2009P033

Final Drainage Report

Queen Creek Road Improvements
Val Vista Drive to EMF

TOG Project No. ST081

June 2010

GILBERT
ARIZONA

Prepared for
Town of Gilbert

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1 INTRODUCTION

1.1 Purpose

The purpose of this drainage report is to present the drainage concept, criteria, methodology and analysis, both on-site and off-site, in support of the proposed roadway improvements on Queen Creek Road, from Val Vista Drive to the East Maricopa Floodway (EMF).

The project is being designed for the Town of Gilbert, (TOG Project #ST081) and will widen the existing roadway according to the Town's major arterial section. Roadway improvements include widening the crossing over the Roosevelt Water Conservation District (RWCD) Canal. In addition to the roadway improvements, the existing bridge over the EMF will also be repaired and widened on the north and south sides to accommodate the new arterial section.

This report will address the recommended drainage improvements, associated with the proposed roadway. The purpose of the drainage report is to address the following issues:

- Establish drainage design criteria and concepts.
- Evaluate off-site and on-site flows that will impact the project.
- Document engineering solutions that minimize impacts to surrounding properties and control rainfall runoff.
- Identify FEMA floodplain designations.
- Evaluate impacts to the water surface elevations within the EMF due to the bridge improvements and widening.
- Analyze scour in the EMF associated with the new bridge piers.

This drainage report summarizes the drainage concept; analysis and design for the final plan submittal. Recommendations for drainage improvements include the construction of curb opening and grate inlets, reinforced concrete pipes, roadside ditches, culverts and outlet structures to collect and convey storm water runoff to proposed retention basins located along Queen Creek Road.

Criteria for the design and analysis of the proposed drainage improvements are based on the Town of Gilbert *Public Works and Engineering Standards and Details*. Hydrologic

and hydraulic calculations were performed according to the methodology and procedures outlined in the Drainage Design Manual of Maricopa County, Volumes 1 and 2.

Included in the appendices are the drainage area maps, off-site and on-site peak flow computations, EMF hydraulics, EMF scour calculations, culvert and ditch calculations, scupper and catch basin analyses, and retention basin design calculations.

2 LOCATION

This project is located within the limits of the Town of Gilbert, Maricopa County, Arizona. Specifically, the project limits are within Section 9, 10, 15 and 16, Township 2 South, Range 6 East of the Gila and Salt River Base Meridian, Maricopa County, Arizona. The drainage improvements on Queen Creek Road extend from Val Vista Drive east to the east side of the EMF. The project location is shown in Figure 1, Project Location Map.

3 SITE CONDITIONS AND PROPOSED DEVELOPMENT

Portions of Queen Creek Road between Val Vista Drive and Greenfield Road and a small portion between Rockwell Street and 165th Street have been widened to the minor arterial section standards as a part of the residential and commercial developments in the area. The west end of the project will tie into existing improvements constructed along Val Vista Drive (Town of Gilbert CIP ST124). The limit of improvements to Queen Creek Road will extend just east of the EMF bridge and tie into existing full street improvements constructed with the commercial development for Lowe's on the north side of Queen Creek Road and the Improvement District 19 development, on the south side of Queen Creek Road.

The new roadway will include two lanes of traffic in each direction comprised of an 11-foot inside lane and an 11-foot outside lane, a 5.5-foot bicycle lane, and a median which varies from 10 feet to 14 feet. Concrete scuppers and catch basins are designed to capture pavement drainage to minimize flow-spread widths and to convey the storm water to new retention basins per the *Town of Gilbert Public Works and Engineering Standards and Details*.

4 FEMA FLOODPLAIN CLASSIFICATION

4.1 FEMA Studies

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) within the project watershed. The project location of Queen Creek Road, from Val Vista Drive to the EMF Bridge is located on the following panels:

2670H, Map No. 04013C2670H for Maricopa County, Arizona and Incorporated Areas, revised September 30, 2005, and

2690H, Map No. 04013C2690H for Maricopa County, Arizona and Incorporated Areas, revised September 30, 2005.

Refer to Figures 2 and 3 for the latest FEMA FIRM maps of the project area. The majority of the project area is located in Shaded Zone X on the FIRM panel.

Shaded Zone X is defined as: *"Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths less than one foot or with drainage areas less than one square mile; and areas protected by levees from 1% annual chance flood."*

Contained within the EMF right-of-way is the Flood Zone A. The only improvements within the EMF channel will be widening of the bridge to the north and south of the existing piers. This will require additional pier columns on both sides of the bridge.

5 OFF-SITE DRAINAGE

The existing topography within the project area slopes mainly to the west and slightly to the north. The project site lies within the limits of the Chandler/Gilbert Floodplain Delineation Study, Phase 1-South, Eastern Canal Watershed Study, prepared by David Evans and Associates for the Flood Control District of Maricopa County. Developments adjacent to the roadway improvements have retained off-site runoff, as required by the town that would have impacted the road. As part of this project, temporary retention basins for undeveloped parcels will be placed to retain off-site runoff generated within those sites until they are developed.

The construction of curb and gutter, inlets, and retention basins will help to reduce or eliminate problematic ponding in the street and along the parcels on the south side of Queen Creek Road near 158th Street. The Queen Creek Road improvements will have no negative drainage related impacts to the adjacent properties. The only significant off-site drainage feature within the project limits, the East Maricopa Floodway, will be discussed further within the following sections.

5.1 Background

The East Maricopa Floodway (EMF) is one of the major regional outfalls for the eastern Maricopa County cities. In 1999, HNTB Corporation, under contract with the Flood Control District of Maricopa County, assessed the conveyance capacity of the entire EMF for three 100-year discharge rates: the original design discharges; the future discharges under the future land use in the watershed; and the existing discharges under the 1999 land use. One of the objectives of HNTB's study was to develop the HEC-RAS models to determine the existing channel performance for the three 100-year discharge rates.

The total EMF project is divided into six reaches from the downstream end at Gila River (Reach 1) to the upstream end at Princess Park (Reach 6). The portion of the EMF that contains the Queen Creek Road Bridge is the upper end of Reach 3. Within this portion of Reach 3, the EMF is a trapezoidal earthen channel with an approximate top width of 250 feet. The EMF channel crosses Queen Creek Road at a 30-degree skew and flows in a southwesterly direction.

The EMF benchmark used for this project is #533 (See EMF Capacity Assessment Plan and Profile Sheets, Sheet 25 of 50). The EMF elevation of the benchmark is 1315.026 feet (NGVD29), and the project survey elevation for the benchmark is 1317.144 feet. Therefore a datum adjustment of +2.12 feet is used to translate elevations from the EMF project elevations to the Queen Creek Road Improvements Project.

Based on direction from FCDMC during the Queen Creek Road Widening Kick-Off Meeting held on December 18, 2008, the 100-year design flow of 6,900 cfs was used to analyze the freeboard under the new bridge improvements.

5.2 Hydraulic Modeling

As mentioned in the previous section, the Flood Control District of Maricopa County provided AZTEC with the effective HEC-RAS analysis to modify for the proposed bridge improvements. The hydraulic modeling was performed using the U.S. Army Corps of Engineers' HEC-RAS program, Version 3.1.3. Due to changes in the new versions of the program the effective model that was obtained did not run properly because there was not a distance from the upstream cross-section to the bridge deck. The effective model was then used as a basis for the duplicate effective model, which was adjusted by changing the distance to 1.0 feet and offsetting that value in the bridge deck width. Once these changes were completed the model ran properly and the water surface elevations of the duplicate effective model were checked against the effective model water surface elevations. No significant differences were found between the two models.

A corrected effective model was created from the duplicate effective model to add in additional cross-sections to the Reach 3 model. The Queen Creek Bridge falls within the upper three cross-sections of Reach 3. Cross-sections from the lower end of Reach 4 were added to show any backwater effects from the bridge to that portion of the EMF because they are in such close proximity to the Queen Creek Bridge.

A pre-project conditions model was created from the corrected effective model to add in the man-made low-flow channel that has been placed within the EMF after the effective study was completed. The low-flow channel is uniform throughout the study reach with an average depth of 1.5 feet, a bottom width of 10 feet, and 5:1 side slopes.

Due to the bridge improvements included in this project, a post-project conditions HEC-RAS model was performed to verify that the pier extensions to the north and south sides of the bridge will not adversely impact the water surface elevations or freeboard under the bridge.

Improvements to the bridge will include widening of both the north and south side of the bridge and placing additional piers on the outside for the wider deck width. The post-project conditions model includes the new width of the bridge. The cross-sections immediately upstream and downstream of the bridge needed to be moved out and renumbered to accommodate the widening of the bridge deck.

Queen Creek Road is a normal crown section. Due to the widening of the roadway section, the low chord of the bridge will be lowered by 0.32 feet. These changes were also added to the HEC-RAS analysis to determine the provided freeboard.

The post-project conditions model was computed and the results were compared to the pre-project conditions model results for the 6,900 cfs 100-year design flow. As the results show in Appendix A, the water surface elevation impacts at the bridge and immediately upstream and downstream of the bridge are insignificant, all are less than 0.1 foot increase. With the bridge at River Mile 13.431 the water surface elevations tie back into the pre-project model upstream at River Mile 13.911 and downstream at River Mile 13.426.

The freeboard was determined based on the post-project conditions with the EMF under the Queen Creek Road Bridge. The freeboard required, as stated by FCDMC, is the greater of 2.0 feet or 0.2*He for subcritical flows, where He is the specific energy head. This requirement is applicable to the entire EMF channel, including the bridges. The freeboard provided at the upstream section of the bridge is 4.02 feet and the freeboard provided at the downstream section of the bridge is 4.15 feet, exceeding the freeboard requirements. The results of the HEC-RAS analysis and the freeboard calculations have been provided in Appendix A.

5.3 Scour Analysis

The hydraulic data that was used for the analysis was confirmed by the Flood Control District of Maricopa County (District) during the project Kick-Off Meeting held on December 18, 2008. Per subsequent discussions with the District and reviews of scour calculations by the District, the 100-year design flow of 6,900 cfs and the 500-year flow of 11,730 cfs (1.7 x 6,900) were selected.

The Drainage Design Manual for Maricopa County (DDMMC), Hydraulics, outlines the District's scour estimating methodology. The Chapter 11 (draft), Sedimentation, is dedicated to outlining the District's erosion and sedimentation procedures. Six forms of scour were considered or analyzed for this reach of the EMF in the vicinity of the Queen Creek Road Bridge; long term degradation, general scour, local scour, bend scour, bed-form scour and scour due to low flow incisement. The following sections provide discussion of the results of investigating each form of scour.

5.3.1 LONG TERM DEGRADATION

Long term degradation was evaluated by comparing the original bed slope of the channel (construction ca. 1985) with the bed slope at the time of the HNTB Study (1999). The results of the evaluation indicate that the original bed slope of the channel was S=0.00030 ft/ft and the bed slope at the time of the HNTB report was 0.00020 ft/ft. This change in slope is very minor over a period of 14 years. Since the channel is man-made and has grade control structures at regular intervals, the long term scour is not considered to be a factor in the total scour estimate for the bridge. A plan sheet from the channel reconstruction project in 1985 and the two representative cross sections (13.280 and 13.471) from the HNTB HEC-RAS model are included in Appendix A.

5.3.2 GENERAL SCOUR

General scour is the lowering of all or part of the streambed or artificial channel due to stormwater runoff in a typical reach of channel. The three General Scour equations considered for this bridge crossing are the Neill, Blench and Lacey equations. The Neill equation is most applicable where there is a constriction in the channel due to a bridge or some other feature. In this location the bridge does not create a constriction, as described in the local scour discussion below, and the Neill equation was not applied.

The Blench equation is most applicable where there is a clear water condition imposed on the stream by a reservoir or a sand and gravel pit upstream of the project location. This situation does not exist in the project area either, so the Blench equation was not applied. Initially, both equations were tested and the calculations resulted in much deeper scour depths than would reasonably be expected for a man-made flood control channel with mild slopes and relatively low design velocities. One reason for this, at

least in regards the Blench equation, is that the multiplying factor 'Z' is the same for a straight reach of channel as a severe bend, in either case Z=0.6. But for a right angle bend Z=1.25. Whereas for the Lacey equation, Z= 0.25 for a straight reach, 0.50 for a moderate bend, and so on up to 1.25 for a vertical rock bank or wall.

The Lacey equation, according to the DDMMC, is more applicable to a natural river system. The equation was, however, developed for use in irrigation canals with uniform section and slope and which are relatively straight. This is the most applicable of the three equations to the East Maricopa Floodway in the Queen Creek Road bridge reach. The calculations for General Scour using the Lacey equation are included in Appendix A.

5.3.3 LOCAL SCOUR

Local scour at a bridge can be caused by three main factors, bridge piers, abutments and contraction of the channel. With the Queen Creek Road Bridge, the abutments are not within the channel and the channel cross-section does not contract due to the bridge. The channel reach upstream and downstream of the Queen Creek Road Bridge is straight, i.e. there are no contractions or bends in the channel section. There is an expansion of the EMF just upstream of the Queen Creek Road Bridge however, the only form of local scour that was examined was pier scour.

The methods used to analyze the pier scour at the proposed Queen Creek Road Bridge are presented in the Federal Highway Administration's Hydraulic Engineering Circular (HEC) No. 18 publication *Evaluating Scour at Bridges.* Pier scour is a function of bed material characteristics and configuration, velocity and depth of the flow upstream and the geometry of the piers as well as well as debris accumulation on the piers. In the case of the Queen Creek Road Bridge the following conditions apply: the pier nose shape is rounded therefore the correction factor is 1.0, the angle of attack of the flow is 0-degrees so the correction factor is 1.0, clear water scour was used since it was the most conservative and its correction factor is 1.1, armoring of the bed is an additional consideration and a correction factor of 1.0 was used as it was the most conservative. The pier width was adjusted for a debris accumulation from the actual width of 4 feet (3 ½ -foot pier on 4-foot drilled shafts) to 8 feet thus accounting for 4 feet of debris. The Froude number of the flow at the upstream cross-section of 0.26 is an additional factor. Once all of the terms of the equation were determined the resulting scour depth, for the 500-year flow, due to the piers is 12.1 feet (See Appendix A).

5.3.4 BEND SCOUR

Bend scour was considered and investigated but was not analyzed in detail because there are no bends in the channel at the Queen Creek Road crossing location. There is a channel bend located about 1,300 feet downstream of the bridge. This is not close

enough to the bridge to induce scour effects to the channel lining at the bridge or the bridge structure itself.

5.3.5 BED-FORM SCOUR

Anti-dune scour and dune scour are two types of bed-form scour. Anti-dunes typically form during transitional flow, between subcritical and supercritical, or during supercritical flow regimes. Dunes form during lower regime flow, or subcritical flow. Subcritical flow conditions occur throughout Reach 3 of the EMF, therefore the Dune Height within the EMF is estimated using the Simons and Senturk (1992) equation:

$d_h = 0.066y^{1.21}$

Where:

d_h is the dune height, in feet, and

y is hydraulic depth of flow, in feet.

Anti-dune scour is not anticipated within the vicinity of the Chandler Heights Road crossing. The bed-form scour is estimated as one-half the Dune Height:

$Z_{bedform} = 0.5d_h$.

Bed-forms typically develop in response to hydraulic conditions in flowing water in alluvial systems. The EMF is not an alluvial channel; it is an engineered channel with uniform dimensions, low sediment load, low debris loads and mild slopes. However, it is not a concrete lined channel and it receives some sediment flow from the drainage area, therefore bed-form scour is anticipated.

5.3.6 LOW FLOW INCISEMENT

In a natural or man-made channel, a low-flow channel, or thalweg, is usually formed over time by storm flows. If the channel does not exist it is often estimated at a depth of 1 foot to 2 feet or greater, depending on conditions. An earthen low-flow channel exists within the EMF, however a new low-flow channel is planned to be constructed to replace the existing condition. The depth of the planned low-flow channel through the project reach is 3 feet. All scour depths resulting from the calculations use the elevation of the planned low-flow channel invert as the baseline for computing scour elevations. The cross-section location is directly upstream of the Queen Creek Road Bridge and is the basis of elevation for the scour elevation estimates.

5.3.7 TOTAL SCOUR

Total scour is the sum total of all applicable forms of scour at a given location. The total 500-year scour for the bridge piers is 19.0 feet and the calculations are presented in Appendix A.

6 ON-SITE DRAINAGE

6.1 Background

The design of the on-site systems is in accordance with the Town of Gilbert's *Public Works and Engineering Standards and Details*. Haestad Method's StormCAD was used to locate and size the scuppers, catch basins, and storm drains.

6.2 Methodology

The Rational Method was used to determine the peak on-site flows. The rational Equation relates the rainfall intensity, a runoff coefficient and the watershed size to generate the peak flow. For the on-site street drainage, the 50-year storm and the 100-year storm events, in addition to the 10-year storm event, were determined for each drainage area. Per the Town of Gilbert, the 10-year storm event shall only inundate one lane of traffic per half street. The 50-year event must be contained within the street right of way and the 100-year event contained below the finished floors.

Precipitation data was determined for the entire project site, and the Depth-Duration-Frequency (DDF) and Intensity-Duration-Frequency (IDF) curves were generated. A minimum time of concentration of 10 minutes was used. A weighted runoff coefficient was determined based on the areas of roofs and concrete, asphalt, desert landscape, and green landscape. Hydrology calculations are included in Appendix B. Refer to the Drainage Areas Map, Figure 4, for the delineated drainage areas, flow paths and locations of concentration points.

For each drainage area, the flow rate, cross slope and longitudinal slope were entered into StormCAD, which reflects methods presented in the *Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22 (HEC-22).* A value of 0.016 was used for Manning's n. Catch basins and scuppers were located and sized based on the limitations of one inundated travel lane.

The combination catch basins are per MAG Standard Detail 534, and the concrete scuppers are per MAG Standard Detail 206. The detailed street flow calculations are included in Appendix B.

In most locations scuppers have been designed to convey street flow into the retention basins. Where scuppers cannot be used to intercept the flows, catch basins and storm drain systems have been designed. The storm drain systems consist of 15"-18" connector pipes from the catch basins to retention basins or 18"-24" storm drain mains. Allowable pipe materials include reinforced concrete pipe (RCP), high density polyethylene pipe (HDPE) and corrugated metal pipe (CMP). Hydraulic grade lines were calculated using StormCAD for concrete pipe. A tailwater of one foot above the bottom of the existing and proposed retention basins was used in the calculations. These hydraulic calculations are presented in Appendix B.

On the south side of Queen Creek Road from the EMF to Greenfield Road the proposed drainage system consists of ditches and pipe culverts to convey the street drainage to the retention basin. The ditches have a 2' bottom, 4:1 side slopes on the north side and 3:1 side slopes on the south side and are a maximum of 2' deep. These calculations are included in Appendix B.

6.3 Design Criteria

The following design criteria and their applications are utilized:

- Based on MAG Standard Details 206 and 534, the gutter transition to the curb openings for a curb height of 6 inches is 2 inches. This transition represents the "local gutter depression" at the openings.

- Curb opening inlets and scuppers have a reduction factor of 0.75 for sump and on-grade applications. To account for the reduction, the curb opening length used for the analysis was reduced by these factors, i.e. 25% reduction from actual length.

- For combination inlets, the 25% length reduction is not required but no credit is to be given to the open curb face in capacity calculations.

- The TOG drainage standards state that the 10-year event shall only inundate one lane of traffic per half street. Based on the proposed multi-lane roadway cross-section, the maximum allowable spread is 16.5-ft which represents the outside11-foot wide lane of traffic and a 5.5-foot bicycle lane (measured from face of curb).

7 Retention Requirements

The retention basins are designed to retain the runoff from 85% of the 50-year, 24-hour storm. The volume was computed from the formula:

$$V = D*A*C$$

Where,

V = Retention volume required (cubic feet)

D = 85% of the 50-year, 24-hour rainfall depth (3 * 0.85 = 2.55 inches)

A = Drainage Area (square feet)

C = Weighted runoff coefficient

The weighted runoff coefficients were calculated for each drainage area based on the values stated in the TOG standards.

Based on existing commercial and residential improvements to the adjacent properties, retention for the half street of Queen Creek Road has already been accounted for at those locations.

The retention basins associated with this project were designed to have maximum 4:1 side slopes, a maximum depth of 2.5 feet (measured from the adjacent street top of curb), and a ponding depth of 2.25 feet. Based on percolation tests done in this area, a percolation rate of 8.3 minutes per inch was used to determine that the basins would drain within the required 36 hours. The larger basins with systems that outfall below ground will have a drywell to help with the percolation. The on-site runoff will enter the basins through either MAG Standard Detail 534 catch basins or MAG Standard Detail 206 scuppers.

Retention along the south side of Queen Creek Road is limited to the area between the sidewalk and the right-of-way. Retention along the north side is limited by the SRP easement. Because of this, the full 50-year, 24-hour storm could not be stored. The Town is permitting the retention basins to be sized for 85% of the 50-year, 24-hour event with 3 inches of freeboard.

Locations of the retention basins are presented on the Drainage Areas Maps. The retention calculations and percolation test results can be found in Appendix C.

8 REFERENCES

Town of Gilbert, *Public Works and Engineering Standards and Details, Article 2: Drainage Engineering.*

Flood Control District of Maricopa County, *Drainage Design Manual Volume One – Hydrology*, September 2003

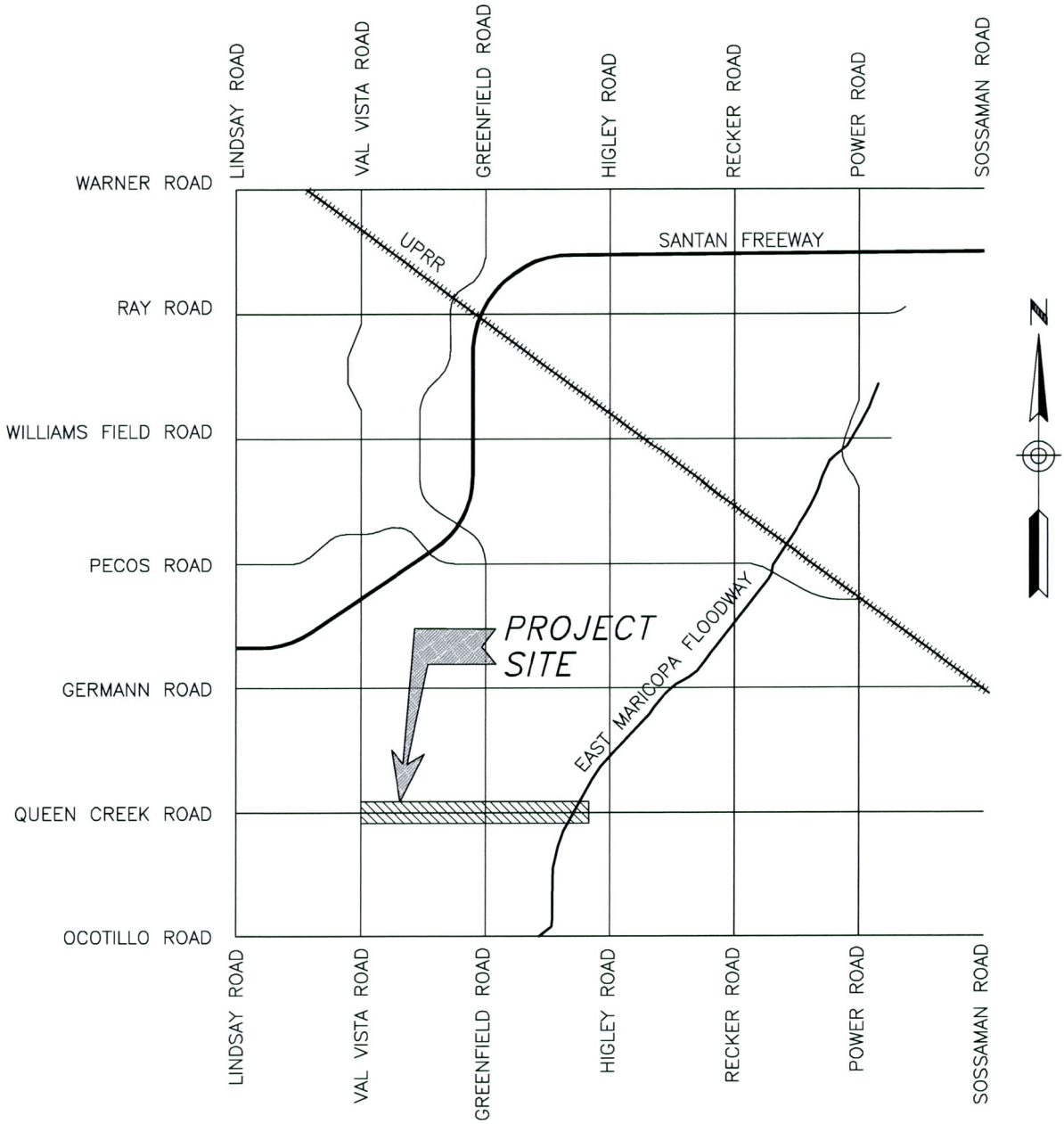
Flood Control District of Maricopa County, *Drainage Design Manual Volume Two – Hydraulics*, September 2003

Federal Emergency Management Agency, *FIRM Flood Insurance Rate Map, Maricopa County, Arizona*, Map No. 04013C2670H, Revised, September 30, 2005.

Federal Emergency Management Agency, *FIRM Flood Insurance Rate Map, Maricopa County, Arizona*, Map No. 04013C2690H, Revised, September 30, 2005.

HNTB Corporation, *East Maricopa Floodway Capacity Assessment Final Study Report,* FCD 97-06, January 1999, Revised February 1999.

FIGURES



PROJECT LOCATION MAP

N.T.S.

SCALE	FIGURE 1	QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF PROJECT LOCATION MAP GILBERT, ARIZONA	DATE: 06/01/2010	AZTEC
HORIZ. NA VERT. NA JOB NO. AZE0825				

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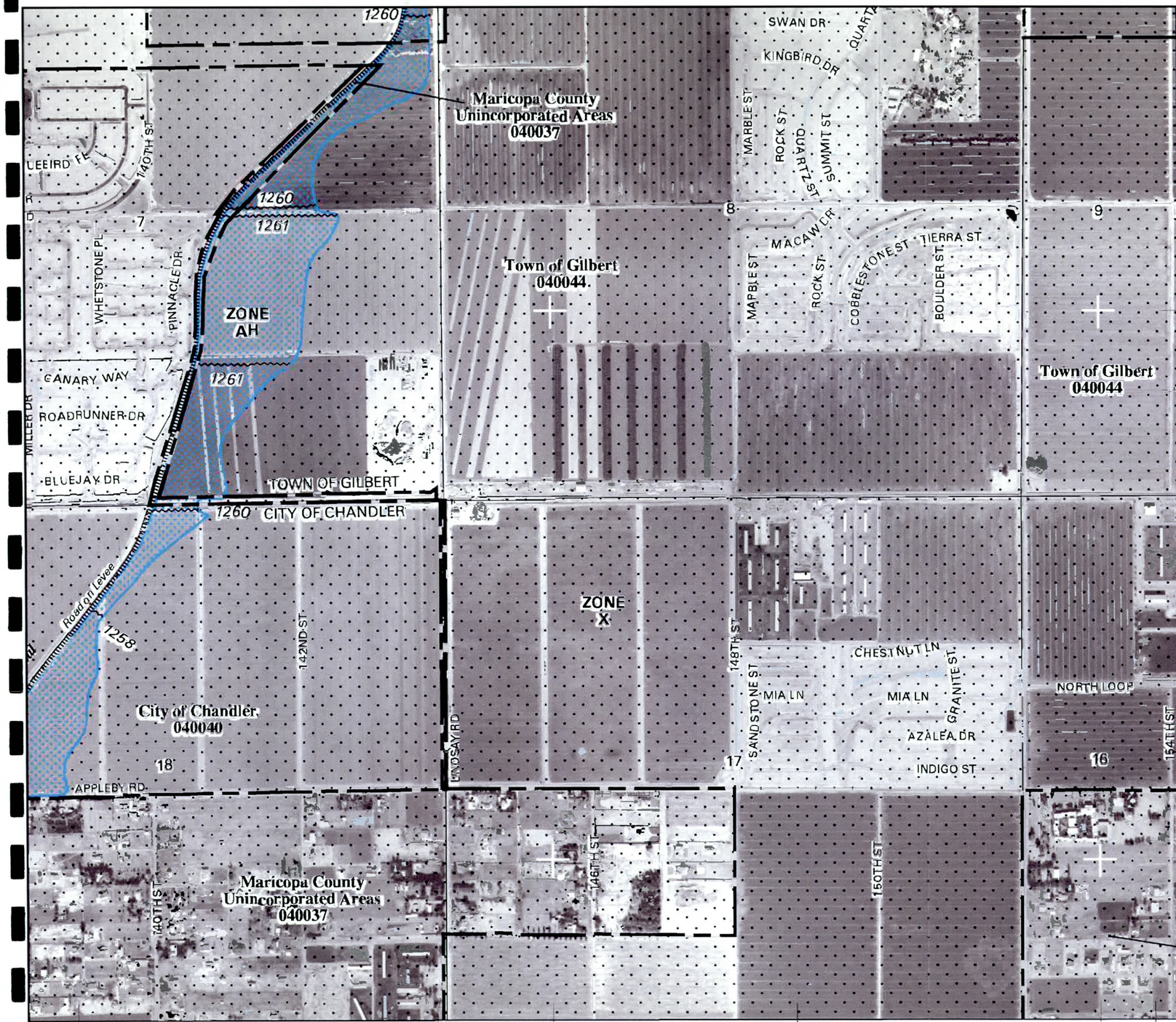


MAP SCALE 1" = 1000'

0 1000 2000 FEET

0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2670H

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

PANEL 2670 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHANDLER, CITY OF	040040	2670	H
GILBERT, TOWN OF	040044	2670	H
MARICOPA COUNTY	040037	2670	H

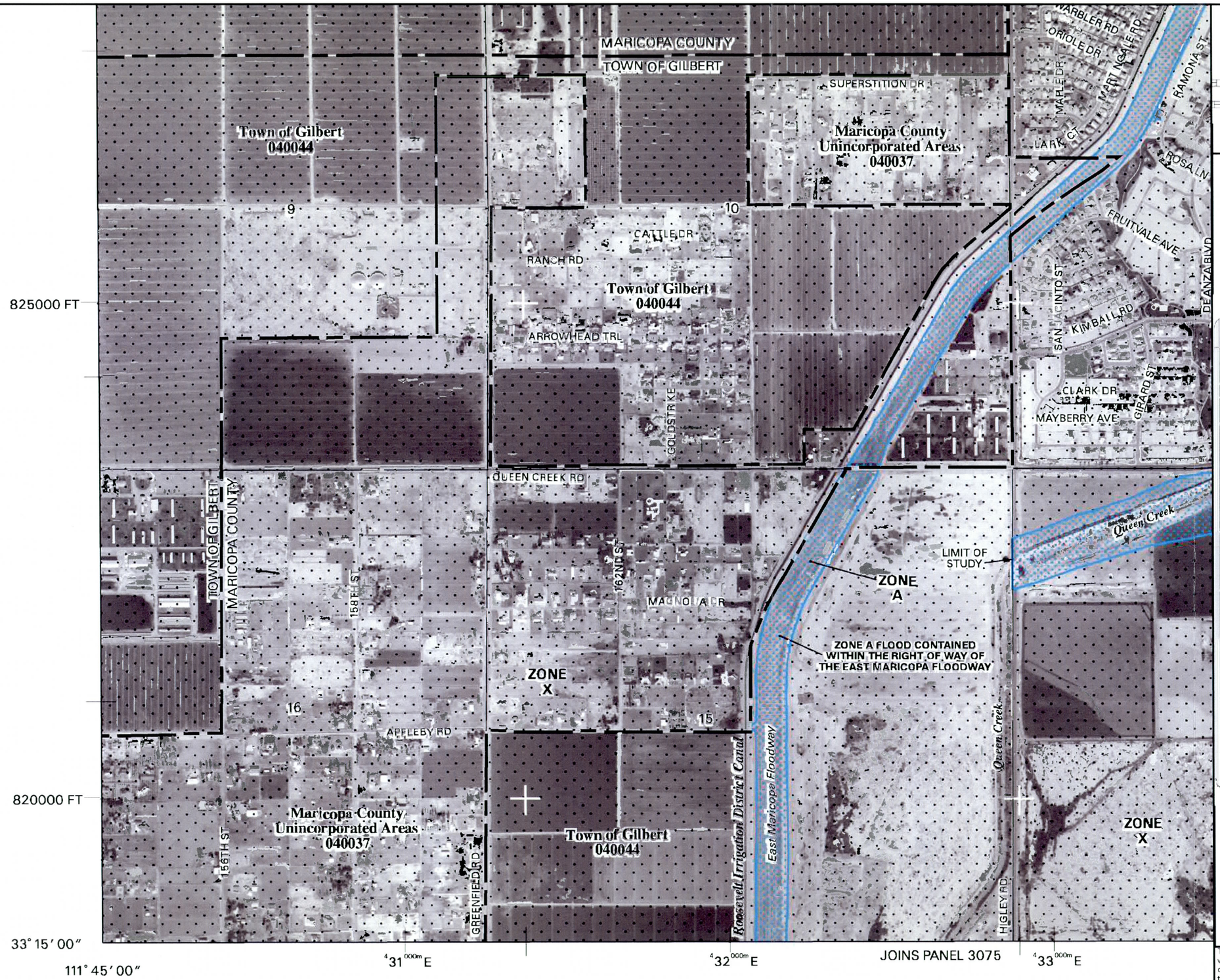
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
04013C2670H

MAP REVISED
SEPTEMBER 30, 2005

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 1000'

0 1000 2000 FEET

0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2690H

FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY, ARIZONA
AND INCORPORATED AREAS

PANEL 2690 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GILBERT, TOWN OF	040044	2690	H
MARICOPA COUNTY	040037	2690	H
MESA, CITY OF	040048	2690	H

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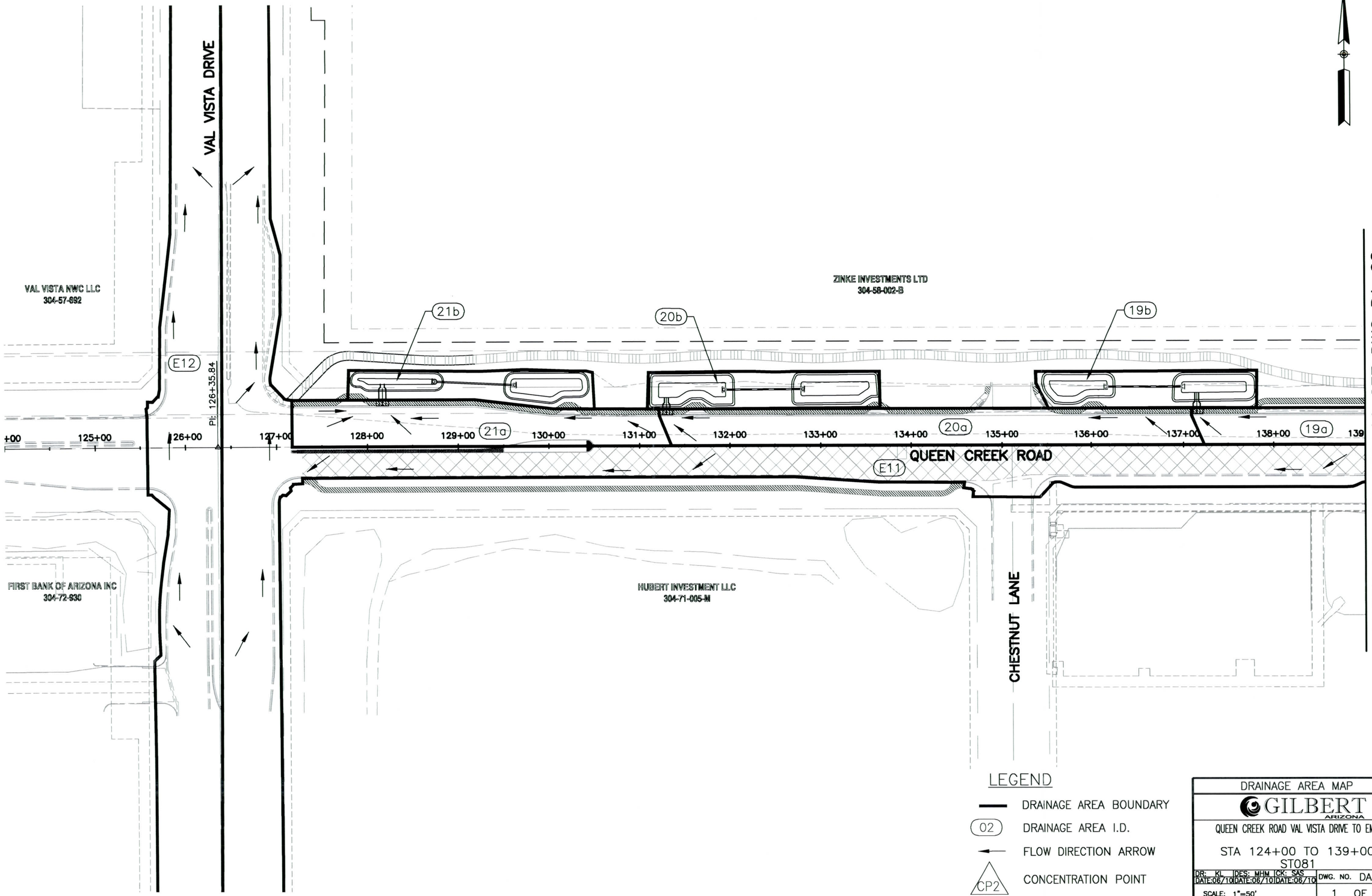

LEGEND

- DRAINAGE AREA BOUNDARY
- 02 DRAINAGE AREA I.D.
- FLOW DIRECTION ARROW
- CP2 CONCENTRATION POINT

DRAINAGE AREA MAP

GILBERT ARIZONA

QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF

STA 124+00 TO 139+00

ST081

DR: KL	DES: MHM	CK: SAS	DWG. NO. DA-01
DATE:06/10	DATE:06/10	DATE:06/10	
SCALE: 1"=50'			1 OF 7

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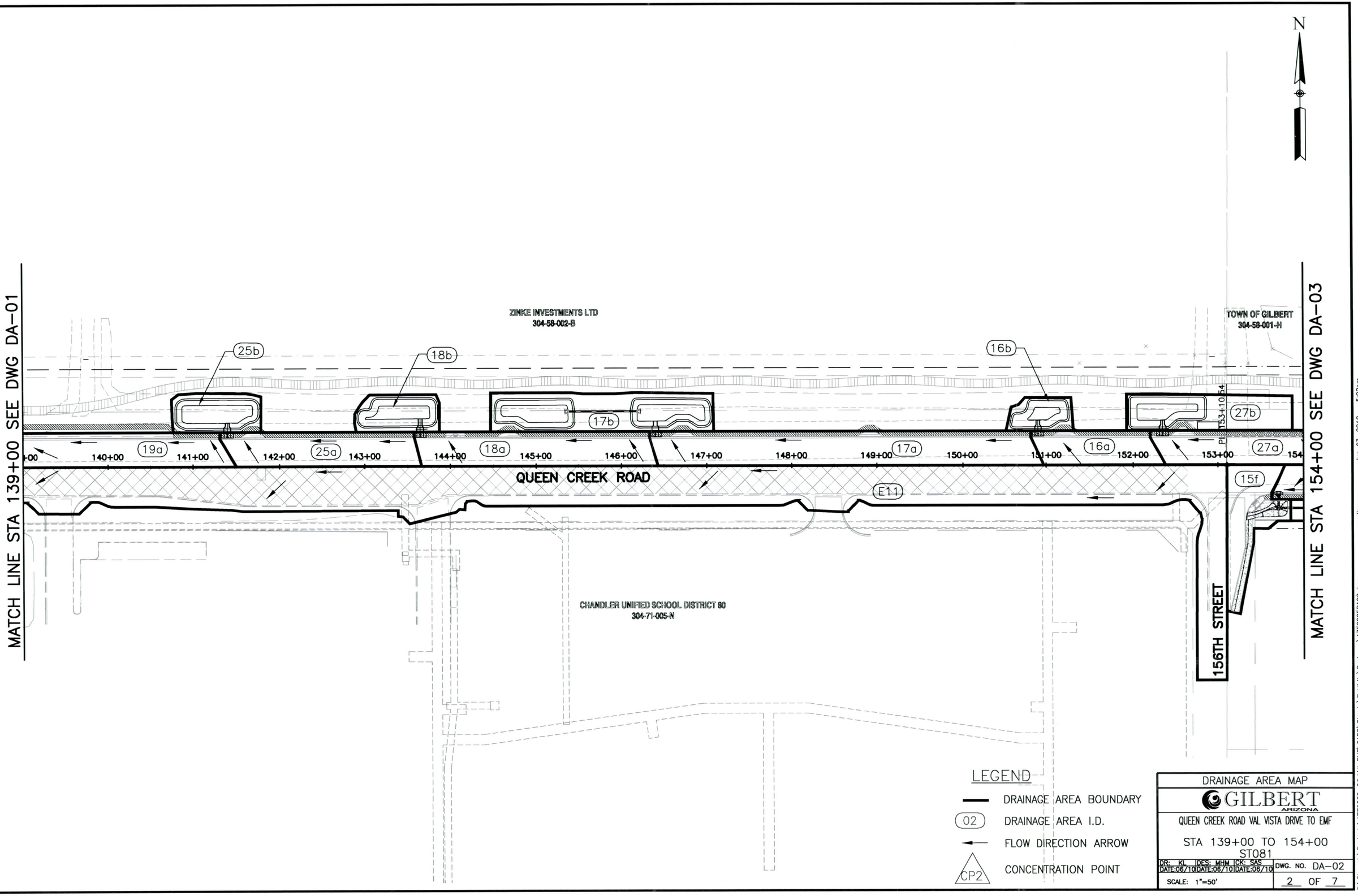
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MATCH LINE STA 139+00 SEE DWG DA-01
MATCH LINE STA 154+00 SEE DWG DA-03
ZINKE INVESTMENTS LTD
304-58-002-B
TOWN OF GILBERT
304-58-001-H
CHANDLER UNIFIED SCHOOL DISTRICT 80
304-71-005-N
QUEEN CREEK ROAD
156TH STREET
25b
18b
16b
17b
27b
19a
25a
18a
17a
16a
27a
15f
E1.1
140+00
141+00
142+00
143+00
144+00
145+00
146+00
147+00
148+00
149+00
150+00
151+00
152+00
153+00
T53+10.54
LEGEND
DRAINAGE AREA BOUNDARY
02 DRAINAGE AREA I.D.
FLOW DIRECTION ARROW
CP2 CONCENTRATION POINT
DRAINAGE AREA MAP
GILBERT ARIZONA
QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF
STA 139+00 TO 154+00
ST081
DR: KL DATE:06/10
DES: MHM DATE:06/10
CK: SAS DATE:06/10
DWG. NO. DA-02
SCALE: 1"=50'
2 OF 7
Jun 03, 2010 - 5:02pm
ssmedley
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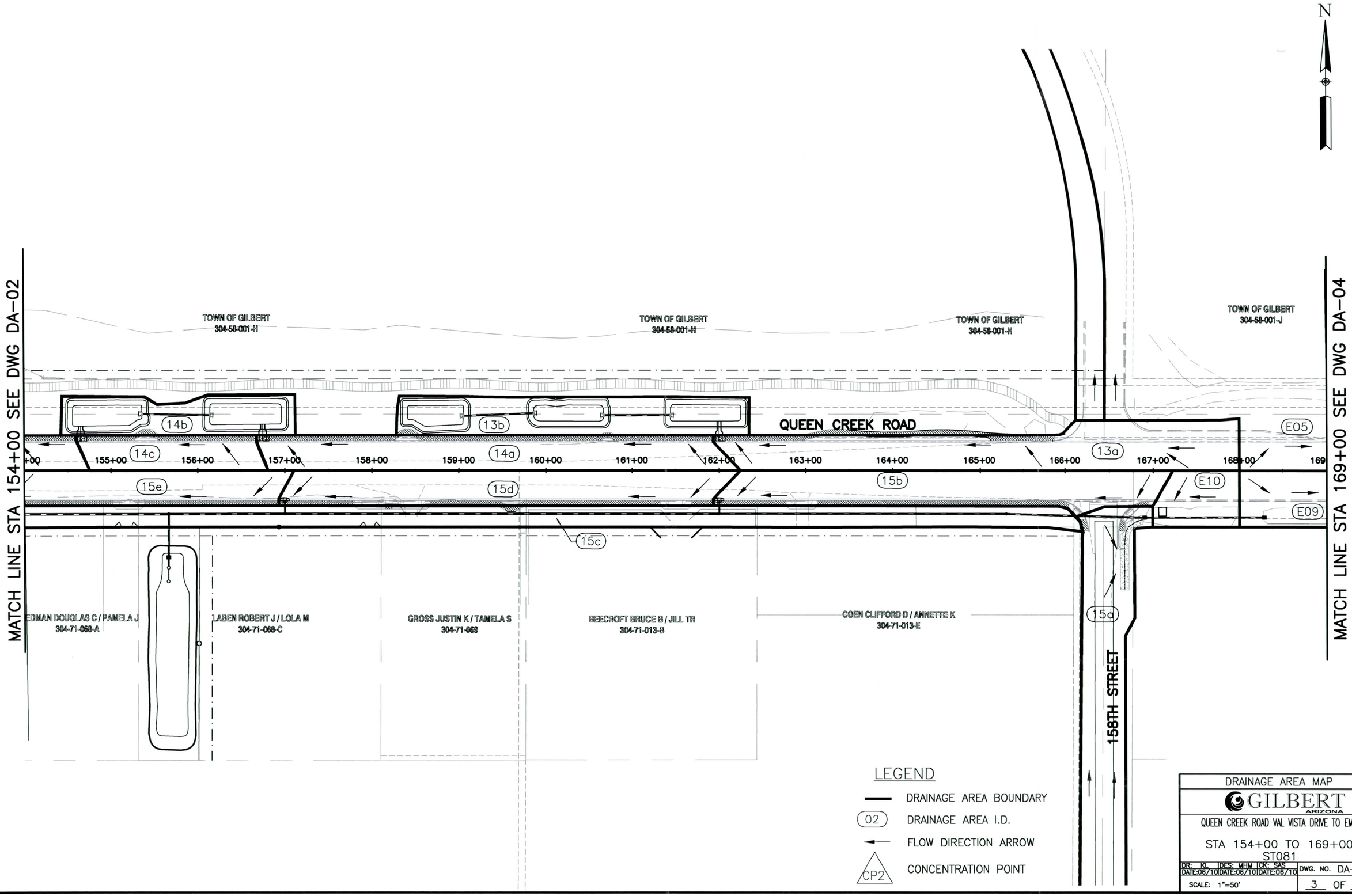

DRAINAGE AREA MAP

GILBERT ARIZONA

QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF

STA 154+00 TO 169+00

ST081

DR: KL DATE:06/10	DES: MHM DATE:06/10	CK: SAS DATE:06/10	DWG. NO. DA-03
SCALE: 1"=50'			3 OF 7

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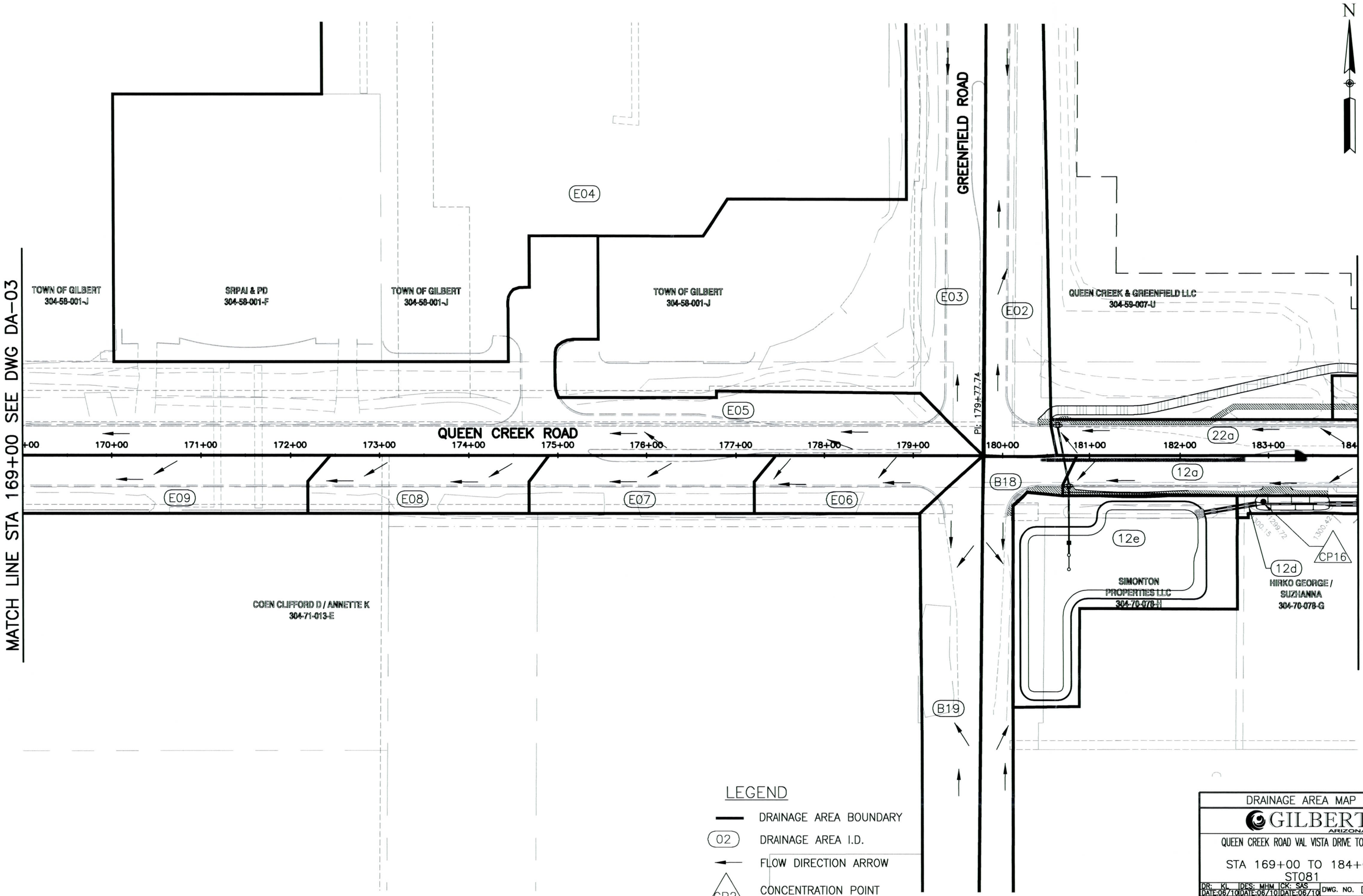

DRAINAGE AREA MAP

GILBERT ARIZONA

QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF

STA 169+00 TO 184+00

ST081

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SCALE: 1"=50'			4 OF 7

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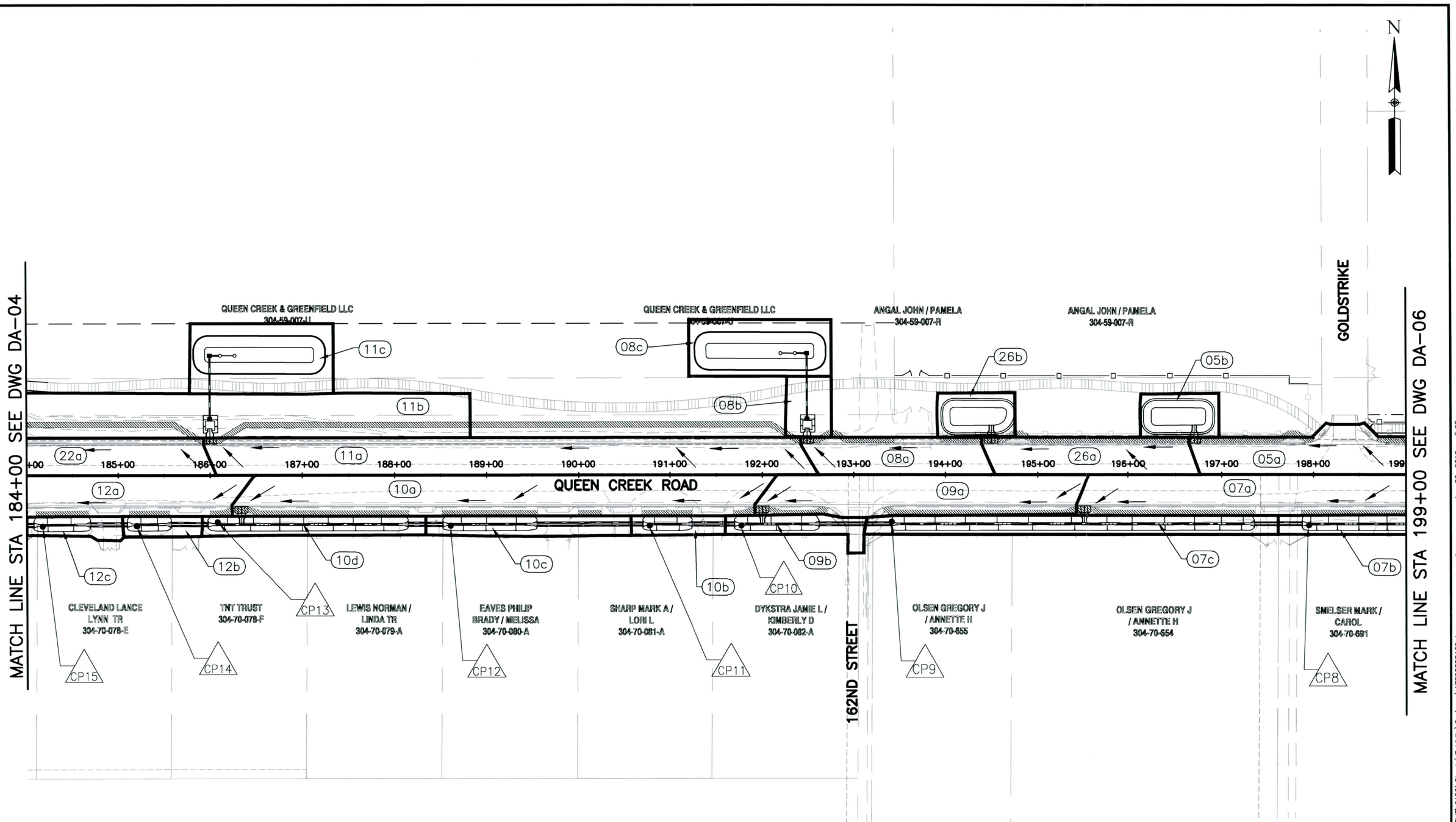

LEGEND

- DRAINAGE AREA BOUNDARY
- 02 DRAINAGE AREA I.D.
- FLOW DIRECTION ARROW
- CP2 CONCENTRATION POINT

DRAINAGE AREA MAP

GILBERT ARIZONA

QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF

STA 184+00 TO 199+00

ST081

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DATE:06/10	DATE:06/10	DATE:06/10	
SCALE: 1"=50'			5 OF 7

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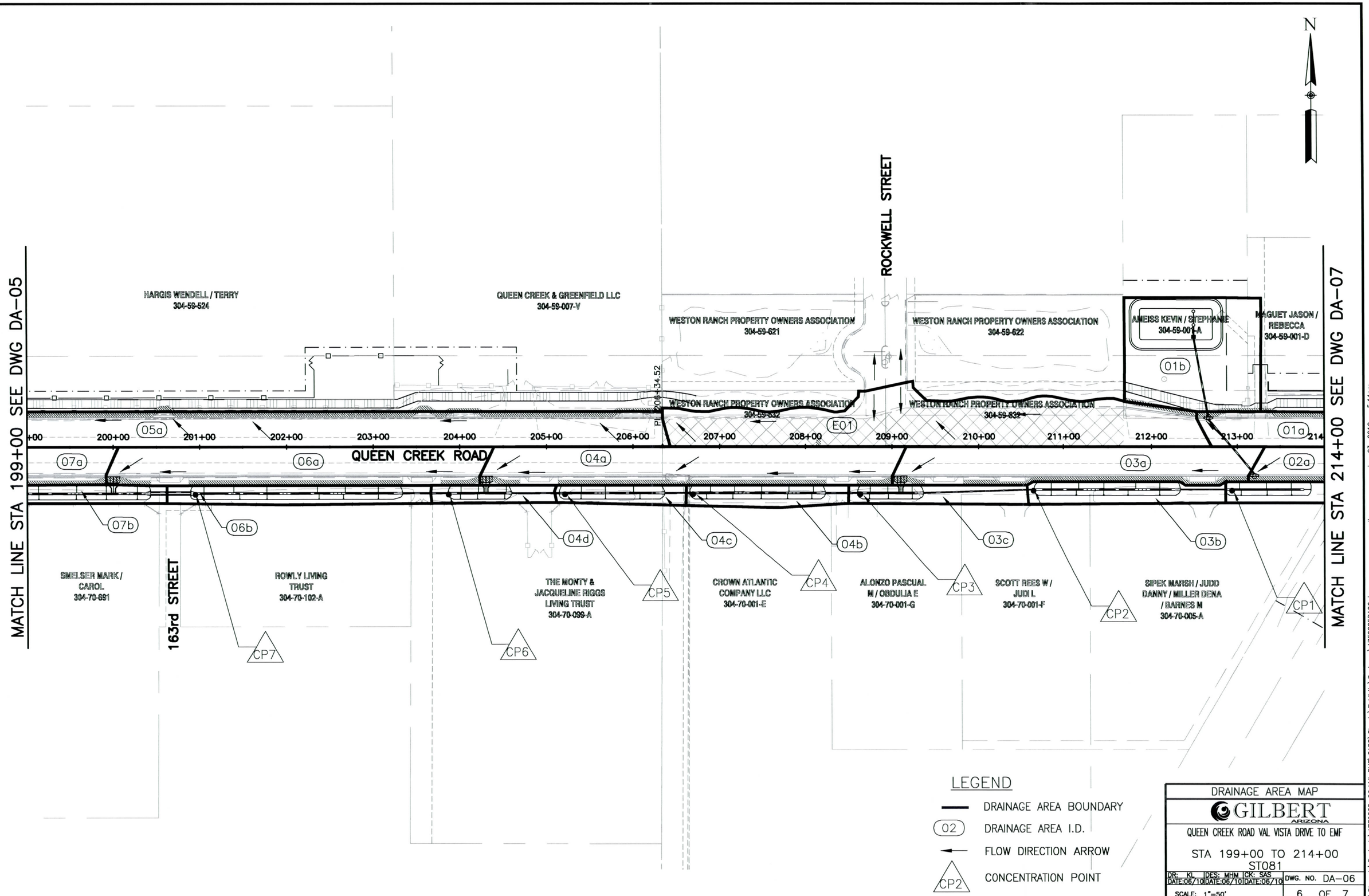
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MATCH LINE STA 199+00 SEE DWG DA-05
MATCH LINE STA 214+00 SEE DWG DA-07
HARGIS WENDELL / TERRY
304-59-524
QUEEN CREEK & GREENFIELD LLC
304-59-007-V
WESTON RANCH PROPERTY OWNERS ASSOCIATION
304-59-621
WESTON RANCH PROPERTY OWNERS ASSOCIATION
304-59-622
AMEISS KEVIN / STEPHANIE
304-59-001-A
MAGUET JASON / REBECCA
304-59-001-D
ROCKWELL STREET
PI 206+34.52
WESTON RANCH PROPERTY OWNERS ASSOCIATION
304-59-632
WESTON RANCH PROPERTY OWNERS ASSOCIATION
304-59-632
E01
01b
01a
05a
200+00
201+00
202+00
203+00
204+00
205+00
206+00
207+00
208+00
209+00
210+00
211+00
212+00
213+00
214
QUEEN CREEK ROAD
07a
06a
04a
03a
02a
07b
06b
04d
04c
04b
03c
03b
SMELSER MARK / CAROL
304-70-691
163rd STREET
ROWLY LIVING TRUST
304-70-102-A
THE MONTY & JACQUELINE RIGGS LIVING TRUST
304-70-099-A
CROWN ATLANTIC COMPANY LLC
304-70-001-E
ALONZO PASCUAL M / OBDULIA E
304-70-001-G
SCOTT REES W / JUDI L
304-70-001-F
SIPEK MARSH / JUDD DANNY / MILLER DENA / BARNES M
304-70-005-A
CP1
CP2
CP3
CP4
CP5
CP6
CP7
LEGEND
DRAINAGE AREA BOUNDARY
02 DRAINAGE AREA I.D.
FLOW DIRECTION ARROW
CP2 CONCENTRATION POINT
DRAINAGE AREA MAP
GILBERT ARIZONA
QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF
STA 199+00 TO 214+00
ST081
DR: KL DATE:06/10
DES: MHM DATE:06/10
CK: SAS DATE:06/10
DWG. NO. DA-06
SCALE: 1"=50'
6 OF 7
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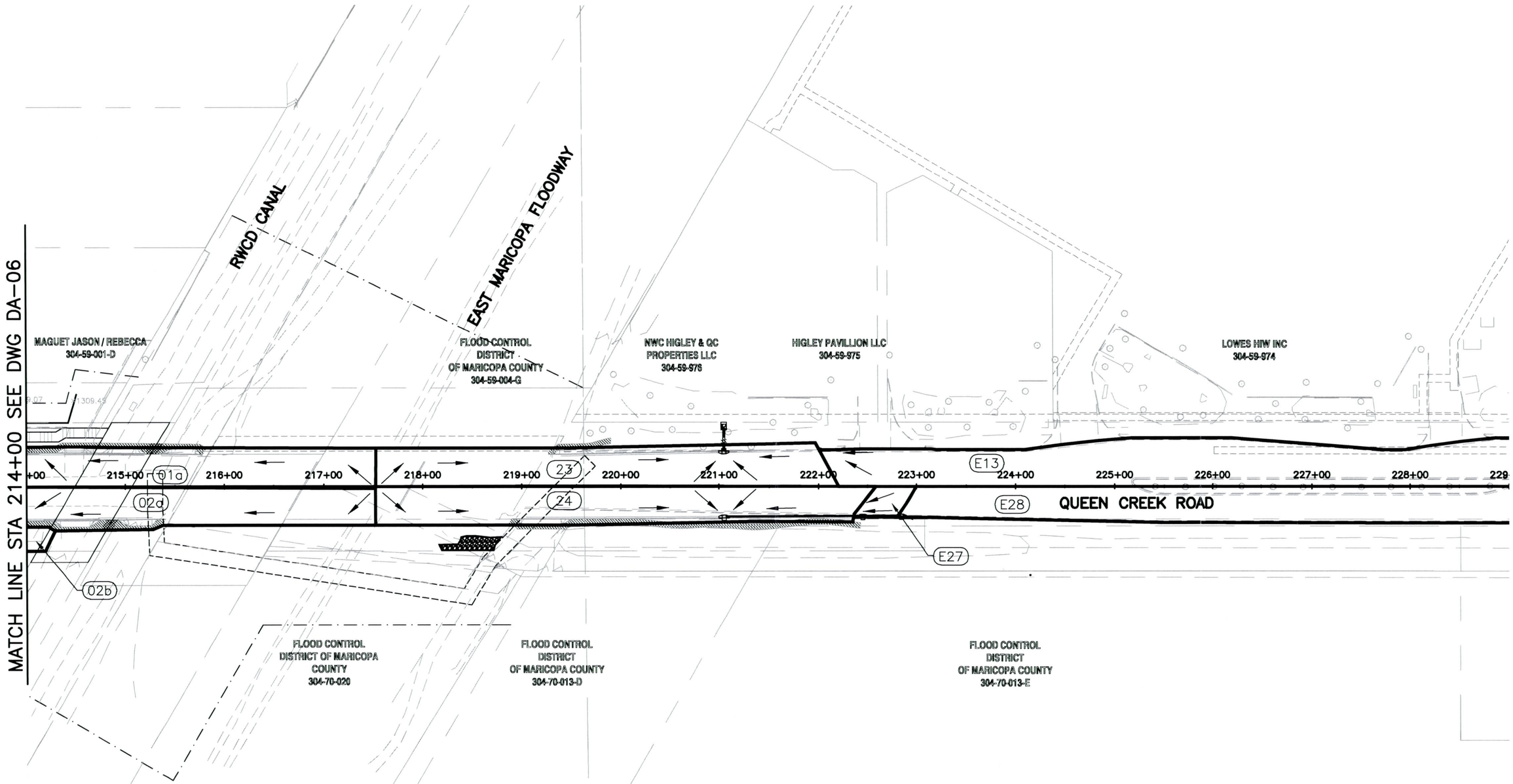
ssmedley
Jun 03, 2010 - 5:11pm



LEGEND

- DRAINAGE AREA BOUNDARY
- (02) DRAINAGE AREA I.D.
- FLOW DIRECTION ARROW
- (CP2) CONCENTRATION POINT

DRAINAGE AREA MAP

GILBERT ARIZONA

QUEEN CREEK ROAD VAL VISTA DRIVE TO EMF

STA 214+00 TO 229+00

ST081

DR: KL DATE:06/10	DES: MHM DATE:06/10	CK: SAS DATE:06/10	DWG. NO. DA-07
SCALE: 1"=50'			7 OF 7

R:\Phoenix\Projects\AZE0825_QC-WtoEMF\CADD\Sheets\Exhibits\Drainage\AZE0825DA07.dwg ssmedley Jun 03, 2010 - 5:13pm

Appendix A:

Off-Site Drainage

Pre-Project HEC-RAS Analysis

(NGVD 29)

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.911	Design	6900.00	1299.38	1308.90	1304.92	1309.29	0.000544	5.00	1380.85	199.13	0.33
Reach 3	13.911	Future	8970.00	1299.38	1310.20	1305.64	1310.66	0.000543	5.46	1644.29	207.30	0.34
Reach 3	13.911	Existing	12910.00	1299.38	1312.19	1306.87	1312.78	0.000550	6.20	2142.88	265.46	0.35
Reach 3	13.842	Design	6900.00	1299.39	1308.65	1304.96	1309.07	0.000621	5.21	1323.34	197.75	0.36
Reach 3	13.842	Future	8970.00	1299.39	1309.95	1305.69	1310.44	0.000608	5.66	1585.42	206.00	0.36
Reach 3	13.842	Existing	12910.00	1299.39	1311.93	1306.91	1312.57	0.000610	6.41	2058.67	266.47	0.37
Reach 3	13.755	Design	6900.00	1299.26	1308.39	1304.51	1308.79	0.000575	5.09	1356.14	198.26	0.34
Reach 3	13.755	Future	8970.00	1299.26	1309.69	1305.24	1310.17	0.000569	5.54	1620.04	206.82	0.35
Reach 3	13.755	Existing	12910.00	1299.26	1311.68	1306.48	1312.29	0.000569	6.27	2128.45	270.11	0.36
Reach 3	13.661	Design	6900.00	1298.26	1308.14	1303.99	1308.51	0.000517	4.93	1400.86	198.69	0.33
Reach 3	13.661	Future	8970.00	1298.26	1309.44	1304.75	1309.89	0.000520	5.39	1665.39	207.05	0.33
Reach 3	13.661	Existing	12910.00	1298.26	1311.43	1305.99	1312.01	0.000528	6.13	2183.32	269.55	0.35
Reach 3	13.566	Design	6900.00	1298.25	1307.85	1303.75	1308.25	0.000541	5.03	1370.43	194.59	0.33
Reach 3	13.566	Future	8970.00	1298.25	1309.15	1304.50	1309.62	0.000547	5.51	1628.79	203.47	0.34
Reach 3	13.566	Existing	12910.00	1298.25	1311.12	1305.76	1311.73	0.000561	6.28	2124.39	267.97	0.36
Reach 3	13.471	Design	6900.00	1298.07	1307.70	1303.19	1307.99	0.000389	4.31	1602.47	225.11	0.28
Reach 3	13.471	Future	8970.00	1298.07	1309.01	1303.87	1309.36	0.000391	4.71	1903.70	238.71	0.29
Reach 3	13.471	Existing	12910.00	1298.07	1311.00	1304.98	1311.45	0.000401	5.40	2447.86	285.67	0.30
Reach 3	13.439	Design	6900.00	1297.84	1307.67	1302.81	1307.88	0.000412	3.76	1834.56	250.84	0.25
Reach 3	13.439	Future	8970.00	1297.84	1308.98	1303.42	1309.25	0.000416	4.13	2169.89	258.92	0.25
Reach 3	13.439	Existing	12910.00	1297.84	1310.97	1304.47	1311.33	0.000447	4.78	2698.46	272.83	0.27
Reach 3	13.431		Bridge									
Reach 3	13.426	Design	6900.00	1298.61	1307.56	1303.11	1307.81	0.000491	3.99	1728.15	246.09	0.27
Reach 3	13.426	Future	8970.00	1298.61	1308.87	1303.73	1309.17	0.000489	4.36	2055.38	255.11	0.27
Reach 3	13.426	Existing	12910.00	1298.61	1310.84	1304.77	1311.23	0.000516	5.02	2571.59	268.89	0.29
Reach 3	13.374	Design	6900.00	1298.27	1307.45	1303.09	1307.70	0.000352	4.01	1719.75	249.59	0.27
Reach 3	13.374	Future	9070.00	1298.27	1308.75	1303.71	1309.05	0.000355	4.43	2048.77	257.41	0.28
Reach 3	13.374	Existing	12990.00	1298.27	1310.72	1304.76	1311.11	0.000361	5.05	2602.22	330.35	0.29
Reach 3	13.28	Design	6900.00	1297.90	1307.27	1302.77	1307.52	0.000352	4.04	1707.43	244.96	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.28	Future	9070.00	1297.90	1308.56	1303.45	1308.87	0.000359	4.47	2030.08	254.02	0.28
Reach 3	13.28	Existing	12990.00	1297.90	1310.52	1304.52	1310.93	0.000372	5.11	2542.06	326.93	0.29
Reach 3	13.232	Design	6900.00	1297.59	1307.16	1302.90	1307.43	0.000386	4.17	1656.51	243.61	0.28
Reach 3	13.232	Future	9070.00	1297.59	1308.45	1303.51	1308.78	0.000389	4.59	1976.89	252.84	0.29
Reach 3	13.232	Existing	12990.00	1297.59	1310.41	1304.61	1310.83	0.000398	5.23	2485.59	327.64	0.30
Reach 3	13.179	Design	6900.00	1297.89	1307.05	1302.81	1307.32	0.000391	4.19	1648.05	242.83	0.28
Reach 3	13.179	Future	9070.00	1297.89	1308.34	1303.45	1308.67	0.000394	4.61	1966.99	251.97	0.29
Reach 3	13.179	Existing	12990.00	1297.89	1310.29	1304.51	1310.72	0.000403	5.25	2472.95	303.77	0.30
Reach 3	13.084	Design	6900.00	1297.40	1306.87	1302.39	1307.13	0.000351	4.04	1708.97	245.26	0.27
Reach 3	13.084	Future	9070.00	1297.40	1308.16	1303.06	1308.47	0.000359	4.47	2030.50	254.30	0.28
Reach 3	13.084	Existing	12990.00	1297.40	1310.11	1304.10	1310.52	0.000373	5.11	2539.64	307.91	0.29
Reach 3	13.037	Design	6900.00	1297.30	1306.79	1302.21	1307.04	0.000334	3.96	1740.98	247.21	0.26
Reach 3	13.037	Future	9070.00	1297.30	1308.08	1302.87	1308.38	0.000343	4.39	2064.69	256.36	0.27
Reach 3	13.037	Existing	12990.00	1297.30	1310.03	1303.93	1310.42	0.000358	5.04	2576.94	312.42	0.29
Reach 3	12.981	Design	6900.00	1297.30	1306.69	1302.20	1306.94	0.000347	4.03	1713.36	244.39	0.27
Reach 3	12.981	Future	9070.00	1297.30	1307.97	1302.87	1308.28	0.000356	4.46	2031.87	252.85	0.28
Reach 3	12.981	Existing	12990.00	1297.30	1309.91	1303.91	1310.32	0.000370	5.13	2534.16	301.82	0.29
Reach 3	12.905	Design	6900.00	1297.17	1306.55	1302.00	1306.80	0.000346	4.03	1712.14	243.34	0.27
Reach 3	12.905	Future	9070.00	1297.17	1307.82	1302.66	1308.13	0.000357	4.47	2028.69	252.68	0.28
Reach 3	12.905	Existing	12990.00	1297.17	1309.76	1303.74	1310.17	0.000368	5.14	2529.13	309.77	0.29
Reach 3	12.884	Design	6900.00	1297.09	1306.51	1301.93	1306.76	0.000341	3.99	1727.38	246.01	0.27
Reach 3	12.884	Future	9070.00	1297.09	1307.79	1302.61	1308.09	0.000351	4.43	2047.13	255.20	0.28
Reach 3	12.884	Existing	12990.00	1297.09	1309.72	1303.67	1310.12	0.000370	5.08	2558.07	315.99	0.29
Reach 3	12.789	Design	6900.00	1296.60	1306.34	1301.78	1306.59	0.000341	4.00	1723.96	244.87	0.27
Reach 3	12.789	Future	9070.00	1296.60	1307.61	1302.43	1307.92	0.000353	4.44	2040.58	254.11	0.28
Reach 3	12.789	Existing	12990.00	1296.60	1309.53	1303.49	1309.94	0.000368	5.11	2540.94	302.14	0.29
Reach 3	12.694	Design	6900.00	1296.54	1306.16	1301.67	1306.42	0.000348	4.03	1714.20	245.39	0.27
Reach 3	12.694	Future	9070.00	1296.54	1307.43	1302.33	1307.74	0.000360	4.47	2029.55	254.20	0.28
Reach 3	12.694	Existing	12990.00	1296.54	1309.34	1303.38	1309.75	0.000374	5.14	2527.40	301.95	0.29

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	12.6	Design	6900.00	1296.53	1305.97	1301.63	1306.23	0.000378	4.13	1669.90	244.54	0.28
Reach 3	12.6	Future	9070.00	1296.53	1307.22	1302.31	1307.55	0.000388	4.57	1982.77	253.72	0.29
Reach 3	12.6	Existing	12990.00	1296.53	1309.13	1303.37	1309.56	0.000403	5.24	2479.20	299.02	0.30
Reach 3	12.552	Design	6900.00	1296.15	1305.89	1301.38	1306.14	0.000350	4.04	1709.72	244.84	0.27
Reach 3	12.552	Future	9070.00	1296.15	1307.14	1302.04	1307.45	0.000364	4.49	2022.29	254.01	0.28
Reach 3	12.552	Existing	12990.00	1296.15	1309.04	1303.10	1309.45	0.000382	5.16	2517.96	296.71	0.30
Reach 3	12.488	Design	6900.00	1296.30	1305.76	1301.42	1306.02	0.000369	4.10	1684.16	245.41	0.28
Reach 3	12.488	Future	9070.00	1296.30	1307.00	1302.08	1307.33	0.000380	4.54	1995.88	253.92	0.29
Reach 3	12.488	Existing	12990.00	1296.30	1308.90	1303.12	1309.32	0.000397	5.22	2488.79	298.02	0.30
Reach 3	12.441	Design	6900.00	1296.21	1305.65	1301.38	1305.92	0.000384	4.16	1658.38	243.40	0.28
Reach 3	12.441	Future	9070.00	1296.21	1306.90	1302.03	1307.23	0.000395	4.61	1966.73	252.14	0.29
Reach 3	12.441	Existing	12990.00	1296.21	1308.79	1303.10	1309.22	0.000413	5.29	2454.94	302.25	0.31
Reach 3	12.349	Design	6900.00	1296.16	1305.46	1301.13	1305.73	0.000389	4.21	1640.11	238.71	0.28
Reach 3	12.349	Future	9070.00	1296.16	1306.70	1301.79	1307.03	0.000403	4.67	1940.43	247.44	0.29
Reach 3	12.349	Existing	12990.00	1296.16	1308.57	1302.89	1309.02	0.000427	5.38	2415.94	260.66	0.31
Reach 3	12.302	Design	6900.00	1296.42	1305.35	1301.19	1305.63	0.000413	4.29	1607.71	237.69	0.29
Reach 3	12.302	Future	9070.00	1296.42	1306.58	1301.82	1306.93	0.000425	4.76	1905.34	246.12	0.30
Reach 3	12.302	Existing	12990.00	1296.42	1308.44	1302.92	1308.91	0.000448	5.47	2375.72	258.88	0.32
Reach 3	12.245	Design	6900.00	1296.00	1305.22	1300.97	1305.51	0.000409	4.29	1607.60	235.82	0.29
Reach 3	12.245	Future	9070.00	1296.00	1306.45	1301.64	1306.80	0.000425	4.77	1902.14	245.11	0.30
Reach 3	12.245	Existing	12990.00	1296.00	1308.30	1302.74	1308.77	0.000452	5.48	2369.65	259.18	0.32
Reach 3	12.177	Design	6900.00	1296.00	1305.10	1300.76	1305.36	0.000378	4.16	1659.03	240.45	0.28
Reach 3	12.177	Future	9070.00	1296.00	1306.32	1301.43	1306.65	0.000394	4.63	1957.41	248.46	0.29
Reach 3	12.177	Existing	12990.00	1296.00	1308.16	1302.50	1308.61	0.000421	5.35	2427.23	817.92	0.31
Reach 3	12.082	Design	6900.00	1295.82	1304.88	1300.71	1305.17	0.000409	4.26	1620.77	240.83	0.29
Reach 3	12.082	Future	9070.00	1295.82	1306.10	1301.37	1306.44	0.000424	4.73	1917.97	249.62	0.30
Reach 3	12.082	Existing	12990.00	1295.82	1307.93	1302.45	1308.39	0.000445	5.44	2393.36	920.60	0.32
Reach 3	11.988	Design	6900.00	1295.43	1304.71	1300.29	1304.97	0.000364	4.10	1683.67	242.66	0.27
Reach 3	11.988	Future	9070.00	1295.43	1305.91	1300.94	1306.24	0.000383	4.58	1980.89	251.03	0.29
Reach 3	11.988	Existing	12990.00	1295.43	1307.73	1302.03	1308.17	0.000412	5.30	2451.31	275.54	0.31

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.893	Design	6900.00	1295.21	1304.51	1300.25	1304.78	0.000388	4.18	1650.81	242.25	0.28
Reach 3	11.893	Future	9070.00	1295.21	1305.70	1300.91	1306.04	0.000407	4.66	1944.63	250.54	0.30
Reach 3	11.893	Existing	12990.00	1295.21	1307.50	1301.95	1307.95	0.000438	5.40	2407.74	263.07	0.31
Reach 3	11.798	Design	6900.00	1295.17	1304.31	1300.10	1304.58	0.000395	4.21	1640.20	241.62	0.28
Reach 3	11.798	Future	9070.00	1295.17	1305.49	1300.74	1305.83	0.000415	4.70	1930.31	249.55	0.30
Reach 3	11.798	Existing	12990.00	1295.17	1307.27	1301.80	1307.73	0.000448	5.44	2386.21	261.53	0.32
Reach 3	11.703	Design	6900.00	1295.18	1304.07	1300.12	1304.37	0.000447	4.37	1578.47	240.83	0.30
Reach 3	11.703	Future	9070.00	1295.18	1305.24	1300.77	1305.61	0.000464	4.86	1864.84	249.08	0.31
Reach 3	11.703	Existing	12990.00	1295.18	1307.01	1301.85	1307.49	0.000495	5.61	2315.12	261.53	0.33
Reach 3	11.609	Design	6900.00	1295.12	1303.85	1300.01	1304.14	0.000451	4.36	1582.70	244.31	0.30
Reach 3	11.609	Future	9070.00	1295.12	1305.01	1300.66	1305.38	0.000465	4.85	1870.69	251.36	0.31
Reach 3	11.609	Existing	12990.00	1295.12	1306.76	1301.68	1307.25	0.000493	5.60	2319.48	261.92	0.33
Reach 3	11.572	Design	6900.00	1295.17	1303.73	1300.03	1304.05	0.000497	4.53	1523.37	238.42	0.32
Reach 3	11.572	Future	9070.00	1295.17	1304.89	1300.69	1305.28	0.000510	5.03	1802.71	245.48	0.33
Reach 3	11.572	Existing	12990.00	1295.17	1306.62	1301.72	1307.14	0.000540	5.81	2237.25	256.07	0.35
Reach 3	11.531	Design	6900.00	1294.79	1303.63	1299.95	1303.94	0.000495	4.51	1531.21	241.04	0.32
Reach 3	11.531	Future	9070.00	1294.79	1304.78	1300.58	1305.17	0.000508	5.00	1813.32	248.43	0.33
Reach 3	11.531	Existing	12990.00	1294.79	1306.51	1301.63	1307.02	0.000537	5.77	2252.21	259.53	0.35
Reach 3	11.486	Design	6900.00	1295.34	1303.48	1300.05	1303.82	0.000553	4.64	1486.04	242.89	0.33
Reach 3	11.486	Future	9070.00	1295.34	1304.63	1300.69	1305.04	0.000556	5.12	1769.91	250.36	0.34
Reach 3	11.486	Existing	12990.00	1295.34	1306.35	1301.70	1306.89	0.000577	5.88	2210.32	261.27	0.36
Reach 3	11.391	Design	6900.00	1294.70	1303.22	1299.67	1303.54	0.000525	4.57	1508.32	242.78	0.32
Reach 3	11.391	Future	9070.00	1294.70	1304.37	1300.29	1304.77	0.000534	5.06	1791.32	250.23	0.33
Reach 3	11.391	Existing	12990.00	1294.70	1306.08	1301.36	1306.60	0.000561	5.83	2228.34	261.31	0.35
Reach 3	11.328	Design	6900.00	1294.88	1303.04	1299.36	1303.37	0.000521	4.62	1493.88	235.96	0.32
Reach 3	11.328	Future	9070.00	1294.88	1304.18	1300.02	1304.58	0.000539	5.13	1767.36	244.38	0.34
Reach 3	11.328	Existing	12990.00	1294.88	1305.86	1301.11	1306.41	0.000579	5.93	2190.70	256.86	0.36
Reach 3	11.321	Design	6900.00	1296.29	1300.86	1300.86	1302.84	0.001623	11.31	610.15	152.45	1.00
Reach 3	11.321	Future	9070.00	1296.29	1301.78	1301.78	1304.01	0.001561	11.98	757.02	168.53	1.00

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.321	Existing	12990.00	1296.29	1303.14	1303.14	1305.76	0.001470	12.99	1000.03	189.14	1.00
Reach 3	11.308	Design	6900.00	1290.71	1300.36	1295.60	1300.73	0.000129	4.94	1397.56	186.01	0.32
Reach 3	11.308	Future	9070.00	1290.71	1301.98	1296.49	1302.42	0.000125	5.30	1710.09	198.95	0.32
Reach 3	11.308	Existing	12990.00	1290.71	1303.89	1297.84	1304.48	0.000142	6.17	2105.04	214.54	0.35
Reach 3	11.297	Design	6900.00	1289.28	1300.43	1294.72	1300.63	0.000329	3.58	1928.32	239.42	0.22
Reach 3	11.297	Future	9070.00	1289.28	1302.07	1295.40	1302.30	0.000324	3.89	2329.78	252.16	0.23
Reach 3	11.297	Existing	12990.00	1289.28	1304.01	1296.51	1304.34	0.000375	4.58	2834.04	267.55	0.25
Reach 3	11.26	Design	6900.00	1288.90	1300.40	1294.15	1300.55	0.000237	3.12	2208.89	263.94	0.19
Reach 3	11.26	Future	10060.00	1288.90	1302.01	1295.07	1302.24	0.000297	3.80	2644.08	277.54	0.22
Reach 3	11.26	Existing	13910.00	1288.90	1303.96	1296.05	1304.25	0.000327	4.35	3200.92	295.64	0.23
Reach 3	11.254		Bridge									
Reach 3	11.249	Design	6900.00	1289.19	1300.36	1294.37	1300.52	0.000264	3.24	2127.78	260.43	0.20
Reach 3	11.249	Future	10060.00	1289.19	1301.96	1295.29	1302.20	0.000330	3.94	2553.70	275.64	0.23
Reach 3	11.249	Existing	13910.00	1289.19	1303.89	1296.27	1304.20	0.000359	4.47	3109.30	295.12	0.24
Reach 3	11.231	Design	8100.00	1289.43	1300.26	1294.43	1300.48	0.000341	3.72	2178.99	269.57	0.23
Reach 3	11.231	Future	10470.00	1289.43	1301.92	1295.10	1302.16	0.000321	3.98	2678.91	319.33	0.23
Reach 3	11.231	Existing	14320.00	1289.43	1303.86	1296.09	1304.17	0.000323	4.46	3334.08	352.75	0.23
Reach 3	11.189	Design	8100.00	1289.50	1300.17	1294.59	1300.40	0.000370	3.82	2122.31	275.40	0.24
Reach 3	11.189	Future	10470.00	1289.50	1301.83	1295.26	1302.09	0.000344	4.07	2639.84	335.56	0.23
Reach 3	11.189	Existing	14320.00	1289.50	1303.78	1296.22	1304.09	0.000337	4.52	3369.23	392.74	0.24
Reach 3	11.127	Design	8100.00	1289.57	1300.05	1294.49	1300.28	0.000370	3.83	2122.10	278.45	0.24
Reach 3	11.127	Future	10470.00	1289.57	1301.72	1295.16	1301.98	0.000342	4.06	2644.73	339.47	0.23
Reach 3	11.127	Existing	14320.00	1289.57	1303.67	1296.12	1303.98	0.000334	4.52	3370.12	393.13	0.24
Reach 3	11.033	Design	8100.00	1289.10	1299.85	1294.34	1300.09	0.000383	3.89	2083.58	257.83	0.24
Reach 3	11.033	Future	10470.00	1289.10	1301.54	1295.02	1301.80	0.000355	4.13	2578.49	316.93	0.24
Reach 3	11.033	Existing	14320.00	1289.10	1303.49	1295.99	1303.81	0.000352	4.60	3282.27	387.53	0.24
Reach 3	10.938	Design	8100.00	1289.19	1299.67	1294.11	1299.90	0.000373	3.84	2116.25	281.02	0.24
Reach 3	10.938	Future	10470.00	1289.19	1301.37	1294.77	1301.62	0.000342	4.06	2641.70	335.76	0.23
Reach 3	10.938	Existing	14320.00	1289.19	1303.32	1295.74	1303.63	0.000334	4.52	3368.97	392.62	0.24

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	10.843	Design	8100.00	1288.79	1299.53	1293.70	1299.75	0.000236	3.75	2165.63	276.90	0.23
Reach 3	10.843	Future	10470.00	1288.79	1301.24	1294.38	1301.49	0.000220	3.99	2683.62	324.71	0.23
Reach 3	10.843	Existing	14320.00	1288.79	1303.19	1295.36	1303.50	0.000222	4.48	3413.67	396.89	0.23
Reach 3	10.749	Design	8100.00	1288.54	1299.39	1293.79	1299.62	0.000255	3.84	2110.00	256.76	0.24
Reach 3	10.749	Future	10470.00	1288.54	1301.11	1294.45	1301.37	0.000237	4.09	2568.33	292.52	0.23
Reach 3	10.749	Existing	14320.00	1288.54	1303.05	1295.43	1303.38	0.000241	4.60	3239.06	955.91	0.24
Reach 3	10.654	Design	8100.00	1288.59	1299.24	1293.87	1299.49	0.000282	3.97	2041.25	254.68	0.25
Reach 3	10.654	Future	10470.00	1288.59	1300.97	1294.55	1301.25	0.000257	4.20	2491.44	265.84	0.24
Reach 3	10.654	Existing	14320.00	1288.59	1302.90	1295.53	1303.25	0.000264	4.75	3013.69	818.72	0.25
Reach 3	10.566	Design	8100.00	1288.55	1299.12	1293.61	1299.36	0.000272	3.93	2060.13	253.70	0.24
Reach 3	10.566	Future	10470.00	1288.55	1300.86	1294.28	1301.13	0.000250	4.17	2511.79	265.33	0.24
Reach 3	10.566	Existing	14320.00	1288.55	1302.78	1295.28	1303.13	0.000258	4.72	3032.00	963.89	0.25
Reach 3	10.518	Design	8100.00	1288.65	1299.05	1293.60	1299.29	0.000276	3.93	2058.60	255.96	0.24
Reach 3	10.518	Future	10470.00	1288.65	1300.79	1294.28	1301.06	0.000251	4.16	2516.05	267.68	0.24
Reach 3	10.518	Existing	14320.00	1288.65	1302.72	1295.26	1303.06	0.000257	4.71	3038.84	679.40	0.25
Reach 3	10.441	Design	8100.00	1287.78	1298.96	1292.97	1299.18	0.000228	3.70	2191.14	259.32	0.22
Reach 3	10.441	Future	10790.00	1287.78	1300.71	1293.74	1300.96	0.000226	4.07	2657.22	402.38	0.23
Reach 3	10.441	Existing	14650.00	1287.78	1302.63	1294.72	1302.96	0.000230	4.61	3203.87	579.15	0.24
Reach 3	10.346	Design	8100.00	1287.67	1298.87	1292.68	1299.06	0.000206	3.56	2276.81	264.26	0.21
Reach 3	10.346	Future	10790.00	1287.67	1300.61	1293.42	1300.85	0.000209	3.93	2747.83	394.31	0.22
Reach 3	10.346	Existing	14650.00	1287.67	1302.53	1294.40	1302.84	0.000215	4.46	3286.16	477.53	0.23
Reach 3	10.252	Design	8100.00	1288.04	1298.72	1292.89	1298.95	0.000246	3.81	2127.05	254.26	0.23
Reach 3	10.252	Future	10790.00	1288.04	1300.46	1293.66	1300.73	0.000244	4.18	2579.12	266.16	0.24
Reach 3	10.252	Existing	14650.00	1288.04	1302.40	1294.64	1302.73	0.000241	4.64	3387.36	478.86	0.24
Reach 3	10.218	Design	8100.00	1287.34	1298.69	1292.50	1298.89	0.000303	3.61	2243.67	258.73	0.22
Reach 3	10.218	Future	10790.00	1287.34	1300.43	1293.25	1300.67	0.000306	3.99	2702.81	269.61	0.22
Reach 3	10.218	Existing	14650.00	1287.34	1302.35	1294.25	1302.67	0.000331	4.53	3235.29	282.75	0.24
Reach 3	10.207		Bridge									

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	10.195	Design	8100.00	1287.41	1298.59	1292.87	1298.81	0.000363	3.83	2113.81	255.21	0.23
Reach 3	10.195	Future	10790.00	1287.41	1300.32	1293.62	1300.59	0.000359	4.21	2565.87	266.71	0.24
Reach 3	10.195	Existing	14650.00	1287.41	1302.12	1294.62	1302.48	0.000392	4.79	3058.03	278.91	0.25
Reach 3	10.171	Design	8100.00	1287.50	1298.54	1292.81	1298.77	0.000257	3.86	2099.61	254.61	0.24
Reach 3	10.171	Future	10800.00	1287.50	1300.28	1293.60	1300.55	0.000252	4.22	2612.11	688.55	0.24
Reach 3	10.171	Existing	14660.00	1287.50	1302.09	1294.59	1302.43	0.000261	4.75	3234.85	880.40	0.25
Reach 3	10.134	Design	8100.00	1288.17	1298.48	1293.25	1298.72	0.000289	3.95	2048.50	261.47	0.25
Reach 3	10.134	Future	10800.00	1288.17	1300.21	1293.99	1300.50	0.000276	4.30	2513.10	273.19	0.25
Reach 3	10.134	Existing	14660.00	1288.17	1302.04	1294.95	1302.37	0.000263	4.69	3436.09	855.62	0.25
Reach 3	10.039	Design	8100.00	1287.88	1298.34	1292.84	1298.58	0.000274	3.91	2069.24	257.76	0.24
Reach 3	10.039	Future	10800.00	1287.88	1300.08	1293.61	1300.36	0.000267	4.27	2529.59	270.72	0.25
Reach 3	10.039	Existing	14660.00	1287.88	1301.93	1294.59	1302.24	0.000243	4.58	3733.72	841.93	0.24
Reach 3	9.944	Design	8100.00	1287.05	1298.21	1292.59	1298.44	0.000264	3.88	2085.41	255.17	0.24
Reach 3	9.944	Future	10800.00	1287.05	1299.95	1293.35	1300.23	0.000258	4.25	2541.68	275.27	0.24
Reach 3	9.944	Existing	14660.00	1287.05	1301.74	1294.34	1302.11	0.000268	4.84	3048.29	842.79	0.25
Reach 3	9.897	Design	8100.00	1287.03	1298.15	1292.40	1298.37	0.000254	3.82	2119.13	258.08	0.24
Reach 3	9.897	Future	10800.00	1287.03	1299.89	1293.19	1300.17	0.000249	4.18	2582.63	280.81	0.24
Reach 3	9.897	Existing	14660.00	1287.03	1301.69	1294.17	1302.04	0.000258	4.77	3092.39	808.19	0.25
Reach 3	9.854	Design	8100.00	1287.02	1298.08	1292.45	1298.31	0.000258	3.85	2105.51	257.54	0.24
Reach 3	9.854	Future	10800.00	1287.02	1299.83	1293.22	1300.11	0.000253	4.21	2566.39	269.88	0.24
Reach 3	9.854	Existing	14660.00	1287.02	1301.62	1294.16	1301.98	0.000266	4.80	3053.67	867.85	0.25
Reach 3	9.849	Design	8100.00	1287.05	1297.96	1292.63	1298.28	0.000357	4.54	1783.94	208.75	0.27
Reach 3	9.849	Future	10800.00	1287.05	1299.67	1293.49	1300.06	0.000360	5.03	2146.85	215.28	0.28
Reach 3	9.849	Existing	14660.00	1287.05	1301.40	1294.56	1301.92	0.000398	5.81	2521.55	270.04	0.30
Reach 3	9.844	Design	8100.00	1287.16	1297.99	1292.46	1298.23	0.000267	3.88	2086.56	258.49	0.24
Reach 3	9.844	Future	10800.00	1287.16	1299.72	1293.22	1300.00	0.000263	4.24	2544.37	289.26	0.24
Reach 3	9.844	Existing	14660.00	1287.16	1301.47	1294.20	1301.83	0.000276	4.85	3022.36	860.53	0.26
Reach 3	9.802	Design	8100.00	1287.21	1297.91	1292.63	1298.16	0.000301	4.04	2006.30	256.24	0.25
Reach 3	9.802	Future	10800.00	1287.21	1299.64	1293.41	1299.94	0.000290	4.39	2460.20	418.87	0.26
Reach 3	9.802	Existing	14660.00	1287.21	1301.38	1294.40	1301.77	0.000302	5.00	2932.74	862.05	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

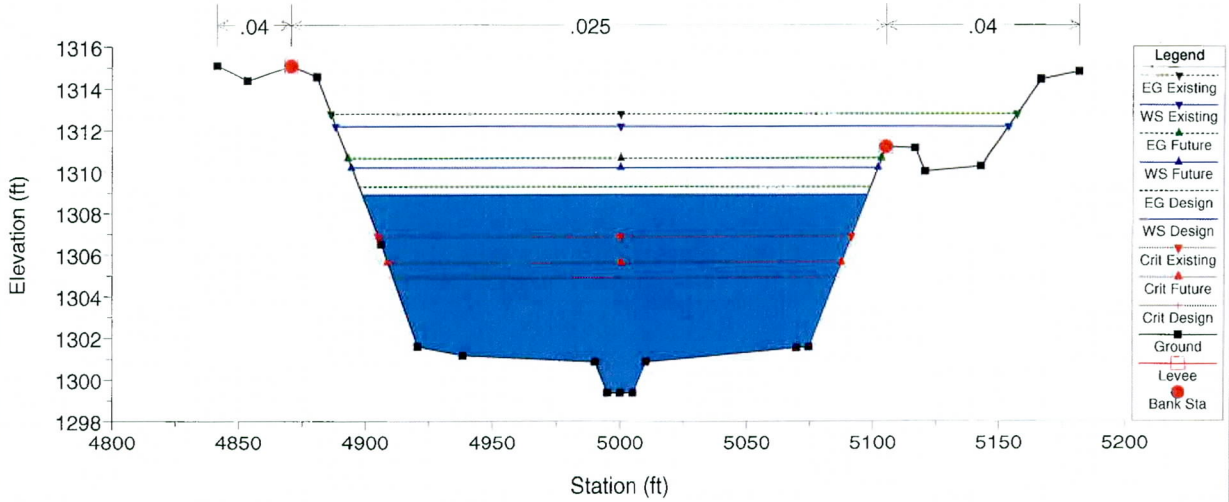
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.708	Design	8100.00	1286.85	1297.79	1292.05	1298.02	0.000256	3.85	2102.70	255.14	0.24
Reach 3	9.708	Future	10800.00	1286.85	1299.52	1292.82	1299.80	0.000254	4.23	2554.72	267.73	0.24
Reach 3	9.708	Existing	14660.00	1286.85	1301.25	1293.84	1301.62	0.000272	4.85	3023.72	857.80	0.26
Reach 3	9.613	Design	8100.00	1286.70	1297.67	1291.87	1297.89	0.000245	3.76	2152.09	264.44	0.23
Reach 3	9.613	Future	10800.00	1286.70	1299.41	1292.66	1299.67	0.000236	4.12	2668.13	315.75	0.23
Reach 3	9.613	Existing	14660.00	1286.70	1301.14	1293.63	1301.48	0.000250	4.70	3219.24	854.79	0.25
Reach 3	9.518	Design	8100.00	1286.59	1297.53	1291.84	1297.76	0.000263	3.88	2089.05	256.27	0.24
Reach 3	9.518	Future	10800.00	1286.59	1299.26	1292.64	1299.54	0.000260	4.24	2545.16	269.55	0.24
Reach 3	9.518	Existing	14660.00	1286.59	1300.98	1293.64	1301.34	0.000276	4.87	3009.40	825.50	0.26
Reach 3	9.424	Design	8100.00	1287.07	1297.38	1291.95	1297.62	0.000286	3.98	2033.82	254.91	0.25
Reach 3	9.424	Future	10800.00	1287.07	1299.12	1292.71	1299.41	0.000277	4.34	2488.00	269.52	0.25
Reach 3	9.424	Existing	14660.00	1287.07	1300.82	1293.73	1301.20	0.000294	4.97	2970.10	732.16	0.27
Reach 3	9.334	Design	8100.00	1286.50	1297.24	1291.92	1297.49	0.000289	3.98	2035.44	257.33	0.25
Reach 3	9.334	Future	10800.00	1286.50	1298.99	1292.69	1299.28	0.000277	4.33	2494.60	403.38	0.25
Reach 3	9.334	Existing	14660.00	1286.50	1300.68	1293.65	1301.06	0.000293	4.97	2952.66	785.17	0.27
Reach 3	9.24	Design	8100.00	1287.00	1297.08	1292.00	1297.34	0.000315	4.10	1976.15	254.97	0.26
Reach 3	9.24	Future	10800.00	1287.00	1298.83	1292.75	1299.13	0.000298	4.44	2432.93	292.10	0.26
Reach 3	9.24	Existing	14660.00	1287.00	1300.51	1293.72	1300.91	0.000315	5.08	2885.49	389.65	0.27
Reach 3	9.145	Design	8100.00	1286.79	1296.91	1291.95	1297.18	0.000329	4.16	1946.94	253.91	0.26
Reach 3	9.145	Future	10800.00	1286.79	1298.67	1292.70	1298.98	0.000308	4.49	2404.32	289.88	0.26
Reach 3	9.145	Existing	14660.00	1286.79	1300.34	1293.68	1300.75	0.000341	5.10	2871.89	387.35	0.28
Reach 3	9.053	Design	8100.00	1286.50	1296.78	1291.38	1297.02	0.000281	3.96	2045.45	255.48	0.25
Reach 3	9.053	Future	10800.00	1286.50	1298.55	1292.14	1298.83	0.000270	4.31	2507.82	282.50	0.25
Reach 3	9.053	Existing	14660.00	1286.50	1300.20	1293.13	1300.59	0.000290	4.96	2952.69	389.11	0.26
Reach 3	9.036	Design	8100.00	1286.20	1296.76	1291.25	1296.99	0.000269	3.89	2079.89	257.85	0.24
Reach 3	9.036	Future	10790.00	1286.20	1298.53	1292.01	1298.81	0.000259	4.24	2546.99	310.82	0.24
Reach 3	9.036	Existing	14630.00	1286.20	1300.19	1292.99	1300.56	0.000282	4.88	3000.57	437.51	0.26
Reach 3	9.018	Design	8700.00	1285.62	1296.72	1291.11	1296.97	0.000273	4.00	2174.04	260.97	0.24
Reach 3	9.018	Future	11920.00	1285.62	1298.46	1291.96	1298.78	0.000285	4.52	2638.71	272.43	0.26

