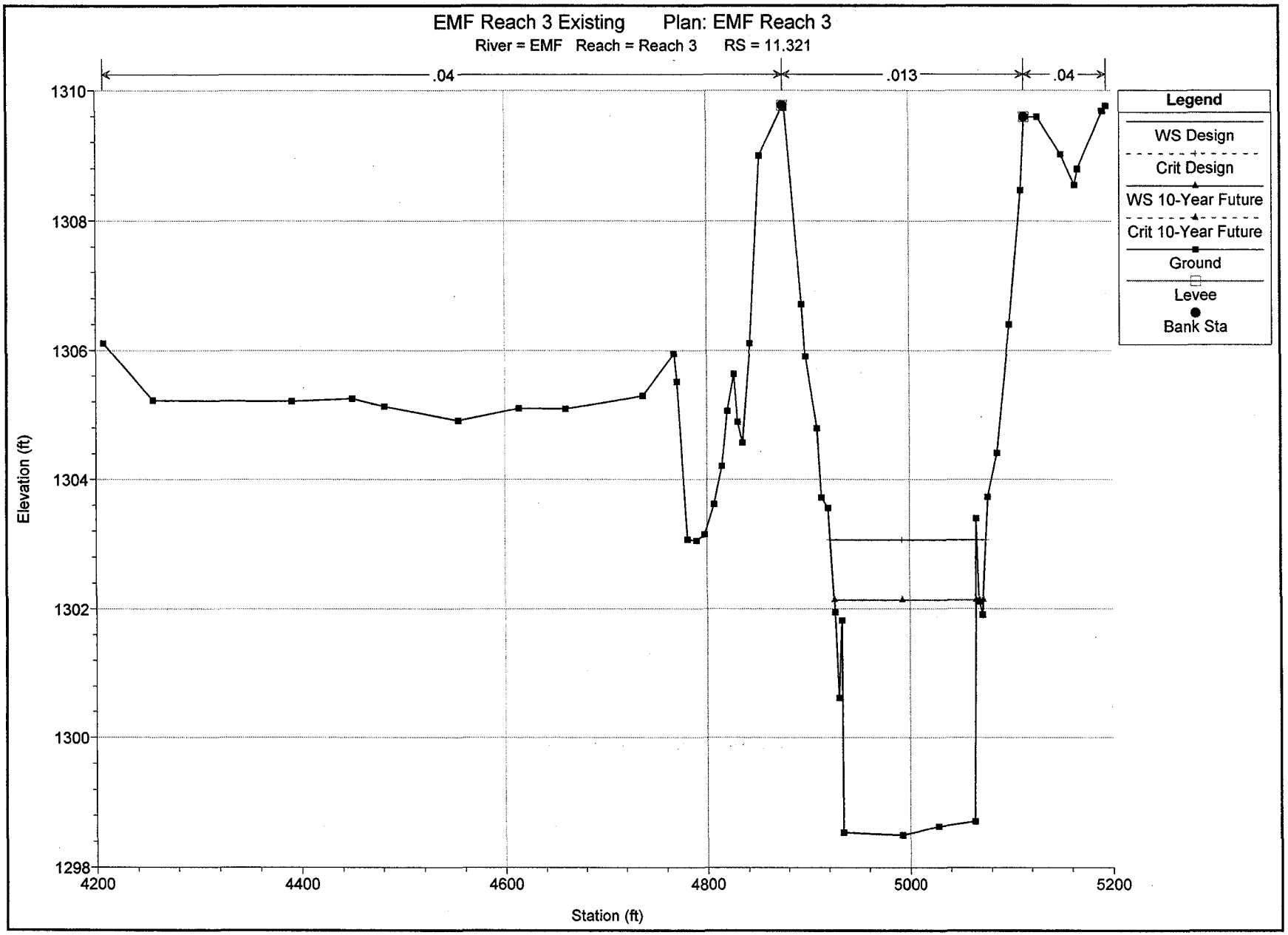
.025
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
1308
1306
1304
1302
1300
1298
1296
4000
4200
4400
4600
4800
5000
5200
Station (ft)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.04
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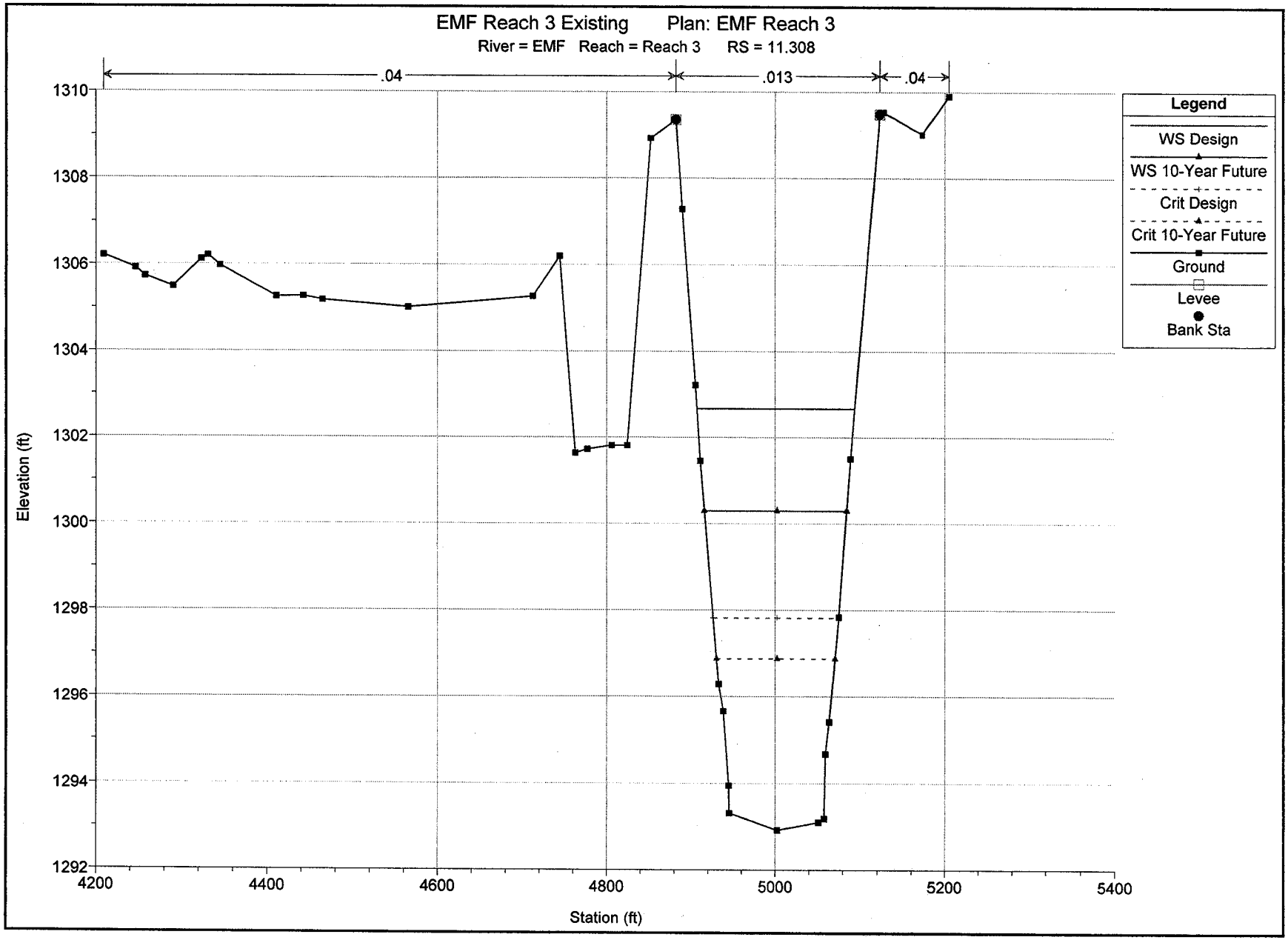
.04
Legend
WS Design
Crit Design
WS 10-Year Future
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
1308
1306
1304
1302
1300
1298
4200
4400
4600
4800
5000
5200
Station (ft)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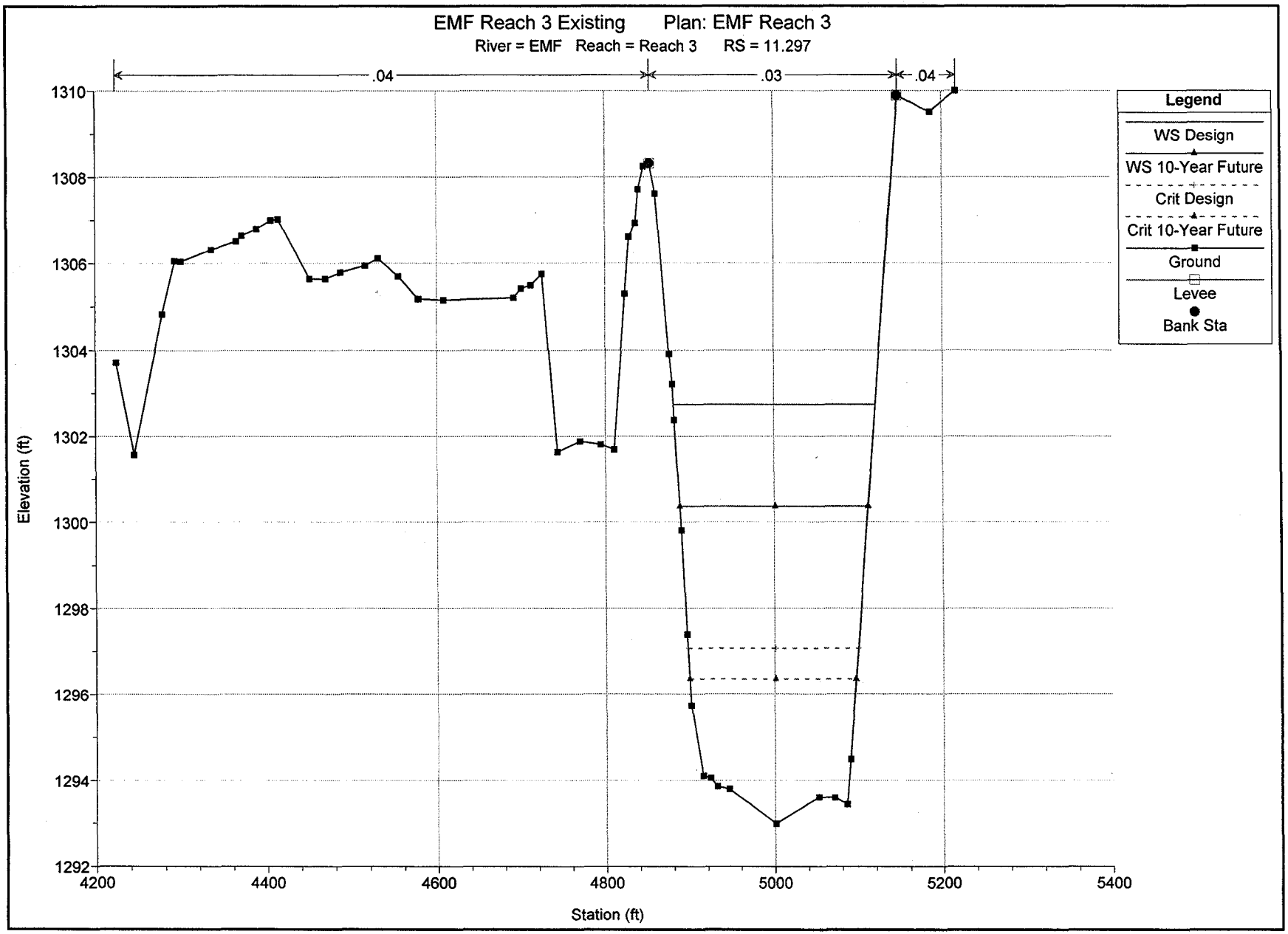
.04
Elevation (ft)
1310
1308
1306
1304
1302
1300
1298
1296
1294
1292
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta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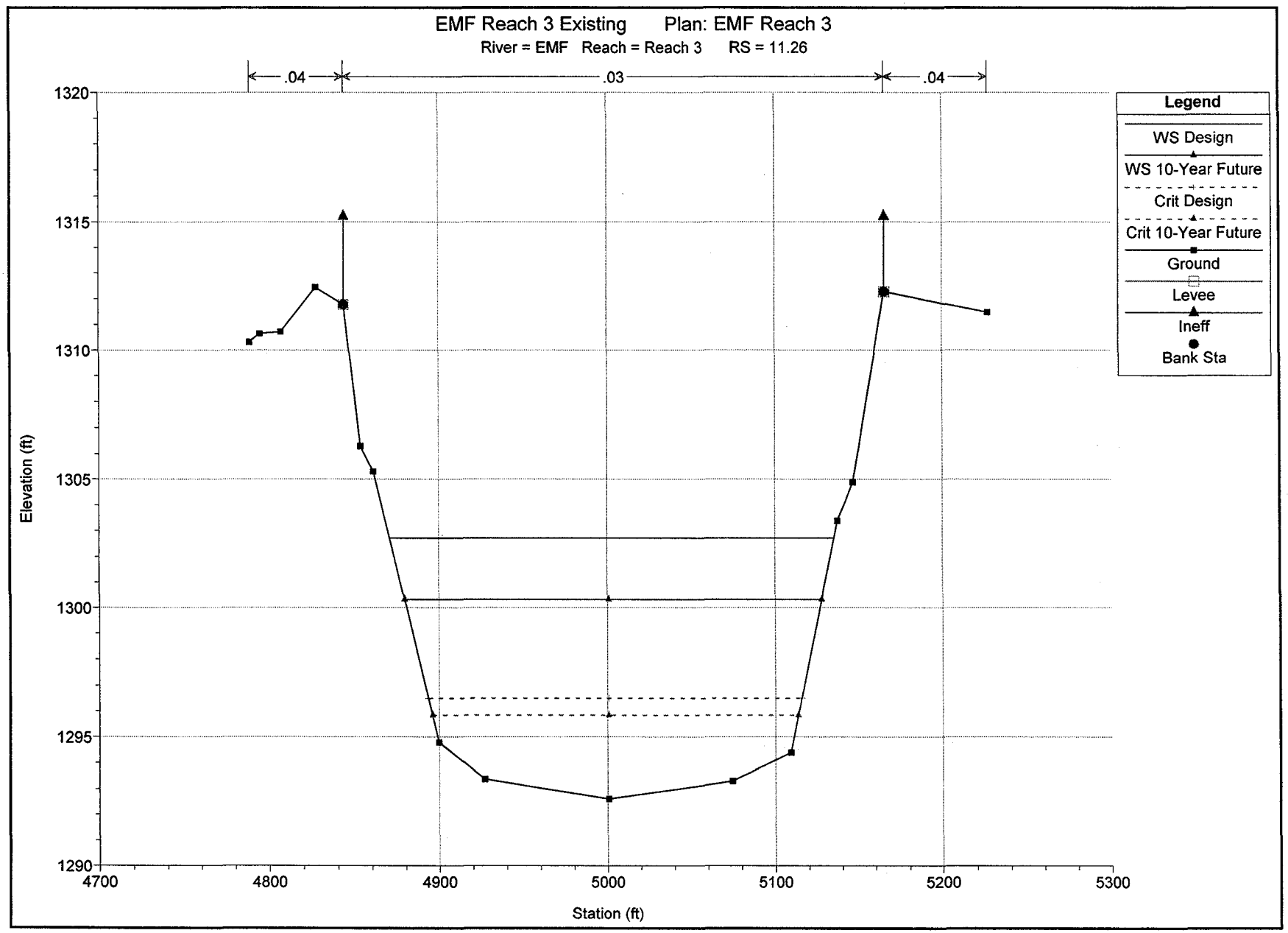
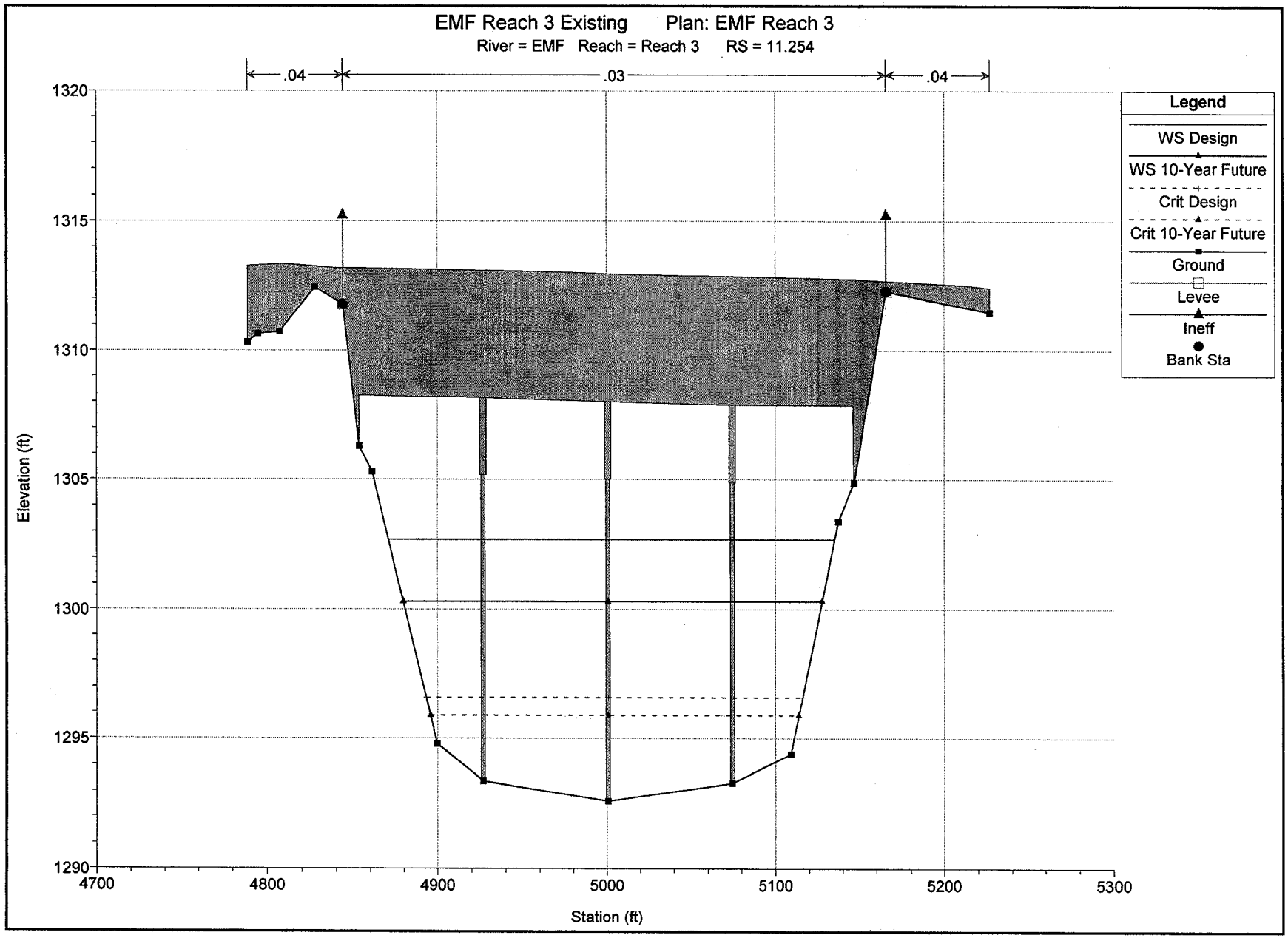
River = EMF Reach = Reach 3 RS = 11.297
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
1308
1306
1304
1302
1300
1298
1296
1294
1292
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.26
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1320
1315
1310
1305
1300
1295
1290
4700
4800
4900
5000
5100
5200
5300
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.254
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1320
1315
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1305
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1290
4700
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4900
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5100
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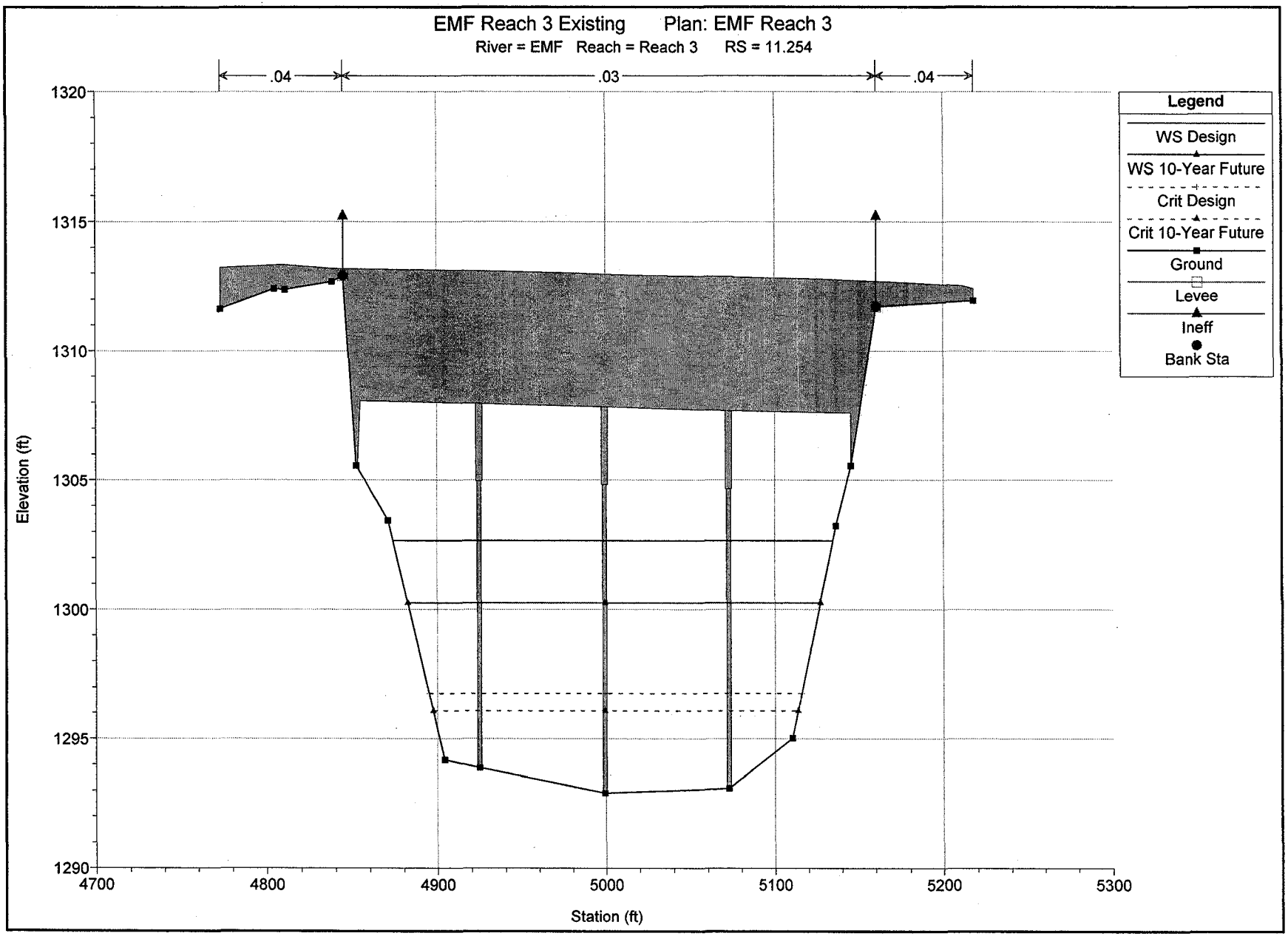
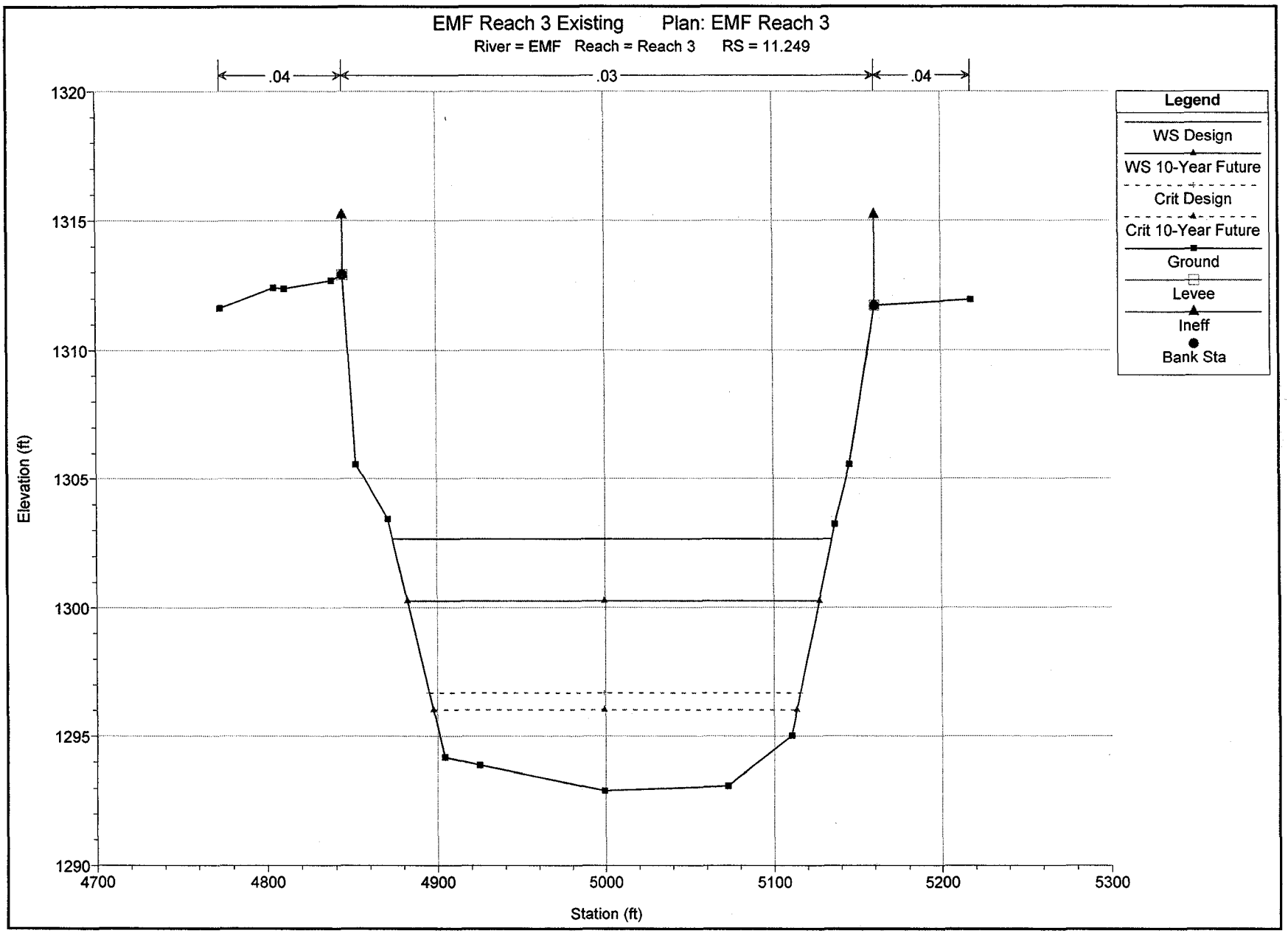
5300
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.254
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1320
1315
1310
1305
1300
1295
1290
4700
4800
4900
5000
5100
5200
5300
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.249
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1320
1315
1310
1305
1300
1295
1290
4700
4800
4900
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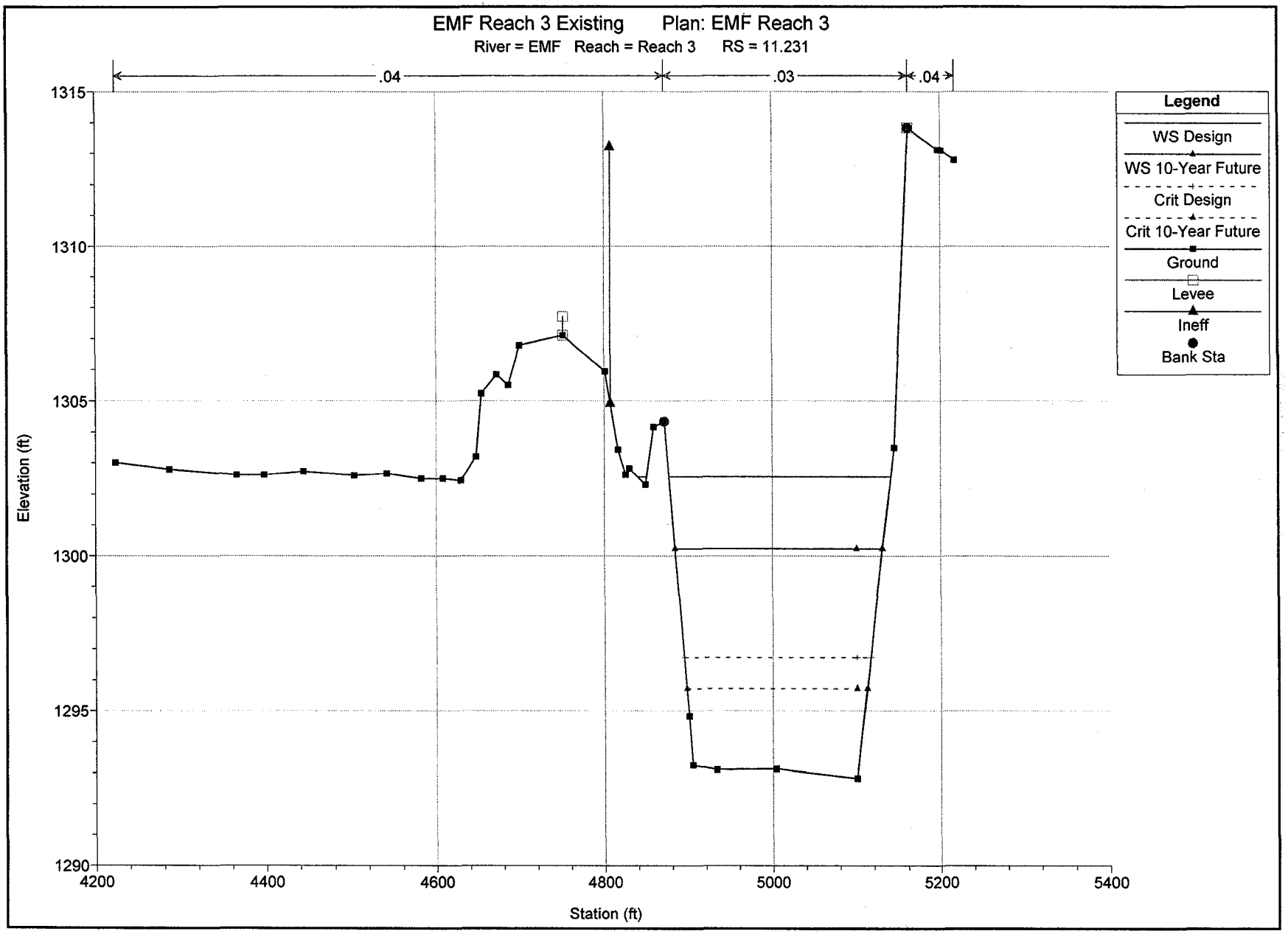
5100
5200
5300
Station (ft)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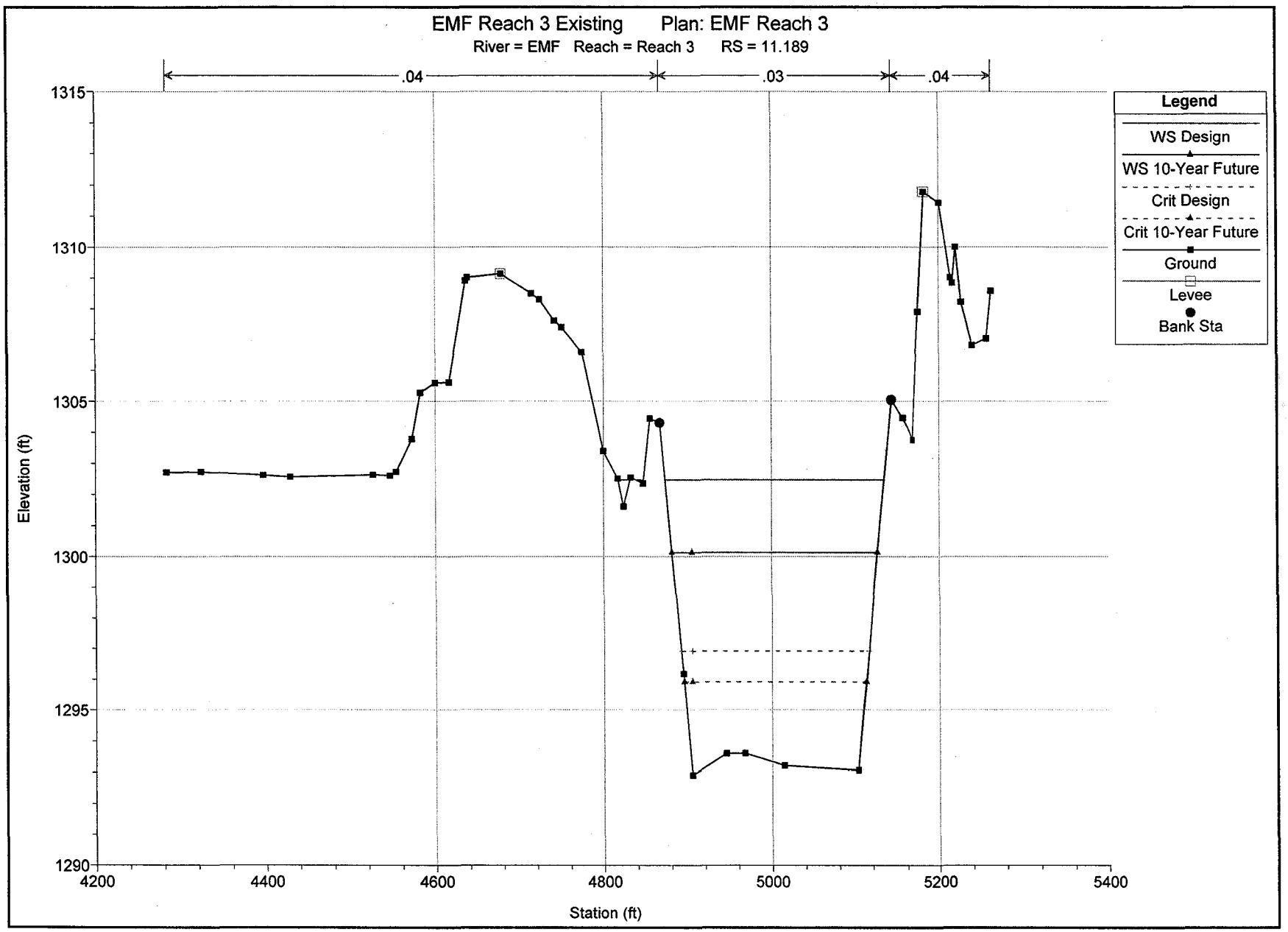
River = EMF Reach = Reach 3 RS = 11.231
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1315
1310
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.189
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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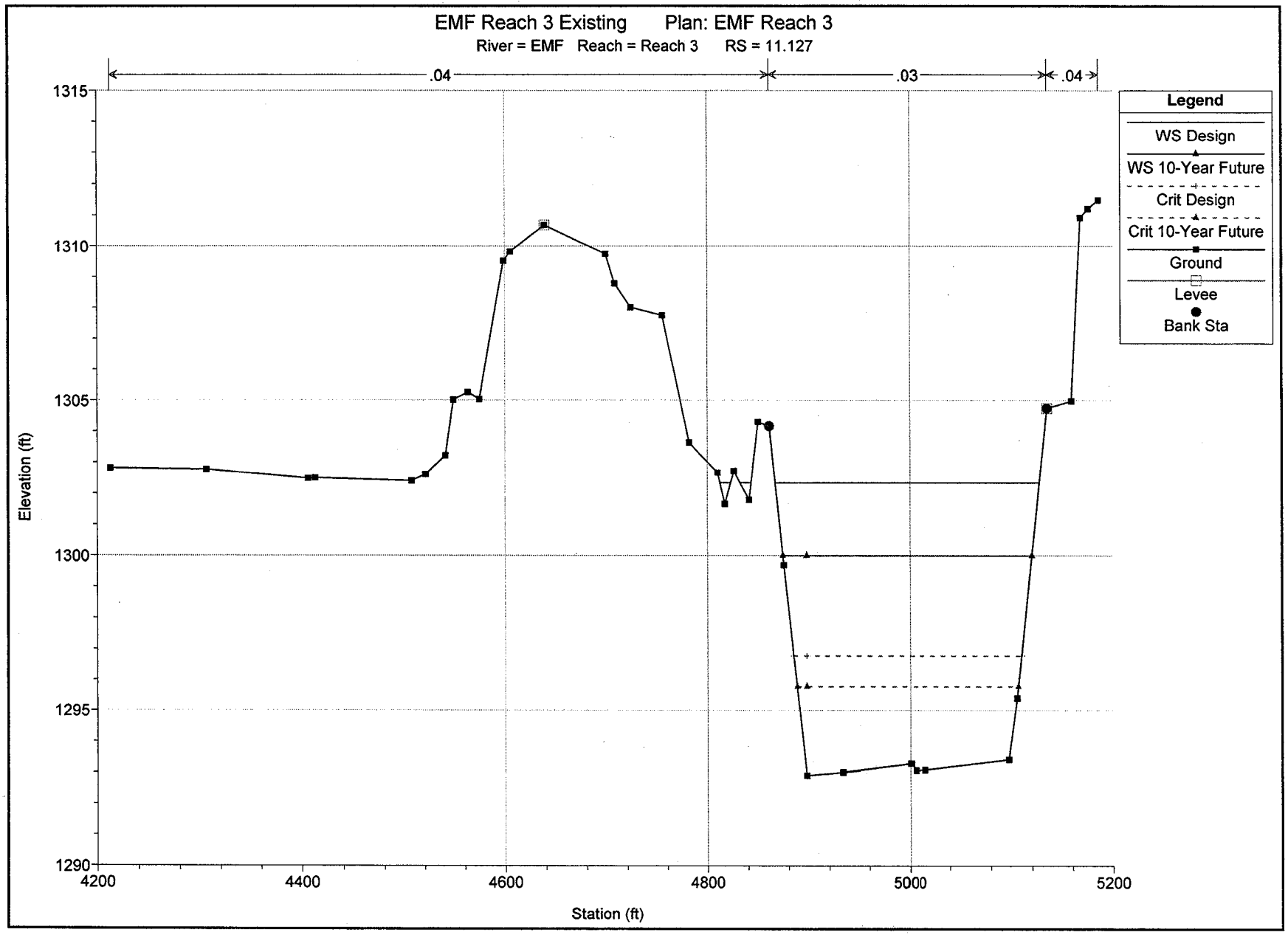
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.127
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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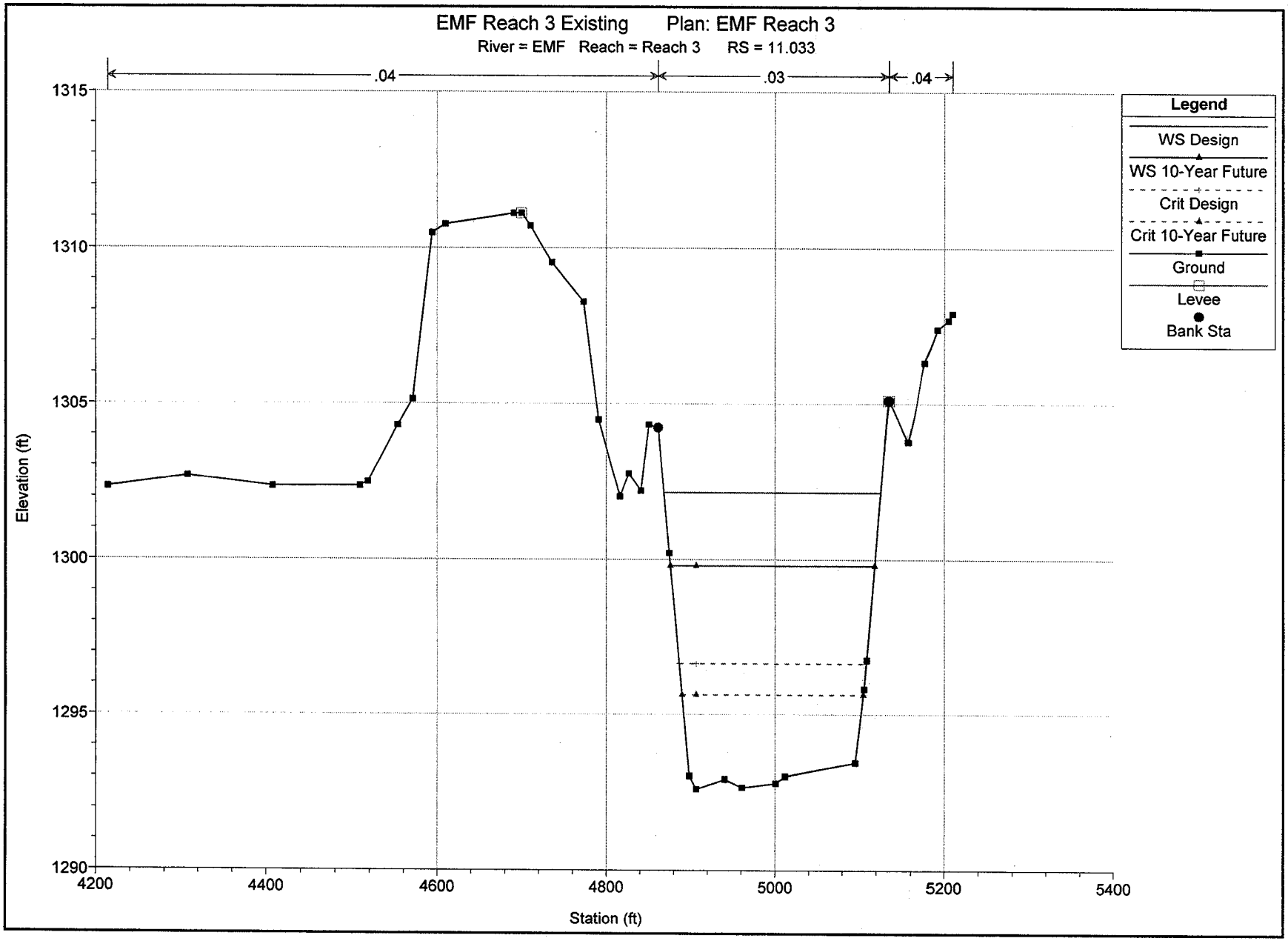
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.033
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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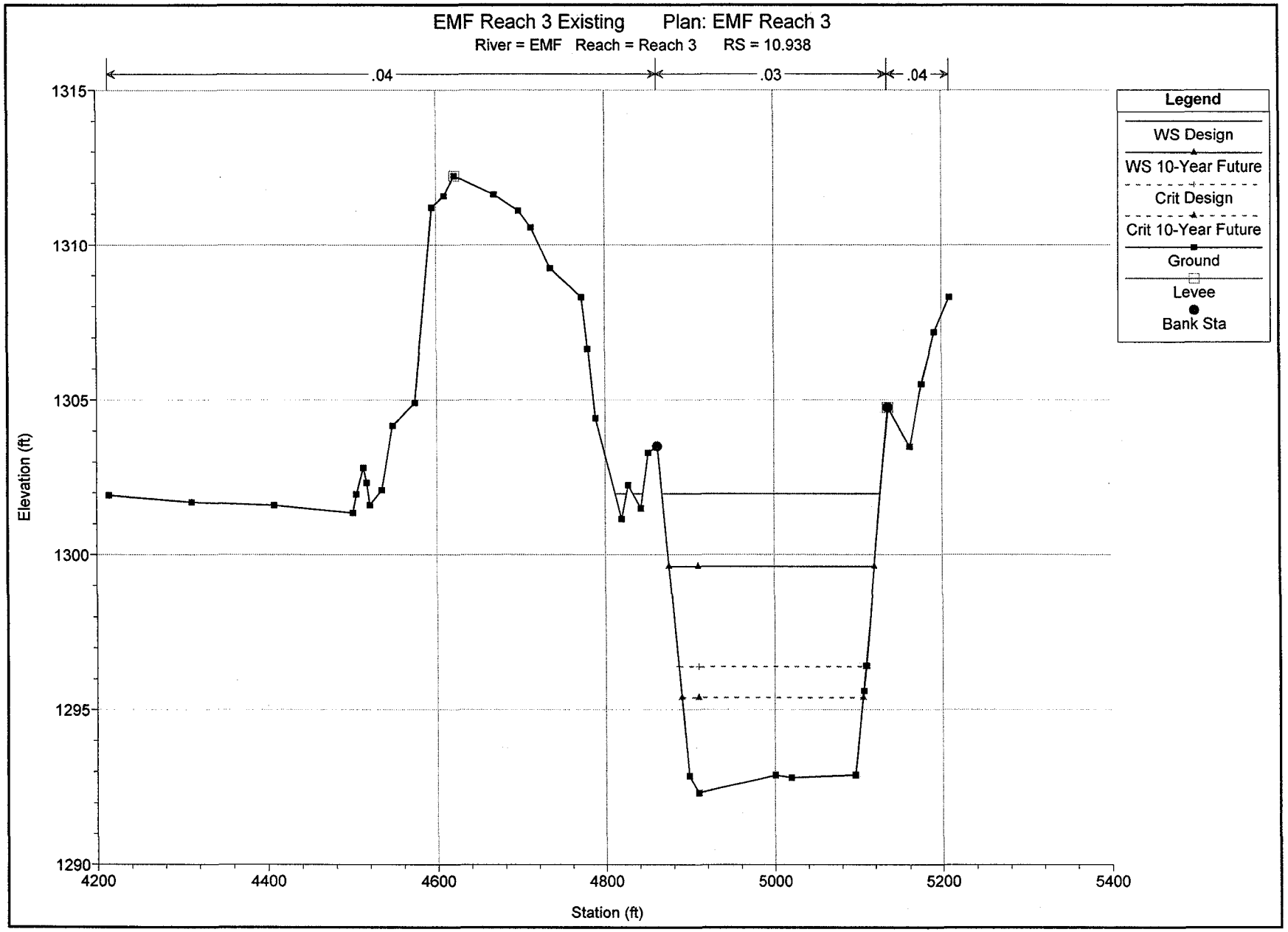
1310
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.938
.04
.03
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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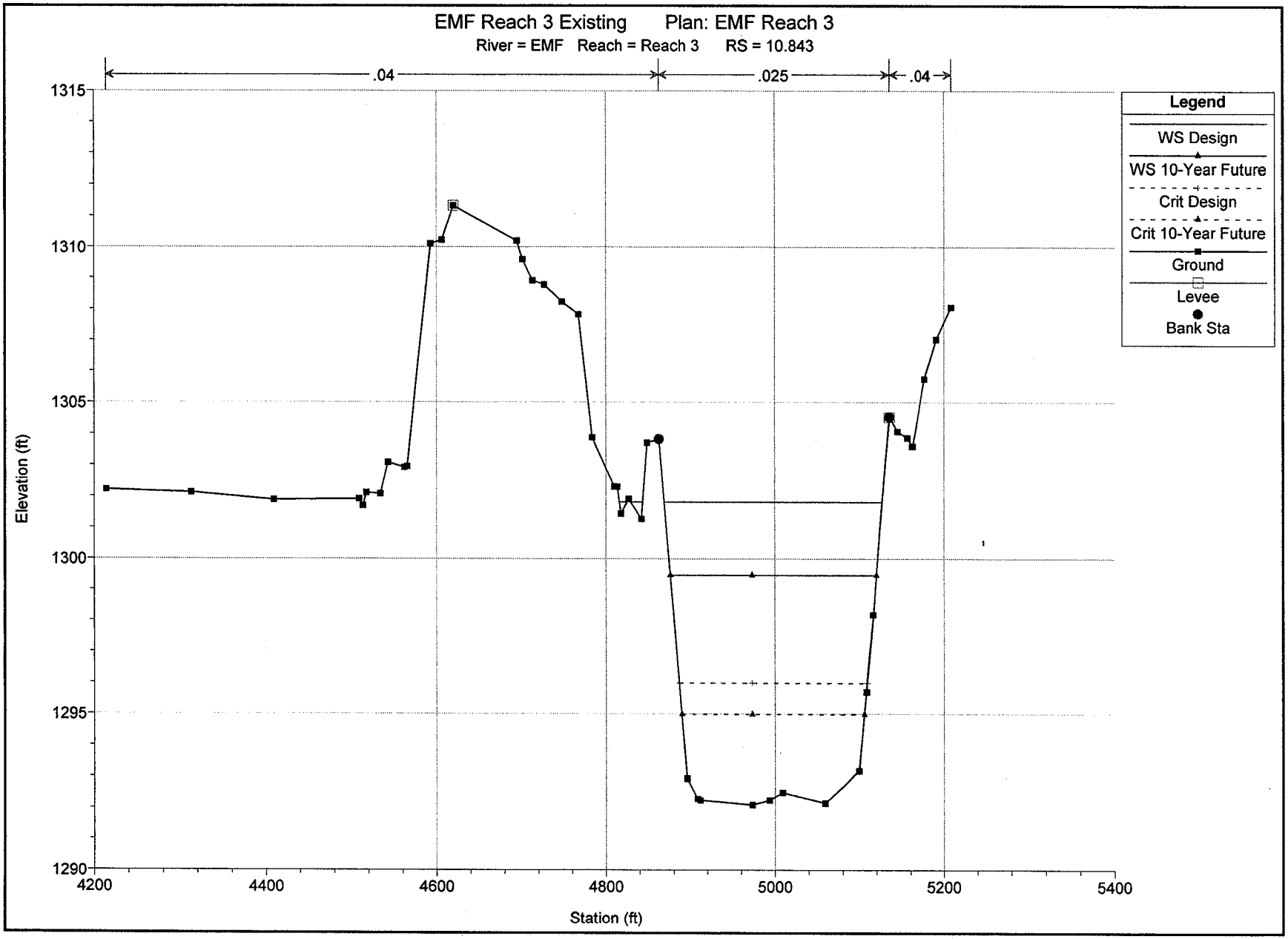
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.843
.04
.025
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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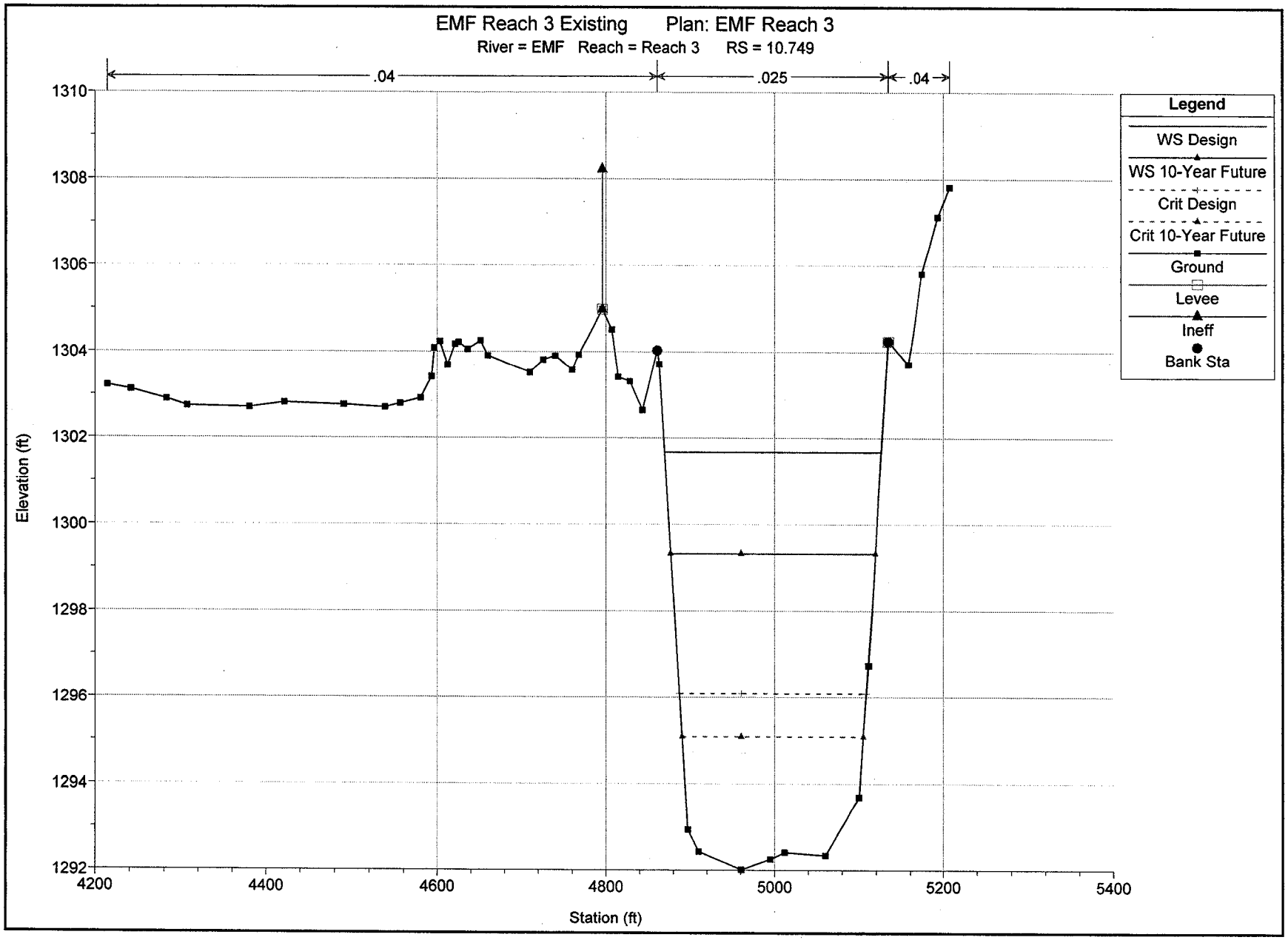
1305
1300
1295
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.749
.04
.025
.04
Elevation (ft)
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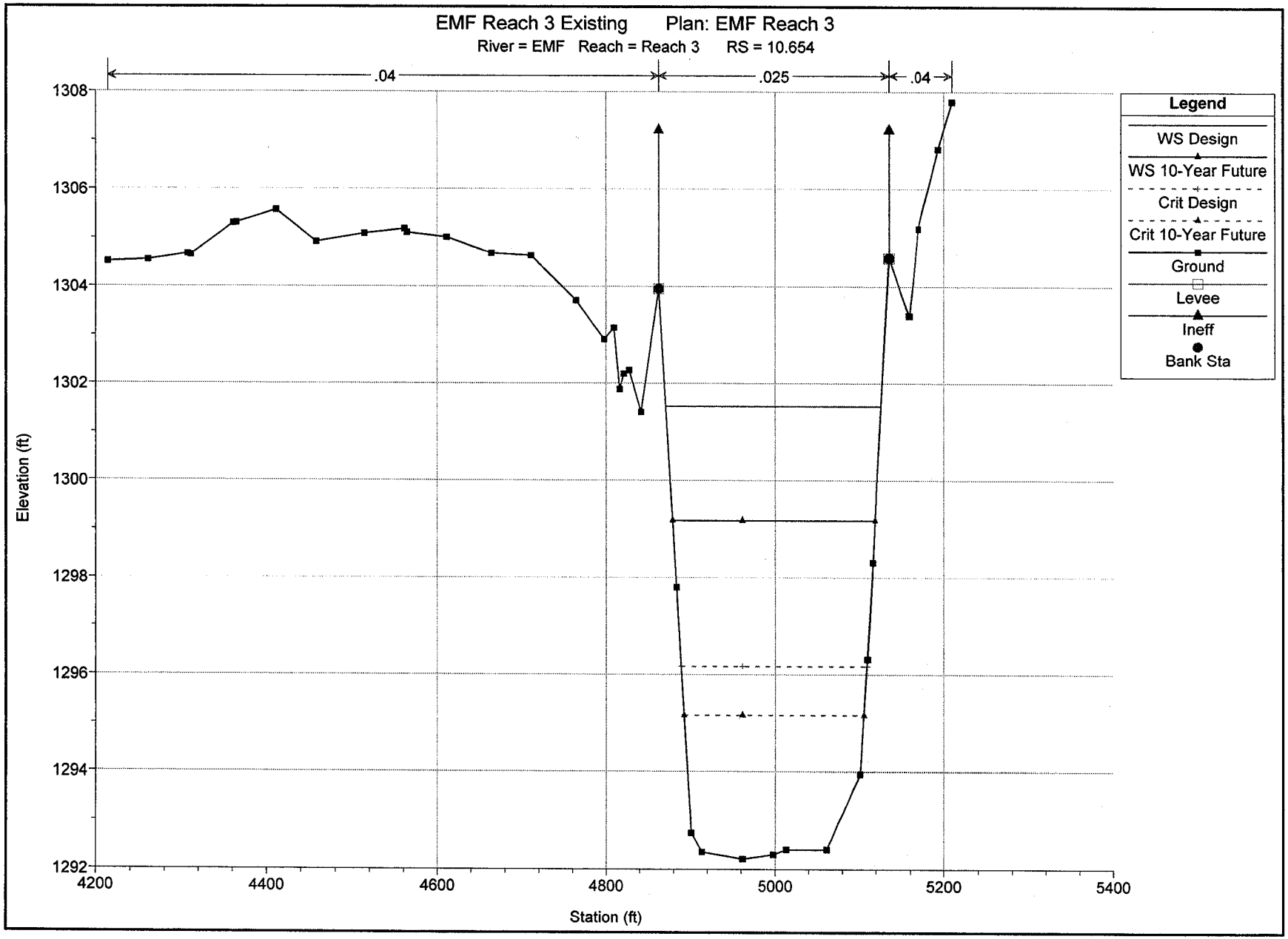
1308
1306
1304
1302
1300
1298
1296
1294
1292
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.654
.04
.025
.04
Elevation (ft)
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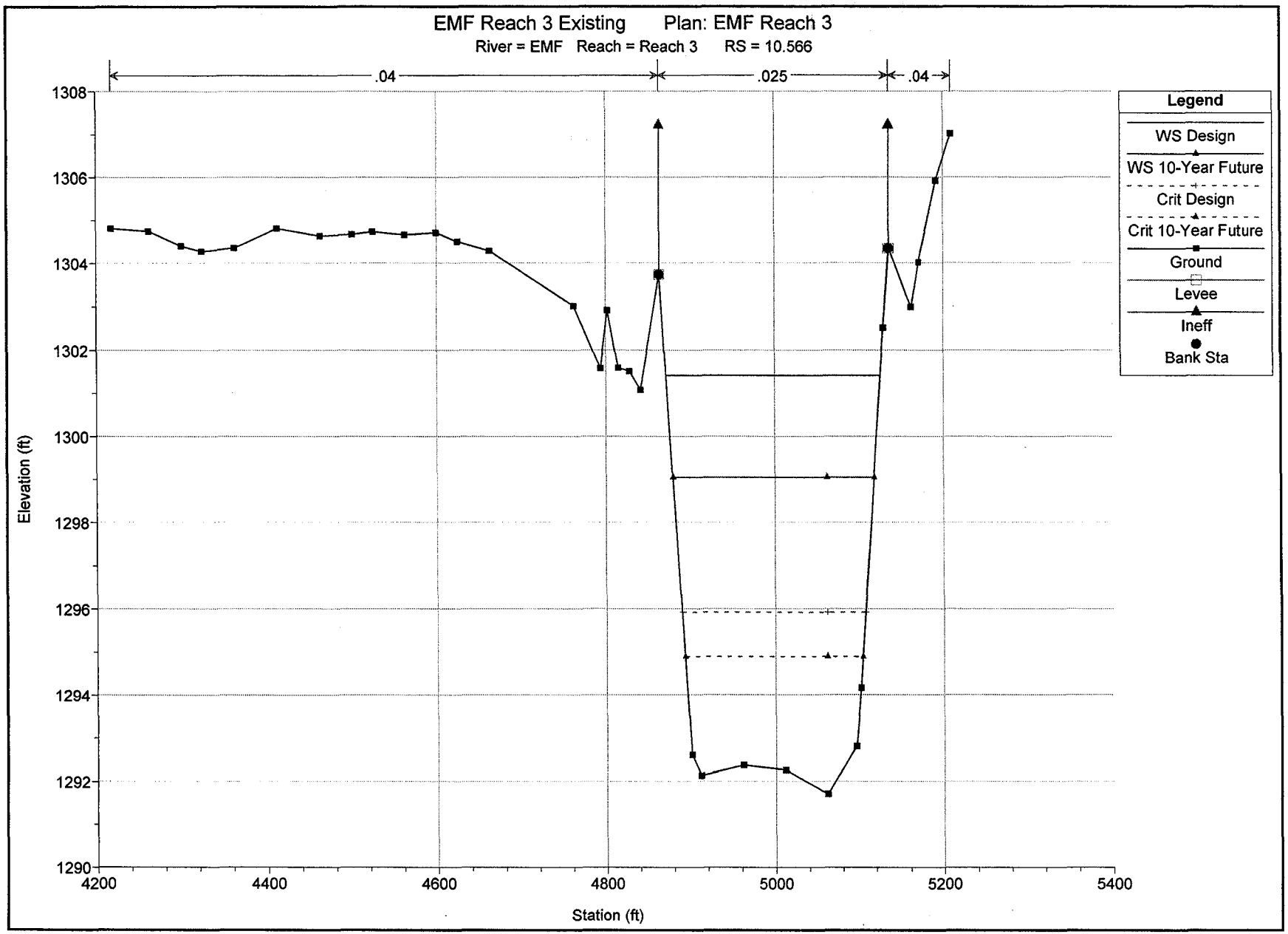
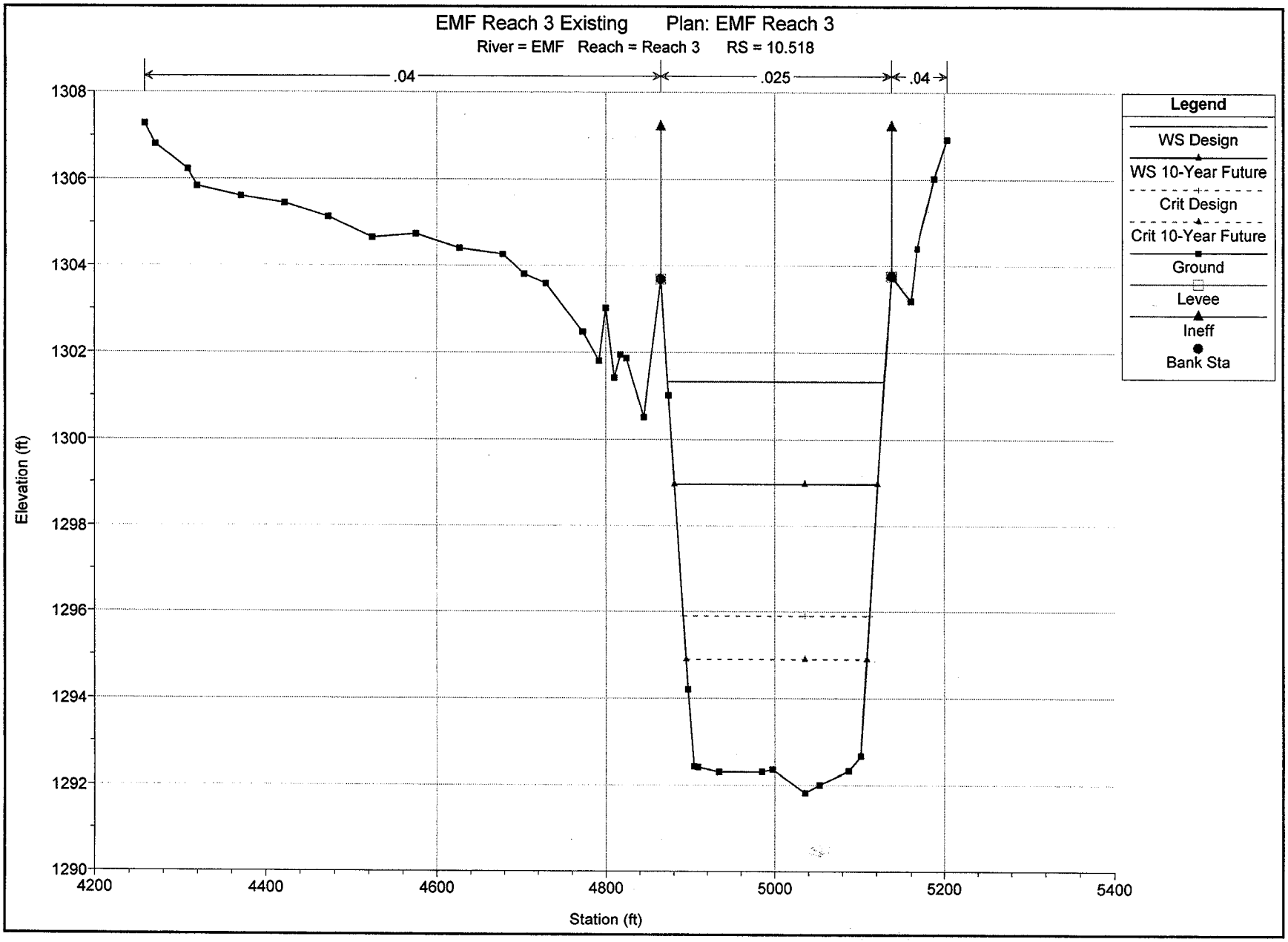
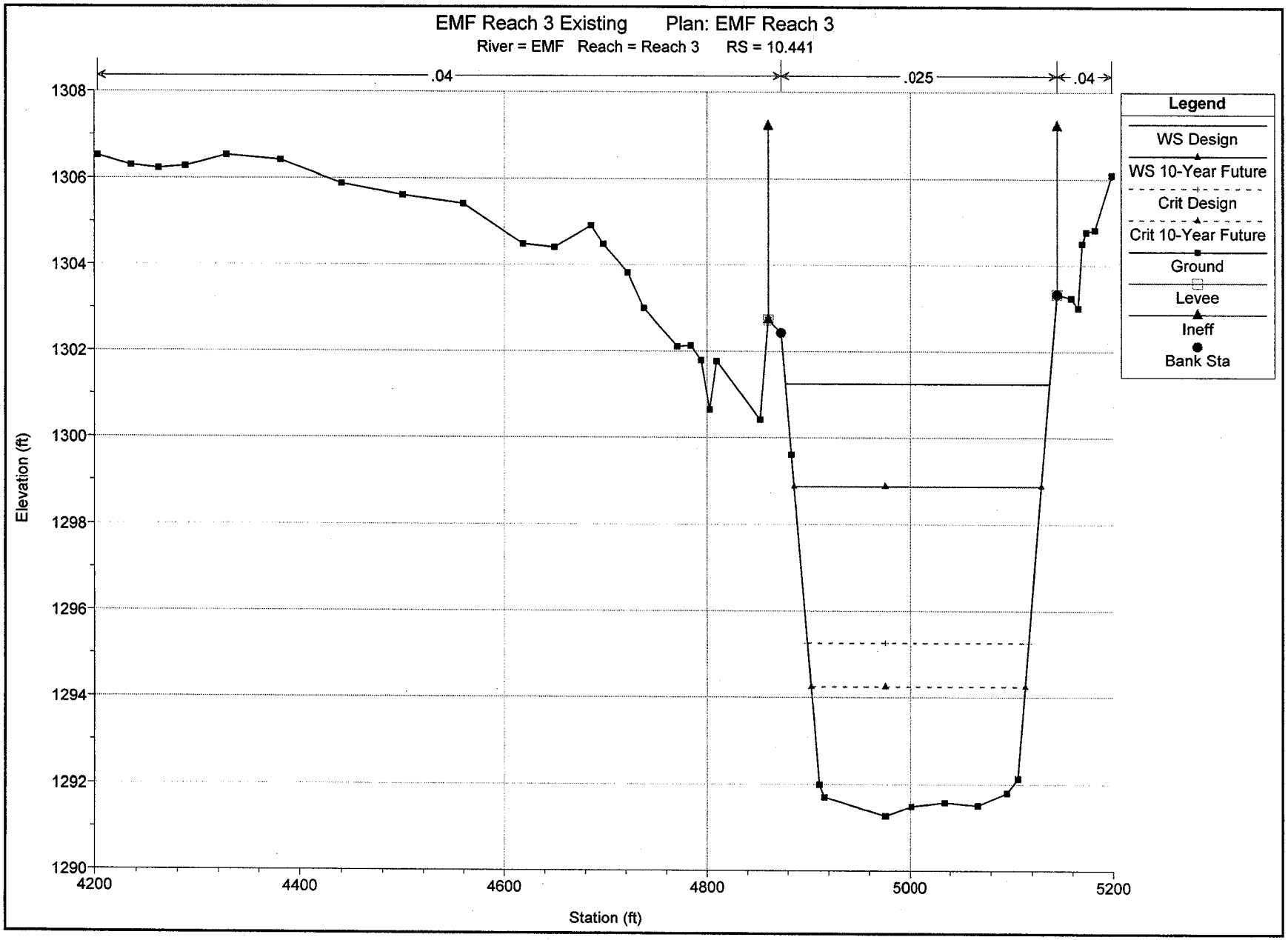
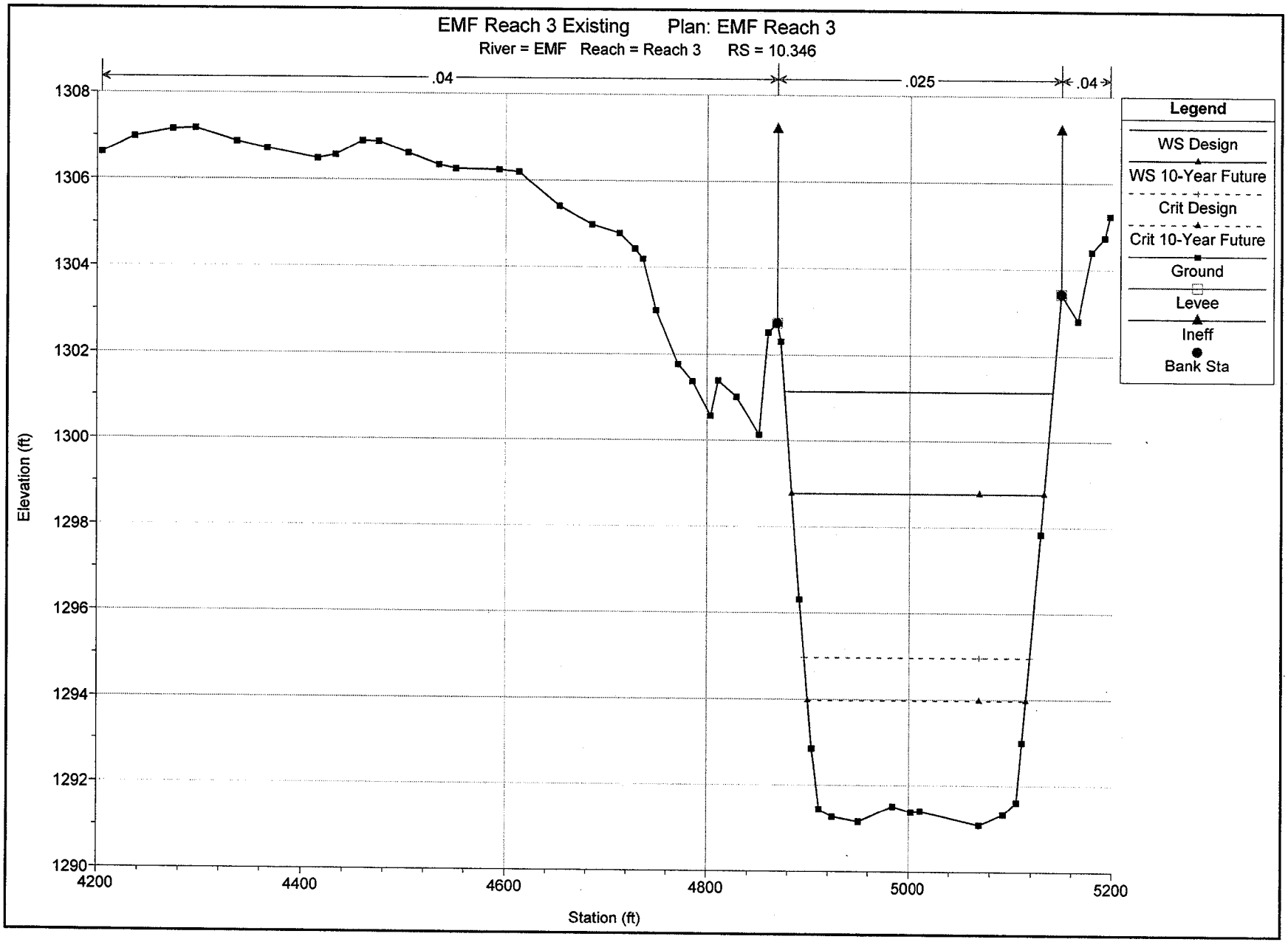
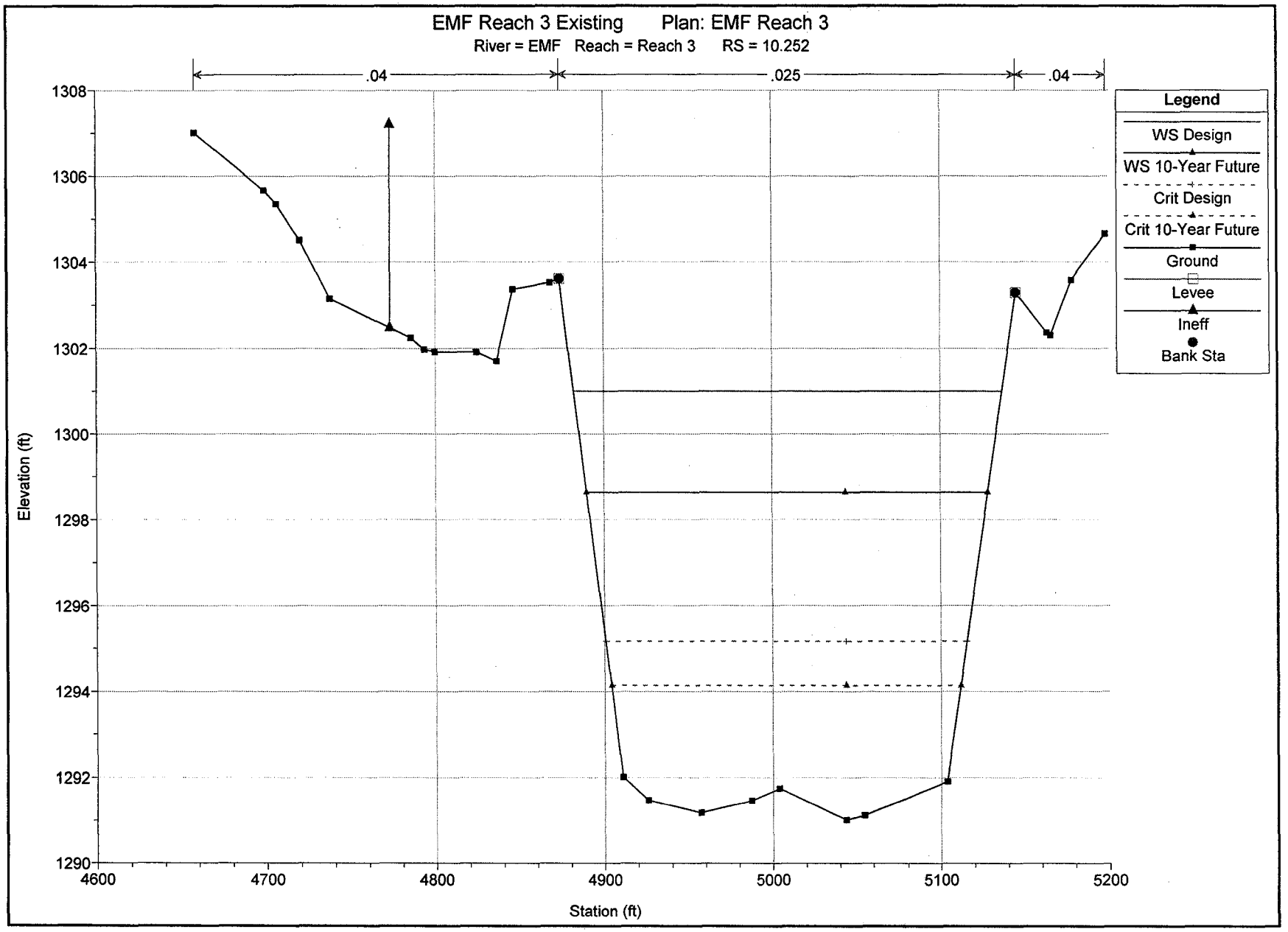
1306
1304
1302
1300
1298
1296
1294
1292
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.566
.04
.025
.04
Elevation (ft)
1308
1306
1304
1302
1300
1298
1296
1294
1292
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.518
.04
.025
.04
Elevation (ft)
1308
1306
1304
1302
1300
1298
1296
1294
1292
1290
4200
4400
4600
4800
5000
5200
5400
Station (ft)
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.441
.04
.025
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1308
1306
1304
1302
1300
1298
1296
1294
1292
1290
4200
4400
4600
4800
5000
5200
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.346
.04
.025
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1308
1306
1304
1302
1300
1298
1296
1294
1292
1290
4200
4400
4600
4800
5000
5200
Station (ft)