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.018	Existing	15770.00	1285.62	1300.12	1292.91	1300.53	0.000300	5.09	3098.71	404.42	0.27
Reach 3	9.001	Design	8700.00	1285.34	1296.69	1290.88	1296.94	0.000272	4.02	2164.84	257.60	0.24
Reach 3	9.001	Future	11920.00	1285.34	1298.43	1291.78	1298.75	0.000287	4.54	2624.42	270.48	0.26
Reach 3	9.001	Existing	15770.00	1285.34	1300.09	1292.74	1300.50	0.000306	5.12	3081.16	746.86	0.27

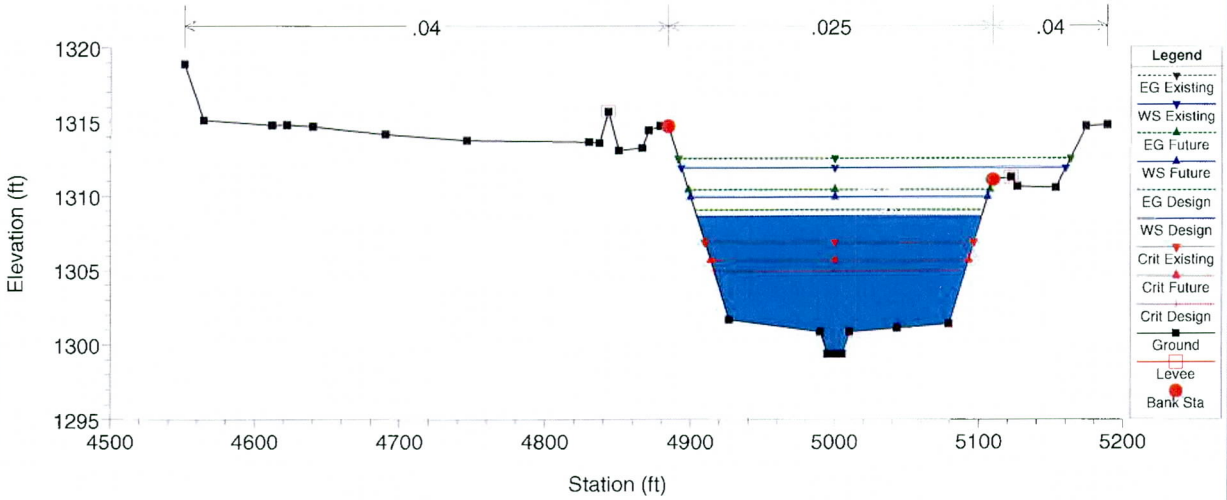
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.911



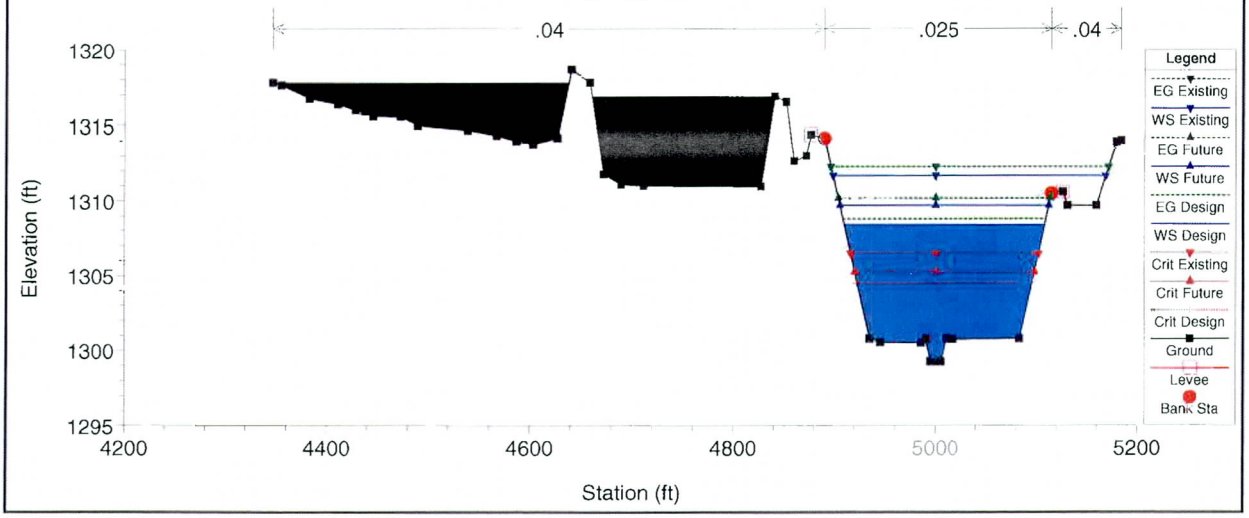
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

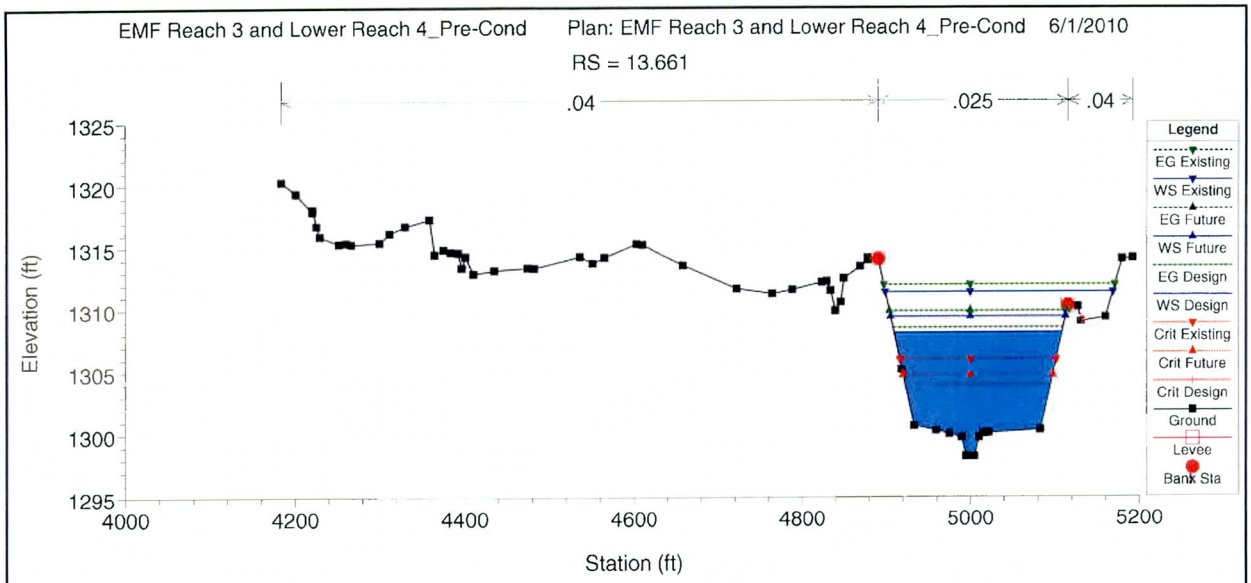
RS = 13.842

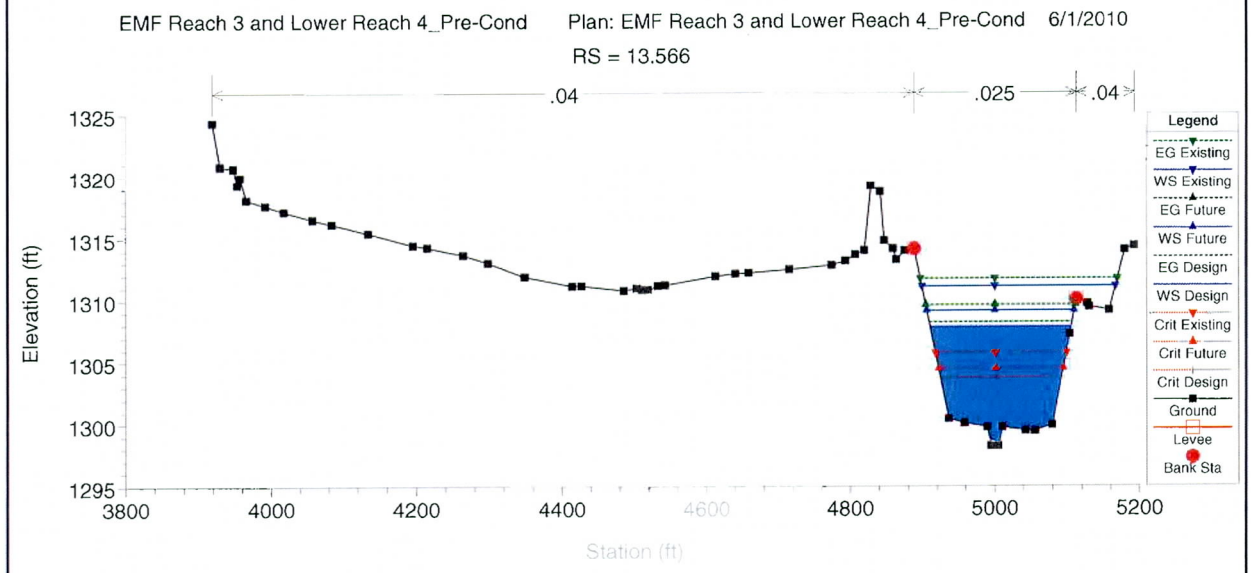


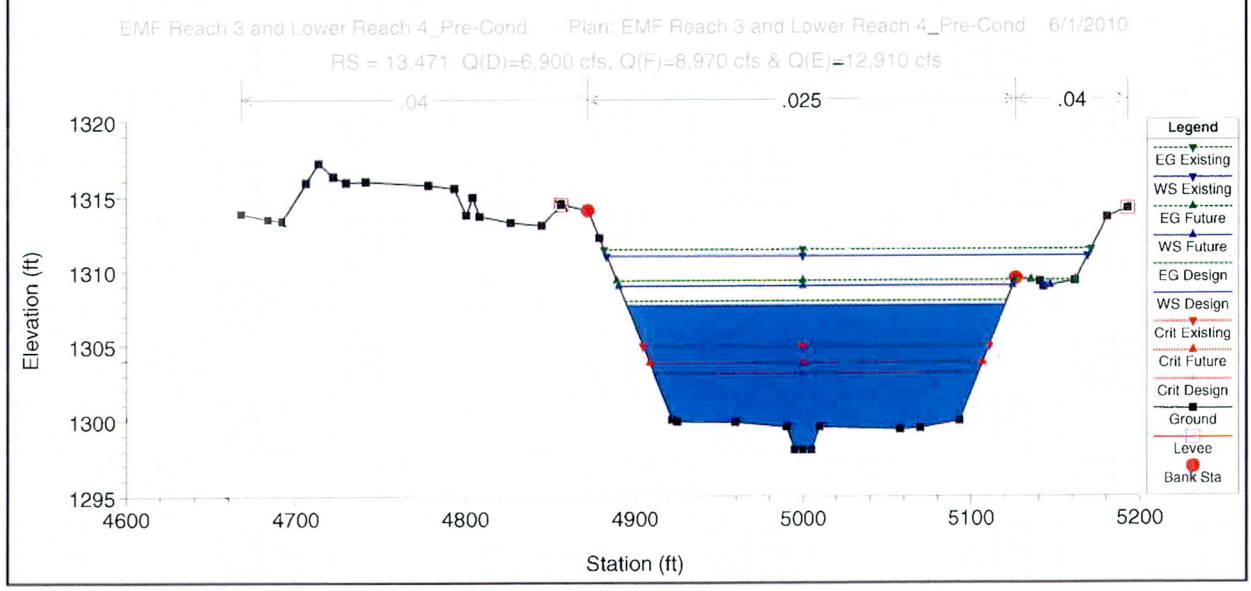
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.755



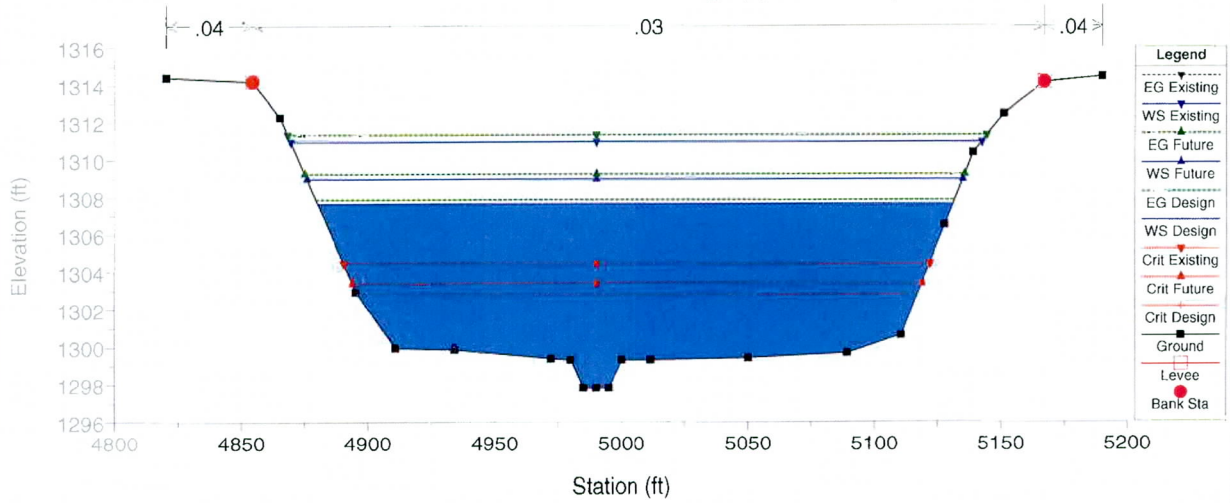

EMF Reach 3 and Lower Reach 4_Pre-Cond
Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010
RS = 13.661
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG Existing
WS Existing
EG Future
WS Future
EG Design
WS Design
Crit Existing
Crit Future
Crit Design
Ground
Levee
Bank Sta


EMF Reach 3 and Lower Reach 4_Pre-Cond
Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010
RS = 13.566
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG Existing
WS Existing
EG Future
WS Future
EG Design
WS Design
Crit Existing
Crit Future
Crit Design
Ground
Levee
Bank Sta


EMF Reach 3 and Lower Reach 4_Pre-Cond
Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010
RS = 13.471 Q(D)=6,900 cfs, Q(F)=8,970 cfs & Q(E)=12,910 cfs
.04
.025
.04
Elevation (ft)
Station (ft)
Legend
EG Existing
WS Existing
EG Future
WS Future
EG Design
WS Design
Crit Existing
Crit Future
Crit Design
Ground
Levee
Bank Sta

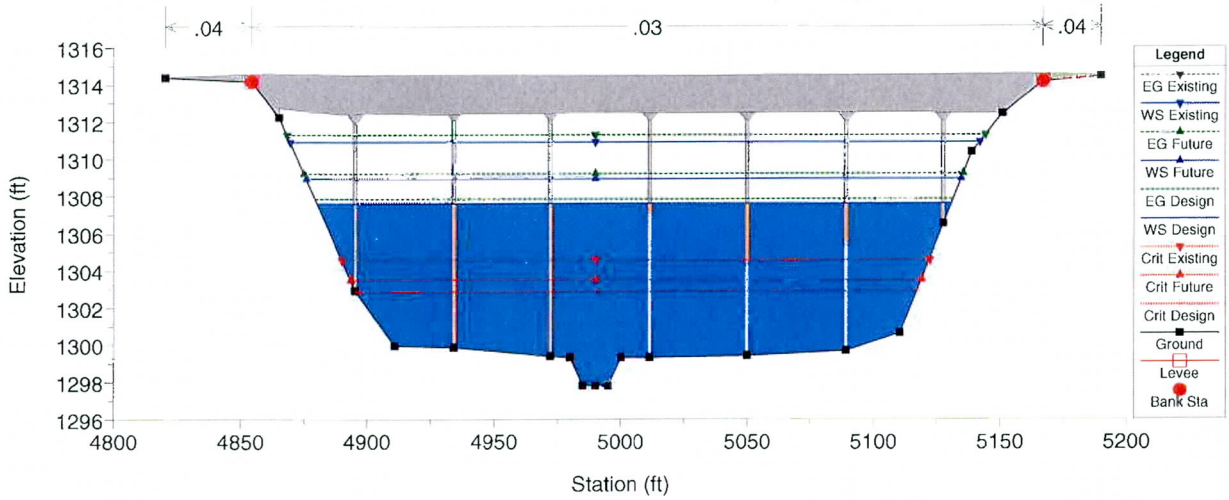
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.439 Queek Creek Road Bridge (Upstream Face)



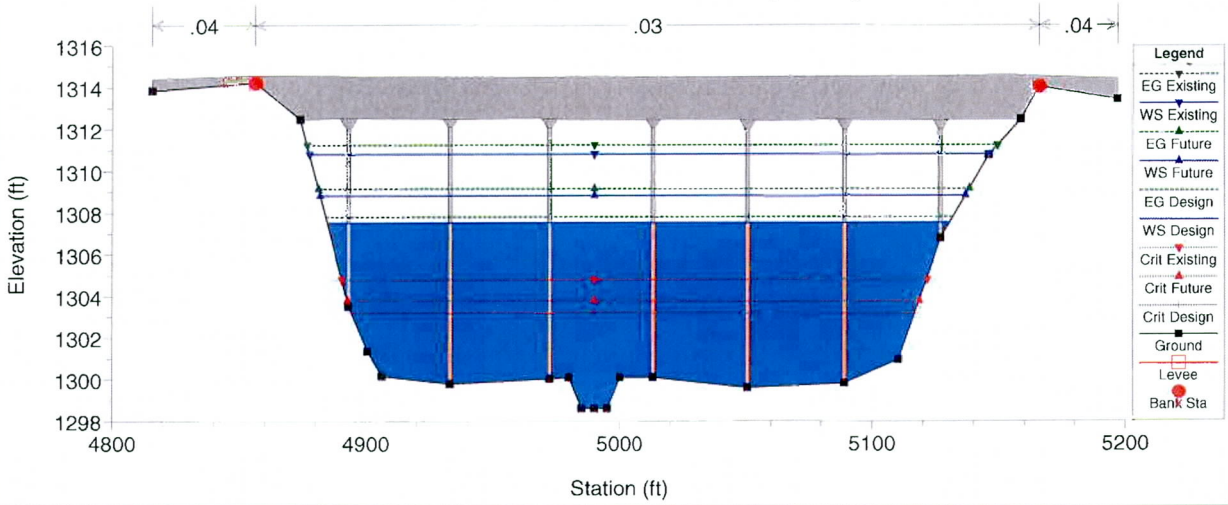
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



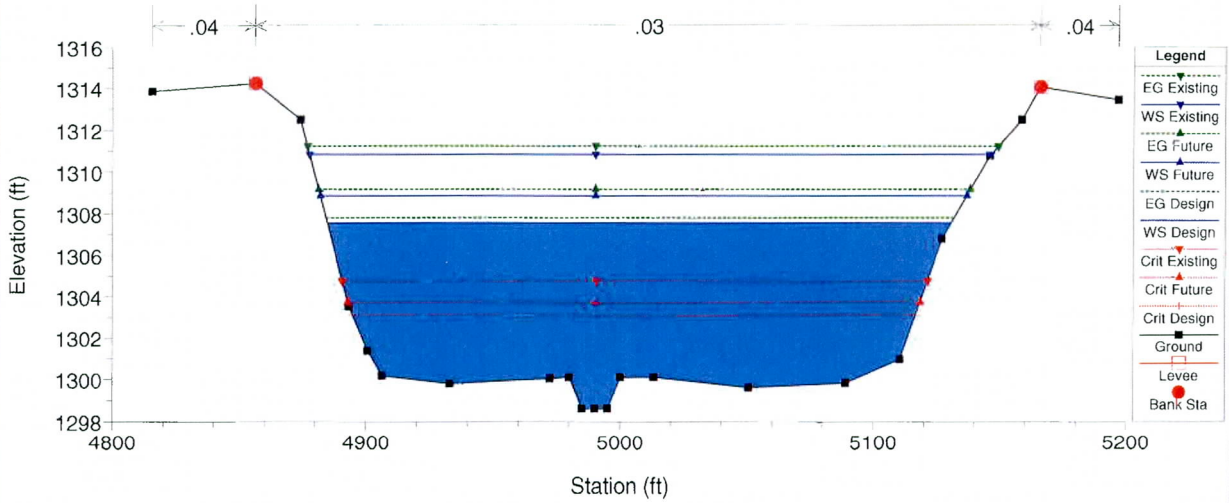
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



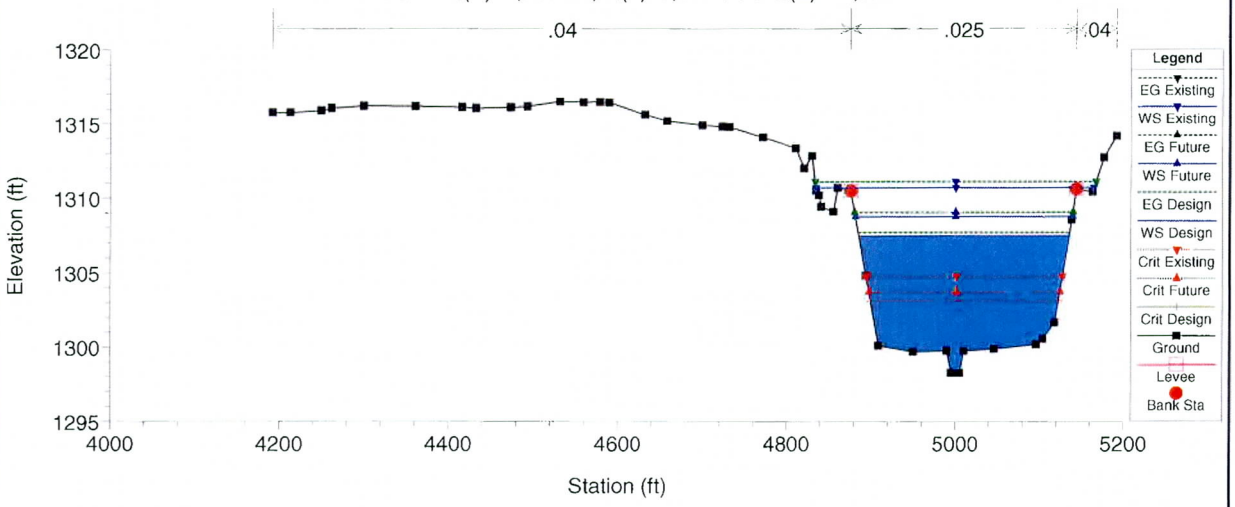
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.426 Queen Creek Road Bridge (Downstream Face)



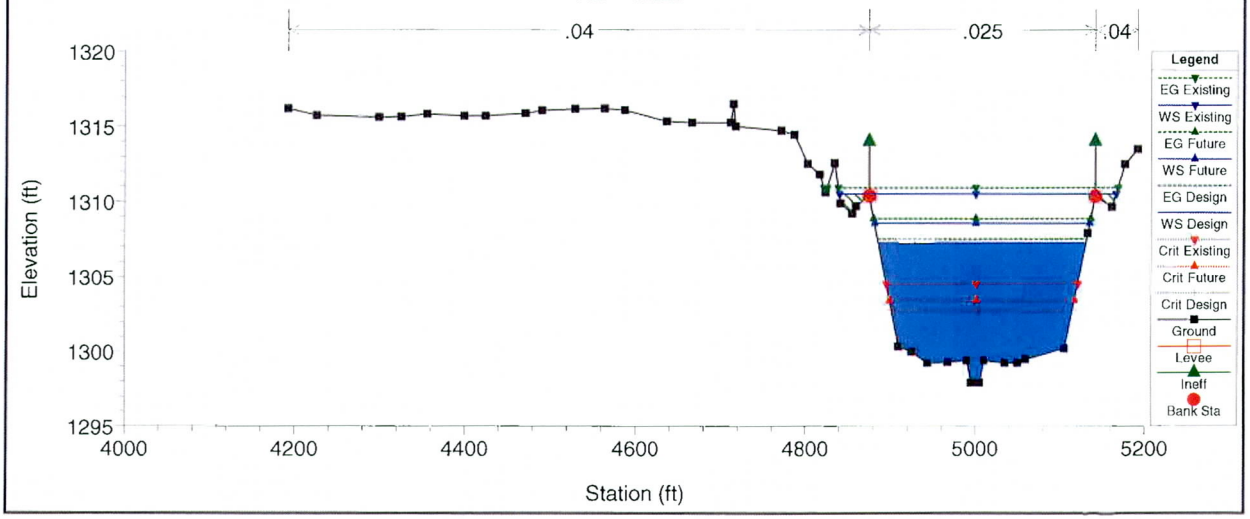
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.374 Q(D)=6,900 cfs, Q(F)=9,070 cfs & Q(E)=12,990 cfs



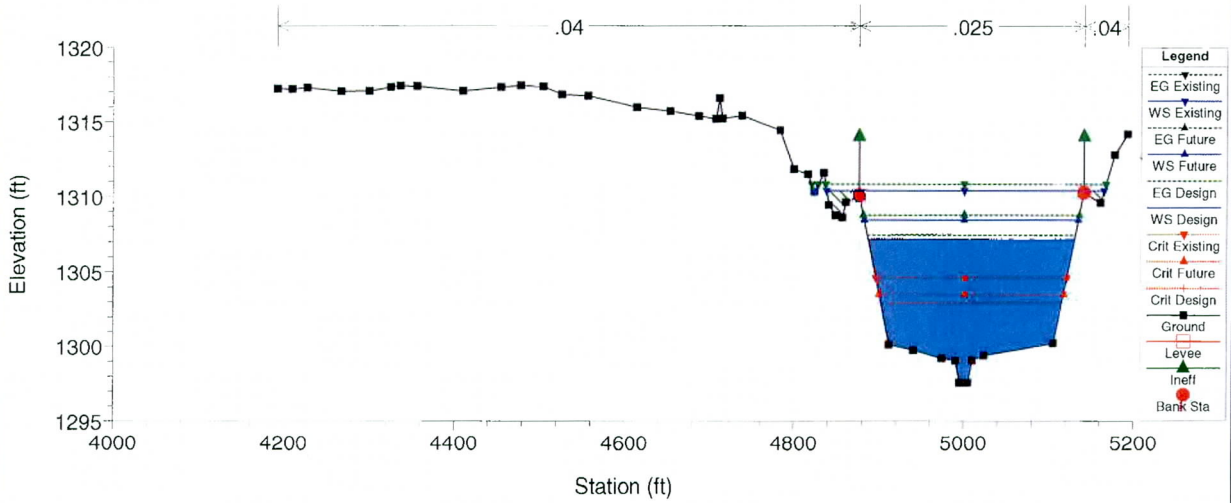
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.28



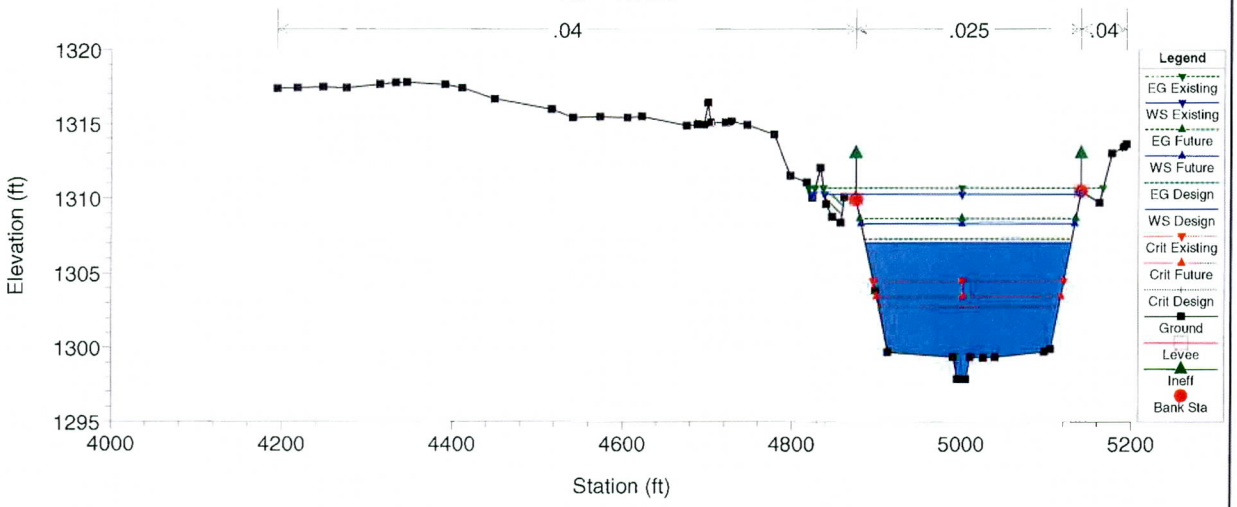
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.232



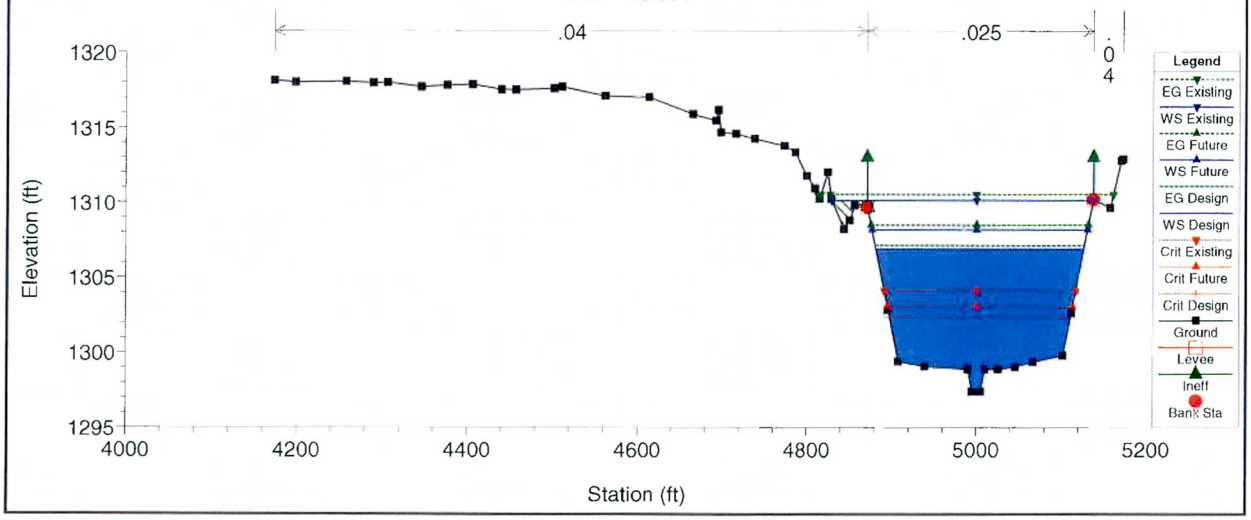
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.179



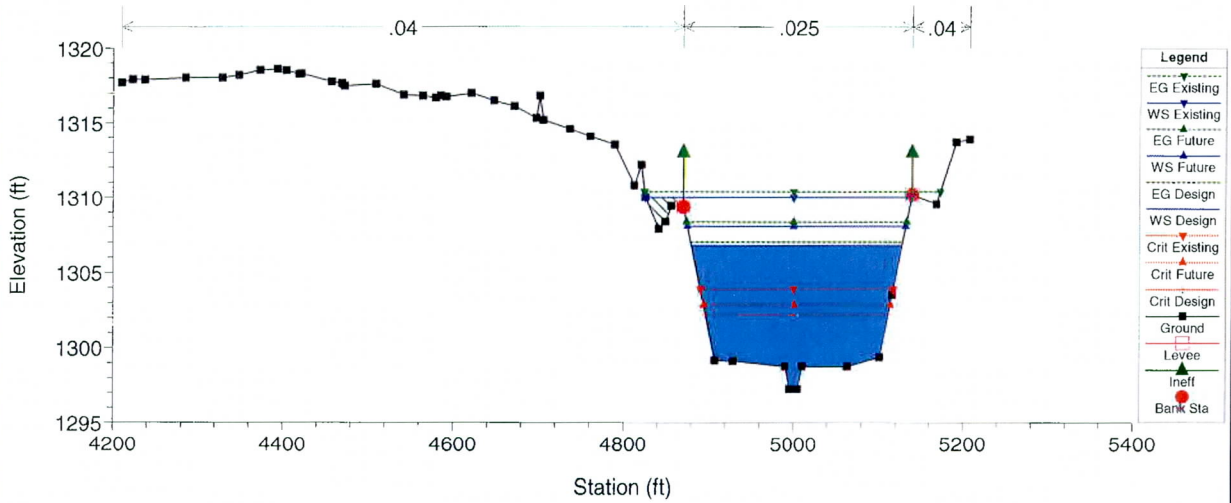
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.084



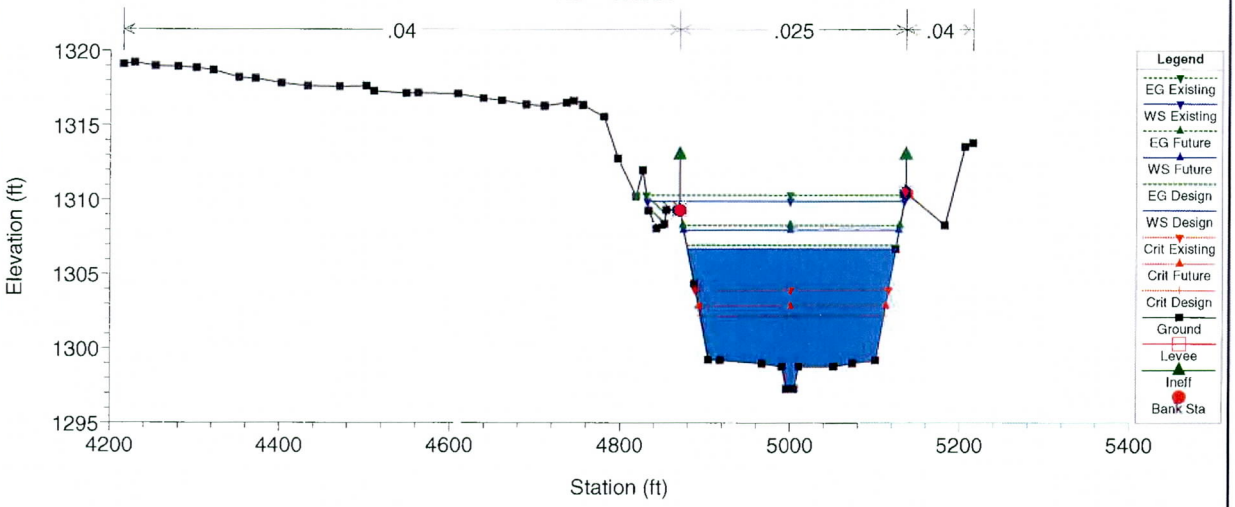
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 13.037



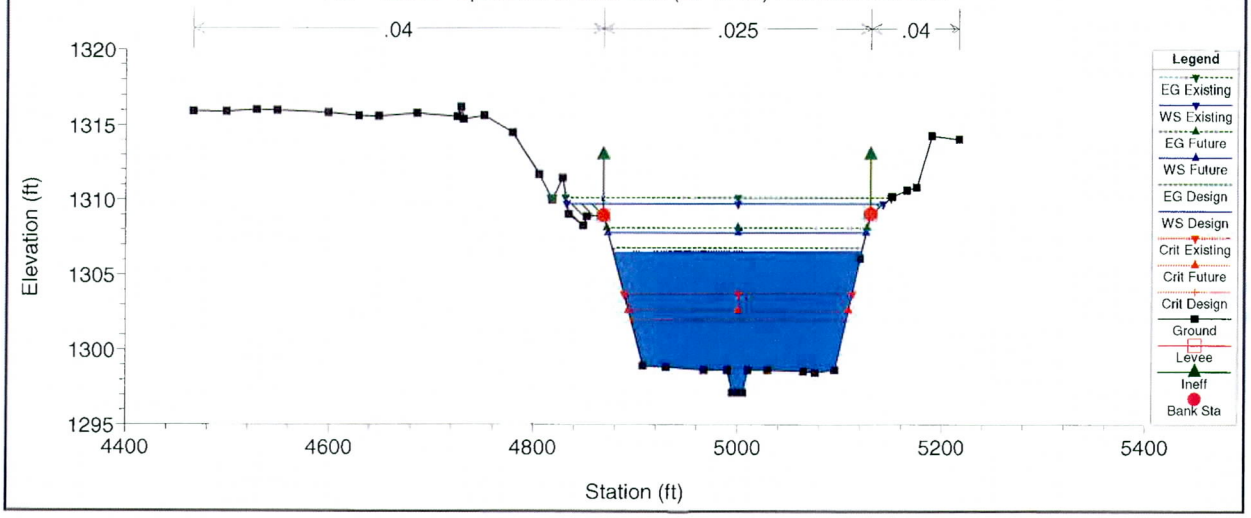
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.981



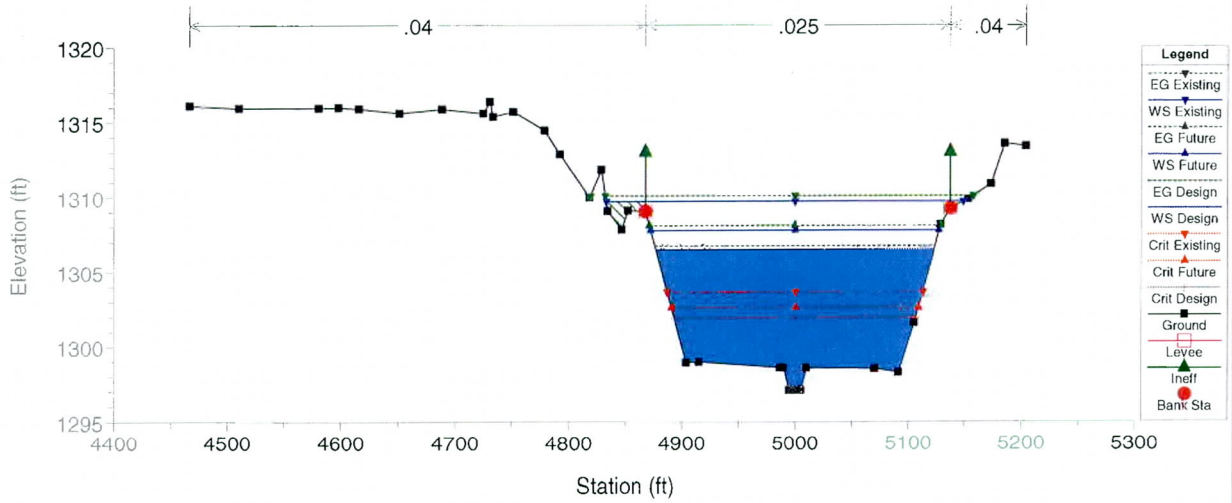
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.905 Upstream of Side Inlet (25' Wide) from the Left Bank



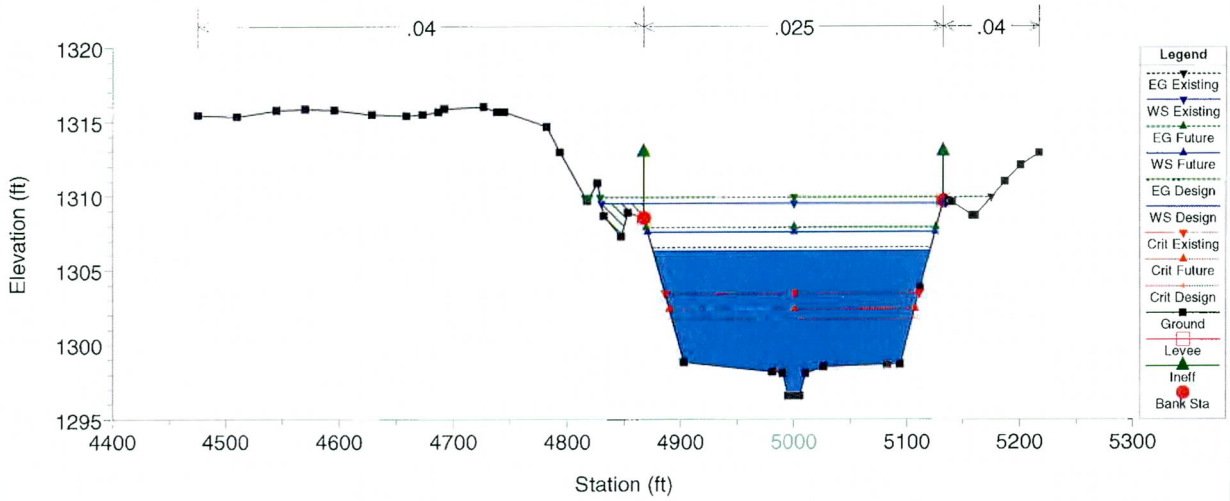
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.884 Downstream of Side Inlet (25' Wide) from the Left Bank



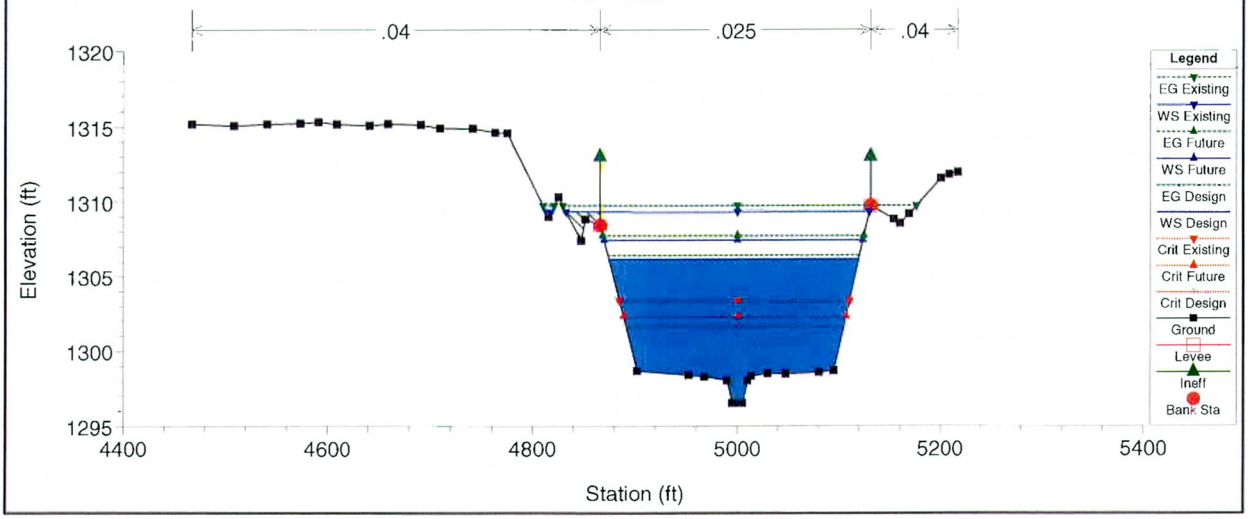
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.789



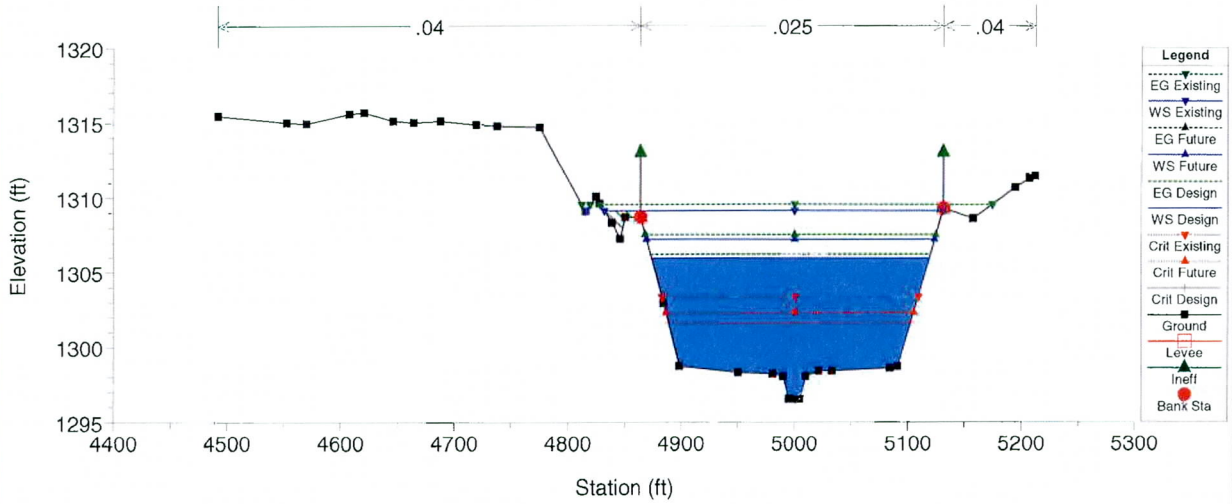
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.694



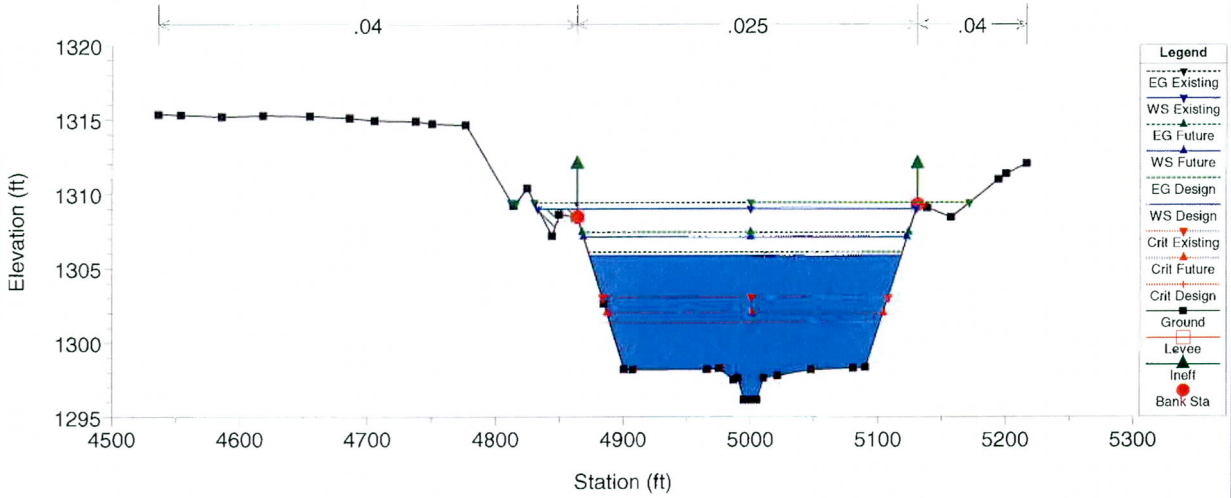
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.6



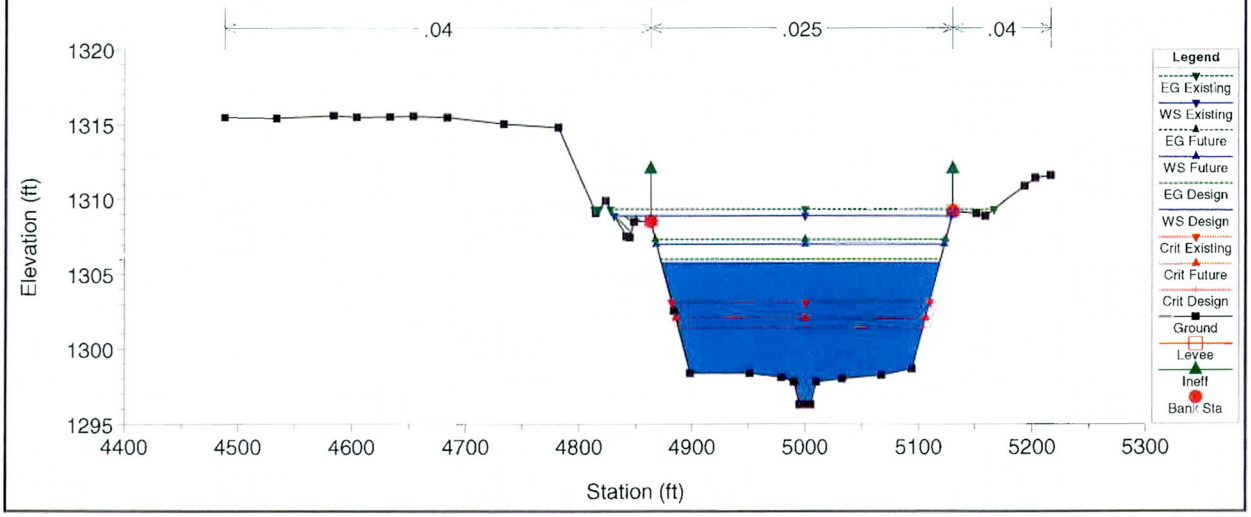
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.552



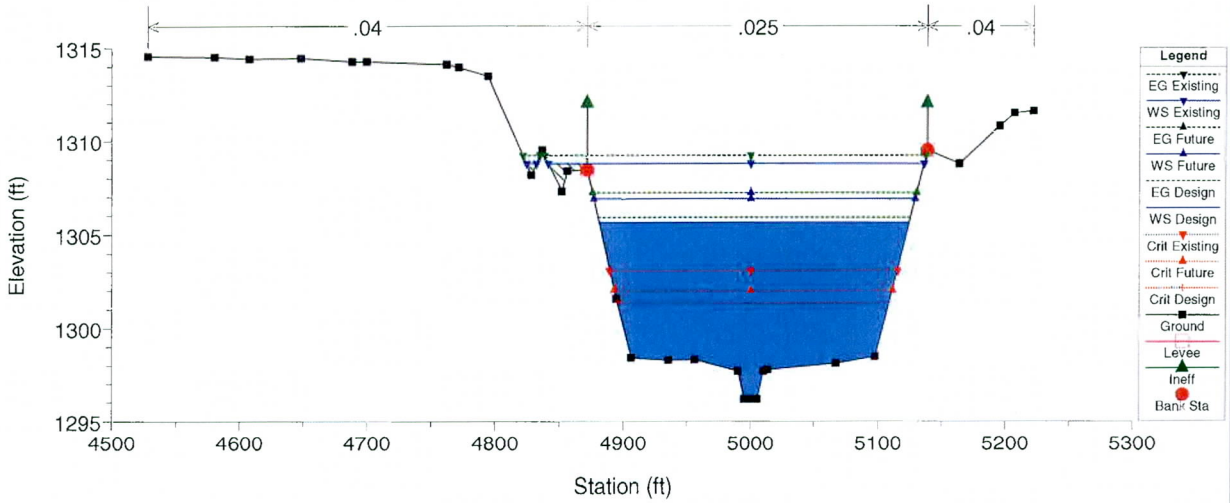
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.488



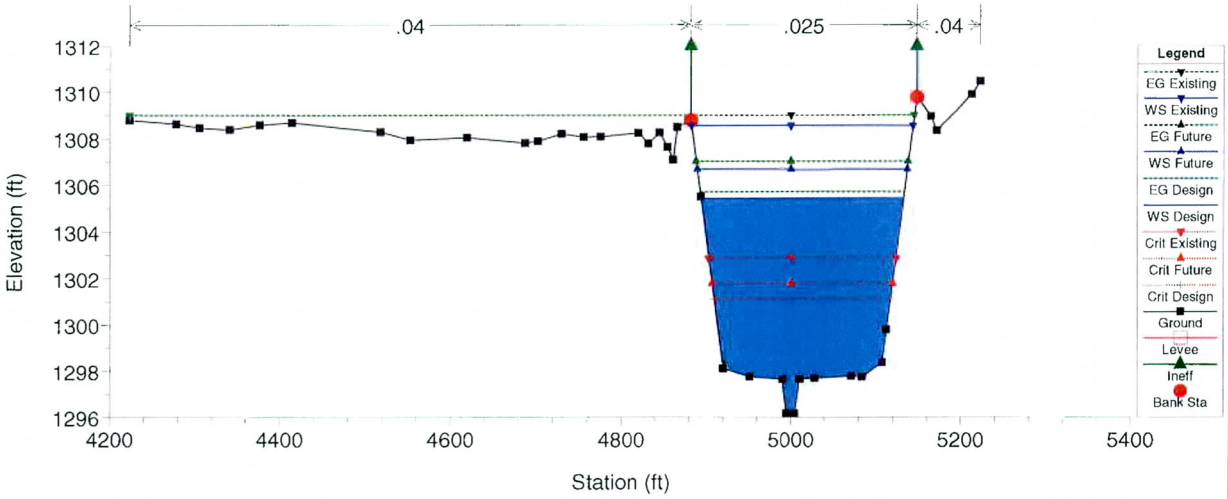
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.441



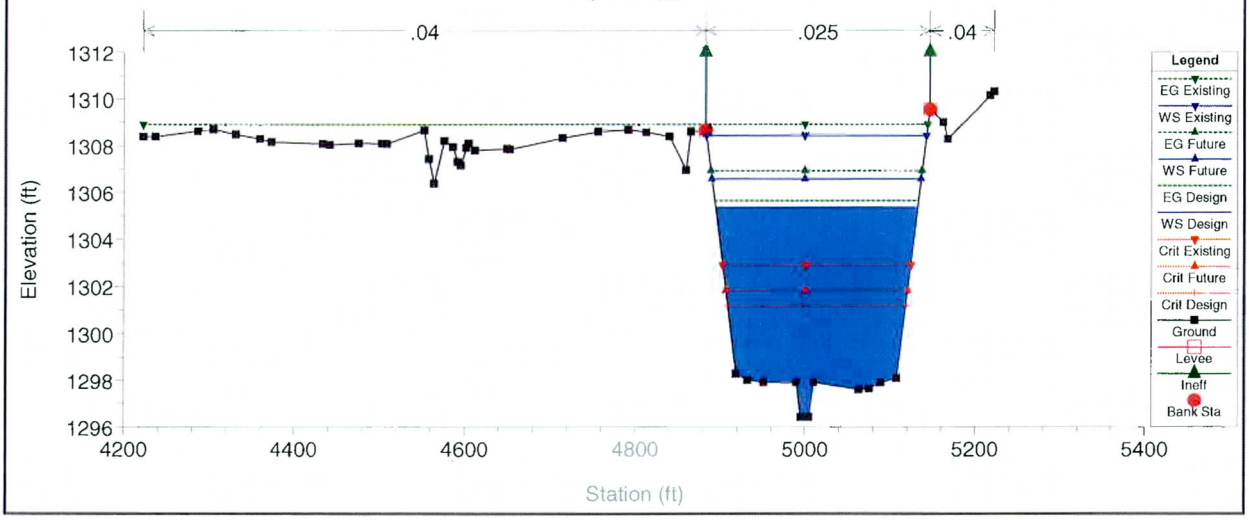
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.349



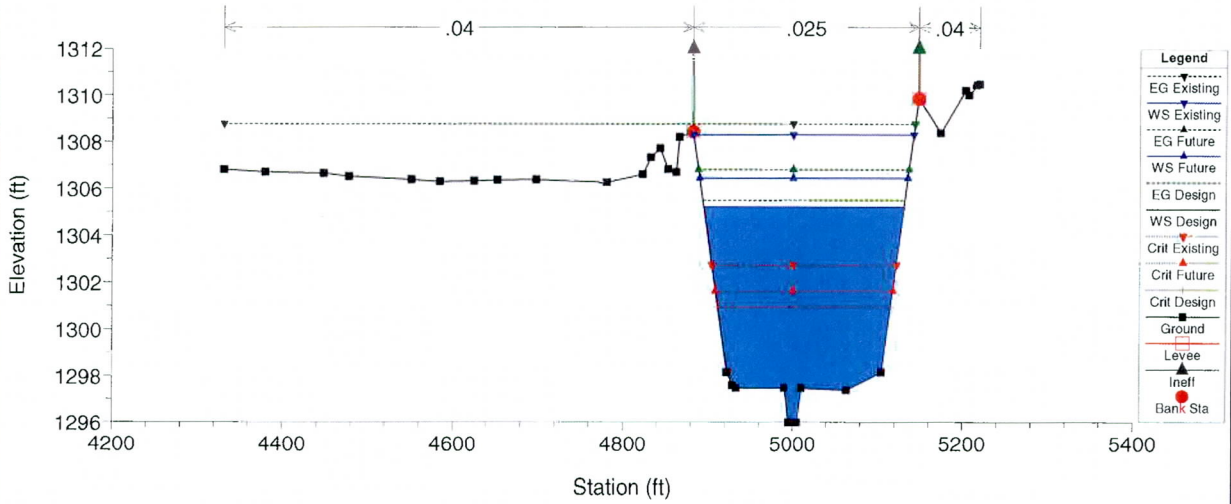
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.302



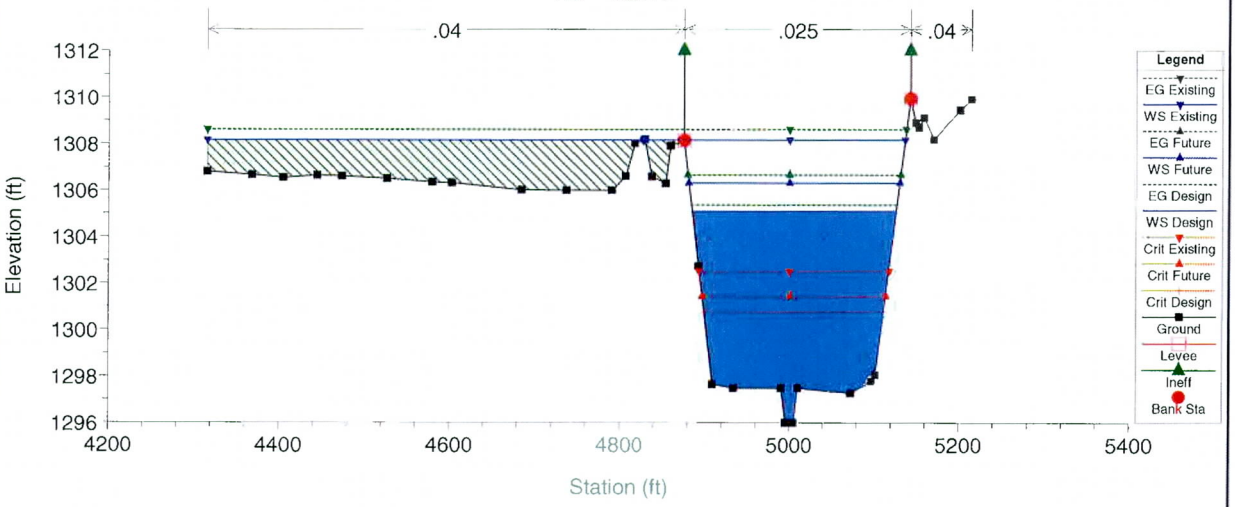
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.245



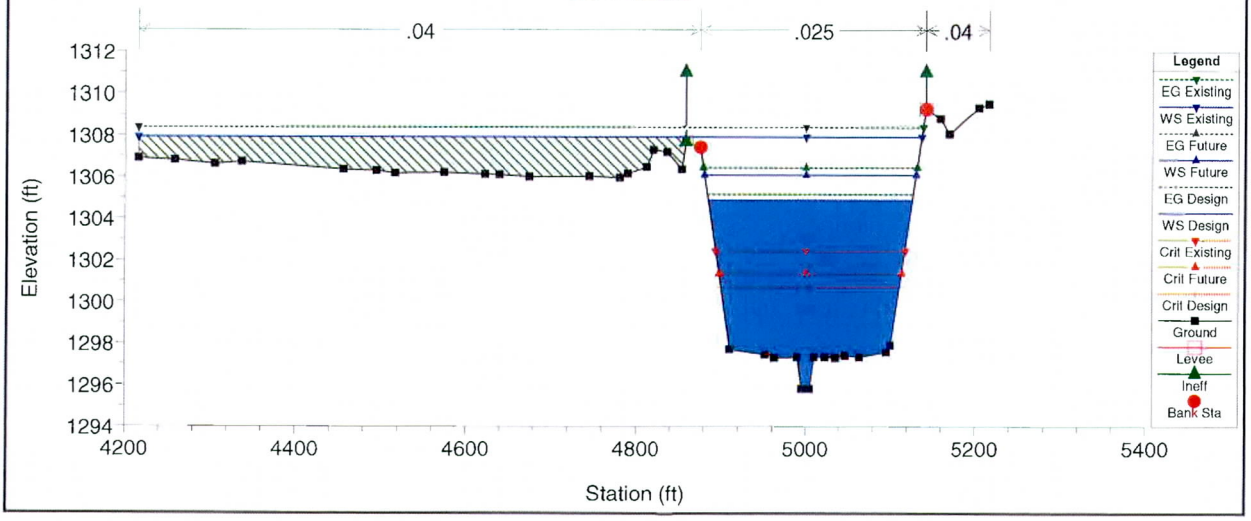
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.177



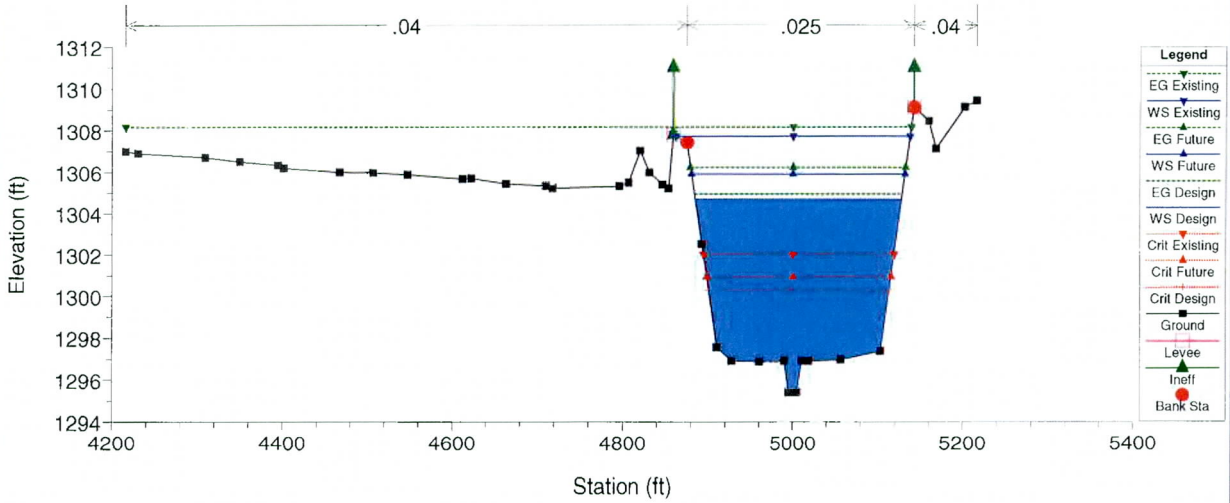
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 12.082



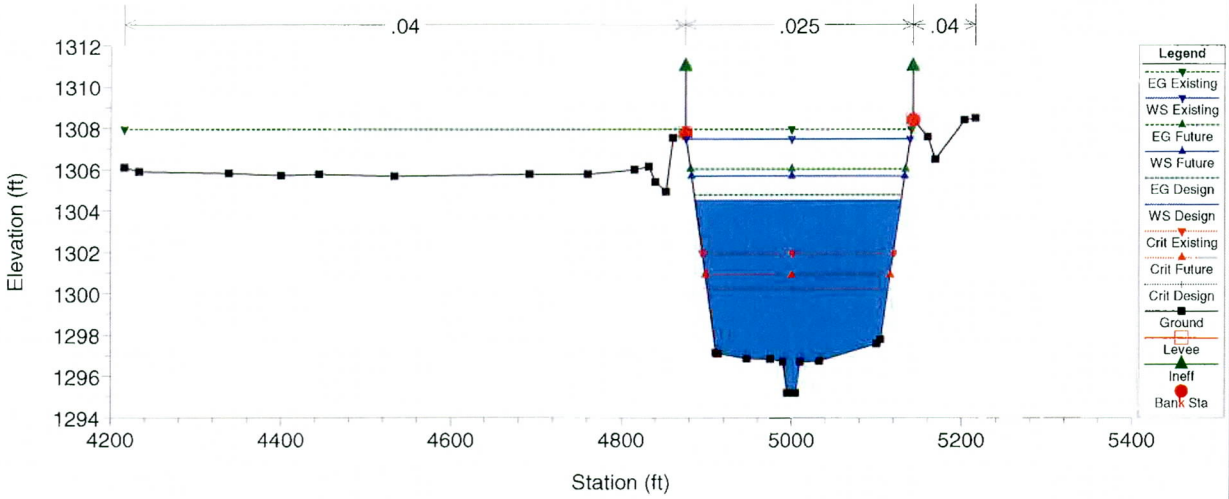
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.988



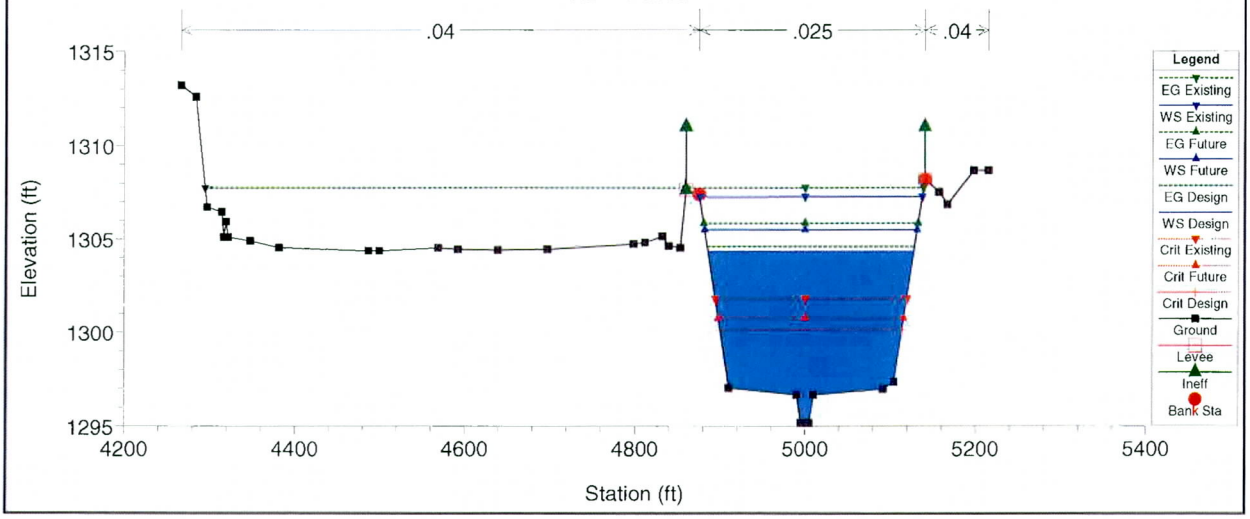
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.893



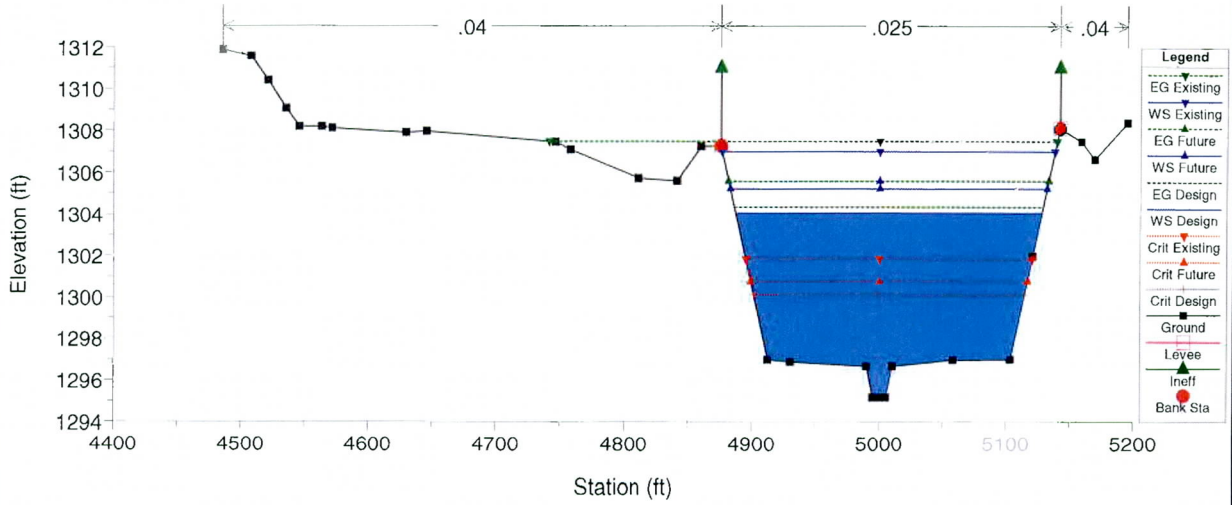
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.798



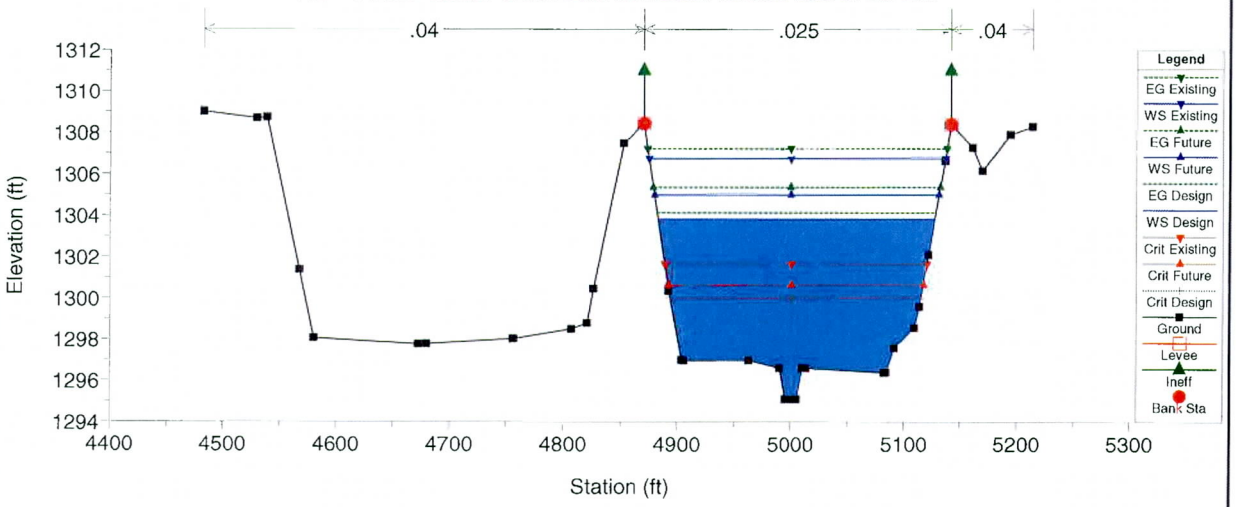
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.703



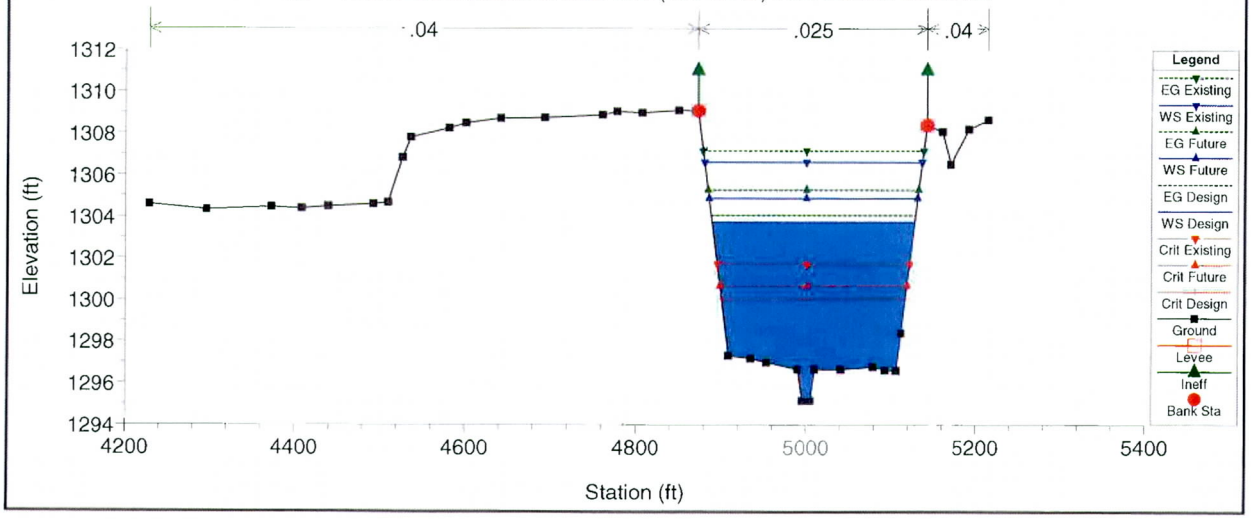
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.609 Queen Creek Detention Basin located East of the EMF



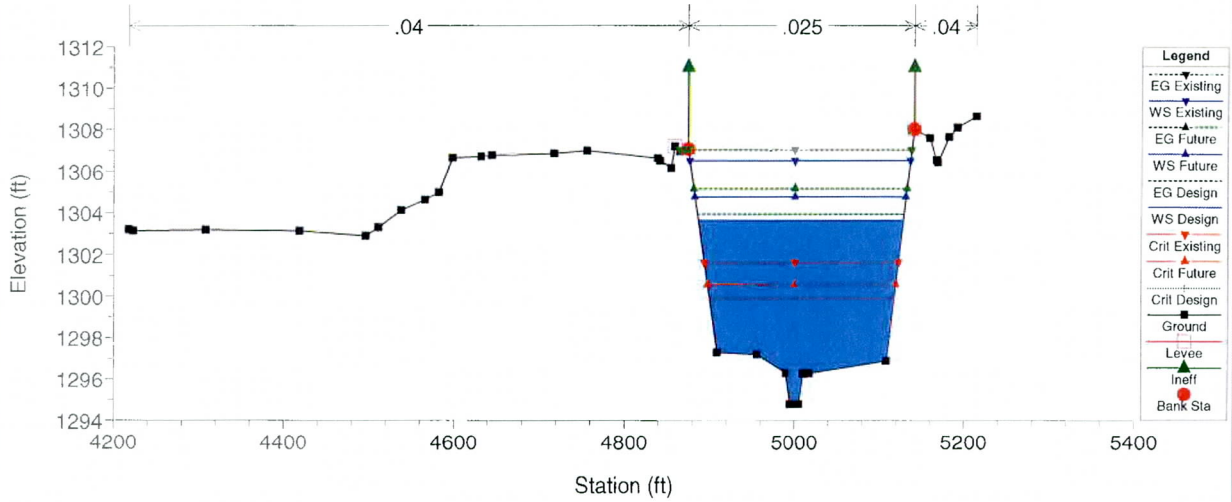
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.572 Downstream of Side Inlet (150' Wide) from the Left Overbank



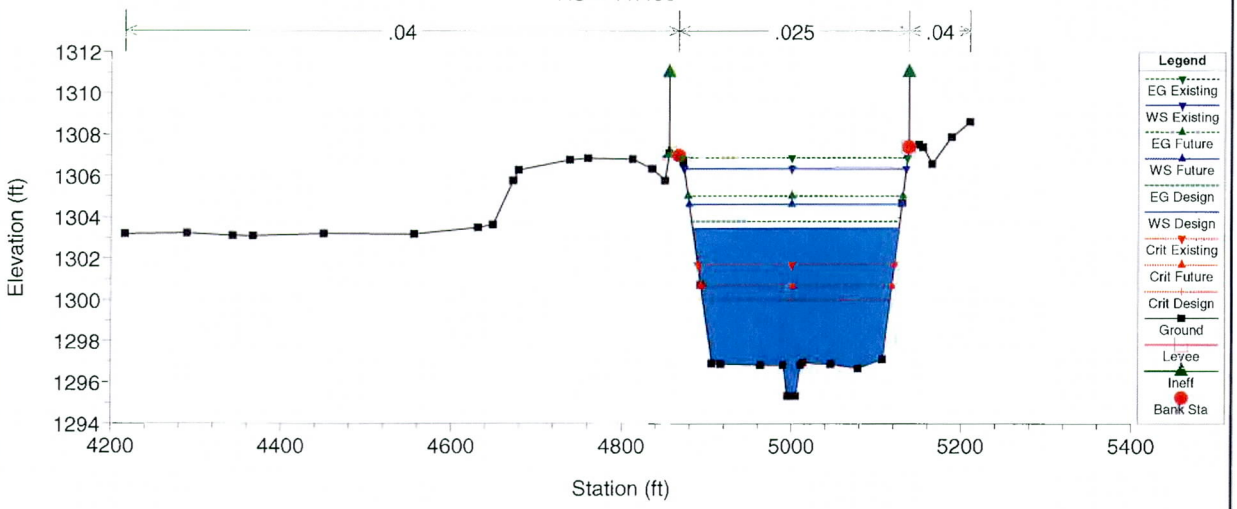
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.531



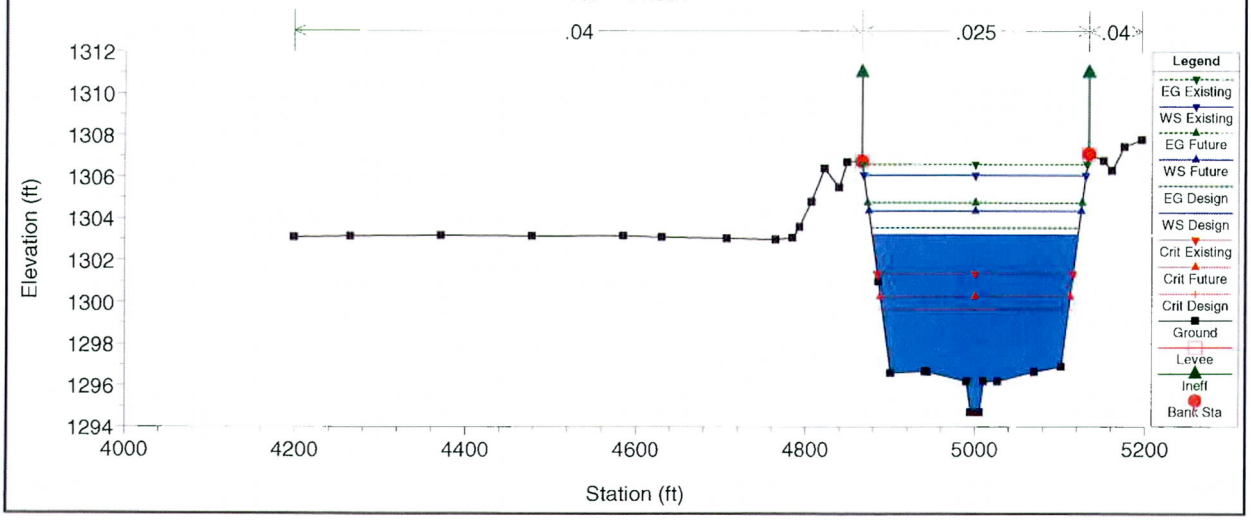
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.486



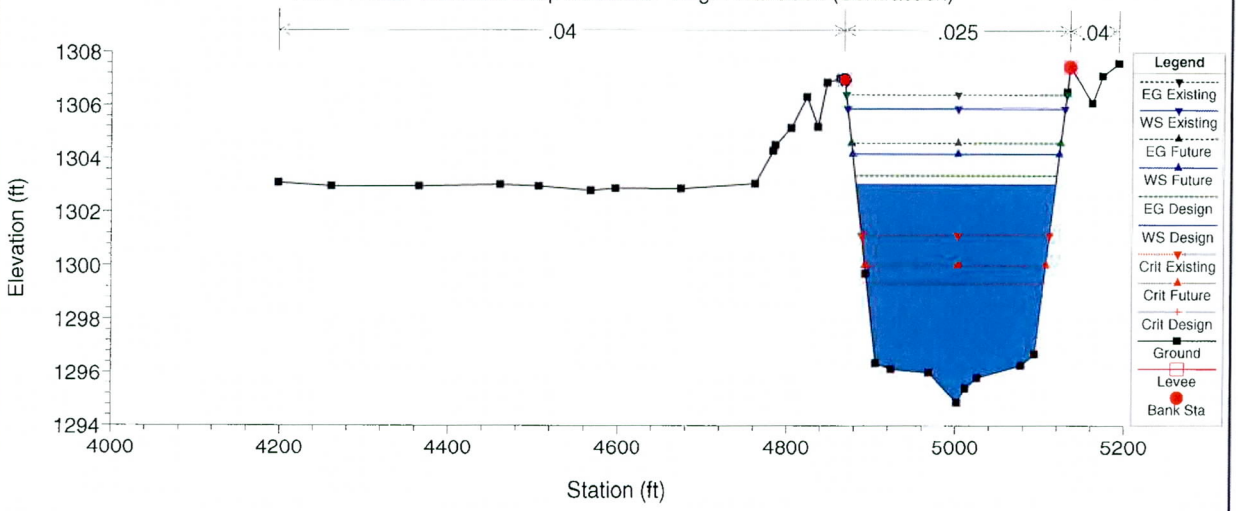
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.391



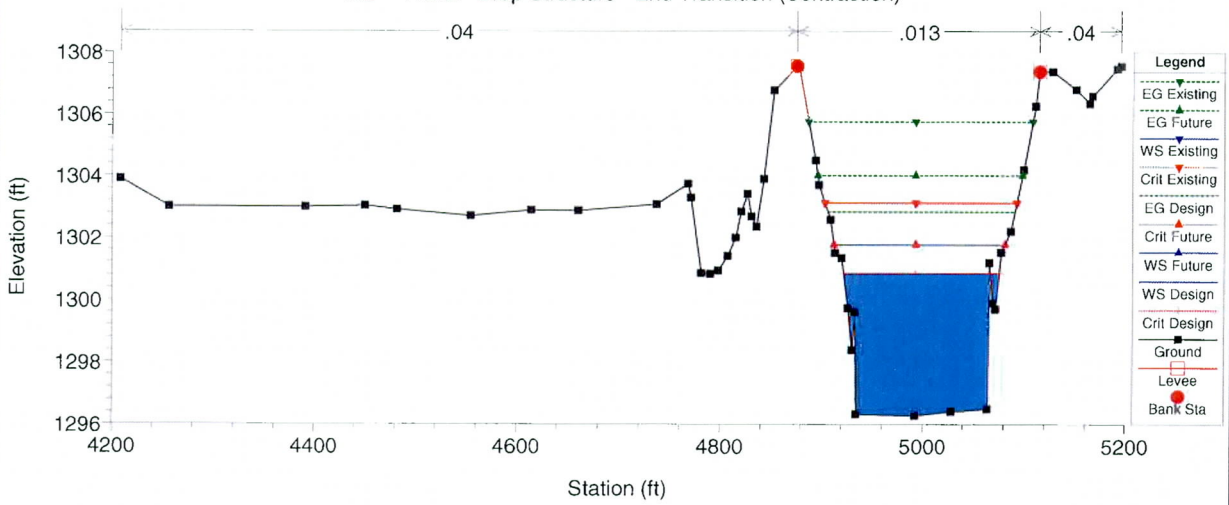
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.328 Concrete Drop Structure - Begin Transition (Contraction)



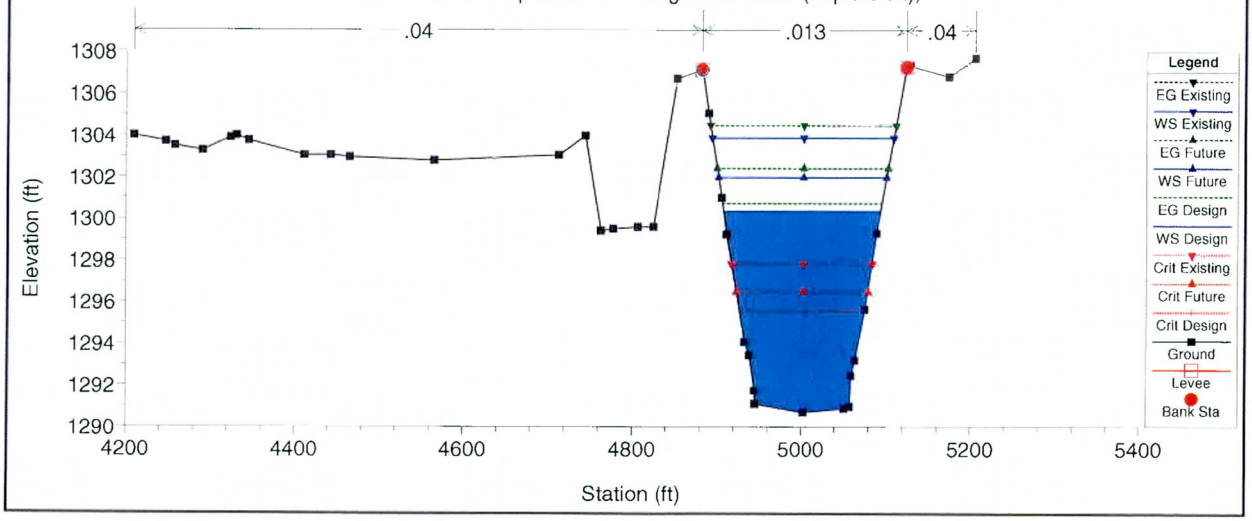
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.321 Drop Structure - End Transition (Contraction)



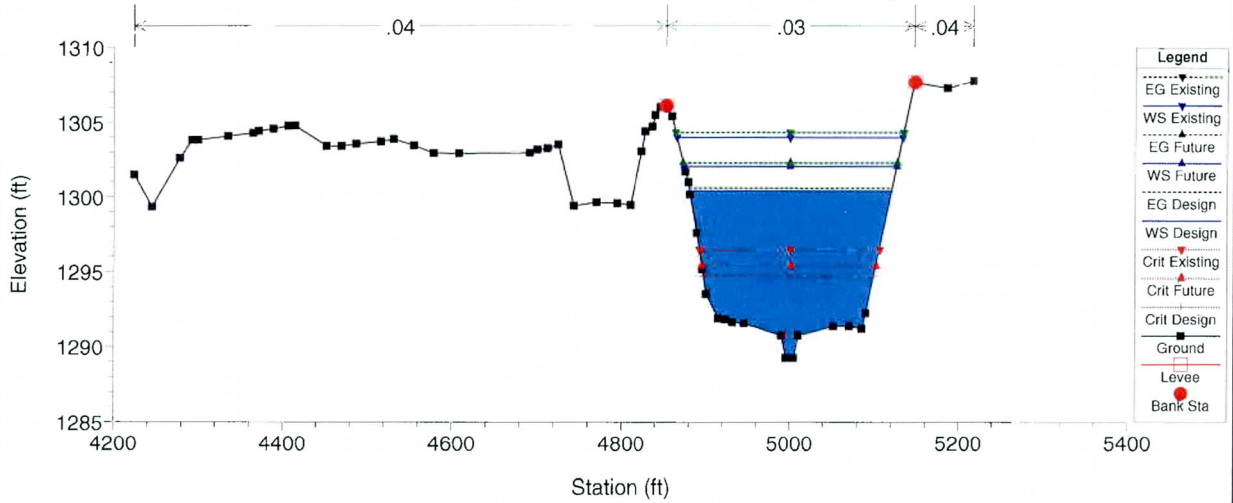
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.308 Drop Structure - Begin Transition (Expansion);



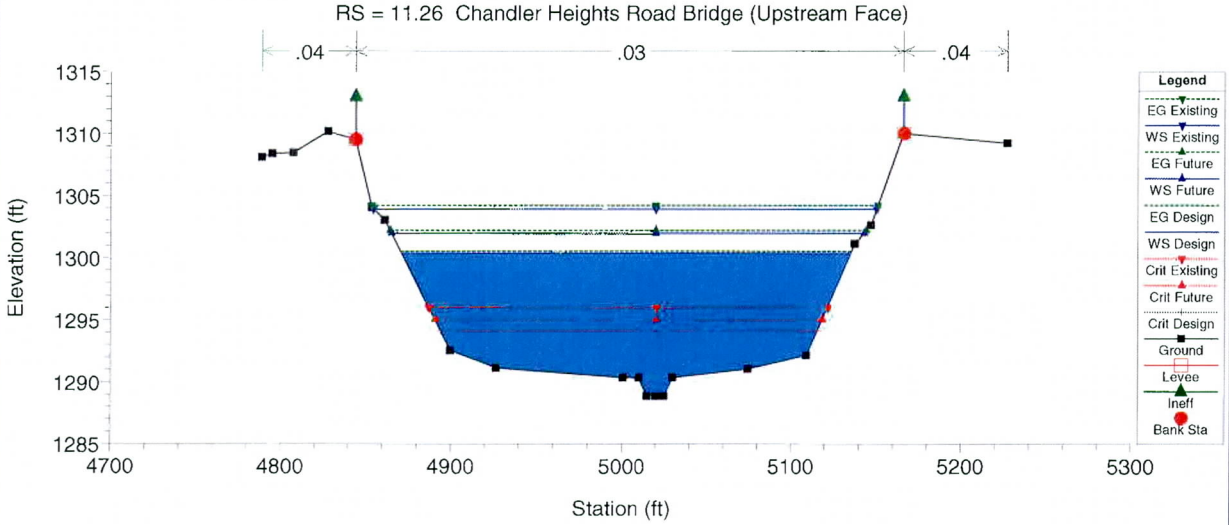
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.297 Drop Structure - End Transition (Expansion);



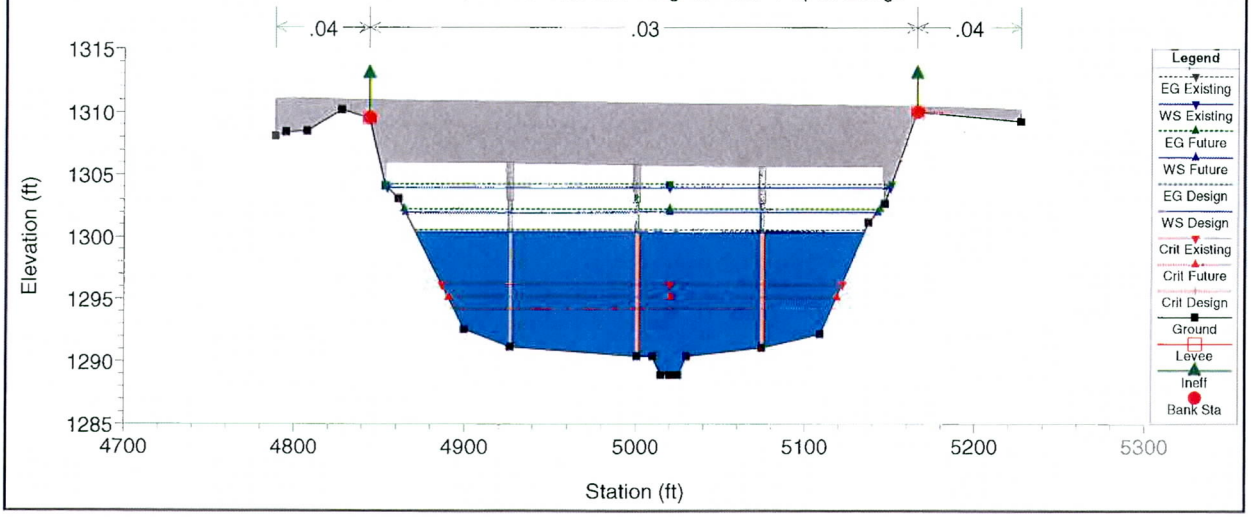
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.26 Chandler Heights Road Bridge (Upstream Face)



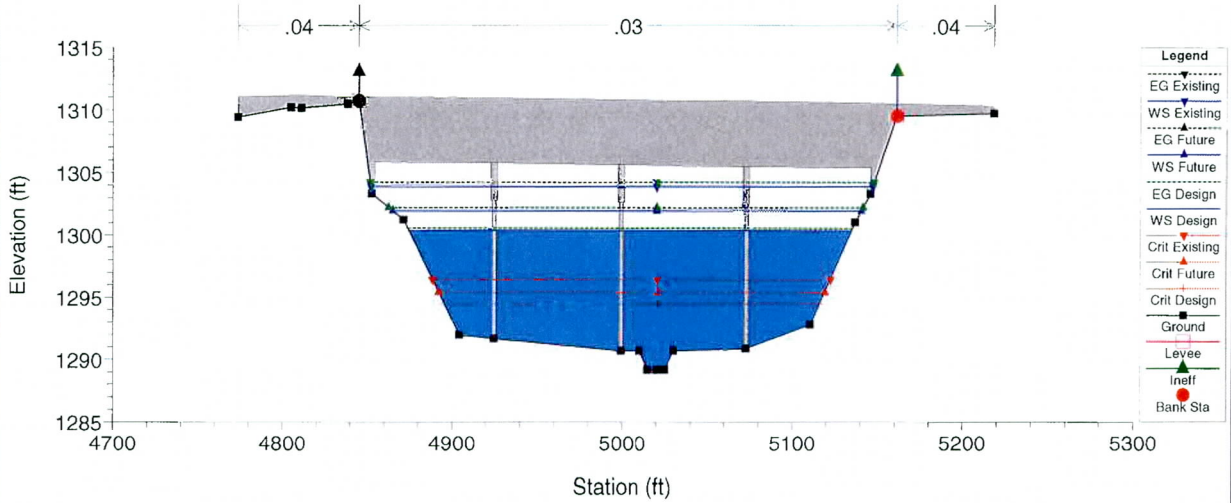
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



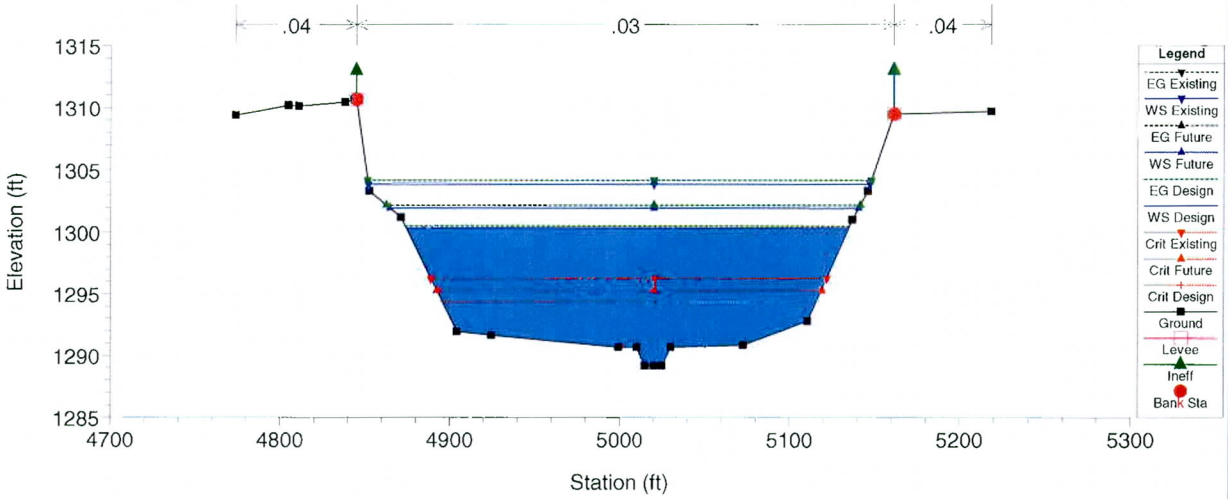
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



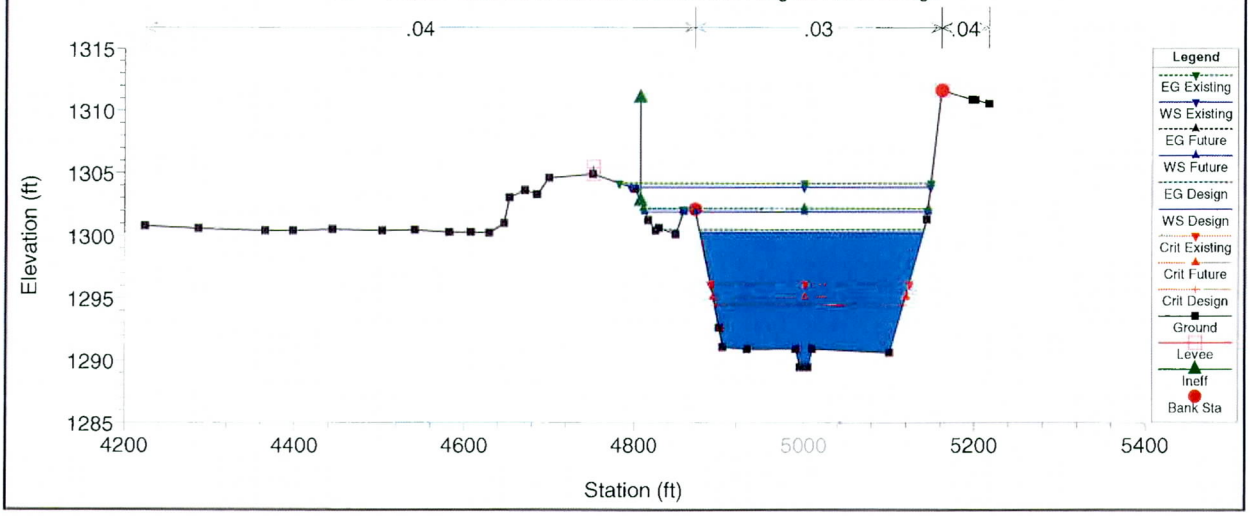
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.249 Chandler Height Road Bridge (Downstream Face)



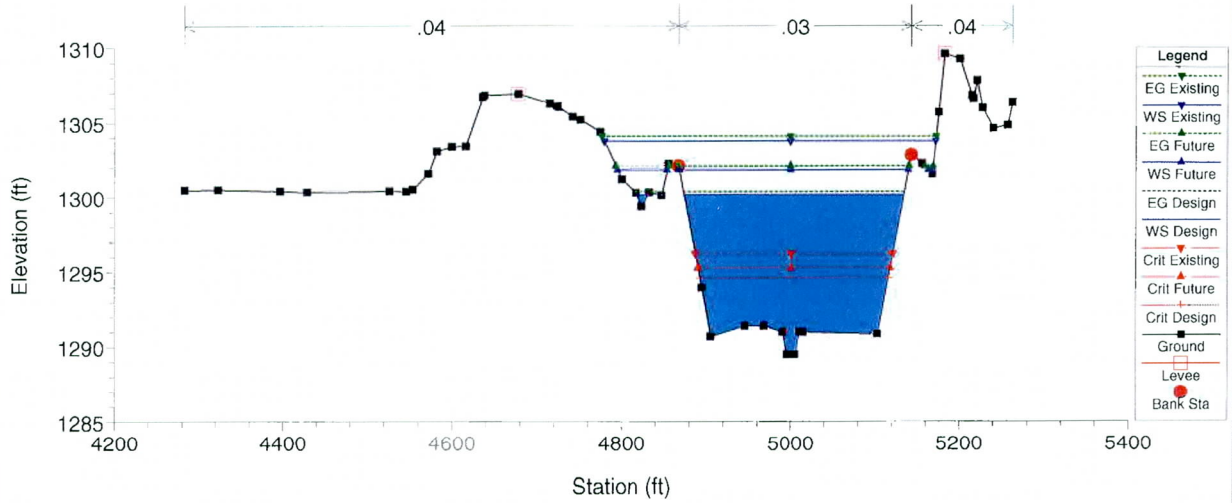
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.231 Just Downstream of Chandler Heights Road Bridge



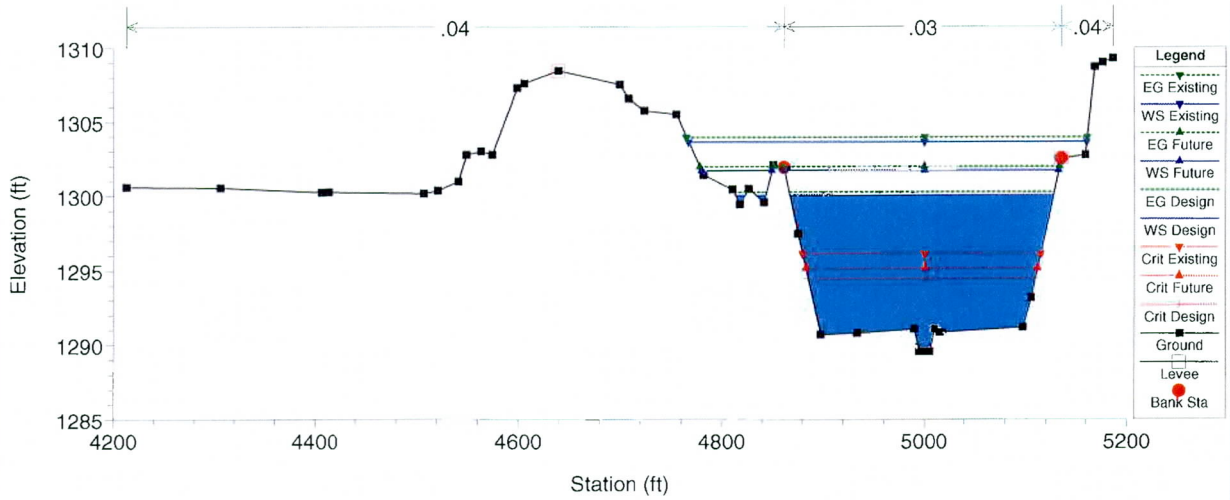
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.189 Dense Grass in channel bed



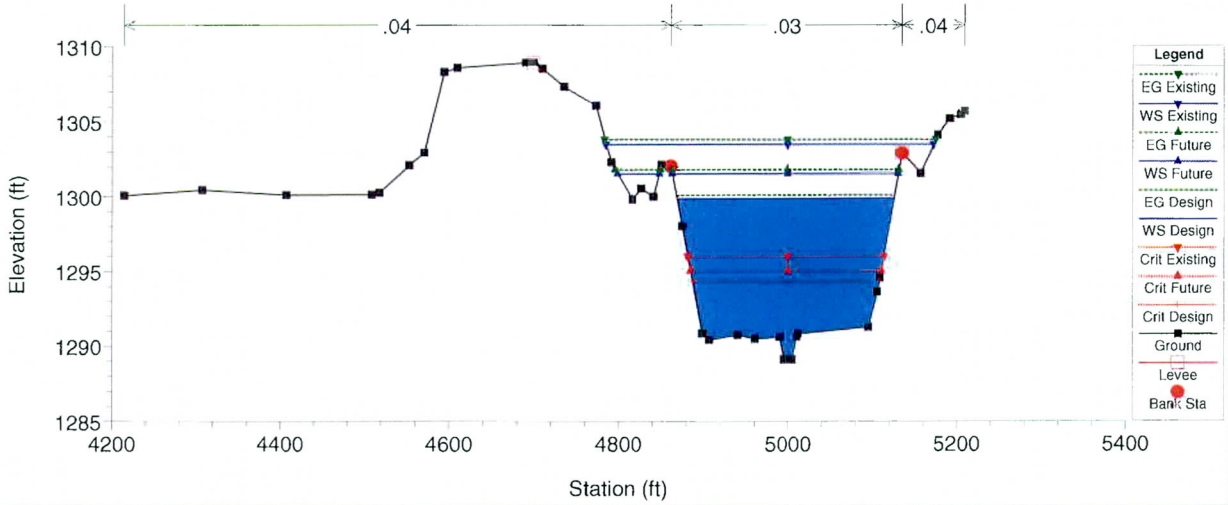
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.127 Dense Grass in channel bed



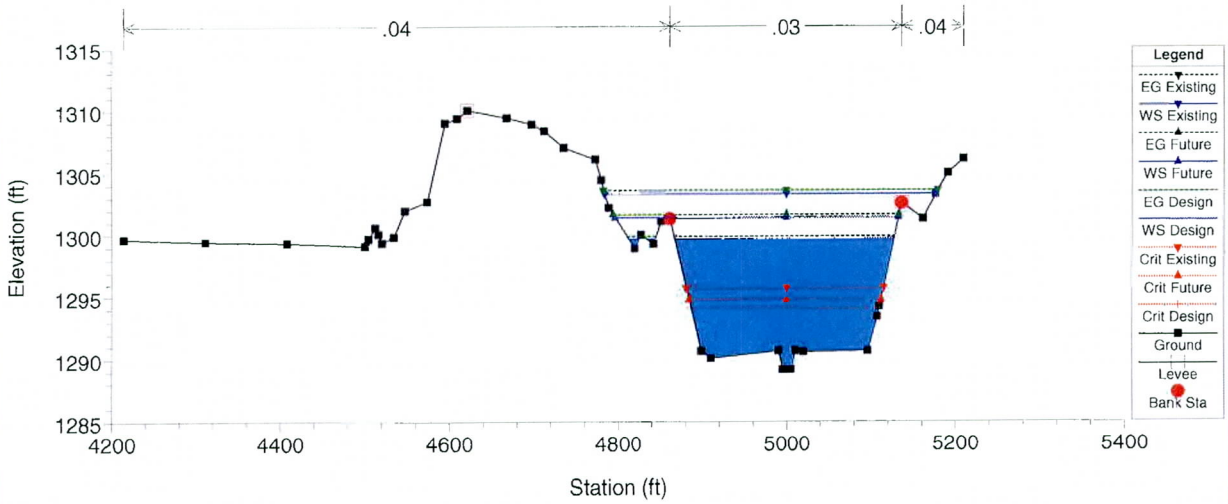
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 11.033 Dense Grass in channel bed



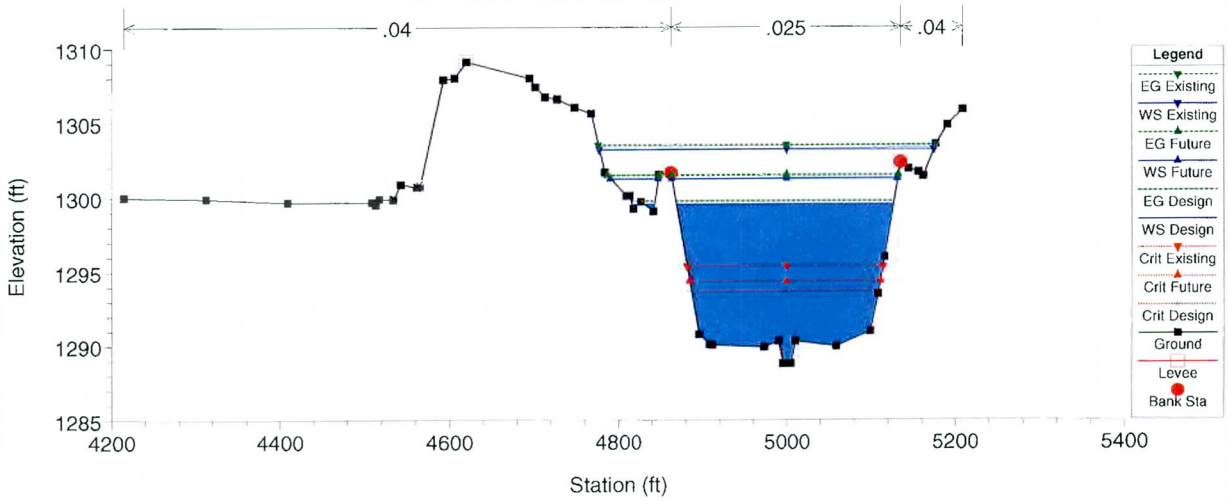
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.938 Dense Grass in channel bed



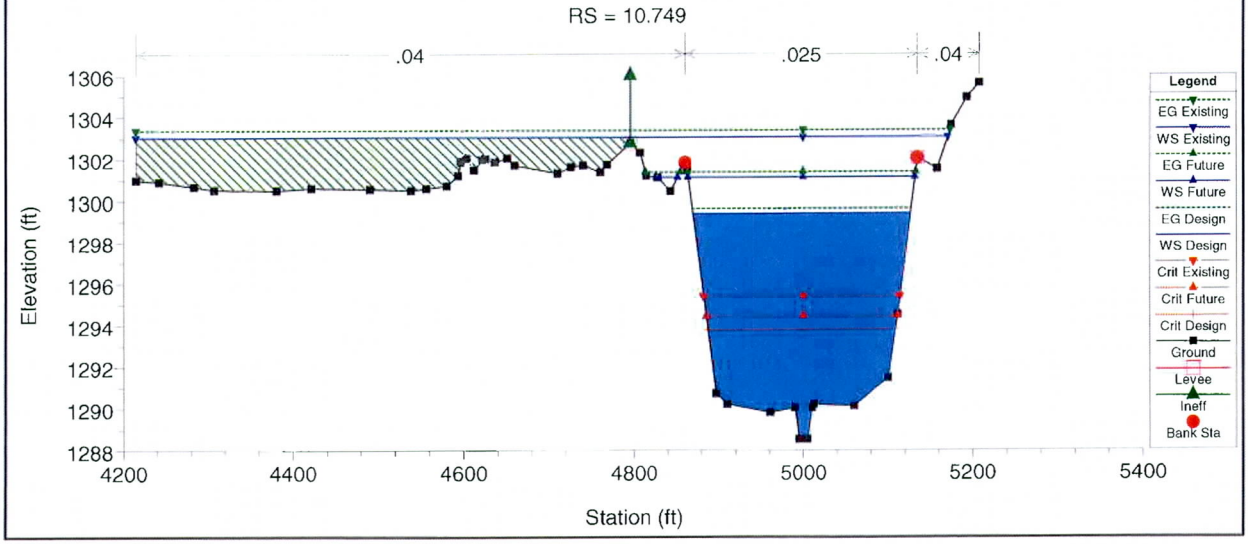
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.843 End Dense Grass in channel bed



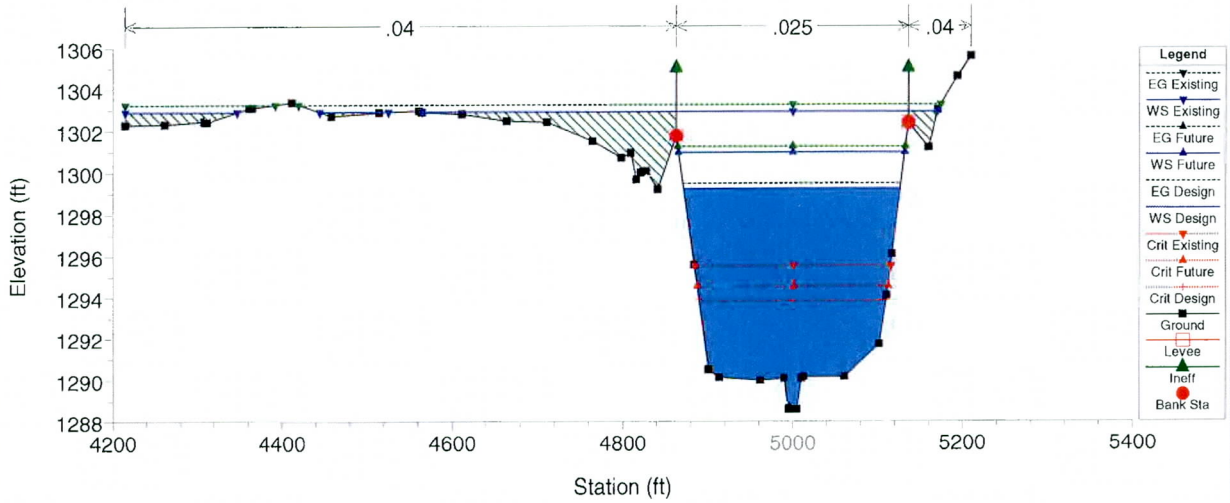
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.749



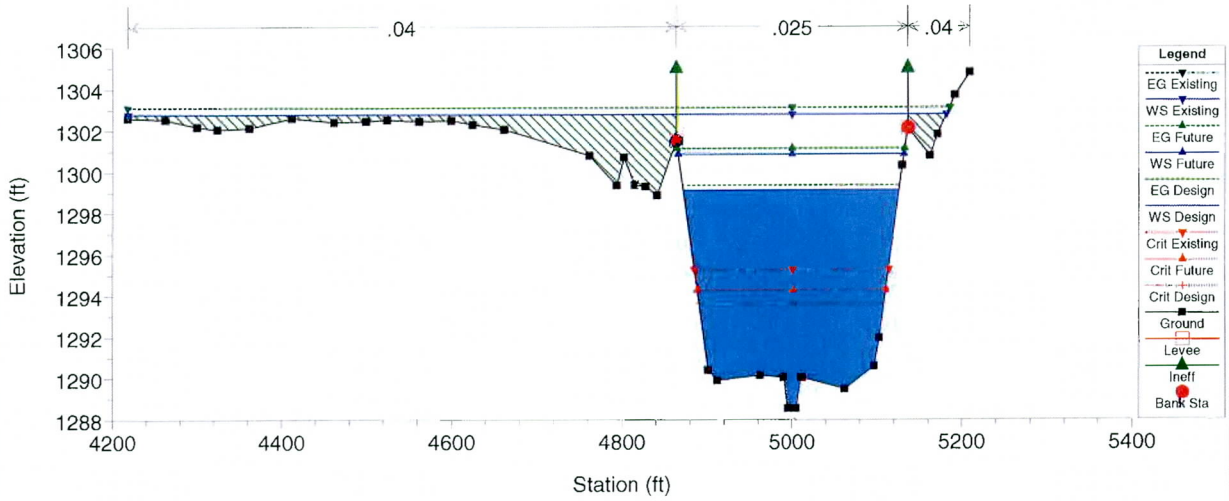
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.654



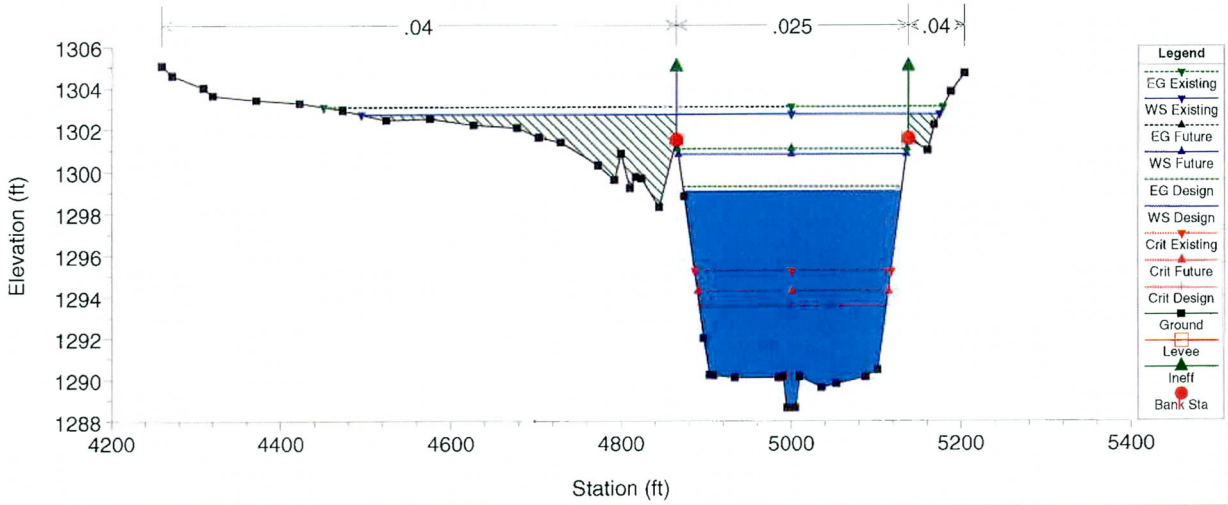
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.566



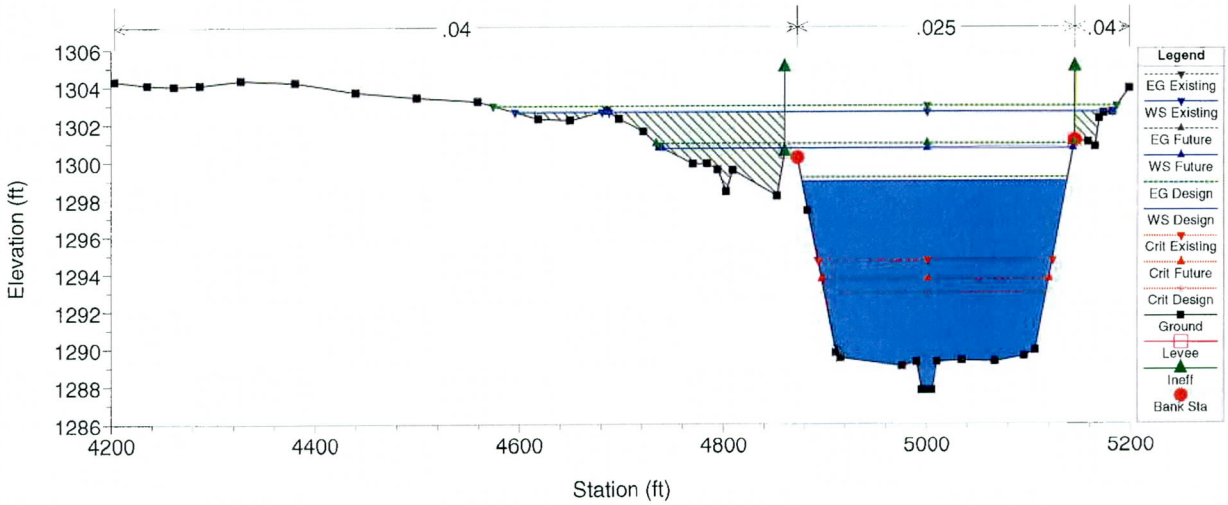
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.518



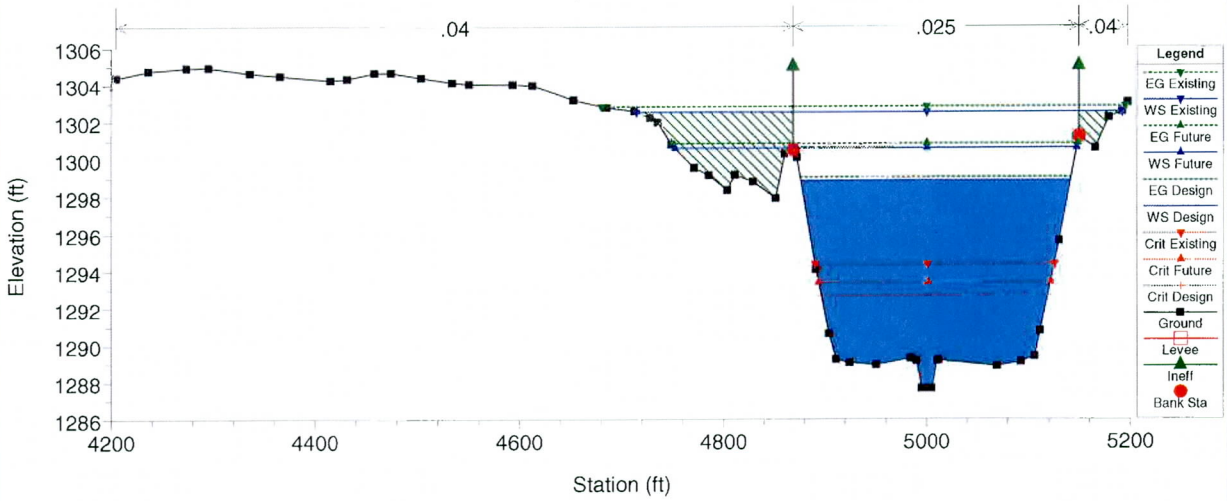
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.441 Downstream of Side Inlet from the Left Bank



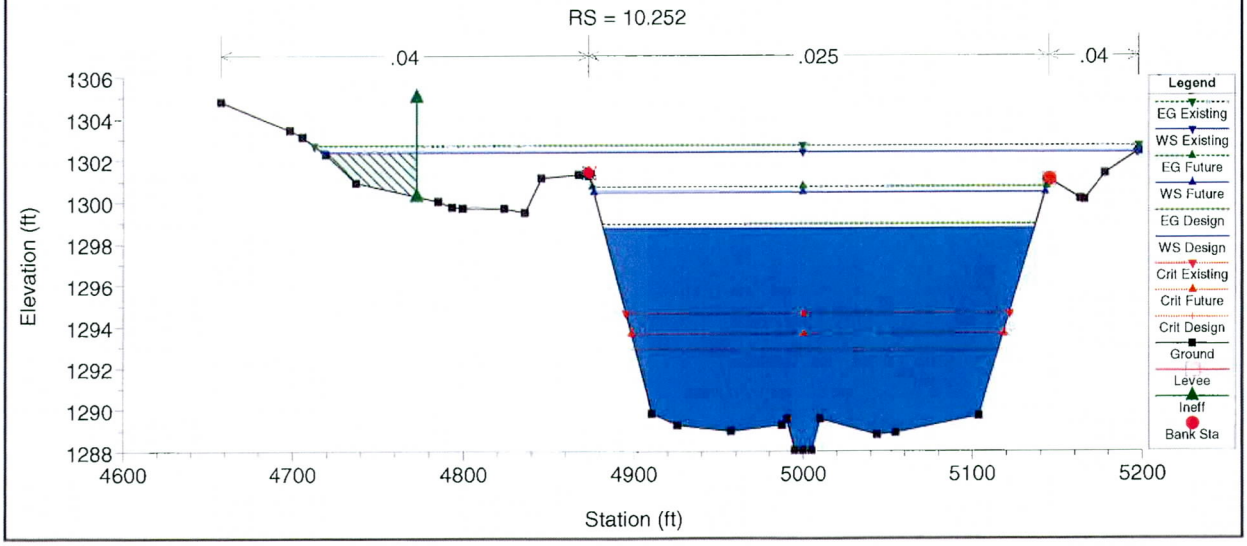
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.346



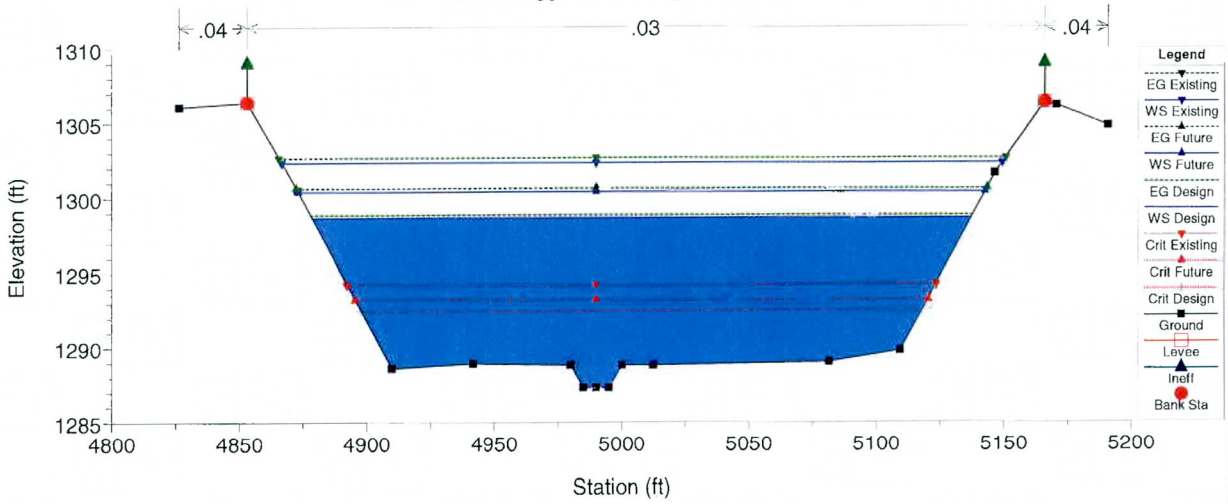
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.252



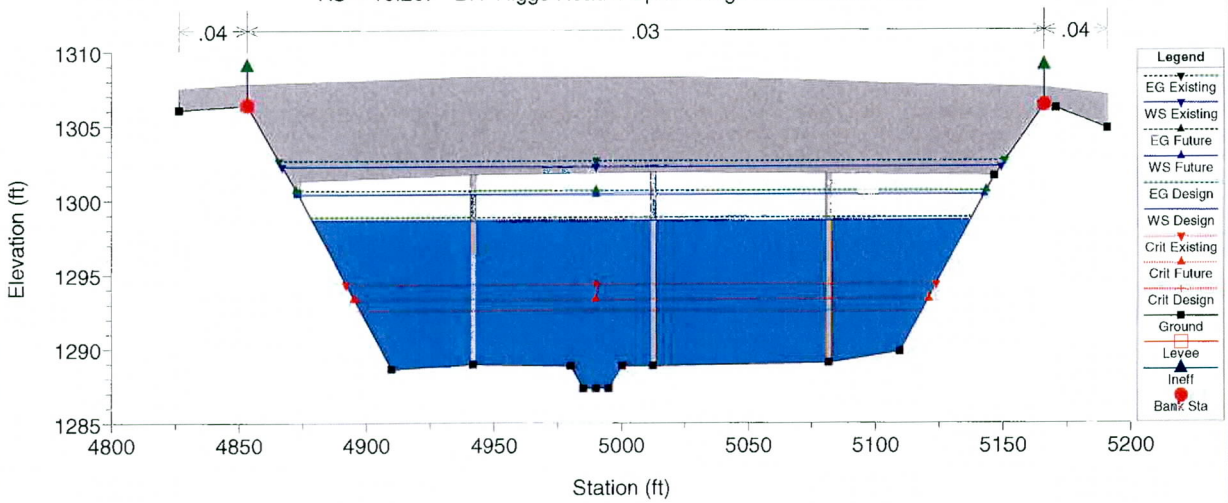
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.218 Riggs Road Bridge (Upstream Face)



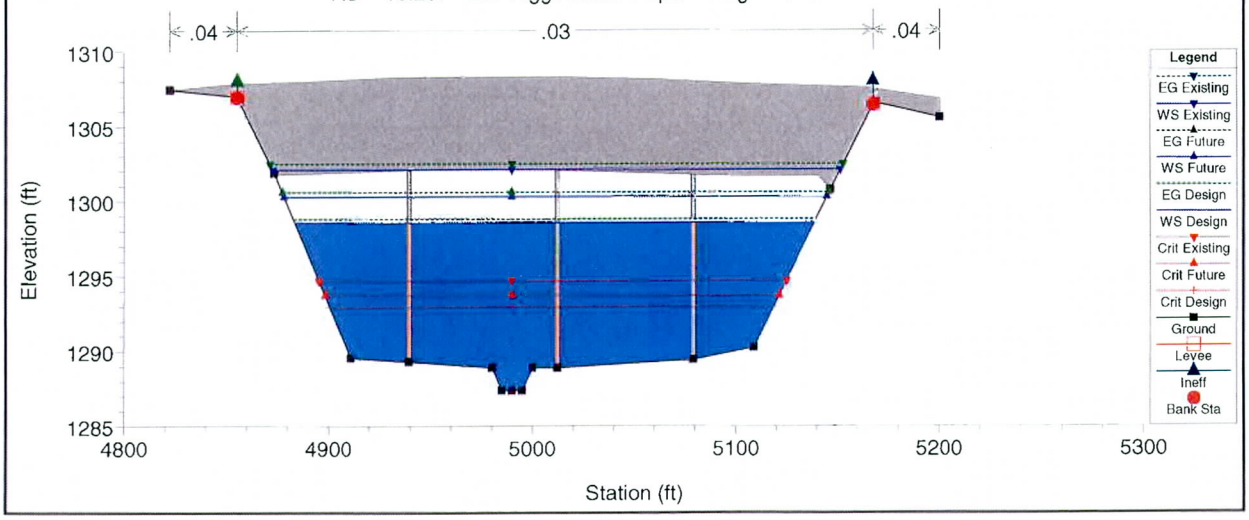
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



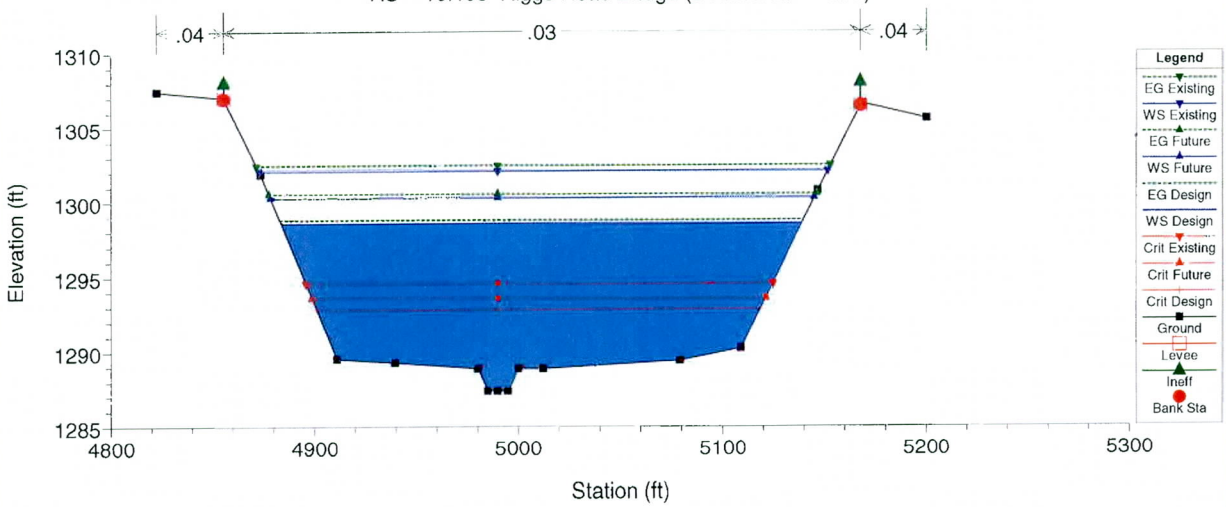
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



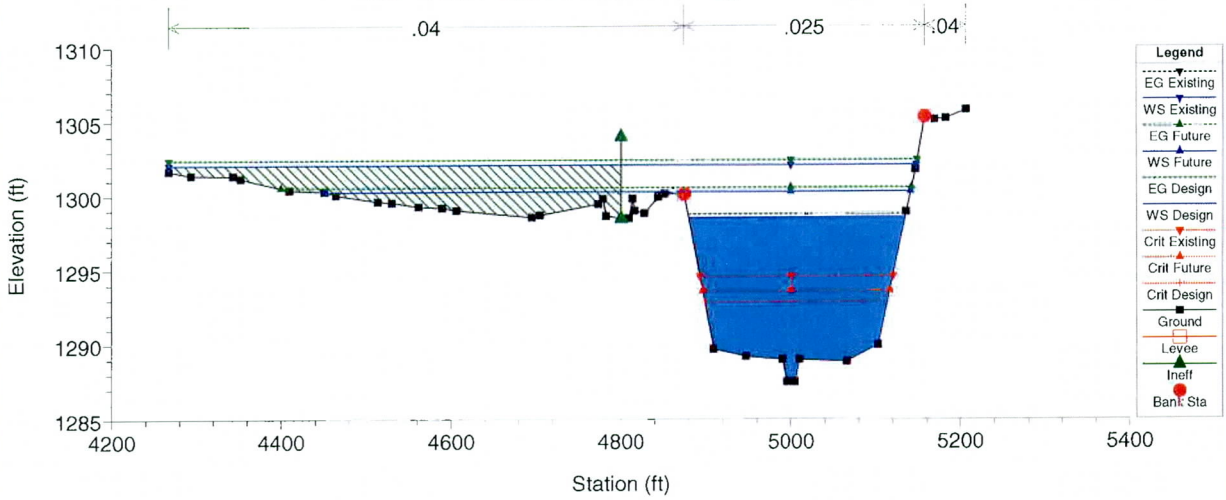
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.195 Riggs Road Bridge (Downstream Face)



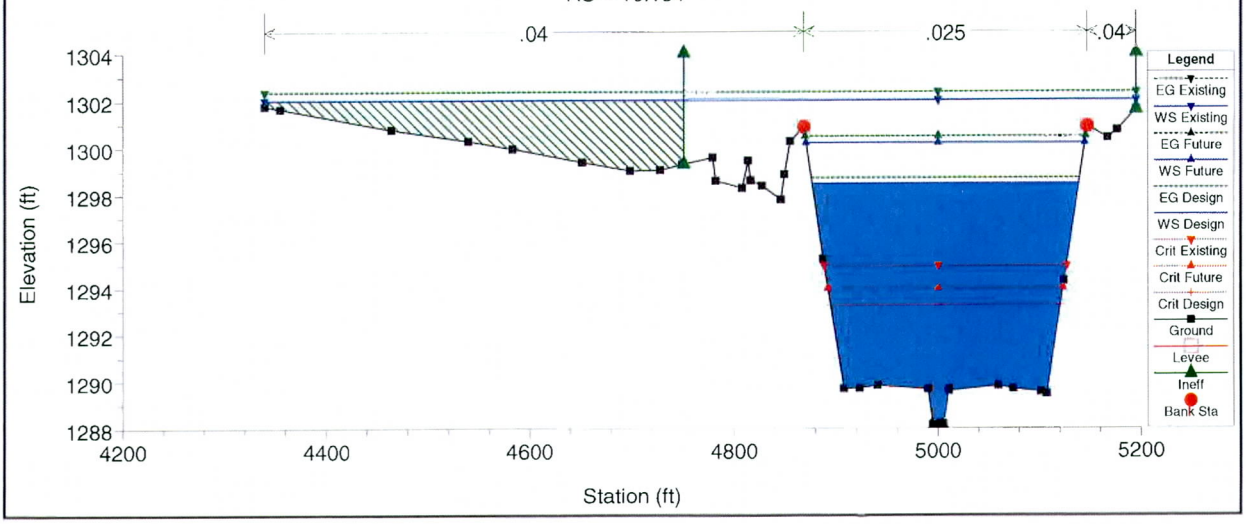
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.171 Just Downstream of Riggs Road Bridge



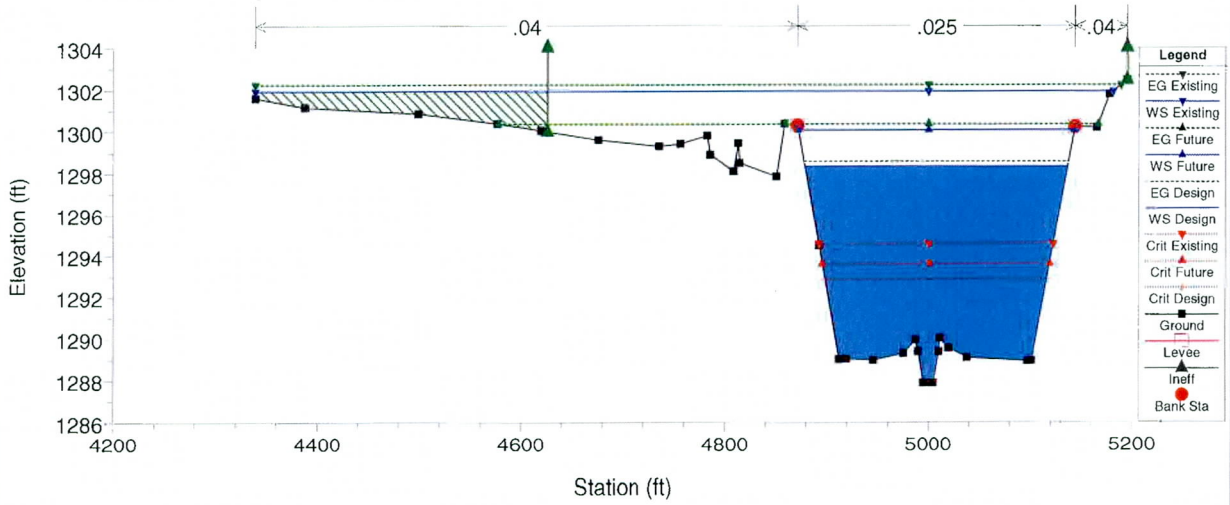
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.134



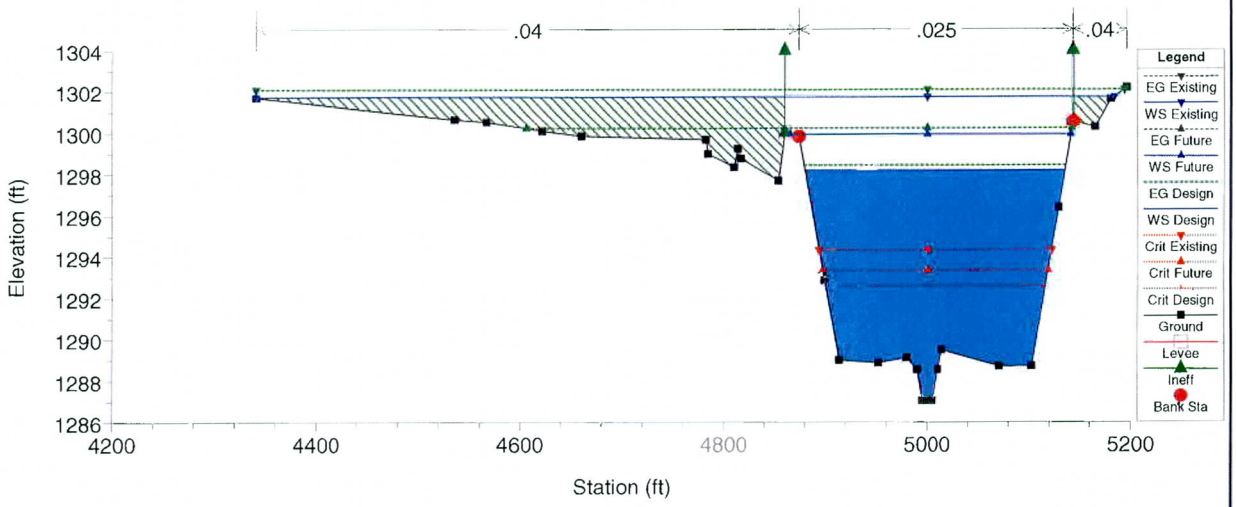
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 10.039



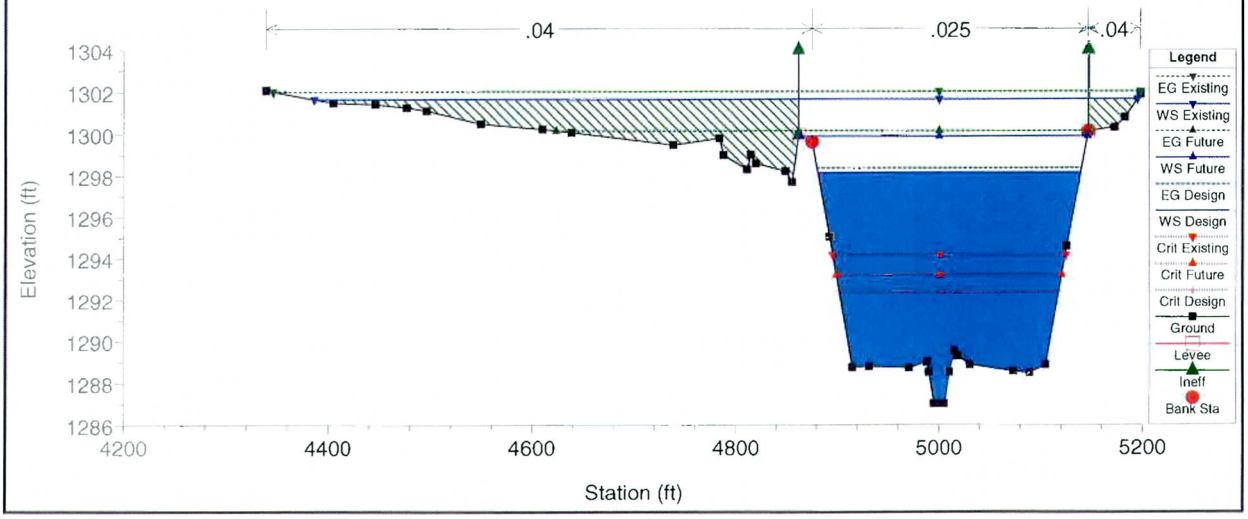
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.944



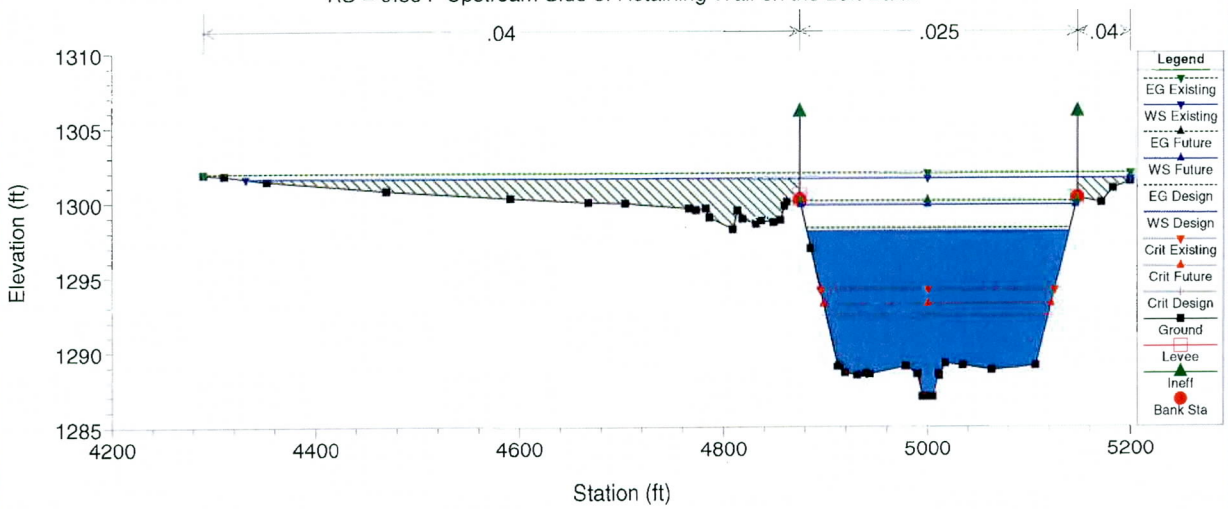
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.897



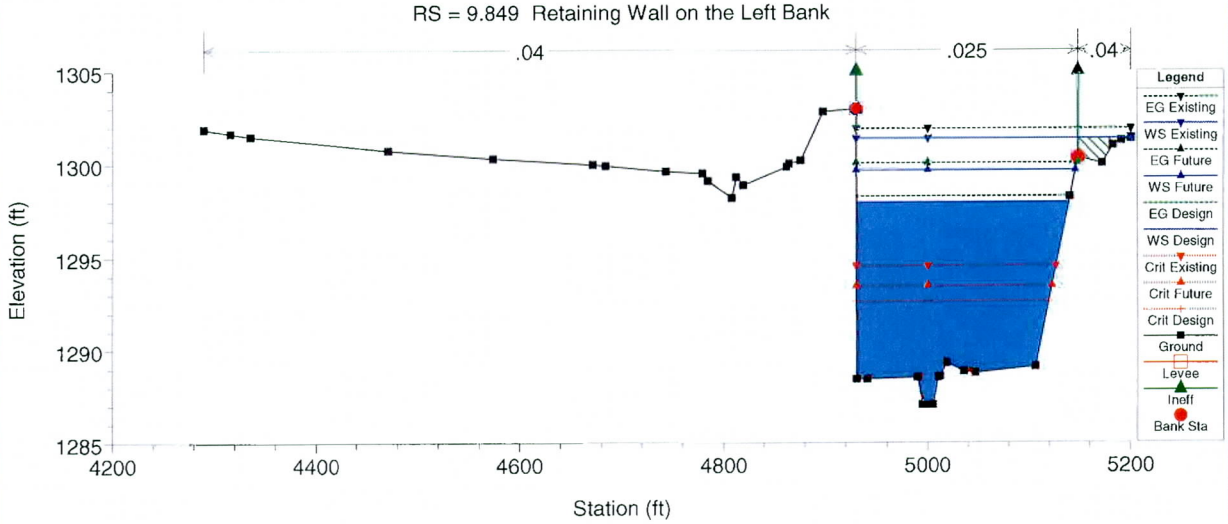
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.854 Upstream Side of Retaining Wall on the Left Bank



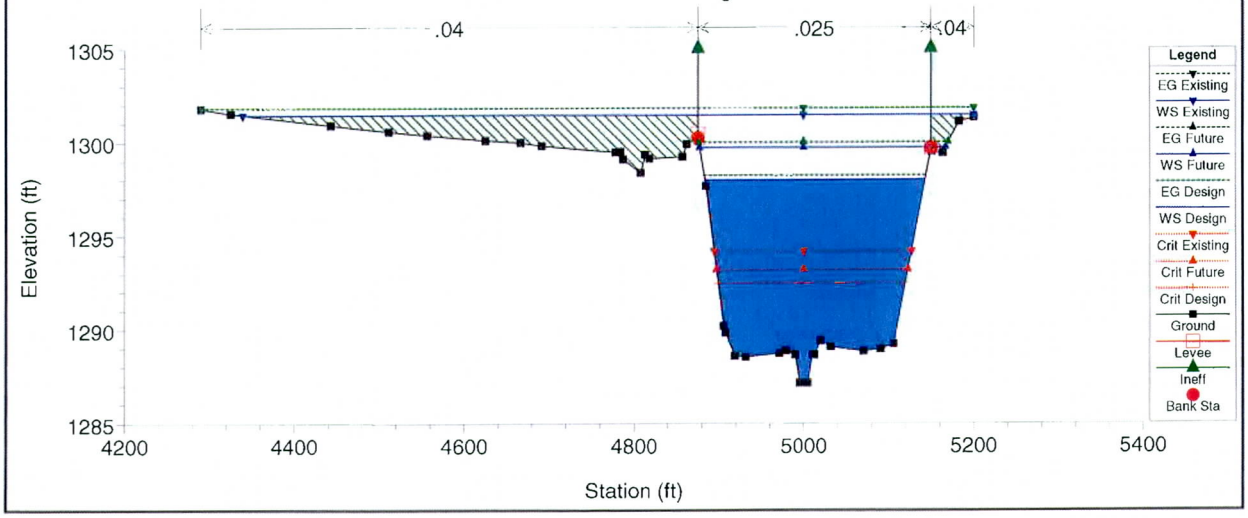
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.849 Retaining Wall on the Left Bank



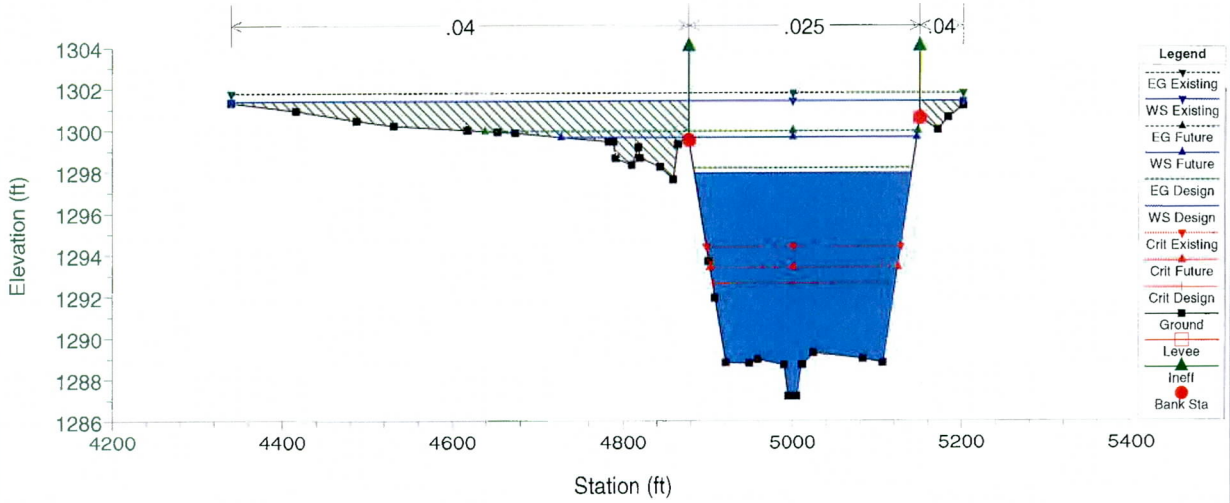
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.844 Downstream Side of Retaining Wall on the Left Bank



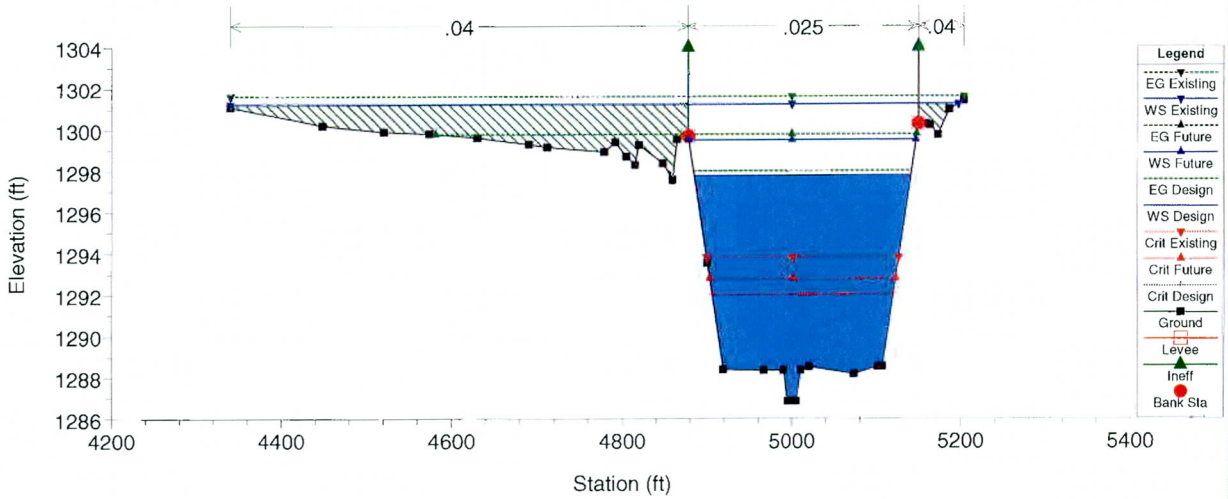
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.802



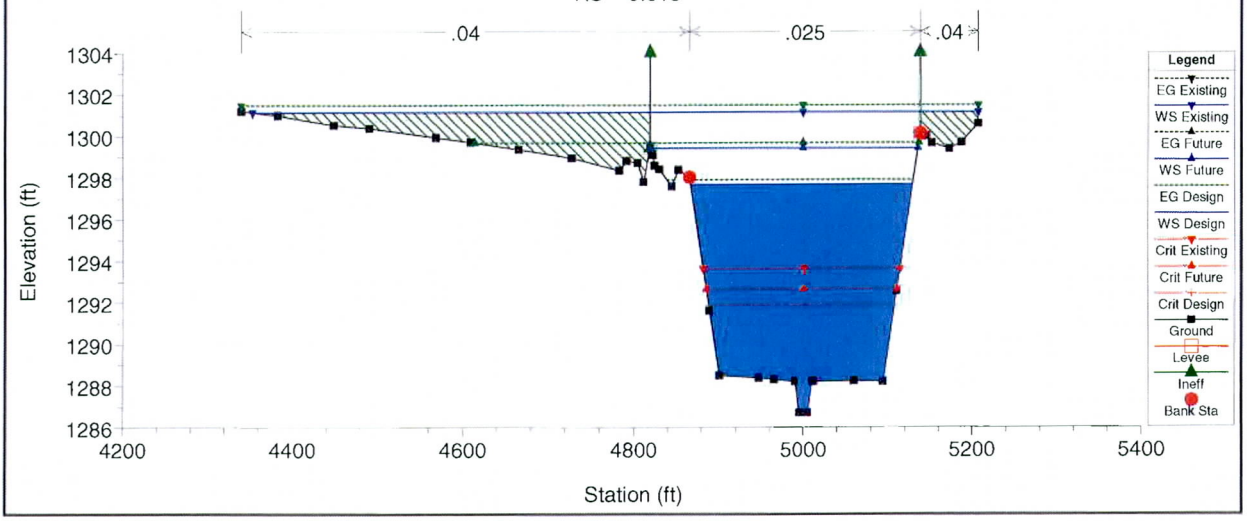
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.708



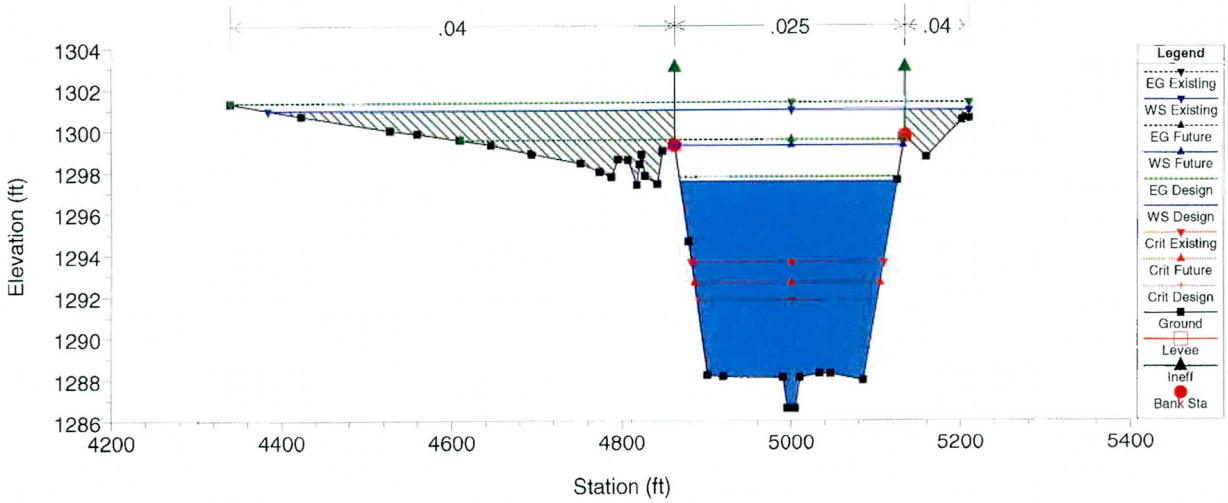
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.613



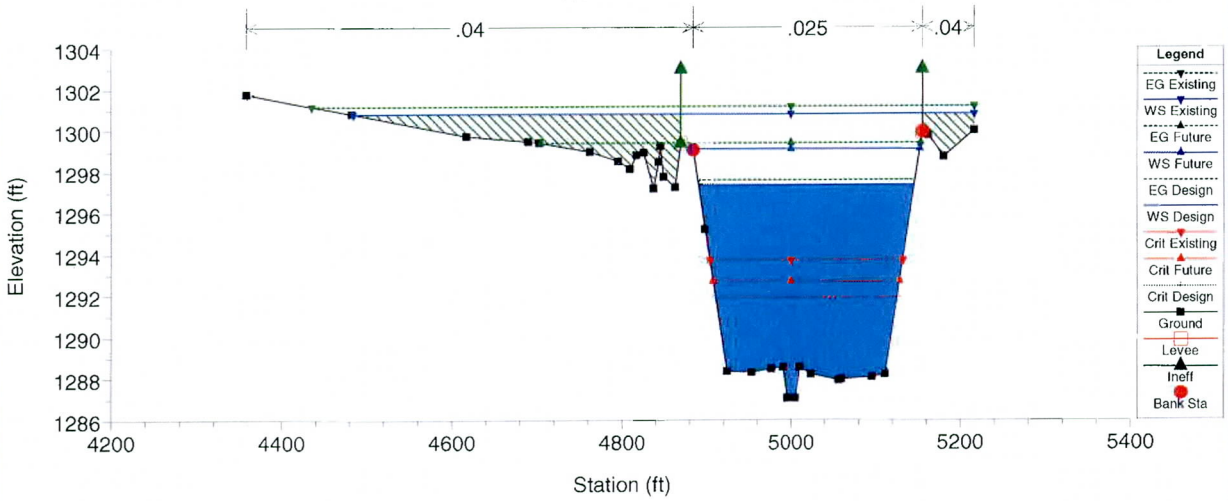
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.518



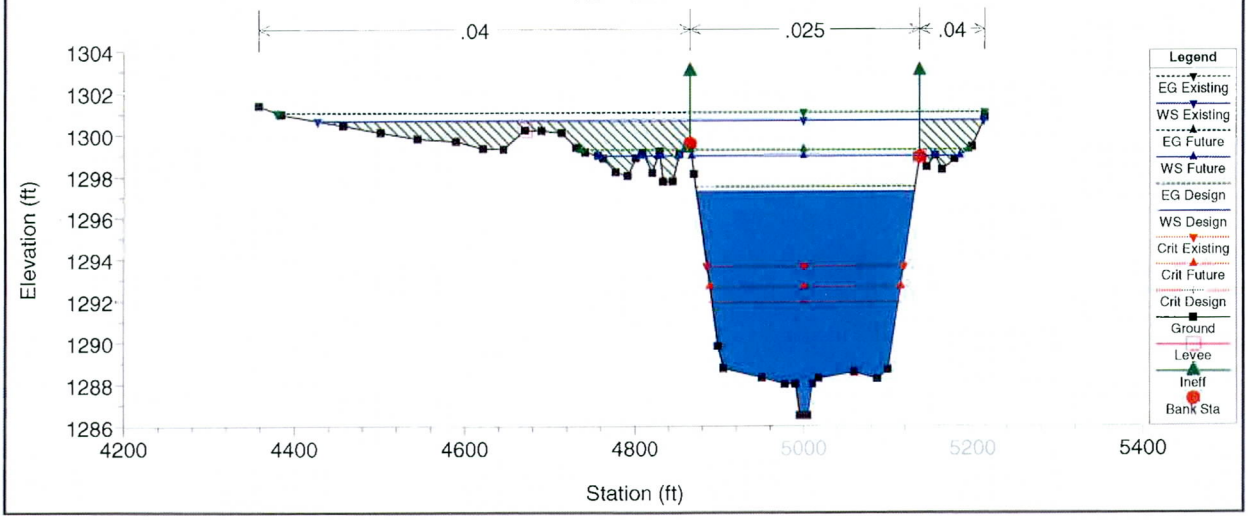
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.424



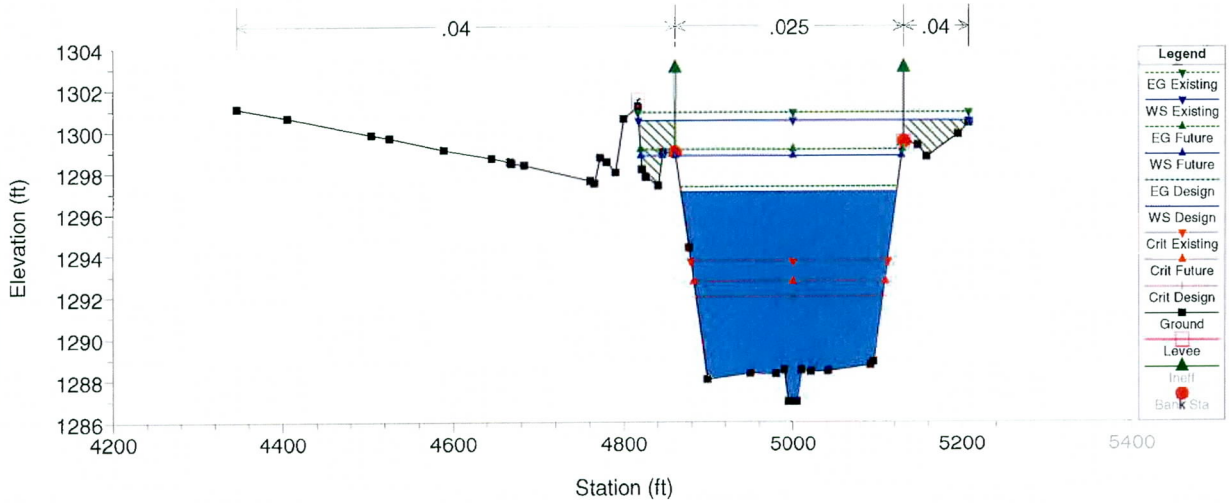
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.334



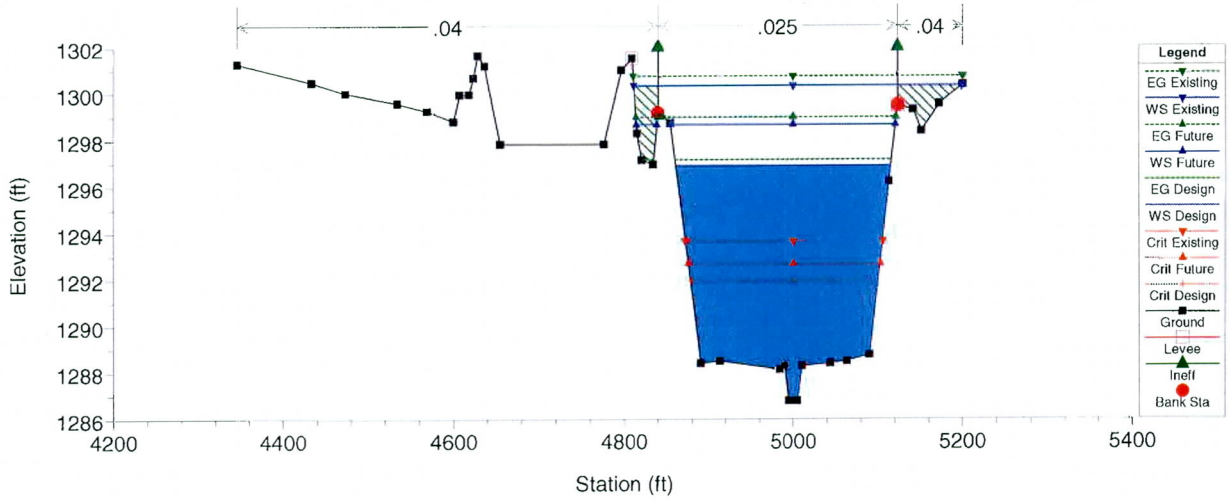
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.24



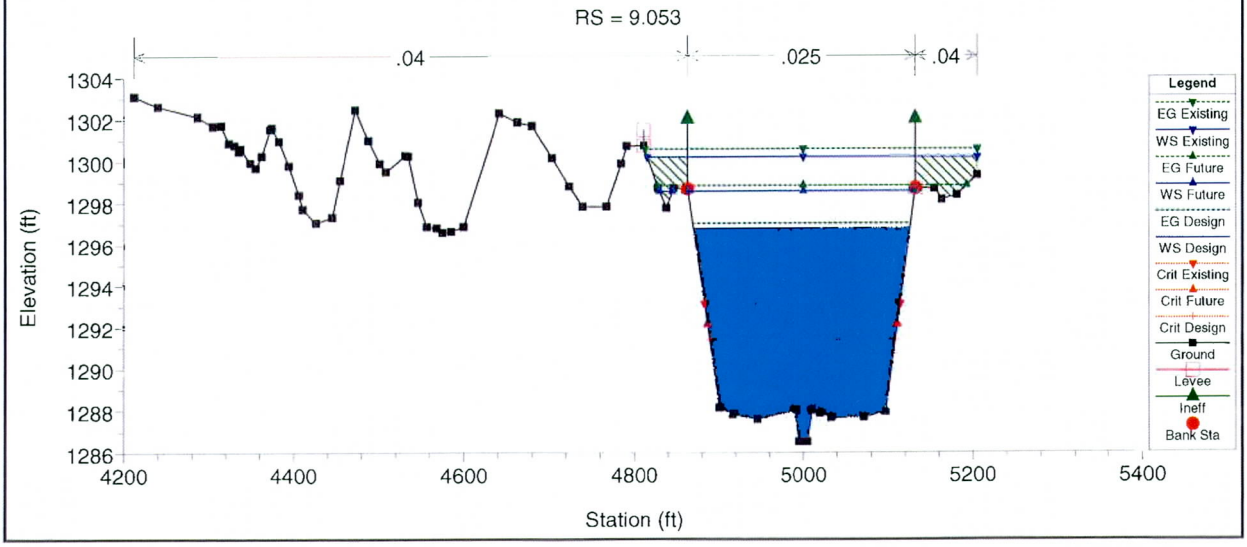
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.145 Detention Basin located East of East Maricopa Floodway Channel



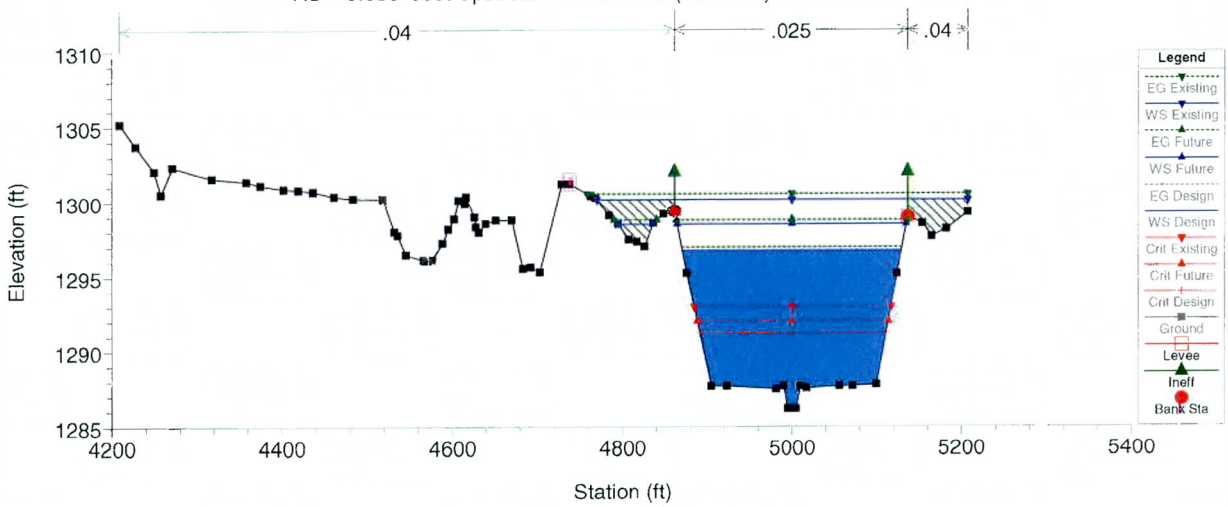
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.053



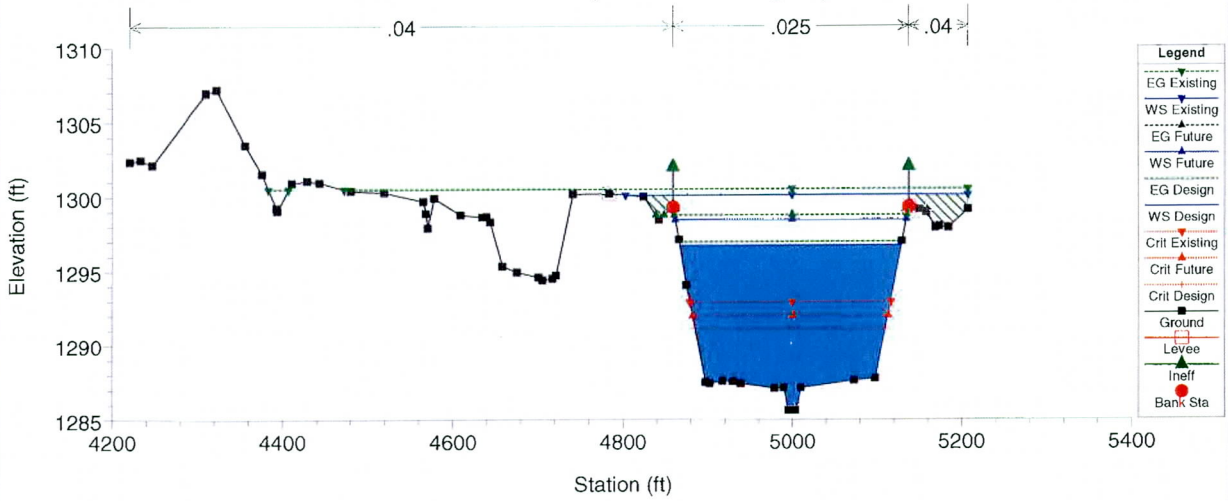
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.036 Just Upstream of Side Inlet (95' Wide) from the Left Bank



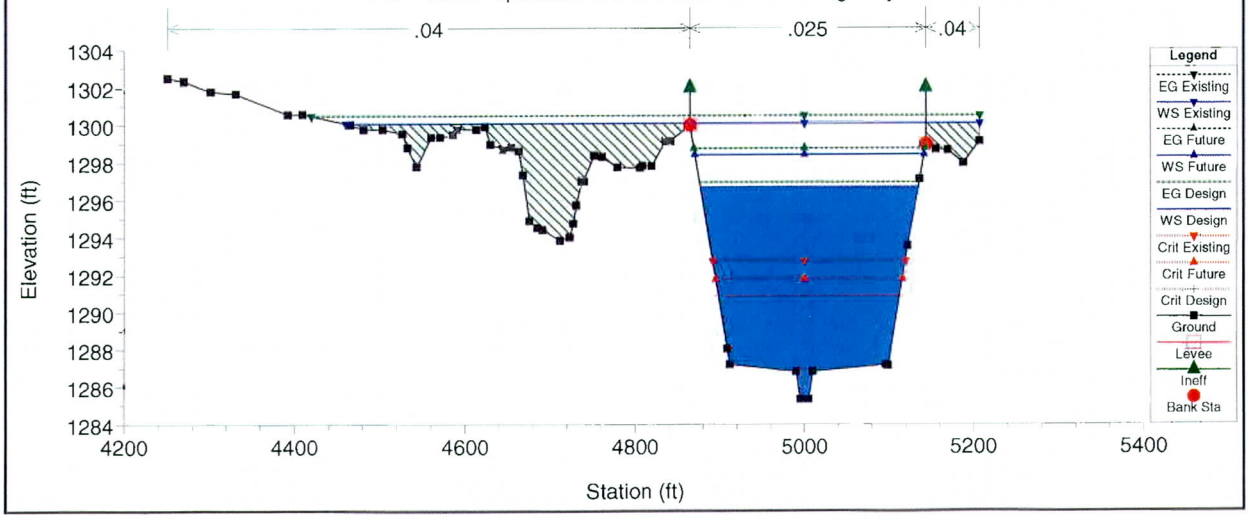
EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.018 Just Upstream of Hunt Highway



EMF Reach 3 and Lower Reach 4_Pre-Cond Plan: EMF Reach 3 and Lower Reach 4_Pre-Cond 6/1/2010

RS = 9.001 Upstream End of Reach 2 at Hunt Highway



Post-Project HEC-RAS Analysis

(NGVD 29)

Queen Creek Improvements Bridge Over EMF - Freeboard Calculations

Station	Proposed Ch. Inv. El.	Original WSEL	Proposed WSEL	Energy Elevation	Left top of Bank El.	Right top of Bank El.	Minimum Depth Provided	Difference in WSEL	Proposed Condition Depth	Proposed He	0.2*He Freeboard Required	Freeboard Provided
1	2	3	4	5	6	7	8	9	10	11	12	13
13.911	1299.38	1308.90	1308.93	1309.31	1315.06	1314.44	15.06	0.03	9.55	9.93	1.99	5.51
13.842	1299.39	1308.65	1308.68	1309.10	1314.73	1314.70	15.31	0.03	9.29	9.71	1.94	6.02
13.755	1299.26	1308.39	1308.43	1308.82	1314.18	1313.96	14.70	0.04	9.17	9.56	1.91	5.53
13.661	1298.26	1308.14	1308.18	1308.55	1314.09	1314.05	15.79	0.04	9.92	10.29	2.06	5.87
13.566	1298.25	1307.85	1307.90	1308.29	1314.17	1314.03	15.78	0.05	9.65	10.04	2.01	6.13
13.471	1298.07	1307.70	1307.75	1308.03	1314.11	1313.60	15.53	0.05	9.68	9.96	1.99	5.85
13.442	1297.84	1307.67	1307.72	1307.94	1314.18	1314.17	16.33	0.05	9.88	10.10	2.02	6.45
13.431 Bridge US	1297.84	1307.64	1307.66	1307.92	1314.18	1314.17	16.33	0.02	9.82	10.08	2.02	6.51
13.431 Bridge DS	1298.61	1307.56	1307.53	1307.83	1314.24	1314.05	15.44	-0.03	8.92	9.22	1.84	6.52
13.426	1298.61	1307.56	1307.56	1307.81	1314.24	1314.05	15.44	0.00	8.95	9.20	1.84	6.49
13.374	1298.27	1307.45	1307.45	1307.70	1310.50	1310.60	12.23	0.00	9.18	9.43	1.89	3.05
13.280	1297.90	1307.27	1307.27	1307.52	1310.40	1310.34	12.44	0.00	9.37	9.62	1.92	3.07

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.911	Design	6900.00	1299.38	1308.93	1304.92	1309.31	0.000538	4.98	1386.20	199.29	0.33
Reach 3	13.911	Future	8970.00	1299.38	1310.23	1305.64	1310.69	0.000536	5.43	1651.48	207.52	0.34
Reach 3	13.911	Existing	12910.00	1299.38	1312.24	1306.87	1312.82	0.000541	6.17	2155.59	265.88	0.35
Reach 3	13.842	Design	6900.00	1299.39	1308.68	1304.96	1309.10	0.000613	5.19	1329.38	197.95	0.35
Reach 3	13.842	Future	8970.00	1299.39	1309.99	1305.69	1310.48	0.000599	5.63	1593.39	206.24	0.36
Reach 3	13.842	Existing	12910.00	1299.39	1311.98	1306.91	1312.61	0.000598	6.37	2072.84	266.91	0.37
Reach 3	13.755	Design	6900.00	1299.26	1308.43	1304.51	1308.82	0.000566	5.06	1362.99	198.49	0.34
Reach 3	13.755	Future	8970.00	1299.26	1309.74	1305.24	1310.21	0.000560	5.51	1628.93	207.10	0.35
Reach 3	13.755	Existing	12910.00	1299.26	1311.74	1306.48	1312.34	0.000558	6.23	2144.26	270.59	0.36
Reach 3	13.661	Design	6900.00	1298.26	1308.18	1303.99	1308.55	0.000509	4.90	1408.60	198.94	0.32
Reach 3	13.661	Future	8970.00	1298.26	1309.49	1304.75	1309.93	0.000511	5.35	1675.25	207.35	0.33
Reach 3	13.661	Existing	12910.00	1298.26	1311.49	1305.99	1312.06	0.000517	6.08	2200.65	270.02	0.34
Reach 3	13.566	Design	6900.00	1298.25	1307.90	1303.75	1308.29	0.000531	5.00	1379.08	194.89	0.33
Reach 3	13.566	Future	8970.00	1298.25	1309.21	1304.50	1309.67	0.000536	5.47	1639.70	203.84	0.34
Reach 3	13.566	Existing	12910.00	1298.25	1311.20	1305.76	1311.79	0.000547	6.23	2143.74	268.54	0.35
Reach 3	13.471	Design	6900.00	1298.07	1307.75	1303.19	1308.03	0.000381	4.28	1613.30	225.45	0.28
Reach 3	13.471	Future	8970.00	1298.07	1309.07	1303.87	1309.41	0.000383	4.68	1917.47	242.25	0.29
Reach 3	13.471	Existing	12910.00	1298.07	1311.08	1304.98	1311.52	0.000391	5.35	2469.61	286.28	0.30
Reach 3	13.442	Design	6900.00	1297.84	1307.72	1302.81	1307.94	0.000402	3.73	1848.28	251.17	0.24
Reach 3	13.442	Future	8970.00	1297.84	1309.04	1303.42	1309.31	0.000406	4.10	2186.40	259.31	0.25
Reach 3	13.442	Existing	12910.00	1297.84	1311.06	1304.47	1311.41	0.000437	4.74	2721.08	273.58	0.27
Reach 3	13.431		Bridge									
Reach 3	13.423	Design	6900.00	1298.61	1307.56	1303.11	1307.81	0.000492	4.00	1726.62	246.04	0.27
Reach 3	13.423	Future	8970.00	1298.61	1308.86	1303.73	1309.16	0.000490	4.37	2053.79	255.07	0.27
Reach 3	13.423	Existing	12910.00	1298.61	1310.84	1304.77	1311.23	0.000517	5.02	2569.86	268.83	0.29
Reach 3	13.374	Design	6900.00	1298.27	1307.45	1303.09	1307.70	0.000352	4.01	1719.75	249.59	0.27
Reach 3	13.374	Future	9070.00	1298.27	1308.75	1303.71	1309.05	0.000355	4.43	2048.77	257.41	0.28
Reach 3	13.374	Existing	12990.00	1298.27	1310.72	1304.76	1311.11	0.000361	5.05	2602.22	330.35	0.29
Reach 3	13.28	Design	6900.00	1297.90	1307.27	1302.77	1307.52	0.000352	4.04	1707.43	244.96	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.28	Future	9070.00	1297.90	1308.56	1303.45	1308.87	0.000359	4.47	2030.08	254.02	0.28
Reach 3	13.28	Existing	12990.00	1297.90	1310.52	1304.52	1310.93	0.000372	5.11	2542.06	326.93	0.29
Reach 3	13.232	Design	6900.00	1297.59	1307.16	1302.90	1307.43	0.000386	4.17	1656.51	243.61	0.28
Reach 3	13.232	Future	9070.00	1297.59	1308.45	1303.51	1308.78	0.000389	4.59	1976.89	252.84	0.29
Reach 3	13.232	Existing	12990.00	1297.59	1310.41	1304.61	1310.83	0.000398	5.23	2485.59	327.64	0.30
Reach 3	13.179	Design	6900.00	1297.89	1307.05	1302.81	1307.32	0.000391	4.19	1648.05	242.83	0.28
Reach 3	13.179	Future	9070.00	1297.89	1308.34	1303.45	1308.67	0.000394	4.61	1966.99	251.97	0.29
Reach 3	13.179	Existing	12990.00	1297.89	1310.29	1304.51	1310.72	0.000403	5.25	2472.95	303.77	0.30
Reach 3	13.084	Design	6900.00	1297.40	1306.87	1302.39	1307.13	0.000351	4.04	1708.97	245.26	0.27
Reach 3	13.084	Future	9070.00	1297.40	1308.16	1303.06	1308.47	0.000359	4.47	2030.50	254.30	0.28
Reach 3	13.084	Existing	12990.00	1297.40	1310.11	1304.10	1310.52	0.000373	5.11	2539.64	307.91	0.29
Reach 3	13.037	Design	6900.00	1297.30	1306.79	1302.21	1307.04	0.000334	3.96	1740.98	247.21	0.26
Reach 3	13.037	Future	9070.00	1297.30	1308.08	1302.87	1308.38	0.000343	4.39	2064.69	256.36	0.27
Reach 3	13.037	Existing	12990.00	1297.30	1310.03	1303.93	1310.42	0.000358	5.04	2576.94	312.42	0.29
Reach 3	12.981	Design	6900.00	1297.30	1306.69	1302.20	1306.94	0.000347	4.03	1713.36	244.39	0.27
Reach 3	12.981	Future	9070.00	1297.30	1307.97	1302.87	1308.28	0.000356	4.46	2031.87	252.85	0.28
Reach 3	12.981	Existing	12990.00	1297.30	1309.91	1303.91	1310.32	0.000370	5.13	2534.16	301.82	0.29
Reach 3	12.905	Design	6900.00	1297.17	1306.55	1302.00	1306.80	0.000346	4.03	1712.14	243.34	0.27
Reach 3	12.905	Future	9070.00	1297.17	1307.82	1302.66	1308.13	0.000357	4.47	2028.69	252.68	0.28
Reach 3	12.905	Existing	12990.00	1297.17	1309.76	1303.74	1310.17	0.000368	5.14	2529.13	309.77	0.29
Reach 3	12.884	Design	6900.00	1297.09	1306.51	1301.93	1306.76	0.000341	3.99	1727.38	246.01	0.27
Reach 3	12.884	Future	9070.00	1297.09	1307.79	1302.61	1308.09	0.000351	4.43	2047.13	255.20	0.28
Reach 3	12.884	Existing	12990.00	1297.09	1309.72	1303.67	1310.12	0.000370	5.08	2558.07	315.99	0.29
Reach 3	12.789	Design	6900.00	1296.60	1306.34	1301.78	1306.59	0.000341	4.00	1723.96	244.87	0.27
Reach 3	12.789	Future	9070.00	1296.60	1307.61	1302.43	1307.92	0.000353	4.44	2040.58	254.11	0.28
Reach 3	12.789	Existing	12990.00	1296.60	1309.53	1303.49	1309.94	0.000368	5.11	2540.94	302.14	0.29
Reach 3	12.694	Design	6900.00	1296.54	1306.16	1301.67	1306.42	0.000348	4.03	1714.20	245.39	0.27
Reach 3	12.694	Future	9070.00	1296.54	1307.43	1302.33	1307.74	0.000360	4.47	2029.55	254.20	0.28
Reach 3	12.694	Existing	12990.00	1296.54	1309.34	1303.38	1309.75	0.000374	5.14	2527.40	301.95	0.29

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	12.6	Design	6900.00	1296.53	1305.97	1301.63	1306.23	0.000378	4.13	1669.90	244.54	0.28
Reach 3	12.6	Future	9070.00	1296.53	1307.22	1302.31	1307.55	0.000388	4.57	1982.77	253.72	0.29
Reach 3	12.6	Existing	12990.00	1296.53	1309.13	1303.37	1309.56	0.000403	5.24	2479.20	299.02	0.30
Reach 3	12.552	Design	6900.00	1296.15	1305.89	1301.38	1306.14	0.000350	4.04	1709.72	244.84	0.27
Reach 3	12.552	Future	9070.00	1296.15	1307.14	1302.04	1307.45	0.000364	4.49	2022.29	254.01	0.28
Reach 3	12.552	Existing	12990.00	1296.15	1309.04	1303.10	1309.45	0.000382	5.16	2517.96	296.71	0.30
Reach 3	12.488	Design	6900.00	1296.30	1305.76	1301.42	1306.02	0.000369	4.10	1684.16	245.41	0.28
Reach 3	12.488	Future	9070.00	1296.30	1307.00	1302.08	1307.33	0.000380	4.54	1995.88	253.92	0.29
Reach 3	12.488	Existing	12990.00	1296.30	1308.90	1303.12	1309.32	0.000397	5.22	2488.79	298.02	0.30
Reach 3	12.441	Design	6900.00	1296.21	1305.65	1301.38	1305.92	0.000384	4.16	1658.38	243.40	0.28
Reach 3	12.441	Future	9070.00	1296.21	1306.90	1302.03	1307.23	0.000395	4.61	1966.73	252.14	0.29
Reach 3	12.441	Existing	12990.00	1296.21	1308.79	1303.10	1309.22	0.000413	5.29	2454.94	302.25	0.31
Reach 3	12.349	Design	6900.00	1296.16	1305.46	1301.13	1305.73	0.000389	4.21	1640.11	238.71	0.28
Reach 3	12.349	Future	9070.00	1296.16	1306.70	1301.79	1307.03	0.000403	4.67	1940.43	247.44	0.29
Reach 3	12.349	Existing	12990.00	1296.16	1308.57	1302.89	1309.02	0.000427	5.38	2415.94	260.66	0.31
Reach 3	12.302	Design	6900.00	1296.42	1305.35	1301.19	1305.63	0.000413	4.29	1607.71	237.69	0.29
Reach 3	12.302	Future	9070.00	1296.42	1306.58	1301.82	1306.93	0.000425	4.76	1905.34	246.12	0.30
Reach 3	12.302	Existing	12990.00	1296.42	1308.44	1302.92	1308.91	0.000448	5.47	2375.72	258.88	0.32
Reach 3	12.245	Design	6900.00	1296.00	1305.22	1300.97	1305.51	0.000409	4.29	1607.60	235.82	0.29
Reach 3	12.245	Future	9070.00	1296.00	1306.45	1301.64	1306.80	0.000425	4.77	1902.14	245.11	0.30
Reach 3	12.245	Existing	12990.00	1296.00	1308.30	1302.74	1308.77	0.000452	5.48	2369.65	259.18	0.32
Reach 3	12.177	Design	6900.00	1296.00	1305.10	1300.76	1305.36	0.000378	4.16	1659.03	240.45	0.28
Reach 3	12.177	Future	9070.00	1296.00	1306.32	1301.43	1306.65	0.000394	4.63	1957.41	248.46	0.29
Reach 3	12.177	Existing	12990.00	1296.00	1308.16	1302.50	1308.61	0.000421	5.35	2427.23	817.92	0.31
Reach 3	12.082	Design	6900.00	1295.82	1304.88	1300.71	1305.17	0.000409	4.26	1620.77	240.83	0.29
Reach 3	12.082	Future	9070.00	1295.82	1306.10	1301.37	1306.44	0.000424	4.73	1917.97	249.62	0.30
Reach 3	12.082	Existing	12990.00	1295.82	1307.93	1302.45	1308.39	0.000445	5.44	2393.36	920.60	0.32
Reach 3	11.988	Design	6900.00	1295.43	1304.71	1300.29	1304.97	0.000364	4.10	1683.67	242.66	0.27
Reach 3	11.988	Future	9070.00	1295.43	1305.91	1300.94	1306.24	0.000383	4.58	1980.89	251.03	0.29
Reach 3	11.988	Existing	12990.00	1295.43	1307.73	1302.03	1308.17	0.000412	5.30	2451.31	275.54	0.31

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.893	Design	6900.00	1295.21	1304.51	1300.25	1304.78	0.000388	4.18	1650.81	242.25	0.28
Reach 3	11.893	Future	9070.00	1295.21	1305.70	1300.91	1306.04	0.000407	4.66	1944.63	250.54	0.30
Reach 3	11.893	Existing	12990.00	1295.21	1307.50	1301.95	1307.95	0.000438	5.40	2407.74	263.07	0.31
Reach 3	11.798	Design	6900.00	1295.17	1304.31	1300.10	1304.58	0.000395	4.21	1640.20	241.62	0.28
Reach 3	11.798	Future	9070.00	1295.17	1305.49	1300.74	1305.83	0.000415	4.70	1930.31	249.55	0.30
Reach 3	11.798	Existing	12990.00	1295.17	1307.27	1301.80	1307.73	0.000448	5.44	2386.21	261.53	0.32
Reach 3	11.703	Design	6900.00	1295.18	1304.07	1300.12	1304.37	0.000447	4.37	1578.47	240.83	0.30
Reach 3	11.703	Future	9070.00	1295.18	1305.24	1300.77	1305.61	0.000464	4.86	1864.84	249.08	0.31
Reach 3	11.703	Existing	12990.00	1295.18	1307.01	1301.85	1307.49	0.000495	5.61	2315.12	261.53	0.33
Reach 3	11.609	Design	6900.00	1295.12	1303.85	1300.01	1304.14	0.000451	4.36	1582.70	244.31	0.30
Reach 3	11.609	Future	9070.00	1295.12	1305.01	1300.66	1305.38	0.000465	4.85	1870.69	251.36	0.31
Reach 3	11.609	Existing	12990.00	1295.12	1306.76	1301.68	1307.25	0.000493	5.60	2319.48	261.92	0.33
Reach 3	11.572	Design	6900.00	1295.17	1303.73	1300.03	1304.05	0.000497	4.53	1523.37	238.42	0.32
Reach 3	11.572	Future	9070.00	1295.17	1304.89	1300.69	1305.28	0.000510	5.03	1802.71	245.48	0.33
Reach 3	11.572	Existing	12990.00	1295.17	1306.62	1301.72	1307.14	0.000540	5.81	2237.25	256.07	0.35
Reach 3	11.531	Design	6900.00	1294.79	1303.63	1299.95	1303.94	0.000495	4.51	1531.21	241.04	0.32
Reach 3	11.531	Future	9070.00	1294.79	1304.78	1300.58	1305.17	0.000508	5.00	1813.32	248.43	0.33
Reach 3	11.531	Existing	12990.00	1294.79	1306.51	1301.63	1307.02	0.000537	5.77	2252.21	259.53	0.35
Reach 3	11.486	Design	6900.00	1295.34	1303.48	1300.05	1303.82	0.000553	4.64	1486.04	242.89	0.33
Reach 3	11.486	Future	9070.00	1295.34	1304.63	1300.69	1305.04	0.000556	5.12	1769.91	250.36	0.34
Reach 3	11.486	Existing	12990.00	1295.34	1306.35	1301.70	1306.89	0.000577	5.88	2210.32	261.27	0.36
Reach 3	11.391	Design	6900.00	1294.70	1303.22	1299.67	1303.54	0.000525	4.57	1508.32	242.78	0.32
Reach 3	11.391	Future	9070.00	1294.70	1304.37	1300.29	1304.77	0.000534	5.06	1791.32	250.23	0.33
Reach 3	11.391	Existing	12990.00	1294.70	1306.08	1301.36	1306.60	0.000561	5.83	2228.34	261.31	0.35
Reach 3	11.328	Design	6900.00	1294.88	1303.04	1299.36	1303.37	0.000521	4.62	1493.88	235.96	0.32
Reach 3	11.328	Future	9070.00	1294.88	1304.18	1300.02	1304.58	0.000539	5.13	1767.36	244.38	0.34
Reach 3	11.328	Existing	12990.00	1294.88	1305.86	1301.11	1306.41	0.000579	5.93	2190.70	256.86	0.36
Reach 3	11.321	Design	6900.00	1296.29	1300.86	1300.86	1302.84	0.001623	11.31	610.15	152.45	1.00
Reach 3	11.321	Future	9070.00	1296.29	1301.78	1301.78	1304.01	0.001561	11.98	757.02	168.53	1.00

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.321	Existing	12990.00	1296.29	1303.14	1303.14	1305.76	0.001470	12.99	1000.03	189.14	1.00
Reach 3	11.308	Design	6900.00	1290.71	1300.36	1295.60	1300.73	0.000129	4.94	1397.56	186.01	0.32
Reach 3	11.308	Future	9070.00	1290.71	1301.98	1296.49	1302.42	0.000125	5.30	1710.09	198.95	0.32
Reach 3	11.308	Existing	12990.00	1290.71	1303.89	1297.84	1304.48	0.000142	6.17	2105.04	214.54	0.35
Reach 3	11.297	Design	6900.00	1289.28	1300.43	1294.72	1300.63	0.000329	3.58	1928.32	239.42	0.22
Reach 3	11.297	Future	9070.00	1289.28	1302.07	1295.40	1302.30	0.000324	3.89	2329.78	252.16	0.23
Reach 3	11.297	Existing	12990.00	1289.28	1304.01	1296.51	1304.34	0.000375	4.58	2834.04	267.55	0.25
Reach 3	11.26	Design	6900.00	1288.90	1300.40	1294.15	1300.55	0.000237	3.12	2208.89	263.94	0.19
Reach 3	11.26	Future	10060.00	1288.90	1302.01	1295.07	1302.24	0.000297	3.80	2644.08	277.54	0.22
Reach 3	11.26	Existing	13910.00	1288.90	1303.96	1296.05	1304.25	0.000327	4.35	3200.92	295.64	0.23
Reach 3	11.254		Bridge									
Reach 3	11.249	Design	6900.00	1289.19	1300.36	1294.37	1300.52	0.000264	3.24	2127.78	260.43	0.20
Reach 3	11.249	Future	10060.00	1289.19	1301.96	1295.29	1302.20	0.000330	3.94	2553.70	275.64	0.23
Reach 3	11.249	Existing	13910.00	1289.19	1303.89	1296.27	1304.20	0.000359	4.47	3109.30	295.12	0.24
Reach 3	11.231	Design	8100.00	1289.43	1300.26	1294.43	1300.48	0.000341	3.72	2178.99	269.57	0.23
Reach 3	11.231	Future	10470.00	1289.43	1301.92	1295.10	1302.16	0.000321	3.98	2678.91	319.33	0.23
Reach 3	11.231	Existing	14320.00	1289.43	1303.86	1296.09	1304.17	0.000323	4.46	3334.08	352.75	0.23
Reach 3	11.189	Design	8100.00	1289.50	1300.17	1294.59	1300.40	0.000370	3.82	2122.31	275.40	0.24
Reach 3	11.189	Future	10470.00	1289.50	1301.83	1295.26	1302.09	0.000344	4.07	2639.84	335.56	0.23
Reach 3	11.189	Existing	14320.00	1289.50	1303.78	1296.22	1304.09	0.000337	4.52	3369.23	392.74	0.24
Reach 3	11.127	Design	8100.00	1289.57	1300.05	1294.49	1300.28	0.000370	3.83	2122.10	278.45	0.24
Reach 3	11.127	Future	10470.00	1289.57	1301.72	1295.16	1301.98	0.000342	4.06	2644.73	339.47	0.23
Reach 3	11.127	Existing	14320.00	1289.57	1303.67	1296.12	1303.98	0.000334	4.52	3370.12	393.13	0.24
Reach 3	11.033	Design	8100.00	1289.10	1299.85	1294.34	1300.09	0.000383	3.89	2083.58	257.83	0.24
Reach 3	11.033	Future	10470.00	1289.10	1301.54	1295.02	1301.80	0.000355	4.13	2578.49	316.93	0.24
Reach 3	11.033	Existing	14320.00	1289.10	1303.49	1295.99	1303.81	0.000352	4.60	3282.27	387.53	0.24
Reach 3	10.938	Design	8100.00	1289.19	1299.67	1294.11	1299.90	0.000373	3.84	2116.25	281.02	0.24
Reach 3	10.938	Future	10470.00	1289.19	1301.37	1294.77	1301.62	0.000342	4.06	2641.70	335.76	0.23
Reach 3	10.938	Existing	14320.00	1289.19	1303.32	1295.74	1303.63	0.000334	4.52	3368.97	392.62	0.24

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	10.843	Design	8100.00	1288.79	1299.53	1293.70	1299.75	0.000236	3.75	2165.63	276.90	0.23
Reach 3	10.843	Future	10470.00	1288.79	1301.24	1294.38	1301.49	0.000220	3.99	2683.62	324.71	0.23
Reach 3	10.843	Existing	14320.00	1288.79	1303.19	1295.36	1303.50	0.000222	4.48	3413.67	396.89	0.23
Reach 3	10.749	Design	8100.00	1288.54	1299.39	1293.79	1299.62	0.000255	3.84	2110.00	256.76	0.24
Reach 3	10.749	Future	10470.00	1288.54	1301.11	1294.45	1301.37	0.000237	4.09	2568.33	292.52	0.23
Reach 3	10.749	Existing	14320.00	1288.54	1303.05	1295.43	1303.38	0.000241	4.60	3239.06	955.91	0.24
Reach 3	10.654	Design	8100.00	1288.59	1299.24	1293.87	1299.49	0.000282	3.97	2041.25	254.68	0.25
Reach 3	10.654	Future	10470.00	1288.59	1300.97	1294.55	1301.25	0.000257	4.20	2491.44	265.84	0.24
Reach 3	10.654	Existing	14320.00	1288.59	1302.90	1295.53	1303.25	0.000264	4.75	3013.69	818.72	0.25
Reach 3	10.566	Design	8100.00	1288.55	1299.12	1293.61	1299.36	0.000272	3.93	2060.13	253.70	0.24
Reach 3	10.566	Future	10470.00	1288.55	1300.86	1294.28	1301.13	0.000250	4.17	2511.79	265.33	0.24
Reach 3	10.566	Existing	14320.00	1288.55	1302.78	1295.28	1303.13	0.000258	4.72	3032.00	963.89	0.25
Reach 3	10.518	Design	8100.00	1288.65	1299.05	1293.60	1299.29	0.000276	3.93	2058.60	255.96	0.24
Reach 3	10.518	Future	10470.00	1288.65	1300.79	1294.28	1301.06	0.000251	4.16	2516.05	267.68	0.24
Reach 3	10.518	Existing	14320.00	1288.65	1302.72	1295.26	1303.06	0.000257	4.71	3038.84	679.40	0.25
Reach 3	10.441	Design	8100.00	1287.78	1298.96	1292.97	1299.18	0.000228	3.70	2191.14	259.32	0.22
Reach 3	10.441	Future	10790.00	1287.78	1300.71	1293.74	1300.96	0.000226	4.07	2657.22	402.38	0.23
Reach 3	10.441	Existing	14650.00	1287.78	1302.63	1294.72	1302.96	0.000230	4.61	3203.87	579.15	0.24
Reach 3	10.346	Design	8100.00	1287.67	1298.87	1292.68	1299.06	0.000206	3.56	2276.81	264.26	0.21
Reach 3	10.346	Future	10790.00	1287.67	1300.61	1293.42	1300.85	0.000209	3.93	2747.83	394.31	0.22
Reach 3	10.346	Existing	14650.00	1287.67	1302.53	1294.40	1302.84	0.000215	4.46	3286.16	477.53	0.23
Reach 3	10.252	Design	8100.00	1288.04	1298.72	1292.89	1298.95	0.000246	3.81	2127.05	254.26	0.23
Reach 3	10.252	Future	10790.00	1288.04	1300.46	1293.66	1300.73	0.000244	4.18	2579.12	266.16	0.24
Reach 3	10.252	Existing	14650.00	1288.04	1302.40	1294.64	1302.73	0.000241	4.64	3387.36	478.86	0.24
Reach 3	10.218	Design	8100.00	1287.34	1298.69	1292.50	1298.89	0.000303	3.61	2243.67	258.73	0.22
Reach 3	10.218	Future	10790.00	1287.34	1300.43	1293.25	1300.67	0.000306	3.99	2702.81	269.61	0.22
Reach 3	10.218	Existing	14650.00	1287.34	1302.35	1294.25	1302.67	0.000331	4.53	3235.29	282.75	0.24
Reach 3	10.207		Bridge									

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	10.195	Design	8100.00	1287.41	1298.59	1292.87	1298.81	0.000363	3.83	2113.81	255.21	0.23
Reach 3	10.195	Future	10790.00	1287.41	1300.32	1293.62	1300.59	0.000359	4.21	2565.87	266.71	0.24
Reach 3	10.195	Existing	14650.00	1287.41	1302.12	1294.62	1302.48	0.000392	4.79	3058.03	278.91	0.25
Reach 3	10.171	Design	8100.00	1287.50	1298.54	1292.81	1298.77	0.000257	3.86	2099.61	254.61	0.24
Reach 3	10.171	Future	10800.00	1287.50	1300.28	1293.60	1300.55	0.000252	4.22	2612.11	688.55	0.24
Reach 3	10.171	Existing	14660.00	1287.50	1302.09	1294.59	1302.43	0.000261	4.75	3234.85	880.40	0.25
Reach 3	10.134	Design	8100.00	1288.17	1298.48	1293.25	1298.72	0.000289	3.95	2048.50	261.47	0.25
Reach 3	10.134	Future	10800.00	1288.17	1300.21	1293.99	1300.50	0.000276	4.30	2513.10	273.19	0.25
Reach 3	10.134	Existing	14660.00	1288.17	1302.04	1294.95	1302.37	0.000263	4.69	3436.09	855.62	0.25
Reach 3	10.039	Design	8100.00	1287.88	1298.34	1292.84	1298.58	0.000274	3.91	2069.24	257.76	0.24
Reach 3	10.039	Future	10800.00	1287.88	1300.08	1293.61	1300.36	0.000267	4.27	2529.59	270.72	0.25
Reach 3	10.039	Existing	14660.00	1287.88	1301.93	1294.59	1302.24	0.000243	4.58	3733.72	841.93	0.24
Reach 3	9.944	Design	8100.00	1287.05	1298.21	1292.59	1298.44	0.000264	3.88	2085.41	255.17	0.24
Reach 3	9.944	Future	10800.00	1287.05	1299.95	1293.35	1300.23	0.000258	4.25	2541.68	275.27	0.24
Reach 3	9.944	Existing	14660.00	1287.05	1301.74	1294.34	1302.11	0.000268	4.84	3048.29	842.79	0.25
Reach 3	9.897	Design	8100.00	1287.03	1298.15	1292.40	1298.37	0.000254	3.82	2119.13	258.08	0.24
Reach 3	9.897	Future	10800.00	1287.03	1299.89	1293.19	1300.17	0.000249	4.18	2582.63	280.81	0.24
Reach 3	9.897	Existing	14660.00	1287.03	1301.69	1294.17	1302.04	0.000258	4.77	3092.39	808.19	0.25
Reach 3	9.854	Design	8100.00	1287.02	1298.08	1292.45	1298.31	0.000258	3.85	2105.51	257.54	0.24
Reach 3	9.854	Future	10800.00	1287.02	1299.83	1293.22	1300.11	0.000253	4.21	2566.39	269.88	0.24
Reach 3	9.854	Existing	14660.00	1287.02	1301.62	1294.16	1301.98	0.000266	4.80	3053.67	867.85	0.25
Reach 3	9.849	Design	8100.00	1287.05	1297.96	1292.63	1298.28	0.000357	4.54	1783.94	208.75	0.27
Reach 3	9.849	Future	10800.00	1287.05	1299.67	1293.49	1300.06	0.000360	5.03	2146.85	215.28	0.28
Reach 3	9.849	Existing	14660.00	1287.05	1301.40	1294.56	1301.92	0.000398	5.81	2521.55	270.04	0.30
Reach 3	9.844	Design	8100.00	1287.16	1297.99	1292.46	1298.23	0.000267	3.88	2086.56	258.49	0.24
Reach 3	9.844	Future	10800.00	1287.16	1299.72	1293.22	1300.00	0.000263	4.24	2544.37	289.26	0.24
Reach 3	9.844	Existing	14660.00	1287.16	1301.47	1294.20	1301.83	0.000276	4.85	3022.36	860.53	0.26
Reach 3	9.802	Design	8100.00	1287.21	1297.91	1292.63	1298.16	0.000301	4.04	2006.30	256.24	0.25
Reach 3	9.802	Future	10800.00	1287.21	1299.64	1293.41	1299.94	0.000290	4.39	2460.20	418.87	0.26
Reach 3	9.802	Existing	14660.00	1287.21	1301.38	1294.40	1301.77	0.000302	5.00	2932.74	862.05	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