EMF Reach 3 Existing Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.252
.04
.025
.04
Legend
WS Design
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
1308
1306
1304
1302
1300
1298
1296
1294
1292
1290
4600
4700
4800
4900
5000
5100
5200
Station (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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
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X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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PROJECT DATA
Project Title: EMF Chandler Heights Basin Mitigation
Project File : Proposed.prj
Run Date and Time: 3/29/02 2:51:48 PM

Project in English units

Project Description:
EMF-Chandler Heights Basin Mitigation
Tetra Tech, Inc
4801 East Washington
Suite 260
Phoenix, AZ 85034

Altered Reach 3 according to proposed landscaping changes designed by Tetra Tech, Inc. Existing sections in River Station 11.231-10.796 were altered according to landscape changes in the left overbank. New sections were also added in this reach.

The bridge routine was slightly altered to enable the model to run on RAS Version 3.0.1. The bridge deck was slightly decreased and the difference was applied to the distance to the upstream cross-section.

Existing topographic data was extracted from HNTB EMF Capacity Assessment Study. All data were adjusted to the NAVD 88 datum. Proposed topographic data was extracted from the Tetra Tech landscaping changes. The starting WSEL was also adjusted to begin at the NAVD 88 datum.

EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT (Reach 3)
FCDMC
Contract No. 97-06
Prepared by HNTB Corporation, January 1999
Contact: B.
Gary Sun
HNTB Corporation
40 North Central Avenue, Suite 300
Phoenix,
Arizona 85004
(602) 528-4300

REACH 3
QUEEN CREEK ROAD TO HUNT
HIGHWAY
(River Mile 13.471 to Mile 9.018)

The Purpose of the Study is to Determine Channel Capacity for Three Given 100-Year Discharges. The Water Surface Profiles Were Calculated Using the U.S. Army Corps of Engineers' HEC-RAS Computer Program, Version 2.1, Dated October 1997, as Implemented by Haestad Methods, Inc.