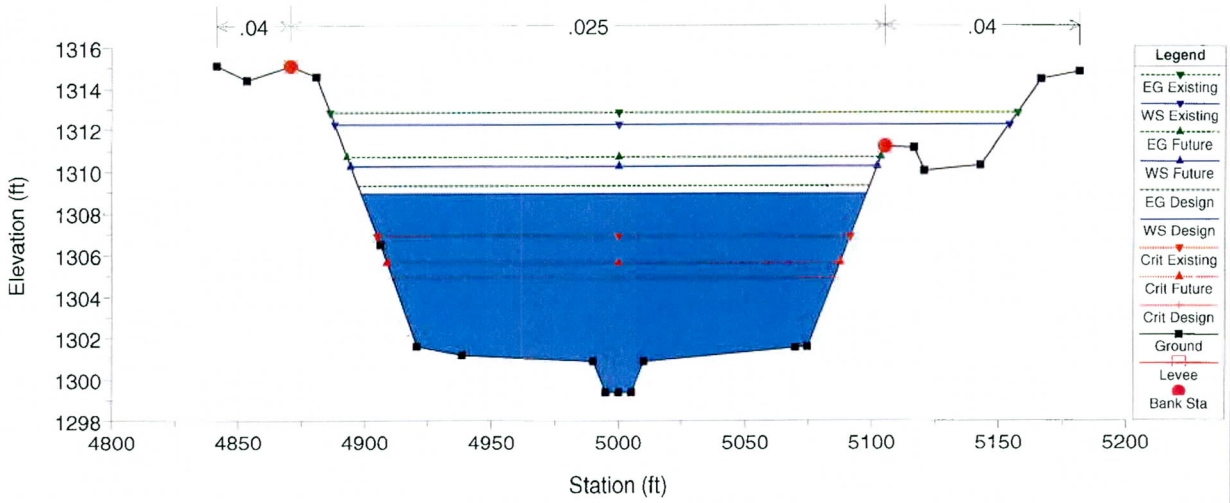
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.708	Design	8100.00	1286.85	1297.79	1292.05	1298.02	0.000256	3.85	2102.70	255.14	0.24
Reach 3	9.708	Future	10800.00	1286.85	1299.52	1292.82	1299.80	0.000254	4.23	2554.72	267.73	0.24
Reach 3	9.708	Existing	14660.00	1286.85	1301.25	1293.84	1301.62	0.000272	4.85	3023.72	857.80	0.26
Reach 3	9.613	Design	8100.00	1286.70	1297.67	1291.87	1297.89	0.000245	3.76	2152.09	264.44	0.23
Reach 3	9.613	Future	10800.00	1286.70	1299.41	1292.66	1299.67	0.000236	4.12	2668.13	315.75	0.23
Reach 3	9.613	Existing	14660.00	1286.70	1301.14	1293.63	1301.48	0.000250	4.70	3219.24	854.79	0.25
Reach 3	9.518	Design	8100.00	1286.59	1297.53	1291.84	1297.76	0.000263	3.88	2089.05	256.27	0.24
Reach 3	9.518	Future	10800.00	1286.59	1299.26	1292.64	1299.54	0.000260	4.24	2545.16	269.55	0.24
Reach 3	9.518	Existing	14660.00	1286.59	1300.98	1293.64	1301.34	0.000276	4.87	3009.40	825.50	0.26
Reach 3	9.424	Design	8100.00	1287.07	1297.38	1291.95	1297.62	0.000286	3.98	2033.82	254.91	0.25
Reach 3	9.424	Future	10800.00	1287.07	1299.12	1292.71	1299.41	0.000277	4.34	2488.00	269.52	0.25
Reach 3	9.424	Existing	14660.00	1287.07	1300.82	1293.73	1301.20	0.000294	4.97	2970.10	732.16	0.27
Reach 3	9.334	Design	8100.00	1286.50	1297.24	1291.92	1297.49	0.000289	3.98	2035.44	257.33	0.25
Reach 3	9.334	Future	10800.00	1286.50	1298.99	1292.69	1299.28	0.000277	4.33	2494.60	403.38	0.25
Reach 3	9.334	Existing	14660.00	1286.50	1300.68	1293.65	1301.06	0.000293	4.97	2952.66	785.17	0.27
Reach 3	9.24	Design	8100.00	1287.00	1297.08	1292.00	1297.34	0.000315	4.10	1976.15	254.97	0.26
Reach 3	9.24	Future	10800.00	1287.00	1298.83	1292.75	1299.13	0.000298	4.44	2432.93	292.10	0.26
Reach 3	9.24	Existing	14660.00	1287.00	1300.51	1293.72	1300.91	0.000315	5.08	2885.49	389.65	0.27
Reach 3	9.145	Design	8100.00	1286.79	1296.91	1291.95	1297.18	0.000329	4.16	1946.94	253.91	0.26
Reach 3	9.145	Future	10800.00	1286.79	1298.67	1292.70	1298.98	0.000308	4.49	2404.32	289.88	0.26
Reach 3	9.145	Existing	14660.00	1286.79	1300.34	1293.68	1300.75	0.000341	5.10	2871.89	387.35	0.28
Reach 3	9.053	Design	8100.00	1286.50	1296.78	1291.38	1297.02	0.000281	3.96	2045.45	255.48	0.25
Reach 3	9.053	Future	10800.00	1286.50	1298.55	1292.14	1298.83	0.000270	4.31	2507.82	282.50	0.25
Reach 3	9.053	Existing	14660.00	1286.50	1300.20	1293.13	1300.59	0.000290	4.96	2952.69	389.11	0.26
Reach 3	9.036	Design	8100.00	1286.20	1296.76	1291.25	1296.99	0.000269	3.89	2079.89	257.85	0.24
Reach 3	9.036	Future	10790.00	1286.20	1298.53	1292.01	1298.81	0.000259	4.24	2546.99	310.82	0.24
Reach 3	9.036	Existing	14630.00	1286.20	1300.19	1292.99	1300.56	0.000282	4.88	3000.57	437.51	0.26
Reach 3	9.018	Design	8700.00	1285.62	1296.72	1291.11	1296.97	0.000273	4.00	2174.04	260.97	0.24
Reach 3	9.018	Future	11920.00	1285.62	1298.46	1291.96	1298.78	0.000285	4.52	2638.71	272.43	0.26

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.018	Existing	15770.00	1285.62	1300.12	1292.91	1300.53	0.000300	5.09	3098.71	404.42	0.27
Reach 3	9.001	Design	8700.00	1285.34	1296.69	1290.88	1296.94	0.000272	4.02	2164.84	257.60	0.24
Reach 3	9.001	Future	11920.00	1285.34	1298.43	1291.78	1298.75	0.000287	4.54	2624.42	270.48	0.26
Reach 3	9.001	Existing	15770.00	1285.34	1300.09	1292.74	1300.50	0.000306	5.12	3081.16	746.86	0.27

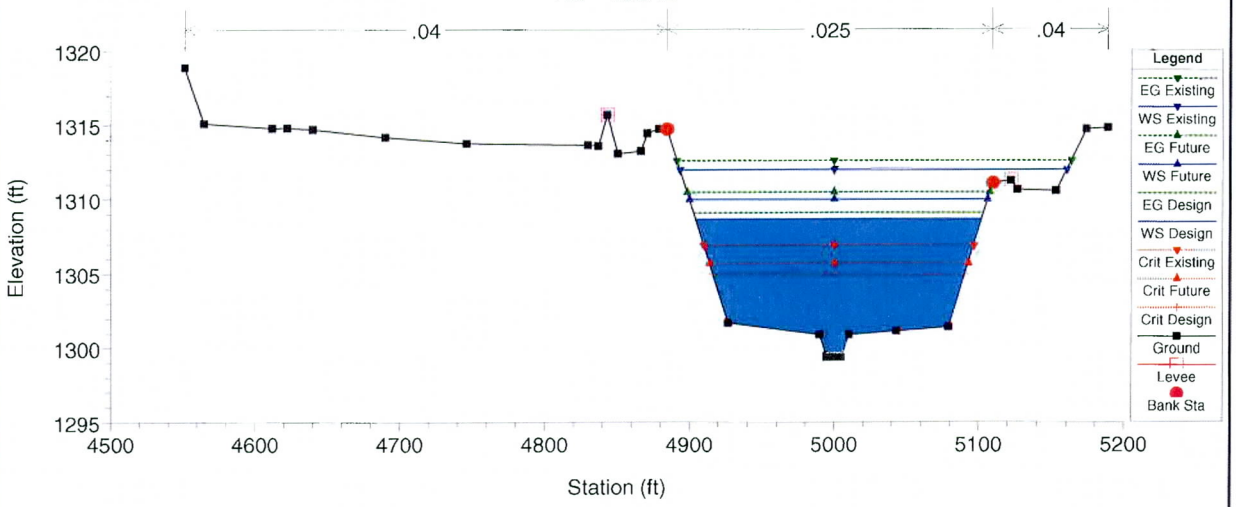
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.911



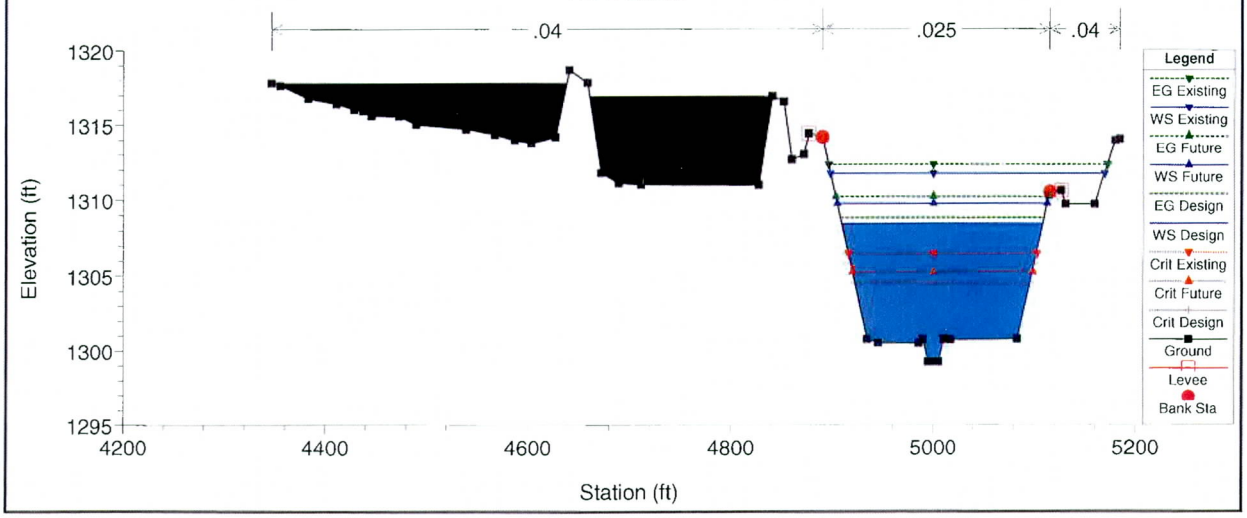
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.842



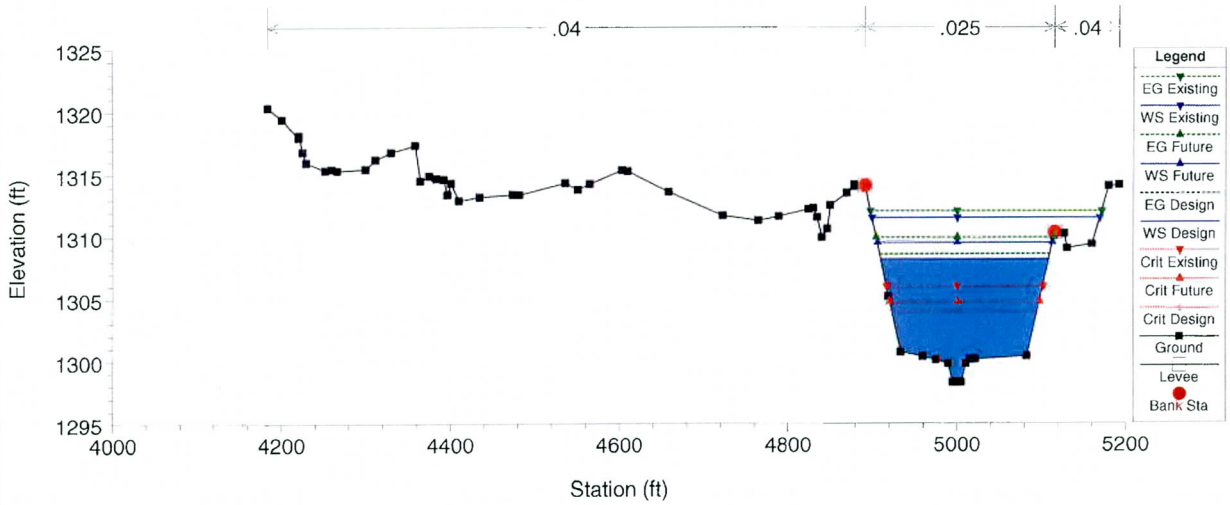
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.755



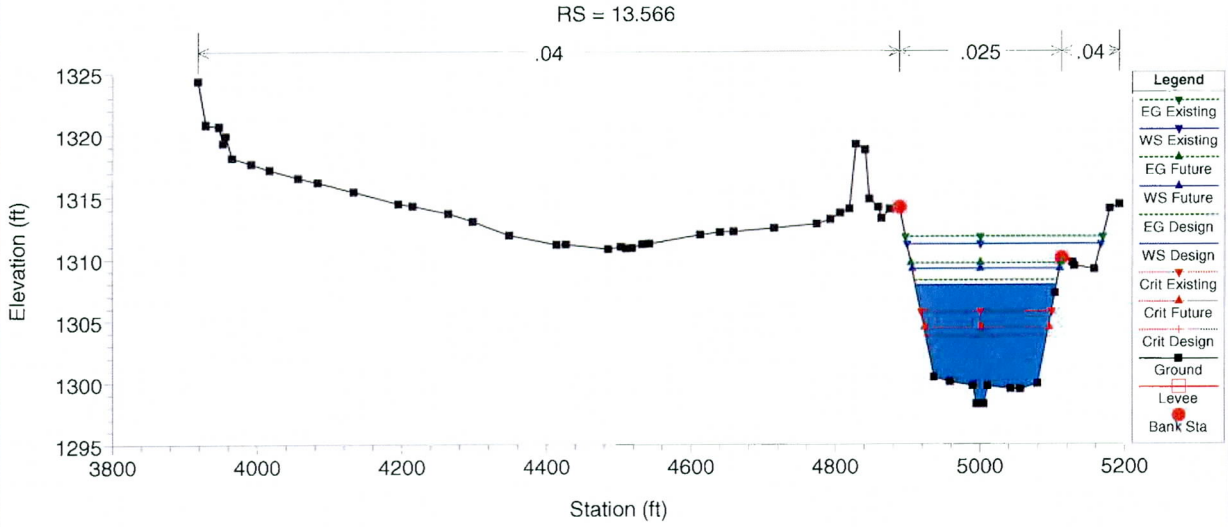
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.661



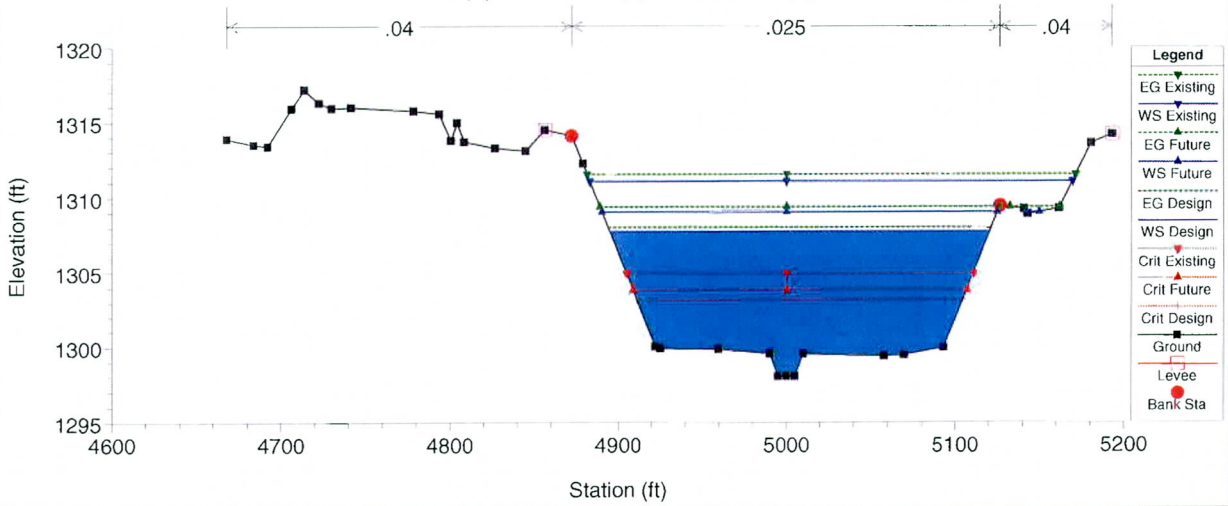
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.566



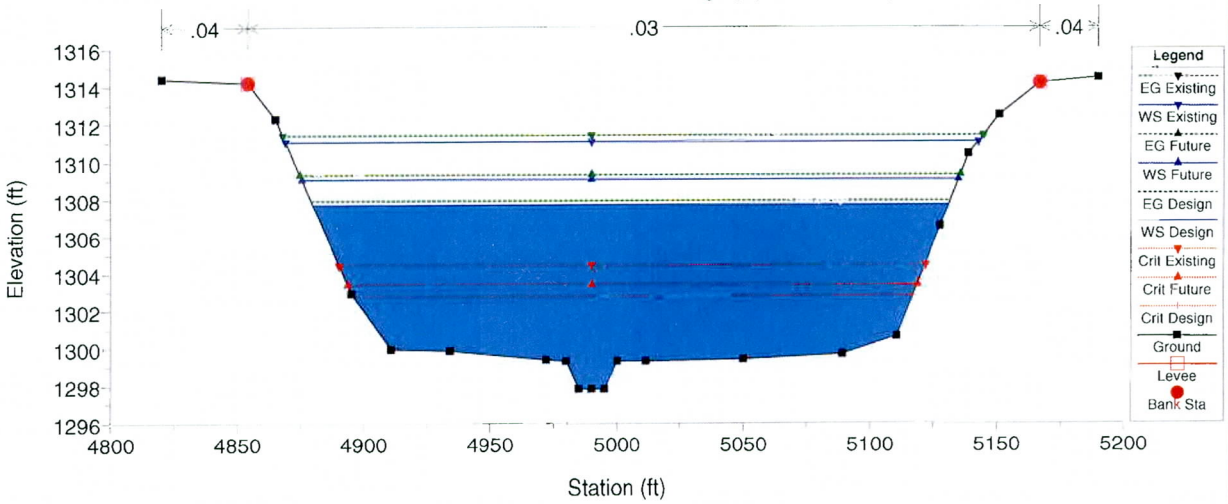
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.471 Q(D)=6,900 cfs, Q(F)=8,970 cfs & Q(E)=12,910 cfs



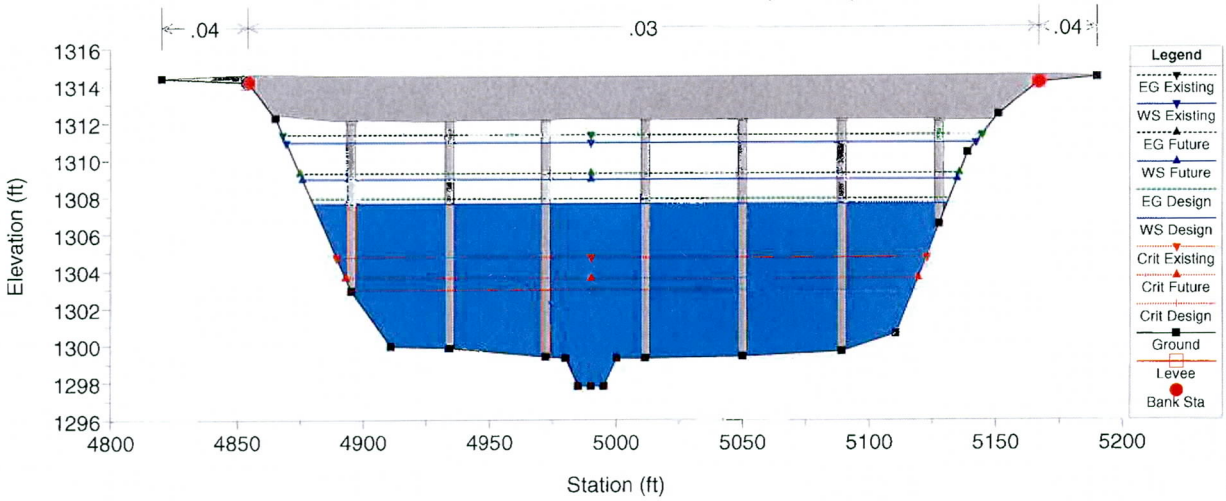
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.442 Queek Creek Road Bridge (Upstream Face)



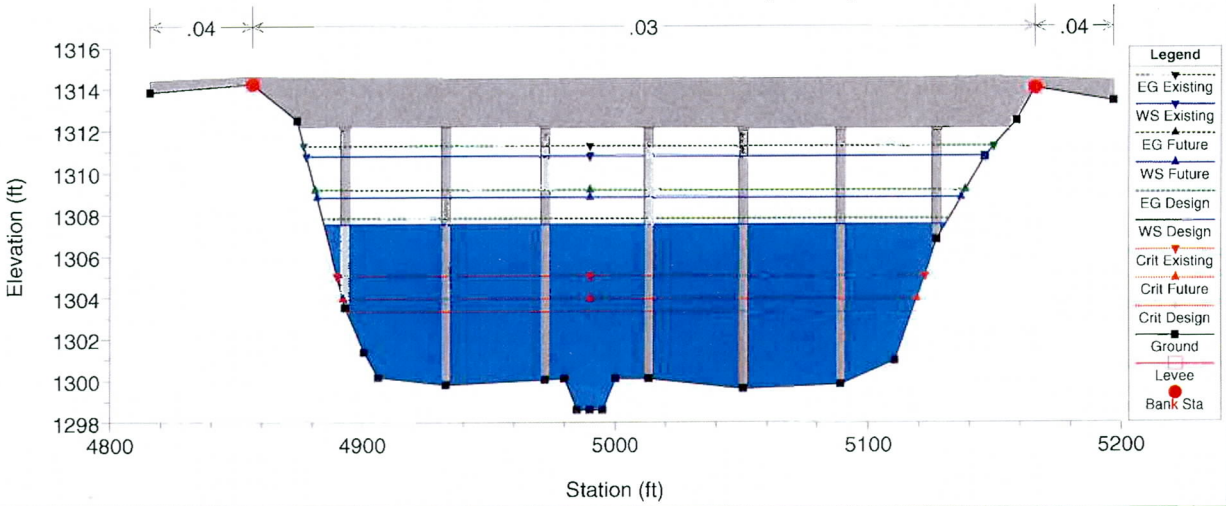
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



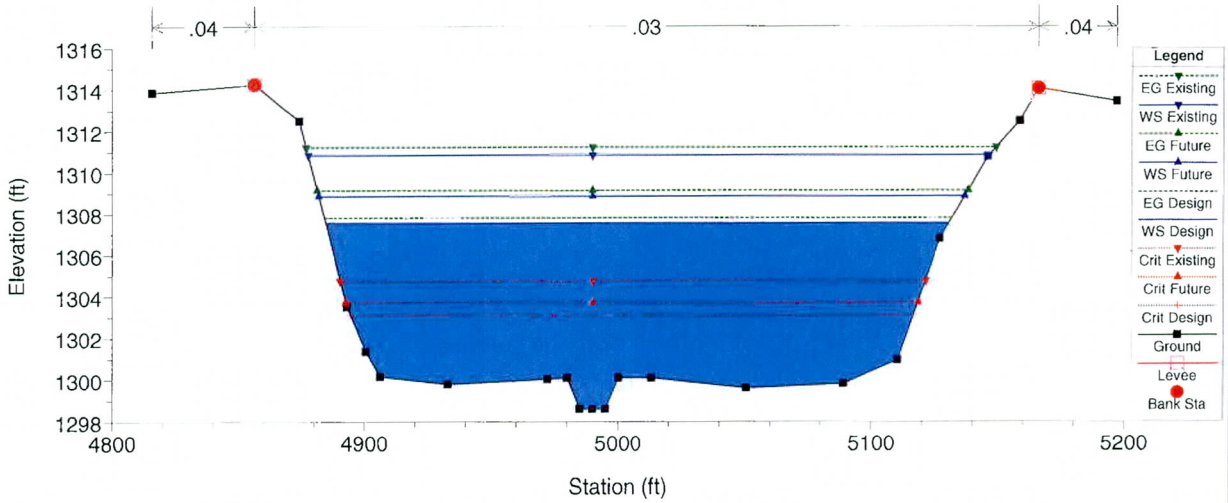
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



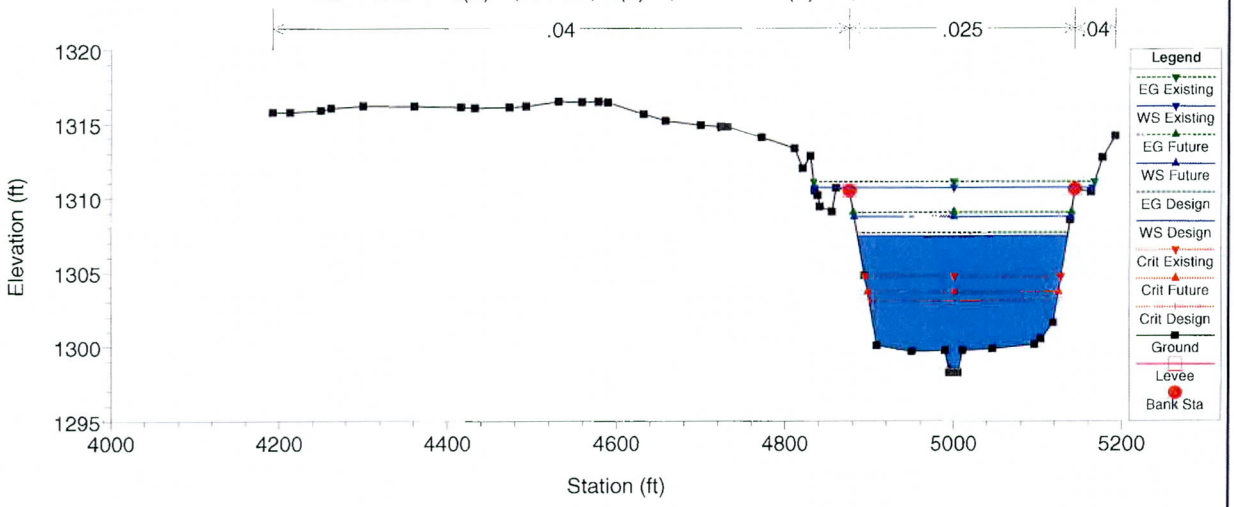
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.423 Queen Creek Road Bridge (Downstream Face)



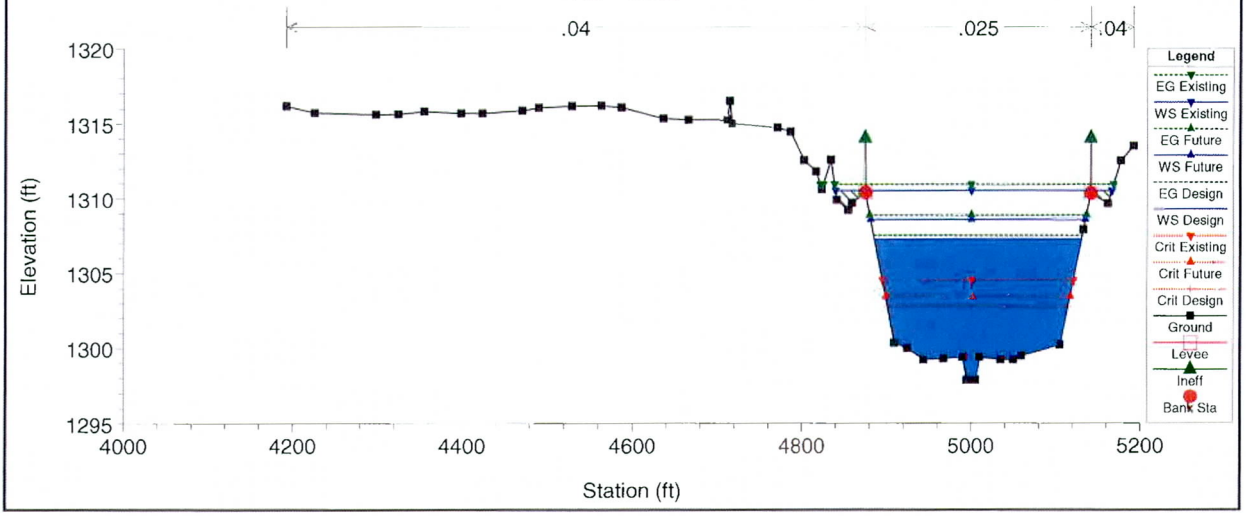
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.374 Q(D)=6,900 cfs, Q(F)=9,070 cfs & Q(E)=12,990 cfs



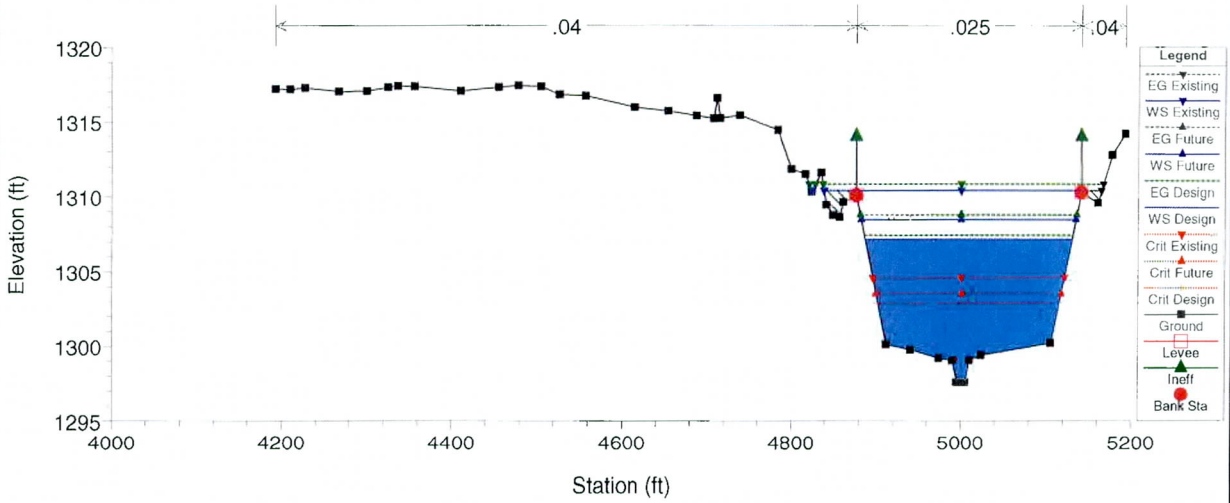
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.28



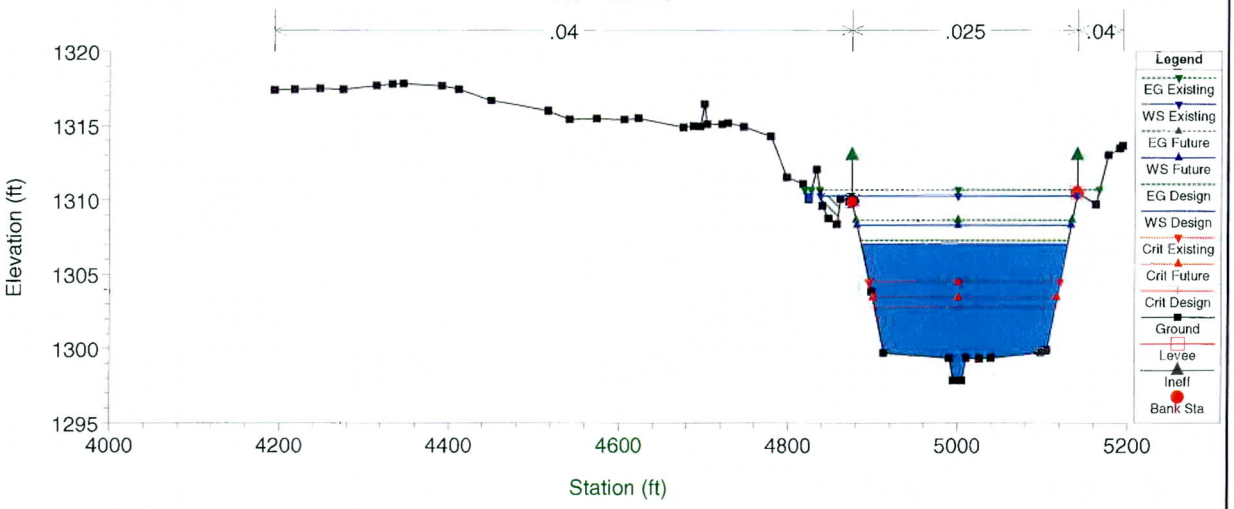
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.232



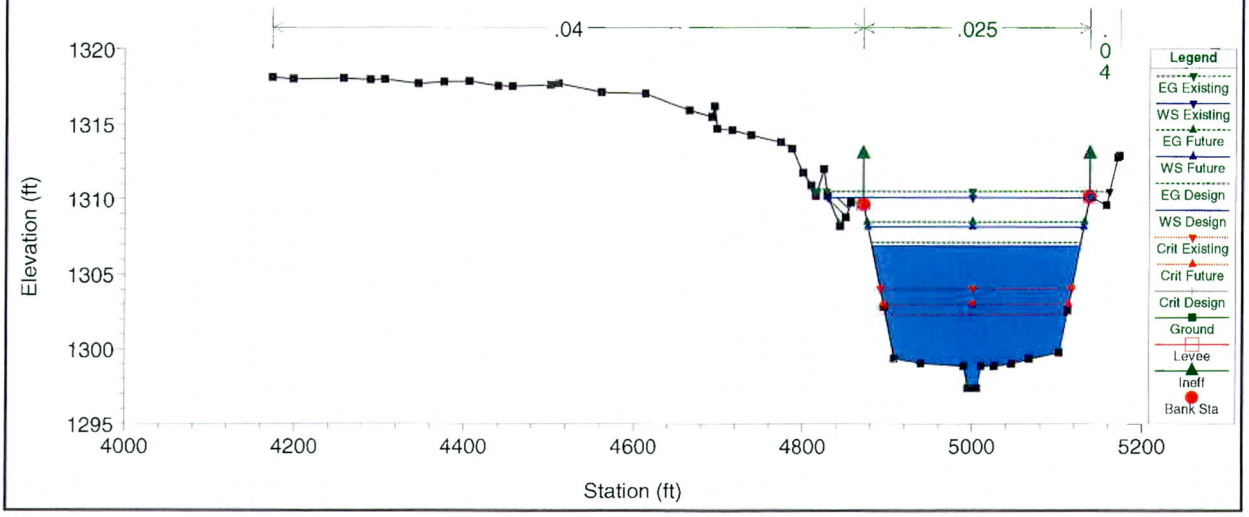
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.179



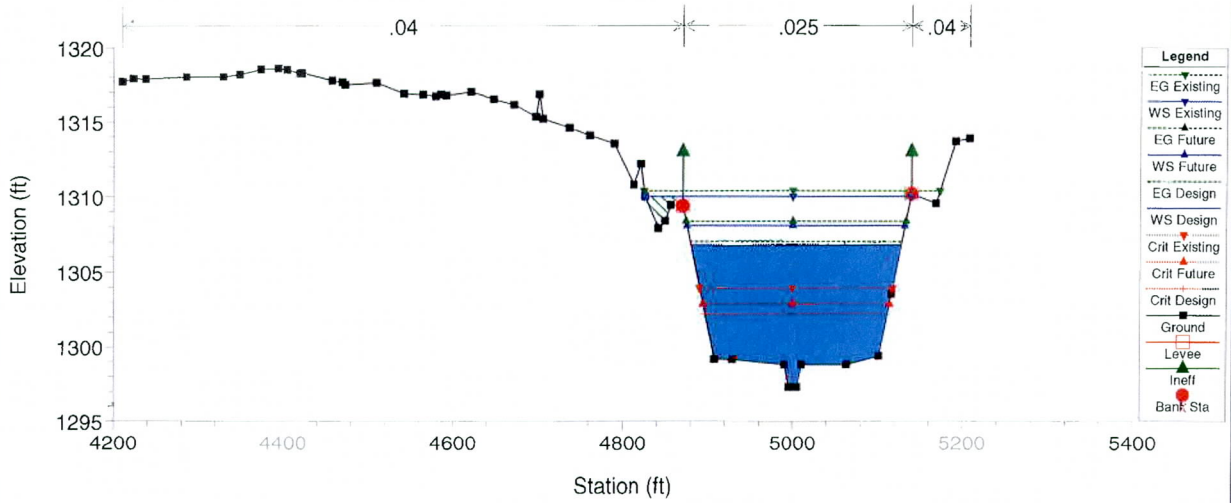
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.084



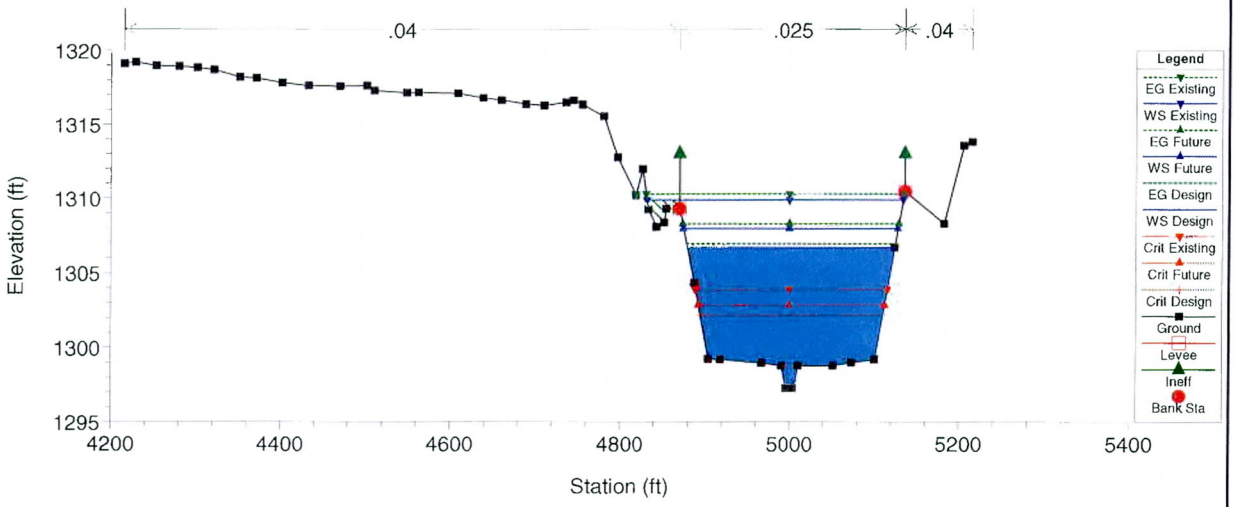
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.037



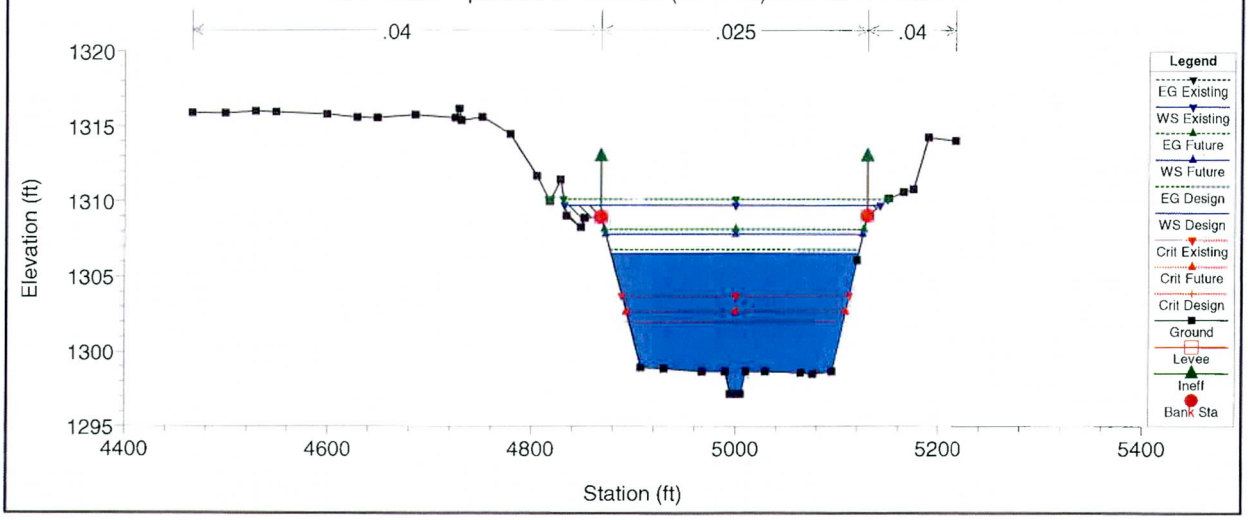
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.981



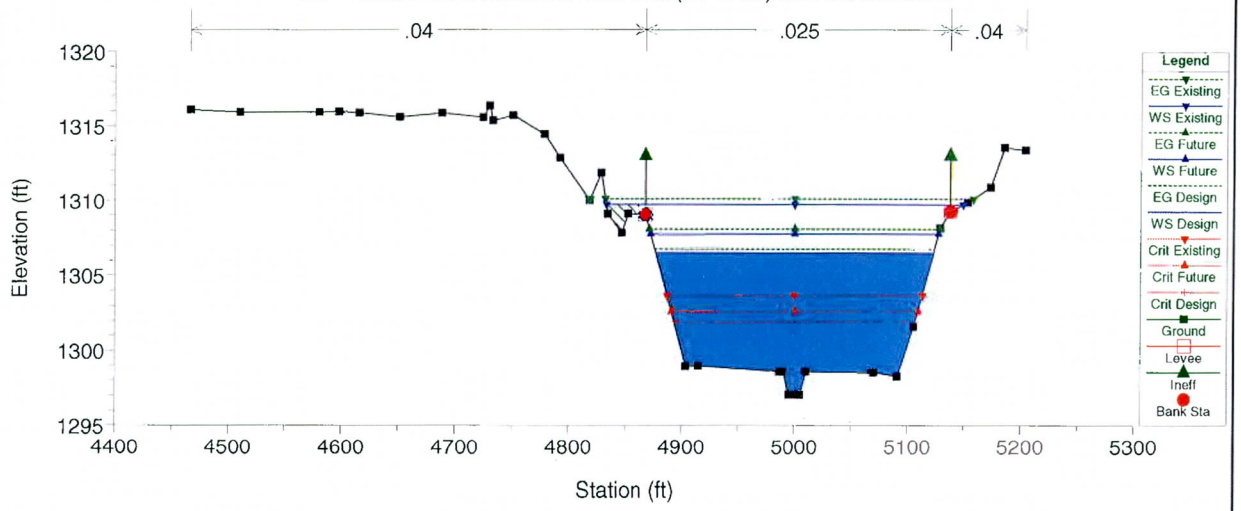
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.905 Upstream of Side Inlet (25' Wide) from the Left Bank



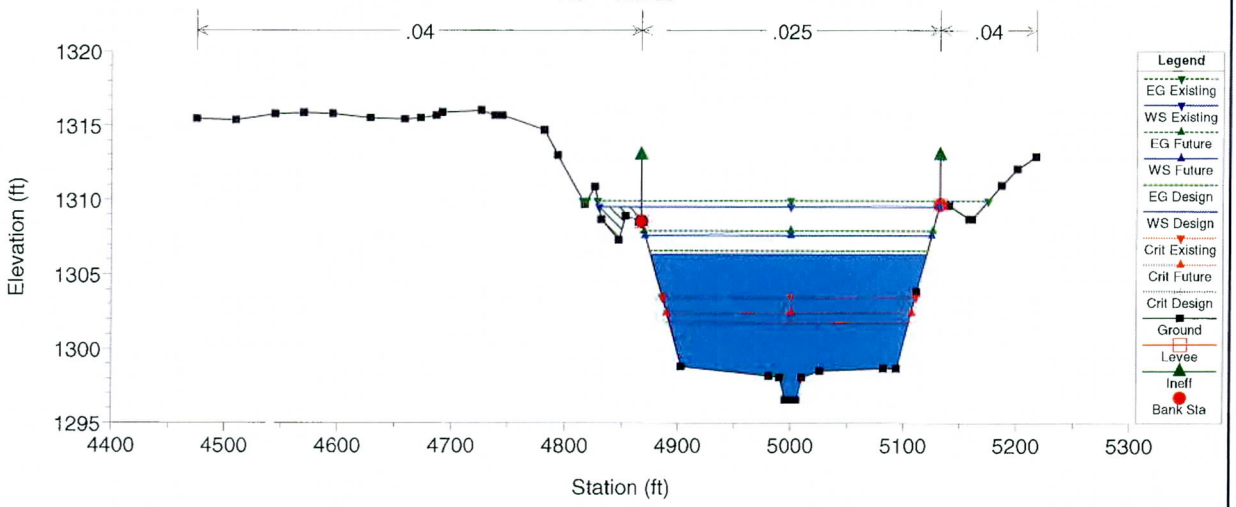
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.884 Downstream of Side Inlet (25' Wide) from the Left Bank



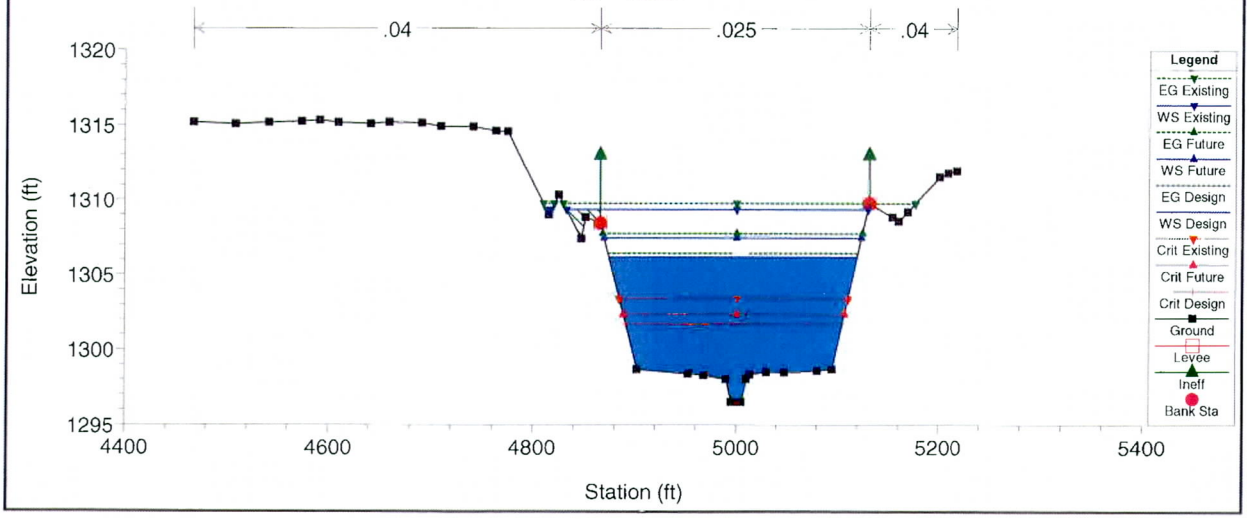
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.789



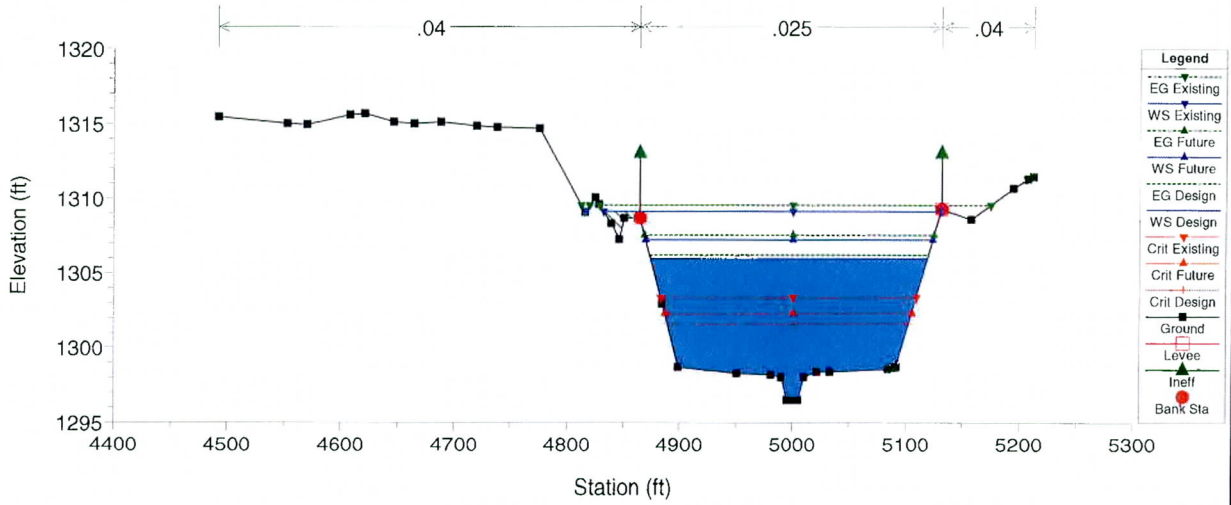
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.694



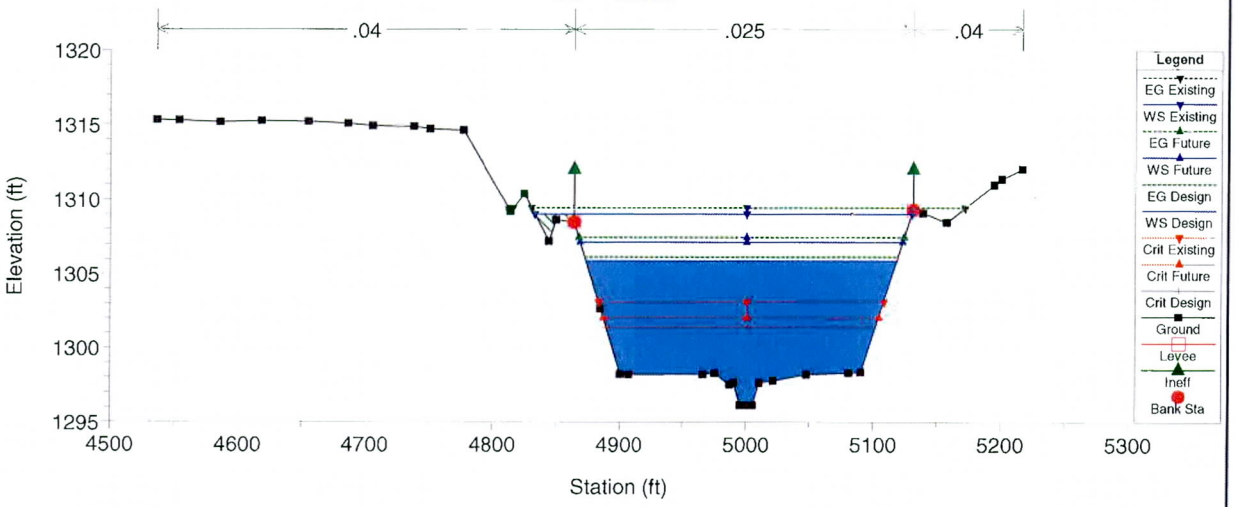
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.6



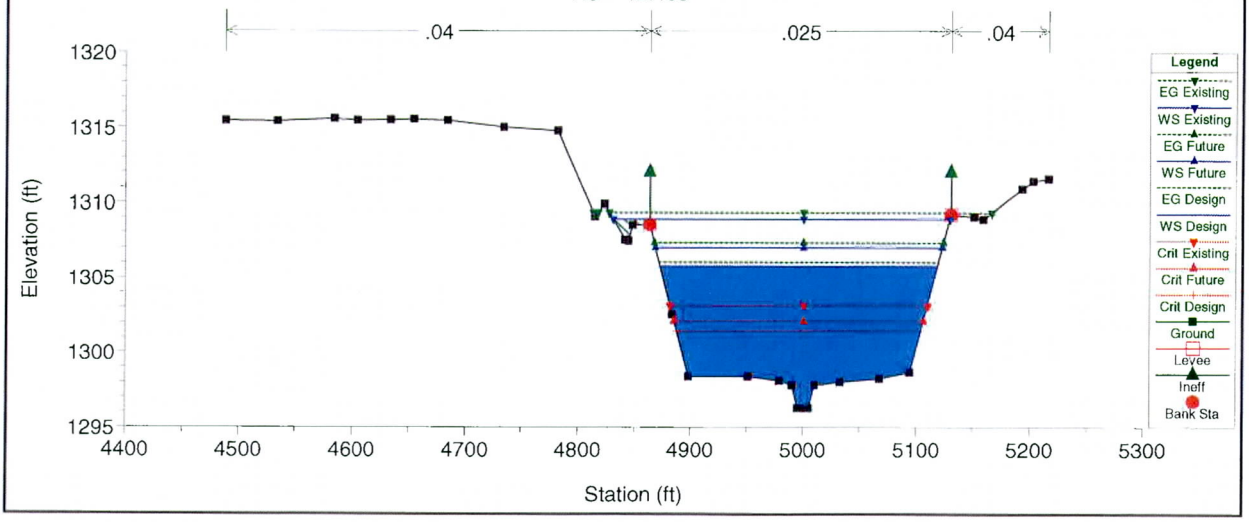
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.552



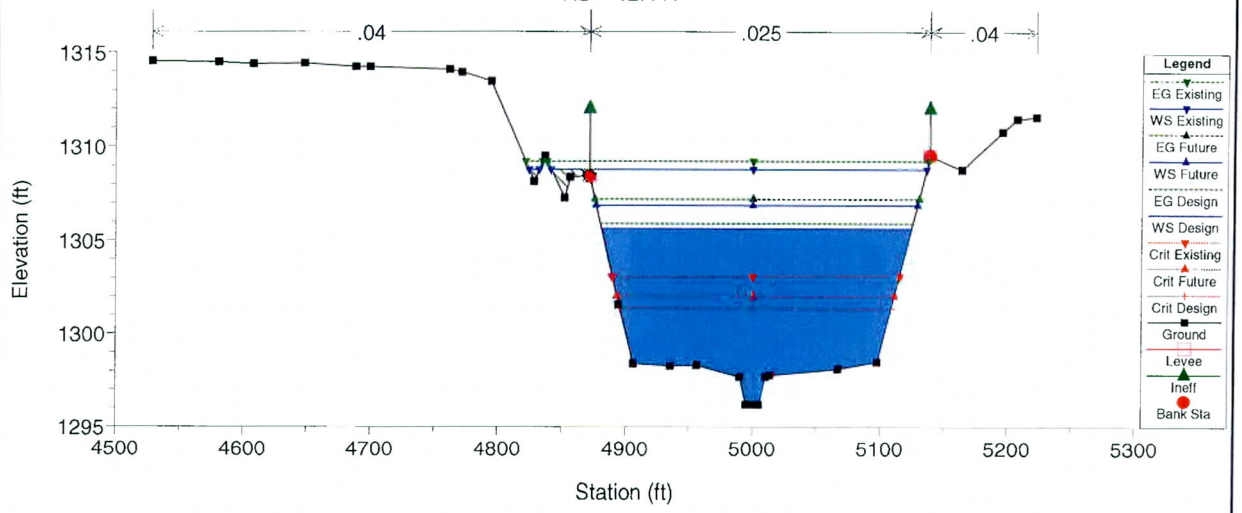
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.488



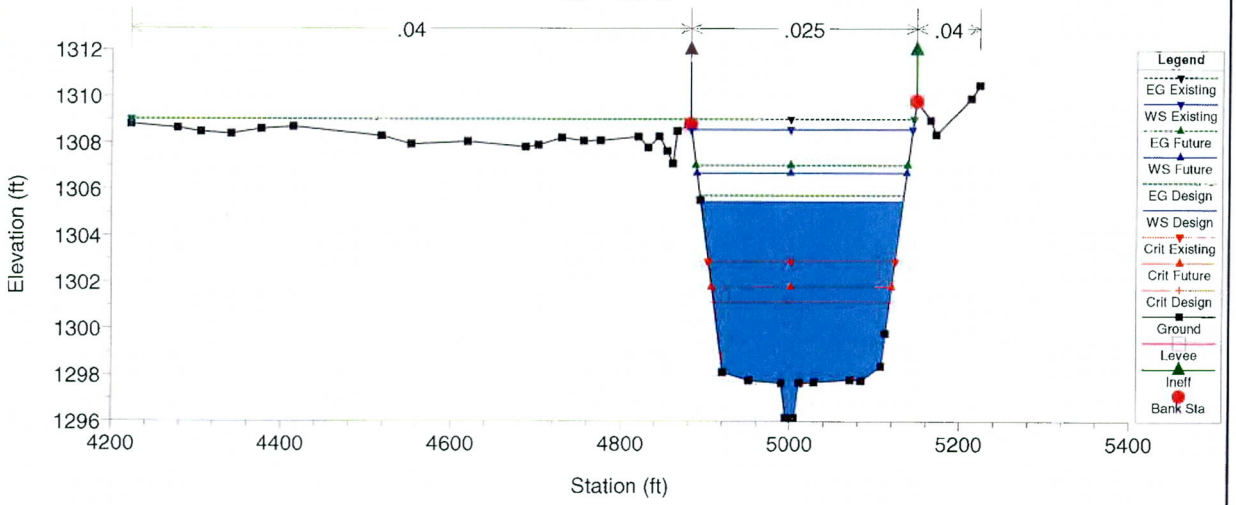
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.441



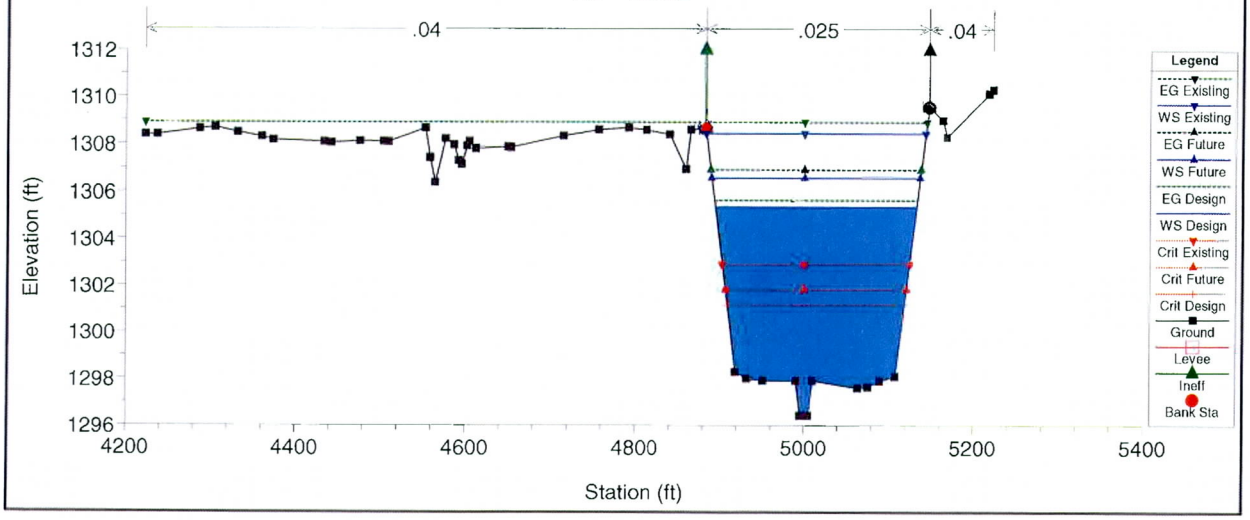
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.349



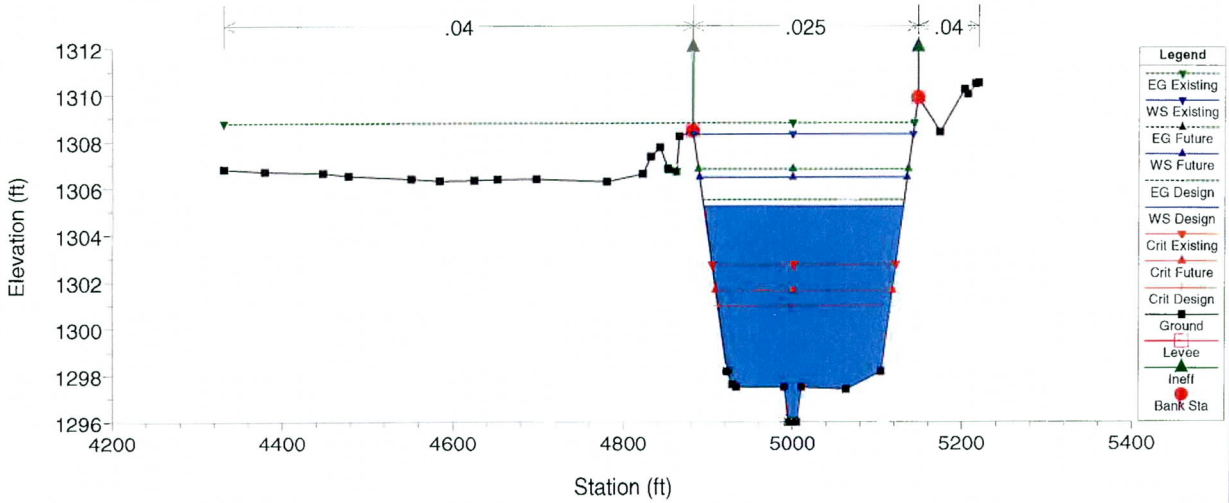
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.302



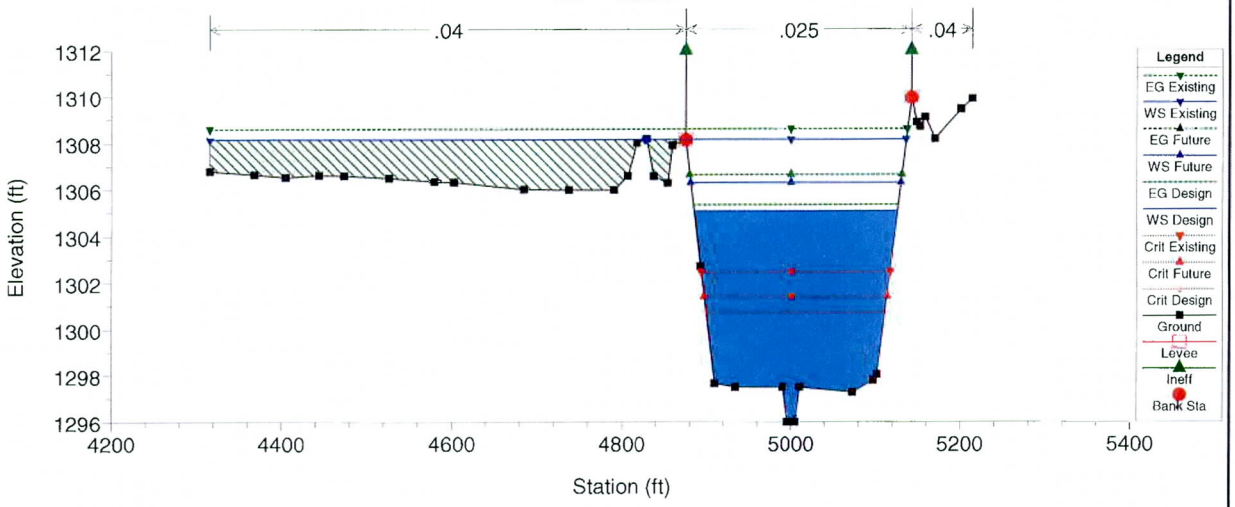
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.245



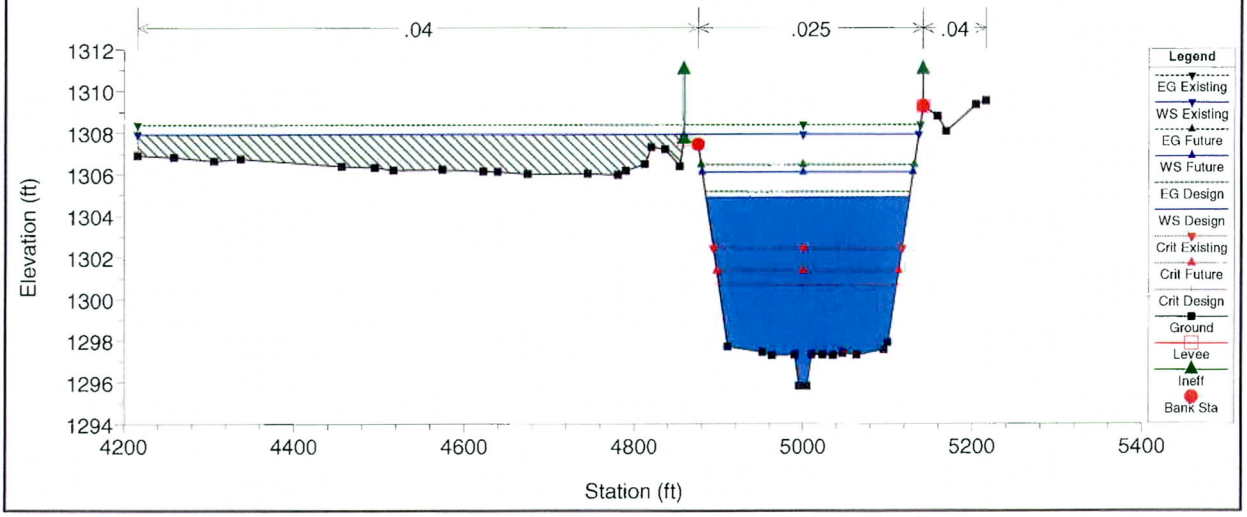
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.177



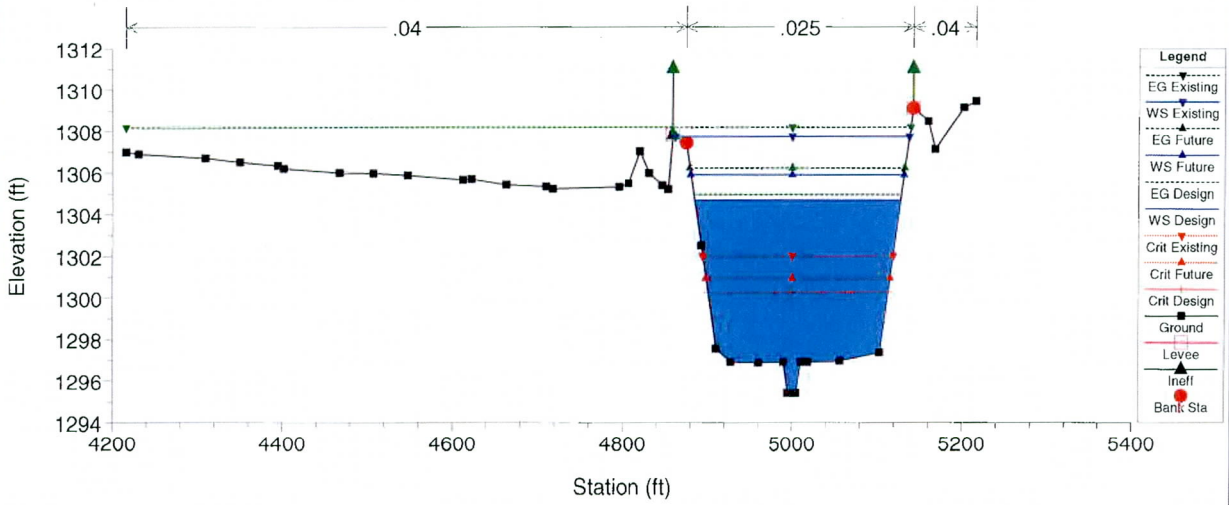
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.082



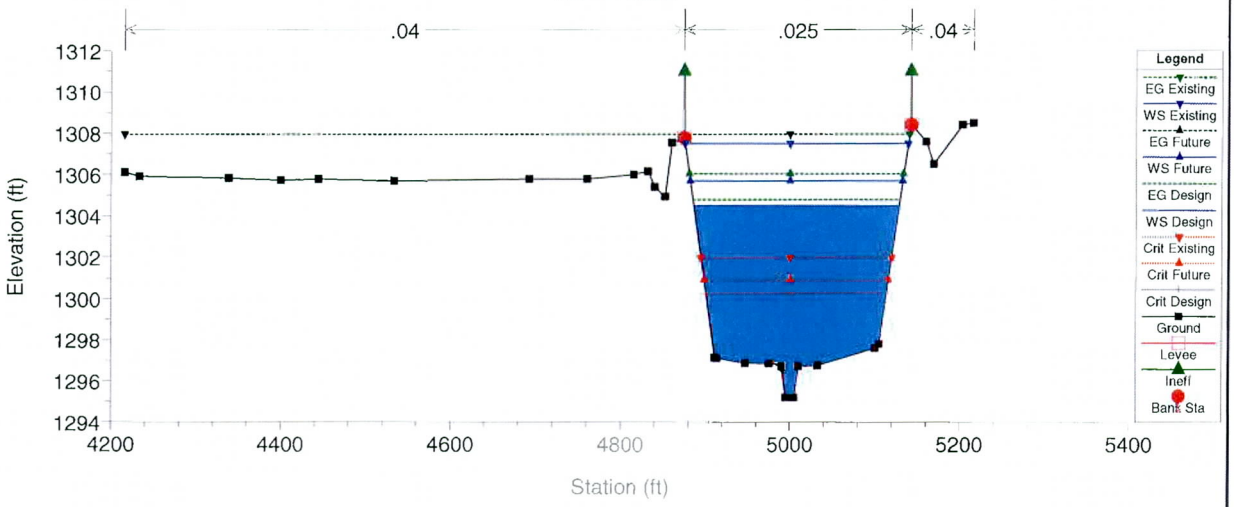
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.988



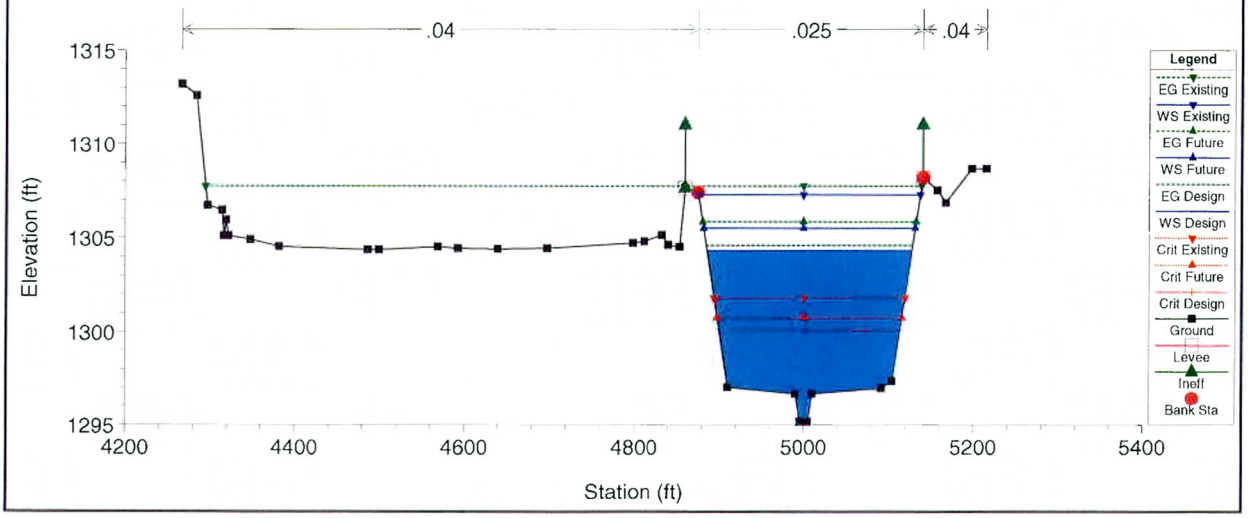
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.893



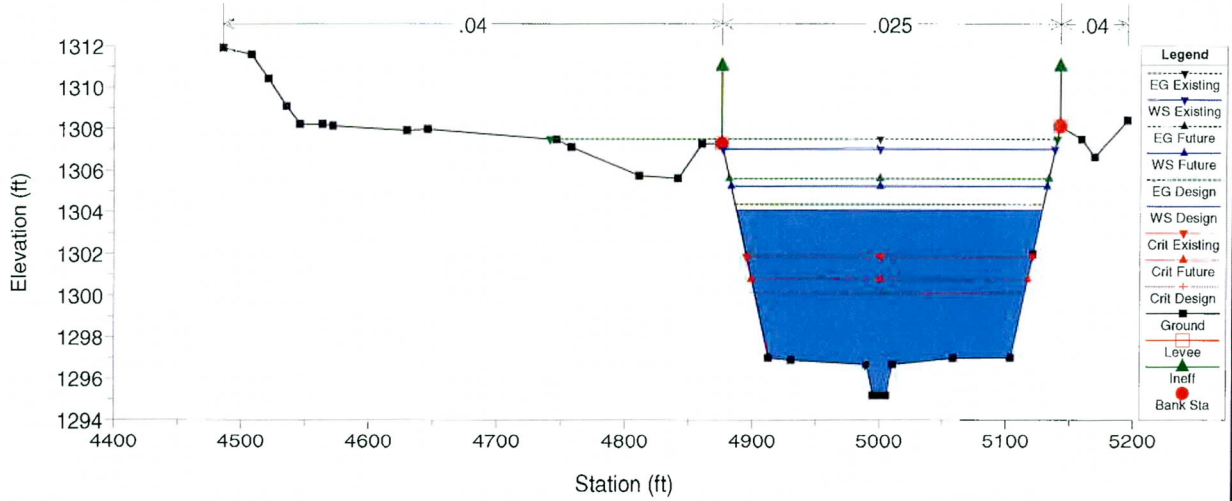
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.798



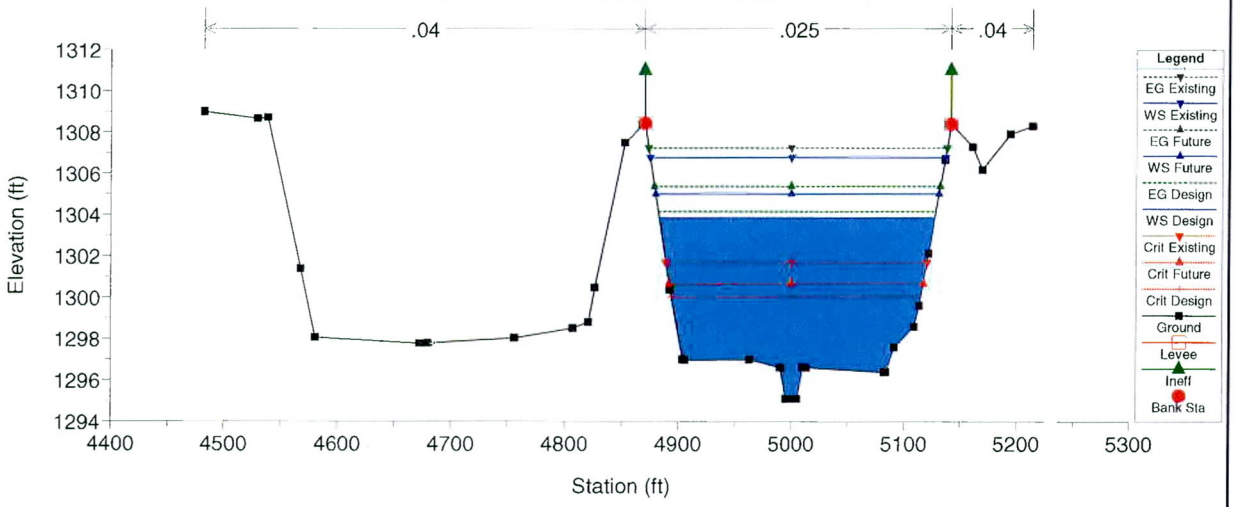
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.703



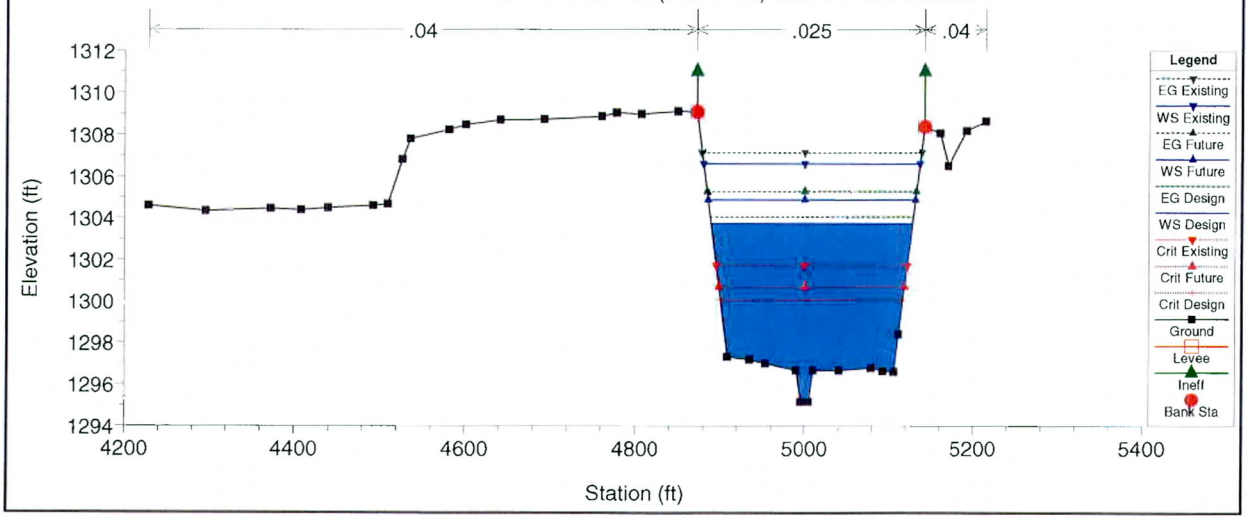
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.609 Queen Creek Detention Basin located East of the EMF



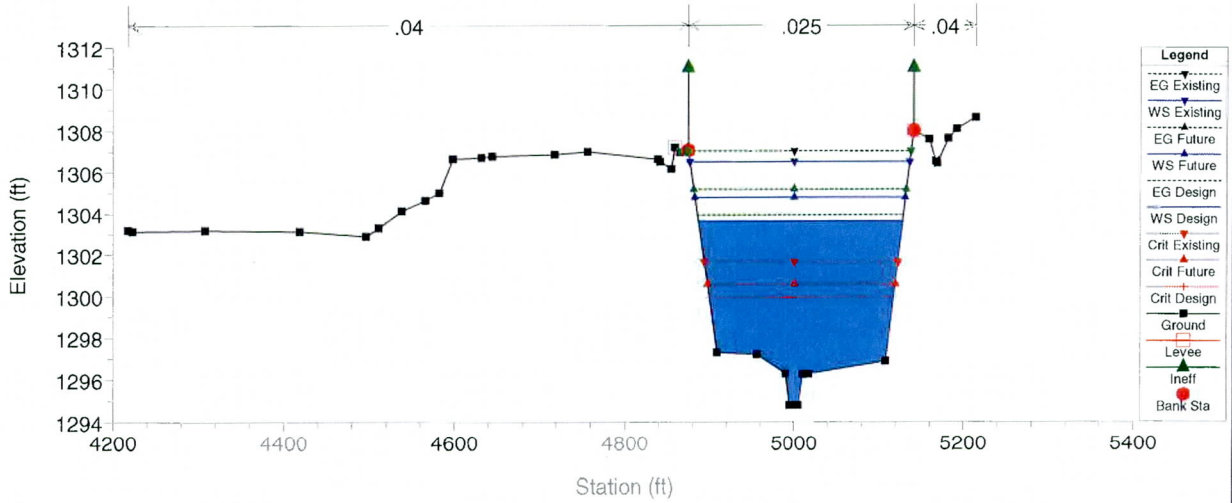
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.572 Downstream of Side Inlet (150' Wide) from the Left Overbank



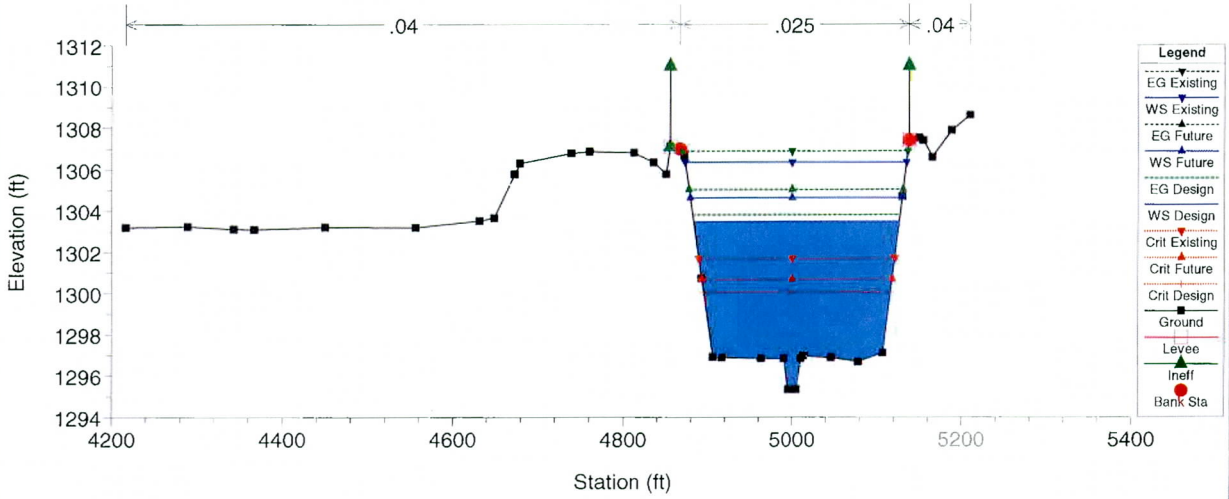
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.531



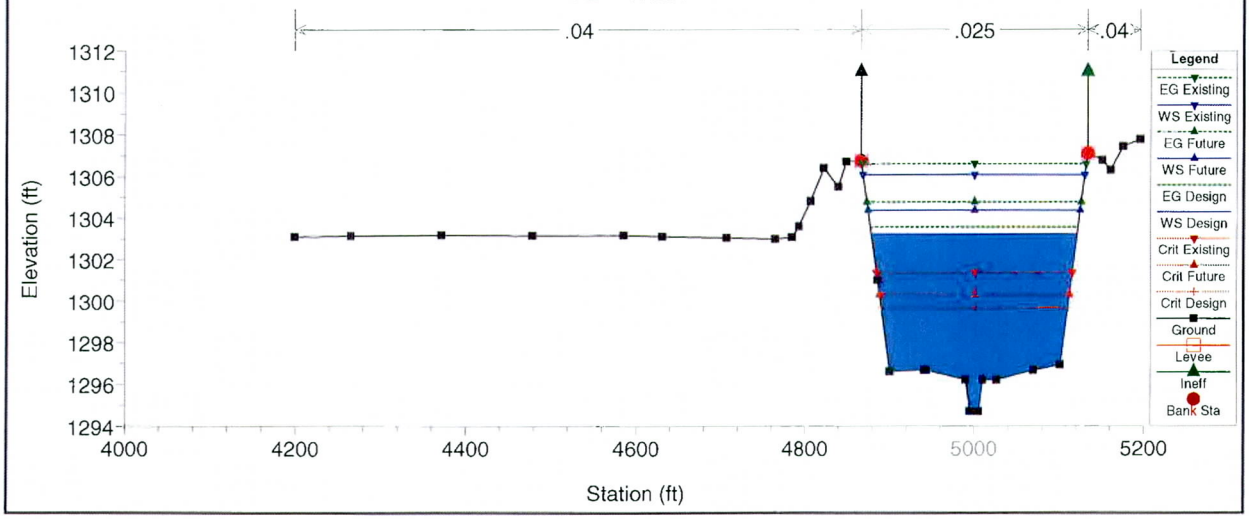
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.486



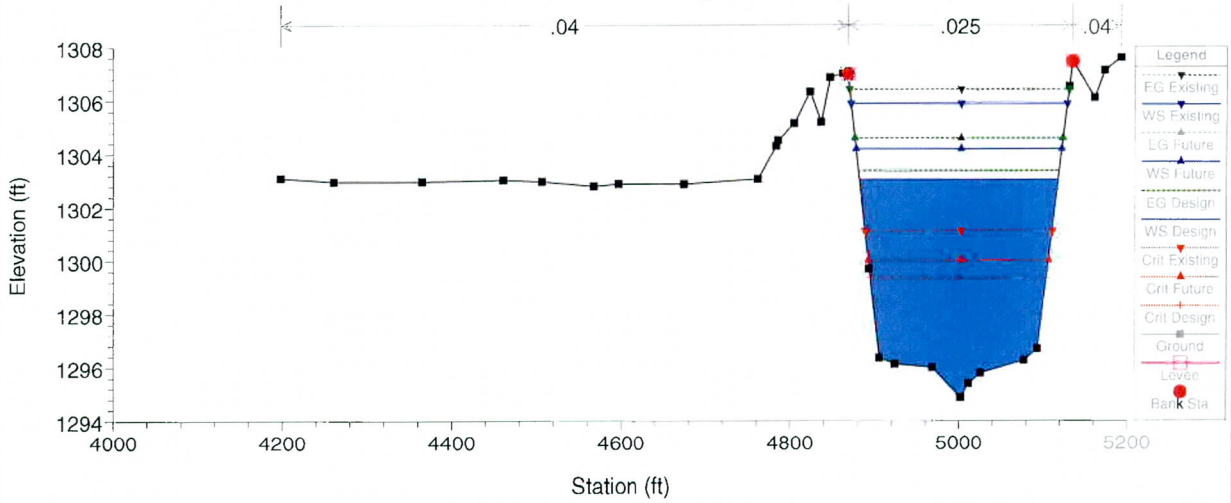
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.391



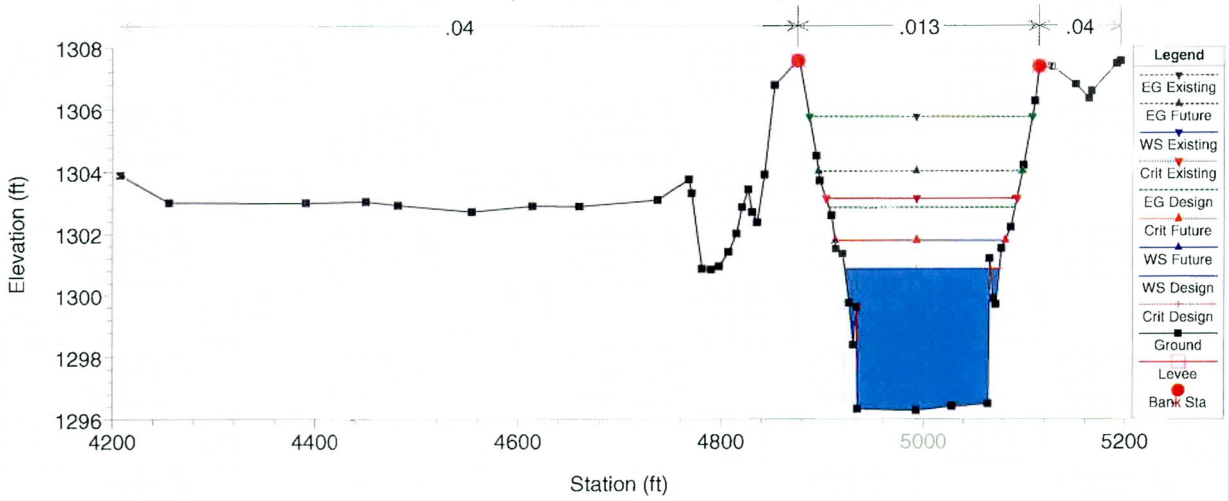
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.328 Concrete Drop Structure - Begin Transition (Contraction)



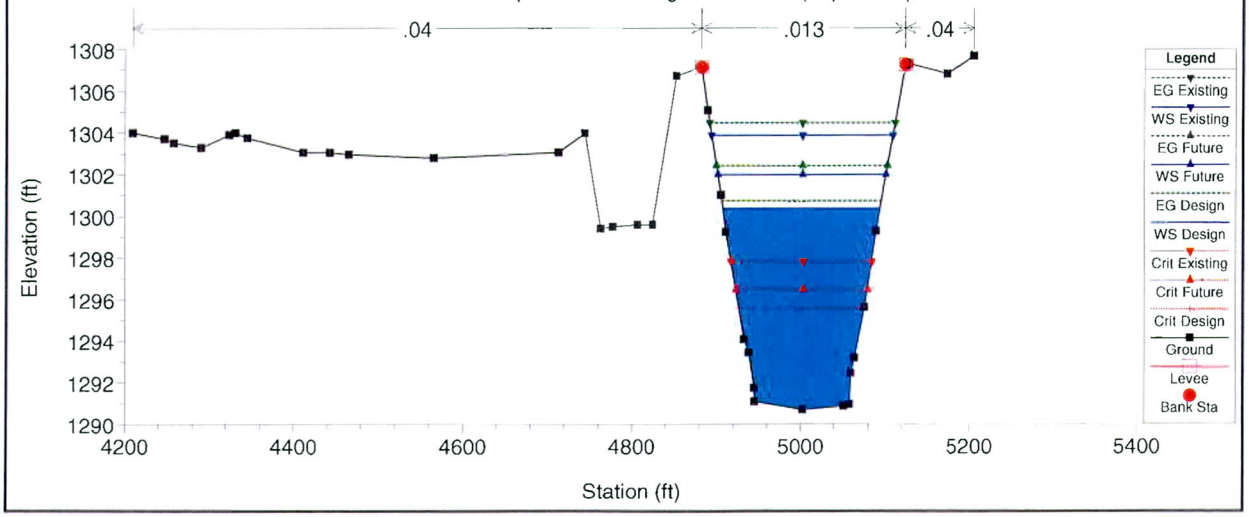
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.321 Drop Structure - End Transition (Contraction)



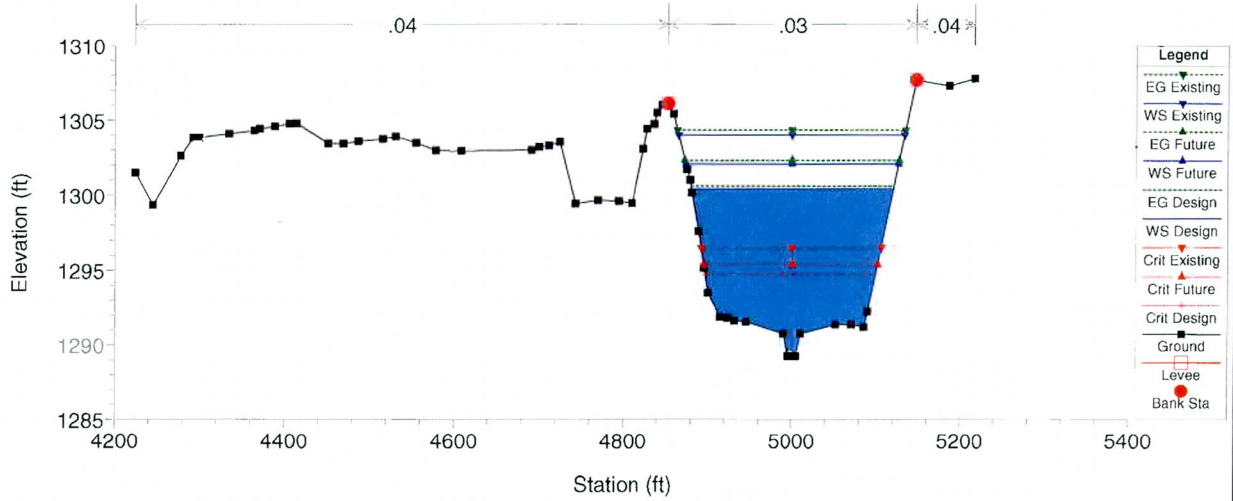
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.308 Drop Structure - Begin Transition (Expansion);



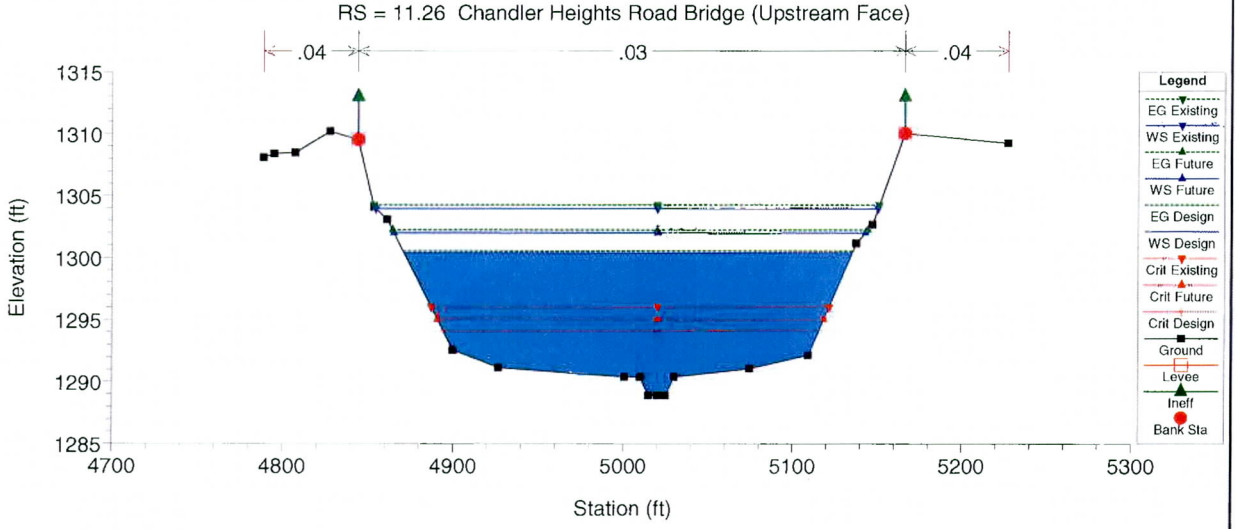
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.297 Drop Structure - End Transition (Expansion);



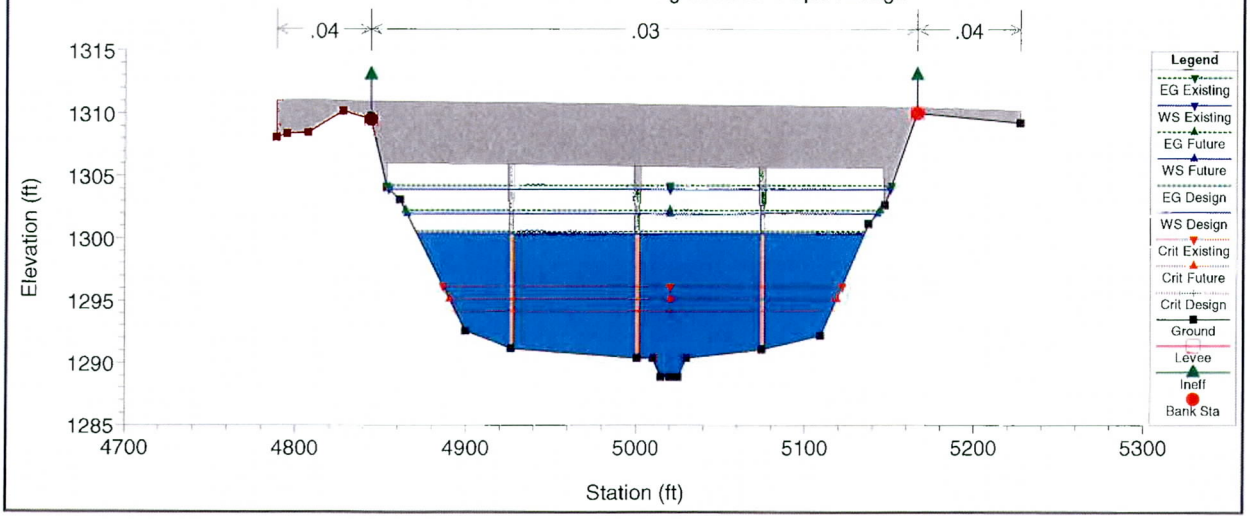
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.26 Chandler Heights Road Bridge (Upstream Face)



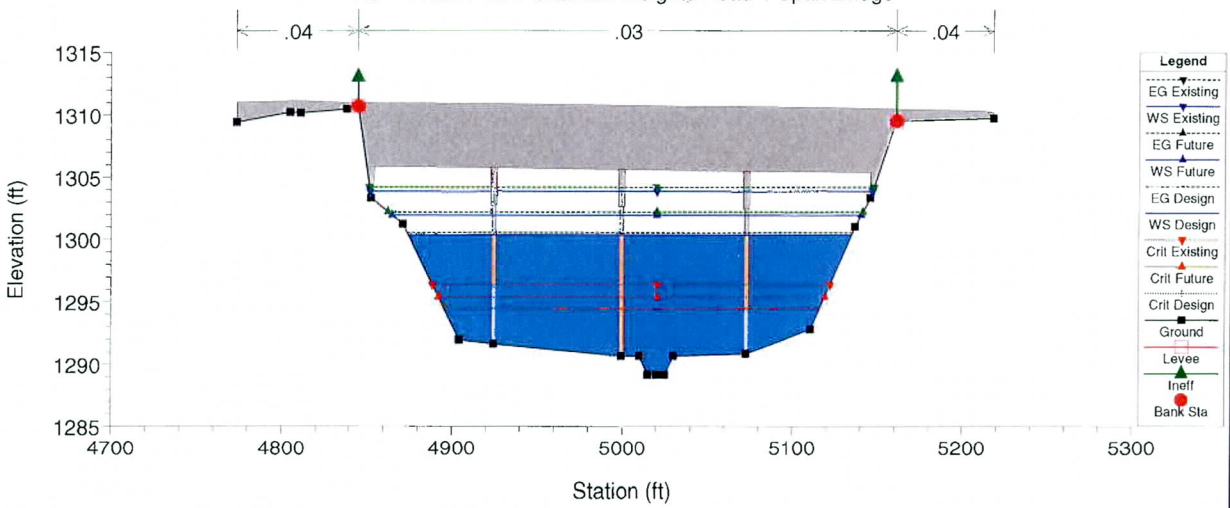
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



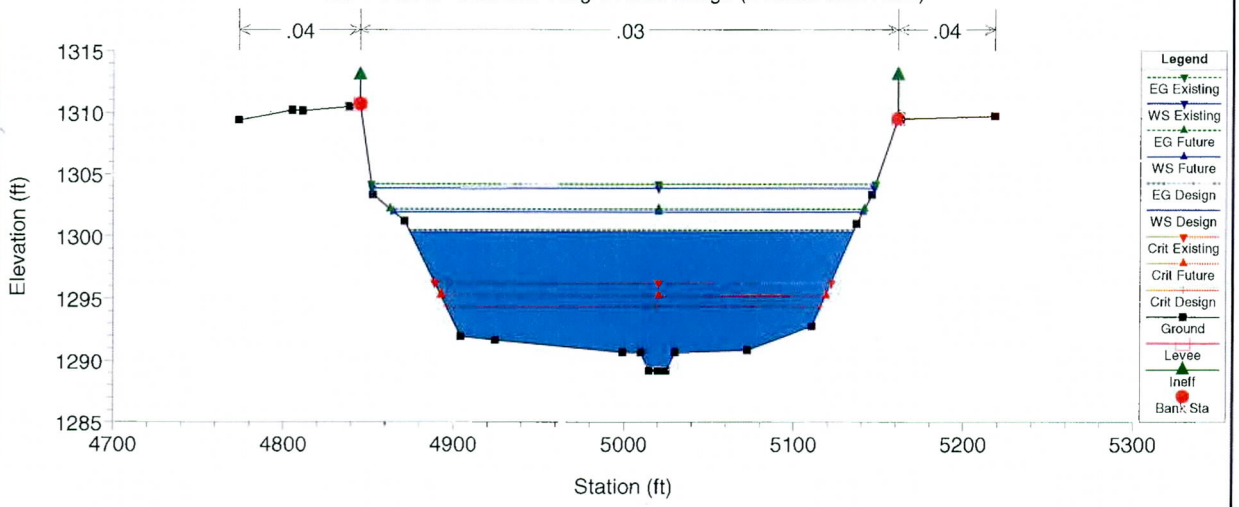
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



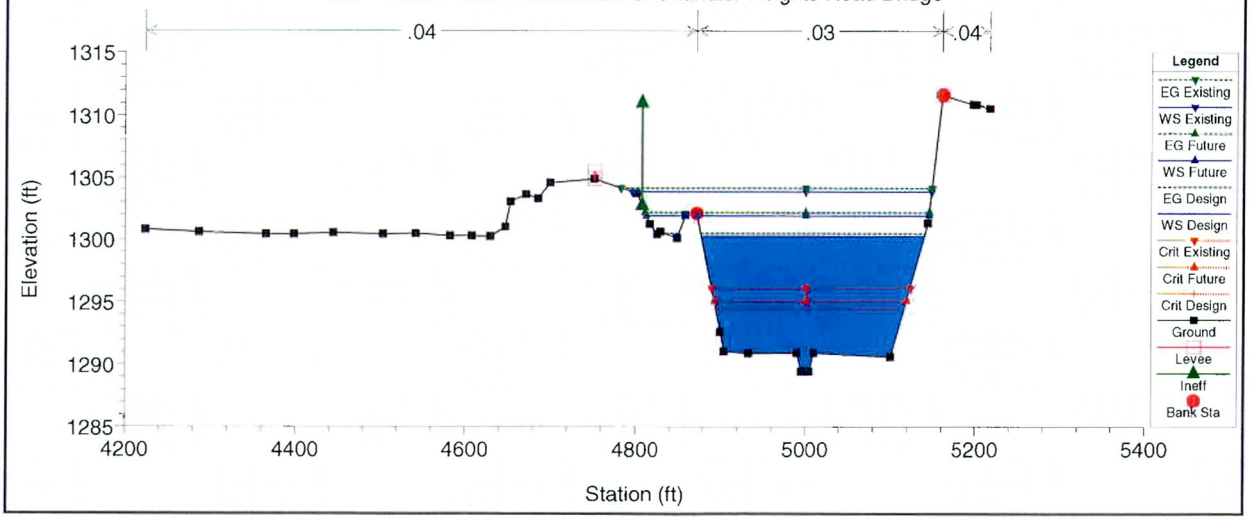
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.249 Chandler Height Road Bridge (Downstream Face)



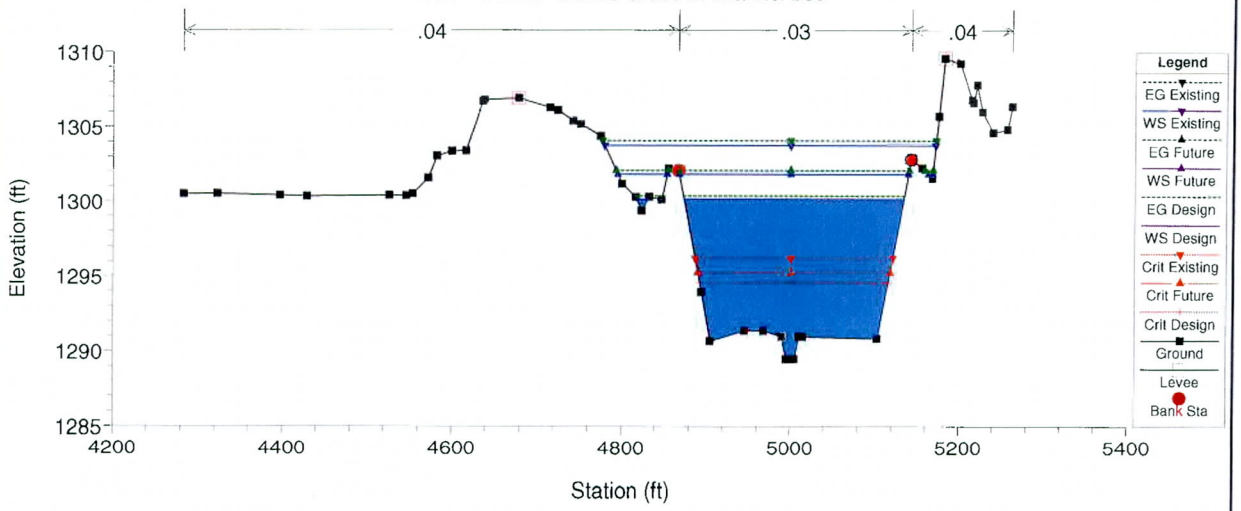
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.231 Just Downstream of Chandler Heights Road Bridge



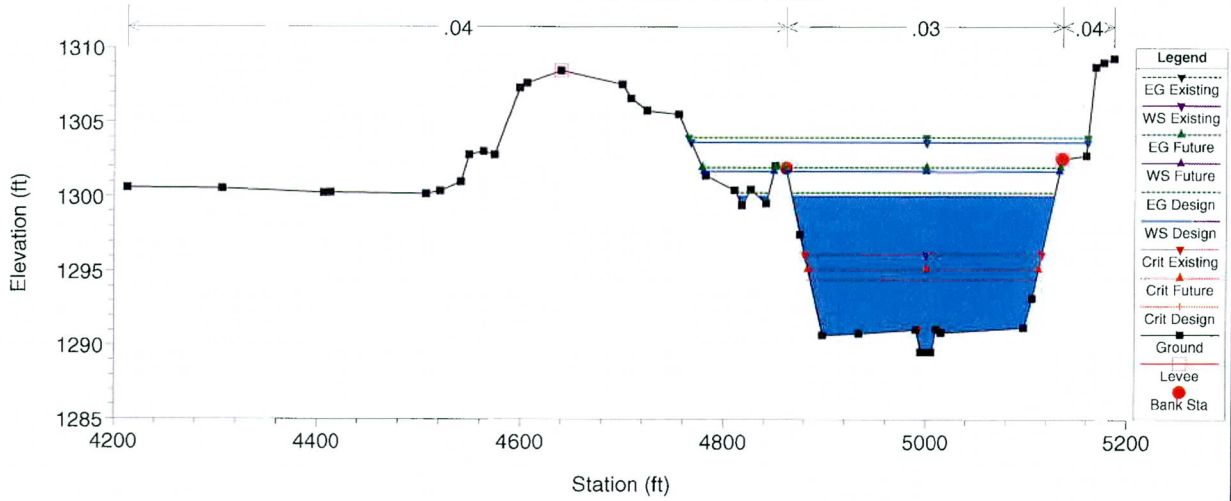
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.189 Dense Grass in channel bed



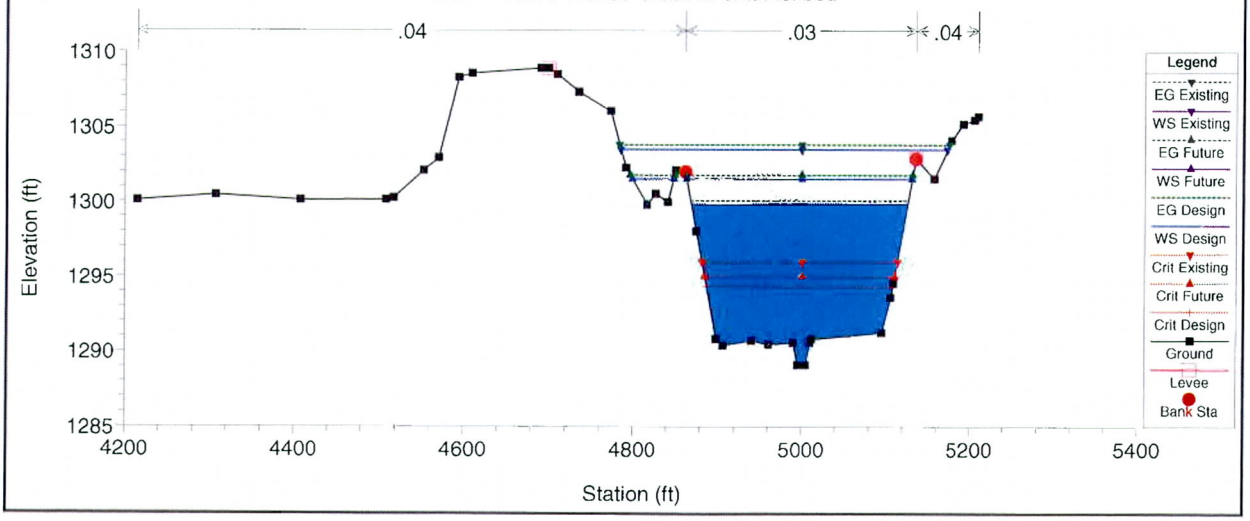
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.127 Dense Grass in channel bed



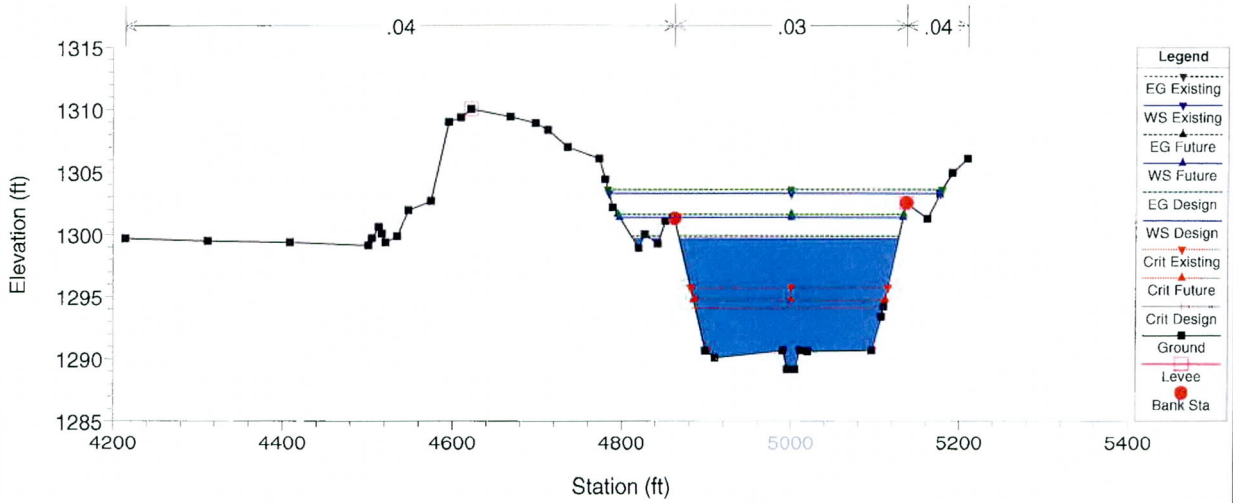
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.033 Dense Grass in channel bed



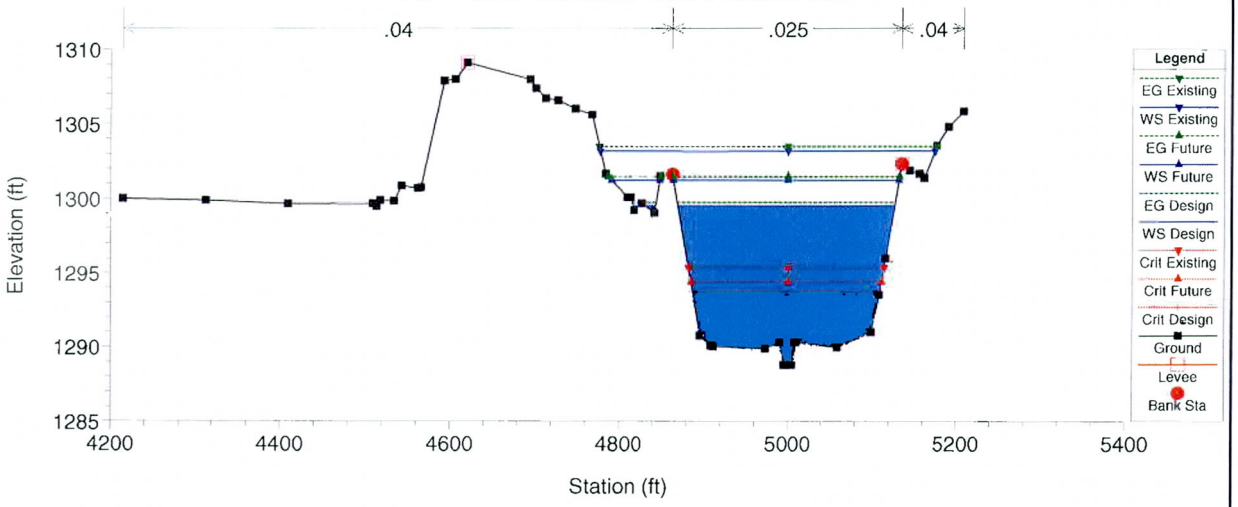
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.938 Dense Grass in channel bed



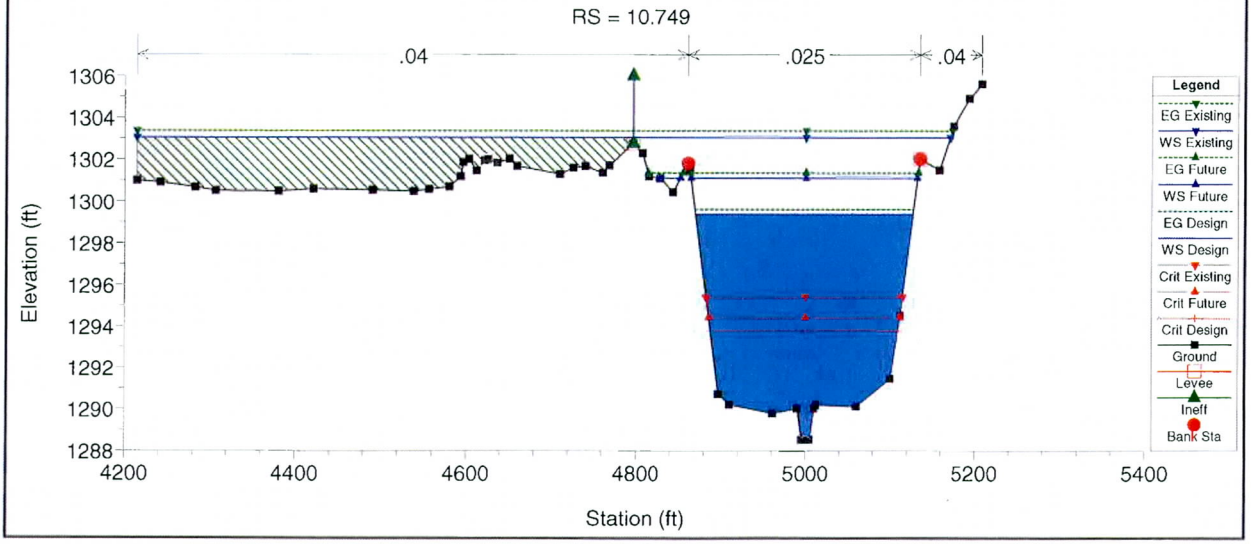
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.843 End Dense Grass in channel bed



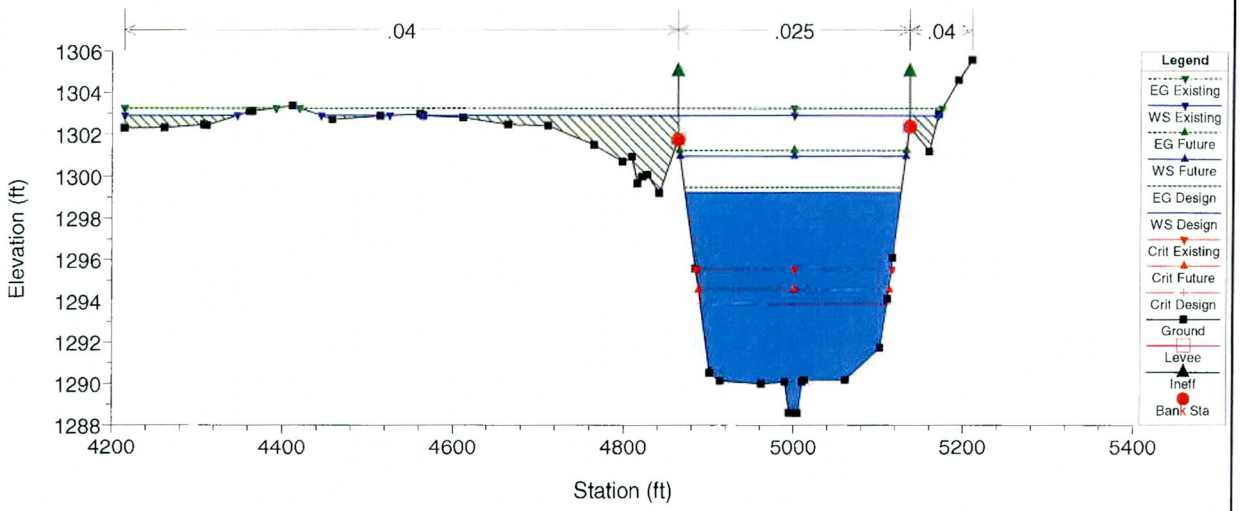
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.749



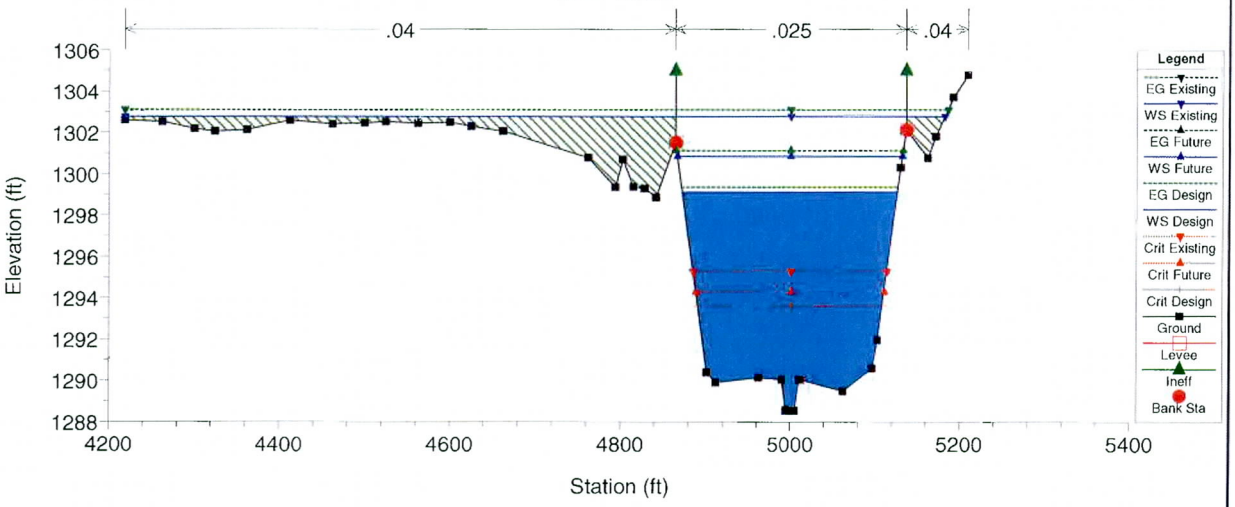
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.654



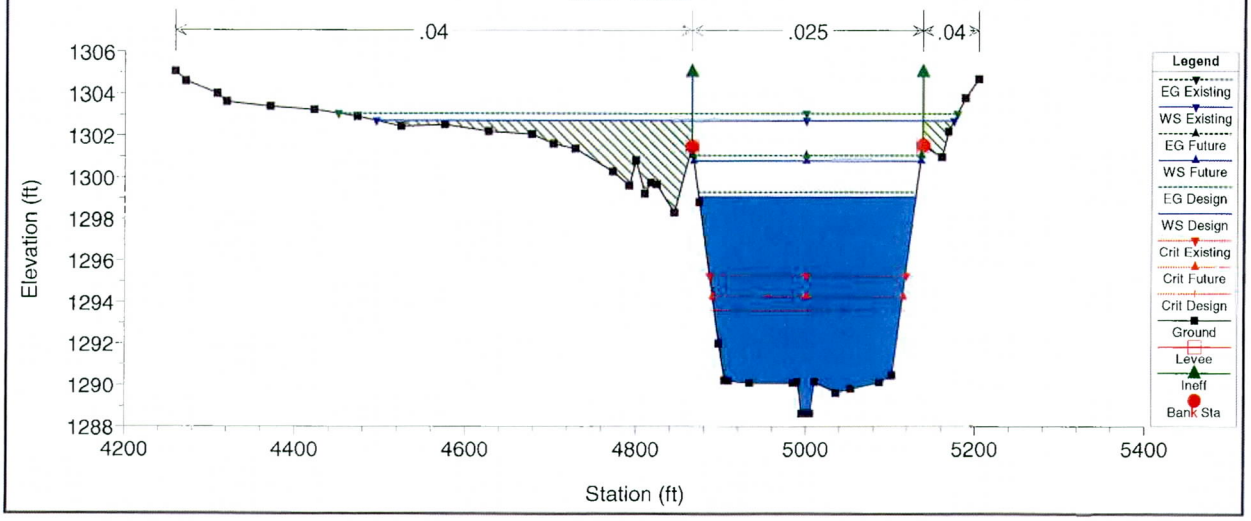
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.566



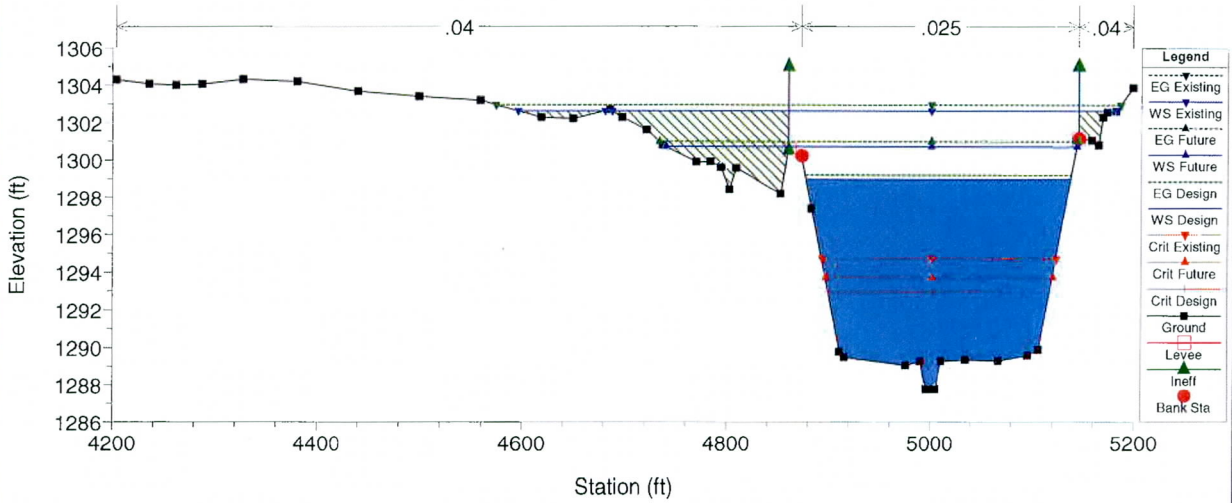
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.518



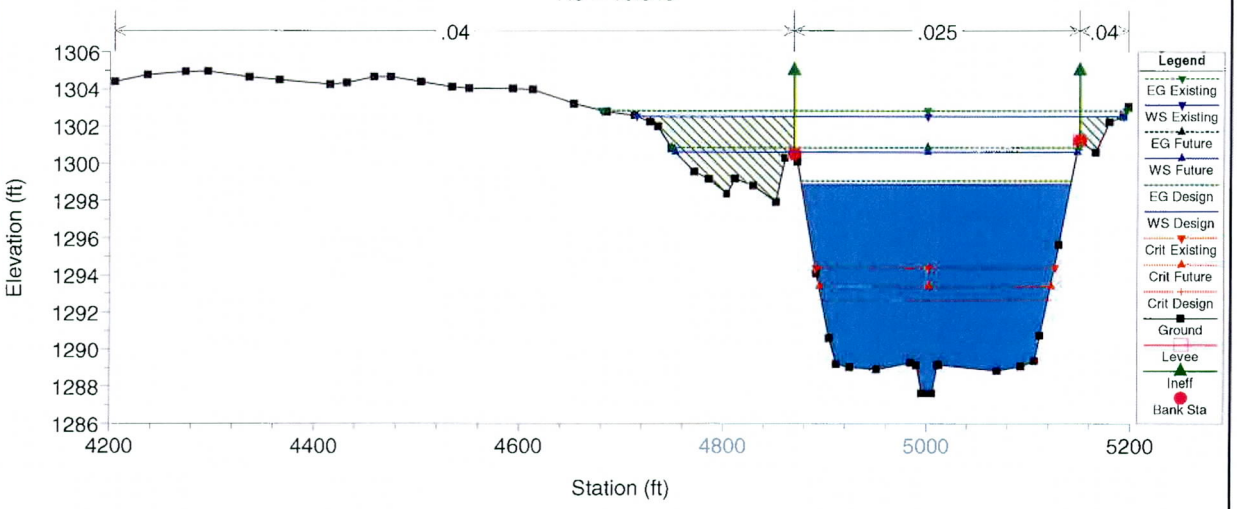
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.441 Downstream of Side Inlet from the Left Bank



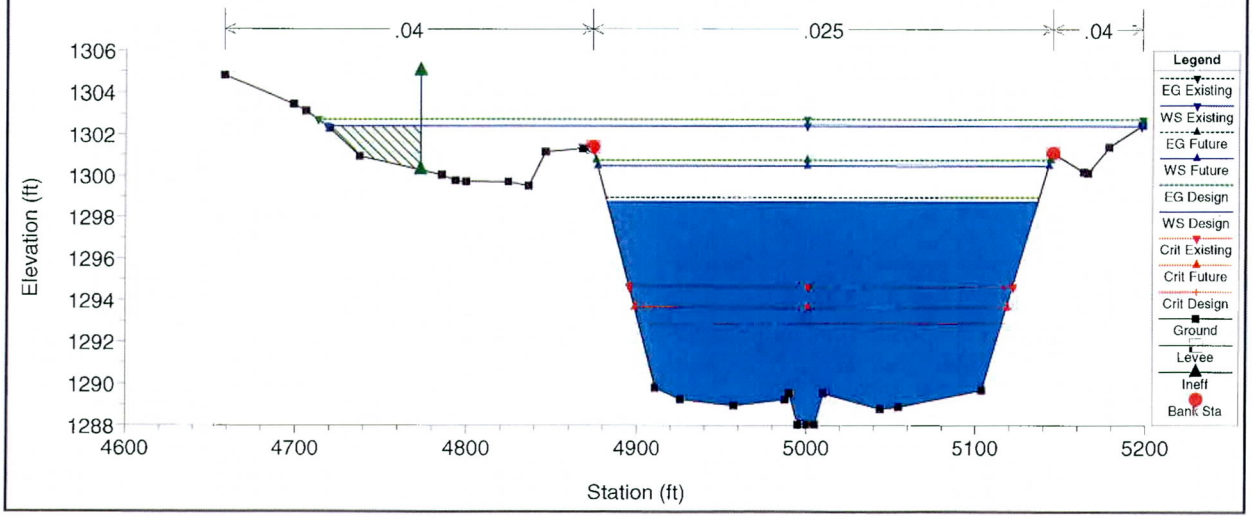
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.346



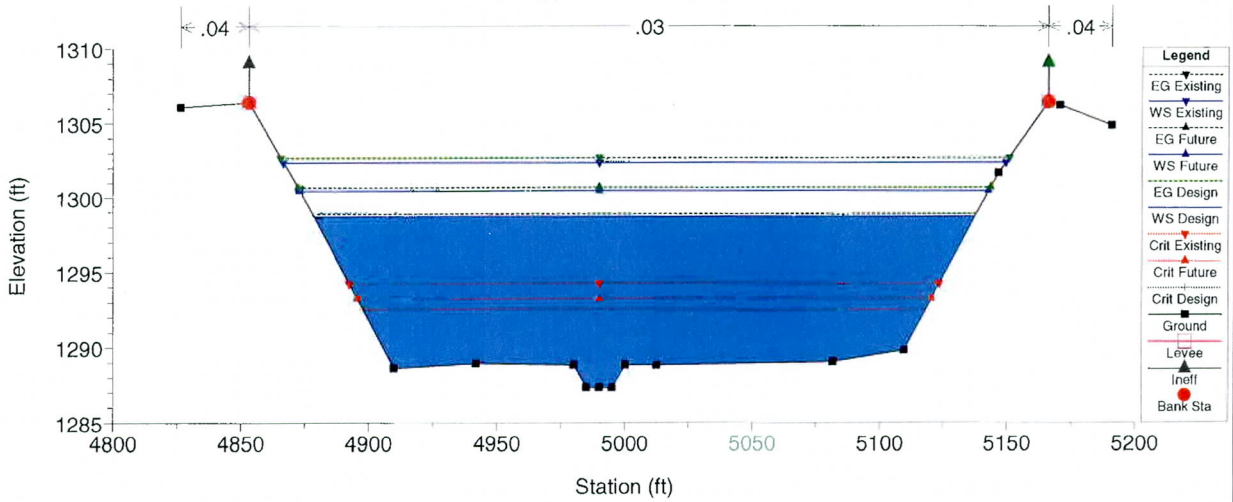
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.252



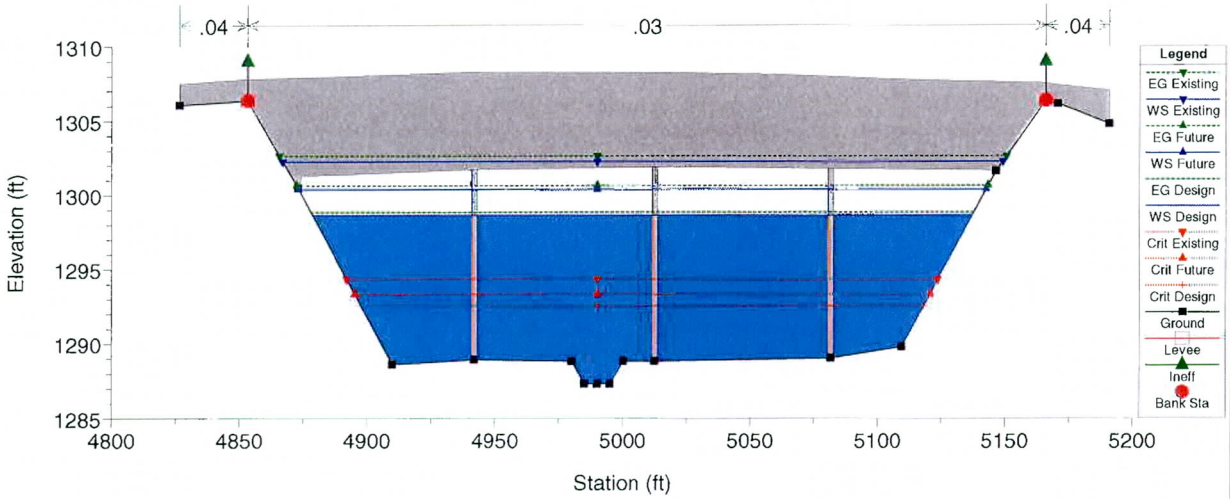
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.218 Riggs Road Bridge (Upstream Face)



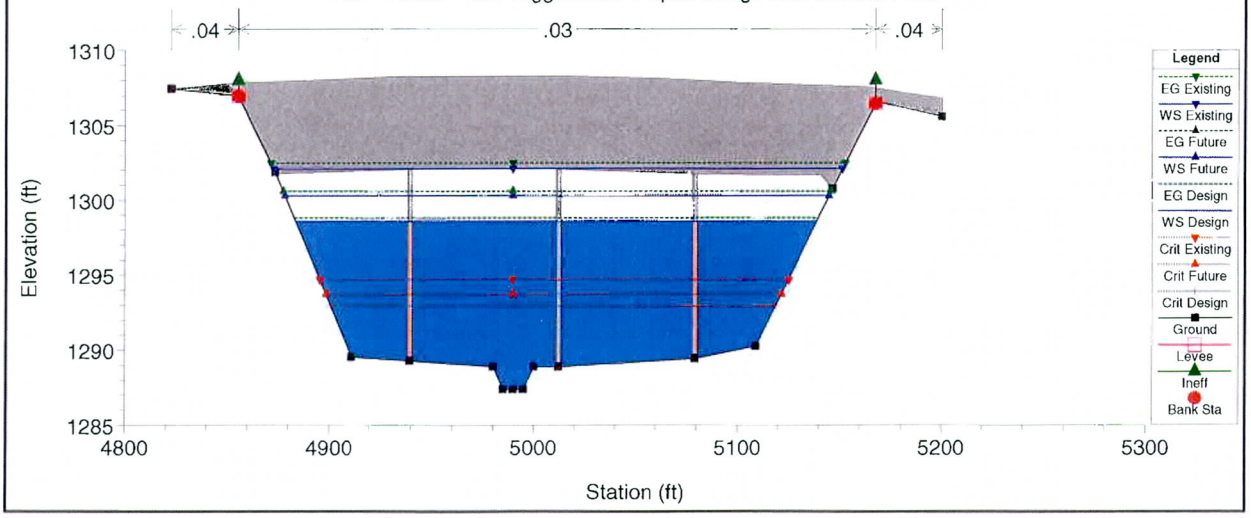
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



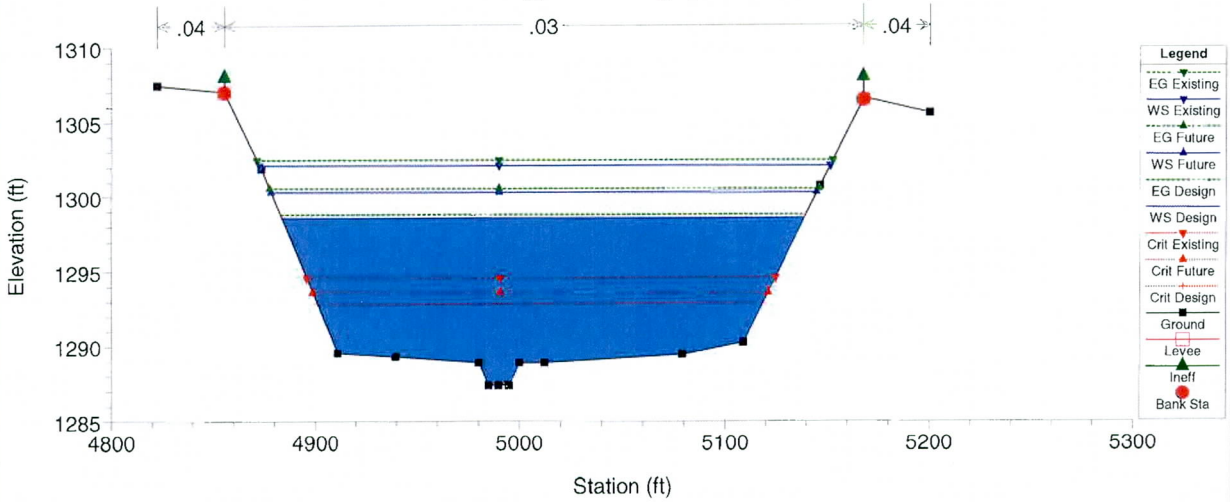
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



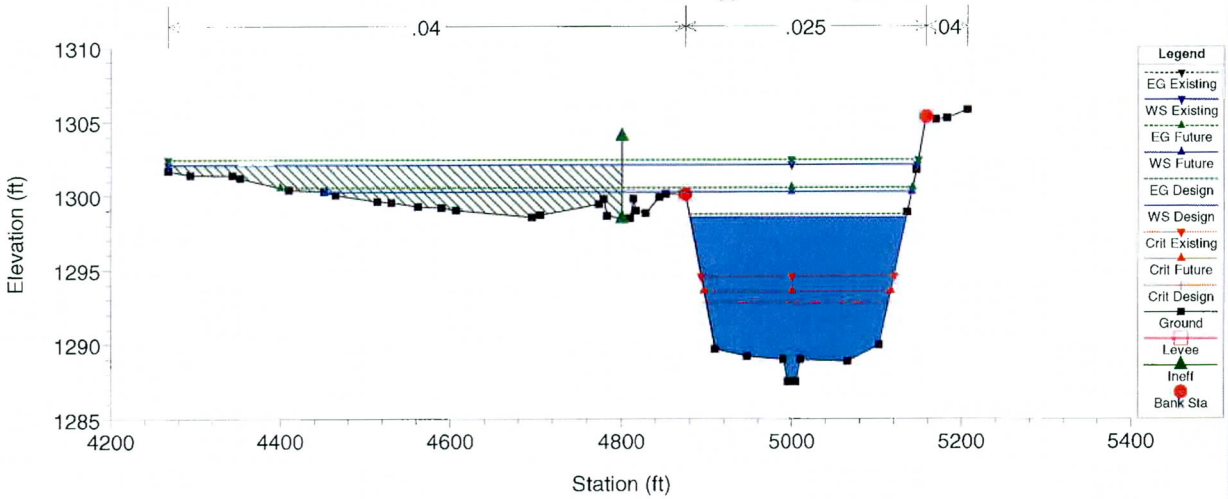
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.195 Riggs Road Bridge (Downstream Face)



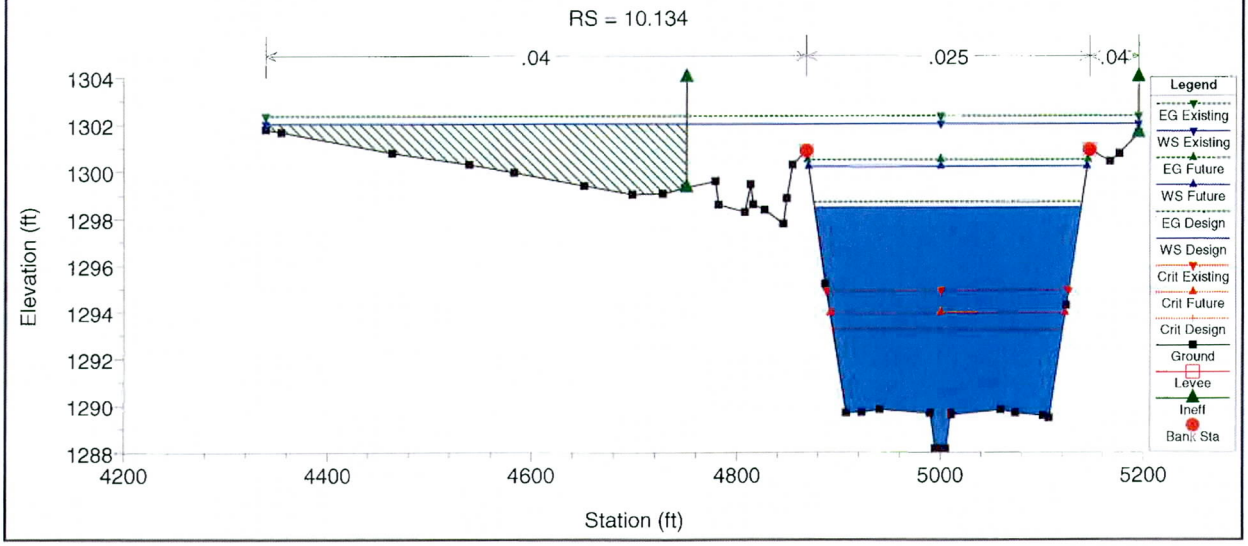
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.171 Just Downstream of Riggs Road Bridge



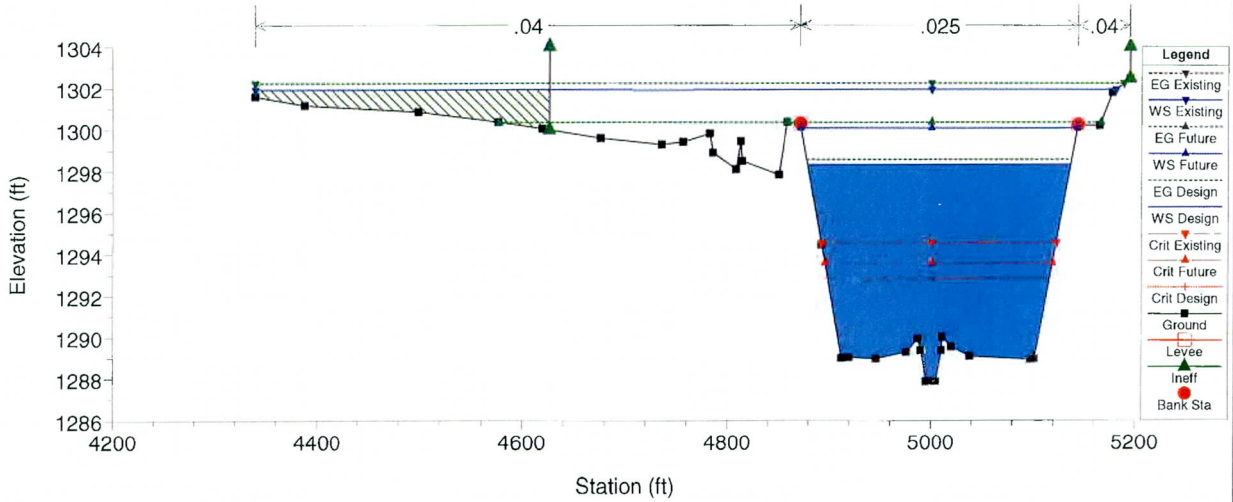
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.134



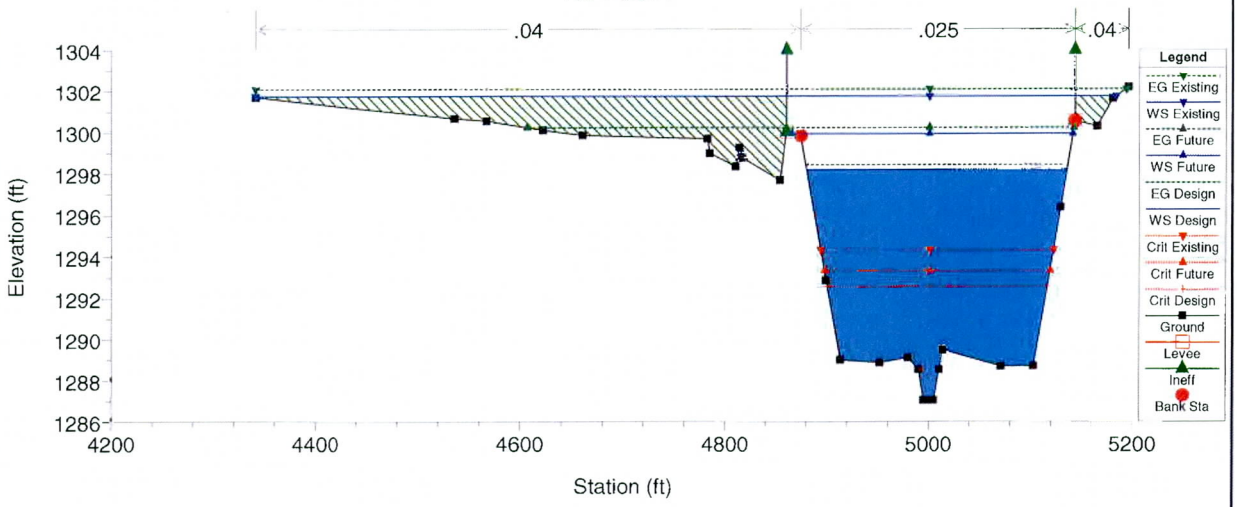
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.039



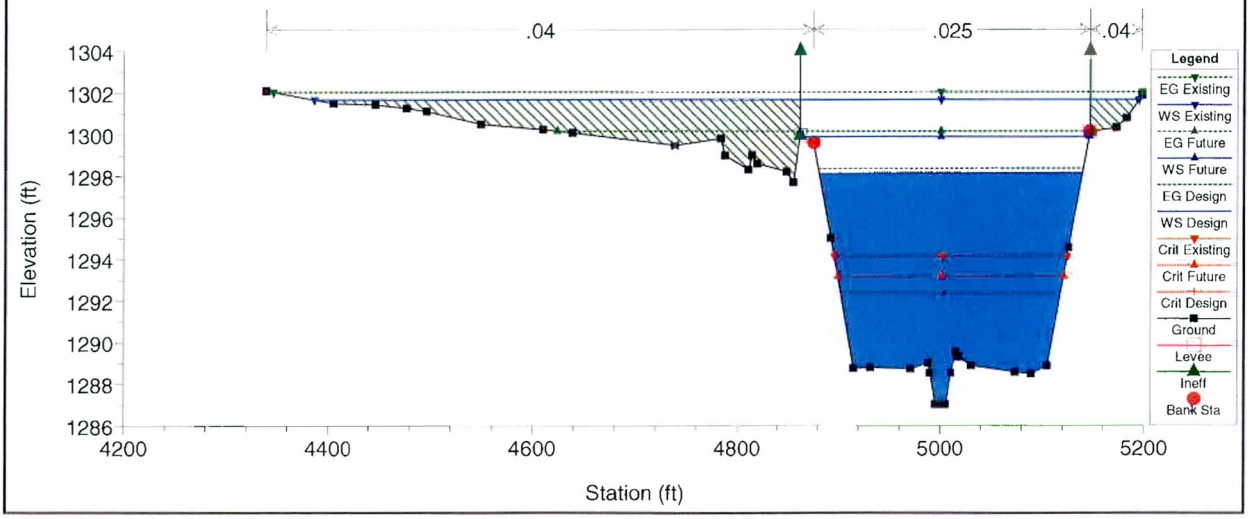
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.944



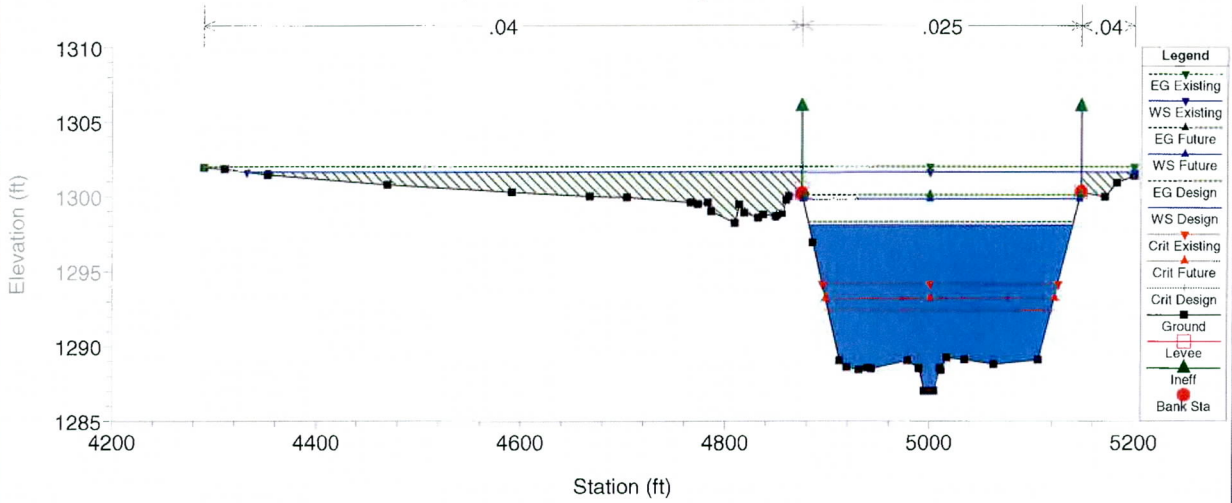
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.897



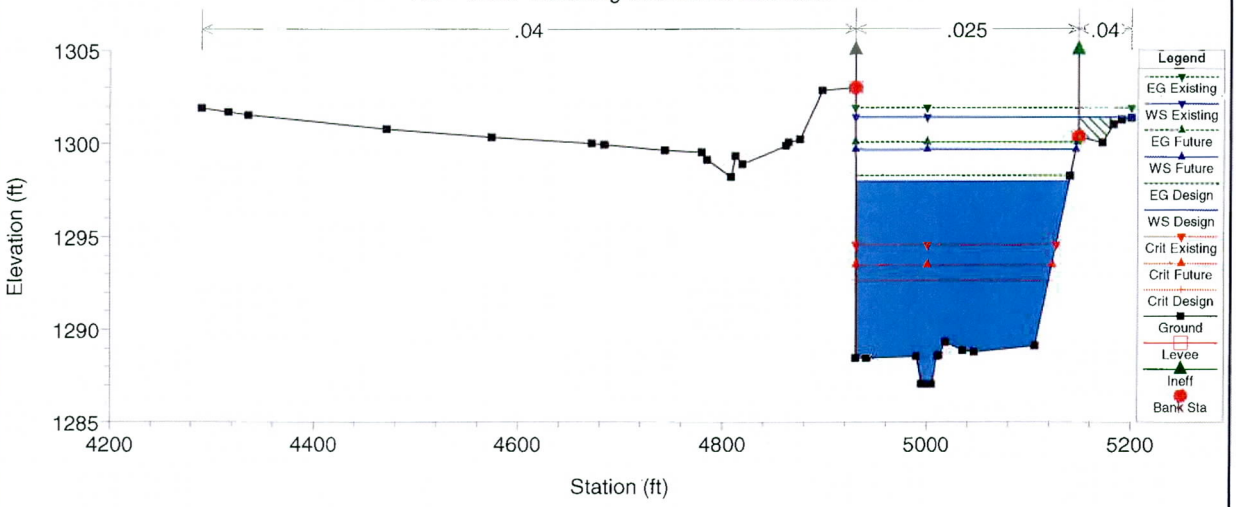
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.854 Upstream Side of Retaining Wall on the Left Bank



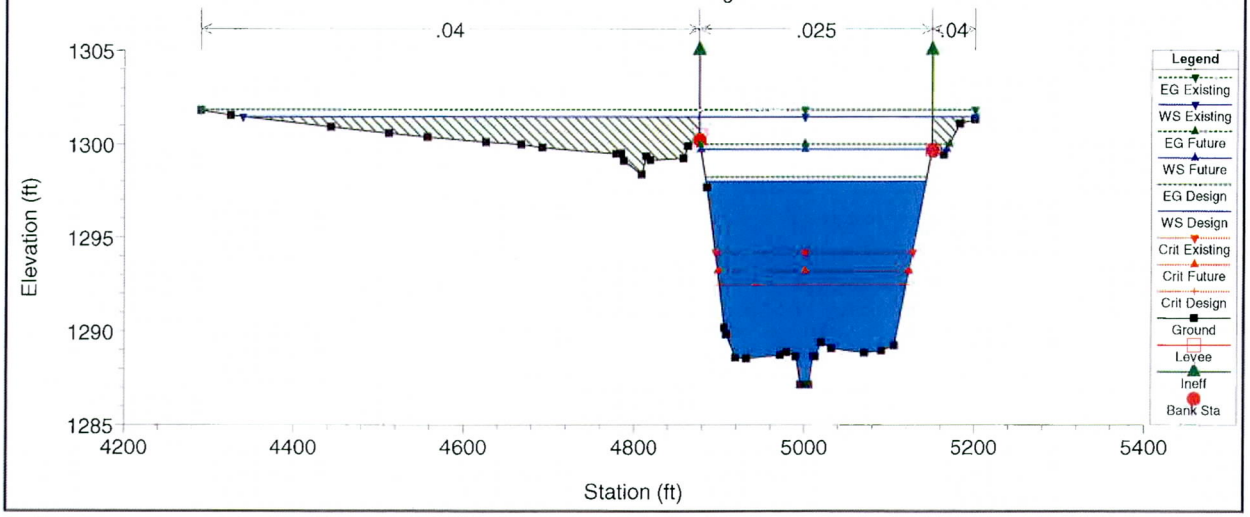
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.849 Retaining Wall on the Left Bank



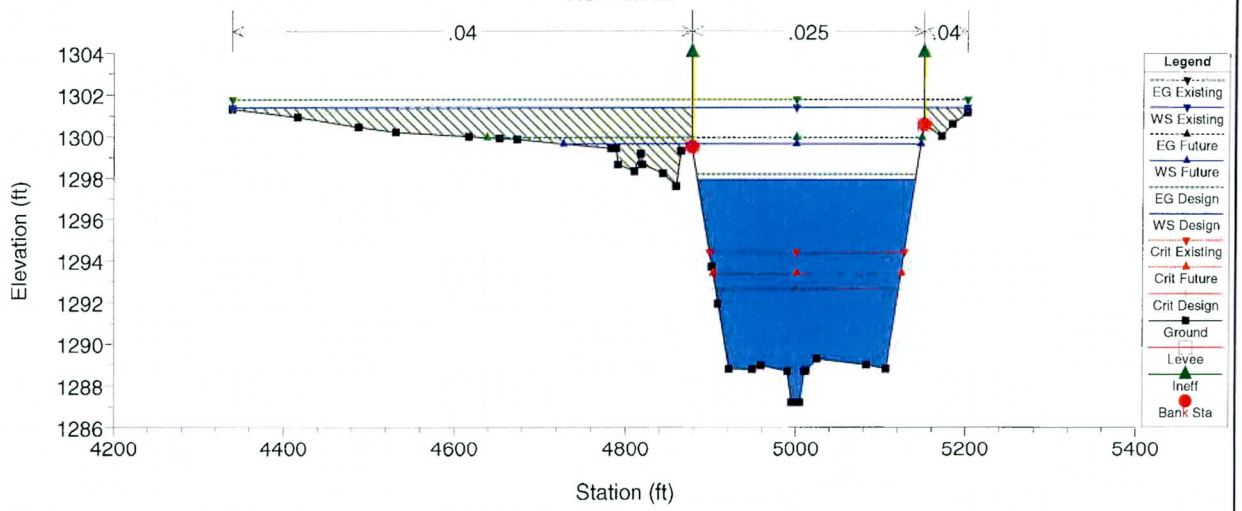
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.844 Downstream Side of Retaining Wall on the Left Bank



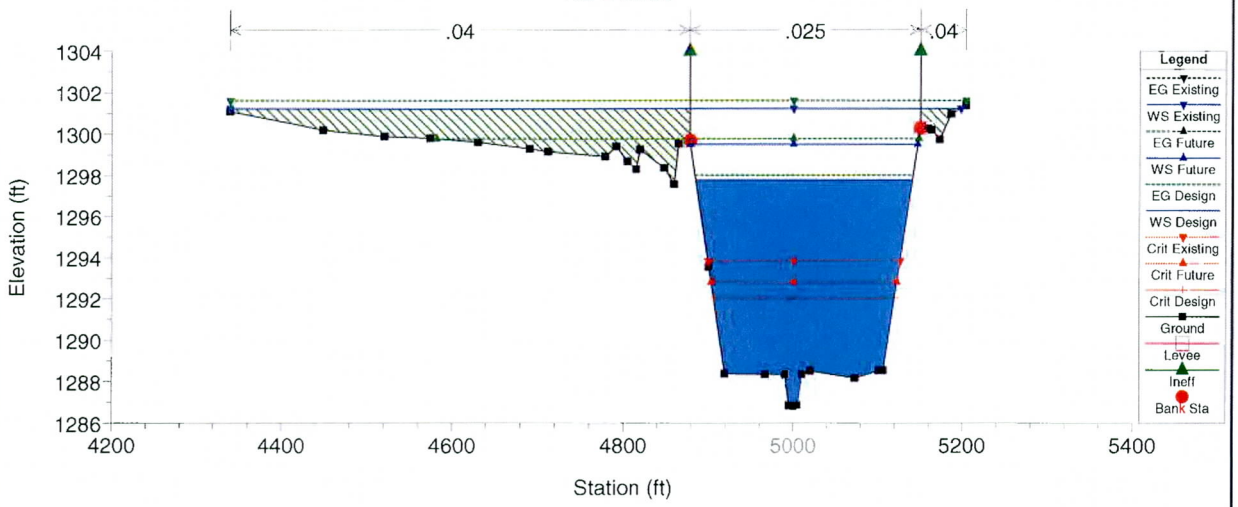
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.802



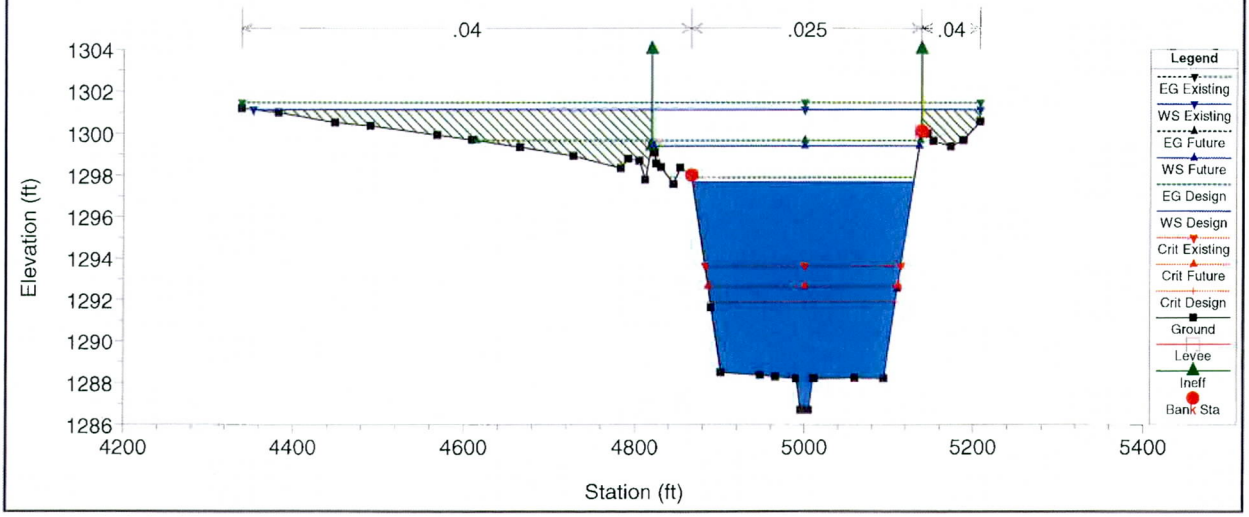
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.708



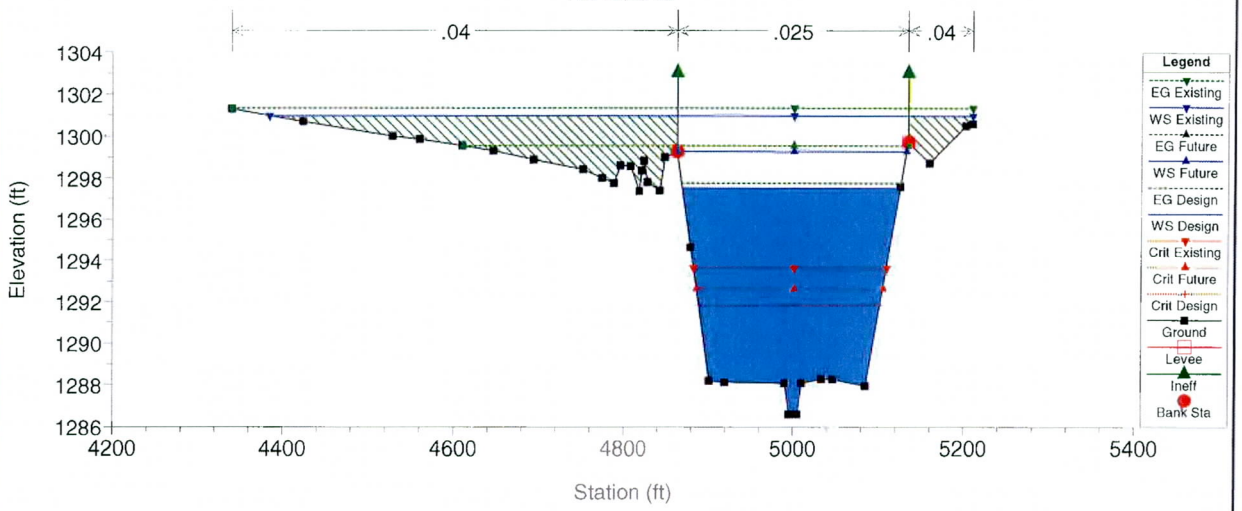
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.613



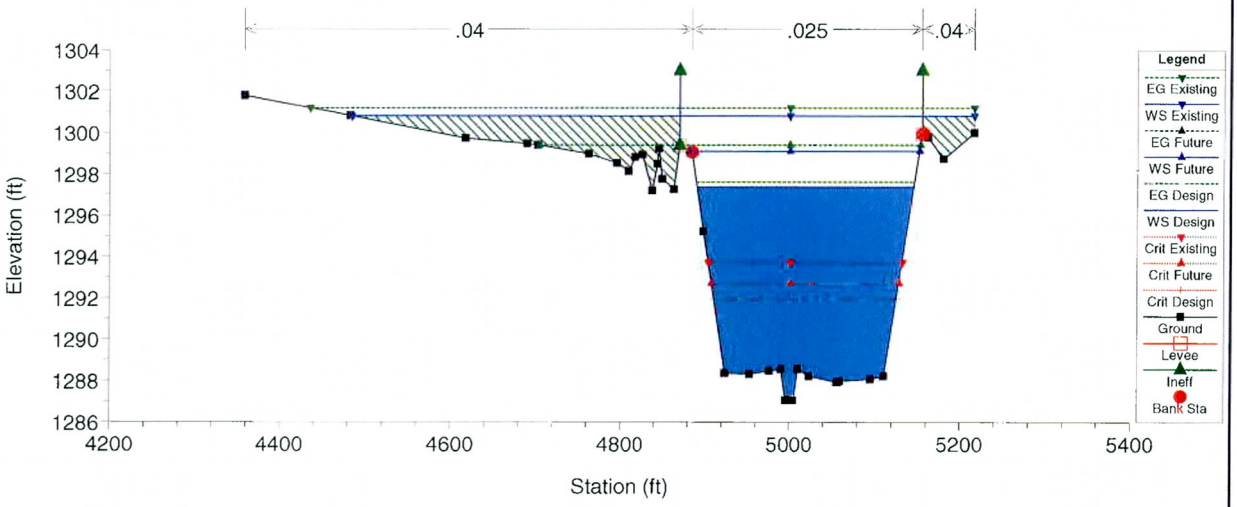
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.518



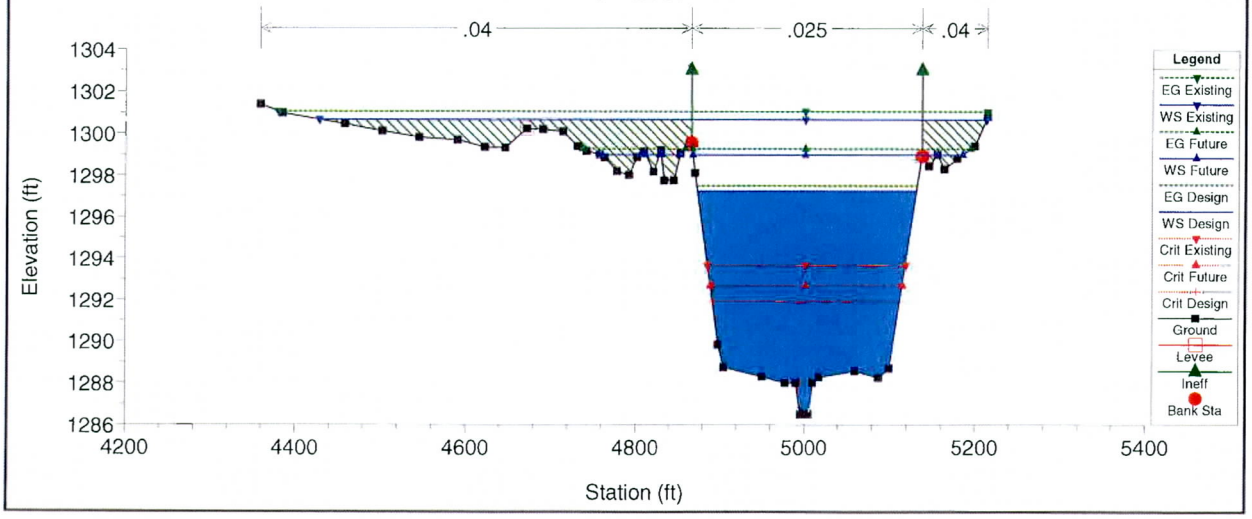
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.424



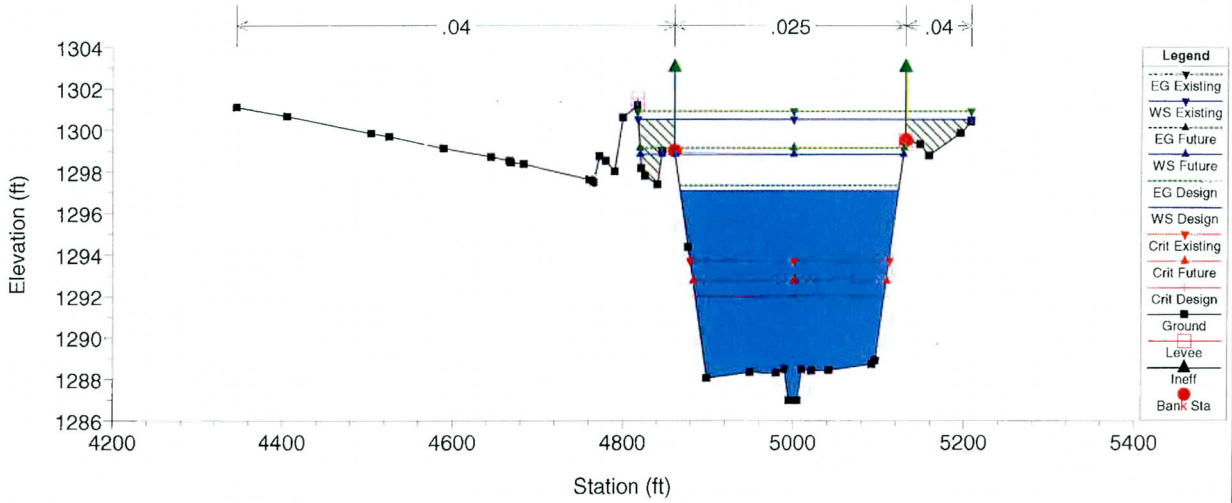
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.334



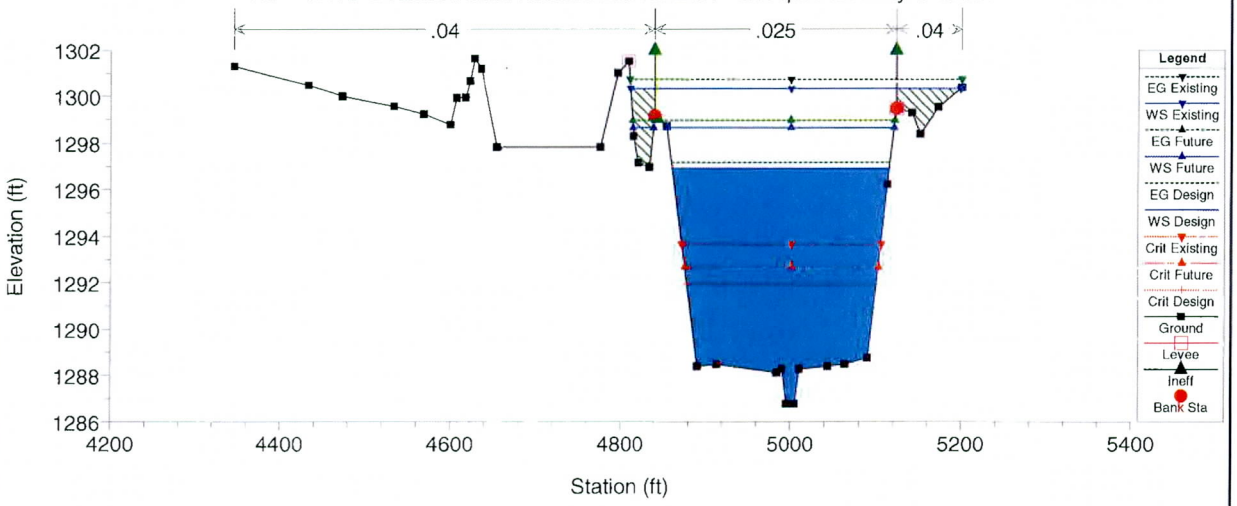
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.24



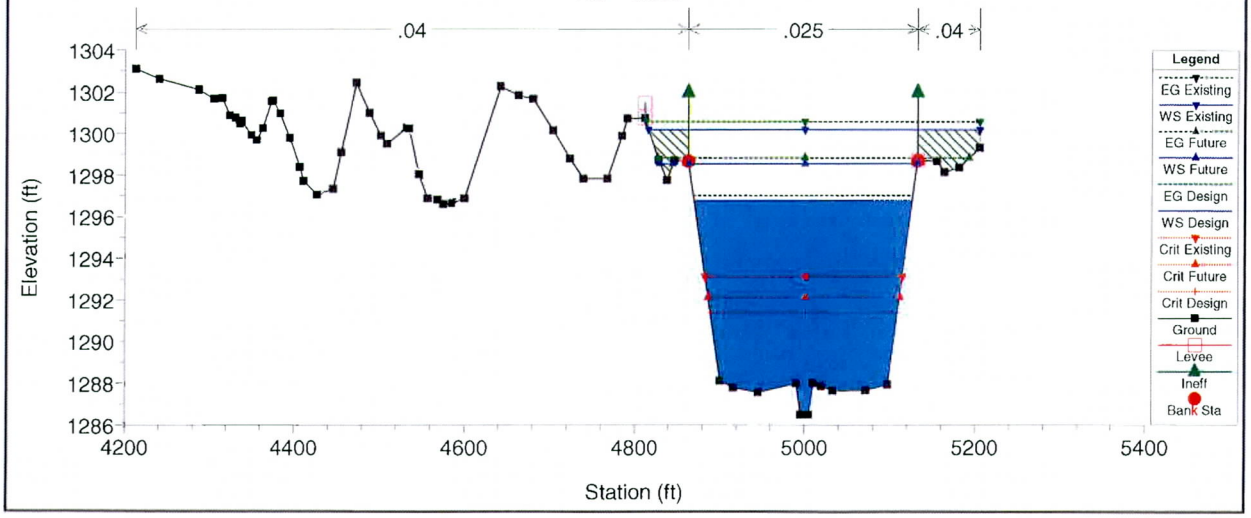
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.145 Detention Basin located East of East Maricopa Floodway Channel



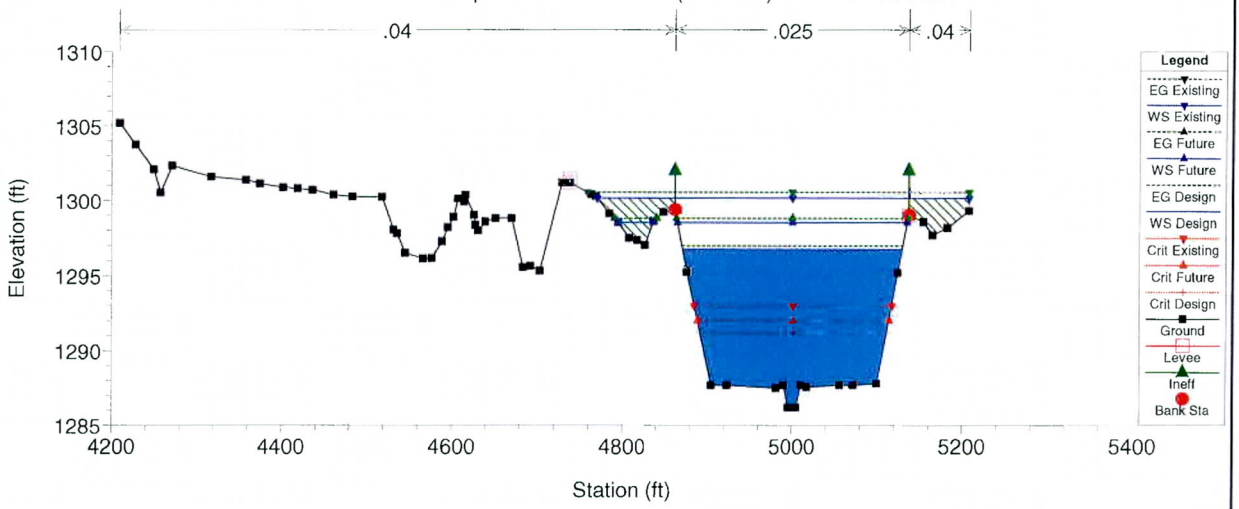
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.053



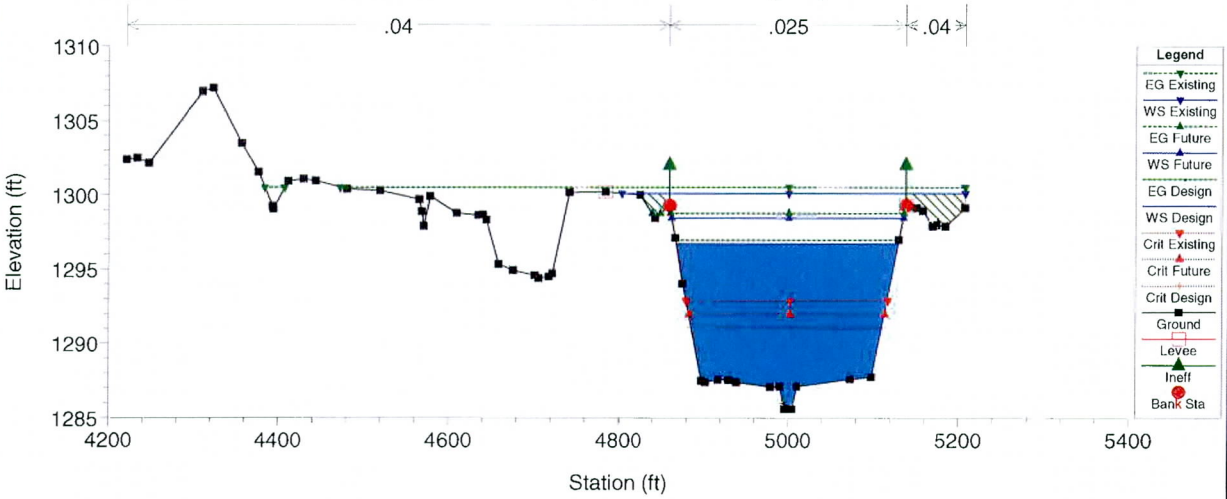
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.036 Just Upstream of Side Inlet (95' Wide) from the Left Bank



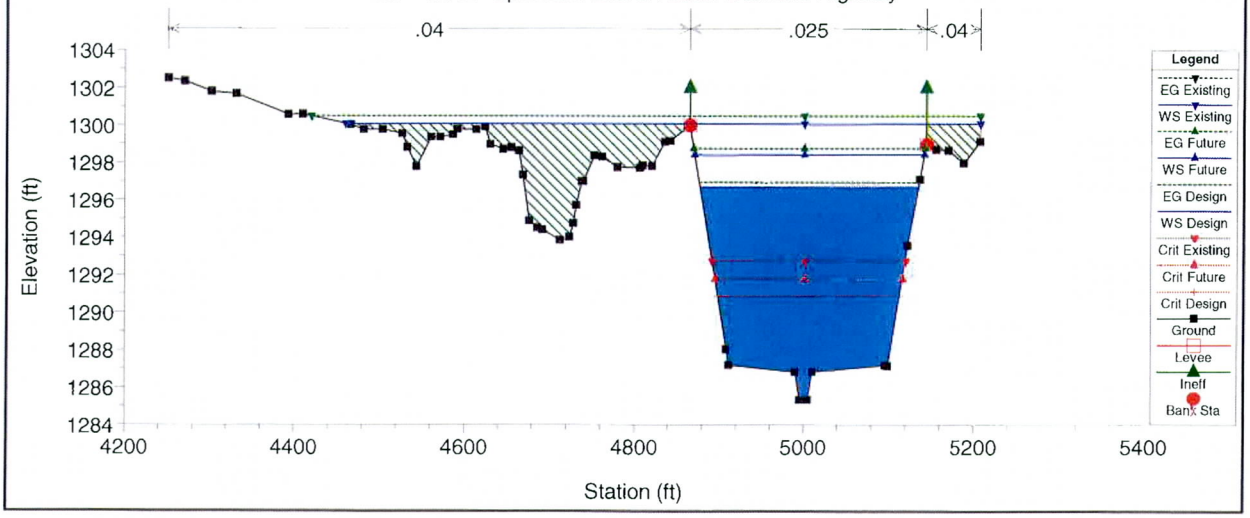
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.018 Just Upstream of Hunt Highway



EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.001 Upstream End of Reach 2 at Hunt Highway



Post-Project HEC-RAS Analysis

(NAVD 88)

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.911	Design	6900.00	1301.50	1311.05	1307.04	1311.43	0.000538	4.98	1386.19	199.29	0.33
Reach 3	13.911	Future	8970.00	1301.50	1312.35	1307.75	1312.81	0.000536	5.43	1651.58	207.52	0.34
Reach 3	13.911	Existing	12910.00	1301.50	1314.36	1308.98	1314.94	0.000541	6.17	2155.59	265.88	0.35
Reach 3	13.911	500-Year	11730.00	1301.50	1313.78	1308.65	1314.33	0.000546	5.98	2003.31	260.78	0.35
Reach 3	13.842	Design	6900.00	1301.51	1310.80	1307.08	1311.22	0.000613	5.19	1329.38	197.95	0.35
Reach 3	13.842	Future	8970.00	1301.51	1312.11	1307.81	1312.60	0.000599	5.63	1593.50	206.25	0.36
Reach 3	13.842	Existing	12910.00	1301.51	1314.10	1309.03	1314.73	0.000598	6.37	2072.84	266.91	0.37
Reach 3	13.842	500-Year	11730.00	1301.51	1313.52	1308.68	1314.12	0.000607	6.19	1919.41	262.08	0.37
Reach 3	13.755	Design	6900.00	1301.38	1310.55	1306.63	1310.94	0.000566	5.06	1362.99	198.49	0.34
Reach 3	13.755	Future	8970.00	1301.38	1311.86	1307.36	1312.33	0.000560	5.51	1629.03	207.10	0.35
Reach 3	13.755	Existing	12910.00	1301.38	1313.86	1308.60	1314.46	0.000558	6.23	2144.23	270.59	0.36
Reach 3	13.755	500-Year	11730.00	1301.38	1313.28	1308.24	1313.84	0.000566	6.05	1987.22	265.80	0.36
Reach 3	13.661	Design	6900.00	1300.38	1310.30	1306.11	1310.67	0.000509	4.90	1408.60	198.94	0.32
Reach 3	13.661	Future	8970.00	1300.38	1311.61	1306.87	1312.05	0.000511	5.35	1675.38	207.36	0.33
Reach 3	13.661	Existing	12910.00	1300.38	1313.61	1308.11	1314.18	0.000517	6.08	2200.61	270.02	0.34
Reach 3	13.661	500-Year	11730.00	1300.38	1313.02	1307.74	1313.56	0.000523	5.91	2042.74	265.70	0.34
Reach 3	13.566	Design	6900.00	1300.37	1310.02	1305.86	1310.41	0.000531	5.00	1379.08	194.89	0.33
Reach 3	13.566	Future	8970.00	1300.37	1311.33	1306.62	1311.79	0.000536	5.47	1639.82	203.84	0.34
Reach 3	13.566	Existing	12910.00	1300.37	1313.32	1307.89	1313.91	0.000548	6.23	2143.71	268.54	0.35
Reach 3	13.566	500-Year	11730.00	1300.37	1312.72	1307.52	1313.29	0.000555	6.05	1986.16	263.89	0.35
Reach 3	13.471	Design	6900.00	1300.19	1309.87	1305.32	1310.15	0.000381	4.28	1613.30	225.45	0.28
Reach 3	13.471	Future	8970.00	1300.19	1311.19	1306.00	1311.53	0.000383	4.68	1917.65	242.29	0.29
Reach 3	13.471	Existing	12910.00	1300.19	1313.19	1307.12	1313.64	0.000391	5.35	2469.57	286.28	0.30
Reach 3	13.471	500-Year	11730.00	1300.19	1312.60	1306.79	1313.01	0.000395	5.19	2299.64	281.46	0.30
Reach 3	13.442	Design	6900.00	1299.96	1309.84	1304.93	1310.06	0.000402	3.73	1848.28	251.17	0.24
Reach 3	13.442	Future	8970.00	1299.96	1311.17	1305.54	1311.43	0.000406	4.10	2186.59	259.31	0.25
Reach 3	13.442	Existing	12910.00	1299.96	1313.18	1306.59	1313.53	0.000437	4.74	2721.04	273.58	0.27
Reach 3	13.442	500-Year	11730.00	1299.96	1312.58	1306.30	1312.90	0.000431	4.58	2558.63	268.12	0.26
Reach 3	13.431		Bridge									
Reach 3	13.423	Design	6900.00	1300.73	1309.68	1305.23	1309.93	0.000492	4.00	1726.62	246.04	0.27
Reach 3	13.423	Future	8970.00	1300.73	1310.99	1305.85	1311.28	0.000490	4.37	2053.98	255.08	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	13.423	Existing	12910.00	1300.73	1312.95	1306.89	1313.35	0.000517	5.02	2569.82	268.83	0.29
Reach 3	13.423	500-Year	11730.00	1300.73	1312.36	1306.59	1312.73	0.000516	4.86	2412.47	264.61	0.28
Reach 3	13.374	Design	6900.00	1300.39	1309.57	1305.22	1309.82	0.000352	4.01	1719.75	249.59	0.27
Reach 3	13.374	Future	9070.00	1300.39	1310.87	1305.84	1311.17	0.000354	4.43	2048.96	257.42	0.28
Reach 3	13.374	Existing	12990.00	1300.39	1312.84	1306.87	1313.23	0.000361	5.05	2602.18	330.35	0.29
Reach 3	13.374	500-Year	11730.00	1300.39	1312.25	1306.55	1312.62	0.000359	4.86	2411.27	265.32	0.28
Reach 3	13.28	Design	6900.00	1300.02	1309.39	1304.89	1309.64	0.000352	4.04	1707.43	244.96	0.27
Reach 3	13.28	Future	9070.00	1300.02	1310.68	1305.57	1310.99	0.000359	4.47	2030.30	254.02	0.28
Reach 3	13.28	Existing	12990.00	1300.02	1312.64	1306.64	1313.05	0.000372	5.11	2542.03	326.92	0.29
Reach 3	13.28	500-Year	11730.00	1300.02	1312.06	1306.29	1312.44	0.000368	4.91	2387.74	263.65	0.29
Reach 3	13.232	Design	6900.00	1299.71	1309.28	1305.00	1309.55	0.000386	4.17	1656.51	243.61	0.28
Reach 3	13.232	Future	9070.00	1299.71	1310.57	1305.63	1310.90	0.000389	4.59	1977.13	252.85	0.29
Reach 3	13.232	Existing	12990.00	1299.71	1312.53	1306.72	1312.95	0.000398	5.23	2485.56	327.64	0.30
Reach 3	13.232	500-Year	11730.00	1299.71	1311.95	1306.41	1312.34	0.000396	5.03	2332.26	262.70	0.30
Reach 3	13.179	Design	6900.00	1300.01	1309.17	1304.93	1309.44	0.000391	4.19	1648.05	242.83	0.28
Reach 3	13.179	Future	9070.00	1300.01	1310.46	1305.57	1310.79	0.000394	4.61	1967.27	251.98	0.29
Reach 3	13.179	Existing	12990.00	1300.01	1312.41	1306.63	1312.84	0.000403	5.25	2472.92	303.77	0.30
Reach 3	13.179	500-Year	11730.00	1300.01	1311.83	1306.32	1312.23	0.000401	5.06	2320.47	261.73	0.30
Reach 3	13.084	Design	6900.00	1299.52	1308.99	1304.51	1309.25	0.000351	4.04	1708.97	245.26	0.27
Reach 3	13.084	Future	9070.00	1299.52	1310.28	1305.18	1310.59	0.000359	4.47	2030.78	254.31	0.28
Reach 3	13.084	Existing	12990.00	1299.52	1312.23	1306.22	1312.64	0.000373	5.11	2539.60	307.91	0.29
Reach 3	13.084	500-Year	11730.00	1299.52	1311.65	1305.92	1312.03	0.000369	4.92	2386.30	263.96	0.29
Reach 3	13.037	Design	6900.00	1299.42	1308.91	1304.33	1309.16	0.000334	3.96	1740.97	247.21	0.26
Reach 3	13.037	Future	9070.00	1299.42	1310.20	1304.99	1310.50	0.000343	4.39	2064.99	256.37	0.27
Reach 3	13.037	Existing	12990.00	1299.42	1312.15	1306.05	1312.54	0.000358	5.04	2576.90	312.42	0.29
Reach 3	13.037	500-Year	11730.00	1299.42	1311.57	1305.71	1311.94	0.000354	4.84	2422.90	303.99	0.28
Reach 3	12.981	Design	6900.00	1299.42	1308.81	1304.32	1309.06	0.000347	4.03	1713.36	244.39	0.27
Reach 3	12.981	Future	9070.00	1299.42	1310.09	1304.99	1310.40	0.000356	4.46	2032.18	252.86	0.28
Reach 3	12.981	Existing	12990.00	1299.42	1312.03	1306.03	1312.44	0.000370	5.13	2534.13	301.82	0.29
Reach 3	12.981	500-Year	11730.00	1299.42	1311.45	1305.70	1311.83	0.000367	4.92	2383.16	298.62	0.29
Reach 3	12.905	Design	6900.00	1299.29	1308.67	1304.12	1308.92	0.000346	4.03	1712.14	243.34	0.27

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	12.905	Future	9070.00	1299.29	1309.94	1304.79	1310.25	0.000357	4.47	2029.03	252.69	0.28
Reach 3	12.905	Existing	12990.00	1299.29	1311.88	1305.86	1312.29	0.000368	5.14	2529.10	309.77	0.29
Reach 3	12.905	500-Year	11730.00	1299.29	1311.30	1305.51	1311.68	0.000368	4.93	2379.03	297.82	0.29
Reach 3	12.884	Design	6900.00	1299.21	1308.63	1304.05	1308.88	0.000341	3.99	1727.38	246.01	0.27
Reach 3	12.884	Future	9070.00	1299.21	1309.91	1304.73	1310.21	0.000351	4.43	2047.47	255.21	0.28
Reach 3	12.884	Existing	12990.00	1299.21	1311.84	1305.79	1312.24	0.000370	5.08	2558.04	315.99	0.29
Reach 3	12.884	500-Year	11730.00	1299.21	1311.27	1305.47	1311.64	0.000369	4.88	2402.91	302.46	0.29
Reach 3	12.789	Design	6900.00	1298.72	1308.46	1303.90	1308.71	0.000341	4.00	1723.96	244.87	0.27
Reach 3	12.789	Future	9070.00	1298.72	1309.73	1304.55	1310.04	0.000353	4.44	2040.95	254.13	0.28
Reach 3	12.789	Existing	12990.00	1298.72	1311.65	1305.62	1312.06	0.000368	5.11	2540.91	302.14	0.29
Reach 3	12.789	500-Year	11730.00	1298.72	1311.08	1305.29	1311.45	0.000364	4.91	2390.04	298.61	0.29
Reach 3	12.694	Design	6900.00	1298.66	1308.28	1303.79	1308.54	0.000348	4.03	1714.19	245.39	0.27
Reach 3	12.694	Future	9070.00	1298.66	1309.55	1304.45	1309.86	0.000360	4.47	2029.95	254.21	0.28
Reach 3	12.694	Existing	12990.00	1298.66	1311.46	1305.50	1311.87	0.000374	5.14	2527.36	301.95	0.29
Reach 3	12.694	500-Year	11730.00	1298.66	1310.89	1305.17	1311.27	0.000371	4.93	2377.24	288.34	0.29
Reach 3	12.6	Design	6900.00	1298.65	1308.09	1303.75	1308.35	0.000378	4.13	1669.90	244.54	0.28
Reach 3	12.6	Future	9070.00	1298.65	1309.35	1304.42	1309.67	0.000387	4.57	1983.20	253.73	0.29
Reach 3	12.6	Existing	12990.00	1298.65	1311.25	1305.49	1311.68	0.000403	5.24	2479.16	299.02	0.30
Reach 3	12.6	500-Year	11730.00	1298.65	1310.68	1305.14	1311.08	0.000399	5.04	2328.48	263.50	0.30
Reach 3	12.552	Design	6900.00	1298.27	1308.01	1303.50	1308.26	0.000350	4.04	1709.72	244.84	0.27
Reach 3	12.552	Future	9070.00	1298.27	1309.26	1304.16	1309.57	0.000363	4.48	2022.76	254.03	0.28
Reach 3	12.552	Existing	12990.00	1298.27	1311.16	1305.22	1311.57	0.000382	5.16	2517.93	296.71	0.30
Reach 3	12.552	500-Year	11730.00	1298.27	1310.59	1304.90	1310.97	0.000379	4.95	2367.59	263.78	0.29
Reach 3	12.488	Design	6900.00	1298.42	1307.88	1303.54	1308.14	0.000369	4.10	1684.16	245.41	0.28
Reach 3	12.488	Future	9070.00	1298.42	1309.13	1304.20	1309.45	0.000379	4.54	1996.38	253.93	0.29
Reach 3	12.488	Existing	12990.00	1298.42	1311.02	1305.24	1311.44	0.000397	5.22	2488.76	298.02	0.30
Reach 3	12.488	500-Year	11730.00	1298.42	1310.45	1304.92	1310.84	0.000393	5.01	2339.09	262.96	0.30
Reach 3	12.441	Design	6900.00	1298.33	1307.77	1303.50	1308.04	0.000384	4.16	1658.38	243.40	0.28
Reach 3	12.441	Future	9070.00	1298.33	1309.02	1304.15	1309.35	0.000395	4.61	1967.25	252.15	0.29
Reach 3	12.441	Existing	12990.00	1298.33	1310.90	1305.22	1311.34	0.000413	5.29	2454.91	302.25	0.31
Reach 3	12.441	500-Year	11730.00	1298.33	1310.34	1304.89	1310.74	0.000408	5.09	2306.52	261.44	0.30

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	12.349	Design	6900.00	1298.28	1307.58	1303.25	1307.85	0.000389	4.21	1640.11	238.71	0.28
Reach 3	12.349	Future	9070.00	1298.28	1308.82	1303.91	1309.16	0.000403	4.67	1940.97	247.46	0.29
Reach 3	12.349	Existing	12990.00	1298.28	1310.69	1305.01	1311.14	0.000427	5.38	2415.91	260.66	0.31
Reach 3	12.349	500-Year	11730.00	1298.28	1310.13	1304.68	1310.54	0.000419	5.16	2271.25	256.71	0.31
Reach 3	12.302	Design	6900.00	1298.54	1307.47	1303.31	1307.75	0.000413	4.29	1607.71	237.69	0.29
Reach 3	12.302	Future	9070.00	1298.54	1308.70	1303.94	1309.05	0.000425	4.76	1905.91	246.13	0.30
Reach 3	12.302	Existing	12990.00	1298.54	1310.56	1305.04	1311.03	0.000448	5.47	2375.69	258.88	0.32
Reach 3	12.302	500-Year	11730.00	1298.54	1310.00	1304.73	1310.43	0.000440	5.25	2232.74	255.07	0.31
Reach 3	12.245	Design	6900.00	1298.12	1307.34	1303.09	1307.63	0.000409	4.29	1607.60	235.82	0.29
Reach 3	12.245	Future	9070.00	1298.12	1308.57	1303.76	1308.92	0.000424	4.77	1902.74	245.13	0.30
Reach 3	12.245	Existing	12990.00	1298.12	1310.42	1304.86	1310.89	0.000452	5.48	2369.62	259.18	0.32
Reach 3	12.245	500-Year	11730.00	1298.12	1309.87	1304.53	1310.30	0.000443	5.27	2227.33	254.98	0.31
Reach 3	12.177	Design	6900.00	1298.12	1307.22	1302.88	1307.48	0.000378	4.16	1659.03	240.45	0.28
Reach 3	12.177	Future	9070.00	1298.12	1308.44	1303.55	1308.77	0.000393	4.63	1958.07	248.48	0.29
Reach 3	12.177	Existing	12990.00	1298.12	1310.28	1304.62	1310.73	0.000421	5.35	2427.20	817.90	0.31
Reach 3	12.177	500-Year	11730.00	1298.12	1309.73	1304.30	1310.14	0.000412	5.13	2284.71	256.96	0.30
Reach 3	12.082	Design	6900.00	1297.94	1307.00	1302.83	1307.29	0.000409	4.26	1620.77	240.83	0.29
Reach 3	12.082	Future	9070.00	1297.94	1308.22	1303.49	1308.57	0.000423	4.73	1918.72	249.65	0.30
Reach 3	12.082	Existing	12990.00	1297.94	1310.05	1304.57	1310.51	0.000445	5.44	2393.32	920.60	0.32
Reach 3	12.082	500-Year	11730.00	1297.94	1309.50	1304.24	1309.93	0.000441	5.23	2244.85	258.95	0.31
Reach 3	11.988	Design	6900.00	1297.55	1306.83	1302.41	1307.09	0.000364	4.10	1683.67	242.66	0.27
Reach 3	11.988	Future	9070.00	1297.55	1308.03	1303.06	1308.36	0.000383	4.58	1981.72	251.05	0.29
Reach 3	11.988	Existing	12990.00	1297.55	1309.85	1304.15	1310.29	0.000412	5.30	2451.27	275.53	0.31
Reach 3	11.988	500-Year	11730.00	1297.55	1309.31	1303.82	1309.71	0.000405	5.08	2306.97	259.91	0.30
Reach 3	11.893	Design	6900.00	1297.33	1306.63	1302.37	1306.90	0.000388	4.18	1650.81	242.25	0.28
Reach 3	11.893	Future	9070.00	1297.33	1307.82	1303.03	1308.16	0.000406	4.66	1945.52	250.56	0.29
Reach 3	11.893	Existing	12990.00	1297.33	1309.62	1304.07	1310.07	0.000438	5.40	2407.71	263.07	0.31
Reach 3	11.893	500-Year	11730.00	1297.33	1309.08	1303.76	1309.50	0.000428	5.17	2266.91	259.32	0.31
Reach 3	11.798	Design	6900.00	1297.29	1306.43	1302.22	1306.70	0.000395	4.21	1640.20	241.62	0.28
Reach 3	11.798	Future	9070.00	1297.29	1307.61	1302.88	1307.95	0.000414	4.70	1931.28	249.58	0.30
Reach 3	11.798	Existing	12990.00	1297.29	1309.39	1303.92	1309.85	0.000448	5.44	2386.18	261.53	0.32
Reach 3	11.798	500-Year	11730.00	1297.29	1308.86	1303.60	1309.28	0.000437	5.22	2247.78	257.95	0.31

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.703	Design	6900.00	1297.30	1306.19	1302.24	1306.49	0.000447	4.37	1578.47	240.83	0.30
Reach 3	11.703	Future	9070.00	1297.30	1307.37	1302.89	1307.73	0.000463	4.86	1865.91	249.11	0.31
Reach 3	11.703	Existing	12990.00	1297.30	1309.13	1303.97	1309.61	0.000495	5.61	2315.09	261.53	0.33
Reach 3	11.703	500-Year	11730.00	1297.30	1308.60	1303.64	1309.05	0.000485	5.38	2178.43	257.81	0.33
Reach 3	11.609	Design	6900.00	1297.24	1305.97	1302.13	1306.26	0.000451	4.36	1582.70	244.31	0.30
Reach 3	11.609	Future	9070.00	1297.24	1307.14	1302.78	1307.50	0.000464	4.85	1871.85	251.39	0.31
Reach 3	11.609	Existing	12990.00	1297.24	1308.88	1303.80	1309.37	0.000493	5.60	2319.45	261.92	0.33
Reach 3	11.609	500-Year	11730.00	1297.24	1308.36	1303.50	1308.81	0.000483	5.37	2183.79	258.81	0.33
Reach 3	11.572	Design	6900.00	1297.29	1305.85	1302.15	1306.17	0.000497	4.53	1523.37	238.42	0.32
Reach 3	11.572	Future	9070.00	1297.29	1307.01	1302.81	1307.40	0.000509	5.03	1803.91	245.51	0.33
Reach 3	11.572	Existing	12990.00	1297.29	1308.74	1303.85	1309.26	0.000540	5.81	2237.22	256.07	0.35
Reach 3	11.572	500-Year	11730.00	1297.29	1308.22	1303.54	1308.71	0.000530	5.57	2105.90	252.91	0.34
Reach 3	11.531	Design	6900.00	1296.91	1305.75	1302.07	1306.06	0.000495	4.51	1531.21	241.04	0.32
Reach 3	11.531	Future	9070.00	1296.91	1306.90	1302.70	1307.29	0.000507	5.00	1814.60	248.47	0.33
Reach 3	11.531	Existing	12990.00	1296.91	1308.63	1303.75	1309.14	0.000537	5.77	2252.18	259.52	0.35
Reach 3	11.531	500-Year	11730.00	1296.91	1308.11	1303.42	1308.59	0.000527	5.53	2119.56	256.22	0.34
Reach 3	11.486	Design	6900.00	1297.46	1305.60	1302.17	1305.94	0.000553	4.64	1486.04	242.89	0.33
Reach 3	11.486	Future	9070.00	1297.46	1306.76	1302.81	1307.17	0.000555	5.12	1771.28	250.39	0.34
Reach 3	11.486	Existing	12990.00	1297.46	1308.47	1303.82	1309.01	0.000577	5.88	2210.28	261.27	0.36
Reach 3	11.486	500-Year	11730.00	1297.46	1307.96	1303.52	1308.46	0.000568	5.65	2077.42	258.03	0.35
Reach 3	11.391	Design	6900.00	1296.82	1305.34	1301.79	1305.66	0.000525	4.57	1508.32	242.78	0.32
Reach 3	11.391	Future	9070.00	1296.82	1306.49	1302.41	1306.89	0.000532	5.06	1792.88	250.27	0.33
Reach 3	11.391	Existing	12990.00	1296.82	1308.20	1303.49	1308.72	0.000561	5.83	2228.31	261.31	0.35
Reach 3	11.391	500-Year	11730.00	1296.82	1307.69	1303.14	1308.17	0.000551	5.59	2096.73	258.03	0.35
Reach 3	11.328	Design	6900.00	1297.00	1305.16	1301.48	1305.49	0.000521	4.62	1493.88	235.96	0.32
Reach 3	11.328	Future	9070.00	1297.00	1306.30	1302.14	1306.71	0.000538	5.13	1769.00	244.43	0.34
Reach 3	11.328	Existing	12990.00	1297.00	1307.98	1303.23	1308.53	0.000579	5.93	2190.67	256.86	0.36
Reach 3	11.328	500-Year	11730.00	1297.00	1307.48	1302.90	1307.99	0.000565	5.69	2063.14	253.16	0.35
Reach 3	11.321	Design	6900.00	1298.41	1302.97	1302.97	1304.96	0.001623	11.31	610.13	152.45	1.00
Reach 3	11.321	Future	9070.00	1298.41	1303.88	1303.88	1306.13	0.001579	12.03	753.84	168.20	1.00
Reach 3	11.321	Existing	12990.00	1298.41	1305.26	1305.26	1307.88	0.001470	12.99	1000.05	189.15	1.00

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.321	500-Year	11730.00	1298.41	1304.83	1304.83	1307.35	0.001502	12.74	920.92	182.13	1.00
Reach 3	11.308	Design	6900.00	1292.83	1302.48	1297.72	1302.85	0.000129	4.94	1397.56	186.01	0.32
Reach 3	11.308	Future	9070.00	1292.83	1304.10	1298.61	1304.54	0.000125	5.30	1710.09	198.95	0.32
Reach 3	11.308	Existing	12990.00	1292.83	1306.01	1299.96	1306.60	0.000142	6.17	2105.04	214.54	0.35
Reach 3	11.308	500-Year	11730.00	1292.83	1305.80	1299.54	1306.30	0.000123	5.69	2060.18	212.82	0.32
Reach 3	11.297	Design	6900.00	1291.40	1302.55	1296.84	1302.75	0.000329	3.58	1928.32	239.42	0.22
Reach 3	11.297	Future	9070.00	1291.40	1304.19	1297.52	1304.42	0.000324	3.89	2329.78	252.16	0.23
Reach 3	11.297	Existing	12990.00	1291.40	1306.13	1298.63	1306.46	0.000375	4.58	2834.04	267.55	0.25
Reach 3	11.297	500-Year	11730.00	1291.40	1305.90	1298.27	1306.18	0.000326	4.23	2773.27	265.74	0.23
Reach 3	11.26	Design	6900.00	1291.02	1302.52	1296.27	1302.67	0.000237	3.12	2208.89	263.94	0.19
Reach 3	11.26	Future	10060.00	1291.02	1304.13	1297.19	1304.36	0.000297	3.80	2644.08	277.54	0.22
Reach 3	11.26	Existing	13910.00	1291.02	1306.08	1298.17	1306.37	0.000327	4.35	3200.92	295.64	0.23
Reach 3	11.26	500-Year	11730.00	1291.02	1305.88	1297.62	1306.09	0.000245	3.73	3141.83	293.58	0.20
Reach 3	11.254		Bridge									
Reach 3	11.249	Design	6900.00	1291.31	1302.48	1296.48	1302.64	0.000264	3.24	2127.77	260.43	0.20
Reach 3	11.249	Future	10060.00	1291.31	1304.08	1297.40	1304.32	0.000330	3.94	2553.69	275.64	0.23
Reach 3	11.249	Existing	13910.00	1291.31	1306.01	1298.40	1306.32	0.000359	4.47	3109.29	295.12	0.24
Reach 3	11.249	500-Year	11730.00	1291.31	1305.83	1297.86	1306.06	0.000270	3.84	3055.56	294.48	0.21
Reach 3	11.231	Design	8100.00	1291.55	1302.38	1296.55	1302.60	0.000341	3.72	2179.02	269.58	0.23
Reach 3	11.231	Future	10470.00	1291.55	1304.04	1297.22	1304.28	0.000321	3.98	2678.91	319.33	0.23
Reach 3	11.231	Existing	14320.00	1291.55	1305.98	1298.21	1306.29	0.000323	4.46	3334.08	352.75	0.23
Reach 3	11.231	500-Year	13770.00	1291.55	1305.71	1298.08	1306.01	0.000324	4.40	3242.01	345.96	0.23
Reach 3	11.189	Design	8100.00	1291.62	1302.29	1296.71	1302.52	0.000370	3.82	2122.34	275.42	0.24
Reach 3	11.189	Future	10470.00	1291.62	1303.95	1297.38	1304.21	0.000344	4.07	2639.84	335.56	0.23
Reach 3	11.189	Existing	14320.00	1291.62	1305.90	1298.34	1306.21	0.000337	4.52	3369.23	392.74	0.24
Reach 3	11.189	500-Year	13770.00	1291.62	1305.63	1298.20	1305.93	0.000340	4.47	3262.78	390.09	0.24
Reach 3	11.127	Design	8100.00	1291.69	1302.17	1296.61	1302.40	0.000370	3.83	2122.14	278.46	0.24
Reach 3	11.127	Future	10470.00	1291.69	1303.84	1297.28	1304.10	0.000342	4.06	2644.73	339.47	0.23
Reach 3	11.127	Existing	14320.00	1291.69	1305.79	1298.24	1306.10	0.000334	4.52	3370.12	393.13	0.24
Reach 3	11.127	500-Year	13770.00	1291.69	1305.52	1298.11	1305.82	0.000337	4.47	3263.07	390.94	0.24