Subcritical Flow Run 3 Water Surface Profiles with 100-Year Discharges Provided by FCDMC (Dated 6-10-98)
Profile 1 - Design
Discharges
Profile 2 - Future Discharges, Future Land Use with Retention and without Proposed FCD CIPs
Profile 3 - Existing Conditions

The Control Line on the Thalweg of East Maricopa Floodway is Station 5,000, and All Cross Section Data were Stationed Looking Downstream. Cross Section Numbers Indicate in River Miles above the Top of Drop Structure at the Downstream End of East Maricopa Floodway. Starting Water Surface Elevation data are the Calculated Water Surface Elevations at Cross Section Mile 9.001 from Reach 2 HEC-RAS 3 Profiles Run.

Levee, Blocked Obstructions, and Ineffective Flow Area Options Were Used to Better Model The Floodplain Limits For Three Different Discharge Sets.

PLAN DATA

Plan Title: EMF Reach 3
Plan File : p:\4534 EMF_RAS\Limits\Proposed\Proposed.p01

Geometry Title: EMF Reach 3
Geometry File : p:\4534 EMF_RAS\Limits\Proposed\Proposed.g01

Flow Title : Design and 10-Year Profile
Flow File : p:\4534 EMF_RAS\Limits\Proposed\Proposed.f01

Plan Summary Information:

Number of:	Cross Sections	= 32	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 1			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

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

FLOW DATA

Flow Title: Design and 10-Year Profile
Flow File : p:\4534 EMF_RAS\Limits\Proposed\Proposed.f01

Flow Data (cfs)

River	Reach	RS	Design	10-Year Future
EMF	Reach 3	11.893	6900	4860
EMF	Reach 3	11.26	6900	4860
EMF	Reach 3	11.231	8100	4980
EMF	Reach 3	10.441	8100	4980

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
EMF	Reach 3	Design		Known WS = 1301
EMF	Reach 3	10-Year Future		Known WS = 1298.6

GEOMETRY DATA

Geometry Title: EMF Reach 3
Geometry File : p:\4534 EMF_RAS\Limits\Proposed\Proposed.g01

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.893

INPUT
Description: Tetra Tech, Inc. Landscape Changes; December 2001. Altered all elevation data to match NAVD 88 datum (+2.21'). Did not alter any other geometry pattern save the landscape changes on the left overbank in River Stations 11.231-10.796.

Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4215.79	1308.31	4232.81	1308.12	4338.31	1308.04	4399.51	1307.93	4443.82	1307.99
4533.1	1307.91	4692.08	1307.99	4760.37	1307.99	4815.24	1308.21	4832.04	1308.36
4839.66	1307.61	4852	1307.14	4859.94	1309.76	4874.53	1309.98	4910.74	1299.35
4913.53	1299.31	4946.83	1299.07	4974.46	1299.06	5004.24	1298.92	5033.04	1298.97
5099.79	1299.81	5104.12	1300.01	5141.77	1310.63	5159.3	1309.8	5168.86	1308.71
5202.69	1310.61	5215.79	1310.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4215.79	.04	4874.53	.025	5141.77	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.53	5141.77	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4874.53 Elevation= 1309.98
Right Levee Station= 5141.77 Elevation= 1310.63

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1307.05	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.78	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.55	Flow Area (sq ft)		1641.57	
E.G. Slope (ft/ft)	0.000395	Area (sq ft)		1641.57	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.66	Top Width (ft)		242.66	
Vel Total (ft/s)	4.20	Avg. Vel. (ft/s)		4.20	
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)		6.76	
Conv. Total (cfs)	347077.7	Conv. (cfs)		347077.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.67	
Min Ch El (ft)	1298.92	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	8.83	406.85	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	54.76	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.67	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.46	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.86	Flow Area (sq ft)		1328.95	
E.G. Slope (ft/ft)	0.000376	Area (sq ft)		1328.95	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	233.53	Top Width (ft)		233.53	
Vel Total (ft/s)	3.66	Avg. Vel. (ft/s)		3.66	
Max Chl Dpth (ft)	6.54	Hydr. Depth (ft)		5.69	
Conv. Total (cfs)	250595.0	Conv. (cfs)		250595.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		235.18	
Min Ch El (ft)	1298.92	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.49	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	4.74	298.07	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	51.51	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.798

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4266.07	1315.4	4283.82	1314.81	4296.87	1308.93	4313.87	1308.67	4316.15	1307.31
4318.92	1308.15	4321.36	1307.31	4347.48	1307.11	4381.08	1306.74	4486.59	1306.56
4499.44	1306.56	4568.78	1306.71	4592.1	1306.63	4639.08	1306.59	4697.61	1306.63
4798.05	1306.92	4811.92	1307.01	4832.28	1307.34	4839.62	1306.82	4853.27	1306.72
4859.65	1309.85	4875.05	1309.61	4909.97	1299.24	5006.87	1298.88	5091.55	1299.18
5103.82	1299.56	5140.12	1310.41	5156.87	1309.73	5166.96	1309.07	5198	1310.88
5215.24	1310.89								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4266.07	.04	4875.05	.025	5140.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.05	5140.12	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4859.65 Elevation= 1309.85
Right Levee Station= 5140.12 Elevation= 1310.41

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.84	Element			
Vel Head (ft)	0.28	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.56	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.41	Flow Area (sq ft)		1624.78	
E.G. Slope (ft/ft)	0.000408	Area (sq ft)		1624.78	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.92	Top Width (ft)		241.92	
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)		4.25	
Max Chl Dpth (ft)	7.68	Hydr. Depth (ft)		6.72	
Conv. Total (cfs)	341797.9	Conv. (cfs)		341797.9	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.01	
Min Ch El (ft)	1298.88	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.72	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	8.83	388.11	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	51.98	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.48	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.27	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.72	Flow Area (sq ft)		1317.85	
E.G. Slope (ft/ft)	0.000386	Area (sq ft)		1317.85	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	233.25	Top Width (ft)		233.25	
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)		3.69	
Max Chl Dpth (ft)	6.39	Hydr. Depth (ft)		5.65	
Conv. Total (cfs)	247266.2	Conv. (cfs)		247266.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		234.96	
Min Ch El (ft)	1298.88	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	4.74	282.88	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	48.83	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.703

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4485.37	1314.11	4507.48	1313.78	4520.75	1312.62	4535	1311.29	4545.53	1310.42
4562.86	1310.41	4571.33	1310.33	4629.3	1310.12	4645.52	1310.18	4746.01	1309.68
4757.74	1309.31	4811.16	1307.95	4841.29	1307.82	4859.86	1309.47	4875.28	1309.5
4912.48	1299.21	4930.54	1299.1	4991.57	1298.92	5010.25	1298.89	5058.44	1299.19
5103.51	1299.21	5120.51	1304.18	5141.71	1310.34	5158.98	1309.69	5169.35	1308.85
5194.78	1310.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4485.37	.04	4875.28	.025	5141.71	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.28	5141.71	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

Left Levee Station= 4875.28 Elevation= 1309.5
Right Levee Station= 5141.71 Elevation= 1310.34

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.63	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.33	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.43	Flow Area (sq ft)		1565.02	
E.G. Slope (ft/ft)	0.000460	Area (sq ft)		1565.02	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.14	Top Width (ft)		241.14	
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)		4.41	
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	321886.7	Conv. (cfs)		321886.7	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		243.12	
Min Ch El (ft)	1298.89	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.81	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	8.83	369.80	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	49.20	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.27	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.04	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.74	Flow Area (sq ft)		1260.26	
E.G. Slope (ft/ft)	0.000445	Area (sq ft)		1260.26	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	232.05	Top Width (ft)		232.05	
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)		3.86	
Max Chl Dpth (ft)	6.15	Hydr. Depth (ft)		5.43	
Conv. Total (cfs)	230364.8	Conv. (cfs)		230364.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		233.68	
Min Ch El (ft)	1298.89	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.58	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	4.74	268.08	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	46.16	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.609

INPUT
Description: Queen Creek Detention Basin located East of the EMF
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4482.74	1311.22	4529.38	1310.91	4538.26	1310.95	4567.38	1303.6	4580.19	1300.28
4672.62	1299.99	4679.77	1300.01	4756.05	1300.25	4806.95	1300.72	4820.62	1301.01
4826.43	1302.69	4852.29	1309.71	4870.34	1310.66	4892.33	1302.58	4903.98	1299.22
4905.6	1299.19	4962.79	1299.21	4995.04	1299.09	5013.55	1298.83	5082.4	1298.6
5083.88	1298.62	5091.04	1299.81	5108.8	1300.79	5113.28	1301.81	5121.35	1304.32
5136.55	1308.86	5141.47	1310.61	5160.77	1309.49	5169.56	1308.38	5194.16	1310.12
5213.86	1310.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4482.74	.04	4870.34	.025	5141.47	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4870.34	5141.47	194.37	194.37	194.37	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4870.34 Elevation= 1310.66
Right Levee Station= 5141.47 Elevation= 1310.61

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.40	Element			
Vel Head (ft)	0.30	Wt. n-Val.		0.025	
W.S. Elev (ft)	1306.09	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1302.36	Flow Area (sq ft)		1560.58	
E.G. Slope (ft/ft)	0.000472	Area (sq ft)		1560.58	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	244.51	Top Width (ft)		244.51	
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42	
Max Chl Dpth (ft)	7.49	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	317442.5	Conv. (cfs)		317442.5	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		246.49	
Min Ch El (ft)	1298.60	Shear (lb/sq ft)		0.19	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	8.83	351.86	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	46.42	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.04	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.81	Reach Len. (ft)	194.37	194.37	194.37
Crit W.S. (ft)	1301.67	Flow Area (sq ft)		1251.56	
E.G. Slope (ft/ft)	0.000467	Area (sq ft)		1251.56	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	236.71	Top Width (ft)		236.71	
Vel Total (ft/s)	3.88	Avg. Vel. (ft/s)		3.88	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	224777.4	Conv. (cfs)		224777.4	
Length Wtd. (ft)	194.37	Wetted Per. (ft)		238.28	
Min Ch El (ft)	1298.60	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.60	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	4.74	253.67	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	43.47	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.572

INPUT
Description: Downstream of Side Inlet (150' Wide) from the Left Overbank Invert elevation of spillway is 1301.3 ftQ(D)=6,900 cfs, Q(F)=10,060 cfs & Q(E)=13,910 cfs
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4228.03	1306.81	4295.67	1306.55	4372.25	1306.68	4407.53	1306.61	4438.92	1306.71
4492.42	1306.81	4509.65	1306.89	4526.49	1309.04	4536.18	1310.02	4581.19	1310.46
4600.92	1310.71	4641.35	1310.94	4693.07	1310.97	4760.4	1311.1	4777.44	1311.27
4806.66	1311.21	4849.84	1311.33	4872.33	1311.32	4908.47	1299.53	4934.51	1299.4
4953.36	1299.21	5007.37	1298.72	5041.14	1298.88	5078.98	1298.99	5092.82	1298.85
5105.78	1298.81	5110.99	1300.61	5141.46	1310.61	5159.88	1310.29	5169.97	1308.71
5191.66	1310.41	5214.3	1310.87						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4228.03	.04	4872.33	.025	5141.46	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.33	5141.46	218.29	218.29	218.29	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent		
888	F	Left Levee	Station= 4872.33	Elevation= 1311.32	
888	F	Right Levee	Station= 5141.46	Elevation= 1310.61	

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.29	Element			
Vel Head (ft)	0.32	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.96	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1302.32	Flow Area (sq ft)		1510.27	
E.G. Slope (ft/ft)	0.000511	Area (sq ft)		1510.27	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	238.55	Top Width (ft)		238.55	
Vel Total (ft/s)	4.57	Avg. Vel. (ft/s)		4.57	
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	305335.8	Conv. (cfs)		305335.8	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		240.74	
Min Ch El (ft)	1298.72	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.91	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	8.83	345.01	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	45.34	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.94	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.69	Reach Len. (ft)	218.29	218.29	218.29
Crit W.S. (ft)	1301.64	Flow Area (sq ft)		1211.30	
E.G. Slope (ft/ft)	0.000505	Area (sq ft)		1211.30	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	230.77	Top Width (ft)		230.77	
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)		4.01	
Max Chl Dpth (ft)	5.97	Hydr. Depth (ft)		5.25	
Conv. Total (cfs)	216338.3	Conv. (cfs)		216338.3	
Length Wtd. (ft)	218.29	Wetted Per. (ft)		232.55	
Min Ch El (ft)	1298.72	Shear (lb/sq ft)		0.16	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	4.74	248.17	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	42.42	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.531

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.5	1305.41	4222.25	1305.35	4308	1305.4	4418.16	1305.35	4496.08	1305.12
4511.08	1305.51	4538.05	1306.35	4565.7	1306.85	4582.06	1307.22	4597.83	1308.86
4631.23	1308.91	4644.31	1308.97	4717.44	1309.07	4755.6	1309.21	4838.62	1308.84
4841.32	1308.71	4854.2	1308.37	4858.48	1309.4	4864.3	1309.17	4874.08	1309.27
4908.36	1299.51	4955.57	1299.43	5010.42	1298.47	5017.73	1298.5	5107.63	1299.11
5139.89	1310.21	5158.23	1309.8	5166.2	1308.75	5168.43	1308.64	5181.52	1309.85
5191.07	1310.31	5213.65	1310.85						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.5	.04	4874.08	.025	5139.89	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4874.08	5139.89	237.2	237.2	237.2	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4858.48 Elevation= 1309.4
Right Levee Station= 5139.89 Elevation= 1310.21

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.17	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.84	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1302.28	Flow Area (sq ft)		1500.09	
E.G. Slope (ft/ft)	0.000529	Area (sq ft)		1500.09	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	241.04	Top Width (ft)		241.04	
Vel Total (ft/s)	4.60	Avg. Vel. (ft/s)		4.60	
Max Chl Dpth (ft)	7.37	Hydr. Depth (ft)		6.22	
Conv. Total (cfs)	299994.6	Conv. (cfs)		299994.6	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		243.06	
Min Ch El (ft)	1298.47	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.94	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	8.83	337.47	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	44.14	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.82	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.56	Reach Len. (ft)	237.20	237.20	237.20
Crit W.S. (ft)	1301.60	Flow Area (sq ft)		1197.92	
E.G. Slope (ft/ft)	0.000530	Area (sq ft)		1197.92	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	232.85	Top Width (ft)		232.85	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)		4.06	
Max Chl Dpth (ft)	6.09	Hydr. Depth (ft)		5.14	
Conv. Total (cfs)	211203.1	Conv. (cfs)		211203.1	
Length Wtd. (ft)	237.20	Wetted Per. (ft)		234.48	
Min Ch El (ft)	1298.47	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.69	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	4.74	242.14	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	41.26	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.486

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4216.49	1305.41	4289.24	1305.46	4343.09	1305.33	4367.05	1305.32	4449.72	1305.42
4556.33	1305.41	4630.96	1305.73	4648.77	1305.87	4672.63	1308	4678.81	1308.51
4739.01	1309.01	4760.28	1309.08	4812.38	1309.04	4835.67	1308.56	4850.72	1308
4855.54	1309.31	4866.67	1309.21	4871.96	1308.89	4892.33	1302.95	4905.72	1299.13
4916.36	1299.11	4963.19	1299.05	5001.44	1298.78	5013.11	1299.18	5045.85	1299.1
5078.16	1298.91	5106.39	1299.34	5129.52	1306.9	5137.42	1309.62	5149.46	1309.73
5154.37	1309.61	5165.09	1308.79	5188.38	1310.09	5209.96	1310.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4216.49	.04	4866.67	.025	5137.42	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.67	5137.42	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4855.54 Elevation= 1309.31
Right Levee Station= 5137.42 Elevation= 1309.62

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1306.03	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.69	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1302.31	Flow Area (sq ft)		1469.56	
E.G. Slope (ft/ft)	0.000572	Area (sq ft)		1469.56	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.89	Top Width (ft)		242.89	
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)		4.70	
Max Chl Dpth (ft)	6.91	Hydr. Depth (ft)		6.05	
Conv. Total (cfs)	288482.3	Conv. (cfs)		288482.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.84	
Min Ch El (ft)	1298.78	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)		1.01	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	8.83	329.38	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	42.82	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.68	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.41	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1301.65	Flow Area (sq ft)		1164.41	
E.G. Slope (ft/ft)	0.000588	Area (sq ft)		1164.41	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	234.59	Top Width (ft)		234.59	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)		4.17	
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	200492.2	Conv. (cfs)		200492.2	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		236.16	
Min Ch El (ft)	1298.78	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.75	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	4.74	235.71	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	39.99	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.391

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4198.58	1305.31	4264.78	1305.36	4371.39	1305.39	4478.02	1305.37	4584.71	1305.38
4630.64	1305.31	4706.78	1305.26	4763.97	1305.19	4783.95	1305.28	4792.56	1305.81
4806.6	1307.01	4822.1	1308.61	4839.06	1307.7	4848.71	1308.91	4866.2	1308.96
4885.37	1303.21	4900.25	1298.81	4940.34	1298.91	4943.29	1298.88	4996.86	1297.9
5026.87	1298.41	5069.74	1298.87	5100.91	1299.14	5133.03	1309.32	5150.72	1308.99
5160.67	1308.51	5175.44	1309.67	5195.42	1310				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4198.58	.04	4866.2	.025	5133.03	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4866.2	5133.03	335.09	335.09	335.09	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4866.2 Elevation= 1308.96
Right Levee Station= 5133.03 Elevation= 1309.32

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.75	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.43	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1301.88	Flow Area (sq ft)		1505.09	
E.G. Slope (ft/ft)	0.000528	Area (sq ft)		1505.09	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	242.77	Top Width (ft)		242.77	
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		4.58	
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		6.20	
Conv. Total (cfs)	300295.0	Conv. (cfs)		300295.0	
Length Wtd. (ft)	335.09	Wetted Per. (ft)		244.72	
Min Ch El (ft)	1297.90	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	8.83	312.31	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	40.03	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.40	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1304.14	Reach Len. (ft)	335.09	335.09	335.09
Crit W.S. (ft)	1301.20	Flow Area (sq ft)		1198.83	
E.G. Slope (ft/ft)	0.000533	Area (sq ft)		1198.83	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	234.44	Top Width (ft)		234.44	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		5.11	
Conv. Total (cfs)	210558.3	Conv. (cfs)		210558.3	
Length Wtd. (ft)	335.09	Wetted Per. (ft)		236.00	
Min Ch El (ft)	1297.90	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	4.74	222.14	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	37.30	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.328

INPUT
Description: Concrete Drop Structure - Begin Transition (Contraction)
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4197.63	1305.31	4260.57	1305.18	4364.57	1305.18	4460.72	1305.23	4506	1305.17
4567.33	1305.01	4596.24	1305.09	4673.99	1305.08	4761.41	1305.27	4782.64	1306.49
4785.09	1306.71	4804.67	1307.34	4822.81	1308.52	4836.14	1307.39	4846.65	1309.06
4861.56	1309.21	4867.11	1309.17	4892.91	1301.91	4905.09	1298.57	4923.76	1298.34
4968.01	1298.21	5001.77	1297.09	5011.18	1297.61	5025.68	1298.01	5077.01	1298.48
5092.72	1298.91	5130.34	1308.72	5133.81	1309.66	5161.04	1308.31	5172.84	1309.33
5192.22	1309.81								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4197.63	.04	4867.11	.025	5133.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4867.11	5133.81	36.18	36.18	36.18	.3	.5

Left Levee Station= 4867.11 Elevation= 1309.17
Right Levee Station= 5133.81 Elevation= 1309.66

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1305.57	Element			
Vel Head (ft)	0.33	Wt. n-Val.		0.025	
W.S. Elev (ft)	1305.24	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1301.55	Flow Area (sq ft)		1493.07	
E.G. Slope (ft/ft)	0.000522	Area (sq ft)		1493.07	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	235.94	Top Width (ft)		235.94	
Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)		4.62	
Max Chl Dpth (ft)	8.15	Hydr. Depth (ft)		6.33	
Conv. Total (cfs)	302104.6	Conv. (cfs)		302104.6	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		237.71	
Min Ch El (ft)	1297.09	Shear (lb/sq ft)		0.20	
Alpha	1.00	Stream Power (lb/ft s)		0.95	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	8.83	300.78	
C & E Loss (ft)	0.50	Cum SA (acres)	2.60	38.19	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1304.22	Element			
Vel Head (ft)	0.26	Wt. n-Val.		0.025	
W.S. Elev (ft)	1303.97	Reach Len. (ft)	36.18	36.18	36.18
Crit W.S. (ft)	1300.86	Flow Area (sq ft)		1197.80	
E.G. Slope (ft/ft)	0.000510	Area (sq ft)		1197.80	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	226.50	Top Width (ft)		226.50	
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)		4.06	
Max Chl Dpth (ft)	6.88	Hydr. Depth (ft)		5.29	
Conv. Total (cfs)	215191.4	Conv. (cfs)		215191.4	
Length Wtd. (ft)	36.18	Wetted Per. (ft)		227.93	
Min Ch El (ft)	1297.09	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	4.74	212.92	
C & E Loss (ft)	0.41	Cum SA (acres)	1.23	35.52	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.321

INPUT
Description: Drop Structure - End Transition (Contraction)
Drop Structure
Crest, elevation 1296.22
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4207.74	1306.11	4255.66	1305.22	4390.86	1305.21	4449.99	1305.25	4481.51	1305.13
4554.1	1304.91	4613.76	1305.1	4660.34	1305.09	4737.25	1305.29	4767.97	1305.95
4770.73	1305.51	4781.01	1303.07	4789.87	1303.05	4797.59	1303.15	4807.11	1303.62
4814.85	1304.21	4820.17	1305.06	4826.54	1305.63	4830.39	1304.89	4835.34	1304.57
4842.58	1306.11	4852.17	1308.99	4875.55	1309.77	4877.25	1309.73	4894.06	1306.71
4897.47	1305.91	4908.89	1304.79	4913.36	1303.72	4919.88	1303.56	4926.32	1301.95
4930.15	1300.61	4932.94	1301.82	4934.53	1298.54	4992.31	1298.5	5028.24	1298.63
5064	1298.71	5065.71	1303.4	5068.71	1302.11	5071.64	1301.91	5077.28	1303.73
5086.49	1304.41	5098.97	1306.4	5110.44	1308.47	5114.12	1309.59	5126.9	1309.59
5150.52	1309.01	5163.9	1308.55	5166.76	1308.79	5191.5	1309.68	5195.15	1309.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4207.74	.04	4875.55	.013	5114.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4875.55	5114.12	65.83	65.83	65.83	.3	.5

Left Levee Station= 4875.55 Elevation= 1311.98
Right Levee Station= 5114.12 Elevation= 1311.8

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1305.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.98	Wt. n-Val.		0.013	
W.S. Elev (ft)	1303.07	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1303.07	Flow Area (sq ft)		610.65	
E.G. Slope (ft/ft)	0.001619	Area (sq ft)		610.65	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	152.49	Top Width (ft)		152.49	
Vel Total (ft/s)	11.30	Avg. Vel. (ft/s)		11.30	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		4.00	
Conv. Total (cfs)	171465.8	Conv. (cfs)		171465.8	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		158.59	
Min Ch El (ft)	1298.50	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		4.40	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	8.83	299.90	
C & E Loss (ft)	0.80	Cum SA (acres)	2.60	38.03	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1303.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.		0.013	
W.S. Elev (ft)	1302.14	Reach Len. (ft)	65.83	65.83	65.83
Crit W.S. (ft)	1302.14	Flow Area (sq ft)		473.53	
E.G. Slope (ft/ft)	0.001717	Area (sq ft)		473.53	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	143.41	Top Width (ft)		143.41	
Vel Total (ft/s)	10.26	Avg. Vel. (ft/s)		10.26	
Max Chl Dpth (ft)	3.64	Hydr. Depth (ft)		3.30	
Conv. Total (cfs)	117300.6	Conv. (cfs)		117300.6	
Length Wtd. (ft)	65.83	Wetted Per. (ft)		148.42	
Min Ch El (ft)	1298.50	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)		3.51	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	4.74	212.23	
C & E Loss (ft)	0.63	Cum SA (acres)	1.23	35.37	

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

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.308

INPUT
Description: Drop Structure - Begin Transition (Expansion);
Drop Structure End
Sill, elevation 1290.72 ft
Detention Basin located East of the
East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4209.01	1306.21	4246.53	1305.92	4257.55	1305.73	4290.27	1305.49	4323.5	1306.12
4330.94	1306.21	4344.93	1305.97	4410.86	1305.26	4442.33	1305.27	4465.04	1305.18
4565.46	1305.01	4712.62	1305.27	4744.19	1306.2	4762.82	1301.63	4776.92	1301.72
4805.92	1301.81	4824.41	1301.81	4852.1	1308.92	4881.88	1309.35	4889.52	1307.29
4905.17	1303.21	4911.04	1301.45	4932.75	1296.29	4938.27	1295.66	4944.87	1293.95
4945.23	1293.31	5002.28	1292.92	5051.1	1293.1	5057.59	1293.18	5059.19	1294.67
5063.65	1295.41	5075.24	1297.84	5088.73	1301.5	5123.24	1309.48	5127.62	1309.53
5173.15	1309.01	5205.09	1309.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4209.01	.04	4881.88	.013	5123.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4881.88	5123.24	58.67	58.67	58.67	.3	.5

Left Levee Station= 4881.88 Elevation= 1309.35
Right Levee Station= 5123.24 Elevation= 1309.48

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.97	Element			
Vel Head (ft)	0.38	Wt. n-Val.		0.013	
W.S. Elev (ft)	1302.59	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1297.83	Flow Area (sq ft)		1402.57	
E.G. Slope (ft/ft)	0.000128	Area (sq ft)		1402.57	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	186.22	Top Width (ft)		186.22	
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)		4.92	
Max Chl Dpth (ft)	9.67	Hydr. Depth (ft)		7.53	
Conv. Total (cfs)	609646.4	Conv. (cfs)		609646.4	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		189.13	
Min Ch El (ft)	1292.92	Shear (lb/sq ft)		0.06	
Alpha	1.00	Stream Power (lb/ft s)		0.29	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	8.83	298.38	
C & E Loss (ft)	0.09	Cum SA (acres)	2.60	37.77	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.60	Element			
Vel Head (ft)	0.38	Wt. n-Val.		0.013	
W.S. Elev (ft)	1300.22	Reach Len. (ft)	58.67	58.67	58.67
Crit W.S. (ft)	1296.88	Flow Area (sq ft)		982.98	
E.G. Slope (ft/ft)	0.000180	Area (sq ft)		982.98	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	167.81	Top Width (ft)		167.81	
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)		4.94	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	361783.7	Conv. (cfs)		361783.7	
Length Wtd. (ft)	58.67	Wetted Per. (ft)		170.12	
Min Ch El (ft)	1292.92	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	4.74	211.13	
C & E Loss (ft)	0.09	Cum SA (acres)	1.23	35.13	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.297

INPUT
Description: Drop Structure - End Transition (Expansion);
Detention Basin
Located just East of the East Maricopa Floodway
Begin Dense Grass
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4223.73	1303.71	4244.85	1301.57	4277.52	1304.83	4292.34	1306.05	4299.21	1306.04
4334.76	1306.31	4364.29	1306.51	4370.8	1306.64	4388.42	1306.79	4405.75	1306.99
4414	1307.01	4451.25	1305.64	4469.66	1305.64	4486.98	1305.78	4515.76	1305.94

4531.01	1306.11	4554.85	1305.69	4578.31	1305.17	4608.04	1305.15	4691.47	1305.2
4700.43	1305.41	4711.98	1305.49	4724.94	1305.75	4743.19	1301.64	4769.74	1301.88
4794.32	1301.81	4810.15	1301.69	4823.35	1305.29	4827.81	1306.61	4836.02	1306.93
4839.35	1307.71	4845.64	1308.24	4852.73	1308.31	4859.56	1307.61	4875.2	1303.91
4878.89	1303.21	4880.98	1302.38	4889.27	1299.81	4895.45	1297.39	4900.47	1295.73
4914.52	1294.11	4923.13	1294.06	4931.49	1293.86	4945.58	1293.8	5001.15	1292.99
5052.01	1293.61	5070.63	1293.6	5085.43	1293.44	5089.54	1294.49	5146.59	1309.89
5186.17	1309.51	5216.69	1310						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4223.73	.04	4852.73	.03	5146.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4852.73	5146.59	140	195.02	255	.3	.5

Left Levee Station= 4852.73 Elevation= 1308.31
Right Levee Station= 5146.59 Elevation= 1309.89

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.67	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1297.07	Flow Area (sq ft)		1904.10	
E.G. Slope (ft/ft)	0.000342	Area (sq ft)		1904.10	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	239.57	Top Width (ft)		239.57	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)		3.62	
Max Chl Dpth (ft)	9.68	Hydr. Depth (ft)		7.95	
Conv. Total (cfs)	373030.5	Conv. (cfs)		373030.5	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		242.06	
Min Ch El (ft)	1292.99	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	8.83	296.16	
C & E Loss (ft)	0.02	Cum SA (acres)	2.60	37.49	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.30	Reach Len. (ft)	140.00	195.02	255.00
Crit W.S. (ft)	1296.36	Flow Area (sq ft)		1355.32	
E.G. Slope (ft/ft)	0.000479	Area (sq ft)		1355.32	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	223.35	Top Width (ft)		223.35	
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)		3.59	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		6.07	
Conv. Total (cfs)	222138.6	Conv. (cfs)		222138.6	
Length Wtd. (ft)	195.02	Wetted Per. (ft)		225.15	
Min Ch El (ft)	1292.99	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.65	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	4.74	209.55	
C & E Loss (ft)	0.03	Cum SA (acres)	1.23	34.87	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.26

INPUT
Description: Chandler Heights Road Bridge (Upstream Face)
Dense Grass in
Channel Bottom

4 Span Bridge with Riprap Protection Manning n Value of .030 used for Channel
Use Field Survey Data for This Cross Section Skew Angle18.86 Degrees, Cross Section Data
Adjusted Downstream of Inlet from the Left Bank Q(D)=8,100 cfs, Q(F)=10,060 cfs & Q(E)=13,910 cfs
Q(D)=6,900 cfs, Q(F)=10,060 cfs & Q(E)=13,910 cfs

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1310.31	4794.79	1310.64	4807.2	1310.71	4827.58	1312.44	4843.98	1311.77
4853.53	1306.29	4861.19	1305.3	4899.71	1294.78	4926.74	1293.38	5000.57	1292.61
5074.51	1293.31	5109.16	1294.4	5137.41	1303.39	5146.82	1304.88	5165.74	1312.27
5226.91	1311.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4843.98	5165.74	57.31	57.31	57.31	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4843.98 Elevation= 1311.77
Right Levee Station= 5165.74 Elevation= 1312.27

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.79	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.64	Reach Len. (ft)	0.30	0.30	0.30
Crit W.S. (ft)	1296.49	Flow Area (sq ft)		2182.68	
E.G. Slope (ft/ft)	0.000247	Area (sq ft)		2182.68	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	264.11	Top Width (ft)		264.11	
Vel Total (ft/s)	3.16	Avg. Vel. (ft/s)		3.16	
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)		8.26	
Conv. Total (cfs)	439267.0	Conv. (cfs)		439267.0	
Length Wtd. (ft)	0.30	Wetted Per. (ft)		266.50	
Min Ch El (ft)	1292.61	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.40	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	8.83	287.01	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	36.36	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.39	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.24	Reach Len. (ft)	0.30	0.30	0.30
Crit W.S. (ft)	1295.83	Flow Area (sq ft)		1570.02	
E.G. Slope (ft/ft)	0.000336	Area (sq ft)		1570.02	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	247.82	Top Width (ft)		247.82	
Vel Total (ft/s)	3.10	Avg. Vel. (ft/s)		3.10	
Max Chl Dpth (ft)	7.63	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	265041.4	Conv. (cfs)		265041.4	
Length Wtd. (ft)	0.30	Wetted Per. (ft)		249.52	
Min Ch El (ft)	1292.61	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	4.74	203.01	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	33.82	

BRIDGE RIVER: EMF
REACH: Reach 3 RS: 11.254

INPUT
Description: Chandler Heights Road 4-Span Bridge Elongated Piers With Semi-Circular Ends
Distance from Upstream XS = .3
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4763.34	1313.18	1309.21	4809.84	1313.33	1309.21	4839.01	1313.18	1308.21
4853.53	1313.17	1306.21	4853.54	1313.17	1308.25	4889.06	1313.13	1308.2
4926.14	1313.09	1308.18	4936.17	1313.08	1308.13	4982.92	1313	1308.04
5000.03	1312.95	1308	5029.65	1312.9	1307.95	5073.64	1312.86	1307.88
5076.71	1312.85	1307.88	5124.3	1312.78	1307.87	5146.16	1312.75	1307.86
5146.82	1312.75	1302.21	5162.06	1312.68	1304.21	5165.74	1312.67	1305.21
5211.21	1312.53	1306.21	5226.91	1312.42	1307.21			

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4788.76	1310.31	4794.79	1310.64	4807.2	1310.71	4827.58	1312.44	4843.98	1311.77
4853.53	1306.29	4861.19	1305.3	4899.71	1294.78	4926.74	1293.38	5000.57	1292.61
5074.51	1293.31	5109.16	1294.4	5137.41	1303.39	5146.82	1304.88	5165.74	1312.27
5226.91	1311.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4788.76	.04	4843.98	.03	5165.74	.04

Bank Sta: Left Right Coeff Contr. Expan.
4843.98 5165.74 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4843.98 Elevation= 1311.77
Right Levee Station= 5165.74 Elevation= 1312.27

Downstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
4763.34	1313.18	1309.21	4809.84	1313.33	1309.21	4839.01	1313.18	1308.21
4844.79	1313.17	1308.21	4852.34	1313.17	1304.21	4854.67	1313.16	1308.07
4889.06	1313.13	1308.02	4927.62	1313.09	1307.96	4936.17	1313.08	1307.94
4982.92	1313	1307.86	5001.46	1312.96	1307.83	5029.65	1312.9	1307.77
5074.77	1312.88	1307.67	5076.71	1312.85	1307.67	5124.3	1312.78	1307.62
5145.58	1312.72	1307.6	5145.59	1312.72	1304.21	5162.06	1312.68	1305.21
5211.21	1312.53	1306.21	5217.93	1312.42	1307.21			

Downstream Bridge Cross Section Data
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4773.32	1311.62	4804.54	1312.41	4810.78	1312.37	4838.25	1312.67	4844.79	1312.9
4852.34	1305.56	4870.98	1303.43	4904.08	1294.18	4924.66	1293.87	4999.19	1292.9
5072.6	1293.09	5110.53	1295.02	5136.59	1303.23	5145.58	1305.56	5160.69	1311.71
5217.93	1311.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4773.32	.04	4844.79	.03	5160.69	.04

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       4844.79 5160.69             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
888       F
888       F
Left Levee      Station= 4844.79      Elevation=  1312.9
Right Levee     Station= 5160.69      Elevation= 1311.71

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream= 4926.74    Downstream= 4924.66
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.38    2.36 1305.18    3.79 1305.18    3.79 1309.21
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.87    2.36 1304.96    3.79 1304.96    3.79 1309.21

Pier Data
Pier Station     Upstream= 5000.57    Downstream= 4999.19
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1291.61    2.36    1305    3.79    1305    3.79 1309.21
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36  1291.9    2.36 1304.83    3.79 1304.83    3.79 1309.21

Pier Data
Pier Station     Upstream= 5074.51    Downstream=  5072.6
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.31    2.36 1304.88    3.79 1304.88    3.79 1309.21
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
    2.36 1292.09    2.36 1304.67    3.79 1304.67    3.79 1309.21

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum              Cd   =    1.33
       Yarnell               KVal =      .9
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

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

BRIDGE OUTPUT Profile #Design
Opening : Single BR

E.G. US. (ft)	1302.79	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1302.64	E.G. Elev (ft)	1302.78	1302.76
Q Total (cfs)	6900.00	W.S. Elev (ft)	1302.62	1302.58
Q Bridge (cfs)	6900.00	Crit W.S. (ft)	1296.57	1296.76
Q Weir (cfs)		Max Chl Dpth (ft)	10.00	9.68
Weir Sta Lft (ft)		Vel Total (ft/s)	3.27	3.38
Weir Sta Rgt (ft)		Flow Area (sq ft)	2109.77	2039.60
Weir Submerg		Froude # Chl	0.20	0.21
Weir Max Depth (ft)		Specif Force (cu ft)	10150.52	9664.70
Min El Weir Flow (ft)	1312.69	Hydr Depth (ft)	8.21	8.05
Min El Prs (ft)	1308.25	W.P. Total (ft)	316.26	311.48
Delta EG (ft)	0.04	Conv. Total (cfs)	370310.5	353586.3
Delta WS (ft)	0.05	Top Width (ft)	256.88	253.43
BR Open Area (sq ft)	3470.18	Frctn Loss (ft)	0.02	0.00
BR Open Vel (ft/s)	3.38	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.14	0.16
Br Sel Method	Energy only	Power Total (lb/ft s)	0.47	0.53

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10-Year Future
Opening : Single BR

E.G. US. (ft)	1300.39	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1300.24	E.G. Elev (ft)	1300.39	1300.36
Q Total (cfs)	4860.00	W.S. Elev (ft)	1300.23	1300.18
Q Bridge (cfs)	4860.00	Crit W.S. (ft)	1295.88	1296.07
Q Weir (cfs)		Max Chl Dpth (ft)	7.61	7.28
Weir Sta Lft (ft)		Vel Total (ft/s)	3.21	3.35
Weir Sta Rgt (ft)		Flow Area (sq ft)	1516.11	1451.63
Weir Submerg		Froude # Chl	0.23	0.24
Weir Max Depth (ft)		Specif Force (cu ft)	5614.69	5269.28
Min El Weir Flow (ft)	1312.69	Hydr Depth (ft)	6.30	6.12
Min El Prs (ft)	1308.25	W.P. Total (ft)	285.02	280.22
Delta EG (ft)	0.04	Conv. Total (cfs)	228828.0	215262.0
Delta WS (ft)	0.05	Top Width (ft)	240.64	237.24
BR Open Area (sq ft)	3470.18	Frctn Loss (ft)	0.03	0.00
BR Open Vel (ft/s)	3.35	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.15	0.16
Br Sel Method	Energy only	Power Total (lb/ft s)	0.48	0.55

Warning: The Yarnell method gave an invalid answer. The upstream energy was less than the downstream energy. The program defaulted to the next valid (user selected) method. If the Yarnell method was the only one selected, the program will default to an energy based solution.
Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.249

INPUT
Description: Chandler Height Road Bridge (Downstream Face) Dense Grass in Channel Bottom 4 Span Bridge with Riprap Protection Manning n Value of .030 used for Channel Use Field Survey Data for This Cross Section Skew Angle 19.00 Degrees, Cross Section Data
Adjusted Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4773.32	1311.62	4804.54	1312.41	4810.78	1312.37	4838.25	1312.67	4844.79	1312.9
4852.34	1305.56	4870.98	1303.43	4904.08	1294.18	4924.66	1293.87	4999.19	1292.9
5072.6	1293.09	5110.53	1295.02	5136.59	1303.23	5145.58	1305.56	5160.69	1311.71
5217.93	1311.94								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4773.32	.04	4844.79	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4844.79	5160.69	150	95.09	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4844.79 Elevation= 1312.9
Right Levee Station= 5160.69 Elevation= 1311.71