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	11.033	Design	8100.00	1291.22	1301.97	1296.46	1302.21	0.000383	3.89	2083.61	257.83	0.24
Reach 3	11.033	Future	10470.00	1291.22	1303.66	1297.14	1303.92	0.000355	4.13	2578.49	316.93	0.24
Reach 3	11.033	Existing	14320.00	1291.22	1305.61	1298.11	1305.93	0.000352	4.60	3282.27	387.53	0.24
Reach 3	11.033	500-Year	13770.00	1291.22	1305.33	1297.98	1305.65	0.000356	4.55	3176.36	384.03	0.24
Reach 3	10.938	Design	8100.00	1291.31	1301.79	1296.22	1302.02	0.000373	3.84	2116.28	281.03	0.24
Reach 3	10.938	Future	10470.00	1291.31	1303.49	1296.89	1303.74	0.000342	4.06	2641.69	335.76	0.23
Reach 3	10.938	Existing	14320.00	1291.31	1305.44	1297.85	1305.75	0.000334	4.52	3368.96	392.62	0.24
Reach 3	10.938	500-Year	13770.00	1291.31	1305.17	1297.73	1305.47	0.000338	4.47	3260.76	389.38	0.24
Reach 3	10.843	Design	8100.00	1290.91	1301.65	1295.83	1301.87	0.000236	3.75	2165.66	276.91	0.23
Reach 3	10.843	Future	10470.00	1290.91	1303.36	1296.50	1303.61	0.000220	3.99	2683.62	324.71	0.23
Reach 3	10.843	Existing	14320.00	1290.91	1305.31	1297.48	1305.62	0.000222	4.48	3413.67	396.89	0.23
Reach 3	10.843	500-Year	13770.00	1290.91	1305.03	1297.33	1305.33	0.000223	4.42	3303.88	393.82	0.23
Reach 3	10.749	Design	8100.00	1290.66	1301.51	1295.91	1301.74	0.000255	3.84	2110.03	256.76	0.24
Reach 3	10.749	Future	10470.00	1290.66	1303.23	1296.57	1303.49	0.000237	4.09	2568.33	292.52	0.23
Reach 3	10.749	Existing	14320.00	1290.66	1305.17	1297.55	1305.50	0.000241	4.60	3239.06	955.91	0.24
Reach 3	10.749	500-Year	13770.00	1290.66	1304.90	1297.41	1305.21	0.000243	4.54	3135.30	953.67	0.24
Reach 3	10.654	Design	8100.00	1290.71	1301.36	1295.98	1301.61	0.000282	3.97	2041.28	254.69	0.25
Reach 3	10.654	Future	10470.00	1290.71	1303.09	1296.67	1303.37	0.000257	4.20	2491.43	265.84	0.24
Reach 3	10.654	Existing	14320.00	1290.71	1305.02	1297.63	1305.37	0.000264	4.75	3013.68	818.72	0.25
Reach 3	10.654	500-Year	13770.00	1290.71	1304.74	1297.48	1305.09	0.000266	4.69	2938.28	639.75	0.25
Reach 3	10.566	Design	8100.00	1290.67	1301.24	1295.73	1301.48	0.000272	3.93	2060.16	253.70	0.24
Reach 3	10.566	Future	10470.00	1290.67	1302.98	1296.40	1303.25	0.000250	4.17	2511.79	265.33	0.24
Reach 3	10.566	Existing	14320.00	1290.67	1304.90	1297.40	1305.25	0.000258	4.72	3032.00	963.89	0.25
Reach 3	10.566	500-Year	13770.00	1290.67	1304.63	1297.27	1304.96	0.000260	4.66	2956.62	862.72	0.25
Reach 3	10.518	Design	8100.00	1290.77	1301.17	1295.72	1301.41	0.000276	3.93	2058.63	255.96	0.24
Reach 3	10.518	Future	10470.00	1290.77	1302.91	1296.40	1303.18	0.000251	4.16	2516.05	267.68	0.24
Reach 3	10.518	Existing	14320.00	1290.77	1304.84	1297.38	1305.18	0.000257	4.71	3038.84	679.40	0.25
Reach 3	10.518	500-Year	13770.00	1290.77	1304.56	1297.25	1304.90	0.000258	4.65	2963.19	581.70	0.25
Reach 3	10.441	Design	8100.00	1289.90	1301.08	1295.09	1301.30	0.000228	3.70	2191.17	259.32	0.22
Reach 3	10.441	Future	10790.00	1289.90	1302.83	1295.86	1303.08	0.000226	4.07	2657.22	402.38	0.23
Reach 3	10.441	Existing	14650.00	1289.90	1304.75	1296.84	1305.08	0.000230	4.61	3203.87	579.15	0.24
Reach 3	10.441	500-Year	13770.00	1289.90	1304.49	1296.62	1304.79	0.000219	4.43	3128.56	523.46	0.23

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	10.346	Design	8100.00	1289.79	1300.99	1294.80	1301.18	0.000206	3.56	2276.83	264.26	0.21
Reach 3	10.346	Future	10790.00	1289.79	1302.73	1295.55	1302.97	0.000209	3.93	2747.82	394.31	0.22
Reach 3	10.346	Existing	14650.00	1289.79	1304.65	1296.51	1304.96	0.000215	4.46	3286.16	477.53	0.23
Reach 3	10.346	500-Year	13770.00	1289.79	1304.39	1296.31	1304.68	0.000204	4.29	3213.20	455.98	0.22
Reach 3	10.252	Design	8100.00	1290.16	1300.84	1295.01	1301.07	0.000246	3.81	2127.08	254.26	0.23
Reach 3	10.252	Future	10790.00	1290.16	1302.58	1295.78	1302.85	0.000244	4.18	2579.12	266.16	0.24
Reach 3	10.252	Existing	14650.00	1290.16	1304.52	1296.77	1304.85	0.000241	4.64	3387.36	478.86	0.24
Reach 3	10.252	500-Year	13770.00	1290.16	1304.26	1296.56	1304.57	0.000231	4.47	3279.07	470.47	0.24
Reach 3	10.218	Design	8100.00	1289.46	1300.81	1294.62	1301.01	0.000303	3.61	2243.70	258.74	0.22
Reach 3	10.218	Future	10790.00	1289.46	1302.55	1295.37	1302.79	0.000306	3.99	2702.81	269.61	0.22
Reach 3	10.218	Existing	14650.00	1289.46	1304.47	1296.37	1304.79	0.000331	4.53	3235.29	282.75	0.24
Reach 3	10.218	500-Year	13770.00	1289.46	1304.22	1296.15	1304.52	0.000312	4.35	3163.88	280.87	0.23
Reach 3	10.207		Bridge									
Reach 3	10.195	Design	8100.00	1289.53	1300.71	1294.99	1300.93	0.000363	3.83	2113.84	255.21	0.23
Reach 3	10.195	Future	10790.00	1289.53	1302.44	1295.74	1302.71	0.000359	4.21	2565.87	266.71	0.24
Reach 3	10.195	Existing	14650.00	1289.53	1304.24	1296.74	1304.60	0.000392	4.79	3058.03	278.91	0.25
Reach 3	10.195	500-Year	13770.00	1289.53	1304.04	1296.53	1304.37	0.000365	4.59	3003.01	277.48	0.25
Reach 3	10.171	Design	8100.00	1289.62	1300.66	1294.93	1300.89	0.000257	3.86	2099.64	254.62	0.24
Reach 3	10.171	Future	10800.00	1289.62	1302.40	1295.73	1302.67	0.000252	4.22	2612.11	688.55	0.24
Reach 3	10.171	Existing	14660.00	1289.62	1304.21	1296.71	1304.55	0.000261	4.75	3234.85	880.40	0.25
Reach 3	10.171	500-Year	13770.00	1289.62	1304.01	1296.50	1304.33	0.000245	4.55	3166.87	879.81	0.24
Reach 3	10.134	Design	8100.00	1290.29	1300.60	1295.36	1300.84	0.000289	3.95	2048.53	261.47	0.25
Reach 3	10.134	Future	10800.00	1290.29	1302.33	1296.11	1302.62	0.000276	4.30	2513.10	273.19	0.25
Reach 3	10.134	Existing	14660.00	1290.29	1304.16	1297.07	1304.49	0.000263	4.69	3436.09	855.62	0.25
Reach 3	10.134	500-Year	13770.00	1290.29	1303.97	1296.85	1304.27	0.000248	4.50	3349.99	855.62	0.24
Reach 3	10.039	Design	8100.00	1290.00	1300.46	1294.96	1300.70	0.000274	3.91	2069.27	257.76	0.24
Reach 3	10.039	Future	10800.00	1290.00	1302.20	1295.73	1302.48	0.000267	4.27	2529.59	270.72	0.25
Reach 3	10.039	Existing	14660.00	1290.00	1304.05	1296.71	1304.36	0.000243	4.58	3733.72	841.93	0.24
Reach 3	10.039	500-Year	13770.00	1290.00	1303.86	1296.46	1304.15	0.000229	4.40	3629.49	838.17	0.23
Reach 3	9.944	Design	8100.00	1289.17	1300.33	1294.71	1300.56	0.000264	3.88	2085.44	255.17	0.24

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.944	Future	10800.00	1289.17	1302.07	1295.47	1302.35	0.000258	4.25	2541.68	275.27	0.24
Reach 3	9.944	Existing	14660.00	1289.17	1303.86	1296.46	1304.23	0.000268	4.84	3048.29	842.78	0.25
Reach 3	9.944	500-Year	13770.00	1289.17	1303.70	1296.24	1304.03	0.000249	4.62	3000.26	815.21	0.24
Reach 3	9.897	Design	8100.00	1289.15	1300.27	1294.52	1300.49	0.000254	3.82	2119.16	258.08	0.24
Reach 3	9.897	Future	10800.00	1289.15	1302.01	1295.31	1302.29	0.000249	4.18	2582.63	280.81	0.24
Reach 3	9.897	Existing	14660.00	1289.15	1303.81	1296.29	1304.16	0.000258	4.77	3092.39	808.19	0.25
Reach 3	9.897	500-Year	13770.00	1289.15	1303.64	1296.07	1303.96	0.000239	4.55	3045.34	787.15	0.24
Reach 3	9.854	Design	8100.00	1289.14	1300.21	1294.57	1300.43	0.000258	3.85	2105.54	257.54	0.24
Reach 3	9.854	Future	10800.00	1289.14	1301.95	1295.34	1302.23	0.000253	4.21	2566.39	269.88	0.24
Reach 3	9.854	Existing	14660.00	1289.14	1303.74	1296.28	1304.10	0.000266	4.80	3053.67	867.84	0.25
Reach 3	9.854	500-Year	13770.00	1289.14	1303.58	1296.09	1303.91	0.000246	4.57	3010.00	849.64	0.24
Reach 3	9.849	Design	8100.00	1289.17	1300.08	1294.75	1300.40	0.000357	4.54	1783.97	208.75	0.27
Reach 3	9.849	Future	10800.00	1289.17	1301.79	1295.61	1302.18	0.000360	5.03	2146.85	215.28	0.28
Reach 3	9.849	Existing	14660.00	1289.17	1303.52	1296.68	1304.04	0.000398	5.81	2521.55	270.04	0.30
Reach 3	9.849	500-Year	13770.00	1289.17	1303.38	1296.44	1303.85	0.000365	5.53	2491.87	260.85	0.29
Reach 3	9.844	Design	8100.00	1289.28	1300.12	1294.58	1300.35	0.000267	3.88	2086.59	258.49	0.24
Reach 3	9.844	Future	10800.00	1289.28	1301.84	1295.35	1302.12	0.000263	4.24	2544.37	289.26	0.24
Reach 3	9.844	Existing	14660.00	1289.28	1303.59	1296.32	1303.95	0.000276	4.85	3022.36	860.53	0.26
Reach 3	9.844	500-Year	13770.00	1289.28	1303.44	1296.11	1303.77	0.000254	4.62	2983.00	833.25	0.25
Reach 3	9.802	Design	8100.00	1289.33	1300.03	1294.75	1300.28	0.000301	4.04	2006.33	256.24	0.25
Reach 3	9.802	Future	10800.00	1289.33	1301.76	1295.53	1302.06	0.000290	4.39	2460.19	418.87	0.26
Reach 3	9.802	Existing	14660.00	1289.33	1303.50	1296.52	1303.89	0.000302	5.00	2932.74	862.05	0.27
Reach 3	9.802	500-Year	13770.00	1289.33	1303.36	1296.29	1303.71	0.000278	4.76	2895.69	850.06	0.26
Reach 3	9.708	Design	8100.00	1288.97	1299.91	1294.17	1300.14	0.000256	3.85	2102.73	255.14	0.24
Reach 3	9.708	Future	10800.00	1288.97	1301.64	1294.94	1301.92	0.000254	4.23	2554.72	267.73	0.24
Reach 3	9.708	Existing	14660.00	1288.97	1303.37	1295.96	1303.74	0.000272	4.85	3023.72	857.80	0.26
Reach 3	9.708	500-Year	13770.00	1288.97	1303.25	1295.74	1303.58	0.000249	4.61	2989.78	852.42	0.24
Reach 3	9.613	Design	8100.00	1288.82	1299.79	1293.99	1300.01	0.000245	3.76	2152.12	264.44	0.23
Reach 3	9.613	Future	10800.00	1288.82	1301.53	1294.78	1301.79	0.000236	4.12	2668.13	315.75	0.23
Reach 3	9.613	Existing	14660.00	1288.82	1303.26	1295.75	1303.60	0.000250	4.70	3219.24	854.79	0.25
Reach 3	9.613	500-Year	13770.00	1288.82	1303.14	1295.55	1303.45	0.000228	4.46	3182.38	829.97	0.23

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

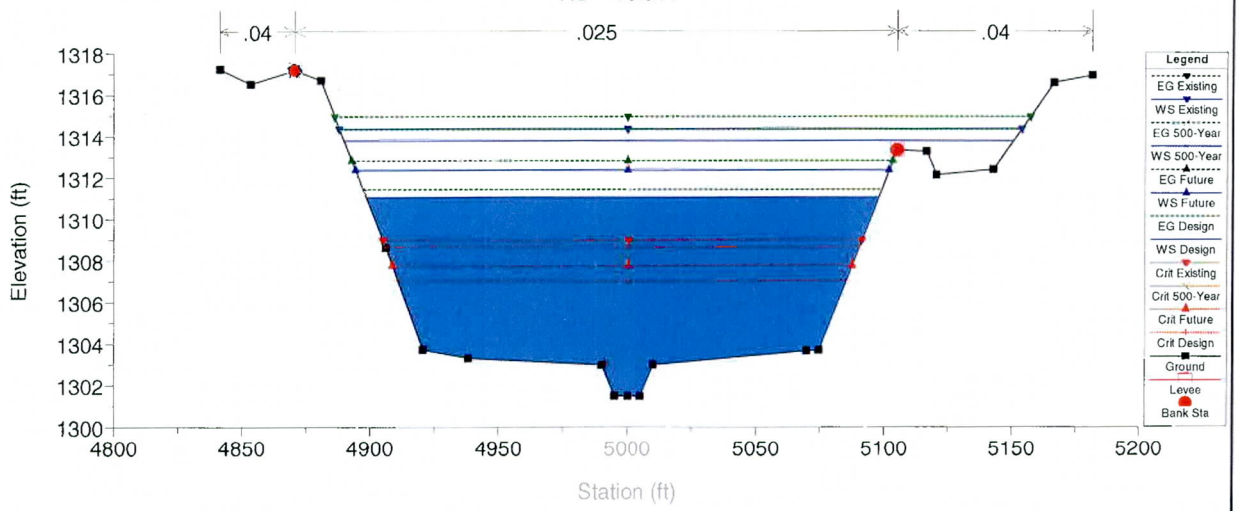
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.518	Design	8100.00	1288.71	1299.65	1293.96	1299.88	0.000263	3.88	2089.08	256.27	0.24
Reach 3	9.518	Future	10800.00	1288.71	1301.38	1294.76	1301.66	0.000260	4.24	2545.16	269.55	0.24
Reach 3	9.518	Existing	14660.00	1288.71	1303.10	1295.76	1303.46	0.000276	4.87	3009.40	825.49	0.26
Reach 3	9.518	500-Year	13770.00	1288.71	1303.00	1295.53	1303.33	0.000251	4.62	2982.37	811.84	0.25
Reach 3	9.424	Design	8100.00	1289.19	1299.50	1294.07	1299.74	0.000286	3.98	2033.85	254.91	0.25
Reach 3	9.424	Future	10800.00	1289.19	1301.24	1294.83	1301.53	0.000277	4.34	2487.99	269.51	0.25
Reach 3	9.424	Existing	14660.00	1289.19	1302.94	1295.85	1303.32	0.000294	4.97	2970.09	732.16	0.27
Reach 3	9.424	500-Year	13770.00	1289.19	1302.85	1295.63	1303.20	0.000266	4.70	2946.23	721.73	0.25
Reach 3	9.334	Design	8100.00	1288.62	1299.36	1294.04	1299.61	0.000289	3.98	2035.47	257.33	0.25
Reach 3	9.334	Future	10800.00	1288.62	1301.11	1294.81	1301.40	0.000277	4.33	2494.59	403.38	0.25
Reach 3	9.334	Existing	14660.00	1288.62	1302.80	1295.77	1303.18	0.000293	4.97	2952.66	785.17	0.27
Reach 3	9.334	500-Year	13770.00	1288.62	1302.73	1295.56	1303.07	0.000265	4.69	2933.81	774.53	0.25
Reach 3	9.24	Design	8100.00	1289.12	1299.20	1294.12	1299.46	0.000315	4.10	1976.19	254.97	0.26
Reach 3	9.24	Future	10800.00	1289.12	1300.95	1294.87	1301.25	0.000298	4.44	2432.93	292.10	0.26
Reach 3	9.24	Existing	14660.00	1289.12	1302.63	1295.84	1303.03	0.000315	5.08	2885.49	389.65	0.27
Reach 3	9.24	500-Year	13770.00	1289.12	1302.58	1295.63	1302.93	0.000283	4.79	2871.77	389.56	0.26
Reach 3	9.145	Design	8100.00	1288.91	1299.03	1294.07	1299.30	0.000329	4.16	1946.97	253.91	0.26
Reach 3	9.145	Future	10800.00	1288.91	1300.79	1294.82	1301.10	0.000308	4.49	2404.32	289.88	0.26
Reach 3	9.145	Existing	14660.00	1288.91	1302.46	1295.80	1302.87	0.000341	5.10	2871.89	387.35	0.28
Reach 3	9.145	500-Year	13770.00	1288.91	1302.43	1295.57	1302.79	0.000304	4.81	2862.89	386.23	0.27
Reach 3	9.053	Design	8100.00	1288.62	1298.90	1293.50	1299.14	0.000281	3.96	2045.48	255.48	0.25
Reach 3	9.053	Future	10800.00	1288.62	1300.67	1294.26	1300.95	0.000270	4.31	2507.82	282.50	0.25
Reach 3	9.053	Existing	14660.00	1288.62	1302.32	1295.25	1302.71	0.000290	4.96	2952.69	389.11	0.26
Reach 3	9.053	500-Year	13770.00	1288.62	1302.31	1295.01	1302.65	0.000257	4.67	2948.43	388.98	0.25
Reach 3	9.036	Design	8100.00	1288.32	1298.88	1293.38	1299.11	0.000269	3.89	2079.92	257.85	0.24
Reach 3	9.036	Future	10790.00	1288.32	1300.65	1294.14	1300.93	0.000259	4.24	2546.98	310.82	0.24
Reach 3	9.036	Existing	14630.00	1288.32	1302.31	1295.10	1302.68	0.000282	4.88	3000.56	437.51	0.26
Reach 3	9.036	500-Year	13770.00	1288.32	1302.29	1294.90	1302.62	0.000251	4.60	2996.44	437.31	0.25
Reach 3	9.018	Design	8700.00	1287.74	1298.84	1293.23	1299.09	0.000273	4.00	2174.07	260.97	0.24
Reach 3	9.018	Future	11920.00	1287.74	1300.58	1294.08	1300.90	0.000285	4.52	2638.71	272.43	0.26
Reach 3	9.018	Existing	15770.00	1287.74	1302.24	1295.03	1302.65	0.000300	5.09	3098.71	404.42	0.27
Reach 3	9.018	500-Year	14790.00	1287.74	1302.24	1294.80	1302.59	0.000264	4.77	3097.56	403.67	0.25

HEC-RAS Plan: EMF R 3 - 4 River: EMF Reach: Reach 3 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 3	9.001	Design	8700.00	1287.46	1298.81	1293.00	1299.06	0.000272	4.02	2164.87	257.60	0.24
Reach 3	9.001	Future	11920.00	1287.46	1300.55	1293.90	1300.87	0.000287	4.54	2624.42	270.48	0.26
Reach 3	9.001	Existing	15770.00	1287.46	1302.21	1294.86	1302.62	0.000306	5.12	3081.16	746.86	0.27
Reach 3	9.001	500-Year	14790.00	1287.46	1302.21	1294.64	1302.57	0.000269	4.80	3081.16	746.86	0.25

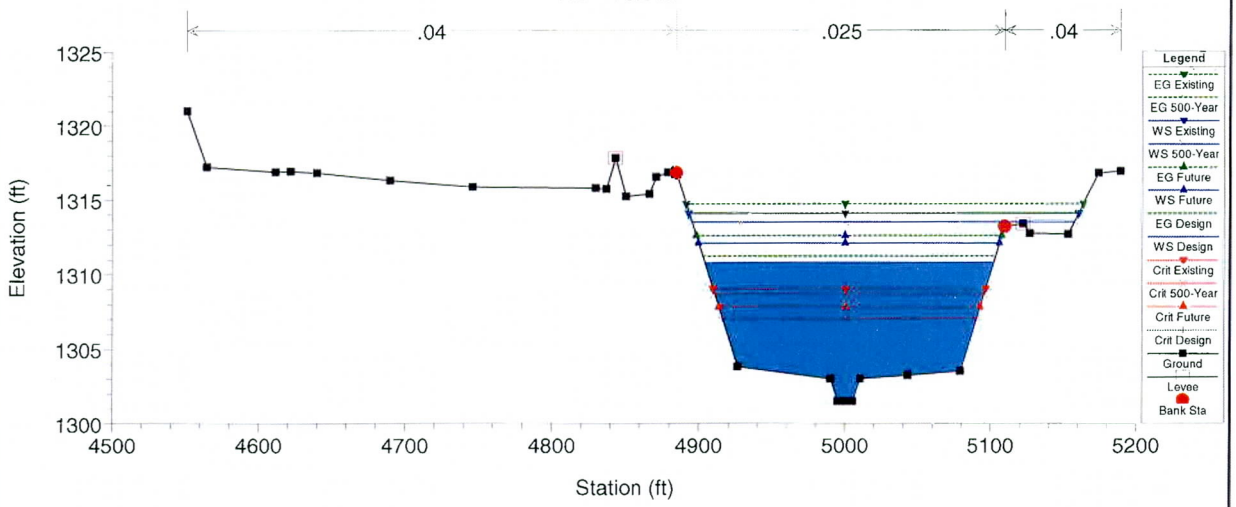
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.911



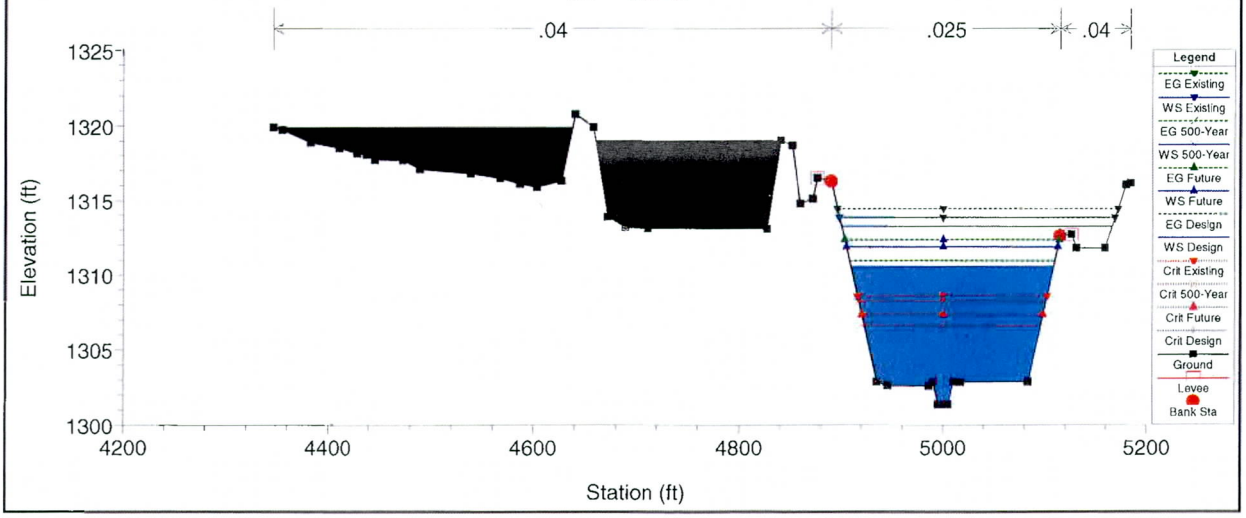
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.842



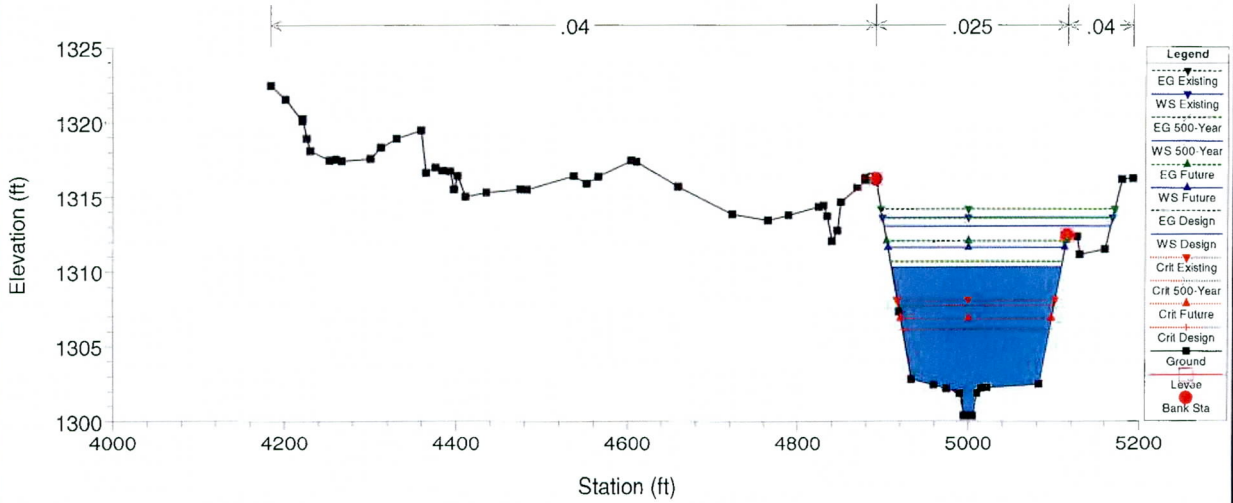
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.755



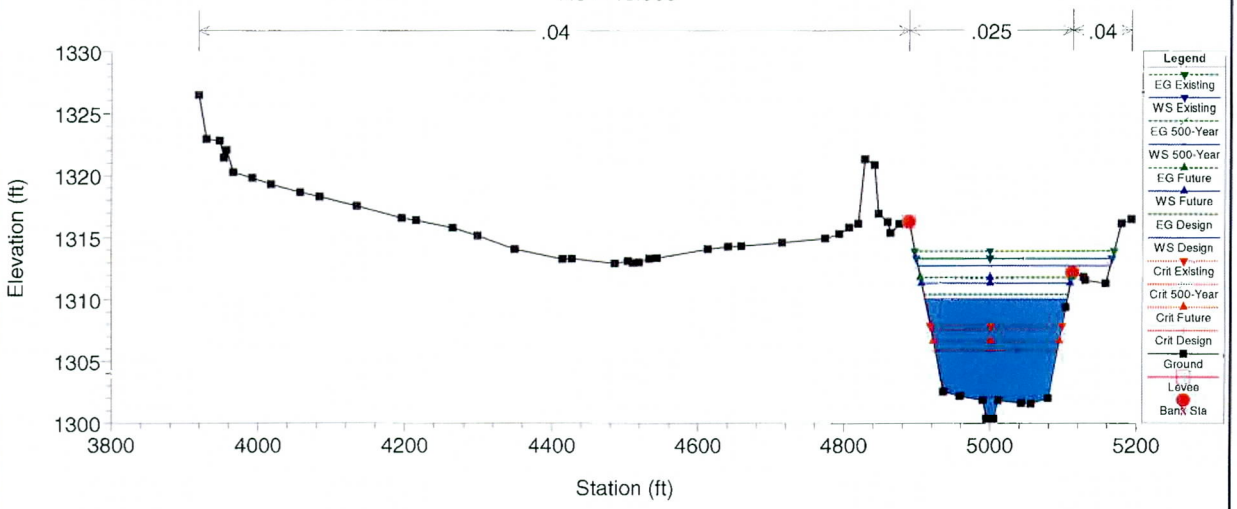
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.661



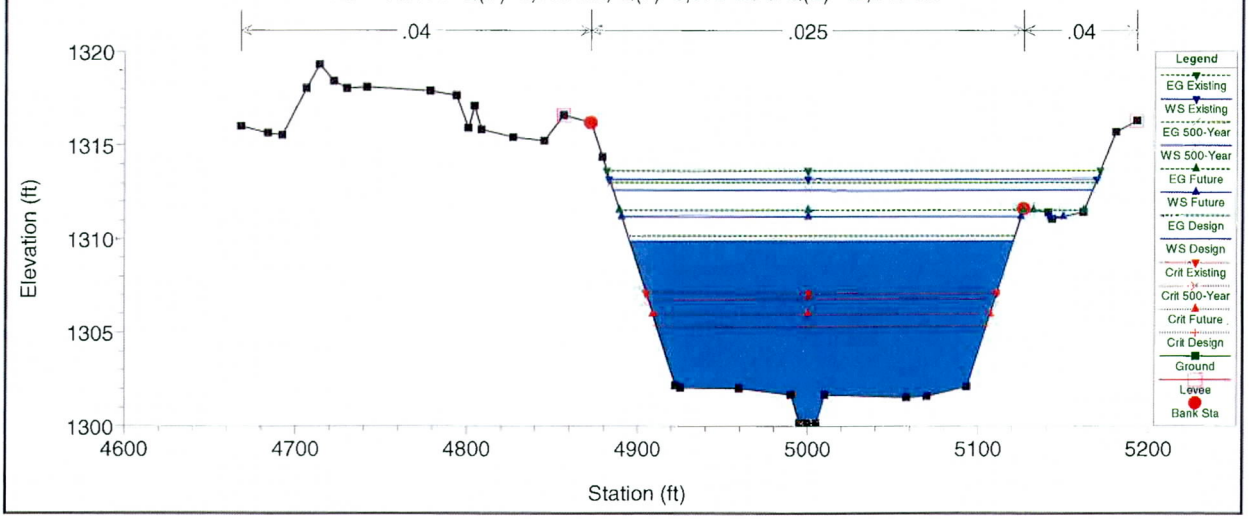
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.566



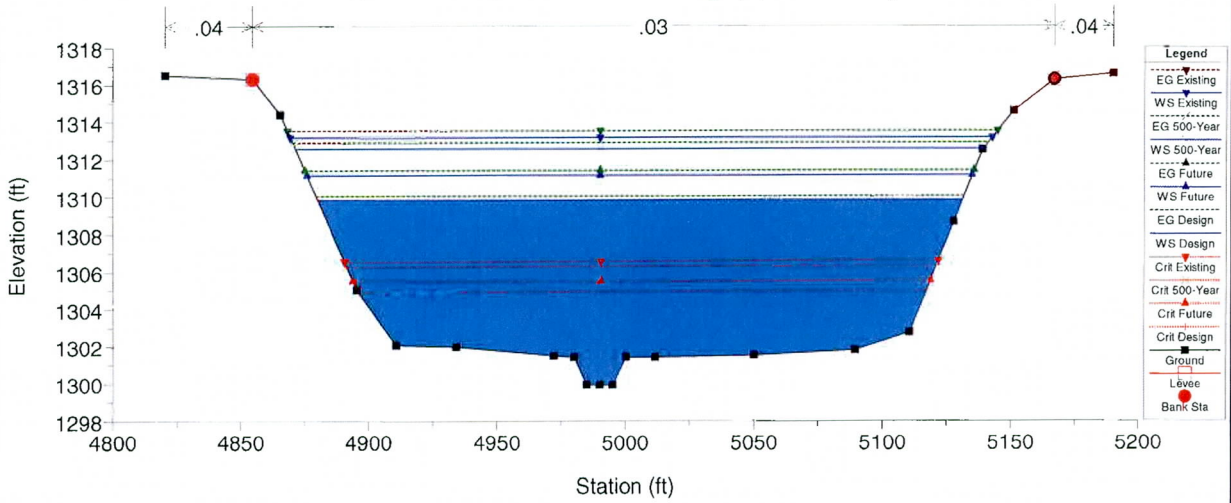
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.471 Q(D)=6,900 cfs, Q(F)=8,970 cfs & Q(E)=12,910 cfs



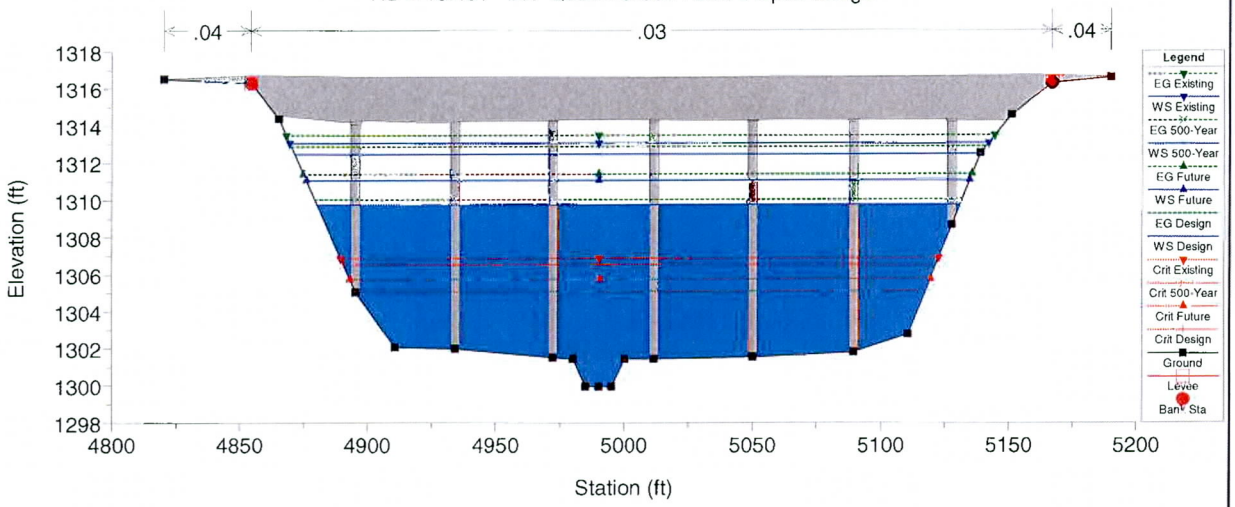
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.442 Queek Creek Road Bridge (Upstream Face)



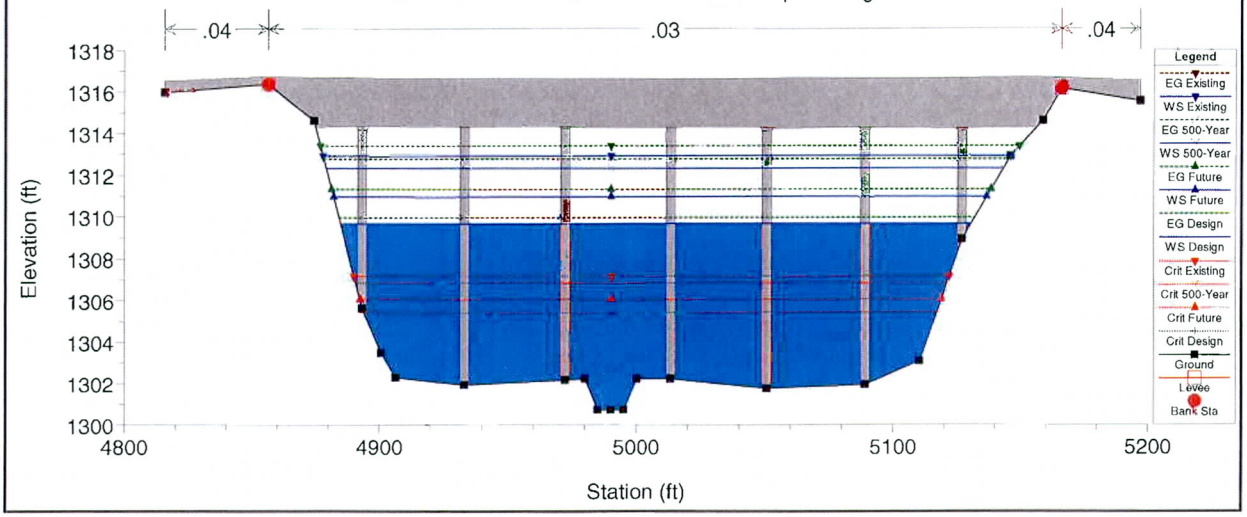
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



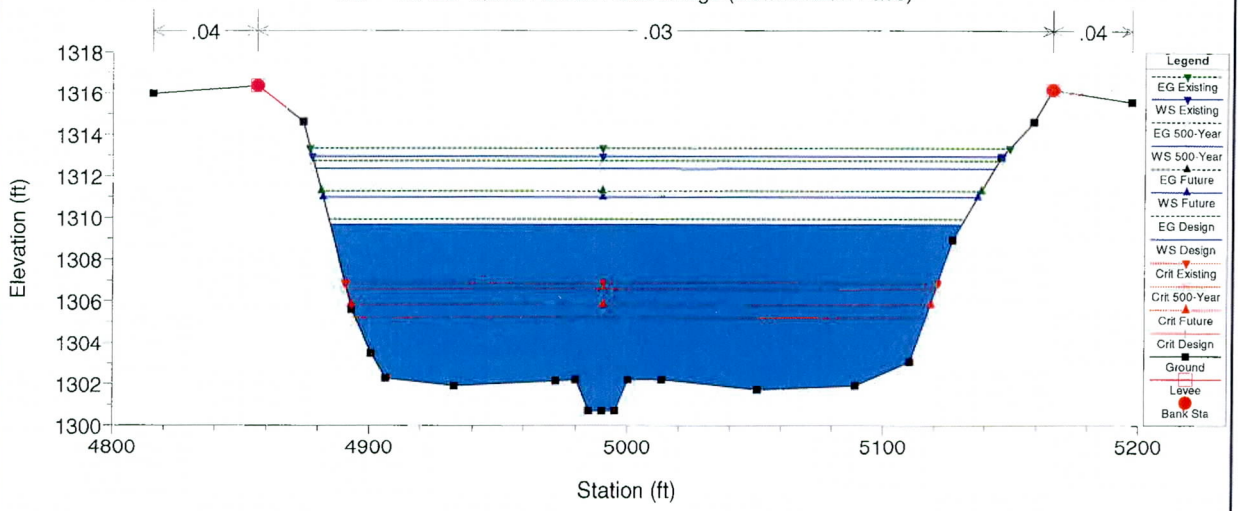
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.431 BR Queen Creek Road 8-Span Bridge



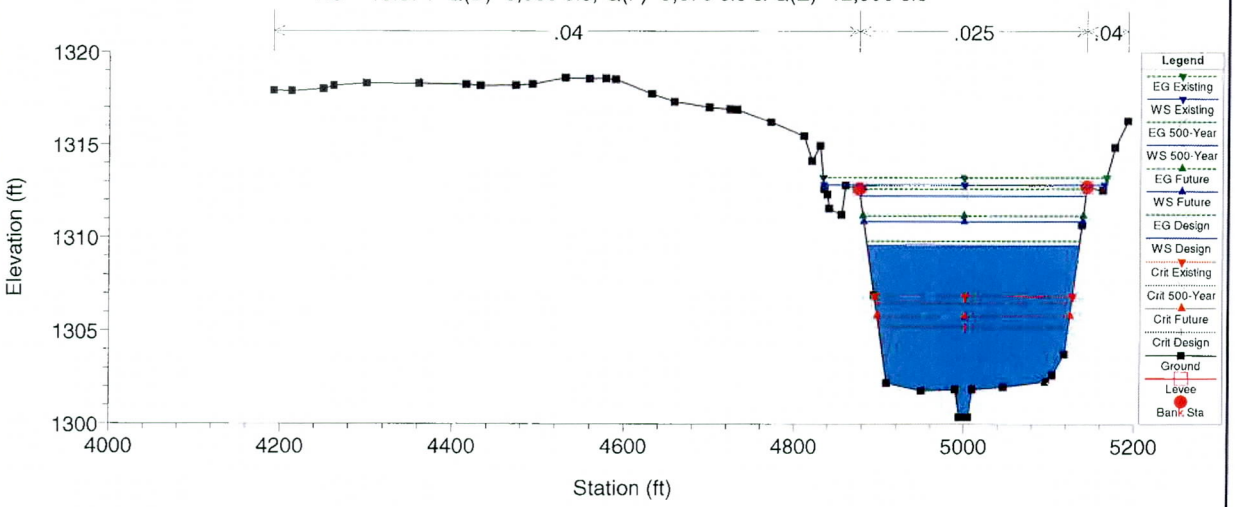
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.423 Queen Creek Road Bridge (Downstream Face)



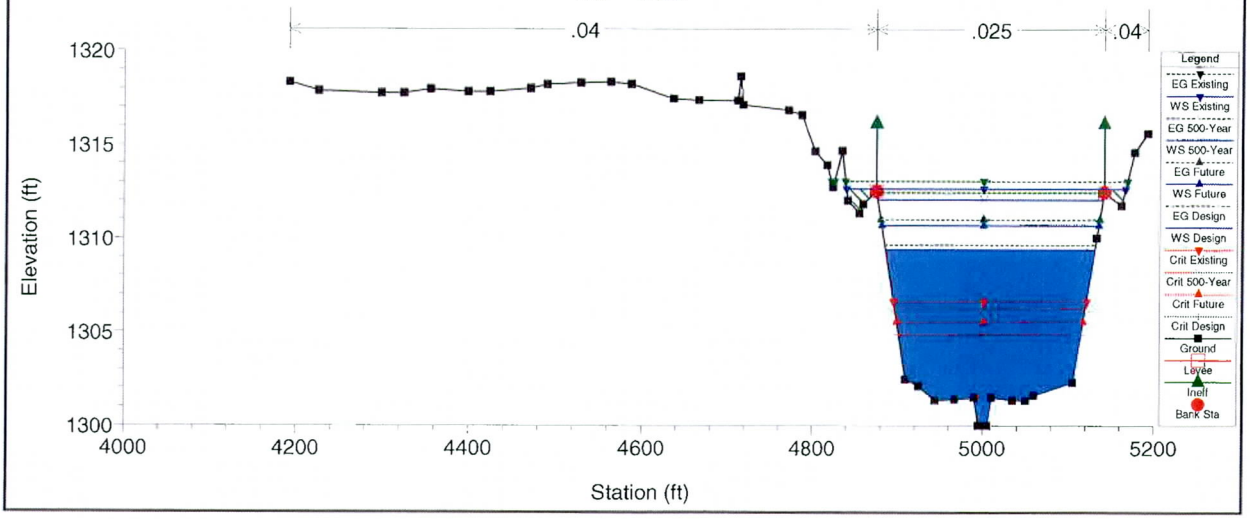
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.374 Q(D)=6,900 cfs, Q(F)=9,070 cfs & Q(E)=12,990 cfs



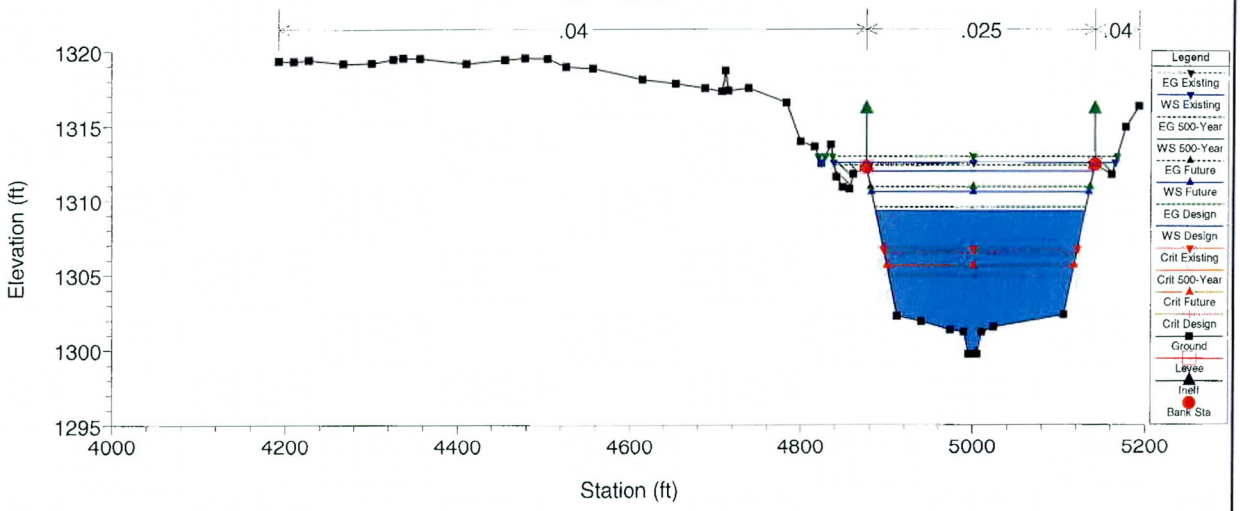
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.28



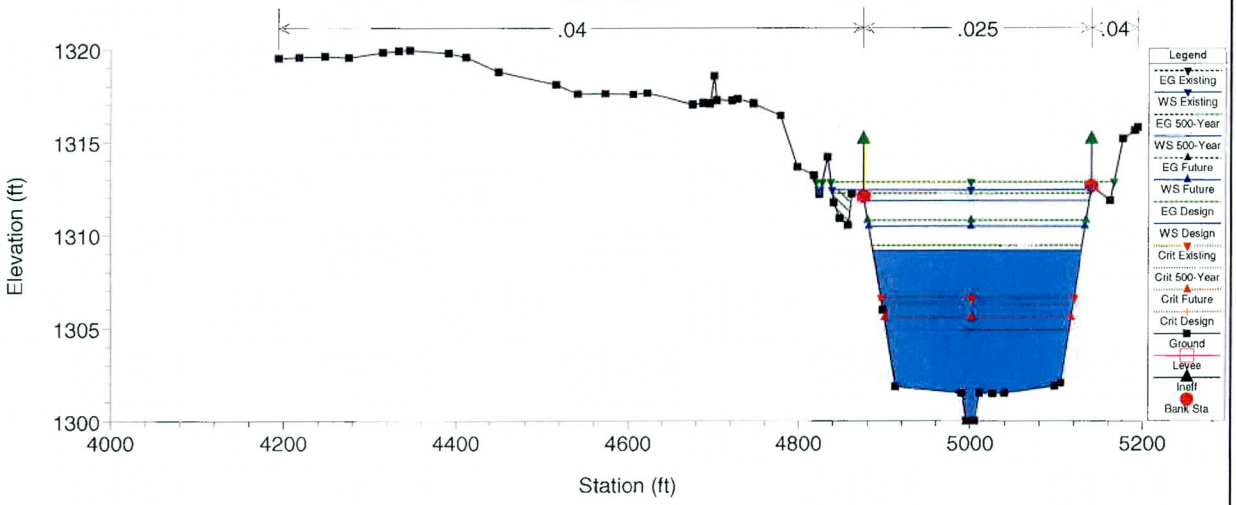
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.232



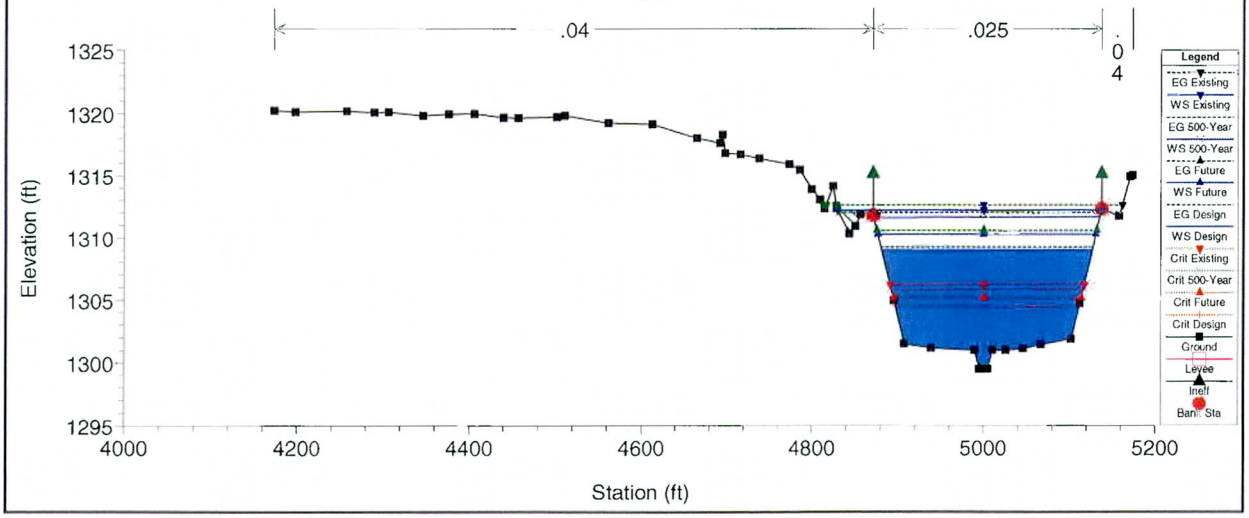
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.179



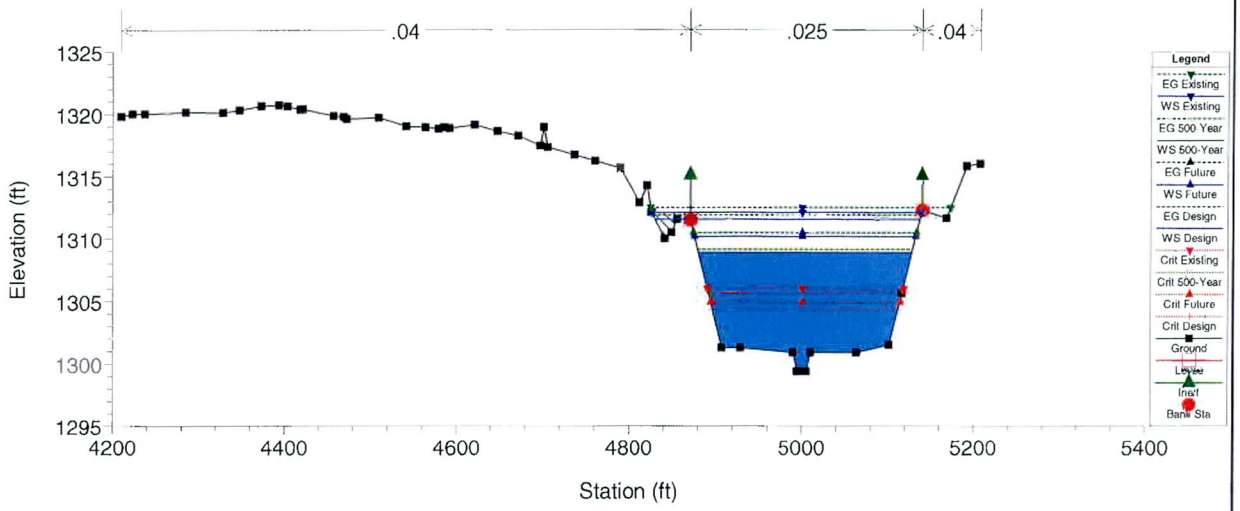
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.084



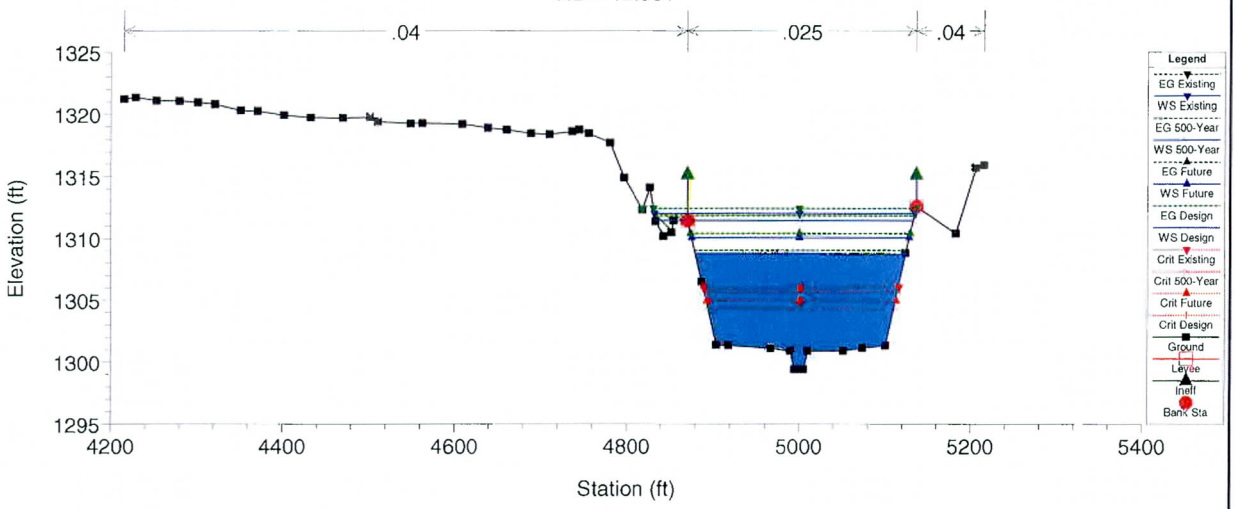
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 13.037



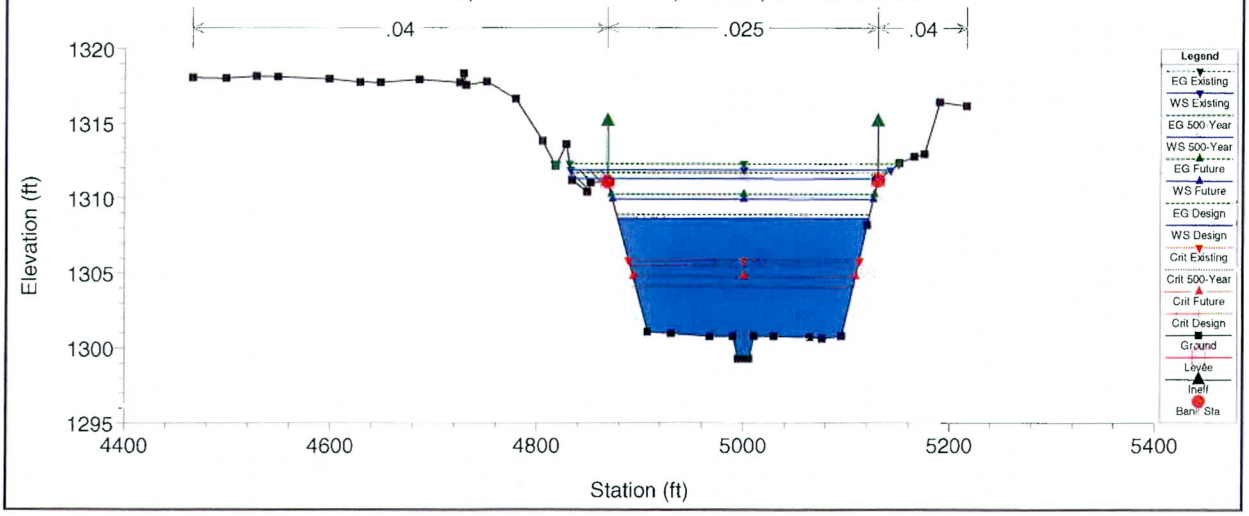
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.981



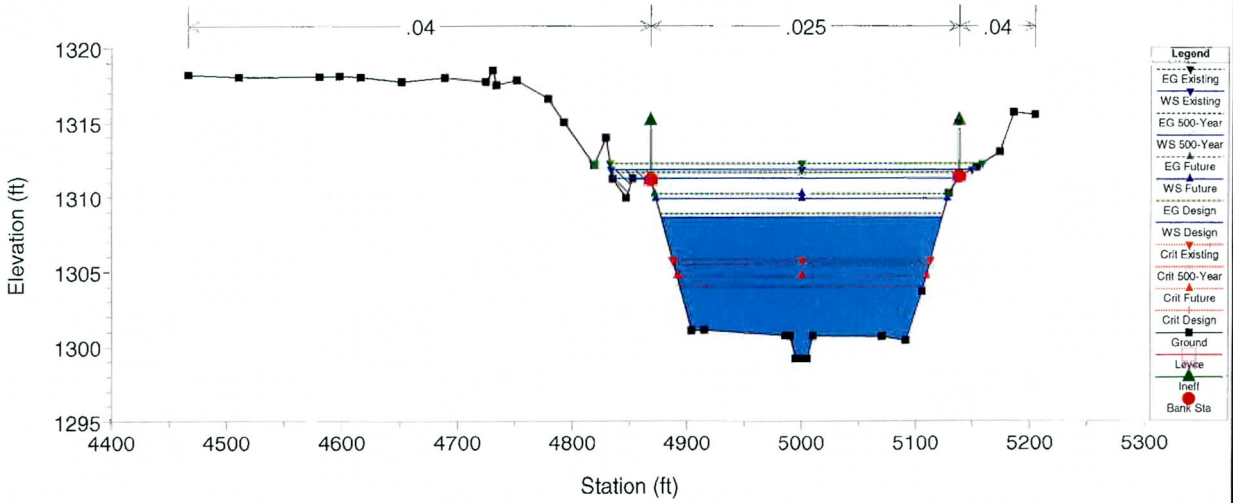
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.905 Upstream of Side Inlet (25' Wide) from the Left Bank



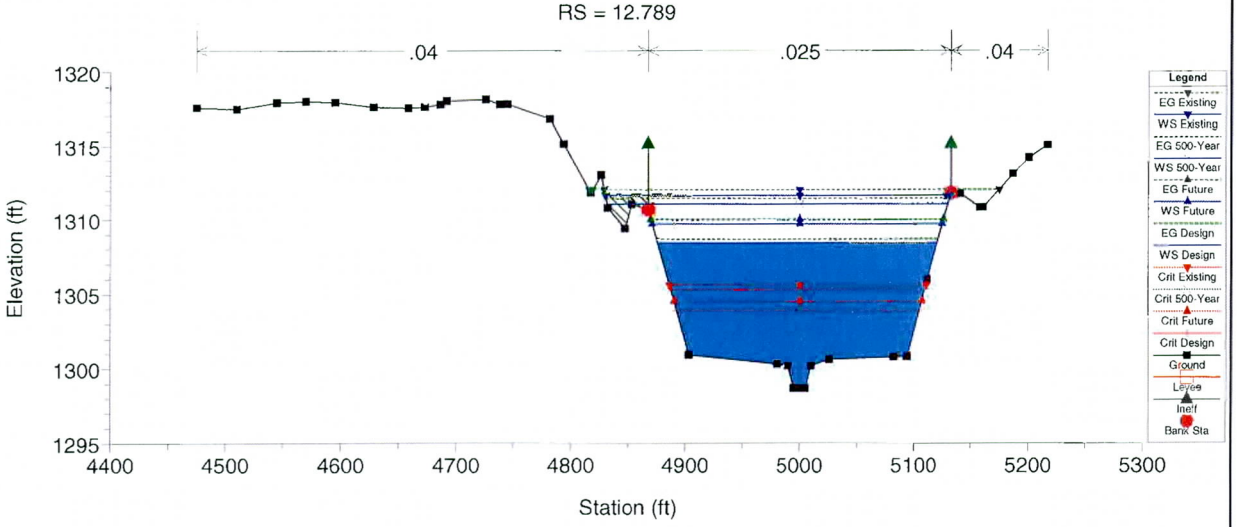
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.884 Downstream of Side Inlet (25' Wide) from the Left Bank



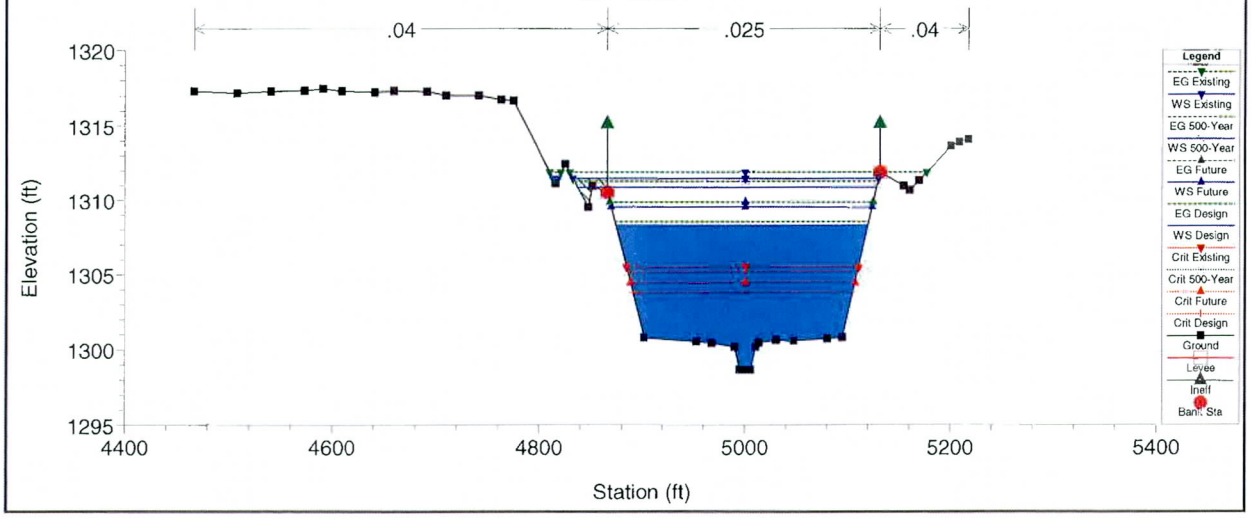
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.789



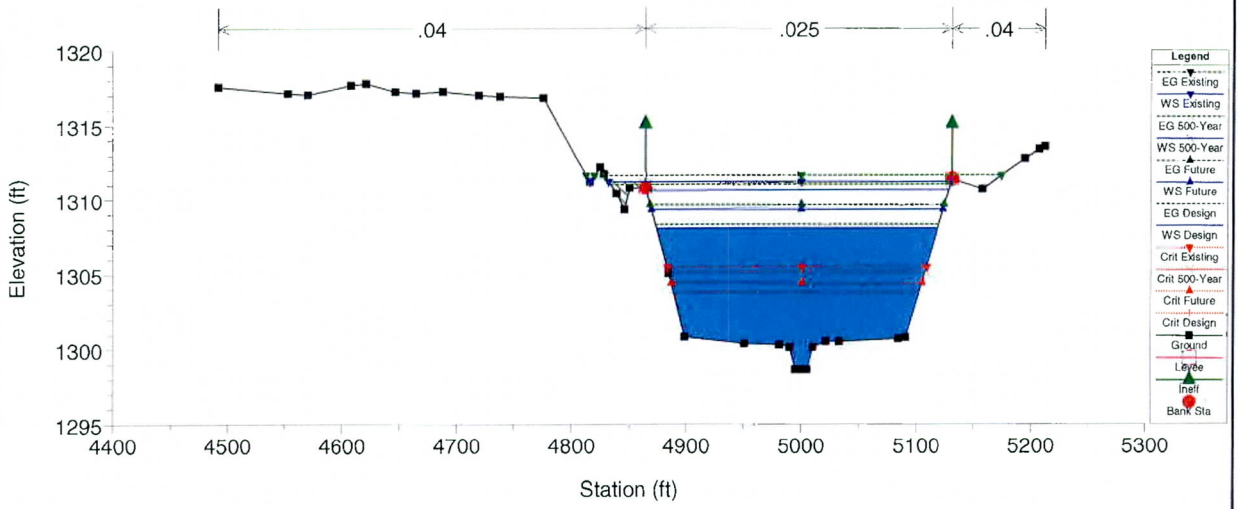
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.694



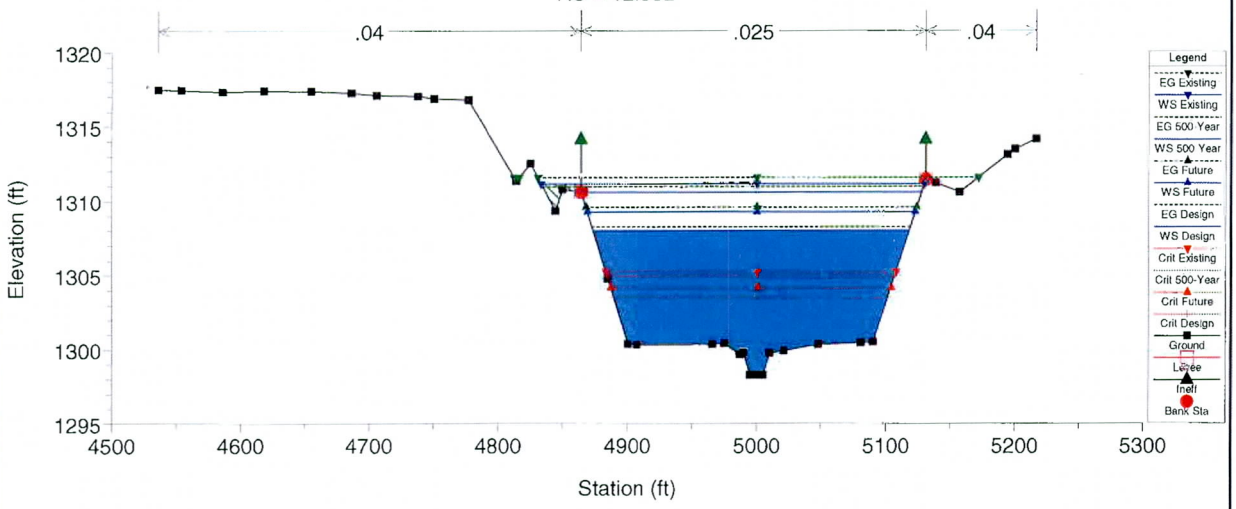
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.6



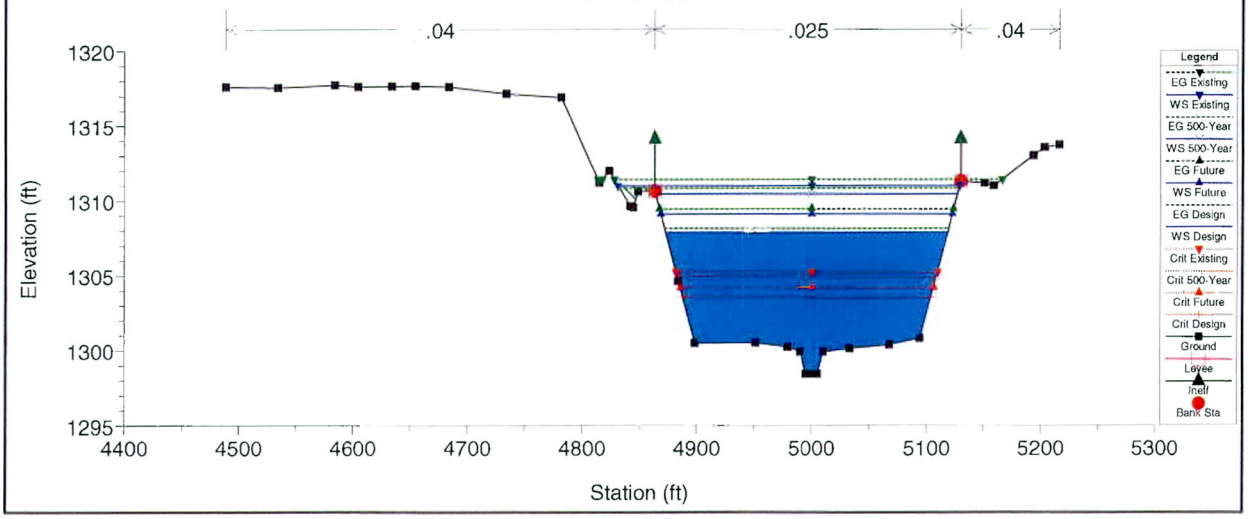
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.552



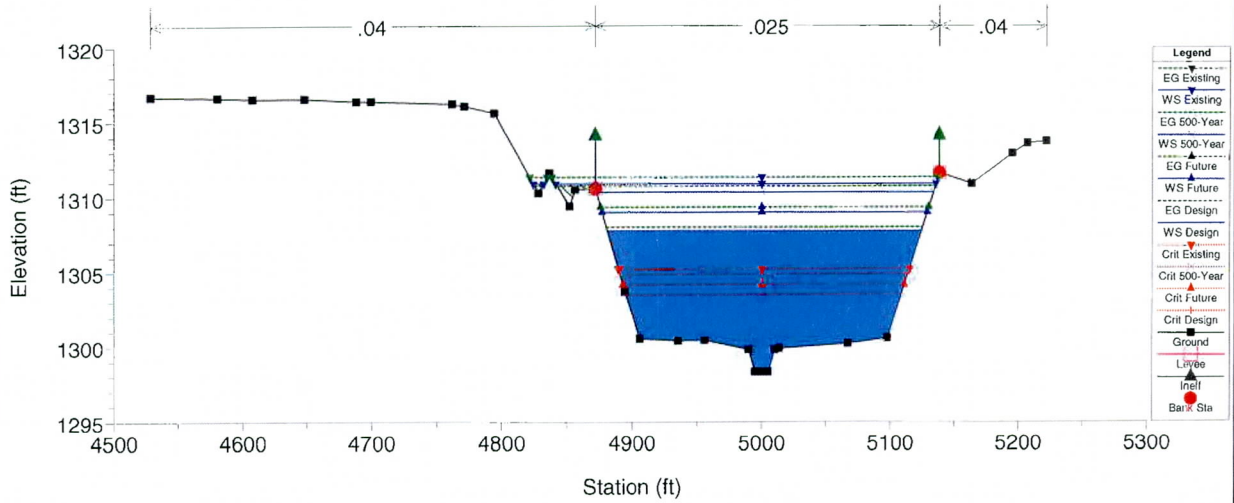
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.488



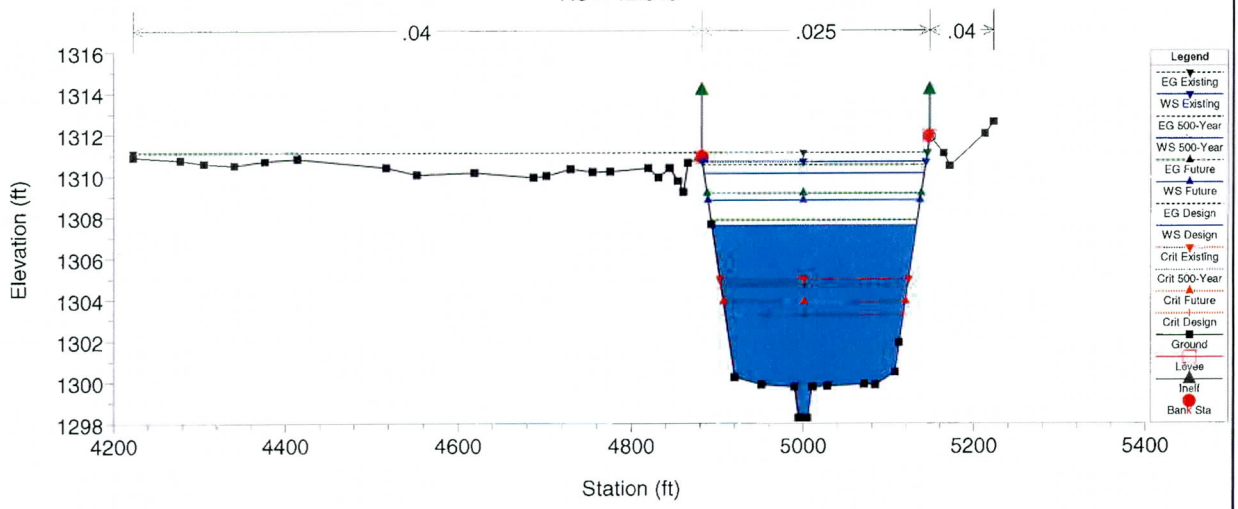
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.441



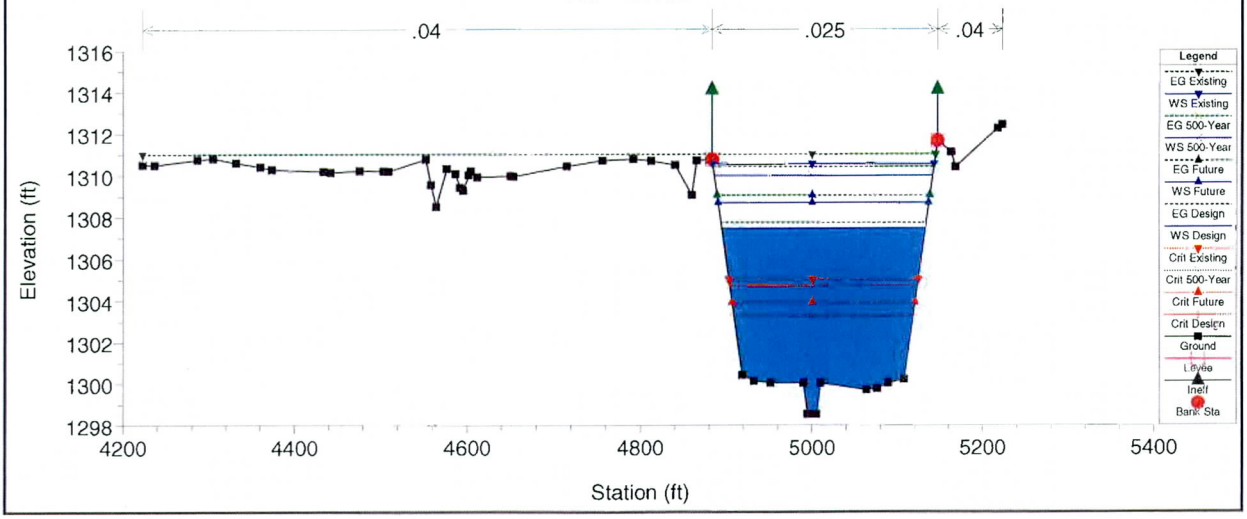
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.349



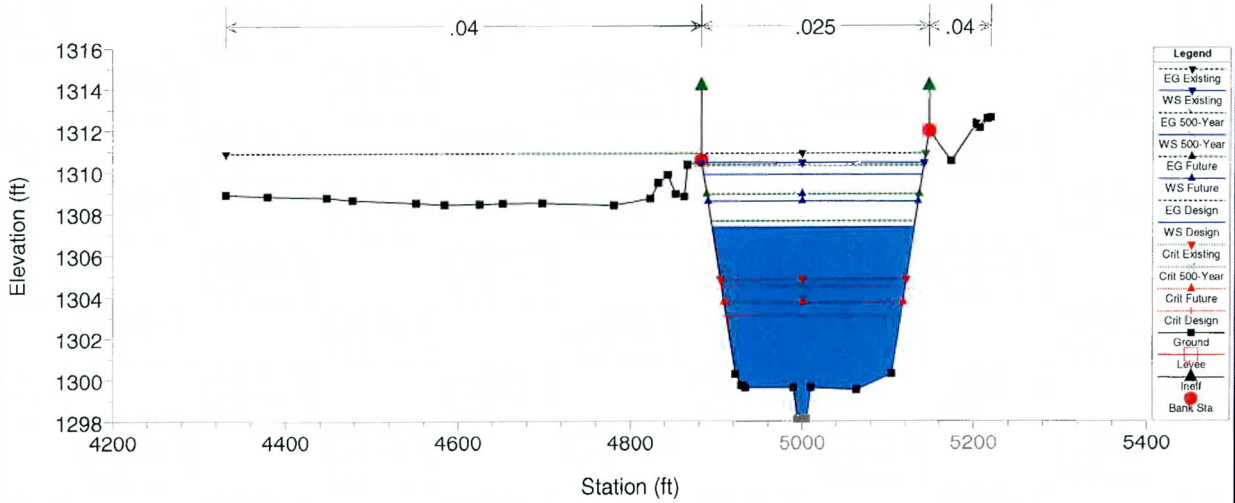
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.302



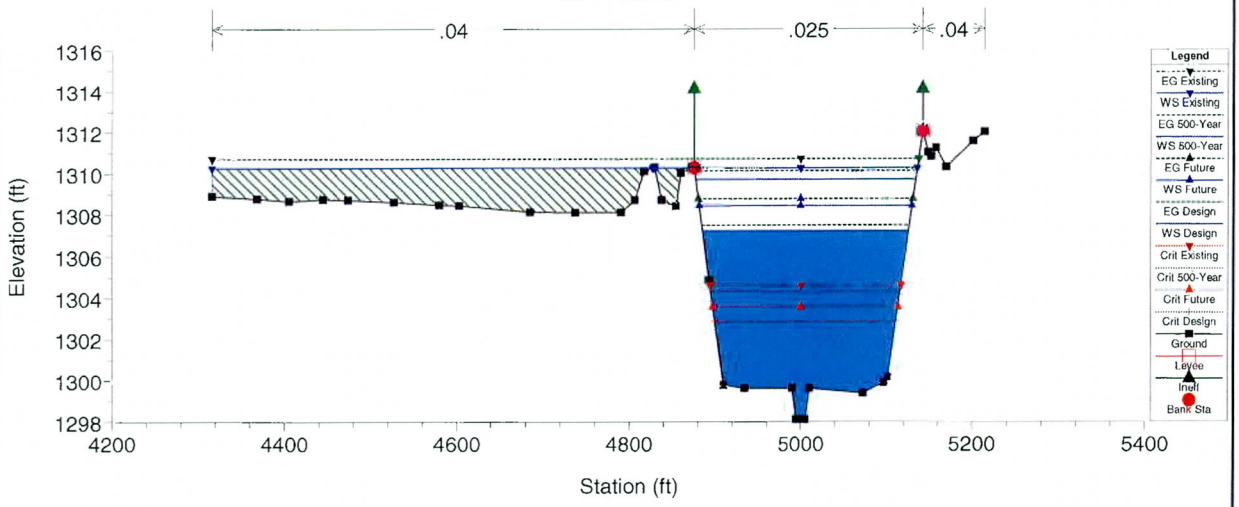
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.245



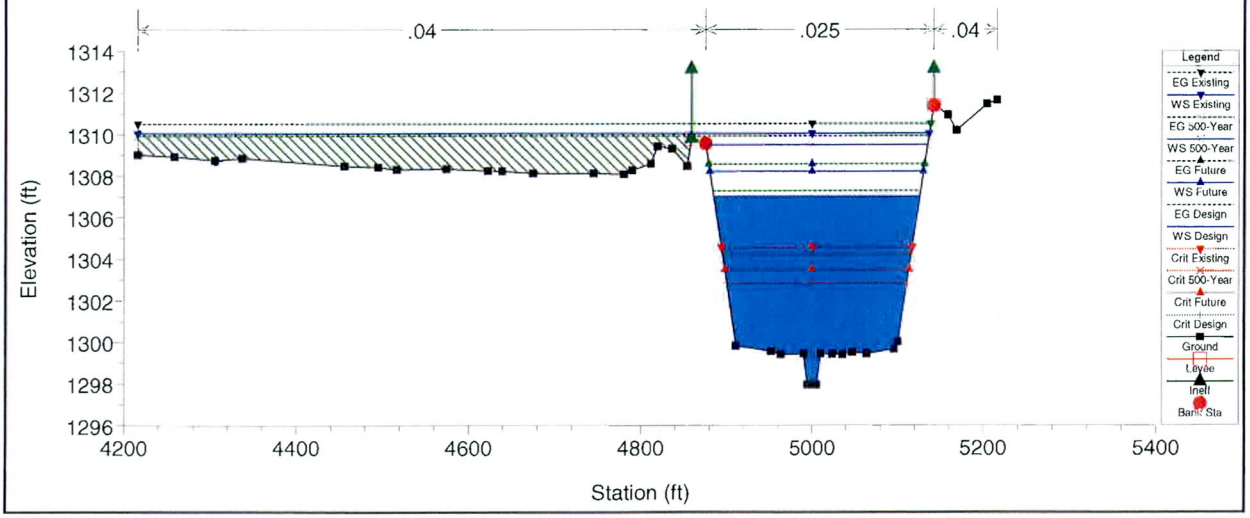
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.177



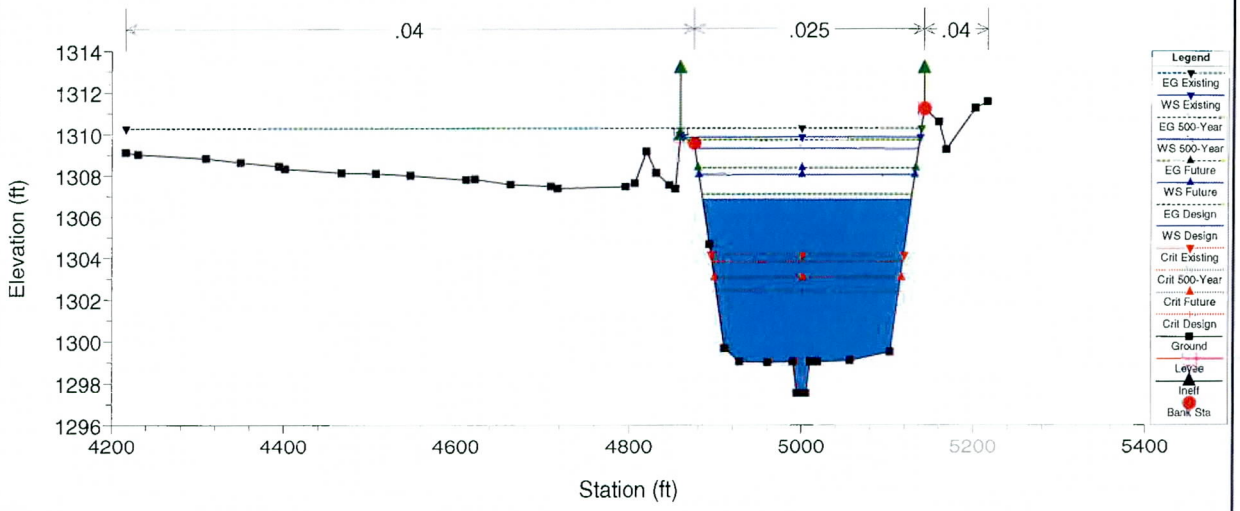
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 12.082



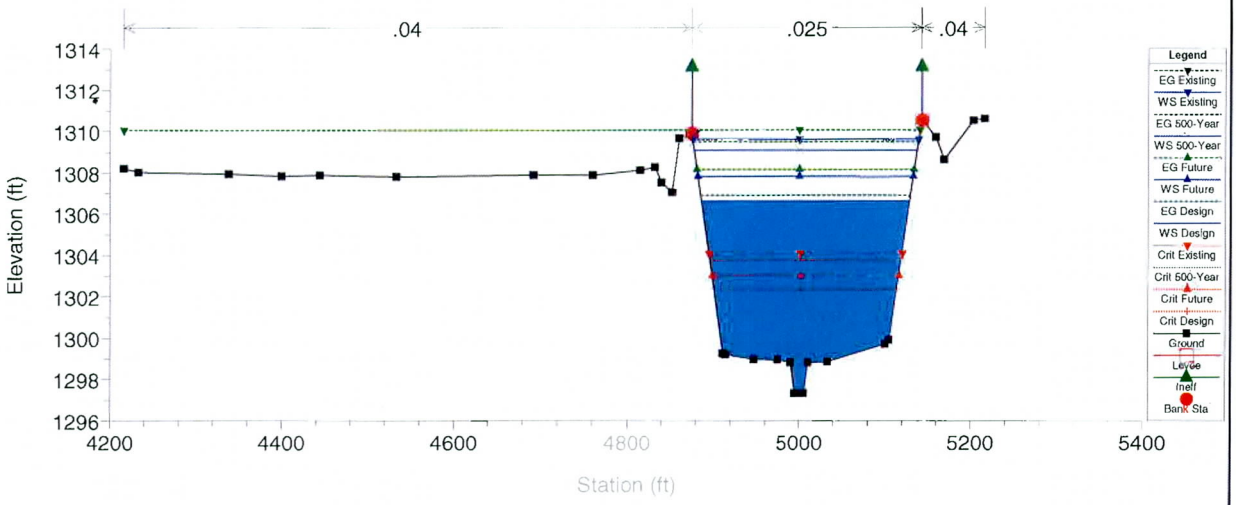
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.988



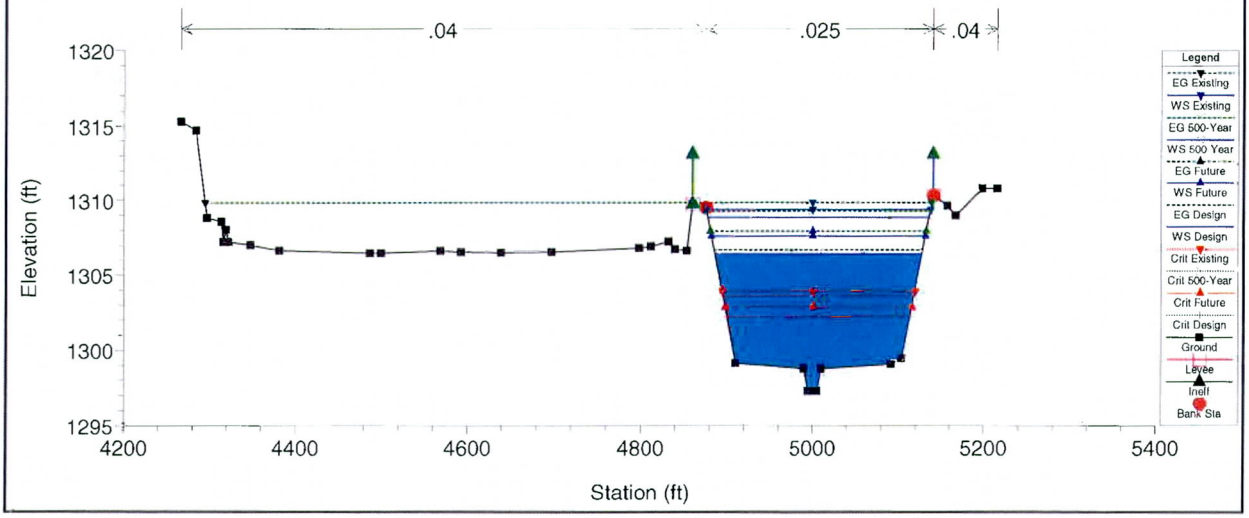
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.893



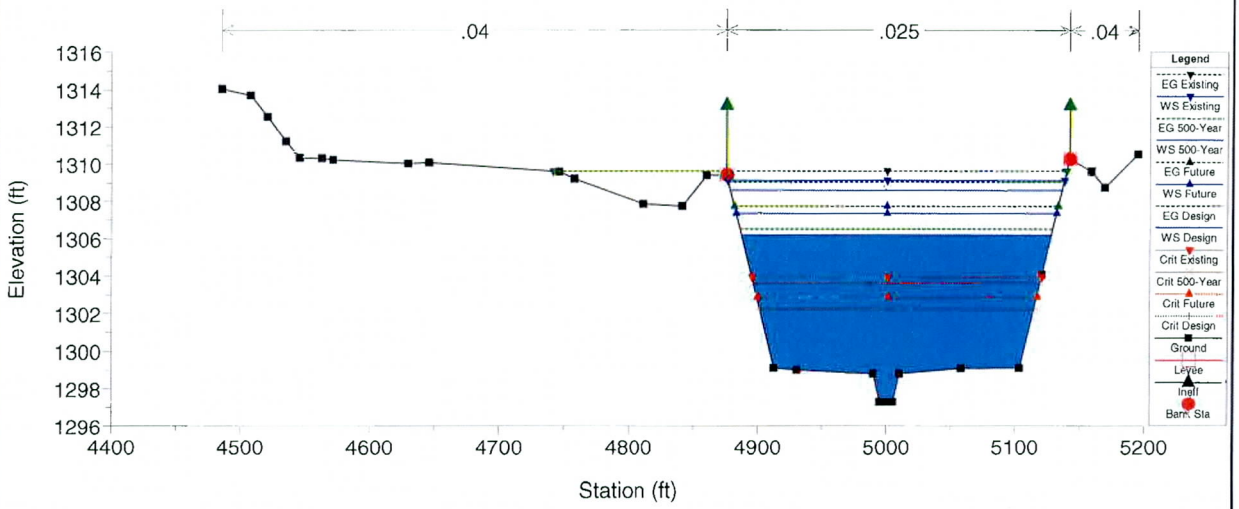
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.798



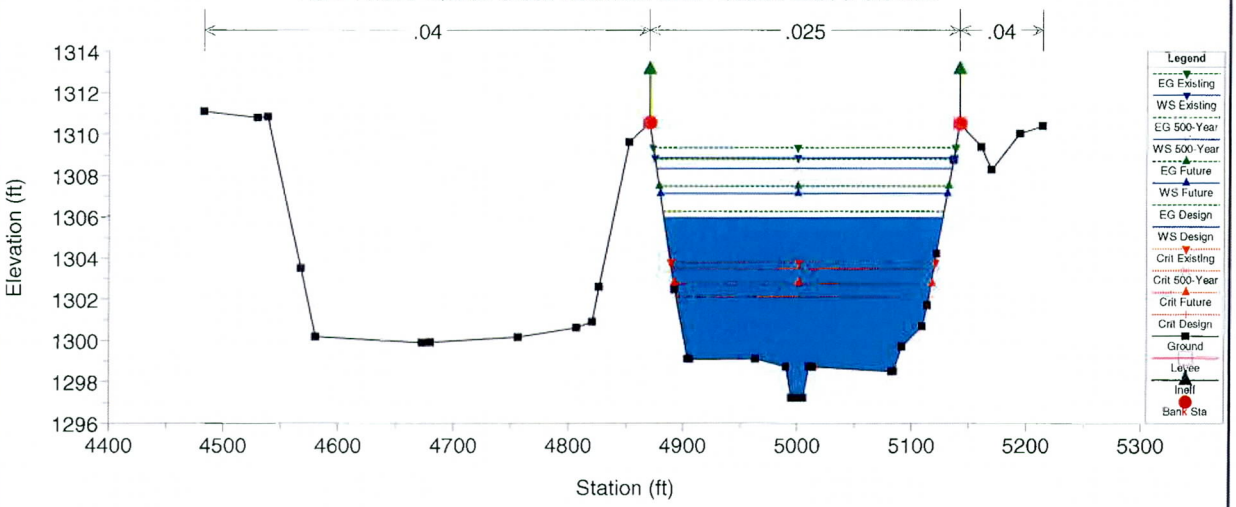
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.703



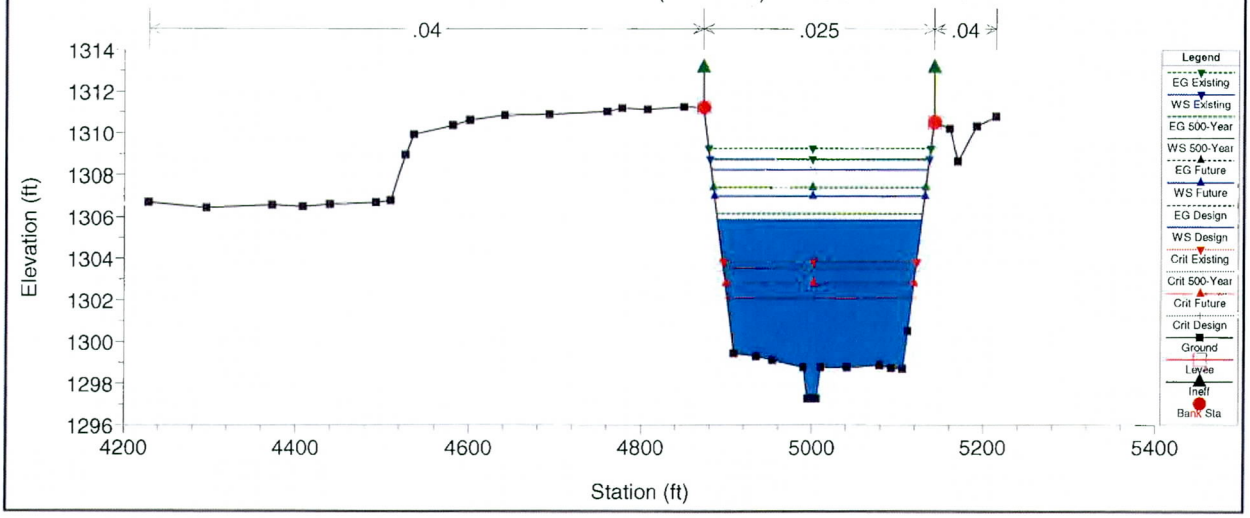
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.609 Queen Creek Detention Basin located East of the EMF



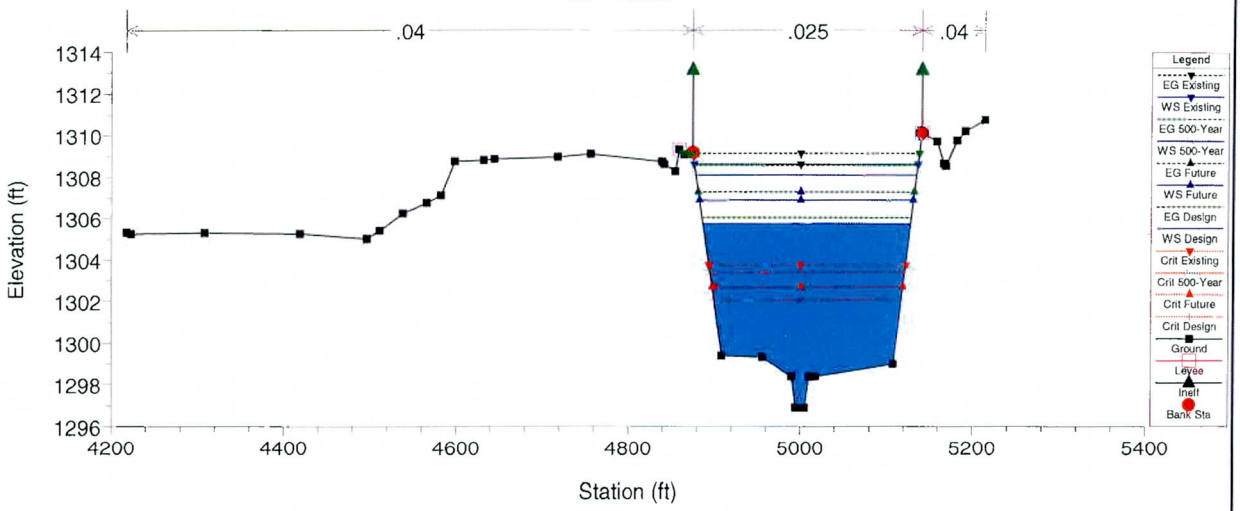
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.572 Downstream of Side Inlet (150' Wide) from the Left Overbank



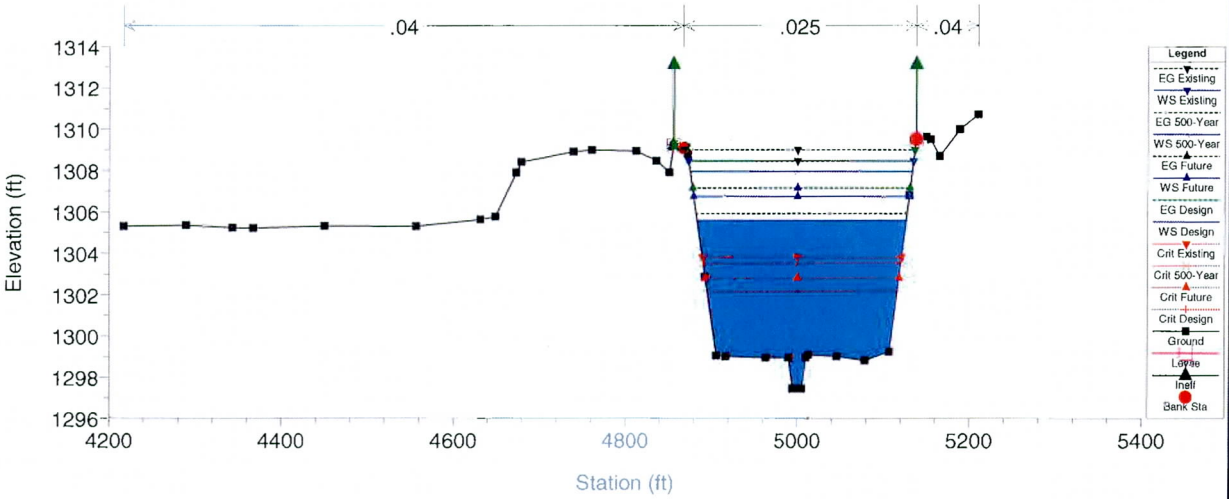
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.531



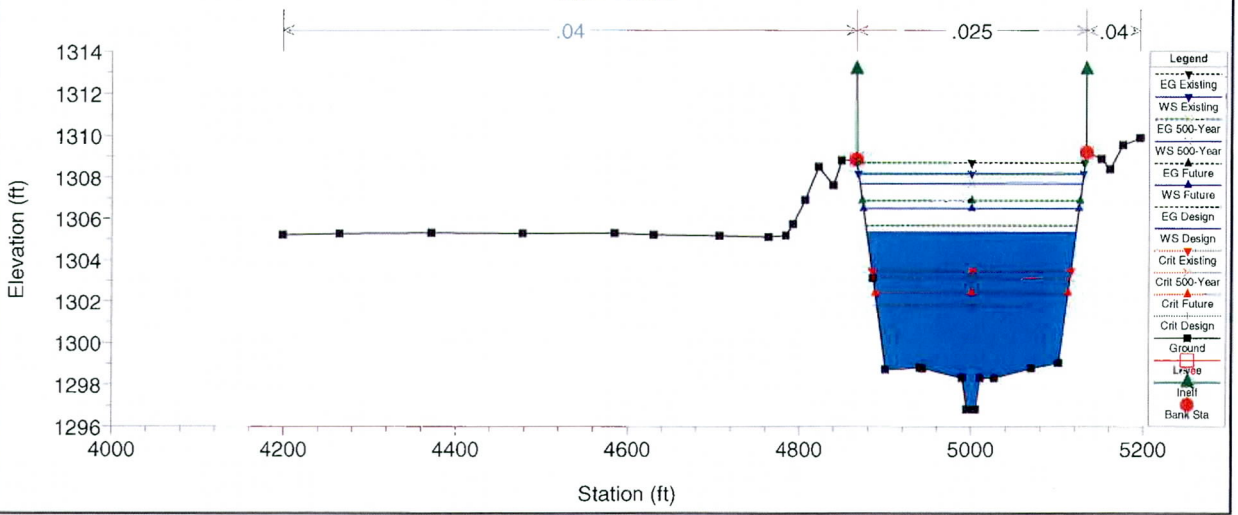
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.486



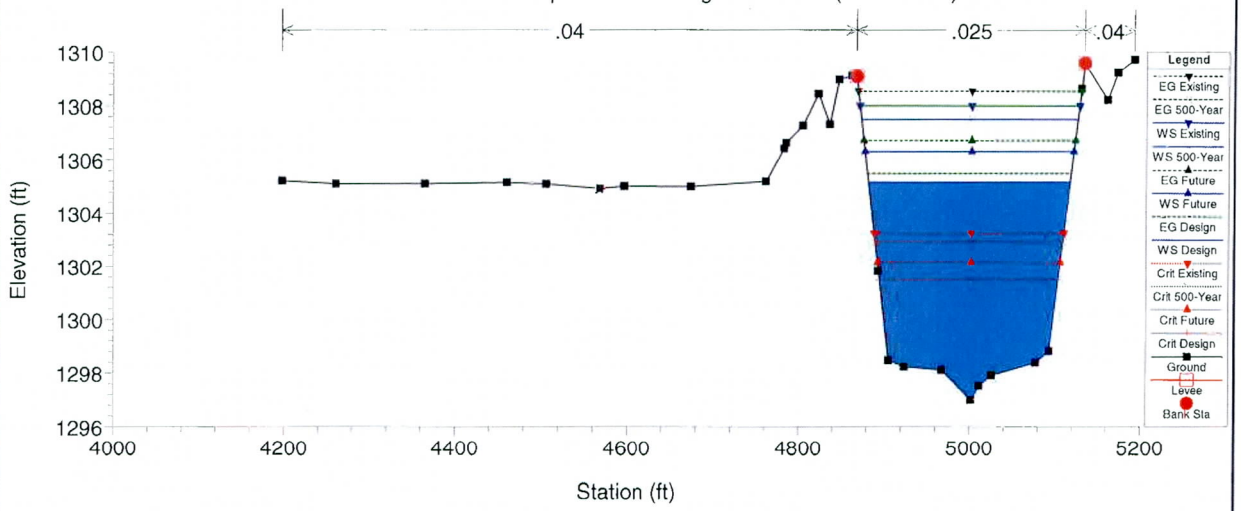
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.391



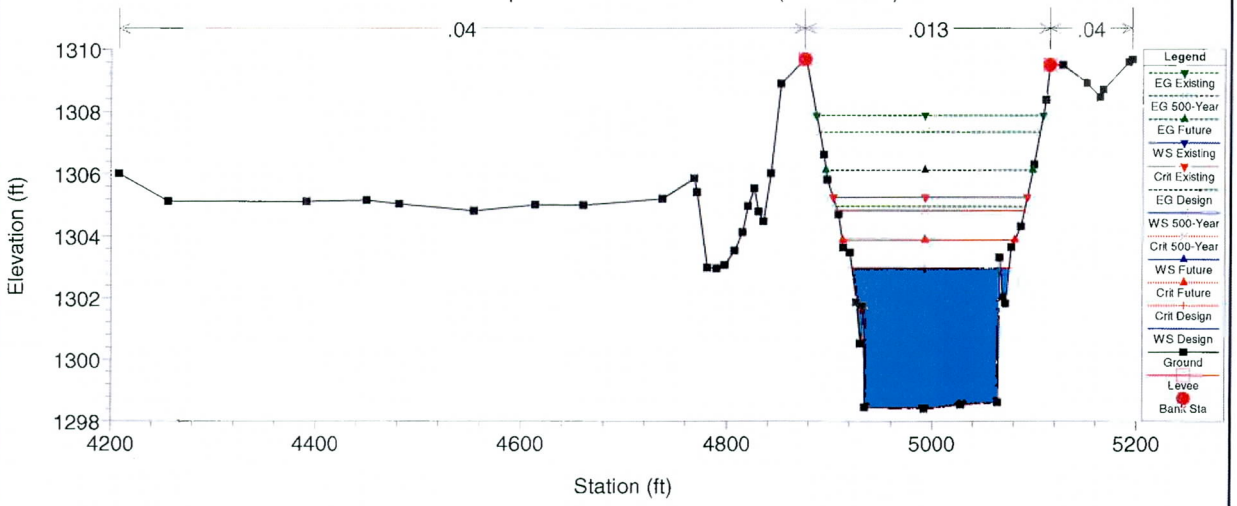
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.328 Concrete Drop Structure - Begin Transition (Contraction)



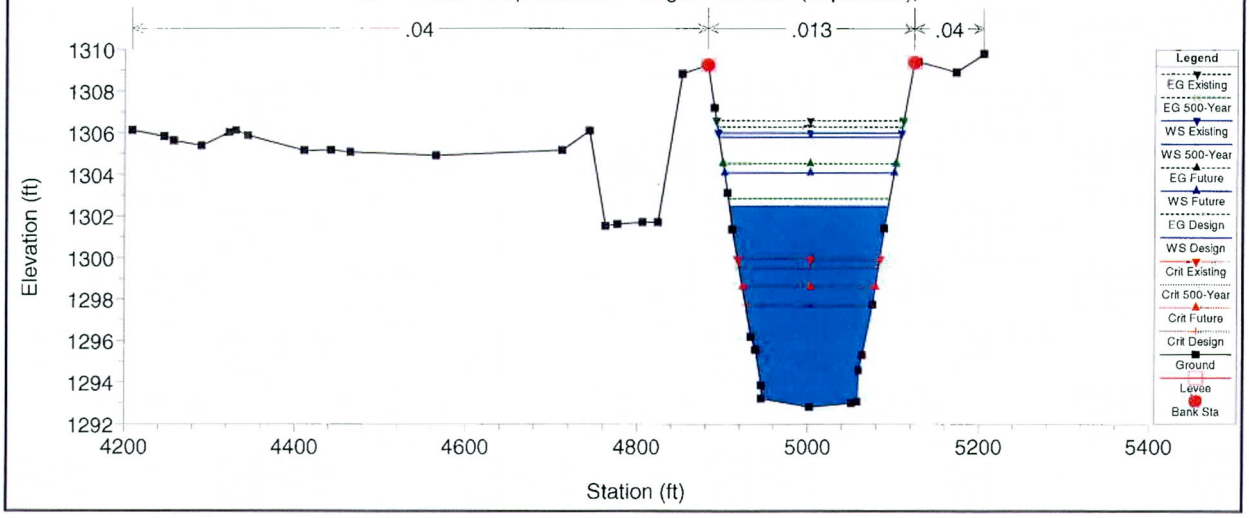
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.321 Drop Structure - End Transition (Contraction)



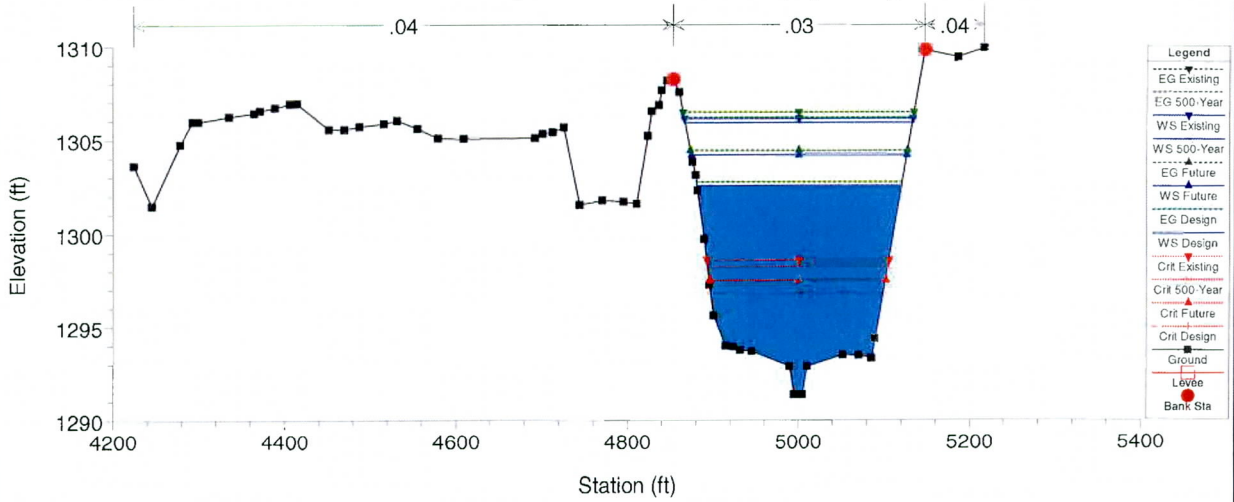
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.308 Drop Structure - Begin Transition (Expansion);



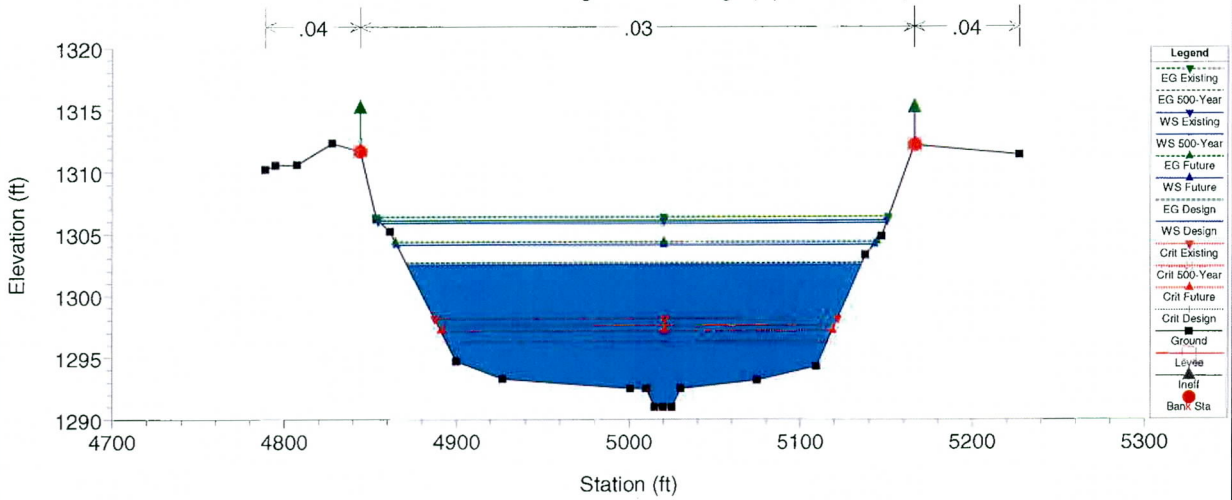
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.297 Drop Structure - End Transition (Expansion);



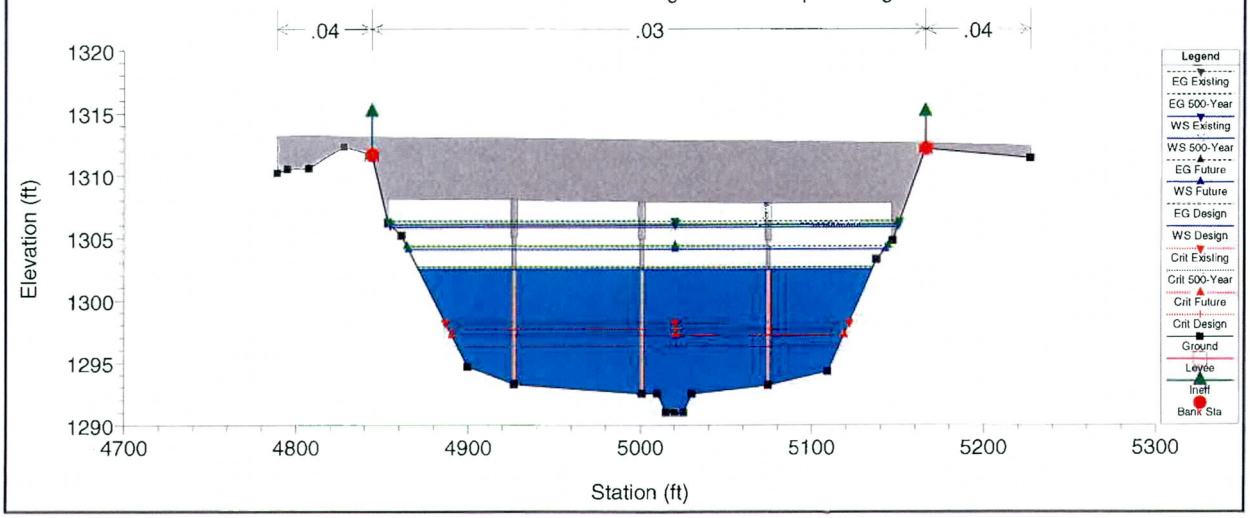
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.26 Chandler Heights Road Bridge (Upstream Face)



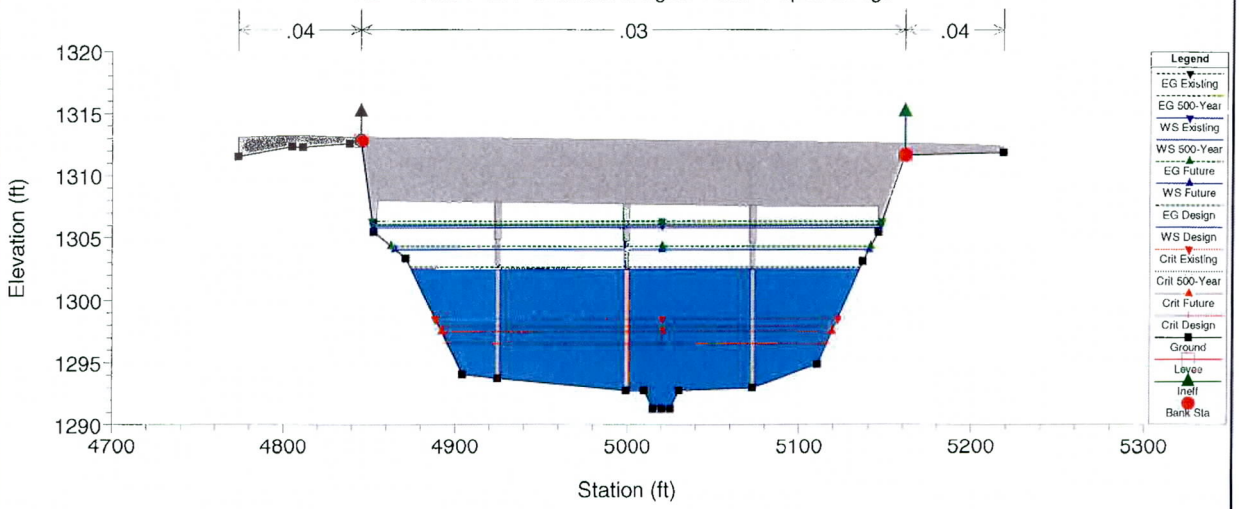
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



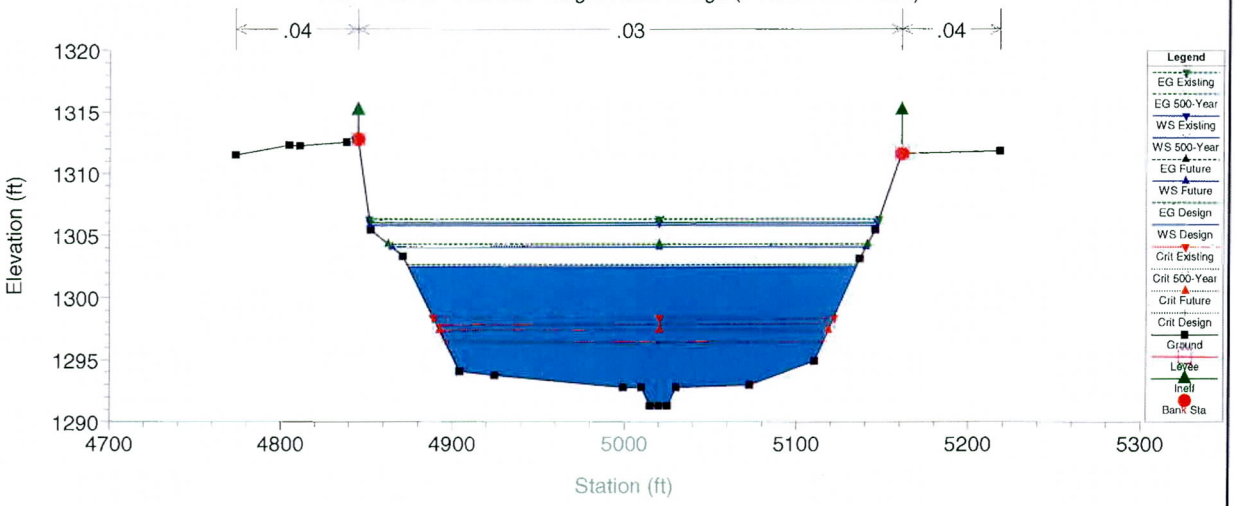
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.254 BR Chandler Heights Road 4-Span Bridge



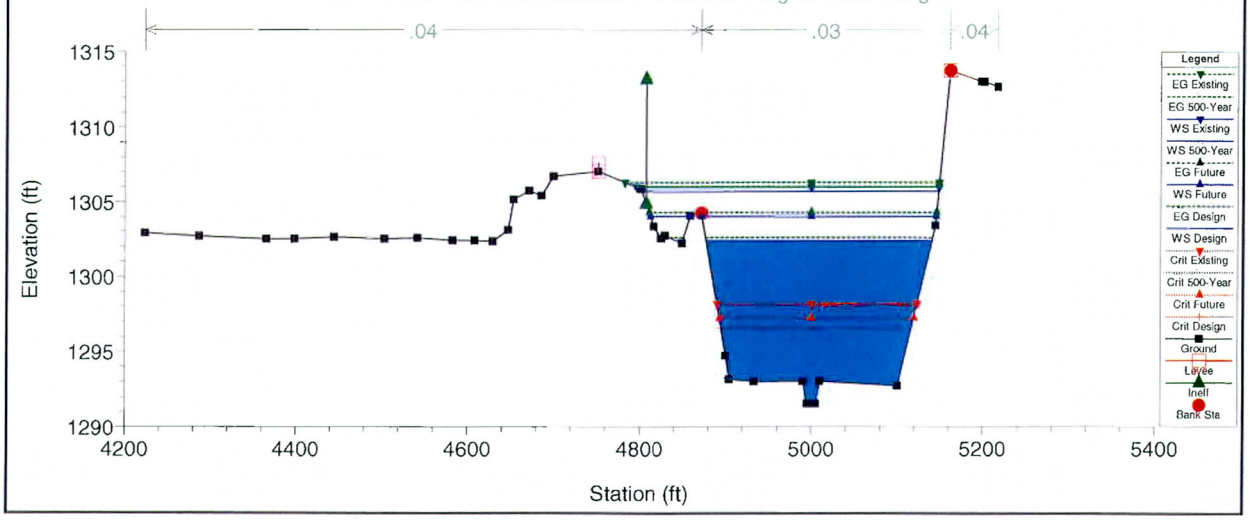
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.249 Chandler Height Road Bridge (Downstream Face)



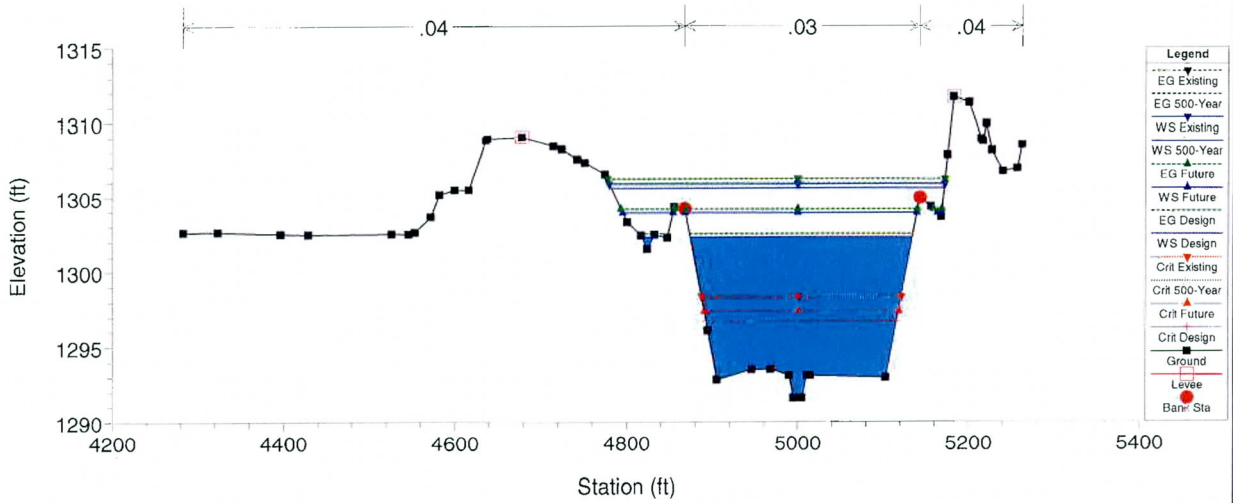
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.231 Just Downstream of Chandler Heights Road Bridge



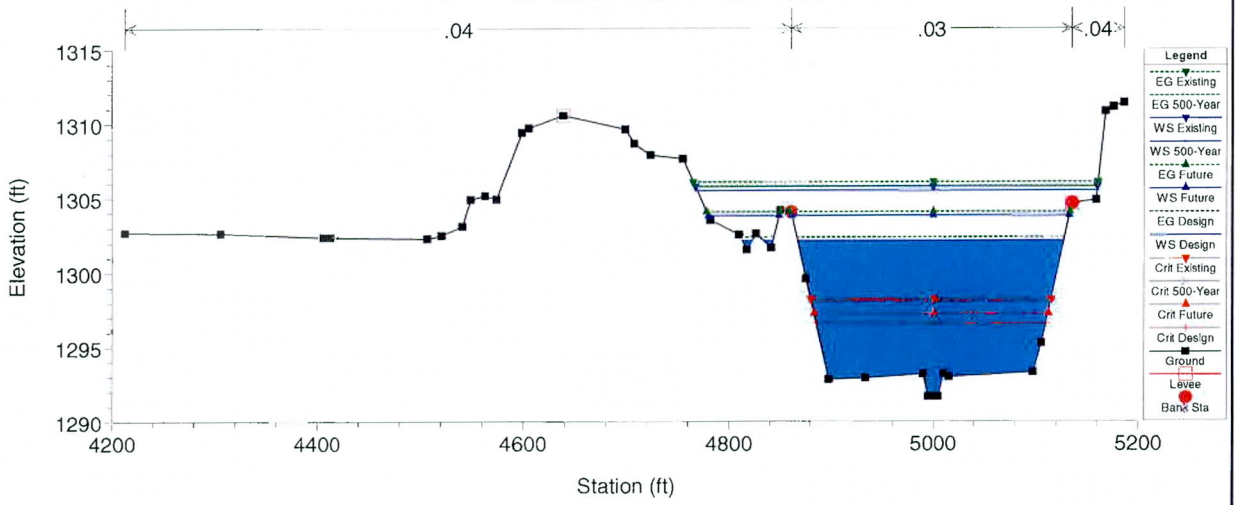
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.189 Dense Grass in channel bed



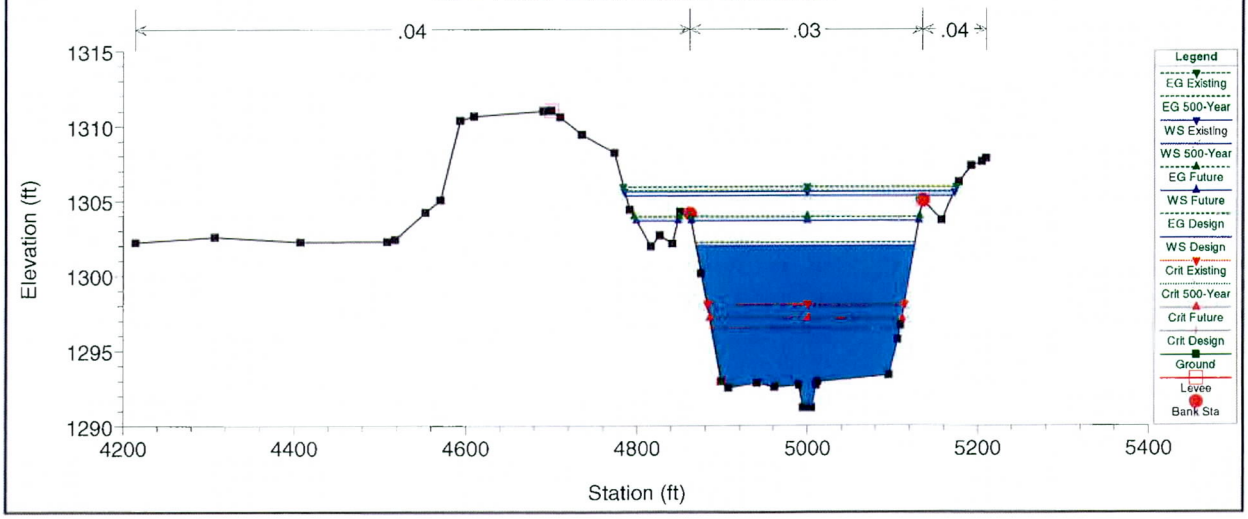
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.127 Dense Grass in channel bed



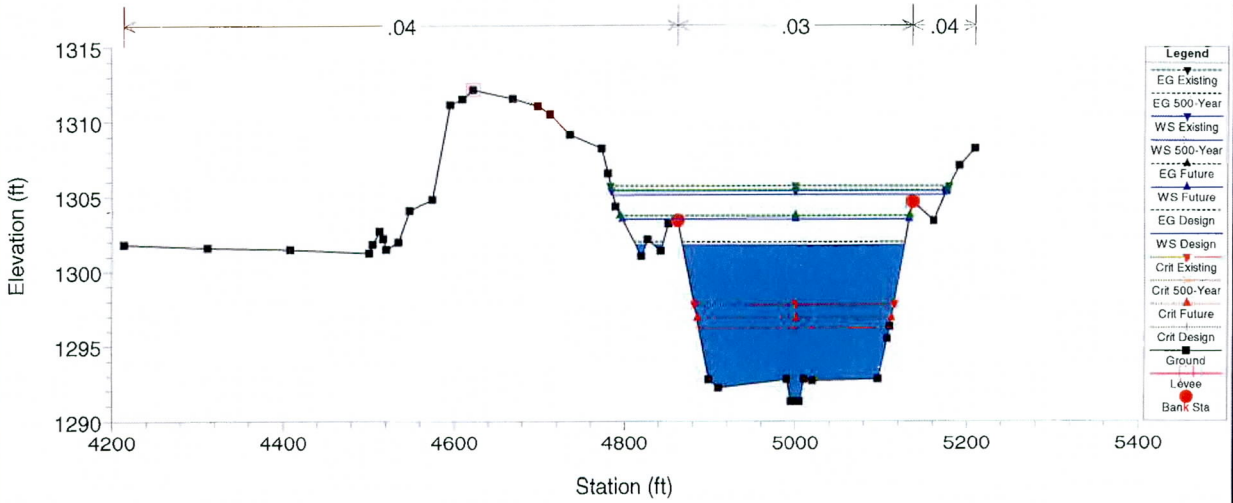
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 11.033 Dense Grass in channel bed



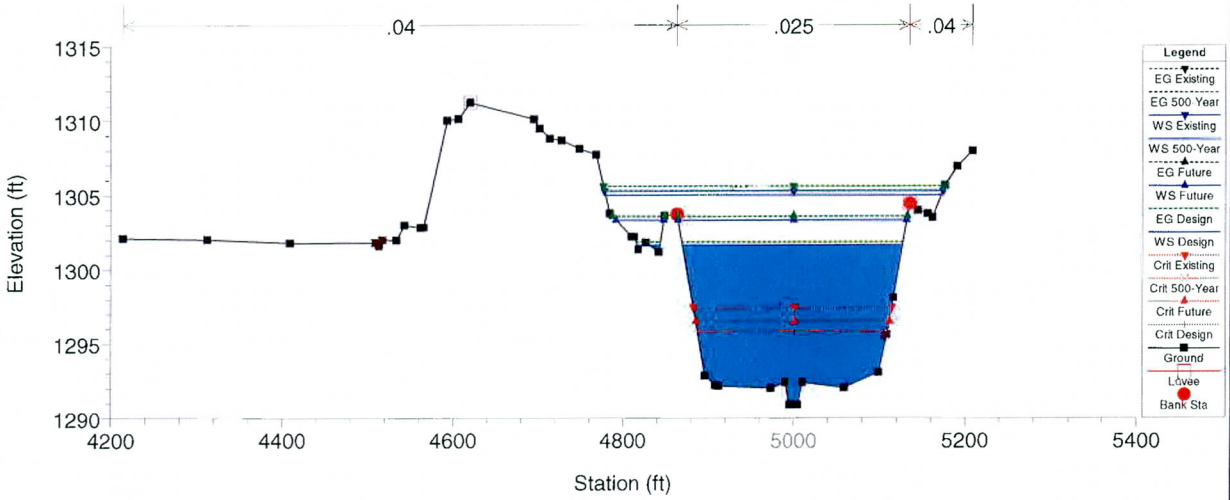
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.938 Dense Grass in channel bed



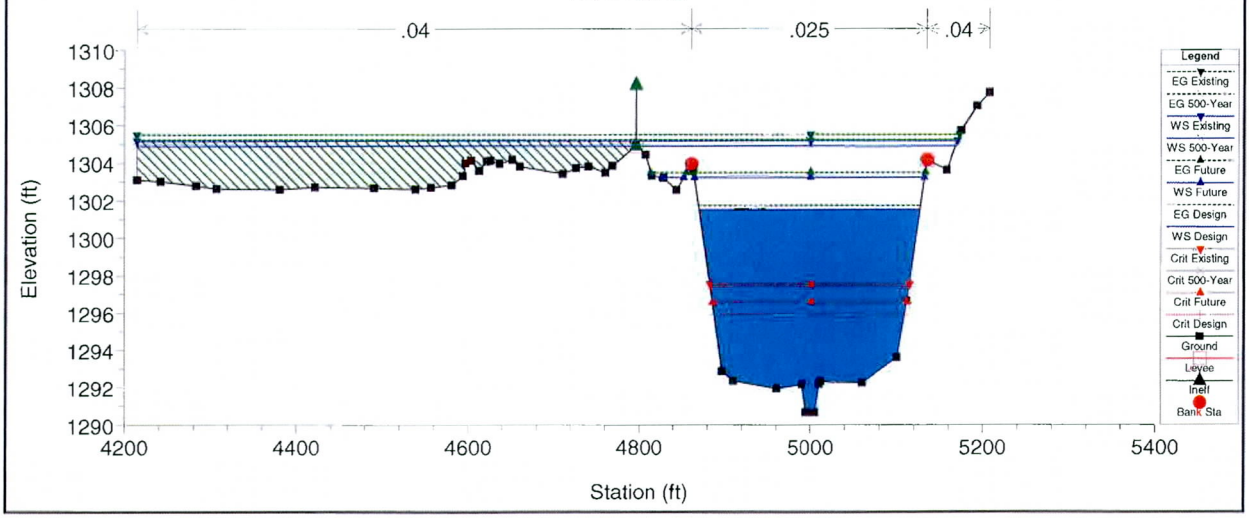
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.843 End Dense Grass in channel bed



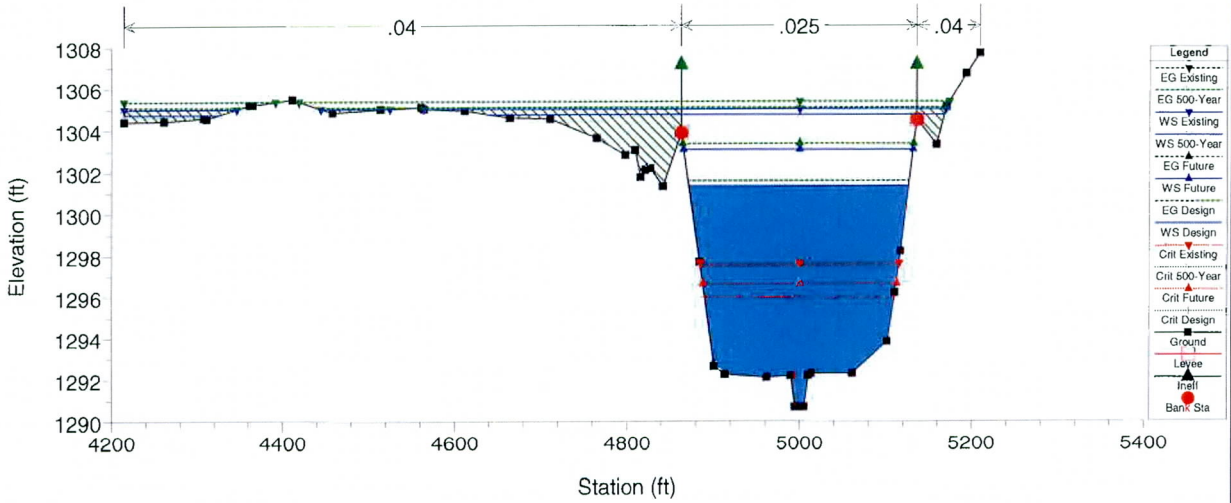
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.749



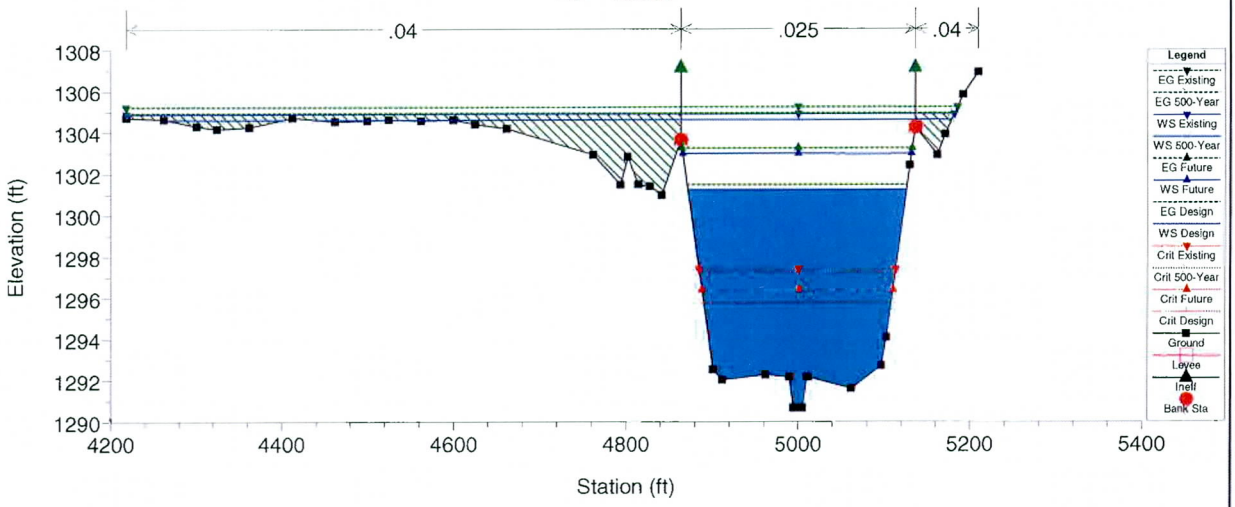
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.654



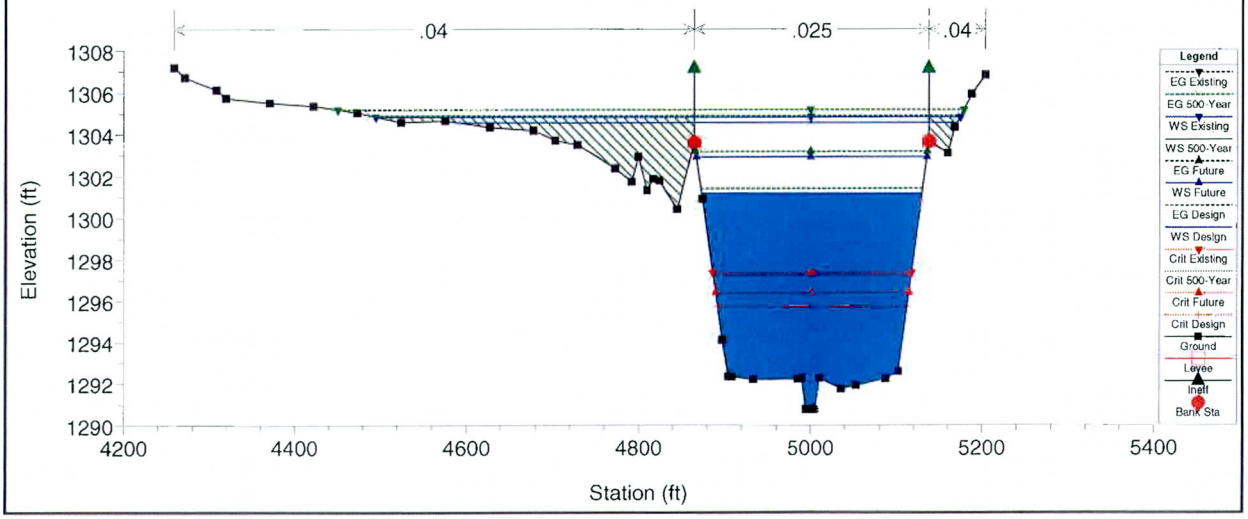
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.566



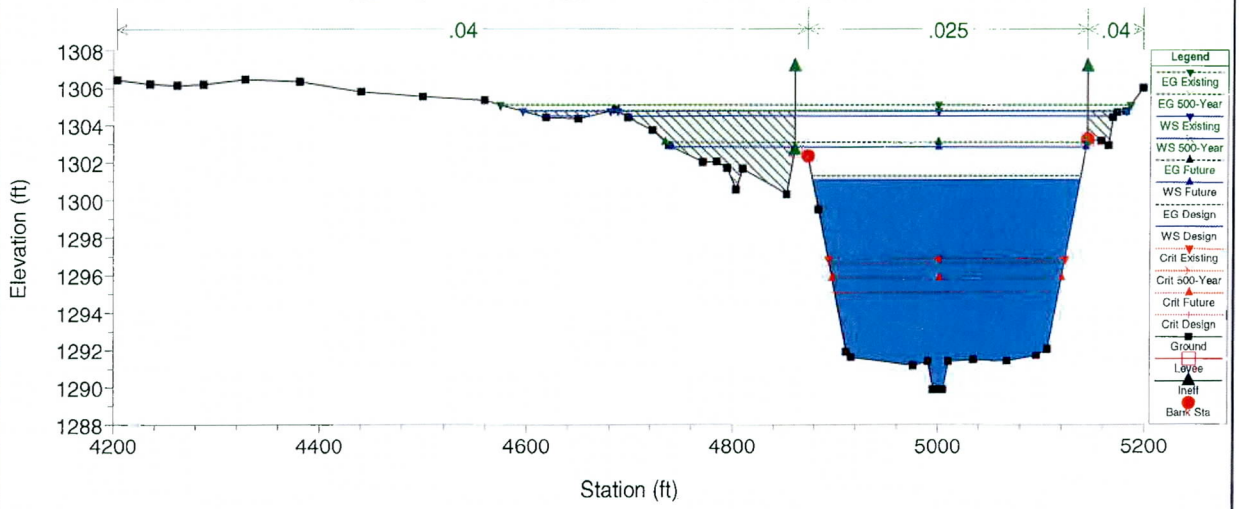
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.518



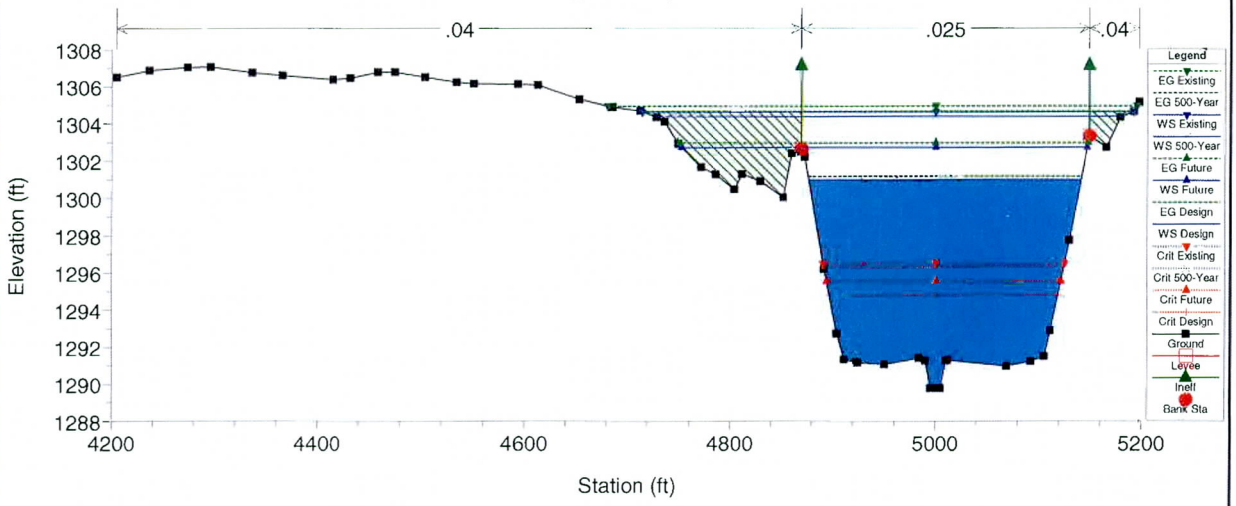
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.441 Downstream of Side Inlet from the Left Bank



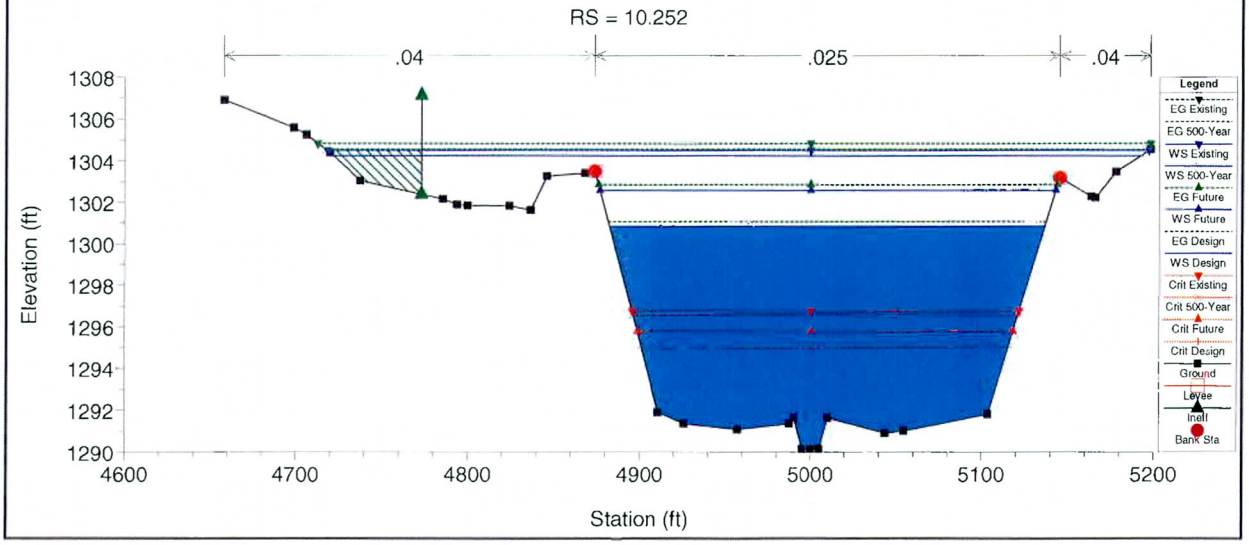
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.346



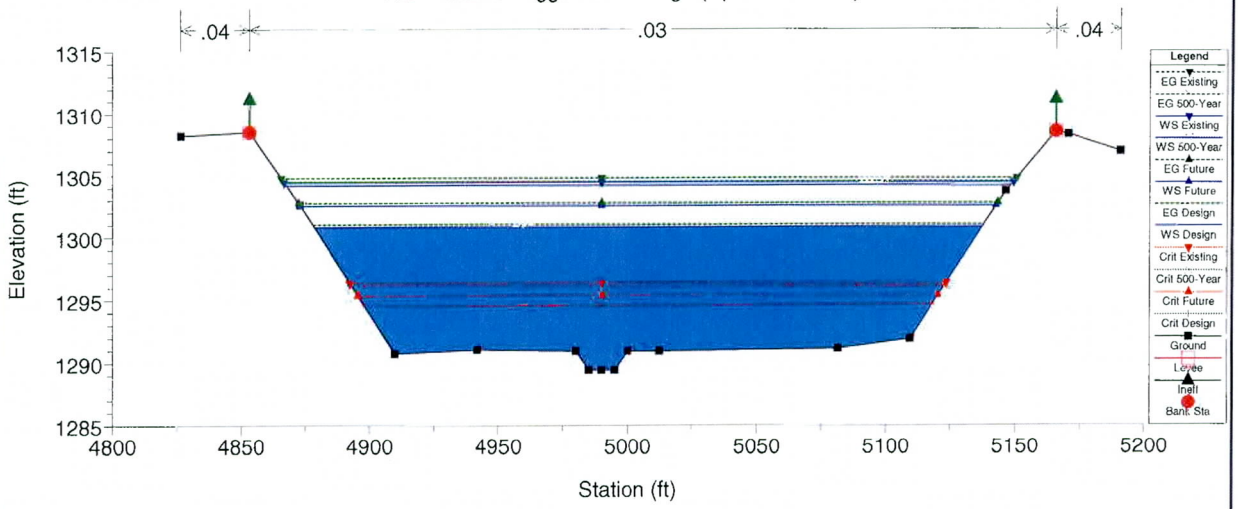
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.252



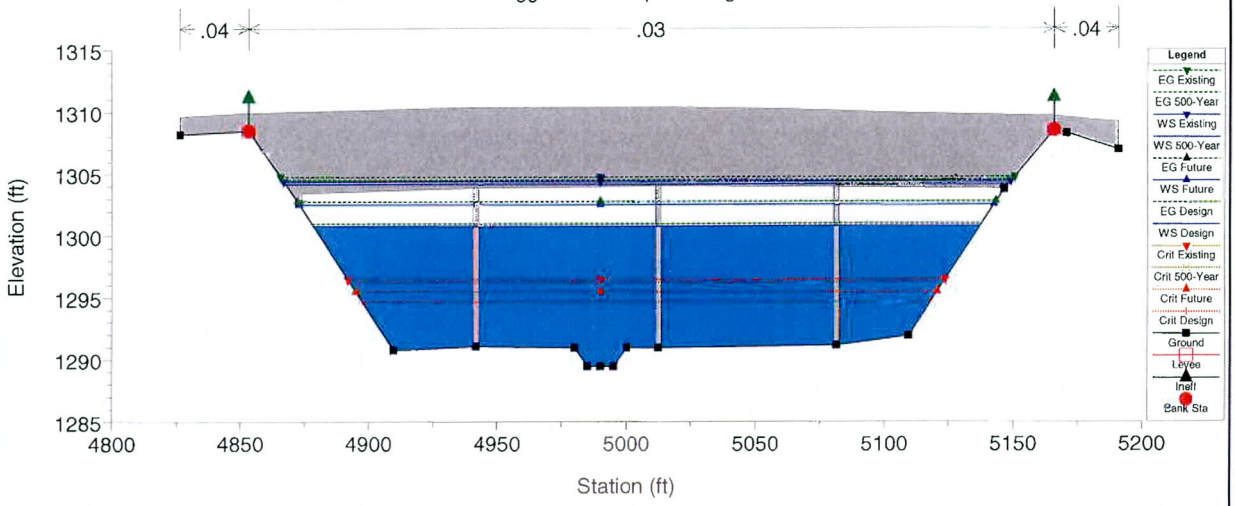
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.218 Riggs Road Bridge (Upstream Face)



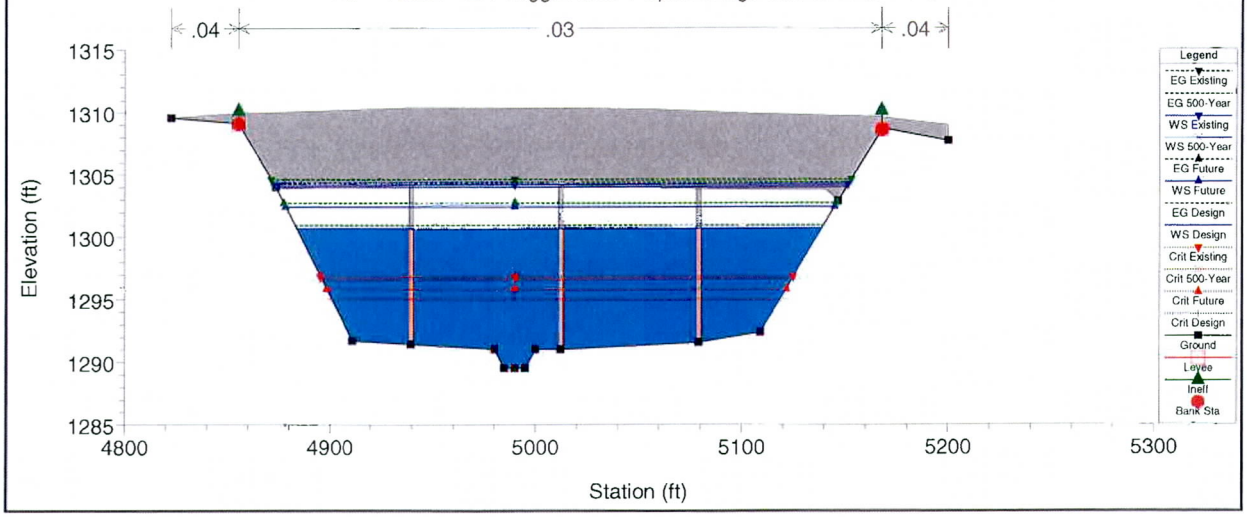
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



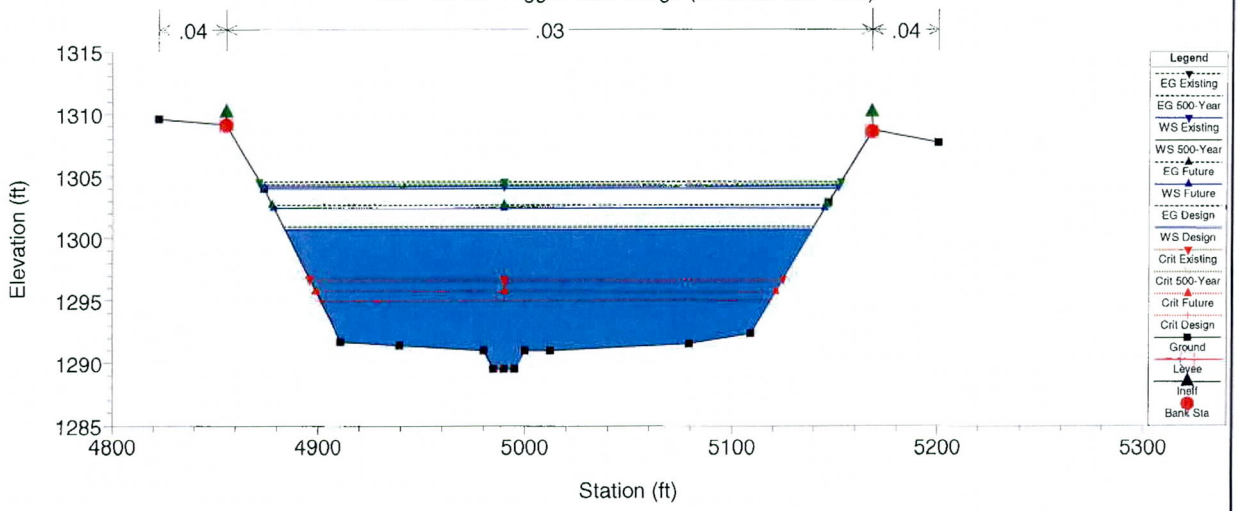
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.207 BR Riggs Road 4-Span Bridge with Circular Piers



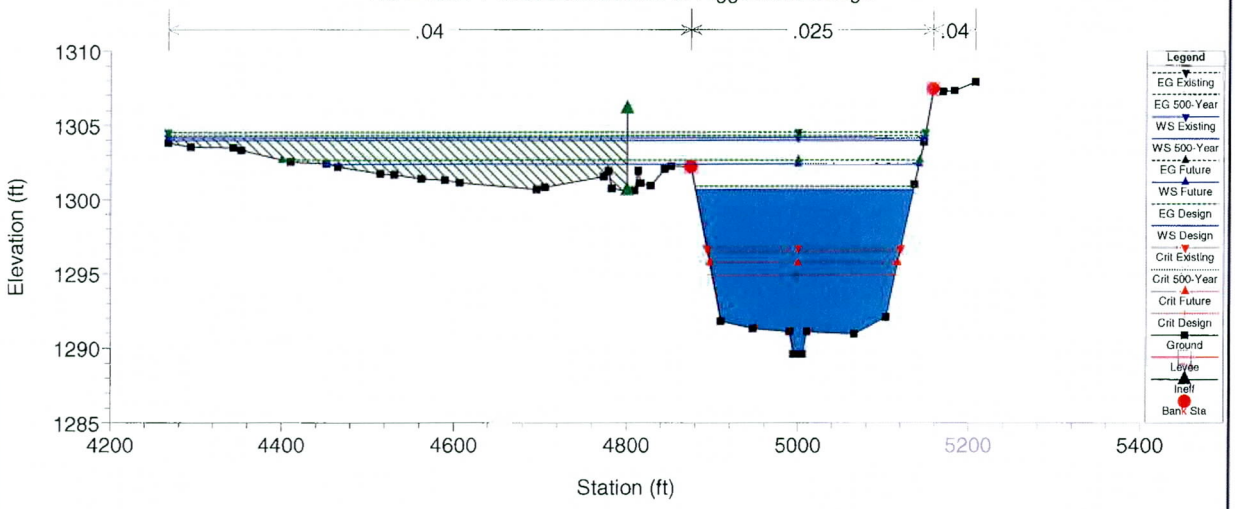
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.195 Riggs Road Bridge (Downstream Face)



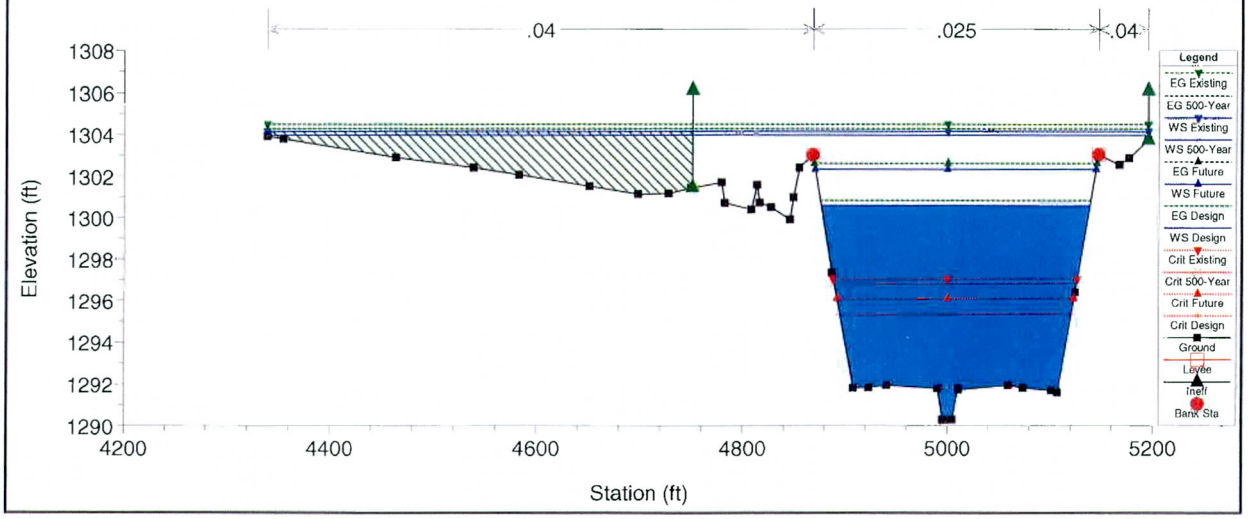
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.171 Just Downstream of Riggs Road Bridge



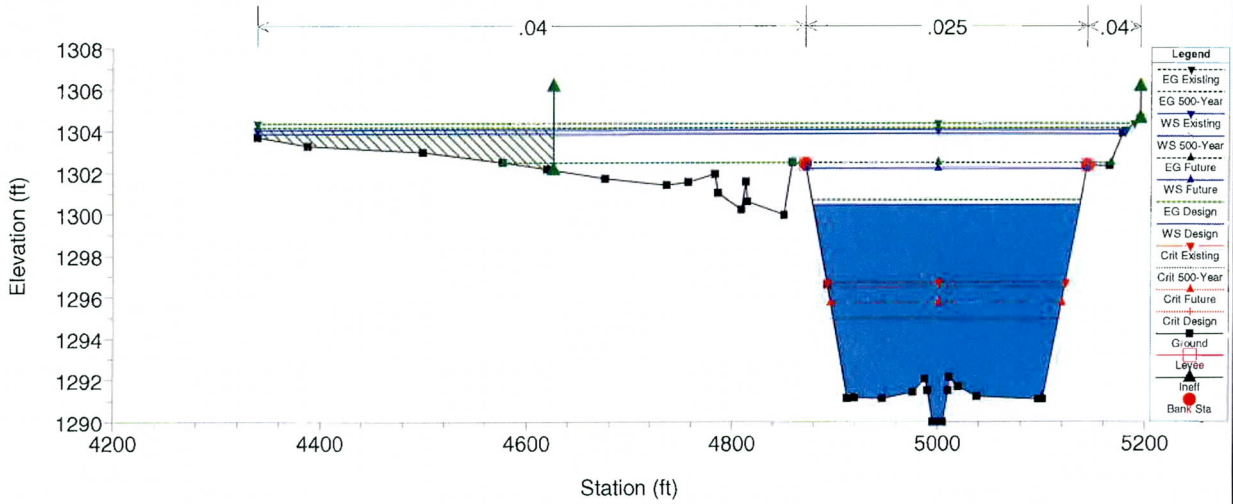
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.134



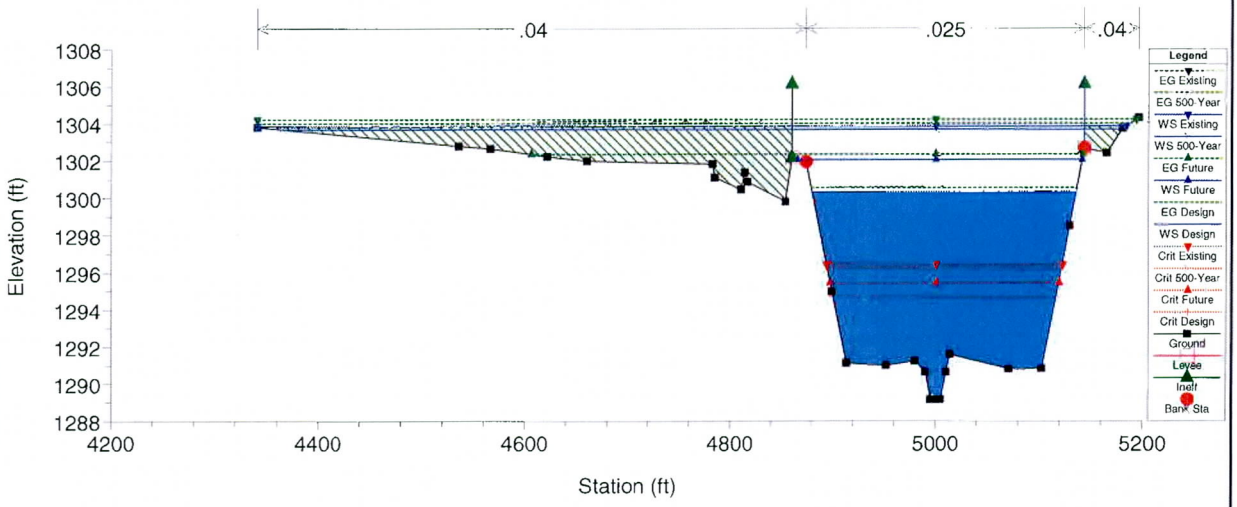
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 10.039



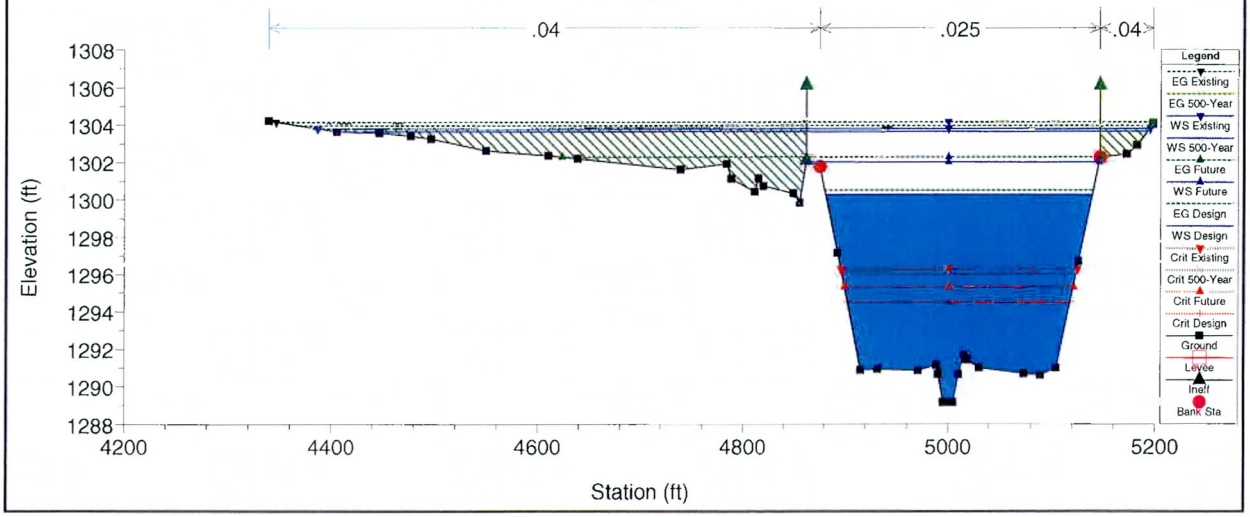
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.944



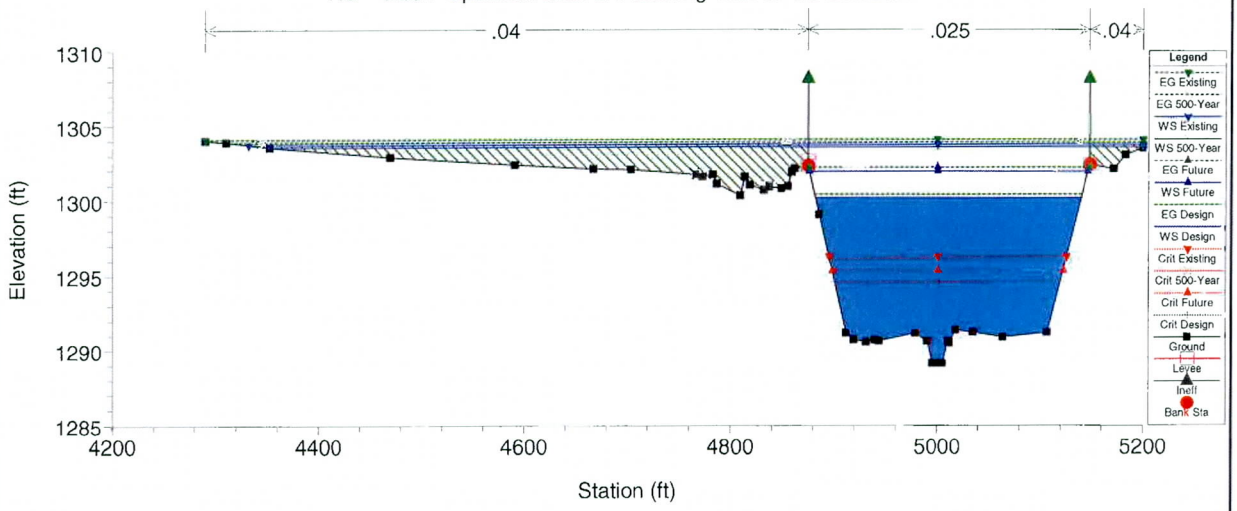
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.897



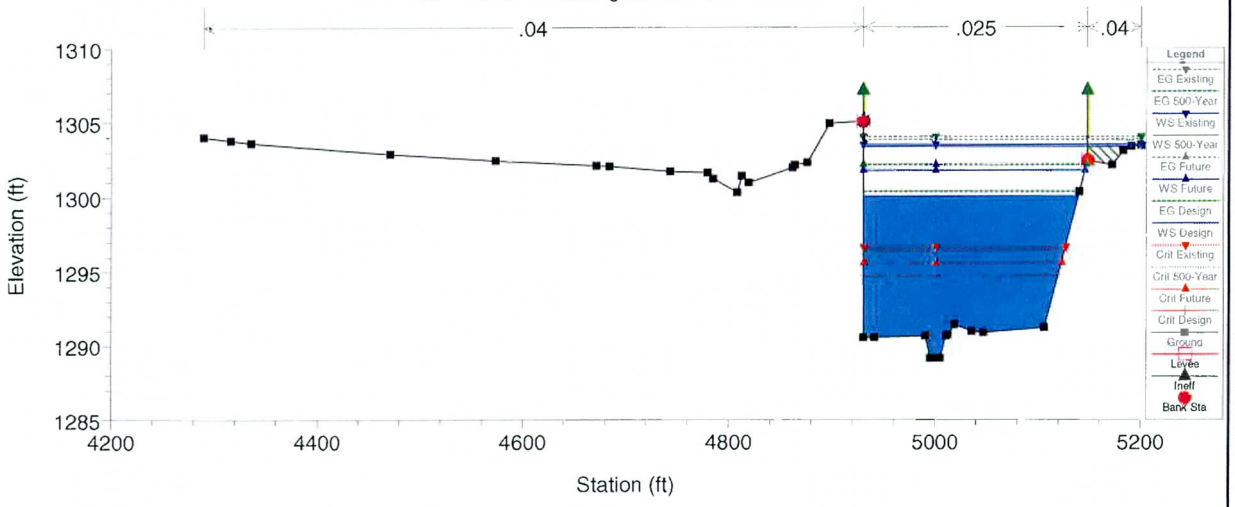
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.854 Upstream Side of Retaining Wall on the Left Bank



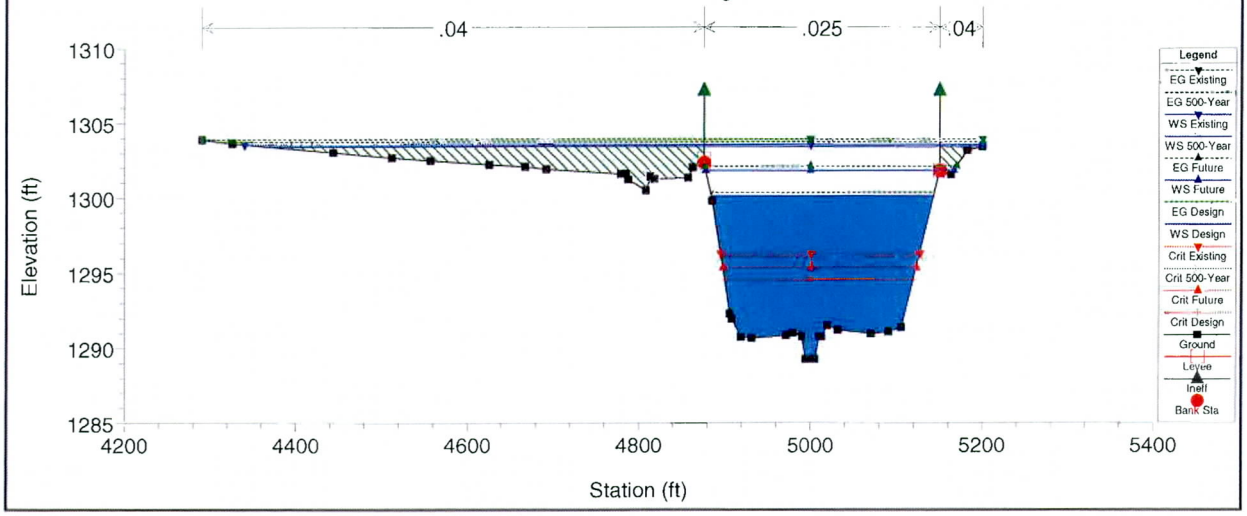
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.849 Retaining Wall on the Left Bank



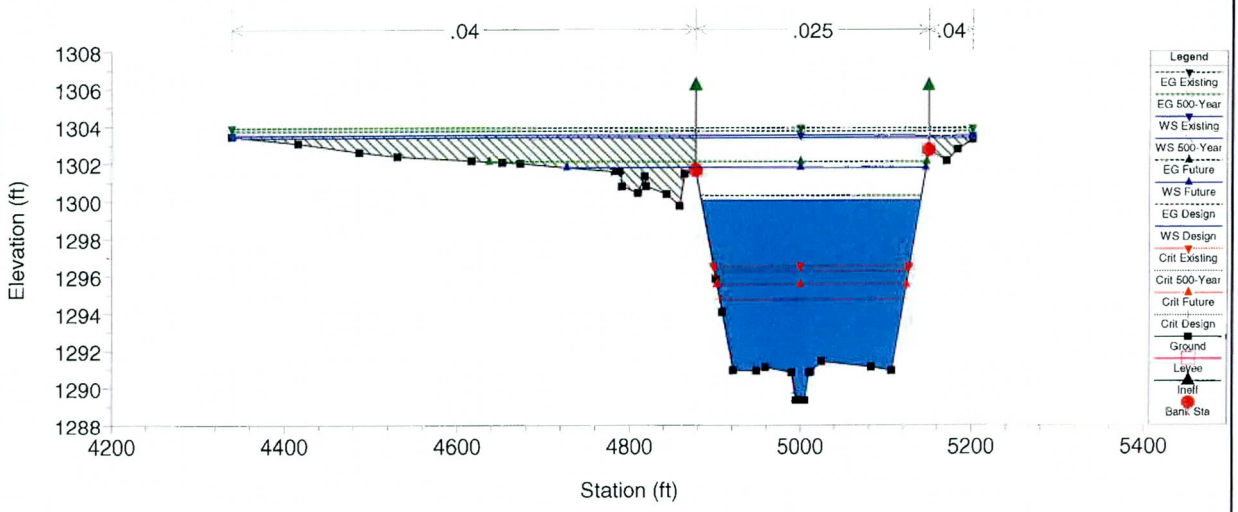
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.844 Downstream Side of Retaining Wall on the Left Bank



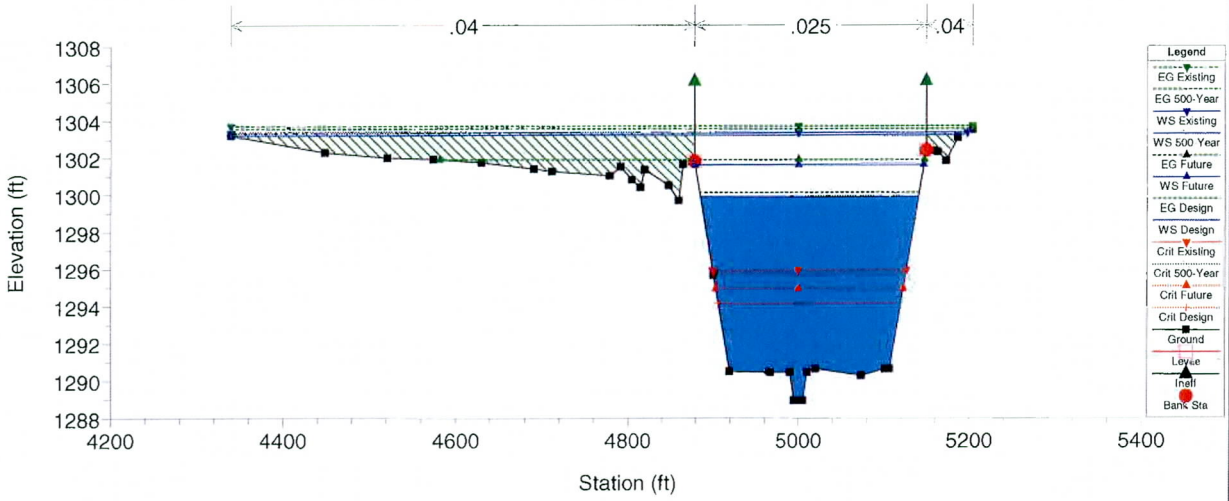
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.802



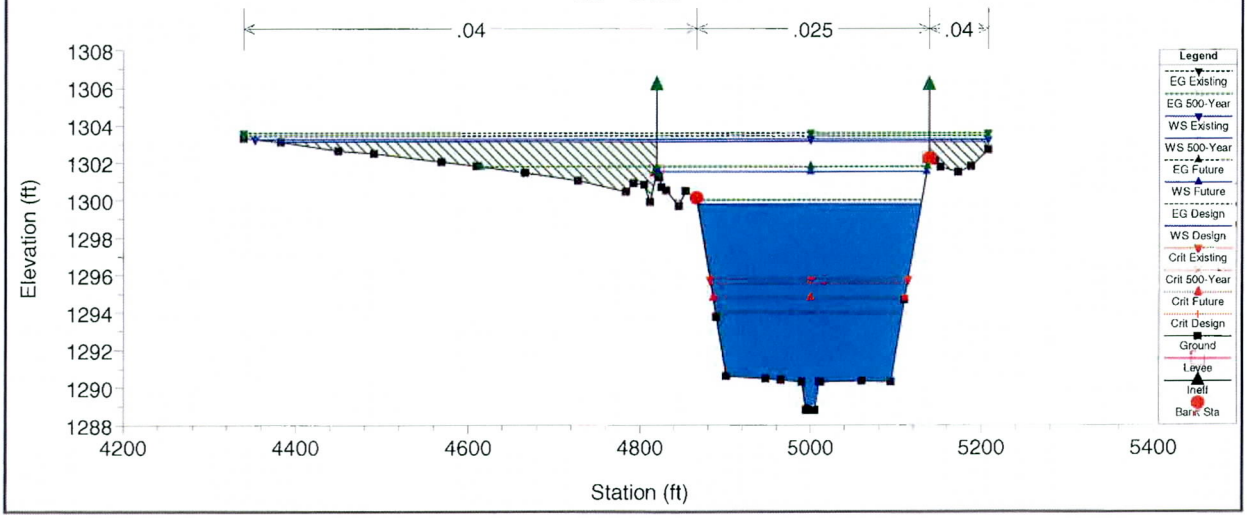
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.708



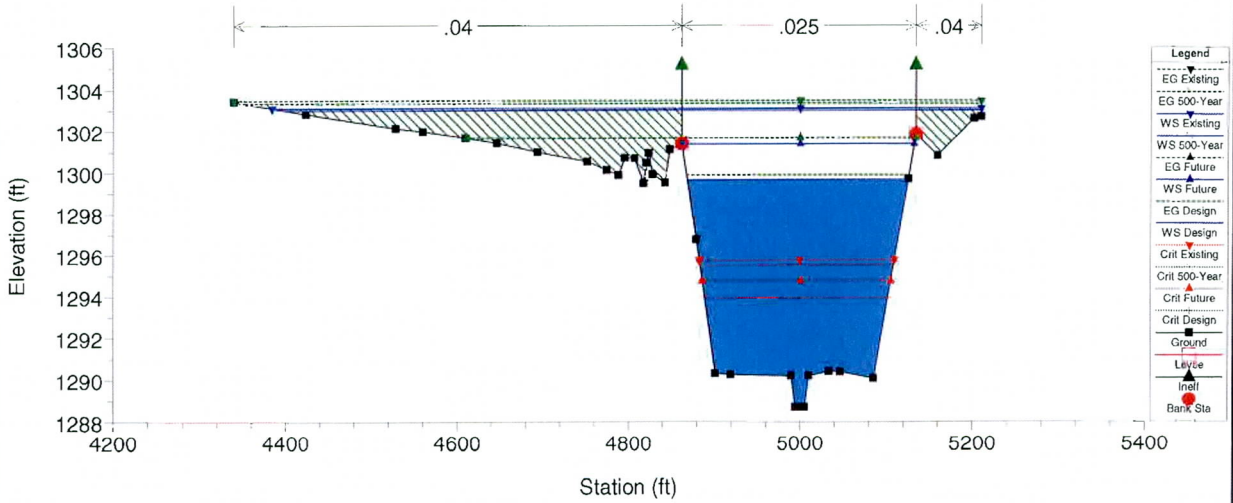
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.613



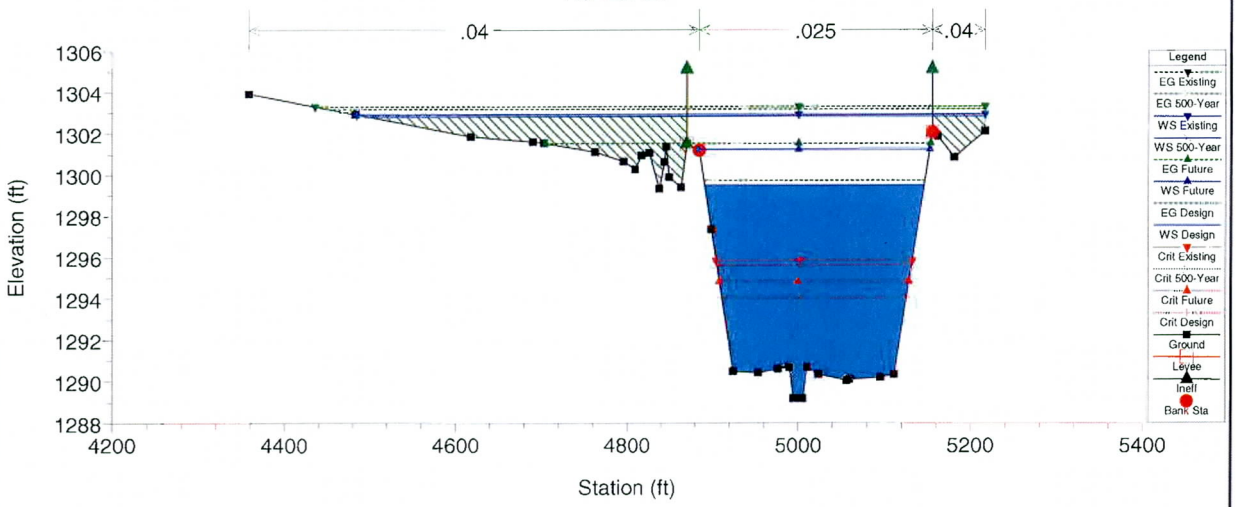
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.518



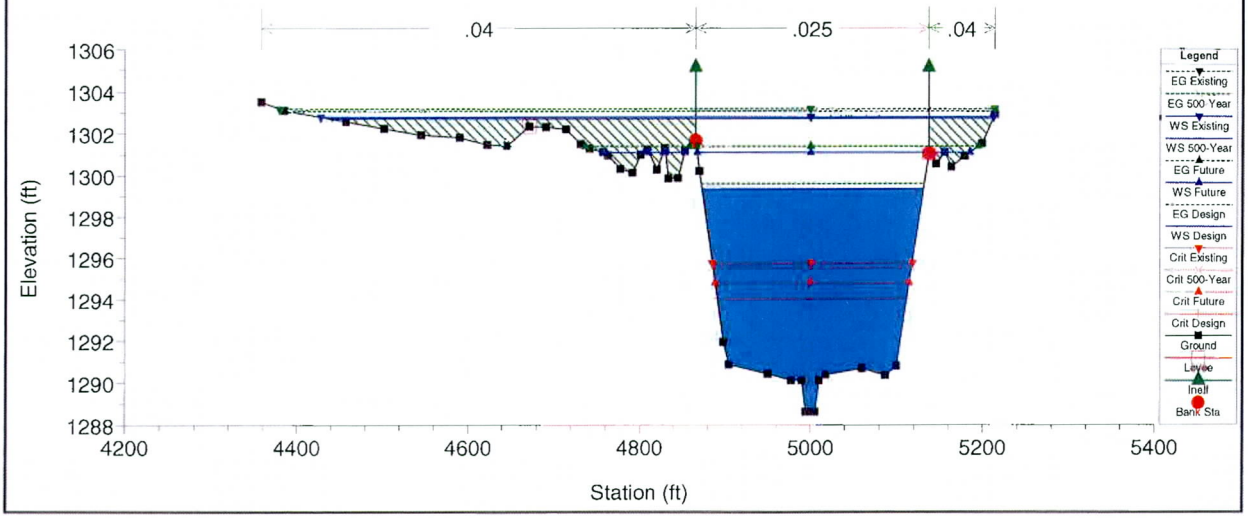
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.424



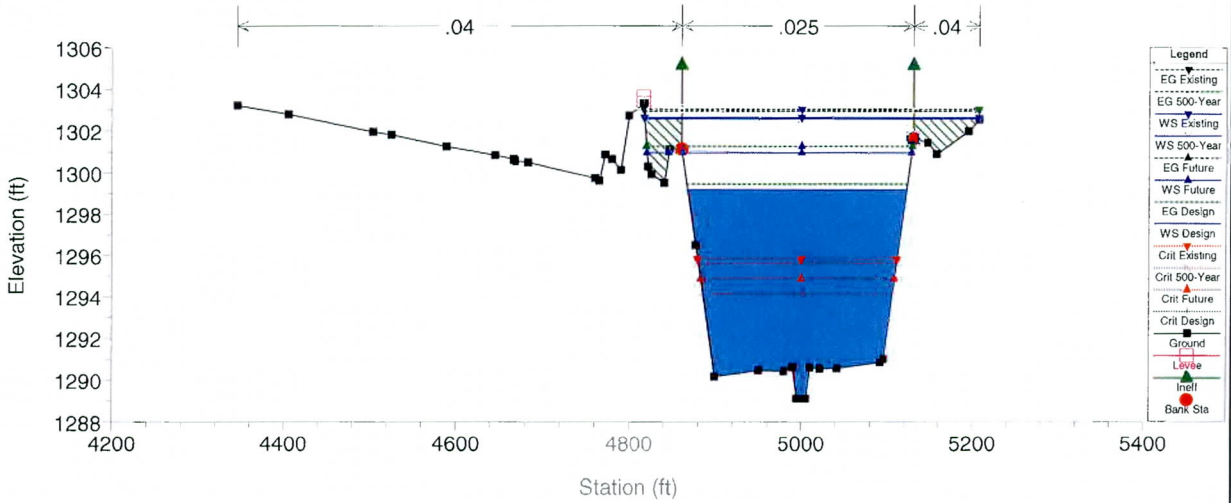
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.334



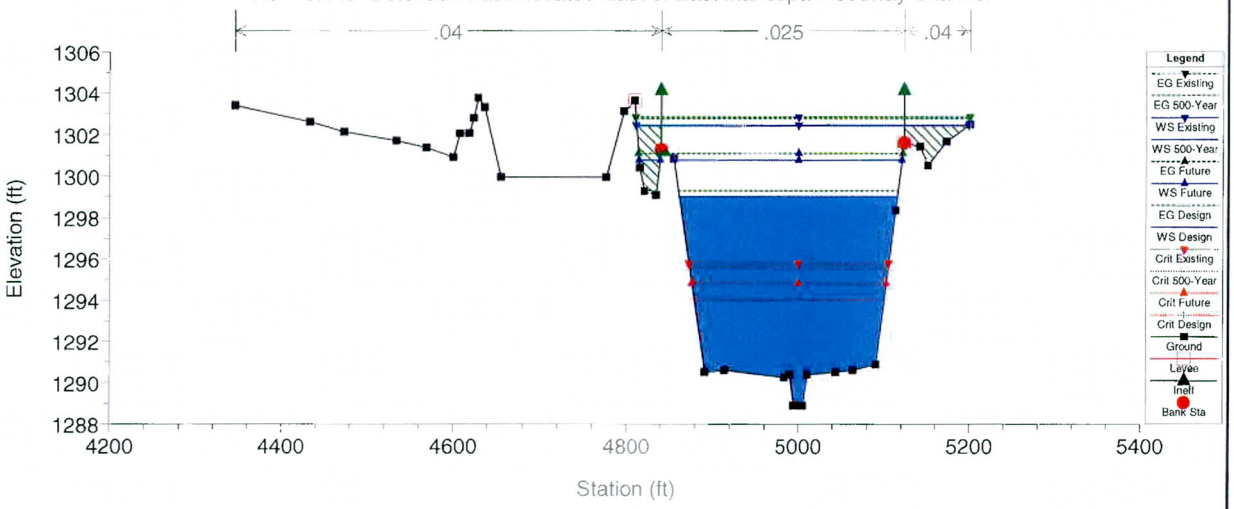
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.24



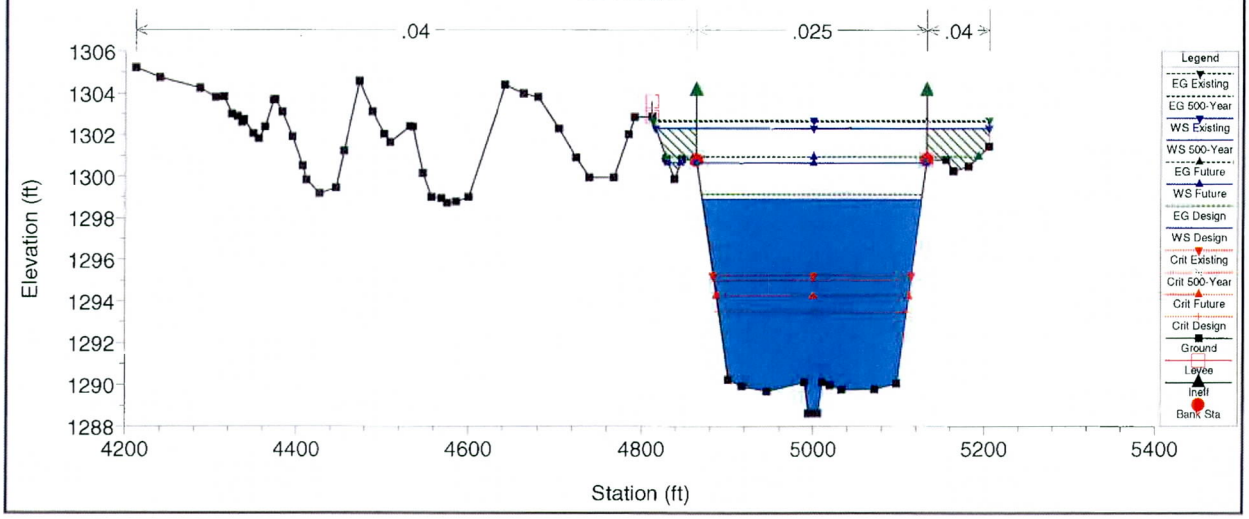
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.145 Detention Basin located East of East Maricopa Floodway Channel



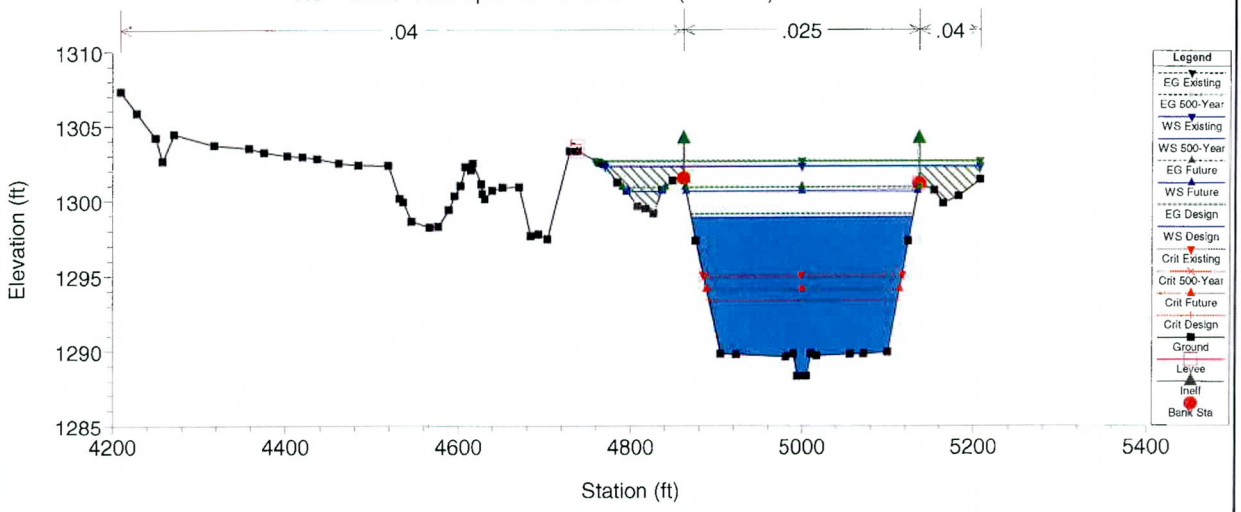
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.053



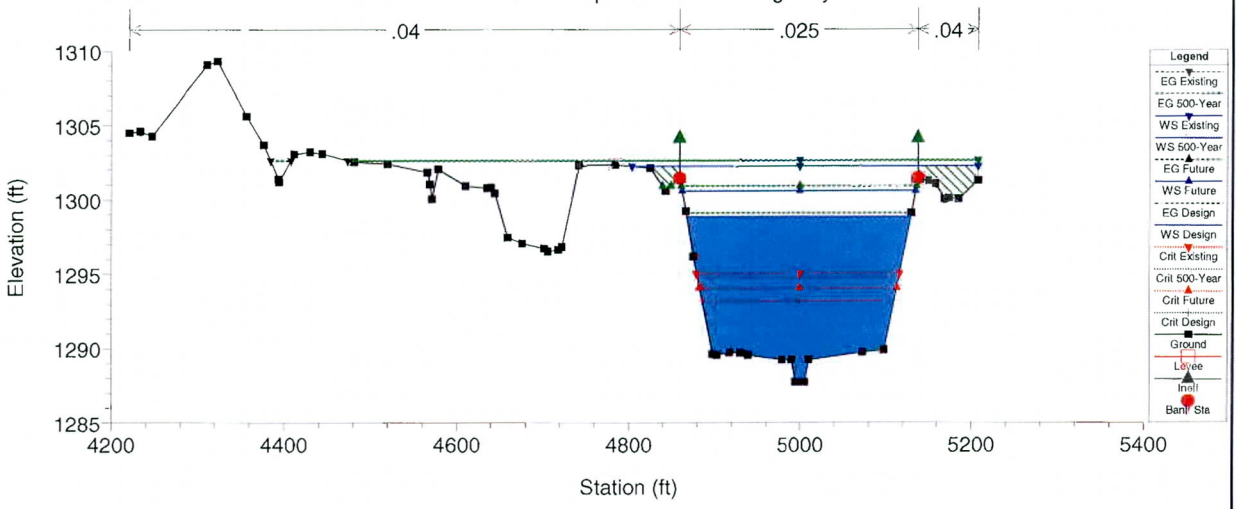
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.036 Just Upstream of Side Inlet (95' Wide) from the Left Bank



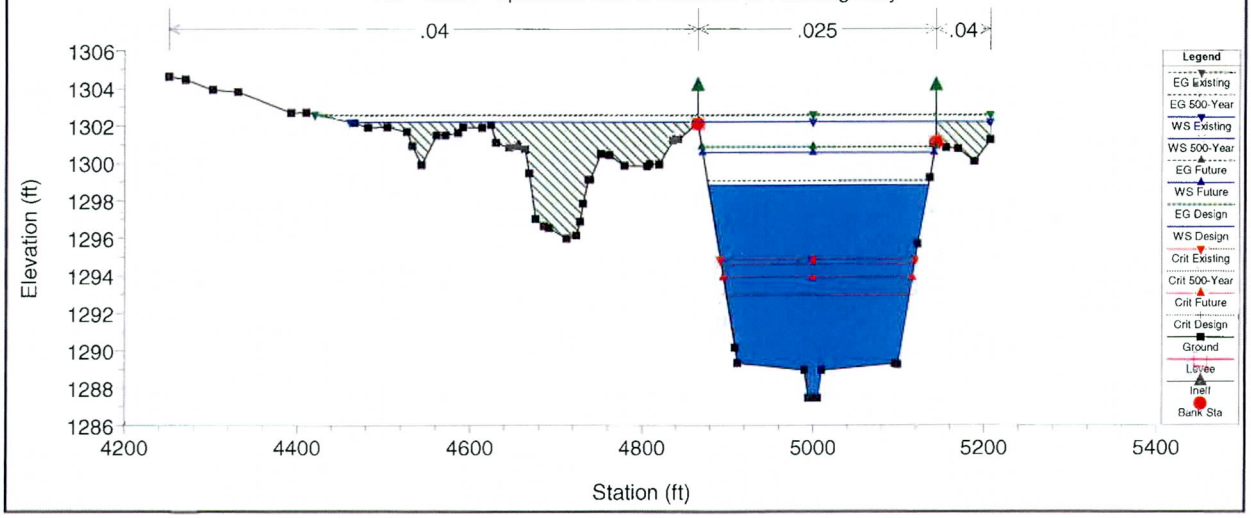
EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.018 Just Upstream of Hunt Highway



EMF Reach 3 and Lower Reach 4_Post-Cond Plan: EMF Reach 3 and Lower Reach 4_Post-Cond 6/1/2010

RS = 9.001 Upstream End of Reach 2 at Hunt Highway



Scour Calculations

Project:	Queen Creek Rd. Bridge Scour	Project No.:	AZE0825
Computed By:	M.Martinez	Date:	8/10/2009
Checked By:	T. Bokich	Date:	8/10/2009
Sheet Name:	100-Year Total Scour	Sheet:	1 of 2

INDIVIDUAL SCOUR COMPONENTS

REFERENCE

$FS(Z_{long\text{-}term})$

FS =	1.3	
$Z_{long\text{-}term}$ =	0.0	
$FS(Z_{long\text{-}term})$ =	0.0	

$FS(Z_{general})$

FS =	1.3		
$Z_{general}$ =	$z*0.47*(Q/f)^{1/3}$		Computing Degradation and Local Scour, BOR, Lacey Equation
z =	0.25	(For Straight Reaches)	
Q =	6,900	cfs	
D_{50} =	0.13	mm	Geotech Report, Ninyo & Moore, 6/18/09 (revised 7/23/09)
D_m =	$1.25*D_{50}$		
D_m =	0.16	mm	
f =	$1.76*(D_m)^{1/2}$		
f =	0.71		
$Z_{general}$ =	2.5	ft	
$FS(Z_{general})$ =	3.3	ft	

$FS(Z_{low\text{-}flow})$

FS =	1.0		
$Z_{low\text{-}flow}$ =	3.0	ft	Project Topo
$FS(Z_{low\text{-}flow})$ =	3.0	ft	

*Note: The low-flow is a designed low-flow channel.

$FS(Z_{bend})$

FS =	1.3		
Z_{bend} =	0.0		No Bends near the bridge
$FS(Z_{bend})$ =	0.0		

$FS(Z_{bedform})$

FS =	1.3		
$Z_{bedform}$ =	$0.5*d_h$		
Froude Number =	0.24		HEC-RAS, Cross Sect. 13.442
Dune or Antidune Equation:	Dune		
Dune Height, d_h =	$0.066*y^{1.21}$		Simons and Senturk
Flow Depth, y =	7.36	ft	HEC-RAS, Cross Sect. 13.442
d_h =	0.7	ft	
$Z_{bedform}$ =	0.4	ft	
$FS(Z_{bedform})$ =	0.5	ft	

REFERENCE

$FS(Z_{local})$

FS =	1.0		
Z_{local} =	y_s/y_1		
y_s/y_1 =	$2.0*(K_1*K_2*K_3*K_4)*(a/y_1)^{0.65} * (Fr_1)^{0.43}$		HEC-18, Eq 21
Flow depth directly upstream of the pier, y_1 =	9.82	ft	HEC-RAS, Cross Sect. 13.431
y_1 =	2.99	m	
Correction factor for pier nose shape, K_1 =	1.0	(Round)	HEC-18, Fig. 7, Table 2
Correction factor for angle of attack of flow, K_2 =	1.0	(Θ = 0)	HEC-18, Table 3, Eq. 23
Correction factor for bed condition, K_3 =	1.1	(Clear Water Scour)	
Correction factor for armoring by bed material, K_4 =	1.0	(Most Conservative)	
a =	Pier Width + Debris		
Pier Width =	4.0	ft	
Debris =	4.0	ft	
a =	2.44	m	
Froude Number, Fr_1 =	0.27		HEC-RAS, Cross Sect. 13.431
Pier Conrtraction Scour Depth, y_s =	3.28	m	
y_s =	10.8	ft	
$FS(Z_{local})$ =	10.8	ft	

TOTAL SCOUR

Outside Pier scour zone of influence

$Z_{t_Outside} = FS(Z_{long\text{-}term} + Z_{general} + Z_{low\text{-}flow} + Z_{bend} + Z_{bedform})$

Drainage Design Manual, Hydraulics, FCDMC

$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	3.3	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{bedform})$ =	0.5	ft
$FS(Z_{low\text{-}flow})$ =	3.0	ft
Zt Outside =	**6.8**	ft

Inside Pier zone of influence

$Z_{t_Inside} = FS(Z_{long\text{-}term} + Z_{general} + Z_{low\text{-}flow} + Z_{bend} + Z_{local})$

Drainage Design Manual, Hydraulics, FCDMC

$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	3.3	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{low\text{-}flow})$ =	3.0	ft
$FS(Z_{local})$ =	10.8	ft
Zt Inside =	**17.1**	ft

Scour Elevations

Project Topo

Bed Elevation =	1301.8	ft
$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	-3.3	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{bedform})$ =	-0.5	ft
$FS(Z_{low\text{-}flow})$ =	-3.0	ft
Zt Outside Scour Elevation =	**1295.0**	ft

Project Topo

Bed Elevation =	1301.8	ft
$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	-3.3	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{low\text{-}flow})$ =	-3.0	ft
$FS(Z_{local})$ =	-10.8	ft
Zt Inside Scour Elevation =	**1284.7**	ft

Project:	Queen Creek Rd. Bridge Scour	Project No.:	AZE0825
Computed By:	M.Martinez	Date:	8/10/2009
Checked By:	T. Bokich	Date:	8/10/2009
Sheet Name:	500-Year Total Scour	Sheet:	1 of 2

INDIVIDUAL SCOUR COMPONENTS

REFERENCE

$FS(Z_{long\text{-}term})$

FS =	1.3	
$Z_{long\text{-}term}$ =	0.0	
$FS(Z_{long\text{-}term})$ =	0.0	

$FS(Z_{general})$

FS =	1.3		
$Z_{general}$ =	$z*0.47*(Q/f)^{1/3}$		Computing Degradation and Local Scour, BOR, Lacey Equation
z =	0.25	(For Straight Reaches)	
Q =	11,730	cfs	
D_{50} =	0.13	mm	Geotech Report, Ninyo & Moore, 6/18/09 (revised 7/23/09)
D_m =	$1.25*D_{50}$		
D_m =	0.16	mm	
f =	$1.76*(D_m)^{1/2}$		
f =	0.71		
$Z_{general}$ =	3.0	ft	
$FS(Z_{general})$ =	3.9	ft	

$FS(Z_{low\text{-}flow})$

FS =	1.0		
$Z_{low\text{-}flow}$ =	3.0	ft	Project Topo
$FS(Z_{low\text{-}flow})$ =	3.0	ft	

*Note: The low-flow is a designed low-flow channel.