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.59	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1296.68	Flow Area (sq ft)		2106.79	
E.G. Slope (ft/ft)	0.000273	Area (sq ft)		2106.79	
Q Total (cfs)	6900.00	Flow (cfs)		6900.00	
Top Width (ft)	260.54	Top Width (ft)		260.54	
Vel Total (ft/s)	3.28	Avg. Vel. (ft/s)		3.28	
Max Chl Dpth (ft)	9.69	Hydr. Depth (ft)		8.09	
Conv. Total (cfs)	417857.8	Conv. (cfs)		417857.8	
Length Wtd. (ft)	95.09	Wetted Per. (ft)		262.92	
Min Ch El (ft)	1292.90	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.45	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	8.83	284.28	
C & E Loss (ft)	0.01	Cum SA (acres)	2.60	36.02	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.19	Reach Len. (ft)	150.00	95.09	40.00
Crit W.S. (ft)	1296.01	Flow Area (sq ft)		1501.82	
E.G. Slope (ft/ft)	0.000383	Area (sq ft)		1501.82	
Q Total (cfs)	4860.00	Flow (cfs)		4860.00	
Top Width (ft)	244.36	Top Width (ft)		244.36	
Vel Total (ft/s)	3.24	Avg. Vel. (ft/s)		3.24	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	248447.3	Conv. (cfs)		248447.3	
Length Wtd. (ft)	95.09	Wetted Per. (ft)		246.04	
Min Ch El (ft)	1292.90	Shear (lb/sq ft)		0.15	
Alpha	1.00	Stream Power (lb/ft s)		0.47	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	4.74	201.05	
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	33.50	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.231

INPUT
Description: Begin Tetra Tech, Inc. Landscaping Changes. Altered left side of channel geometry according to proposed landscape changes in the EMF Chandler Heights Basin Mitigation. Changed all geometry elevation data to match the NAVD 88 datum (+2.21'). Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Just Downstream of Chandler Heights Road Bridge Downstream of Side Inlet (60' Wide)from the Left Bank Q(D)=8,100 cf; Dense Grass in channel bed

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4699	1305	4702	1304	4705	1303	4732	1302	4805	1302
4815	1303	4820	1304	4845	1305	4850	1306	4854	1307
4858	1306	4862	1305	4865	1304	4899.91	1294.82	4904.44	1293.25
4933.04	1293.11	5004.04	1293.14	5100	1292.83	5143.88	1303.5	5160.69	1313.83
5197.16	1313.11	5201.03	1313.09	5216.94	1312.78				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4699	.05	4865	.03	5160.69	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4854	5160.69	285	255	234	.3	.5

Left Levee Station= 4854 Elevation= 1307
Right Levee Station= 5160.69 Elevation= 1313.83

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.50	Reach Len. (ft)	285.00	255.00	234.00
Crit W.S. (ft)	1296.73	Flow Area (sq ft)		2186.90	
E.G. Slope (ft/ft)	0.000346	Area (sq ft)		2186.90	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	269.03	Top Width (ft)		269.03	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	9.67	Hydr. Depth (ft)		8.13	
Conv. Total (cfs)	435309.2	Conv. (cfs)		435309.2	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		271.45	
Min Ch El (ft)	1292.83	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.65	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	8.83	279.59	
C & E Loss (ft)	0.04	Cum SA (acres)	2.60	35.45	

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.16	Reach Len. (ft)	285.00	255.00	234.00
Crit W.S. (ft)	1295.73	Flow Area (sq ft)		1579.72	
E.G. Slope (ft/ft)	0.000351	Area (sq ft)		1579.72	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	250.53	Top Width (ft)		250.53	
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)		3.15	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		6.31	
Conv. Total (cfs)	265758.7	Conv. (cfs)		265758.7	
Length Wtd. (ft)	255.00	Wetted Per. (ft)		252.36	

Min Ch El (ft)	1292.83	Shear (lb/sq ft)		0.14
Alpha	1.00	Stream Power (lb/ft s)		0.43
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	4.74	197.69
C & E Loss (ft)	0.00	Cum SA (acres)	1.23	32.96

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.189

INPUT
Description: TT; Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs. Dense Grass in channel bed
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4605	1305	4610	1304	4622	1303	4629	1304	4660	1307
4678	1307	4691	1306	4750	1298	4756	1297	4800	1297
4808	1298	4815	1299	4825	1300	4845	1300	4880	1299
4885	1298	4892	1296	4898	1294	4904.99	1292.91	4945.28	1293.6
4967.54	1293.61	5014.61	1293.21	5102.61	1293.07	5142.31	1305.05	5155.45	1304.47
5167.81	1303.76	5175.47	1307.91	5182.37	1311.79	5200.5	1311.44	5214.52	1309.02
5216.65	1308.84	5220.62	1310.01	5226.99	1308.22	5239.88	1306.83	5256.77	1307.04
5262.35	1308.58								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4605	.05	4885	.03	5142.31	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4678	5142.31	192	232	270	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Left Levee Station= 4678 Elevation= 1307
Right Levee Station= 5182.37 Elevation= 1311.79

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1302.59	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.032	
W.S. Elev (ft)	1302.45	Reach Len. (ft)	192.00	232.00	270.00
Crit W.S. (ft)	1296.87	Flow Area (sq ft)		2713.80	
E.G. Slope (ft/ft)	0.000294	Area (sq ft)		2713.80	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	416.48	Top Width (ft)		416.48	
Vel Total (ft/s)	2.98	Avg. Vel. (ft/s)		2.98	
Max Chl Dpth (ft)	9.54	Hydr. Depth (ft)		6.52	
Conv. Total (cfs)	472792.3	Conv. (cfs)		472792.3	
Length Wtd. (ft)	232.00	Wetted Per. (ft)		419.24	
Min Ch El (ft)	1292.91	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.35	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	8.83	265.25	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	33.44	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.22	Element			
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1300.06	Reach Len. (ft)	192.00	232.00	270.00
Crit W.S. (ft)	1295.89	Flow Area (sq ft)		1545.78	
E.G. Slope (ft/ft)	0.000379	Area (sq ft)		1748.68	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	390.93	Top Width (ft)		390.93	
Vel Total (ft/s)	3.22	Avg. Vel. (ft/s)		3.22	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)		5.31	

Conv. Total (cfs)	255926.9	Conv. (cfs)			255926.9
Length Wtd. (ft)	232.00	Wetted Per. (ft)			292.79
Min Ch El (ft)	1292.91	Shear (lb/sq ft)			0.12
Alpha	1.00	Stream Power (lb/ft s)			0.40
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		4.74	187.95
C & E Loss (ft)	0.02	Cum SA (acres)		1.23	31.08

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.141

INPUT
Description: New Tetra Tech, Inc. Cross Section. Assume same dense grass in channel bed. Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580	1304	4585	1303	4595	1302	4615	1302	4635	1303
4680	1310	4735	1310	4767	1305	4793	1300	4800	1299
4810	1297	4818	1296	4835	1295.5	4855	1296	4864	1297
4892	1294	4892.86	1293.12	5049.48	1293.12	5102.84	1293.12	5106.95	1294.33
5109.65	1295.12	5110.9	1295.52	5115.87	1297.12	5121.44	1298.84	5122.32	1299.12
5122.86	1299.29	5128.59	1301.12	5130.4	1301.7	5134.82	1303.12	5152.74	1304.34
5163.94	1305.12	5166.12	1306.33	5167.45	1307.12	5168.58	1307.82	5170.91	1309.12
5189.89	1309.12								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4580	.05	4892	.03	5134.82	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4735	5134.82	85	85	85	.1	.3

Left Levee Station= 4735 Elevation= 1310
Right Levee Station= 5170.91 Elevation= 1309.12

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.032	
W.S. Elev (ft)	1302.39	Reach Len. (ft)	85.00	85.00	85.00
Crit W.S. (ft)	1296.67	Flow Area (sq ft)		2710.73	
E.G. Slope (ft/ft)	0.000269	Area (sq ft)		2710.73	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	351.96	Top Width (ft)		351.96	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)		7.70	
Conv. Total (cfs)	493689.5	Conv. (cfs)		493689.5	
Length Wtd. (ft)	85.00	Wetted Per. (ft)		354.53	
Min Ch El (ft)	1293.12	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	8.83	250.80	
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	31.39	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.032	
W.S. Elev (ft)	1300.01	Reach Len. (ft)	85.00	85.00	85.00
Crit W.S. (ft)	1295.74	Flow Area (sq ft)		1898.74	
E.G. Slope (ft/ft)	0.000293	Area (sq ft)		1898.74	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	332.20	Top Width (ft)		332.20	

Vel Total (ft/s)	2.62	Avg. Vel. (ft/s)			2.62
Max Chl Dpth (ft)	6.89	Hydr. Depth (ft)			5.72
Conv. Total (cfs)	290974.1	Conv. (cfs)			290974.1
Length Wtd. (ft)	85.00	Wetted Per. (ft)			334.18
Min Ch El (ft)	1293.12	Shear (lb/sq ft)			0.10
Alpha	1.00	Stream Power (lb/ft s)			0.27
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		4.74	178.24
C & E Loss (ft)	0.00	Cum SA (acres)		1.23	29.16

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.127

INPUT
Description: TT; Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Dense
Grass in channel bed

Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580	1304	4585	1303	4594	1302	4635	1301	4675	1302
4690	1303	4735	1308	4758	1308	4820	1298	4825	1297
4830	1296	4848	1296	4852	1297	4880	1297	4885	1298
4891	1296	4897	1294	4897.89	1292.91	4933.76	1293.01	5000.58	1293.28
5005.77	1293.07	5015.59	1293.08	5097.28	1293.41	5105.44	1295.39	5135.04	1304.74
5159.06	1304.98	5168.1	1310.92	5175.86	1311.21	5186.12	1311.48		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4580	.05	4885	.03	5135.04	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4758	5135.04	250	250	250	.1	.3

Left Levee Station= 4758 Elevation= 1308
Right Levee Station= 5135.04 Elevation= 1304.74

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.032	
W.S. Elev (ft)	1302.34	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1296.82	Flow Area (sq ft)		2481.34	
E.G. Slope (ft/ft)	0.000316	Area (sq ft)		2481.34	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	334.37	Top Width (ft)		334.37	
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)		3.26	
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)		7.42	
Conv. Total (cfs)	455959.4	Conv. (cfs)		455959.4	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		337.62	
Min Ch El (ft)	1292.91	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.47	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	8.83	245.74	
C & E Loss (ft)	0.02	Cum SA (acres)	2.60	30.72	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.031	
W.S. Elev (ft)	1299.96	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1295.80	Flow Area (sq ft)		1712.75	
E.G. Slope (ft/ft)	0.000354	Area (sq ft)		1712.75	

Q Total (cfs)	4980.00	Flow (cfs)			4980.00
Top Width (ft)	312.10	Top Width (ft)			312.10
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)			2.91
Max Chl Dpth (ft)	7.05	Hydr. Depth (ft)			5.49
Conv. Total (cfs)	264828.3	Conv. (cfs)			264828.3
Length Wtd. (ft)	250.00	Wetted Per. (ft)			314.79
Min Ch El (ft)	1292.91	Shear (lb/sq ft)			0.12
Alpha	1.00	Stream Power (lb/ft s)			0.35
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		4.74	174.71
C & E Loss (ft)	0.01	Cum SA (acres)		1.23	28.53

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.080

INPUT
Description: New Tetra Tech, Inc. Cross Section. Assume same dense grass in channel bed. Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580	1304	4610	1303	4635	1302	4728	1302	4735	1302
4742	1301	4772	1300	4777	1299	4782	1298	4785	1297
4792	1296	4805	1295	4840	1294.5	4880	1295	4885	1296
4898	1294	4923.87	1292.76	5103.88	1292.76	5109.92	1294.56	5110.57	1294.76
5113.61	1295.71	5116.96	1296.76	5117.99	1297.06	5123.51	1298.76	5127.72	1300.03
5130.03	1300.76	5133	1301.68	5138.09	1302.76	5164.09	1304.58	5166.84	1304.76
5167.18	1304.76	5169.93	1304.76	5175.35	1305.18	5176.72	1305.23	5206.74	1304.76
5210.59	1304.76	5216.64	1304.76	5217.02	1304.43	5219.03	1302.76	5220.11	1301.79
5221.33	1300.76	5227.53	1300.76	5232.13	1300.76	5239.23	1300.76	5244.94	1300.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4580	.05	4885	.03	5138.09	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4735	5138.09	250	250	250	.1	.3

Left Levee Station= 4580 Elevation= 1304
Right Levee Station= 5176.72 Elevation= 1305.23

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.033	
W.S. Elev (ft)	1302.31	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1296.27	Flow Area (sq ft)	32.68	3034.47	
E.G. Slope (ft/ft)	0.000226	Area (sq ft)	32.68	3034.47	
Q Total (cfs)	8100.00	Flow (cfs)	6.59	8093.41	
Top Width (ft)	508.85	Top Width (ft)	107.86	400.99	
Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)	0.20	2.67	
Max Chl Dpth (ft)	9.55	Hydr. Depth (ft)	0.30	7.57	
Conv. Total (cfs)	538606.3	Conv. (cfs)	438.1	538168.2	
Length Wtd. (ft)	250.00	Wetted Per. (ft)	107.87	403.24	
Min Ch El (ft)	1292.76	Shear (lb/sq ft)	0.00	0.11	
Alpha	1.02	Stream Power (lb/ft s)	0.00	0.28	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	8.73	229.91	
C & E Loss (ft)	0.01	Cum SA (acres)	2.29	28.61	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1300.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	

W.S. Elev (ft)	1299.92	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1295.47	Flow Area (sq ft)		2115.30	
E.G. Slope (ft/ft)	0.000241	Area (sq ft)		2115.30	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	354.99	Top Width (ft)		354.99	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	7.16	Hydr. Depth (ft)		5.96	
Conv. Total (cfs)	321100.8	Conv. (cfs)		321100.8	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		356.81	
Min Ch El (ft)	1292.76	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.21	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	4.74	163.73	
C & E Loss (ft)	0.01	Cum SA (acres)	1.23	26.62	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.033

INPUT
Description: TT; Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Dense
Grass in channel bed
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580	1304	4585	1303	4592	1302	4603	1301	4638	1301
4658	1302	4675	1303	4695	1304	4702	1305	4710	1306
4792	1306	4796	1305	4803	1304	4811	1303	4825	1302
4840	1301	4845	1300	4879	1299	4892	1296	4897	1294
4898.39	1293.04	4906.79	1292.62	4940.36	1292.93	4960.96	1292.67	5000.57	1292.81
5011.89	1293.02	5095.3	1293.46	5105.49	1295.83	5108.79	1296.76	5134.81	1305.11
5157.24	1303.78	5177.78	1306.33	5192.28	1307.41	5205.15	1307.69	5209.71	1307.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4580	.05	4892	.03	5134.81	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4792	5134.81	105	105	105	.1	.3

Left Levee Station= 4792 Elevation= 1306
Right Levee Station= 5134.81 Elevation= 1305.11

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.12	Reach Len. (ft)	105.00	105.00	105.00
Crit W.S. (ft)	1296.67	Flow Area (sq ft)		2155.36	
E.G. Slope (ft/ft)	0.000377	Area (sq ft)		2155.36	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	302.22	Top Width (ft)		302.22	
Vel Total (ft/s)	3.76	Avg. Vel. (ft/s)		3.76	
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)		7.13	
Conv. Total (cfs)	417391.2	Conv. (cfs)		417391.2	
Length Wtd. (ft)	105.00	Wetted Per. (ft)		304.66	
Min Ch El (ft)	1292.62	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	8.64	215.01	
C & E Loss (ft)	0.01	Cum SA (acres)	1.98	26.59	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.030	
W.S. Elev (ft)	1299.75	Reach Len. (ft)	105.00	105.00	105.00
Crit W.S. (ft)	1295.66	Flow Area (sq ft)		1481.60	
E.G. Slope (ft/ft)	0.000410	Area (sq ft)		1481.60	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	264.54	Top Width (ft)		264.54	
Vel Total (ft/s)	3.36	Avg. Vel. (ft/s)		3.36	
Max Chl Dpth (ft)	7.13	Hydr. Depth (ft)		5.60	
Conv. Total (cfs)	245891.6	Conv. (cfs)		245891.6	
Length Wtd. (ft)	105.00	Wetted Per. (ft)		266.47	
Min Ch El (ft)	1292.62	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	4.74	153.40	
C & E Loss (ft)	0.01	Cum SA (acres)	1.23	24.84	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 11.013

INPUT
Description: New Tetra Tech, Inc. Cross Section. Assume same dense grass in channel bed. Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4578	1304	4590	1303	4600	1302	4605	1301	4630	1300
4652	1301	4663	1302	4674	1303	4688	1304	4698	1305
4708	1306	4717	1307	4772	1307	4792	1306	4802	1305
4823	1303	4845	1300	4883	1298	4884.24	1296.46	4887.7	1295.42
4890.9	1294.46	4892.12	1294.1	4897.42	1292.46	5065.66	1292.46	5103.57	1292.46
5104.34	1292.69	5110.42	1294.46	5111.67	1294.84	5117.02	1296.46	5121.92	1297.93
5123.67	1298.46	5129.87	1300.34	5130.26	1300.46	5130.74	1300.61	5136.79	1302.46
5150.36	1302.46	5156.2	1302.46	5161.6	1302.46	5166.41	1302.46	5176.75	1303.54
5185.5	1304.46	5202.53	1304.46	5213.9	1304.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4578	.05	4883	.03	5136.79	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4772	5136.79	395	395	395	.1	.3

Left Levee Station= 4772 Elevation= 1307
Right Levee Station= 5185.5 Elevation= 1304.46

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.030	
W.S. Elev (ft)	1302.12	Reach Len. (ft)	395.00	395.00	395.00
Crit W.S. (ft)	1296.01	Flow Area (sq ft)		2388.79	
E.G. Slope (ft/ft)	0.000280	Area (sq ft)		2388.79	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	306.20	Top Width (ft)		306.20	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)		3.39	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		7.80	
Conv. Total (cfs)	484117.3	Conv. (cfs)		484117.3	
Length Wtd. (ft)	395.00	Wetted Per. (ft)		309.15	
Min Ch El (ft)	1292.46	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.46	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	8.64	209.54	
C & E Loss (ft)	0.02	Cum SA (acres)	1.98	25.86	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.030	
W.S. Elev (ft)	1299.74	Reach Len. (ft)	395.00	395.00	395.00
Crit W.S. (ft)	1295.04	Flow Area (sq ft)		1691.52	
E.G. Slope (ft/ft)	0.000287	Area (sq ft)		1691.52	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	277.98	Top Width (ft)		277.98	
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)		2.94	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)		6.09	
Conv. Total (cfs)	294159.1	Conv. (cfs)		294159.1	
Length Wtd. (ft)	395.00	Wetted Per. (ft)		280.42	
Min Ch El (ft)	1292.46	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.32	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	4.74	149.58	
C & E Loss (ft)	0.01	Cum SA (acres)	1.23	24.18	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.938

INPUT
Description: TT; Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Dense
Grass in channel bed
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4579	1304	4595	1304	4619	1308	4652	1308	4678	1303
4685	1302	4715	1297	4740	1296	4755	1295	4780	1294.5
4810	1295	4822	1296	4842	1295	4845	1294	4868	1302
4875	1300	4895	1294	4898.49	1292.87	4909.68	1292.32	5000.64	1292.9
5019.9	1292.82	5096.02	1292.91	5106.69	1295.61	5109.46	1296.42	5135.91	1304.76
5161.16	1303.49	5176.44	1305.51	5191.3	1307.18	5209.42	1308.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4579	.05	4868	.03	5135.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4868	5135.91	265	265	265	.1	.3

Left Levee Station= 4652 Elevation= 1308
Right Levee Station= 5135.91 Elevation= 1304.76

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.050	0.030	
W.S. Elev (ft)	1302.05	Reach Len. (ft)	265.00	265.00	265.00
Crit W.S. (ft)	1296.41	Flow Area (sq ft)	1040.69	2129.54	
E.G. Slope (ft/ft)	0.000239	Area (sq ft)	1040.69	2129.54	
Q Total (cfs)	8100.00	Flow (cfs)	1509.64	6590.36	
Top Width (ft)	442.68	Top Width (ft)	183.36	259.32	
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)	1.45	3.09	
Max Chl Dpth (ft)	9.73	Hydr. Depth (ft)	5.68	8.21	
Conv. Total (cfs)	524079.4	Conv. (cfs)	97675.6	426403.8	
Length Wtd. (ft)	265.00	Wetted Per. (ft)	185.42	261.99	
Min Ch El (ft)	1292.32	Shear (lb/sq ft)	0.08	0.12	
Alpha	1.25	Stream Power (lb/ft s)	0.12	0.38	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	3.92	189.05	
C & E Loss (ft)	0.01	Cum SA (acres)	1.15	23.30	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.050	0.030	
W.S. Elev (ft)	1299.65	Reach Len. (ft)	265.00	265.00	265.00
Crit W.S. (ft)	1295.45	Flow Area (sq ft)	625.99	1526.00	
E.G. Slope (ft/ft)	0.000274	Area (sq ft)	625.99	1526.00	
Q Total (cfs)	4980.00	Flow (cfs)	752.86	4227.14	
Top Width (ft)	405.71	Top Width (ft)	162.16	243.55	
Vel Total (ft/s)	2.31	Avg. Vel. (ft/s)	1.20	2.77	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)	3.86	6.27	
Conv. Total (cfs)	301013.4	Conv. (cfs)	45506.1	255507.3	
Length Wtd. (ft)	265.00	Wetted Per. (ft)	163.62	245.52	
Min Ch El (ft)	1292.32	Shear (lb/sq ft)	0.07	0.11	
Alpha	1.26	Stream Power (lb/ft s)	0.08	0.29	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.90	134.99	
C & E Loss (ft)	0.01	Cum SA (acres)	0.49	21.82	

Warning: Divided flow computed for this cross-section.

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.890

INPUT
Description: New Tetra Tech, Inc. Cross Section. Assume same dense grass in channel bed. Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4578	1304	4585	1303	4592	1302	4610	1301	4645	1300
4679	1301	4695	1301	4725	1297	4760	1296	4790	1295
4825	1294.5	4870	1295	4881	1296	4889	1294	4895.25	1292.21
4938.08	1292.21	5102.48	1292.21	5105.56	1293.2	5108.86	1294.21	5113.51	1295.67
5115.3	1296.21	5120.39	1297.75	5121.86	1298.21	5123.46	1298.71	5128.39	1300.21
5131.67	1301.21	5134.95	1302.21	5150.26	1302.21	5153.39	1302.21	5155.04	1302.21
5166.11	1302.21	5176.52	1303.65	5180.75	1304.21	5206.54	1304.21	5213.43	1304.21
5213.54	1304.12	5215.79	1302.21	5217.35	1300.89	5218.14	1300.21	5218.89	1299.58
5220.5	1298.21	5226.09	1298.21	5229.1	1298.21	5231.53	1299.96	5231.89	1300.21
5234.34	1300.21	5234.98	1300.21	5243.55	1300.21	5249.79	1298.64	5250.81	1298.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4578	.05	4881	.03	5134.95	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4695	5134.95	235	235	235	.1	.3

Left Levee Station= 4578 Elevation= 1304
Right Levee Station= 5180.75 Elevation= 1304.21

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.034	
W.S. Elev (ft)	1302.03	Reach Len. (ft)	235.00	235.00	235.00
Crit W.S. (ft)	1295.80	Flow Area (sq ft)	131.32	3435.98	
E.G. Slope (ft/ft)	0.000176	Area (sq ft)	131.32	3435.98	
Q Total (cfs)	8100.00	Flow (cfs)	60.75	8039.25	
Top Width (ft)	542.54	Top Width (ft)	103.19	439.35	
Vel Total (ft/s)	2.27	Avg. Vel. (ft/s)	0.46	2.34	
Max Chl Dpth (ft)	9.82	Hydr. Depth (ft)	1.27	7.82	

Conv. Total (cfs)	610801.2	Conv. (cfs)	4581.2	606220.0
Length Wtd. (ft)	235.00	Wetted Per. (ft)	103.25	441.68
Min Ch El (ft)	1292.21	Shear (lb/sq ft)	0.01	0.09
Alpha	1.05	Stream Power (lb/ft s)	0.01	0.20
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.35	172.12
C & E Loss (ft)	0.00	Cum SA (acres)	0.28	21.17

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.033	
W.S. Elev (ft)	1299.62	Reach Len. (ft)	235.00	235.00	235.00
Crit W.S. (ft)	1294.97	Flow Area (sq ft)		2393.72	
E.G. Slope (ft/ft)	0.000195	Area (sq ft)		2393.72	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	421.07	Top Width (ft)		421.07	
Vel Total (ft/s)	2.08	Avg. Vel. (ft/s)		2.08	
Max Chl Dpth (ft)	7.41	Hydr. Depth (ft)		5.68	
Conv. Total (cfs)	356218.9	Conv. (cfs)		356218.9	
Length Wtd. (ft)	235.00	Wetted Per. (ft)		422.94	
Min Ch El (ft)	1292.21	Shear (lb/sq ft)		0.07	
Alpha	1.00	Stream Power (lb/ft s)		0.14	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		123.07	
C & E Loss (ft)	0.00	Cum SA (acres)		19.80	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.843

INPUT
Description: TT; Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with trees and shrubs.

End Dense
Grass in channel bed
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4580	1304	4617	1304	4645	1305	4705	1305	4721	1304
4755	1301	4771	1300	4785	1297	4812	1296	4835	1295
4858	1294.5	4878	1295	4882	1296	4893	1294	4895.89	1292.94
4908.24	1292.3	4911.45	1292.25	4973.02	1292.11	4993.46	1292.25	5009.09	1292.5
5059.09	1292.16	5098.86	1293.18	5108.1	1295.71	5115.7	1298.18	5134.92	1304.54
5144.4	1304.08	5156.11	1303.87	5161.83	1303.61	5176.85	1305.75	5190.84	1307.03
5208.72	1308.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4580	.05	4882	.03	5134.92	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4705	5134.92	250	250	250	.1	.3

Left Levee Station= 4705 Elevation= 1305
Right Levee Station= 5134.92 Elevation= 1304.54

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1302.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.032	
W.S. Elev (ft)	1301.94	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1296.01	Flow Area (sq ft)		2879.55	
E.G. Slope (ft/ft)	0.000241	Area (sq ft)		2879.55	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	

Top Width (ft)	382.67	Top Width (ft)	382.67
Vel Total (ft/s)	2.81	Avg. Vel. (ft/s)	2.81
Max Chl Dpth (ft)	9.83	Hydr. Depth (ft)	7.52
Conv. Total (cfs)	521429.5	Conv. (cfs)	521429.5
Length Wtd. (ft)	250.00	Wetted Per. (ft)	384.98
Min Ch El (ft)	1292.11	Shear (lb/sq ft)	0.11
Alpha	1.00	Stream Power (lb/ft s)	0.32
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	155.09
C & E Loss (ft)	0.01	Cum SA (acres)	18.95

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.032	
W.S. Elev (ft)	1299.53	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1295.10	Flow Area (sq ft)		2004.90	
E.G. Slope (ft/ft)	0.000260	Area (sq ft)		2004.90	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	346.61	Top Width (ft)		346.61	
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)		2.48	
Max Chl Dpth (ft)	7.42	Hydr. Depth (ft)		5.78	
Conv. Total (cfs)	309073.2	Conv. (cfs)		309073.2	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		348.40	
Min Ch El (ft)	1292.11	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.23	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		111.20	
C & E Loss (ft)	0.01	Cum SA (acres)		17.73	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.796

INPUT
Description: New Tetra Tech, Inc. Cross Section. Left Overbank roughness is a combination Desert Brush Overbank and Constructed Earth Channel with Trees and Shrubs.

Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4578	1304	4661	1303	4673	1303	4692	1304	4743	1311
4770	1311	4815	1304	4846	1303	4880	1297	4886	1296
4894	1294	4901.54	1293.74	4931.83	1292.34	4937.99	1292.06	4941.4	1292.06
4991.03	1292.06	5033.25	1292.06	5044.36	1292.06	5044.81	1292.06	5053.07	1292.06
5062.81	1292.06	5076.42	1292.76	5102.17	1294.06	5102.23	1294.06	5103.23	1294.36
5110.58	1296.06	5113.85	1297.15	5116.4	1298.06	5120.5	1299.33	5122.9	1300.06
5126.03	1301	5128.32	1301.78	5129.14	1302.06	5134.5	1303.78	5135.34	1304.06
5138.52	1304.06	5138.56	1304.06	5138.72	1304.06	5163.96	1304.06	5173.01	1305.37
5177.87	1306.06	5184.08	1306.52	5204.71	1307.93	5206.52	1308.06	5206.7	1308.06
5210.09	1308.06	5211.16	1307.08	5212.24	1306.06	5212.63	1305.7	5214.36	1304.06
5215.44	1303.04	5216.48	1302.06	5217.56	1301.03	5218.59	1300.06	5225.81	1300.06
5228.31	1300.06	5229.81	1301.68	5230.15	1302.06	5236.84	1302.06	5244.2	1302.06
5246.34	1301.51	5251.61	1300.11	5251.8	1300.06	5252.55	1300.06	5252.83	1300.06
5259.41	1300.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4578	.05	4886	.03	5135.34	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4770	5135.34	250	250	250	.1	.3

Left Levee Station= 4770 Elevation= 1311
Right Levee Station= 5206.52 Elevation= 1308.06

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.030	
W.S. Elev (ft)	1301.77	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1296.07	Flow Area (sq ft)		2193.50	
E.G. Slope (ft/ft)	0.000336	Area (sq ft)		2193.50	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	275.31	Top Width (ft)		275.31	
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)		3.69	
Max Chl Dpth (ft)	9.71	Hydr. Depth (ft)		7.97	
Conv. Total (cfs)	441991.2	Conv. (cfs)		441991.2	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		277.29	
Min Ch El (ft)	1292.06	Shear (lb/sq ft)		0.17	
Alpha	1.00	Stream Power (lb/ft s)		0.61	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		140.53	
C & E Loss (ft)	0.00	Cum SA (acres)		17.07	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.030	
W.S. Elev (ft)	1299.39	Reach Len. (ft)	250.00	250.00	250.00
Crit W.S. (ft)	1295.08	Flow Area (sq ft)		1563.48	
E.G. Slope (ft/ft)	0.000353	Area (sq ft)		1563.48	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	254.24	Top Width (ft)		254.24	
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)		3.19	
Max Chl Dpth (ft)	7.33	Hydr. Depth (ft)		6.15	
Conv. Total (cfs)	265025.6	Conv. (cfs)		265025.6	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		255.64	
Min Ch El (ft)	1292.06	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.43	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		100.96	
C & E Loss (ft)	0.00	Cum SA (acres)		16.00	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.749

INPUT
Description: End Tetra Tech, Inc. Landscape Changes. Return to Original EMF Capacity Assessment Study. Beginning here to the end of the reach, the only alteration was the elevation change to the NAVD 88 Datum (+2.21').

Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.25	1303.21	4241.38	1303.11	4282.61	1302.89	4306.9	1302.73	4380.3	1302.7
4421.26	1302.81	4490.41	1302.76	4538.41	1302.7	4556.35	1302.79	4580.3	1302.92
4593.28	1303.41	4596.42	1304.08	4602.9	1304.23	4612.02	1303.68	4621.13	1304.17
4625.16	1304.21	4636.13	1304.05	4651.34	1304.25	4660.04	1303.9	4710.03	1303.51
4725.78	1303.81	4740.07	1303.9	4760.04	1303.57	4767.96	1303.93	4795.74	1304.98
4806.95	1304.51	4814.31	1303.41	4828.19	1303.31	4843.24	1302.65	4860.68	1304.03
4862.86	1303.71	4896.96	1292.94	4910.04	1292.43	4960.65	1292.01	4995.11	1292.25
5012.19	1292.41	5060.04	1292.34	5099.65	1293.69	5111.09	1296.73	5134.52	1304.24
5157.67	1303.71	5174.55	1305.81	5192.99	1307.13	5207.5	1307.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.25	.04	4860.68	.025	5134.52	.04

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

```
      4860.68 5134.52              500     500     500             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F
Left Levee      Station= 4795.74      Elevation= 1304.98
Right Levee     Station= 5134.52      Elevation= 1304.24
```

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.68	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1296.09	Flow Area (sq ft)		2105.67	
E.G. Slope (ft/ft)	0.000257	Area (sq ft)		2105.67	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	257.22	Top Width (ft)		257.22	
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)		3.85	
Max Chl Dpth (ft)	9.67	Hydr. Depth (ft)		8.19	
Conv. Total (cfs)	505025.0	Conv. (cfs)		505025.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		259.77	
Min Ch El (ft)	1292.01	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		128.19	
C & E Loss (ft)	0.00	Cum SA (acres)		15.54	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.30	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.08	Flow Area (sq ft)		1512.72	
E.G. Slope (ft/ft)	0.000270	Area (sq ft)		1512.72	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	242.29	Top Width (ft)		242.29	
Vel Total (ft/s)	3.29	Avg. Vel. (ft/s)		3.29	
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)		6.24	
Conv. Total (cfs)	303338.8	Conv. (cfs)		303338.8	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.11	
Min Ch El (ft)	1292.01	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.34	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		92.14	
C & E Loss (ft)	0.00	Cum SA (acres)		14.58	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.654

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4214.24	1304.51	4260.97	1304.54	4307.48	1304.67	4310.97	1304.65	4360.98	1305.3
4364.36	1305.31	4410.97	1305.57	4457.77	1304.92	4514.08	1305.09	4560.97	1305.18
4563.99	1305.11	4610.98	1305.01	4663.79	1304.68	4710.98	1304.63	4764.35	1303.71
4797.76	1302.91	4809.24	1303.15	4815.88	1301.88	4820.99	1302.2	4827.33	1302.27
4841.44	1301.41	4862.58	1303.95	4883.68	1297.79	4900.77	1292.74	4913.33	1292.35
4961.47	1292.21	4997.55	1292.3	5013.12	1292.4	5060.97	1292.4	5101.18	1293.95
5110.07	1296.31	5116.33	1298.31	5135.28	1304.58	5158.96	1303.4	5170.22	1305.19
5193.51	1306.81	5209.42	1307.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4214.24	.04	4862.58	.025	5135.28	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4862.58	5135.28	465.44	465.44	465.44	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888		F	
888		F	

Left Levee Station= 4862.58 Elevation= 1303.95
Right Levee Station= 5135.28 Elevation= 1304.58

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1301.78	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.53	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1296.17	Flow Area (sq ft)		2038.96	
E.G. Slope (ft/ft)	0.000283	Area (sq ft)		2038.96	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	255.20	Top Width (ft)		255.20	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)		3.97	
Max Chl Dpth (ft)	9.32	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	481272.2	Conv. (cfs)		481272.2	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		257.64	
Min Ch El (ft)	1292.21	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.56	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)		104.41	
C & E Loss (ft)	0.00	Cum SA (acres)		12.60	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1299.33	Element			
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.15	Reach Len. (ft)	465.44	465.44	465.44
Crit W.S. (ft)	1295.16	Flow Area (sq ft)		1449.14	
E.G. Slope (ft/ft)	0.000307	Area (sq ft)		1449.14	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	239.84	Top Width (ft)		239.84	
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)		3.44	
Max Chl Dpth (ft)	6.94	Hydr. Depth (ft)		6.04	
Conv. Total (cfs)	284377.1	Conv. (cfs)		284377.1	
Length Wtd. (ft)	465.44	Wetted Per. (ft)		241.55	
Min Ch El (ft)	1292.21	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)		75.14	
C & E Loss (ft)	0.00	Cum SA (acres)		11.81	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.566

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4217.79	1304.81	4261.85	1304.74	4299.91	1304.4	4323.81	1304.27	4361.85	1304.35
4411.85	1304.81	4461.84	1304.63	4499.55	1304.67	4524.2	1304.73	4561.84	1304.66
4599.35	1304.71	4624.39	1304.5	4661.85	1304.28	4761.85	1303.01	4793.49	1301.57
4801.87	1302.91	4814.64	1301.58	4827.88	1301.5	4841.4	1301.07	4863.63	1303.73
4900.88	1292.61	4911.85	1292.13	4961.84	1292.37	5011.84	1292.26	5061.85	1291.71
5096.04	1292.81	5101.85	1294.17	5129.28	1302.51	5135.55	1304.34	5161.76	1302.99
5171.01	1304.01	5191.76	1305.92	5209.25	1307.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4217.79	.04	4863.63	.025	5135.55	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4863.63	5135.55	280	250	222	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

Left Levee Station= 4863.63 Elevation= 1303.73
Right Levee Station= 5135.55 Elevation= 1304.34

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1301.65	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.41	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1295.92	Flow Area (sq ft)		2056.61	
E.G. Slope (ft/ft)	0.000274	Area (sq ft)		2056.61	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.23	Top Width (ft)		254.23	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.69	Hydr. Depth (ft)		8.09	
Conv. Total (cfs)	489333.7	Conv. (cfs)		489333.7	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		256.77	
Min Ch El (ft)	1291.71	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		82.52	
C & E Loss (ft)	0.00	Cum SA (acres)		9.88	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1299.19	Element			
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1299.01	Reach Len. (ft)	280.00	250.00	222.00
Crit W.S. (ft)	1294.90	Flow Area (sq ft)		1467.47	
E.G. Slope (ft/ft)	0.000292	Area (sq ft)		1467.47	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	238.35	Top Width (ft)		238.35	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)		3.39	
Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)		6.16	
Conv. Total (cfs)	291496.4	Conv. (cfs)		291496.4	
Length Wtd. (ft)	250.00	Wetted Per. (ft)		240.19	
Min Ch El (ft)	1291.71	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		59.56	
C & E Loss (ft)	0.00	Cum SA (acres)		9.26	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.518

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4258.45	1307.28	4270.94	1306.8	4308.36	1306.22	4319.34	1305.84	4370.51	1305.61
4421.71	1305.45	4472.9	1305.13	4524.09	1304.66	4575.29	1304.74	4626.47	1304.41
4677.67	1304.27	4703.2	1303.81	4728.84	1303.59	4772.47	1302.48	4791.69	1301.81
4799.57	1303.03	4809.96	1301.41	4817.08	1301.95	4824.01	1301.87	4844.77	1300.51
4864.63	1303.69	4873.97	1301.01	4897	1294.21	4904.18	1292.43	4908.56	1292.41
4933.61	1292.3	4984.8	1292.31	4997.31	1292.36	5036	1291.83	5052.87	1292.01
5087.17	1292.33	5101.39	1292.67	5137.14	1303.76	5159.71	1303.19	5167.77	1304.41
5187.78	1306.02	5203.51	1306.91						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4258.45	.04	4864.63	.025	5137.14	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4864.63	5137.14	460	408.26	365	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

Left Levee Station= 4864.63 Elevation= 1303.69
Right Levee Station= 5137.14 Elevation= 1303.76

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.33	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1295.90	Flow Area (sq ft)		2058.39	
E.G. Slope (ft/ft)	0.000276	Area (sq ft)		2058.39	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	256.45	Top Width (ft)		256.45	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	9.50	Hydr. Depth (ft)		8.03	
Conv. Total (cfs)	487207.4	Conv. (cfs)		487207.4	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		259.02	
Min Ch El (ft)	1291.83	Shear (lb/sq ft)		0.14	
Alpha	1.00	Stream Power (lb/ft s)		0.54	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		70.72	
C & E Loss (ft)	0.01	Cum SA (acres)		8.41	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1299.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.93	Reach Len. (ft)	460.00	408.26	365.00
Crit W.S. (ft)	1294.90	Flow Area (sq ft)		1462.51	
E.G. Slope (ft/ft)	0.000299	Area (sq ft)		1462.51	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	240.57	Top Width (ft)		240.57	
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)		3.41	
Max Chl Dpth (ft)	7.10	Hydr. Depth (ft)		6.08	
Conv. Total (cfs)	288070.1	Conv. (cfs)		288070.1	
Length Wtd. (ft)	408.26	Wetted Per. (ft)		242.43	
Min Ch El (ft)	1291.83	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.38	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		51.15	
C & E Loss (ft)	0.01	Cum SA (acres)		7.88	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.441

INPUT
Description: Downstream of Side Inlet from the Left Bank Q(D)=8,100 cfs, Q(F)=10,790 cfs & Q(E)=14,650 cfs
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4203.3	1306.51	4235.34	1306.29	4261.67	1306.22	4287.54	1306.27	4327.76	1306.52
4380.59	1306.41	4440.03	1305.88	4499.48	1305.61	4558.96	1305.41	4618.41	1304.49
4649.32	1304.41	4685.49	1304.91	4697.36	1304.49	4721.67	1303.82	4737.32	1303
4770.29	1302.11	4783.88	1302.13	4794.06	1301.79	4802.65	1300.64	4809.22	1301.77
4852.28	1300.41	4860.25	1302.73	4872.95	1302.43	4883.31	1299.61	4910.83	1292
4915.66	1291.71	4975.62	1291.27	5001.12	1291.49	5034.6	1291.58	5067.01	1291.51
5095.33	1291.81	5105.93	1292.13	5144.26	1303.33	5157.98	1303.24	5164.91	1303.01
5168.87	1304.51	5173.15	1304.78	5181.65	1304.83	5198.26	1306.09		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4203.3	.04	4872.95	.025	5144.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4872.95	5144.26	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888			F
888			F

Left Levee Station= 4860.25 Elevation= 1302.73
Right Levee Station= 5144.26 Elevation= 1303.33

CROSS SECTION OUTPUT Profile #Design

			Left OB	Channel	Right OB
E.G. Elev (ft)	1301.46	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.24	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1295.26	Flow Area (sq ft)		2187.04	
E.G. Slope (ft/ft)	0.000230	Area (sq ft)		2187.04	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	259.80	Top Width (ft)		259.80	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	9.97	Hydr. Depth (ft)		8.42	
Conv. Total (cfs)	534408.3	Conv. (cfs)		534408.3	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		262.37	
Min Ch El (ft)	1291.27	Shear (lb/sq ft)		0.12	
Alpha	1.00	Stream Power (lb/ft s)		0.44	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		50.82	
C & E Loss (ft)	0.00	Cum SA (acres)		5.99	

CROSS SECTION OUTPUT Profile #10-Year Future

			Left OB	Channel	Right OB
E.G. Elev (ft)	1298.99	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.84	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.25	Flow Area (sq ft)		1583.41	
E.G. Slope (ft/ft)	0.000232	Area (sq ft)		1583.41	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	242.80	Top Width (ft)		242.80	
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)		3.15	
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		6.52	
Conv. Total (cfs)	326800.0	Conv. (cfs)		326800.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		244.70	
Min Ch El (ft)	1291.27	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.30	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		36.87	
C & E Loss (ft)	0.00	Cum SA (acres)		5.62	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.346

INPUT
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4204.52	1306.61	4236.47	1306.98	4273.71	1307.15	4295.96	1307.17	4336.33	1306.87
4365.99	1306.71	4414.92	1306.48	4431.91	1306.56	4458.29	1306.89	4474.42	1306.88
4503.66	1306.61	4533.9	1306.34	4550.58	1306.25	4593.38	1306.23	4612.78	1306.18
4652.86	1305.41	4685.14	1304.99	4712.36	1304.79	4727.78	1304.44	4735.75	1304.2
4749.1	1303.01	4771.13	1301.77	4785.51	1301.37	4803.47	1300.57	4810.82	1301.39
4828.94	1301.01	4851.17	1300.14	4860.03	1302.51	4869	1302.73	4872.63	1302.31
4891.24	1296.31	4903.87	1292.84	4911.3	1291.44	4924.19	1291.27	4950.31	1291.16
4984	1291.51	5002.09	1291.38	5012.03	1291.4	5069.26	1291.09	5092.68	1291.33
5105.64	1291.61	5111.11	1292.99	5129.38	1297.84	5148.95	1303.43	5165.41	1302.81
5178.97	1304.41	5191.87	1304.74	5197.09	1305.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4204.52	.04	4869	.025	5148.95	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4869	5148.95	500	500	500	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Left Levee Station= 4869 Elevation= 1302.73
Right Levee Station= 5148.95 Elevation= 1303.43

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.14	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1294.97	Flow Area (sq ft)		2271.12	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		2271.12	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	264.70	Top Width (ft)		264.70	
Vel Total (ft/s)	3.57	Avg. Vel. (ft/s)		3.57	
Max Chl Dpth (ft)	10.05	Hydr. Depth (ft)		8.58	
Conv. Total (cfs)	562024.0	Conv. (cfs)		562024.0	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		267.33	
Min Ch El (ft)	1291.09	Shear (lb/sq ft)		0.11	
Alpha	1.00	Stream Power (lb/ft s)		0.39	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		25.24	
C & E Loss (ft)	0.00	Cum SA (acres)		2.98	

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1298.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.74	Reach Len. (ft)	500.00	500.00	500.00
Crit W.S. (ft)	1293.98	Flow Area (sq ft)		1653.70	
E.G. Slope (ft/ft)	0.000208	Area (sq ft)		1653.70	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	248.82	Top Width (ft)		248.82	
Vel Total (ft/s)	3.01	Avg. Vel. (ft/s)		3.01	
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		6.65	
Conv. Total (cfs)	345674.5	Conv. (cfs)		345674.5	
Length Wtd. (ft)	500.00	Wetted Per. (ft)		250.74	
Min Ch El (ft)	1291.09	Shear (lb/sq ft)		0.09	
Alpha	1.00	Stream Power (lb/ft s)		0.26	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)		18.30	
C & E Loss (ft)	0.00	Cum SA (acres)		2.80	

CROSS SECTION RIVER: EMF
REACH: Reach 3 RS: 10.252

INPUT
Description: End of Tetra Tech, Inc. Landscape Changes; December 2001 study.
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4658.04	1307.01	4698.66	1305.67	4705.96	1305.35	4719.74	1304.51	4737.35	1303.15
4785.48	1302.24	4793.47	1301.97	4799.57	1301.92	4824.28	1301.91	4836.29	1301.7
4845.85	1303.36	4867.88	1303.52	4873.51	1303.61	4910.83	1292.01	4925.86	1291.47
4957.19	1291.18	4987.25	1291.46	5003.76	1291.75	5043.67	1291.01	5054.5	1291.12
5103.62	1291.91	5144.94	1303.29	5163.49	1302.37	5165.79	1302.31	5178.08	1303.58
5197.94	1304.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4658.04	.04	4873.51	.025	5144.94	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4873.51	5144.94	208	128	12	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
888	F		

Left Levee Station= 4873.51 Elevation= 1303.61
Right Levee Station= 5144.94 Elevation= 1303.29

CROSS SECTION OUTPUT Profile #Design

E.G. Elev (ft)	1301.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.025	
W.S. Elev (ft)	1301.00	Reach Len. (ft)			
Crit W.S. (ft)	1295.16	Flow Area (sq ft)		2125.84	
E.G. Slope (ft/ft)	0.000246	Area (sq ft)		2125.84	
Q Total (cfs)	8100.00	Flow (cfs)		8100.00	
Top Width (ft)	254.72	Top Width (ft)		254.72	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81	
Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)		8.35	
Conv. Total (cfs)	516336.6	Conv. (cfs)		516336.6	
Length Wtd. (ft)		Wetted Per. (ft)		257.34	
Min Ch El (ft)	1291.01	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.48	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #10-Year Future

E.G. Elev (ft)	1298.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.025	
W.S. Elev (ft)	1298.60	Reach Len. (ft)			
Crit W.S. (ft)	1294.15	Flow Area (sq ft)		1534.23	
E.G. Slope (ft/ft)	0.000252	Area (sq ft)		1534.23	
Q Total (cfs)	4980.00	Flow (cfs)		4980.00	
Top Width (ft)	238.28	Top Width (ft)		238.28	
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25	
Max Chl Dpth (ft)	7.59	Hydr. Depth (ft)		6.44	
Conv. Total (cfs)	313909.8	Conv. (cfs)		313909.8	
Length Wtd. (ft)		Wetted Per. (ft)		240.22	
Min Ch El (ft)	1291.01	Shear (lb/sq ft)		0.10	
Alpha	1.00	Stream Power (lb/ft s)		0.33	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:EMF

Reach	River Sta.	n1	n2	n3
Reach 3	11.893	.04	.025	.04
Reach 3	11.798	.04	.025	.04
Reach 3	11.703	.04	.025	.04
Reach 3	11.609	.04	.025	.04
Reach 3	11.572	.04	.025	.04
Reach 3	11.531	.04	.025	.04
Reach 3	11.486	.04	.025	.04
Reach 3	11.391	.04	.025	.04
Reach 3	11.328	.04	.025	.04
Reach 3	11.321	.04	.013	.04
Reach 3	11.308	.04	.013	.04
Reach 3	11.297	.04	.03	.04
Reach 3	11.26	.04	.03	.04
Reach 3	11.254	Bridge		
Reach 3	11.249	.04	.03	.04
Reach 3	11.231	.05	.03	.04
Reach 3	11.189	.05	.03	.04
Reach 3	11.141	.05	.03	.04
Reach 3	11.127	.05	.03	.04
Reach 3	11.080	.05	.03	.04
Reach 3	11.033	.05	.03	.04
Reach 3	11.013	.05	.03	.04
Reach 3	10.938	.05	.03	.04
Reach 3	10.890	.05	.03	.04
Reach 3	10.843	.05	.03	.04
Reach 3	10.796	.05	.03	.04
Reach 3	10.749	.04	.025	.04
Reach 3	10.654	.04	.025	.04
Reach 3	10.566	.04	.025	.04
Reach 3	10.518	.04	.025	.04
Reach 3	10.441	.04	.025	.04
Reach 3	10.346	.04	.025	.04
Reach 3	10.252	.04	.025	.04

SUMMARY OF REACH LENGTHS

River: EMF

Reach	River Sta.	Left	Channel	Right
Reach 3	11.893	500	500	500
Reach 3	11.798	500	500	500
Reach 3	11.703	500	500	500
Reach 3	11.609	194.37	194.37	194.37
Reach 3	11.572	218.29	218.29	218.29
Reach 3	11.531	237.2	237.2	237.2
Reach 3	11.486	500	500	500
Reach 3	11.391	335.09	335.09	335.09
Reach 3	11.328	36.18	36.18	36.18
Reach 3	11.321	65.83	65.83	65.83
Reach 3	11.308	58.67	58.67	58.67
Reach 3	11.297	140	195.02	255
Reach 3	11.26	57.31	57.31	57.31
Reach 3	11.254	Bridge		
Reach 3	11.249	150	95.09	40
Reach 3	11.231	285	255	234
Reach 3	11.189	192	232	270
Reach 3	11.141	85	85	85
Reach 3	11.127	250	250	250
Reach 3	11.080	250	250	250
Reach 3	11.033	105	105	105
Reach 3	11.013	395	395	395
Reach 3	10.938	265	265	265
Reach 3	10.890	235	235	235
Reach 3	10.843	250	250	250
Reach 3	10.796	250	250	250
Reach 3	10.749	500	500	500
Reach 3	10.654	465.44	465.44	465.44
Reach 3	10.566	280	250	222
Reach 3	10.518	460	408.26	365
Reach 3	10.441	500	500	500
Reach 3	10.346	500	500	500
Reach 3	10.252	208	128	12

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: EMF

Reach	River Sta.		Contr.	Expan.
Reach 3	11.893		.1	.3
Reach 3	11.798		.1	.3
Reach 3	11.703		.1	.3
Reach 3	11.609		.1	.3
Reach 3	11.572		.1	.3
Reach 3	11.531		.1	.3
Reach 3	11.486		.1	.3
Reach 3	11.391		.1	.3
Reach 3	11.328		.3	.5
Reach 3	11.321		.3	.5
Reach 3	11.308		.3	.5
Reach 3	11.297		.3	.5
Reach 3	11.26		.3	.5
Reach 3	11.254	Bridge		
Reach 3	11.249		.3	.5
Reach 3	11.231		.3	.5
Reach 3	11.189		.1	.3
Reach 3	11.141		.1	.3
Reach 3	11.127		.1	.3
Reach 3	11.080		.1	.3
Reach 3	11.033		.1	.3
Reach 3	11.013		.1	.3
Reach 3	10.938		.1	.3
Reach 3	10.890		.1	.3
Reach 3	10.843		.1	.3
Reach 3	10.796		.1	.3
Reach 3	10.749		.1	.3
Reach 3	10.654		.1	.3
Reach 3	10.566		.1	.3
Reach 3	10.518		.1	.3
Reach 3	10.441		.1	.3
Reach 3	10.346		.1	.3
Reach 3	10.252		.3	.5

Profile Output Table - Standard Table 1

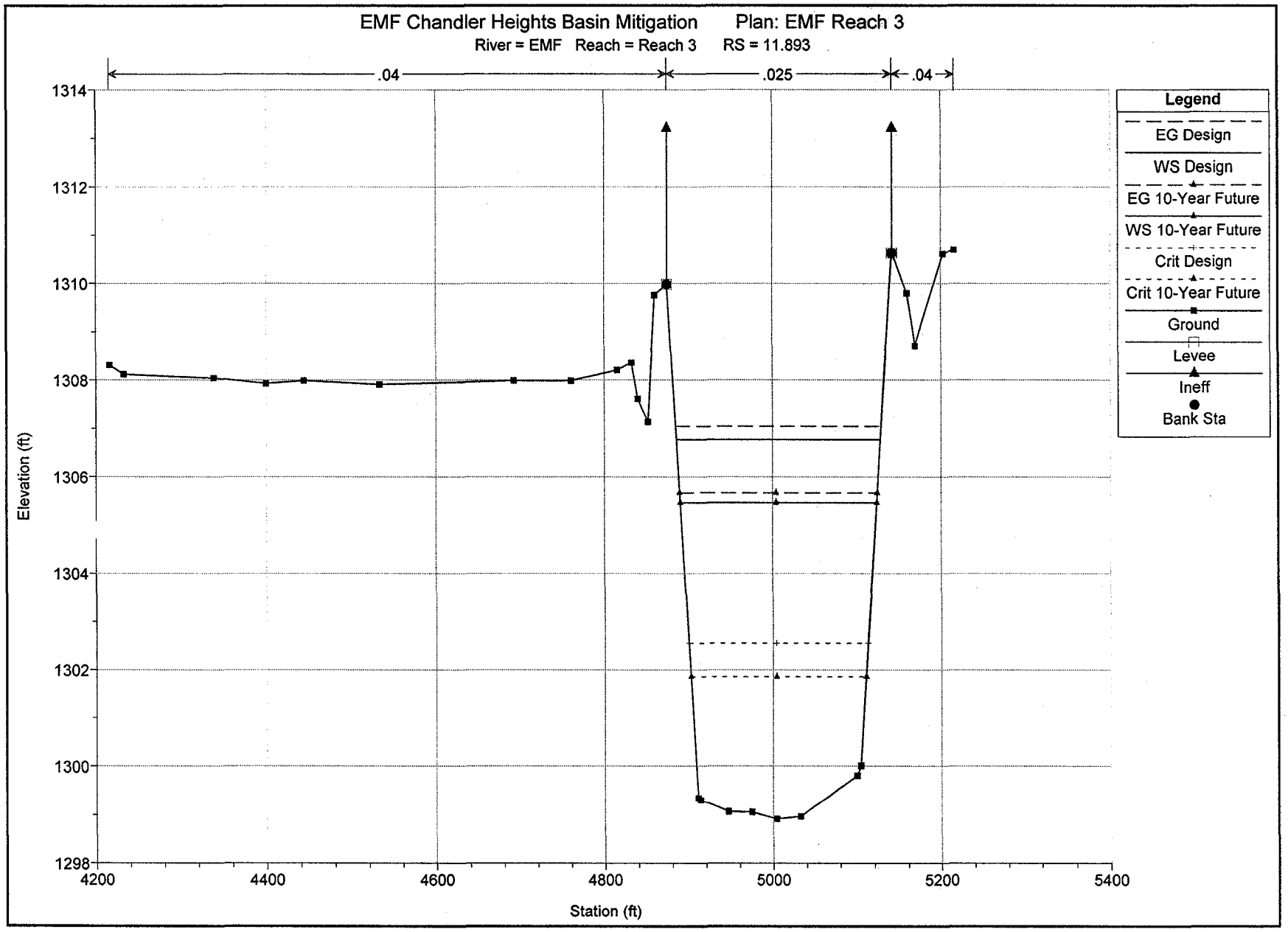
Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 3	11.893	6900.00	1298.9	1306.8	1302.5	1307.1	0.000395	4.2	1641.6	242.7	0.28
Reach 3	11.893	4860.00	1298.9	1305.5	1301.9	1305.7	0.000376	3.7	1328.9	233.5	0.27
Reach 3	11.798	6900.00	1298.9	1306.6	1302.4	1306.8	0.000408	4.2	1624.8	241.9	0.29
Reach 3	11.798	4860.00	1298.9	1305.3	1301.7	1305.5	0.000386	3.7	1317.9	233.2	0.27
Reach 3	11.703	6900.00	1298.9	1306.3	1302.4	1306.6	0.000460	4.4	1565.0	241.1	0.30
Reach 3	11.703	4860.00	1298.9	1305.0	1301.7	1305.3	0.000445	3.9	1260.3	232.0	0.29
Reach 3	11.609	6900.00	1298.6	1306.1	1302.4	1306.4	0.000472	4.4	1560.6	244.5	0.31
Reach 3	11.609	4860.00	1298.6	1304.8	1301.7	1305.0	0.000467	3.9	1251.6	236.7	0.30
Reach 3	11.572	6900.00	1298.7	1306.0	1302.3	1306.3	0.000511	4.6	1510.3	238.6	0.32
Reach 3	11.572	4860.00	1298.7	1304.7	1301.6	1304.9	0.000505	4.0	1211.3	230.8	0.31
Reach 3	11.531	6900.00	1298.5	1305.8	1302.3	1306.2	0.000529	4.6	1500.1	241.0	0.32
Reach 3	11.531	4860.00	1298.5	1304.6	1301.6	1304.8	0.000530	4.1	1197.9	232.9	0.32
Reach 3	11.486	6900.00	1298.8	1305.7	1302.3	1306.0	0.000572	4.7	1469.6	242.9	0.34
Reach 3	11.486	4860.00	1298.8	1304.4	1301.6	1304.7	0.000588	4.2	1164.4	234.6	0.33
Reach 3	11.391	6900.00	1297.9	1305.4	1301.9	1305.8	0.000528	4.6	1505.1	242.8	0.32
Reach 3	11.391	4860.00	1297.9	1304.1	1301.2	1304.4	0.000533	4.1	1198.8	234.4	0.32
Reach 3	11.328	6900.00	1297.1	1305.2	1301.6	1305.6	0.000522	4.6	1493.1	235.9	0.32
Reach 3	11.328	4860.00	1297.1	1304.0	1300.9	1304.2	0.000510	4.1	1197.8	226.5	0.31
Reach 3	11.321	6900.00	1298.5	1303.1	1303.1	1305.1	0.001619	11.3	610.6	152.5	1.00
Reach 3	11.321	4860.00	1298.5	1302.1	1302.1	1303.8	0.001717	10.3	473.5	143.4	1.00
Reach 3	11.308	6900.00	1292.9	1302.6	1297.8	1303.0	0.000128	4.9	1402.6	186.2	0.32
Reach 3	11.308	4860.00	1292.9	1300.2	1296.9	1300.6	0.000180	4.9	983.0	167.8	0.36
Reach 3	11.297	6900.00	1293.0	1302.7	1297.1	1302.9	0.000342	3.6	1904.1	239.6	0.23
Reach 3	11.297	4860.00	1293.0	1300.3	1296.4	1300.5	0.000479	3.6	1355.3	223.3	0.26
Reach 3	11.26	6900.00	1292.6	1302.6	1296.5	1302.8	0.000247	3.2	2182.7	264.1	0.19
Reach 3	11.26	4860.00	1292.6	1300.2	1295.8	1300.4	0.000336	3.1	1570.0	247.8	0.22
Reach 3	11.254	Bridge									
Reach 3	11.249	6900.00	1292.9	1302.6	1296.7	1302.8	0.000273	3.3	2106.8	260.5	0.20
Reach 3	11.249	4860.00	1292.9	1300.2	1296.0	1300.4	0.000383	3.2	1501.8	244.4	0.23
Reach 3	11.231	8100.00	1292.8	1302.5	1296.7	1302.7	0.000346	3.7	2186.9	269.0	0.23
Reach 3	11.231	4980.00	1292.8	1300.2	1295.7	1300.3	0.000351	3.2	1579.7	250.5	0.22

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
Reach 3	11.189	8100.00	1292.9	1302.4	1296.9	1302.6	0.000294	3.0	2713.8	416.5	0.21
Reach 3	11.189	4980.00	1292.9	1300.1	1295.9	1300.2	0.000379	3.2	1545.8	390.9	0.25
Reach 3	11.141	8100.00	1293.1	1302.4	1296.7	1302.5	0.000269	3.0	2710.7	352.0	0.19
Reach 3	11.141	4980.00	1293.1	1300.0	1295.7	1300.1	0.000293	2.6	1898.7	332.2	0.19
Reach 3	11.127	8100.00	1292.9	1302.3	1296.8	1302.5	0.000316	3.3	2481.3	334.4	0.21
Reach 3	11.127	4980.00	1292.9	1300.0	1295.8	1300.1	0.000354	2.9	1712.7	312.1	0.22
Reach 3	11.080	8100.00	1292.8	1302.3	1296.3	1302.4	0.000226	2.7	3067.2	508.9	0.17
Reach 3	11.080	4980.00	1292.8	1299.9	1295.5	1300.0	0.000241	2.4	2115.3	355.0	0.17
Reach 3	11.033	8100.00	1292.6	1302.1	1296.7	1302.3	0.000377	3.8	2155.4	302.2	0.25
Reach 3	11.033	4980.00	1292.6	1299.7	1295.7	1299.9	0.000410	3.4	1481.6	264.5	0.25
Reach 3	11.013	8100.00	1292.5	1302.1	1296.0	1302.3	0.000280	3.4	2388.8	306.2	0.21
Reach 3	11.013	4980.00	1292.5	1299.7	1295.0	1299.9	0.000287	2.9	1691.5	278.0	0.21
Reach 3	10.938	8100.00	1292.3	1302.1	1296.4	1302.2	0.000239	3.1	3170.2	442.7	0.19
Reach 3	10.938	4980.00	1292.3	1299.7	1295.5	1299.8	0.000274	2.8	2152.0	405.7	0.20
Reach 3	10.890	8100.00	1292.2	1302.0	1295.8	1302.1	0.000176	2.3	3567.3	542.5	0.15
Reach 3	10.890	4980.00	1292.2	1299.6	1295.0	1299.7	0.000195	2.1	2393.7	421.1	0.15
Reach 3	10.843	8100.00	1292.1	1301.9	1296.0	1302.1	0.000241	2.8	2879.6	382.7	0.18
Reach 3	10.843	4980.00	1292.1	1299.5	1295.1	1299.6	0.000260	2.5	2004.9	346.6	0.18
Reach 3	10.796	8100.00	1292.1	1301.8	1296.1	1302.0	0.000336	3.7	2193.5	275.3	0.23
Reach 3	10.796	4980.00	1292.1	1299.4	1295.1	1299.5	0.000353	3.2	1563.5	254.2	0.23
Reach 3	10.749	8100.00	1292.0	1301.7	1296.1	1301.9	0.000257	3.8	2105.7	257.2	0.24
Reach 3	10.749	4980.00	1292.0	1299.3	1295.1	1299.5	0.000270	3.3	1512.7	242.3	0.23
Reach 3	10.654	8100.00	1292.2	1301.5	1296.2	1301.8	0.000283	4.0	2039.0	255.2	0.25
Reach 3	10.654	4980.00	1292.2	1299.1	1295.2	1299.3	0.000307	3.4	1449.1	239.8	0.25
Reach 3	10.566	8100.00	1291.7	1301.4	1295.9	1301.6	0.000274	3.9	2056.6	254.2	0.24
Reach 3	10.566	4980.00	1291.7	1299.0	1294.9	1299.2	0.000292	3.4	1467.5	238.3	0.24
Reach 3	10.518	8100.00	1291.8	1301.3	1295.9	1301.6	0.000276	3.9	2058.4	256.5	0.24
Reach 3	10.518	4980.00	1291.8	1298.9	1294.9	1299.1	0.000299	3.4	1462.5	240.6	0.24
Reach 3	10.441	8100.00	1291.3	1301.2	1295.3	1301.5	0.000230	3.7	2187.0	259.8	0.22
Reach 3	10.441	4980.00	1291.3	1298.8	1294.2	1299.0	0.000232	3.1	1583.4	242.8	0.22
Reach 3	10.346	8100.00	1291.1	1301.1	1295.0	1301.3	0.000208	3.6	2271.1	264.7	0.21
Reach 3	10.346	4980.00	1291.1	1298.7	1294.0	1298.9	0.000208	3.0	1653.7	248.8	0.21
Reach 3	10.252	8100.00	1291.0	1301.0	1295.2	1301.2	0.000246	3.8	2125.8	254.7	0.23
Reach 3	10.252	4980.00	1291.0	1298.6	1294.1	1298.8	0.000252	3.2	1534.2	238.3	0.23

Profile Output Table - Standard Table 2

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 3	11.893	1307.05	1306.78	0.27	0.20	0.00		6900.00		242.66
Reach 3	11.893	1305.67	1305.46	0.21	0.19	0.00		4860.00		233.53
Reach 3	11.798	1306.84	1306.56	0.28	0.22	0.00		6900.00		241.92
Reach 3	11.798	1305.48	1305.27	0.21	0.21	0.00		4860.00		233.25
Reach 3	11.703	1306.63	1306.33	0.30	0.23	0.00		6900.00		241.14
Reach 3	11.703	1305.27	1305.04	0.23	0.23	0.00		4860.00		232.05
Reach 3	11.609	1306.40	1306.09	0.30	0.10	0.00		6900.00		244.51
Reach 3	11.609	1305.04	1304.81	0.23	0.09	0.00		4860.00		236.71
Reach 3	11.572	1306.29	1305.96	0.32	0.11	0.00		6900.00		238.55
Reach 3	11.572	1304.94	1304.69	0.25	0.11	0.00		4860.00		230.77
Reach 3	11.531	1306.17	1305.84	0.33	0.13	0.00		6900.00		241.04
Reach 3	11.531	1304.82	1304.56	0.26	0.13	0.00		4860.00		232.85
Reach 3	11.486	1306.03	1305.69	0.34	0.27	0.00		6900.00		242.89
Reach 3	11.486	1304.68	1304.41	0.27	0.28	0.00		4860.00		234.59
Reach 3	11.391	1305.75	1305.43	0.33	0.18	0.00		6900.00		242.77
Reach 3	11.391	1304.40	1304.14	0.26	0.17	0.00		4860.00		234.44
Reach 3	11.328	1305.57	1305.24	0.33	0.03	0.50		6900.00		235.94
Reach 3	11.328	1304.22	1303.97	0.26	0.03	0.41		4860.00		226.50
Reach 3	11.321	1305.05	1303.07	1.98	0.02	0.80		6900.00		152.49
Reach 3	11.321	1303.78	1302.14	1.64	0.03	0.63		4860.00		143.41
Reach 3	11.308	1302.97	1302.59	0.38	0.01	0.09		6900.00		186.22
Reach 3	11.308	1300.60	1300.22	0.38	0.02	0.09		4860.00		167.81
Reach 3	11.297	1302.87	1302.67	0.20	0.06	0.02		6900.00		239.57
Reach 3	11.297	1300.50	1300.30	0.20	0.08	0.03		4860.00		223.35
Reach 3	11.26	1302.79	1302.64	0.16	0.00	0.00		6900.00		264.11
Reach 3	11.26	1300.39	1300.24	0.15	0.00	0.00		4860.00		247.82
Reach 3	11.254	Bridge								
Reach 3	11.249	1302.75	1302.59	0.17	0.03	0.01		6900.00		260.54
Reach 3	11.249	1300.35	1300.19	0.16	0.03	0.00		4860.00		244.36
Reach 3	11.231	1302.71	1302.50	0.21	0.08	0.04		8100.00		269.03
Reach 3	11.231	1300.31	1300.16	0.15	0.09	0.00		4980.00		250.53
Reach 3	11.189	1302.59	1302.45	0.14	0.07	0.00		8100.00		416.48

Reach	River Sta	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Reach 3	11.189	1300.22	1300.06	0.16	0.08	0.02		4980.00		390.93
Reach 3	11.141	1302.53	1302.39	0.14	0.02	0.00		8100.00		351.96
Reach 3	11.141	1300.12	1300.01	0.11	0.03	0.00		4980.00		332.20
Reach 3	11.127	1302.51	1302.34	0.17	0.07	0.02		8100.00		334.37
Reach 3	11.127	1300.10	1299.96	0.13	0.07	0.01		4980.00		312.10
Reach 3	11.080	1302.43	1302.31	0.11	0.07	0.01	6.59	8093.41		508.85
Reach 3	11.080	1300.01	1299.92	0.09	0.08	0.01		4980.00		354.99
Reach 3	11.033	1302.34	1302.12	0.22	0.03	0.01		8100.00		302.22
Reach 3	11.033	1299.92	1299.75	0.18	0.04	0.01		4980.00		264.54
Reach 3	11.013	1302.30	1302.12	0.18	0.10	0.02		8100.00		306.20
Reach 3	11.013	1299.88	1299.74	0.13	0.11	0.01		4980.00		277.98
Reach 3	10.938	1302.18	1302.05	0.13	0.05	0.01	1509.64	6590.36		442.68
Reach 3	10.938	1299.76	1299.65	0.10	0.06	0.01	752.86	4227.14		405.71
Reach 3	10.890	1302.11	1302.03	0.08	0.05	0.00	60.75	8039.25		542.54
Reach 3	10.890	1299.68	1299.62	0.07	0.05	0.00		4980.00		421.07
Reach 3	10.843	1302.06	1301.94	0.12	0.07	0.01		8100.00		382.67
Reach 3	10.843	1299.63	1299.53	0.10	0.08	0.01		4980.00		346.61
Reach 3	10.796	1301.98	1301.77	0.21	0.07	0.00		8100.00		275.31
Reach 3	10.796	1299.55	1299.39	0.16	0.08	0.00		4980.00		254.24
Reach 3	10.749	1301.91	1301.68	0.23	0.13	0.00		8100.00		257.22
Reach 3	10.749	1299.47	1299.30	0.17	0.14	0.00		4980.00		242.29
Reach 3	10.654	1301.78	1301.53	0.25	0.13	0.00		8100.00		255.20
Reach 3	10.654	1299.33	1299.15	0.18	0.14	0.00		4980.00		239.84
Reach 3	10.566	1301.65	1301.41	0.24	0.07	0.00		8100.00		254.23
Reach 3	10.566	1299.19	1299.01	0.18	0.07	0.00		4980.00		238.35
Reach 3	10.518	1301.57	1301.33	0.24	0.10	0.01		8100.00		256.45
Reach 3	10.518	1299.11	1298.93	0.18	0.11	0.01		4980.00		240.57
Reach 3	10.441	1301.46	1301.24	0.21	0.11	0.00		8100.00		259.80
Reach 3	10.441	1298.99	1298.84	0.15	0.11	0.00		4980.00		242.80
Reach 3	10.346	1301.34	1301.14	0.20	0.11	0.00		8100.00		264.70
Reach 3	10.346	1298.88	1298.74	0.14	0.11	0.00		4980.00		248.82
Reach 3	10.252	1301.23	1301.00	0.23				8100.00		254.72
Reach 3	10.252	1298.76	1298.60	0.16				4980.00		238.28