$FS(Z_{bend})$

FS =	1.3		
Z_{bend} =	0.0		No Bends near the bridge
$FS(Z_{bend})$ =	0.0		

$FS(Z_{bedform})$

FS =	1.3		
$Z_{bedform}$ =	$0.5*d_h$		
Froude Number =	0.26		HEC-RAS, Cross Sect. 13.442
Dune or Antidune Equation:	Dune		
Dune Height, d_h =	$0.066*y^{1.21}$		Simons and Senturk
Flow Depth, y =	9.54	ft	HEC-RAS, Cross Sect. 13.442
d_h =	1.0	ft	
$Z_{bedform}$ =	0.5	ft	
$FS(Z_{bedform})$ =	0.7	ft	

			REFERENCE
$FS(Z_{local})$			
FS =	1.0		
Z_{local} =	y_s/y_1		
y_s/y_1 =	$2.0*(K_1*K_2*K_3*K_4)*(a/y_1)^{0.65} * (Fr_1)^{0.43}$		HEC-18, Eq 21
Flow depth directly upstream of the pier, y_1 =	12.52	ft	HEC-RAS, Cross Sect. 13.431
y_1 =	3.82	m	
Correction factor for pier nose shape, K_1 =	1.0	(Round)	HEC-18, Fig. 7, Table 2
Correction factor for angle of attack of flow, K_2 =	1.0	(θ = 0)	HEC-18, Table 3, Eq. 23
Correction factor for bed condition, K_3 =	1.1	(Clear Water Scour)	
Correction factor for armoring by bed material, K_4 =	1.0	(Most Conservative)	
a =	Pier Width + Debris		
Pier Width =	4.0	ft	
Debris =	4.0	ft	
a =	2.44	m	
Froude Number, Fr_1 =	0.29		HEC-RAS, Cross Sect. 13.431
Pier Conrtraction Scour Depth, y_s =	3.69	m	
y_s =	12.1	ft	
$FS(Z_{local})$ =	12.1	ft	

TOTAL SCOUR

Outside Pier scour zone of influence

$Z_{t_Outside} = FS(Z_{long\text{-}term} + Z_{general} + Z_{low\text{-}flow} + Z_{bend} + Z_{bedform})$ — Drainage Design Manual, Hydraulics, FCDMC

$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	3.9	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{bedform})$ =	0.7	ft
$FS(Z_{low\text{-}flow})$ =	3.0	ft
Zt Outside =	**7.5**	ft

Inside Pier zone of influence

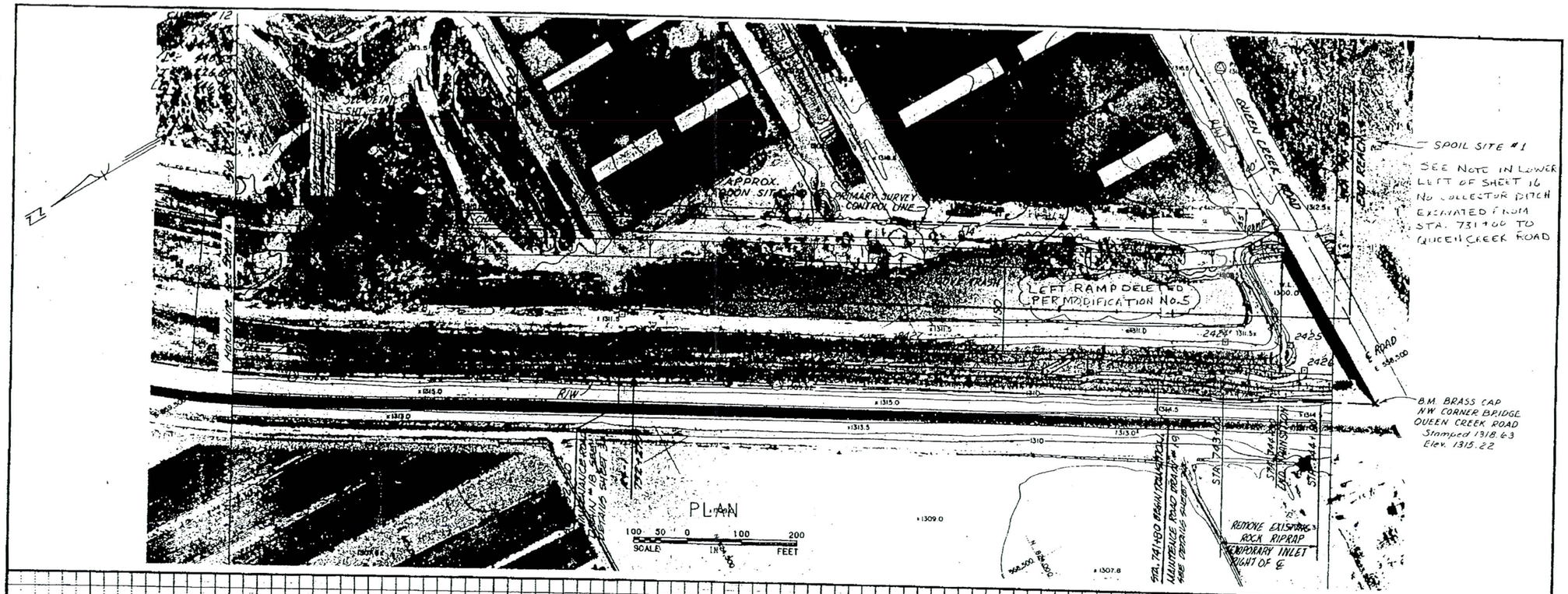
$Z_{t_Inside} = FS(Z_{long\text{-}term} + Z_{general} + Z_{low\text{-}flow} + Z_{bend} + Z_{local})$ — Drainage Design Manual, Hydraulics, FCDMC

$FS(Z_{long\text{-}term})$ =	0.0	ft
$FS(Z_{general})$ =	3.9	ft
$FS(Z_{bend})$ =	0.0	ft
$FS(Z_{low\text{-}flow})$ =	3.0	ft
$FS(Z_{local})$ =	12.1	ft
Zt Inside =	**19.0**	ft

Scour Elevations

Bed Elevation =	1301.8	ft	Project Topo
$FS(Z_{long\text{-}term})$ =	0.0	ft	
$FS(Z_{general})$ =	-3.9	ft	
$FS(Z_{bend})$ =	0.0	ft	
$FS(Z_{bedform})$ =	-0.7	ft	
$FS(Z_{low\text{-}flow})$ =	-3.0	ft	
Zt Outside Scour Elevation =	**1294.3**	ft	

Bed Elevation =	1301.8	ft	Project Topo
$FS(Z_{long\text{-}term})$ =	0.0	ft	
$FS(Z_{general})$ =	-3.9	ft	
$FS(Z_{bend})$ =	0.0	ft	
$FS(Z_{low\text{-}flow})$ =	-3.0	ft	
$FS(Z_{local})$ =	-12.1	ft	
Zt Inside Scour Elevation =	**1282.8**	ft	


SPOIL SITE #1
SEE NOTE IN LOWER LEFT OF SHEET 16
NO COLLECTOR DITCH EXTENDED FROM STA. 731+00 TO QUEEN CREEK ROAD
B.M. BRASS CAP
N.W. CORNER BRIDGE
QUEEN CREEK ROAD
Stamped 1318.63
Elev. 1315.22
APPROX. BOOM SITE
PRIMARY SURVEY CONTROL LINE
LEFT RAMP DELETED PER MODIFICATION No. 5
QUEEN CREEK ROAD
R/W
PLAN
SCALE 1"=100'
FEET
REMOVE EXISTING ROCK RIPRAP
TEMPORARY INLET
RIGHT OF ℄
STA. 741+80 BEGIN TRANSITION
MAINTENANCE ROAD DETAIL
SEE DETAILS SHEET 16
STA. 743+00
STA. 744+00 END TRANSITION
STA. 744+66
END REACH 4
STA 725+00
STA 730+00
STA 735+00
STA 740+00
STA 745+00
MATCH SHT. 14
STA. 726+58 E. SIDE WEIRS PROJECTED TO ℄
SEE DETAIL SHT. 32
STA. 725+00 EL. 1301.20 Top of Berm Elev. ℄ Rt.
EL. 1301.11
EL. 1300.70
STA. 727+00
EL. 1300.7
STA. 727+00 EL. 1311.
STA. 731+00 EL. 1314.1
STA. 731+00 EL. 1314.
TYPICAL BERM LEFT
ELEVATION
S=0.0006
FLOODWAY INVERT
STA. 740+00 EL. 1310.16
TOP OF BERM OVER
EXISTING GROUND @ ℄
STA. 741+00 EL. 1311.5
S=0.00003
STA. 742+00 EL. 1313.63 Change in Slope
STA. 744+00 EL. 1313.90 TOP OF BERM LT.
STA. 744+00 EL. 1310.12 Top of Berm RT.
STA. 745+28.17 END REACH 4
EL. 1299.58
COMPACTED EARTH LINING
BOTTOM & SIDES
SEE TYPICAL SECTION SHTS. 16 & 17
PROFILE
AS-BUILT
STA. 725+00 TO 745+00
RWCD FLOODWAY - REACH 4
WILLIAMS-CHANDLER WPP
MARICOPA & PINAL COUNTIES, ARIZONA
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Designed DAVE THACKERAY 3-85
Drawn M. Phillips 3/85
Checked L.M.S.
Approved by
Title
Sheet No. 15 of 36
Drawing No. AZ-85010-CH

13.471 (End of Reach 3) (Beginning of Reach 4)

MATCHLINE SEE SHEET 24 OF 50

EAST MARICOPA FLOODWAY

M13.5

QUEEN CREEK RD.

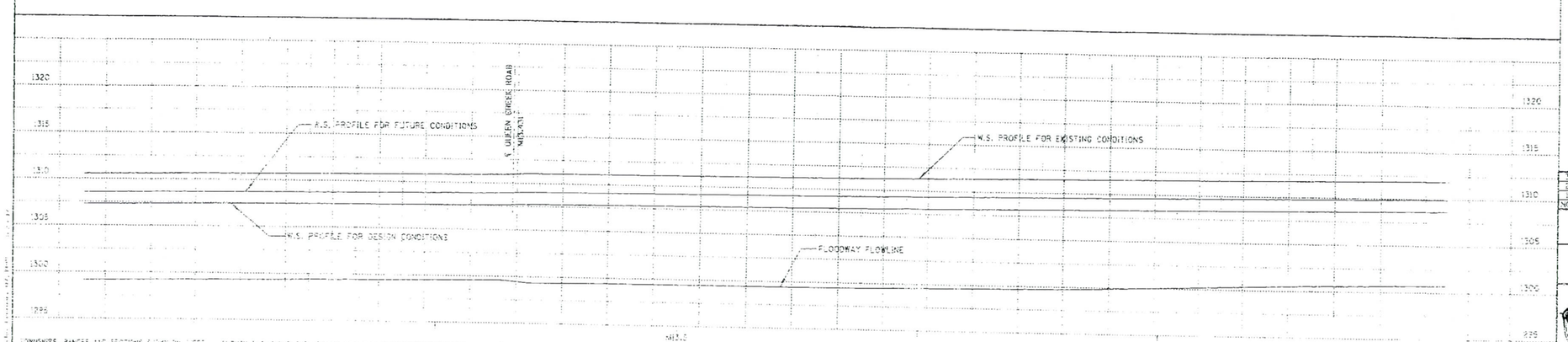
MATCHLINE SEE SHEET 26 OF 50

QD= 6900 CFS, ED=1307.34 W.S. ELEV. 13.280
QF= 9070 CFS, EF=1309.63 W.S. ELEV.
QE=12930 CFS, EE=1310.55 W.S. ELEV.

13.439 QD= 6900 CFS, ED=1307.73 W.S. ELEV.
QF= 8970 CFS, EF=1309.05 W.S. ELEV.
QE=12910 CFS, EE=1311.03 W.S. ELEV.

13.471 QD= 6900 CFS, ED=1307.77 W.S. ELEV.
QF= 8970 CFS, EF=1309.08 W.S. ELEV.
QE=12910 CFS, EE=1311.06 W.S. ELEV.

13.566 QD= 6900 CFS, ED=1307.93 W.S. ELEV.
QF= 8690 CFS, EF=1309.23 W.S. ELEV.
QE=12630 CFS, EE=1311.19 W.S. ELEV.



TOWNSHIPS, RANGES AND SECTIONS SHOWN ON THIS MAP WERE LOCATED BY APPROXIMATE METHODS AND ARE FOR REFERENCE PURPOSES ONLY.

SURVEY DATUM WAS THE ARIZONA STATE PLAN COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983. THE VERTICAL DATUM WAS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

PHOTOGRAPHY BY: AERIAL MAPPING COMPANY, INC.
SURVEY BY: PROJECT ENGINEERING CONSULTANTS, LTD.
FLIGHT DATES: OCTOBER 1997 TO NOVEMBER 20, 1997.

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS. (1:100 HORIZONTAL SCALE AND 2' CONTOUR INTERVAL) AND BASED ON FIELD CONTROL PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD.

ELEVATION REFERENCE MARKS

ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929

ID NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
933	1315.525	FCD AND ARIZONA HIGHWAY DEPARTMENT BRASS CAP FLUSH W/CONCRETE @ NORTHWEST CORNER OF QUEEN CREEK ROAD BRIDGE OVER THE EAST MARICOPA FLOODWAY (TEMPORARY ELEV. 1318.63')

SHEET NOTES:

1. CROSS SECTION STATION 0.000 IS HYDRAULIC BASE LINE EXCEPT AS NOTED.
2. 100-YEAR DISCHARGE VALUES USED FOR THE DESIGN, FUTURE AND EXISTING CONDITIONS WERE PROVIDED BY FCDMC DATED JUNE 12, 1998.
3. WATER SURFACE PROFILES SHOWN WERE THE WATER SURFACE ELEVATIONS CALCULATED ASSUMING ALMOST ALL OF FLOWS CONTAINED INSIDE THE CHANNEL.

LEGEND

- FENCE
- CONTOUR
- × 1206.3 SPOT ELEVATION
- BUILDING
- AERIAL SURVEY CONTROL PANEL
- ELEVATION REFERENCE MARK
- APPROXIMATE SECTION LINE INTERSECTION
- APPROXIMATE SECTION LINE
- MO.1 — MO.2 HYDRAULIC BASELINE WITH RIVER MILE
- THALWEG / EDGE OF WATER

100 YEAR FLOODPLAIN BOUNDARIES FOR:

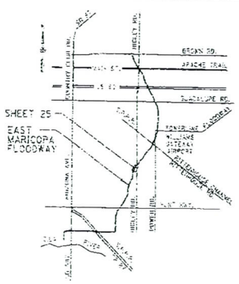
- DISCHARGES UNDER DESIGN CONDITIONS
- DISCHARGES UNDER FUTURE CONDITIONS
- DISCHARGES UNDER EXISTING CONDITIONS

CROSS SECTIONS:

0.004 QD=XXX CFS, ED = 100 YR. W.S. ELEV.
QF=XXX CFS, EF = 100 YR. W.S. ELEV.
QE=XXX CFS, EE = 100 YR. W.S. ELEV.

CROSS SECTION 0.004 (IN MILES) WITH 100-YEAR DISCHARGES FOR DESIGN, FUTURE AND EXISTING CONDITIONS WITH CORRESPONDING WATER SURFACE ELEVATIONS IN FEET

KEYMAP



NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

EAST MARICOPA FLOODWAY CAPACITY ASSESSMENT FCD 97-06

STAMP	BY	DATE
DESIGNED	R. CARRANZA	7/99
DRAWN	M. PRICE	7/99
CHECKED	B. SUN	7/99

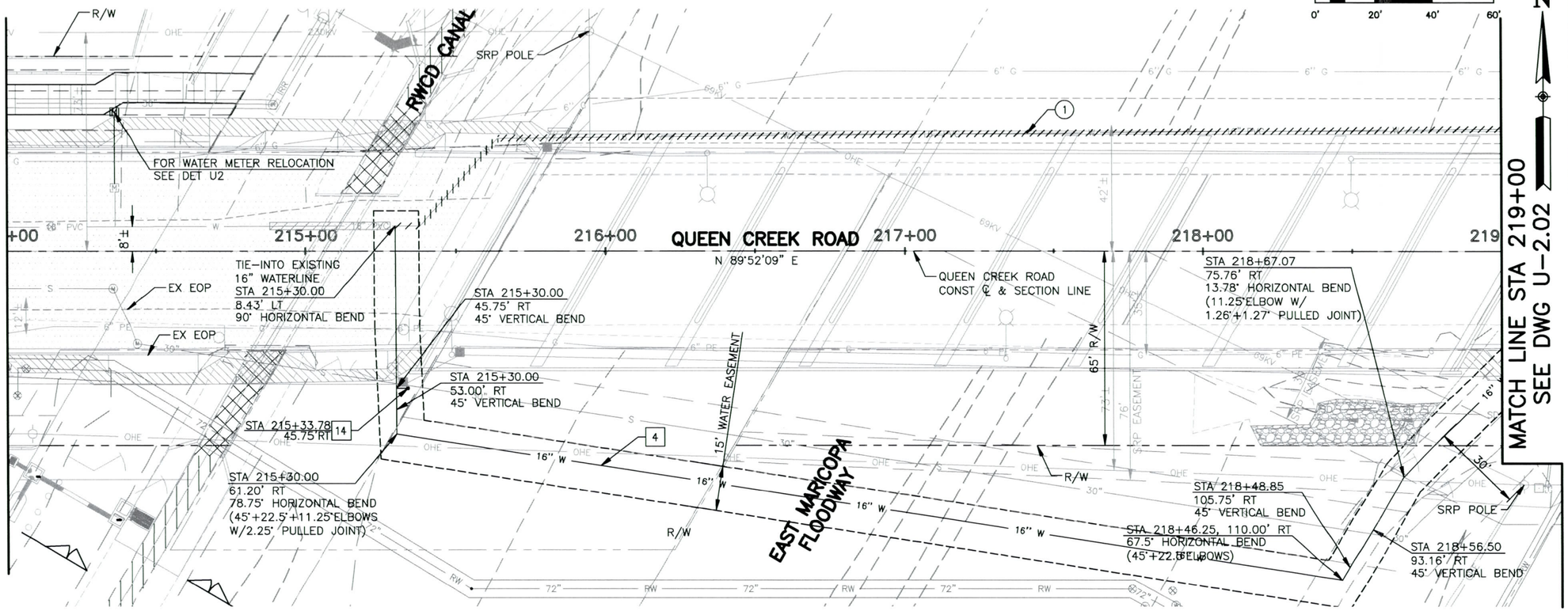
HNTB

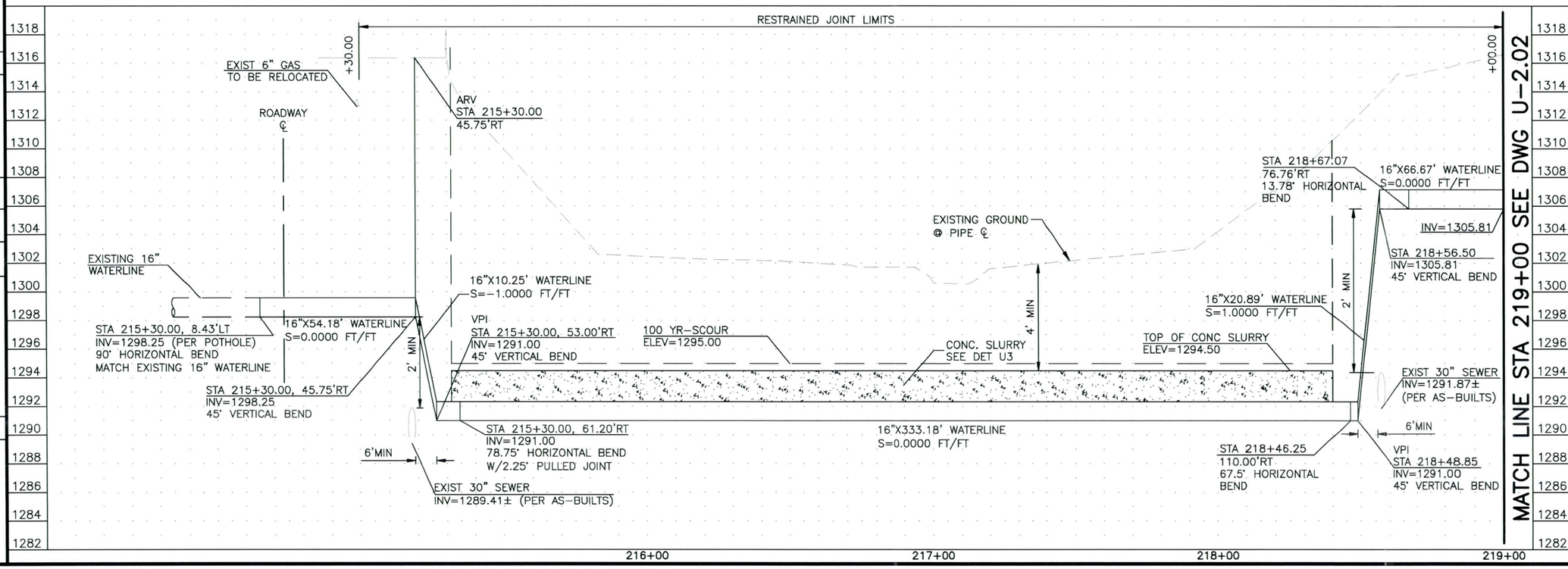
WORK STUDY PLAN & PROFILE
REACH 3 AND REACH 4

SHEET NO. 25 OF 50

F.H.W.A. REGION	STATE	PROJ. NO.	NO.	TOTAL	AS BUILT
9	ARIZ	ST081			

AZTEC





CONSTRUCTION NOTES

NO	DESCRIPTION	UNIT	QTY
4	16" POLYWRAPPED DIP WATERLINE W/ FITTINGS TRENCH BEDDING PER DET U3	LF	486
14	2" AIR/VACUUM RELEASE ASSEMBLY PER DET U6	EA	1

REMOVAL/RELOCATION NOTES

NO	DESCRIPTION	UNIT	QTY
1	REMOVE EXISTING 16" WATERLINE	LF	383

NOTE:

1) CLEARANCE AND SPECIAL PROTECTION OF PROPOSED WATERLINE AND EXISTING SEWER LINE & RECLAIMED WATERLINE SHALL MEET MAG SPECIFICATION 610.5.5.

2) TRENCH BACKFILL IN TRANSVERSE CONDITION FOR THE NEW WATERLINE UNDER PAVEMENT REQUIRES FULL DEPTH ABC SLURRY PER TOG DET 45.

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 38007 ROBERT E. LYONS Date Signed ARIZONA, U.S.A.
Expires 9/30/2011

CALL TWO WORKING DAYS BEFORE YOU BEGIN WORK FOR THE LOCATION OF UNDERGROUND FACILITIES
602-263-1100
1-800-STAKE-IT
MARICOPA COUNTY

QUEEN CREEK RD 16" WATER LINE

GILBERT ARIZONA

QUEEN CREEK ROAD IMPROVEMENTS

STA 214+00 TO 219+00
ST081-PHASE 2

DR: SAW DATE:06/10	DES: JK DATE:06/10	CK: REL DATE:06/10	DWG. NO. U-2.01
SCALE: 1"=20' HORIZONTAL 1"=2' VERTICAL			62 OF 106

NO.	DESCRIPTION	REV BY	CKD BY	DATE

REVISION BY TOWN OF GILBERT

NO.	DESCRIPTION	REV BY	CKD BY	DATE

REVISION BY TOWN OF GILBERT

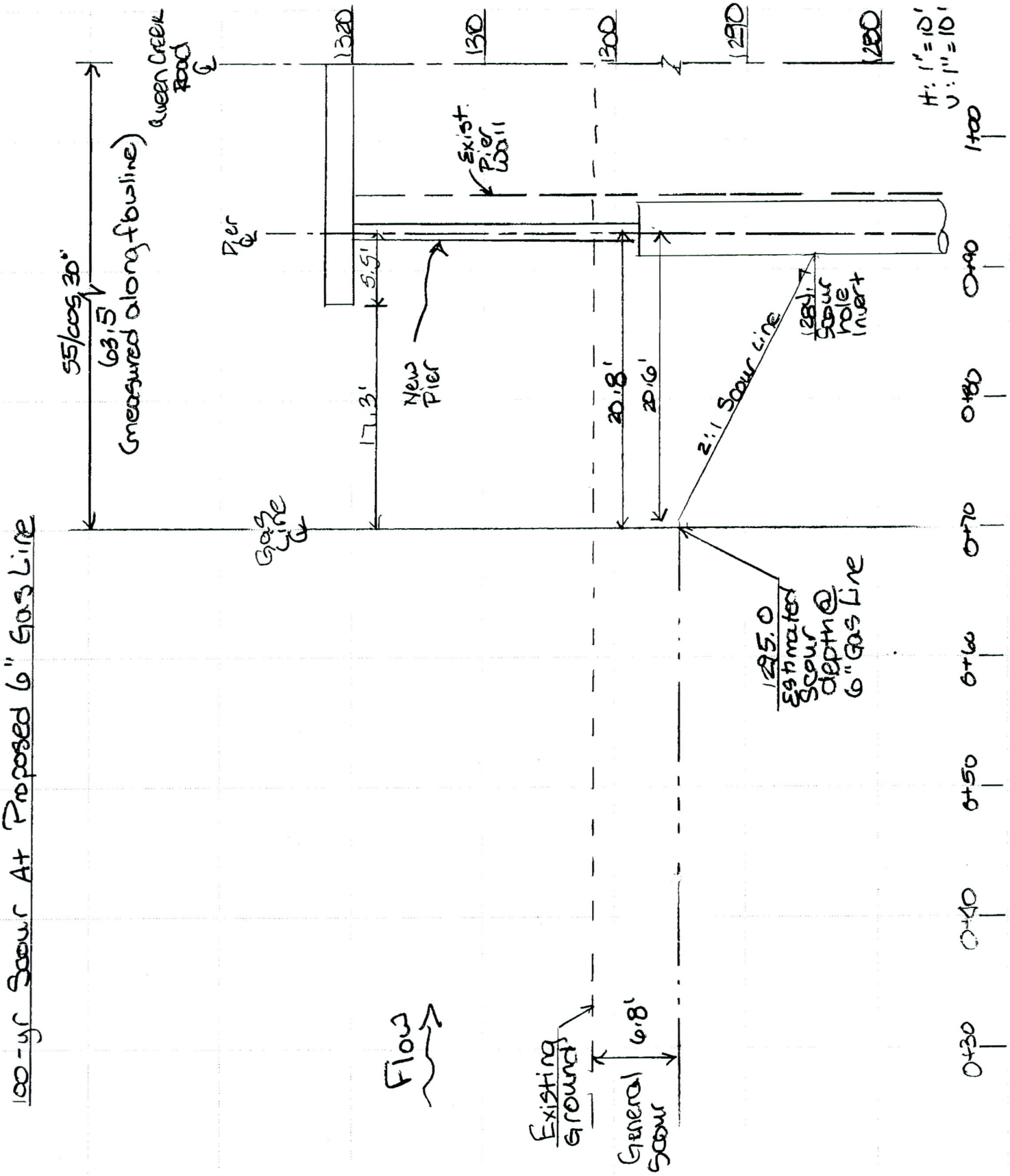
NO.	DESCRIPTION	REV BY	CKD BY	DATE

REVISION BY TOWN OF GILBERT

AZTEC ENGINEERING

4561 E. McDowell Road
Phoenix, AZ 85008-4505
Phone (602) 454-0402
Fax (602) 454-0403

Project: Queen Creek Road — Project No: A2E0825
Computed by: SAS — Date: 6/2/10
Checked by: MHM — Date: 6/2/10
Sheet Name: Emf Scour @ 6" Gas — Sheet: 1 — Of: ____



Appendix B:

On-Site Drainage

Hydrology

AZTEC
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Precipitation
NOAA ATLAS 14

Project:	Queen Creek Road: Val Vista to EMF	By:	Michael H. Martinez
	Town of Gilbert	Date:	2/23/2009
	T.O.G. Project #: ST081	Checked By:	
	AZTEC Project #: AZE0825	Date:	

RAINFALL DEPTH-DURATION-FREQUENCY
SITE SPECIFIC D-D-F TABLE

Frequency (N-year)	Rainfall Depth (inches) Duration									
	5-min	10-min	15-min	30-min	1-hour	2-hour	3-hour	6-hour	12-hour	24-hour
2	0.25	0.38	0.46	0.62	0.77	0.88	0.93	1.10	1.25	1.49
5	0.33	0.51	0.63	0.85	1.05	1.18	1.23	1.41	1.58	1.92
10	0.40	0.61	0.76	1.02	1.26	1.41	1.46	1.66	1.84	2.26
25	0.49	0.75	0.93	1.25	1.55	1.71	1.78	1.99	2.19	2.73
50	0.56	0.85	1.06	1.43	1.77	1.95	2.04	2.25	2.46	3.00
100	0.63	0.96	1.20	1.61	1.99	2.20	2.30	2.53	2.74	3.49
500	0.81	1.23	1.52	2.05	2.53	2.78	2.97	3.20	3.39	4.45

* Override 50-year, 24-hour depth of 3.10 inches (NOAA Atlas 14 Value) with 3.00 inches (Town of Gilbert Standard Depth).

RAINFALL INTENSITY-DURATION-FREQUENCY
SITE SPECIFIC I-D-F TABLE

Frequency (N-year)	Rainfall Intensity (inches/hour) Duration									
	5-min	10-min	15-min	30-min	1-hour	2-hour	3-hour	6-hour	12-hour	24-hour
2	3.00	2.28	1.84	1.24	0.77	0.44	0.31	0.18	0.10	0.06
5	3.96	3.06	2.52	1.70	1.05	0.59	0.41	0.24	0.13	0.08
10	4.80	3.66	3.04	2.04	1.26	0.71	0.49	0.28	0.15	0.09
25	5.88	4.50	3.72	2.50	1.55	0.86	0.59	0.33	0.18	0.11
50	6.72	5.10	4.24	2.86	1.77	0.98	0.68	0.38	0.21	0.13
100	7.56	5.76	4.80	3.22	1.99	1.10	0.77	0.42	0.23	0.15
500	9.72	7.38	6.08	4.10	2.53	1.39	0.99	0.53	0.28	0.19

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 02b

Concentration Pt. 1: Culvert at STA 212+86.50

Watershed Type	m	b	A
A	-0.00625	0.04	0.08

Length of Longest Flowpath =	125	feet
	0.02	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1308.54	feet
Slope of Longest Flowpath =	193.04	ft/mi
Kb =	0.0469	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	2.3	
15	3.04	2.7	
10	3.66	2.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	2.0	
15	4.24	2.4	
10	5.10	2.3	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	1.9	
15	4.80	2.3	
10	5.76	2.2	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.58	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.08	acres
10-Year Storm Event =	**0.2**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.70	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.08	acres
50-Year Storm Event =	**0.3**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.73	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.08	acres
100-Year Storm Event=	**0.3**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, and 03b

Concentration Pt. 2: Culvert at STA 210+65.10

Watershed Type	m	b	A
A	-0.00625	0.04	0.21

Length of Longest Flowpath =	355	feet
	0.07	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1307.25	feet
Slope of Longest Flowpath =	87.16	ft/mi
Kb =	0.0442	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	4.8	
15	3.04	5.8	
10	3.66	5.4	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.3	
15	4.24	5.1	
10	5.10	4.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.1	
15	4.80	4.8	
10	5.76	4.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.58	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.21	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

10-Year Storm Event = **0.4** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.70	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.21	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

50-Year Storm Event = **0.7** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.73	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.00	acres
A (Desert Landscape) =	0.21	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

100-Year Storm Event= **0.9** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

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Drainage Area 02b, 03a, 03b, and 03c

Concentration Pt. 3: Culvert at STA 208+63.00

Watershed Type	m	b	A
A	-0.00625	0.04	0.72

Length of Longest Flowpath =	555	feet
	0.11	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1306.10	feet
Slope of Longest Flowpath =	66.69	ft/mi
Kb =	0.0409	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.68	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.31	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.72	acres

10-Year Storm Event = **1.8** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.3	
15	3.04	7.5	
10	3.66	7.0	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.5	
15	4.24	6.6	
10	5.10	6.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.3	
15	4.80	6.3	
10	5.76	5.9	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.81	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.31	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.72	acres

50-Year Storm Event = **3.0** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.85	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.31	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.72	acres

100-Year Storm Event= **3.5** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, and 04b

Concentration Pt. 4: Culvert at STA 206+70.00

Watershed Type	m	b	A
A	-0.00625	0.04	0.82

Length of Longest Flowpath =	745	feet
	0.14	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1305.70	feet
Slope of Longest Flowpath =	52.52	ft/mi
Kb =	0.0405	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	7.8	
15	3.04	9.3	
10	3.66	8.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	6.9	
15	4.24	8.2	
10	5.10	7.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	6.6	
15	4.80	7.8	
10	5.76	7.3	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.67	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.41	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.82	acres

10-Year Storm Event = **2.0** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.80	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.41	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.82	acres

50-Year Storm Event = **3.3** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.83	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.41	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.82	acres

100-Year Storm Event= **3.9** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04b, and 04c

Concentration Pt. 5: Culvert at STA 205+22.00

Watershed Type	m	b	A
A	-0.00625	0.04	0.90

Length of Longest Flowpath =	895	feet
	0.17	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1304.50	feet
Slope of Longest Flowpath =	50.79	ft/mi
Kb =	0.0403	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.6	
15	3.04	10.3	
10	3.66	9.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.6	
15	4.24	9.1	
10	5.10	8.4	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.3	
15	4.80	8.6	
10	5.76	8.1	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.66	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.49	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.90	acres
10-Year Storm Event =	**2.2**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.79	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.49	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.90	acres
50-Year Storm Event =	**3.6**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.82	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.49	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.90	acres
100-Year Storm Event=	**4.3**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

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Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, and 04d

Concentration Pt. 6: Culvert at STA 203+87.00

Watershed Type	m	b	A
A	-0.00625	0.04	1.46

Length of Longest Flowpath =	1,030	feet
	0.20	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1303.90	feet
Slope of Longest Flowpath =	47.21	ft/mi
Kb =	0.0390	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	3.53	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.56	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.46	acres
10-Year Storm Event =	**3.5**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	9.3	
15	3.04	11.1	
11	3.53	10.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	8.2	
15	4.24	9.8	
10	5.10	9.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.8	
15	4.80	9.3	
10	5.76	8.7	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.82	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.56	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.46	acres
50-Year Storm Event =	**6.1**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.56	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.46	acres
100-Year Storm Event=	**7.2**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, and 06b

Concentration Pt. 7: Culvert at STA 200+95.00

Watershed Type	m	b	A
A	-0.00625	0.04	1.61

Length of Longest Flowpath =	1,320	feet
	0.25	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1303.90	feet
Slope of Longest Flowpath =	36.84	ft/mi
Kb =	0.0387	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.68	
I =	3.53	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.71	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.61	acres
10-Year Storm Event =	**3.8**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	11.4	
15	3.04	13.5	
11	3.53	12.8	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	10.0	
15	4.24	11.9	
10	5.10	11.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	9.6	
15	4.80	11.4	
10	5.76	10.6	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.81	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.71	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.61	acres
50-Year Storm Event =	**6.7**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.85	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.90	acres
A (Desert Landscape) =	0.71	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.61	acres
100-Year Storm Event=	**7.8**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, and 07b

Concentration Pt. 8: Culvert at STA 197+95.00

Watershed Type	m	b	A
A	-0.00625	0.04	2.19

Length of Longest Flowpath =	1,620	feet
	0.31	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1303.10	feet
Slope of Longest Flowpath =	32.63	ft/mi
Kb =	0.0379	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	12.9	
15	3.04	15.4	
16	2.96	15.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	11.4	
15	4.24	13.5	
13	4.57	13.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	10.9	
15	4.80	12.9	
13	5.16	12.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.96	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.34	acres
A (Desert Landscape) =	0.85	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.19	acres
10-Year Storm Event =	**4.4**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.82	
I =	4.57	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.34	acres
A (Desert Landscape) =	0.85	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.19	acres
50-Year Storm Event =	**8.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	5.16	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.34	acres
A (Desert Landscape) =	0.85	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.19	acres
100-Year Storm Event=	**9.7**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, and 07c

Concentration Pt. 9: Culvert at STA 193+41.00

Watershed Type	m	b	A
A	-0.00625	0.04	2.85

Length of Longest Flowpath =	2,075	feet
	0.39	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1301.89	feet
Slope of Longest Flowpath =	28.55	ft/mi
Kb =	0.0372	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.73	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.79	acres
A (Desert Landscape) =	1.06	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.85	acres

10-Year Storm Event = **5.4** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	15.1	
15	3.04	17.9	
19	2.73	18.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	13.3	
15	4.24	15.8	
16	4.13	16.0	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	12.7	
15	4.80	15.1	
15	4.80	15.1	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	4.13	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.79	acres
A (Desert Landscape) =	1.06	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.85	acres

50-Year Storm Event = **9.7** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.80	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	1.79	acres
A (Desert Landscape) =	1.06	acres
A (Green Landscape) =	0.00	acres
A (Total) =	2.85	acres

100-Year Storm Event= **11.8** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

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Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, and 09b

Concentration Pt. 10: Culvert at STA 191+77.00

Watershed Type	m	b	A
A	-0.00625	0.04	3.28

Length of Longest Flowpath =	2,245	feet
	0.43	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1301.33	feet
Slope of Longest Flowpath =	27.71	ft/mi
Kb =	0.0368	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.14	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.28	acres
10-Year Storm Event =	**6.0**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	15.8	
15	3.04	18.7	
20	2.66	19.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	13.9	
15	4.24	16.5	
17	4.02	16.8	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	13.3	
15	4.80	15.8	
16	4.67	15.9	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	4.02	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.14	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.28	acres
50-Year Storm Event =	**11.0**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.87	
I =	4.67	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.14	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.28	acres
100-Year Storm Event=	**13.3**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, and 10b

Concentration Pt. 11: Culvert at STA 190+78.00

Watershed Type	m	b	A
A	-0.00625	0.04	3.33

Length of Longest Flowpath =	2,340	feet
	0.44	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1301.00	feet
Slope of Longest Flowpath =	27.33	ft/mi
Kb =	0.0367	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	16.1	
15	3.04	19.2	
20	2.66	20.2	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	14.2	
15	4.24	16.9	
17	4.02	17.3	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	13.6	
15	4.80	16.1	
16	4.67	16.3	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.19	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.33	acres
10-Year Storm Event =	**6.1**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	4.02	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.19	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.33	acres
50-Year Storm Event =	**11.1**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.67	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.19	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.33	acres
100-Year Storm Event=	**13.4**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

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Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, 10b, and 10c

Concentration Pt. 12: Culvert at STA 188+61.00

Watershed Type	m	b	A
A	-0.00625	0.04	3.44

Length of Longest Flowpath =	2,560	feet
	0.48	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1300.26	feet
Slope of Longest Flowpath =	26.50	ft/mi
Kb =	0.0366	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.52	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.30	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.44	acres
10-Year Storm Event =	**6.0**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	17.0	
15	3.04	20.3	
22	2.52	21.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	15.0	
15	4.24	17.8	
18	3.92	18.4	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	14.3	
15	4.80	17.0	
17	4.55	17.4	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.82	
I =	3.92	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.30	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.44	acres
50-Year Storm Event =	**11.1**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.55	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.14	acres
A (Desert Landscape) =	1.30	acres
A (Green Landscape) =	0.00	acres
A (Total) =	3.44	acres
100-Year Storm Event=	**13.4**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, 10a, 10b, 10c, and 10d

Concentration Pt. 13: Culvert at STA 186+08.00

Watershed Type	m	b	A
A	-0.00625	0.04	4.14

Length of Longest Flowpath =	2,810	feet
	0.53	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1299.40	feet
Slope of Longest Flowpath =	25.76	ft/mi
Kb =	0.0361	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.46	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.42	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.14	acres

10-Year Storm Event = **7.0** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	17.9	
15	3.04	21.3	
23	2.46	23.0	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	15.7	
15	4.24	18.7	
20	3.72	19.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	15.0	
15	4.80	17.9	
19	4.32	18.6	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	3.72	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.42	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.14	acres

50-Year Storm Event = **12.8** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.87	
I =	4.32	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.42	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.14	acres

100-Year Storm Event= **15.5** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, 10a, 10b, 10c, 10d, and 12b

Concentration Pt. 14: Culvert at STA 185+20.00

Watershed Type	m	b	A
A	-0.00625	0.04	4.18

Length of Longest Flowpath =	2,900	feet
	0.55	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1299.10	feet
Slope of Longest Flowpath =	25.51	ft/mi
Kb =	0.0361	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.39	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.46	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.18	acres
10-Year Storm Event =	**6.9**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	18.2	
15	3.04	21.6	
24	2.39	23.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	16.0	
15	4.24	19.1	
20	3.72	20.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	15.3	
15	4.80	18.2	
19	4.32	18.9	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	3.72	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.46	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.18	acres
50-Year Storm Event =	**12.9**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.32	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.46	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.18	acres
100-Year Storm Event=	**15.6**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, 10a, 10b, 10c, 10d, 12b, and 12c

Concentration Pt. 15: Culvert at STA 184+17.00

Watershed Type	m	b	A
A	-0.00625	0.04	4.23

Length of Longest Flowpath =	3,005	feet
	0.57	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1298.74	feet
Slope of Longest Flowpath =	25.25	ft/mi
Kb =	0.0361	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.39	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.51	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.23	acres
10-Year Storm Event =	**7.0**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	18.6	
15	3.04	22.1	
24	2.39	24.2	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	16.3	
15	4.24	19.5	
21	3.62	20.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	15.6	
15	4.80	18.6	
19	4.32	19.3	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	3.62	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.51	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.23	acres
50-Year Storm Event =	**12.7**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.32	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.51	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.23	acres
100-Year Storm Event=	**15.8**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c, 09a, 09b, 10a, 10b, 10c, 10d, 12b, 12c and 12d

Concentration Pt. 16: Culvert at STA 182+94.00

Watershed Type	m	b	A
A	-0.00625	0.04	4.29

Length of Longest Flowpath =	3,125	feet
	0.59	miles
Upper Elevation =	1313.11	feet
Lower Elevation =	1298.32	feet
Slope of Longest Flowpath =	24.99	ft/mi
Kb =	0.0360	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.69	
I =	2.33	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.29	acres
10-Year Storm Event =	**6.9**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	19.0	
15	3.04	22.6	
25	2.33	25.0	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	16.7	
15	4.24	19.9	
21	3.62	21.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	16.0	
15	4.80	19.0	
20	4.20	20.0	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.83	
I =	3.62	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.29	acres
50-Year Storm Event =	**12.8**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.86	
I =	4.20	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	2.72	acres
A (Desert Landscape) =	1.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	4.29	acres
100-Year Storm Event=	**15.5**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 01a

Watershed Type	m	b	A
A	-0.00625	0.04	0.45

Length of Longest Flowpath =	485	feet
	0.09	miles
Upper Elevation =	1317.76	feet
Lower Elevation =	1310.56	feet
Slope of Longest Flowpath =	78.38	ft/mi
Kb =	0.0422	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.45	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.45	acres

10-Year Storm Event = **1.2** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.7	
15	3.04	6.8	
10	3.66	6.3	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.0	
15	4.24	6.0	
10	5.10	5.6	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.8	
15	4.80	5.7	
10	5.76	5.3	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.45	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.45	acres

50-Year Storm Event = **2.1** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.45	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.45	acres

100-Year Storm Event= **2.4** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 02a

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	430	feet
	0.08	miles
Upper Elevation =	1317.76	feet
Lower Elevation =	1310.87	feet
Slope of Longest Flowpath =	84.60	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.2	
15	3.04	6.2	
10	3.66	5.8	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.6	
15	4.24	5.5	
10	5.10	5.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.4	
15	4.80	5.2	
10	5.76	4.9	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
10-Year Storm Event =	**1.3**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
50-Year Storm Event =	**2.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
100-Year Storm Event=	**2.6**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 03a

Watershed Type	m	b	A
A	-0.00625	0.04	0.40

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0425	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
15	3.04	7.2	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
15	4.24	6.3	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.1	
15	4.80	6.0	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.40	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.40	acres

10-Year Storm Event = **1.1** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.40	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.40	acres

50-Year Storm Event = **1.8** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.40	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.40	acres

100-Year Storm Event= **2.2** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 04a

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
15	3.04	7.1	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
15	4.24	6.3	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
15	4.80	6.0	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
10-Year Storm Event =	**1.3**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
50-Year Storm Event =	**2.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
100-Year Storm Event=	**2.6**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 05a

Watershed Type	m	b	A
A	-0.00625	0.04	0.93

Length of Longest Flowpath =	970	feet
	0.18	miles
Upper Elevation =	1308.60	feet
Lower Elevation =	1304.42	feet
Slope of Longest Flowpath =	22.75	ft/mi
Kb =	0.0402	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	11.5	
15	3.04	13.7	
14	3.15	13.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	10.1	
15	4.24	12.1	
12	4.74	11.6	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	9.7	
15	4.80	11.5	
11	5.55	10.9	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.15	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.93	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.93	acres
10-Year Storm Event =	**2.2**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	4.74	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.93	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.93	acres
50-Year Storm Event =	**4.0**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.55	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.93	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.93	acres
100-Year Storm Event=	**4.8**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 06a

Watershed Type	m	b	A
A	-0.00625	0.04	0.44

Length of Longest Flowpath =	435	feet
	0.08	miles
Upper Elevation =	1306.92	feet
Lower Elevation =	1305.45	feet
Slope of Longest Flowpath =	17.84	ft/mi
Kb =	0.0422	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
10-Year Storm Event =	**1.2**	cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.5	
11	3.53	9.6	
10	3.66	9.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.5	
11	4.92	8.5	
10	5.10	8.3	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.2	
11	5.55	8.1	
10	5.76	8.0	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
50-Year Storm Event =	**2.0**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
100-Year Storm Event=	**2.4**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 07a

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
15	3.04	7.1	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
15	4.24	6.3	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
15	4.80	6.0	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
10-Year Storm Event =	**1.3**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
50-Year Storm Event =	**2.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
100-Year Storm Event=	**2.6**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 08a

Watershed Type	m	b	A
A	-0.00625	0.04	0.18

Length of Longest Flowpath =	205	feet
	0.04	miles
Upper Elevation =	1304.67	feet
Lower Elevation =	1302.99	feet
Slope of Longest Flowpath =	43.27	ft/mi
Kb =	0.0447	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	4.6	
15	3.04	5.5	
10	3.66	5.1	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.0	
15	4.24	4.8	
10	5.10	4.5	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	3.9	
9	6.08	4.2	
10	5.76	4.3	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.18	acres

10-Year Storm Event = **0.5** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.18	acres

50-Year Storm Event = **0.8** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.18	acres

100-Year Storm Event= **1.0** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 08b

Watershed Type	m	b	A
A	-0.00625	0.04	0.26

Length of Longest Flowpath =	215	feet
	0.04	miles
Upper Elevation =	1304.67	feet
Lower Elevation =	1300.50	feet
Slope of Longest Flowpath =	102.41	ft/mi
Kb =	0.0437	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	3.6	
15	3.04	4.2	
10	3.66	3.9	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	3.1	
15	4.24	3.7	
10	5.10	3.5	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	3.0	
9	6.08	3.2	
10	5.76	3.3	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.70	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
10-Year Storm Event =	**0.7**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.84	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
50-Year Storm Event =	**1.1**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.87	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.18	acres
A (Desert Landscape) =	0.08	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
100-Year Storm Event=	**1.3**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 09a

Watershed Type	m	b	A
A	-0.00625	0.04	0.35

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0428	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.35	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.35	acres

10-Year Storm Event = **1.0** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.1	
15	3.04	7.2	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
15	4.24	6.4	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.1	
15	4.80	6.1	
10	5.76	5.7	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.35	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.35	acres

50-Year Storm Event = **1.6** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.35	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.35	acres

100-Year Storm Event= **1.9** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 10a

Watershed Type	m	b	A
A	-0.00625	0.04	0.58

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0415	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
15	3.04	7.1	
10	3.66	6.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.2	
15	4.24	6.2	
10	5.10	5.8	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
15	4.80	6.0	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.58	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.58	acres
10-Year Storm Event =	**1.6**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.58	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.58	acres
50-Year Storm Event =	**2.7**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.58	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.58	acres
100-Year Storm Event=	**3.1**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 11a

Watershed Type	m	b	A
A	-0.00625	0.04	0.61

Length of Longest Flowpath =	660	feet
	0.13	miles
Upper Elevation =	1303.89	feet
Lower Elevation =	1300.78	feet
Slope of Longest Flowpath =	24.88	ft/mi
Kb =	0.0413	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	9.4	
10	3.66	10.4	
11	3.53	10.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	8.3	
9	5.39	9.0	
10	5.10	9.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.9	
9	6.08	8.6	
10	5.76	8.8	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.53	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.61	acres
10-Year Storm Event =	**1.6**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.61	acres
50-Year Storm Event =	**2.8**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.61	acres
100-Year Storm Event=	**3.3**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 11b

Watershed Type	m	b	A
A	-0.00625	0.04	1.18

Length of Longest Flowpath =	670	feet
	0.13	miles
Upper Elevation =	1303.89	feet
Lower Elevation =	1298.50	feet
Slope of Longest Flowpath =	42.48	ft/mi
Kb =	0.0396	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	7.8	
9	3.86	8.5	
10	3.66	8.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	6.9	
9	5.39	7.5	
10	5.10	7.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	6.6	
9	6.08	7.2	
10	5.76	7.3	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.67	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.18	acres
10-Year Storm Event =	**2.9**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.80	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.18	acres
50-Year Storm Event =	**4.8**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.84	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.61	acres
A (Desert Landscape) =	0.57	acres
A (Green Landscape) =	0.00	acres
A (Total) =	1.18	acres
100-Year Storm Event=	**5.7**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 12a

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
15	3.04	7.1	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
15	4.24	6.3	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
15	4.80	6.0	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

10-Year Storm Event = **1.3** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

50-Year Storm Event = **2.2** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

100-Year Storm Event= **2.6** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 13a

Watershed Type	m	b	A
A	-0.00625	0.04	0.63

Length of Longest Flowpath =	600	feet
	0.11	miles
Upper Elevation =	1295.55	feet
Lower Elevation =	1292.43	feet
Slope of Longest Flowpath =	27.46	ft/mi
Kb =	0.0413	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.7	
9	3.86	9.4	
10	3.66	9.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.6	
9	5.39	8.3	
10	5.10	8.5	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.3	
9	6.08	7.9	
10	5.76	8.1	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.63	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.63	acres
10-Year Storm Event =	**1.7**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.63	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.63	acres
50-Year Storm Event =	**2.9**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.63	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.63	acres
100-Year Storm Event=	**3.4**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 14a

Watershed Type	m	b	A
A	-0.00625	0.04	0.50

Length of Longest Flowpath =	550	feet
	0.10	miles
Upper Elevation =	1293.32	feet
Lower Elevation =	1291.12	feet
Slope of Longest Flowpath =	21.12	ft/mi
Kb =	0.0419	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	9.1	
9	3.86	9.9	
10	3.66	10.1	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	8.0	
9	5.39	8.7	
10	5.10	8.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.6	
9	6.08	8.3	
10	5.76	8.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres
10-Year Storm Event =	**1.4**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres
50-Year Storm Event =	**2.3**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres
100-Year Storm Event=	**2.7**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 14c

Watershed Type	m	b	A
A	-0.00625	0.04	0.28

Length of Longest Flowpath =	315	feet
	0.06	miles
Upper Elevation =	1292.01	feet
Lower Elevation =	1290.35	feet
Slope of Longest Flowpath =	27.82	ft/mi
Kb =	0.0435	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.4	
9	3.86	7.0	
10	3.66	7.1	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.7	
9	5.39	6.2	
10	5.10	6.3	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.4	
9	6.08	5.9	
10	5.76	6.0	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.28	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.28	acres
10-Year Storm Event =	**0.8**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.28	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.28	acres
50-Year Storm Event =	**1.3**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.28	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.28	acres
100-Year Storm Event=	**1.5**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 15a

Watershed Type	m	b	A
A	-0.00625	0.04	0.96

Length of Longest Flowpath =	765	feet
	0.14	miles
Upper Elevation =	1297.40	feet
Lower Elevation =	1294.09	feet
Slope of Longest Flowpath =	22.85	ft/mi
Kb =	0.0401	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	10.2	
15	3.04	12.1	
12	3.40	11.6	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	9.0	
15	4.24	10.7	
10	5.10	10.0	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	8.6	
15	4.80	10.2	
10	5.76	9.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.65	
I =	3.40	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.36	acres
A (Desert Landscape) =	0.60	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.96	acres
10-Year Storm Event =	**2.1**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.78	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.36	acres
A (Desert Landscape) =	0.60	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.96	acres
50-Year Storm Event =	**3.8**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.81	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.36	acres
A (Desert Landscape) =	0.60	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.96	acres
100-Year Storm Event=	**4.5**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 15b

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	520	feet
	0.10	miles
Upper Elevation =	1295.33	feet
Lower Elevation =	1292.57	feet
Slope of Longest Flowpath =	28.02	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.1	
9	3.86	8.8	
10	3.66	9.0	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.1	
9	5.39	7.7	
10	5.10	7.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	6.8	
9	6.08	7.4	
10	5.76	7.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

10-Year Storm Event = **1.3** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

50-Year Storm Event = **2.2** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres

100-Year Storm Event= **2.6** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 15d

Watershed Type	m	b	A
A	-0.00625	0.04	0.47

Length of Longest Flowpath =	515	feet
	0.10	miles
Upper Elevation =	1293.32	feet
Lower Elevation =	1291.32	feet
Slope of Longest Flowpath =	20.50	ft/mi
Kb =	0.0420	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.47	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.47	acres

10-Year Storm Event = **1.3** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.9	
9	3.86	9.6	
10	3.66	9.8	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.8	
9	5.39	8.5	
10	5.10	8.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.5	
9	6.08	8.1	
10	5.76	8.3	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.47	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.47	acres

50-Year Storm Event = **2.2** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.47	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.47	acres

100-Year Storm Event= **2.5** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 15e

Watershed Type	m	b	A
A	-0.00625	0.04	0.31

Length of Longest Flowpath =	359	feet
	0.07	miles
Upper Elevation =	1292.10	feet
Lower Elevation =	1290.59	feet
Slope of Longest Flowpath =	22.21	ft/mi
Kb =	0.0432	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	7.3	
9	3.86	8.0	
10	3.66	8.1	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	6.5	
9	5.39	7.0	
10	5.10	7.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	6.2	
9	6.08	6.7	
10	5.76	6.8	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.31	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.31	acres

10-Year Storm Event = **0.9** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.31	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.31	acres

50-Year Storm Event = **1.4** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.31	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.31	acres

100-Year Storm Event= **1.7** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 15f

Watershed Type	m	b	A
A	-0.00625	0.04	0.17

Length of Longest Flowpath =	135	feet
	0.03	miles
Upper Elevation =	1290.77	feet
Lower Elevation =	1289.33	feet
Slope of Longest Flowpath =	56.32	ft/mi
Kb =	0.0448	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	3.4	
9	3.86	3.7	
10	3.66	3.8	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	3.0	
9	5.39	3.3	
10	5.10	3.4	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	2.9	
9	6.08	3.1	
10	5.76	3.2	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.17	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.17	acres

10-Year Storm Event = **0.5** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.17	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.17	acres

50-Year Storm Event = **0.8** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.17	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.17	acres

100-Year Storm Event= **0.9** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 16a

Watershed Type	m	b	A
A	-0.00625	0.04	0.26

Length of Longest Flowpath =	300	feet
	0.06	miles
Upper Elevation =	1291.26	feet
Lower Elevation =	1289.66	feet
Slope of Longest Flowpath =	28.16	ft/mi
Kb =	0.0437	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres

10-Year Storm Event = **0.7** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.3	
9	3.86	6.8	
10	3.66	6.9	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.5	
9	5.39	6.0	
10	5.10	6.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.3	
9	6.08	5.7	
10	5.76	5.8	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres

50-Year Storm Event = **1.2** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres

100-Year Storm Event= **1.4** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 17a

Watershed Type	m	b	A
A	-0.00625	0.04	0.42

Length of Longest Flowpath =	465	feet
	0.09	miles
Upper Elevation =	1290.48	feet
Lower Elevation =	1288.53	feet
Slope of Longest Flowpath =	22.14	ft/mi
Kb =	0.0424	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.3	
9	3.86	9.0	
10	3.66	9.2	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.3	
9	5.39	7.9	
10	5.10	8.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.0	
9	6.08	7.6	
10	5.76	7.7	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.42	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.42	acres
10-Year Storm Event =	**1.2**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.42	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.42	acres
50-Year Storm Event =	**1.9**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.42	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.42	acres
100-Year Storm Event=	**2.3**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 18a

Watershed Type	m	b	A
A	-0.00625	0.04	0.26

Length of Longest Flowpath =	280	feet
	0.05	miles
Upper Elevation =	1289.46	feet
Lower Elevation =	1287.84	feet
Slope of Longest Flowpath =	30.55	ft/mi
Kb =	0.0437	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.9	
9	3.86	6.4	
10	3.66	6.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.2	
9	5.39	5.6	
10	5.10	5.8	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
9	6.08	5.4	
10	5.76	5.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
10-Year Storm Event =	**0.7**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
50-Year Storm Event =	**1.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.26	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.26	acres
100-Year Storm Event=	**1.4**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 19a

Watershed Type	m	b	A
A	-0.00625	0.04	0.41

Length of Longest Flowpath =	455	feet
	0.09	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.22	feet
Slope of Longest Flowpath =	23.21	ft/mi
Kb =	0.0424	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.1	
9	3.86	8.8	
10	3.66	8.9	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.1	
9	5.39	7.7	
10	5.10	7.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	6.8	
9	6.08	7.4	
10	5.76	7.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.41	acres

10-Year Storm Event = **1.1** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.41	acres

50-Year Storm Event = **1.9** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.41	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.41	acres

100-Year Storm Event= **2.2** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 20a

Watershed Type	m	b	A
A	-0.00625	0.04	0.56

Length of Longest Flowpath =	610	feet
	0.12	miles
Upper Elevation =	1287.11	feet
Lower Elevation =	1283.95	feet
Slope of Longest Flowpath =	27.35	ft/mi
Kb =	0.0416	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.56	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.56	acres

10-Year Storm Event = **1.5** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.8	
9	3.86	9.5	
10	3.66	9.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.7	
9	5.39	8.4	
10	5.10	8.6	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.4	
9	6.08	8.0	
10	5.76	8.2	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.56	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.56	acres

50-Year Storm Event = **2.6** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.56	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.56	acres

100-Year Storm Event= **3.0** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 21a

Watershed Type	m	b	A
A	-0.00625	0.04	0.44

Length of Longest Flowpath =	310	feet
	0.06	miles
Upper Elevation =	1284.91	feet
Lower Elevation =	1282.87	feet
Slope of Longest Flowpath =	34.75	ft/mi
Kb =	0.0422	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.9	
9	3.86	6.4	
10	3.66	6.5	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.2	
9	5.39	5.6	
10	5.10	5.7	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.9	
9	6.08	5.4	
10	5.76	5.5	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
10-Year Storm Event =	**1.2**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
50-Year Storm Event =	**2.0**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.44	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.44	acres
100-Year Storm Event=	**2.4**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 22a

Watershed Type	m	b	A
A	-0.00625	0.04	0.50

Length of Longest Flowpath =	545	feet
	0.10	miles
Upper Elevation =	1301.68	feet
Lower Elevation =	1298.93	feet
Slope of Longest Flowpath =	26.64	ft/mi
Kb =	0.0419	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.4	
9	3.86	9.1	
10	3.66	9.3	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.4	
9	5.39	8.0	
10	5.10	8.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.1	
9	6.08	7.7	
10	5.76	7.8	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres

10-Year Storm Event = **1.4** cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres

50-Year Storm Event = **2.3** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.50	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.50	acres

100-Year Storm Event= **2.7** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 23

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
9	3.86	6.5	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
9	5.39	5.7	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
9	6.08	5.5	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
10-Year Storm Event =	**1.3**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
50-Year Storm Event =	**2.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
100-Year Storm Event=	**2.6**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 24

Watershed Type	m	b	A
A	-0.00625	0.04	0.48

Length of Longest Flowpath =	320	feet
	0.06	miles
Upper Elevation =	1288.22	feet
Lower Elevation =	1286.18	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0420	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	6.0	
9	3.86	6.5	
10	3.66	6.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	5.3	
9	5.39	5.7	
10	5.10	5.9	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	5.0	
9	6.08	5.5	
10	5.76	5.6	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
10-Year Storm Event =	**1.3**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
50-Year Storm Event =	**2.2**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.48	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.48	acres
100-Year Storm Event=	**2.6**	cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 25a

Watershed Type	m	b	A
A	-0.00625	0.04	0.20

Length of Longest Flowpath =	225	feet
	0.04	miles
Upper Elevation =	1288.69	feet
Lower Elevation =	1287.31	feet
Slope of Longest Flowpath =	32.38	ft/mi
Kb =	0.0444	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.20	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.20	acres

10-Year Storm Event = **0.5** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.2	
9	3.86	5.7	
10	3.66	5.8	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.6	
9	5.39	5.0	
10	5.10	5.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.4	
9	6.08	4.8	
10	5.76	4.9	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.20	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.20	acres

50-Year Storm Event = **0.9** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.20	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.20	acres

100-Year Storm Event= **1.1** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area 26a

Watershed Type	m	b	A
A	-0.00625	0.04	0.21

Length of Longest Flowpath =	230	feet
	0.04	miles
Upper Elevation =	1305.68	feet
Lower Elevation =	1303.67	feet
Slope of Longest Flowpath =	46.14	ft/mi
Kb =	0.0442	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.21	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

10-Year Storm Event = **0.6** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	4.7	
15	3.04	5.6	
10	3.66	5.3	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.2	
15	4.24	5.0	
10	5.10	4.6	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.0	
15	4.80	4.7	
10	5.76	4.4	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.21	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

50-Year Storm Event = **1.0** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.21	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.21	acres

100-Year Storm Event= **1.1** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area 27a

Watershed Type	m	b	A
A	-0.00625	0.04	0.22

Length of Longest Flowpath =	240	feet
	0.05	miles
Upper Elevation =	1291.55	feet
Lower Elevation =	1290.02	feet
Slope of Longest Flowpath =	33.66	ft/mi
Kb =	0.0441	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.22	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.22	acres

10-Year Storm Event = **0.6** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	5.3	
15	3.04	6.3	
10	3.66	5.9	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	4.7	
15	4.24	5.6	
10	5.10	5.2	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	4.5	
15	4.80	5.3	
10	5.76	5.0	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.22	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.22	acres

50-Year Storm Event = **1.0** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.22	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.22	acres

100-Year Storm Event= **1.2** cfs

Denotes information that needs to be entered.

Project Name:	**Queen Creek: Val Vista Drive to the EMF**	Date:	**6/2/2010**
Subject:	**10-, 50-, & 100-Year Peak Discharge**	Computed By:	**MHM**
Location:	**Town of Gilbert - ST081**	Checked By:	**SAS**

AZTEC www.aztec.us

Drainage Area E01

Watershed Type	m	b	A
A	-0.00625	0.04	0.73

Length of Longest Flowpath =	625	feet
	0.12	miles
Upper Elevation =	1310.98	feet
Lower Elevation =	1307.65	feet
Slope of Longest Flowpath =	28.13	ft/mi
Kb =	0.0409	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.73	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.73	acres

10-Year Storm Event = **2.0** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	8.7	
11	3.53	9.8	
10	3.66	9.7	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	7.7	
11	4.92	8.7	
10	5.10	8.5	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	7.4	
11	5.55	8.3	
10	5.76	8.2	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.73	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.73	acres

50-Year Storm Event = **3.4** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.73	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.73	acres

100-Year Storm Event= **3.9** cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area E27

Watershed Type	m	b	A
A	-0.00625	0.04	0.03

Length of Longest Flowpath =	60	feet
	0.01	miles
Upper Elevation =	1315.69	feet
Lower Elevation =	1314.73	feet
Slope of Longest Flowpath =	84.48	ft/mi
Kb =	0.0495	

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	2.1	
11	3.53	2.4	
10	3.66	2.4	OK

Minimum 10 Min. Tc

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	1.9	
11	4.92	2.1	
10	5.10	2.1	OK

Minimum 10 Min. Tc

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	1.8	
11	5.55	2.0	
10	5.76	2.0	OK

Minimum 10 Min. Tc

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.66	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.03	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.03	acres
10-Year Storm Event =	**0.1**	cfs

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	5.10	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.03	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.03	acres
50-Year Storm Event =	**0.1**	cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.03	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.03	acres
100-Year Storm Event=	**0.2**	cfs

Denotes information that needs to be entered.

Project Name:	Queen Creek: Val Vista Drive to the EMF	Date:	6/2/2010
Subject:	10-, 50-, & 100-Year Peak Discharge	Computed By:	MHM
Location:	Town of Gilbert - ST081	Checked By:	SAS

AZTEC www.aztec.us

Drainage Area E28

Watershed Type	m	b	A
A	-0.00625	0.04	0.91

Length of Longest Flowpath =	1,000	feet
	0.19	miles
Upper Elevation =	1320.19	feet
Lower Elevation =	1314.83	feet
Slope of Longest Flowpath =	28.30	ft/mi
Kb =	0.0403	

Q=CIA **10-Year Event**

$C_{10} = C_{50}/1.20$

C (Roofs and Concrete) =	0.79	
C (Asphalt) =	0.75	
C (Desert Landscape) =	0.58	
C (Green Landscape) =	0.21	
C =	0.75	
I =	3.27	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.91	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.91	acres

10-Year Storm Event = **2.2** cfs

$Tc=11.4L^{0.50}K_b^{0.52}S^{-0.31}I^{-0.38}$

Trials **10-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	4.80	10.9	
12	3.40	12.5	
13	3.27	12.7	OK

Tc = 13.0 min

Trials **50-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	6.72	9.6	
10	5.10	10.7	
11	4.92	10.8	OK

Tc = 11.0 min

Trials **100-Year Event**

Tc (min)	I(in/hr)	Calculated Tc (min)	
5	7.56	9.2	
15	4.80	10.9	
10	5.76	10.2	OK

Minimum 10 Min. Tc

Q=CIA **50-Year Event**

C_{50} Per Town of Gilbert Engineering Standards

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.90	
C (Desert Landscape) =	0.70	
C (Green Landscape) =	0.25	
C =	0.90	
I =	4.92	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.91	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.91	acres

50-Year Storm Event = **4.0** cfs

Q=CIA **100-Year Event**

$C_{100} = C_{10}*1.25$ (0.95 maximum)

C (Roofs and Concrete) =	0.95	
C (Asphalt) =	0.94	
C (Desert Landscape) =	0.73	
C (Green Landscape) =	0.26	
C =	0.94	
I =	5.76	in/hr
A (Roofs and Concrete) =	0.00	acres
A (Asphalt) =	0.91	acres
A (Desert Landscape) =	0.00	acres
A (Green Landscape) =	0.00	acres
A (Total) =	0.91	acres

100-Year Storm Event= **4.9** cfs

Denotes information that needs to be entered.

Hydraulics

Station	Lt/Rt	Label	Inlet C	System Intensity (in/hr)	Area (acres)	Local Rational Flow (cfs)	Total Carryover Flow (cfs)	Total Inlet Rational Flow (cfs)	Inlet Type	Inlet Location	Longitudinal Slope (ft/ft)	Road Cross Slope (ft/ft)	Gutter Cross Slope (ft/ft)	Mannings n	Gutter Ditch Spread (ft)	Gutter Ditch Depth (ft)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target
206+45.00	Lt	Exist-01	0.75	3.66	0.73	2.02	0.23	2.25	Grate MAG 534-Double	On Grade	0.0034	0.0250	0.0420	0.016	10.31	0.28	1.89	0.36	<Automatic>
212+66.82	Lt	I-01a	0.75	3.45	0.45	1.25	0.00	1.25	Grate MAG 534-Double	On Grade	0.0115	0.0250	0.0420	0.016	6.48	0.19	1.01	0.23	Exist-01
213+20.00	Rt	I-02a	0.75	3.66	0.48	1.33	0.00	1.33	Grate MAG 534-Double	On Grade	0.0170	0.0250	0.0420	0.016	6.15	0.18	1.04	0.28	I-03a
192+50.00	Lt	I-08a	0.75	3.66	0.18	0.50	0.00	0.50	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	5.73	0.17	0.50	0.00	I-11a
186+00.00	Lt	I-11a	0.75	3.54	0.61	1.63	0.00	1.63	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	9.11	0.25	1.54	0.09	I-22
162+00.00	Lt	I-13a	0.75	3.66	0.63	1.74	0.00	1.74	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	9.92	0.27	1.67	0.07	I-14a
156+75.00	Lt	I-14a	0.75	3.66	0.50	1.38	0.07	1.46	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	9.26	0.26	1.44	0.02	I-14c
150+90.00	Lt	I-16	0.75	3.66	0.26	0.72	0.00	0.72	Curb MAG 206 Scupper	On Grade	0.0025	0.0200	0.0420	0.016	8.06	0.19	0.72	0.00	I-17
146+40.00	Lt	I-17	0.75	3.66	0.42	1.16	0.00	1.16	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	8.49	0.24	1.16	0.00	I-18
143+65.00	Lt	I-18	0.75	3.66	0.26	0.72	0.00	0.72	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	7.04	0.20	0.72	0.00	I-19
137+15.00	Lt	I-19	0.75	3.66	0.41	1.13	0.00	1.13	Curb MAG 206 Scupper	On Grade	0.0025	0.0240	0.0420	0.016	8.62	0.23	1.13	0.00	I-20
131+30.00	Lt	I-20	0.75	3.66	0.56	1.55	0.00	1.55	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	9.48	0.26	1.52	0.03	I-21
121+17.16	Lt	I-21	0.75	3.66	0.44	1.22	0.03	1.25	Curb MAG 206 Scupper	In Sag		0.0240	0.0420		6.63	0.18	1.25	0.00	
209+10.00	Rt	I-03a	0.75	3.66	0.40	1.11	0.28	1.39	Curb MAG 206 Scupper	On Grade	0.0047	0.0250	0.0420	0.016	8.05	0.23	1.32	0.07	I-04a
204+30.00	Rt	I-04a	0.75	3.66	0.48	1.33	0.07	1.40	Curb MAG 206 Scupper	On Grade	0.0025	0.0260	0.0420	0.016	8.90	0.25	1.39	0.01	I-06a
200+00.00	Rt	I-06a	0.75	3.66	0.44	1.22	0.01	1.22	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	8.16	0.23	1.22	0.01	I-07a
195+50.00	Rt	I-07a	0.75	3.66	0.48	1.33	0.01	1.34	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	8.44	0.24	1.31	0.02	I-09a
192+00.00	Rt	I-09a	0.75	3.66	0.35	0.97	0.02	0.99	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	7.52	0.21	0.99	0.00	I-10a
186+34.00	Rt	I-10a	0.75	3.66	0.58	1.60	0.00	1.60	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	9.06	0.25	1.52	0.08	I-12a
180+75.00	Rt	I-12a	0.75	3.52	0.48	1.33	0.08	1.41	Grate MAG 534-Double	On Grade	0.0034	0.0250	0.0420	0.016	8.62	0.24	1.24	0.18	<Automatic>
180+62.31	Lt	I-22	0.75	3.66	0.50	1.38	0.09	1.48	Grate MAG 534-Double	On Grade	0.0034	0.0250	0.0420	0.016	8.77	0.24	1.29	0.19	<Automatic>
167+10.00	Rt	Exist-10	0.75	3.66	0.14	0.39	0.00	0.39	Curb MAG 206 Scupper	On Grade	0.0200	0.0200	0.0420	0.016	4.02	0.11	0.39	0.00	I-15b
221+05.00	Lt	I-23	0.75	3.66	0.48	1.33	0.00	1.33	Grate MAG 534-Double	In Sag		0.0200	0.0420		7.90	0.19	1.33	0.00	
141+40.00	Lt	I-25	0.75	3.66	0.20	0.55	0.00	0.55	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	6.35	0.18	0.55	0.00	I-19
196+70.00	Lt	I-05a	0.75	3.16	0.93	2.22	0.00	2.22	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	10.27	0.28	1.93	0.30	I-26a
194+50.00	Lt	I-26a	0.75	3.66	0.21	0.58	0.35	0.93	Curb MAG 206 Scupper	On Grade	0.0034	0.0250	0.0420	0.016	7.32	0.21	0.93	0.00	I-08a
192+50.00	Lt	I-08b	0.7	3.66	0.26	0.67	0.00	0.67	Ditch MAG 537 (Single)	In Sag					4.37	0.09	0.67	0.00	
153+70.45	Rt	I-15f	0.75	2.64	0.17	0.34	0.00	0.34	Ditch MAG 537 (Single)	In Sag					2.28	0.07	0.34	0.00	
153+70.54	Rt	I-15e	0.75	3.66	0.31	0.86	0.16	1.02	Grate MAG 534-Double	On Grade	0.0034	0.0250	0.0420	0.016	7.59	0.21	0.91	0.11	<Automatic>
157+00.00	Rt	I-15d	0.75	3.66	0.47	1.30	0.14	1.44	Grate MAG 534-Double	On Grade	0.0025	0.0250	0.0420	0.016	9.22	0.25	1.28	0.16	I-15e
162+00.00	Rt	I-15b	0.75	3.66	0.48	1.33	0.00	1.33	Grate MAG 534-Double	On Grade	0.0025	0.0250	0.0420	0.016	8.94	0.25	1.19	0.14	I-15d
166+90.00	Rt	I-15a	0.64	3.41	0.96	2.13	0.00	2.13	Ditch MAG 535	In Sag					3.81	0.16	2.13	0.00	
168+30.00	Rt	I-E09	0	0.00	0.00	0.00	0.00	0.00	Ditch MAG 535	In Sag					0.00	0.00	0.00	0.00	
186+00.00	Lt	I-11b	0.67	3.66	1.18	2.91	0.00	2.91	Generic Default 100%	In Sag		0.0200	0.0200		0.00	0.00	2.91	0.00	
154+65.00	Lt	I-14c	0.75	3.66	0.28	0.77	0.02	0.79	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	7.32	0.21	0.79	0.00	I-27
222+84.74	Rt	I-E28	0.75	3.29	0.91	2.26	0.00	2.26	Grate MAG 534-Double	On Grade	0.0025	0.0260	0.0420	0.016	10.70	0.30	1.96	0.31	I-E27
222+44.86	Rt	I-E27	0.75	3.53	0.03	0.08	0.34	0.42	Grate MAG 534-Double	On Grade	0.0200	0.0200	0.0420	0.016	4.19	0.12	0.37	0.05	I-24
221+05.00	Rt	I-24	0.75	3.66	0.41	1.13	0.05	1.18	Grate MAG 534-Double	In Sag		0.0250	0.0420		6.18	0.18	1.18	0.00	
152+35.00	Lt	I-27	0.75	4.80	0.21	0.76	0.00	0.76	Curb MAG 206 Scupper	On Grade	0.0025	0.0250	0.0420	0.016	7.21	0.20	0.76	0.00	I-16

Label	Upstream Node	Downstream Node	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Average Velocity (ft/s)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line (ft)
Exist-01	Exist-01	Exist-01	1.89	106	0.0158	15 inch	0.013	1,299.85	1,298.17	1.54	1,307.65	1,301.76	1,303.75	1,303.66
P-01a	I-01a	O-01a	1.94	93	0.0084	18 inch	0.013	1,300.48	1,299.70	1.10	1,310.56	1,306.50	1,309.03	1,309.00
P-02a	I-02a	I-01a	1.04	87	0.0043	15 inch	0.013	1,307.37	1,307.00	0.85	1,311.33	1,310.56	1,309.08	1,309.06
P-12a	I-12a	O-12a	2.43	61	0.0377	18 inch	0.013	1,291.50	1,289.20	1.37	1,298.98	1,296.00	1,298.53	1,298.50
P-22	I-22	I-12a	1.29	70	0.0061	15 inch	0.013	1,295.43	1,295.00	1.05	1,298.94	1,298.98	1,298.59	1,298.56
P-23	I-23	O-23	1.33	22	0.0045	15 inch	0.013	1,312.20	1,312.10	1.08	1,314.83	1,315.10	1,314.01	1,314.00
P-08b	I-08b	O-08b	0.67	74	0.0649	15 inch	0.013	1,296.10	1,291.30	0.55	1,300.50	1,297.10	1,300.11	1,300.10
P-15e	I-15e	I-15f	0.91	18	0.0228	15 inch	0.013	1,287.49	1,287.08	0.74	1,290.49	1,289.33	1,289.33	1,289.33
P-15f	I-15f	J-15i	1.00	196	0.0064	24 inch	0.013	1,286.33	1,285.08	0.32	1,289.33	1,291.58	1,290.94	1,290.94
P-15j	J-15i	O-15	3.36	50	0.0332	24 inch	0.013	1,285.08	1,283.42	1.07	1,291.58	1,288.42	1,290.93	1,290.92
P-15i	J-15d	J-15i	2.89	133	0.0138	24 inch	0.013	1,286.91	1,285.08	0.92	1,291.91	1,291.58	1,290.97	1,290.95
P-15d	I-15d	J-15d	1.28	16	0.0100	15 inch	0.013	1,287.82	1,287.66	1.04	1,291.32	1,291.91	1,290.99	1,290.99
P-15h	J-15c	J-15d	2.35	170	0.0025	24 inch	0.013	1,287.34	1,286.91	0.75	1,292.34	1,291.91	1,290.99	1,290.97
P-15g	J-15b	J-15c	2.74	330	0.0025	24 inch	0.013	1,288.16	1,287.34	0.87	1,292.69	1,292.34	1,291.04	1,290.99
P-15b	I-15b	J-15b	1.19	16	0.0100	15 inch	0.013	1,289.07	1,288.91	0.97	1,292.57	1,292.69	1,291.06	1,291.05
P-E09	I-E09	I-15a	0.00	140	0.0029	15 inch	0.013	1,291.79	1,291.39	0.00	1,294.09	1,294.09	1,291.99	1,291.99
P-15a	I-15a	J-15a	2.13	160	0.0134	15 inch	0.013	1,291.39	1,289.24	5.25	1,294.09	1,293.99	1,291.97	1,291.18
P-15c	J-15a	J-15b	2.09	330	0.0010	18 inch	0.013	1,288.99	1,288.66	1.18	1,293.99	1,292.69	1,291.17	1,291.04
P-11b	I-11b	O-11b	2.91	69	0.0507	15 inch	0.013	1,295.50	1,292.00	2.37	1,300.50	1,297.00	1,300.14	1,300.00
P-24	I-24	I-E27	1.18	140	0.0019	15 inch	0.013	1,311.76	1,311.50	2.18	1,314.43	1,314.73	1,313.00	1,312.95
P-E27	I-E27	I-E28	1.50	40	0.0018	18 inch	0.013	1,311.50	1,311.43	2.25	1,314.73	1,314.83	1,312.95	1,312.94
P-29	I-E28	Ex-14	3.36	12	0.0017	18 inch	0.013	1,311.43	1,311.41	2.69	1,314.83	1,314.91	1,312.92	1,312.91

Worksheet for STA 182+96.00 to STA 183+57.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	12.80	ft^3/s

Results

Normal Depth	1.11	ft
Flow Area	6.52	ft^2
Wetted Perimeter	10.08	ft
Hydraulic Radius	0.65	ft
Top Width	9.76	ft
Critical Depth	0.73	ft
Critical Slope	0.02127	ft/ft
Velocity	1.96	ft/s
Velocity Head	0.06	ft
Specific Energy	1.17	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.11	ft
Critical Depth	0.73	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02127	ft/ft

Worksheet for STA 184+18.00 to STA 184+59.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	12.70	ft^3/s

Results

Normal Depth	1.10	ft
Flow Area	6.48	ft^2
Wetted Perimeter	10.05	ft
Hydraulic Radius	0.64	ft
Top Width	9.73	ft
Critical Depth	0.72	ft
Critical Slope	0.02129	ft/ft
Velocity	1.96	ft/s
Velocity Head	0.06	ft
Specific Energy	1.16	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.10	ft
Critical Depth	0.72	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02129	ft/ft

Worksheet for STA 185+47.00 to STA 185+20.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	12.90	ft^3/s

Results

Normal Depth	1.11	ft
Flow Area	6.56	ft^2
Wetted Perimeter	10.10	ft
Hydraulic Radius	0.65	ft
Top Width	9.79	ft
Critical Depth	0.73	ft
Critical Slope	0.02125	ft/ft
Velocity	1.97	ft/s
Velocity Head	0.06	ft
Specific Energy	1.17	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.11	ft
Critical Depth	0.73	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02125	ft/ft

Worksheet for STA 188+04.00 to STA 186+08.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	12.80	ft^3/s

Results

Normal Depth	1.11	ft
Flow Area	6.52	ft^2
Wetted Perimeter	10.08	ft
Hydraulic Radius	0.65	ft
Top Width	9.76	ft
Critical Depth	0.73	ft
Critical Slope	0.02127	ft/ft
Velocity	1.96	ft/s
Velocity Head	0.06	ft
Specific Energy	1.17	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.11	ft
Critical Depth	0.73	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02127	ft/ft

Worksheet for STA 189+44.00 to STA 188+63.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	11.10	ft^3/s

Results

Normal Depth	1.04	ft
Flow Area	5.86	ft^2
Wetted Perimeter	9.57	ft
Hydraulic Radius	0.61	ft
Top Width	9.28	ft
Critical Depth	0.68	ft
Critical Slope	0.02169	ft/ft
Velocity	1.89	ft/s
Velocity Head	0.06	ft
Specific Energy	1.10	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.04	ft
Critical Depth	0.68	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02169	ft/ft

Worksheet for STA 191+13.00 to STA 190+81.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	11.10	ft^3/s

Results

Normal Depth	1.04	ft
Flow Area	5.86	ft^2
Wetted Perimeter	9.57	ft
Hydraulic Radius	0.61	ft
Top Width	9.28	ft
Critical Depth	0.68	ft
Critical Slope	0.02169	ft/ft
Velocity	1.89	ft/s
Velocity Head	0.06	ft
Specific Energy	1.10	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.04	ft
Critical Depth	0.68	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02169	ft/ft

Worksheet for STA 192+52.00 to STA 191+60.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	11.00	ft^3/s

Results

Normal Depth	1.04	ft
Flow Area	5.82	ft^2
Wetted Perimeter	9.54	ft
Hydraulic Radius	0.61	ft
Top Width	9.25	ft
Critical Depth	0.67	ft
Critical Slope	0.02171	ft/ft
Velocity	1.89	ft/s
Velocity Head	0.06	ft
Specific Energy	1.09	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.04	ft
Critical Depth	0.67	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02171	ft/ft

Worksheet for STA 197+25.00 to STA 193+51.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	9.70	ft^3/s

Results

Normal Depth	0.98	ft
Flow Area	5.31	ft^2
Wetted Perimeter	9.13	ft
Hydraulic Radius	0.58	ft
Top Width	8.85	ft
Critical Depth	0.63	ft
Critical Slope	0.02209	ft/ft
Velocity	1.83	ft/s
Velocity Head	0.05	ft
Specific Energy	1.03	ft
Froude Number	0.42	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.98	ft
Critical Depth	0.63	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02209	ft/ft

Worksheet for STA 200+32.00 to STA 197+98.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	8.20	ft^3/s

Results

Normal Depth	0.91	ft
Flow Area	4.68	ft^2
Wetted Perimeter	8.60	ft
Hydraulic Radius	0.54	ft
Top Width	8.34	ft
Critical Depth	0.58	ft
Critical Slope	0.02261	ft/ft
Velocity	1.75	ft/s
Velocity Head	0.05	ft
Specific Energy	0.95	ft
Froude Number	0.41	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.91	ft
Critical Depth	0.58	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02261	ft/ft

Worksheet for STA 203+23.00 to STA 200+90.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	6.70	ft^3/s

Results

Normal Depth	0.83	ft
Flow Area	4.03	ft^2
Wetted Perimeter	8.01	ft
Hydraulic Radius	0.50	ft
Top Width	7.78	ft
Critical Depth	0.52	ft
Critical Slope	0.02326	ft/ft
Velocity	1.66	ft/s
Velocity Head	0.04	ft
Specific Energy	0.87	ft
Froude Number	0.41	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.83	ft
Critical Depth	0.52	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02326	ft/ft

Worksheet for STA 204+58.00 to STA 203+97.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	6.10	ft^3/s

Results

Normal Depth	0.79	ft
Flow Area	3.76	ft^2
Wetted Perimeter	7.75	ft
Hydraulic Radius	0.49	ft
Top Width	7.53	ft
Critical Depth	0.50	ft
Critical Slope	0.02356	ft/ft
Velocity	1.62	ft/s
Velocity Head	0.04	ft
Specific Energy	0.83	ft
Froude Number	0.40	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.79	ft
Critical Depth	0.50	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02356	ft/ft

Worksheet for STA 206+26.00 to STA 205+25.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00340	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.60	ft^3/s

Results

Normal Depth	0.61	ft
Flow Area	2.55	ft^2
Wetted Perimeter	6.48	ft
Hydraulic Radius	0.39	ft
Top Width	6.30	ft
Critical Depth	0.37	ft
Critical Slope	0.02541	ft/ft
Velocity	1.41	ft/s
Velocity Head	0.03	ft
Specific Energy	0.65	ft
Froude Number	0.39	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.61	ft
Critical Depth	0.37	ft
Channel Slope	0.00340	ft/ft
Critical Slope	0.02541	ft/ft

Worksheet for STA 208+12.00 to STA 206+76.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00470	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.30	ft^3/s

Results

Normal Depth	0.54	ft
Flow Area	2.13	ft^2
Wetted Perimeter	5.97	ft
Hydraulic Radius	0.36	ft
Top Width	5.81	ft
Critical Depth	0.35	ft
Critical Slope	0.02573	ft/ft
Velocity	1.55	ft/s
Velocity Head	0.04	ft
Specific Energy	0.58	ft
Froude Number	0.45	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.54	ft
Critical Depth	0.35	ft
Channel Slope	0.00470	ft/ft
Critical Slope	0.02573	ft/ft

Worksheet for STA 209+36.00 to STA 208+71.00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00470	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	3.00	ft^3/s

Results

Normal Depth	0.52	ft
Flow Area	1.98	ft^2
Wetted Perimeter	5.78	ft
Hydraulic Radius	0.34	ft
Top Width	5.64	ft
Critical Depth	0.34	ft
Critical Slope	0.02610	ft/ft
Velocity	1.51	ft/s
Velocity Head	0.04	ft
Specific Energy	0.56	ft
Froude Number	0.45	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.52	ft
Critical Depth	0.34	ft
Channel Slope	0.00470	ft/ft
Critical Slope	0.02610	ft/ft

Worksheet for STA 212+23.18 to STA 210+75.10

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.00350	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	0.70	ft^3/s

Results

Normal Depth	0.26	ft
Flow Area	0.78	ft^2
Wetted Perimeter	3.93	ft
Hydraulic Radius	0.20	ft
Top Width	3.85	ft
Critical Depth	0.14	ft
Critical Slope	0.03283	ft/ft
Velocity	0.90	ft/s
Velocity Head	0.01	ft
Specific Energy	0.28	ft
Froude Number	0.35	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.26	ft
Critical Depth	0.14	ft
Channel Slope	0.00350	ft/ft
Critical Slope	0.03283	ft/ft

Worksheet for STA 213+75.00 to STA 212+96.50

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.033	
Channel Slope	0.01150	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	2.00	ft
Discharge	0.30	ft^3/s

Results

Normal Depth	0.12	ft
Flow Area	0.29	ft^2
Wetted Perimeter	2.87	ft
Hydraulic Radius	0.10	ft
Top Width	2.83	ft
Critical Depth	0.08	ft
Critical Slope	0.03814	ft/ft
Velocity	1.04	ft/s
Velocity Head	0.02	ft
Specific Energy	0.14	ft
Froude Number	0.58	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.12	ft
Critical Depth	0.08	ft
Channel Slope	0.01150	ft/ft
Critical Slope	0.03814	ft/ft

Appendix C:

Retention Calculations

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 1:
Areas 01a, 01b, and 02a

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.85	0.90	0.77
Desert Landscape	0.48	0.70	0.34
Green Landscape	0.00	0.25	0.00
Totals	1.33		1.10

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	57,935	ft^2
Total Area =	1.33	acre
C Value =	0.83	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**10,191**	cu.ft.
V_{req} =	**0.23**	acre-feet

Basin 1-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1306.50	3,085	0	0
	1307.50	4,092	3,576	3,576
	1308.50	5,200	4,635	8,211
HW	1309.00	5,810	2,751	10,962

Total Retention =	**10,962**	**cu.ft.**
V_{prov} =	**0.25**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 5:
Areas 05a and 05b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.93	0.90	0.84
Desert Landscape	0.09	0.70	0.06
Green Landscape	0.00	0.25	0.00
Totals	1.02		0.90

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	44,431	ft^2
Total Area =	1.02	acre
C Value =	0.88	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**8,331**	cu.ft.
V_{req} =	**0.19**	acre-feet

Basin 5-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1302.20	1,199	0	0
	1303.20	1,861	1,518	1,518
HW	1304.20	2,623	2,231	3,749

Total Retention =	**3,749**	**cu.ft.**
V_{prov} =	**0.09**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.2' deep water = 3.2 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 8:
Areas 08a, 08b and 08c

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.18	0.90	0.16
Desert Landscape	0.47	0.70	0.33
Green Landscape	0.00	0.25	0.00
Totals	0.65		0.49

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	28,314	ft^2
Total Area =	0.65	acre
C Value =	0.76	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**4,545**	cu.ft.
V_{req} =	**0.10**	acre-feet

Basin 8-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1297.10	1,903	0	0
	1298.10	3,008	2,435	2,435
	1299.10	4,213	3,594	6,028
HW	1300.10	5,518	4,851	10,879

Total Retention =	**10,879**	**cu.ft.**
V_{prov} =	**0.25**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.2' deep water = 3.2 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 11:
Areas 11a, 11b and 11c

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.61	0.90	0.55
Desert Landscape	0.57	0.70	0.40
Green Landscape	0.00	0.25	0.00
Totals	1.18		0.95

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	51,401	ft^2
Total Area =	1.18	acre
C Value =	0.80	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**8,775**	cu.ft.
V_{req} =	**0.20**	acre-feet

Basin 11-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1297.00	1,903	0	0
	1298.00	3,008	2,435	2,435
	1299.00	4,213	3,594	6,028
HW	1300.00	5,518	4,851	10,879

Total Retention =	**10,879**	**cu.ft.**
V_{prov} =	**0.25**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.2' deep water = 3.2 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 12: Simonton

Areas 02b, 03a, 03b, 03c, 04a, 04b, 04c, 04d, 06a, 06b, 07a, 07b, 07c 09a, 09b, 10a, 10b, 10c, 10d, 12a, 12b, 12c, 12d, 12e, 22a

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	3.60	0.90	3.24
Desert Landscape	2.73	0.70	1.91
Green Landscape	0.00	0.25	0.00
Totals	6.33		5.15

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	275,735	ft^2
Total Area =	6.33	acre
C Value =	0.81	weighted runoff coefficient

V_{req} = DAC

	V_{req} =	**47,680**	cu.ft.	
Addtnl. Vol. from Others	V_{add} =	**9,913**	cu.ft.	Greenfield Rd. Project
	V_{req} =	**57,593**	cu.ft.	
	V_{req} =	**1.32**	acre-feet	

Basin 12-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1296.00	19,190	0	0
	1296.50	20,691	9,968	9,968
	1297.50	23,769	22,212	32,180
HW	1298.50	26,947	25,341	57,522

Total Retention =	**57,522**	**cu.ft.**
V_{prov} =	**1.32**	**acre-feet**

*Volume is calculated using conic method

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

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Basin 13:
Areas 13a and 13b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.63	0.90	0.57
Desert Landscape	0.41	0.70	0.29
Green Landscape	0.00	0.25	0.00
Totals	1.04		0.85

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	45,302	ft^2
Total Area =	1.04	acre
C Value =	0.82	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**7,905**	cu.ft.
V_{req} =	**0.18**	acre-feet

Basin 13-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1290.00	1,491	0	0
	1290.50	1,891	844	844
HW	1291.50	2,819	2,340	3,183

Basin 13-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1290.00	1,449	0	0
	1290.50	1,843	821	821
HW	1291.50	2,741	2,277	3,098

Basin 13-3:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1290.00	1,371	0	0
	1290.50	1,714	770	770
HW	1291.50	2,508	2,098	2,868

Total Retention =	**9,149**	**cu.ft.**
V_{prov} =	**0.21**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Basin 14:
Areas 14a, 14b and 14c

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.50	0.90	0.45
Desert Landscape	0.27	0.70	0.19
Green Landscape	0.00	0.25	0.00
Totals	0.77		0.64

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	33,541	ft^2
Total Area =	0.77	acre
C Value =	0.83	weighted runoff coefficient

V_{req} = DAC

V_{req} = **5,915** cu.ft.
V_{req} = **0.14** acre-feet

Basin 14-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1289.00	1,938	0	0
	1289.50	2,112	1,012	1,012
HW	1290.50	3,341	2,703	3,715

Basin 14-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1289.00	1,812	0	0
	1289.50	2,657	1,111	1,111
HW	1290.50	3,168	2,909	4,019

Total Retention = 7,735 cu.ft.
V_{prov} = **0.18 acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 15:
Areas 15a, 15b, 15c, 15d, 15e and 15f

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	1.73	0.90	1.56
Desert Landscape	1.32	0.70	0.92
Green Landscape	0.00	0.25	0.00
Totals	3.05		2.48

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	132,858	ft^2
Total Area =	3.05	acre
C Value =	0.81	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**22,965**	cu.ft.
V_{req} =	**0.53**	acre-feet

Basin 15-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1288.42	7,309	0	0
	1289.42	9,894	8,569	8,569
	1290.42	11,489	10,682	19,251
HW	1290.92	12,308	5,948	25,199

Total Retention =	**25,199**	**cu.ft.**
V_{prov} =	**0.58**	**acre-feet**

*Volume is calculated using conic method

Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 16:
Areas 16a and 16b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.13	0.90	0.12
Desert Landscape	0.06	0.70	0.04
Green Landscape	0.00	0.25	0.00
Totals	0.19		0.16

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	8,276	ft^2
Total Area =	0.19	acre
C Value =	0.84	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**1,472**	cu.ft.
V_{req} =	**0.03**	acre-feet

Basin 16-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1287.60	431	0	0
	1288.60	1,424	879	879
HW	1289.60	1,611	1,517	2,396

Total Retention =	**2,396**	**cu.ft.**
V_{prov} =	**0.06**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Basin 17:
Areas 17a and 17b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.42	0.90	0.38
Desert Landscape	0.27	0.70	0.19
Green Landscape	0.00	0.25	0.00
Totals	0.69		0.57

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	30,056	ft^2
Total Area =	0.69	acre
C Value =	0.82	weighted runoff coefficient

V_{req} = DAC

V_{req} = **5,248** cu.ft.
V_{req} = **0.12** acre-feet

Basin 17-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1286.60	1,272	0	0
	1287.10	1,676	735	735
HW	1288.10	2,570	2,107	2,842

Basin 17-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1286.60	1,376	0	0
	1287.10	1,763	783	783
HW	1288.10	2,693	2,212	2,994

Total Retention = 5,836 cu.ft.
V_{prov} = **0.13 acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 18:
Areas 18a and 18b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.26	0.90	0.23
Desert Landscape	0.09	0.70	0.06
Green Landscape	0.00	0.25	0.00
Totals	0.35		0.30

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	15,246	ft^2
Total Area =	0.35	acre
C Value =	0.85	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**2,749**	cu.ft.
V_{req} =	**0.06**	acre-feet

Basin 18-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1285.70	970	0	0
	1286.70	1,719	1,327	1,327
HW	1287.70	2,581	2,135	3,462

Total Retention =	**3,462**	**cu.ft.**
V_{prov} =	**0.08**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 19:
Areas 19a and 19b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.41	0.90	0.37
Desert Landscape	0.23	0.70	0.16
Green Landscape	0.00	0.25	0.00
Totals	0.64		0.53

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	27,878	ft^2
Total Area =	0.64	acre
C Value =	0.83	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**4,906**	cu.ft.
V_{req} =	**0.11**	acre-feet

Basin 19-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1283.30	822	0	0
	1284.30	1,548	1,166	1,166
HW	1285.30	2,383	1,951	3,117

Basin 19-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1283.30	814	0	0
	1284.30	1,472	1,127	1,127
HW	1285.30	2,033	1,745	2,872

Total Retention =	**5,988**	**cu.ft.**
V_{prov} =	**0.14**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Basin 20:
Areas 20a and 20b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.56	0.90	0.50
Desert Landscape	0.24	0.70	0.17
Green Landscape	0.00	0.25	0.00
Totals	0.80		0.67

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	34,848	ft^2
Total Area =	0.80	acre
C Value =	0.84	weighted runoff coefficient

V_{req} = DAC

V_{req} = **6,220** cu.ft.
V_{req} = **0.14** acre-feet

Basin 20-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1281.90	1,067	0	0
	1282.90	1,833	1,433	1,433
HW	1283.90	2,713	2,259	3,692

Basin 20-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1281.90	947	0	0
	1282.90	1,750	1,328	1,328
HW	1283.90	2,664	2,191	3,519

Total Retention = 7,211 cu.ft.
V_{prov} = **0.17 acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Basin 21:
Areas 21a and 21b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.44	0.90	0.40
Desert Landscape	0.21	0.70	0.15
Green Landscape	0.00	0.25	0.00
Totals	0.65		0.54

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	28,314	ft^2
Total Area =	0.65	acre
C Value =	0.84	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**5,026**	cu.ft.
V_{req} =	**0.12**	acre-feet

Basin 21-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1280.80	1,271	0	0
	1281.80	1,852	1,553	1,553
HW	1282.80	2,490	2,163	3,716

Basin 21-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1280.80	497	0	0
	1281.80	1,074	767	767
HW	1282.80	1,709	1,379	2,146

Total Retention =	**5,862**	**cu.ft.**
V_{prov} =	**0.13**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 25:
Areas 25a and 25b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.20	0.90	0.18
Desert Landscape	0.11	0.70	0.08
Green Landscape	0.00	0.25	0.00
Totals	0.31		0.26

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	13,504	ft^2
Total Area =	0.31	acre
C Value =	0.83	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**2,379**	cu.ft.
V_{req} =	**0.05**	acre-feet

Basin 25-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1285.60	1,613	0	0
	1286.10	2,015	905	905
HW	1287.10	3,371	2,664	3,569

Total Retention =	**3,569**	**cu.ft.**
V_{prov} =	**0.08**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 26:
Areas 26a and 26b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.21	0.90	0.19
Desert Landscape	0.09	0.70	0.06
Green Landscape	0.00	0.25	0.00
Totals	0.30		0.25

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	13,068	ft^2
Total Area =	0.30	acre
C Value =	0.84	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**2,333**	cu.ft.
V_{req} =	**0.05**	acre-feet

Basin 26-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1301.40	1,288	0	0
	1302.40	1,985	1,624	1,624
HW	1303.40	2,782	2,372	3,996

Total Retention =	**3,996**	**cu.ft.**
V_{prov} =	**0.09**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.2' deep water = 3.2 hours

Site:	Queen Creek Road - Val Vista Drive to the EMF
Location:	
Description:	Onsite and Offsite Retention
Reference:	Town of Gilbert Public Works and Engineering Standards and Details

Basin 27:
Areas 27a and 27b

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.22	0.90	0.20
Desert Landscape	0.15	0.70	0.11
Green Landscape	0.00	0.25	0.00
Totals	0.37		0.30

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	16,117	ft^2
Total Area =	0.37	acre
C Value =	0.82	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**2,805**	cu.ft.
V_{req} =	**0.06**	acre-feet

Basin 27-1:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
	1287.60	431	0	0
	1288.60	1,424	879	879
HW	1289.60	1,611	1,517	2,396

Total Retention =	**2,396**	**cu.ft.**
V_{prov} =	**0.06**	**acre-feet**

*Volume is calculated using conic method

Perc. rate = 8 min/in.
Time to Perc.1.5' deep water = 2.4 hours

Basin Ex-2:
Areas 23 and Existing property

Based on the Hydrology Report for The Retail Shopping Center, the existing retention basin already accounts for the half street along the property. This project will be adding a portion of the bridge into the existing retention basin. The following calculations are for just the increase of volume due to the additional area draining to this basin.

Ground Cover	A (Acres)	C (50 yr)	C x A
Roofs and Concrete	0.00	0.95	0.00
Asphalt	0.15	0.90	0.14
Desert Landscape	0.00	0.70	0.00
Agriculture	0.00	0.25	0.00
Totals	0.15		0.14

50-Year, 24-Hour Rainfall Depth (D)	3	Inches
Reduced Rainfall Depth (0.85 X D)	2.55	Inches
Total Area =	6,534	ft^2
Total Area =	0.15	acre
C Value =	0.90	weighted runoff coefficient

V_{req} = DAC

V_{req} =	**1,250**	cu.ft.
V_{req} =	**0.03**	acre-feet

The additional volume required will be retained within the foot of freeboard provided.
The existing high water elevation is 1314.0 and the new high water elevation is 1314.3

Additional Volume in Basin Ex-2:

	Elevation	Area (ft^2)	Incremental Volume (ft^3)	Accumulated Volume* (ft^3)
Old HW	1314.00	4,261	0	0
	1314.15	4,564	662	662
New HW	1314.30	4,870	707	1,369

Total Retention = 1,369 cu.ft.

*Volume is calculated using conic method