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.893
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Elevation (ft)
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4200
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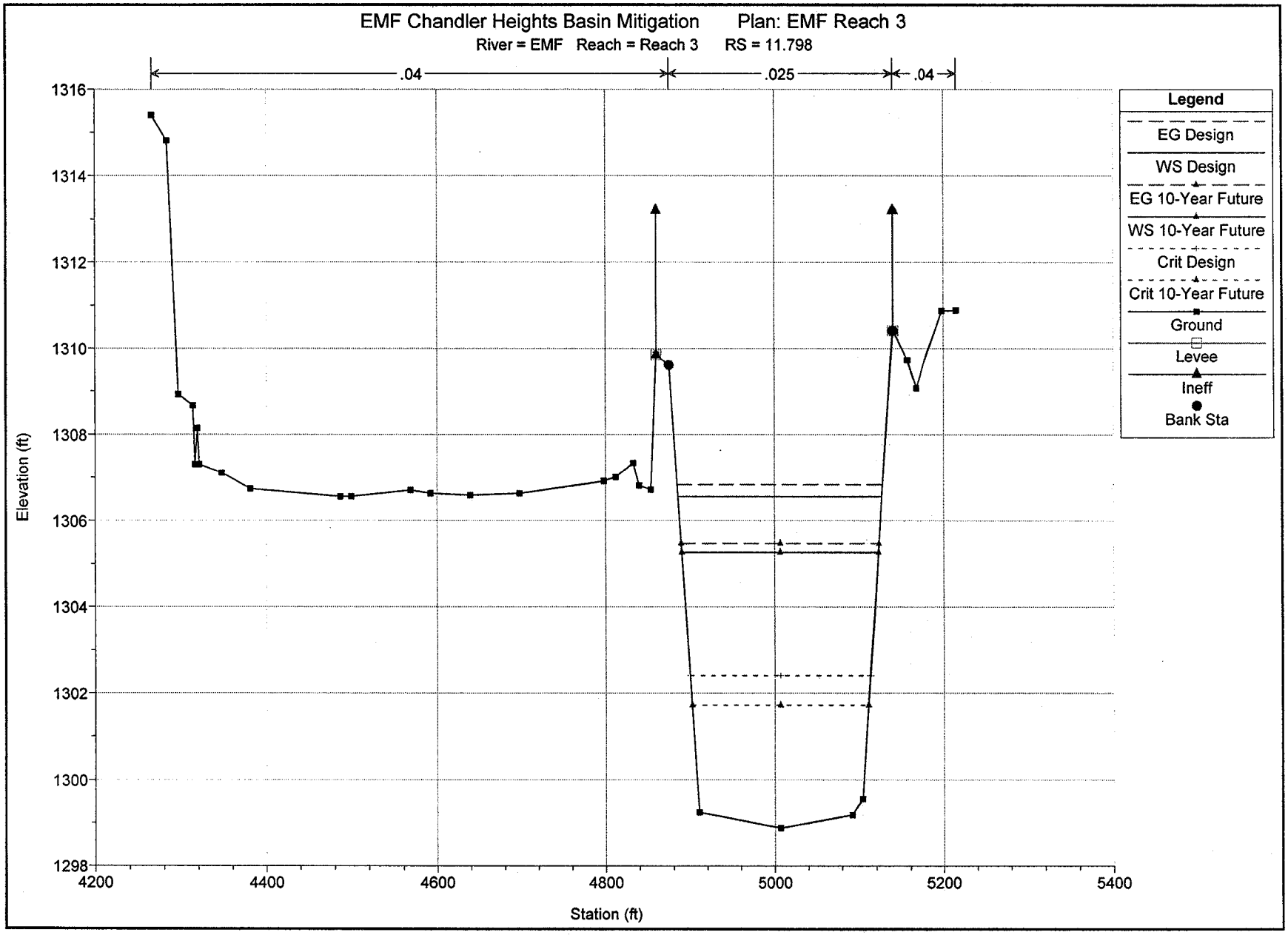
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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Elevation (ft)
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Station (ft)
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WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
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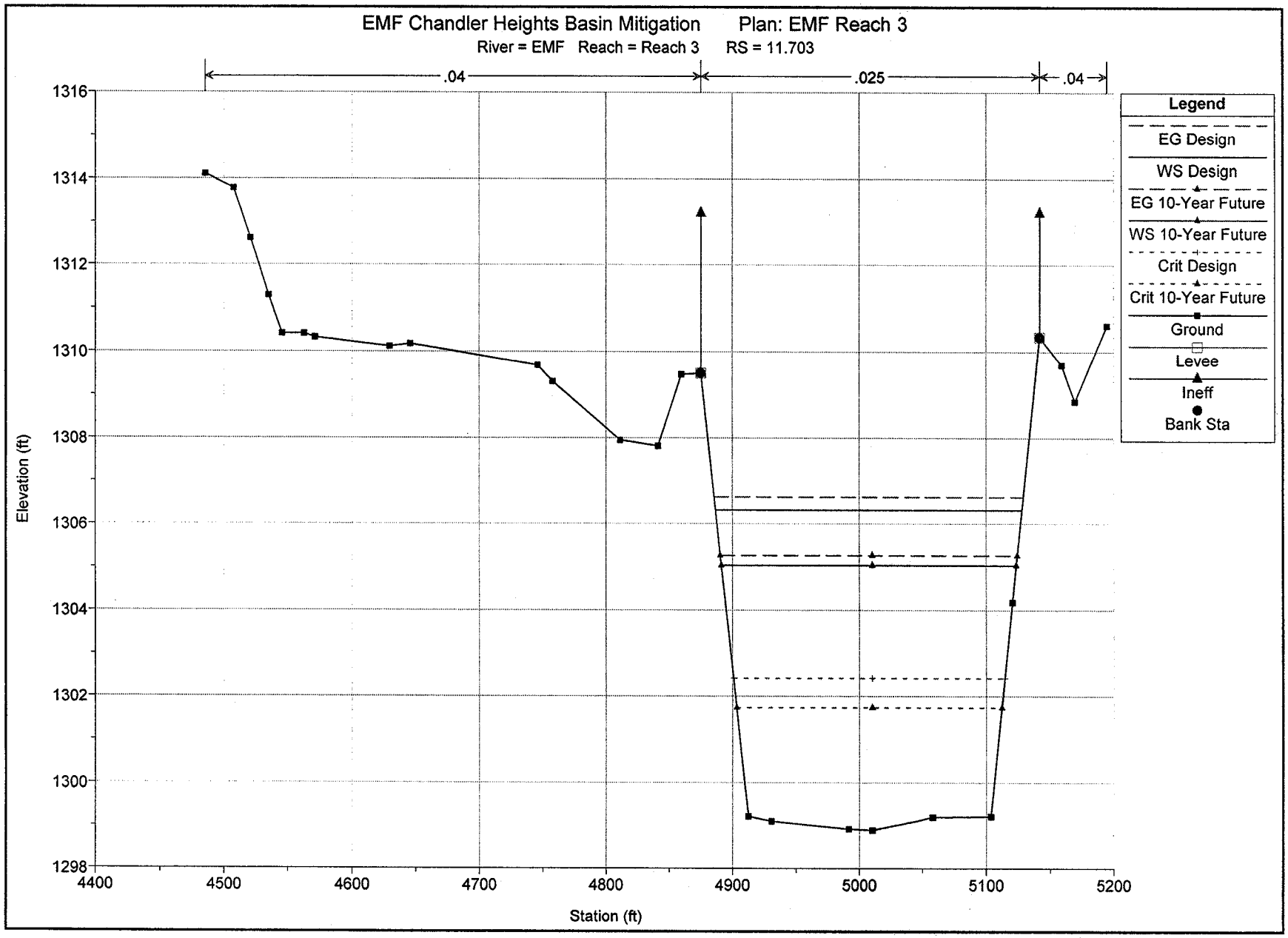
Bank Sta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RS = 11.703
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Elevation (ft)
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Station (ft)
Legend
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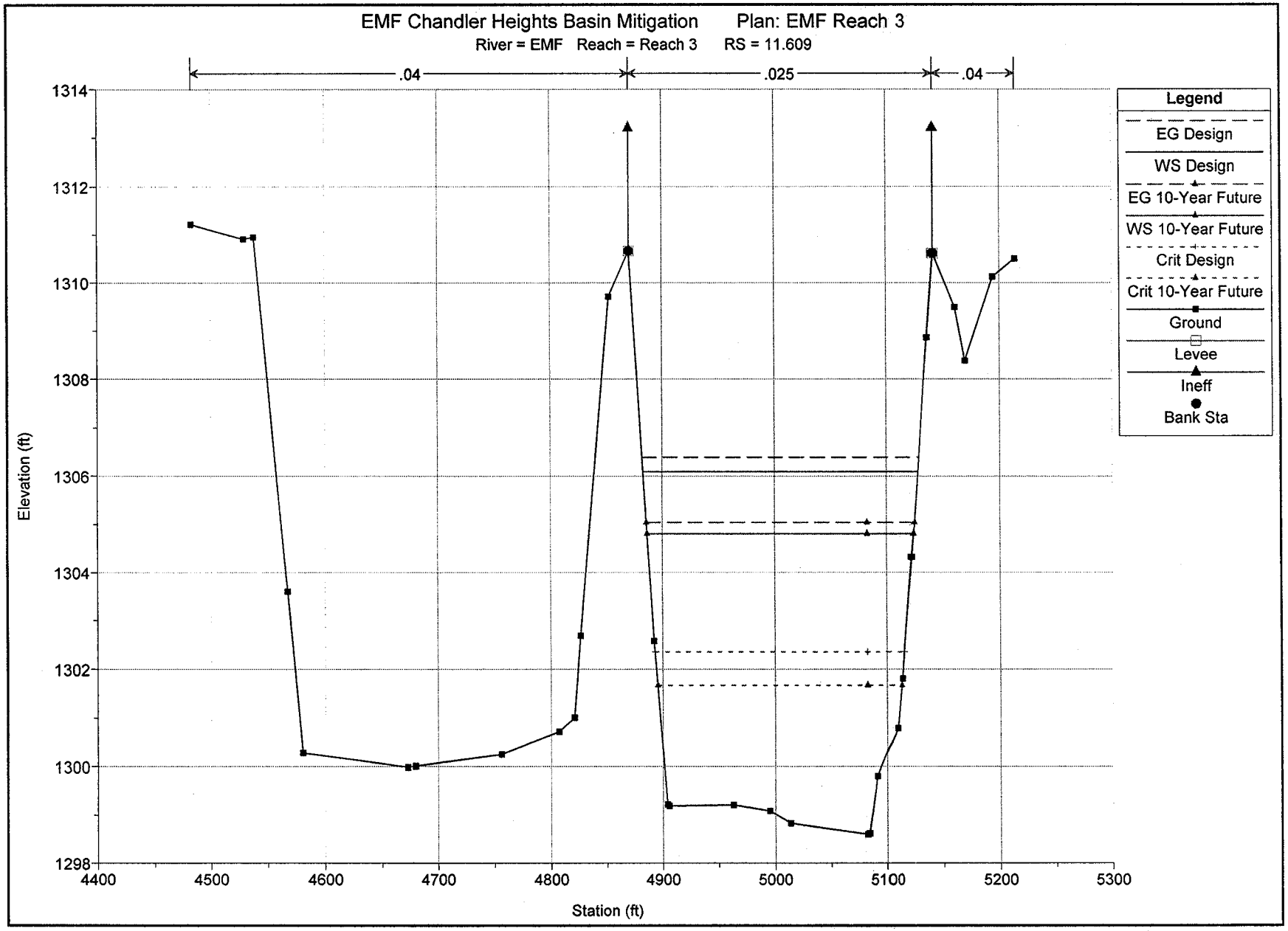
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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Elevation (ft)
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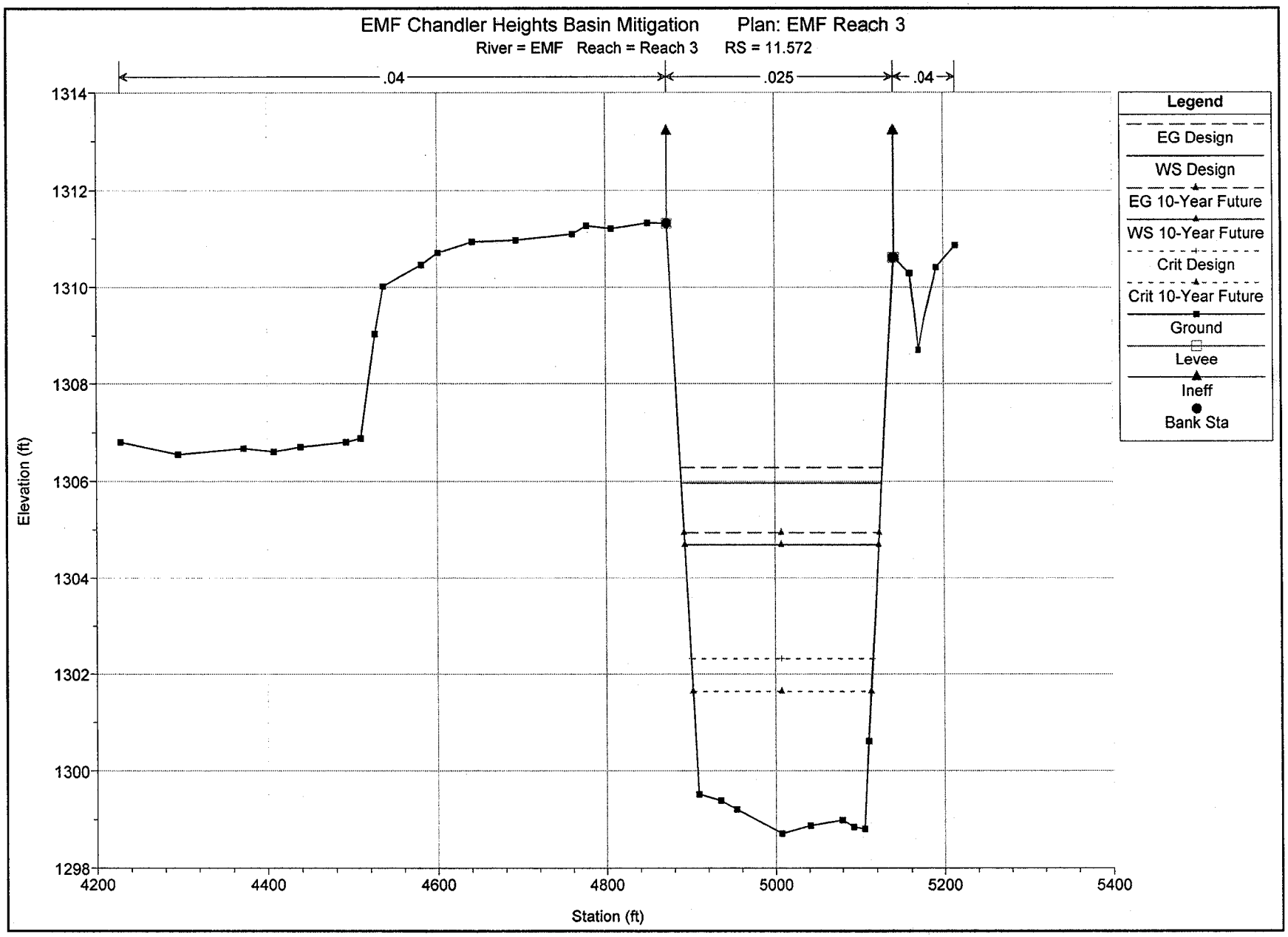
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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.025
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Elevation (ft)
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4200
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5000
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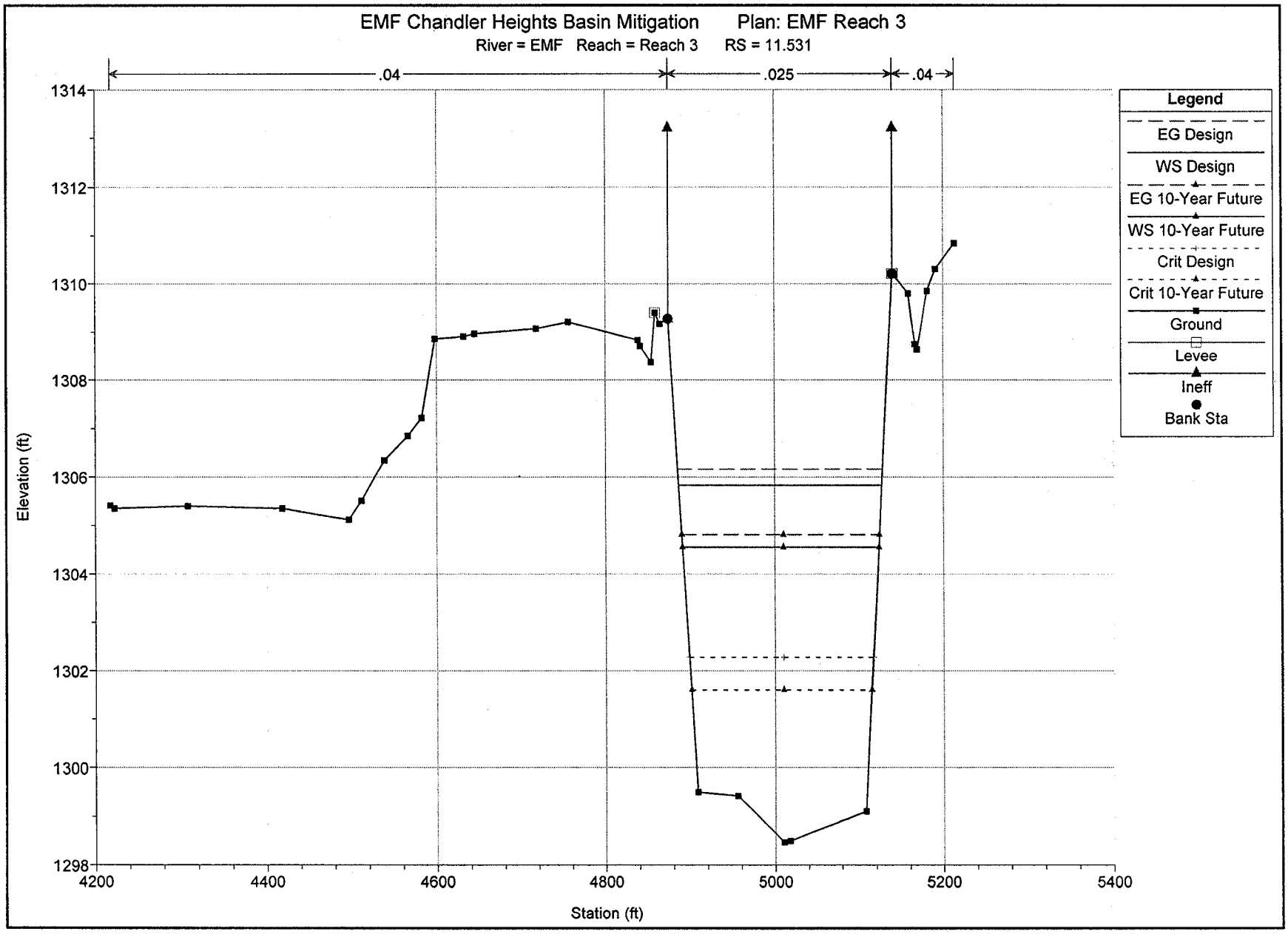
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.531
.04
.025
.04
Elevation (ft)
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1312
1310
1308
1306
1304
1302
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1298
4200
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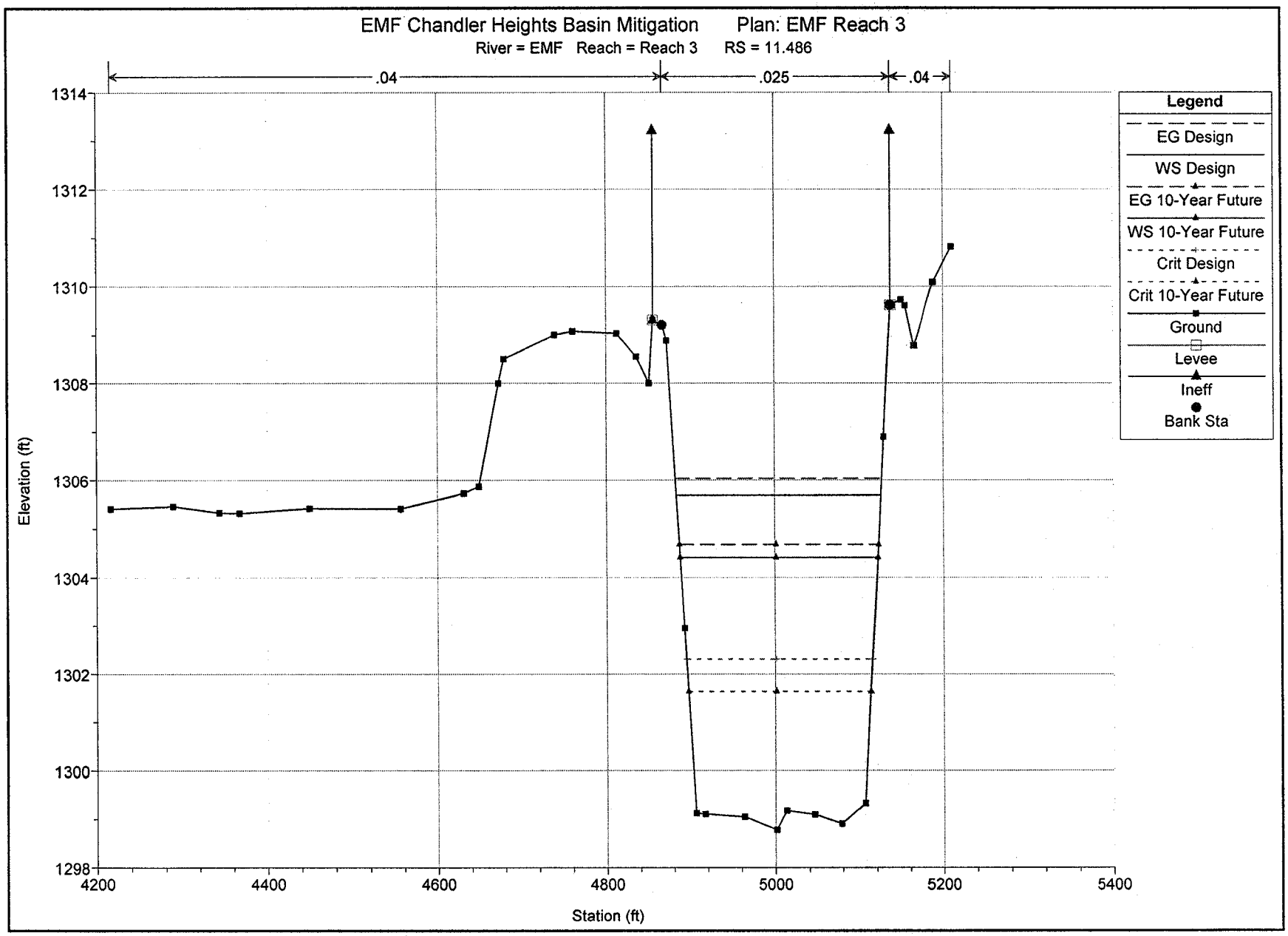
4800
5000
5200
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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River = EMF Reach = Reach 3 RS = 11.486
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Elevation (ft)
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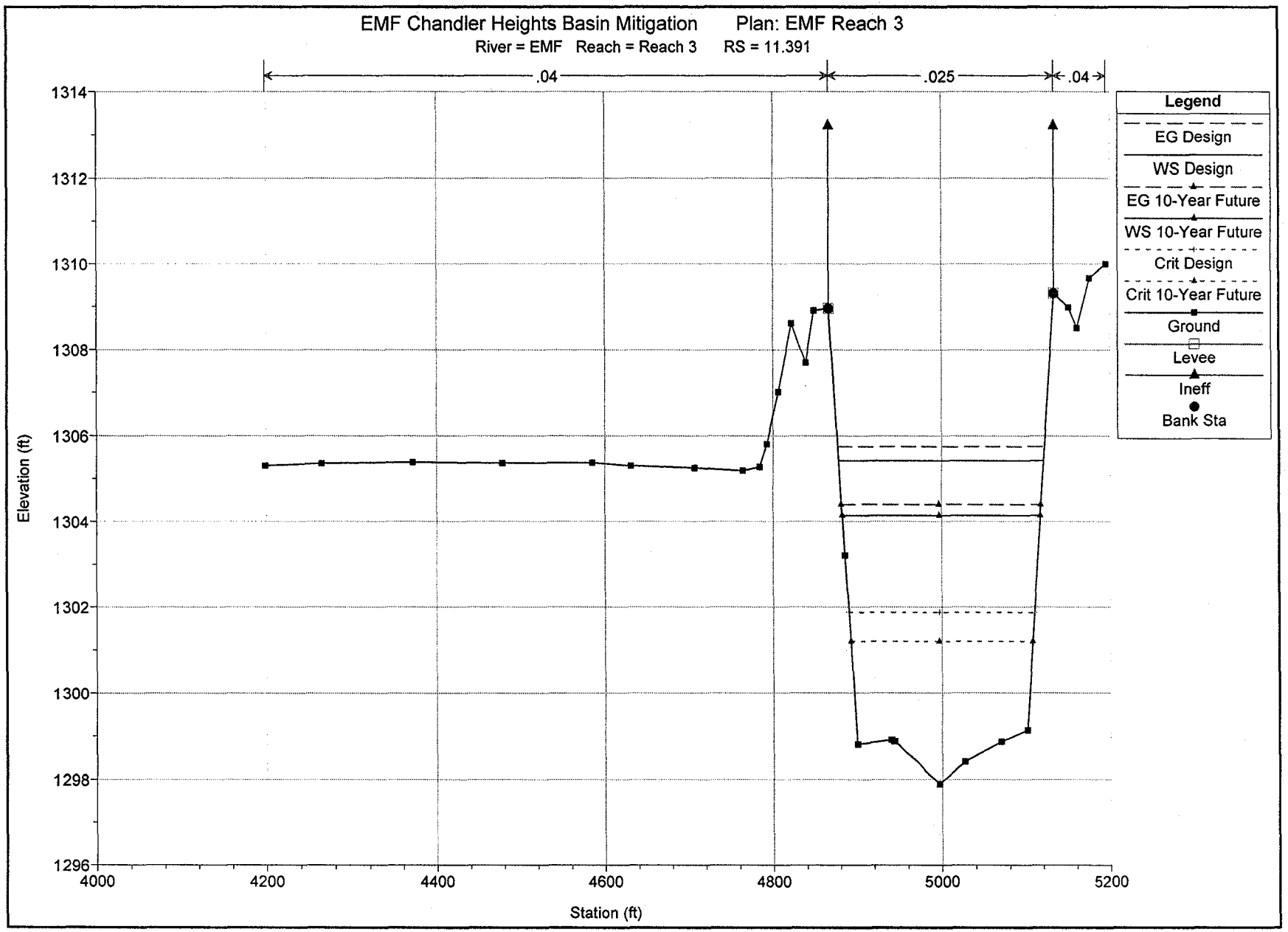
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.391
.04
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.04
Elevation (ft)
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1312
1310
1308
1306
1304
1302
1300
1298
1296
4000
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4400
4600
4800
5000
5200
Station (ft)
Legend
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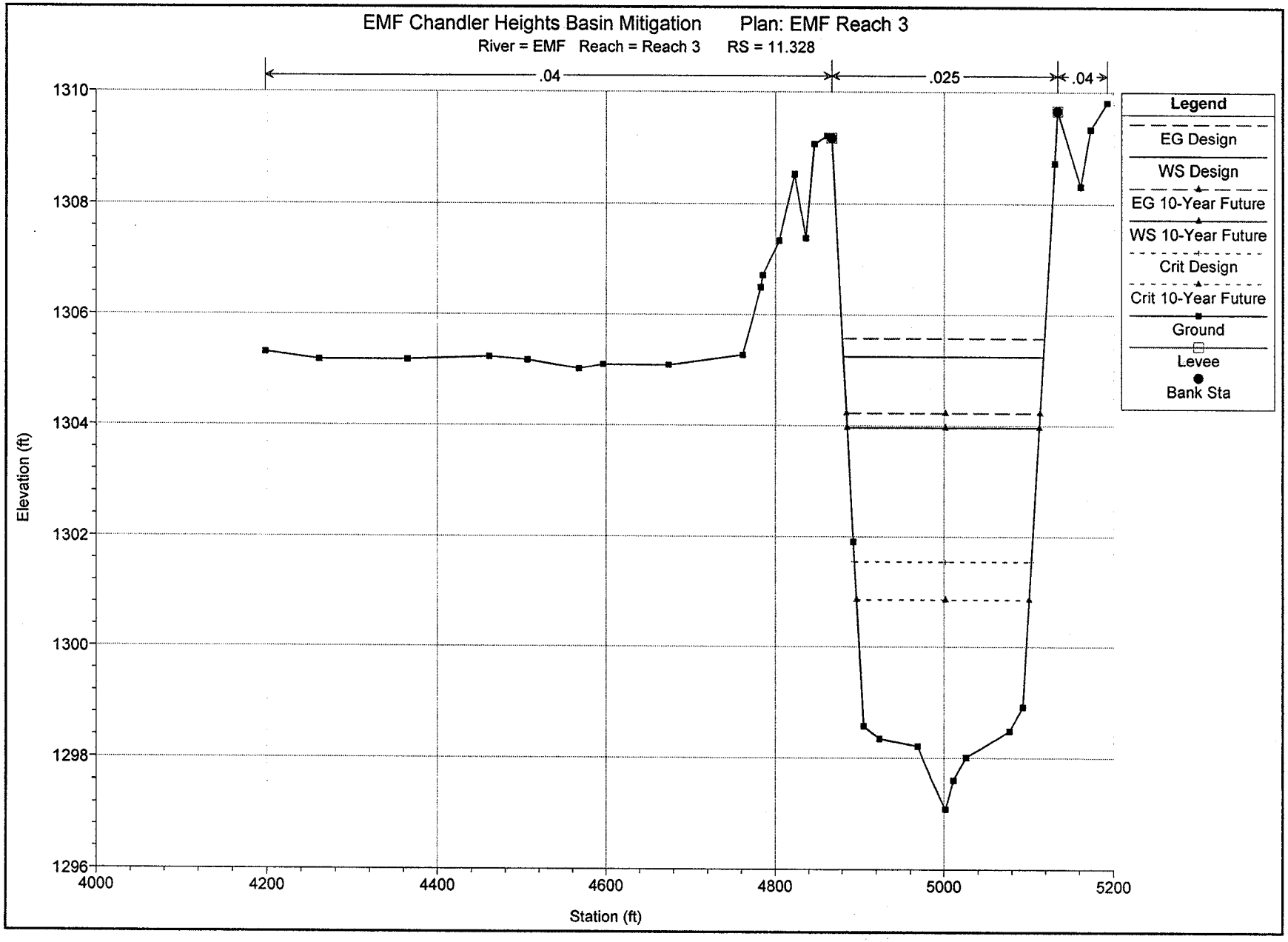
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.328
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.04
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
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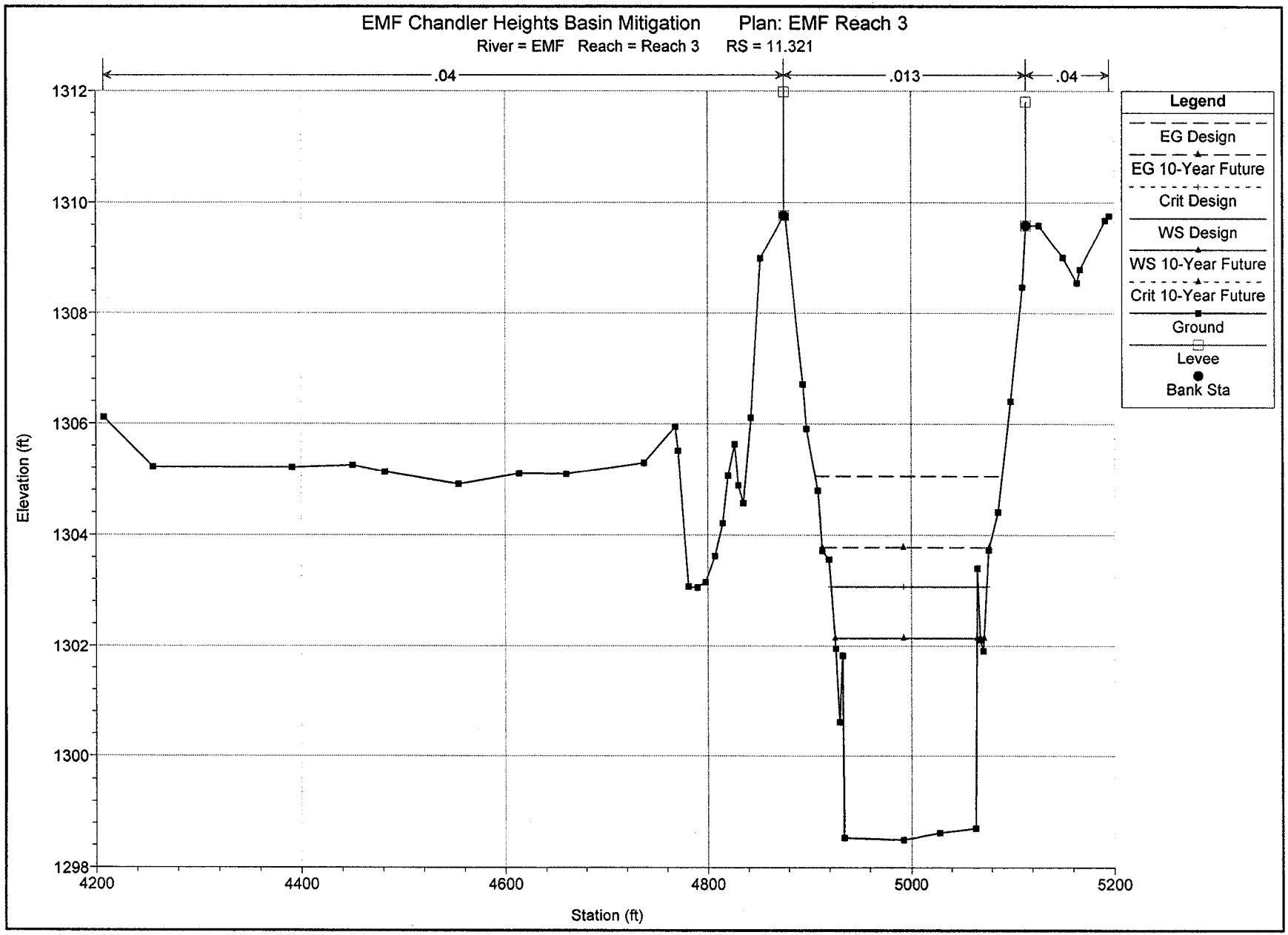
Station (ft)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Plan: EMF Reach 3
River = EMF Reach = Reach 3
RS = 11.321
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Legend
EG Design
EG 10-Year Future
Crit Design
WS Design
WS 10-Year Future
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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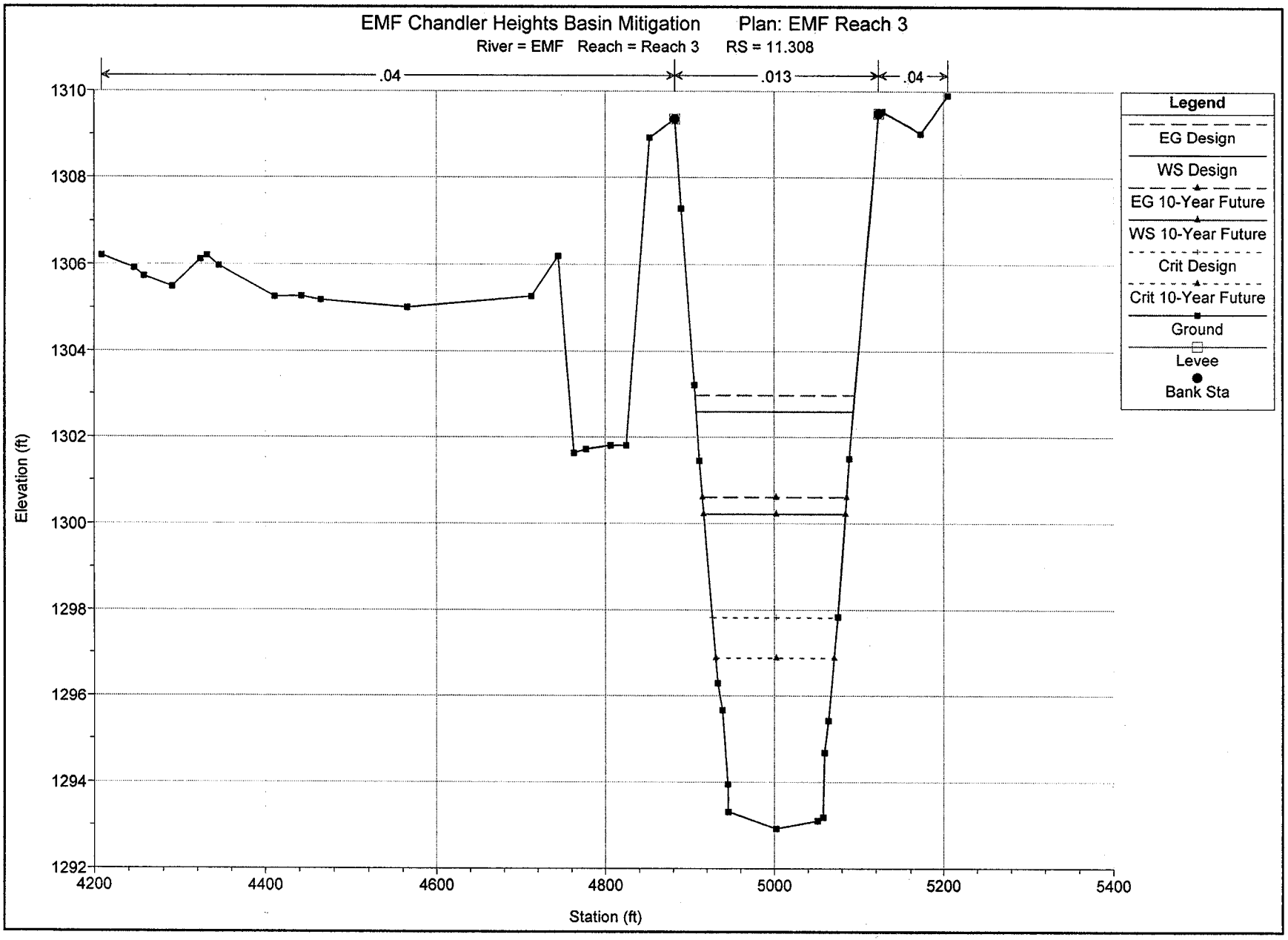
Station (ft)


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.308
.04
.013
.04
Elevation (ft)
1310
1308
1306
1304
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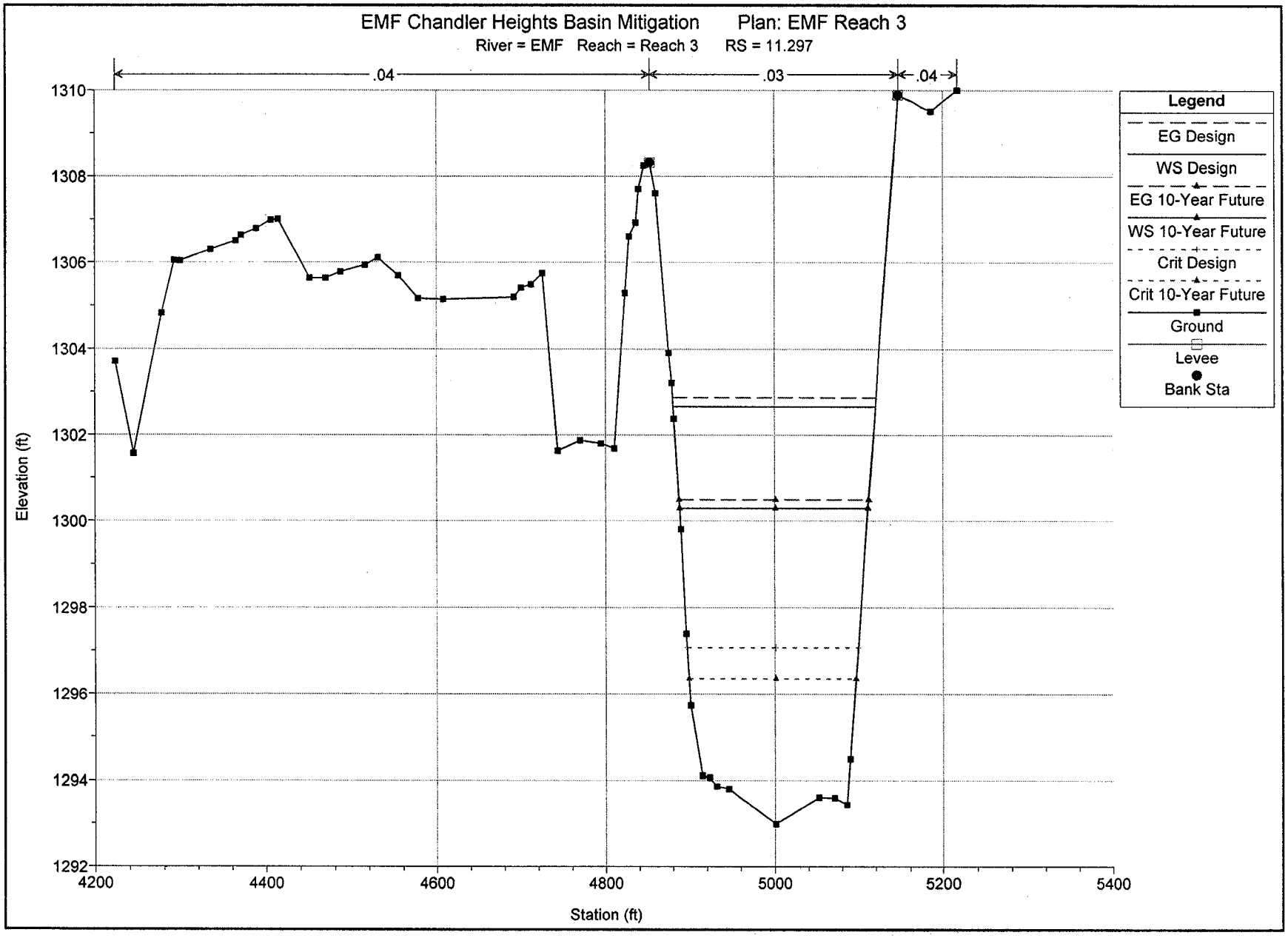
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.297
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.04
Elevation (ft)
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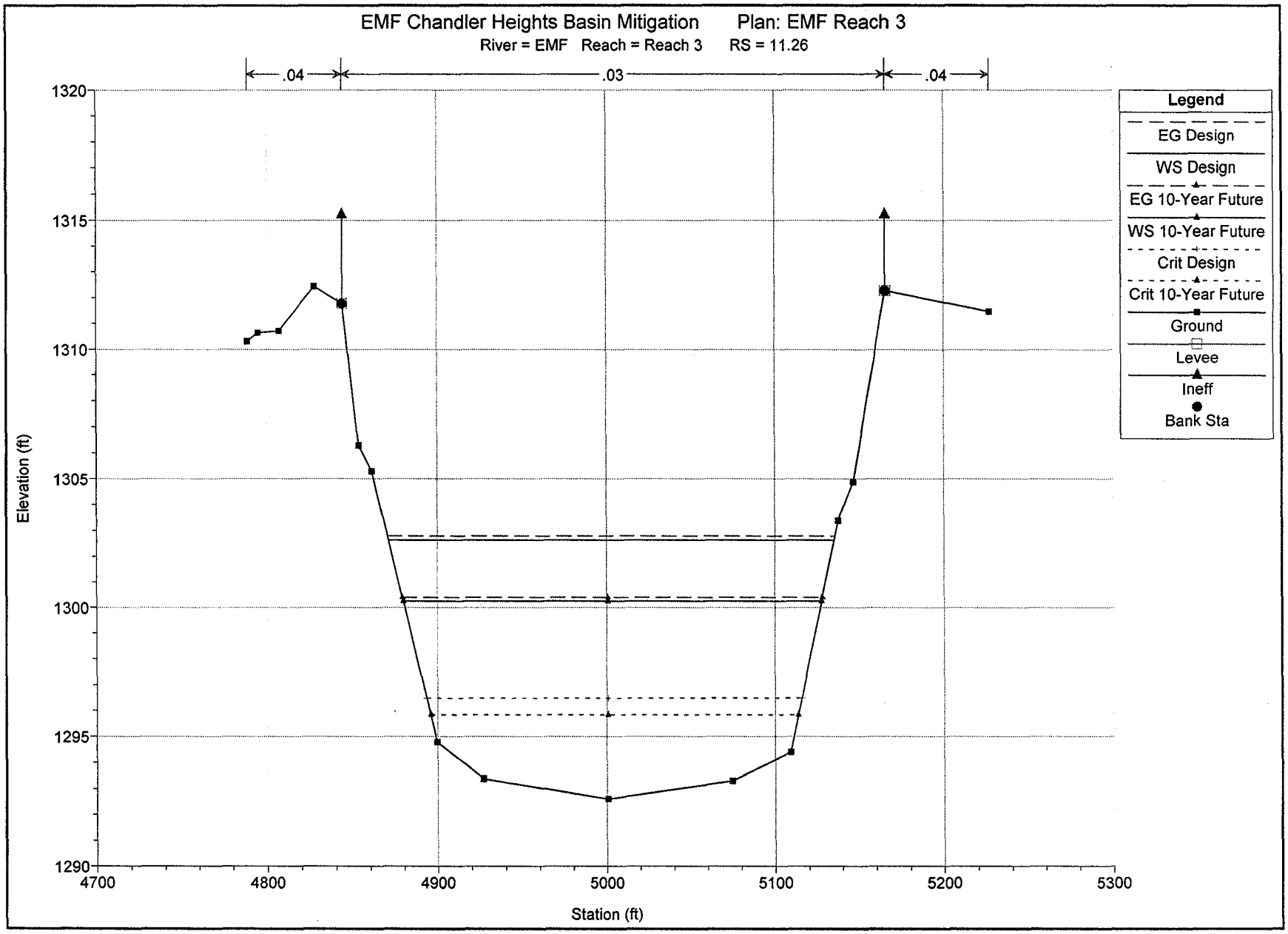
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.26
.04
.03
.04
Elevation (ft)
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1315
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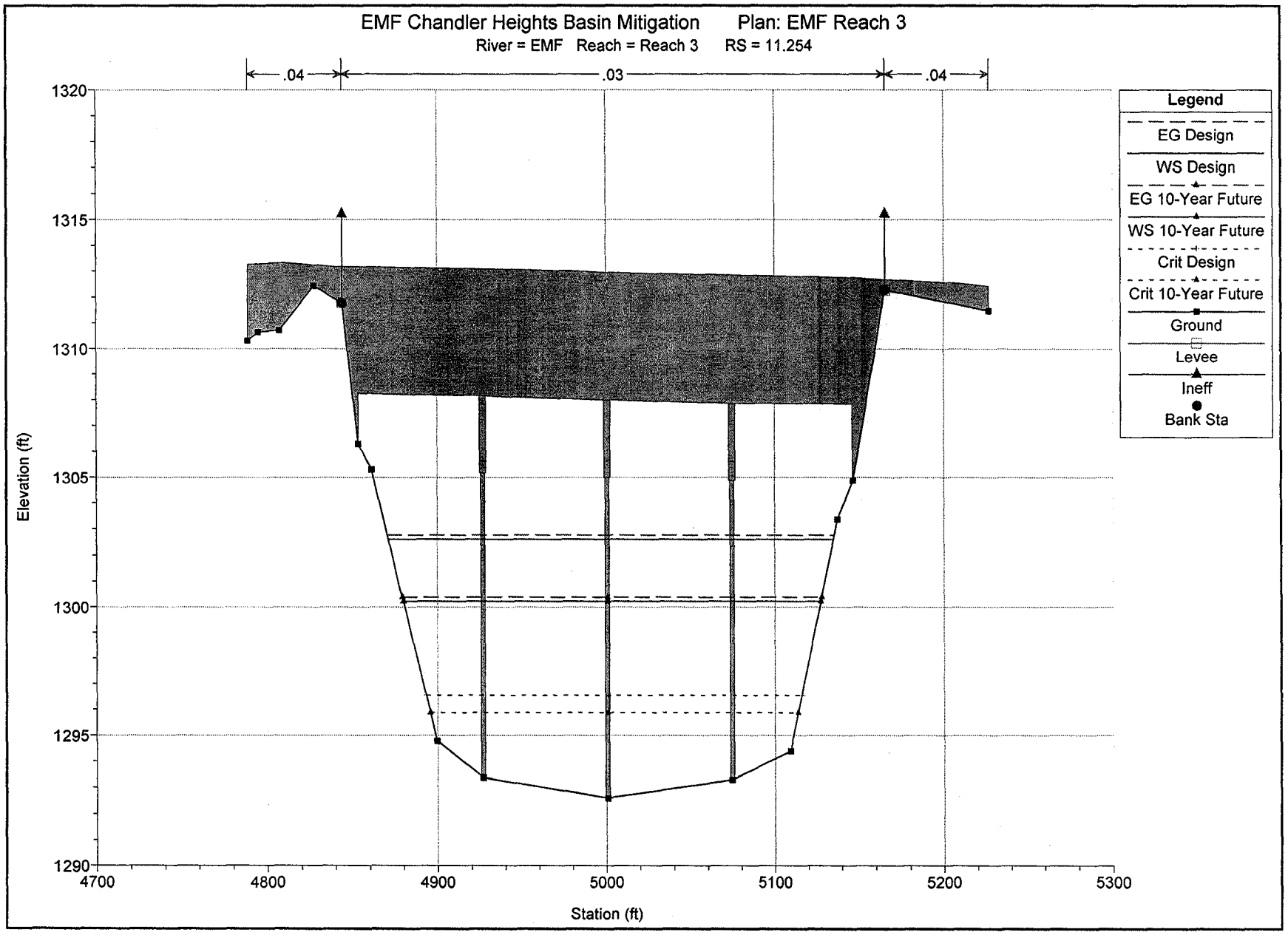
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.254
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.03
.04
Elevation (ft)
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5300
Station (ft)
Legend
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WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
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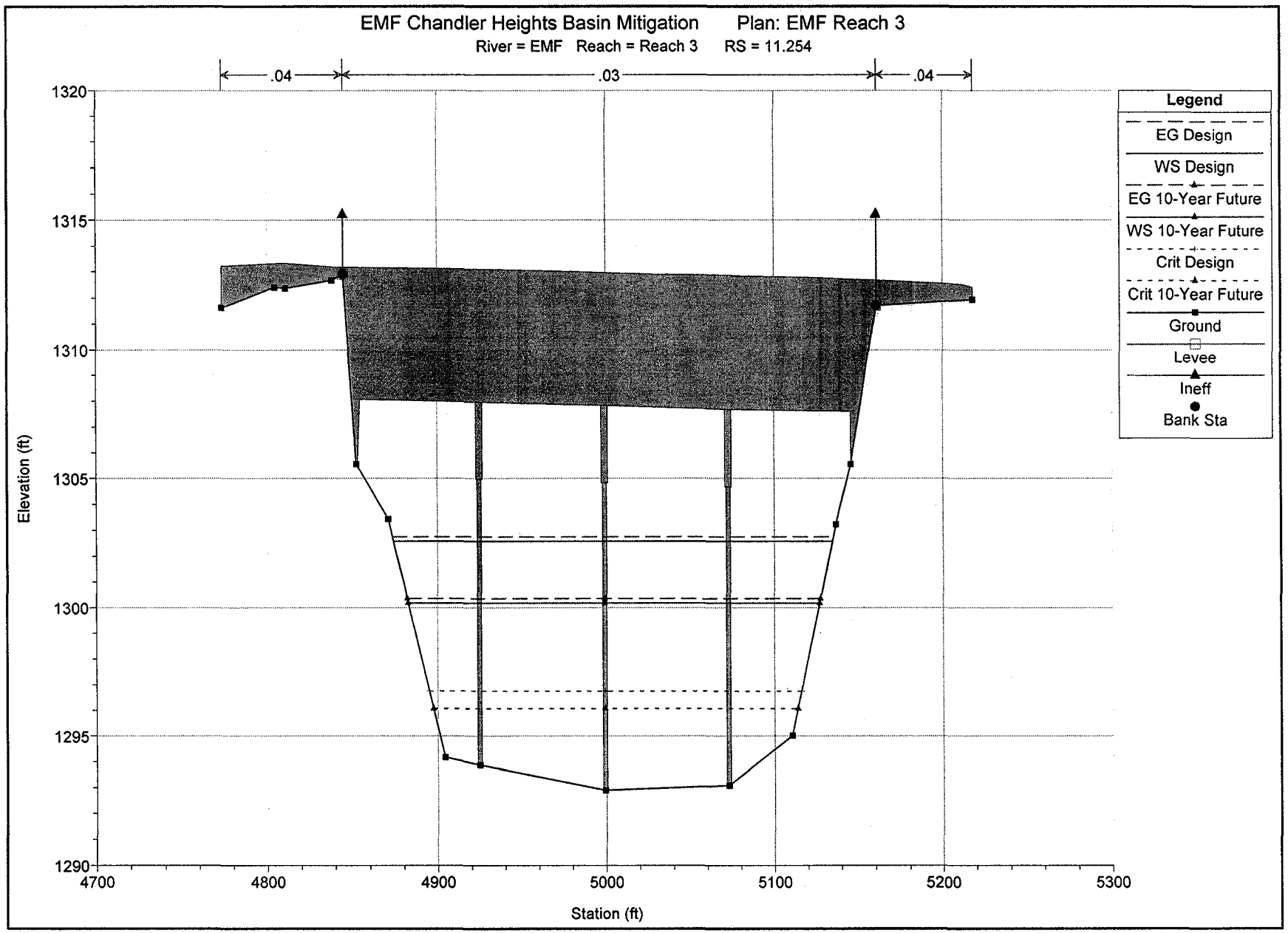
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.254
.04
.03
.04
Elevation (ft)
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Station (ft)
Legend
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WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
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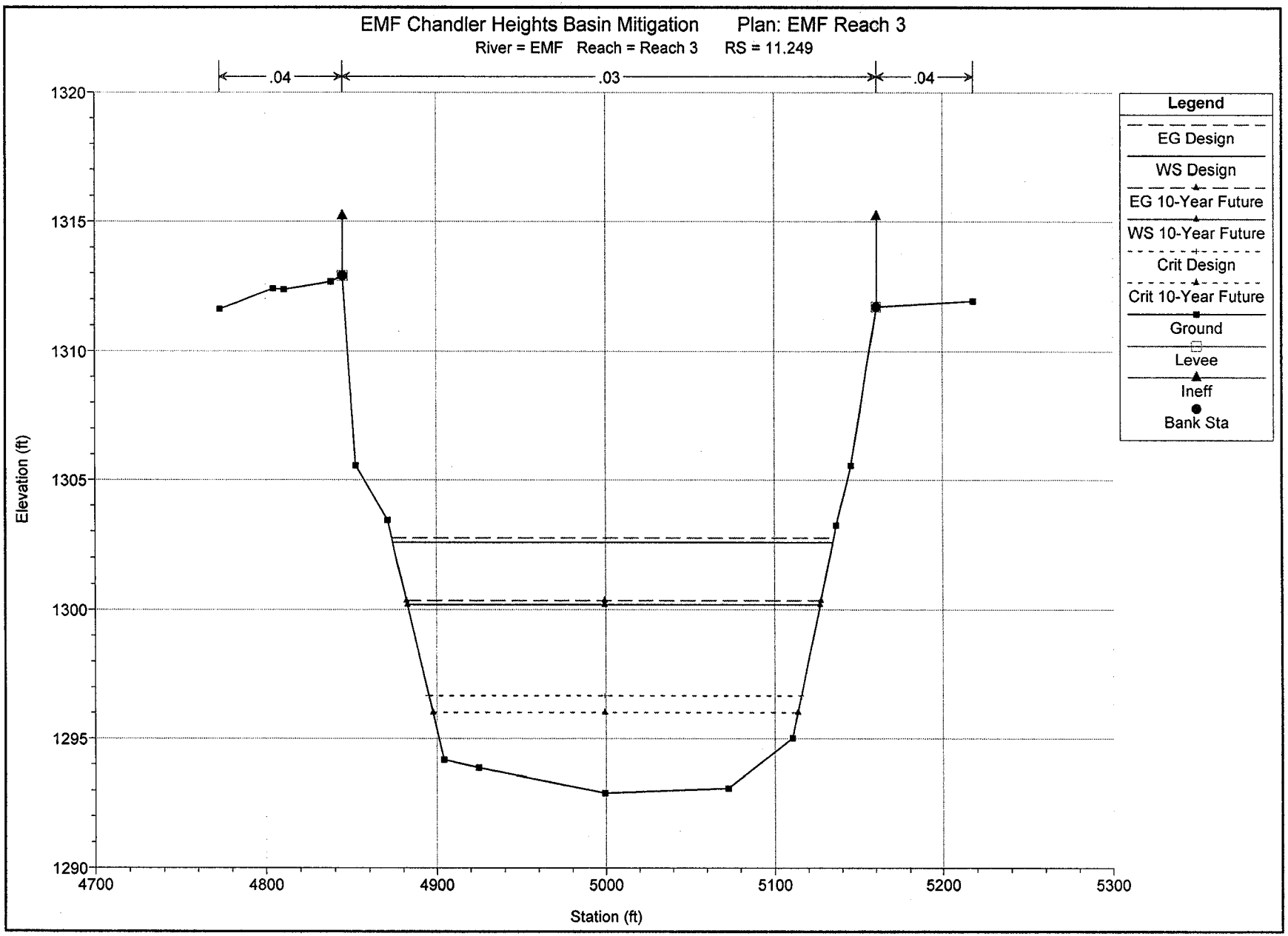
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.249
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.04
Elevation (ft)
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Station (ft)
Legend
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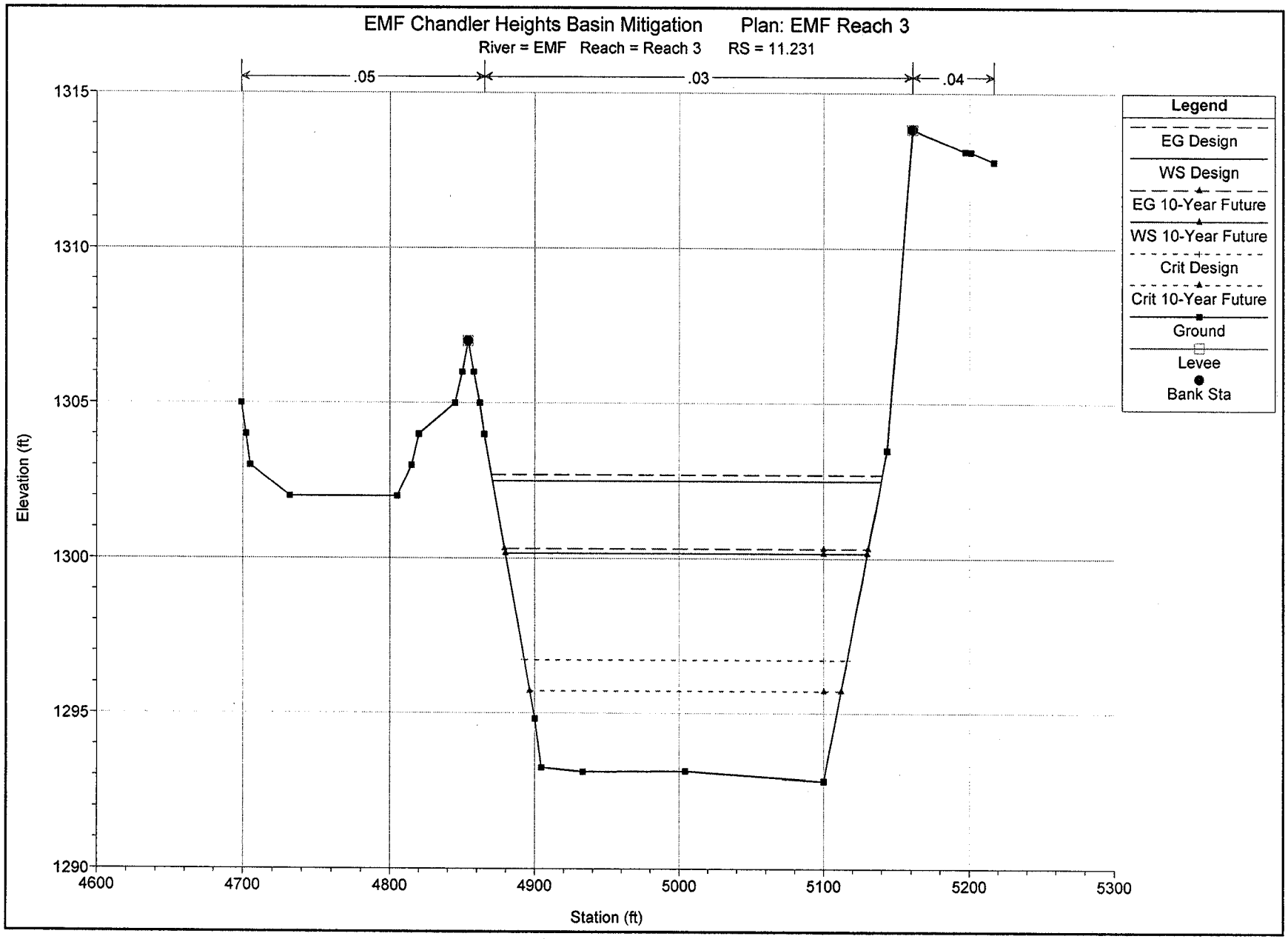
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.231
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Legend
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WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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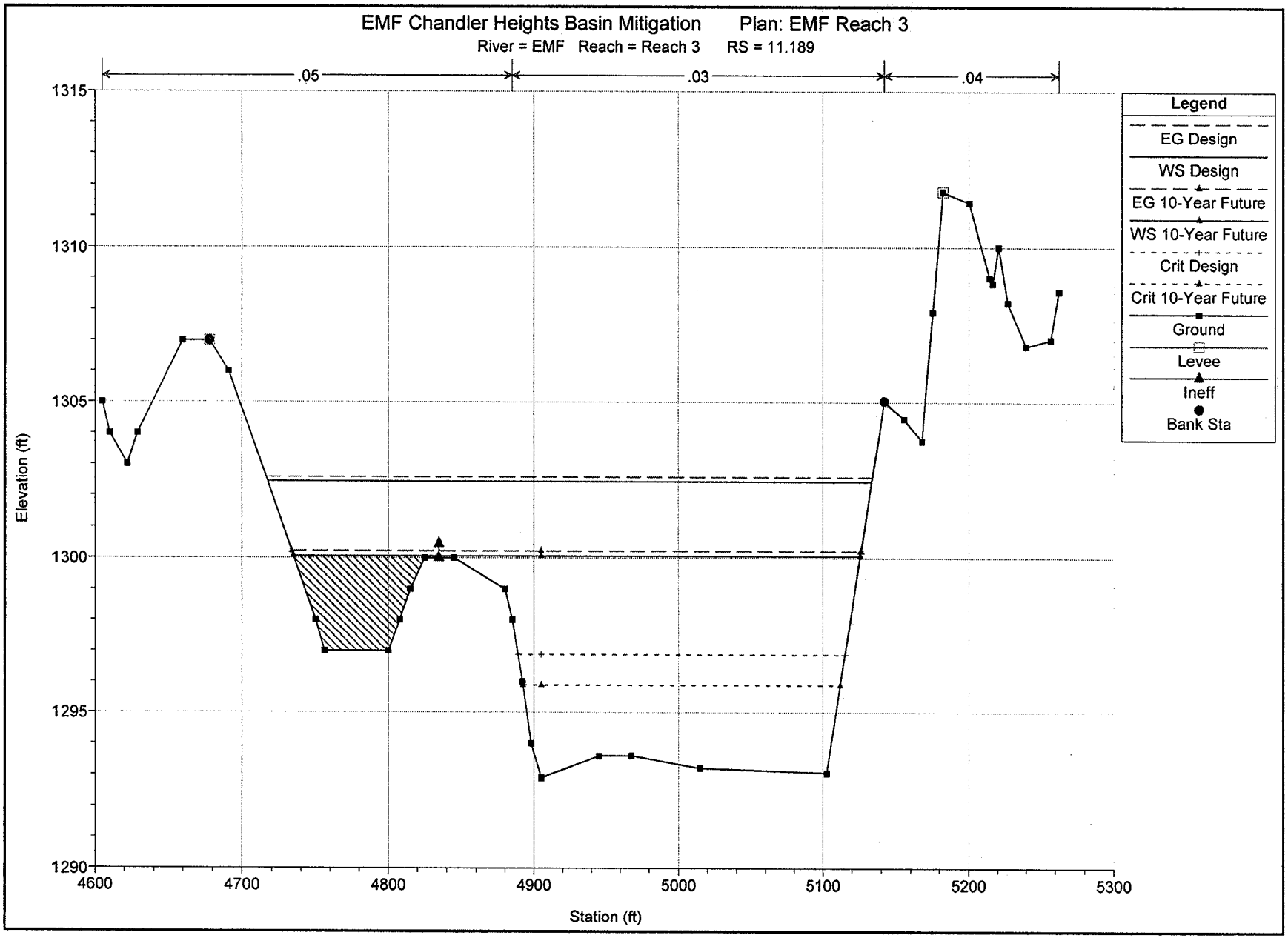
Station (ft)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Elevation (ft)
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Station (ft)
Legend
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EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
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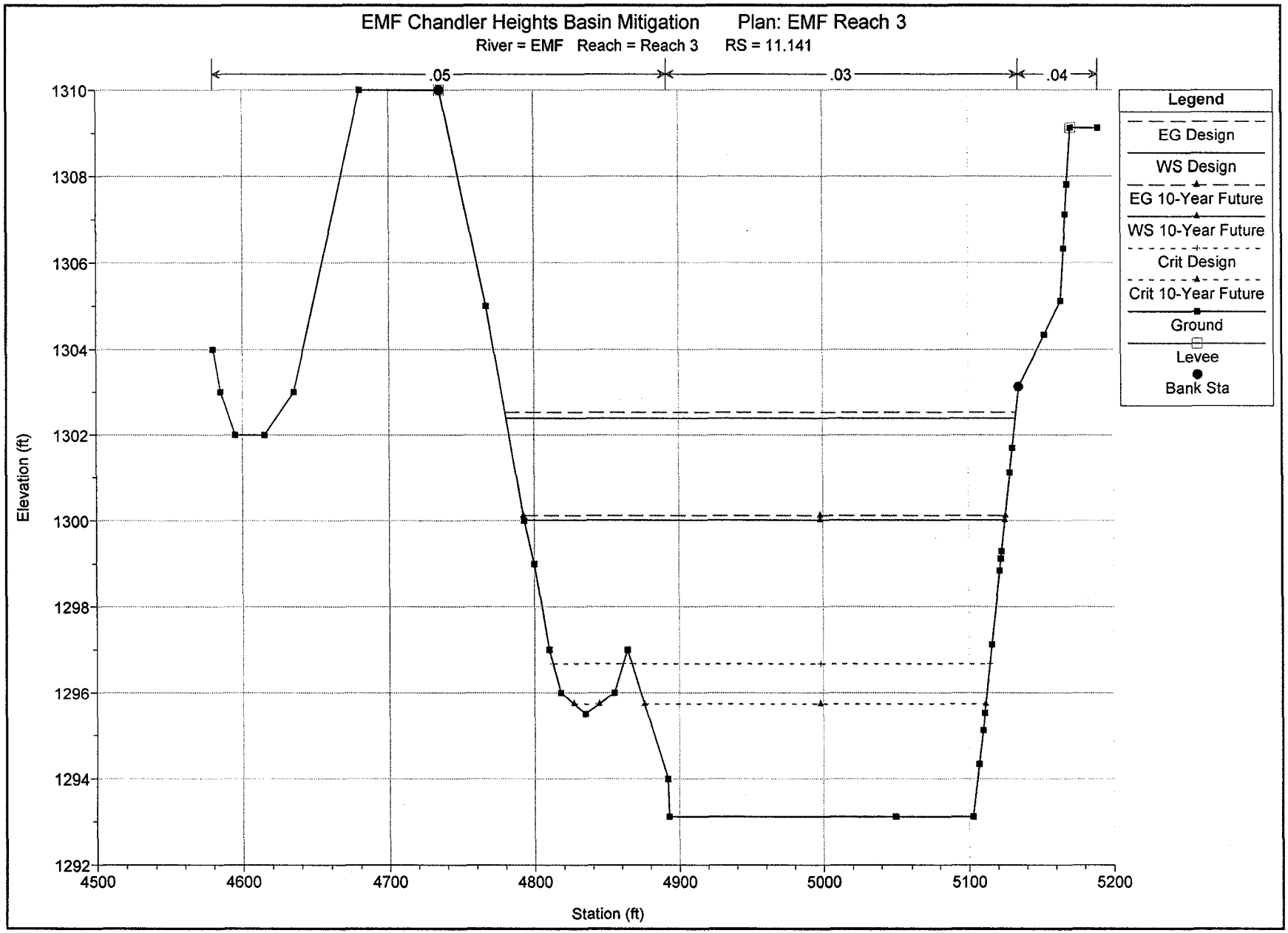
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River = EMF Reach = Reach 3 RS = 11.141
.05
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Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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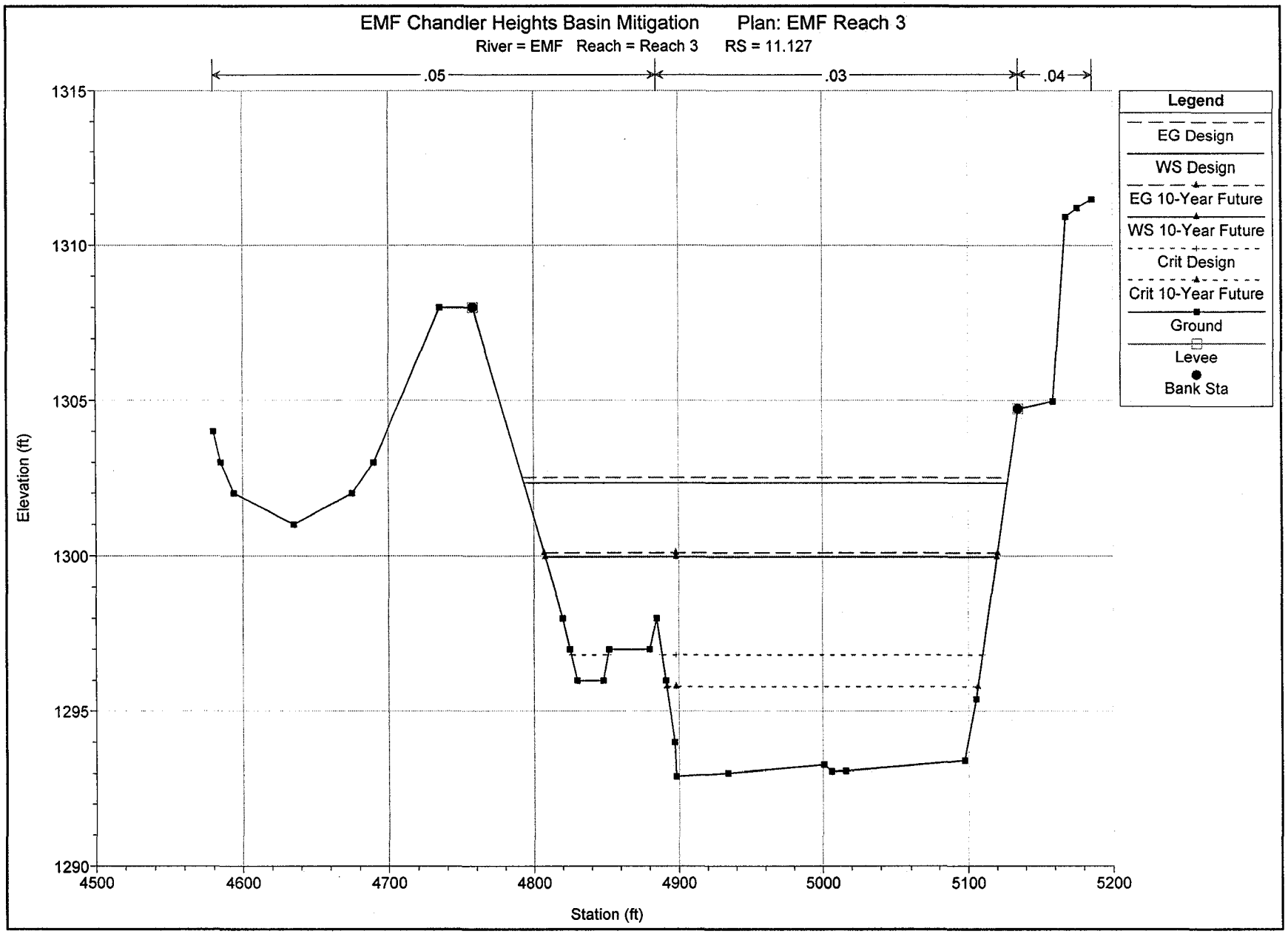
5200
Station (ft)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River = EMF Reach = Reach 3 RS = 11.127
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Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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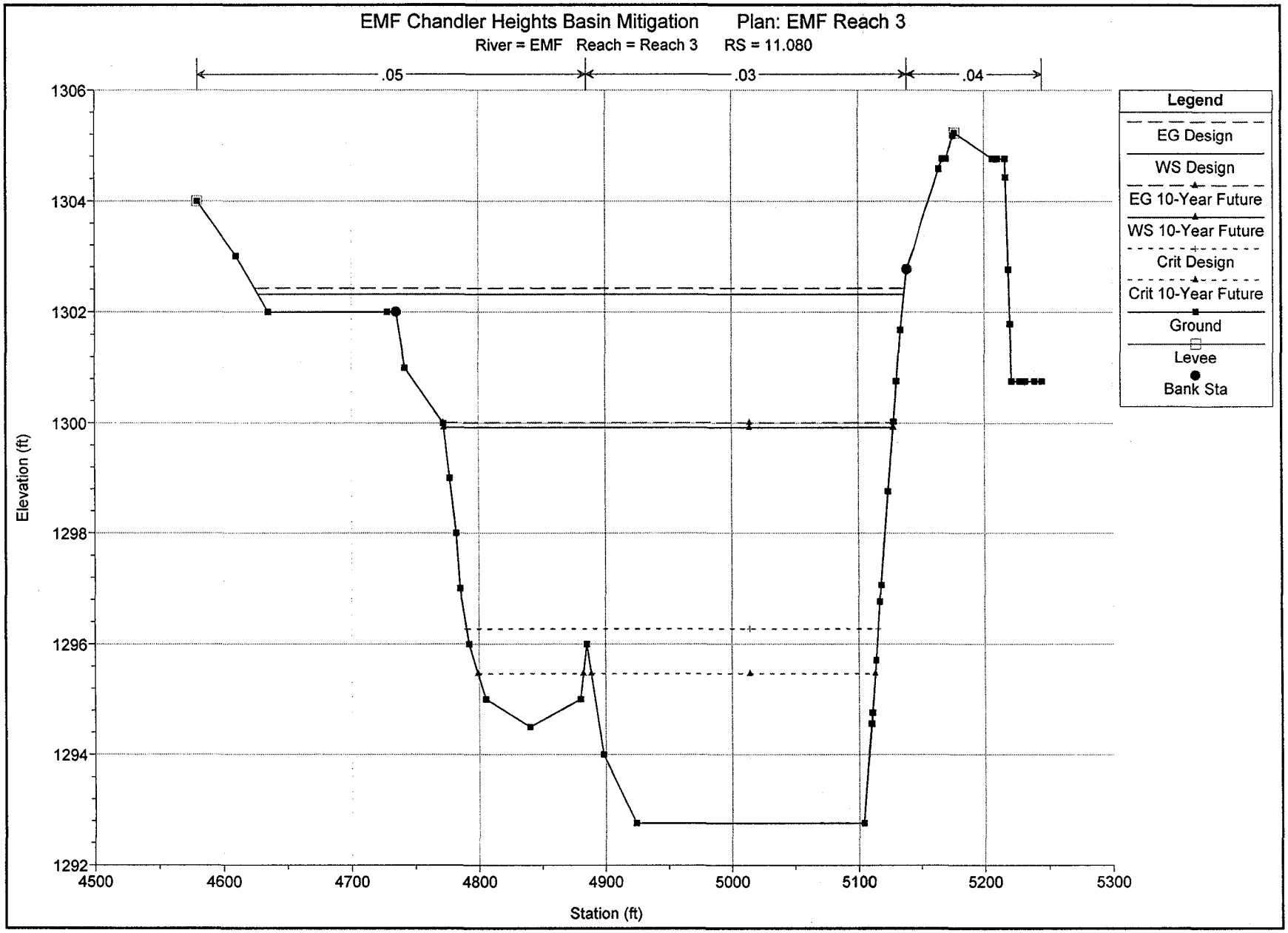
Station (ft)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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.080
.05
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.04
Elevation (ft)
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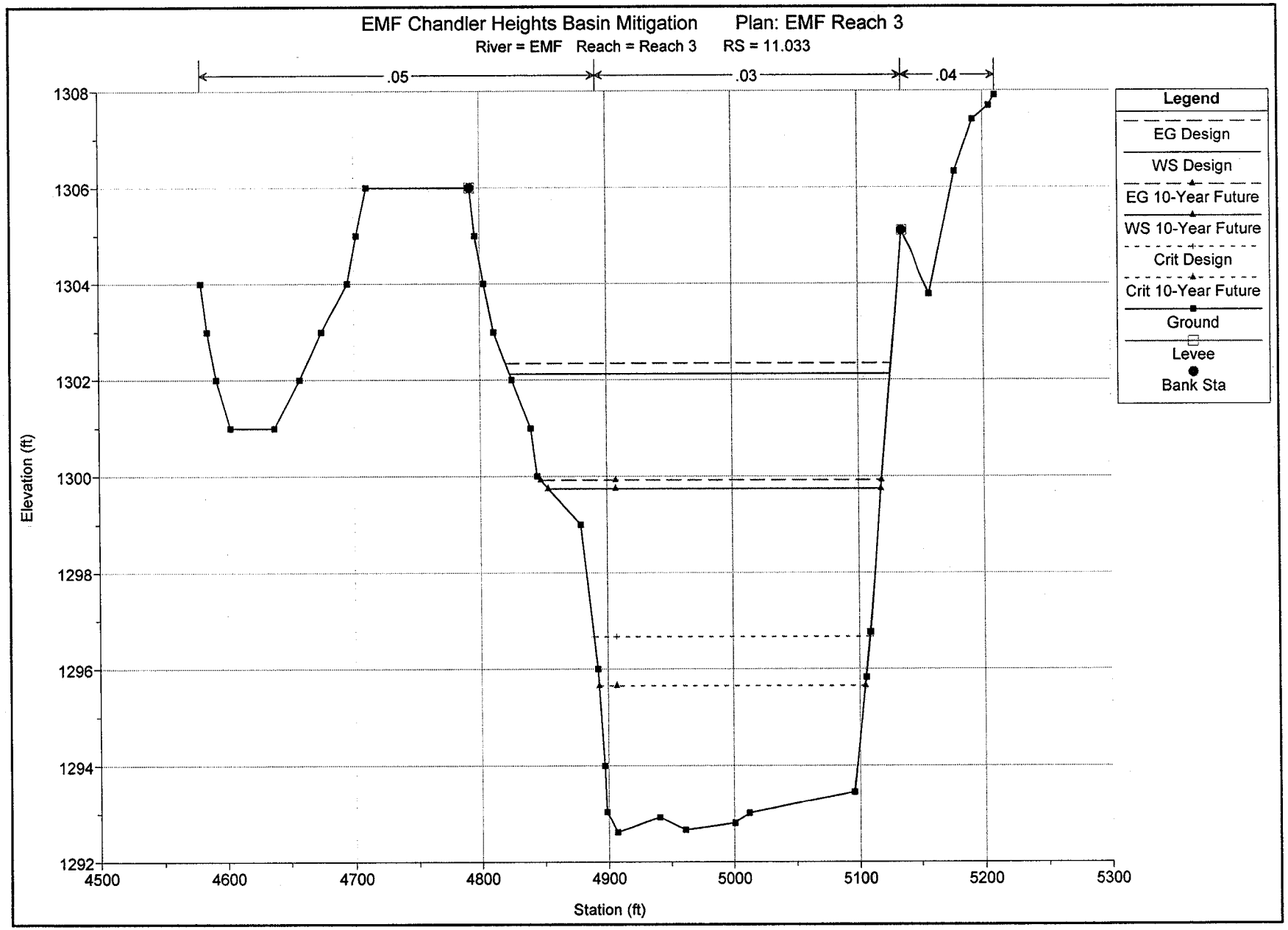
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.033
.05
.03
.04
Elevation (ft)
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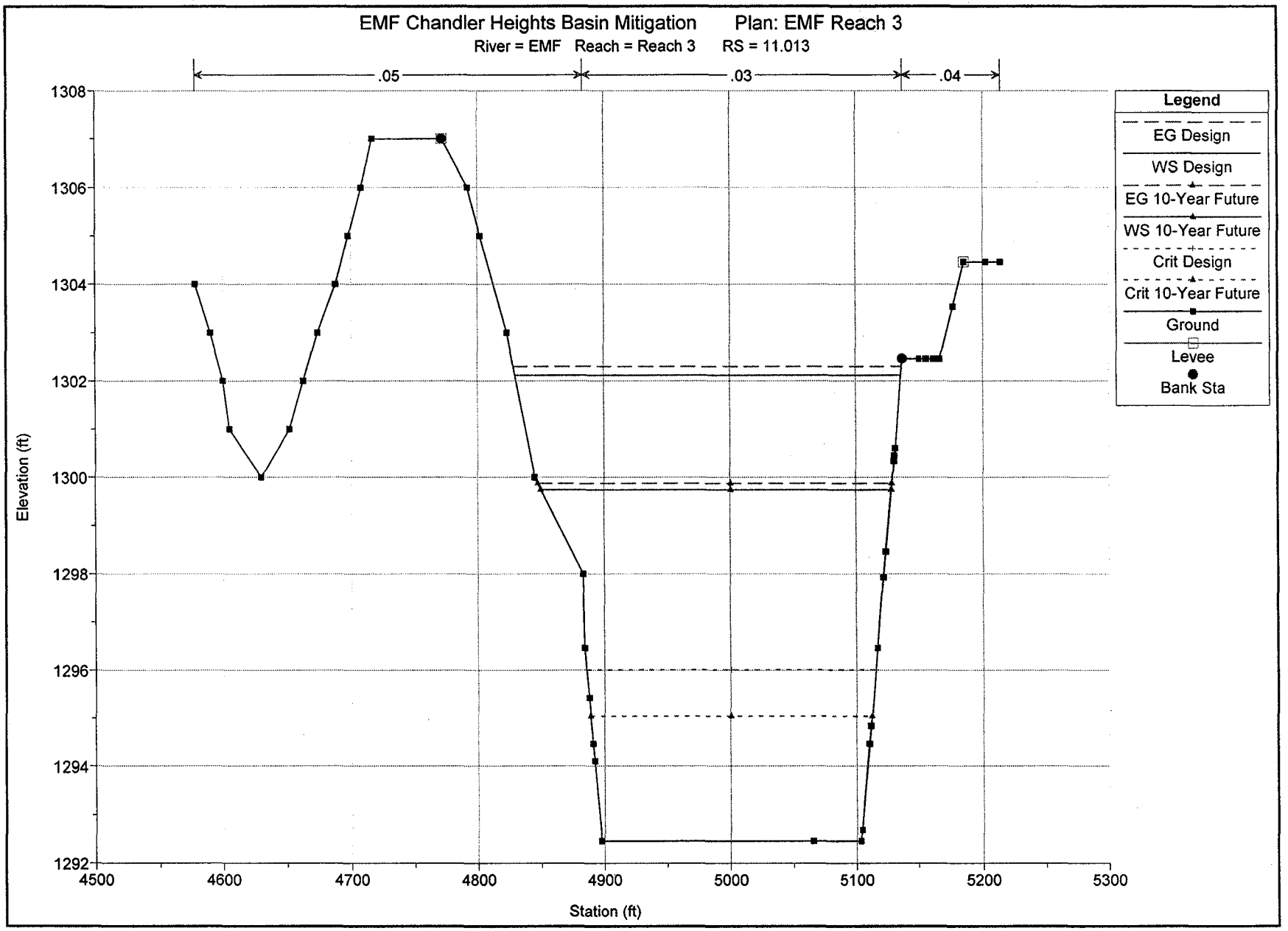
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 11.013
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Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
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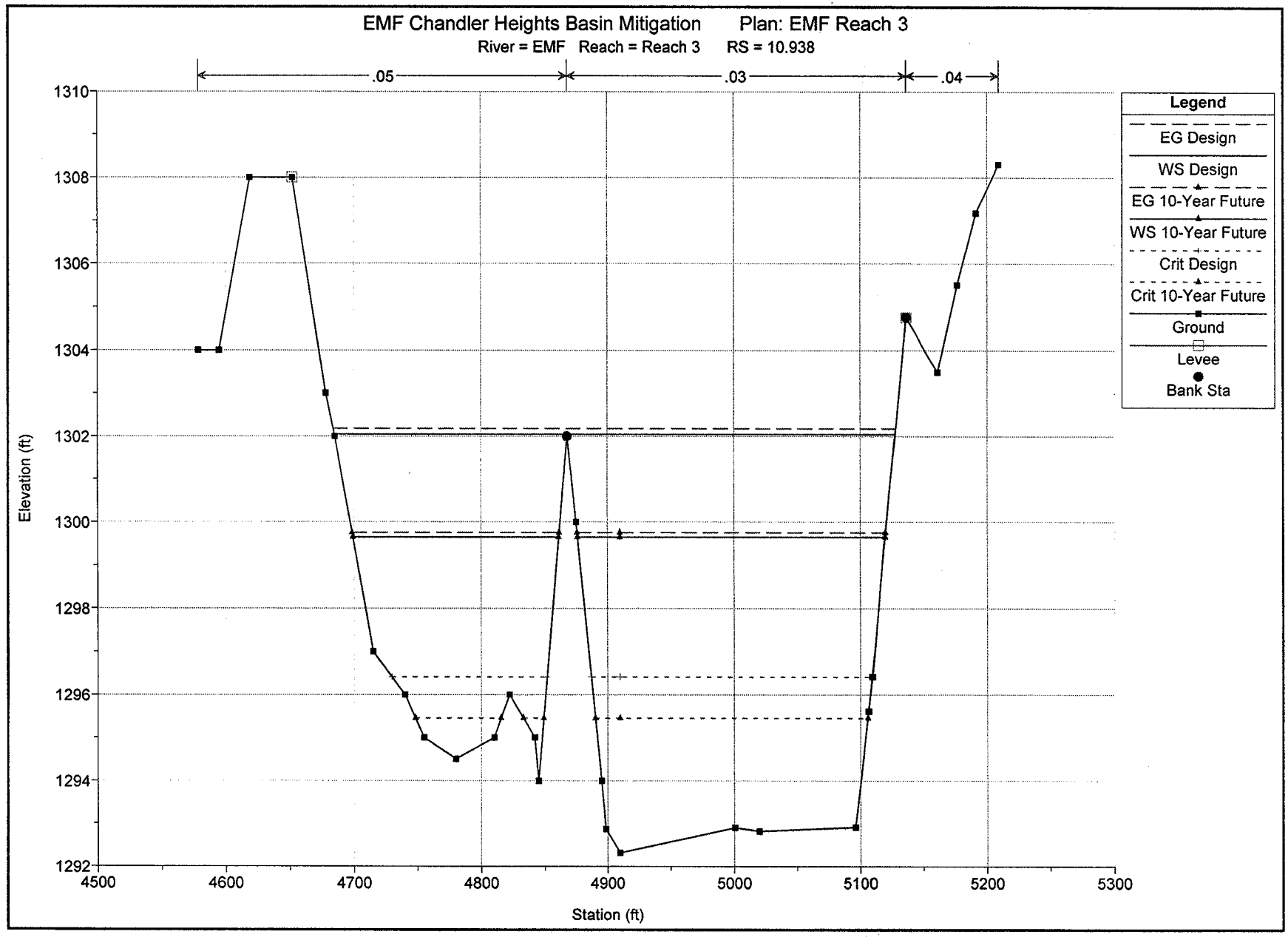
Station (ft)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Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.938
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.04
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
1308
1306
1304
1302
1300
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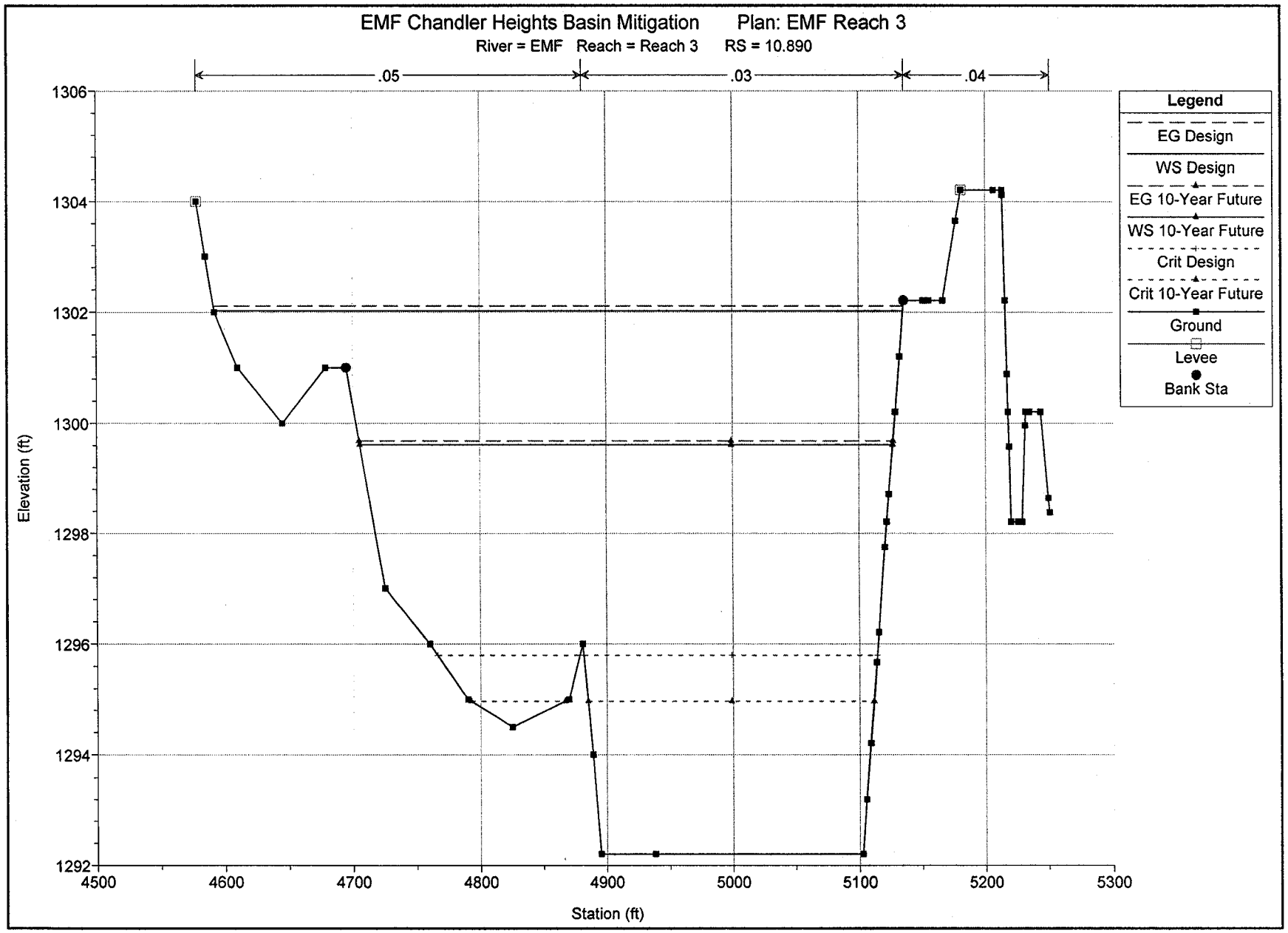
5200
5300
Station (ft)


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.890
.05
.03
.04
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1306
1304
1302
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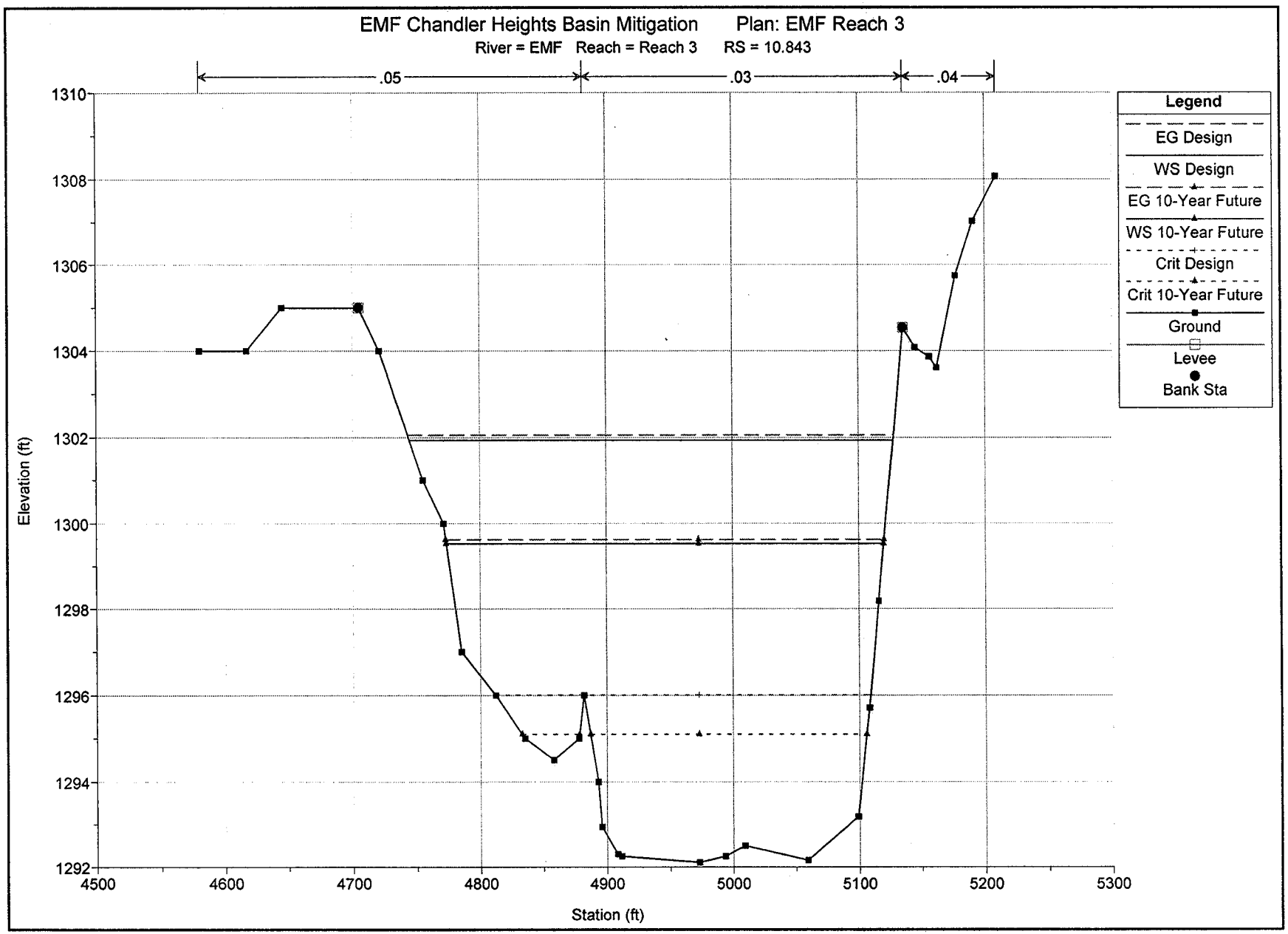
Station (ft)


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.843
.05
.03
.04
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1310
1308
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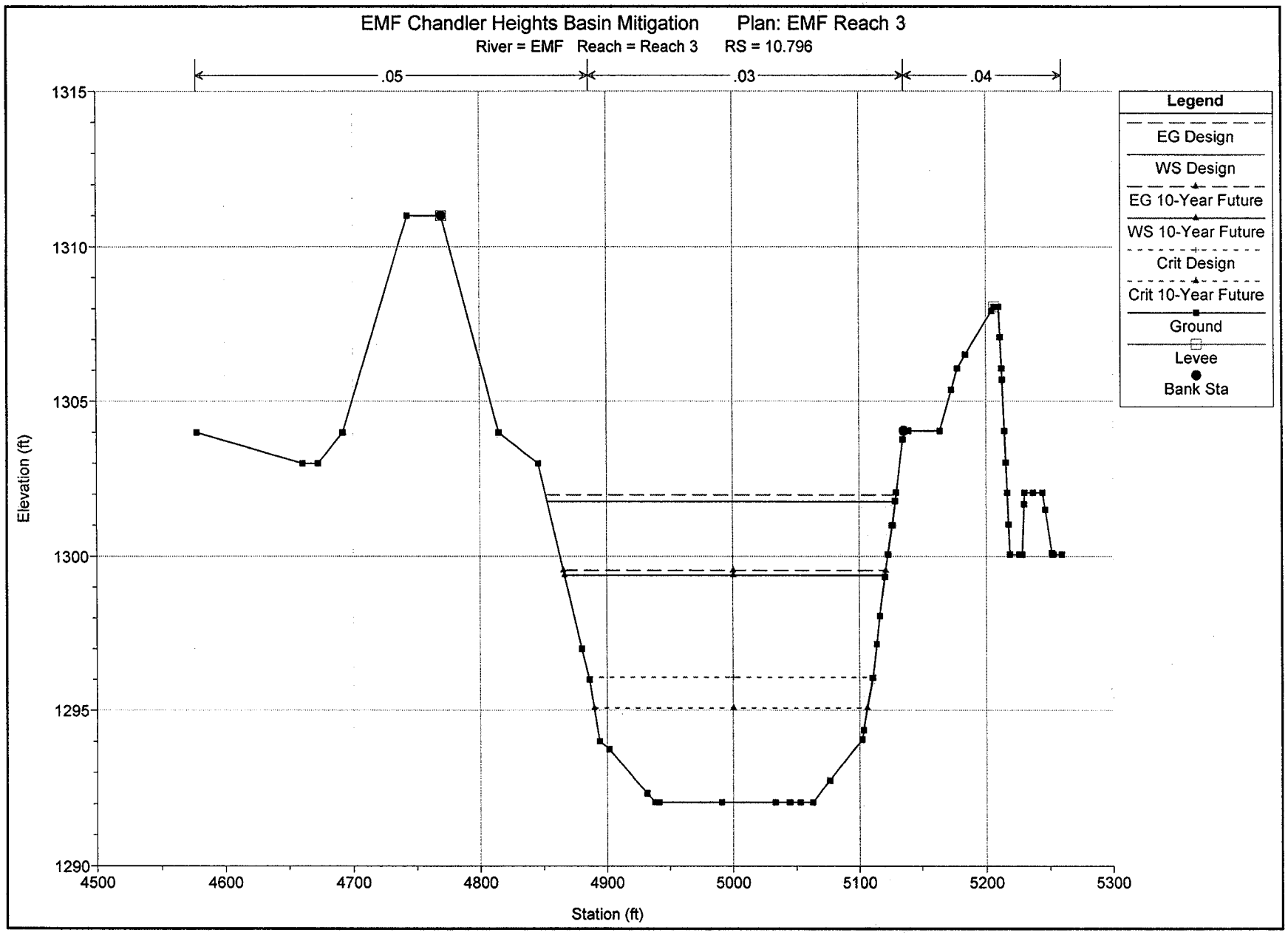
5300
Station (ft)


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF
Reach = Reach 3
RS = 10.796
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.03
.04
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Bank Sta
Elevation (ft)
1315
1310
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5100
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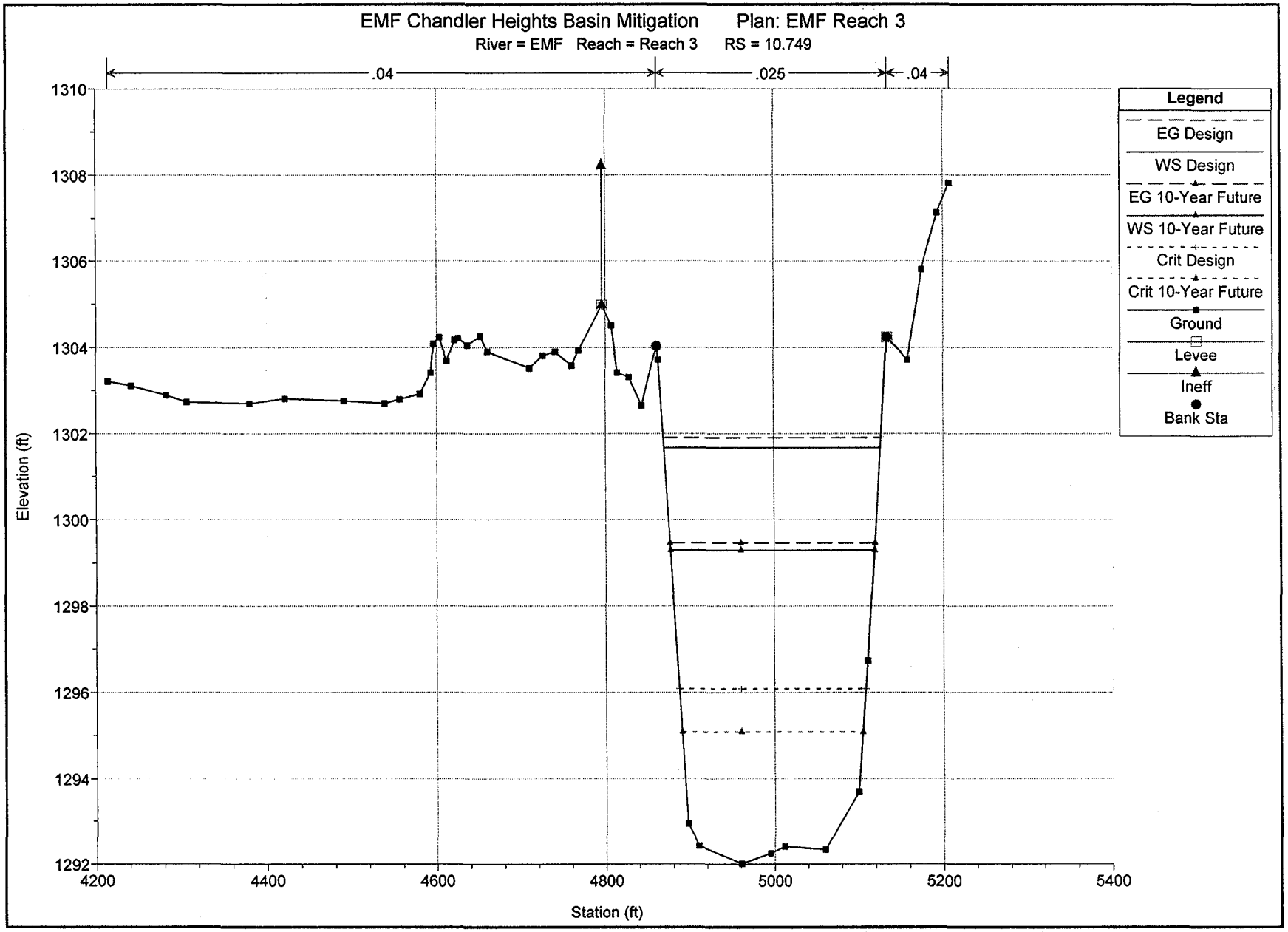
Station (ft)


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.749
.04
.025
.04
Elevation (ft)
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1308
1306
1304
1302
1300
1298
1296
1294
1292
4200
4400
4600
4800
5000
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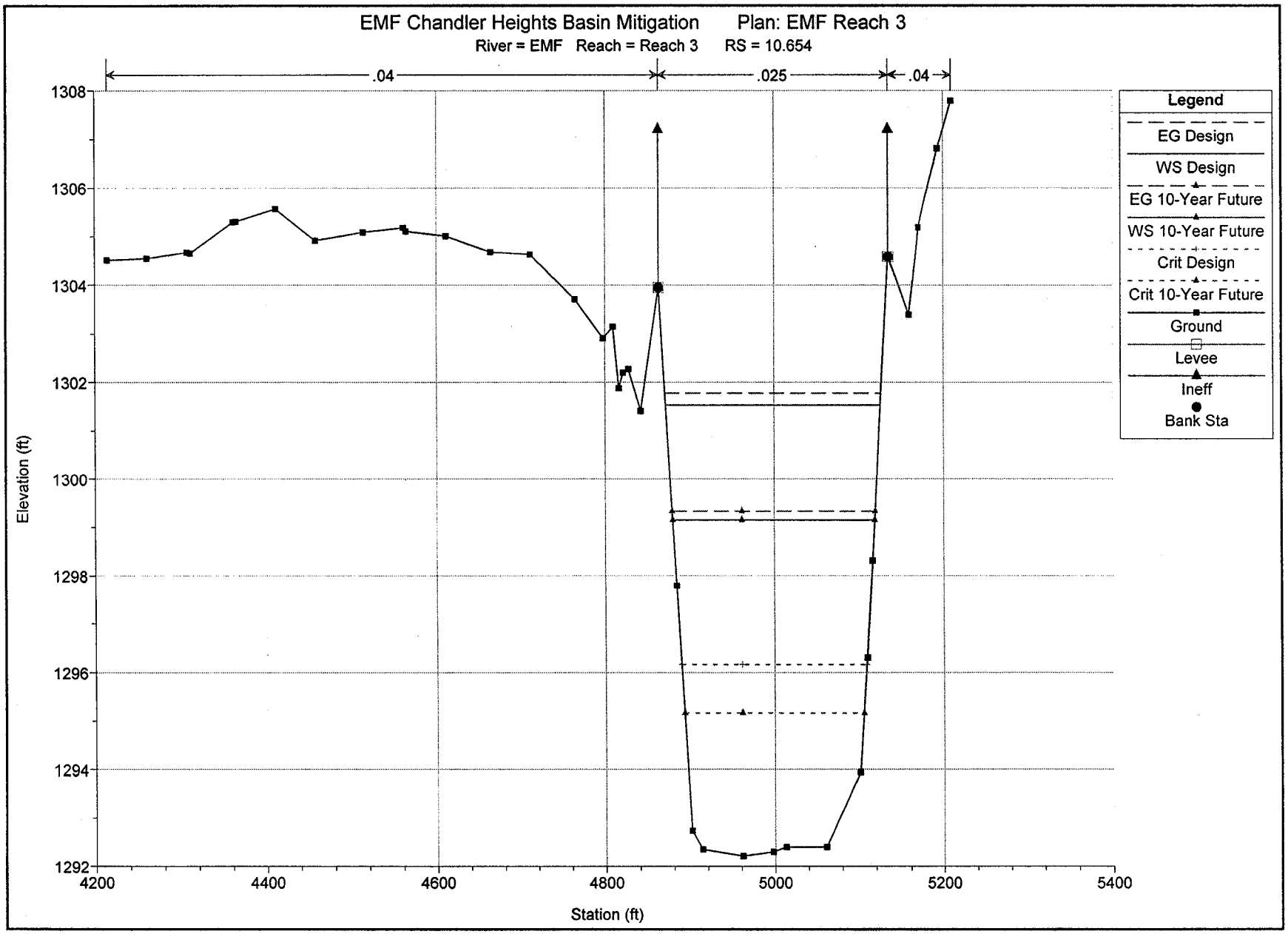
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.654
.04
.025
.04
Elevation (ft)
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1306
1304
1302
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1292
4200
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4600
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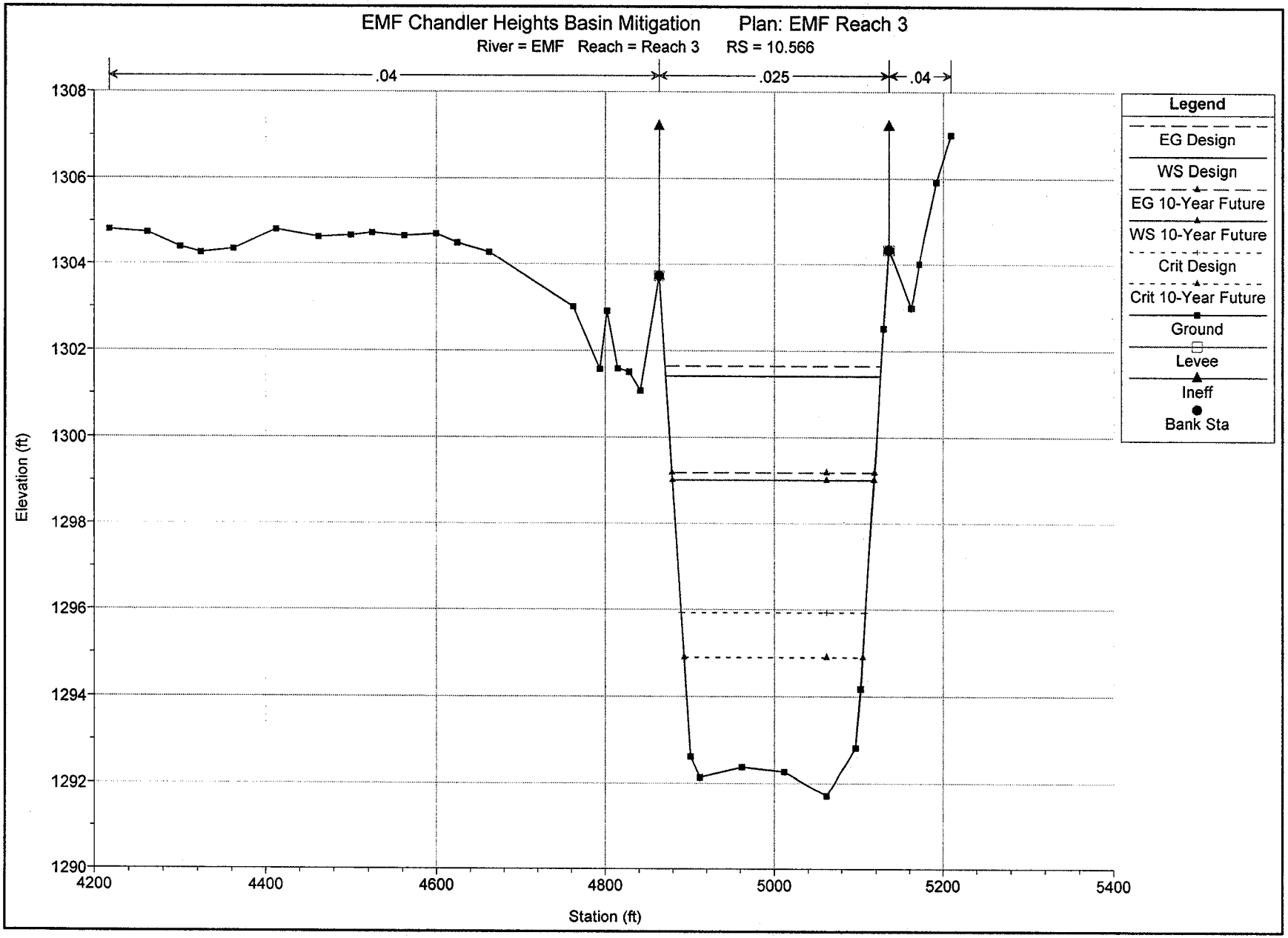
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.566
.04
.025
.04
Elevation (ft)
1308
1306
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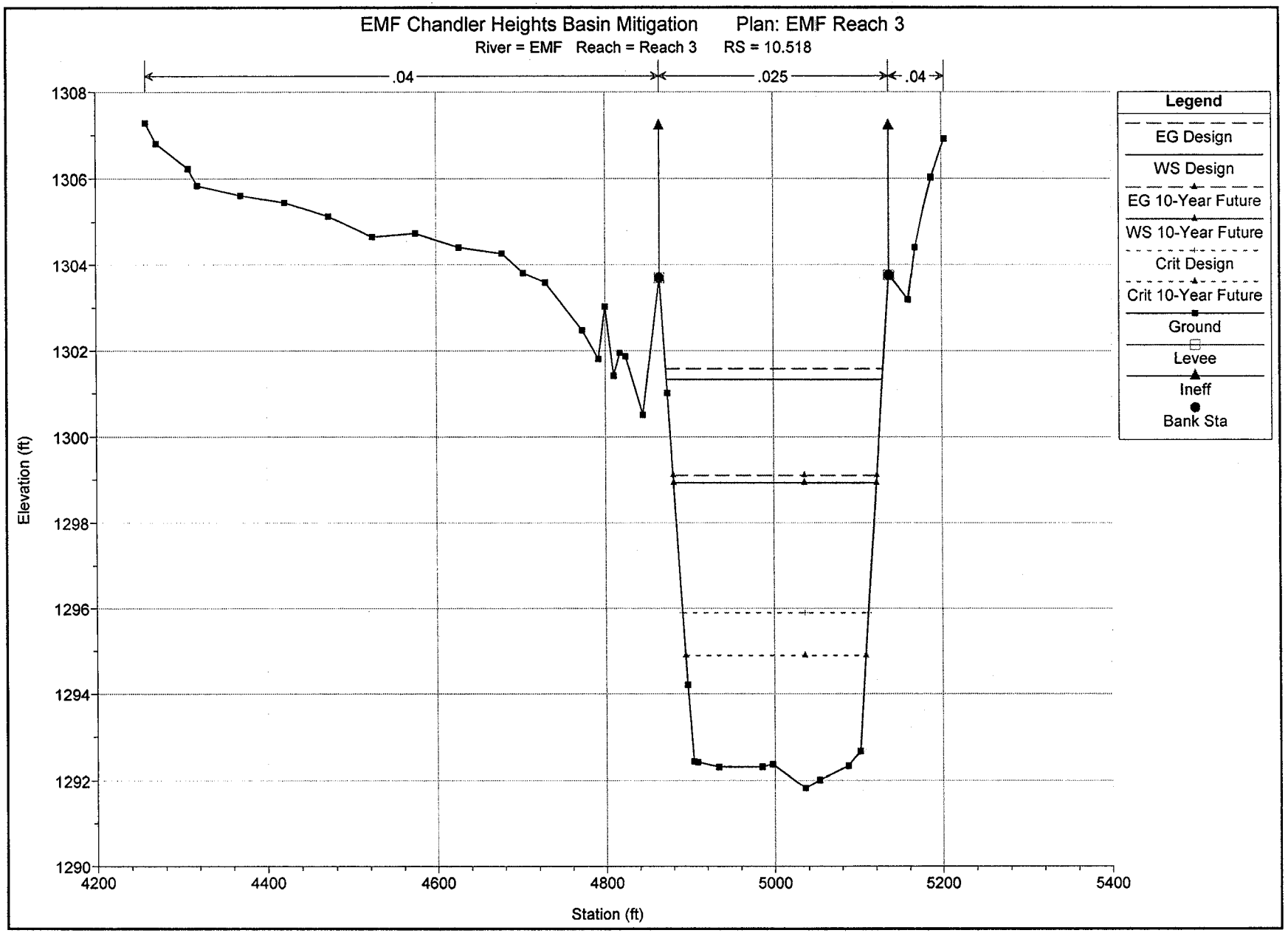
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.518
.04
.025
.04
Elevation (ft)
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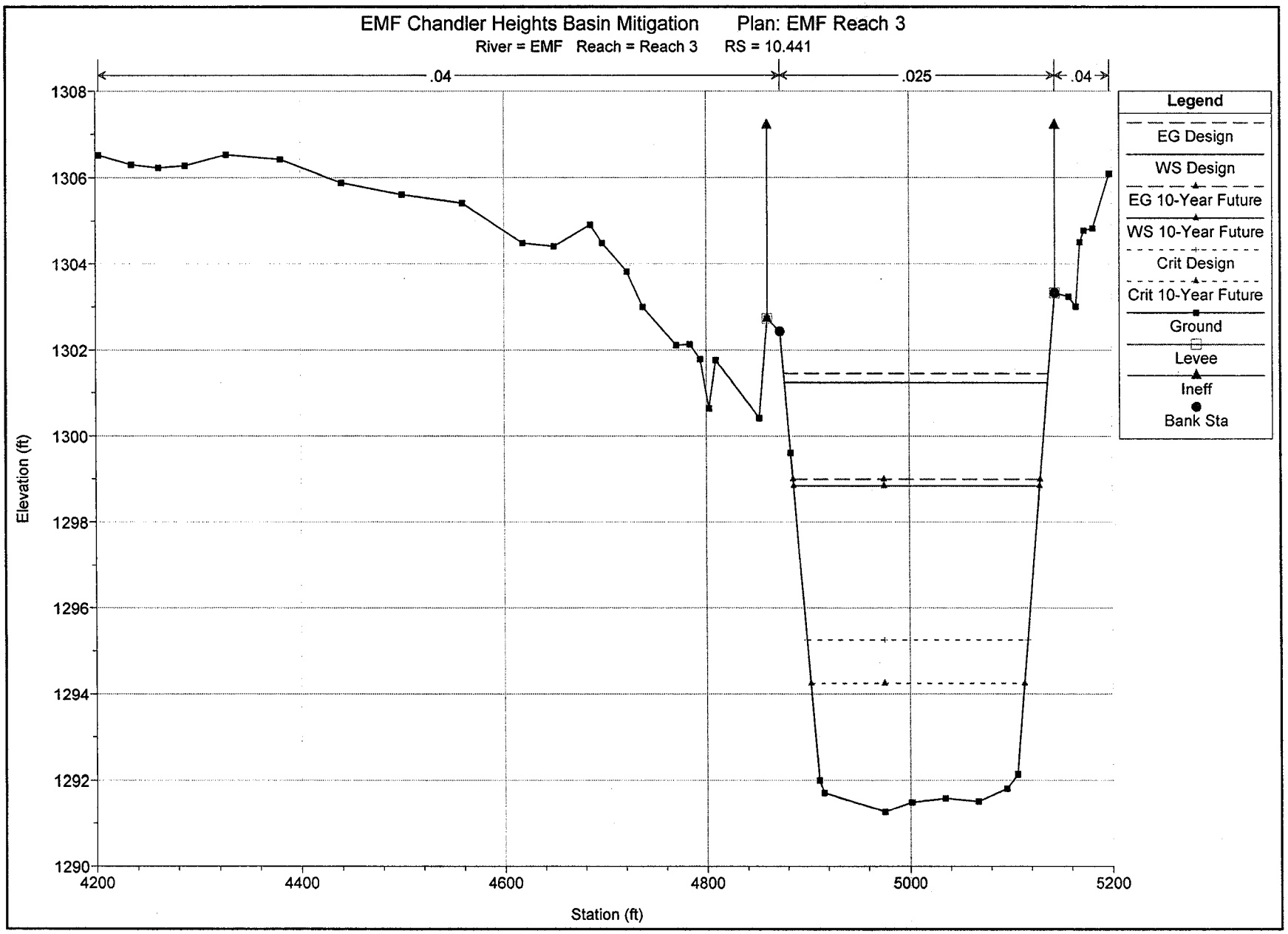
5400
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.441
.04
.025
.04
Elevation (ft)
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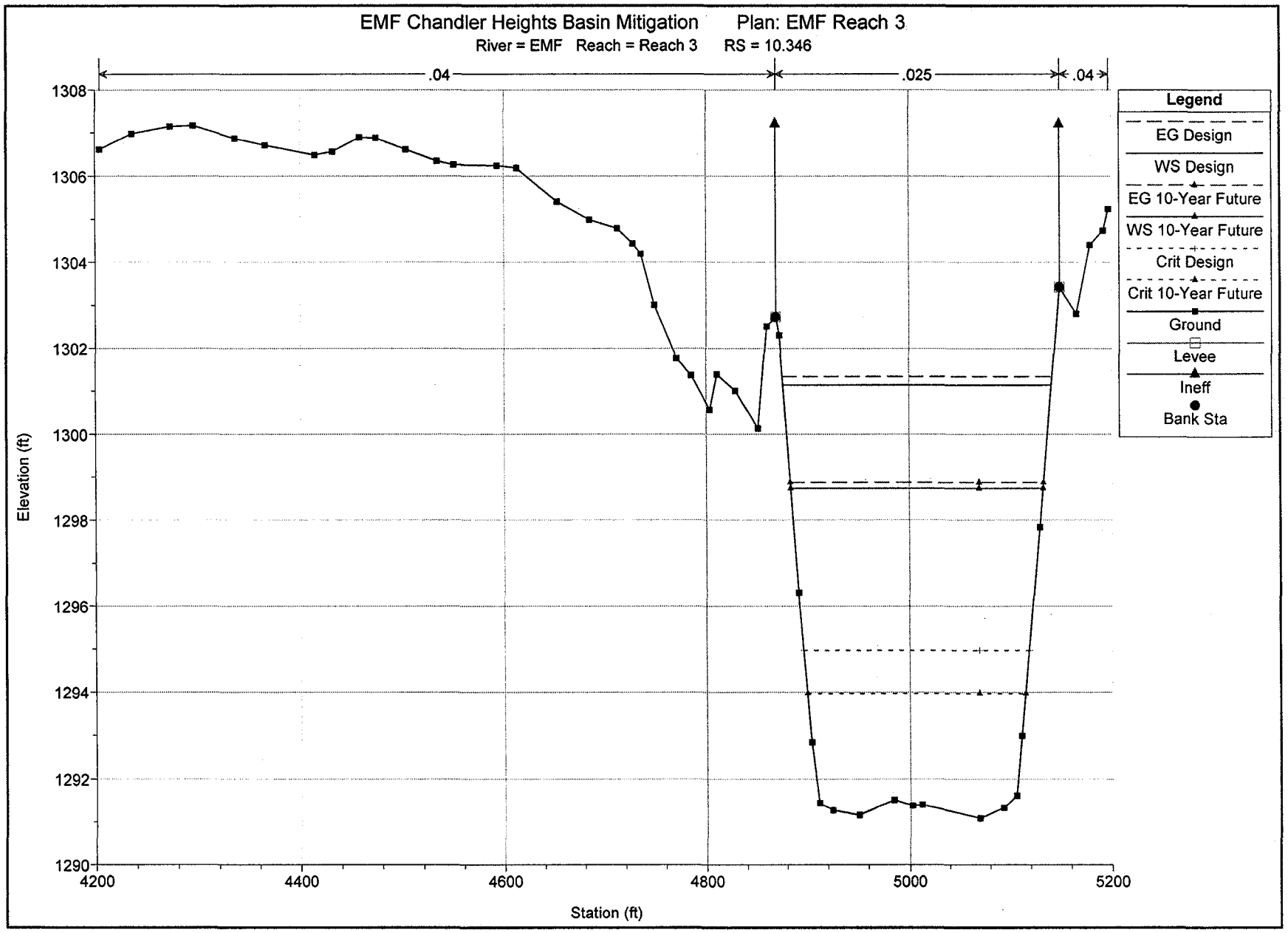
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.346
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.025
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Elevation (ft)
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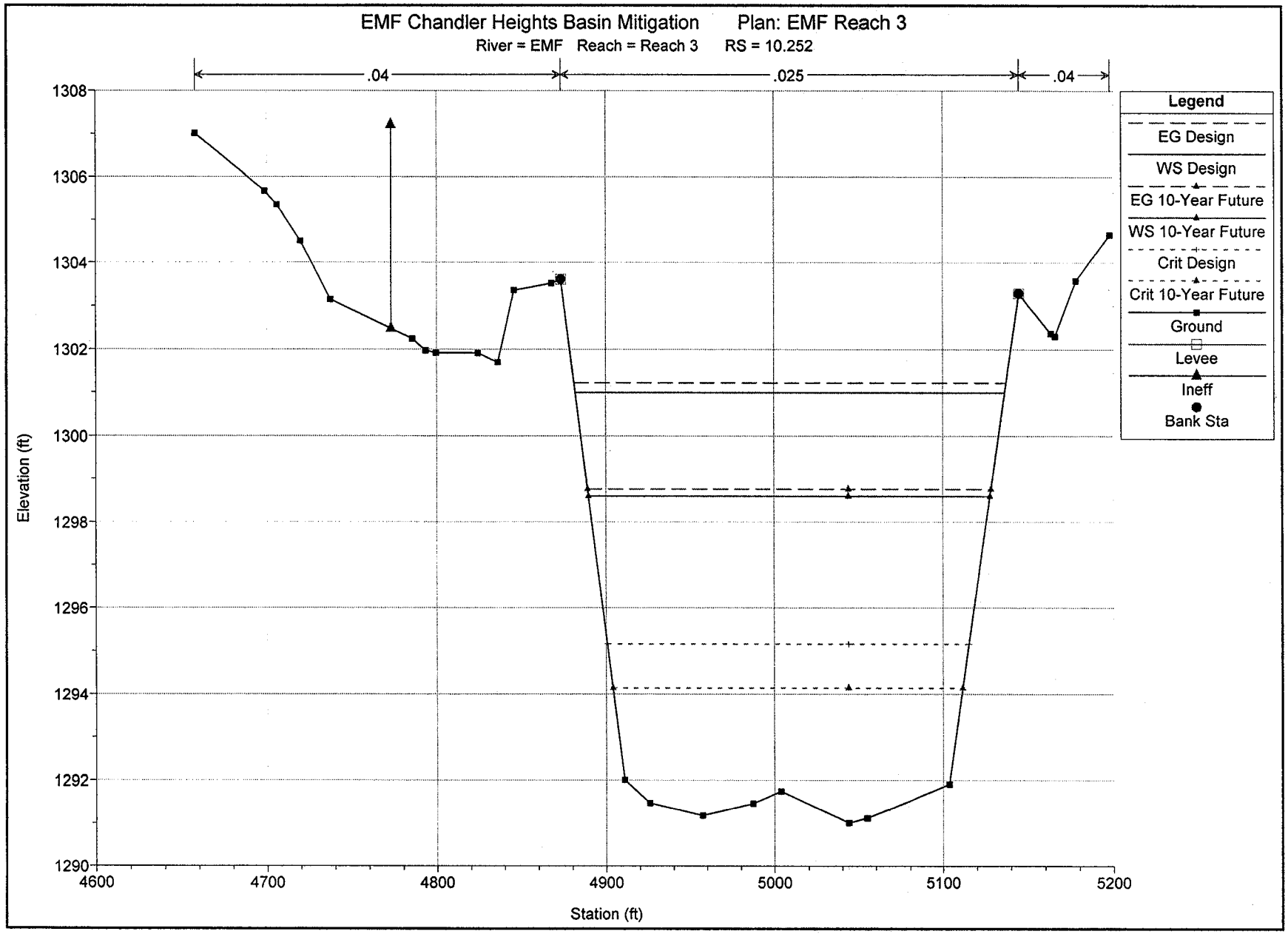
Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
Ineff
Bank Sta


EMF Chandler Heights Basin Mitigation
Plan: EMF Reach 3
River = EMF Reach = Reach 3 RS = 10.252
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.025
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Elevation (ft)
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Station (ft)
Legend
EG Design
WS Design
EG 10-Year Future
WS 10-Year Future
Crit Design
Crit 10-Year Future
Ground
Levee
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